Transnet Pipelines

an Operating Division **TRANSNET SOC LTD**

[Registration Number 1990/000900/30]

REQUEST FOR PROPOSAL (RFP)

FOR THE PROVISION OF CLEANING AND HYGIENE SERVICES AT TRANSNET PIPELINES SITE OFFICES, CUTLER COMPLEX, ISLAND VIEW IN DURBAN FOR A PERIOD OF THREE (3) YEARS

RFP NUMBER	**: TPL/2023/09/0003/43847/RFP**
ISSUE DATE	**: 01 March 2024**
COMPULSORY BRIEFING	**: 14 March 2024**
CLOSING DATE	**: 26 March 2024**
CLOSING TIME	**: 12h00pm**
TENDER VALIDITY PERIOD	**: 180 business days from closing date**

Contents

Number Heading

T1.1 TENDER NOTICE AND INVITATION TO TENDER

SECTION 1: NOTICE TO TENDERERS

1. INVITATION TO TENDER

Responses to this Tender [hereinafter referred to as a **Tender**] are requested from persons, companies, close corporations or enterprises [hereinafter referred to as a Tenderer].

DESCRIPTION	**The Provision of Cleaning and Hygiene Services at Transnet Pipelines Site Offices, Cutler Complex, Island View in Durban for a period of three (3) years**
TENDER DOWNLOADING	**This Tender may be downloaded directly from the National Treasury eTender Publication Portal at www.etenders.gov.za and the Transnet website at https://transnetetenders.azurewebsites.net (please use Google Chrome to access Transnet link) FREE OF CHARGE.**

COMPULSORY TENDER CLARIFICATION MEETING	A Compulsory Tender Clarification Meeting will be conducted at **TPL Site Offices at corner of Trinidad and Iran Road, Cutler Complex, Island View** on the **14 March 2024,** at **10:00am [10 O'clock]** for a period of ± 2 (two) hours. [Tenderers to provide own transportation and accommodation]. Tenderers to provide full names, company name and ID documents for a visitors permit to be arranged 24 hours before Tender Clarification Meeting. The Compulsory Tender Clarification Meeting will start punctually and information will not be repeated for the benefit of Tenderers arriving late. **A Site visit/walk will take place, tenderers are to note**: • Tenderers are required to wear safety shoes. • Tenderers without the recommended PPE will not be allowed on the site walk. • Tenderers and their employees, visitors, clients and customers entering Transnet Offices, Depots, Workshops and Stores will have to undergo breathalyser testing. • All forms of firearms are prohibited on Transnet properties and premises. • The relevant persons attending the meeting must ensure that their identity documents, passports or drivers licences are on them for inspection at the access control gates. Certificate of Attendance in the form set out in the **Returnable Schedule T2.2-01** hereto must be completed and submitted with your

	Tender as proof of attendance is required for a **compulsory** site meeting and/or tender briefing. **Tenderers are required to bring this Returnable Schedule T2.2-01 to the Compulsory Tender Clarification Meeting to be signed by the *Employer's* Representative.** **Tenderers failing to attend the compulsory tender briefing will be disqualified.**
CLOSING DATE	**Date : 26 March 2024 Time: 12:00pm** Tenderers must ensure that tenders are uploaded timeously onto the system. **If a tender is late, it will not be accepted for consideration.**

2. TENDER SUBMISSION

Transnet has implemented a new electronic tender submission system, the e-Tender Submission Portal, in line with the overall Transnet digitalization strategy where suppliers can view advertised tenders, register their information, log their intent to respond to bids and upload their bid proposals/responses on to the system.

a) The Transnet e-Tender Submission Portal can be accessed as follows:

Log on to the Transnet eTenders management platform website (https://transnetetenders.azurewebsites.net);

- Click on "ADVERTISED TENDERS" to view advertised tenders;
- Click on "SIGN IN/REGISTER – for bidder to register their information (must fill in all mandatory information);
- Click on "SIGN IN/REGISTER" - to sign in if already registered;
- Toggle (click to switch) the "Log an Intent" button to submit a bid;
- Submit bid documents by uploading them into the system against each tender selected.
- **Tenderers are required to ensure that electronic bid submissions are done at least a day before the closing date to prevent issues which they may encounter due to their internet speed, bandwidth or the size of the number of uploads they are submitting. Transnet will not be held liable for any challenges experienced by bidders as a result of the technical challenges. Please do not wait for the last hour to submit. A Tenderer can upload 30mb per upload and multiple uploads are permitted.**

b) The tender offers to this tender will be opened as soon as possible after the closing date and time. Transnet shall not, at the opening of tenders, disclose to any other company any

confidential details pertaining to the Tender Offers / information received, i.e. pricing, delivery, etc. The names and locations of the Tenderers will be divulged to other Tenderers upon request.

c) Submissions must not contain documents relating to any Tender other than that shown on the submission.

3. CONFIDENTIALITY

All information related to this RFP is to be treated with strict confidentiality. In this regard Tenderers are required to certify that they have acquainted themselves with the Non-Disclosure Agreement. All information related to a subsequent contract, both during and after completion thereof, will be treated with strict confidence. Should the need however arise to divulge any information gleaned from provision of the Works, which is either directly or indirectly related to Transnet's business, written approval to divulge such information must be obtained from Transnet.

4. DISCLAIMERS

Tenderers are hereby advised that Transnet is not committed to any course of action as a result of its issuance of this Tender and/or its receipt of a tender offer. In particular, please note that Transnet reserves the right to:

4.1. Award the business to the highest scoring Tenderer/s unless objective criteria justify the award to another tenderer.

4.2. Not necessarily accept the lowest priced tender or an alternative Tender;

4.3. Go to the open market if the quoted rates (for award of work) are deemed unreasonable;

4.4. Should the Tenderers be awarded business on strength of information furnished by the Tenderer, which after conclusion of the contract is proved to have been incorrect, Transnet reserves the right to terminate the contract;

4.5. Request audited financial statements or other documentation for the purposes of a due diligence exercise;

4.6. Not accept any changes or purported changes by the Tenderer to the tender rates after the closing date;

4.7. Verify any information supplied by a Tenderer by submitting a tender, the Tenderer/s hereby irrevocably grant the necessary consent to the Transnet to do so;

4.8. Conduct the evaluation process in parallel. The evaluation of Tenderers at any given stage must therefore not be interpreted to mean that Tenderers have necessarily passed any previous stage(s);

4.9. Unless otherwise expressly stated, each tender lodged in response to the invitation to tender shall be deemed to be an offer by the Tenderer. The Employer has the right in its sole and unfettered discretion not to accept any offer.

4.10. Not be held liable if tenderers do not provide the correct contact details during the clarification session and do not receive the latest information regarding this RFP with the possible consequence of being disadvantaged or disqualified as a result thereof.

4.11. Transnet reserves the right to exclude any Tenderers from the tender process who has been convicted of a serious breach of law during the preceding 5 [five] years including but not limited to breaches of the Competition Act 89 of 1998, as amended. Tenderers are required to indicate in tender returnable T2.2-13 [**Breach of Law**] whether or not they have been found guilty of a serious breach of law during the past 5 [five] years.

4.12. Transnet reserves the right to perform a risk analysis on the preferred tenderer to ascertain if any of the following might present an unacceptable commercial risk to the employer*:*

- *unduly high or unduly low tendered rates or amounts in the tender offer;*
- *contract data of contract provided by the tenderer; or*
- *the contents of the tender returnables which are to be included in the contract.*

5. Transnet will not reimburse any Tenderer for any preparatory costs or other work performed in connection with this Tender, whether or not the Tenderer is awarded a contract.

6. NATIONAL TREASURY'S CENTRAL SUPPLIER DATABASE

Tenderer are required to self-register on National Treasury's Central Supplier Database (CSD) which has been established to centrally administer supplier information for all organs of state and facilitate the verification of certain key supplier information. The CSD can be accessed at https://secure.csd.gov.za/. Tenderer are required to provide the following to Transnet in order to enable it to verify information on the CSD:

Supplier Number..... and Unique registration reference number.....

Transnet urges its clients, suppliers and the general public

to report any fraud or corruption to

TIP-OFFS ANONYMOUS: 0800 003 056 OR Transnet@tip-offs.com

T1.2 TENDER DATA

The conditions of tender are the Standard Conditions of Tender as contained in Annex C of the CIDB Standard for Uniformity in Engineering and Construction Works Contracts. The Standard for Uniformity in Construction Procurement was first published in Board Notice 62 of 2004 in Government Gazette No 26427 of 9 June 2004. It was subsequently amended in Board Notice 67 of 2005 in Government Gazette No 28127 of 14 October 2005, Board Notice 93 of 2006 in Government Gazette No 29138 of 18 August 2006, Board Notice No 9 of 2008 in Government Gazette No 31823 of 30 January 2009, Board Notice 86 of 2010 in Government Gazette No 33239 of 28 May 2010, Board Notice 136 of 2015 in Government Gazette 38960 of 10 July 2015 and Board Notice 423 of 2019 in Government Gazette No 42622 of 8 August 2019.

This edition incorporates the amendments made in Board Notice 423 of 2019 in Government Gazette 42622 of 8 August 2019. (see www.cidb.org.za).

The Standard Conditions of Tender make several references to Tender data for detail that apply specifically to this tender. The Tender Data shall have precedence in the interpretation of any ambiguity or inconsistency between it and the Standard Conditions of Tender.

Each item of data given below is cross-referenced in the left-hand column to the clause in the Standard Conditions of Tender to which it mainly applies.

Clause		**Data**
C.1.1	The *Employer* is	**Transnet SOC Ltd** **(Reg No. 1990/000900/30)**
C.1.2	The tender documents issued by the *Employer* comprise:	
	Part T: The Tender	
	Part T1: Tendering procedures	T1.1 Tender notice and invitation to tender T1.2 Tender data
	Part T2 : Returnable documents	T2.1 List of returnable documents T2.2 Returnable schedules
	Part C: The contract	
	Part C1: Agreements and contract data	C1.1 Form of offer and acceptance C1.2 Contract data (Part 1 & 2) C1.3 Form of Securities
	Part C2: Pricing data	C2.1 Pricing instructions C2.2 Price List

	Part C3: Scope of work	C3.1 Service Information
	Part C4: Affected Property	C4.1 Affected Property
C.1.4	The Employer's agent is:	Purchasing Manager
	Name:	Ezekhaya Sojezi
	Address:	202 Anton Lembede Street, Durban
	Tel No.	031 813 4041
	E – mail	ezekhaya.sojezi@transnet.net

C.2.1 Only those tenderers who satisfy the following eligibility criteria are eligible to submit tenders:

1. **Stage One - Eligibility with regards to attendance at the compulsory clarification meeting:**
   An authorised representative of the tendering entity or a representative of a tendering entity that intends to form a Joint Venture (JV) must attend the compulsory clarification meeting in terms C2.7

Any tenderer that fails to meet the stipulated eligibility criteria will be regarded as an unacceptable tender.

2. **Stage Two - Eligibility in terms of general and legislation qualification criteria:**
   Only those tenderers who has the following requirements are eligible to submit tenders:
   1. Proof of Bargaining Council for Contract Cleaning Certificate Services
   2. Proof of valid Letter of Good standing
   3. Proof valid proof of UIF

Any tenderer that fails to meet the stipulated eligibility criteria will be regarded as an unacceptable tender.

3. **Stage Three - Functionality: (if applicable)**

Only those tenderers who obtain the minimum qualifying score for functionality will be evaluated further in terms of price and the applicable preference point system. The minimum qualifying for score for functionality is **60** points.

The evaluation criteria for measuring functionality and the points for each criteria and, if any, each sub-criterion are as stated in C.3.11 below.

	Any tenderer that fails to meet the stipulated eligibility criteria will be regarded as an unacceptable tender.
C.2.7	The arrangements for a compulsory clarification meeting are as stated in the Tender Notice and Invitation to Tender. **Tenderers must complete and sign the attendance register.** Addenda will be issued to and tenders will only be received from those tendering entities including those entities that intends forming a joint venture appearing on the attendance register. Tenderers are also required to bring their RFP document to the briefing session and have their returnable document **T2.2-01 Certificate of Attendance** signed off by the Employer's authorised representative.
C.2.12	No alternative tender offers will be considered.
C.2.13.3	Each tender offer shall be in the **English Language.**
C.2.13.5 C2.15.1	The *Employer*'s details and identification details that are to be shown on each tender offer package are as follows: Identification details: The tender documents must be uploaded with: ▪ Name of Tenderer: ▪ Contact person and details: ▪ The Tender Number: **TPL/2023/09/0003/43847/RFP** ▪ The Tender Description: **The Provision of Cleaning and Hygiene Services at Transnet Pipelines Site Offices, Cutler Complex, Island View in Durban for a period of three (3) years** Documents must be marked for the attention of: ***Employer*'s Agent:**
C.2.13.9	Telephonic, telegraphic, facsimile or e-mailed tender offers will not be accepted.
C.2.15	The closing time for submission of tender offers is: Time: **12:00pm** on the **26 March 2024** Location: The Transnet e-Tender Submission Portal: (https://transnetetenders.azurewebsites.net); **NO LATE TENDERS WILL BE ACCEPTED**
C.2.16	The tender offer validity period is **180 business days** after the closing date. Tenderers are to note that they may be requested to extend the validity period of their tender, on the same terms and conditions, if Transnet's internal evaluation and governance approval processes has not been finalised within the validity period.

C.2.23 The tenderer is required to submit with his tender:

1. A valid Tax Clearance Certificate issued by the South African Revenue Services. **Tenderers also to provide Transnet with a TCS PIN to verify Tenderers compliance status**.

2. A **valid B-BBEE Certificate** from a Verification Agency accredited by the South African Accreditation System [**SANAS**], or a **sworn affidavit** confirming annual turnover and level of black ownership, in line with the code of good practice, together with the tender;

3. Proof of registration on the Central Supplier Database;

4. Letter of Good Standing with the Workmen's compensation fund by the tendering entity or separate Letters of Good Standing from all members of a newly constituted JV.

Note: Refer to Section T2.1 for List of Returnable Documents

C3.11 The minimum number of evaluation points for functionality is: **60**

The procedure for the evaluation of responsive tenders is Functionality, Price and Preference:

Only those tenderers who attain the minimum number of evaluation points for Functionality will be eligible for further evaluation, failure to meet the minimum threshold will result in the tender being disqualified and removed from any further consideration.

Functionality Criteria

The functionality criteria and maximum score in respect of each of the criteria are as follows:

Functionality criteria	Sub-criteria	Sub-criteria points	Maximum number of points
T2.2-03 Company Experience Tenderers are required to demonstrate their company's relevant experience with regards to the provision of Office cleaning services	Number of relevant successfully completed office cleaning services contract of high value	40	**60**
	Value of relevant successfully completed office cleaning services contract	20	

T2.2-04 Key Persons Experience	Team leader or Supervisor experience in office cleaning services	20	**30**
	Team leader or Supervisor Qualification	10	
T2.2-05 Health and Safety Requirements	Health and Safety, and Management Plan	10	**10**
Maximum possible score for Functionality			**100**

Functionality shall be scored independently by not less than 3 (three) evaluators and averaged in accordance with the following schedules:

- T2.2-03 Previous Experience
- T2.2-04 Management & CVs of Key Persons
- T2.2-05 Health and Safety Requirements

Each evaluation criteria will be assessed in terms of scores of 0, 20, 40, 60, 80 or 100

The scores of each of the evaluators will be averaged, weighted and then totalled to obtain the final score for functionality, unless scored collectively. (See CIDB Inform Practice Note #9).

Note: Any tender not complying with the above-mentioned requirements, will be regarded as non-responsive and will therefore <u>not</u> be considered for further evaluation. This note must be read in conjunction with Clause C.2.1.

C.3.11. Only tenders that achieve the minimum qualifying score for functionality will be evaluated further in accordance with the 80/20 or 90/10 preference points systems as described in Preferential Procurement Regulations.

80 where the financial value of one or more responsive tenders received have a value equal to or below R50 million, inclusive of all applicable taxes,

Thresholds	Minimum Threshold
Technical / functionality	60

Evaluation Criteria	Final Weighted Scores
Price	80
Specific goals - Scorecard	20
TOTAL SCORE:	**100**

Up to 100 minus W_1 tender evaluation points will be awarded to tenderers who complete the preferencing schedule and who are found to be eligible for the preference claimed. **Should the evidence required for any of the Specific Goals applicable in this tender not be provided, a tenderer will score zero preference points for that particular "Specific Goal".**

In terms of Transnet Preferential Procurement Policy (TPPP) and Procurement Manuals, the following preference points must be awarded to a bidder who provides the relevant required evidence for claiming points

Selected Specific Goal	Number of points allocated (80/20)
B-BBEE Level of contributor (1 or 2)	10
Company majority owned by black women	10
Non-Compliant and/or B-BBEE Level 3-8 contributors	0

The following Table represents the evidence to be submitted for claiming preference points for applicable specific goals in a particular tender:

Specific Goals	Acceptable Evidence
B-BBEE	B-BBEE Certificate / Sworn-Affidavit B-BBEE Cert case of JV, a consolidate scorecard will be accep DTIC guidelines

30% Black Women Owned Entities	B-BBEE Certificate / Sworn-Affidavit / CIPC B-BBEE Certificate (in case of JV, a consolidate scorecard will be accept) as per DTIC guidelines
50% Black Youth Owned Entities	Certified copy of ID Documents of the Owners and B-BBEE Certificate / Affidavit (in case of JV, a consolidate scorecard will be accept)
Entities Owned by People with Disability (PWD)	Certified copy of ID Documents of the Owners and Doctor's note confirming the disability and/or Employment Equity Act 1(EEA1) form.
Entities/Black People living in rural areas	Entity's Municipal/ESKOM bill or letter from Induna/chief confirming residential address not older than 3 months
South African Enterprises	CIPC Registration Documents
EME or QSE 51% Black Owned	B-BBEE Certificate / Affidavit (in case of JV, a consolidate scorecard will be accept) as per DTIC guidelines
Entities that are 51 % Black Owned	B-BBEE Certificate / Sworn-Affidavit B-BBEE Certificate (in case of JV, a consolidate scorecard will be accept) as per DTIC guidelines
Promoting exports orientated production for Job creation	Returnable section/annexure……..on job creation
Local Content and Local Production	Returnable Local Content and production Annexures
NIPP	NIPP Returnable documents
Creation of new jobs and labour intensification	Returnable section/annexure……..on job creation.
The promotion of supplier development through sub-contracting or JV for a minimum of 30% of the value of a contract to South African Companies which are: I. 30% Black Women, 51% Black Youth and 51% Black People with disabilities II. Entities with a specified minimum B-BBEE level (1 and 2) III. EMEs and/or QSEs who are 51% Black-owned	Sub-contracting agreements and Declaration / Joint Venture Agreement. Certified copy of ID Documents of the Owners and B-BBEE Certificate / Affidavit (in case of JV, a consolidate scorecard will be accept) of the sub-contracted entities.
The promotion of enterprises located in a specific province/region/municipal area for work to be done or services to be rendered in that province/region/municipal area	CIP - Registered address of entity

The maximum points for this bid are allocated as follows:

DISCRIPTION	POINTS
PRICE	80
SELECTED SPECIFIC GOAL B-BBEE Level of contribution (1 or 2)	10
Company majority owned by black women	10
Total points for Price and Specific Goals must not exceed	100

Note: Transnet reserves the right to carry out an independent audit of the tenderers scorecard components at any stage from the date of close of the tenders until completion of the contract.

C.3.13 Tender offers will only be accepted if:

1. The tenderer or any of its directors/shareholders is not listed on the Register of Tender Defaulters in terms of the Prevention and Combating of Corrupt Activities Act of 2004 as a person prohibited from doing business with the public sector;

2. the tenderer does not appear on Transnet's list for restricted tenderers and National Treasury's list of Tender Defaulters;

3. the tenderer has fully and properly completed the Compulsory Enterprise Questionnaire and there are no conflicts of interest which may impact on the tenderer's ability to perform the contract in the best interests of the Employer or potentially compromise the tender process and persons in the employ of the state.

4. Transnet reserves the right to award the tender to the tenderer who scores the highest number of points overall, unless there are **objective criteria** which will justify the award of the tender to another tenderer. Objective criteria include but are not limited to the outcome of a due diligence exercise to be conducted. The due diligence exercise may take the following factors into account inter alia;

   the tenderer:

   a) is not under restrictions, or has principals who are under restrictions, preventing participating in the employer's procurement,
   b) is not undergoing a process of being restricted by Transnet or other state institution that Transnet may be aware of,

c) can, as necessary and in relation to the proposed contract, demonstrate that he or she possesses the professional and technical qualifications, professional and technical competence, financial resources, equipment and other physical facilities, managerial capability, reliability, experience and reputation, expertise and the personnel, to perform the contract,
d) has the legal capacity to enter into the contract,
e) is not insolvent, in receivership, under Business Rescue as provided for in chapter 6 of the Companies Act, 2008, bankrupt or being wound up, has his affairs administered by a court or a judicial officer, has suspended his business activities, or is subject to legal proceedings in respect of any of the foregoing,
f) complies with the legal requirements, if any, stated in the tender data and
g) is able, in the option of the employer to perform the contract free of conflicts of interest.

C.3.17	The number of paper copies of the signed contract to be provided by the Employer is 1 (one).

T2.1 List of Returnable Documents

2.1.1 These schedules are required for pre-qualification and eligibility purposes:

T2.2-01 **Eligibility Criteria Schedule -** Certificate of attendance at Compulsory Tender Clarification Meeting

T2.2-02 **Eligibility Criteria Schedule -** General and Legislation qualification criteria

2.1.2 Stage Five as per CIDB: these schedules will be utilised for evaluation purposes:

T2.2-03 **Evaluation Schedule:** Company Experience

T2.2-04 **Evaluation Schedule:** Key Persons Experience

T2.2-05 **Evaluation Schedule:** Health & Safety Requirements

2.1.3 Returnable Schedules:

General:

T2.2-06 Authority to submit tender

T2.2-07 Record of addenda to tender documents

T2.2-08 Risk Elements

T2.1-09 Subcontracting Form

Agreement and Commitment by Tenderer:

T2.2-10: CIDB SFU ANNEX G Compulsory Enterprise Questionnaire

T2.2-11 Non-Disclosure Agreement

T2.2-12 RFP Declaration Form

T2.2-13 RFP – Breach of Law

T2.2-14 Certificate of Acquaintance with Tender Document

T2.2-15 Service Provider Integrity Pact

T2.2-16 Supplier Code of Conduct

2.1.4 Transnet Vendor Registration Form:

T2.2-17 Supplier Declaration Form

2.2 C1.1 Offer portion of Form of Offer & Acceptance

2.3 C1.2 Contract Data

2.4 C2.1 Pricing Instructions

2.5 C2.2 Price List

T2.2-01 : Eligibility Criteria Schedule:

Certificate of Attendance at Tender Clarification Meeting

This is to certify that

.....

(Company Name)

Represented by: .....

(Name and Surname)

Was represented at the compulsory tender clarification meeting

Held at:		
On (date)		Starting time:

Particulars of person(s) attending the meeting:

Name .....

Signature .....

Capacity .....

Attendance of the above company at the meeting was confirmed:

Name .....

Signature .....

For and on Behalf of the *Employers Agent.*

Date .....

T2.2-02 Eligibility Criteria

Only those tenderers who has the following requirements are eligible to submit tenders:

1. **Proof of Bargaining Council for Contract Cleaning Certificate Services**
2. **Proof of valid Letter of Good standing**
3. **Proof valid proof of UIF**

Note: Tenderers without proof of the above requirements will be disqualified.

T2.2-03 Company's Project Related Experience

1. Tenderers are required to demonstrate their company's relevant experience with regards to the provision of Office cleaning services, in relation to the Scope of *service* required. They shall supply a sufficiently detailed list of contracts, indicating the following:
    a) Name of clients,
    b) Start and end dates of office cleaning service contracts,
    c) Value of the office cleaning contracts,
    d) Scope description provided by Tenderer,
    e) Name and contact details of clients representative.
2. Tenderers are required to demonstrate their experience with regards to the following:
    a) The provision of office cleaning services of high value (>R 1 million per facility)

Index of documentation attached to this schedule:

……

……

……

……

……

……

……

……

……

Number of relevant successfully completed office cleaning services contract of high value where the Tenderer provided office cleaning services.

Criteria/ Minimum Score	% Weighting	Sub - Criteria	Score
Number of relevant successfully completed office cleaning service contract of high value where the Tenderer provided office cleaning services.	0%	Information insufficient to determine score	0
	20%	The Tenderer has at least completed 1 office cleaning service contract where the Tenderer provided office cleaning services.	8
	40%	The Tenderer has at least completed 2 office cleaning service contracts where the Tenderer provided office cleaning services.	16
	60%	The Tenderer has at least completed 3 office cleaning service contracts where the Tenderer provided office cleaning services.	24
	80%	The Tenderer has at least completed 4 office cleaning service contracts where the Tenderer provided office cleaning services.	32
	100%	The Tenderer has at least completed 5 office cleaning service contracts where the Tenderer provided office cleaning services.	40

- **References must be provided for each completed contract.**

Value of relevant successfully completed office cleaning services contract where the Tenderer provided office cleaning services.

Criteria/ Minimum Score	% Weighting	Sub - Criteria	Score
Value of relevant successfully completed office cleaning service contracts where the Tenderer provided office cleaning services.	0%	Information insufficient to determine score	0
	20%	The Tenderer has completed a cumulative (total value) office cleaning service contracts >R 1 - 2 m where the Tenderer provided office cleaning services.	4
	40%	The Tenderer has completed a cumulative (total value) office cleaning service contracts >R 2 - 3 m where the Tenderer provided office cleaning services.	8
	60%	The Tenderer has completed a cumulative (total value) office cleaning service contracts >R 3 - 4 m where the Tenderer provided office cleaning services.	12
	80%	The Tenderer has completed a cumulative (total value) office cleaning service contracts >R 4 - 5 m where the Tenderer provided office cleaning services.	16
	100%	The Tenderer has completed a cumulative (total value) office cleaning service contracts >R 5 m where the Tenderer provided office cleaning services.	20

- **References must be provided for each completed contract.**

T2.2-04 Key Persons Experience

1. Curriculum Vitae and proof of qualifications shall be provided for the following key personnel:
    a) Team Leader/Supervisor
2. Copies of qualifications and proof of attendance for training courses must have been certified by a Commissioner of Oath within the last three months and must be appended to the tender.
3. To attain the indicated scores, all requirements set forth under the various scoring categories must be attained.

Index of documentation attached to this schedule:

……

……

……

……

A. Key for scoring for team leader or Supervisor experience in office cleaning services

Team leader or Supervisor Experience **Weighting 20**	0%	Information insufficient to determine score	0
	20%	1 to 2 year experience in office cleaning services as supervisor.	4
	40%	>2 to 3 years' experience in office cleaning services as supervisor.	8
	60%	>3 to 4 years' experience in office cleaning services as supervisor.	12
	80%	>4 to 5 years' experience in office cleaning services as supervisor.	16
	100%	More than 5 years' experience in office cleaning services as supervisor.	20

B. Key for scoring Team leader or Supervisor Qualification

Team leader or Supervisor Qualifications **Weighting 10**	0%	Information insufficient to determine score	0
	20%	The CV of the Supervisor needs to demonstrate accredited qualification of the following: • Grade 10 only	2
	40%	The CV of the Supervisor needs to demonstrate accredited qualification of the following: • Grade 11 only	4
	60%	The CV of the Supervisor needs to demonstrate accredited qualification of the following: • Grade10 to 11 and proof of supervisory qualification	6
	80%	The CV of the Supervisor needs to demonstrate accredited qualification of the following: • Grade 12 or higher only	8
	100%	The CV of the Supervisor needs to demonstrate accredited qualification of the following: • Grade 12 or higher with proof of supervisory qualification	10

Signed _____ Date _____

Name _____ Position _____

Tenderer _____

T2.2-05 Company's Health & Safety Management

1. Bidders are required to submit a project specific health and safety Plan. The safety plan should be accompanied by the following documents:
    a) A valid Letter of Good standing with the Department of Labour.
    b) Safety, Policy signed and dated by the Chief Executive Officer, applicable to the company services rendered.

2. Table or outline the Roles & Responsibilities, such as the 16.2 Site Manager / Site supervisor 8.2(i) CR8.5 Safety officer, CR9.1 Risk Assessor as per the Occupational health and safety Act 85 of 1993.
3. List of job categories for the project and competencies required per category and develop a training Matrix for Supervisor who will be working on the project. This matrix must include Management and highlight training planned dates.
4. Overview of Risk Assessment process and examples for project specific activity.
5. One-year synopsis of SHE incidents, description, type, incidents related to scope of work, and describe action taken to prevent re-occurrence.
6. Complete and return with tender documentation the Contractor Safety Questionnaire included.

Index of documentation attached to this schedule:

……

……

……

……

……

……

……

1. Health and Safety, and Management Plan

Criteria/ Minimum Score	% Weighting	Sub - Criteria	Score
Health and Safety, and Management Plan Max 10 points	0%	Information insufficient to determine score	0
	20%	The Bidder has completed at least 1 of the above safety file requirements	2
	40%	The Bidder has completed at least 2 of the above safety file requirements	4
	60%	The Bidder has completed at least 3 of the above safety file requirements	6
	80%	The Bidder has completed at least 4 of the above safety file requirements	8
	100%	The Bidder has completed at least 5 or more of the above safety file requirements	10

Signed _____ Date _____

Name _____ Position _____

Bidder _____

T2.2-06: Authority to submit a Tender

Indicate the status of the tenderer by ticking the appropriate box hereunder. The tenderer must complete the certificate set out below for his category of organisation or alternatively attach a certified copy of a company / organisation document which provides the same information for the relevant category as requested here.

A - COMPANY	B - PARTNERSHIP	C - JOINT VENTURE	D - SOLE PROPRIETOR

A. Certificate for Company

I, _____ chairperson of the board of directors _____ _____, hereby confirm that by resolution of the board taken on _____ (date), Mr/Ms _____, acting in the capacity of _____, was authorised to sign all documents in connection with this tender offer and any contract resulting from it on behalf of the company.

Signed		Date	
Name		Position	Chairman of the Board of Directors

B. Certificate for Partnership

We, the undersigned, being the **key partners** in the business trading as _____ _____ hereby authorise Mr/Ms _____ acting in the capacity of _____, to sign all documents in connection with the tender offer for Contract _____ and any contract resulting from it on our behalf.

Name	**Address**	**Signature**	**Date**

NOTE: This certificate is to be completed and signed by the full number of Partners necessary to commit the Partnership. Attach additional pages if more space is required.

C. Certificate for Joint Venture

We, the undersigned, are submitting this tender offer in Joint Venture and hereby authorise Mr/Ms _____, an authorised signatory of the company _____, acting in the capacity of lead partner, to sign all documents in connection with the tender offer for Contract _____ _____ and any contract resulting from it on our behalf.

This authorisation is evidenced by the attached power of attorney signed by legally authorised signatories of all the partners to the Joint Venture.

Furthermore we attach to this Schedule a copy of the joint venture agreement which incorporates a statement that all partners are liable jointly and severally for the execution of the contract and that the lead partner is authorised to incur liabilities, receive instructions and payments and be responsible for the entire execution of the contract for and on behalf of any and all the partners.

Name of firm	**Address**	**Authorising signature, name (in caps) and capacity**

D. Certificate for Sole Proprietor

I, _____, hereby confirm that I am the sole owner of the business trading as _____.

Signed		Date	
Name		Position	Sole Proprietor

T2.2-07: Record of Addenda to Tender Documents

This schedule as submitted confirms that the following communications received from the *Employer* before the submission of this tender offer, amending the tender documents, have been taken into account in this specific tender offer:

	Date	**Title or Details**
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

T2.2-08: Risk Elements

Tenderers to identify and evaluate the potential risk elements associated with the Works and possible mitigation thereof. The risk elements and the mitigation as identified thereof by the Tenderer are to be submitted.

If No Risks are identified "No Risks" must be stated on this schedule.

Tenderers are also to evaluate any risk/s stated by the *Employer* in Contract Data Part C1, and provide possible mitigation thereof.

Tenders to note: Notwithstanding this information, all costs related to risk elements which are at the Contractor's risk are deemed to be included in the tenderer's offered total of the Prices.

T2.2-09 Proposed Sub-Contractors :

Tenderer to note that if successful, any deviations from the list of proposed sub-contractors in the contract phase will be subject to acceptance by the *Service Manager* in terms of the Conditions of Contract. Please also note the applicable Z clauses in Contract Data by *Employer*.

Provide **detailed information** of the proposed Sub-contractors below:

	Name of proposed Sub-contractor	**Proposed Sub-contractor National Treasury Central Supplier Database Registration Number Address and Region**	**Nature and extent of work**	**B-BBEEE Certificates or Sworn Affidavit attached behind this schedule? Yes/No**	**Percentage (%) of the sub-contracted works in terms of the tendered total of the prices.**
1.					
2.					
3.					
4.					
5.					

T2.2-10: ANNEX G Compulsory Enterprise Questionnaire

The following particulars hereunder must be furnished.

In the case of a Joint Venture, separate enterprise questionnaires in respect of each partner/member must be completed and submitted.

Section 1: Name of enterprise: _____

Section 2: VAT registration number, if any: _____

Section 3: CIDB registration number, if any: _____

Section 4: CSD number: _____

Section 5: Particulars of sole proprietors and partners in partnerships

Name	**Identity number**	**Personal income tax number**

***** Complete only if sole proprietor or partnership and attach separate page if more than 3 partners

Section 6: Particulars of companies and close corporations

Company registration number _____

Close corporation number _____

Tax reference number: _____

Section 7: The attached SBD4 must be completed for each tender and be attached as a tender requirement.
Section 8: The attached SBD 6 must be completed for each tender and be attached as a requirement.

The undersigned, who warrants that he / she is duly authorised to do so on behalf of the enterprise:

i) authorizes the Employer to obtain a tax clearance certificate from the South African Revenue Services that my / our tax matters are in order;

ii) confirms that the neither the name of the enterprise or the name of any partner, manager, director or other person, who wholly or partly exercises, or may exercise, control over the enterprise appears on the Register of Tender Defaulters established in terms of the Prevention and Combating of Corrupt Activities Act of 2004;

iii) confirms that no partner, member, director or other person, who wholly or partly exercises, or may exercise, control over the enterprise appears, has within the last five years been convicted of fraud or corruption;

iv) confirms that I / we are not associated, linked or involved with any other tendering entities submitting tender offers and have no other relationship with any of the tenderers or those responsible for compiling the scope of work that could cause or be interpreted as a conflict of interest; and

v) confirms that the contents of this questionnaire are within my personal knowledge and are to the best of my belief both true and correct.

Signed _____ Date .....

Name _____ Position .....

Enterprise name .....

SBD 6.1

PREFERENCE POINTS CLAIM FORM

This preference form must form part of all bids invited. It contains general information and serves as a claim for preference points for Specific Goals contribution. Transnet will award preference points to companies who provide valid proof of evidence as per the table of evidence in paragraph 4.1 below.

1. GENERAL CONDITIONS

1.1 The following preference point systems are applicable to all bids:

- the 80/20 system for requirements with a Rand value of up to R50 000 000 (all applicable taxes included); and
- the 90/10 system for requirements with a Rand value above R50 000 000 (all applicable taxes included).

1.2 The value of this bid is estimated to not exceed R50 000 000 (all applicable taxes included) and therefore the **80/20** preference point system shall be applicable. Despite the stipulated preference point system, Transnet shall use the lowest acceptable bid to determine the applicable preference point system in a situation where all received acceptable bids are received outside the stated preference point system.

1.3 Preference points for this bid shall be awarded for:

(a) Price;

(b) B-BBEE Status Level of Contribution; and

(c) Any other specific goal determined in the Transnet preferential procurement policy

1.4 The maximum points for this bid are allocated as follows:

	POINTS
PRICE	**80**
B-BBEE STATUS LEVEL OF CONTRIBUTION Level 1 or 2 **COMPANY MAJORITY OWNED BY BLACK WOMEN**	**20**
Total points for Price and B-BBEE must not exceed	**100**

1.5 Failure on the part of a bidder to submit proof of evidence required for any of the specific goals together with the bid will be interpreted to mean that preference points for that specific goal are not claimed.

1.6 The purchaser reserves the right to require of a bidder, either before a bid is adjudicated or at any time subsequently, to substantiate any claim in regard to preferences, in any manner required by the purchaser.

2. DEFINITIONS

(a) **"all applicable taxes"** includes value-added tax, pay as you earn, income tax, unemployment insurance fund contributions and skills development levies;

(b) **"B-BBEE"** means broad-based black economic empowerment as defined in section 1 of the Broad-Based Black Economic Empowerment Act;

(c) "**B-BBEE status level of contributor"** means the B-BBEE status received by a measured entity based on its overall performance using the relevant scorecard contained in the Codes of Good Practice on Black Economic Empowerment, issued in terms of section 9(1) of the Broad-Based Black Economic Empowerment Act;

(d) **"bid"** means a written offer in a prescribed or stipulated form in response to an invitation by an organ of state for the supply/provision of services, works or goods, through price quotations, advertised competitive bidding processes or proposals;

(e) **"Broad-Based Black Economic Empowerment Act"** means the Broad-Based Black Economic Empowerment Act, 2003 (Act No. 53 of 2003);

(f) **"EME"** means an Exempted Micro Enterprise as defines by Codes of Good Practice under section 9 (1) of the Broad-Based Black Economic Empowerment Act, 2003 (Act No. 53 of 2003);

(g) **"functionality"** means the ability of a bidder to provide goods or services in accordance with specification as set out in the bid documents

(h) **"Price"** includes all applicable taxes less all unconditional discounts.

(i) **"Proof of B-BBEE Status Level of Contributor"**

i) the B-BBBEE status level certificate issued by an authorised body or person;

ii) a sworn affidavit as prescribed by the B-BBEE Codes of Good Practice; or

iii) any other requirement prescribed in terms of the B-BBEE Act.

(j) **"QSE"** means a Qualifying Small Enterprise as defines by Codes of Good Practice under section 9 (1) of the Broad-Based Black Economic Empowerment Act, 2003 (Act No. 53 of 2003);

(k) **"rand value"** means the total estimated value of a contract in South African currency, calculated at the time of bid invitations, and includes all applicable taxes and excise duties.

(l) **Specific goals"** means targeted advancement areas or categories of persons or groups either previously disadvantaged or falling within the scope of the Reconstruction and Development Programme identified by Transnet to be given preference in allocation of procurement contracts in line with section 2(1) of the PPPFA.

3. POINTS AWARDED FOR PRICE

3.1 THE 80/20 PREFERENCE POINT SYSTEMS

A maximum of 80 points is allocated for price on the following basis:

80/20

$$Ps = 80\left(1 - \frac{Pt - P\min}{P\min}\right)$$

Where

Ps = Points scored for comparative price of bid under consideration

Pt = Comparative price of bid under consideration

Pmin = Comparative price of lowest acceptable bid

4. EVEDINCE REQUIRED FOR CLAIMING SPECIFIC GOALS

4.1 In terms of Transnet Preferential Procurement Policy (TPPP) and Procurement Manuals, preference points must be awarded to a bidder for providing evidence in accordance with the table below::

Specific Goals	Acceptable Evidence
B-BBEE Status contributor	B-BBEE Certificate / Sworn- Affidavit / B-BBEE CIPC Certificate (in case of JV, a consolidated scorecard will be accepted) as per DTIC guideline
30% Black Women Owned Entities	B-BBEE Certificate / Sworn- Affidavit / B-BBEE CIPC Certificate (in case of JV, a consolidated scorecard will be accepted) as per DTIC guideline
+50% Black Youth Owned Entities	Certified copy of ID Documents of the Owners and B-BBEE Certificate / Sworn- Affidavit / B-BBEE CIPC Certificate (in case of JV, a consolidated scorecard will be accepted) as per DTIC guideline
Entities Owned by People with Disability (PWD)	Certified copy of ID Documents of the Owners / Doctor's note and /or EEA1 form confirming the disability
Entities/Black People living in rural areas	Entity 's Municipal/ESKOM bill or letter from Induna/chief confirming residential address not older than 3 months.
South African Enterprises	CIPC Certificate
EME or QSE 51% Black Owned	B-BBEE Certificate / Sworn-Affidavit / CIPC Certificate
Entities that are 51 % Black Owned	CI B-BBEE Certificate / Sworn- Affidavit / B-BBEE CIPC Certificate (in case of JV, a consolidated scorecard will be accepted) as per DTIC guideline
Promoting exports Orientated for Job creation	Section……Job Creation Schedule Returnable documents
Local Content and Local Production	Returnable Local Content and production Annexures
NIPP	NIPP Returnable documents
Creation of new jobs and labour intensification	Section……Job Creation Schedule Returnable documents
The promotion of supplier development through sub-contracting or JV for a minimum of 30% of the value of a contract to	Sub-contracting agreements and Declaration / Joint Venture Agreement and CIPC – B-BBEE Certificate / Sworn- Affidavit / B-BBEE CIPC Certificate as per DTIC guideline

South African Companies which are: I. 30% Black Women, 51% Black Youth and 51% Black people with disabilities II. Entities with a specified minimum B-BBEE level (1 and 2) III. EMEs and/or QSEs who are 51% black-owned	
The promotion of enterprises located in a specific province/region/municipal area for work to be done or services to be rendered in that province/region/municipal area	CIPC – B-BBEE Certificate / Sworn- Affidavit / B-BBEE CIPC Certificate (in case of JV, a consolidated scorecard will be accepted) as per DTIC guidelines and Proof Registered address of entity

4.2 The table below indicates the required proof of B-BBEE status depending on the category of enterprises:

Enterprise	**B-BBEE Certificate & Sworn Affidavit**
Large	Certificate issued by SANAS accredited verification agency
QSE	Certificate issued by SANAS accredited verification agency Sworn Affidavit signed by the authorised QSE representative and attested by a Commissioner of Oaths confirming annual turnover and black ownership (only black-owned QSEs - 51% to 100% Black owned) [Sworn affidavits must substantially comply with the format that can be obtained on the DTI's website at www.dti.gov.za/economic_empowerment/bee_codes.jsp.]
EME[1]	Sworn Affidavit signed by the authorised EME representative and attested by a Commissioner of Oaths confirming annual turnover and black ownership Certificate issued by CIPC (formerly CIPRO) confirming annual turnover and black ownership Certificate issued by SANAS accredited verification agency only if the EME is being measured on the QSE scorecard

4.3 A trust, consortium or joint venture (including unincorporated consortia and joint ventures) must submit a consolidated B-BBEE Status Level verification certificate for every separate bid.

[1] In terms of the Implementation Guide: Preferential Procurement Regulations, 2017, Version 2, paragraph 11.11 provides that in the Transport Sector, EMEs can provide a letter from accounting officer or get verified and be issued with a B-BBEE certificate by SANAS accredited professional or agency as the Transport Sector Code has not been aligned to the generic Codes. EMEs in the Transport Sector are not allowed to provide a sworn affidavit as the generic codes are not applicable to them.

4.4 Tertiary Institutions and Public Entities will be required to submit their B-BBEE status level certificates in terms of the specialized scorecard contained in the B-BBEE Codes of Good Practice.

4.5 A person will not be awarded points for B-BBEE status level if it is indicated in the bid documents that such a bidder intends sub-contracting more than 25% of the value of the contract to any other enterprise that does not qualify for at least the points that such a bidder qualifies for, unless the intended sub-contractor is an EME that has the capability and ability to execute the sub-contract.

4.6 A person awarded a contract may not sub-contract more than 25% of the value of the contract to any other enterprise that does not have an equal or higher B-BBEE status level than the person concerned, unless the contract is sub-contracted to an EME that has the capability and ability to execute the sub-contract.

4.7 Bidders are to note that the rules pertaining to B-BBEE verification and other B-BBEE requirements may be changed from time to time by regulatory bodies such as National Treasury or the DTI. It is the Bidder's responsibility to ensure that his/her bid complies fully with all B-BBEE requirements at the time of the submission of the bid.

5. BID DECLARATION

5.1 Bidders who claim points in respect of B-BBEE Status Level of Contribution must complete the following:

6. B-BBEE STATUS LEVEL OF CONTRIBUTION CLAIMED IN TERMS OF PARAGRAPHS 1.4 AND 6.1

6.1 B-BBEE Status Level of Contribution: . = ……(maximum of 20 points)

(Points claimed in respect of paragraph 6.1 must be in accordance with the table reflected in paragraph 4.1 and must be substantiated by relevant proof of B-BBEE status level of contributor.

7. SUB-CONTRACTING

7.1 Will any portion of the contract be sub-contracted?

(***Tick applicable box***)

YES		NO	

7.1.1 If yes, indicate:

i) What percentage of the contract will be subcontracted……%
ii) The name of the sub-contractor……..
iii) The B-BBEE status level of the sub-contractor……..
iv) Whether the sub-contractor is an EME or QSE.
(Tick applicable box)

YES		NO	

8. DECLARATION WITH REGARD TO COMPANY/FIRM

8.1 Name of company/firm:.....

8.2 VAT registration number:.....

8.3 Company registration number:.....

8.4 TYPE OF COMPANY/ FIRM

- ☐ Partnership/Joint Venture / Consortium
- ☐ One person business/sole propriety
- ☐ Close corporation
- ☐ Company
- ☐ (Pty) Limited

[TICK APPLICABLE BOX]

8.5 DESCRIBE PRINCIPAL BUSINESS ACTIVITIES

.....
.....
.....

8.6 COMPANY CLASSIFICATION

- ☐ Manufacturer
- ☐ Supplier
- ☐ Professional Service provider
- ☐ Other Service providers, e.g. transporter, etc.

[*TICK APPLICABLE BOX*]

8.7 Total number of years the company/firm has been in business:.....

8.8 I/we, the undersigned, who is / are duly authorised to do so on behalf of the company/firm, certify that the points claimed, based on the B-BBE status level of contribution indicated in paragraphs 1.4 and 6.1 of the foregoing certificate, qualifies the company/ firm for the preference(s) shown and I / we acknowledge that:

i) The information furnished is true and correct;

ii) The preference points claimed are in accordance with the General Conditions as indicated in paragraph 1 of this form;

iii) In the event of a contract being awarded as a result of points claimed as shown in paragraph 1.4 and 6.1, the contractor may be required to furnish documentary proof to the satisfaction of the purchaser that the claims are correct;

iv) If a bidder submitted false information regarding its B-BBEE status level of contributor,, which will affect or has affected the evaluation of a bid, or where a bidder has failed to declare any subcontracting arrangements or any of the conditions of contract have not been fulfilled, the purchaser may, in addition to any other remedy it may have

(a) disqualify the person from the bidding process;

(b) recover costs, losses or damages it has incurred or suffered as a result of that person's conduct;

(c) cancel the contract and claim any damages which it has suffered as a result of having to make less favourable arrangements due to such cancellation;

(d) if the successful bidder subcontracted a portion of the bid to another person without disclosing it, Transnet reserves the right to penalise the bidder up to 10 percent of the value of the contract;

(e) recommend that the bidder or contractor, its shareholders and directors, or only the shareholders and directors who acted on a fraudulent basis, be restricted by the National Treasury from obtaining business from any organ of state for a period not exceeding 10 years, after the audi alteram partem (hear the other side) rule has been applied; and

(f) forward the matter for criminal prosecution.

WITNESSES 1. …….. 2. ……	…… SIGNATURE(S) OF BIDDERS(S) DATE: ……..

BIDDER'S DISCLOSURE

1. PURPOSE OF THE FORM

Any person (natural or juristic) may make an offer or offers in terms of this invitation to bid. In line with the principles of transparency, accountability, impartiality, and ethics as enshrined in the Constitution of the Republic of South Africa and further expressed in various pieces of legislation, it is required for the

bidder to make this declaration in respect of the details required hereunder.

Where a person/s are listed in the Register for Tender Defaulters and / or the List of Restricted Suppliers, that person will automatically be disqualified from the bid process.

2. Bidder's declaration

2.1 Is the bidder, or any of its directors / trustees / shareholders / members / partners or any person having a controlling interest2 in the enterprise, employed by the state? **YES/NO**

2.1.1 If so, furnish particulars of the names, individual identity numbers, and, if applicable, state employee numbers of sole proprietor/ directors / trustees / shareholders / members/ partners or any person having a controlling interest in the enterprise, in table below.

Full Name	**Identity Number**	**Name of State institution**

2.2 Do you, or any person connected with the bidder, have a relationship with any person who is employed by the procuring institution? **YES/NO**

2.2.1 If so, furnish particulars:

……
……

2.3 Does the bidder or any of its directors / trustees / shareholders / members / partners or any person having a controlling interest in the enterprise have any interest in any other related enterprise whether or not they are bidding for this

[2] the power, by one person or a group of persons holding the majority of the equity of an enterprise, alternatively, the person/s having the deciding vote or power to influence or to direct the course and decisions of the enterprise.

contract? **YES/NO**

2.3.1 If so, furnish particulars:
……
……

3 DECLARATION

I, the undersigned, (name)…… in submitting the accompanying bid, do hereby make the following statements that I certify to be true and complete in every respect:

3.1 I have read and I understand the contents of this disclosure;
3.2 I understand that the accompanying bid will be disqualified if this disclosure is found not to be true and complete in every respect;
3.3 The bidder has arrived at the accompanying bid independently from, and without consultation, communication, agreement or arrangement with any competitor. However, communication between partners in a joint venture or consortium3 will not be construed as collusive bidding.
3.4 In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications, prices, including methods, factors or formulas used to calculate prices, market allocation, the intention or decision to submit or not to submit the bid, bidding with the intention not to win the bid and conditions or delivery particulars of the products or services to which this bid invitation relates.
3.4 The terms of the accompanying bid have not been, and will not be, disclosed by the bidder, directly or indirectly, to any competitor, prior to the date and time of the official bid opening or of the awarding of the contract.

3.5 There have been no consultations, communications, agreements or arrangements made by the bidder with any official of the procuring institution in relation to this procurement process prior to and during the bidding process except to provide clarification on the bid submitted where so required by the institution; and the bidder was not involved in the drafting of the specifications or terms of reference for this bid.

3.6 I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to bids and contracts, bids that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No 89 of 1998 and or may be reported to the National Prosecuting Authority (NPA) for criminal investigation and or may be restricted from conducting business with the public sector for a period not exceeding ten (10) years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation.

[3] Joint venture or Consortium means an association of persons for the purpose of combining their expertise, property, capital, efforts, skill and knowledge in an activity for the execution of a contract.

I CERTIFY THAT THE INFORMATION FURNISHED IN PARAGRAPHS 1, 2 and 3 ABOVE IS CORRECT.
I ACCEPT THAT THE STATE MAY REJECT THE BID OR ACT AGAINST ME IN TERMS OF PARAGRAPH 6 OF PFMA SCM INSTRUCTION 03 OF 2021/22 ON PREVENTING AND COMBATING ABUSE IN THE SUPPLY CHAIN MANAGEMENT SYSTEM SHOULD THIS DECLARATION PROVE TO BE FALSE.

.....	.....
Signature	Date
.....	.....
Position	Name of bidder

T2.2-11 NON-DISCLOSURE AGREEMENT

Note to tenderers: This Non-Disclosure Agreement is to be completed and signed by an authorised signatory:

THIS AGREEMENT is made effective as of ..... day of ..... 20..... by and between:

TRANSNET SOC LTD

(Registration No. 1990/000900/30), a company incorporated and existing under the laws of South Africa, having its principal place of business at Transnet Corporate Centre 138 Eloff Street , Braamfontein , Johannesburg 2000

and

.....

(Registration No. .....),a private company incorporated and existing under the laws of South Africa having its principal place of business at

.....

.....

WHEREAS

Transnet and the Company wish to exchange Information [as defined below] and it is envisaged that each party may from time to time receive Information relating to the other in respect thereof. In consideration of each party making available to the other such Information, the parties jointly agree that any dealings between them shall be subject to the terms and conditions of this Agreement which themselves will be subject to the parameters of the Tender Document.

IT IS HEREBY AGREED

1. INTERPRETATION

In this Agreement:

1.1 **Agents** mean directors, officers, employees, agents, professional advisers, contractors or sub-contractors, or any Group member;

1.2 **Bid** or **Bid Document** (hereinafter Tender) means Transnet's Request for Information [**RFI**] Request for Proposal [**RFP**] or Request for Quotation [**RFQ**], as the case may be;

1.3 **Confidential Information** means any information or other data relating to one party [the **Disclosing Party**] and/or the business carried on or proposed or intended to be carried on by that party and which is made available for the purposes of the Bid to the other party [the **Receiving Party**] or its Agents by the Disclosing Party or its Agents or recorded in agreed minutes following oral disclosure and any other information otherwise made available by the Disclosing Party or its Agents to the Receiving Party or its Agents, whether before, on or after the date of this Agreement, and whether in writing or otherwise, including any information, analysis or specifications derived from, containing or reflecting such information but excluding information which:

1.3.1 is publicly available at the time of its disclosure or becomes publicly available [other than as a result of disclosure by the Receiving Party or any of its Agents contrary to the terms of this Agreement]; or

1.3.2 was lawfully in the possession of the Receiving Party or its Agents [as can be demonstrated by its written records or other reasonable evidence] free of any restriction as to its use or disclosure prior to its being so disclosed; or

1.3.3 following such disclosure, becomes available to the Receiving Party or its Agents [as can be demonstrated by its written records or other reasonable evidence] from a source other than the Disclosing Party or its Agents, which source is not bound by any duty of confidentiality owed, directly or indirectly, to the Disclosing Party in relation to such information;

1.4 **Group** means any subsidiary, any holding company and any subsidiary of any holding company of either party; and

1.5 **Information** means all information in whatever form including, without limitation, any information relating to systems, operations, plans, intentions, market opportunities, know-how, trade secrets and business affairs whether in writing, conveyed orally or by machine-readable medium.

2. CONFIDENTIAL INFORMATION

2.1 All Confidential Information given by one party to this Agreement [the **Disclosing Party**] to the other party [the **Receiving Party**] will be treated by the Receiving Party as secret and confidential and will not, without the Disclosing Party's written consent, directly or indirectly communicate or disclose [whether in writing or orally or in any other manner] Confidential Information to any other person other than in accordance with the terms of this Agreement.

2.2 The Receiving Party will only use the Confidential Information for the sole purpose of technical and commercial discussions between the parties in relation to the Tender or for the subsequent performance of any contract between the parties in relation to the Tender.

2.3 Notwithstanding clause 2.1 above, the Receiving Party may disclose Confidential Information:

2.3.1 to those of its Agents who strictly need to know the Confidential Information for the sole purpose set out in clause 2.2 above, provided that the Receiving Party shall ensure that such Agents are made aware prior to the disclosure of any part of the Confidential Information that the same is confidential and that they owe a duty of confidence to the Disclosing Party. The Receiving Party shall at all times remain liable for any actions of such Agents that would constitute a breach of this Agreement; or

2.3.2 to the extent required by law or the rules of any applicable regulatory authority, subject to clause 2.4 below.

2.4 In the event that the Receiving Party is required to disclose any Confidential Information in accordance with clause 2.3.2 above, it shall promptly notify the Disclosing Party and cooperate with the Disclosing Party regarding the form, nature, content and purpose of such disclosure or any action which the Disclosing Party may reasonably take to challenge the validity of such requirement.

2.5 In the event that any Confidential Information shall be copied, disclosed or used otherwise than as permitted under this Agreement then, upon becoming aware of the same, without prejudice to any rights or remedies of the Disclosing Party, the Receiving Party shall as soon as practicable notify the Disclosing Party of such event and if requested take such steps [including the institution of legal proceedings] as shall be necessary to remedy [if capable of remedy] the default and/or to prevent further unauthorised copying, disclosure or use.

2.6 All Confidential Information shall remain the property of the Disclosing Party and its disclosure shall not confer on the Receiving Party any rights, including intellectual property rights over the Confidential Information whatsoever, beyond those contained in this Agreement.

3. RECORDS AND RETURN OF INFORMATION

3.1 The Receiving Party agrees to ensure proper and secure storage of all Information and any copies thereof.

3.2 The Receiving Party shall keep a written record, to be supplied to the Disclosing Party upon request, of the Confidential Information provided and any copies made thereof and, so far as is reasonably practicable, of the location of such Confidential Information and any copies thereof.

3.3 The Company shall, within 7 [seven] days of receipt of a written demand from Transnet:

3.3.1 return all written Confidential Information [including all copies]; and

3.3.2 expunge or destroy any Confidential Information from any computer, word processor or other device whatsoever into which it was copied, read or programmed by the Company or on its behalf.

3.4 The Company shall on request supply a certificate signed by a director as to its full compliance with the requirements of clause 3.3.2 above.

4. ANNOUNCEMENTS

4.1 Neither party will make or permit to be made any announcement or disclosure of its prospective interest in the Tender without the prior written consent of the other party.

4.2 Neither party shall make use of the other party's name or any information acquired through its dealings with the other party for publicity or marketing purposes without the prior written consent of the other party.

5. DURATION

The obligations of each party and its Agents under this Agreement shall survive the termination of any discussions or negotiations between the parties regarding the Tender and continue thereafter for a period of 5 [five] years.

6. PRINCIPAL

Each party confirms that it is acting as principal and not as nominee, agent or broker for any other person and that it will be responsible for any costs incurred by it or its advisers in considering or pursuing the Tender and in complying with the terms of this Agreement.

7. ADEQUACY OF DAMAGES

Nothing contained in this Agreement shall be construed as prohibiting the Disclosing Party from pursuing any other remedies available to it, either at law or in equity, for any such threatened or actual breach of this Agreement, including specific performance, recovery of damages or otherwise.

8. PRIVACY AND DATA PROTECTION

8.1 The Receiving Party undertakes to comply with South Africa's general privacy protection in terms Section 14 of the Bill of Rights in connection with this Tender and shall procure that its personnel shall observe the provisions of such Act [as applicable] or any amendments and re-enactments thereof and any regulations made pursuant thereto.

8.2 The Receiving Party warrants that it and its Agents have the appropriate technical and organisational measures in place against unauthorised or unlawful processing of data relating to the Tender and against accidental loss or destruction of, or damage to such data held or processed by them.

9. GENERAL

9.1 Neither party may assign the benefit of this Agreement, or any interest hereunder, except with the prior written consent of the other, save that Transnet may assign this Agreement at any time to any member of the Transnet Group.

9.2 No failure or delay in exercising any right, power or privilege under this Agreement will operate as a waiver of it, nor will any single or partial exercise of it preclude any further exercise or the exercise of any right, power or privilege under this Agreement or otherwise.

9.3 The provisions of this Agreement shall be severable in the event that any of its provisions are held by a court of competent jurisdiction or other applicable authority to be invalid, void or otherwise unenforceable, and the remaining provisions shall remain enforceable to the fullest extent permitted by law.

9.4 This Agreement may only be modified by a written agreement duly signed by persons authorised on behalf of each party.

9.5 Nothing in this Agreement shall constitute the creation of a partnership, joint venture or agency between the parties.

9.6 This Agreement will be governed by and construed in accordance with South African law and the parties irrevocably submit to the exclusive jurisdiction of the South African courts.

Signed	.....	Date	.....
Name	.....	Position	.....
Tenderer	.....		

T2.2-12: RFP DECLARATION FORM

NAME OF COMPANY: _____

We _____ do hereby certify that:

1. Transnet has supplied and we have received appropriate tender offers to any/all questions (as applicable) which were submitted by ourselves for tender clarification purposes;
2. we have received all information we deemed necessary for the completion of this Tender;
3. at no stage have we received additional information relating to the subject matter of this tender from Transnet sources, other than information formally received from the designated Transnet contact(s) as nominated in the tender documents;
4. we are satisfied, insofar as our company is concerned, that the processes and procedures adopted by Transnet in issuing this tender and the requirements requested from tenderers in responding to this tender have been conducted in a fair and transparent manner; and
5. furthermore, we acknowledge that a direct relationship exists between a family member and/or an owner / member / director / partner / shareholder (unlisted companies) of our company and an employee or board member of the Transnet Group as indicated below: *[Respondent to indicate if this section is not applicable]*

   FULL NAME OF OWNER/MEMBER/DIRECTOR/
   PARTNER/SHAREHOLDER: ADDRESS:

   _____

   _____

   _____

   Indicate nature of relationship with Transnet:

   _____

   _____

   _____

   _____

   [Failure to furnish complete and accurate information in this regard may lead to the disqualification of your response and may preclude a Respondent from doing future business with Transnet]

We declare, to the extent that we are aware or become aware of any relationship between ourselves and Transnet (other than any existing and appropriate business relationship with Transnet) which could unfairly advantage our company in the forthcoming adjudication process, we shall notify Transnet immediately in writing of such circumstances.

6. We accept that any dispute pertaining to this tender will be resolved through the Ombudsman process and will be subject to the Terms of Reference of the Ombudsman. The Ombudsman process must first be exhausted before judicial review of a decision is sought. (Refer "Important Notice to respondents" below).

7. We further accept that Transnet reserves the right to reverse a tender award or decision based on the recommendations of the Ombudsman without having to follow a formal court process to have such award or decision set aside.

8. We have acquainted ourselves and agree with the content of T2.2-17 "Service Provider Integrity Pact".

For and on behalf of ..... duly authorised thereto
Name:
Signature:
Date:

IMPORTANT NOTICE TO TENDERERS

- Transnet has appointed a Procurement Ombudsman to investigate any material complaint in respect of tenders exceeding R5,000,000.00 (five million S.A. Rand) in value. Should a Tenderer have any material concern regarding an tender process which meets this value threshold, a complaint may be lodged with Transnet's Procurement Ombudsman for further investigation.
- It is incumbent on the Tenderer to familiarise himself/herself with the Terms of Reference for the Transnet Procurement Ombudsman, details of which are available for review at Transnet's website www.transnet.net.

- An official complaint form may be downloaded from this website and submitted, together with any supporting documentation, within the prescribed period, to procurement.ombud@transnet.net
- For transactions below the R5,000,000.00 (five million S.A. Rand) threshold, a complaint may be lodged with the Chief Procurement Officer of the relevant Transnet Operating Division.
- All Tenderers should note that a complaint must be made in good faith. If a complaint is made in bad faith, Transnet reserves the right to place such a tenderer on its List of Excluded Bidders.

T2.2-13: REQUEST FOR PROPOSAL – BREACH OF LAW

NAME OF COMPANY: _____

I / We _____ do hereby certify that ***I/we have/have not been*** found guilty during the preceding 5 (five) years of a serious breach of law, including but not limited to a breach of the Competition Act, 89 of 1998, by a court of law, tribunal or other administrative body. The type of breach that the Tenderer is required to disclose excludes relatively minor offences or misdemeanours, e.g. traffic offences.

Where found guilty of such a serious breach, please disclose:

NATURE OF BREACH:

_____
_____
_____

DATE OF BREACH:

_____

Furthermore, I/we acknowledge that Transnet SOC Ltd reserves the right to exclude any Tenderer from the tendering process, should that person or company have been found guilty of a serious breach of law, tribunal or regulatory obligation.

Signed on this _____ day of _____ 20____

_____

SIGNATURE OF TENDER

T2.2-14 Certificate of Acquaintance with Tender Documents

NAME OF TENDERING ENTITY:

_____

1. By signing this certificate I/we acknowledge that I/we have made myself/ourselves thoroughly familiar with, and agree with all the conditions governing this RFP. This includes those terms and conditions of the Contract, the Supplier Integrity Pact, Non-Disclosure Agreement etc. contained in any printed form stated to form part of the documents thereof, but not limited to those listed in this clause.

2. I/we furthermore agree that Transnet SOC Ltd shall recognise no claim from me/us for relief based on an allegation that I/we overlooked any tender/contract condition or failed to take it into account for the purpose of calculating my/our offered prices or otherwise.

3. I/we understand that the accompanying Tender will be disqualified if this Certificate is found not to be true and complete in every respect.

4. For the purposes of this Certificate and the accompanying Tender, I/we understand that the word "competitor" shall include any individual or organisation, other than the Tenderer, whether or not affiliated with the Tenderer, who:

   a) has been requested to submit a Tender in response to this Tender invitation;

   b) could potentially submit a Tender in response to this Tender invitation, based on their qualifications, abilities or experience; and

   c) provides the same Services as the Tenderer and/or is in the same line of business as the Tenderer

5. The Tenderer has arrived at the accompanying Tender independently from, and without consultation, communication, agreement or arrangement with any competitor. However communication between partners in a joint venture or consortium will not be construed as collusive Tendering.

6. In particular, without limiting the generality of paragraph 5 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:

   a) prices;

b) geographical area where Services will be rendered [market allocation]

c) methods, factors or formulas used to calculate prices;

d) the intention or decision to submit or not to submit, a Tender;

e) the submission of a tender which does not meet the specifications and conditions of the tender; or

f) Tendering with the intention not winning the tender.

7. In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications and conditions or delivery particulars of the Services to which this tender relates.

8. The terms of the accompanying tender have not been, and will not be, disclosed by the Tenderer, directly or indirectly, to any competitor, prior to the date and time of the official tender opening or of the awarding of the contract.

9. I/We am/are aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to tenders and contracts, tenders that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No 89 of 1998 and/or may be reported to the National Prosecuting Authority [NPA] for criminal investigation. In addition, Tenderers that submit suspicious tenders may be restricted from conducting business with the public sector for a period not exceeding 10 [ten] years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation.

Signed on this _____ day of _____20___

_____

SIGNATURE OF TENDERER

T2.2-15 Service Provider Integrity Pact

Important Note: All potential tenderers must read this document and certify in the RFP Declaration Form that that have acquainted themselves with, and agree with the content.

The contract with the successful tenderer will automatically incorporate this Integrity Pact and shall be deemed as part of the final concluded contract.

INTEGRITY PACT

Between

TRANSNET SOC LTD

Registration Number: 1990/000900/30

("Transnet")

and

The Contractor (hereinafter referred to as the "Tenderer/Service Providers/Contractor")

PREAMBLE

Transnet values full compliance with all relevant laws and regulations, ethical standards and the principles of economical use of resources, fairness and transparency in its relations with its Tenderers/Service Providers/Contractors.

In order to achieve these goals, Transnet and the Tenderer/Service Provider/Contractor hereby enter into this agreement hereinafter referred to as the "Integrity Pact" which will form part of the Tenderer's/Service Provider's/Contractor's application for registration with Transnet as a vendor.

The general purpose of this Integrity Pact is to agree on avoiding all forms of dishonesty, fraud and corruption by following a system that is fair, transparent and free from any undue influence prior to, during and subsequent to the currency of any procurement and/or reverse logistics event and any further contract to be entered into between the Parties, relating to such event.

All Tenderers/Service Providers/Contractor's will be required to sign and comply with undertakings contained in this Integrity Pact, should they want to be registered as a Transnet vendor.

1 OBJECTIVES

1.1 Transnet and the Tenderer/Service Provider/Contractor agree to enter into this Integrity Pact, to avoid all forms of dishonesty, fraud and corruption including practices that are anti-competitive in nature, negotiations made in bad faith and under-pricing by following a system that is fair, transparent and free from any influence/unprejudiced dealings prior to, during and subsequent to the currency of the contract to be entered into with a view to:

a) Enable Transnet to obtain the desired contract at a reasonable and competitive price in conformity to the defined specifications of the works, goods and services; and

b) Enable Tenderers/Service Providers/Contractors to abstain from bribing or participating in any corrupt practice in order to secure the contract.

2 COMMITMENTS OF TRANSNET

Transnet commits to take all measures necessary to prevent dishonesty, fraud and corruption and to observe the following principles:

2.1 Transnet hereby undertakes that no employee of Transnet connected directly or indirectly with the sourcing event and ensuing contract, will demand, take a promise for or accept directly or through intermediaries any bribe, consideration, gift, reward, favour or any material or immaterial benefit or any other advantage from the Tenderer, either for themselves or for any person, organisation or third

party related to the contract in exchange for an advantage in the tendering process, Tender evaluation, contracting or implementation process related to any contract.

2.2 Transnet will, during the registration and tendering process treat all Tenderers/ Service Providers/Contractor with equity, transparency and fairness. Transnet will in particular, before and during the registration process, provide to all Tenderers/ Service Providers/Contractors the same information and will not provide to any Tenderers/Service Providers/Contractors confidential/additional information through which the Tenderers/Service Providers/Contractors could obtain an advantage in relation to any tendering process.

2.3 Transnet further confirms that its employees will not favour any prospective Tenderers/Service Providers/Contractors in any form that could afford an undue advantage to a particular Tenderer during the tendering stage, and will further treat all Tenderers/Service Providers/Contractors participating in the tendering process in a fair manner.

2.4 Transnet will exclude from the tender process such employees who have any personal interest in the Tenderers/Service Providers/Contractors participating in the tendering process.

3 OBLIGATIONS OF THE TENDERER / SERVICE PROVIDER

3.1 Transnet has a '**Zero Gifts**' Policy. No employee is allowed to accept gifts, favours or benefits.

a) Transnet officials and employees **shall not** solicit, give or accept, or from agreeing to solicit, give, accept or receive directly or indirectly, any gift, gratuity, favour, entertainment, loan, or anything of monetary value, from any person or juridical entities in the course of official duties or in connection with any operation being managed by, or any transaction which may be affected by the functions of their office.

b) Transnet officials and employees **shall not** solicit or accept gifts of any kind, from vendors, suppliers, customers, potential employees, potential vendors, and suppliers, or any other individual or organisation irrespective of the value.

c) Under **no circumstances** should gifts, business courtesies or hospitality packages be accepted from or given to prospective suppliers participating in a tender process at the respective employee's Operating Division, regardless of retail value.

d) Gratuities, bribes or kickbacks of any kind must never be solicited, accepted or offered, either directly or indirectly. This includes money, loans, equity, special privileges, personal favours, benefit or services. Such favours will be considered to constitute corruption.

3.2 The Tenderer/Service Provider/Contractor commits itself to take all measures necessary to prevent corrupt practices, unfair means and illegal activities during any stage of its Tender or during any ensuing contract stage in order to secure the contract or in furtherance to secure it and in particular the Tenderer/Service Provider/Contractor commits to the following:

a) The Tenderer/Service Provider/Contractor will not, directly or through any other person or firm, offer, promise or give to Transnet or to any of Transnet's employees involved in the tendering process or to any third person any material or other benefit or payment, in order to obtain in exchange an advantage during the tendering process; and

b) The Tenderer/Service Provider/Contractor will not offer, directly or through intermediaries, any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any employee of Transnet, connected directly or indirectly with the tendering process, or to any person, organisation or third party related to the contract in exchange for any advantage in the tendering, evaluation, contracting and implementation of the contract.

3.3 The Tenderer/Service Provider/Contractor will not collude with other parties interested in the contract to preclude a competitive Tender price, impair the transparency, fairness and progress of the tendering process, Tender evaluation, contracting and implementation of the contract. The Tenderer / Service Provider further commits itself to delivering against all agreed upon conditions as stipulated within the contract.

3.4 The Tenderer/Service Provider/Contractor will not enter into any illegal or dishonest agreement or understanding, whether formal or informal with other Tenderers/Service Providers/Contractors. This applies in particular to certifications, submissions or non-submission of documents or actions that are restrictive or to introduce cartels into the tendering process.

3.5 The Tenderer/Service Provider/Contractor will not commit any criminal offence under the relevant anti-corruption laws of South Africa or any other country. Furthermore, the Tenderer/Service Provider/Contractor will not use for illegitimate purposes or for restrictive purposes or personal gain, or pass on to others, any information provided by Transnet as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

3.6 A Tenderer/Service Provider/Contractor of foreign origin shall disclose the name and address of its agents or representatives in South Africa, if any, involved directly or indirectly in the registration or tendering process. Similarly, the Tenderer / Service Provider / Contractor of South African nationality shall furnish

the name and address of the foreign principals, if any, involved directly or indirectly in the registration or tendering process.

3.7 The Tenderer/Service Provider/Contractor will not misrepresent facts or furnish false or forged documents or information in order to influence the tendering process to the advantage of the Tenderer/Service Provider/Contractor or detriment of Transnet or other competitors.

3.8 Transnet may require the Tenderer/Service Provider/Contractor to furnish Transnet with a copy of its code of conduct. Such code of conduct must address the compliance programme for the implementation of the code of conduct and reject the use of bribes and other dishonest and unethical conduct.

3.9 The Tenderer/Service Provider/Contractor will not instigate third persons to commit offences outlined above or be an accessory to such offences.

3.10 The Tenderer/Service Provider/Contractor confirms that they will uphold the ten principles of the United Nations Global Compact (UNGC) in the fields of Human Rights, Labour, Anti-Corruption and the Environment when undertaking business with Transnet as follows:

a) Human Rights

- Principle 1: Businesses should support and respect the protection of internationally proclaimed human rights; and
- Principle 2: make sure that they are not complicit in human rights abuses.

b) Labour

- Principle 3: Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining;
- Principle 4: the elimination of all forms of forced and compulsory labour;
- Principle 5: the effective abolition of child labour; and
- Principle 6: the elimination of discrimination in respect of employment and occupation.

c) Environment

- Principle 7: Businesses should support a precautionary approach to environmental challenges;

• Principle 8: undertake initiatives to promote greater environmental responsibility; and

• Principle 9: encourage the development and diffusion of environmentally friendly technologies.

d) Anti-Corruption

• Principle 10: Businesses should work against corruption in all its forms, including extortion and bribery.

4 INDEPENDENT TENDERING

4.1 For the purposes of that Certificate in relation to any submitted Tender, the Tenderer declares to fully understand that the word "competitor" shall include any individual or organisation, other than the Tenderer, whether or not affiliated with the Tenderer, who:

a) has been requested to submit a Tender in response to this Tender invitation;
b) could potentially submit a Tender in response to this Tender invitation, based on their qualifications, abilities or experience; and
c) provides the same Goods and Services as the Tenderer and/or is in the same line of business as the Tenderer.

4.2 The Tenderer has arrived at his submitted Tender independently from, and without consultation, communication, agreement or arrangement with any competitor. However communication between partners in a joint venture or consortium will not be construed as collusive tendering.

4.3 In particular, without limiting the generality of paragraph 5 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:

a) prices;
b) geographical area where Goods or Services will be rendered [market allocation];
c) methods, factors or formulas used to calculate prices;
d) the intention or decision to submit or not to submit, a Tender;
e) the submission of a Tender which does not meet the specifications and conditions of the RFP; or
f) tendering with the intention of not winning the Tender.

4.4 In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications

and conditions or delivery particulars of the Goods or Services to which his/her tender relates.

4.5 The terms of the Tender as submitted have not been, and will not be, disclosed by the Tenderer, directly or indirectly, to any competitor, prior to the date and time of the official Tender opening or of the awarding of the contract.

4.6 Tenderers are aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to Tenders and contracts, Tenders that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No 89 of 1998 and/or may be reported to the National Prosecuting Authority [**NPA**] for criminal investigation and/or may be restricted from conducting business with the public sector for a period not exceeding 10 [ten] years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation.

4.7 Should the Tenderer find any terms or conditions stipulated in any of the relevant documents quoted in the Tender unacceptable, it should indicate which conditions are unacceptable and offer alternatives by written submission on its company letterhead, attached to its submitted Tender. Any such submission shall be subject to review by Transnet's Legal Counsel who shall determine whether the proposed alternative(s) are acceptable or otherwise, as the case may be.

5 DISQUALIFICATION FROM TENDERING PROCESS

5.1 If the Tenderer/Service Provider/Contractor has committed a transgression through a violation of section 3 of this Integrity Pact or in any other form such as to put its reliability or credibility as a Tenderer/Service Provider/Contractor into question, Transnet may reject the Tenderer's / Service Provider's / Contractor's application from the registration or tendering process and remove the Tenderer/Service Provider/Contractor from its database, if already registered.

5.2 If the Tenderer/Service Provider/Contractor has committed a transgression through a violation of section 3, or any material violation, such as to put its reliability or credibility into question. Transnet may after following due procedures and at its own discretion also exclude the Tenderer/Service Provider /Contractor from future tendering processes. The imposition and duration of the exclusion will be determined by the severity of the transgression. The severity will be determined by the circumstances of the case, which will include amongst others the number of transgressions, the position of the transgressors within the company hierarchy of the Tenderer/Service Provider/Contractor and the amount

of the damage. The exclusion will be imposed for up to a maximum of 10 (ten) years. However, Transnet reserves the right to impose a longer period of exclusion, depending on the gravity of the misconduct.

5.3 If the Tenderer/Service Provider/Contractor can prove that it has restored the damage caused by it and has installed a suitable corruption prevention system, or taken other remedial measures as the circumstances of the case may require, Transnet may at its own discretion revoke the exclusion or suspend the imposed penalty.

6 TRANSNET'S LIST OF EXCLUDED TENDERERS (BLACKLIST)

6.1 The process of restriction is used to exclude a company/person from conducting future business with Transnet and other organs of state for a specified period. No Tender shall be awarded to a Tenderer whose name (or any of its members, directors, partners or trustees) appear on the Register of Tender Defaulters kept by National Treasury, or who have been placed on National Treasury's List of Restricted Suppliers. Transnet reserves the right to withdraw an award, or cancel a contract concluded with a Tenderer should it be established, at any time, that a tenderer has been restricted with National Treasury by another government institution.

6.2 All the stipulations on Transnet's restriction process as laid down in Transnet's Supply Chain Policy and Procurement Procedures Manual (CPM included) are included herein by way of reference. Below follows a condensed summary of this restriction procedure.

6.3 On completion of the restriction procedure, Transnet will submit the restricted entity's details (including the identity number of the individuals and registration number of the entity) to National Treasury for placement on National Treasury's Database of Restricted Suppliers for the specified period of exclusion. National Treasury will make the final decision on whether to restrict an entity from doing business with any organ of state for a period not exceeding 10 years and place the entity concerned on the Database of Restricted Suppliers published on its official website.

6.4 The decision to restrict is based on one of the grounds for restriction. The standard of proof to commence the restriction process is whether a "*prima facie*" (i.e. on the face of it) case has been established.

6.5 Depending on the seriousness of the misconduct and the strategic importance of the Goods/Services, in addition to restricting a company/person from future business, Transnet may decide to terminate some or all existing contracts with the company/person as well.

6.6 A Service Provider or Contractor to Transnet may not subcontract any portion of the contract to a blacklisted company.

6.7 Grounds for blacklisting include: If any person/Enterprise which has submitted a Tender, concluded a contract, or, in the capacity of agent or subcontractor, has been associated with such Tender or contract:

a) Has, in bad faith, withdrawn such Tender after the advertised closing date and time for the receipt of Tenders;
b) has, after being notified of the acceptance of his Tender, failed or refused to sign a contract when called upon to do so in terms of any condition forming part of the Tender documents;
c) has carried out any contract resulting from such Tender in an unsatisfactory manner or has breached any condition of the contract;
d) has offered, promised or given a bribe in relation to the obtaining or execution of the contract;
e) has acted in a fraudulent or improper manner or in bad faith towards Transnet or any Government Department or towards any public body, Enterprise or person;
f) has made any incorrect statement in a certificate or other communication with regard to the Local Content of his Goods or his B-BBEE status and is unable to prove to the satisfaction of Transnet that:

(i) he made the statement in good faith honestly believing it to be correct; and

(ii) before making such statement he took all reasonable steps to satisfy himself of its correctness;

g) caused Transnet damage, or to incur costs in order to meet the contractor's requirements and which could not be recovered from the contractor;
h) has litigated against Transnet in bad faith.

6.8 Grounds for blacklisting include a company/person recorded as being a company or person prohibited from doing business with the public sector on National Treasury's database of Restricted Service Providers or Register of Tender Defaulters.

6.9 Companies associated with the person/s guilty of misconduct (i.e. entities owned, controlled or managed by such persons), any companies subsequently formed by the person(s) guilty of the misconduct and/or an existing company where such person(s) acquires a controlling stake may be considered for blacklisting. The decision to extend the blacklist to associated companies will be at the sole discretion of Transnet.

7 PREVIOUS TRANSGRESSIONS

7.1 The Tenderer/Service Provider/Contractor hereby declares that no previous transgressions resulting in a serious breach of any law, including but not limited to, corruption, fraud, theft, extortion and contraventions of the Competition Act 89 of 1998, which occurred in the last 5 (five) years with any other public sector undertaking, government department or private sector company that could justify its exclusion from its registration on the Tenderer's/Service Provider's/Contractor's database or any tendering process.

7.2 If it is found to be that the Tenderer/Service Provider/Contractor made an incorrect statement on this subject, the Tenderer/Service Provider/Contractor can be rejected from the registration process or removed from the Tenderer/ Service Provider/Contractor database, if already registered, for such reason (refer to the Breach of Law Returnable Form contained in the document.)

8 SANCTIONS FOR VIOLATIONS

8.1 Transnet shall also take all or any one of the following actions, wherever required to:

a) Immediately exclude the Tenderer/Service Provider/Contractor from the tendering process or call off the pre-contract negotiations without giving any compensation the Tenderer/Service Provider/Contractor. However, the proceedings with the other Tenderer/ Service Provider/Contractor may continue;
b) Immediately cancel the contract, if already awarded or signed, without giving any compensation to the Tenderer/Service Provider/Contractor;
c) Recover all sums already paid by Transnet;
d) Encash the advance bank guarantee and performance bond or warranty bond, if furnished by the Tenderer/Service Provider/Contractor, in order to recover the payments, already made by Transnet, along with interest;
e) Cancel all or any other contracts with the Tenderer/Service Provider/Contractor; and
f) Exclude the Tenderer/ Service Provider/Contractor from entering into any Tender with Transnet in future.

9 CONFLICTS OF INTEREST

9.1 A conflict of interest includes, inter alia, a situation in which:

a) A Transnet employee has a personal financial interest in a tendering / supplying entity; and

b) A Transnet employee has private interests or personal considerations or has an affiliation or a relationship which affects, or may affect, or may be perceived to affect his / her judgment in action in the best interest of Transnet, or could affect the employee's motivations for acting in a particular manner, or which could result in, or be perceived as favouritism or nepotism.

9.2 A Transnet employee uses his / her position, or privileges or information obtained while acting in the capacity as an employee for:

a) Private gain or advancement; or

b) The expectation of private gain, or advancement, or any other advantage accruing to the employee must be declared in a prescribed form.

Thus, conflicts of interest of any Tender committee member or any person involved in the sourcing process must be declared in a prescribed form.

9.3 If a Tenderer/Service Provider/Contractor has or becomes aware of a conflict of interest i.e. a family, business and / or social relationship between its owner(s)/ member(s)/director(s)/partner(s)/shareholder(s) and a Transnet employee/ member of Transnet's Board of Directors in respect of a Tender which will be considered for the Tender process, the Tenderer/Service Provider/ Contractor:

a) must disclose the interest and its general nature, in the Request for Proposal ("RFX") declaration form; or

b) must notify Transnet immediately in writing once the circumstances has arisen.

9.4 The Tenderer/Service Provider/Contractor shall not lend to or borrow any money from or enter into any monetary dealings or transactions, directly or indirectly, with any committee member or any person involved in the sourcing process, where this is done, Transnet shall be entitled forthwith to rescind the contract and all other contracts with the Tenderer/Service Provider/Contractor.

10 DISPUTE RESOLUTION

10.1 Transnet recognises that trust and good faith are pivotal to its relationship with its Tenderer / Service Provider / Contractor. When a dispute arises between Transnet and its Tenderer / Service Provider / Contractor, the parties should use their best endeavours to resolve the dispute in an amicable manner, whenever possible. Litigation in bad faith negates the principles of trust and good faith on which commercial relationships are based. Accordingly, following a blacklisting process as mentioned in paragraph 6 above, Transnet will not do business with a company that litigates against it in bad faith or is involved in any action that

reflects bad faith on its part. Litigation in bad faith includes, but is not limited to the following instances:

a) **Vexatious proceedings**: these are frivolous proceedings which have been instituted without proper grounds;
b) **Perjury:** where a Tenderer / Service Provider / Contractor make a false statement either in giving evidence or on an affidavit;
c) **Scurrilous allegations:** where a Tenderer / Service Provider / Contractor makes allegations regarding a senior Transnet employee which are without proper foundation, scandalous, abusive or defamatory; and
d) **Abuse of court process:** when a Tenderer / Service Provider / Contractor abuses the court process in order to gain a competitive advantage during a Tender process.

11 GENERAL

11.1 This Integrity Pact is governed by and interpreted in accordance with the laws of the Republic of South Africa.

11.2 The actions stipulated in this Integrity Pact are without prejudice to any other legal action that may follow in accordance with the provisions of the law relating to any civil or criminal proceedings.

11.3 The validity of this Integrity Pact shall cover all the tendering processes and will be valid for an indefinite period unless cancelled by either Party.

11.4 Should one or several provisions of this Integrity Pact turn out to be invalid the remainder of this Integrity Pact remains valid.

11.5 Should a Tenderer/Service Provider/Contractor be confronted with dishonest, fraudulent or corruptive behaviour of one or more Transnet employees, Transnet expects its Tenderer/Service Provider/Contractor to report this behaviour directly to a senior Transnet official/employee or alternatively by using Transnet's "Tip-Off Anonymous" hotline number 0800 003 056, whereby your confidentiality is guaranteed.

The Parties hereby declare that each of them has read and understood the clauses of this Integrity Pact and shall abide by it. To the best of the Parties' knowledge and belief, the information provided in this Integrity Pact is true and correct.

I …….. duly authorised by the tendering entity, hereby certify that the tendering entity are **fully acquainted** with the contents of the Integrity Pact and further **agree to abide by it** in full.

Signature .....

Date .....

T2.2-16 : Supplier Code of Conduct

Transnet SOC Limited aims to achieve the best value for money when buying or selling goods and obtaining services. This however must be done in an open and fair manner that supports and drives a competitive economy. Underpinning our process are several acts and policies that any supplier dealing with Transnet must understand and support. These are:

- The Transnet Procurement Policy – A guide for Tenderers.
- Section 217 of the Constitution - the five pillars of Public PSCM (Procurement and Supply Chain Management): fair, equitable, transparent, competitive and cost effective;
- The Public Finance Management Act (PFMA);
- The Broad Based Black Economic Empowerment Act (BBBEE)
- The Prevention and Combating of Corrupt Activities Act (PRECCA); and
- The Construction Industry Development Board Act (CIDB Act).

This code of conduct has been included in this contract to formally appraise Transnet Suppliers of Transnet's expectations regarding behaviour and conduct of its Suppliers.

Prohibition of Bribes, Kickbacks, Unlawful Payments, and Other Corrupt Practices

Transnet is in the process of transforming itself into a self-sustaining State Owned Enterprise, actively competing in the logistics industry. Our aim is to become a world class, profitable, logistics organisation. As such, our transformation is focused on adopting a performance culture and to adopt behaviours that will enable this transformation.

1. ***Transnet SOC Limited will not participate in corrupt practices. Therefore, it expects its suppliers to act in a similar manner.***
    - Transnet and its employees will follow the laws of this country and keep accurate business records that reflect actual transactions with, and payments to, our suppliers.
    - Employees must not accept or request money or anything of value, directly or indirectly, from suppliers.
    - Employees may not receive anything that is calculated to:
        - Illegally influence their judgement or conduct or to ensure the desired outcome of a sourcing activity;

- Win or retain business or to influence any act or decision of any person involved in sourcing decisions; or
- Gain an improper advantage.

- There may be times when a supplier is confronted with fraudulent or corrupt behaviour of Transnet employees. We expect our Suppliers to use our "Tip-offs Anonymous" Hot line to report these acts. (0800 003 056).

2. *Transnet SOC Limited is firmly committed to the ideas of free and competitive enterprise.*

- Suppliers are expected to comply with all applicable laws and regulations regarding fair competition and antitrust practices.
- Transnet does not engage with non-value adding agents or representatives solely for the purpose of increasing BBBEE spend (fronting).

3. Transnet's relationship with suppliers requires us to clearly define requirements, to exchange information and share mutual benefits.

- Generally, suppliers have their own business standards and regulations. Although Transnet cannot control the actions of our suppliers, we will not tolerate any illegal activities. These include, but are not limited to:
  - Misrepresentation of their product (origin of manufacture, specifications, intellectual property rights, etc);
  - Collusion;
  - Failure to disclose accurate information required during the sourcing activity (ownership, financial situation, BBBEE status, etc.);
  - Corrupt activities listed above; and
  - Harassment, intimidation or other aggressive actions towards Transnet employees.
- Suppliers must be evaluated and approved before any materials, components, products or services are purchased from them. Rigorous due diligence is conducted and the supplier is expected to participate in an honest and straight forward manner.
- Suppliers must record and report facts accurately, honestly and objectively. Financial records must be accurate in all material respects.

Conflicts of Interest

A conflict of interest arises when personal interests or activities influence (or appear to influence) the ability to act in the best interests of Transnet SOC Limited.

- Doing business with family members.
- Having a financial interest in another company in our industry

Where possible, contracts will be negotiated to include the above in the terms of such contracts. To the extent such terms are not included in contractual obligations and any of the above code is breached, then Transnet reserves its right to review doing business with these suppliers.

I, _____ of _____

(insert name of Director or as per Authority Resolution from Board of Directors)

(insert name of Company)

hereby acknowledge having read, understood and agree to the terms and conditions set out in the "Transnet Supplier Code of Conduct."

Signed this on day _____ at _____

_____

Signature

T2.2-17: Insurance provided by the *Contractor*

Clause 83.1 in NEC3 Term Service Contract (June 2005)(amended June 2006 and April 2013) requires that the *Contractor* provides the insurance stated in the insurance table except any insurance which the *Employer* is to provide as stated in the Contract Data.

Please provide the following details for insurance which the *Contractor* is still to provide. Notwithstanding this information all costs related to insurance are deemed included in the tenderer's rates and prices.

Insurance against (See clause 83.1 of the TSC)	**Name of Insurance Company**	**Cover**	**Premium**
Liability for death of or bodily injury to employees of the *Contractor* arising out of and in the course of their employment in connection with this contract			
Motor Vehicle Liability Insurance comprising (as a minimum) "Balance of Third Party" Risks including Passenger and Unauthorised Passenger Liability indemnity with a minimum indemnity limit of R5 000 000			
Insurance in respect of loss of or damage to own property and equipment.			
(Other)			

T2.2-18 SUPPLIER DECLARATION FORM

Transnet Vendor Management has received a request to load / change your company details onto the Transnet vendor master database. Please return the completed Supplier Declaration Form (SDF) together with the required supporting documents as per Appendix A to the Transnet Official who is intending to procure your company's services / products, to enable us to process this request. Please only submit the documentation relevant to your request.

Please Note: all organisations, institutions and individuals who wish to provide goods and/or services to organs of the State must be registered on the National Treasury's Central Supplier Database (CSD). This needs to be done via their portal at https://secure.csd.gov.za/ **before applying to Transnet**.

General Terms and Conditions:

Please Note: Failure to submit the relevant documentation will delay the vendor creation / change process.

Where applicable, the respective Transnet Operating Division processing your application may request further or additional information from your company.

The Service Provider warrants that the details of its bank account ("the nominated account") provided herein, are correct and acknowledges that payments due to the Supplier will be made into the nominated account. If details of the nominated account should change, the Service Provider must notify Transnet in writing of such change, failing which any payments made by Transnet into the nominated account will constitute a full discharge of the indebtedness of Transnet to the Supplier in respect of the payment so made. Transnet will incur no liability for any payments made to the incorrect account or any costs associated therewith. In such an event, the Service Provider indemnifies and holds Transnet harmless in respect of any payments made to an incorrect bank account and will, on demand, pay Transnet any costs associated herewith.

Transnet expects its suppliers to timeously renew their Tax Clearance and B-BBEE certificates (Large Enterprises and QSEs less than 51% black owned) as well as sworn affidavits in the case of EMEs and QSEs with more than 51% black ownership as per Appendices C and D.

In addition, please take note of the following very important information:

1. **If your annual turnover is R10 million or less,** then in terms of the DTI Generic Codes of Good Practice, you are classified as an Exempted Micro Enterprise (EME). If your company is classified as an EME, please include in your submission a sworn affidavit confirming your company's most recent annual turnover is less than R10 million and percentage of black ownership and black female ownership in the company (Appendix C) OR B-BBEE certificate issued by a verification agency accredited by SANAS in terms of the EME scorecard should you feel you will be able to attain a better B-BBEE score. It is only in this context that an EME may submit a B-BBEE verification certificate. These EME sworn affidavits must be accepted by the . Government introduced this mechanism specifically to reduce the cost of doing business and regulatory burden for these entities and the template for the sworn affidavit is available at no cost on the website www.thedti.gov.za or EME certificates at CIPC from www.cipic.co.za.

The B-BBEE Commission said "that only time an EME can be verified by a SANAS accredited verification professional is when it wishes to maximise its B-BBEE points and move to a higher B-BBEEE recognition level, and that must be done use the QSE Scorecard".

2. **If your annual turnover is between R10 million and R50 million,** then in terms of the DTI codes, you are classified as a Qualifying Small Enterprise (QSE). A QSE which is at least 51% black owned, is required to submit a sworn affidavit confirming their annual total revenue of between R10 million and R50 million and level of black ownership (Appendix D). QSE 'that does not qualify for 51% of black ownership, are required to submit a B-BBEE verification certificate issued by a verification agency accredited by SANAS their QSEs are required to submit a B-BBEE verification certificate issued by a verification agency accredited by SANAS.

Please Note: B-BBEE certificate and detailed scorecard should be obtained from an accredited rating agency (e.g. SANAS Member).

3. **If your annual turnover exceeds R50 million,** then in terms of the DTI codes, you are classified as a Large Enterprise. Large Enterprises are required to submit a B-BBEE level verification certificate issued by a verification agency accredited by SANAS.

Please Note: B-BBEE certificate and detailed scorecard should be obtained from an accredited rating agency (e.g. SANAS Member).

4. **The supplier to furnish proof to the procurement department as required in the Fourth Schedule of the Income Tax Act. 58 of 1962** whether a supplier of service is to be classified as an "employee", "personal service provider" or "labour broker". Failure to do so will result in the supplier being subject to employee's tax.

5. **No payments can be made to a vendor until the** vendor has been registered / updated, and no vendor can be registered / updated until the vendor application form, together with its supporting documentation, has been received and processed**.** No payments can be made to a vendor until the vendor has met / comply with the procurement requirements.

6. It is in line with PPPFA Regulations, only valid B-BBBEE status level certificate issued by an unauthorised body or person OR a sworn affidavit as prescribed by the B-BBEE Codes of Good Practice, OR any other requirement prescribed in terms of the Broad- Based Black Economic Empowerment Act.

7. The B-BBEE Commission advises entities and organs of state to reject B-BBEE certificates that have been issues by verification agencies or professionals who are not accredited by South African National Accreditation Systems ("SANAS) as such B-BBEE certificates are invalid for lack of authority and mandate to issue them. A list of SANAS Accredited agencies is available on the SANAS website at www.sanas.co.za.

8. Presenting banking details. Please note: Banks have decided to enable the customers and provide the ability for customers to generate Account Confirmation/Bank Account letters via their online platform; this is a digital approach to the authentication of banking details.

SUPPLIER DECLARATION FORM

Supplier Declaration Form

Important Notice: all organisations, institutions and individuals who wish to provide goods and/or services to organs of the State must be registered on the National Treasury Central Supplier Database (CSD). This needs to be done via their portal at https://secure.csd.gov.za/ **before applying to Transnet**.	
CSD Number (MAAA xxxxxxx):	

Company Trading Name						
Company Registered Name						
Company Registration No Or ID No If a Sole Proprietor						
Company Income Tax Number						
Form of Entity	CC	Trust	Pty Ltd	Limited	Partnership	Sole Proprietor
	Non-profit (NPO's or NPC)	Personal Liability Co	State Owned Co	National Govt	Provincial Govt	Local Govt
	Educational Institution	Specialised Profession	Financial Institution	Joint Venture	Foreign International	Foreign Branch Office

Did your company previously operate under another name?	Yes		No	
If **YES** state the previous details below:				
Trading Name				
Registered Name				
Company Registration No Or ID No If a Sole Proprietor				

Form of Entity	CC	Trust	Pty Ltd	Limited	Partnership	Sole Proprietor
	Non-profit (NPO's or NPC)	Personal Liability Co	State Owned Co	National Govt	Provincial Govt	Local Govt
	Educational Institution	Specialised Profession	Financial Institution	Joint Venture	Foreign International	Foreign Branch Office

Your Current Company's VAT Registration Status	
VAT Registration Number	
If **Exempted from VAT registration,** state reason and	

submit proof from SARS in confirming the exemption status	
If your business entity is not VAT Registered, please submit a current original sworn affidavit (see example in Appendix I). Your Non VAT Registration must be confirmed annually.	

Company Banking Details		Bank Name	
Universal Branch Code		Bank Account Number	

Company Physical Address			
		Code	
Company Postal Address			
		Code	
Company Telephone number			
Company Fax Number			
Company E-Mail Address			
Company Website Address			

Company Contact Person Name	
Designation	
Telephone	
Email	

Is your company a Labour Broker?	Yes		No			
Main Product / Service Supplied e.g. Stationery / Consulting / Labour etc.						
How many personnel does the business employ?	Full Time		Part Time			
Please Note: Should your business employ more than 2 full time employees who are not connected persons as defined in the Income Tax Act, please submit a sworn affidavit, as per Appendix II.						

Most recent Financial Year's Annual Turnover	<R10Million **EME**		>R10Million <R50Million **QSE**		>R50Million **Large Enterprise**	

Does your company have a valid proof of B-BBEE status?	Yes		No						
Please indicate your Broad Based BEE status (Level 1 to 9)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Majority Race of Ownership									

% Black Ownership		% Black Women Ownership		% Black Disabled person(s) Ownership		% Black Youth Ownership	

% Black Unemployed		% Black People Living in Rural Areas		% Black Military Veterans			

Please Note: Please provide proof of B-BBEE status as per Appendix C and D:

- Large Enterprise and QSEs with less than 51% black ownership need to obtain a B-BBEE certificate and detailed scorecard from an accredited rating agency;
- EMEs and QSEs with at least 51% black ownership may provide an affidavit using the templates provided in Appendix C and D respectively;
- Black Disabled person(s) ownership will only be accepted if accompanied with a certified letter signed by a physician on the physician's letterhead confirming the disability;
- A certified South African identification document will be required for all Black Youth Ownership.

Supplier Development Information Required	
EMPOWERING SUPPLIER An Empowering Supplier is a B-BBEE compliant Entity which complies with at least three criteria if it is a large Entity, or one criterion if it is a Qualifying Small Enterprise ("QSE"), as detailed in Statement 400 of the New Codes. In terms of the requirements of an Empowering Supplier, numerous companies found it challenging to meet the target of 25% transformation of raw materials or beneficiation including local manufacturing, particularly so, if these companies imported goods or products from offshore. The matter was further compounded by the requirement for 25% of Cost of Sales, excluding labour cost and depreciation, to be procured from local producers or suppliers.	YES ○ NO ○
FIRST TIME SUPPLIER A supplier that we haven't as yet Traded within Transnet and will be registered via our database for the 1st time.	YES ○ NO ○
SUPPLIER DEVELOPMENT PLAN Supplier Development Plan is a plan that when we as Transnet award a supplier a long term contract depending on the complexity of the Transaction. We will negotiate supplier development obligations that they must meet throughout the contract duration. e.g. we might request that they (create jobs or do skills development or encourage procurement from designated groups. (BWO, BYO & BDO etc.).	YES ○ NO ○
DEVELOPMENT PLAN DOCUMENT	YES ○ NO ○

Agreed plan that will be crafted with the supplier in regards to their development (It could be for ED OR SD in terms of their developmental needs they may require with the company.	*If Yes- Attach supporting documents
ENTERPRISE DEVELOPMENT BENEFICIARY A supplier that is not as yet in our value chain that we are assisting in their developmental area.	YES ○ NO ○
SUPPLIER DEVELOPMENT BENEFICIARY A supplier that we are already doing business with or transacting with and we are also assisting them assisting them in their developmental area e.g. (They might require training or financial assistance etc.)	YES ○ NO ○
GRADUATION FROM ED TO SD BENEFICIARY When a supplier that we assisted with as an ED beneficiary then gets awarded a business and we start Transacting with.	YES ○ NO ○
ENTERPRISE DEVELOPMENT RECIPIENT A supplier that isn't in our value chain as yet but we have assisted them with an ED intervention	YES ○ NO ○

By signing below, I hereby verify that I am duly authorised to sign for and on behalf of firm / organisation and that all information contained herein and attached herewith are true and correct			
Name and Surname		Designation	
Signature		Date	

APPENDIX B

Affidavit or Solemn Declaration as to VAT registration status

Affidavit or Solemn Declaration

I, _____ solemnly swear/declare that _____ is not a registered VAT vendor and is not required to register as a VAT vendor because the combined value of taxable supplies made by the provider in any 12 month period has not exceeded or is not expected to exceed R1million threshold, as required in terms of the Value Added Tax Act.

Signature: _____

Designation: _____

Date: _____

Commissioner of Oaths

Thus signed and sworn to before me at _____ on this the _____ day of _____ 20_____,

the Deponent having knowledge that he/she knows and understands the contents of this Affidavit, and that he/she has no objection to taking the prescribed oath, which he/she regards binding on his/her conscience and that the allegations herein contained are all true and correct.

_____
Commissioner of Oaths

APPENDIX C

SWORN AFFIDAVIT – B-BBEE QUALIFYING SMALL ENTERPRISE – GENERAL

I, the undersigned,

Full name & Surname	
Identity number	

Hereby declare under oath as follows:

1. The contents of this statement are to the best of my knowledge a true reflection of the facts.

2. I am a Member / Director / Owner of the following enterprise and am duly authorised to act on its behalf:

Enterprise Name:	
Trading Name (If Applicable):	
Registration Number:	
Enterprise Physical Address:	
Type of Entity (CC, (Pty) Ltd, Sole Prop etc.):	
Nature of Business:	
Definition of "Black People"	As per the Broad-Based Black Economic Empowerment Act 53 of 2003 as Amended by Act No 46 of 2013 "Black People" is a generic term which means Africans, Coloureds and Indians – (a) who are citizens of the Republic of South Africa by birth or descent; or (b) who became citizens of the Republic of South Africa by naturalisationi- i. before 27 April 1994; or ii. on or after 27 April 1994 and who would have been entitled to acquire citizenship by naturalization prior to that date;"

Definition of "Black Designated Groups"	Black Designated Groups means: (a) unemployed black people not attending and not required by law to attend an educational institution and not awaiting admission to an educational institution; (b) Black people who are youth as defined in the National Youth Commission Act of 1996; (c) Black people who are persons with disabilities as defined in the Code of Good Practice on employment of people with disabilities issued under the Employment Equity Act; (d) Black people living in rural and under developed areas; (e) Black military veterans who qualifies to be called a military veteran in terms of the Military Veterans Act 18 of 2011;"

3. I hereby declare under Oath that:

- The Enterprise is _____% Black Owned as per Amended Code Series 100 of the Amended Codes of Good Practice issued under section 9 (1) of B-BBEE Act No 53 of 2003 as Amended by Act No 46 of 2013,
- The Enterprise is _____% Black Female Owned as per Amended Code Series 100 of the Amended Codes of Good Practice issued under section 9 (1) of B-BBEE Act No 53 of 2003 as Amended by Act No 46 of 2013,
- The Enterprise is _____% Black Designated Group Owned as per Amended Code Series 100 of the Amended Codes of Good Practice issued under section 9 (1) of B-BBEE Act No 53 of 2003 as Amended by Act No 46 of 2013,

- Black Designated Group Owned % Breakdown as per the definition stated above:
- Black Youth % = _____%
- Black Disabled % =_____%
- Black Unemployed % =_____%
- Black People living in Rural areas % = _____%
- Black Military Veterans % =_____%

- Based on the Financial Statements/Management Accounts and other information available on
  the latest financial year-end of _____, the annual Total Revenue was between
  R10,000,000.00 (Ten Million Rands) and R50,000,000.00 (Fifty Million Rands),

- Please confirm on the table below the B-BBEE level contributor, **by ticking the applicable box.**

100% Black Owned	**Level One** (135% B-BBEE procurement recognition level)	
At Least 51% black owned	**Level Two** (125% B-BBEE procurement recognition level)	

4. I know and understand the contents of this affidavit and I have no objection to take the prescribed oath and consider the oath binding on my conscience and on the owners of the enterprise which I represent in this matter.

5. The sworn affidavit will be valid for a period of 12 months from the date signed by commissioner.

Deponent Signature

.....

Date **.....**

_____

Commissioner of Oaths
Signature & stamp

APPENDIX D

SWORN AFFIDAVIT – B-BBEE EXEMPTED MICRO ENTERPRISE – GENERAL

I, the undersigned,

Full name & Surname	
Identity number	

Hereby declare under oath as follows:

1. The contents of this statement are to the best of my knowledge a true reflection of the facts.

2. I am a Member / Director / Owner of the following enterprise and am duly authorised to act on its behalf:

Enterprise Name:	
Trading Name (If Applicable):	
Registration Number:	
Enterprise Physical Address:	
Type of Entity (CC, (Pty) Ltd, Sole Prop etc.):	
Nature of Business:	

Definition of "Black People"	As per the Broad-Based Black Economic Empowerment Act 53 of 2003 as Amended by Act No 46 of 2013 "Black People" is a generic term which means Africans, Coloureds and Indians – (a) who are citizens of the Republic of South Africa by birth or descent; or (b) who became citizens of the Republic of South Africa by naturalisationi- i. before 27 April 1994; or ii. on or after 27 April 1994 and who would have been entitled to acquire citizenship by naturalization prior to that date;"
Definition of "Black Designated Groups"	"Black Designated Groups means: (a) unemployed black people not attending and not required by law to attend an educational institution and not awaiting admission to an educational institution; (b) Black people who are youth as defined in the National Youth Commission Act of 1996; (c) Black people who are persons with disabilities as defined in the Code of Good Practice on employment of people with disabilities issued under the Employment Equity Act; (d) Black people living in rural and under developed areas; (e) Black military veterans who qualifies to be called a military veteran in terms of the Military Veterans Act 18 of 2011;"

3. I hereby declare under Oath that:

- The Enterprise is _____% Black Owned as per Amended Code Series 100 of the Amended Codes of Good Practice issued under section 9 (1) of B-BBEE Act No 53 of 2003 as Amended by Act No 46 of 2013,
- The Enterprise is _____% Black Female Owned as per Amended Code Series 100 of the Amended Codes of Good Practice issued under section 9 (1) of B-BBEE Act No 53 of 2003 as Amended by Act No 46 of 2013,

- The Enterprise is _____% Black Designated Group Owned as per Amended Code Series 100 of the Amended Codes of Good Practice issued under section 9 (1) of B-BBEE Act No 53 of 2003 as Amended by Act No 46 of 2013,

- Black Designated Group Owned % Breakdown as per the definition stated above:
- Black Youth % = _____%
- Black Disabled % =_____%
- Black Unemployed % =_____%
- Black People living in Rural areas % = _____%
- Black Military Veterans % =_____%

- Based on the Financial Statements/Management Accounts and other information available on the latest financial year-end of _____, the annual Total Revenue was R10,000,000.00 (Ten Million Rands) or less

- Please Confirm on the below table the B-BBEE Level Contributor, **by ticking the applicable box.**

100% Black Owned	**Level One** (135% B-BBEE procurement recognition	
At least 51% Black Owned	**Level Two** (125% B-BBEE procurement recognition level)	
Less than 51% Black Owned	**Level Four** (100% B-BBEE procurement recognition level)	

4. I know and understand the contents of this affidavit and I have no objection to take the prescribed oath and consider the oath binding on my conscience and on the Owners of the Enterprise which I represent in this matter.

5. The sworn affidavit will be valid for a period of 12 months from the date signed by commissioner.

Deponent Signature

.....

Date **.....**

_____

Commissioner of Oaths

Signature & stamp

VENDOR REGISTRATION DOCUMENTS CHECKLIST

Please note that you will have to provide the first two documents on the list (highlighted in red) and the rest will be provided by the supplier:

	Yes	No
1. Complete the "Supplier Declaration Form" (SDF) (commissioned). See attachment.		
2. Complete the "Supplier Code of Conduct" (SCC). See attachment.		
3. Copy of cancelled cheque OR letter from the bank verifying banking details (with **bank stamp not older than 3 Months & sign by Bank Teller**).		
4. Certified (**Not Older than 3 Months**) copy of Identity document of Shareholders/Directors/Members (where applicable).		
5. Certified copy of certificate of incorporation, CM29 / CM9 (name change).		
6. Certified copy of share Certificates of Shareholders, CK1 / CK2 (if CC).		
7. A letter with the company's letterhead confirming both **Physical** and **Postal** address.		
8. Original or certified copy of SARS Tax Clearance certificate and Vat registration certificate.		
9. BBBEE certificate and detailed scorecard from a **SANAS** Accredited Verification Agency and/or Sworn Certified Affidavit.		
10. Central Supplier Database (CSD) Summary Registration Report.		

C1.1 Form of Offer & Acceptance

Offer

The Employer, identified in the Acceptance signature block, has solicited offers to enter into a contract for the procurement of:

The Provision of Cleaning and Hygiene Services at Transnet Pipelines Site Offices, Cutler Complex, Island View in Durban for a period of three (3) years

The tenderer, identified in the Offer signature block, has examined the documents listed in the Tender Data and addenda thereto as listed in the Returnable Schedules, and by submitting this Offer has accepted the Conditions of Tender.

By the representative of the tenderer, deemed to be duly authorised, signing this part of this Form of Offer and Acceptance the tenderer offers to perform all of the obligations and liabilities of the *Contractor* under the contract including compliance with all its terms and conditions according to their true intent and meaning for an amount to be determined in accordance with the *conditions of contract* identified in the Contract Data.

The offered total of the Prices exclusive of VAT is	**R**
Value Added Tax @ 15% is	**R**
The offered total of the Prices inclusive of VAT is	**R**
(in words)	

This Offer may be accepted by the Employer by signing the Acceptance part of this Form of Offer and Acceptance and returning one copy of this document including the Schedule of Deviations (if any) to the tenderer before the end of the period of validity stated in the Tender Data, or other period as agreed, whereupon the tenderer becomes the party named as the *Contractor* in the *conditions of contract* identified in the Contract Data.

Signature(s) .....

Name(s) .....

Capacity .....

For the tenderer: .....

(Insert name and address of organisation)

Name & signature of witness .....

Date .....

Tenderer's CIDB registration number: N/A

Acceptance

By signing this part of this Form of Offer and Acceptance, the Employer identified below accepts the tenderer's Offer. In consideration thereof, the Employer shall pay the Contractor the amount due in accordance with the *conditions of contract* identified in the Contract Data. Acceptance of the tenderer's Offer shall form an agreement between the Employer and the tenderer upon the terms and conditions contained in this agreement and in the contract that is the subject of this agreement.

The terms of the contract, are contained in:

Part C1	Agreements and Contract Data, (which includes this Form of Offer and Acceptance)
Part C2	Pricing Data
Part C3	Scope of Work: Service Information

and drawings and documents (or parts thereof), which may be incorporated by reference into the above listed Parts.

Deviations from and amendments to the documents listed in the Tender Data and any addenda thereto listed in the Returnable Schedules as well as any changes to the terms of the Offer agreed by the tenderer and the Employer during this process of offer and acceptance, are contained in the Schedule of Deviations attached to and forming part of this Form of Offer and Acceptance. No amendments to or deviations from said documents are valid unless contained in this Schedule.

The tenderer shall within two weeks of receiving a completed copy of this agreement, including the Schedule of Deviations (if any), contact the Employer's agent (whose details are given in the Contract Data) to arrange the delivery of any securities, bonds, guarantees, proof of insurance and any other documentation to be provided in terms of the *conditions of contract* identified in the Contract Data at, or just after, the date this agreement comes into effect. Failure to fulfil any of these obligations in accordance with those terms shall constitute a repudiation of this agreement.

Notwithstanding anything contained herein, this agreement comes into effect on the date of award.

Unless the tenderer (now *Contractor*) within five working days of the date of such receipt notifies the Employer in writing of any reason why he cannot accept the contents of this agreement, this agreement shall constitute a binding contract between the Parties.

Signature(s) .....

Name(s) .....

Capacity .....

for the Employer .....

(Insert name and address of organisation)

Name & signature of witness .....

Date .....

.

Schedule of Deviations

Note:

1. To be completed by the Employer prior to award of contract. This part of the Offer & Acceptance would not be required if the contract has been developed by negotiation between the Parties and is not the result of a process of competitive tendering.
2. The extent of deviations from the tender documents issued by the Employer prior to the tender closing date is limited to those permitted in terms of the Conditions of Tender.
3. A tenderer's covering letter must not be included in the final contract document. Should any matter in such letter, which constitutes a deviation as aforesaid be the subject of agreement reached during the process of Offer and Acceptance, the outcome of such agreement shall be recorded here and the final draft of the contract documents shall be revised to incorporate the effect of it.

No.	Subject	Details
1		
2		
3		
4		
5		

By the duly authorised representatives signing this Schedule of Deviations below, the Employer and the tenderer agree to and accept this Schedule of Deviations as the only deviations from and amendments to the documents listed in the Tender Data and any addenda thereto listed in the Tender Schedules, as well as any confirmation, clarification or changes to the terms of the Offer agreed by the tenderer and the Employer during this process of Offer and Acceptance.

It is expressly agreed that no other matter whether in writing, oral communication or implied during the period between the issue of the tender documents and the receipt by the tenderer of a completed signed copy of this Form shall have any meaning or effect in the contract between the parties arising from this Agreement.

	For the tenderer:	**For the Employer**
Signature	.....	.....
Name	.....	.....
Capacity	.....	.....
On behalf of	..... *(Insert name and address of organisation)*	..... *(Insert name and address of organisation)*
Name & signature of witness	.....	.....
Date	.....	.....

C1.2 Contract Data

Part one - Data provided by the *Employer*

Clause	Statement	Data
1	**General**	
	The *conditions of contract* are the core clauses and the clauses for main Option:	
		A: Priced contract with price list
	dispute resolution Option	**W1: Dispute resolution procedure**
	and secondary Options	
		X2 Changes in the law
		X17: Low service damages
		X18: Limitation of liability
		Z: *Additional conditions of contract*
		Z1 Additional obligations in respect of Termination
		Z2 Right Reserved by Transnet to Conduct Vetting through SSA
		Z3 Additional clause relating to Collusion
		Z4 Protection of Personal Information Act
	of the NEC3 Term Service Contract (June 2005) (and amended June 2006 and April 2013)	
10.1	The *Employer* is:	**Transnet SOC Ltd**

	Address	Registered address: **Transnet Corporate Centre** **138 Eloff Street** **Braamfontein** **Johannesburg** **2000**
	Having elected its Contractual Address for the purposes of this contract as:	**Transnet Pipelines** **202 Anton Lembede Street** **Durban, South Africa** **4001**
10.1	The *Service Manager* is (name):	**TBA**
	Address	**Transnet Pipelines Site Offices, Cutler Complex, Island View in Durban**
	Tel	**TBA**
	e-mail	**TBA**
11.2(2)	The Affected Property is	**Transnet Pipelines Site Offices, Cutler Complex, Island View in Durban**
11.2(13)	The *service* is	**The Provision of Cleaning and Hygiene Services at Transnet Pipelines Site Offices, Cutler Complex, Island View in Durban**
11.2(14)	The following matters will be included in the Risk Register	**None**
11.2(15)	The Service Information is in	**The Scope of Services**
12.2	The *law of the contract* is the law of	**the Republic of South Africa subject to the jurisdiction of the Courts of South Africa.**
13.1	The *language of this contract* is	**English**
13.3	The *period for reply* is	**2 weeks**
2	**The *Contractor*'s main responsibilities**	(If the optional statement for this section is not used, no data will be required for this section)
21.1	The *Contractor* submits a first plan for acceptance within	**2 weeks of the Contract Date**
3	**Time**	
30.1	The *starting date* is.	**TBA**
30.1	The *service period* is	**36 (thirty six) months**
4	**Testing and defects**	**No additional data is required for this section of the *conditions of contract*.**

5	**Payment**	
50.1	The *assessment interval* is	**18th (eighteenth) day of each successive month.**
51.1	The *currency of this contract* is the	**South African Rand.**
51.2	The period within which payments are made is	**Payment will be effected on or before the last day of the month following the month during which a valid Tax Invoice and Statement were received.**
51.4	The *interest rate* is	**The prime lending rate of the Standard Bank South Africa.**
6	**Compensation events**	**No additional data**
7	**Use of Equipment Plant and Materials**	**No additional data is required for this section of the *conditions of contract*.**
8	**Risks and insurance**	
83.1	The minimum limit of indemnity for insurance in respect of loss and damage to property (except goods, plant and materials and equipment) and liability for bodily injury or death of a person (not an employee of the *Contractor)* caused by activity in connection with this contract for any one event is:	**Whatever *Contractor* deems necessary as the *Employer* is not carrying this indemnity.**
83.1	The minimum limit of indemnity for insurance in respect of death of or bodily injury to employees of the *Contractor* arising out of and in the course of their employment in connection with this contract for any one event is:	**As prescribed by the Compensation for Occupational Injuries and Diseases Act No. 130 of 1993 and the *Contractor's* common law liability for people falling outside the scope of the Act.**
83.1	Motor Vehicle Liability Insurance comprising (as a minimum) "Balance of Third Party" Risks including Passenger and Unauthorised Passenger Liability indemnity with a minimum indemnity limit of R 5 000 000	
83.1	The *Contractor* liability to the *Employer* for indirect or consequential loss including loss of profit, revenue and goodwill, is limited to:	**The Total of the Prices.**
83.1	For any one event, the *Contractor* liability to the *Employer* for loss of or damage to the *Employers* property is limited to:	**The Total of the Prices.**

83.1	The *Contractor* total liability to the *Employer* for all matters arising under or in connection with this contract, other than the excluded matters, is limited to:	**The Total of the Prices.**
9	**Termination**	**There is no Contract Data required for this section of the *conditions of contract*.**
10	**Data for main Option clause**	
A	**Priced contract with price list**	
20.5	The *Contractor* prepares forecasts of the final total of the Prices for the whole of the *service* at intervals no longer than	**4 weeks.**
11	**Data for Option W1**	
W1.1	The *Adjudicator* is (Name)	**Both parties will agree as and when a dispute arises. If the parties cannot reach an agreement on the *Adjudicator*, the chairman of the Association of Arbitrators will appoint an *Adjudicator.***
W1.2(3)	The *Adjudicator nominating body* is: If no *Adjudicator nominating body* is entered, it is	 **The Association of Arbitrators (Southern Africa)**
W1.4(2)	The *tribunal* is:	**Arbitration**
W1.4(5)	The *arbitration procedure* is	**The Rules for the Conduct of Arbitrations of the Association of Arbitrators (Southern Africa)**
	The place where arbitration is to be held is	**Durban, South Africa**
	The person or organisation who will choose an arbitrator - if the Parties cannot agree a choice or - if the arbitration procedure does not state who selects an arbitrator, is	 **The Chairman of the Association of Arbitrators (Southern Africa)**
12	**Data for secondary Option clauses**	
X2	**Changes in the law**	**No additional data is required for this Option**
X17	**Low service damages**	
X17.1	The *service level table* is in	**Scope of Work, Section 12**
X18	**Limitation of liability**	
X18.1	The *Contractor*'s liability to the *Employer* for indirect or consequential loss is limited to	**Nil.**

X18.2	For any one event, the *Contractor*'s liability to the *Employer* for loss of or damage to the *Employer*'s property is limited to	**The deductible of the relevant insurance policy**
X18.4	The *Contractor*'s total liability to the *Employer*, for all matters arising under or in connection with this contract, other than the excluded matters, is limited to	**Total of the Prices.**
Z	***Additional conditions of contract***	

Z1	**Obligations in respect of Termination**	
Z1.1		The following will be included under core clause 91.1: In the second main bullet, after the word 'partnership' add 'joint venture whether incorporated or otherwise (including any constituent of the joint venture)'; and Under the second main bullet, insert the following additional bullets after the last sub-bullet: • commenced business rescue proceedings (R22) • repudiated this Contract (R23)
Z1.2	Termination Table	The following will be included under core clause 90.2 Termination Table as follows: Amend "A reason other than R1 – R21" to "A reason other than R1 – R23"
Z1.3		Amend "R1 – R15 or R18" to "R1 – R15, R18, R22 or R23."
		27.7.13 Should the contract be extended, the same provisions as applicable in interval Five shall continue to apply until Completion Date.

Z2	**Right Reserved by Transnet to Conduct Vetting through SSA**	
Z2.1		Transnet reserves the right to conduct vetting through State Security Agency (SSA) for security clearances of any Contractor who has access to National Key Points for the following without limitations: 1. Confidential – this clearance is based on any information which may be used by malicious, opposing or hostile elements to harm the objectives and functions of an organ of state. 2. Secret – clearance is based on any information which may be used by malicious, opposing or hostile elements to disrupt the objectives and functions of an organ of state. 3. Top Secret – this clearance is based on information which may be used by malicious, opposing or hostile elements to neutralise the objectives and functions of an organ of state.
Z3	**Additional clause relating to Collusion in the Construction Industry**	
Z3.1		The contract award is made without prejudice to any rights Transnet may have to take appropriate action later with regard to any declared bid rigging including blacklisting.
Z4	**Protection of Personal Information Act**	
Z4.1		The *Employer* and the *Contractor* are required to process information obtained for the duration of the Agreement in a manner that is aligned to the Protection of Personal Information Act

C1.2 Contract Data

Part two - Data provided by the *Contractor*

The tendering contractor is advised to read both the NEC3 Term Service Contract (June 2005) and the relevant parts of its Guidance Notes (TSC3-GN) in order to understand the implications of this Data which the tenderer is required to complete.

Completion of the data in full, according to Options chosen, is essential to create a complete contract.

Clause	Statement	Data
10.1	The *Contractor* is (Name):	
	Address	
	Tel No.	
	Fax No.	
11.2(8)	The *direct fee percentage* is	**.....%**
	The *subcontracted fee percentage* is	**.....%**
11.2(14)	The following matters will be included in the Risk Register	**.....**
11.2(15)	The Service Information for the *Contractor*'s plan is in:	**.....**
21.1	The plan identified in the Contract Data is contained in:	**.....**
24.1	The key persons are:	
	1 Name:	**.....**
	Job:	**.....**
	Responsibilities:	**.....**
	Qualifications:	**.....**
	Experience:	**.....**
	2 Name:	**.....**
	Job	**.....**
	Responsibilities:	**.....**
	Qualifications:	**.....**
	Experience:	**.....**
		.....

		CV's (and further key person's data including CVs) are in .....
A	**Priced contract with price list**	
11.2(12)	The *price list* is in	**.....**
11.2(19)	The tendered total of the Prices is	**R.....**

PART C2: PRICING DATA

Document reference	Title	No of pages
C2.1	Pricing instructions: Option A	3
C2.2	Price List	8

C2.1 Pricing instructions: Option A

1.1 The *conditions of contract*

1.2 How the contract prices work and assesses it for progress payments

Clause 11 in NEC3 Term Services Contract (TSC), June 2005 (with amendments June 2006 and April 2013) Option A states:

Identified and defined terms 11 11.2 (17) The Price for Services Provided to Date is the total of

- the Price for each lump sum item in the Price List which the *Contractor* has completed and
- where a quantity is stated for an item in the Price List, an amount calculated by multiplying the quantity which the *Contractor* has completed by the rate.

(19) The Prices are the amounts stated in the Price column of the Price List, where a quantity is stated for an item in the Price List, the Price is calculated by multiplying the quantity by the rate.

1.3 Measurement and Payment

1.3.1 The Price List provides the basis of all valuations of the Price for Services Provided to Date, payments in multiple currencies and general progress monitoring.

1.3.2 The Prices are obtained from the Price List. The Prices includes for all direct and indirect costs, overheads, profits, risks, liabilities, obligations, etc. relative to the contract.

C2.2 Price List

I/We quote as follows for the services required, on a "fixed price" basis, excluding VAT:

SUMMARY COST CARRIED FORWARD TO OFFER & ACCEPTANCE	
Total cost for Year 1	R
Total cost for Year 2	R
Total cost for Year 3	R
TOTAL CARRIED TO OFFER & ACCEPTANCE	

PRICE LIST FOR PERIOD YEAR 1 (12 MONTHS)

Item No	DESCRIPTION	Unit	(a)	(b)	(c)	D=(axbxc)
			Quantity	Rate	No Months	Total Value
	LABOUR RATES FOR AREAS TO BE CLEANED/ MAINTAINED					
1	Team leader	Hrs	1980		12	
	Cleaning Staff					
2	Worker #1	Hrs	1980		12	
3	Worker #2	Hrs	1980		12	
4	Worker #3	Hrs	1980		12	
5	Worker #4	Hrs	1980		12	
	RENTAL OF HYGIENE EQUIPMENT					
6	Auto Hand paper towel dispenser including Batteries as required	Monthly	3		12	
7	Sanitary Bin Units (Box, Lids & Plastic)	Monthly	4		12	
8	Auto Sanitisers for Urinals including Batteries as required	Monthly	2		12	
9	Seat Spray Dispensers	Monthly	8		12	
10	Soap Dispenser units - including Batteries as required	Monthly	4		12	

Item No	DESCRIPTION	Unit	(a)	(b)	(c)	D=(axbxc)
			Quantity	Rate	No Months	Total Value
11	Air freshener units - including Batteries as required	Monthly	3		12	
12	Wall Bins without Lids	Monthly	3		12	
13	Collection of 4 off Sanitary Bin Units including disposal.	Weekly	4		12	
	PEST CONTROL (Including Pest Control Certificates)					
14	Treatment for Rodents - Outside	Monthly	1		12	
15	Spiders, Ants and Cockroaches, Flies (Spray) – **Outside** - two (2) (9mx3m), eight (8) (12mx3m), six (6) (6mx3m) and one (1) (12mx6m) Park Homes.	Monthly	1		12	
16	Spiders, Ants and Cockroaches, Flies (Spray) – **Inside** - two (2) (9mx3m), eight (8) (12mx3m), six (6) (6mx3m) and one (1) (12mx6m) Park Homes.	Every 3 Months	1		4	
17	Treatment for Cockroaches (Bait) - Inside	Every 6 Months	1		2	

Item No	DESCRIPTION	Unit	(a)	(b)	(c)	D=(axbxc)
			Quantity	Rate	No Months	Total Value
	HYGIENE CONSUMABLES					
18	Hand Paper Towel Rolls (As & when required)	Number	9		12	
19	Bales (48 Rolls per bale) Double Ply Toilet Roils (As & when required)	Number	2		12	
20	Hand Soap Sachets Refills (As & when required)	Number	4		12	
21	Toilet Seat Spray Sachets Refills (As & when required)	Number	4		12	
22	Hand sanitiser refills Flex Alcohol (75%) Sanitizer 500ml and kills over 99.99% of gems (As & when required)	Number	3		12	
23	P Mats for Urinals (As & when required)	Number	4		12	
24	Urinal auto flush refills (As & when required)	Number	4		12	
25	Entry Medicals	Number	5			
26	Allowance for Safety Files and Cutler Access Permit for personnel required to work on Site. Subcontractors to be included	Lump Sum	1			
Sub Total for Year 1 carried to Summary						**R**

PRICE LIST FOR PERIOD YEAR 2 (12 MONTHS)

Item No	DESCRIPTION	Unit	(a)	(b)	(c)	D=(axbxc)
			Quantity	Rate	No Months	Total Value
	LABOUR RATES FOR AREAS TO BE CLEANED/ MAINTAINED					
1	Team leader	Hrs	1980		12	
	Cleaning Staff					
2	Worker #1	Hrs	1980		12	
3	Worker #2	Hrs	1980		12	
4	Worker #3	Hrs	1980		12	
5	Worker #4	Hrs	1980		12	
	RENTAL OF HYGIENE EQUIPMENT					
6	Auto Hand paper towel dispenser including Batteries as required	Monthly	3		12	
7	Sanitary Bin Units (Box, Lids & Plastic)	Monthly	4		12	
8	Auto Sanitisers for Urinals including Batteries as required	Monthly	2		12	
9	Seat Spray Dispensers	Monthly	8		12	
10	Soap Dispenser units - including Batteries as required	Monthly	4		12	
11	Air freshener units - including Batteries as required	Monthly	3		12	
12	Wall Bins without Lids	Monthly	3		12	
13	Collection of 4 off Sanitary Bin Units including disposal.	Weekly	4		12	
Item	**DESCRIPTION**	**Unit**	**(a)**	**(b)**	**(c)**	**D=(axbxc)**

No			Quantity	Rate	No Months	Total Value
	PEST CONTROL (Including Pest Control Certificates)					
14	Treatment for Rodents – Outside	Monthly	1		12	
15	Spiders, Ants and Cockroaches, Flies (Spray) – **Outside** - two (2) (9mx3m), eight (8) (12mx3m), six (6) (6mx3m) and one (1) (12mx6m) Park Homes.	Monthly	1		12	
16	Spiders, Ants and Cockroaches, Flies (Spray) – **Inside** - two (2) (9mx3m), eight (8) (12mx3m), six (6) (6mx3m) and one (1) (12mx6m) Park Homes.	Every 3 Months	1		4	
17	Treatment for Cockroaches (Bait) – Inside	Every 6 Months	1		2	
	HYGIENE CONSUMABLES					
18	Hand Paper Towel Rolls (As & when required)	Number	9		12	
19	Bales (48 Rolls per bale) Double Ply Toilet Roils (As & when required)	Number	2		12	
20	Hand Soap Sachets Refills (As & when required)	Number	4		12	
21	Toilet Seat Spray Sachets Refills (As & when required)	Number	4		12	
22	Hand sanitiser refills Flex Alcohol (75%) Sanitizer 500ml and kills over 99.99% of gems (As & when required)	Number	3		12	
23	P Mats for Urinals (As & when required)	Number	4		12	
Item	**DESCRIPTION**	**Unit**	**(a)**	**(b)**	**(c)**	**D=(axbxc)**

No			Quantity	Rate	No Months	Total Value
24	Urinal auto flush refills (As & when required)	Number	4		12	
25	Periodic medicals	Number	5			
Sub Total for Year 2 carried to Summary						R

PRICE LIST FOR PERIOD YEAR 3 (12 MONTHS)

Item No	DESCRIPTION	Unit	(a)	(b)	(c)	D=(axbxc)
			Quantity	Rate	No Months	Total Value
	LABOUR RATES FOR AREAS TO BE CLEANED/ MAINTAINED					
1	Team leader	Hrs	1980		12	
	Cleaning Staff					
2	Worker #1	Hrs	1980		12	
3	Worker #2	Hrs	1980		12	
4	Worker #3	Hrs	1980		12	
5	Worker #4	Hrs	1980		12	
	RENTAL OF HYGIENE EQUIPMENT					
6	Auto Hand paper towel dispenser including Batteries as required	Monthly	3		12	
7	Sanitary Bin Units (Box, Lids & Plastic)	Monthly	4		12	
8	Auto Sanitisers for Urinals including Batteries as required	Monthly	2		12	
9	Seat Spray Dispensers	Monthly	8		12	
Item	**DESCRIPTION**	**Unit**	**(a)**	**(b)**	**(c)**	**D=(axbxc)**

No			Quantity	Rate	No Months	Total Value
10	Soap Dispenser units - including Batteries as required	Monthly	4		12	
11	Air freshener units - including Batteries as required	Monthly	3		12	
12	Wall Bins without Lids	Monthly	3		12	
13	Collection of 4 off Sanitary Bin Units including disposal.	Weekly	4		12	
	PEST CONTROL (Including Pest Control Certificates)					
14	Treatment for Rodents – Outside	Monthly	1		12	
15	Spiders, Ants and Cockroaches, Flies (Spray) – **Outside -** two (2) (9mx3m), eight (8) (12mx3m), six (6) (6mx3m) and one (1) (12mx6m) Park Homes.	Monthly	1		12	
16	Spiders, Ants and Cockroaches, Flies (Spray) – **Inside -** two (2) (9mx3m), eight (8) (12mx3m), six (6) (6mx3m) and one (1) (12mx6m) Park Homes.	Every 3 Months	1		4	
17	Treatment for Cockroaches (Bait) - Inside	Every 6 Months	1		2	
	HYGIENE CONSUMABLES					
18	Hand Paper Towel Rolls (As & when required)	Number	9		12	
19	Bales (48 Rolls per bale) Double Ply Toilet Roils (As & when required)	Number	2		12	
Item No	**DESCRIPTION**	**Unit**	**(a)**	**(b)**	**(c)**	**D=(axbxc)**
			Quantity	**Rate**	**No**	**Total Value**

					Months	
20	Hand Soap Sachets Refills (As & when required)	Number	4		12	
21	Toilet Seat Spray Sachets Refills (As & when required)	Number	4		12	
22	Hand sanitiser refills Flex Alcohol (75%) Sanitizer 500ml and kills over 99.99% of gems (As & when required)	Number	3		12	
23	P Mats for Urinals (As & when required)	Number	4		12	
24	Urinal auto flush refills (As & when required)	Number	4		12	
25	Periodic Medicals	Number	5			
26	Exit Medicals	Number	5			
Sub Total for Year 3 carried to Summary						**R**

Scope of Work: Service Information

Service Information

1 Description of the Service and Executive Overview

The *Contractor* shall provide an efficient and effective Office Cleaning Service for a period of 36 (thirty-six) months at Transnet Pipelines Site Offices at TM1 within the Cutler Complex, Island View in Durban, ensuring a high standard of cleaning is delivered and maintained, meeting the *Employer's* expectations.

	SERVICE / DUTIES – CLEANING SERVICES	FREQUENCY
1.	**Floor Maintenance:**	
	Vinyl Floors:	
	Sweep and damp mop	Daily
2.	**DUSTING:**	
	Dust all horizontal surfaces (low level)	Daily
	Dust all high ledges and fittings*	Weekly
	Dust all vertical surfaces (walls, cabinets, etc.)*	Weekly
	Dust all window ledges (high and low)	Daily
	Clean all telephones	Daily
	*to a height of 2 meters	
3.	**WASTE DISPOSAL:**	
	Empty all office & kitchen waste bins areas	Daily
	Remove all waste to specified areas	Daily
4.	**WALLS , ETC:**	
	Spot clean all low surfaces (i.e. glass, walls, doors and light switches)	Daily
5.	**ALL TOILETS AND RESTROOMS OR ABLUTIONS:**	
	Maintain floor according to type	Daily
	Damp mop floor with disinfectant	Daily
	Empty and clean all waste receptacles	Daily
	Clean and sanitise all bowls, basins and urinals	Daily
	Replenish consumables (i.e. toilet paper, soap and towel cabinets)	Daily

	SERVICE / DUTIES – CLEANING SERVICES	FREQUENCY
6.	**WINDOW CLEANING:**	
	Clean interior and exterior faces of all accessible windows up to approximately 2m	Once Monthly
7.	**BLINDS:**	
	Dust	Weekly
8.	**WASTE / REFUSE AREA:**	
	Maintain waste / refuse area, the area to be kept in a clean and hygienic condition	Daily
	Recycling paper, plastic, empty milk cartons, cans, etc. will be collected and deposited in special containers in the designated area.	Daily
9.	**AIR DUCTS, GRILLS & VENTS (Reachable)**	
	Thoroughly wipe with an appropriate detergent and cloth and keep vents free from dust, also wipe area surrounding the vent.	Weekly
10.	**MISCELLANEOUS:**	
	Water Dispensing Machines will be clean & free of stains	Daily
	Dust/Wipe Desks and Office Furniture	Daily
	Polish desks and office furniture	Weekly
	Wash vinyl-covered furniture	Weekly
	Clean cloth-covered furniture	Weekly
11.	**EXTERNAL WORKS:**	
	Wash down external Park Home walls	Monthly
12.	**HYGIENE EQUIPMENT**	
	Auto Hand paper towel dispenser including Batteries as required	Monthly
	Soap Dispenser units - including Batteries as required	Monthly
	Sanitary Bin Units (Box, Lids & Plastic)	Monthly
	Seat Spray Dispensers	Monthly
	Wall Bins without Lids	Monthly
	Collection of Sanitary Bin Units including disposal.	Weekly

	SERVICE / DUTIES – CLEANING SERVICES	FREQUENCY
13.	**PEST CONTROL (Including Pest Control Certificates)**	
	Treatment for Rodents - Outside	Monthly
	Spiders, Ants and Cockroaches, Flies (Spray) – **Outside -** two (2) (9mx3m), eight (8) (12mx3m), six (6) (6mx3m) and one (1) (12mx6m) Park Homes.	Monthly
	Spiders, Ants and Cockroaches, Flies (Spray) – **Inside -** two (2) (9mx3m), eight (8) (12mx3m), six (6) (6mx3m) and one (1) (12mx6m) Park Homes.	Every 3 Months
	Treatment for Cockroaches (Bait) - Inside	Every 6 Months
14	**HYGIENE CONSUMABLES**	
	Hand Paper Towel Rolls	As and when required
	Bales (48 Rolls per bale) Double Ply Toilet Roils	As and when required
	Hand Soap Sachets Refills	As and when required
	Toilet Seat Spray Sachets Refills	As and when required
	Hand sanitiser refills Flex Alcohol (75%) Sanitizer 500ml and kills over 99.99% of gems	As and when required
	P Mats for Urinals	As and when required
15	Entry Medicals	Annually
	Exit Medicals	Once off
	Allowance for Safety Files and Cutler Access Permit for personal required to work on Site. Subcontractors to be included	Lump Sum

DAILY CLEANING		
STAFF	**DAY(S)**	**WORKING HOURS**
2 x Male Cleaner 3 x Female Cleaners (inclusive of Supervisor)	Mon – Fri (Excl. Public Holidays)	8

2 Areas of Operation

- All Offices
- Passages
- Kitchens
- Boardrooms
- Toilets
- Storerooms
- Parking Area

3 Staff Requirements and Supervision

3.1 The *Contractor* shall provide the staff for the execution of the Service, which shall be supervised by means of regular inspections during the day by a Supervisor of the *Contractor* who is expected to:

3.1.1 Have a thorough knowledge of the various cleaning tasks, equipment and material

3.1.2 To be able to properly train and manage employees in their individual tasks

3.1.3 To maintain and control an effective inspection and follow-up programme. A control inspection through all premises of minimum once a month, together with the Site Agent, will take place.

3.2 The *Contractor* is to note that instructions will be given by the Site Agent to the Supervisor for various duties to be carried out by the cleaners and general workers.

3.3 The *Contractor* shall at all times ensure that **all** cleaning staff have been provided with branded uniforms specifying the company name with a name badge for the employee and Safety Boots.

3.4 The *Contractor* shall provide relief staff within 1 day in the event of any cleaning personnel being absent.

3.5 The *Contractor* must assure that the cleaning personnel will be required to sign in and out at the Facilities Controller's Office at Island View Site.

3.6 The Contractor is to ensure honesty and integrity of personnel. Where allegations of theft arise, the employee must be immediately replaced with a new employee.

4 Equipment, Material & Consumables

4.1 The *Contractor* shall provide all necessary equipment, cleaning materials and branded uniforms specifying the company name with a name badge for the employee and Safety Boots, for the execution of the work.

4.2 The *Contractor* shall provide the following equipment, cleaning materials for the execution of the work:

- 4.2.1 Brooms and mops,
- 4.2.2 Cleaning utensils such as cleaning and dusting cloths and scourers,
- 4.2.3 Floor, tile, vinyl, dish cleaning chemicals,
- 4.2.4 Toilet and urinal cleaning chemicals and detergents,
- 4.2.5 To prevent cross-contamination, the *Contractor* must colour-code different cleaning cloths for each cleaning area. This will prevent the cleaners from inadvertently using a cleaning cloth for the toilet in the kitchen.

4.3 Material safety datasheets are required for all chemicals utilised (cleaning & pest control)
4.4 The *Contractor* is to use environmentally friendly pesticides and submit an SDS prior to use of pesticides.
4.5 All Cleaning Materials and Consumables are to be SABS Approved or Equivalent.
4.6 Supervisor inspection are compulsory.
4.7 Hand Towel Dispenser batteries to be kept on site, in stock.
4.8 All hygiene consumables are required on an 'as and when required' basis. An instruction for the provision of the hygiene consumables will be issued to the *Contractor*. The *Contractor* will only be paid for the hygiene consumables provided.

5 Personal Protective Equipment

The *Contractor* shall provide all necessary PPE and branded uniforms specifying the company name with a name badge for the employee and Safety Boots for the execution of the work. The *Contractor*'s Supervisor is to inspect staff uniforms and Safety Boots on a monthly basis. Uniforms and Safety Boots to always be suitable and in good condition. Safety boots to be provided annually per employee and meet SANS & TPL requirements (009-TPL-OPS-SHEQ-2096).

6 Working Hours

Interior cleaning operations will be conducted between 07:00 and 12:30 and 13:00 to 15:30 from Mondays to Fridays inclusive, by trained males and/or females.

7 Waste Disposal

All waste to be disposed of at the allocated waste sites as specified by the Service/ Facilities Manager.

8 Health and Safety Management

8.1 Health and Safety Standard

The *Contractor* shall comply with the requirements of the Transnet *Contractor* Management Procedure TRN-IMS-GRP-PROC-014 and OHS Act 85 of 1993 and its applicable regulations and any laws applicable in the terms of Health and Safety.

8.2 Contractor's General Requirements for Health and Safety

The *Contractor* is solely responsible for carrying out the work under the Contract having the highest regard for the health and safety of its employees, Transnet's employees and persons at or in the vicinity of the Site, the Works, temporary work, materials, the property of third parties and any purpose relating to the *Contractor* carrying out its obligations under this Contract. The *Contractor* is to note the minimum requirements for access and egress control processes to the Site as per TRN-IMS-GRP-PROC-010.

The *Contractor* must initiate and maintain safety precautions and programs to conform to all applicable Health and Safety laws or other requirements, including requirements of any applicable government and client corporate, business unit and site requirements. The *Contractor* must, at its own cost, erect and maintain safeguards for the protection of workers and the public. The *Contractor* must manage all reasonably foreseeable hazards created by performance of the Services**.**

8.3 Contractor's Health and Safety File (Minimum Requirement)

Prior to entering the site the *Contractor* must furnish the Client with a Health and Safety file & cleaners are to be equipped with the relevant branded uniforms specifying the company name with a name badge for the employee and Safety Boots prior to accessing the site.

.

The SHE file must include but not limited to the following documents:

8.3.1 A valid Letter of Good Standing with the Workman's compensation.
8.3.2 Proof of relevant insurances to carry out work.
8.3.3 *Contractor* Health & Safety Plan correlating with Transnet *Contractor* Management Procedure TRN-IMS-GRP-PROC-014 submitted and approved
8.3.4 Copy of *Contractor* Safety, Health, Environment, Quality (SHEQ) policy
8.3.5 Mandatory agreement as per section 37.2 of the OSHACT. Act 85 of 1993 and CR 5.1(K)
8.3.6 Legal Appointments of Employees who require appointment as per OHSACT.
8.3.7 Risk Assessments, Method statements and Safe Working Procedures
8.3.8 Employee Induction packs shall include the following documents:
8.3.8.1 Employee scope of work.
8.3.8.2 Proof of site-specific induction (*Contractor*).
8.3.8.3 Copy of ID Document.
8.3.8.4 Legal Letter of Appointment for those who require appointment as per OHSACT.
8.3.8.5 Abbreviated CV for the management and Legal appointees.
8.3.8.6 Proof of competence for supervisor and general workers undertaking grass cutting activity.
8.3.8.7 Valid entry medical certificate of fitness done by an Occupational Health Practitioner.
8.3.9 Task specific Risk Assessment based on the scope of work.
8.3.10 Organogram of reporting structure: This document must provide all persons appointed in terms of OHS Act & Regulations (85 of 1993) including contact details. (rev, date, approval) All other statutory registers as required by the OHS Act No. 85 of 1993.
8.3.11 The *Contractor* will be issued with a starter kit at the kick-off Meeting, the starter kit will contain all the health and safety templates and procedures to be used throughout the contract.
8.3.12 All safety documents shall comply with the Project Document Control Procedure.
8.3.13 The *Contractor* shall furnish the client with Periodic medicals every twelve months, as well as Exit Medicals done by an Occupational Health Practitioner at the end of the contract.

The *Contractor* to ensure that their Health & Safety Management plan as well as their Baseline Risk Assessment includes the management of communicable diseases, including COVID-19. COVID-19 is no longer treated as a separate item.

9 Environmental Management Requirements

9.1 All work is to be conducted in accordance with the principles of the National Environmental Management Act, 1998 (Act No. 107 of 1998) but not limited to other applicable regulations as well as acceptable environmental good practices. The following Project Environmental Specifications (PES) included in the Annexures of works information provide the minimum acceptable standards that shall be adhered to for this contract:

9.1.1 Transnet Integrated Management System Policy Commitment Statement (TIMS)
9.1.2 Project Environmental Authorisation (Reference Number 12/12/20/735)
9.1.3 Project Environmental Management Plan (EMP) (Reference No. 2684358-J-AOO-EN-RP-005 Rev 5):

9.1.3.1 All waste to be disposed of at the allocated waste receptacles.
9.1.3.2 Waste to be disposed as per the waste type as marked in the waste receptacles i.e., general waste vs. hazardous waste.
9.1.3.3 No burning of waste is allowed on site.
9.1.3.4 The *Contractor* shall regularly service and clean out all ablution facilities to avoid odours.
9.1.3.5 Spillages of hazardous substances to be reported to TPL and be cleaned immediately.
9.1.3.6 The *Contractor* is to conserve water when undertaking their activities.
9.1.3.7 Noise levels to be kept at minimum.
9.1.3.8 Any leaks observed on site to be reported to TPL.

9.2 The *Contractor* shall perform all activities within the site and working areas having due regard to the environment and to environmental management practices as more particularly described within the aforesaid Project Environmental Specifications.

9.3 The Service Provider shall utilize the waste facilities provided on site for all general and hazardous waste produced on site. The health Risk Waste to be managed as per the safety requirements.

9.4 All personnel will be required to attend a compulsory environmental induction prior to commencement with their activities.

10 Pricing Instruction

10.1 The total annual cost of employment of a person is the total amount borne by the *Contractor* in respect of the employment of such a person per year, calculated at the amounts applicable to such a person at the time when the services are rendered, including basic salary, or a nominal market related salary, fringe benefits not reflected in the basic salary, including normal annual bonus;

10.2 Employer's contribution to medical aid; group life insurance premiums borne by the *Contractor*; the *Contractor*'s contribution to a pension or provident fund; and all other benefits or allowances payable in terms of a letter of appointment, including any transportation allowance or company vehicle benefits, telephone and/or computer allowances, etc. and amounts payable in terms of the Act including, but not limited to, the Basic Conditions of Employment Act. Hence, staff rates are to include for all burdens/on-costs, statutory holidays and all leave entitlements (normal leave, sick leave, family

responsibility leave, etc.) in terms of such person's conditions of employment and/or in terms of the Basic Conditions of Employment Act.

10.3 When pricing the *Contractor* must take into account the ± 3 weeks Builders Break in December of each year and all public holidays.

10.4 When pricing the *Contractor* should take into account the cost of cleaning materials to be included in the rate.

10.5 All items within the price list are split between works for a 12 month period i.e. Year 1, Year 2 and Year 3 The prices are therefore fixed for the duration of the contract and not subject to escalation.

10.6 The *Contractor* should note that payment will be made in terms of proven cost (hours worked/proof of delivery of hygiene consumables/proof of installation of hygiene equipment/proof of completed pest control activities etc.). Daily signed attendance registers by the Site Agent, for each cleaner and general worker is required as back-up documentation for payment.

10.7 The Tenderer is required to provide all labour, provide all necessary equipment, cleaning materials and Personal Protective Equipment for the execution of the work as set out in the pricing data and corresponding works information.

10.8 Specific duties include but not limited to, vacuuming all offices, dusting and polishing all wooden furniture, emptying all waste bins, cleaning of windows and dusting of all sills, cleaning toilets and refilling toilet paper, assisting with tea when requested as well as maintaining and upkeep of kitchen such as washing utensils, mopping, sweeping, cleaning of fridges and microwaves.

10.9 All cleaning to be undertaken as often as required.

10.10 The Tenderer is to allow for the necessary Personal Protective Equipment for each Employee on site in order to carry out his/her task safely,

10.11 Should an employee take a leave of absence (for whatever reason), a replacement member of staff shall be allowed for, provided that medicals are up to date for the replacement.

10.12 The Tenderer to allow in his hourly rate for Annual Leave, Bonus (where applicable), sick leave and all other staff related costs.

10.13 In addition to annual leave, Tenderer's to allow all statutory public holidays as well as compulsory December shut down of the site commencing on 16 December and re-opening on 02 January.

10.14 If a staff member is absent from work, provision must be allowed for a replacement (including valid medicals for the replacement) within 1 Day of becoming aware of the event, failing which will result in non-payment for Employee for that duration

10.15 The hours stated in the Pricing Data are based on 165 working hours per month however the successful Tender will be paid on the Actual hours worked each month and not the hours stated in the Price List.

10.16 All Consumables e.g. cleaning chemicals will be SABS Approved or Equivalent and must be (within the parameters of HSE Rules and regulations).

10.17 Hand Towel and Soap Dispenser batteries to be kept on site, in stock.

10.18 All hygiene consumables are required on an 'as and when required' basis. An instruction for the provision of the consumables will be issued to the *Contractor*. The *Contractor* will only be paid for the hygiene consumables provided, however the *Contractor* is to provide a price for the duration of the Contract.

10.19 *Contractor*s Supervisor is compulsory.

10.20 The prices are inclusive of all transportation of staff, to and from site.

10.21 The site address where the services are required is within the Island View Cutler Site Complex Bayhead.

11 Escalation

11.1 All items within the price list are split between works for a 12 month period (i.e. Year 01, Year 02 and Year 03).
The prices are therefore fixed for the duration of the contract and not subject to escalation.

12 Penalties

12.1 The Employer shall be entitled to impose/levy penalties against the *Contractor* should the *Contractor* be in breach of certain provisions of the Contract. Such penalties shall be deducted from the monthly amount due to the *Contractor* by the Employer, after the *Contractor* has been notified of such penalties.

12.2 Notwithstanding the provision of this penalty, the Employer shall:
- 12.2.1 not be precluded from exercising its right to terminate the Contract in the event of Persistent Minor Breach; and
- 12.2.2 shall not be precluded from claiming damages from the *Contractor*, should damages be suffered by the Employer or any third party as a result of any conduct or failure on the part of the *Contractor* or any of its employees.

The following penalties shall apply to the Sites for non-compliance with the obligations of the *Contractor*.

Item No.	Description	Penalty per Incident
1	Daily cleaning roster not signed per office/ablution facility/kitchen	R200
2	Un-availability of necessary equipment, cleaning materials and Personal Protective Equipment for the execution of the work	R500
3	Cleaner/General worker sleeping on duty	R300

12.3 Notwithstanding any other provision, the penalty deduction shall be limited to a maximum of 50% (fifty percent) of the monthly contract value payable to the *Contractor* in respect of any particular Site.

12.4 Any penalty imposed in terms of the offset against the invoiced (vatable) amount, as declared in the *Contractor*'s Tax Invoice, to which the penalty has attached, and the VAT payable by the Employer to the *Contractor* shall be calculated on the invoiced amount less the service-related penalty imposed.

LIST OF ANNEXURES:

1. DEAT EIA ROD – 10 Feb 09	27 Pages
2. Revised Environmental Management Plan (EMP) – Trunk line and Facilities	183 Pages
3. Contractor Health and Safety Specification Guideline (TRN-IMS-GRP-GDL-014.3)	157 Pages
4. TIMS Policy Commitment Statement	1 Page
5. Contractor Questionnaire (TRN-IMS-GRP-GDL 014.7)	3 Pages
6. Transnet Standard Operating Procedure for cleaning & hygiene services	52 Pages
7. Access and Egress Control Procedure	12 Pages
8. Standard Operating Procedure For Personal Protective Equipment (PPE)	25 Pages

Compiled by:

_____
Audesius Khwani
Site Agent
Date:

Approved / Not Approved:

_____
Renee Naidoo
Project Director
Date:

environment
& tourism

Department:
Environmental Affairs and Tourism
REPUBLIC OF SOUTH AFRICA

Private Bag X 447 · PRETORIA · 0001 · Fedsure Building · 315 Pretorius Street · PRETORIA
Tel (+ 27 12) 310 3911 · Fax (+ 2712) 322 2682

FAX COVER SHEET

DATE : 10 Feb. 09

TO :	Mr Carlos Galego
ORGANISATION :	Transnet Limited
FAX :	(031) 361 1341
FROM :	Lene Grobbelaar
TEL :	(012) 310 3087
ROOM NO :	4th Floor, South Tower, Room 418
FAX :	(012) 320 7539
NO. PAGES :	(including cover page)
SUBJECT :	
MESSAGE : TRANSNET NEW MULTI-PRODUCTS PIPE LINE BETWEEN DURBAN AND JAMESON PARK	

DEAR Mr. Galego

Please receive herein the attached letter for your attention.

Regards,

Signature

environment & tourism
Department:
Environmental Affairs and Tourism
REPUBLIC OF SOUTH AFRICA

Private Bag X447, Pretoria, 0001 • Fedsure Building, 315 Pretorius Street, Pretoria, 0002. Tel: (+27 12) 310 3911 Fax: (+27 12) 322 2882

Reference: 12/12/20/735
Enquiries: Mr John Geeringh
Telephone: (012) 310 3491 **Fax:** (012) 320 7539 **E-mail:** jgeeringh@deat.gov.za

Mr Carlos Galego
Transnet Limited
P O Box 3113
DURBAN
4000

Fax no: (031) 361 1341

PER FACSIMILE / MAIL

Dear Mr Galego

APPLICATION FOR AUTHORISATION: R. 387: TRANSNET NEW MULTI-PRODUCTS PIPE LINE BETWEEN DURBAN AND JAMESON PARK (REFERENCE NUMBER: 12/12/20/735).

The environmental Impact assessment report (EIAR) and draft environmental management plan (EMP), dated November 2008, for the abovementioned project, submitted to the department refers. Please be advised that the Department has accepted the EIAR and EMP in terms of GN R. 385: 35 1(a) of the Environmental Impact Assessment Regulations, 2006, and has decided to grant authorisation. The environmental authorisation and reasons for the decision are attached herewith.

In terms of GN R. 385: 10(2), you are instructed to notify all registered interested and affected parties (IAPs), in writing and within ten (10) calendar days of the date of this letter, of the Department's decision in respect of your application as well as the provisions regarding the making of appeals that are provided for in the regulations.

Your attention is drawn to Chapter 7 of the Regulations which regulates appeal procedures. Attached please find a simplified copy of the appeals procedure to be followed. Kindly include a copy of this procedure with the letter of notification to IAPs.

A copy of the official appeal form can be obtained from:
Mr PKM Retief, Appeals Administrator, Tel: 012 310 3705, pretief@deat.gov.za ; or
Mr H Grové, Appeals Administrator, Tel: 012 310 3070, hgrove@deat.gov.za, at the Department.

Should you wish to appeal any aspect of the decision, you must, *inter alia,* lodge a notice of intention to appeal with the Minister, within 10 days of receiving notice of the decision, by means of one of the following methods:

By facsimile: 012 320 7561;

By post: Private Bag X447, Pretoria, 0001; or
By hand: 2nd Floor, Fedsure Form Building, North Tower, cor. Van der Walt and Pretorius Streets, Pretoria.

Should the applicant decide to appeal, the applicant must serve a copy of its notice of intention to appeal on all registered IAPs as well as a notice indicating where, and for what period, the appeal submission will be available for inspection.

Please include the Department, attention of the Director: Environmental Impact Evaluation, in the list of IAPs, notified through your notification letter of the decision, for record purposes.

The authorised activity may not commence within thirty (30) days of the date of signature of the authorisation. Please further note that the Minister may, on receipt of appeals against the authorisation or conditions thereof suspend the authorisation pending the outcome of the appeals procedure.

Yours sincerely

Ms Nosipho Ngcaba
Director – General
Department of Environmental Affairs and Tourism
Letter signed by: L McCourt
Designation: Chief-Director, Environmental Impact Management

Date: 10/2/2009

CC:	Mr Mark Wood	ZITHOLELE	Fax:	011 447 7018
Copy to:	Mr Herman Grove	DEAT		

APPEALS PROCEDURE IN TERMS OF CHAPTER 7 OF R. 385 OF 2006 TO BE FOLLOWED BY THE APPLICANT AND INTERESTED AND AFFECTED PARTIES UPON RECEIPT OF NOTIFICATION OF AN ENVIRONMENTAL AUTHORISATION

APPLICANT	INTERESTED AND AFFECTED PARTIES (IAPs)
Receive notice of Environmental Authorisation from the relevant Competent Authority	Receive notice of Environmental Authorisation from Applicant/Consultant
Within 10 days of receipt of notification, notify the relevant Competent Authority and all IAPs of intention to appeal	Within 10 days of receipt of notification, notify the relevant Competent Authority of intention to appeal
Notification served by the Applicant must include: . A copy of the notice of intention to appeal; and . A notice indicating where and for what period the appeal submission will be available for inspection by all IAPs	3. Appellant must serve on the Applicant 3.1. A copy of the notice of intention to appeal A notice indicating where and for what period the appeal submission will be available for inspection by the applicant
The appeal must be submitted to the relevant Competent Authority or delegated organ of State within 30 days of lodging of the notice of intention to appeal	The appeal must be submitted to the relevant Competent Authority or delegated organ of State within 30 days of lodging of the notice of intention to appeal
A person or organ of state that receives notice of an appeal may submit a responding statement to the relevant Competent Authority or delegated organ of state within 30 days from the date that the appeal submission was made available for inspection by the appellant	An Applicant that receives notice of an appeal may submit a responding statement to the relevant Competent Authority or delegated organ of State within 30 days from the date the appeal submission was made available for inspection by the appellant

NOTES:

1. An appeal against a decision must be lodged with:-

a) the Minister if the decision was issued by the Director- General (or another official) acting in his/ her capacity as the delegated Competent Authority
b) the MEC if the decision was issued by the Head of Department (or another official) acting in his/ her capacity as the delegated Competent Authority
c) the delegated organ of state where relevant.

2. An appeal lodged with:-

a) the Minister must be submitted to the Department of Environmental Affairs and Tourism
b) the MEC must be submitted to the provincial department responsible for environmental affairs
c) the delegated organ of state, where relevant, must be submitted to the delegated organ of state

3. An appeal must be:-

a) on an official form obtainable or published by the relevant department
b) accompanied by:
   - a statement setting out the grounds of appeal
   - supporting documentation which is referred to in the appeal and is not available to the relevant Competent Authority
   - a statement that the appellant has complied with regulation 62 (2) or (3) together with copies of the notices referred to in regulation 62
   - the prescribed appeal fee, if any.

4. A copy of the official appeal form can be obtained from:

See authorisation cover letter.

environment & tourism

Department:
Environmental Affairs and Tourism
REPUBLIC OF SOUTH AFRICA

Environmental Authorisation

Authorisation register number: *12/12/20/735*
Last amended:
Holder of authorisation: *TRANSNET LIMITED*
Location of activity: *DURBAN TO JAMESON PARK NEAR HEIDELBERG*

Decision

The Department is satisfied, on the basis of information available to it and subject to compliance with the conditions of this environmental authorisation, that the applicant should be authorised to undertake the activity specified below.

Details regarding the basis on which the Department reached this decision are set out in Annexure 1.

Activities authorised

By virtue of the powers conferred on it by the National Environmental Management Act, 1998 (Act No. 107 of 1998) and the Environmental Impact Assessment Regulations, 2006 the Department hereby authorises –

Transnet Limited

with the following contact details –

Mr Carlos Galego
Transnet Limited
Private Bag X 4
GALLO MANOR
2052

Tel no: 011 287 9768
Fax no: 011 258 8846

to undertake the following activities (hereafter referred to as "the development"):

GN R. 387:

1. *The construction of facilities or infrastructure, including associated structures or infrastructure, for –*

(c) the above ground storage of a dangerous good, including petrol, diesel, liquid petroleum gas or paraffin, in containers with a combined capacity of 1000 cubic metres or more at any one location or site including the storage of one or more dangerous goods, in a tank farm;

(e) any process or activity which requires a permit or license in terms of legislation governing the generation or release of emissions, pollution, effluent or waste and which is not identified in Government Notice No. R. 386 of 2006;

(f) the recycling, re-use, handling, temporary storage or treatment of general waste with a throughput capacity of 50 tons or more daily average measured over a period of 30 days;

(g) the use, recycling, handling, treatment, storage or final disposal of hazardous waste;

10/2/09

(j) the bulk transportation of dangerous goods using pipelines, funiculars or conveyors with a throughput capacity of 50 tons or 50 cubic metres or more per day;

(o) the final disposal of general waste covering an area of 100 square metres or more or 200 cubic metres or more of airspace;

(r) the microbial deactivation, chemical sterilisation or non-thermal treatment of waste or effluent;

2. Any development activity, including associated structures and infrastructure, where the total area of the developed area is, or is intended to be, 20 hectares or more.

7. Reconnaissance, exploration, production and mining as provided for in the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), as amended in respect of such permits and rights; and

10. Any process or activity identified in terms of section 53(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).

GN R. 386:

1. The construction of facilities or infrastructure, including associated structures or infrastructure, for –

(m) any purpose in the one in ten year flood line of a river or stream, or within 32 metres from the bank of a river or stream where the flood line is unknown, ..., for the purpose of installing the trunkline;

4 The dredging, excavation, infilling, removal or moving of soil, sand or rock exceeding 5 cubic metres from a river, tidal lagoon, tidal river, lake, in-stream dam, floodplain or wetland;

12. The transformation or removal of indigenous vegetation of 3 hectares or more or of any size where the transformation or removal would occur within a critically endangered or an endangered ecosystem listed in terms of section 52 of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004);

18. The subdivision of portions of land 9 hectares or larger into portions of 5 hectares or less.

20. The transformation of an area zoned for use as public open space or for a conservation purpose to another use; and

25 The expansion of or changes to existing facilities for any process or activity, which requires an amendment of an existing permit or license or a new permit or license in terms of legislation governing the release of emissions, pollution, effluent;

10/2/09

for the construction of the NMPP from Durban to Jameson Park near Heidelberg, as described in the environmental impact assessment report (EIAR), dated November 2008, submitted to the department on 10 November 2008.

The development will take place between Island View at the Port of Durban to Jameson Park near Heidelberg within the jurisdiction of the *eThekwini, UMgungundlovu and Uthukela District Municipalities of KwaZulu Natal, the Fezile Dabi and Thabo Mofutsanyane district Municipalities of the Free State, the Gert Sibande District Municipality of Mpumalanga and the Sedibeng Distric Municipality of Gauteng* hereafter referred to as "the property", as described in the EIAR dated November 2008.

The development of the NMPP will take place along the route corridor with a width of 1000m outside built up areas (to allow for minor adjustment due to localised environmental conditions) as described in the EIAR dated November 2008 and as shown ***on the map set included in the EIAR dated November 2008 appendix 12-1***, and will consist of the following **major components**:

- The 24 inch **pipe line of approximately 555km** in accordance with the provisions of SANS 10089 which will be buried at a minimum depth of 1 metre along its entire length with a fibre optic cable installed with the pipe line as shown in figure 2-23 and 2-24 in the EIAR, The servitude area will be rehabilitated upon completion of construction to its natural condition prior to construction;
- Establishment of associated **construction camps, lay down areas for pipe sections** prior to assembly and installation and an **access road** for construction along the servitude;
- The final pipe line position will be marked with white markers every 300 metres and at points where the pipe line change direction, as well as distance markers and markers visible from the air for aerial inspection by helicopter as indicated on photograph 2-35 on page 60 of the EIAR. Cathodic protection will be installed along the pipe line to prevent corrosion;
- Construction of **eight (8) pump stations** along the route each with associated **buildings, pumps, electrical infrastructure, fire protection and water management structures** within the perimeter fence of the pump station at the approximate locations as shown on the maps included in Chapter 8 of the EIAR dated November 2008 (pump station site 1A is the authorised position for pump station 1) and shown in Figure 2-38 and photo 2-45 on page 83 of the EIAR. The will be a phased implementation of pump

10/2/09

station construction with stations 1, 3 and 5 to be constructed at the start of the project and stations 2, 4 and 6-8 during a later timeframe in the project implementation. During the first phase of the project only valve stations will be constructed at pump station sites 7 and 8;

- A **coastal fuel terminal** at Island View at the Port of Durban with associated infrastructure for operation, fire protection and water management as shown in figures 2-14 and 2-15 in the EIAR implemented in a phased approach in accordance with the provisions of API Standard 2610 and SANS 10089-1; and
- An **inland fuel terminal** at Jameson Park near Heidelberg with associated infrastructure for operation, fire protection and water management, as shown in figures 2-17 and 2-18 in the EIAR implemented in a phased approach in accordance with the provisions of API Standard 2610 and SANS 10089-1.

The granting of this environmental authorisation is subject to the conditions set out below.

Conditions

Scope of authorisation

1.1 Authorisation of the development is subject to the conditions contained in this authorisation, which conditions form part of the environmental authorisation and are binding on the holder of the authorisation.

1.2 The holder of the authorisation shall be responsible for ensuring compliance with the conditions by any person acting on his or her behalf, including but not limited to, an agent, sub-contractor, employee or person rendering a service to the holder of the authorisation.

1.3 The authorised development may only be carried out at the property indicated above and as described in the EIAR dated November 2008 and as shown on the map set included in the EIAR as Appendix 12-1.

1.4 Any substantial changes to the project description set out in the EIAR dated November 2008, and authorised under this authorisation must be approved, in writing, by the Department before such changes may be effected. In assessing whether to grant such approval or not, the Department may request such information as it deems necessary to evaluate the significance and impacts of such changes and it may be necessary for

10/2/09

the holder of the authorisation to apply for further authorisation in terms of the regulations.

1.5 This development must commence within a period of four (4) years from the date of issue. If commencement of the development does not occur within that period, the authorisation lapses and a new application for environmental authorisation must be made in order for the development to be undertaken.

1.6 This authorisation does not negate the holder of the authorisation's responsibility to comply with any other statutory requirements that may be applicable to the development and associated infrastructure.

1.6.1 Relevant legislation that must be complied with by the holder of this authorisation include but is not limited to:

- Compliance with the requirements of Section 38 of the National Heritage Resources Act, Act 25 of 1999, including any comments and recommendations of the relevant heritage resources authority responsible for the area in which the development is proposed.
- All provisions of the Occupational Health and Safety Act, Act 85 of 1993.
- Provisions of the Environment Conservation Act, Act 73 of 1989.
- Provisions of the NEMA Air Quality Management Act, Act 39 of 2004.
- Provisions of the Conservation of Agricultural Resources Act, Act 43 of 1983.
- Provisions of the National Forests Act, Act 84 of 1998.
- Provisions of the National Water Act, Act 36 of 1998.
- All provisions of the Hazardous Substances Act, Act 15 of 1973.
- The National Key Points Act, Act 102 of 1980.
- The Petroleum Pipelines Act, Act 60 of 2003.
- Provisions of the Explosives Act, Act 26 of 1956.
- All provisions of the Fencing Act, Act 31 of 1963.
- Relevant local authority bylaws and regulations.
- Should any activity be planned on site that is a listed activity in terms of the NEMA regulations, 2006, which is not covered by this authorisation, a separate application for such activity must be lodged with the relevant competent authority.

10/2/09

Appeal of authorisation

1.7 The holder of the authorisation must notify every registered interested and affected party (IAP), in writing and within 10 (TEN) calendar days, of receiving notice of the Department's decision to authorise the development.

1.8 The notification referred to in 1.7 must –

1.8.1 Specify the date on which the authorisation was issued;

1.8.2 Inform the interested and affected party of the appeal procedure provided for in Chapter 7 of the regulations;

1.8.3 Advise the interested and affected party that a copy of the authorisation will be furnished on request, and

1.8.4 Give the reasons for the decision.

Management of the activity

1.9 Management during the construction phase:

1.9.1 The environmental management plan (EMP) for the construction phase included in the EIAR dated November 2008 and submitted to the department, is hereby approved for implementation. The mitigation measures proposed in the EIAR dated November 2008 and requirements stipulated in the EMP as included in the EIAR dated November 2008 for environmental management during the construction phase forms part of the conditions of this environmental authorisation and must be implemented by the holder of this authorisation.

1.9.2 The holder of this authorisation must ensure the following measures are implemented during the construction phase of the NMPP development:

- All contractor staff must undergo environmental awareness induction training with regard to protection of the natural environment, the conditions of the environmental authorisation, the requirements of the EMP and the respect of the rights of landowners on whose properties construction takes place.
- Measures for waste avoidance, minimisation and disposal of construction waste at an appropriately registered facility.
- Measures for dust control during the construction phase.

- Measures for noise control during the construction period where construction activities occur close to residences or built-up areas to limit the nuisance factor of noise.
- Measures to ensure public access to any homesteads or amenities must at all times be guaranteed and shall not be restricted due to this development.
- Archaeological remains, features and structures older than 60 years are protected by the National Heritage Resources Act, 1999 (Act No. 25 of 1999). Should any archaeological or palaeontological artefacts be exposed during excavation for the purpose of laying the pipe line, construction in the vicinity of the finding must be stopped. A heritage specialist must be called to the site for inspection. Under no circumstances shall any artefacts be destroyed or removed from the site. The South African Heritage Resource Agency must be informed of any new finds.

1.9.3 The approved construction EMP will be seen as a dynamic document. Should the construction activities exceed any predicted impact levels, the EMP must be amended to include any additional requirements. However, any proposed changes to the EMP must be submitted to the competent authority in writing.

1.9.4 Amendments to the EMP must be approved in writing by the competent authority before such changes can be implemented.

Servitude works area and pipe lay down areas

1.9.5 This development is authorised on condition that Transnet acquires the necessary servitude for the pipe line route. Transnet must negotiate with affected landowners within the authorised corridor alignment prior to the start of construction activities. Proof of such negotiations must be made available to the Department on request should any dispute arise.

1.9.6 In addition, any route adjustment, due to the specific local circumstances, which deviates outside the authorised corridor alignment, should be assessed and reported to the department for acceptance in writing before implementation.

1.9.7 All construction works are limited to the servitude area negotiated with the landowner. The works area must be properly demarcated.

10/4/09

1.9.8 No construction workers shall be allowed to reside on any site unless a written agreement with the affected landowner is obtained.

1.9.9 All work areas must be supplied with proper sanitation facilities.

1.9.10 No open fires are allowed on site for heating or cooking purposes. The applicant shall ensure that the contractor have fire fighting equipment available at all work sites in the event of accidental fires, especially during welding of the pipe line sections.

1.9.11 All pipe lay down areas outside the negotiated servitude area must be negotiated with the affected landowner and written agreement must be obtained. Proof of such negotiations must be made available to the Department on request should any dispute arise.

1.9.12 Servitude vegetation clearing must be done in accordance with the recommendations of the EIAR and a search and rescue operation of protected species should be done. Rescued specimens can be transplanted immediately where possible or be stored in a nursery area for use later during the rehabilitation process.

1.9.13 No protected species of vegetation may be destroyed without the required permit from the provincial nature conservation department.

Construction camps

1.9.14 No construction camp site may be established without written approval from the affected landowner.

1.9.15 The holder of this authorisation must have a specific management plan for management of the day to day operation of the construction camp sites, including measures for waste management, sanitation and water management.

1.9.16 Construction camps must be inspected weekly by the environmental control officer (ECO) for compliance with the management plan for camp sites.

1.9.17 Construction camp sites must be kept neat and the visual impact of camp sites must be mitigated to acceptable levels through screening.

1.9.18 No water may be abstracted from or effluent or waste water released into natural sources without the required permits from DWAF and Transnet must have written agreements with landowners for use of any water from private boreholes or dams.

10/2/09

Workshop areas at construction camps

1.9.19 Workshop areas must have a concrete floor area for servicing of vehicles.

1.9.20 All carbon containing fuels and lubricants must be stored inside a bunded area which can accommodate 110 percent of the stored liquids.

1.9.21 All spills of carbon materials shall be contained and cleaned up immediately and polluted soils shall be disposed of in a registered waste site. Minor spills can be treated on site.

1.9.22 Should it be necessary to service any vehicles or equipment in the servitude construction area due to a breakdown, a drip tray shall be used to prevent carbon spills onto the soil.

1.9.23 All carbon waste material generated at the workshop shall be contained in proper storage drums for recycling or disposal at a registered waste site.

Pump stations

1.9.24 Noise abatement measures as proposed in box 8-2 on page 274 of the EIAR must be installed at all pump stations to reduce the impact of noise associated with pumping during the operational phase, especially in pump stations in close proximity to residential areas.

1.9.25 Security lighting installed at pump stations must be designed in such a way that light spill to the surrounding areas is minimised, especially where pump stations are constructed in rural areas with a high visual quality and where light spill may cause a significant aesthetical impact.

1.9.26 Landscaping and design of pump station structures must be done to ensure that the pump station blend in with the surrounding area to minimise the visual impact of the pump station.

Wetland, river and stream crossings

1.9.27 Construction at wetland, river and stream crossings shall be done in accordance with figures 2-25, 2-26, 2-27 and 2-28 of the EIAR dated November 2008.

10/2/09

1.9.28 Where wetland crossings are required, the approval of the Department of Water Affairs and Forestry (DWAF) on the engineering design shall be obtained in writing before any construction commence on such sites.

1.9.29 Special care shall be taken when doing any construction work in wetland areas and the area of disturbance shall be kept to the absolute minimum.

1.9.30 All wetland areas disturbed during construction shall be rehabilitated to the written satisfaction of a representative of DWAF.

1.9.31 All river and stream crossings shall be done in accordance with a DWAF approved design drawing.

1.9.32 Vegetation at river and stream bank crossings may be cut and treated with a suitable registered herbicide to prevent further growth and root development. Under no circumstances will de-stumping of trees on river and stream banks be allowed as this may lead to unacceptable erosion except where DWAF approves an open trench design to cross a river or stream.

1.9.33 River and stream banks must be protected against possible erosion by carefully controlling access and construction activities in such areas.

1.9.34 Measures to ensure prevention of pollution of wetlands or rivers and streams during the construction phase must be implemented by the applicant.

1.9.35 Once construction at river, stream or wetland crossings are completed, the relevant DWAF official must sign a release form indicating that rehabilitation was done satisfactorily at each crossing point. The release forms must be made available to the department on request should any dispute arise.

Rehabilitation of works areas and construction camps

1.9.36 Upon completion of construction the works area must be rehabilitated in accordance with the recommendations of the specialist ecologist.

1.9.37 All areas disturbed during the construction phase of the project excluding those areas where permanent structures are erected must be rehabilitated fully to the satisfaction of the landowner.

1.9.38 Once construction is completed, all landowners must sign a release form indicating that rehabilitation was done satisfactorily and that all outstanding issues or claims have been settled by Transnet. The release forms must be made available to the department on request should any dispute arise.

10/2/09

Service infrastructure

1.9.39 Disruption of service infrastructure must be kept to an absolute minimum. Should it be necessary to disrupt any services during the construction phase, the affected parties must be informed at least two (2) weeks in advance.

1.9.40 Should any accidental damage to service infrastructure take place during construction activities, Transnet must take immediate action to restore such disrupted service in the shortest time possible.

1.9.41 Any claims for damage to service infrastructure due to construction activities by landowners must be addressed within 30 days from such claim being submitted.

1.9.42 Road crossings of the pipe line must be done as shown in figures 2-29 and 2-30. All major and secondary road crossings must be done in accordance with a provincial roads department or SANRAL approved design drawing.

1.9.43 The use of existing roads to gain access to the servitude works area is preferred; however use of any private access roads must be agreed with the landowners in writing. All private roads not to be used for the purpose of construction must be marked clearly with no entry signs.

1.9.44 Transnet must ensure that contractors adhere to an agreed speed limit on private roads to prevent accidents and road damage.

1.9.45 Upon completion of construction all private roads must be rehabilitated to their original condition and to the satisfaction of the landowner.

1.9.46 No fences may be flattened for the purpose of construction without the consent from the landowner. All fence crossings shall be fitted with a proper servitude gate before construction commences to ensure access for the construction teams.

1.9.47 Where required deviations of fences may be done with the written consent of the landowner to allow for construction activities.

1.9.48 Upon completion of construction all damage to fencing shall be properly fixed to the satisfaction of the landowners.

1.10 Management during the operational phase.

1.10.1 The operational management of the NMPP must be included in the Transnet environmental management system (EMS) for pipe line servitudes.

1.10.2 Leak detection systems must be installed under any new tanks installed at both the Island View or Inland terminals and any old tanks upgraded or replaced as part of this project shall also be fitted with leak detection systems.

1.10.3 A monitoring programme for ground water monitoring must be implemented at the coastal and inland terminals to detect any leaking pollutants and ground water pollution that may occur during the operational phase. If ground water pollution is detected, Transnet must implement measures to remedy the situation immediately.

Monitoring of the construction activities

1.11 Monitoring of the activity during construction

1.11.1 The holder of this authorisation must appoint a suitably qualified and responsible person that will act as an Environmental Control Officer (ECO) for the construction period that will have the responsibility of implementing the approved construction EMP as well as the conditions of this authorisation.

- The ECO shall be appointed before the start of construction and the competent authority must be notified of the details and contact numbers of the appointee in writing for record and communication purposes.
- The ECO must compile and present the environmental awareness induction training referred to in 1.9.2 above.
- The ECO shall submit a two-monthly compliance report, in writing, to The Director: Environmental Impact Evaluation and copy the holder of this authorisation with such report. This report shall include a description of all activities on site, problems identified, transgressions noted and remedial action implemented. The report must reflect the reference number of the project on the cover page.
- The ECO must monitor the construction works on a daily basis to ensure the holder of this authorisation complies with the conditions of this authorisation. Records relating to compliance monitoring must be kept on site and made available for inspection to any relevant and competent authority in respect of this development.
- The ECO must compile the compliance audit report referred to in 1.12 below upon completion of the construction phase. The audit report must cover the construction phase that has been completed and handed over to

Transnet for operation by the contractor. The compliance audit report must indicate the DEAT project reference number on the cover page.

- The ECO shall maintain the following on site:
  - A site diary.
  - Copies of all reports submitted to the Department.
  - A complaints register of all public complaints and the remedies applied to such complaints.
- The ECO must compile a report on all rehabilitation measures implemented for future monitoring and measurement of success of the rehabilitation measures during the operational phase of the development.
- The ECO must remain employed until all rehabilitation measures as well as site clean-up are completed, the release forms were signed by the landowners and DWAF and the site is handed over to the holder of the authorisation for operation.

1.11.2 The holder of this authorisation must monitor the operational phase of the development once operation commence as part of the Transnet EMS. The operational phase commence when all construction activities on a phase of the pipe line and associated infrastructure is completed.

1.11.3 Should the responsibility for compliance with this authorisation be transferred to any other juristic person, the transfer of the environmental authorisation from the initial holder of the authorisation to any other juristic person must be formally recorded in writing and a copy of the transfer document indicating the contact details of the juristic person must be submitted to the Director: Environmental Impact Evaluation for record purposes.

Reporting to the Department

1.12 The holder of the authorisation must submit an environmental compliance audit report to the Department: Attention of the Director: Environmental Impact Evaluation, upon completion of the construction activities as planned for the establishment of the NMPP and associated infrastructure. The environmental audit report must –

1.12.1 Indicate the date of the audit, the name of the auditor, the DEAT project reference number and the outcome of the audit in terms of compliance with the Environmental Authorisation conditions as well as the requirements of the EMP.

10/2/04

1.13 Commencement

1.13.1 The authorised activities may not commence within thirty (30) days of date of signature of this authorisation. Commencement includes site establishment.

1.13.2 Should you be notified by the minister of a suspension of the authorisation pending any appeals decision on the authorised activities, you may not commence with the activities unless authorised by the minister in writing.

1.14 Notification to authorities

1.14.1 Thirty (30) days written notice must be given to the Department that construction of the facilities will commence. Commencement for the purposes of this condition includes site preparation. The notice must include a date on which it is anticipated that the construction activity will commence.

1.14.2 Thirty (30) days written notice must be given to the Department that the operational phase of the facilities will commence.

Site closure and decommissioning

1.15 Should the NMPP ever become redundant and have to be decommissioned, the holder of the authorisation shall undertake the required actions as prescribed by legislation at the time and comply with all relevant legal requirements administered by any relevant and competent authority at that time for the decommissioning phase.

General

1.16 A copy of this authorisation must be kept at the site office where the development will be undertaken. The authorisation must be produced to any authorised official of the Department who requests to see it and must be made available for inspection by any employee or agent of the holder of the authorisation who works or undertakes work at the property.

1.17 Where any of the contact details of the holder of this authorisation change, including the name of the responsible person, the physical or postal address and / or telephonic

10/6/09

details, the holder of the authorisation must notify the Department as soon as the new details become known.

1.18 Upon transfer of the management function of the development the future holder of the authorisation must take ownership of the implementation of the conditions of this environmental authorisation.

1.19 The holder of the authorisation must notify the Department, in writing and within 48 (fourty eight) hours, if any condition of this authorisation cannot be or is not adhered to. Any notification in terms of this condition must be accompanied by reasons for the non-compliance. Non-compliance with a condition of this authorisation may result in criminal prosecution or other actions provided for in the National Environmental Management Act, 1998 and the regulations.

1.20 National government, provincial government, local authorities or committees appointed in terms of the conditions of this authorisation or any other public authority shall not be held responsible for any damages or losses suffered by the holder of the authorisation or his successor in title in any instance where construction or operation subsequent to construction be temporarily or permanently stopped for reasons of non-compliance by the holder of the authorisation with the conditions of authorisation as set out in this document or any other subsequent document emanating from these conditions of authorisation.

Date of environmental authorisation: 10 February 2009

Ms Nosipho Ngcaba

Director – General

Department of Environmental Affairs and Tourism

Letter signed by: Lize McCourt

Designation: Chief Director: Environmental Impact Management

Annexure 1: Reasons for Decision

1. Background

The applicant, Transnet Limited, applied for authorisation to undertake the following activities –

GN R. 387:

1. The construction of facilities or infrastructure, including associated structures or infrastructure, for-

(c) the above ground storage of a dangerous good, including petrol, diesel, liquid petroleum gas or paraffin, in containers with a combined capacity of 1000 cubic metres or more at any one location or site including the storage of one or more dangerous goods, in a tank farm;

(h) any process or activity which requires a permit or license in terms of legislation governing the generation or release of emissions, pollution, effluent or waste and which is not identified in Government Notice No. R. 386 of 2006;

(i) the recycling, re-use, handling, temporary storage or treatment of general waste with a throughput capacity of 50 tons or more daily average measured over a period of 30 days;

(j) the use, recycling, handling, treatment, storage or final disposal of hazardous waste;

(j) the bulk transportation of dangerous goods using pipelines, funiculars or conveyors with a throughput capacity of 50 tons or 50 cubic metres or more per day;

(o) the final disposal of general waste covering an area of 100 square metres or more or 200 cubic metres or more of airspace;

(r) the microbial deactivation, chemical sterilisation or non-thermal treatment of waste or effluent;

2. Any development activity, including associated structures and infrastructure, where the total area of the developed area is, or is intended to be, 20 hectares or more.

7. Reconnaissance, exploration, production and mining as provided for in the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), as amended in respect of such permits and rights; and

10. Any process or activity identified in terms of section 53(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).

10/2/09

GN R. 386:

1. The construction of facilities or infrastructure, including associated structures or infrastructure, for –

(m) any purpose in the one in ten year flood line of a river or stream, or within 32 metres from the bank of a river or stream where the flood line is unknown, ..., for the purpose of installing the trunkline;

4 The dredging, excavation, infilling, removal or moving of soil, sand or rock exceeding 5 cubic metres from a river, tidal lagoon, tidal river, lake, in-stream dam, floodplain or wetland;

12. The transformation or removal of indigenous vegetation of 3 hectares or more or of any size where the transformation or removal would occur within a critically endangered or an endangered ecosystem listed in terms of section 52 of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004);

18. The subdivision of portions of land 9 hectares or larger into portions of 5 hectares or less.

20. The transformation of an area zoned for use as public open space or for a conservation purpose to another use; and

25 The expansion of or changes to existing facilities for any process or activity, which requires an amendment of an existing permit or license or a new permit or license in terms of legislation governing the release of emissions, pollution, effluent;

for the construction of the NMPP from Durban to Jameson Park near Heidelberg, as described in the environmental impact assessment report (EIAR), dated November 2008, submitted to the department on 10 November 2008.

In terms of NEMA, section 24 C (2) and regulation GN R. 385: 3 the national department becomes the competent authority to issue an environmental authorisation, as the applicant is a parastatal company, namely Transnet Limited and the activity will take place over four provincial boundaries.

The applicant appointed Zitholele Consulting to undertake a scoping / EIA process and to compile an EIAR as required by regulation GN R. 385: 27. Zitholele appointed various specialists whom compiled specialist studies and assessed the various potential impacts identified. Mitigation measures to mitigate potential impacts were identified and included in the EIAR.

10/2/09

2. Information considered in making the decision

In reaching its decision, the Department took, *inter alia*, the following into consideration -

a) The information contained in the SR and POSEIA dated July 2008 as accepted by the department;
b) The comments and responses document appended to the EIAR in Appendix 4-3 and comments from key interested and affected parties;
c) The information contained in the final EIAR, dated November 2008 and submitted to the department on 10 November 2008;
d) The information contained in the specialist studies as included in the EIAR dated November 2008;
e) Comments received from the provincial departments of KwaZulu Natal, Mpumalanga and the Free State on the final EIAR;
f) Comments received from KZN Ezemvelo on the final EIAR;
g) Comments from Ethekwini Municipality;
h) Comments received from SAHRA, the Free State heritage authority and AMAFA;
i) Comments received from the Directorate: Biodiversity and Heritage;
j) Minutes of meetings held between the consultants and the various authorities in all four affected provinces;
k) Meeting with the consultant held on 19 June 2008 to discuss the way forward for the EIA phase of the study;
l) Route maps as included in the final EIAR;
m) A helicopter site visit on the proposed final route on 16 January 2009 attended by Mr Geeringh of the department; and
(n) The objectives and requirements of relevant legislation, policies and guidelines, including section 2 of the National Environmental Management Act, 1998 (Act No. 107 of 1998).

3. Key factors considered in making the decision

All information presented to the Department was taken into account in the Department's decision on the EIAR and EMP. Factors considered in making the decision are the following:

16/2/09

- The need and desirability for the construction of the NMPP is clearly understood. The demand for fuel inland will soon outstrip the supply capacity of the existing pipe line and the existing pipe line is nearing the end of its life span.
- The potential impacts of the construction, operational and decommissioning of the NMPP is assessed in detail and no fatal flaws were identified on the proposed route of the pipe line, the positions of the pump stations, inland and coastal terminals.
- Feasible and reasonable alternative options including the no-go option were investigated as part of the assessment process.
- A sufficient public participation process was undertaken and the consultant has satisfied the minimum requirements as prescribed in the EIA regulations, 2006 for public involvement.
- The consultant appointed various specialists to assist with the assessment of potential impacts and the specialists have recommended feasible and implement able mitigation measures to minimise potential impacts.
- No significant environmental degradation will result directly from the activities applied for and authorised in this authorisation if the approved EMP and proposed mitigation measures in the EIAR which form part of this authorisation is implemented.
- The applicant has the ability to implement the conditions of this authorisation and the requirements of the EMP.
- The requirements of the Regulations, 2006, have been complied with in respect of this application for authorisation for construction of the proposed NMPP.

A summary of the potential impacts identified which, in the Department's view, were of the most significance is set out below.

Pump stations:

a) The potential impacts on safety, health and security of the people in the surrounding area.
b) The potential impacts on air quality, noise pollution and waste management.
c) The potential social impacts associated with the relocation of people.
d) The potential impacts on land use.
e) Potential impact on property values.
f) The potential noise impact.

10/12/09

g) The potential impacts on heritage resources.
h) The potential impact on sense of place and visual aesthetics.
i) The potential impacts on wetlands and biodiversity.
j) The potential water pollution due to leaks from equipment.

Trunkline:

a) The potential impacts on safety, health and security of the people in the vicinity of the pipe line.
b) The potential impacts on air quality, noise pollution and waste management.
c) The potential social impacts associated with the relocation of people.
d) The potential impacts on land use, eco-tourism and farming operations.
e) Potential impact on property values.
f) The potential noise impact.
g) The potential impacts on heritage resources.
h) The potential impact on sense of place and visual aesthetics.
i) The potential impacts on wetlands, rivers and biodiversity.
j) Potential erosion impacts.
k) The technical constraints to the placement of a pipe line.
l) The potential impacts on water resources due to numerous possible river and stream crossings.
m) The potential groundwater water pollution due to leaks from equipment.

Coastal terminal:

a) The potential impacts on safety, health and security of the people in the surrounding area.
b) The potential impacts on air quality, noise pollution and water quality management.
c) The potential impact of flooding and inundation.
d) The potential impacts on transportation and infrastructure.
e) The potential impact on sense of place and visual aesthetics.
f) The potential water pollution due to leaks from equipment.

Inland terminal:

a) The potential impacts on safety, health and security of the people in the surrounding area.
b) The potential impacts on air quality, noise pollution and water quality management.

10/12/09

c) The potential impact on geo-hydrology.
d) The potential impacts on transportation and infrastructure.
e) The potential impact on sense of place and visual aesthetics.
f) The potential water pollution due to leaks from equipment.
g) The potential impacts on wetlands, ecology and biodiversity.
h) The future development of surrounding land and land use.

All impacts identified were assessed in detail and mitigation measures were proposed to mitigate those impacts that could not be avoided in total to acceptable levels. The implementation of the mitigation measures as part of the EMP is crucial to ensure that the project execution will have the minimum impact of the environment. The mitigation measures have been included in draft EMP submitted with the EIAR dated November 2008 are feasible and can be implemented. No fatal flaws were identified by any specialist in relation to the proposed final route alignment of the NMPP or the positions of the pump stations, coastal and inland terminals. Re-routing of the pipe line route was done regularly throughout the study as information became available to ensure that areas where significant impacts were identified are bypassed.

4. Findings

After consideration of the information and factors listed above, the department made the following findings -

- The proposed development is required to address the fuel supply needs of South Africa, especially the inland regions of the Free State, Gauteng, Mpumalanga and North West into the future. The need for the proposed development is clearly demonstrated and justified.
- The fuel supply line would have a positive impact on securing fuel supply to central South Africa and it would improve supply quantities.
- A detailed public participation process was undertaken and the consultant has satisfied the minimum requirements as prescribed in the EIA Regulations, 2006 for public involvement.
- The procedure followed for the EIA process has been adequate and compliant to the requirements of the Regulations, 2006.
- The information contained in the EIAR is deemed accurate and credible.

10/2/09

- The assessment of impacts is detailed and has indicated no fatal flaws with regard to the final proposed route and pump stations, the inland as well as the coastal terminal positions.
- There area proposed for the development is already somewhat disturbed due to existing infrastructure, servitudes or agricultural activities and the proposed mitigation measures will ensure that the potential impact of the proposed NMPP project is minimised.
- The proposed development is compatible with the proposed site for the development, especially in the light of existing infrastructure in close proximity to the proposed NMPP route, as well as the placement of the coastal and inland terminals next to existing infrastructure.
- Most legal and procedural requirements have been met.
- Comments raised by I&APs are included in the EIAR in a comments and response addendum and the consultant has responded on issues and comments.
- A draft EMP that complies with the requirements of the Regulations, 2006: 34 was included in the EIAR submitted to the department for acceptance.
- The applicant is capable of implementing the proposed conditions of the environmental authorisation and proposed mitigation measures.
- The principles of NEMA can largely be upheld.

In view of the above, the Department is satisfied that, subject to compliance with the conditions contained in the environmental authorisation, the proposed activity will not conflict with the general objectives of integrated environmental management laid down in Chapter 5 of the National Environmental Management Act, 1998 and that any potentially detrimental environmental impacts resulting from the proposed activity can be mitigated to acceptable levels. The application is accordingly authorised.

10/12/08

TRANSNET

NMPP Alliance

Transnet Limited

New Multi Product Pipeline (NMPP) Project

Revised Environmental Management Plan (EMP) – Trunkline and Facilities

2684358-J-A00-EN-RP-005

REV 5 – Issued for Use

NMPP Alliance

TRANSNET

NMPP Alliance

Transnet Limited

New Multi Product Pipeline (NMPP) Project

Revised Environmental Management Plan (CEMP) – Trunkline and Facilities

12 April 2010

NMPP Alliance Arup Worley Parsons JV
Building 16,
Harrowdene Office Park, Woodmead
Sandton, Gauteng, South Africa
Tel +27 11 287 9700 Fax +27 11 258 8846
www.arup.com

Job number 2684358

Job title	New Multi Product Pipeline (NMPP) Project		Job number 2684358
Document title	Revised Environmental Management Plan (CEMP) – Trunkline and Facilities		File reference
Document ref	2684358-J-A00-EN-RP-005		

Revision	Date				
3	29 Apr 2009	Revision Description	Issued for Internal Review		
			Prepared by	Checked by	Approved by
		Name	Wilna Haarhoff Tim Liversage	Brian Whitfield Marine Lasne	Carol Vosloo
		Signature			
4	3 June 2009	Filename			
		Description	Issued for Use – Incorporated comments from ECO's, CTR and NMPP		
			Prepared by	Checked by	Approved by
		Name	Wilna Haarhoff	Tim Liversage	Carol Vosloo
		Signature			
5	12 April 2010	Filename			
		Description	Issued for Use – Incorporated Annexure F (SAPREF EMP) and Annexure G (Specialist Studies Referenced in the EMP) Minor Changes to Content of the EMP		
			Prepared by	Checked by	Approved by
		Name	Wilna Haarhoff	Carol Vosloo	Andy Robershaw
		Signature			
		Filename			
		Description			
			Prepared by	Checked by	Approved by
		Name			
		Signature			

Issue Document Verification with Document ✓

TRANSNET

NMPP Alliance

Transnet Limited

New Multi Product Pipeline (NMPP) Project

Revised Environmental Management Plan (CEMP) – Trunkline and Facilities

2684358-J-A00-EN-RP-005

REV 5 – Issued for Use

Sign-Off

Organisation	Name	Signature	Date
NMPP Alliance Accepted	Carol Vosloo		
	Andy Robertshaw		
Transnet Pipelines Accepted			
Transnet Capital Projects Accepted	Paul de Ruyter		

Preamble

In Chapter 4 of the EIA, a description is provided of the complexities of integrating the environmental assessment and management (EA&M) process with the project development process. While the EA&M process seeks detailed, site-specific information at an early stage in the project development process, this information may only become available during preliminary and detailed design (which occurs at a later stage in the project development process). The absence of sufficient project information must not undermine the robustness of an EIA, and for this reason EIA practitioners focus strongly on sourcing that information that is required for good decision-making rather than necessarily sourcing all information.

In developing the Environmental Management Programme (EMP), the emphasis is to identify all environmental management requirements. The EMP is more demanding of detailed, site specific information than is the case for the EIA. However, in terms of the National Environmental Management Act (NEMA) regulations, the EMP must be developed and submitted at the same time as the EIA and must also be authorised before construction commences. In addition, there is sometimes a perception that in developing a project, detailed design is completed in its entirety before construction starts. In reality, in EPC projects, construction schedules demand that construction starts shortly after the start of detailed design which for most of the project runs in parallel and only slightly ahead of construction.

This means that detailed design is only completed at any time for those portions of the route that are about to be constructed with detailed information on further parts of the route only becoming available at a later stage when construction progresses to those points. This is a difficult issue to manage on a single site, but is compounded on a linear project such as the NMPP trunkline, where the EMP must be approved (in terms of the Regulations) at an early stage in the project development process, well before detailed design has commenced for other parts of the route. A further complexity is that given the uncertainty of the form of the detailed designs, Contractors are understandably reluctant to accept detailed prescription on what they must do to achieve a given environmental management objective.

Contractors often see prescription as undermining the design process, which incorporates a broader range of issues such as schedule, cost and other things. This does not mean that construction Contractors do not want to implement environmental management requirements, but they prefer an opportunity to develop the best possible approach to addressing the requirement. For example, if the requirement is to ensure that sediment loading in stormwater runoff from the construction site is prevented, then a prescription that an impoundment dam must be built forgoes other ways of meeting the same requirement such as stone gabions, velocity inhibitors, geo-fabrics and other. In these terms, Contractors would rather have

outcomes specified in the EMP than detailed prescription about what they must do to meet the outcomes.

Authorities on the other hand seek prescription because they need the reassurance that the environmental management requirements will be met. It is also often easier to determine whether a prescription (such as an impoundment dam) has been implemented rather than determining whether the outcome has been met (for example if there was a storm in the early hours of the morning). Unfortunately, an EMP that is too prescriptive limits opportunities for improved environmental management. For example, if the EMP prescribes watering three times a day to control dust, there are circumstances where the nature of the surface, low wind conditions and water scarcity require less watering then there is little point (and indeed even potentially negative consequences) of enforcing the watering three times a day requirement.

There will always be circumstances where a particular prescription simply does not work. This can occur for a variety of reasons, but a key driver is where site - specific conditions prove to be different to those that were anticipated. A highly prescriptive EMP does not provide for changes in approach where such circumstances occur. EMPs are often described as 'living' documents which can purportedly be updated and changed to adapt to the new conditions. The difficulty is that the EMP is approved once only by the authorities and there is no regulatory mechanism for an updated EMP to be approved. Even were such a regulatory provision to exist, the pace of construction on a pipeline project dictates that changes need to be made quickly and decisively – there simply cannot be a process of waiting for approval every time a change is needed.

It is for these various reasons that it is proposed here that the principle of adaptive environmental management be recognised and indeed authorised by DEAT as part of the authorisation of the EMP. Adaptive environmental management is an internationally recognised concept (see inter alia Roux, DJ, et al. 1999) that allows for, and indeed demands, that environmental management approaches be changed where they are proving to be ineffective. Adaptive environmental management does not mean a 'trial and error' approach it simply means that if there are better ways of achieving the same objective, or indeed improving the outcome, then these better ways should be allowed to be implemented without being viewed as a contravention of the conditions of authorisation.

The principle of adaptive environmental management must not give carte blanche to proponents and their contractors to change things as they see fit. Consequently, it is proposed that certain specialist supervisory personnel have limited authoritative powers to make decisions "in the field", in response to specific conditions encountered. For this reason it is proposed that the following procedure must be implemented wherever adaptive management principles are utilised:

- Senior qualified environmental personnel must be employed by Transnet on site, which have both the competence and credibility to interpret the recommendations of the EIA and principles specified in the EMP. This would imply Transnet's ECOs be afforded the authority to amend specific mitigation measures or requirements in the EMP in response to situations where they are not applicable or sufficient, provided that these changes are informed by an appropriately qualified and experienced specialist consultant when necessary. To this end the contractor's ELOs will be in constant communication with the appointed Transnet ECOs to ensure that situations are dealt with as soon as is possible;

- Such personnel must be issued a mandate, in writing by the project proponent, to provide guidance and instructions to the Contractors.

- An adaptive environmental management register must be developed for the project by the Contractor;

- Wherever a change from what is presented in the EMP is required, these changes must be detailed in the register including location, date, scope and cause of the condition encountered and reasons for the change;

- A clear statement of the required outcome must be detailed in the register (e.g. to meet a water quality limit, improve rehabilitation and so forth);

- Evidence must be provided and included in the register to show how the required outcome has been met (e.g. presentation of a data record, photographic evidence and so forth);

- The register must be available for audits and if, in the opinion of the authorities conducting the audit, the change resulted in a deterioration rather than an improvement, a compliance notice must be issued; and,

- The adaptive management register must be transmitted weekly via email to the Independent Environmental Auditor and ECO's, as well being presented and discussed at the Environmental Management Committee (EMC) or other similar bodies that may be established as part of the conditions of the authorisation.

References

Roux, DJ, et al. 1999. Adaptive assessment and management of riverine ecosystems: the Crocodile/Elands River case study. Water SA, vol. 25(4), pp 501-511; and,

Glossary, abbreviations and acronyms

Applicant / Owner	Transnet
Bids	Formal proposals by prospective service providers for different components of the design and construction of the project
Cement laden water	Water containing cement or concrete arising from the Contractor's activities
CTR EMS	Contractors' Environmental Management System
Contaminated water	Means water contaminated by the Contractor's activities such as with hazardous substances, hydrocarbons, paints, solvents and runoff from plant, workshop or personnel wash areas but excludes water containing cement/ concrete or silt.
dBA	A-weighted sound pressure level
DE	Design Engineer
DEAT	The National Department of Environmental Affairs and Tourism
DWAF	The Department of Water Affairs and Forestry – both national office and their various regional offices, which are divided across the country on the basis of water catchment areas.
ECA	Environment Conservation Act (Act 73 of 1989)
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment as contemplated in GN R385 of 21 April 2006 ("GN R 385") of the National Environmental Management Act (107 of 1998).
EIR	Environmental Impact Report
EMC	Environmental Monitoring Committee
EO	Environmental Officer (Contractor)
EMI	Environmental Management Inspector ("Green Scorpion")– from DEAT and Provincial Environmental Departments
EMP	Environmental Management Plan
Environment	The Environment is defined in terms of the National Environmental Management Act (Act 107 of 1998) as the surroundings within which humans exist and that are made up of: The land, water and atmosphere of the earth: Micro-organisms Plant and animal life Any part or combination of the first three items and the inter-relationships between them The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing.
Environmental Authorisation	Previously referred to as a Record of Decision (RoD). This constitutes the approval or dismissal of project as issued by the relevant environmental authority
EPCM	Engineering, procurement and construction management - viz. the 'managing' contractor
Fauna	All living biological creatures, usually capable of motion, including insects and predominantly of protein-based consistency.
Fence	A physical barrier in the form of posts and barbed wire or any other concrete construction, ("palisade"- type fencing included), constructed with the purpose of keeping humans and animals within or out of defined boundaries.

Fine	A monetary penalty against the Contractor by the PM as per request from the ECO.
Flood line	The line or mark to which a flood could rise, every 50 (1:50 year flood line), or 100 (1:100 year flood line) years
Flora	All living plants, grasses, shrubs, trees, etc., usually incapable of easy natural motion and capable of photosynthesis.
HSE	Health, safety and environment
I&AP	Interested and Affected Parties
IEA	Independent Environmental Auditor
Induction Training	Training provided to all new employees prior to them being allowed on site
ISO 14001	The environmental management systems standard of the International Standards Organisation
JPCCT	Jameson Park Community Commonage Trust
Key Indicators	Variables that provide a measure (indication) of environmental management performance
LLM	Lesedi Local Municipality
LLO	Landowner Liaison Officer
MPRDA	The Mineral and Petroleum Resources Development Act (Act 28 of 2002)
NEMA	National Environmental Management Act (Act 107 of 1998)
NGO	Non Government Organisation
NHRA	National Heritage Resources Act (Act 25 of 1999)
Non-compliance	Failure to comply with the requirements of the EMP
NWA	National Water Act (Act 36 of 1998)
PM	Project Manager
Potentially hazardous substance	Is a substance, which can have a deleterious effect on the environment. Hazardous Chemical Substances are defined in the Regulations for Hazardous Chemical Substances published in terms of the Occupational Health and Safety Act.
PPE	Personal Protective Equipment
Putrescible Waste	Waste that decomposes
RE	Resident Engineer
RoW	Construction Right of Way
SABS	South African Bureau of Standards
SAHRA	South African Heritage Resource Agency
Silt laden water	Water containing sand and silt arising from the Contractor's activities and/or as a result of natural run-off.
SMME	Small, micro and medium enterprises

Solid waste	All solid waste, including construction debris, chemical waste, excess cement/concrete, wrapping materials, timber, tins, cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers)
Spot Fine	A fine against a labourer by the PM as per request from the ECO. This fine should be used for the labourers' benefit.
Stormwater	Rainfall run-off from the site.
Swale	A depression between slopes that provides for drainage
TLB	Tractor, Load & Backhoe
Topsoil	The layer of soil covering the earth which provides a suitable environment for the germination of seed; allows the penetration of water; is a source of micro-organisms, plant nutrients and in some cases seed; and is not of a depth of more than 0,5 metres or such depth as the Minister may prescribe for a specific prospecting or exploration area or mining area.
Trunkline	For the purposes of this EMP this refers to the NMPP Project for the section between Durban and Jameson Park including the associated infrastructure such as terminals, pump stations, block valves, cathodic protection etc.
Vegetation	Any and all forms of plants, see also Fauna
Wastewater	Water containing cement washings, oil, fuel or other contaminants.
Wetland	A low lying area where the land is saturated with water, either permanently or temporarily and as characterised by specific indicator plant species and soil types
WUL	Water Use License (DWAF)

Contents

1 Environmental Management Framework

1.1 Introduction

The purpose of this Environmental Management Plan (EMP) is to ensure that the environment is properly considered during the design, construction, operations and decommissioning of the NMPP Trunkline and that negative impacts are minimised or prevented and positive impacts enhanced. At the same time the EMP provides a logical extension of the Environmental Impact Assessment (EIA) and ensures that recommendations contained in the EIA are implemented, and that the project does not deviate from the environmental profile that formed the basis of the assessment.
Specific objectives of the EMP are to:

- Summarise the range of potential adverse impacts that have been identified throughout the Environmental Impact Assessment (EIA) process of the project;
- Identify a range of mitigation measures that could reduce the potential adverse effects that the project has to acceptable or minimal levels;
- Detail specific actions, tasks and responses that are or may be required in response to incidents to ensure that environmental impact is minimised and mitigated;
- Where appropriate, specify timeframes within which required actions must take place and identify the required outcome or result of specific measures;
- Identify measures that could optimise the potential beneficial impacts of the project;
- Create a management structure and process through which the concerns of Interested and Affected Parties (I&APs) can be captured or documented and adequately addressed;
- Establish a process for the monitoring and auditing of environmental impacts and assessing the success of mitigation measures employed;
- Ensure that the construction process and operational phase of the project occur within the boundaries and parameters of acceptable practice that have been established;
- Specify actions and practices that will ensure good public relations and safe working conditions.

In order to ensure that these objectives have been properly planned for and integrated with project implementation, the format of the ISO 14001 Environmental Management Systems (EMS) standard has been used to provide a framework for the EMP. The use of this framework ensures that the environmental management requirements on the project are

properly planned for, implementation is effective, and, most importantly perhaps, that the environmental management function is always reviewed in a spirit of continuous improvement. In addition the use of the ISO 14001 EMS standard means that the EMP can be easily extended into a formalised EMS should this be required.

1.1.1 The Structure of the EMP

The EMP has been structured on the major components of the ISO 14001 Environmental Management Systems standard. These components are presented in Figure 1-1 together with a brief written description of what is required for each component in the sections that follow.

1.1.2 Environmental Policy

The importance of an environmental policy lies in the fact that it is principally the organisation itself that defines how it will give effect to environmental management. While there are several sources of specific environmental management and performance requirements including the EIA and other regulatory requirements, it is up to an organisation to define how it will address and manage all these requirements, as well as others that may be identified by the organisation.

1.1.3 Planning

Planning requires the characterisation of the various environmental aspects and related potential impacts that can result from the organisation's activities and defining mitigation to prevent or reduce negative impacts and enhance the benefits. In the case of the NMPP Trunkline the major potential impacts have been characterised through the Environmental Impact Assessment (EIA) process. The EIA is the key (but not exclusive) source of identified impacts and the resultant environmental management requirements that must be implemented during the execution of the project.

1.1.4 Implementation

Implementation is the key to the success of the EMP and arguably one of the most difficult components to achieve. Implementation is the process of ensuring that the planning is effectively implemented and as such is based on a clear delineation of responsibilities, an effective structure for implementation and 'management controls'.

Structure and responsibilities define the key roles that need to be fulfilled in the implementation of the project and the environmental management responsibilities of those roles. These include dedicated environmental management personnel as well as general project personnel because everyone on the project has a role to play in ensuring effective environmental management. Management controls serve to ensure that there is a robust mechanism for implementation of the environmental management requirements.

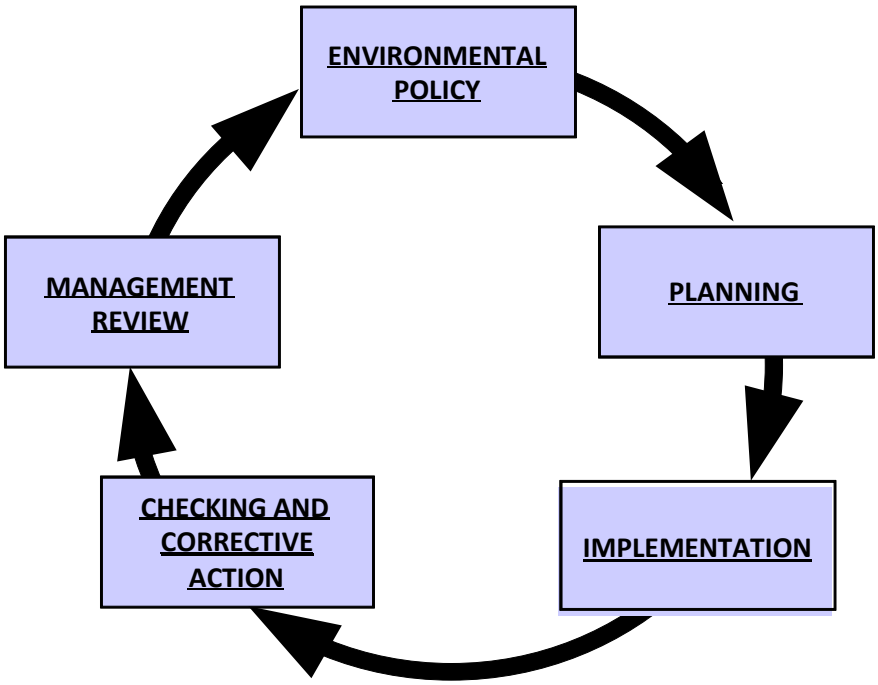


FIGURE 1-1: *Schematic illustration of the environmental management philosophy presented in this document.*
**ISO refers to 'Implementation and Operation'. By operation is meant the 'operationalisation' of planning control measures. Because the project involves distinct phases, which include 'construction' & 'operation', the ISO definition of 'operation' not used here since it causes confusion.*

1.1.5 Checking and preventative corrective action

Checking and corrective action is the process of gathering information on environmental management performance, reviewing that information and deciding on the necessary corrective and preventative actions that are required in response.

1.1.6 Management Review

The final component of the EMP is a formal management review. The review must occur regularly and serves for senior project management to review the environmental

management performance during the preceding period and to propose measures for continually improving that performance.

1.2 Environmental Policy

The Contractor and EPCM will produce an Environmental Policy which is aligned with the Transnet Corporate Responsibilities and Policies.

This Policy will be communicated to all Project personnel and made available to the public.

1.3 Planning

1.3.1 Overview

Planning serves to ensure that all the environmental management requirements that must be implemented for the NMPP Trunkline are identified and mechanisms defined for their implementation. The EIA plays a critical role in highlighting the environmental management requirements which derive from the recommendations for mitigation of impacts presented in the EIA specialist reports as well as legal requirements. The specialist assessments are based in turn on assessing the environmental aspects and impacts of the different project phases of the NMPP and these derive from the facilities and the activities associated with each project phase. In this section, the NMPP is briefly presented together with the facilities and activities associated with each project phase. Thereafter, the environmental management requirements that derive from the EIA are presented. The planning component of the environmental management philosophy is presented schematically in Figure 1-2.

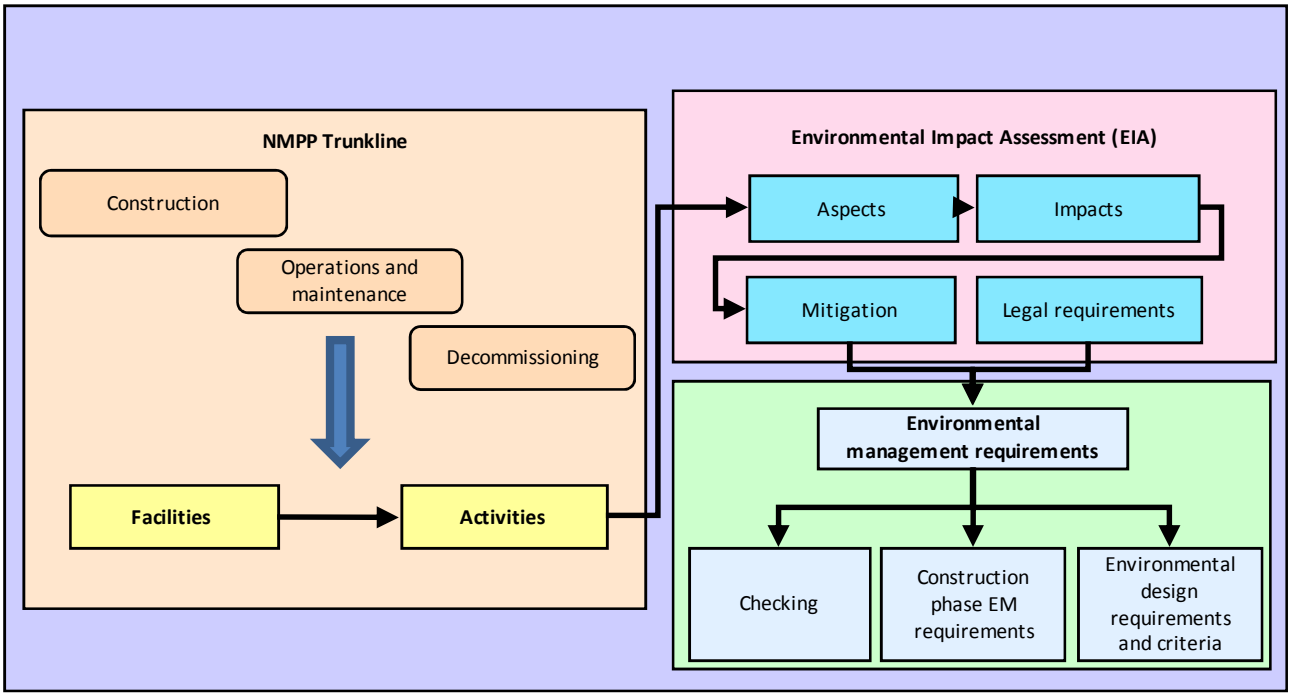


FIGURE 1-2: *Schematic illustration of the planning component of the environmental management philosophy.*

1.3.2 The NMPP Project

Transnet's proposed NMPP project is designed to efficiently transport refined fuels (93 and 95 octane petrol, low and high sulphur diesel and aviation / jet fuel) from Durban to inland South Africa. The project consists of:

- A new 24 inch multi-products liquid fuel pipeline ("trunk line") including eight pump stations along the route from Durban, KwaZulu-Natal to Jameson Park near Heidelberg in Gauteng. The pipeline will be buried for its entire length;
- A coastal fuel terminal to accumulate the fuels prior to their delivery into the pipeline.
- An inland fuel terminal at Jameson Park near Heidelberg, to accumulate fuels received from the trunk lines, prior to distribution into the inland pipeline network.

1.3.3 Project Phases

Design phase

The design process has three major components namely:

- Conceptual design – during which the broad principles of what needs to be established are defined;

- Basic design; and,
- Detailed design

In terms of design the broad principles of what needs to be built are established as conceptual design which are subsequently further detailed through the basic design and detailed design processes. What is constructed is taken directly from the detailed design. It is important to recognise that it is economically important to get the physical construction started as soon as possible after the completion of the design and what this means is that the design process and the construction process run in parallel albeit with a lag between the two.

Construction phase

The construction phase entails a set of activities required for the physical building of the Trunkline and associated infrastructure including;

- Establishment of lay-down areas;
- Construction of temporary facilities;
- Surveying and staking the construction right of way (RoW);
- Removing trees, boulders and debris from the construction RoW;
- Preparing a level working surface for construction equipment;
- Topsoil stripping and stockpiling;
- Pipe transportation;
- Trench excavation;
- Pipe bending;
- Welding, weld quality testing, weld blast cleaning and coating;
- Pipe laying;
- Trench backfilling;
- Reinstatement;
- Hydro-testing; and,
- Pipeline cleaning, gauging and drying.

Special Construction Techniques are employed where difficult or restricted terrain is encountered. These include the following:

- Open-cut river and stream crossings;

- Directional drilling;
- Road, railway line and driveway crossings;
- Other linear infrastructure crossings (pipelines, cables, irrigation systems);
- Tightly spaced or highly populated areas;
- Agricultural areas and significant natural features.

In addition to the establishment of the pipeline, pump stations and terminals, the following temporary facilities will be established:

- Construction camps;
- Access roads;
- Fencing; and,
- Borrow pits.

Operations phase

Operations consist of:

- Product dispatch;
- Inspections;
- Maintenance of pipeline and associated infrastructure;
- Maintenance of servitude.

De-commissioning phase

In the event that the pipeline is decommissioned the following activities would take place, subject to an appropriate environmental investigation:

- Removal of all petroleum products from the pipeline;
- Test integrity of pipeline;
- Fill pipeline with water;
- Maintain cathodic protection;
- Monitor pipeline for leaks and repair.

1.3.4 Environmental Management Requirements

On the basis of the impacts identified and assessed in the EIA, mitigation is presented to minimise or prevent negative impacts and to enhance potential benefits. The mitigation and other recommendations contained in the EIA are collectively referred to here as environmental management requirements. These environmental management requirements include, but are not necessarily limited to the management of:

- Geology and soils (including borrow pits, seismicity, blasting, dolomite and erosion);
- Fauna, flora and habitat (including areas of special sensitivity / conservation value, threatened species, and agricultural areas and activities);
- Water (including surface water features, river and wetland crossings, ground and surface water pollution and hydrology and stormwater);
- Air and noise (including air quality and dust);
- General construction activities (including construction access and traffic, vegetation clearing, topsoil and subsoil, borrow areas, stone and rock waste, waste management, reinstatement, construction right of way and gates and fences);
- The social environment (including archaeological sites and graves, employment, land owner and occupier relations, complaints, community health management and visual impact);
- Recruitment (including promotion of local labour and skills development and training);
- Transportation management (including pedestrian safety, traffic disruption minimisation and abnormal loads);
- Water conservation;
- Ongoing management and maintenance of construction impacts (including warranty of re-vegetation, vegetation maintenance and repair and replacement);
- Emergency and Response (including emergency preparedness and fire prevention and management);
- Materials handling and storage (including leak and spill management and spill remediation and recovery;
- Conditions of authorisation.

These various requirements apply to different project phases, different sections of the project, different facilities, different activities and in some circumstances to the entire project. It is therefore important to structure the environmental management requirements in such a way that they are properly understood, correctly allocated to the component of the project to

which they apply, and that they are effectively implemented during the execution of the project. To this end, and in recognition of the way in which the project will be executed, the environmental management categories have been categorised into environmental design requirements and criteria, construction phase requirements, and checking. Each of these categories is described in more detail in the following section.

Environmental design requirements and criteria

There is a range of environmental management requirements that apply directly to the physical infrastructure that will be created namely the pipeline, terminals and pump stations. Examples of these requirements include vapour recovery at the terminals, noise limitations and others. The mechanism implementing these requirements is ensuring that the requirements are recognised by, and feed into, the design process. In this manner, the environmental management requirements are incorporated in the design and are thus included in the facilities that are constructed. This first category of environmental management requirements is thus environmental design requirements and criteria that must be incorporated in the design of the pipeline.

Construction phase environmental management requirements

The construction phase sees the construction of the pipeline according to the detailed design that is developed. However, in the construction process, there are a range of activities and temporary (construction) facilities that are not directly addressed in the design process. Examples of these activities and temporary facilities include refuelling and servicing of machinery, construction camps, temporary access roads and so forth. There is obviously a range of environmental management requirements that apply thus to the construction phase, that are not incorporated in the design process and these requirements thus form the second category of requirements.

1.3.5 Checking

Checking refers to the mechanisms that serve to check the efficacy of implementation of the environmental management requirements and the outcomes of the environmental management function. These mechanisms include monitoring of selected environmental variables, audits (both internal and external) and inspections. Specific requirements that emerge from the EIA are thus captured in this section.

1.3.6 Legal Requirements

All project activities must adhere to and comply with all South African legislation and regulations and this requirement must also be included in the Contractors' conditions. Should there be changes in legislation and/or regulations then actions will be taken to incorporate

such changes and to pass these requirements on to the Contractors. Specific legislation that must be complied with includes, but is not necessarily limited to:

- Animal Protection Act, 1962 (Act 71 of 1962)
- Atmospheric Pollution Prevention Act, 1965 (Act 45 of 1965)
- Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983)
- Constitution of South Africa (Act 108 of 1996)
- Environmental Conservation Act, 1989 (Act 73 of 1989)
- Hazardous Substances Act (Act 15 of 1973)
- Mine Health and Safety Act, 1996 (Act 29 of 1996)
- Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002)
- Municipal Structures Act, 1998 (Act 117 o 1998)
- Municipal Systems Act, 2000 (Act 32 of 2000)
- National Environmental Management Act, 1998 (Act No. 107 of 1998)
- National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004)
- National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004)
- National Environmental Management: Waste Act, 2008 (Act 59 of 2008)
- National Forests Act (Act No 84 of 1998)
- National Heritage Resources Act, 1999 (Act 25 of 1999)
- National Monuments Act, 1969 (Act 28 of 1969).
- National Parks Act, 1976 (Act 57 of 1976)
- National Veld and Forest Fire Act, 1998 (Act 101 of 1998)
- National Water Act, 1998 (Act 36 of 1998)
- Occupational Health and Safety Act, 1993 (Act 85 of 1993)
- Protected Species – Provincial Ordinances

Standards and Specific Legal Requirements

Specific guidelines and policy requirements include:

- American Society of Mechanical Engineers (ASME) B31.4 Pipeline Transportation
- American Society for Testing Materials (ASTM)
- American Petroleum Institute (API)
- National Association of Corrosion Engineers (NACE)
- National Fire Protection Association (NFPA) standards
- International Standards Organization (ISO) 9000/2000 Quality Systems
- South African standards, codes and regulations, which include:
- South African Occupational Health and Safety Act (OHASA) Act 85 of 1993
- South African National Standard (SANS) 10089 (pertaining to the petroleum industry)
- Petroleum Pipelines Act, Act 60 of 2003
- National Key Points Act, Act 102 of 1980

Development Frameworks

On different parts of the alignment various development frameworks will also apply such as Metropolitan Open Space Systems (MOSS), Integrated Development Plans (IDP) and Spatial Development Frameworks (SDF). These requirements must also be **considered where possible** in the project implementation process during construction.

1.3.7 Objectives and Targets

In order to ensure that environmental management performance follows from the environmental policy and planning, objectives and targets must be developed and prescribed which provide the basis for monitoring of that performance. Objectives and targets must be specified for both leading indicators (i.e. the implementation of the requirements of the EMP) and lagging indicators (environmental performance monitoring).

1.4 Implementation

1.4.1 Overview

Effective implementation of the planning described in the previous section is dependent on ensuring that the environmental management requirements are integrated into the process by which the NMPP Trunkline will be built. Much of what is presented in this section is geared towards meeting that requirement. This is supplemented by the detailing of the responsibilities of the various role players that may have either a direct or an indirect role to play in terms of environmental management together with training and awareness programmes that will be implemented during the execution of the project. The implementation component of the environmental management philosophy is presented in Figure 1-3.

1.4.2 Integration with the Construction Process

The most effective way of ensuring implementation of the environmental management requirements is by integrating those requirements into the construction process. The greater the degree of integration with the construction process the greater the probability that the environmental management requirement will be implemented. For this reason it is necessary to describe key elements of the construction process before presenting how the integration of the environmental management requirements will be effected on the NMPP Trunkline Project.

1.4.3 Management of the Construction Process

The construction management structure is shown schematically in Figure 1-4. It is made up of the project owners (Transnet Pipelines), an engineering, procurement and construction management (EPCM) contractor (the NMPP Alliance), made up of a joint between ARUP and Worley Parsons) principal contractors and a host of sub-contractors. The EPCM contractor also has a design function where conceptual and detailed designs are prepared for construction. The EPCM acts as an agent for the project owners in managing the implementation of the project and ultimately to deliver a functioning trunkline to the project owners at the end of the project period.

The EPCM defines a scope of work for the principal contractors, and facilitates the process of identifying and appointing the contractor. The EPCM then manages the principal contractors in delivering on the scope of work including an ongoing process of developing detailed designs for construction by the principal contractors. The principal contractors will in turn appoint a range of sub-contractors for the completion of various functions within the defined scope of work.

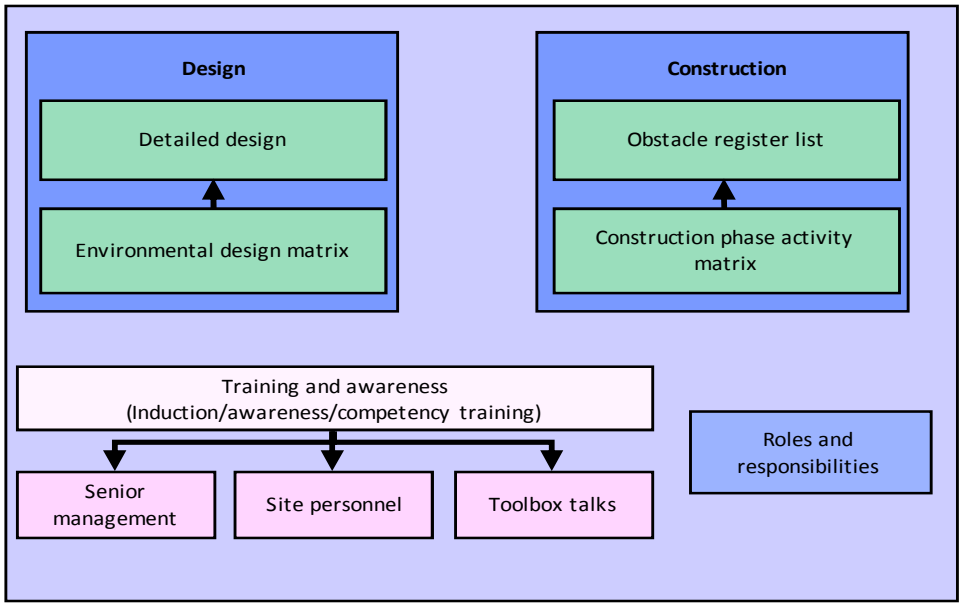


FIGURE 1-3: *Schematic illustration of implementation and operation of the environmental management philosophy.*

The design process

The design process is the ideal mechanism for translating the environmental management requirements into instructions to contractors. As described previously, the environmental management requirements have been divided into different categories including environmental design criteria.

A matrix has been

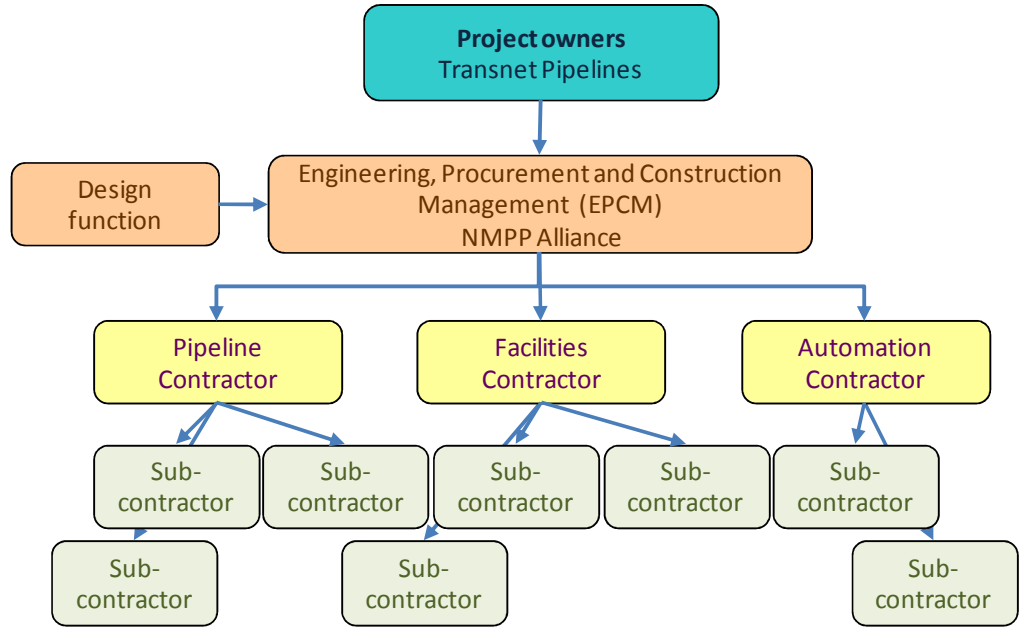


FIGURE 1-4: *Schematic presentation of the management structure that will be used for the execution of the NMPP Trunkline project. .*

n developed to link all the environmental design criteria identified during the planning process to the various facilities that will be established for the NMPP Trunkline. As the conceptual and detailed design is developed the environmental design requirements and criteria must be incorporated. The purpose of the matrix is to provide a clear reference system whereby a design engineer can easily source the environmental requirements that must be included in the design without having to work through the entire EMP. At the same time a review process must also be established to ensure that the detailed designs do in fact contain the environmental design requirements and criteria and that review process must be formally recorded and signed off as part of the design review process.

The construction process

On the basis of the designs that are prepared by the EPCM and in response to the defined scope of work and engineering and construction specifications, the contractors will physically construct the project.

A key mechanism used by the pipeline contractor in the construction process is the Pre-Construction Survey whereby the contractor defines all the tasks that will need to be completed along the different sections of the route. The Pre-Construction Survey could contain direct engineering challenges such as traversing services, difficult geology and so forth, but can also be environmentally related obstacles such as river or wetland crossings.

Design requirements of the pipeline will be presented in the Engineering Alignment Sheets issued to the contractor from the EPCM. Detail requirements such as the listing of all the temporary facilities that will be established will be identified by the contractor according to accepted method statements. Typical drawings issued to the contractor will indicate the various construction activities that will take place such as topsoil stripping, clearing and grubbing, trench excavations and so forth.

A review function must also be established to ensure that the contractor has understood and provided for the environmental management requirements. This can be checked against the Pre-Construction Survey or in the method statements that will be submitted by the contractor to the EPCM for the establishment of temporary facilities. In a similar vein a physical inspection regime must also be established to ensure that the physical construction of the facilities and pipeline infrastructure accords with the environmental management requirements.

1.4.4 Management Controls

Procedures

Although many of the environmental management requirements will be the responsibility of individual contractors, there is a range of environmental management requirements that are the direct responsibility of the EPCM. In order to ensure that these responsibilities are understood and effectively implemented during the execution of the project a range of procedures will be developed that will be managed by the EPCM and Contractor. The following procedures will be developed in support of the implementation of the EMP:

- Requirements of the EPCM in implementing the EMP;
- Audits and inspections;
- Monitoring;
- Recording, logging and reporting incidents;
- Corrective and preventive action;
- Review and approval of the Contractor's EMP (CEMP);
- Environmental awareness;
- HIV/AIDS awareness;
- Fire control and emergency preparedness;
- Materials handling and storage
- Leak and spill management;
- Recruitment and labour;
- SMME development;
- Engineering/design environmental review; and,
- Management review.

Note that the content of these procedures will be drawn to a large extent from the content of the EMP, but with more detailed elaboration of specific implementation requirements.

Contractor management

The most critical element of environmental management on any construction project is ensuring that contractors know what they have to do and then checking that they implement those requirements effectively in the execution of their construction activities. It is extremely

important to recognise that only contractors do any physical construction work on site so that anything that is required must be translated into instructions to contractors.

From an environmental management point of view the main contractor is compelled to submit its detailed Environmental Management System (EMS) documentation, procedures and method statements to the EPCM for acceptance. Contractors are required to detail in their procedures and method statements what their activities are and how they will manage those activities to ensure that the various environmental management requirements are met.

An important philosophy in managing contractors is to ensure that they take ownership of the environmental requirements and one of the ways in which this is promoted is through ensuring that they develop and implement their own procedures and method statements.

All of the environmental management requirements that the owner must uphold, and that are contained in this EMP are presented as contract conditions that are legally enforceable in terms of the contract concluded between the owner and the contractor.

The contract conditions that will be issued will stipulate the requirements for each contractor to develop their own procedures and method statements, the contractor will not be allowed to mobilise until such time as the procedures and / or method statements has been accepted by the EPCM.

1.4.5 Roles and Responsibilities

Effective environmental management during the design and construction of the NMPP Trunkline will be critically dependent on a number of project personnel. The purpose of this section is to define roles for personnel and to detail concomitant responsibilities in the execution of the EMP. Before doing so it is also necessary to define the various organisations that are responsible for implementing the project together with the environmental management responsibilities each carries. Please see Figure 1-4 for a more general description of the relationship between these organisations.

1.4.5.1 Transnet Pipelines

Transnet Limited, through their operating division Transnet Pipelines is the ‘owner’ of the project and as such the environmental authorisation and subsequent operational environmental permits will be issued in the name of Transnet Limited. Transnet Pipelines is thus responsible for ensuring that all the conditions of the environmental authorisation are fully implemented and are the overall custodians of the various environmental management requirements that need to be implemented.

Key Role Players (Transnet pipelines)

Environmental Manager (Transnet)

The Main responsibility of the Transnet Environmental Manager during operations will be to report to Transnet Management on the progress in terms of compliance of the Environmental Management Plan Requirements

Environmental Control Officers (ECOs)

Reporting to the Environmental Manager.

The ECOs will be appointed by Transnet prior to the start of the site preparation and construction phase. Due to the physical extent and complexity of the project and the fact that construction will simultaneously take place in multiple locations, Transnet will be required to appoint a sufficient number of ECOs to adequately and efficiently monitor all areas of construction.

An ECO must be appointed to monitor construction at each of the Terminal complexes, with additional ECOs to be appointed to monitor construction of the pipeline and pump stations.

The Environmental Manager and Project Manager must determine the appropriate number of ECO's required during review of the project schedule presented by the contractor. If at any point during the project it becomes apparent that the number of ECO's is not sufficient, additional ECO's must be appointed for the duration of the remainder of the project. The number of ECO's may be reduced once construction has reached a substantial level of completion.

The appointed ECO's must be sufficiently qualified with a degree in environmental practice or equivalent from a recognised University or Technikon (or recognised equivalent), and a further post-graduate degree in environmental practice or equivalent, from a University or Technikon (or recognised equivalent) in order to understand and perform all tasks required. The ECO's must also be able to effectively communicate and deal with the Contractor as well as affected landowners and members of the public. The resumes of all ECO's to work on the project have to be accepted by Transnet prior to appointment.

It is advisable that an Independent Managing Environmental Consultant / ECO is appointed by the applicant in order to manage all ECO's on site, since it is anticipated that not all ECO's might have appropriate site experience.

This Managing Environmental Consultant / ECO will have a degree in environmental practice or equivalent from a recognised University or Technikon (or recognised equivalent), and a further post-graduate degree in environmental practice or equivalent, from a University or Technikon (or recognised equivalent). Furthermore the Managing Environmental Consultant / ECO shall have a minimum of five years working experience in the field of Environmental Management and in particular have relevant experience as an environmental site officer.

The role of the ECOs is to support the successful implementation of the EMP through:

- Investigating and reporting on major environmental incidents;
- Auditing the implementation of the EMP
- Overseeing the execution of the activities described in the EMP.
- Maintaining and managing the monitoring programme.
- Participating in the Environmental Management Committee (EMC)
- Providing liaison on environmental issues between all other parties, i.e. the Contractor, Project Manager, Resident Engineer, Landowners and Authorities.
- Full familiarisation with the findings and conditions of the EMP and Environmental Authorisation, including any potential amendments or additions to these documents. Having a good working knowledge of all relevant environmental policies, legislation, guidelines and standards.
- Ensuring that all Contractors/ Contractor environmental personnel/sub-Contractors/employees are fully aware of their environmental responsibilities. This will take the form of an initial environmental awareness-training program in which requirements of this document will be explained, as well as follow-up or additional training sessions as required.
- Monitoring the actions of the above parties to ensure that the developer and/or Contractor are adhering to all stipulations of the EMP.
- Conducting site meetings and inspections at regular intervals as stated within the EMP and / or Environmental Authorisation as well as on a case-by-case basis as the conditions of the project may determine. The findings should be documented as part of the site meeting minutes.

- Submitting EMP compliance reports at regular intervals as determined by the EMP and / or Environmental Authorisation and submit these to the Contractor for appropriate and timorous action if required. Copies of the reports will also be submitted to the Project Manager and relevant authorities and any other parties determined by the Environmental Authorisation. The reports must be thorough yet concise, logically structured and understandable.
- Regular liaison with the Construction team, Environmental Officers (Contractor), Land Liaison Officers (LLO's) and Project Manager to ensure that all relevant information is reliably communicated between parties.
- Regular liaison with all Interested and Affected Parties (I&AP) including all landowners.
- Conducting a post construction environmental audit to ensure that all conditions in the EMP have been adhered to.

1.4.5.2 The NMPP Alliance (EPCM)

The NMPP Alliance is a joint venture between Arup and Worley-Parsons and fulfils the role of Engineering, Procurement and Construction Management (EPCM). In other words the EPCM is the managing contractor that takes the requirements of the client and translates these requirements into designs, procures the necessary equipment and services and manages the construction process. The EPCM will be accountable for environmental management during the construction phase and are thus responsible for implementing the EMP under the custodianship of Transnet Pipelines. The EPCM is the representative of Transnet Pipelines during the Engineering and Construction Phase.

Amongst other responsibilities the EPCM must:

- Maintain a register which keeps a record of all incidents which occur on the site, which relate to any aspect of the EMP. These include but are not limited to the following:
- Health and safety incidents;
- Incidents relating to safety and security of the site and construction camps;
- Public complaints and incidents involving third parties;
- Incidents involving hazardous materials or substances; and,
- Ensure that amicable relations with all third parties, including affected landowners and other I&APs are maintained and minimise the disruption and inconvenience suffered by these individuals as a result of construction activities.

Key role-players (EPCM)

Project Manager (PM)

The PM will be responsible for the overall management and overseeing of the contract, from initiation to completion of construction. As such the PM is the ultimate custodian of all elements of the project, from design, construction and commissioning through to operations and ultimately de-commissioning. In these terms the PM is, inter alia, the ultimate custodian of all environmental management requirements and legal obligations for the project. In response to these requirements the PM:

- Will be expected to be familiar with and ensure adherence to the conditions of the EMP and Environmental Authorisation, including any potential amendments or additions to the document;
- Will be responsible for monitoring the site activities, both directly and through appointed agents, in order to ensure compliance;
- Must ensure that sufficient resources are available to the other role players to efficiently perform their tasks in terms of the EMP;
- Must appoint the independent ECOs to ensure strict adherence to the EMP;
- Will be responsible for conducting internal audits of the construction process and conditions on site and compare these with the EMP and will ultimately be responsible for ensuring that remedial steps are taken where non-compliance occurs;
- Will, in consultation with any members of the Project Consultant Team and/or Environmental Manager and/or ECOs as the case may be, be responsible for the approval of the Emergency Response Plan and Fire Prevention and Management Plan;
- Will liaise with the Contractor to obtain the contact details and particulars of the Landowner Liaison Officers and Environmental Liaison Officers. He will submit this information, together with the details of the appointed Environmental Control Officers, Environmental Manager and Approved Inspection Authority (see separate Items below) to DEAT, as well as all relevant provincial and local authorities.

Environmental Manager (EM) (EPCM)

Reports to the Project Manager.

The role of the Environmental Manager is to ensure that all environmental management requirements are recognised and effectively implemented during the execution of the Project. Specific requirements include to:

- Plan and direct the implementation of the Environmental Management Programme;
- Ensure that all the construction procedures and method statements comply with the environmental requirements in this EMP;
- Manage scheduled external audits and inspections on contractors performance on site, with subsequent report back to management;
- Coordinate and oversee the activities of the ECOs;
- Ensure that information is effectively communicated and distributed between all parties;
- Be aware of the environmental issues relating to the project and regularly meet with the ECOs to keep abreast of current events. Should an ECO not be able to respond to a specific query from the Contractor or Contractors environmental personnel or a landowner, the matter must be referred to the Environmental Manager who will take whatever actions are deemed necessary.

Design Engineer

The design engineer is the consultant responsible for the initial design of the project prior to construction commencing. The design engineer is not normally available on site during the construction period, but will be consulted throughout the construction period of the project regarding any issues that fall outside the scope of responsibility of the resident engineer.

Servitude Negotiators

The EPCM will appoint dedicated Servitude Negotiators whose responsibility it will be to liaise on an ongoing basis with all landowners in terms of servitude negotiations and keep them informed of progress and next steps of construction.

The Servitude Negotiators will act as the primary contact affected landowners and will facilitate all negotiations between the Contractor and landowners. It will be the responsibility of the Servitude Negotiators to keep landowners updated and informed of all activities and decisions relating to construction that may affect them and shall ensure that relevant contact

details of the Contractor and ECOs are available in order for landowners to make contact if required;

Approved Inspection Authority (AIA)

An AIA will be appointed by Transnet Pipelines in terms of the Occupational Health and Safety Act (Act 85 of 1993) as well as the API 1104 Code and all relevant national and international quality standards. It will be the responsibility of the AIA to check whether the installations conform to the relevant designs and specifications, as well as the general quality of materials used and construction workmanship. The AIA will provide assessments and recommendations to Transnet as well as the relevant authorities in this regard. The project is to be assessed by an AIA group to ensure quality and compliance.

1.4.5.3 Individual contractors

Three principal contractors will be appointed for the construction of the NMPP Trunkline namely:

- The pipeline contractor;
- The facilities (terminals and pump stations) contractor; and,
- Automation contractor.

The principal contractors will also appoint a number of sub-contractors.

Key role-players (Contractor)

Environmental Manager (EM) (Contractor)

The role of the Environmental Manager is to ensure that all environmental management requirements are recognised and effectively implemented during the execution of the Project.

Specific requirements include to:

- Ensure the implementation of the Environmental Management Programme;
- Development of all the relevant construction procedures and method statements in order to comply with the environmental requirements in this EMP;
- Ensure that contractors on site develop, implement and monitor the environmental management plan, construction procedures and method statements;

- Manage scheduled internal audits and inspections on contractors performance on site, with subsequent report back to management;
- Ensure that information is effectively communicated and distributed between all parties;
- Be aware of the environmental issues relating to the project and regularly meet with the ECOs to keep abreast of current events. Should an ECO not be able to respond to a specific query from the Contractor or Contractors environmental personnel or a landowner, the matter must be referred to the Environmental Manager who will take whatever actions are deemed necessary.

Contractor Environmental Officers (EOs)

The EOs will be appointed by the Contractor to monitor the activities on the site on a daily basis against the EMP conditions. The EOs will liaise on a daily basis with the ECOs on site and will report back to the ECOs on any significant occurrences during all site inspections and site meetings. The Eos will keep the ECOs informed of the contractors planned construction within areas of environmental concern such as wetlands, heritage sites and other sensitive areas. All communication between these parties in this regard will be confirmed in writing via email. The EOs must further immediately report any major incidents or occurrences to the ECOs to ensure immediate remedial action. Each construction site section must have an appointed EO who will be present on site whenever any construction activities are taking place.

Construction Manager (CM)

The role of the CM is to ensure that all contractors on site abide by the requirements of the EMP and that the plant and pipeline is constructed in such a manner that meets all specified contractual and legal environmental requirements.

Site Engineers

The role of the Site Engineers is to ensure that environmental requirements and restraints are passed on to the design engineers and to check that the plant and pipeline is designed to meet all specified environmental parameters and to contractual and legal requirements. A resident engineer acts as a direct, on-site resource for all technical aspects related to the project. He/she is available on the construction site at all times, overseeing all phases of the construction activities. The resident engineer will issue site instructions with regard to minor technical or procedural issues and where significant technical constraints or issues are encountered must liaise with the project design engineer.

1.4.5.4 General

Community / Land Liaison Officers (CLOs / LLO's)

In addition, the Contractor and EPCM will appoint dedicated CLOs / LLO's whose responsibility it will be to liaise on an ongoing basis with landowners and affected parties and keep them informed of progress and next steps of construction.

The CLOs / LLO's must be able to communicate with affected parties in all languages commonly spoken in a specific area and must have good interpersonal skills and communication ability. A sufficient number of CLOs / LLO's must be appointed by the Contractor and EPCM to ensure that all landowners are timeously consulted and informed of any events that may affect them. The CLOs / LLO's must have a good understanding of the project and all construction procedures and the environmental factors and impacts that may occur as a result of construction. Where a CLO / LLO is not able to answer a specific query from a landowner, the matter must be referred to the relevant ECO or otherwise Environmental Manager to resolve in the event that the issue is related to the EMP or environment.

The CLO / LLO will act as a primary contact with I&APs. It will be the responsibility of the CLO / LLO to keep I&APs updated and informed of all activities and decisions relating to construction that may affect them and shall ensure that relevant contact details of the Contractor and ECOs are available in order for I&APs to make contact if required;

1.4.5.5 Training and awareness

All employees will receive suitable environmental training, to ensure they are aware of their responsibilities and are competent to carry out their work in an environmentally acceptable manner. The Main Contractor will lead all environmental training programmes as required by the EMP. Sub-Contractors are compelled through their contract conditions to follow all requirements of the EMP, where the necessary training to their workforce will be essential to ensure that this requirement is met.

The Contractor must ensure that all of his construction staff receive basic training related to environmental matters, as well as acceptable conduct, storage and handling of chemicals and potentially hazardous substances, waste management, and prevention of pollution of natural resources. The Contractor must also ensure foremen and managing site personal receive detailed training with regards to the requirements of the EMP.

Training must be given or otherwise facilitated by the Contractor EO and all staff must be aware of where detailed information relating to any aspect of the EMP or environmental requirements can be obtained.

It is the responsibility of the Contractor to ensure that he is fully familiar with the requirements of this EMP. Should the Contractor require any information or explanation regarding any aspect relating to the EMP it will be his responsibility to contact the ECO for advice. In addition the following personnel will receive specific environmental training:

Informal training of all staff on site is also required on an on-going basis through informal discussions, on-site supervision and through facilitation of day to day activities. This responsibility falls within all that received basic or specialized training.

If it is found through formal reporting structures, informal site inspections and observations of day to day activities that certain training was inadequate, the contractor must ensure that such training is reviewed and revised if necessary and that all staff relevant to such areas are re-trained in order to ensure compliance to this EMP.

Higher level of training for senior management on all relevant environmental issues will be conducted by the Main Contractor. The focus will fall on legislation, EMP philosophy, structure and reporting requirements, permit procedures, application requirements and general environmental management activities.

Individual employees play an essential role in that they are directly involved in the physical construction activities and thus need to understand the limitation, restrictions and/or other environmental requirements in implementing their day to day tasks. It is important to note, however, that individual employees involved in construction activities will principally be under the direct supervision of the contractors.

All general workers will receive induction training which will be presented by the Contractor Health and Safety Manager Representatives. The induction training will include an environmental management component which will be presented where possible by the Contractor Environmental Representitives. The induction training is still to be developed but will address the following themes:

- General introduction to environment management;
- Why environmental management is required on the project;
- Roles and responsibilities of individuals on the project; and.

- Specific issues that need to be managed:
    - Dust;
    - Fire control;
    - Materials handling and storage;
    - Leaks and spills prevention;
    - Noise;
    - Waste;
    - Fauna and flora;
    - Waste water;
    - Transportation; and,
    - Water conservation.
    - Sensitive areas (wetlands, heritage sites etc.)

1.4.5.6 Toolbox talks and awareness campaigns

All workers will receive weekly toolbox talks that will be presented by individual contractors and facilitated by the Contractor EO on specific environmental topics that are relevant to their activities. These toolbox talks will be supplemented by site wide environmental awareness campaigns that will be run by the Main Contractor to promote sensitivity to and understanding of given environmental management issues.

Themes for tool box talks are to be developed but at this stage include:

- What is the environment;
- Why does it need to be protected;
- Environmental aspects and impacts of the NMPP Trunkline construction;
- What can individuals do;
- Water conservation;
- Managing litter;
- Use of ablutions;
- Spillage prevention and reporting;

- Environmentally sensitive areas;
- Careful driving (dangers of speeding, use of defined access routes);
- Not interfere with local inhabitants;
- Condom use; and,

Contractors Environmental Management requirements

1.5 Checking, Preventative and Corrective Action

1.5.1 Overview

Checking and preventative and corrective action is based on a process of gathering information on both leading and lagging indicators, reviewing this information in a systematic manner and making decisions on the basis of the performance reflected by the indicators. Preventative and corrective action can be initiated whenever it is appropriate to do so, for example during an inspection a non-compliance can be communicated to the contractor for immediate action on a major or serious issue, but as a minimum the environmental management performance of the project will be reviewed on a monthly basis and corrective and preventative actions formally documented and implemented. In this section the various mechanisms used to gather information and to take action in response to that information are presented and described. Checking and preventative and corrective action is illustrated schematically in Figure 1-5.

This component consists of four key activities including:

- Monitoring of selected environmental quality variables;
- Daily inspections of the site and activities across the site;
- Formalised audits on individual contractors as well as specific activities where these are identified as being problematic; and,
- Reporting on a monthly basis as an input to the review and management process.

1.5.2 Monitoring

A series of environmental variables that are to be monitored during the Construction phase of the project are listed below. The specific monitoring requirements are described in greater detail in Section 2 and 3. Monitoring results will be presented monthly and compared to the

objectives and targets stated in the EMP. Where the target values are not being met, further mitigation will be pursued.

The following parameters are to be monitored on an ongoing basis during the construction phase by the Contractor:

Parameter	Frequency	Responsibility
Water Monitoring		
Water Supply for Camps	Monthly Quantitative Assessment and Water Quality Testing	CTR / EO
Sewage Waste Water	Monthly Quantitative Assessment and Water Quality Testing	CTR / EO
Waste Water from Oil / waste water separators	Weekly Visual Inspections / 3 Monthly Lab Analysis	CTR / EO
Water Discharge	Before and During Construction / Weekly Lab Analysis	CTR / EO
Water Quality of water course crossings	Before and During Construction / Weekly Lab Analysis	CTR / EO
Water Supply	Quantitative / Water Abstraction Records	CTR / EO
Dust Monitoring		
Dust Control	Visual Inspection / Daily	CTR / EO
Dust Fallout	Visual Inspection / Daily	CTR / EO
Blasting		
Vibration	Once During Actual Blasting	CTR / EO
Noise	During Actual Blasting	CTR / EO
Construction Activities		
Noise	Before and During Work / At least once a month	CTR / EO

It should be noted that Noise and Vibration monitoring during blasting and other construction activities will only be conducted in areas of close proximity of dwellings, housing or within towns / cities. There is a further requirement to monitor noise and vibration in areas where sensitive receptors are present such as for example areas where sensitive threatened species occur such as the Oribi.

1.5.3 Inspections

Due to the transient nature of the Project phase, the greatest source of information is that sourced through ongoing visual inspection. This will be the function of firstly the contractors Environmental Officers and secondly the ECOs who will spend the bulk of their time on site monitoring compliance to the EMP and noting any activities that transgress the requirements specified in the EMP.

At the same time some potential impacts are difficult to monitor quantitatively, such as soil erosion and waste management. The ongoing inspections by the ECO's and EO's, provides valuable qualitative information on effects such as these so that action can be taken to mitigate against further potential effects.

These inspections must take place daily, weekly and monthly and must be adequately documented for record purposes. In addition, these reports must be sent via official communication channels to ECO's. In this way ECO's can evaluate the effectivity of the contractors EO's monitoring procedures and provide specific input as to aspects of the EMP or unforeseen issues on site that require additional attention.

1.5.4 Internal Audits

Two types of internal audits will be conducted by the Independant Environmental Auditor. These will be formal scheduled audits that follow a defined programme and that are continued across all the contractors that are on site. The second type of audit is where the monitoring data and the inspection reports highlight problems and the response will be to initiate an internal audit focussed on that specific problem area highlighted. The

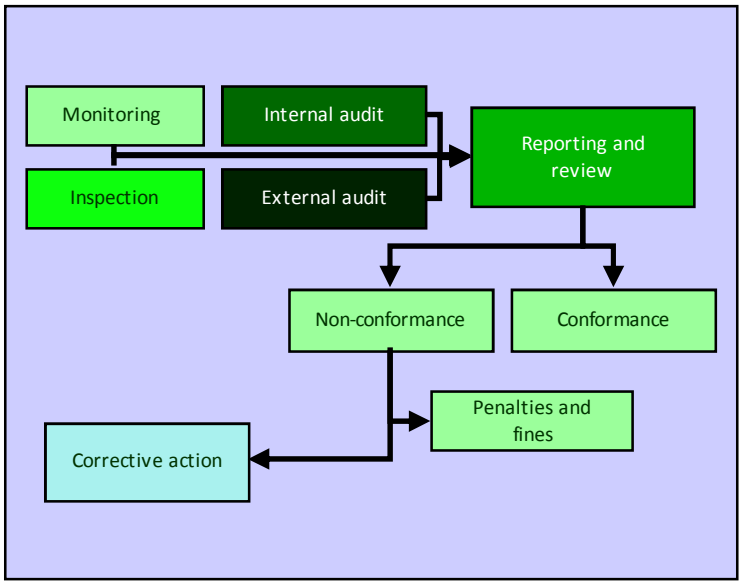


FIGURE 1-5: *Schematic illustration indicating checking and preventative and corrective action within the environmental management philosophy.*

purpose of the audit will be to ascertain the source of the problem and to define what action must be taken to prevent its recurrence.

1.5.5 Reporting

A bi-monthly environmental audit report will be prepared by the Independent Auditor and tabled in the Environmental Management Committee meeting. The report must include a description of at least the following:

- Incidents and complaints;
- Implementation of the EMP
    - Inspections
    - Audits
    - Approvals
- Key corrective actions.

A monthly environmental performance report will be prepared by the Contractor and also tabled in the Environmental Management Committee meeting. The report must include a description of at least the following:

- Incidents and complaints;
- Implementation of the EMP
    - Inspections
    - Audits
    - Approvals
- Performance against targets;
- Selected environmental monitoring results; and,
- Key corrective actions.

Note that compliance / non-compliance and incident records must be kept by the both the EPCM and Contractor and shall be made available on request from the authorities. These records should be made available to ECO's on request as they are present on site daily and can monitor the progress of corrective actions objectively as an independent party. It is particularly important that the ECO's are involved in the process of the close-out of open non-conformances.

1.5.6 Preventative and Corrective Action

Where preventative and corrective action is identified, this can be implemented as follows.

Verbal instruction

Verbal instructions are likely to be the most frequently used form of corrective action and are given in response to minor transgressions that are evident during routine site inspections. Verbal instructions are also used to create further awareness amongst contractors, as often the transgressions are a function of ignorance rather than vindictiveness.

If required verbal instructions are to be followed up by whomever issued them as written instructions as stipulated as per the contractual agreements.

Response times are at the discretion of the person/s that provided the verbal instruction and should be documented.

Written instructions

Written instructions will be given following site visits, audits or as result of discussion sessions with the contractor. These written instructions could be made electronic via for example email, meeting minutes, action registers etc. The written instructions will indicate the source or sources of the problems and proposed solutions to those problems. The implementation of these solutions will be assessed in a follow-up site visit, audit or discussion session and further written instructions issued if required.

Response times are at the discretion of the person/s that provided the written instruction and should be documented.

Project Management Instructions – PMI's

In cases where written instructions deem to be inadequately addressed or constitute a change of scope to the Contractor as per the signed contract, a PMI will be issued which must be resolved as specified in the PMI. The PMI will indicate the source or sources of the problems and proposed solutions to those problems. The Contractor will have to reply in writing as required by the contract to demonstrate implementation of the PMI if necessary.

Response times are at the discretion of the person/s that provided the written instruction and should be documented.

Contract notice

A contract notice is a more extreme form of written notice because it reflects the transgressions as a potential breach of contract. If there is not an adequate response to a contract notice then the next step can be to have the contractor removed from the site and the contract cancelled.

Response times are at the discretion of the person/s that provided the contract notice and should be documented.

Work stoppage

When, in the opinion of the Environmental Manager (Transnet), a construction activity will result in environmental damage, the Environmental Manager will formally advise the PM, who will in turn order the Contractor to halt the activity. The Contractor will keep written records of instructions received from the ECO and PM concerning environmental matters.

Only written instructions for stoppages that have been issued as per the contractual agreement and that have been signed off by the Project Manager will be considered a valid instruction to the Contractor.

1.5.7 Stakeholder Engagement

Throughout the project ongoing liaison should be maintained with authorities and communities alike to ensure that the following is effected:

- Timeous advanced warning of any project activities that may have some impact on surrounding communities;
- Ongoing feedback on the project and environmental performance; and,
- A continuous conduit is established whereby complaints can be lodged and speedily and efficiently resolved.

The public is to be kept informed with regard to the project in general and its environmental performance during the construction and operational phases. Mechanisms to facilitate communication between Transnet Pipelines and the public are to be established which include as a minimum:

Ad hoc consultation meetings

The public is to be kept informed with regard to environmental performance during the construction and operational phases of the project. The following two forums will be used as mechanisms to facilitate communication between Transnet and the public.

Focus Groups

Transnet has a communications department which is responsible for stakeholder engagement. This department will engage all willing and available NGOs, especially environmental NGOs.

Interested and Affected Parties (I&APs)

Community / Land Liaison Officers will engage in face to face meetings with the public. I&APs will be informed about the progress of the project at meetings that will be held at pre-determined venues.

Participation in the Environmental Monitoring Committee (EMC)

A procedure will be established by the EPCM in terms of the setting up and operation of an EMC.

1.5.8 Complaints

A complaints procedure will be developed by the EPCM.

The procedure will include the development for a complaints register that will be used to record and track all complaints that are received regarding the activities on the project. A dedicated telephone number and an email address will be established and advertised as a means of lodging complaints. Complaints will be addressed as per the procedure.
The nature of the complaint, the source, the turn-around time and the remedial action implemented will all be recorded in the complaints register. Complaints will be reviewed during Environmental Coordination Meetings as a performance indicator.

All complaints from the public should immediately be dealt with and recommendations or instructions will be issued through the Project Manager to the Contractor if required, as soon as is practical. In all cases the complaints procedure developed by the EPCM must be followed.

The Contractor is to take remedial action as soon as is practical to ensure that issues are dealt with timeously. Timeframes for rectification of non-compliance as specified by the Environmental Authorisation should be considered to be a minimum and where possible the Contractor must endeavour to respond sooner.

Compliance and record-keeping

Through an ongoing review of information from the inspections, audits, monitoring and incident reporting, non-compliances with the requirements of the EMP and conditions of authorisation, will be identified by the EPCM. Reporting thresholds will be as per the Environmental Authorisation conditions as specified by the authorities to ensure that non-compliances are identified and reported to the authorities timeously.

A register will also be kept of all non-compliances together with the responses received from the authorities. All records related to the implementation of the EMP (e.g. ECO diary, methods statements etc.) must be kept together in the site office in a safe but accessible manner. Records will be kept as per the Project Document Control Procedures, and should at any time be made available for scrutiny by any relevant authority if requested.

The EMP, including all annexure as well as the Environmental Authorisation must be kept on site at all times. Whenever additions or revisions to any of the above documentation are issued these must be issued to the Contractor immediately and must replace redundant versions. It is the responsibility of the Contractor to ensure that the relevant documents are kept on site and the responsibility of the EPCM to ensure that the Contractor is issued with the most updated and relevant documents. Furthermore the EMP will be included into the Contractual Clauses of the construction contract and will be made binding on all Contractors operating on or affecting the site.

The Contractor and ECO will keep written and photographic records of the site surroundings before, during and after construction on the site. The photos will be clearly annotated to include a description of the exact date and location when and where they were taken, as well as any specific issues that need to be highlighted. Note must be made of what party was responsible for damage caused to ensure liability for damage. The Contractor shall be held liable for all preventable damage to the environment and shall be responsible for the cost and implementation of all remedial actions to be taken.

1.6 Management Review

In keeping with the ISO 14001 requirements, a formal management review will be conducted regularly. The purpose of the review will be to critically examine what is working and what is not in respect of the EMP and its implementation and to decide on modifications to the EMP

as necessary. The process of management review is in keeping with the principle of continual improvement. Given the period of construction it is envisaged that a management review will take place at 6-monthly intervals. The management review requires the participation of the following as a minimum:

1.6.1 Contractor Representatives

- Environmental Manager
- Contractor Project Manager
- Environmental Officers
- Construction Manager

1.6.2 EPCM Representatives

- Project Manager
- Environmental Manager
- Construction Manager
- Independent Inspection Authority

1.6.3 Transnet Representatives

- Project Manager
- Environmental Manager
- Environmental Control Officers

1.6.4 Independents

- Independent Auditor.

A formal agenda is to be tabled and minutes kept of the meeting which must detail the continual improvement interventions decided in the management review.

The Management Review meeting will be organized and chaired by the EPCM.

1.7 Summary

The environmental management philosophy presented in this document is based on the ISO14001 Environmental Management Systems standard. The management philosophy is thus based on 5 key components namely policy, planning, implementation and operation, checking and corrective action and management review. Each of these individual components has been described in this section of the EMP. The overall environmental management philosophy is best presented schematically to show how all the components piece together. That schematic presentation is given in Figure 6. The report was prepared after almost seven months of public and authority consultation during the Scoping Phase of the EIA between Mid January and 7 July 2008. In accordance with Regulation 31 of the EIA Process Regulations, the National Department of Environmental Affairs and Tourism (DEAT) approved the Final Scoping Report and EIA Plan of Study on 8 August 2008. The Draft EIA and the Draft EMP were available for public review between 22 September 2008 and 27 October 2008. The Final EIA was submitted to DEAT on 6 November 2008. This EMP is considered the revised EMP which is to be submitted to the DEAT for review and approval during June 2009.

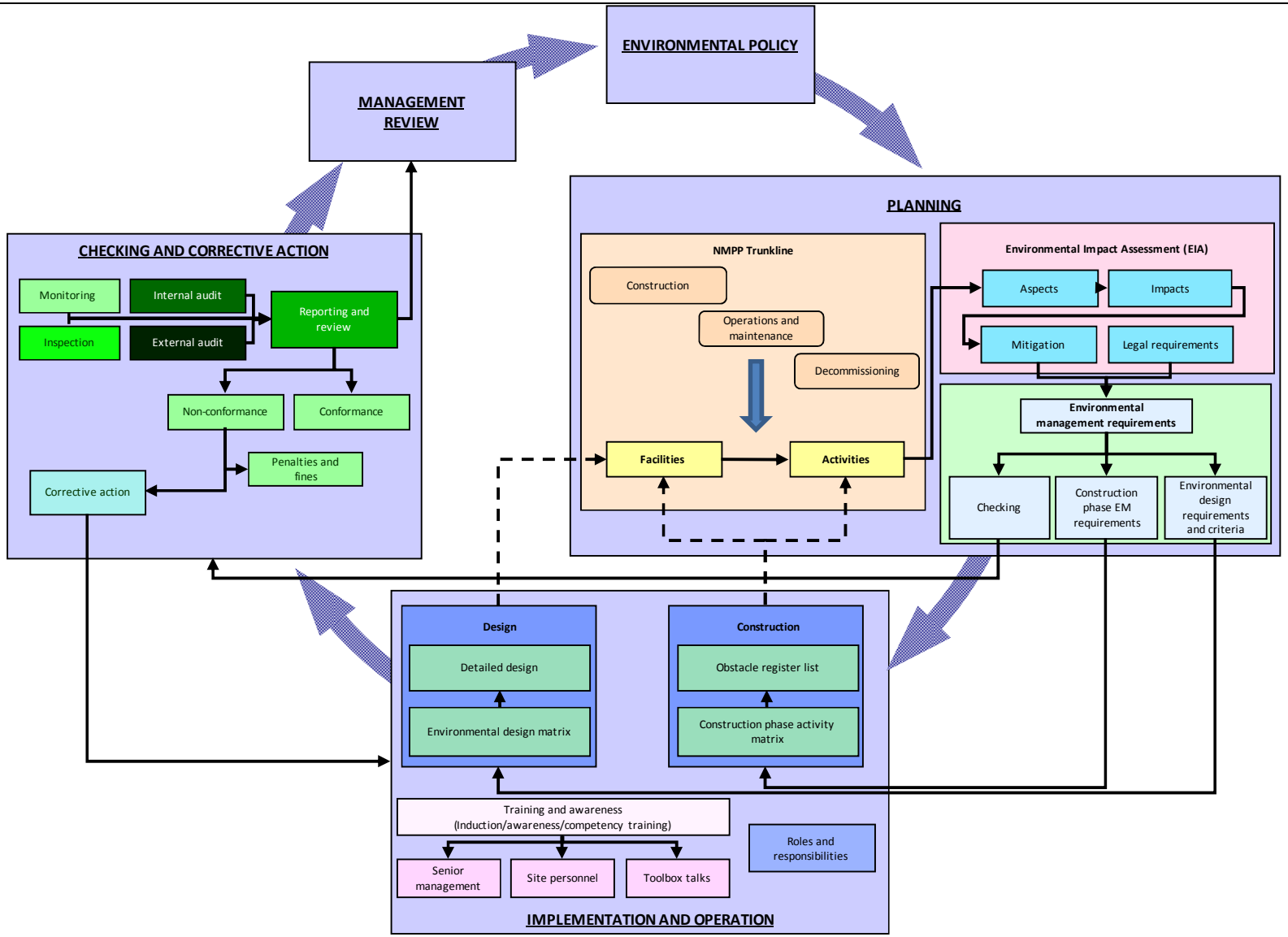


FIGURE 1-6: *Schematic illustration indicating checking and preventative and corrective action within the environmental management philosophy.*

2 Construction Phase

2.1 General Conduct and Site Management

2.1.1 Construction Camps

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a	GEN	The landowner and Contractor must enter into a written contractual agreement regarding the specific terms and conditions of the use of the land and the Contractor may not erect any structure prior to a signed agreement having been reached. The chosen site, as well as a Method Statement for the establishment of the Construction Camp will then be submitted to the NMPP Alliance for approval.	CTR	EPCM	√
b	GEN	The Contractor shall ensure that Construction Camp site selection is done in consultation with local authorities, traditional leaders and the community to ensure that a mutually acceptable site is chosen.	CTR	ECO	
c	SS	Temporary Construction Camps must not be situated near remote areas that are likely to constitute important faunal refuges	CTR	ECO	
d	GEN	The Contractor shall not, regardless of the above provisions, locate campsites in any area in which vegetation is pristine, or that is from an environmental perspective deemed unsuitable for this purpose, nor within 100m of any watercourse, nor in any area that could cause nuisance or safety hazards to surrounding landowners, inhabitants or the general public. Prior to the commencement of construction, the Contractor shall also prepare documentation for each proposed campsite which contains, but is not limited to, details of: • site layout including access points and material storage areas; • topsoil management; • cuts and fills; • sewage treatment; • erosion control; • fencing; • general waste management; • provision for vehicle and plant servicing; • management of hazardous materials, • water supply; • management of veld fire risk;	CTR	ECO EPCM	√

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		• rehabilitation. The documentation shall be submitted to the ECO and NMPP Alliance for acceptance prior to establishment on site.			
e	GEN	All Construction Camps are to be fenced off in such a manner that unlawful entry is prevented and access is controlled. Signage shall be erected at all access points in compliance with all applicable occupational health and safety requirements. All access points to the Construction Camp should be controlled by a guard or otherwise monitored, to prevent unlawful access.	CTR	EPCM	
f	GEN	The Contractor must minimise the footprint of the Construction Camp and ensure that vegetation is only cleared where absolutely necessary.	CTR	ECO	
g	GEN	Site activities that may result in nuisance (e.g. noise) to adjacent landowners must be located on the site in a way that serves to minimise the risk of such nuisance.	CTR		
h	GEN	Surface drainage measures must be established in the Construction Camps so as to prevent • Ponding of water; • Erosion as a result of accelerated runoff; and, • Uncontrolled discharge of polluted runoff. • Damage to Contractor Access Roads	CTR	ECO	
i	GEN	Where the Construction Camp may be construed as a visual intrusion by adjacent landowners or users, sufficient visual screening must be erected around the perimeter of the camp. The screening shall be designed so as not to constitute a further visual intrusion.	CTR		√
j	GEN	A waste transition area must be established on site that is properly demarcated and fenced and provides for the segregation of different waste types (domestic waste, scrap metal, hazardous waste). The waste transition area must be covered (roofed) to prevent water ingress.	CTR		√
k	GEN	The waste transition area must be maximised in order to facilitate waste separation into recyclable and non-recyclable items. Recyclable items shall be further separated into glass, various plastics, paper and bio-degradable items. Recycling efforts shall be maximised to the greatest extent possible within the context of the project.	CTR		√
l	GEN	An area for the storage of hazardous materials must be established that conforms to the relevant safety requirements and that provides for spillage prevention and containment.	CTR		√
m	GEN	All Construction Camps shall be provided with portable fire extinguishing equipment, in accordance with all relevant legislation and must be readily accessible.	CTR		
n	GEN	Specific areas for the batching of concrete and mixing of other construction materials must be designated and bunded to prevent contamination of surface water and soil contamination, or otherwise be done on temporary liner materials which can be removed afterwards. This also applies for any work that is necessitated outside of the Construction Camp.	CTR		
o	GEN	Designated vehicle and construction machinery servicing areas must be established within the	CTR		

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		Construction Camp and must be bunded and hard surfaced (concrete) to prevent surface water and soil contamination, or otherwise be done on temporary liner materials which can be removed afterwards. This also applies for any work that is necessitated outside of the Construction Camp.			
p	GEN	Temporary refuse collection and material storage areas shall take into consideration the prevailing wind direction, surface runoff patterns, topography and visual context and shall be so situated to cause the minimum of nuisance to adjacent properties.	CTR		
q	GEN	The Contractor shall ensure that adequate potable water provision is made to all Construction Camps and that all water-dependent sanitary requirements (washing, showering, etc) are adequately facilitated.	CTR		
r	GEN	The Contractor must provide sufficient ablution facilities, in the form of portable / VIP toilets, at the Construction Camps and along construction sites, and shall conform to all relevant health and safety standards and codes. No pit latrines, French drain systems or soak away systems shall be allowed and toilets may not be situated within 100 meters of any surface water body or 1:100 year flood line. A sufficient number of toilets shall be provided to accommodate the number of personnel working in any given area.	CTR		
s	GEN	The Contractor shall ensure that adequate sanitation services in the form of showers are available to accommodate the amount of workers to be housed in the Construction Camps and shall ensure that these are provided with effective drainage facilities and systems.	CTR		
t	GEN	The Contractor must take preventative measures to reduce pressure on municipal service provision capacity. If services for a Construction Camp are to be sourced from the local municipality, the latter must be informed well in advance.	CTR		
u	GEN	Municipal water, or where required agreements with landowners should be reached with regards to their water use rights, shall be used for all activities such as washing of equipment or disposal of any type of waste, dust suppression, concrete mixing, compacting, etc. Necessary WUL shall be obtained from DWAF if required.	CTR		
v	GEN	Any discharge from the Construction Camps into municipal storm water systems shall comply with the applicable municipal and / or DWAF standards.	CTR		
w	GEN-	Monitoring points shall be established wherever so required by either municipal authorities or DWAF and water quality results shall be provided to these bodies upon request.	CTR	ECO	
x	GEN	The Contractor shall comply with all applicable laws, regulations, permit and approval conditions and requirements relevant to the storage, use, and proper disposal of hazardous materials.	CTR		
y	GEN	The Contractor shall manage all hazardous materials and wastes in a safe and responsible manner, and shall prevent contamination of soils, pollution of water and/or harm to people or animals as a result of the use of these materials.	CTR		

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
z	GEN	All hazardous substances shall be stored in designated areas that are bunded and provided with a hard, impervious surface, as well as sufficient roof cover to prevent the ingress of water. All bunded areas will be provided with a catchment sump that drains to a separator unit that prevents runoff from entering and contaminating any adjacent areas. Bund walls must be of a sufficient height to contain at least 110% of the volume of any materials stored within the bunded area.	CTR		
aa	GEN	The hazardous materials storage area must be locked and access restricted to authorised personnel, and must be clearly marked as such.	CTR		
bb	GEN	The Contractor shall at all times have a skip on site for the disposal of hazardous waste and polluted soil, which will be cleaned regularly. Waste shall have a turnaround cycle that will ensure that the skips never exceed their maximum carrying capacity.	CTR		
cc	GEN	The Contractor shall not construct fixed fuel storage or service or refuel any vehicle or equipment within 100 metres of a watercourse or wetland, within a floodplain, or where there is the potential for spilled fuel to enter a watercourse.	CTR		
dd	GEN	The Contractor may not store in above ground containers a combined volume of fuel equal to or greater than 30 cubic meters on the site without the appropriate Environmental Authorisation. All fuel storage areas will be bunded to contain at least 110 % of the volume stored and will be provided with a hard impervious surface.	CTR		
ee	GEN	If a batching plant is necessary, run-off should be managed effectively to avoid contamination of any adjacent areas and must be contained within a bunded area.	CTR		
ff	GEN	The Contractor shall prepare Construction Camp Management Plan/s which is to be submitted to Transnet for approval.	CTR		
gg	GEN	The Contractor shall keep Construction Camps in a clean and tidy condition at all times.	CTR		
hh	GEN	The Construction Camps shall be maintained in accordance with the relevant procedures and documentation accepted by the EPCM and Transnet.	CTR		
ii	GEN	The Contractor shall maintain an effective waste management regime that ensures that there is adequate provision for waste disposal (in the form of bins), segregation and frequent removal (at least weekly) for permanent disposal at a licensed waste disposal facility.	CTR		
jj	GEN	The waste management regime must be supplemented by awareness raising and training amongst workers to ensure that the regime is properly implemented.	CTR	ECO	
kk	GEN	No permanent waste disposal shall be permitted at the campsites.	CTR		
ll	GEN	No fires will be allowed and the Contractor must make alternative arrangements for heating. LP Gas may be used, provided that all required safety measures are in place. The Contractor shall take specific measures to prevent the spread of veld fires, caused by activities at the campsites. These measures may include appropriate instruction of employees about fire risks and the construction of firebreaks around the site perimeter.	CTR		

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
mm	GEN / SS	For emergency repairs drip trays and or suitable absorbent material shall be placed under vehicles that must be repaired outside of the Construction Camp designated area, which shall be emptied in a suitable container and transported to the Construction Camp.	CTR		√
nn	GEN	All major spills as specified in the contractor emergency response procedure of any materials, chemicals, fuels or other potentially hazardous or pollutant substances must be cleaned immediately and the cause of the spill investigated. Preventative measures must be identified and submitted to the EPCM and ECO for information. Emergency response procedures to be followed and implemented	CTR	ECO	
oo	GEN	The Incident / Investigation reports from the Contractor will be submitted to the authorities if required by the EPCM and Transnet	EPCM	Transnet / ECO	
pp	GEN	Construction workers and site staff shall not be permitted to use any other open water body or natural water source adjacent to or within the designated site for the purposes of bathing, washing of clothing or for any construction or related activities without the necessary DWAF approval.	CTR		
qq	GEN + SS	The Contractor shall prepare a Hazardous Materials and Waste Management Plan for inclusion in the site specific Environmental Plans to be submitted to Transnet prior to establishment on site. This plan shall include, but shall not be limited to, measures to prevent: • contamination of soils; • pollution of water; • accidental fires; • risk/injury to people or animals.	CTR		√
rr	GEN	The Contractor shall classify all hazardous materials to be used on site according to recognised Codes of Practice such as SABS Code 0228 for the Identification and Classification of Dangerous Substances and Goods and the Department of Water Affairs and Forestry *Minimum Requirements for the Handling, Classification and Disposal of Hazardous Waste*, and shall ensure that the handling, storage, transport and disposal of these materials meets the requirements of these Codes.	CTR		
ss	GEN	Material Safety Data Sheets (MSDS) Information and records of all materials stored must be available and strict control of the volumes stored and removed must be kept.	CTR		
tt	GEN	Staff must be trained in the hazards and required precautionary measures for dealing with these substances.	CTR		
uu	GEN	All Waste within the designated waste skips (hazardous or general) may only be disposed at a licensed disposal site to receive such materials. The Contractor shall keep written record of materials dumped and shall provide such proof to Transnet when requested.	CTR		√
vv	GEN	Concrete mixing must only take place within designated area, subject to suitable environmental protection measures.	CTR		

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
ww	GEN	The Contractor shall use ready mixed concrete wherever possible.	CTR		
xx	GEN	No vehicles transporting concrete to the site may be washed outside of designated and runoff-isolated areas, which shall be rehabilitated as soon as no longer in use.	CTR		
yy	GEN	Any soil that has been contaminated with concrete shall be removed and disposed of at a licensed disposal site.	CTR		
zz	GEN	The Contractor shall remove all waste concrete, building sand and gravel as far as possible from the Construction Right of Way as well as any other area where it may occur as a result of construction activities and dispose thereof at a licensed dumpsite. The Contractor shall repair any environmental damage caused in the process.	CTR		

2.1.2 Security

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL MANAGEMENT REQUIREMENT	Main Responsibility	Support	Method Statement / Procedure
a	GEN	A third party security firm shall be appointed to oversee security and access control for the entire construction phase of the project. A Security Management Plan shall be submitted to Transnet for approval.	CTR	EPCM	√
b	GEN	The security management plan as well as conduct on site must be in accordance with all applicable legislation and standards, notwithstanding any of the requirements specified in this EMP.	CTR	EPCM	
c	GEN	Construction workers are not allowed to collect firewood from areas adjacent to the site and poaching is strictly prohibited.	CTR	EPCM	
d	GEN	Trespassing by any project personnel onto any adjacent property is strictly forbidden and offenders may be summarily disciplined.	CTR	EPCM	
e	GEN	Where an existing fence must be taken down due to its interference with construction activities, the relevant landowner must be informed beforehand and the affected area secured to ensure that security is not compromised. As soon as work is completed, the fence shall be reinstated to its original condition or better by the Contractor at no cost to the landowner.	CTR	EPCM	√

2.1.3 Construction Access

ITEM NO.	GENERAL/SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	The Contractor shall survey the limits of the Construction Right of Way for the pipeline construction and of any additional workspace areas required for construction and shall clearly demarcate the limits of the Construction Right of Way in such a manner (stakes, fencing etc) that it can clearly be identified. These stakes shall be preserved throughout the work under contract.	CTR	NMPP	
b	GEN	The Contractor will be responsible for the development of a Pre-Construction Survey Plan and will present this plan to Transnet for acceptance	CTR	ECO / NMPP	
c	SS	In areas defined by the alignment sheets, where sensitive areas or pristine habitat is affected, fencing or stakes painted in a conspicuous colour is required in order to protect these environments, The use of these measures must be discussed and agreed with the ECO's, in order to establish access control, protection of sensitive environments and protection of areas outside the Construction Right of Way (RoW).	CTR	ECO	
d	GEN	During the Survey of the Pipeline Route and Construction RoW, the ECOs and EO's (Contractor), with the assistance of any of the specialist project consultants if required, must conduct a pre-construction survey of the entire alignment prior to construction commencing. This survey shall be properly documented and photographed by the ECO's. As part of the inventory, wetlands and other environmentally significant areas must be physically pegged on site in such a manner that they are clearly visible. The inventory shall include specific records of, but not be limited to, the following: • Delineation of wetlands. • All areas that have specifically been earmarked or identified for "search and rescue" operations for certain species • Areas of untransformed grassland or pristine vegetation • Possible and confirmed graves and heritage sites • Any other environmental features as specified in the alignment sheets	ECO	CTR	√
e	GEN + SS	In certain special cases, such as game farms, the Construction Right of Way will be fenced off by the Contractor during construction if required and will be negotiated with the land owner beforehand. This also applies in agricultural areas where cattle cannot realistically be relocated for the duration of construction. The fence to be erected must be securely anchored to the ground and be able to prevent animals from pushing it over.	CTR	EPCM	
f	GEN	In urban / high-density areas, or in any areas where the pipeline will pass close to human settlements in rural areas, community facilities, schools or other places where people will be at risk or where access control is deemed to be a problem, the Contractor shall also erect fencing for the duration of construction. Warning signage in English and all applicable local languages must be erected along the fencing, in clearly visible locations.	CTR	EPCM	√

ITEM NO.	GENERAL/SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
g	GEN	In all instances where fencing of the pipeline Construction Right of Way is required, the Contractor shall submit a Method Statement including the design specification of the fence to be used, for approval by Transnet and the affected landowner/s, prior to commencing.	CTR	EPCM	√
h	GEN	The width of the pipe line Construction Right of Way and working areas are indicated on the alignment sheets and will be issued to the Contractor for Construction.	EPCM	Transnet	
i	GEN	If the Contractor identify any areas where deviations of the pipeline route as stipulated in the alignment sheets is required, such deviation requests must be submitted to the Pipeline Engineering Department (Includes the Environmental Department) for Approval	CTR	EPCM	
j	GEN	If any deviations are identified as result of Land Liaison negotiations, such deviations must be communicated to the Pipeline Engineering Department (Includes the Environmental Department) for Approval.	EPCM		
k	Trunkline	In instances where physical constraints are imposed on the normal construction procedure, be it by existing buildings, services, residences, roads, dams and reservoirs, excessively restrictive terrain or any other significant permanent structures, the Contractor shall use “street works” whereby a reduced Construction Right of Way is used, as described in the Final EIA report, or any suitable variation thereof. The Contractor shall identify all areas where “street works” are to be employed and shall clearly and accurately demarcate such areas on a map. The contractor shall produce a Method Statement for the various methodologies proposed and shall receive written approval from the relevant engineers and ECO before commencing with construction.	CTR	EPCM	√
l	Terminals	The construction sites for the two Terminal complexes and eight Pump Stations shall be fully enclosed by a security fence, with the minimum amount of access points required for operations to occur effectively.	CTR	EPCM	
m	All	All access points to enclosed construction sites shall be controlled and a register of all persons entering and exiting shall be kept, which shall be controlled at the end of every day to ensure all persons not authorised to remain within the construction site have been vacated. Only authorised security personnel may be present on site after normal construction hours, except for emergency situations.	CTR	EPCM /ECO	
n	All	Access to and along any construction site shall be obtained - • on a public road; • on an existing private road or track with the consent of the relevant owner or occupier of land; • along the pipeline and Construction Right of Way; and • along a “specially approved route” as defined below. Access to and along the Construction Right of Way explicitly excludes access to land	CTR	EPCM / ECO	

ITEM NO.	GENERAL/SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		other than the access routes referred to above, unless otherwise agreed to with the relevant landowner.			
o	GEN	In all areas where construction requires gravelling or other methods of improving existing roads or access points, the Contractor shall completely remove these materials after construction and prior to rehabilitation of the area. However where such improvements were effected on an adjacent landowner's property, the Contractor should leave them in place if the landowner so desires.	CTR	EPCM / ECO	
p	GEN	All damage to access roads or access points caused by the Contractor as a result of construction activities shall be repaired as soon as possible. This includes the removal of any litter, soil heaps, building rubble and other elements that were not there prior to construction. All areas that were cleared of vegetation shall be rehabilitated as soon as construction activities have been completed in the affected area.	CTR	EPCM / ECO	√
q	GEN	The Contractor shall ensure that contractor employees remain within the Construction Right of Way or on approved roads providing access to the Construction Right of Way.	CTR		
r	GEN	The Contractor shall plan and manage his construction operations in such a manner that the minimum amount of vehicle trips and vehicles are used.	CTR		
s	GEN	The Contractor shall liaise with the local municipality and traffic authorities in an area prior to construction commencing and if so required, shall prepare a Transport Management Plan to be approved by the relevant municipality prior to construction commencing.	CTR		
t	GEN	Planning of material and equipment delivery must be done in advance by the Contractor so that the minimum disruption is caused to traffic in the area and nuisance to adjacent landowners is kept to a minimum.	CTR		
u	GEN	The Contractor shall ensure that all transport companies are provided with guidelines or speed and access restrictions to ensure that main access roads are not deviated from in order to deliver goods.	CTR	EPCM	
v	GEN monitoring	The Contractor shall ensure that utilising local rural village roads not constructed for large vehicles is restricted to the minimum possible. The Contractor shall monitor the impact of heavy duty vehicles on local secondary roads and any damage shall be addressed timeously in consultation with the relevant authorities.	CTR	EPCM	
w	GEN	Where particularly large vehicles will be required to move on public roads, the Contractor must notify local traffic authorities well in advance so that the necessary safety arrangements can be made. All relevant traffic regulations must also be adhered to in this regard.	CTR		
x	GEN	The Contractor shall employ suitable warning methods wherever required during construction process to ensure that safety measures are adhered to. Warning signage shall be erected according to applicable traffic regulations.	CTR		
y	GEN	Damage caused to roads as result of the Contractor activities shall be repaired either	CTR	EPCM	

ITEM NO.	GENERAL/SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		immediately, if instructed to do so, or timeously as stipulated in the contractual agreements between the Contractor and Transnet, or as required by any landowners and local municipalities. All roads that have been used or are being used by the Contractor will be inspected on a regular basis in order to establish the status of any possible damages caused by the Contractor Activities. Potholes, ruts, areas of surface water ponding and other damage to roads which can be proven to have been caused by the Contractor will be continually repaired to avoid damage to vehicles of other road users.			
z	GEN	The Contractor must limit dust pollution from dirt roads wherever required by wetting or watering down road surfaces.	CTR		
aa	GEN	The Contractor shall prevent trespassing on the site. Public entry to the site shall be prohibited and signs to this effect shall be erected at points of potential public entry.	CTR		
bb	GEN	The Contractor shall restrict the number of entry and exit points to the properties of adjacent landowners to the minimum required for operations to occur, for security reasons. The Contractor shall take sufficient measures to ensure that his activities do not compromise the landowners or occupiers security, and to reduce the loss, injury or death of any farm animals or game to the greatest extent possible and using measures in agreement with the affected landowners.	CTR		
cc	GEN	The dismantling of gates and fences shall be subject to any special conditions reached in the Landowner Servitude / Consent Agreements between Transnet and the Affected Landowners.	CTR	EPCM	
dd	GEN	The Contractor must reinstate all existing fences and gates that have been dismantled during the course of construction to their original state and design specifications, or better as required by the affected landowners	CTR	EPCM	
ee	GEN	Fencing requirements will be agreed to with the landowners prior to fences being changed. Reinstatement of fences also needs to be accepted and signed off by the landowner.	CTR	EPCM	
ff	GEN	Where the Contractor has installed temporary gates in fences of adjacent landowners, these must be removed and the fences be replaced as soon as construction has been completed in the area, unless the owner wishes for the gate to remain.	CTR	EPCM	
gg	GEN	Wherever electrified security fencing has to be temporarily taken down for construction purposes, the Contractor shall provide a security guard to patrol the affected area or shall reach a written agreement with the affected landowner before fences are disturbed or removed. All fences disturbed are to be repaired or reinstated to a similar or better condition as soon as is practicable afterwards.	CTR	EPCM	
hh	GEN	The Contractor's LLOs shall inform adjacent landowners when construction workers are most likely to enter their land through existing gates and fences or use their access roads and shall to whatever extent possible stick to these schedules.	CTR	EPCM	√

ITEM NO.	GENERAL/SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
ii	GEN	The Contractor shall ensure that every one of his construction workers are thoroughly sensitised to the need for all gates to adjacent land to be closed whenever the gate is not in use. The Contractor must ensure that this requirement is adhered to at all times and will be solely responsible for any financial or other loss suffered by adjacent landowners due to the Contractor's failure to adhere to this requirement.	CTR		
jj	GEN	Where livestock or animals do escape as a result of gates being left open it will be the responsibility of the Contractor to ensure that they are safely rounded up again. The Contractor must immediately inform the relevant landowner should this occur and must assist the landowner in whatever way required to ensure that the animals are safely rounded up.	CTR		
kk	GEN	Where informal footpaths exist, the Contractor shall establish temporary crossings wherever these cross the Construction Right of Way. The placement of temporary crossing is to be decided in consultation with landowners to minimise disruption of people's movement patterns.	CTR		
ll		The Contractor shall set up and maintain a register of all gates and fences erected which specifies the type of fence and/or gate/s, length, date erected and removed for each individual landowner, which shall be used for possible dispute resolution. The LLO shall regularly inspect the register to ensure that it is complete and up to date.	CTR	ECO	

2.2 Geotechnical Stability and Contamination

2.2.1 Seismicity and Geological Instability

ITEM NO.	GENERAL/ SITE SPECIFIC	IRONMENTAL MANAGEMENT REQUIREMENTS	Main Responsibility	Support	Method Statement / Procedure
a	GEN	In areas where potentially unstable geologic conditions are encountered, such as fault lines in rock formations, potential instability of underlying rock, potential slip circles or embankment failure etc., the Contractor shall take all necessary measures to ensure the safety of workers.	CTR	EPCM	
b	GEN	Engineering solutions to address specific risks as result of potentially unstable geologic conditions shall be obtained if required.	EPCM	CTR	

2.2.2 Induced Instability

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL MANAGEMENT REQUIREMENTS	Main Responsibility	Support	Method Statement / Procedure
a	GEN + SS monitoring	Ongoing monitoring shall be conducted by the Contractor at any areas identified as being potentially unstable to ascertain whether any further mitigation will then need to be implemented. This may include localized re-alignment of the route or stabilizing the slope by measures such as rock anchors, temporary retaining structures, de-watering and the like.	CTR	EPCM	

2.2.3 Dispersive Soils

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a	GEN	Dispersion testing must be undertaken during the detailed geotechnical investigation, especially in areas of steep slopes situated within the Karoo Supergroup. The best indication of the dispersive nature of a soil is usually obtained by subjecting the material to a range of dispersion tests which can be performed by commercial soils laboratories.	CTR	EPCM	
b	GEN	Typical and practical measures that are used to mitigate the effect of dispersive soils include: • Compaction of soils at a moisture content slightly wet of the optimum moisture content, • Treatment of the backfilled soils with a suitable agent prior to compaction.	CTR	EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		• If the suggested laboratory testing highlight particular areas of highly dispersive soils, compaction of the backfill material can be undertaken at a slightly higher than normal moisture content.			

2.2.4 Soil Creep

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a	SS	The following potentially unstable talus slopes have been identified and must be further investigated to establish if creep is likely to occur. • Along the Durban – Umlaas Road section • Approaching and slightly beyond the Transnet Pipelines pump station at Van Reenen. • Between Umlaas Road and Van Reenen • The Alignment Sheets must be consulted for the exact locations of these areas.	EPCM	CTR	
b	GEN	Where possible, localised deviations of the pipeline shall be employed to avoid areas of specific risk identified during the detailed assessment of these areas.	EPCM	CTR	
c	GEN	Where feasible the Contractor shall, where soil creep may occur, lay the pipeline at a depth where intact, stable slope conditions prevail, i.e. below the colluvium (or talus) and residual soils into underlying geological formation. Alternatively appropriate engineering solutions such as slope stabilisation by means of rock anchoring may also be employed.	EPCM	CTR	

2.2.5 Unstable Steep Side Slopes

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a	SS	The Contractor shall employ where necessary mitigation measures to stabilise side slopes of excavations where steep side slope conditions are encountered. The following areas of concern have been identified: • The crossing of the Meul River valley • The Alignment Sheets must be consulted for the exact locations of these areas.	CTR	EPCM	
b	GEN	Where feasible the Contractor, where unstable side slopes may occur, may propose to locally adjust or slightly deviate the alignment of the pipeline within the Construction Right of Way to avoid these conditions.	CTR	EPCM	

2.2.6 Landslides

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a	SS	The Contractor must take cognisance of the following potential landslide risk areas: • Natal Group sandstone/Dwyka Tillite. South East inferred movement direction - coordinates X+33 19201.59; Y+22 840.23 • Natal Group sandstone. West inferred movement direction – coordinates X+33 18919.82; Y+30 494.07. • The Alignment Sheets must be consulted for the exact locations of these areas.	CTR	EPCM	
b	SS	If re-routing is not practical in the above cases the Contractor shall dig out the landslide and stabilise the slope before embedding the pipeline. Alternatively appropriate engineering solutions such as slope stabilisation by means of rock anchoring may also be employed.	EPCM	CTR	

2.2.7 Liquefaction

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a	GEN	The Pipeline Engineering Team and the Contractor must be aware of the potential for liquefaction as per the alignment sheets.	EPCM	CTR	
b	SS	A loose horizon of fine sand (colluvium) overlying hard impervious Natal Group sandstone on even a fairly gentle slope is vulnerable to 'liquefaction'. Should such ground conditions be encountered along the route, the pipeline shall be embedded into the sandstone bedrock and not supported entirely within the sandy colluvium. The Alignment Sheets must be consulted for the exact locations of these areas.	EPCM	CTR	

2.2.8 Expansive Clays

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a	GEN	Pipeline appropriately designed so as to prevent rupturing and distress. Design measures from detailed geotechnical investigation.	EPCM	CTR	

a	SS	Pollution potential assessed by detailed geohydrological study with appropriate mitigation measures.	EPCM	CTR	
c	GEN	Monitoring of pipeline via the long term to continually check for leaks.	EPCM	CTR	
d	GEN	Should leaks occur then pipeline appropriately repaired and / or remedial measures implemented to prevent repeat of problem.	EPCM	CTR	
e	SS	In areas where expansive clays are present it is recommended that the expansive clay be removed where it is shallow and replaced with an inert soil or that the pipe be supported upon a suitably designed ground beam.	CTR	EPCM	
f	GEN	The pipe should be designed for the predicted total heave/shrinkage movement at a particular affected section of the pipe	EPCM	CTR	

2.2.9 Contaminated Soils

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a	SS	The Contractor must take cognisance of the fact that localised soil contamination has been identified in the following localities and may be encountered elsewhere: • Ash fill has been used along parts of the alluvial and estuarine flats of the southern corridor. This fill is highly alkaline with very appreciable levels of salts, which could adversely affect the pipeline coating over the design life of the pipe. • Chromium waste sites have been identified to the north of the Umlaas Canal and around the Lanxess premises. • Illegal dumping of chemical waste has been observed at the Mbokodweni River. • Some of the aeolian sands in the AECI area of Umbogintwini have been contaminated by chemicals used in the former ammunition, explosives and fertilizer industries.	CTR	EPCM	
b	GEN	If and where chemical contamination and corrosion levels are considered to be unacceptably high, additional coating or measures (concrete encasement) or other appropriate engineering solutions should be provided to ensure the integrity of the pipeline.	EPCM	CTR	√
c	GEN	The Contractor shall take all reasonable measures to ensure that existing contaminated soil excavated during construction does not cause contamination of adjacent, uncontaminated areas. Contaminated soil removed from the construction area shall be dumped at a licensed dumpsite.	CTR	EPCM	√
d	GEN	The Contractor is to employ soil sampling techniques in areas where localized soil contamination has been identified. Results of the samples is to be presented to the Engineering Teams.	CTR	EPCM	√
e	GEN	Where in the opinion of the Engineer, material is not suitable for use as backfill it shall be removed to a licensed disposal area and not be used for any other purpose.	EPCM	CTR	

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
f	GEN	Where in the opinion of the Engineer, material is not suitable for use as backfill it shall be removed to a licensed disposal area and not be used for any other purpose.	EPCM	CTR	

2.3 Threatened Plants

2.3.1 Search and Rescue

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a	GEN	Damage or harm to threatened plant species is illegal in terms of the National Environmental Management: Biodiversity Act (Act 10 of 2004). Threatened species are defined in terms of the most recent Red Data list of Southern African Plants. While every effort has been made to ensure that the pipeline route does not impact on threatened species, the Contractor shall be responsible for any action necessary to ensure the prevention of harm to such species found during construction.	CTR	ECO	
b		The Contractor with the assistance of the ECO or suitable botanical specialist should review the vegetation specialist studies issued, indicating all sensitive areas where possible Red Data Species could be found. The RoW should then be inspected before and during construction in order to identify as far as possible any such species which must be protected and/or relocated	CTR	ECO	
c		Any Red Data species found to be impacted or possibly damaged by the pipeline construction activities during the above inspections must be reported immediately to the ECO's and EPCM in writing. The Contractor should put measures in place such as demarcation of the area, in order to protect such species, until the necessary permits have been obtained through the ECO's	CTR	ECO	
d		Thus the ECO's will be responsible for reporting such finds to the relevant Departments, Conservation or Park Boards Authorities, on behalf of Transnet and will also be responsible for obtaining all the necessary permits for relocation of a Red Data specie(s)	ECO	CTR / EPCM	
e		The ECO will be responsible to call upon a suitably qualified botanical expert to oversee: • Rescue of the plant(s) and transplantation in a suitable local habitat in a conserved area or in a recognised botanical garden; or, where this is not possible • The collection of seeds and cuttings for use at botanical gardens and for storage in seed banks (if authorised by the relevant authority).	ECO	CTR / EPCM	
f	GEN	The Contractor shall prohibit and actively prevent the harvesting of endangered, significant or medicinal or any other plants by his employees. Construction workers shall only assist with the removal of significant vegetation if requested to do so by a specialist and agreed to by the Contractor. All plants removed in this fashion will be handed over to the appropriate specialist and shall not be kept by the Contractor or his staff.	CTR	ECO	

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
g	SS	The Threatened Species Study must be consulted in order to identify and mark species for removal if necessary within the construction sites. (**Annexure A**).	ECO	CTR	
h	GEN	The CLO / LLO shall also ensure that local people are advised when construction is about to commence so that they can harvest any plants which are of traditional value before they are destroyed.	CTR	ECO	
i	SS	Between Curry's Post and Kiesbeen, sites were identified as being potentially suitable for important species requiring 'search-and-rescue' actions; These have been indicated on the alignment sheets and below are a summary of the areas listed: The Alignment Sheets must be consulted for exact KP's • Boulder grasslands with interspersed wetlands and high species diversity. Possible habitat for *Syncolostemon latidens* and *Stachys rivularis*). • Near Griffin's Hill. Themeda grasslands with wetlands, high species diversity. Note: These areas are adjacent to the existing pipeline, but has possible habitat for *Bowiea volublis* and *Stachys rivularis*. • Dolerite hills with possible habitat for *Bowiea volubilis*. • North of Wyford farm. Pipeline route lies adjacent to the eastern edge of the historically important wagon track (vegetation is disturbed, with *Hyparrhenia hirta* dominant), but the western side of the wagon track has a long, narrow remnant of high-diversity *Themeda triandra* grassland on a sandstone ridge. There is very little of this habitat left in the vicinity, so the 30m construction corridor boundary should be strictly enforced by confining all disturbance to the east of the wagon trail (which in any case needs to be protected during construction). The grassland strip to the west of the wagon trail should not be driven on, used for stockpiling materials of any sort, or damaged in any other way during construction. • North of Van Reenen. Moist grassland dominated by *Themeda triandra* and *Monocymbium ceresiiforme*, with extensive seeps. Possibly good habitat for *Kniphofia typhoides*; other endangered species possibly occur (also see de Castro vegetation report on the Free State sector). This section of pipeline is not adjacent to existing roads and therefore access to the pipeline needs to be carefully planned and demarcated to avoid unnecessary driving through the grasslands and seeps. Access in this area should be strictly controlled and access points agreed with the ECO's. All traffic for construction should be confined to the pipeline RoW and controlled by the CTR and ECO's	CTR	ECO	
j	SS	In Mpumalanga - the 12.5 km of semi transformed and untransformed habitat affected in Mpumalanga, not along existing roads and inclusive of intervening wetlands, was checked for threatened species by a botanist during November 2008. All threatened or Near-Threatened species that were found were mapped (**Annexure A**).Appropriate in situ and/or ex situ	ECO	CTR	

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		conservation measures shall be developed and implemented with the involvement of the Mpumalanga Parks Board.			
k	SS	In Gauteng, the crossing point of the Blesbokspruit floodplain near the inland terminal site in Gauteng was searched for *T. erythrorrhiza* in November 2008. Any species of signifance that were found was mapped, appropriate in situ and/or ex situ conservation measures should be developed and implemented, with the involvement of the Gauteng Directorate of Nature Conservation. In addition, the 600m of untransformed habitat affected, not along existing roads, were checked for threatened species by a botanist during November 2009. (**Annexure A**).	ECO	CTR	

2.3.2 Training of Contract Staff

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a	GEN	Environmental awareness training is required for all contractor staff on site, working in the RoW or any construction area, regarding the preservation of endangered, significant, medicinal or any other plants of significant importance.	CTR	ECO	
b	GEN	The Contractor shall ensure that all construction workers receive basic Environmental Awareness Training appropriate to their field of expertise which is to be accepted by the ECO, and shall ensure that staff members are continuously updated on any environmental issues related to the project. This training may take the form of information posters and pamphlets, “toolbox talks” and other easily accessible methods of information communication. The contractor shall ensure that all staff is educated regarding basic principles of environmental awareness and responsibility and that supervisors or foremen, or the EO’s, are sufficiently trained.	CTR	ECO	
c	GEN	It is the responsibility of the Contractor to ensure that he is familiar with the fauna or flora species, habitat types, landforms, natural processes or any other component or process of the natural environment described or listed in this EMP. Should any uncertainty arise the Contractor shall immediately consult with the ECO.	CTR	ECO	

2.4 Threatened Animals

2.4.1 Mammals

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a	SS	The Contractor is alerted to the fact that locations have been identified as sites were specific endangered Oribi may occur. The Contractor shall ensure that all personnel receive relevant ongoing environmental training in the form of "toolbox" talks, pamphlets etc. in order to be aware of their environmental responsibilities. The Contractor shall furthermore ensure that all personnel working in these locations respect and do not disturb these animals: The locations has been indicated on the Alignment Sheets and if any such species are found to be disturbed by the construction activities the ECO's should be notified. The ECO's should also be consulted to confirm these possible locations as indicated on the alignment sheets. The CTR will also ensure that there is no damage if possible to the Oribi preferred diet species. The ECO's shall be consulted in the identification of the locations of preferred diet species.	CTR	ECO	
b	GEN	The following measures apply to Oribi conservation in all areas earmarked as possible habitat for this species:			
		• Construction and post-construction work in areas where Oribi occur must be completed as quickly as possible in order to minimise risk.	CTR	ECO	
		• Onsite labour accommodation must be prohibited in areas where Oribi occur. Labour to be transported to site daily from camps approved for labour construction housing.	CTR	ECO	
		• Subject to agreement with the landowners, the construction servitude must be fenced through those farms where Oribi occur and shade cloth installed where possible to minimize visibility of the construction site from Oribi habitat.	CTR	ECO	√
		• The above conditions must be discussed with the ECO's. Discussion must also be facilitated with authorities if necessary. Landowners should also be involved. It is important for all parties to agree to the controls to be put into place. It will be necessary to define these controls on a farm by farm basis and to discuss and agree to these with the environmental authorities and the affected landowners.	ECO	CTR / EPCM	√
c		Noise levels in the vicinity of threatened mammal species, particularly Oribi (as identified in this EMP) are to be limited where possible. If blasting is required, adequate notification must be provided to the landowner beforehand, so that animals can be moved if required.	CTR	ECO	

2.4.2 Birds

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a		The construction team must be briefed about the importance of threatened birds and how to avoid their disturbance. An Environmental Management Procedure is to be compiled, prior to construction, which guides the contract team with respect to the management of construction in areas where threatened birds occur.	CTR	ECO / EPCM	√
b		Any individual found deliberately harassing any wildlife in any way should face disciplinary measures, following which the possibility of immediate dismissal from the contract. The construction teams must be warned about the penalties for harassing, trapping or hunting the threatened bird species.	CTR	ECO / EPCM	
c		The Contractor is informed that threatened crane species were identified during the EIA Phase and are noted within the Alignment Sheets and also noted in the (**Annexure A**)., The ECO's should be consulted in terms of the significance of these species and the preservation of their habitat as far as possible. When any of these species are noted or seen in the vicinity of the Construction Areas, the ECO's must be notified.	CTR	ECO	√
d		In the event that the ECO requires guidance about the management of a particular situation with respect to cranes then he is to have access to assistance from an ornithologist.	ECO	CTR /EPCM	
e		Construction of the pipeline in the route sections within 3000 m of the known Wattled Crane breeding sites must be done outside of the Crane breeding season (construction permissible inside the 3000 m buffer between September and April). Thus no construction between May to August. These sections include the two breeding sites (shown on alignment sheets) on the farm Oaklands (1000 m west of pipeline), and the farm Rondebosch (1300 m west of pipeline). (**Annexure A**).	CTR	ECO	
f		The ECO's shall consult with the Crane Foundation (contact person Mr. Andre Rossouw 072391 9750) when the contractor is planning construction at these points listed above and indicated on the alignment sheets.	ECO	CTR /EPCM	
g	SS	The alignment shall be searched by an ornithologist between approxemately KP120. and KP122. and any distance beyond this for the purposes of a buffer, to confirm that no Blue Swallow occur. While the pipeline does not traverse any confirmed Blue Swallow foraging and nesting areas, the owner of the property between KP 123 and KP 123.8, just south of Howick, believes that Blue Swallows forage in the KZN Mistbelt Grassland on his property. No nesting sites were found during the walk-through survey during the EIA Phase, but the presence of the birds need to be confirmed during the summer season before any decisions about mitigation are made and communicated to the contractor.	EPCM	ECO	
h	GEN	The occurrence of threatened cliff nesting species must be checked by an ornithologist prior to construction at KP 344 near Tafelberg, some 50 km north of Van Reenen. In the event that threatened raptors or other threatened species are nesting on these cliffs, then reduced blasting charges and blast matts must be used to lesson blast noise in the event that blasting	EPCM	ECO	

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		is necessary between KP341 and KP347. This must be communicated to the Contractor.			

2.4.3 Reptiles

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a	GEN	The Contractor shall ensure that no African Rock Pythons or any other snakes are killed or otherwise harassed and shall contact the ECO should a python be found within or near a construction site. The CTR shall as a minimum provide basic snake awareness training to all employees and sub-contractors.	CTR	ECO	
b		The Contractor shall prior to clearance commencing in any areas identified as suitable habitat for chameleon species notify the EPCM and ECO's at least 2 weeks prior to construction activities to commence in these areas in writing.	CTR	EPCM / ECO	
c		The above notification is to allow that a suitably qualified expert to search the alignment within this section, so as to rescue and relocate any Drakensberg Dwarf Chameleon and other endangered species found here.	ECO	EPCM	
d	SS	Valuable habitat for endangered chameleon species has been identified between KP143.5 and KP151 and is indicated on the alignment sheets.	EPCM	ECO	
e	SS	It is the responsibility of the ECO to familiarize themselves with the location of suitable habitats for chameleon species as described in the ***FINAL EIA Specialist Studies 10A and 10B***.	ECO	CTR	
f	SS	The Contractor shall on instruction from the ECO's ensure that all dolerite sills and boulders occurring as indicated on the alignment sheets are protected. The areas of protection are described in the ***FINAL EIA Specialist Studies 10A and 10B***. It is the Contractor's responsibility to ensure that these areas are protected against damage to the greatest extent possible as these constitute suitable habitat for chameleon species as stated above.	CTR	ECO	
g	SS	Search and rescue of threatened chameleon species must be undertaken by a suitable qualified specialist immediately prior to construction in the 9 locations (Approx KP11.9) defined in the EIA Specialist Studies as potentially suitable habitat for the Black Headed Dwarf Chameleon and Midlands Dwarf Chameleon.	ECO	EPCM	
h		The Contractor will be required to fence all areas identified as suitable habitats for endangered chameleon species on instruction from the ECO's. A bufferzone will be agreed with the ECO's.	CTR	ECO	
i		The route has been aligned to avoid the known burrows of the threatened Girdled Lizard, which is found in the Free State. The ECOs and EO's should familiarise themselves with	ECO	CTR / EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		species (before construction starts) to recognise the burrows of the Girdled Lizard. In the event that burrows of this species are found along the route, prior to construction, then construction in the area must be halted until such time as the colony can be surveyed by a suitable qualified expert and a re-route devised to avoid them if necessary.			

2.4.4 Invertebrates (Millipedes and Earthworms, Snails and Slugs)

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a	SS	It is the responsibility of the ECO to familiarize themselves with the locations of where significant invertebrates could be found on the Trunkline route and should notify the CTR of these locations in writing. These are described in the ***FINAL EIA Specialist Studies 10A and 10B***.	ECO	CTR	
b	SS	The Contractor shall notify the EPCM two weeks in advance in writing before any work is to commence in areas as indicated on the alignment sheets where significant invertebrates could occur as described in the ***FINAL EIA Specialist Studies 10A and 10B***.	CTR	EPCM / ECO	
c	SS	The EPCM shall ensure that the appropriate specialists in KZN be afforded the opportunity to inspect the proposed route alignment in these areas indicated on the alignment sheets. [D. Herbert (molluscs), J. Plisko (earthworms) – both of the Natal Museum, Pietermaritzburg - and Prof. M. Hamer or Dr Friederike Voight (millipedes) of UKZN, Pietermaritzburg during Construction.	EPCM	ECO	
d	SS	The Specialists will be afforded the opportunity to 'rescue' any representatives of these groups (mentioned above) and/or retrieve specimens which may fall into the trench while it is open, for study purposes.	ECO's	CTR	
e	GEN	The ECO's and EO's (CTR) will be trained on the significance of identifying and recovery of specimens of invertebrates disturbed by construction activities.	EPCM	ECO	
f	GEN + SS	Dr. D. Herbert of the Natal Museum, and Prof. M. Hamer (UKZN) should be informed of construction progress and timeously notified in order to search sub-sectors of the route prior to the construction corridor being cleared so that any snail species and other invertebrates with very localised distributions that are present, can be relocated.	ECO	EPCM	

2.4.5 General

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a	GEN	If any potentially dangerous, particularly fragile or any animal is discovered in a trench or within the construction servitude, operations in the direct vicinity of the animal shall be halted if necessary, and if feasible, the area of the trench or RoW in which it is found shall be temporarily blocked off. The EO shall immediately inform the ECO, who shall issue instructions for further actions that need to be taken.	CTR	ECO	
b	GEN	The Contractor shall cover the exposed open ends of all sections of pipe at the end of each day with DPC or other similar sheeting, which shall be tightly fitting over the pipe opening to prevent animals from entering the pipe at night.	CTR	EPCM	
c	GEN	The Contractor shall specifically ensure that no antelope are poached, killed, injured or harassed along any section of the alignment or any area adjacent to a construction site where they occur.	CTR	ECO	
d		The Contractor shall ensure that all of his construction workers receive training, developed by the Contractor and accepted by the ECO, as to the procedure that should be followed if any animals, including mammals, reptiles, amphibians, birds and invertebrates are discovered in an open trench or any other excavation area.	CTR	ECO	
e	GEN	The Contractor shall ensure that all construction workers receive basic Environmental Awareness Training appropriate to their field of expertise which is to be accepted by the ECO, and shall ensure that staff members are continuously updated on any environmental issues related to the project. This training may take the form of information posters and pamphlets, “toolbox talks” and other easily accessible methods of information communication. The contractor shall ensure that all staff are educated regarding basic principles of environmental awareness and responsibility and that supervisors or foremen, or the EOs, are sufficiently trained to oversee general environmental compliance.	CTR	ECO	

2.5 Conservation Areas

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a	SS	Special Care should be taken in conservation areas in terms of any wild animals which may be affected by construction activities. Proper awareness training should be done by the Contractor accepted by the ECO, to inform all persons on the construction site about the sigficance of the areas that they are working in.	CTR	ECO	
b	SS	The Contractor should take note of the following listed Private and Nature Conservation areas that may be affected by Construction Activities. These areas are indicated on the alignment sheets • Umbogovango Nature Reserve • Mphafa Private Nature Reserve • Eston Conservancy • Acacia Fields Game Farm • Lower Mpushini Conservancy • Umgenyana Conservancy • Arboretum and Mamba Valley 'Nature Reserves' occur on opposite sides of the railway tracks between	CTR	ECO	
c	SS	The Contractor is to adhere to any special conditions as specified in the Landowner Agreements in areas where any Private of other Nature Reserves are affected by the Pipeline Construction Activities.	CTR	ECO	

2.6 Other Areas of Conservation Significance

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a	SS	The Contractor shall ensure that where it is unavoidable that the route has to cut across wetlands in which Swamp Forests occur as indicated on the alignment sheets – the mitigation recommendations for wetland rehabilitation as described in this EMP be implemented.	CTR	ECO	
b	SS	In the area of Coastal Lowland Forest as indicated on alignment sheets, the Contractor shall where the route passes between the railway embankment and the Amanzimtoti Treatment Works narrow the construction corridor to the greatest extent possible. The Contractor must remove the existing fence, replace it on the east side with a temporary fence during construction, construct the pipeline inside the railway reserve, then erect a new fence where the existing fence is. There are a few trees (*Albizzia sp., Chaetacme sp., Trema sp.*) in the railway reserve and in the construction path. The contractor shall ensure that the canopies of trees east of the sewer and projecting west into the railway reserve that protrude into the construction Right of Way are carefully trimmed and damaged as little as possible. Another possible impact resulting from this recommendation is that disturbing the forest margin on the sewer servitude could lead to alien plant incursion,	CTR	ECO	
c	SS	Transnet should undertake to control alien plants on the sewer servitude and forest margin until forest margin stability is re-attained (a few years).	Transnet		
d	SS	Where the route runs in the railway reserve between the two forests known as Mamba Valley and Arboretum as indicated on the alignment sheets these forest areas shall be fenced off for the duration of construction to prevent the forests from being used as shade rest areas, littering and toilets.	CTR	ECO	
e	SS	Where the route runs very closely adjacent to wetland dominated by *Phragmites* sp. The Contractor shall ensure that all applicable measures pertaining to wetland damage prevention and mitigation are employed. (This is indicated on the alignment sheets)	CTR	ECO	
f	SS	Horizontal drilling should not be used to cross Old Main Road as this is likely to result in profound disturbance to the wetland.	CTR	NMPP / ECO	
g	SS	Care must also be exercised as indicated on the alignment sheets where the proposed route runs closely adjacent to the boundary of the Umbogovango Nature Reserve.	CTR	ECO	
h	SS	As indicated on the alignment sheets the excavation of the trench could cause an increase in the volume of water which may be leaking beneath the berm from the adjacent wetland and end up flowing along the bottom of the trench. In the light of these concerns the Contractor shall assess the significance of the issue described above using a suitably qualified specialist	CTR	ECO	

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		and ensure that excavation of this section of the route be undertaken in accordance with the recommendations of the specialist, so as to minimize risk to the wetland. Dewatering and silt traps – erosion control			

2.7 River Crossings

2.7.1 Management of Water / River Crossings

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a	GEN	The Contractor is responsible for controlling riparian and in-stream damage to the river systems through which the pipeline is routed. In the event of aquatic organism stress caused by the works which, in the judgement of Transnet and the ECO, could have irreversible effects on the river ecosystem or individual species, the Contractor shall be instructed by Transnet to halt construction at the river crossing until adequate controls are put in place.	CTR	ECO / EPCM	
b	SS	The Contractor shall prepare a detailed method statement for review by the EPCM, in accordance with DWAF WUL (if available). The method statement shall include but not be limited to: • A biophysical description of the site (profile, depth and width of channel(s), geo-technical drawings, large trees, reed beds, etc); • The proposed timing and duration of river crossing construction; • A list of the typical types of equipment that will be used for the excavation, laying of pipe, backfilling of the trench and control of water; • Measures that will be used to control suspended sediment and turbidity (e.g. berms, hay bales, bidem curtains, river diversions, settling ponds), damage to riparian vegetation, spillage of fuels and oils, cement and other foreign materials and a monitoring program to provide rapid feedback on the effectiveness of controls. • Measures that will be used to ensure that identified and surveyed trees in the riparian fringe within the construction right of way, that are scheduled for protection, shall not be damaged during construction • Measures that will be used to stabilize river embankments after construction and to return the channel to its pre-construction profile or to a more stable profile. • Measures that will be used to minimize the impact of blasting on aquatic species in the event that construction under submerged conditions is necessary. • Methods used to remove alien and invader plant species within the Construction Right Of Way at major river crossings.	CTR	EPCM / ECO	√

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
c	SS	Major river crossings for the purpose of this EMP shall be defined as 3rd order streams and higher. The following 3rd to 6th order river crossings are applicable to this EMP: **Upper Vaal Water Management Area:** Gauteng (Stream ID 0) - Blesbokspruit (-26.47830; 28.42573) Gauteng/Mpumalanga border (Stream ID 5) - Suikerbosrand River (-26.60630; 28.49510) Mpumalanga (Stream ID 15) Molspruit (-26.76319; 28.63873) Mpumalanga (Stream ID 19) Silverbankspruit (-26.80779; 28.68192) Mpumalanga (Stream ID 29) - Waterval River (-26.94900; 28.76282) Mpumalanga (Stream ID 32) - Bossiesspruit (-27.00247; 28.81091) Free State (Stream ID 33) - Vaal River(-27.03821; 28.82225) Free State (Stream ID 36) - Skoonspruit (-27.10891; 28.88281) Free State (Stream ID 41) - Brakspruit (-27.18719; 28.95679) Free State (Stream ID 44) - Skulpspruit (-27.26004; 29.00236) Free State (Stream ID 49) - Venterspruit (-27.33950; 29.04701) Free State (Stream ID 50) - Venterspruit (-27.35701; 29.06416) Free State (Stream ID 76) - Holspruit (-27.68740; 29.12953) Free State (Stream ID 87) - Rondawelspruit (-27.81029; 29.16120) Free State (Stream ID 91) - Cornelis River (-27.86114; 29.16498) Free State (Stream ID 117) - Wilge River(-28.28508; 29.37774) Free State (Stream ID 118) - Meul River(-28.00867; 29.22635) **Thukela Water Management Area:** KwaZulu Natal (Stream ID 133) - Sandspruit (-28.44220; 29.48943) KwaZulu Natal (Stream ID 140) - Sand River (-28.52474; 29.56952) KwaZulu Natal (Stream ID 143) - Dewdrop Stream(-28.57673; 29.61215) KwaZulu Natal (Stream ID 155) - Tugela River (-28.75417; 29.66578) KwaZulu Natal (Stream ID 156) - Doringspruit (-28.83515; 29.74549) KwaZulu Natal (Stream ID 157) - Bloukrans River(-28.88645; 29.77135) KwaZulu Natal (Stream ID 160) - Drakespruit (-28.91746; 29.80329) KwaZulu Natal (Stream ID 165) - Boesmans River (-29.00634; 29.89603) KwaZulu Natal (Stream ID 180) - Mooi River(-29.18408; 30.03757) **Mvoti to Umzimkulu Water Management Area:** KwaZulu Natal (Stream ID 190) - uMngeni River (-29.49027; 30.20813) KwaZulu Natal 1(Stream ID 94) - Gwen's Spruit (-29.51519; 30.28703) KwaZulu Natal (Stream ID 197) - Doringspruit (-29.52226; 30.32776) KwaZulu Natal (Stream ID 198) - Doringspruit (-29.52169; 30.33038)	INFO		

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		KwaZulu Natal (Stream ID 205) - uMsunduze River(-29.61910; 30.45394) KwaZulu Natal (Stream ID 206) - uMsunduze River (-29.63333; 30.45681) KwaZulu Natal (Stream ID 207) - uMsunduze River(-29.63448; 30.45773) KwaZulu Natal (Stream ID 208) - Mpushini River (-29.65160; 30.46904) KwaZulu Natal (Stream ID 211) - uMlazi River (-29.80121; 30.52061) KwaZulu Natal (Stream ID 217) - Klipspruit (-29.97923; 30.64945) KwaZulu Natal (Stream ID 236) - Mbokodweni (-30.00453; 30.92320) KwaZulu Natal (Stream ID 237) - uMlazi River (-29.95514; 30.94851)			
d	GEN	The Contractor shall comply with any conditions of approval set by the DWAF.	CTR	EPCM / ECO	
e	SS + GEN	During construction the Contractor shall make provision to maintain the natural flow of any drainage line affected by construction.	CTR	ECO	
f	SS + GEN	In excavating the bed of the water body for the pipeline, the Contractor shall comply with the following: • Backfill will be done in accordance with the specifications and typical drawings issued to the Contractor. The Contractor together with the ECO's will review and assess the appropriateness of the drawings and specifications issued and will inform the EPCM if changes are required. • Where blasting takes place, the rock replaced in the trench at the surface is to give the trench as natural an appearance as possible, so that in low flow periods, a linear scar is not obvious.	CTR	ECO / EPCM	
g	SS + GEN	Where isolating the location of works, the following measures, among others, must be considered by the Contractor or as instructed by the ECO, as per the method statement in order to minimise the risk of increased suspended sediment in the water column downstream of the works: • Elimination of surface flow through the construction site; • The use of non-erodible materials for the construction of any berms, coffer dams or other isolation structures used in a works within a flowing watercourse. The use of non-earthen dam structures, such as aquadams, are possible options; • In cases where the entire flow of water of a water body is diverted around the water crossing site, it must be returned to the water body immediately downstream of the crossing site; • The use of silt fences or hay bales to isolate the construction area from the water body in situations where the flow velocities and volumes are low; • The removal and temporary storage of any material excavated from the bed or banks of the water body to a location out of the water body until the materials are permanently removed from the location or backfilled into the water body. Where sufficient space exists, and where the storage will not cause any environmental	CTR	ECO	√

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		damage, this may be within the macro-channel banks of the river. • The treatment of any water removed from the isolation area, prior to discharge back into the downstream river course, to remove suspended sediment.			
h	SS + GEN monitoring	The Contractor shall monitor the effect of construction on downstream sediment loads. The monitoring programme shall include sampling in the river upstream and downstream of the works during the period when construction in the river is taking place. The details of the sampling programme shall include, as a minimum, provision for daily samples as agreed with the ECO's for each crossing point for the duration of the river crossing works. The samples shall be analysed on site for total suspended solids and turbidity, using recognised methods of determination, and the results shall be presented to Transnet at least on a monthly basis, or on request by Transnet when required. Sampling times shall be selected to correspond with any periods of higher sediment generation. At its sole discretion, Transnet may reduce the sampling rate at times when sediment is not being generated by the works. The Contractor shall at all times remain responsible for keeping accurate and updated records of suspended sediment and turbidity measured during construction.	CTR	ECO / EPCM	√
i	SS + GEN monitoring	The ECO or other specialist consultant appointed by Transnet shall undertake periodic independent audits of sediment generation caused by the construction works in the rivers in order to verify the results of the sediment monitoring maintained by the Contractor.	ECO	EPCM / CTR	
j	SS + GEN	During the carrying out of the works, the Contractor shall remove any fish that are found within the isolated portion of the watercourse crossing site, without harm to the fish. The Contractor shall obtain advice from the ECO on the relocation of the fish.	CTR	ECO	
k	SS + GEN	Where pipeline construction through river channels involves excavation of submerged rock, the contractor shall give preference to methods that do not involve underwater blasting. In the event that the Contractor adjudges underwater blasting methods to be the only practical method this shall be fully motivated and all necessary plans shall be prepared to demonstrate that the work can be conducted without significant risk to aquatic organisms. Such plans shall be submitted to Transnet for approval and acceptance as a part of the method statements for each major river crossing prior to implementation of the works. The plans shall include all information as listed below: **Measures to reduce blast shock, such as:** • Minimising the size of explosive charges per delay and the number of days of explosive exposure. • Subdividing the explosives deployment, using electric detonating caps with delays to reduce total pressure. • Use of decking in drill holes to reduce total pressure. • Use of shaped charges at surfaces to focus blast energy.	CTR	EPCM	√

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		• Use of angular stemming material in drill holes to reduce energy dispersal to the aquatic environment. • Use of energy absorbers upstream and downstream of the blast, such as temporary gabion structures. **Measures to reduce impact on spawning fish, such as:** • Limiting the season of explosive use from March to September (non-spawning season). • Use of non-explosive scare techniques to move fish from the immediate blast zone (Use of small repelling explosive charges are not considered to be an effective means of driving fish from a blast area. Acoustic repellent devices and/or bubble curtains may need to be considered).			
l	SS + GEN monitoring	The Contractor shall notify the EPCM and Transnet in advance of any underwater blasting scheduled for the major river crossings. The Contractor shall monitor the effect of underwater blasts upstream and downstream of the blast zone. If any fish mortality results from a blast, the Contractor shall record the species and size and shall immediately notify the ECO / Transnet and the DWAF.	CTR	EPCM	
m	SS + GEN monitoring	The EPCM and Transnet will inform DWAF in advance of any underwater blasting scheduled for the major river crossings.	EPCM	CTR	
n	SS + GEN	Where rehabilitating the water / river crossing works, the Contractor shall comply with the following (this will be included in the Rehabilitation Plan) • The Contractor and ECO's shall maintain a photographic record of all river / water crossings prior to construction, during construction and after rehabilitation • The river channel embankments shall be returned to the pre-existing (or a more stable) profile than that which existed prior to construction as per the river / water crossing method statements • River embankments shall be stabilised, using any necessary protection measures, including re-vegetation, rip rap, reno mattresses and other measures, to ensure that the banks are protected against erosion; • Measures using indigenous grasses to permanently stabilise disturbed areas shall be fully effective as described in the re-vegetation sections of this EMP; • Debris disposal and clean up shall be carried out to return the river course to its pre-existing condition prior to the works.	CTR	ECO	√
o	GEN + SS	In rehabilitating the river crossings, the Contractor shall, in addition to the requirements specified in the re-vegetation specification, include the re-planting of indigenous trees in the riparian fringe, removed during construction and shall plant two trees of the same or similar species for each tree removed. All trees at each river crossing shall be alive and healthy at the	CTR	EPCM / Transnet	

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		end of the construction liability period. All trees are to be purchased from a reputable commercial supplier and are to be supplied with a phyto-sanitary certificate which certifies that the soil in which they were propagated is weed free.			
p	GEN + SS	The precise location of the trees as stipulated above in the riparian zone shall be provided to the Contractor by the ECO's	ECO	CTR	
q	GEN + SS	Where legally required if water within a stream / wetland is to be diverted by means of dams, the construction of dams must be authorised by DWAF as part of the permitting process for the proposed NMPP under the National Water Act (Act 36 of 1998). In addition, any EIA authorisation requirements, in terms of the regulations promulgated on the 1st July 2006 under Section 24 and 24D of the National Environmental Management Act, Act No. 107 of 1998 must be complied with.	CTR	EPCM / Transnet	
r	GEN + SS	The EPCM (for Transnet) will apply for DWAF WUL for the following: Impeding or Diversion of flow and the Altering of the Beds and Banks of a water course	EPCM	Transnet	
s	GEN	Any dam / impoundment constructed should only be a temporary structure and must be completely removed once the construction of the pipeline has been completed. The area covered by the dam wall, and by any water impounded behind this structure, including any vegetation that is disturbed must be completely rehabilitated.	CTR	ECO	
t	GEN	The CTR will be responsible to comply to all relevant legislation pertained to the use and protection of water resources.	CTR	ECO	
u	GEN	The pipeline must be designed to take into account the potential occurrence of severe year flood events and to ensure the stability of the pipeline as it crosses rivers.	EPCM	CTR	√

2.7.2 Pollution Prevention (Including River / Water / Wetland Crossings)

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	No dumping of any building rubble, soil, litter, organic matter or chemical substances may occur within any drainage line or area of standing water. Dumping and temporary storage of the above shall only occur at predetermined locations.	CTR	ECO	
b	GEN	The Contractor shall ensure that construction workers do not use any water body for washing, cleaning or as latrine area.	CTR	ECO	
c	GEN	Access of people and vehicles to wetlands and any other water bodies along the pipeline construction servitude must be restricted as far as possible. Signage must remain for the duration of construction activities.	CTR	ECO	
d	GEN	The contractor shall ensure that the placing of silt fences / silt barriers adjacent to all water bodies occurs to prevent discharge of silt into the water bodies, and the inclusion of buffer	CTR	ECO	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		zones as required by Legislation in which no stockpiles, machinery, chemicals or construction camps must be included to prevent pollution into the wetland. Where no specific standards exists or have not been identified in this EMP a minimum boundary of 32 meters shall apply or otherwise specified in the Water Use License (WUL).			
e	GEN	In cases where any seepage water is removed from the pipeline trench (including from wetlands) as part of a dewatering process, this water may contain a high silt load, which could have a detrimental effect if discharged back into the wetland. It is thus recommended that water from dewatering operations be cleaned of silt as far as possible prior to the water being discharged into the wetland. Advanced notice of intended construction with these areas is to be provided to ECO'S, EO's and wetland specialist. Erosion and silt control mechanisms must be in place prior to the onset of construction within any wetland or river crossing. EO's must liaise with ECO's and Engineers (or specialist wetland crossing team foremen) as to where these measures should be placed to ensure adequate and reasonable distances for access to the de-watering points. Since de-watering points are often dependent on site conditions that can change rapidly, EO's and the erosion control team should be present at all times within these areas, ready to mobilize new measures for erosion and silt control as when necessary upon request of the ECO's.	CTR	ECO	

2.7.3 Horizontal Directional Drilling

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a	SS	The Contractor shall prepare a detailed Method Statement for all HDD sites for approval by the EPCM and Transnet prior to commencing with Construction.	CTR	Transnet / EPCM	√
b	SS	The Contractor shall take all expected measures required to prevent risks typically associated with HDD methods of construction including but not limited to ground subsidence during drilling operations, inadvertent spills of bentonite and final disposal of the grout.	CTR	Transnet / EPCM	
c	SS	If any sensitive environments are expected to be affected by HDD Activities such as wetlands, river, water crossings or any other environments classified as sensitive as part of this EMP, mitigation measures will be stipulated in the method statements issued to the EPCM and Transnet.	CTR	Transnet / EPCM	√
d	SS + GEN monitoring	As part of the method statements to be provided by the contractor prior to construction, procedures for monitoring the flow and recycling of bentonite will be submitted and reviewed. This will include emergency measures to deal with unwanted spillages. Details will also be required of where and how the bentonite grout is finally disposed of. Although this grout is non-toxic, it has the consistency of mud and disposal thereof will have to be carefully controlled to avoid any adverse environmental impacts.	CTR	Transnet / EPCM	√

2.7.4 Blasting Operations

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL MANAGEMENT REQUIREMENT	Main Responsibility	Support	Method Statement / Procedure
a	GEN	The Contractor shall employ industry standard methods to control the impact of blasting and limit the risk of damage to buildings and structures by reducing blast vibrations induced in the rock mass, eliminating fly rock and limiting air-blast and noise to acceptable levels.	CTR	EPCM	
b	GEN	To limit damage to structures, even old buildings, to only very slight damage (less than 5%) The Contractor shall adhere to all published PPV limits for built-up or potential risk areas and strictly enforced. Regular peak particle velocity (PPV) measurements shall be taken along the route where blasting is being carried out close to buildings, using a velocity seismograph. The Contractor shall submit the results to the EPCM at agreed-upon intervals.	CTR	EPCM	
c	GEN + SS	The Contractor shall use blast mats wherever fly-rock may result in damage to adjacent buildings, power lines or other built structures, or sensitive ecological areas.	CTR	EPCM	
d	GEN	The Contractor shall apply due diligence and all industry-accepted methods to limit factors contributing to the development of an airblast and noise, which include overcharged blast holes, poor stemming, uncovered detonating cord, venting of explosive gasses and inadequate burden giving rise to cratering.	CTR	EPCM	
e	GEN	The Contractor shall control blasting operations to ensure sound pressure levels are kept below the generally accepted 'no damage' level of 140 decibels. The Contractor must investigate local area requirements and enforce these if different from the latter stated.	CTR	EPCM	
f	GEN + SS	Where blasting is disallowed due to any reason, only pneumatic tools or chemical breaking of the rock should be permitted.	CTR	EPCM	
g	GEN	The Contractor will be responsible to enforce any special conditions as stipulated in the Land Owner agreements in terms of blasting operations in close proximity to boreholes, the recommended mitigation measures shall be employed upon consultation with the affected landowner and could include the following: • Pump test to establish existing reliability of borehole supply, prior to construction, so that this may serve as a benchmark against which change can be measured. • Use of special methods to limit potential damage to boreholes if blasting is to be used. • Use of controlled blasting or mechanical excavation on those properties where it is agreed that there is a potential risk to boreholes due to normal blasting methods. • Monitoring of blast shock using standard monitoring practices.	CTR	EPCM	√
h	GEN	Notwithstanding any information provided within the EMP or any other report, the Contractor shall ensure that appropriate mitigation is employed wherever hard rock is encountered and blasting is required.	CTR	EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL MANAGEMENT REQUIREMENT	Main Responsibility	Support	Method Statement / Procedure
i	GEN + SS	Homesteads and structures • Prepare a photographic survey (including a crack survey) of all structures in proximity to the pipeline so as to manage issues relating construction damage, including damage caused by blasting and vibration. The survey intent must be well communicated and agreed with householders. Proper documentation should be kept in the form of a database or similar. • This database will serve as a baseline for determining the impact of construction-related blasting and vibration on buildings. The intent of this survey must be communicated to all stakeholders, and must be conducted with their consent. Where impacts on structures are unavoidable as result of blasting operations, Contractor shall compensate owners for damages based on a valuation by a certified valuer.	CTR	EPCM	√
j	GEN	Complaints regarding blasting-damage to structures must be lodged with the Land Liaison Officers	EPCM	ECO / CTR	
k	GEN	Such complaints will be investigated by the contractor and their validity determined by comparing the post-construction state of structures with their state as recorded in the photographic survey. A register must be kept of all construction-related complaints (including those that are not specifically related to building damage). The register must be designed in such a way as to capture: • The name of the person lodging the complaint, • The nature of the complaint, • The date on which it was lodged, • What action was taken, and by whom, to address the complaint, • The date on which this action was taken, and • The outcome of this action.	CTR	EPCM	
l	GEN	In addition to the complaints register, a record must be kept of all communication with communities.	EPCM	ECO / CTR	
m	GEN	The Contractor shall submit Method Statements for all methods of blasting mitigation for approval by the EPCM prior to commencing with such activities and shall comply with all relevant ISO standards and health and safety legislation.	CTR	EPCM	√

2.8 Waste Management and Littering

2.8.1 General Waste

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL MANAGEMENT REQUIREMENT	Main Responsibility	Support	Method Statement / Procedure
a	GEN	The Contractor shall prevent littering and the random discard of solid waste on the site. The Contractor shall not dispose of any waste in the pipeline trench. The trench shall be inspected on a daily basis and all foreign objects shall be removed and properly disposed of.	CTR	ECO	
b	GEN	It is recommended that Litter collection points are to be provided along the RoW and Construction Sites. It is also advisable that the Contractor establishes central waste collection and sorting sites where litter and other waste will be stored temporarily for sorting purposes and collection. A waste recycling mindset should be encouraged. Collected waste may only be disposed of at licensed dumpsites and the Contractor shall keep written proof of materials disposed.	CTR	ECO / EPCM	
c	GEN	The Contractor is to prepare a method statement in terms of waste management to be accepted by Transnet.	CTR	ECO / EPCM	√

2.8.2 Hazardous Waste

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL MANAGEMENT REQUIREMENT	Main Responsibility	Support	Method Statement / Procedure
a	GEN	All necessary precaution measures shall be taken to prevent soil or surface water pollution from hazardous materials used during construction and any spills shall immediately be cleaned up and all affected areas rehabilitated.	CTR	ECO	
b	SS	An area for the storage of hazardous materials must be established within construction camps that conforms to the relevant safety requirements and that provides for spillage prevention and containment	CTR	ECO	
c	GEN	The Contractor shall comply with all applicable laws, regulations, permit and approval conditions and requirements relevant to the storage, use, and proper disposal of hazardous materials.	CTR	ECO	
d	SS	All hazardous substances shall be stored in designated areas within the construction camps that are bunded and provided with a hard, impervious surface, as well as sufficient roof cover to prevent the ingress of water. All bunded areas will be provided with a catchment sump that	CTR	ECO	

		drains to a separator unit that prevents runoff from entering and contaminating any adjacent areas. Bund walls must be of a sufficient height to contain at least 110% of the volume of any materials stored within the bunded area.			
e	SS	The hazardous materials storage area must be locked and access restricted to authorised personnel, and must be clearly marked as such.	CTR	ECO	
f	SS	The Contractor shall at all times have a skip on site (Construction Camps) for the disposal of hazardous waste and polluted soil, which will be cleaned regularly. Waste shall have a turnaround cycle that will ensure that the skips never exceed their maximum carrying capacity.	CTR	ECO	
g	GEN	All major spills as specified in the contractor emergency response procedure of any materials, chemicals, fuels or other potentially hazardous or pollutant substances must be cleaned immediately and the cause of the spill investigated. Preventative measures must be identified and submitted to the EPCM and ECO for information.	CTR	ECO	
h	GEN	The Contractor shall prepare a Hazardous Materials and Waste Management Plan for inclusion in the site specific Environmental Plans to be submitted to Transnet prior to establishment on site. This plan shall include, but shall not be limited to, measures to prevent: • contamination of soils; • pollution of water; • accidental fires; • risk/injury to people or animals.	CTR	EPCM / ECO	√
i	GEN	The Contractor shall classify all hazardous materials to be used on site according to recognised Codes of Practice such as SABS Code 0228 for the Identification and Classification of Dangerous Substances and Goods and the Department of Water Affairs and Forestry *Minimum Requirements for the Handling, Classification and Disposal of Hazardous Waste*, and shall ensure that the handling, storage, transport and disposal of these materials meets the requirements of these Codes.	CTR	ECO	
j	GEN	Material Safety Data Sheets (MSDS) Information and records of all materials stored must be available and strict control of the volumes stored and removed must be kept.	CTR	ECO	
k	GEN	Staff must be trained in the hazards and required precautionary measures for dealing with these substances.	CTR	ECO	
l	SS	All Waste within the designated waste skips (hazardous or general) may only be disposed at a licensed disposal site to receive such materials. The Contractor shall keep written record of materials dumped and shall provide such proof to Transnet when requested.	CTR	ECO	
m	GEN	The Contractor shall manage all hazardous materials and wastes in a safe and responsible manner, and shall prevent contamination of soils, pollution of water and/or harm to people or animals as a result of the use of these materials.	CTR	ECO	
n	GEN	Construction equipment and vehicles are not to be serviced within the Construction Right of Way or any other area outside of the Construction Camps as a matter of course and this practice should be limited to breakdowns and unavoidable maintenance only. In such	CTR	ECO	

		instances drip trays or other absorbent material shall be placed underneath the serviced vehicle, the contents of which shall only be disposed of in the hazardous materials skip at the Construction Camp, or otherwise a dumping site licensed to receive such waste. No dumping of any broken parts, oils, grease or any other material in the Construction Right of Way or adjacent areas will be tolerated under any circumstances and strict action shall be taken against any offenders.			

2.9 Boreholes and Springs

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL MANAGEMENT REQUIREMENT	Main Responsibility	Support	Method Statement / Procedure
a	SS	The Contractor is to take note of any special conditions listed within landowner agreements with landowners within the Curry's Post Area. It was noted that 2 springs and 1 borehole in the Curry's Post area in KZN Midlands, are located either within or immediately adjacent to the construction zone of the trunk line route. • Spring No. 755-S1: To minimise any possible negative impacts on the vulnerable water sources, it is recommended that where alternate potable water supply sources are available, that these water sources are checked prior to, during and after construction of the pipeline to ensure that flow rates/ water quality remain unaffected. • Spring No. 757-S1: It is recommended that the pipeline route is moved to the eastern side of the proposed route to reduce the possibility of the spring being disturbed/ effected. If blasting is to be undertaken in this vicinity, alternate water supply options, such as drilling and equipping of a borehole should be investigated. • Borehole No. 792-1: The pipeline route is moved to the western side of the proposed route. If blasting is to be undertaken in this vicinity, it is recommended that this borehole is pump tested under the supervision of a Geohydrologist. The borehole should then be sleeved with 140mm Class 12 factory slotted casing to ensure the stability of the borehole, before being re-pump tested to re-confirm the yield after the installation of the casing to ensure that the borehole remains operational, as this borehole forms the only source of potable water to the school. (**Annexure B**).	CTR	ECO / EPCM	
b	GEN	In all cases, the Land Liaison Officers (LLO's) must verify with landowners whether they make use of any water supply boreholes or springs within 200 m of the pipeline.	EPCM	ECO	
c	GEN	If any boreholes or groundwater sources are identified, over and above those listed in (**Annexure B**), these should be logged by the Contractor.	CTR	ECO	
d	GEN	In the event that blasting is required in a section of route which is within 200 m of a borehole or shallow groundwater source, the yield is to be tested prior to and after blasting has taken place.	CTR	EPCM	√

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL MANAGEMENT REQUIREMENT	Main Responsibility	Support	Method Statement / Procedure
		Any damage to yields which is incurred as a result of pipeline construction is to be fully compensated for, if necessary, by means of drilling an additional borehole or using the other means to supply water to the affected landowner.			
e	GEN	In the case of identification of any additional farm water supply from springs and seeps, close to the alignment, these should be reviewed by the ECOs and an appropriate course of action determined.	CTR	ECO / EPCM	√

2.10 Veld Fires

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL MANAGEMENT REQUIREMENT	Main Responsibility	Support	Method Statement / Procedure
a	GEN	The Contractor shall minimise the risk of bush or veld fires caused by any activity on the site. Where adjacent areas are at risk of fire, the Contractor shall produce Method Statements indicating how the spread of fires will be prevented. These are to be accepted by the affected adjacent landowner/s, ECO and local Fire Departments and/or Fire Protection Agencies (FPA).	CTR	ECO / EPCM	√
b	GEN	The Contractor shall ensure through fire breaks and other appropriate measures that all Construction Camps are protected from the risk of oncoming veld fires that have originated on adjacent properties.	CTR	ECO / EPCM	
c	GEN+SS	Where construction sites, specifically the Pump Station and Terminal sites are at risk of oncoming fires the Contractor shall also provide firebreaks and shall where necessary coordinate fire prevention efforts with adjacent landowners and local FPA.	CTR	ECO / EPCM	

2.11 Soil and Erosion Management

2.11.1 Vegetation Clearing

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	Where possible, trees existing within the Construction right of Way that are not interfering with the operation of construction (either individual specimens or groups) shall be left undisturbed, and shall be clearly marked.	CTR	ECO	
b	GEN	When entering areas of predominantly indigenous vegetation the ECO's will be consulted in terms of the possibilities of transplantation of any specimens that are of ecological significance within the RoW to outside of the Construction RoW.	CTR	ECO	
c		The ECO's and LLO's will consult with all landowners where the above stated is relevant in order to reach land owner agreements.	ECO	EPCM / CTR	
d		The Contractor shall notify the ECO's of any protected or endangered species which requires removal found within the construction RoW or any other construction area.	CTR	ECO	
e	GEN	The ECO will be responsible for permits to be obtained for the removal of any protected or endangered species, as required by the National Environmental Management: Biodiversity Act (Act 10 of 2004) and any other related legislation or local ordinances. Such species shall be photographically recorded and inventoried, and their position indicated on the site plan prior to removal. Removal of plants shall be the responsibility of the appointed dedicated permitting officials.	ECO	CTR / EPCM	
f	GEN	The Contractor may not remain in possession of any endangered plants and shall be fined as per any relevant legislation. All specimens removed must be relinquished to the relevant conservation authorities.	CTR	ECO	
g	GEN	The Contractor shall remove all alien invader plant species from the construction site as directed by the ECO.	CTR	ECO	
h	GEN	The Contractor will agree with the ECO on site appropriate weed control measures to be put in place, in order to develop a weed control management plan. The plan will be dependant on the species encountered and the location of their occurrence. The plan will also take into account areas where weed infestation cannot be appropriately managed as result of surrounding area weed infestation, which might limit the success of weed control on the construction sites. Such areas will be mapped and noted in the Weed Control Management Plan and communicated to the ECO's.	CTR	ECO	√
i	GEN	Herbicides and pesticides may only be used for vegetation clearance and alien plant species eradication with the prior approval of Transnet and the ECO. Wherever the Contractor	CTR	ECO / EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		proposes to use these measures he shall submit a Method Statement for approval. The use of these measures shall only be considered if it can be demonstrated that alternative measures are not feasible or practicable.			
j	GEN	No soil stripping or vegetation removal shall take place on areas within any site that the Contractor does not require for construction works.	CTR	ECO	

2.11.2 Topsoil and Subsoil Management

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	The Contractor shall prior to commencement of Topsoil Stripping determine the average depth of topsoil for each construction spread. This will be agreed in consultation with the ECO. Typically topsoil constitutes the top 150mm of soil including organic matter, however the depth may vary from virtually zero to 300mm.	CTR	ECO	
b	GEN	Topsoil shall be stripped in the presence of the ECO. Once the Contractor has demonstrated to the satisfaction of the ECO that the topsoil in a specific area is being sufficiently stripped and stockpiled, these activities may then subject to agreement of the ECO, take place unsupervised. However this in no way absolves the Contractor of any responsibility in this regard and the Contractor will be expected to act with due diligence at all times.	CTR	ECO	
c	GEN	The Contractor shall take care not to mix topsoil and subsoil during stripping operations.	CTR	ECO	
d	GEN	The Contractor shall separately stockpile topsoil and subsoil and shall ensure that all construction workers are able to distinguish between the different stockpiles. All construction workers shall be educated about the importance and correct methodology of soil management.	CTR	ECO	
e	GEN	The Contractor shall ensure that no littering, waste disposal, fuel or chemical contamination, plant matter dumping or other activity occurs that may introduce pollutants or foreign plant species into stockpiled soils.	CTR	ECO	
f	GEN	If significant contamination or pollution of topsoil occurs, the Contractor shall ensure that the entire depth of affected soil is carefully removed and shall dispose thereof at a licensed hazardous waste site. Written proof of disposal shall be kept and forwarded to the ECO and Transnet on request.	CTR	ECO / EPCM	√
g	GEN	The Contractor shall replace all polluted or contaminated soils that have been contaminated as a result of his construction activities at own expense with soil that is of a standard acceptable to the ECO and that conforms to all relevant topsoil specifications of the National Department of Agriculture.	CTR	ECO	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
h	GEN	All soil stockpiles shall be kept free of any weeds or alien invader plant species through regular weeding. Through instruction from the ECO's weeds, where practicable shall be removed completely from the RoW.	CTR	ECO	
i	GEN	To the greatest extent possible topsoil and subsoil shall be handled twice only-once to get it off of the trench alignment and a second time to replace it.	CTR	ECO	
j	GEN	The process of returning topsoil to the servitude must be undertaken using equipment that limits compacting of the topsoil to a minimum.	CTR	ECO	
k	GEN	The Contractor shall endeavour to minimise the period during which topsoil is stockpiled to the greatest extent possible, so as not to diminish its plant support capacity.	CTR	ECO	
l	GEN	Topsoil shall be used for rehabilitation purposes only and shall only be placed on top of all other subsoil. Under no circumstances shall topsoil be used for filling of the pipe trench or any other excavations.	CTR	ECO	
m	GEN	The Contractor shall remove topsoil from the full width of the construction corridor where required	CTR	ECO	
n	GEN	All soil stockpiles shall be so positioned that they are not in any way impacted upon by vehicular movement, other materials storage or construction activities in general.	CTR	ECO	
o	GEN	Soil stockpiles shall not be so positioned that they obstruct any water drainage line or area of concentrated runoff.	CTR	ECO	
p	GEN	Where stockpiles are necessarily positioned along any sloped area, diversion berms or rock packs shall be constructed around their uphill sides to prevent scouring of the stockpile. Extreme care must be taken that runoff does not concentrate around the edges of the diversion structures and straw mulch should be spread around the edges of the structures to prevent erosion.	CTR	ECO	
q	GEN	Soil stockpiles shall not exceed 2 metres in height, unless prior approval has been obtained from the ECO.	CTR	ECO	
r	GEN	At all Terminal and Pump Station construction sites, all stockpiled topsoil shall be conserved by limiting the surface area to volume ratio of stockpiles. Fewer, larger stockpiles should be used in preference over more, smaller stockpiles. However this should not be done at the cost of greater areas of vegetation clearance.	CTR	ECO	
s	GEN	Topsoil shall be windrowed along the construction Right of Way along the pipeline construction site, in such a manner and position that it is not driven over by construction vehicles or trampled by workers. Topsoil shall be turned during stripping and left undisturbed until it is reinstated during rehabilitation.	CTR	ECO	
t	GEN	The full depth of topsoil must be stripped from all areas that will be affected by construction-related activities and shall include the construction footprint, working and storage areas as well as any other operational spaces.	CTR	ECO	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
u	GEN	All soils must be reinstated in the reverse order of that in which they have been removed. Extreme care should be taken so that intermixing of soils does not occur during reinstatement. After the completion of the backfilling, re-contouring and erosion control works, the Contractor shall spread the topsoil evenly at uniform depth over the areas from which it was removed.	CTR	ECO	
v	GEN	Any Construction Vehicle movement over topsoil stockpiles shall be prohibited.	CTR	ECO	
w	GEN + SS	A fixed-point photo survey shall be undertaken of all sections of the pipeline that crosses through agricultural land to allow for a comparison between the state of the landscape after rehabilitation and what it was before. In order to identify any reduction in soil fertility, it is recommended that soil tests be conducted at regular intervals along the route through all affected communities. These tests must be conducted before construction, once the route has been pegged, with a repeat test from the same location six months after soil reinstatement. These tests should include tests of organic soil content.	CTR	ECO	

2.11.3 Erosion prevention and mitigation

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN + SS	The following generic measures are provided to limit the occurrence of and mitigate existing erosion. The Contractor is furthermore referred to the Procedures for Arresting Gully Erosion supplied in this EMP, as derived from the "Erosion Risk Assessment Report" compiled for the NMPP project by Mentis (June 2008) (***FINAL EIA Specialist Study 10C***). While the Contractor may implement these and / or alternative methods of erosion prevention and rehabilitation, the Contractor remains liable for environmental compliance and shall ensure that erosion is prevented and successfully mitigated, notwithstanding any provision or methodology described in this EMP. Wherever so required, the Contractor shall obtain specialist input in the interpretation and application of specific methods and if so required, shall provide Method Statements for approval by the ECOs and / or consulting engineer prior to commencing with their installation.	CTR	EPCM / ECO	√
b	GEN	On cultivated land the Contractor shall backfill the pipeline trench to approximately the same compaction density as the existing soil nearby, and/or hump backfill over the trench and allow it to settle before handing back for farm use.	CTR	ECO	
c	GEN	The Contractor shall construct berms at frequent intervals to divert and disperse runoff and / or develop contour bank systems to divert runoff flowing down slope along the backfilled trench. The berms are to be constructed before a dense perennial grass cover is to be established.	CTR	EPCM / ECO	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
d	GEN	The Contractor shall mulch soils on steep and long slopes and on erodible soils where deemed necessary, as a precaution to limit erosion in the event of unseasonal rains, before a dense perennial grass cover has been established. Mulch obtained from any alien plant species matter is not to be used for this purpose.	CTR	EPCM / ECO	√
e	GEN	The Contractor shall lay out stone packs on the contour on bare expanses of earth where deemed necessary, especially where there are slaking shale's present. Stone packs shall be frequently spaced and must be long enough to prevent lateral erosion around the structures.	CTR	ECO	
f	GEN	The Contractor shall construct drop weirs or gabion structures to prevent susceptible slopes against knicks. The Contractor may consult a suitably qualified and experienced agricultural engineer and shall submit Method Statements for their design to the ECO prior to construction commencing.	CTR	ECO	√
g	GEN	The Contractor shall take diligent aftercare for the duration of the contract whereby all sites that have been rehabilitated are visited after every storm, in order to ascertain whether erosion has occurred. The Contractor is reminded of the fact that his responsibilities do not end with the implementation of initial rehabilitation measures and shall repair rills or gullies that have formed. Erosion damage is to be filled with suitable soil, smoothed to match the adjacent topography and re-grassed.	CTR	EPCM / ECO	
h	GEN	Where highly erodible soils with high proportions of silt and fine sand, or low proportions of clay are encountered the Contractor shall employ mulch before grassing. Grass establishment and maintenance must be done to a high standard – refer to re-vegetation guidelines provided in this EMP in section 2.13.2	CTR	ECO	√
i	GEN	Where duplex soils are encountered grass establishment and maintenance must be done to a high standard– refer to re-vegetation guidelines provided in this EMP.	CTR	ECO	
j	GEN	Where dispersive soils are encountered the Contractor shall either apply gypsum to displace excess sodium, or incorporate mulch to permit sodium infiltration and leaching out with rainwater. Soil amelioration shall be done where required in order to establish grass cover– refer to re-vegetation guidelines provided in this EMP.	CTR	ECO	
k	GEN	Where the pipeline traverses sections of slaking shale, all areas of exposed shale are to be covered with soil which is then properly grassed. The Contractor shall take special precautions to prevent incision and to stabilise gully sides - refer to the Guideline Procedure for Arresting Gully Erosion.	CTR	ECO	
l	GEN	Wherever the pipeline traverses long or steep slopes, the Contractor shall reinstate the original topographical profile as soon as the pipe has been placed in the trench and covered. Berms, rock stacks and other soil conservation measures should be employed to divert runoff from the Construction Right of Way which will initially not have attained any vegetative cover. A dense perennial grass cover should be established as soon as possible - refer to re-vegetation guidelines provided in this EMP.	CTR	ECO	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
m	GEN	In sections of the alignment where a low degree of existing plant cover is encountered prior to construction, the Contractor shall undertake grass establishment as soon after construction as possible. Soil fertilisation shall be done and fertiliser-responsive grass species must be used. Proper aftercare of at least two years shall be done by the servitude maintenance teams, to ensure that sufficient vegetative cover is attained - refer to re-vegetation guidelines provided in this EMP.	CTR	ECO	
n	GEN	The Contractor shall take the necessary measures to prevent trench subsidence, which may lead to severe gully erosion and possible pipe exposure. Wherever the pipeline traverses slopes, the Contractor shall construct trench-breakers in the trench to prevent subsurface flow. Backfill shall be properly compacted and slightly heaped, so that the soil surface of the trench, once settling has occurred, is not lower than the surrounding soil levels. However the backfilled trench should not be less permeable than surrounding soils, which may lead to underground damming of water. Contour banks should be developed over the Construction Right of Way which will prevent preferred runoff channels from developing along the backfilled trench. The Contractor shall establish suitable natural vegetation cover over all disturbed areas and such cover must be to a degree where the erosion potential is minimised.	CTR	ECO	
o	GEN	Wherever the pipeline crosses a watercourse the Contractor shall ensure that all excess spoils are removed from the watercourse and that adequate care is taken that the profile of the stream channel is not altered. Where temporary alteration of the stream channel profile is required the Contractor shall reinstate the stream channel to as close to its original profile as possible. The Contractor shall where feasible establish plant cover by selectively procuring native plants form upstream and downstream areas and transplanting on the disturbed sections.	CTR	ECO	
p	GEN + SS	Where temporary vehicle crossings are required over watercourses, the Contractor shall either construct a low drift in the watercourse that flow passes over; or a temporary bridge structure that the flow passes under. Neither structure shall be so constructed that the flow of water is impeded. This will be subject to the approval and issue of the WUL.	CTR	ECO	
q		The Contractor shall submit a Method Statement for the design of all temporary stream crossings for acceptance by the EPCM prior to its construction.	CTR	EPCM / ECO	√
r	GEN	Wherever berms are constructed, these will be installed as per the typical drawings. The contractor shall submit method statements for the installation of berms. (refer to Guideline Procedure for Arresting Gully Erosion.	CTR	EPCM / ECO	√
s	GEN	The Contractor shall take preventative measures to prevent severe erosion of un-vegetated steep slopes, caused by unseasonal rain. Hessian bags or other degradable cloth shall be pegged down over exposed surfaces. These measures shall be done where bare slopes may be at risk of erosion.	CTR	EPCM / ECO	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
t	GEN	*Guideline Procedure for Arresting Gully Erosion General* • Identify the causes of gully initiation & growth • Neutralize the cause of gully erosion • Adapt designs and procedures to arrest gully growth and fit each specific case • Important: Start gully reclamation work at the upslope end and work down-slope • If there is excess water entering and enlarging a gully, divert and disperse the water • Fence of all rehabilitation areas to exclude livestock during reclamation operation *Drop weirs to arrest gullies* • Construct with rock in gabions, or concrete, or bricks and mortar • Preferably locate the structures across wide (not narrow) sections of the gully • Key weirs into the gully sides and gully floor • Line gabions underneath, upslope and on sides with geofabric • Weirs must be lower at gully centre than at gully sides to provide an overflow • Weir sides must be flush with and not project above the gully banks • Many small weirs are preferable to a few big weirs • Build weirs on grade-line (the top of one structure is level with the bottom of the next upslope structure) • For very steep gradients a gabion staircase is warranted • At the foot of the weir, build a dissipation structure (stilling pond or apron underlain with geofabric) • Moist gully floors can be planted to indigenous reeds (*Phragmites spp*) • Inspect at least annually and after big storm events. Repair damage immediately *Rock packs to protect & reclaim bare areas* • Use biodegradeable hessian on soil surface and rocks laid along contour to reclaim large bare sloping areas (e.g. slaking shales) • Many modest rock packs at close intervals down a slope are preferable to a few big packs • Construct on the grade-line (top of one structure to be level with the bottom of the next structure upslope)	CTR	EPCM / ECO	
u	SS	The Contractor shall be expected to employ mitigation measures as required wherever soil erosion risk areas are encountered. These areas has been captured in the alignment sheets as far as possible. The Contractor is to take note of the potential high risk soil erosion areas as identified in the geotechnical assessment reports carried out for the project located in the ***FINAL EIA Specialist Study 7A, 7B and 7C***, these are listed below: • Erosion of the unconsolidated Berea type sand is a medium-level risk, which will	CTR	EPCM / ECO	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		however be aggravated where the vegetation on slopes steeper than 1:5 (20%) is removed over extensive lengths. • Vertical slopes range up to 1:2.9 (35%), which is steep and approaching the internal friction angle of the soils. • Steep topography where rainfall is fairly high, hillsides and valley lines are generally stable, with minimal evidence of long-term erosion. • The presence of dispersive and erodible soils has however resulted in significant and extensive erosion of the lower-slope stratified colluvial pedisediment soils, creating erosion gulleys (dongas). • Crossing of the Wilge River • Vaalkop • Crossing of the Verkykerskop-Harrismith Road • Crossing of the Meul River Valley • Long steep slopes near Tafelkop • Ascent of the Draaihoek scarp • Steep rise north of Holspruit Stream • Langverwag • Crossing of Brakspruit • Crossing of the Vaal River			
v	SS	The Contractor is to take note of the risk areas as identified in the Erosion Risk Assessment Report (***FINAL EIA Specialist Study 10C***) All risk areas are indicated on the alignment sheets	CTR	ECO	

2.12 Waste Rock

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	The Contractor may move surface stone and rock to facilitate pipeline construction, but shall not stockpile or dispose of this material off the Construction Right of Way without landowner consent	CTR	ECO	
b	GEN	Waste rock excavated during the construction process shall be replaced in the trench to whatever extent possible, to reduce the amount of rock that has to be transported from the site.	CTR	ECO	
c	GEN	No permanent dumping or spreading of rock spoil over the construction right of way to be permitted	CTR	ECO	
d	GEN	The Contractor shall prepare a Method Statement detailing the proposed locations and method of disposing of excess spoil excavated from the pipeline trench or construction sites. As a general rule, windrowing of excavated material along the perimeter of the trench shall be allowed. Excavated spoil and other granular material shall be collected and transported to a suitable licensed disposal site if considered to be waste and where such material cannot be re-used. The Contractor shall identify erosion gullies or old borrow pits for preferential rehabilitation of such areas with the excess spoil and other granular material. The Method Statement shall include the measures that are proposed to stabilise and rehabilitate any such sites (erosion gullies and old borrow pits).	CTR	ECO	√
e	GEN	The Contractor shall under no circumstance dump rocks or stone waste into adjacent veld areas, pastures or agricultural land, or in any natural area or river or water body. Rock waste shall be disposed of at a dumping facility licensed to receive such waste and the Contractor shall keep written record of all materials dumped.	CTR	ECO	

2.13 Rehabilitation

2.13.1 Reinstatement

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	A detailed reinstatement database shall be developed for the entire pipeline route per KP section, detailing the condition to which rehabilitation must be done and any specific rehabilitation objectives that are to be achieved.	CTR	ECO	
b	GEN	The Contractor shall remove all temporary works along the Construction Right of Way and fences and private roads disturbed by construction shall be restored to their original condition unless another agreement is reached with the applicable landowner.	CTR	ECO	
c	GEN	On arable land, the Contractor shall ensure that stone and rock unearthed during construction does not constrain use of the land or adjacent land after rehabilitation. Rock Spoil within ploughing depths must be prevented in areas where this rock did not previously occur.	CTR	ECO	
d	GEN	Rehabilitation shall establish a grass cover. The Contractor is to consult with a vegetation specialist to advise on the best grass and plant species (planting methodology) that should be used for rehabilitation. The Contractor will include the recommendations of the vegetation specialist in the reinstatement database for review and acceptance by the ECO's and Transnet. This reinstatement database will be in compliance with the re-vegetation guidelines specified in this EMP in section 2.13.2.	CTR	ECO	
e	GEN	The Contractor shall ensure that this grass cover is maintained for the duration of the rehabilitation period. Areas where the vegetation does not establish shall be re-vegetated within the 1 year rehabilitation period. The Contractor shall be responsible for topsoil shaping, ensuring the required drainage patterns and main soil engineering works. However a specialist rehabilitation contractor may be appointed or otherwise consulted for seeding and vegetation establishment	CTR	ECO	
f	GEN	The Contractor shall prepare a rehabilitation plan, prior to re-vegetation, detailing the method of preparation, soil amelioration, fertilising and seeding to be used in rehabilitating each area of the works and the post-establishment maintenance regime to be implemented. The Contractor shall consider the guideline presented in this EMP in this regard. While the Contractor may implement alternative methods of grass establishment and fertiliser and maintenance regimes, compliance with this EMP re-vegetation guidelines will be judged strictly in accordance with the species composition and cover established at the end of the maintenance period	CTR	ECO	√

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
g	GEN	The Contractor shall maintain and submit to the ECO detailed records of the method used to re-establish grass in each area of the contract. These records shall include the following and / or any other relevant items: • Subsoil preparation (scarifying/ripping/disking) • Soil tests (Fertility Testing – Agricultural Land, or as required by any landowner) • Volume of soil spread • Soil amelioration applied • Fertiliser application • Seed source, mixture and quantity • Date of seeding • Method of seeding (hydro-seeding, hand-seeding, sodding) • Post-establishment maintenance (fertilising, weeding, mowing/slashing)	CTR	ECO	
h	GEN	The Contractor shall restore the trench and Construction Right of Way to the natural contours of the ground and shall allow normal surface drainage.	CTR	ECO	
i	GEN	The Contractor shall loosen compacted soils along the Construction Right of Way by means of a plough or scarifier. Scarifying areas where topsoil has been removed shall be carried out prior to the replacement of topsoil. Care shall be taken to avoid topsoil inversion if scarifying is carried out in areas where topsoil has not been removed. Any ploughing or scarifying operation shall not exceed a depth of 100mm.	CTR	ECO	
j	GEN	The Contractor shall prevent concentrated run-off along, or next to, the Construction Right of Way, and shall do so by shaping the land, establishing vegetation, and taking other appropriate measures to absorb and disperse runoff.	CTR	ECO	
k	GEN	The Contractor shall, cover the backfilled pipeline trench evenly with topsoil to a minimum depth of 150mm. Where the natural topsoil depth is less the applied topsoil shall be adjusted accordingly. If necessary, hostile sub-soils shall be ameliorated by liming, fertilisation and incorporation of organic matter. If any sections of the route exist where sufficient topsoil could not be stripped during vegetation clearing,	CTR	ECO	
l	GEN	If required, although not encouraged, the Contractor shall import topsoil with the same soil properties as where it must be used as far as possible in order not to change the local soil properties. The soil should be of the same general type as the soil being supplemented as far as possible and which shall be free of all invasive alien and invader plant species.	CTR	ECO	
m	GEN	Where the land is naturally armoured with surface rock or stone, the Contractor shall, after construction, replace the armouring rock over the Construction Right of Way to protect against erosion, in a manner similar to its original condition.	CTR	ECO	

2.13.2 Re-Vegetation Guidelines

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	**Rehabilitation procedure** The long term objective for rehabilitation is as follows: Rehabilitation must ensure that in the long term, re-establishment of the vegetation that existed prior to the construction of the line is facilitated to the greatest extent possible. • Site - specific conditions must be established and characterised so as to provide a detailed basis for the choice of rehabilitation approach; • Detailed information must be sourced on how best to rehabilitate, drawing on landowners and other stakeholders' experience and preferences, as well as an understanding (as far as this may be possible) of why rehabilitation efforts in the area have either succeeded or failed; • Based on the above the appointed rehabilitation specialist must detail the rehabilitation approach that will be used in that specific section of the line and communicate the same to the affected landowners; • The specific rehabilitation approach must draw also on the recommendations contained below and these should be used as is appropriate to the specific requirements for that section of the line and upholding the preferences of the landowners; • The rehabilitation approach must detail the full extent of the rehabilitation requirements, the time required for the same, monitoring and corrective action and allocation of responsibilities between the contractors, construction manager and Transnet; • Supervision and monitoring of the rehabilitation must be ensured for the entire duration of the rehabilitation and must not be limited to the construction phase only; • The approach must be carefully documented so that is clear as to the approaches that have been used in specific areas so that the learning can be carried forward to other parts of the line, or indeed other projects.	Transnet		√
b	GEN + SS monitoring	**Task** • If the site of application is a planted pasture, determine the pre-construction soil fertility at a reputable soil fertility lab. • For all sites to be grassed, determine soil fertility of soil/spoil material to be grassed by resort to soil sampling & testing at a reputed soil fertility lab. • Exclude domestic livestock from the area to be rehabilitated, by fencing construction Right of Way if necessary.	CTR	ECO	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		• Reinstate the land to pre-construction profile, as closely as possible. • Apply mulch (hay, straw, kraal manure or chicken litter) at 5 t/ha & incorporate to 10 cm if (a) the land is steeper than 1 in 5 and construction was completed between 1 Feb & 31 Aug or (b) very high soil erodibility exists. • If acid saturation >20% then apply calcitic lime to reduce acid saturation to 2% OR If acid saturation > 10% & Mg < 100 mg/kg then apply dolomitic lime at ≥1 t/ha. Lime should be applied 2 months before grassing & incorporated to 10 cm depth. • Undertake grass establishment between 1 Oct & 31 Jan only or as agreed by the landowner and/or specialist where required.			
c	GEN	In order to ensure that re-vegetation efforts are successfully undertaken and that the desired end results are obtained a specialist contractor may be appointed or consulted with for this purpose. Re-vegetation efforts of pristine grassland areas and planted pasture cannot be left to the individual landowners as they do not have the means, or the technical experience to oversee that it is successfully executed.	CTR	ECO	
e	GEN	The use of alien invasive species such as Pennisetum clandestinum (kikuyu grass) for re-vegetation shall be strictly avoided unless where existing kikuyu pasture is being re-instated.	CTR	ECO	

2.13.3 Control of Alien Plants

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	In consultation with the ECO's and where practicable areas where the pipeline construction train passes through stands of any alien invasive plant species as defined in the latest published official invasive alien plant species lists, all vehicles must be thoroughly cleaned to ensure that no propagules of these species cling to the construction vehicles and are thus dispersed into surrounding habitats. Of particular concern in this regard are the following alien invader species: black wattle (*Acacia mearnsii*), silver poplar (*Populus X canescens*), black locust (*Robinnia pseudoacacia*) and kikuyu grass (*Pennisetum clandestinum*).	CTR	ECO	√

2.13.4 Warranty of re-vegetation

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	Once the grass has been established and an 'acceptable cover' has been achieved, as defined in the Re-vegetation guidelines found in this EMP, the rehabilitation period shall commence. This period shall extend for a minimum period of one calendar year. If the vegetation is still compliant with the definition of acceptable cover after one calendar year, then the requirements of the re-grassing specification shall be deemed to have been met. Transnet, in consultation with the ECO, shall determine whether acceptable cover has been achieved.	CTR	ECO	√
b	GEN	Re-vegetation shall be done on the pipeline Right of Way including, but not limited to, all borrow areas, temporary access roads, spoil sites, camp sites and the like.	CTR	ECO	√

2.14 Prevention of Nuisance

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	The Contractor shall comply with the legal requirements for the management of noise impact specified in the Noise Regulations under the Environment Conservation Act (Act 79 of 1989). If instructed to do so by the ECO, the Contractor shall demonstrate compliance with the noise regulations by means of measurement of residual noise levels at receiver points specified by the ECO. Measurement shall be in accordance with the requirements of the noise regulations.	CTR	ECO	
b	GEN	Wherever local authorities have determined maximum allowable ceiling noise levels for certain areas, these levels shall be adhered to.	CTR	ECO	
c	GEN	All construction equipment, machinery and vehicles shall be in good working order and maintained regularly.	CTR	ECO	
d	GEN	The Contractor shall notify all landowners and inhabitants within 200m of a blast zone of the dates and times at which blasting is scheduled to occur. Blasting shall not be undertaken outside of the hours as contractually agreed upon without the agreement of the affected landowners and occupiers.	CTR	ECO	
e	GEN	The Contractor's employees shall not make recreational use of all-terrain / 4x4 vehicles or motorcycles on the site.	CTR	ECO	
f	GEN	Wherever possible the Contractor shall limit the clearing of the full Construction Right of Way as much as possible so that unnecessary vegetation loss is avoided and to prevent unnecessary dust nuisance.	CTR	ECO	
g	GEN	The rehabilitation and stabilisation of vegetation of all rehabilitated areas, buffer strips and new landforms shall be done as soon as the forms are complete in order to minimize dust nuisance. Dust suppression to be applied in all areas.	CTR	ECO	
h	GEN	The liberation of dust into the surrounding environment shall be effectively controlled by the use of water spraying and/or other dust-allaying agents, such as dust nets. Regular and effective damping down of all working areas and exposed surfaces (especially during dry and windy periods) must be carried out to avoid dust pollution that will have a negative impact on the surrounding environment. When necessary, these working areas should be damped down as far as necessary as warranted by the conditions encountered on site as instructed by the ECO. Where practical or required due to construction occurring within water-constrained areas, alternative means of dust suppression agreed upon may also be employed.	CTR	ECO	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
i	GEN	When working close to residential areas nuisance in terms of dust and noise will be controlled as far as possible and adjacent landowners will be notified in advance of planned working hours and duration of works.	CTR	ECO	
j	GEN	The Contractor shall regularly consult the Complaints Register and shall immediately attend to any complaints emanating from adjacent landowners or the public in general.	CTR	EPCM / ECO	
k	GEN	The Contractor shall not burn any waste in a Construction Camp or on site.	CTR	ECO	
l	GEN	The Contractor shall ensure that all litter and refuse collection points are so situated that they do not cause nuisance to adjacent landowners or the general public en sure that regular collection of all waste is carried out. The Contractor shall immediately attend to any complaints emanating from adjacent landowners or the public in general.	CTR	ECO	
m	GEN	The Contractor shall regularly service and clean out all site toilets to avoid odours.	CTR	ECO	

2.15 Construction Contract Employment

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	The Contractor is to strictly abide by all applicable labour legislation. Any transgression of labour legislation must be reported to Transnet or the Department of Labour.	CTR	EPCM / Transnet	
b	GEN	Where farm workers are employed as casual labourers on the project, this shall be done in liaison with landowners. Any persons applying for jobs with the construction Contractor are to be informed that such jobs are temporary and do not offer any security of employment. Local labour employed in this fashion must enter into a limited duration contract that clearly stipulate the duration of the contract period.	CTR	EPCM / Transnet	
c	GEN	Where necessary in areas where communities are affected, the CLOs (Contractor) shall consult with the communities in terms of job creation and other aspects that may affect these communities during construction.	CTR	EPCM / Transnet	
d	GEN	The Contractor shall where applicable establish local “labour and employment desks” as a contact point for local community members who wish to seek employment on the project. These locations of these points must be communicated to the public as part of the Construction Awareness Creation and Education Programme and may be undertaken at the site offices.	CTR	EPCM / Transnet	
e	GEN	The Contractor shall where applicable use the services of local SMMEs (Small, micro and medium enterprises). The Contractor shall establish the types of goods and services provided by them in accordance with the project contract requirements.	CTR	EPCM / Transnet	
f	GEN	Where potentially feasible such as at the Terminal and Pump Station construction sites the Contractor shall establish linkages with other institutions involved in skills development and SMME development, such as the community development programme of the local municipality and non-governmental organisations (NGOs) active in the area. The performance indicator of this measure shall be minutes of meetings conducted with representatives of these institutions.	CTR	EPCM / Transnet	
g	GEN	The Contractor shall endeavour to maximise local employment opportunities through training and capacity building to enhance benefits to the local communities.	CTR	EPCM / Transnet	
h	GEN	In order to promote the creation of employment opportunities for the communities that will be affected by the construction process of the pipeline, the Contractor shall to the greatest extent possible employ persons living within the District Municipality or within 100km of the construction site for general labour and construction activities. Employment of non-local labour for the purposes of general construction activities shall only be considered if it can be demonstrated that sufficient numbers of local labourers could not be obtained. The	CTR	EPCM / Transnet	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		appointment of higher level construction activities shall be done on the basis of skill and experience in the specific engineering requirements of these tasks. Preference shall be given to local labour and these positions may only be filled with non-local persons if it can be demonstrated that no suitable persons are recorded in the skills register to fill these positions. The performance indicator for the promotion of employment of women and youth would be the number of local persons who are employed in the construction phase of the project.			
i	GEN	Transnet shall include Training of emerging BEE companies as part of its overall Corporate Social Responsibility programme and include conditions in the NMPP construction contract to involve and train emerging BEE companies. Conditions shall be included in the construction contract to utilise BEE companies in procurement of goods and services.	CTR	EPCM / Transnet	
j	GEN	Provide training/ skills development initiative under the auspices of the Corporate Social Responsibility programme of Transnet to develop local entrepreneurial skills.	CTR	EPCM / Transnet	
k	GEN	The Contractor shall prepare employment policy compliance reports to be submitted to Transnet at regular intervals, as agreed to between both parties beforehand, illustrating how the Contractor is honouring the various employment policies.	CTR	EPCM / Transnet	

2.16 Social and Land Use Impacts

2.16.1 Construction Awareness

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	A Method Statement shall be submitted to Transnet for approval for a community Construction Awareness Creation and Education Programme, which will be aimed at informing and educating I&APs about the manner of construction and related activities that will be occurring in their area.	EPCM	Transnet / CTR	√
b	GEN	The Construction Awareness Creation and Education Programme shall be done in accordance with Transnet Communication Policies and within this framework consist of a variety of media relevant to each affected area which could include, but not be limited to: • Toll-free phone-in system • Posters • Information brochures • Handout leaflets • Newspaper and radio advertisements • Open days or presentation at local community centres, libraries and other public facilities.	EPCM	Transnet / CTR	
c	GEN	The Construction Awareness Creation and Education Programme should provide I&APs with information on when construction will start in a particular area, how long it will last, the contact details of servitude negotiators and then contact details of the contractor LLOs, the dangers of construction such as open trenches, large construction vehicles, etc. and information on how to stay safe with construction taking place in the area. All potentially hazardous working areas are to be demarcated as such with signage English and locally spoken languages and barrier tape.	EPCM	Transnet / CTR	
d	GEN	The Construction Awareness Creation and Education Programme shall sensitise community members to the need to prevent children and animals from wandering into the Construction Right of Way and shall specifically highlight and identify the various dangers associated with the construction process.	EPCM	Transnet / CTR	
e	GEN	The Construction Awareness Creation and Education Programme shall be extended into the operational phase to sensitise community members to safety issues related to trunkline operation.	EPCM	Transnet / CTR	
f	GEN	As part of the Construction Awareness Creation and Education Programme the Contractor shall furnish all adjacent landowners with the contact details of all relevant emergency	EPCM	Transnet / CTR	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		response bodies and local authorities to be notified in the event of a fire, hazardous material spill or environmental incident. Such information shall also be contained in all distributed media and advertisements.			
g	GEN	Any changes in the arranged construction schedules must be communicated to affected landowners in a timeous manner.	EPCM	Transnet / CTR	

2.16.2 Landowner and Occupier Relations

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	The Contractor shall strive to ensure good lines of communication with landowners prior and during the entire construction period, as well as during construction phase impact management.	CTR	EPCM / Transnet	
b	GEN	The Contractor shall appoint dedicated Land Owner Liaison Officers (LLOs) to liaise on an ongoing basis with landowners and keep them informed of construction progress and any specific activities that may influence them.	CTR	EPCM / Transnet	
c	GEN	Dedicated LLOs must be appointed for each construction spread and must be fluent in the languages spoken in the area. LLOs must also have good inter-personal skills and must be effective communicators with the ability to clearly and understandably communicate matters relating to the project to affected parties.	CTR	EPCM / Transnet	
d	GEN	LLO's will be employed to discuss all matters in terms of this EMP and Construction with all affected landowners	EPCM	Transnet	
e	GEN	Notification on the start of construction activities on a particular area will be provided to all affected landowners. Such notification shall occur well enough in advance for landowners to consult any third parties and make required arrangements prior to any activity commencing on their property. Typically a minimum period of two weeks should be allowed.	CTR	EPCM / Transnet	
f	GEN	Landowners should be notified by the LLOs of the Contractor's name and contact details, the number and type of construction workers on site, the construction schedule and all other relevant information so that affected landowners are able to make any necessary arrangements prior to construction commencing.	CTR	EPCM / Transnet	
g	GEN	Where the land users are not the current owners they should receive copies of these servitude agreements and be informed of the owners' approval that construction can commence. Occupation certificates need to be signed by the current tenants.	EPCM	Transnet	
h	GEN	If any activities are required to be outside the proposed construction area, the Contractor shall enter into Landowner Consent Agreements with all affected landowners prior to any activity commencing on their land. In these agreements, the affected landowner will stipulate	CTR	EPCM / Transnet	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		any special conditions that the Contractor will adhere to whilst occupying the affected landowner's land. The agreements must be signed by both the Contractor and landowner before any activities may take place on the affected landowner's property. The CTR shall supply copies of such documentation to the LLO and it must be kept on property file together with all other relevant documentation.			
i	GEN	All construction workers that will access an adjacent property must be fully briefed on the requirements of the Landowner Consent Agreements prior to construction taking place. Thus the Construction team is to be aware of all specific conditions of land owner agreements	CTR	EPCM / Transnet	
j	GEN	Where possible the LLOs must assist the landowner, if he/she so requires, with any arrangements that must be made in order for construction to take place.	EPCM	Transnet	
k	GEN	Transnet shall continue to negotiate with landowners and accommodate, where reasonable, any further requests for minor adjustment of the alignment where affected landowners request it. While this process is already well advanced as a result of the EIA process, it is likely that there will be such requests during negotiations for servitudes.	EPCM	Transnet	
l	GEN	A database of complaints regarding damage to structures must be maintained by the Contractor. Such complaints will be investigated and their validity determined by comparing the post-construction state of structures with their state as recorded in the photographic survey. A register must be kept of all construction-related complaints (including those that are not specifically related to building damage). The register must be designed in such a way as to capture: • The name of the person lodging the complaint, • His or her domicile and contact details • The nature of the complaint, • The date on which it was lodged, • What action was taken, and by whom, to address the complaint, • The date on which this action was taken, and • The outcome of this action.	CTR	EPCM / Transnet	
m		A General Complaints Register for periodic review by Transnet that logs all complaints raised by landowners, occupiers or the general public about construction activities will be developed. This Complaints Register will be regularly updated.	EPCM	ECO / Transnet / CTR	
n	GEN	An investigation shall also be launched into the cause of every complaint lodged in order to take remedial action and prevent recurrence. The findings of these investigations will be communicated to Transnet.	EPCM	ECO / Transnet / CTR	
o	GEN	A method of communication with I&AP will be established. This could include the development of Community Liaison Forums (CLF's) specifically in areas where Farmers Associations exist, the CLOs shall liaise directly with the organisations to set up a Forum where affected landowners can register their comments and complaints. A Method Statement	EPCM	ECO / Transnet / CTR	√

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		for approval by Transnet for how the Forum is to operate and how responses received through it is to be included in the Complaints Register. The LLOs shall inform all adjacent landowners of the Forum and the relevant contact details and procedures. However comments from individual landowners must still be facilitated by the Complaints Register.			
p	GEN + SS monitoring	In instances where Community Monitoring Committees or Liaison Forums have been requested by the affected communities, the LLOs are to assist the relevant communities to set up and establish such committees. These committees will then act as a forum where affected communities can register their comments and complaints. This Forum will operate in the same manner as contemplated above.	EPCM	ECO / Transnet / CTR	
q	GEN	The Contractor shall specifically ascertain from all adjacent landowners whether there are any potentially hazardous conditions or dangerous materials storage on their property that may be affected by construction. These should be accurately surveyed before construction commences and indicated on a map and all relevant information captured. The landowner must sign off that all such sites or structures and information has been captured.	CTR	EPCM	
r	GEN	The Contractor shall prepare individual Method Statements for every occurrence involving potentially hazardous conditions or materials, indicating what the particular risk/s are that have been identified, how they are to be mitigated and if required, what specialist inputs will be obtained in the process. All Method Statements are to be accepted by Transnet and the affected landowner prior to any related action being taken.	CTR	EPCM	√
s	GEN	The Contractor must also determine from the affected landowners whether there are any dams, permanent paved roads, buildings, driveways, servitudes, underground services, building foundations or other underground structures that may be affected by construction. Notwithstanding any information provided by the various landowners, it remains the responsibility of the Contractor to locate and survey all services and structures.	CTR	EPCM	
t	GEN	Where services or servitudes do not belong to the landowner of the property on which they occur, the Contractor shall determine to whom the services belong. The Contractor shall submit his Method Statement and obtain written permission from the owner of the service, prior to commencing with crossing operations.	CTR	EPCM	√
u	GEN	The Contractor shall take all reasonable measures to ensure that the power supply to adjacent landowners is not disrupted. Where this may potentially occur the Contractor shall have a back-up power supply at hand to ensure that power can be restored as soon as possible, should an interruption occur.	CTR	EPCM	
v	GEN	The Contractor shall in all instances request permission to access adjacent landowners' land and may not commence with any vegetation or land clearance without having a written agreement with the relevant landowners.	CTR	EPCM	
w	GEN	The Contractors responsibility towards affected landowners, in terms of reinstatement and rehabilitation, shall only end once written approval and sign-off for the work has been	CTR	EPCM / ECO	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		received from both the ECO and the relevant landowner.			
x	GEN	Payment of retention moneys to the Contractor, the amounts or percentages to be determined by Transnet, shall be contractually tied to sign-off on the reinstatement of the Construction Right of Way and shall only be released to the Contractor once write-off has been received.	CTR	EPCM	
y	GEN + SS	Wherever the pipeline route passes through arable agricultural land, a fixed-point photo survey shall be undertaken, and soil fertility tests shall be conducted at regular intervals along the route before and after construction as required in previous sections of this EMP.	CTR	EPCM / ECO	
z	GEN	After construction, where the alignment passes through pasture and grazing land the disturbed area of veld must be fenced for at least two seasons to allow the veld to re-establish itself before livestock is re-introduced. This must only be done with the consent of the relevant landowner, however the importance of these measures in terms of erosion prevention and land capacity rejuvenation must be clearly communicated to the landowner.	CTR	EPCM / ECO	
aa	GEN	Where irrigation and fertilisers are required to ensure the re-establishment of rooigras veld, such will be negotiated with the landowner and implemented by Transnet.	CTR	EPCM / ECO	
bb	GEN	Where possible, the pipeline design shall be so aligned that surface markers are placed on the edges of agricultural crop fields, so as to minimise their nuisance to farming activities.	CTR	EPCM / ECO	
cc	GEN	Where possible, other surface infrastructure (such as the block valves and CP marker posts) must be located at points where they do not impact directly on cultivation.	CTR	EPCM / ECO	
dd	GEN	Where possible, the pipeline route should be adjusted to avoid impact on agricultural irrigation systems. Adequate compensation must be paid to farmers for disruption of or loss to irrigation systems that will include provision to re-establish or move the systems.	CTR	EPCM / ECO	
ee	GEN	Noise levels in the vicinity of threatened mammal species, particularly Oribi (as identified in this EMP and indicated on the Alignment Sheets) are to be limited where possible. If blasting is required, adequate notification must be provided to the landowner beforehand, so that animals can be moved if required.	CTR	EPCM / ECO	
ff	GEN	The Contractor shall endeavour not to disrupt water supply to game and livestock and shall, where water supply installations are in place, ensure that alternative water provision is ensured prior to any disruption to water supply is caused.	CTR	EPCM / ECO	
gg	GEN	Wherever possible, the Contractor shall ensure that the construction schedule is to be planned so that construction on game farms does not take place during the hunting season. Where this is not possible the Contractor shall ensure that all coordination and safety measures required are taken to ensure the safety of his workers. The Contractor's LLOs shall liaise with all relevant landowners well in advance in this regard to ensure that information regarding the hunting season and activities is accurate and that all required planning and scheduling takes place beforehand.	CTR	EPCM / ECO	

2.17 Subsistence farming

2.17.1 Loss of Fertility and Soil Productivity

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN monitoring	**Handling of topsoil to reduce the risk of reduced productivity:** • The contractor must ensure that stone and rock within the soil profile and at the surface do not constrain use of agricultural land. • In order to reduce the risk of damage to soil structure, the process of returning topsoil to the servitude must be undertaken using equipment that limits compacting of soil to a minimum. This precaution is particularly relevant to clay soils. • Mitigation measures as outlined in the erosion management section of the EMP must be implemented to ensure that drainage patterns are properly reinstated.	CTR	EPCM / ECO	
b	GEN	**Pre- and post-construction audits:** • A fixed-point photo survey should be undertaken in areas where subsistence farming is practices to allow for a comparison between the state of the landscape before and after rehabilitation.	CTR	EPCM / ECO	
c	GEN	**Minimizing risk to building infrastructure:** • In areas where building structures are potentially impacted, the construction servitude shall be narrowed, as far as possible, in order to avoid the need for relocation • A database shall be maintained, with records including photographs, GPS coordinates and owner details of all structures potentially affected by construction. An appropriate distance for record keeping would be around 50 m from the pipeline centreline.	CTR	EPCM / ECO	
d	GEN	**Livelihood support to subsistence farmer communities:** It is acknowledged that, even if these measures are implemented, the possibility remains that disturbed land might not be completely reinstated to its former productive capacity. In order to account for this possibility, it is recommended that the following additional measures be implemented to minimise potential impacts on the livelihoods and food security of poor rural communities: • A livelihood restoration team should be established to undertake support activities.	EPCM	Transnet	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		• The team will use the expertise of an agricultural specialist, in order to advice on appropriate rehabilitation techniques. • Workers who are familiar with the area and can speak the local languages will be employed. • The team will be responsible to assist project-affected communities in dealing with construction-related impacts and to minimise any impacts on restored land after the construction period. • It is recommended that the livelihood restoration team consists of at least two extension workers who will be dedicated to the project for six months after implementation. • In order to reduce the communities' dependence on subsistence agriculture, the possibility must be investigated to implementing community development programmes in the area.			
e	GEN	**Implementation monitoring and evaluation programme: Post Construction** • A programme must be implemented to monitor long-term impact of the project on the livelihoods of poor communities in this Ngonyama Trust Area and to evaluate the effectiveness of livelihood restoration measures. • Aspects to be monitored as part of this programme include the condition of soils and crops, as well as progress and results of livelihood restoration activities (to be assessed using standard Input-Output-Outcome-Impact methodology), • The activities and findings of the monitoring and evaluation programme must be documented in reports at regular intervals (e.g. yearly). These reports shall document the effectiveness of management measures designed to minimise the long-term impact of the project on the livelihoods of poor rural communities, as well as problem areas and remedial actions proposed.	Transnet		
f	GEN	**Disruption of daily movement patterns** • Establishment of temporary crossing points is recommended. The recommendations for the placement of temporary crossings are based on the assumption that the spacing of temporary crossings should limit the additional distance that people have to walk to about 500 metres.	CTR	EPCM / ECO	
g	GEN	• Once the Trunkline route for construction has been finalised and surveyed, meetings should be held with local community leaders to confirm where temporary access points should be located	CTR	EPCM / ECO	
h	GEN	• Mechanisms should be established to ensure that problems are dealt with promptly. It is recommended that a team of community liaison officers (CLO) be appointed. The CLOs should be local residents, and should comprise a representative sample of	CTR	EPCM / ECO	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		communities along this section of the trunkline route. • The CLOs will serve as points of contact between the ECO and the communities, ensuring that residents are kept informed on a day-to-day basis of construction progress and when access will be blocked. It is also recommended that the CLOs assist in circulating a printed timetable of the construction schedule. • It is recommended that measures be implemented to address pedestrian safety at crossing points and in the vicinity of construction works			
i	GEN	**Loss of Crops and fruit trees** • Once the final route alignment has been established and the construction RoW marked, a survey must be conducted to compile a complete inventory of all crops and other community resources that will be lost within the construction servitude. For compensation purposes, this inventory must include the details of the household owning those crops. • A certified valuer should be appointed to conduct the survey and assess the value of losses incurred. Values will vary according to the soil and climatic conditions along the length of the pipeline; hence, it is not possible to specify a "generic" value for all instances of a particular crop. The valuer shall be assisted by skilled social scientists versed in methods used to determine the extent and value of resource losses in subsistence communities. • The valuer would need to undertake the survey at the time of disturbance to calculate the compensation amount, which should take account of the "food value" of the crop (subsistence value) rather than the commercial value. • Compensation for lost crops should be in kind rather than cash, where practical. Payments will mainly be in the form of grain payments rather than fresh produce. • Any individual fruit trees that are lost during construction must be inventoried and replaced, if necessary, adjacent to the servitude. If fruit trees are used for subsistence purposes, it is recommended that two saplings be provided for each fruit tree that is lost. If trees are used for commercial purposes, commercial compensation rates will apply. • The fact that about one-third of the fields surveyed in KwaMakhuta and one-half of those in Ingonyama Trust were fallow at the time of the survey (which was in March, towards the end of the rainy season) indicates that a large proportion of arable land in these areas is not under permanent cultivation. This raises the issue of whether and how compensation should be provided for the loss of fallow land. Households may argue that they did not prepare land for cultivation because they were prevented from doing so, or because they anticipated that their work would be lost to the project anyway, and that they should be compensated for foregone opportunities for	EPCM	Transnet	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		cultivation. In this regard, it must be clearly communicated to communities well in advance that they should in no way alter their agricultural activities in view of the project. • Where land is fallow at the time construction commences, but is possibly being used from grazing of livestock on weeds or the previous season's crop residue, this must be assessed and suitable compensation provided. This compensation must be paid to the owner of the field (where ownership can be established) or to the traditional authority (where communal grazing occurs). The value of this compensation should take account of local market rates of leasing grazing, with adjustments being made to allow for the condition of grazing and the subsistence value of livestock. The policy and procedure for determining this value would be negotiated with the Compensation Determination Committee (CDC). • With regard to the timing of compensation payments, it is recommended that payments be made before construction commences. It is recognised that such an approach deviates from Transnet's existing policy of making compensation payments after construction is complete. However, this deviation is considered essential to ensure that the loss of arable land does not impact on affected households' food security.			

2.17.2 Loss of Land

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	A Compensation Determination Committee (CDC) should be established that represents project-affected households, the traditional authority, local government and the project proponent. The function of the CDC would be to serve as a platform for negotiation of all matters related to compensation for losses incurred through the project, including the methods by which values will be attached to these losses and the methods by which compensation will be provided. The main function of the CDC will be to negotiate and give final sign-off on an Entitlement Framework describing: • Which categories of project-affected persons will be entitled to compensation; • How the compensation amount for each project-affected person will be calculated, based on the his or her current assets that will be affected by the project; and • The form in which compensation will be provided.	EPCM	Transnet	
b	GEN	The values for the various types of land as set out in the Entitlement Framework will be negotiated in the CDC, taking account of the subsistence value of land types (as opposed to	EPCM	Transnet	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		their commercial value). The same process will apply to the various classes of veld (rangeland).			
c	GEN	Once the CDC has given final sign-off on the Entitlement Framework, the procedure set out in the framework for calculating compensation amounts shall be employed to calculate the amount due to each project-affected person. This compensation amount will be reflected in a compensation agreement set up for each project-affected household, and signed by the household and an authorised representative of the CDC.	EPCM	Transnet	
d	GEN	The possibility should be investigated of adding a solatium to compensate for inconvenience suffered by affected households. It is recommended that the value of this solatium be set at 10% of the value of compensation for land within the six-metre permanent servitude.	EPCM	Transnet	
e	GEN	Systems and support must be established to facilitate the process of affected land owners obtaining alternative land, either through long-term lease agreements with those with surplus land or through new allocations by the Chief.	EPCM	Transnet	
f	GEN	Servitude agreements to be signed with land owners prior to commencement of construction. Where the land users are not the current owners they should receive copies of these servitude agreements and be informed of the owners' approval that construction can commence. Individual landowners are to be compensated for the loss of permanent servitude. In cases of communal land the means of compensation for the permanent servitude lost must be established in consultation with the local authorities, the traditional authority (if relevant) and the current land users.	EPCM	Transnet	

2.17.3 Social Investment in poor rural communities

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	Trunkline	As a part of Social Investment in poor rural communities through which the trunkline is routed, Transnet shall investigate the possibility of initiating and contributing to community development and education programmes.	Transnet		

2.18 Commercial Farming

2.18.1 Loss of Land

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	**Compensation for the loss of land:** Compensation must be paid for the servitude as if the land were lost to the owner, despite the fact that the owner will still have access to and use of the land. Compensation will be undertaken based on Transnet's Servitude and Land Acquisition Principles: • Servitude acquisition based on negotiations with landowners and an amicable agreement being reached. Expropriation shall not be used unless all other reasonable avenues have been exhausted. • Appointment of a professional valuer to compile an evaluation of the land lost under the 6-metre servitude, based on prevailing market conditions. • 100% compensation for the servitude area based on the strip valuation on registration of the servitude. • Land required for the pump stations will be purchased from landowners at market-related prices. In addition, it is recommended that provision be made for the payment of a solatium on the value of the property, to the value of 10% of total consideration amount if the consideration amount does not exceed R100 000, 5% if the consideration does not exceed R100 000, 3% if the consideration does not exceed R500 000 and 1% if the consideration exceeds R1million.	EPCM	Transnet	
b	GEN	**Continued use of land within the servitude:** Most farming activities can still take place over the servitude; farmers would therefore continue to have the benefit of the land.	EPCM	Transnet	
c	GEN	**Loss of crops and grazing land:** The approximate extent and value of crop and other obvious losses should be quantified by a certified valuer, based on substantiated information assuming a certain proportion of standing crops at the time of construction. Compensation should be calculated as the full value of any losses incurred by the farmer. If it can be clearly established that there was opportunity for cultivation lost because of construction activities, compensation for uncultivated fields will be reviewed on this basis.	EPCM	Transnet	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
d		**Loss of rooigras veld:** The value of compensation for the loss of rooigras veld will include provision for reestablishment, where practical.	EPCM	Transnet	
e		**Disruption of planting cycles:** The following mitigation measures are recommended: • Transnet is to advise farmers to continue with normal farming activities, as they will be compensated for any loss they may incur due to crop damage through construction, whatever the stage of production at the time construction commences.	EPCM	Transnet	
f		• If feasible, construction should be planned in such a way that construction activities occur outside of the critical agricultural phases. • A clear and efficient communication channel must be established between the construction management team and all affected farms. • Farmers should be provided with adequate notification of the construction schedule. • The construction contractor must make every effort to keep to the prior arranged and communicated schedules.	CTR	EPCM	
g		**Disproportionate impact on small properties, and fragmentation of farm land:** Wherever possible, the trunkline route should be aligned to avoid small properties where a large proportion (more than a pre-determined %) of the property would be temporarily lost to the servitude, and also to avoid the creation of small, unusable residual pieces of land cut off from the remainder of a farm. Alternatively, full compensation must be paid, determined by a certified valuer.	EPCM	Transnet	
h	GEN	**Loss of deep-rooted crops:** Where possible, the trunkline route should be aligned so as to avoid cutting through orchards or plantations. Where this is not practical, the compensation principles outlined above for the loss of land and the temporary loss of crops will also apply to the permanent loss of trees.	EPCM	Transnet	

2.18.2 Loss of Soil Productivity

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	Rigorous soil management and erosion prevention and management principles as outlined in this EMP are to be adhered to at all times.	CTR	EPCM	
b	GEN	**Servitude agreements:** • The land owner has the right to specify and negotiate conditions related to the	EPCM	Transnet	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		pipeline construction into the servitude agreement with Transnet under 'Special Conditions' • Landowners are to be informed by Transnet's servitude negotiators that landowners have the power to negotiate servitude agreements. • A sign-off system should be implemented between the Contractor and landowners, and retention payments to the Contractor be tied to sign-off on servitude agreements. • Compensation payments for agreed construction damages should not be withheld from the landowner in cases where the landowner is not willing to sign off rehabilitation and re-instatement activities.			
c		**Pre- and post-construction audits:** The following measures are recommended: • A fixed-point photo survey should be undertaken, and soil tests be conducted at regular intervals along the route before and after construction as defined by the ECO. This should be undertaken by specialists if required;. Areas where fertiliser is required to improve soil productivity should be identified on the basis of soil tests.	CTR	EPCM / ECO	
d	GEN	**Reduction in the quality of grazing land:** A similar approach must be adopted as for the loss of crops: • Compensation must be paid to the value of grazing land that is lost to construction. • After construction , the disturbed area of veld should be fenced for at least two seasons subject to agreement with the farmer/landowner to allow the veld to re-establish itself before livestock is re-introduced, while ensuring that the farmer has access to other parts of the farm traversed by the fenced-off area. • Where Themeda veld exists on a property the area affected by the construction servitude is to be estimated and the farmer is to be paid additional compensation for the assumed reduction in grazing capability after construction. A reasonable rate for compensation is to be calculated on the basis of the difference in price between range land which is semi-transformed and range land which is untransformed (pristine).	EPCM	CTR / ECO / Transnet	
e	GEN	**Game** • Maintain water supply to game farms in cases where watering points are cut of from the remainder of the farm during construction. • Discuss scheduling with landowners and where possible, accommodate requests which avoid construction during peak hunting season.	CTR	EPCM / ECO	
f		• Where the above stated is not possible, the game farmer is to be compensated for any demonstrable loss of income that will be incurred due to lost sales, based on records of previous 2 years.	EPCM	CTR / ECO / Transnet	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
g	GEN	**Irrigation Systems** • Where possible, the trunkline route should be adjusted to avoid impact on irrigation systems. • Compensation should be paid to farmers for disruption of or loss to irrigation systems that will include provision to re-establish or move the systems. • Where disruption of irrigation systems would result in inability to irrigate crops outside the construction servitude, the farmer is to be compensated to the full value of either being able to water such crops by alternative means until the irrigation system is re-installed, or for the full value of the standing crop should the crop be lost due to lack of irrigation.	EPCM	CTR / ECO / Transnet	
h	GEN	**Feedlots** • Pipeline construction may take place in close proximity (within a few metres) of a feedlot. Temporary relocation of the feedlot should be undertaken at Transnet's cost to a distance where cattle would not be stressed by the noise and activity of construction. • The landowner should be compensated for any loss of or injury to cattle during temporary relocation and returning cattle to the property. • Appropriate security measures should be provided to safeguard the cattle while in the temporary feedlot.	EPCM	CTR / ECO / Transnet	
i	GEN	**Impacts on water sources, water pipelines and electricity lines** • The pipeline should be rerouted wherever possible to avoid impacts to water sources on farms. Where this is not possible, the source of water should be rehabilitated to the same condition as prior to the impact, if the latter is not possible Transnet should compensate the landowner to the extent of being able to replace the volume of water from such a water source. • Transnet's servitude negotiators should make it clear to landowners that landowners should detail all water sources, water pipelines, electricity lines and other such infrastructure under 'Special Conditions' in the servitude agreement. • All damages should be communicated by the Contractor to the landowner. • Any interruption of or damages to existing infrastructure should be fully repaired by the Contractor to the satisfaction of the landowner.	EPCM	CTR / ECO / Transnet	
j	GEN	**Loss of access to land and roads** • Once the line has been pegged, and to make final decisions on access points, the Contractor should discuss access with landowners, their workers, tenants and other inhabitants. • Timetables of when access points would be blocked, provided elsewhere or shifted	CTR	EPCM / ECO	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		should be developed and communicated. • In the case of informal footpaths, a temporary, safe crossing point should be established at 500 m intervals. The dangers of construction should be well communicated to users. • In the case of roads, the placement of temporary crossings is to be decided in consultation with landowners to minimise disruption of people's movement patterns. • Landowners are to be consulted to identify essential access routes (e.g. access to cattle for feed or water). Once these are identified, construction activities are to be planned in such a way as to minimise disruption of these access routes, and where unavoidable, temporary access should be provided. • Where the Contractor requires access roads to the construction servitude, such access roads should be planned in consultation with the landowner, and follow the recommendations of the Natural Heritage Specialist Study. • Should a landowner wish to retain the construction access road, this should be granted. Where the landowner does not wish to retain the road, the road should be de-compacted and rehabilitated following the recommendations of the Natural Heritage Specialist Study.			
k	GEN	**Impact on farm workers and non-landowning tenants** • In cases where tenants lease parts of a farm from its owner, the lease should be terminated according to the conditions specified in the lease agreement. • In cases where labour tenants have acquired rights to parts of a farm, they should be compensated for the impact on their land in the same way as farm owners. • Where labour tenants are partly reliant on subsistence agriculture for food security, it may be necessary to provide additional support after the construction phase to ensure full re-establishment of agricultural production.	EPCM	CTR / ECO / Transnet	
l	GEN	Loss of *Themeda* climax grassveld: In grazing areas, the main risk relating to soil productivity is the potential loss of Rooigras (*Themeda triandra*). Rooigras is a climax grass with a high carrying capacity. A total of approximately 299 ha of Rooigras will be impacted by the proposed pipeline route. While the rehabilitation of the pipeline construction servitude to Rooigras may be achieved in some instances, in the view of the specialist team this cannot be guaranteed. In most cases, a more realistic assumption would be rehabilitation to semi-transformed vegetation consisting of a mix of pioneer and other seral species. The socio-economic consequences of this will be a decrease in the carrying capacity of the veld in these areas. An estimate of the loss in value is in the order of R2000 per hectare. While this does not result in large scale depreciation in value – a total of R598 000 for the entire pipeline route - it will represent a significant long term loss to individual stock farmers unless it is compensated for.	EPCM	CTR / ECO / Transnet	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		• Align the route to avoid climax Themeda grassveld wherever possible. • Determine the quality of grazing land and the area of Rooigras that will be affected on each landowner's property, based on the database prepared for the EIA. Use this as a basis for discussion with the landowner and for compensation calculations. • Rehabilitate areas of climax grassland to as high a standard as is reasonably practical, with a view to creating stable conditions, free of erosion and invasive plants, and encouraging the return of Themeda grassveld. Follow the principles set out in the Natural Heritage Erosion Study. • For the purposes of compensation, accept that Themeda cannot be re-established in the foreseeable future and compensate farmers who lose Themeda veld accordingly. It can be assumed that in all cases, a minimum of Mtshiki veld will be re-established on the pipeline construction right of way. Compensation rates are to be determined by an independent land valuer by establishing the difference in value between farms that are predominantly Mtshiki veld versus farms that are predominantly Themeda veld. The order of magnitude difference is expected to be in the range of R2000/ha. • Where stock is present in the camp, fence off the construction right of way for a period of up to two seasons in order to facilitate establishment of the vegetation. Where necessary, and based on negotiations with the farmer, provide access across the right of way.			
m	GEN	Transnet are to consider a reasonable increase in the negotiated value of compensation in those agricultural smallholdings where there is a risk of property depreciation. As far as possible, all property acquisition is to be based on Transnet's stated principles of willing buyer / willing seller, and expropriation is not to be considered except as a final resort when all other reasonable measures have been exhausted. Smallholdings are defined in the report as properties less than 2 ha and there are about 45 along the route.	EPCM	Transnet	

2.19 Community and Worker health management

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	The Contractor shall prepare and implement a programme to minimise the spread of HIV infection as a result of the construction contract. The programme shall be prepared with the assistance of a medical doctor with experience of HIV prevention and treatment. A typical programme would include, among other things, the implementation of the following measures: • An HIV/AIDS training course and on-going education on transmission of HIV/AIDS and STDs to employees, through workshops, posters and informal information sessions. • Undertaking an HIV/AIDS and STD prevalence survey amongst all workers on a regular basis through voluntary testing. • Encouragement of employees to determine their HIV status. • Supply of condoms at the project site. • Encouragement of the early treatment of STDs in employees, to minimise the risk of HIV infection. • Encouragement of early treatment and monitoring of secondary/opportunistic infections such as coughs, influenza and pneumonia. • Promotion of an HIV/AIDS stigma free environment by means of an open and non-discriminatory approach to the epidemic at all levels of employment. • Development of a comprehensive Construction Camp management plan including rules for on-site behaviour, entrance and exit policies, and prohibition of the sex worker trade.	CTR	EPCM	
b	GEN	The Contractor shall take appropriate steps to prevent the contamination of farmers' livestock with 'measles'. This would typically involve the administration of antihelminthics to contract employees for the control of tapeworm, as well as strict enforcement of the use of site mobile toilets to prevent contamination.	CTR	EPCM	
c	GEN	The Contractor shall ensure that his workers are treated for worms as well as any other infectious diseases or conditions that may be relevant to a specific region.	CTR	EPCM	
d	GEN	Where feasible the Contractor shall align his Community and Worker Health Programme with those of other organisations in the area (i.e. the Local Municipality etc.).	CTR	EPCM	
e	GEN	The Contractor shall ensure that sufficient recreation space is provided within the Construction Camp to facilitate the number of workers housed and shall provide entertainment facilities where possible. The Contractor is furthermore encouraged to provide	CTR	EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		shuttle transportation for workers to and from local entertainment venues and shall ensure strict adherence to Construction Camp entry and closing time procedures.			

2.20 Cultural Heritage

2.20.1 General

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	A Heritage Awareness Program must be initiated as part of the construction induction of the NMPP, which can take place as a series of toolbox talks and utilising a variety of other media, so that all persons are informed about the heritage sites that have been identified, and aware that future heritage artefacts may be found on-site. The Contractor is to ensure that his workforce is aware of the necessity of reporting any possible historical or archaeological finds to the EO or ECO.	CTR	EPCM	
b	GEN	The Contractor will be responsible to prepare a Heritage Management Plan which incorporates all information from the Heritage Specialist Studies and relevant provincial heritage resources authorities	CTR	EPCM	
c	GEN	Any finds of possible palaeontological, archaeological or historical significance identified during survey or construction must immediately be reported to the EPCM and Transnet in writing before any construction commences in the area.	CTR	ECO / EPCM	
d	GEN	Permits for the construction, destruction, damage or alteration of the heritage sites shall be obtained prior to such activities taking place.	ECO	CTR / EPCM	
e	GEN	Where relevant, the ECO's will be responsible to inform the relevant specialist consultant and local heritage resources authority as well as SAHRA, in order to be in compliance with the National Heritage Resources Act (Act 25 of 1999).	ECO	CTR / EPCM	
f	GEN	Discovered artefacts or any item of potential significance shall not be moved or tampered with under any circumstances until the necessary permits has been obtained by the ECO's	CTR	ECO / EPCM	
g	GEN	The Contractor will be responsible for the preservation of any finds (including existing documented heritage sites / graves) through the use of appropriate measures such as fencing of the area on instruction from the ECO/heritage specialist.	CTR	ECO / EPCM	

2.20.2 Palaeontological Sites

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
h	GEN	A palaeontology workshop shall be presented to the field managers and Contractor staff involved with the construction in order to sensitise them to the fossils that may be encountered en route. This is to enable them to contact the palaeontologist if anything of major significance is discovered and they need advice in how to continue.	EPCM	ECO / CTR	
a	GEN	Transnet shall appoint a qualified consulting palaeontologist, who is registered with SACNAS to advise and assist wherever fossils are encountered within the Construction Right of Way. Palaeontology awareness, as part of regular “toolbox” talks and by means of other appropriate media should be encouraged whereby key personnel are trained to identify items or palaeontological significance.	EPCM	ECO / CTR	
b	GEN	The ECO shall wherever fossils are encountered notify the palaeontologist, who shall apply for a permit from the South African Heritage Resource Agency (SAHRA) to salvage the fossils. According to the stipulations of the permit, with permission of the land owner, the palaeontologist shall collect (and excavate if necessary) fossils found on the route. These fossils must then be taken to, and stored at a recognised fossil repository as stipulated in the permit. It is acknowledged, by SAHRA, that in the case of palaeontological remains, the permitting of removal of fossils must often be post-facto.	ECO	EPCM	
c	GEN	The appointed consultant shall conduct a palaeontological surface survey after the pegging of the route has been completed in areas where fossils are known to occur. A Heritage Management Plan will be developed by the palaeontologist. It is recommended that this be done in sections, i.e. for individual or groups of construction spreads at a time. During this survey fossil localities shall be marked by means of a GPS and topographical map and after obtaining a permit from SAHRA, removed.	EPCM	ECO / CTR	
d	GEN + SS	The Contractor is notified of the fact that the section of the pipeline alignment from Howick to Heidelberg is palaeontologically significant. The Contractor shall take particular care in identifying plant fossils, of which leaf imprints is the predominant palaeontological feature, through the sections extending from Howick to Ladysmith and between Villiers and Heidelberg. Animal fossils have been found in: • Rosetta, • Bergville, • Van Reenen, • Harrismith and • Warden regions. Petrified tree trunks have been found in the • Tarkastad Subgroup in Harrismith, • Warden and	CTR	ECO / EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		• Van Reenen regions The Contractor shall implement any special precautionary measures that the palaeontologist may specify along these sections.			
e	GEN	Where possible the Contractor shall ensure that excavated material, in areas where plant fossils have previously been found, are left in undisturbed piles adjacent to the trench. The palaeontologist or assistant trained by the palaeontologist shall be allowed to collect any fossil-bearing material unhindered. This shall be done so as not to hold up the trenching operations. In the case of the plant fossils, the appointed palaeontologist should collect samples from the excavated material for storage at a fossil repository.	CTR	ECO / EPCM	
f	GEN	In the case of plant fossil sites, which shall be documented in the Heritage Management Plan, which normally are found in shales and are less sensitive to excavation than the mudstone where animal fossils may occur, the appointed palaeontologist should collect samples from the excavated trench material for storage at a fossil repository. Fossil wood is common in the sandstones of the escarpment and Harrismith region. Petrified tree trunks should also be removed with care and long sections will have to be excavated.	EPCM	ECO	√
g	GEN	In the case of animal skeletons, the fossils should be excavated by a suitably qualified palaeontologist with more care, using standard excavation techniques. Site visits along the Rosetta to Warden sections of the pipeline alignment should be done more frequently by a palaeontologist to assist in the removal of animal fossils.	EPCM	ECO	
h	GEN	The only major palaeontological obstruction that may be encountered is a palaeosurface. These are very scarce and of high scientific value and therefore irreplaceable. There are known palaeosurfaces to the east of Mooi River, but the possibility exists that others may be encountered. The appointed palaeontologist shall conduct a survey of areas of the pipeline route between Pietermaritzburg and Heidelberg where surface rock outcrops and where there is a possibility of palaeosurfaces being encountered. This survey should be done once the pipeline route has been pegged in the field by the project surveyors but before vegetation clearing takes place. In the event that a palaeosurface along the route is found, then slight realignment of the pipeline will need to be negotiated with the landowner or the surface must be removed, under the supervision of the palaeontologist, for safekeeping by a recognised heritage institution, after obtaining a permit from SAHRA.	EPCM	ECO	

2.20.3 Archaeological and Historic Sites

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	In Areas where the RoW is not fenced off, all archaeological and historical sites that occur within 100 meters of the centre of the Construction Right of Way shall be demarcated and fenced so that they are clearly visible and shall be pointed out to all construction workers by the EO or resident archaeologist.	CTR	ECO / EPCM	
b	GEN	In General all sites of archaeological and historical sites that occur within the Construction RoW or any other construction site, shall be demarcated and fenced	CTR	ECO / EPCM	
c	GEN	A Heritage Specialist shall be appointed by Transnet to develop a Heritage Management Plan. This plan will be issued to the Contractor for reference.	EPCM	ECO	
d	GEN	All such sites shall be photographed and measured before construction takes place as directed by a heritage specialist.	EPCM	ECO	
e	GEN	Buildings, stone walling, and other features may only be damaged if mitigation as prescribed by the ECO or resident archaeologist occurs and if duly permitted by the relevant Heritage Conservation authority.	EPCM	ECO / CTR	
f	GEN monitoring	On-site supervision during the construction phase reserves the right to 'circumvent construction' in a specific area where material may need to be salvaged. 'Circumvent Construction' will mean that work can continue further along the pipeline until the salvage operation is complete.	ECO	EPCM / CTR	
g	GEN	Some sites extend over a large area. If a currently undiscovered portion of the site is affected, the entire site should be mapped to obtain all the information of importance so a true assessment of the site can be undertaken. Trial sections of trench should be dug beforehand (and in the presence of a suitably qualified archaeologist) in sections of the alignment where it is anticipated that additional sites of significance may be encountered, so that these may be discovered before the construction train reaches these areas.	EPCM	ECO	
h	GEN	Mapping and/or excavating sites must where possible be undertaken during the winter or early summer months when grass and/ or vegetation are not too dense. Grass shall otherwise be cut in order for sites to be properly mapped.	EPCM	ECO	
i	GEN	Visual impacts from pipeline markers along sections of the alignment that have been identified as being of historical or heritage significance must be counteracted by laying the markers flat on the ground and pointing in the direction of the next marker.	CTR	ECO / EPCM	
j	GEN	In some instances excavating and mapping a site prior to disruption would be a preferable form of preservation of the heritage site. In this way information is not lost but rather recorded for future use.	EPCM	ECO	

2.21 Safety and Emergency Planning and Response

2.21.1 Emergency Preparedness

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	The Contractor shall develop an Emergency Plan that will enable rapid and effective spill response as well as to all other expected types of environmental emergencies, in accordance with recognised international standards and as per the tender requirements and conditions of contract.	CTR	ECO / EPCM	√
b	GEN	The Emergency Plan shall in accordance with the National Environmental Management Act (Act 107 of 1998) Section 30(3) notify the Director General, the relevant provincial head of the Department in which the incident occurred, the local municipal authorities and police, traffic police, fire departments, local medical and ambulance. Further measures should include the establishment of a network of communication between the Contractor and farmers associations, conservancies, farmer neighbourhood watches, etc. Where emergency incidents related to water resources occur such shall be reported to the above agencies as well as DWAF, in accordance with Section 20 of the National Water Act (Act 36 of 1998).	CTR	ECO / EPCM	
c	GEN	The Emergency Plan shall be submitted to the Project Manager for approval, who must in turn consult with the Environmental Manager and various consulting project engineers for their inputs and approval.	CTR	ECO / EPCM	
d	GEN	The Contractor shall test emergency preparedness with drill operations and shall review drills, conduct mock emergencies and remedy shortcomings to ensure a high level of emergency readiness to deal with environmental and third party incidents. The Contractor shall submit a concise but thorough summary report of each emergency response drill held, to the Project Manager for record keeping purposes. All emergency preparedness drill and reporting procedures shall comply with the requirements of the Occupational Health and Safety Act (Act 85 of 1993).	CTR	ECO / EPCM	
e	GEN	The Contractor's Emergency Plan must make specific contractual provision for a major spill of any hazardous material, where either substantial environmental damage or potential danger to members of the public or his construction workers is possible. Service level agreements with suitably qualified and experienced specialist cleanup and rehabilitation contractors must be built into the plan, so that in the event of a major incident occurring, immediate and effective response will be possible.	CTR	ECO / EPCM	

2.21.2 Fire Prevention and Management

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	The Contractor shall prepare a Fire Prevention and Fire Emergency Management Plan as a part of the Environmental Plan to be submitted to the Project Manager prior to establishment on site. The plan shall include, but not be limited to, the following: • Sources of fire risk; • Measures to comply with any requirements of local authority fire departments; • Measures to minimise the risk of accidental veld fires caused by any activity related to the works; • Measures to control an accidental veld fire.	CTR	ECO / EPCM	√
b	GEN	The Fire Prevention and Fire Emergency Management Plan shall outline all necessary precautions to prevent the ignition of veld fires, caused either deliberately or accidentally as a result of the work being performed. This plan should also outline precautions to prevent construction teams from being trapped by runaway veld fires.	CTR	ECO / EPCM	
c	GEN	The Contractor shall provide adequate fire fighting equipment at specified localities on any construction site and Construction Camp, to meet any emergency resulting from ignition of a veld fire. This equipment should include, but not be limited to, fire extinguishers, fire resistant clothing for fire fighters and fire fighting flails.	CTR	ECO / EPCM	
d	GEN + SS	The areas of commercial plantations as well as agricultural cropland through which the pipeline is routed are particularly sensitive to fire hazard and fires will result in substantial financial loss to the affected landowners. The Contractor shall strictly comply with all fire management requirements set by the owners of these plantations. The Contractor may expect that hot work will be strictly halted under specified meteorological conditions. Certain “low risk” hot works such as welding and oxy acetylene flame work may be carried out under windy conditions, provided that a fire watchman with appropriate and adequate fire fighting equipment be on standby at all times when such work is being carried out.	CTR	ECO / EPCM	
e	GEN	The Fire Prevention and Management Plan shall in accordance with the National Environmental Management Act (Act 107 of 1998) Section 30(3) notify the Director General, the relevant provincial head of the Department in once any incidents occurred, the local municipal authorities and police, traffic police, fire departments, local medical and ambulance. Further measures should include the establishment of a network of communication between the Contractor and farmers associations, conservancies, farmer neighbourhood watches, etc.	CTR	ECO / EPCM	

2.21.2 Health and Safety Management

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL MANAGEMENT REQUIREMENT	Main Responsibility	Support	Method Statement / Procedure
a	GEN	A Health and Safety plan must be drawn up by the Contractor that is in accordance with the Occupational Health and Safety Act (Act 85 of 1993) and all other relevant legislation and best practice standards and which must be accepted by Transnet.	CTR	ECO / EPCM	√
b	GEN	The Health and Safety plan as well as conduct on site must be in accordance with all applicable legislation and standards, notwithstanding any of the requirements specified in this EMP.	CTR	ECO / EPCM	

2.22 Hydrotesting

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	Once the details of the proposed hydrotesting programme have been established, the Contractor must develop a treatment programme for the water at each site, prior to disposal. Record must be kept of this programme, with treatment methods and, where necessary, specific test results supporting the methods. This information must be made available on request from the Department of Water Affairs and Forestry (DWAF). All relevant permits/authorisations must be obtained prior to abstraction or discharge of water.	CTR	ECO / EPCM	√
b	GEN	The following specific recommendations are made to manage the impact of NMPP trunk line hydrotesting: • Exercise caution when selecting a water source and verify that the quality of the water is such that, in itself, it does not present a disposal problem in another environment (eg: high salinity, SRB presence, sewerage effluent, etc). • Design the quantity of oxygen scavenger on a stochiometric basis plus a small residual - excessive addition of scavenger does not improve corrosion control, but does increase TDS. Excess oxygen scavenger is readily deactivated by aeration, and the water is readily re-oxygenated by the same method. Disposal water is to be re-oxygenated before release into natural ecosystems • If disposal into an aquatic ecosystem is considered, increased concentrations of Zn, Cu and Mn are to be considered and may warrant further investigation of the ecosystem tolerance and site specific conditions of the waterway used for disposal. • Consider contaminant levels in the disposal water in the context of the local aquatic ecosystem prior to discharge. While the contaminant levels are generally not toxic and do not contain significant levels of plant or aquatic nutrients, turbidity tends to increase due to iron compounds introduced into water by hydrostatic testing. This is not a significant risk to land or marine ecosystems and can be readily managed, but it may need to be managed in order to avoid a reduction in light transmission and any detrimental impact to aquatic life. • If flushing is used to pre-clean the pipeline, special consideration needs to be given to the disposal of flushing water. Although of small volume, flushing water may contain higher levels of contaminants than test water. • If the source water is heavily contaminated, or if the water must be treated with	CTR	ECO / EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		biocide, the foregoing conclusions are not relevant, and project-specific testing, including eco-toxicity testing, is required to determine the contaminant level and the treatment process.			
c	GEN	It is further recommended that a monitoring programme be implemented before, during and after the pipeline testing procedure. The monitoring programme should comprise the following: • Chemical sampling. The ecological assessment should be complemented with analyses of chemical grab samples.	CTR	ECO / EPCM	√

2.23 De-Commissioning of Construction Facilities

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL MANAGEMENT REQUIREMENTS	Main Responsibility	Support	Method Statement / Procedure
a	GEN	Once the construction phase has been completed all temporary Construction Camps and other infrastructure is to be completely dismantled and the entire area completely rehabilitated. All physical structures are to be removed, and where possible materials should be recycled, re-used or given to locals or adjacent landowners for their use.	CTR	ECO / EPCM	√
b	GEN	All waste must be removed to appropriate licensed waste disposal facilities.	CTR	ECO / EPCM	
c	GEN	No polluted soil or remnants of concrete batching may remain once the area has been vacated by the Contractor.	CTR	ECO / EPCM	
d	GEN	The Construction Camp site shall be rehabilitated to resemble the natural topography as closely as possible.	CTR	ECO / EPCM	
e	GEN	All compacted areas are to be ripped, levelled and re-vegetated. All erosion damage that may have occurred will be repaired and made good. Wetland areas will be rehabilitated as directed by the Wetland Specialist employed by the developer (Transnet).	CTR	ECO / EPCM	
f	GEN	Rehabilitation of such sites will not be deemed complete until the ECO has indicated that rehabilitation is sufficient and sign-off from both Transnet and landowner has been received.	CTR	ECO / EPCM	

3 Construction Phase – Monitoring and Auditing

3.3 General

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	The ECO's shall monitor and inspect the Contractors' written records to demonstrate compliance with this EMP, and the Contractor shall make available each record for this purpose.	ECO	CTR / EPCM	
b	GEN	The ECOs shall undertake audits to assess the Contractor's compliance with the EMP. Intensive auditing may be anticipated for sensitive sections of the route such as river and stream crossings, game ranches and the pristine sections of the route. The Contractor shall participate in the environmental audits, and shall answer questions and provide information as the ECOs may require.	ECO	CTR / EPCM	

3.4 Water Analysis

3.4.1 Point Source (waste water released from a specific point)

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	Point source water monitoring standards and practices are to be implemented in all areas where waste water is released into the environment at a specific source.	CTR	ECO / EPCM	
b	GEN	Sampling should take place on a regular basis, approximately once a week where there is a regular flow of discharge into the environment. If testing can not take place due to no discharge being released this should be recorded.	CTR	ECO / EPCM	
c	GEN	Water from external sources such as the municipal water supply system and boreholes may be monitored from time to time to provide a set of baseline data to compare samples to. This is to determine exactly what the impact of the water use activities are on the quality of the discharge.	CTR	ECO / EPCM	
d	GEN	The exact location and regularity of monitoring points is to be agreed by the environmental representatives of the Contractor and the ECO's and must be documented.	CTR	ECO / EPCM	
e	GEN	Records of all sampling locations and data should be kept and submitted to Transnet on a Monthly Basis.	CTR	ECO / EPCM	
f	GEN	As a general rule, parameters to be measured are to comply with the "General Limit" as presented in the DWAF Water Quality Standards and Guidelines	CTR	ECO / EPCM	

3.4.2 Diffuse Source Water

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	Diffuse source water testing is recommended for areas where disturbance to a water body or course has been the direct result of construction activities.	CTR	ECO / EPCM	
b	GEN	This monitoring should be undertaken both up and down stream of the construction works to enable the results to be compared. The up and down stream samples are to be taken during the same monitoring period each time so that they can be compared. Sampling points are to be identified and agreed with the Engineer and should be situated approximately 50m upstream and 50m downsteam of the project activities. The same sampling points should be used each time sampling is done. The location and frequency of sampling must be agreed with the ECO;s and records of all sampling data must be kept and submitted to Transnet.	CTR	ECO / EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
c	GEN	It is further recommended that in conjunction with this monitoring fixed point photographs are taken to record changed in the stream over time. These are also to be used for rehabilitation of stream crossings after construction activities haven ended.	CTR	ECO / EPCM	

3.4.3 Sampling Protocols

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	The Contractor will prepare a Sampling Protocol as part of the Monitoring Method Statement for review and acceptance by Transnet.	CTR	ECO / EPCM	√
b	GEN	**Method A:** The bottles are all numbered with permanent markers to identify where the samples were taken. Stickers may become wet or peel off, thus potentially confusing to the person required to do the testing.	CTR	ECO / EPCM	
c	GEN	**Procedure:** • 250 ml plastic sample bottles will be rinsed using clean water • The sample bottles will then be rinsed using sample water from the sampling site • Samples are to be taken as close as possible to the centre line of the river. These sites are to be used as fixed sampling sites for the duration of the contract • The bottles must be submerged below water level to allow for the water to enter the bottles and to circulate, ensuring foreign objects are not trapped up in the bottled but are allowed to escape. • The bottle is immediately capped and the outside dried • The relevant information is recorded onto the monitoring sheet • The samples are placed in a box, kept cool and outside of direct sunlight and transported to the lab • It is then placed in a cooler box and maintained cold and transported to a suitable laboratory within 24 hours of collection • The results of which are submitted to the engineer and entered into the data base	CTR	ECO / EPCM	
d	GEN	**Method B: Monitoring is conducted in the field using hand held monitoring equipment.** These tests include diffuse monitoring in the river, whereby samples are taken at four equi-distant points across the river channel, fifty meters above and below the feature / monitoring site or disturbance. The tests are required for the settlement pond/s, sewerage retention pond/s, dewatering operation/s and all those areas contaminated by construction activities on	CTR	ECO / EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		site.			
e	GEN	**Procedure** • All handheld equipment will be calibrated at a regular basis to ensure accurate results are being achieved. • The samples sites will be at the same location to maintain accurate data collection. • It will be attempted to conduct the sampling at the same time each day to relay similar results • Probes will be placed and not thrown in the water, to ensure no damage to the equipment • Readings will be transferred at the sampling location to the data collection sheet • These readings will be captured on the data base to be submitted to the Engineer	CTR	ECO / EPCM	
f	GEN	Sampling sites The point source monitoring is to occur where effluent is emanating from settlement ponds, sewerage treatment works, batch and crusher plants, washing areas and any other area where water or effluent is discharged into the environment. The water will be monitored as agreed with the ECO's	CTR	ECO / EPCM	

3.5 Noise Monitoring

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	The Contractor shall prepare a noise monitoring procedure.	CTR	ECO / EPCM	√
b	GEN	Noise monitoring shall be carried out using integrated sound level meters the calibration certificate of which shall be attached to this document once the unit is available.	CTR	ECO / EPCM	
c	GEN	Noise monitoring shall respect the following requirements: • Monitoring is to take place at points of impact where there is expected to be disturbance to the public or landowners form construction activities and at worksite boundaries if applicable; • Monitoring points are to be agreed with the ECO's on site and are to be recorded and referenced properly. • This data will be submitted to Transnet on a monthly basis.	CTR	ECO / EPCM	
d	GEN	Noise baselines: • Baseline noise monitoring shall be conducted so that the real Impact caused by construction activities could be effectively measured; • Baseline noise monitoring should take place for at least 2 weeks but preferably 1 month prior to construction activities in an area and should continue for at least 2 weeks but preferably one month after the major construction activities have ended.	CTR	ECO / EPCM	
e	GEN	Monitoring along the construction activities: • During construction activities noise levels are to be monitored at all points as agreed with the ECO's at least once per week. • The monitoring points are to remain constant and are to be monitored during a variety of times during working hours. • These periods are to be times during which construction activities are taking place and should not fall over lunch breaks, on public holidays or other periods of reduced activities. • Data recorded is to reflect the ambient average noise level for the monitoring period. • The data is to reflect the ambient average noise level for the monitoring period. • The data is to be recorded onto field data sheets and is to be captured on a central database. • The reporting of all noise monitoring data is to be done via the relevant reporting	CTR	ECO / EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		channels to Transnet.			
f	GEN	Calibration certificates are to be provided for all new equipment and regular field calibration is to be done as per the manufacturer's specifications. These calibrations are also to be recorded on a register.	CTR	ECO / EPCM	
g	GEN	The measurement and rating of environmental noise with respect to land use, health, annoyance and to speech communication shall be as per SANS 10103:2004. The contractor is to monitor noise in relation to the type of area in which activities are taking place.	CTR	ECO / EPCM	

3.6 Dust Monitoring

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	The Contractor is required to implement a dust management programme, the aim of which is to ensure that the air quality on site does not impact negatively on the health or environment of the persons, animals and plants that are living and working in close proximity to the construction activities. The primary purpose of the dust management programme is to be able to measure the efficiency of the dust management programme. As dust is an immediate problem which results in loss of visibility "at the present moment" so visual monitoring of dust conditions is considered to be the most effective means of monitoring this.	CTR	ECO / EPCM	
b	GEN	Should there be areas where the management of dust suppression is not effective it is recommended that a quantifiable system is implemented. • The Contractor shall agree with the ECO's the areas of greatest importance in terms of managing dust on site. • A number of meters for measurement of dust are to be placed thought the works areas during the work activities. • As far as possible dust monitoring stations will be active for at least 1 month prior to the onset of construction in the dry season in areas as directed by the ECO's. • The meters will be placed in representative areas in such a way that they will not be impacted on by construction activities. • The location of the meters is to be agreed based on the closest points of impact such as schools, houses, dangerous bends on roads and at businesses. • The meters will collect fall out dust either in a single bucket unit or in a directional dust collection device with four removable dust collection cups. • The agreement of the preferred collection device for each area is to be agreed on site with the ECO's. the determination of this will be based on the potential dust sources. • In areas where dust is from sources other than construction are expected the directional meters are recommended. • All meters are to be at a height of 2m above the ground and are to be firmly planted or weighed down to prevent wind damage. • Monthly collection of the samples is to be done. • Where readings are unacceptably high the areas will be classified as a hot spot and weekly monitoring may be advised until such time as the dust problem has been	CTR	ECO / EPCM	

<table>
<tr><th>ITEM NO.</th><th>GENERAL/ SITE SPECIFIC</th><th>MITIGATION MEASURES</th><th>Main Responsibility</th><th>Support</th><th>Method Statement / Procedure</th></tr>
<tr><td></td><td></td><td>rectified.</td><td></td><td></td><td></td></tr>
<tr><td>c</td><td>GEN</td><td>The classification of dust levels is indicated in the table below and is based on the Department of Environmental Affairs and Department of Minerals and Energy definition of dust levels.

<table><tr><th>Dust level</th><th>Quality)g/m²/day)</th><th>Action required</th></tr><tr><td>Slight</td><td>> 250</td><td>No additional action</td></tr><tr><td>Moderate</td><td>250 to 500</td><td>Investigate cause of increase and upgrade dust management efforts with water carts</td></tr><tr><td>Heavy</td><td>500 to 800</td><td>Increase dust management efforts with water carts or binding agents</td></tr><tr><td>Very heavy</td><td>800 to 1200</td><td>Use of additional agents for dust management</td></tr></table></td><td>CTR</td><td>ECO / EPCM</td><td></td></tr>
<tr><td>d</td><td>GEN</td><td>Areas considered to be “active areas” where dust can be expected include:
All areas were trenching, drilling, blasting and backfilling are taking place.
Where the above activities are taking place including areas were hauling is actively being undertaken.
Note that rehabilitation areas are not considered to require monitoring.
It is also noted that other material will from time to time skew results. This other material includes ash from veld fires, sand, grass and other seeds.
These will not be totally eliminated by the design of the meters and the interpretation of the results are to take these factors into account</td><td>CTR</td><td>ECO / EPCM</td><td></td></tr>
</table>

4 Post-Construction / Operational Phase– Monitoring and Auditing

4.1 Re-establishment of livelihoods in poor communities

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a		Transnet shall monitor the re-establishment of the livelihoods of all households in the traditional authority areas and other areas that are affected by temporary disruption of farming production due to construction of the trunkline. The monitoring indices shall be finalized once the inventory or resources that will be affected during construction has been completed (refer Section 2.20.3 above). Monitoring shall be continued for a period of 5 years after construction.	Transnet		√
b		Aspects to be monitored as part of this monitoring programme shall include the condition of soils and crops, as well as progress and results of livelihood restoration activities (to be assessed using standard Input-Output-Outcome-Impact methodology), The activities and findings of the monitoring and evaluation programme shall be documented in reports at regular intervals (e.g. yearly). These reports shall document the effectiveness of management measures designed to minimise the long-term impact of the project on the livelihoods of poor rural communities, as well as problem areas and remedial actions proposed.	Transnet		

4.2 Monitoring of Rehabilitation

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	Pipeline	A detailed post-construction rehabilitation monitoring plan shall be developed which includes all monitoring required to evaluate the success of rehabilitation along the trunkline right of way and to specify remedial measures, where necessary. The monitoring shall be undertaken along the trunkline for a minimum of 5 years, whereafter the programme may be modified or discontinued, being replaced by standard maintenance management of the servitude in some or all areas of the right of way.	Transnet		√

4.3 Monitoring of River Crossings

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	SS	A baseline SASS-5 inventory / survey is to be carried out at all major river and stream crossings as identified in this EMP (3rd to 6th order) before construction activities commence. This survey is to include an assessment of the occurrence of fish and aquatic invertebrate species and shall be compared with post-construction surveys carried out for the same sections. The post-construction surveys shall be carried out twice per year initially, and annually thereafter, as recommended by a suitably qualified aquatic ecologist. The annual surveys shall be carried out for a period of 3 years after construction, following which SASS-5 monitoring may be discontinued at all of the streams where, in the opinion of the aquatic ecologist, the crossings have fully stabilized. Continued monitoring of the other streams shall be as determined on the recommendation of the aquatic ecologist.	EPCM	Transnet / CTR / ECO	

5 Design and Operational Phase

The environmental management requirements detailed in this section include both activities that will need to be conducted during the design and operation of the project.

5.1 Site Locations of Facilities

<table>
<tr><th>ITEM NO.</th><th>PROJECT COMPONENT</th><th>MITIGATION MEASURES</th><th>Main Responsibility</th><th>Support</th><th>Method Statement / Procedure</th></tr>
<tr><td>a</td><td>Trunkline</td><td>The Final EIA Route for the trunkline, as specified as Shape File DNR_JMP_200908 shall be implemented, except in cases where changes can be motivated on the grounds of landowner reluctance or refusal to grant servitudes or any other material grounds that have a proven safety, ecological or cultural advantage, to the satisfaction of Transnet's EPCM team including the environmental manager.</td><td>EPCM</td><td>Transnet</td><td></td></tr>
<tr><td>b</td><td>Trunkline</td><td>Any route changes required after the Construction Team reviewed the Servitude which is made subsequent to the Final EIA Route (and the route changes described in item d) below, shall be fully documented, and shall be verified as acceptable by the EPCM if within the 1000m approved corridor (Thus a deviation of more than 500m from the EIA Final Route)</td><td>CTR</td><td>EPCM / ECO</td><td></td></tr>
<tr><td>c</td><td>Trunkline</td><td>If any route changes made subsequent to the Final EIA Route falls outside the 1000m corridor approved as part of the Environmental Authorisation, Amendment Applications shall b e communicated to the relevant Authority which could include additional specialist ecological consultant or cultural historian input as required.</td><td>EPCM</td><td>Transnet</td><td></td></tr>
<tr><td>d</td><td>Trunkline</td><td>The four route changes at river crossings that have been recommended subsequent to the Final EIA Route (the EIA Final Route as published in Appendix 12-1 and Appendix 12-2 of the FINAL EIA, Shape File DNR_JMP_200908) shall be incorporated in the route design. Precise river crossing locations shall only be finalized only after the geotechnical surveys at rivers have been completed, but the general location of the following crossings, as the basis for the geotechnical investigation, shall be altered as follows:

<table><tr><th>River</th><th>Approximate Realignment</th></tr><tr><td>Mpushini</td><td>30 m downstream</td></tr><tr><td>Bushmans</td><td>400 m upstream</td></tr><tr><td>Tugela</td><td>50 m downstream</td></tr><tr><td>Venterspruit</td><td>20 m upstream above bridge (or alternative stabilization)</td></tr></table></td><td>EPCM</td><td>Transnet</td><td></td></tr>
<tr><td>e</td><td>Inland Terminal</td><td>The revised location for the Inland Terminal, as illustrated in Figure 7-8 in the Final EIA, should be implemented in preference to the original layout.</td><td>EPCM</td><td>Transnet</td><td></td></tr>
</table>

5.2 Risk Management

5.2.1 General

ITEM NO.	PROJECT COMPONENT	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	All	Transnet shall operate the pipeline in accordance with the standards of a recognised international Code of Practice for the Operation and Maintenance of Pipelines, such as the American Society of Mechanical Engineers (ASME).	Transnet	EPCM	
b	All	Transnet shall implement a recognised environmental management system for the project for the management of environmental impacts associated with the operation of the pipeline.	Transnet		√
c	All	Transnet shall prepare a Maintenance Plan for the operation of the pipeline. This plan shall meet the requirements of ASME B31.8 and shall include, but not be limited to, the following: • Detailed instructions for employees covering maintenance procedures for the pipeline during normal operations and repairs. • Details of pipeline surveillance requirements including methods, personnel frequency and record keeping. • Particular reference to those portions of the pipeline presenting the greatest hazard to the public in the event of an emergency or because of extraordinary maintenance requirements. • Procedures for monitoring of the pipeline for evidence of accelerated erosion or invasion of the servitude by noxious weeds during the rehabilitation period.	Transnet		√
d	Pipeline	Transnet shall establish an ongoing programme of communication and education within the various affected communities around the terminals, pump stations and trunkline to ensure that people are aware of risks associated with the pipeline so as to prevent the digging of pit latrines or other excavations over the pipeline.	Transnet		
e	Pipeline	Transnet shall enhance the safety of the trunkline through the commercial, industrial, urban, suburban and peri-urban areas (eThekwini and environs, Umlaas Road to Howick) by on-going education of local authorities and communities on the risks of, and precautions to be taken.	Transnet		
f	Pipeline	Along the entire length of the trunkline, on-going surveillance must be undertaken of pipeline integrity particularly with respect to erosion and scouring, and especially from the foot of Griffins Hill, across the Tugela Basin, up the Low Drakensberg at Van Reenen and across the eastern Free State to Vrede.	Transnet		

5.2.2 Trunkline – Quantified risk Assessment Mitigation

ITEM NO.	PROJECT COMPONENT	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	Pipeline	Risk reduction is to be effected along those sections of the pipeline where sensitive developments exist within defined risk isopleths, as determined by Core Risk (Pty) Ltd, and where risk mitigating measures are thus required. These requirements are detailed in the following document: ***Risk Review and Evaluation NMPP Trunkline, 2684358-B-PL1-RM-RP-011***	Transnet	EPCM	
b	All	Transnet shall comply with all statutory requirements for hazardous installations	Transnet	EPCM	
c	Pipeline	Transnet shall implement the mitigation described in Table 10-13 in the Environmental Impact Report (EIR) (**Annexure C**) to ensure that the risks associated with the pipeline are reduced to levels considered to be acceptable according to the Risk Review and Evaluation NMPP Trunkline 2684358 B-PL1-RM-RP-011 system.	Transnet	EPCM	
d	All	Transnet shall conduct a recognised Process Hazard Analysis (HAZOP, FMEA) for the proposed pipeline prior to construction. This is to ensure that all design and operational hazards have been identified and adequate mitigation put in place. It would be preferable if the study could be facilitated by an independent party who cannot benefit financially from offering services, equipment or instrumentation for the project.	Transnet	EPCM	
e	Pipeline	As part of the HAZOP, Transnet should assess the reduction in risk caused by the recent proposals for sections of Horizontal Directional Drilling (HDD) in eThekwini.	Transnet	EPCM	
f	All	Transnet shall prepare a safety document detailing safety and design features that would reduce the impacts from fires, explosions and flammable atmospheres and issue to the HAZOP assessment body at the time of the HAZOP assessment. The built facility can be audited against the safety document to ensure compliance with the EIA Authorisation. Codes such as IEC 61511 can be used to achieve these requirements. Transnet and their contractors must demonstrate that sufficient mitigation has been included in the designs to ensure the safe continued operation of the pipeline.	Transnet	EPCM	√
g	All	Transnet shall finalise emergency response documentation to ensure appropriate preparedness to deal quickly and effectively with spillages that have the potential to impact significantly on the health and safety of surrounding communities.	Transnet	EPCM	√
h	Pipeline	The leak detection system of the trunkline must be regularly maintained to ensure continuous functionality.	Transnet		
i	Pipeline	In addition to the design, construction, operation and maintenance of the pipeline as well as the electronic monitoring devices (ATMOS Leak Detection, pressure and flow monitoring etc), patrols as per the ASME B31.4 Code of 2006 must take place at intervals as specified in that Code or as agreed to with the regulating authority (NERSA). Quarterly foot patrols along the pipeline of one (1) kP length must take place opposite to sensitive groundwater areas such as existing boreholes situated within 500 m of the pipeline servitude and in the	Transnet		

ITEM NO.	PROJECT COMPONENT	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		groundwater flow direction that are used for the supply of potable groundwater to the farming activities, whether domestic consumption or irrigation. In the event of a leak being detected during these patrols, Transnet shall immediately activate their emergency plan and notify the relevant authorities within 24 hours of such an incident.			

5.2.3 Trunkline – Ecological Risk Assessment

ITEM NO.	PROJECT COMPONENT	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	SS	Transnet shall consider decreasing the interval between block valves installed along sections of the pipeline with a higher risk of environmental damage (i.e. Island View to Howick and especially from chainage 0 to 50 kP) due to third party interference. The interval distance in such instances shall be finalized by means of the Quanititative Risk Assessment (QRA) study on a case-to-case basis by a qualified risk assessor, the project engineer in consultation with Transnet, an experienced ecologist and any other party deemed relevant.	Transnet	EPCM	
b	GEN	The design and positioning of block valves shall ensure that they are accessible under worst case scenarios, such as 1:100 year flood conditions.	Transnet	EPCM	
c	GEN	The placement of block and check valves specified in NMPP Alliance report 'Valve Location Report for the DNR-JMP Trunkline' (Doc. No. 2684358-J-PL1-PL-RP-002) shall not be modified except on the basis of a Quantitative Risk Assessment.	Transnet	EPCM	

5.2.4 Coastal Terminal – Quantified Risk Assessment

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a	GEN	All Emergency Plans and Procedures developed by Transnet must be compiled to deal with the potential incidents outlined in the independent specialist risk assessments and other potential emergencies identified as part of the Transnet Risk management policies and procedures.	Transnet	EPCM	√
b	SS	The on-site emergency plan at the Island View Terminal TM1 will have to be compiled to enable it to fit into the Cutler Projects emergency plan for the entire Island View Complex. It is important that the Cutler Project are consulted to ensure that they can provide the necessary levels of fire fighting capability for the additional risk brought by the Transnet Island View Coastal Terminal.	Transnet	EPCM	√
c	SS	The potential consequences of the incidents identified in this assessment should be discussed	Transnet	EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		with the Cutler Project and the eThekwini Fire and Disaster Services who would be expected to render emergency services to the Terminal. The Transnet Coastal Terminal, if it will be established at Island View would also have to be integrated into the Cutler Projects fire fighting systems. The latter is to be upgraded as required in order to have sufficient capacity to deal with risks identified.			

5.2.5 Buncefield Incident Recommendations

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a	SS	The following recommendations that have been developed as a result of the Buncefield Incident in the United Kingdom, shall be critically reviewed and implementation strategies relevant to the specific context of the Coastal and Inland Terminals shall be developed:	Transnet	EPCM	
b	SS - monitoring	1.) The Competent Authority and operators of Buncefield-type sites should develop and agree a common methodology to determine Safety Integrity Level (SIL) requirements for overfill prevention systems in line with the principles set out in Part 3 of B3 EN 61511 ref 3) This methodology should take account of: • the existence of nearby sensitive resources or populations; • the nature and intensity of depot operations; • realistic reliability expectations for tank gauging systems; and the extent / rigour of operator monitoring. Application of the methodology should be clearly demonstrated in the COMAH safety report submitted to the Competent Authority for each applicable site. Existing safety reports will need to be reviewed to ensure this methodology is adopted. **Process Action**: SIL Review **Instrumentation Action**: SIL Review – The Engineering Contractor proposes that the independent level switch be an analogue level transmitter, not a digital switch. The independent level transmitter will enable the control system to identify a division between the two level transmitters and thus give a division alarm indicating a faulty level signal.	Transnet	EPCM	
c	SS – monitoring	2.) Operators of Buncefield-type sites should, as a priority, review and amend as necessary their management systems for maintenance of equipment and systems to ensure their continuing integrity in operations. This should include, but not be limited to reviews of the following: • the arrangements and procedures for periodic proof testing of storage tank overfill	Transnet	EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		• prevention systems to minimise the likelihood of any failure that could result in loss of containment; any revisions identified pursuant to this review should be put into immediate effect; • the procedures for implementing changes to equipment and systems to ensure any such changes do not impair the effectiveness of equipment and systems in preventing loss of containment or in providing emergency response. **Instrumentation Action**: The above proposal will enable the system to perform a self verification. In addition it is recommended that a periodic trip test procedure is implemented.			
d	SS – monitoring	3.) Operators of Buncefield-type sites should protect against loss of containment of petrol and other highly flammable liquids by filling a high integrity, automatic operating overfill prevention system (or a number of such systems, as appropriate) that is physically and electrically operated and independent from the tank gauging system. Such systems should meet the requirements of Part 1 of B8 EN 615111 for the required safety integrity level, as determined by the agreed methodology (see Recommendation 1). Where independent automatic overfill prevention systems are already provided, their efficacy and reality should be reappraised in line with the principles of Part 1 of B8 EN 615111 and for the required safety integrity level, as determined by the agreed methodology (see Recommendation 1). **Process Action:** High level trips are installed as per SIL review outcomes. **Instrumentation Action**: To be determined by the SIL review. However, the implementation of the proposed system noted in recommendation one should satisfy the SIL review.	Transnet	EPCM	
e	SS – monitoring	4.) The overfill prevention system (comprising means of level detection, logic control equipment and independent means of flow control) should be engineered, operated and maintained to achieve and maintain an appropriate level of safety integrity in accordance with the requirements of the recognised industry standard for safety instrumented systems, Part 1 of B8 EN 61511. **Process Action**: Implement SIL review recommendations. **Instrumentation action**: To be determined by the SIL review. However, the inclusion of level alarms and level set points should be linked to the tank inlet flow control valve thereby slowing the flow down as the vessel reaches a high level state. Failing this the independent levels transmitter should trip an independent and dedicated fall safe inlet on/off valve which is located as close to the tank as possible.	Transnet	EPCM	
f	SS	5.) All elements of an overfill prevention system should be proof tested in accordance with the	Transnet	EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		validated arrangements and procedures sufficiently frequently to ensure the specified safety integrity level is maintained in practice in accordance with the requirements of Part 1 of BS EN 61511. **Instrumentation Action**: Comment as per recommendation two.			
g	SS	6.) The sector should put in place arrangements to ensure the receiving site (as opposed to the transmitting location) has ultimate control of tank filling. The receiving site should be able to safely terminate or divert a transfer (to prevent loss of containment or other dangerous conditions) without depending on the actions of a remote third party, or on the availability of communications to a remote location. These arrangements will need to consider upstream implications for the pipeline network, other facilities on the system and refiners. **Process Action**: The design of the system and the Operating Procedure must ensure that the receiving site is able to safely terminate or divert a transfer without depending on the actions of a remote third party, or on the availability of communications to a remote location. These arrangements will need to consider upstream implications for the pipeline network, other facilities on the system and refineries specify the necessary interlocks to prevent overfilling of tanks. **Instrumentation Action**: As per the Process description and possible inclusion of the following – TM1 – The control system should verify and batch the product via the custody valve, flow meter and the vessel flow control valve. In the event of a high level condition, the flow control valve should reduce flow, if the independent “High High” level is reached the fail safe valve on the tank and the Custody valve should be tripped. The feeder lines should be sized to accept possible surge conditions or the suppliers should have a spill back or antisurge system installed. The TM 2 control system should control the flow into the terminal having the ability to shut down the down stream VSD’s. In the event of a high level condition, the flow control valve should reduce flow, if the independent “High High” level is reached the fail safe valve on the tank and the down stream VSD’s should be tripped. Both options should allow for possible flow diversion into alternative tanks.	Transnet	EPCM	
h	SS	7.) In conjunction with Recommendation 6, the sector and the Competent Authority should undertake a review of the adequacy of existing safety arrangements, including communications, employed by those responsible for pipeline transfers of fuel. This work should be signed with implementing Recommendations 19 and 20 on high reliability organisations to ensure major hazard risk controls address the management of critical organisational interfaces.	Transnet	EPCM	
i	SS	8.) The Competent Authority and the sector should jointly review existing standards for secondary and tertiary containment with a view to the Competent Authority producing revised	Transnet	EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		guidance by the end of 2007. The review should include, but not be limited to the following: • developing a minimum level of performance specification of secondary containment (typically this will be bunding); • developing suitable means for assessing risk so as to prioritise the programme of engineering work in response to the new specification; • formally specifying standards to be achieved so that they may be insisted upon in the event of lack of progress with improvements; • improving firewater management and the installed capability to transfer containment and fires; • providing greater assurance of tertiary containment measures to prevent escape of liquids from site and threatening a major accident to the environment. **Civils Action**: Main bund walls to accommodate credible failure of largest tank in impoundment with freeboard of all fire weir applications for one hour, intermediate bund walls to contain minimum of 110% within the subdivision. All discharges from the impoundment will pass through an effluent treatment system prior to release into either an effluent trade system or containment and waste land system or into a commercial sewer treatment system or for transport to refinery for re-processing. If required the under flow weir system between the intermediate bunds will allow for early off take of contaminated fire water.			
j	SS	9.) Revised standards should be applied in full to new build sites and to new partial installations. On existing sites, it may not be practicable to fully upgrade building and site drainage. Where this is so operators should develop and agree with the Competent Authority risk-based plans for phased upgrading as close to new plant standards as is reasonable practicable.	Transnet	EPCM	
k	SS - monitoring	10.) The sector should work with the Competent Authority to prepare guidance and/or standards on how to achieve a high reliability industry through placing emphasis on the assurance of human and organisational factors in design, operation, maintenance, and testing. Of particular importance are: • understanding and defining the role and responsibilities of the control room operators (including in automated systems) in ensuring safe transfer processes; • providing suitable information and system interfaces for front line staff to enable them to reliably detect, diagnose and respond to potential incidents; • training, experience and competence assurance of staff for safety critical and environmental protection activities; • defining appropriate workload, staffing levels and working conditions for front line personnel; • ensuring robust communications management within and between sites and	Transnet	EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		contractors and with operators of distribution systems and transmitting sites (such as refineries); • prequalification auditing and operational monitoring of contractors' capabilities to supply, support and maintain high integrity equipment **Process Action**: The roles and responsibilities of the control room operators will be included in the Operating Manual. **Instrumentation Action**: Certified Operator training on the control system.			
l	SS	11.) The sector should ensure that the resulting guidance and/or standards is/are implemented fully throughout the sector, including where necessary with the refining and distribution sectors. The Competent Authority should check that this is done.	Transnet	EPCM	
m	SS	12.) The sector should put in place arrangements to ensure that good practice in these areas, incorporating experience from other high hazard sectors, is shared openly between organisations.	Transnet	EPCM	
n	SS	13.) The Competent Authority should ensure that safety reports submitted under the COMAH Regulations contain information to demonstrate that good practice in human and organisation design, operation, maintenance and testing is implemented as rigorously as for control and environmental protection engineering systems.	Transnet	EPCM	
o	SS	14.) The sector should set up arrangements to collate incident data on high potential incidents including overfilling, equipment failure, spills and alarm system defects, evaluate trends, and communicate information on risks, their related solutions and control measures to the industry. **Instrumentation Action**: The control system Alarming and reporting philosophy should be reviewed during the Safety Integrity Level (SIL) review.	Transnet	EPCM	
p	SS	15.) The arrangements set up to meet Recommendation 23 should include, but not be limited to, the following: • thorough investigation of root causes of failures and malfunctions of safety and environmental protection critical elements during testing or maintenance, or in service; • developing incident databases that can be shared across the entire sector, subject to data protection and other legal requirements. Examples exist of effective voluntary systems that could provide suitable models; • collaboration between the workforce and its representatives, duty holders and regulators to ensure lessons are learned from incidents, and best practices are shared.	Transnet	EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		Instrumentation Action: Ensure that first up Alarming, time stamping and recording philosophies are adhered to during the implementation of the control system. This will enable accurate and timely reporting of any incident.			
q	SS	16.) In particular, the sector should draw together current knowledge of major hazard events, failure histories of safety and environmental protection critical elements, and developments in new knowledge and innovation to continuously improve the control of risks. This should take advantage of the experience of other high hazard sectors such as chemical processing offshore oil and gas operations, nuclear processing and railways. Instrumentation Action: Ensure that the instrumentation and implementation meets BIL and world best practice recommendations.			

5.2.6 Fire Fighting Capacity coastal Terminal at Island View Complex

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		Water Supply:			
a	SS	The water supply to TM 1 will be provided by the existing “Cutler” seawater pump sets and reticulation. There is a high pressure storm water system with large bore (Ø 20”) reticulation routed throughout the Island View complex.	Transnet	EPCM	
b	SS	A Ø 15” spur of the Cutler reticulation terminates at the intersection of Trinidad Road and Bahrain Road, adjacent to TM 1. The water supply to TM 1 will be taken from this point.	Transnet	EPCM	
c	SS	The Cutler system is able to supply the maximum required flow rate at the desired pressure.	Transnet	EPCM	
d	SS	The maximum design water demand has been based on the largest credible fire event. This has been taken to be a fire in one of the large bunds and cooling of half of the circumference of two adjacent tanks.	Transnet	EPCM	
		Premix (Foam Concentrate / Water) Supply:			
e	SS	While the Cutler reticulation is normally filled with water, foam premix can be fed into the reticulation when required. This is achieved using the foam concentrate and variable flow proportioners located in the Cutler pump stations. This concentrate is currently AFFF which is suitable for use with the products to be stored at TM 1. Consideration is currently being given to replacing the AFFF with Alcoseal.	Transnet	EPCM	
f	SS	As a result of the distance between the Cutler pump stations and the various depots, the Cutler	Transnet	EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		committee has provided a 40,000 litre mobile foam injection unit. This comprises a foam tank and variable flow proportioner which is connected in-line in the line feeding the depot. The injection of foam is thus achieved locally until such time as the premix supplied by the Cutler pump stations reaches the depot.			
g	SS	As a result of the arrangement, the same feed lines will be used to supply both water demand (tank cooling) and foam premix demand (bund foam and tank foam). Once premix is being supplied to the site, it will also be used for tank cooling.	Transnet	EPCM	
		Hydrant Ring main"			
h	SS	A 16" ring main with 4-header fire hydrants strategically located not more than 90m apart has been provided around the tank farm and manifolds. This ring main also feeds tank cooling facilities and bund and tank foam facilities.	Transnet	EPCM	
i	SS	The ring main has been provided with isolating valves to permit a section of the main to be isolated in the event of damage to a portion of the ring.	Transnet	EPCM	
j	SS	The pressure available at each hydrant will be 10 bar.	Transnet	EPCM	
k	SS	Above-ground steel piping installed on the product piping pipe racks, is proposed. As the system is operating with seawater, the ring main should be internally lined with concrete or epoxy.	Transnet	EPCM	
		Foam Concentrate Supply:			
l	SS	As foam premix is supplied to the site from the Cutler system, foam stocks and injection facilities are not provided at the depot.	Transnet	EPCM	
		Bund Protection			
m	SS	Sufficient Medium Expansion bund foam pourers are provided to ensure an application rate of 4,1 litres / m2 / min, as per SANS 10089, to each bund.	Transnet	EPCM	
n	SS	The flow to each bund area will be controlled by actuated valves which can be operated locally or remotely at the fire pump station. It is proposed that these valves be located above-ground with heat shields.	Transnet	EPCM	
o	SS	The piping feeding the individual pourers will be run "below ground" within the earth bund walls. Below-ground piping will be externally wrapped steel. As the system is operating with seawater, the bund foam lines should be internally lined with epoxy.	Transnet	EPCM	
p	SS	The maximum foam travel distance on the largest bunds is 30 metres which is acceptable.	Transnet	EPCM	
q	SS	The flow from the bund pourers will be via a gentle slope or directed to the bund to prevent pickup of product as it falls to the ground. The bund walls will be protected from scour.	Transnet	EPCM	
		Tank Foam Protection			
r	SS	Fixed top foam pourers supplying medium expansion foam into the storage tanks are proposed. An adequate number of pourers have been provided to ensure an application rate of 4,1 litres / m2 / min as per NFPA for all fixed roof tanks (with or without internal floating	Transnet	EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		blankets).			
s	SS	Control of foam to the tank foam pourers will be by manually operated valves located at a safe distance from the tank. A single valve will control the flow to each tank while each pourer will be fed by an individual riser.	Transnet	EPCM	
t	SS	As the system is operating with seawater, the steel tank foam lines should be internally lined with epoxy.	Transnet	EPCM	
Tank Cooling					
u	SS	Fixed cooling spray rings are proposed for all tanks.	Transnet	EPCM	
v	SS	The cooling facilities proposed would comprise a fixed cooling ring at the top of the tank shell.	Transnet	EPCM	
w	SS	The application rate for the shell protection is 30 litres / metre of circumference, as per SANS 10089.	Transnet	EPCM	
x	SS	Flow control to the tank cooling ring would be by an actuated valve which can be operated locally or remotely at the fire pump station. It is proposed that these valves be located above ground with heat shields to permit manual operation. A second (alternative) supply to these facilities on the other side of the bund is not proposed.	Transnet	EPCM	
y	SS	As the system is operating with seawater, the steel tank cooling lines should be internally lined with epoxy.	Transnet	EPCM	
Manifold protection					
z	SS	4500 l/min oscillating foam monitors are provided to distribute low expansion foam to the bunded manifold and pump bay areas in the event of a fire. A single hydrant head is provided upstream of the isolating valve on the riser pipe to each monitor.	Transnet	EPCM	
aa	SS	The application rate is 6,5 l/m2 per NFPA requirements for shallow spill fires.	Transnet	EPCM	
bb	SS	Each pair of monitors is each fed by a separate foam premix line and can be activated by push button in the fire station.	Transnet	EPCM	
cc	SS	The monitors will also protect the small slops tank in the manifold area	Transnet	EPCM	
Tanker Loading Area Protection					
dd	SS	A manually directed 1800 l/min foam monitor (normally mounted towards the tanker area) has been provided to protect the tanker loading area.	Transnet	EPCM	
ee	SS	This monitor can be manually activated by push-button in the fire pump station.	Transnet	EPCM	
Portable Equipment					
ff	SS	The following foam equipment has been allowed for at each pump station: • Four portable 4,500 litre/min foam monitors • Four portable 4,500 litre/min ground water monitors	Transnet	EPCM	
Building Protection					

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
gg	SS	The form of fire suppression for the buildings has not yet been confirmed.	Transnet	EPCM	
hh	SS	Detection sensors will be provided in the Control Room and the Generator Building, but not the workshop.	Transnet	EPCM	
ii	SS	Hose reels and extinguishers will be provided for all buildings as required by Building Regulations.	Transnet	EPCM	
		Alarm System			
jj	SS	Starting the main fire pumps will activate an audible and visual alarm.	Transnet	EPCM	
kk	SS	Any alarm conditions will be linked to the local SCADA system as well as being relayed to the Master Control Centre in Durban.	Transnet	EPCM	

5.2.7 Coastal Terminal at Island View Complex – Associated Infrastructure

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
r	SS	A detailed EMP was developed for the installation of the new pipelines and associated infrastructure to Link Engen's Island View B (IVB), Island View C (IVC) and the Island View D (IVD) storage facilities in order to supply fuel products to Transnet's NMPP. The details of the installation of this infrastructure is attached together with the EMP (**Annexure E**)	Transnet	EPCM	
s	SS	Shell and BP South African Petroleum Refineries (Pty.) Ltd. (SAPREF) currently has a number of fuel storage facilities and associated infrastructure at the Island View Complex, Port of Durban, KwaZulu-Natal. The development of Transnet's New Multi Product Pipeline (NMPP) requires that SAPREF undertakes changes to their storage and transfer facilities at Island View. The activities will entail the relocation of SAPREF's Bayhead B tanks to Bayhead A, and the installation of associated piping; as well as the replacement of the current Mogas, AGO and Jet feeder lines to the NMPP Island View Terminal with above ground lines.(**Annexure F**)	Transnet	EPCM	

5.2.8 Pump Stations – Quantified Risk Assessment Mitigation

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		General			
a	SS	The Emergency Plans for the different Pump Stations must be compiled to deal with the potential incidents outlined in the specialist risk assessment and other potential emergencies identified as part of the Transnet Risk management policies and procedures.	Transnet	EPCM	√
b	SS	It is critical that the Local Authorities in whose areas the Pump Stations are located, and who would be expected to render emergency services to the Transnet Pump Station in the event of an incident are fully conversant with the risks on these Pump Stations.	Transnet	EPCM	
c	SS	As far as fire fighting is concerned on each of the Pump Stations, the Engineering Contractor will propose a fire fighting capability method:	Transnet	EPCM	
		Water Supply			
d	SS	Water storage facilities to provide for one hour's supply at the maximum design demand have been provided. Once the source(s) of supply and potential rate of make-up supplies have been determined, a risk assessment is to be carried out to determine if the volume of water to be stored should be increased. An open reinforced concrete water reservoir is proposed, all necessary authorisations and permits should be in place.	Transnet	EPCM	
e	SS	The maximum design water demand has been based on the largest credible fire event. This has been taken to be all four monitors at the manifold operating simultaneously, but not the spill basin protection concurrently.	Transnet	EPCM	
f	SS	A single, diesel engine driven fire water pump capable of delivering the design flow rate at the required pressure has been proposed. It will be housed in a blast resistant (structure) fire pump station building.	Transnet	EPCM	
g	SS	Fire fighting pump start signals may be generated: • By push-button in the fire pump station. • By push-button in the control room. • By push-button in the security kiosk. • On activation of the detection system in the manifold area.	Transnet	EPCM	
h	SS	The fire fighting pump set can only be stopped in the fire pump station.	Transnet	EPCM	
i	SS	A Fire Department connection has been allowed for.	Transnet	EPCM	
		Hydrant Ring main			
j	SS	A 4" firewater ring main with 2-header fire hydrants strategically located not more than 90m apart has been provided. Below ground HDPE piping is proposed.	Transnet	EPCM	
k	SS	The ring main has been provided with isolating valves to permit a section of the main to be isolated in the event of damage to a portion of the ring.	Transnet	EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
l	SS	The pressure available at each hydrant will be 10 bar.	Transnet	EPCM	
		Foam Concentrate Supply			
m	SS	Sufficient foam concentrate storage for one hour of operation of foam facilities at the design flow rate has been allowed for. In the event that the water storage volume is increased to more than one hour, consideration should be given to increasing the volume of foam concentrate stored. A steel foam concentrate tank is proposed.	Transnet	EPCM	
n	SS	The maximum foam concentrate demand has been based on all four manifold monitors operating simultaneously, but not the spill basin concurrently. The foam induction ratio allowed for is 3%.	Transnet	EPCM	
o	SS	Multi-purpose foam (suitable for products containing alcohol or polar solvents) will be used. This will be suitable for fuels with up to 5% alcohol content. If it is possible that the alcohol content could exceed 5% in the future the proportioner(s) must be ordered with a 3% / 6% selector and the foam stocks would have to be increased when these fuels are handled.	Transnet	EPCM	
p	SS	A progressive cavity positive displacement foam pump is provided to deliver foam concentrate at the correct flow rate and pressure, to the balanced pressure proportioner (BPP) which then supplies foam premix to the manifold monitors, tanker loading monitor and spill basin pourers. A suction strainer has not been provided as the type of pump proposed is able to deal with solids.	Transnet	EPCM	
q	SS	In order to ensure that a backflow of water via the BPP to the foam concentrate tank does not occur, a motorized trunnion mounted ball valve with automatic body bleed is provided in addition to the check valve in the foam concentrate feed to the BPP. A “test” button will be provided to ensure that this valve remains closed when the system is being tested.	Transnet	EPCM	
r	SS	The foam concentrate tank, pump and BPP will be located in the fire pump station building.	Transnet	EPCM	
		Manifold Protection			
s	SS	Four 3000 l/min oscillating foam monitors are provided to distribute low expansion foam to the bunded manifold area in the event of a fire. A single hydrant head is provided upstream of the isolating valve on the riser pipe to each monitor.	Transnet	EPCM	
t	SS	The application rate is 6.5l/m2 per NFPA requirements for shallow spill fires.	Transnet	EPCM	
u	SS	The two pairs of monitors are each fed by a separate foam premix line. Either of these pairs of monitors (or both pairs) can be activated (started and stopped): • By push-button in the fire pump station. • By push-button in the control room. • By push-button in the security kiosk. • On activation of the detection system in the manifold area (start only).	Transnet	EPCM	
v	SS	The monitors should be connected in diagonal pairs so that if one system fails there is still effective fire fighting even if there is wind.	Transnet	EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
w	SS	The monitors should also protect the small slops tank in the manifold area.	Transnet	EPCM	
		Tanker Loading Area Protection			
x	SS	A manually directed 1800 l/min foam monitor (normally mounted towards the tanker area) has been provided to protect the tanker loading area.	Transnet	EPCM	
y	SS	This monitor can be manually activated (started and stopped): By push-button in the fire pump station. By push-button in the control room. By push-button in the security kiosk.	Transnet	EPCM	
		Spill Basin Protection			
z	SS	Two medium expansion (MEX) powers have been provided to protect the spill basin, one MEX 1800 for the main chamber and one MEX 450 for the two small chambers.	Transnet	EPCM	
aa	SS	The application rate is 6,5 l/m2/min as per NFPA and SANS 10089.	Transnet	EPCM	
bb	SS	The MEX pourers can be manually activated (started and stopped): • By push-button in the fire pump station. • By push-button in the control room. • By push-button in the security kiosk.	Transnet	EPCM	
cc	SS	In the event of the manifold monitors being activated while the spill basin MEX pourers are operating, the MEX pourers will be shut down.	Transnet	EPCM	
		Portable Equipment			
dd	SS	The following foam equipment has been allowed for at each pump station: • Two portable 4,500 litre/min foam monitors. • Two portable 4,500 litre/min ground water monitors.	Transnet	EPCM	
		Building Protection			
ee	SS	The form of fire suppression for the buildings has not yet been confirmed.	Transnet	EPCM	
ff	SS	Building detection sensors will be provided in the Control Room and the Generator Building, but not the workshop.	Transnet	EPCM	
gg	SS	Hose reels and extinguishers will be provided for all buildings as required by Building Regulations.	Transnet	EPCM	
		Detection System			
hh	SS	Ultra-violet / Infra-red (UV/IR) fire detection sensors are proposed. In order to activate any of the fire fighting systems or alarms, a “double knock” will be required. This will be achieved by requiring two sensors to be activated in order to start the fire fighting system and a single knock to sound an alarm. The sensors will be located taking cognizance of the equipment installed in the area.	Transnet	EPCM	
ii	SS	The detectors in the manifold area will start the fire pumps, activate both pairs of foam monitors and sound an alarm.	Transnet	EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
jj	SS	The detectors at the spill basin and tanker loading area will merely sound an alarm.	Transnet	EPCM	
kk	SS	In the event of the detectors in the manifold area being activated while the foam pourers at the spill basin are operating, the valve controlling foam premix flow to the spill basin will be closed, giving priority to the manifold protection.	Transnet	EPCM	
ll	SS	A fire detection system will be provided in the Control Room and the Generator Building. These systems will sound an alarm.	Transnet	EPCM	
mm	SS	Any alarm conditions will be linked to the local SCADA system as well as being relayed to the Master Control Centre in Durban.	Transnet	EPCM	

5.2.9 Emergency Response Capability

ITEM NO.	PROJECT COMPONENT	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	All	Transnet shall establish an Operational Emergency Plan that will govern all activities related to the response to an emergency. The Emergency Plan shall in accordance with the National Environmental Management Act (Act 107 of 1998) Section 30(3) notify the Director General, the relevant provincial head of the Department in which the incident occurred, the local municipal authorities and police, traffic police, fire departments, local medical and ambulance. Further measures should include the establishment of a network of communication between Transnet and farmers associations, conservancies, farmer neighbourhood watches, etc. Where emergency incidents related to water resources occur such shall be reported to the above agencies as well as DWAF, in accordance with Section 20 of the National Water Act (Act 36 of 1998).	Transnet		√
b	All	Furthermore the plan shall: • Establish a system for receiving, identifying and classifying emergencies which require immediate response by the operating company; • Identify specific emergency response authorities along the route, with all emergency contact details and the procedures necessary to ensure rapid and effective response from these authorities. • Identify emergency response resources, including specialised equipment and materials, to be deployed to assist emergency response authorities in the case of an accident. • Establish a procedure to ensure prompt and adequate handling of all calls which concern emergencies whether they are from customers, the public, company employees, or other sources.	Transnet		

ITEM NO.	PROJECT COMPONENT	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		• Establish a procedure to ensure the prompt and effective response to a notice of each type of emergency including the action to be taken by all personnel involved and the first employee at the scene; • Indicate clearly the responsibility for training employees to respond effectively and in accordance with the emergency procedures; • Indicate clearly those responsible for updating the information contained in the emergency plan; • Establish a procedure for responding to community and media enquiries and to the disseminate information to the public; • Establish reporting procedures for documenting an emergency.			
c	All	The emergency preparedness plan must be ready for implementation at all times should an emergency situation arise.	Transnet		
d	All	An awareness campaign must be undertaken to inform landowners/residents affected by the pipeline of the existence of the pipeline and of the emergency contact details.	Transnet		
e	Pipeline	Pipeline Monitoring shall be supported by the ATMOS leak detection system. Remote controlled and/or manual shut off valves placed at regular intervals along the pipeline will be activated to limit the hazard and damage from an accidental discharge.	Transnet		
f	All	In the event of an accidental spillage or discharge, all free product must immediately be recovered. In the event of a major spill a geo-hydrologist specialist must assess the spill site and conduct a risk assessment of the affected area. If considered to be necessary by the geohydrologist, other specialists shall also be involved in order to make a proper assessment of the impact and remediation requirements. If indicated to be necessary by the risk assessment, all contaminated soil must be excavated and be disposed of at a licensed hazardous waste disposal facility. All further measures required by the assessment must be implemented as soon as is possible and the site must be rehabilitated to the satisfaction of DWAF. All organisations and emergency services as required by the National Environmental Management Act (Act 107 of 1998) Section 30(3) .The opportunity for the onsite remediation and reuse of contaminated soil must be investigated prior to disposal and DWAF informed in this regard. Monitoring boreholes must be installed at such sites to monitor whether the spill has resulted in groundwater contamination and all private boreholes within a radius of 500 metres from the spill should be monitored bi-annually for the presence of organic substances.	Transnet		
g	All	Excavation of contaminated soil must involve careful removal of soil using appropriate tools/machinery to storage containers until treated or disposed of at a licensed hazardous landfill site.	Transnet		
h	All	The Environmental Managers must determine the precise method of treatment of polluted soil. This could involve the application of soil absorbent materials as well as oil-digestive	Transnet		

ITEM NO.	PROJECT COMPONENT	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		powders to the contaminated soil. Transnet could also employ a reliable company who specialise in spill remediation.			
i	All	If a spill occurs on an impermeable surface such as cement or concrete, the surface spill must be contained using oil absorbent material.	Transnet		
j	All	If necessary, oil absorbent sheets or pads must be attached to leaky machinery or infrastructure.	Transnet		
k	All	Materials used for the remediation of petrochemical spills must be used according to product specifications and guidance for use.	Transnet		
l	All	Contaminated remediation materials must be carefully removed from the area of the spill so as to prevent further release of petrochemicals to the environment, and stored in adequate containers until appropriate disposal.	Transnet		

5.2.10 Noise

ITEM NO.	PROJECT COMPONENT	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	Pump stations Terminals	Mitigation implemented to reduce the impact of sound generated by the pumps at the eight pump stations and the two terminals shall be in accordance with the requirements specified Attached in the Noise Specialist Study (***FINAL EIA Specialist Study 11***) with reference to the findings in the EIA.	Transnet	EPCM	
b	Pump stations Terminals	The effectiveness of acoustic mitigation shall be verified, once each facility is operational, by means of acoustic monitoring of sound levels at the sensitive receptors around the pumps stations and terminals. The monitoring is to be conducted by an independent acoustician using recognised acoustic methodologies (CONCAWE, SANS 10103).	Transnet	EPCM	

5.2.11 Aesthetics

ITEM NO.	PROJECT COMPONENT	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	SS	All of the site specific measures described in Visual Aesthetics Study (***FINAL EIA Specialist Study 17***) shall be implemented for each pump station and terminal and shall be considered in consultation with the relevant Local Municipalities if necessary, prior to construction commencing.	Transnet	EPCM	

ITEM NO.	PROJECT COMPONENT	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
b	GEN	The cut and fill slopes of all embankments that are to be constructed at all Terminal and Pump Station sites shall be shaped to angles and forms that are reflected in the adjacent landscape in order to reduce the visual impact. The edges of embankments shall be blended with the existing landforms, in order to reduce the impression that the project has been 'engineered' through the landscape. Due to the multitude of different scenarios that will be required, the engineer will be required to provide on-site direction wherever required. In specific areas of application, a qualified landscape architect shall be appointed to design contextually appropriate mitigation measures. These may include, but not necessarily be limited to, all sections where the alignment passes through residential areas, sections that are highly visible or regularly frequented by a large number of people.	Transnet	EPCM	
c	GEN	The materials selected for all building roofing and walls shall be of a nature which does not reflect or deflect sunlight or artificial light during the day or night due to their colour or texture. All building surfaces shall, within the bounds of financial and operational practicality and which shall be demonstrated by the Contractor, have matt-textured finished, and shall not be glossy, so as to reduce reflection and glare from the surfaces. Roof material shall not be a silver colour (e.g. unpainted galvanised corrugated iron) or be glossy to the extent that it can reflect the sun or artificial light.	Transnet	EPCM	
d	GEN	The colours of all building and structures surfaces shall be complementary to the colours in the surrounding landscape, and shall, within the bounds of financial and operational practicality and which shall be demonstrated by the Contractor, be olive green with buff trim, light grey, grey green, blue grey, dark buff, rust, ochre or any other natural tones such as variations of tan to be accepted by the Transnet. Furthermore the existing blue roofs of Pump Station 6 at Van Reenen should be painted a more neutral colour such as tan.	Transnet	EPCM	
e	GEN	The building forms should be broken by roof overhangs and steps in the façade. This will create shadow lines which, in turn, assist in the mottling or breaking up of the visible building form.	Transnet	EPCM	
f	GEN	Large and long shed-like structures must be designed to have their bulk visually broken up by vertical bands or blocks of appropriate colour. Alternatively the façade could be made visually less imposing by the placement of other smaller buildings in front of it, the creation of shadows from roof overhangs and the stepping of the surface to accommodate other necessary elements of the buildings function.	Transnet	EPCM	
g	GEN	Transnet shall ensure that the minimum amount of light required to ensure safety at night is utilised at all new pump station sites. Lights shall be so positioned and directed that they do not cause light pollution into adjacent properties.	Transnet	EPCM	
h	GEN	Where allowable, security lighting that is movement activated rather than permanently switched on, shall be utilized to prevent unnecessary constant illumination.	Transnet	EPCM	
i	GEN	All security lighting shall have 'blinkers' or be specifically designed to ensure light is	Transnet	EPCM	

ITEM NO.	PROJECT COMPONENT	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		directed downwards while preventing side spill. Manufacturers have such lights in their catalogues. This may require that light pole numbers will increase to give the required illumination on the ground. Lighting for security and safety must be directed downwards and towards the structures to reduce light spill beyond the property boundary.			
j	GEN	Area lighting on tall masts should be confined to the lower landform elevations. Tall structures such as towers will by law (aviation requirements) have to be fitted with a red flashing light if they exceed a certain height. These structures should be limited to a minimum height to reduce having to comply with aviation requirements.	Transnet	EPCM	
k	GEN	To limit the visual impact of the facilities on the adjacent community and from the roads close to the site, screening berms should be constructed from material removed from the site. These berms must be of sufficient height and be vegetated with indigenous vegetation. To be effective, the berms should be constructed as close as possible to the viewer. The forms of the berms should be organic (non-geometric). A geometrically-shaped berm will impose an additional visual impact on the landscape by contrasting with the flowing forms of the landscape, thereby defeating its purpose.	Transnet	EPCM	
l	GEN	The Contractor shall ensure that all existing large trees, if any are present, which fall outside the earthworks area on any construction site, are retained, to act as visual screening element.	Transnet	EPCM	
m	GEN	Wherever possible, existing vegetation beyond the site's perimeter should be supplemented if it will improve the screening of the Terminals and Pump Stations from the adjacent land uses. This should be considered, particularly where the land use is residential.	Transnet	EPCM	
n	GEN	The colour of the visible portion of the tanks at the Pump Stations and Terminal sites shall be two-tone, subject to approval from Transnet. The top portion seen against the sky shall be grey or light grey while the lower portion shall be olive green or rust coloured.	Transnet	EPCM	
o	GEN monitoring	The rehabilitation and stabilisation by vegetation of all new landforms e.g. platform side slopes, road fill or cut slopes must be done as soon as the forms are complete. The monitoring and management of the vegetation programme is important to ensure that problems (erosion, die back and lack of grass cover) are identified early so that corrective measures can be taken.	Transnet	EPCM	

5.2.12 Groundwater Pollution – Inland Terminal

ITEM NO.	PROJECT COMPONENT	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	Inland terminal	Catastrophic failure of the storage facilities resulting in leakage of hydrocarbon fuels is a potentially severe impact to groundwater surrounding ecosystems. The facility should be designed in such a way that any leakage is contained, or in the event of total failure, does not flow towards or seep into the pan situated to the north of the site.	Transnet	EPCM	
b	Inland terminal	Before borehole BH 1 (**Annexure D**) is included for long-term systematic monitoring purposes, it is recommended that it is purged by pumping it dry repeatedly to ensure that all the contingent contamination is flushed out.	Transnet	EPCM	
c	Inland terminal	An additional monitoring borehole should be drilled up-gradient from the site in order to compare up-gradient concentrations with the concentrations obtained in boreholes BH1 and BH6 (newly drilled borehole). (**Annexure D**). Monitoring of the boreholes will verify the existing water quality within the aquifer and will also identify any alteration of water quality over time.	Transnet	EPCM	
d	Inland terminal	Monitoring of the boreholes should be undertaken on a quarterly basis to verify the efficiency of the secondary containment structures, as discussed in the relevant specialist report. The hydrocarbon contaminants for which monitoring should be undertaken are listed in Specialist Study 6 of the Final EIA.	Transnet		√

5.2.13 Surface Water Pollution – Inland Terminal

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a	SS	Transnet shall ensure that the design of the water management facilities includes sufficient storage in the final spill basin to permit a reduction in the release rate of treated effluent to less than the maximum proposed rate of 30l/s, should this prove to be necessary once operational monitoring is underway.	Transnet	EPCM	
b	SS	Transnet shall ensure that the outlet from the final spilling basin to the environment makes provision to vary the release at intervals below the maximum flow rate.	Transnet	EPCM	
c	SS	Design an artificial wetland into which the discharge is proposed with the involvement of an expert thoroughly familiar with the functioning of such systems. It is important that this wetland is managed and its effectiveness monitored and not seen as a walk away technology.	Transnet	EPCM	
d	SS	Transnet shall develop a detailed water and waste management plan in which the approach, control methods and day to day management and monitoring commitments are clearly specified. This should include details of the proposals specified in the Effluent Management Philosophy to capture oils and grease products to be stored, treat them to an acceptable water	Transnet	EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		quality, and remove the residue to an appropriate waste site or for reprocessing. The proposed philosophy for Transnet's inland terminal (NMPP Alliance, Drainage and Effluent Philosophy, 28 July 2008, Doc. No. 2684358-U-AA00-PR-PH-005) will need to be refined and thereafter form the basis of detailed design and management requirements. Details needed: • expected discharge rates from the site (daily time step); • volumes of the storage facility including the final; • water treatment options; and • release strategies (where, when and how including details of the artificial wetland).			
e	SS	Prior to first operation of the terminal, Transnet shall conduct a series of definitive ecotoxicity tests, based on the most representative sample possible, including traces of any other possible contaminants such as foam products used for fire fighting. The tests are to be prepared by an accredited laboratory and submitted to DWAF.	Transnet	EPCM	
f	SS Monitoring	Transnet shall undertake quarterly in-stream bio-monitoring (ecotoxicity monitoring), both upstream and downstream of the discharge point once the terminal is operational. Include site observations of sediment and water appearance for possible oil contamination. Bio-monitoring is to be undertaken by an accredited laboratory. Results are to be analysed and evaluated and the full reports submitted to DWAF, the local municipality, Gauteng Nature Conservation and the Rivers database on a monthly basis.	Transnet		
g	SS Monitoring	Transnet shall develop a record of the relationship between releases from the terminal's final spilling basin and flows in the Blesbokspruit. This will necessitate the development of rating curves and regular measurement of flows at a convenient point in the Blesbokspruit, such as the river bridge on the Poortjie Road. It will also require records to be kept of the rate of release of effluent from the final spilling basin. This release monitoring programme should be continued for a minimum of 3 years and until there is sufficient data to determine a flow dilution curve that can be used to minimise potential ecological impacts in the Blesbokspruit. Subject to an absence of significant impact the monitoring can be discontinued at this point.	Transnet		
h	SS Monitoring	Transnet shall consider the use of biological indicators, such as Daphnia, as a quick method of checking water quality in the final spilling basin prior to release. This will obviate the need for extensive laboratory testing, since portable instruments are not available to test as low as concentrations as 2.5mg/l. The possibility of using this method is to be developed further and included within the final operational water and waste management plan for the terminal.	Transnet		

5.2.14 Inland Terminal – Conservation Offsets

ITEM NO.	PROJECT COMPONENT	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	Inland Terminal	Due to the combined impacts of current and proposed developments at the Inland Terminal, an area between the R42, the road to Poortje, the Blesbokspruit and a tributary of the Blesbokspruit in the east is proposed as a conservation offset to accommodate the Giant Bullfrogs and associated amphibians and reptiles. The conservation offset is intended as a means of ensuring the survival of a viable population of the threatened species in this area, as well as providing a refuge for other important wildlife The offset area is approximately 300 ha which includes the Terminal area. It is proposed that this area should be protected.	Transnet		
b	Inland Terminal	If it is made available for the grazing of livestock, stocking capacity must be strictly controlled to increase above ground plant biomass. No termite mounds that occur outside of the terminal construction area should be destroyed. In order to be effective, cultivation around the pan which is the Bullfrog breeding site must cease. This is important for both juvenile and adult frogs, but perhaps more so for the former which may not burrow as deep as the adult.	Transnet		
c	Inland Terminal	Transnet shall continue to negotiate with the Lesedi Local Municipality and GDACE and come to an agreement as to how the conservation may be implemented and managed. It is understood that there are some constraints affecting the alienation of the land which would require the approval of the Premier of the province to alter. The negotiations necessary to settle this matter with the Provincial Authorities, the Lesedi Municipality and the lessees of the Commonage are not a part of this EIA. However, the benefits of such a land management proposal, with agreed compensation for lost agricultural land would be: • A guarantee of conservation of the Bullfrog breeding colony at the pan. • Much improved ecological conditions between the pan and the Blesbokspruit, with a guarantee of conserved habitat for threatened species such as the Grass Owl. • An opportunity to create linkages between the conservation area and other areas along the Blesbokspruit, which is an objective of the Lesedi Environmental Management Framework. • An occupant (Transnet) to assist in the maintenance of the conservation area, which would help resolve one of the problems GDACE faces in respect of the management of a small but important conservation areas. • Fair replacement of the lost agricultural land and farming infrastructure or other agreed means of ensuring the Department of Land Affairs and Municipal goals for expansion of community agriculture are not compromised and that the current lessees of the land are not placed at any disadvantage compared with	Transnet		

ITEM NO.	PROJECT COMPONENT	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		their current circumstances. It is emphasised that the above proposals are made as a basis for discussion between the major parties and are not intended as binding requirements of a Record of Decision. It is understood that Transnet, Lesedi Municipality and GDACE have recently determined that a final agreement will be entered into, based on a Memorandum of Understanding (MOU) between the three parties. In support of the MOU, it will be necessary to: • Determine the critical factors that are required to make this conservation scheme a success (an Environmental Sustainability Study). Such a study must include an assessment of the carrying capacity of the land proposed for conservation purposes, a review of management requirements for the conservation area with particular reference to actions necessary to facilitate a reduction in threat to the Bullfrog community, and determination of ways of encouraging grass owls and other threatened species. • Establish the final parameters of the environmental offset required by GDACE, including the obligations of each party to the scheme and its administration and management, and all other requirements to make the proposal workable and sustainable. • Define the most appropriate way of compensating the Municipality for the loss of land and of providing alternative means of meeting Municipal objectives to provide grazing and arable land to previously disadvantaged communities. The MOU shall also establish appropriate means of compensating existing leaseholders for any losses incurred as a result of the Transnet NMPP facility and the establishment of the larger conservation area.			
d	Inland Terminal	The breeding success of the African Bullfrog and Grass Owl occurrence and breeding in the Conservation Area shall be monitored at intervals that are agreed with Lesedi Municipality and GDACE. The schedule shall be included in the Management Framework for the Conservation Area, to be determined through discussion between the three parties. Monitoring should be undertaken as a part of the range management and stocking programme, managed by an ecologist.	Transnet		

5.3 Servitude Maintenance and Repairs

5.3.1 Soil, Surface and Groundwater

ITEM NO.	PROJECT COMPONENT	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	Pipeline	Transnet shall maintain a full record of landowner communications after construction during the operational phase. If any complaints are logged about lost soil productivity, prepare a follow-up audit and record the nature of the problem and whether it has been resolved. These records are to be made available for independent audit.	Transnet		
b	All	If water within a stream / wetland is to be diverted for operational maintenance or repair reasons, the construction of dams and the impeding of flow must be authorised by the Department of Water Affairs and Forestry as part of the permitting process under the National Water Act (Act 36 of 1998).	Transnet		
c	All	Any dam / impoundment constructed should only be a temporary structure and must be completely removed once the repair of the pipeline has been completed. The area covered by the dam wall, and by any water impounded behind this structure, including any vegetation that is disturbed must be completely rehabilitated.	Transnet		
d	All	Transnet shall undertake diligent aftercare with maintenance crews visiting the site after every major storm, at least in the first summer and until stability and resilience are attained, and damage is repaired (ie rills and gullies are filled, smoothed and re-grassed).	Transnet		

5.3.2 Air Quality and Noise

ITEM NO.	PROJECT COMPONENT	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	All	Dust suppression shall be employed wherever maintenance or repair of any component of the project, including the pipeline and associated installations, Pump Stations or Terminals require vegetation removal. Dust levels shall be controlled to the extent that adjacent parties are not adversely affected. Where complaints are received immediate remedial action shall be taken to ensure that the problem does not persist.	Transnet		
b	All	Transnet Pipelines must ensure that noise levels at the Pump Stations and Terminals adhere to the relevant noise regulations. Ambient operational noise levels must be within the operational parameters established for the project and all applicable legislation pertaining to noise must be adhered to. Wherever local authorities have determined maximum allowable ceiling noise levels for certain areas, these levels shall be adhered to.	Transnet		

5.3.3 Biodiversity

ITEM NO.	PROJECT COMPONENT	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	Pipeline	Transnet shall be responsible to the implementation of a Rehabilitation Plan for the Construction Right of Way after the Contractor defects period is over. This Plan shall include a detailed 'monitoring programme' intended to monitor the success of re-vegetation and enable the recommendation of management interventions were necessary. Such monitoring should be conducted over a period of at least 5 years. Annual site inspections carried out by suitably qualified specialists and photographic surveys summarised in periodic assessment reports shall be carried out.	Transnet		√
b	Pipeline	In accordance with the document entitled 'GDACE Requirements for Biodiversity Assessments' (GDACE, 2006), an ongoing monitoring and eradication programme for all invasive plant species growing within the pipeline servitude must be implemented by Transnet.	Transnet		
c	Pipeline	Indigenous vegetation must be maintained within the permanent pipeline servitude. Any area that is disturbed by Transnet Pipelines must be re-vegetated and rehabilitated. A vegetation / rehabilitation specialist might be used to advice on the most appropriate measures for re-vegetation. Natural vegetative conditions should be encouraged.	Transnet		
d	All	No roads related to operational maintenance of the pipeline should be constructed through wetlands.	Transnet		
e	All	Rehabilitation must be executed in such a manner that surface run-off will not cause erosion of disturbed areas during and following rehabilitation.	Transnet		

ITEM NO.	PROJECT COMPONENT	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
f	All	No faunal species occurring either within the permanent pipeline servitude or on adjacent properties may be intentionally harmed by maintenance staff during any routine maintenance of the pipeline. The setting of snares will be strictly prohibited and Transnet shall take stringent actions against any individual found to be guilty of such offence.	Transnet		

5.3.4 Wetlands

ITEM NO.	PROJECT COMPONENT	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	Pipeline	As a general principle, wetland soils should not be disturbed through any maintenance or repairs work. However, if the pipeline section within a wetland needs to be accessed for emergency repairs, the mitigation below must be applied: **Erosion Control** • Where possible, silt barriers or other relevant measures shall be installed along the edge of streams and wetlands, to prevent soil erosion and sedimentation from the maintenance works into the adjacent water body. • If any signs of erosion develop wherever the pipeline passes through a wetland or riparian area, the maintenance and repair Contractor or Transnet shall immediately refer the matter to an agricultural engineer. • Every effort must be taken to ensure that wherever a trench is excavated, it is backfilled and vegetation blocks re-instated in as short a time as possible. **Trenching** • Where trenching is done, soils removed must be separately stored and returned in the reverse order as they were removed to reinstate any subsurface layering of the profiles. All soils shall be stored in such a manner and position that it is not disturbed by construction activities. • Topsoil shall be protected from wash away and shall be covered with Hessian sheets or similar acceptable cover if it will be stockpiled for a period of two weeks or longer. • Where trenches are dug through seasonal and permanent sections of wetlands (where seepage is thus likely to be a factor) the sides of trenches should be stabilised through shoring up or battering back, to ensure that the trenches do not collapse. • Where they occur within wetlands, impermeable clay layers or hard plinthites must be restored to ensure that perched water tables supporting wetland habitats are	Transnet		

ITEM NO.	PROJECT COMPONENT	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		kept intact. Impermeable layers encountered within the wetland, and their depths must be noted. In the event of the need to disrupt a previously impermeable layer such as ferricrete, measures must be taken to ensure that the non-permeability of this layer is restored. • All trench breakers that are temporarily disturbed as a result of maintenance and / or repair activities shall be reinstated prior to back filling. Where trenching required for maintenance may potentially increase the risk of preferential subsurface drainage routes, additional trench breakers shall be installed. • Clay material for clay plugs (if these are used) shall not be sourced from the servitude, adjacent areas or wetland / riparian habitat, but from a commercial source. • The working right of way limit must be restricted to the minimum required to complete the work. This will limit compaction of the soils by the heavy machinery and prevent the vehicles from sinking in to the wet/moist soil			
b	Pipeline	Where possible, any required pipeline rehabilitation during operation and maintenance in wetland and rivers should occur during dry (winter months) when water levels and seepage are at their lowest.	Transnet		
c	Pipeline	Vegetation removal within any wetland or riparian habitat area shall be done as described in elsewhere in this the DEMP.	Transnet		

5.3.5 Waste Management

ITEM NO.	PROJECT COMPONENT	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	Pump stations, Terminals	Transnet shall ensure that to whatever extent is practicable, solid waste generated at all Pump Station and Terminals installations is separated into recyclable and non-recyclable items and that recycling takes place.	Transnet		
b	Pump stations, Terminals	Transnet shall ensure that solid waste collection and sanitation is managed effectively at all Pump Stations and Terminals in order to avoid the possibility of ground and surface water pollution.	Transnet		

6 Decommissioning Phase– Generic

6.1 Pipeline Decommissioning

6.1.1 Abandonment Plan

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	Transnet shall prepare an Abandonment Plan for submission to the regulatory authorities, at least three years ahead of abandonment. The appropriate authorities and the laws that must be complied with shall be those applicable at the time.	Transnet		√

6.1.2 Abandonment Options

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	Transnet shall determine whether there are any practical options to re-use the pipeline in preference to abandoning it. These shall be discussed with the regulatory authority(s). Assuming that there are no such options, the specifications below shall apply.	Transnet		
b	GEN	Two basic options that Transnet shall consider are: • abandonment-in-place and • pipeline removal. In the former case, the cathodic protection of the pipeline shall be removed. In addition to these options, any further options that are relevant at the time shall be considered, taking into account existing and future land use around the pipeline. These may include the opportunity to re-use the pipeline for other purposes.	Transnet		
c	GEN	The abandonment techniques described in this EMP are confined to those possible using currently available technology. As pipeline abandonment's become more prevalent, improved abandonment methods will probably be developed. Transnet shall comply with the prevailing best practice in the petroleum industry to determine and implement abandonment options.	Transnet		

6.1.3 Development and Implementation of an Abandonment Plan

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	Transnet shall prepare a site specific analysis in order to develop the Abandonment Plan. The analysis shall include an assessment of any relevant environmental and land use issues applicable at the time.	Transnet		
b	GEN	Transnet shall consider whether cost-effective alternatives are feasible for the various sections of pipeline. One abandonment technique may not be employed for the entire pipeline, and Transnet shall determine whether different options exist for the various sections of pipe.	Transnet		
c	GEN	Transnet shall provide an opportunity for meaningful input into the planning process by the affected stakeholders, as defined by the scope of the project. In particular, landowners and land managers shall be consulted in this process, in accordance with a recognized guideline such as the Department of Environmental Affairs and Tourism Guideline Series on Integrated Environmental Management (1992).	Transnet		
d	GEN	Transnet shall review the legal framework under which the pipeline is operated at the time. Beyond the requirements of the principal regulatory authorities, Transnet shall determine any other legislation that may affect the abandonment project (for example, municipal requirements) and this shall be considered and complied with.	Transnet		
e	GEN	Transnet shall review the servitude agreements with landowners to verify whether any terms and conditions in the agreements have a bearing on the abandonment decision-making process.	Transnet		
f	GEN	Transnet shall secure landowner and authority approvals, as required at the time, for the pipeline abandonment and site rehabilitation and shall implement the Abandonment Plan, the scope of which should include post-abandonment responsibilities.	Transnet		
g	GEN	On completion of the abandonment project, Transnet shall secure final authority release.	Transnet		

6.1.4 Post - Abandonment Responsibilities

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN monitoring	Once the pipeline has been abandoned, Transnet may retain a number of responsibilities. These may include responsibility for ensuring that the right-of-way and any facilities left in place remain free of problems associated with the abandonment. If required by the regulatory authorities, a Right-of-Way monitoring program shall be included in the Post-Abandonment Plan and accounted for in the abandonment budget.	Transnet		
b	GEN monitoring	In developing a monitoring plan, Transnet shall consider the effects of each abandonment issue for each segment of the pipeline being abandoned. Specific monitoring requirements shall be included for potentially sensitive areas.	Transnet		

6.1.5 Key environmental issues during Pipeline Abandonment

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	Abandonment issues arise from the need to address public safety, environmental protection, and future land use. The primary environmental issues that typically need to be considered are as follows: • land use management; • ground subsidence; • soil and groundwater contamination; • pipe cleanliness; • water crossings; • erosion; • creation of water conduits.	Transnet		
b	GEN	Most issues are not unique to the abandonment phase of the pipeline life-cycle, but could involve an altered scope, varied timeline, or additional stakeholders when compared to the issues of pipeline installation and operation. In order to responsibly abandon a pipeline, the owner must consider all of the issues and determine how they relate to the pipeline under consideration, in addition to addressing stakeholder concerns and incorporating collected input.	Transnet		
c	GEN	It is possible that a combination of both the abandonment-in-place and removal options will be used, based on site-specific requirements. Thus, it is important that all aspects	Transnet		

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		of the abandonment issues be considered. The abandonment in-place option does not necessarily eliminate the need for land disturbance or field activity, while pipeline removal need not necessarily encompass the same level of disturbance or activity as that of pipeline construction.			
		Land Use Management			
d	GEN	Land use is the most important factor to consider in determining whether a pipeline section should be abandoned in place or removed. Therefore, an understanding of the current and potential land uses along the pipeline Right-of-Way is necessary to make informed decisions about available abandonment options.	Transnet		
e	GEN	Of particular concern with respect to land use management are areas sensitive to land disturbance, such as pristine natural habitat, parks, unstable or highly erodible slopes, areas susceptible to severe wind erosion and irrigated land, particularly flood irrigation systems. Additionally, land improvements such as the installation of drainage systems, landscaping, and permanent structure installations could be affected by a proponent's decision to abandon a line.	Transnet		
f	GEN	Future land use should be considered because a pipeline abandoned in place could become a physical obstruction to development, such as excavation for foundations, pilings, or ongoing management practices such as deep ploughing or the installation of sub-drains. It is important that input be gathered from appropriate sources such as landowners, land managers, and local authority's sites to support the decision to abandon in place. In addition, sufficient documentation must be kept to allow for detailed location information for future developers or owners.	Transnet		
g	GEN	The decision to abandon in place or through removal should be made on the basis of a comprehensive site-specific assessment. In this context, the land management characteristics that may be better suited to pipeline abandonment-in-place include: • natural areas; • unstable or highly erodible surfaces; • river crossings; • flood irrigated fields; • road and railway crossings; • foreign pipeline crossings; • areas of pristine habitat; • wetlands; • areas exhibiting poor and/or limited access.	Transnet		
h	GEN	The key environmental protection measures to be considered when a pipeline is to be	Transnet		

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
	monitoring	abandoned in place are as follows: • minimal disruption to ongoing or future land management activities; • a complete and documented pipeline cleaning procedure; • the clean-up of any spills or contaminated sites to prevailing regulatory requirements; • a re-vegetation strategy to achieve pre-abandonment conditions, keeping erosion control and soil stability as a priority; • topsoil conservation for all areas disturbed during the abandonment process; • reclamation of all site access roads; • documented as-built information for future reference; and • a monitoring program acceptable to all affected parties to ensure a process to complete remediation.			
i	GEN	Proper environmental protection measures should be implemented, including appropriate soil handling procedures and contingency plans (e.g. for spills and wind or water erosion), protection of cultural features, weed control, and site reclamation.	Transnet		
j	GEN	Prior to the commencement of field activity, rehabilitation criteria should be agreed upon with the regulatory authorities and landowners. The rehabilitation programme will normally be designed to ensure that the condition of the right-of-way land surface is made at least equivalent to that existing just prior to the commencement of abandonment activities, and as close as circumstances permit to the condition of the land that existed prior to pipeline installation, and may entail: • removing, storing, and replacing topsoil; • soil contamination analysis and-clean up, if required; • contouring disturbed land to control drainage; • seeding affected areas to prevent erosion and establish vegetation; • removal of all structures to a minimum depth of one metre below final contour elevation; • scarifying and/or compacting excavated areas to compensate for future settlement; and • site-specific environmental requirements.	Transnet		
k	GEN monitoring	A right-of-way monitoring plan should be developed to ensure that reclamation efforts are successful and that no problems arise.	Transnet		

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		Ground Subsidence			
l	GEN	The long-term structural deterioration of a pipeline abandoned in place may lead to some measure of ground subsidence. This is a primary issue to consider for larger-diameter pipelines because of potential environmental and safety concerns. More particularly, ground subsidence could create the potential for water channelling and subsequent erosion, lead to topsoil loss, impact on land use and land aesthetics, and/or pose a safety hazard.	Transnet		
m	GEN	The acceptable subsidence limits and the potential factors affecting those limits are significant areas requiring attention in the development of any abandonment plan. Erosion may cause direct siltation to a watercourse, or cause slope failures and subsequent siltation. Where potential siltation is an issue, the owner must be prepared to deal with protection measures for aquatic species.	Transnet		
		Soil and Groundwater Contamination			
n	GEN	The Abandonment Plan should address the potential for contamination associated with the abandonment activities, as well as the need to eliminate any contamination that may already exist, and include the appropriate pipe cleaning or pigging procedure. Any contamination noted prior to abandonment activity should be cleaned up to the applicable legal standards prior to full project disturbance, unless it is more economical to include the cleanup in the scope of abandonment activity and it can be demonstrated that environmental damage will not be amplified.	Transnet		
o	GEN	Typical sources of contamination that need to be considered are: • the substances produced from the reservoir in the hydrocarbon stream and deposited on the walls of the pipeline; • pipeline coatings and their degradation products • historical leaks and spills of product that were not cleaned to current standards	Transnet		
		Pipe Cleanliness			
p	GEN	In light of potential contamination concerns, the cleanliness of the pipeline is an issue for both abandonment techniques. Pipe that is to be removed should be cleaned to a level where any remaining residues will not cause harm in any future intended use of the pipe. Removed pipe that may eventually be put to some alternative use (e.g. pilings) may require more study to determine the appropriate cleanliness requirements for the future use. For pipe that is targeted for disposal, existing disposal or land filling guidelines will determine the required cleanliness of the pipe.	Transnet		
q	GEN	For pipe that will be abandoned in place, the issue of pipe cleanliness is related to corrosion and the creation of water conduits. Eventually the pipe will corrode until perforated and the structural integrity of the pipe will suffer. Whether the rate of	Transnet		

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		deterioration will be greater than the life of the contaminants left as internal residue of the pipe will depend on local circumstances and will need to be considered. Similarly, the rate and structural location of any corrosion must be considered, in that it may allow water to infiltrate the abandoned pipe and transport pipe residues to some other exit point.			
		Water Crossings			
r	GEN + SS	There are many factors to consider in deciding whether a section of pipeline crossing a water body or wetland should be abandoned in place or removed. More specifically, the risks associated with abandoning the pipeline in place, including the potential for contamination and pipe exposure, have to be weighed against the cost and environmental impact of removal.	Transnet		
s	GEN	These trade-offs should be assessed on a site-specific basis, taking into account the size and dynamics of the water body, the design of the pipeline crossing, soil characteristics, slope stability, and environmental sensitivities. While these issues must be evaluated, in most cases it can be expected that abandonment-in-place will be the preferred option.	Transnet		
t	GEN	If the pipeline crossing is to be abandoned in place, the pipe should be left in as clean a state as possible to minimize the potential for contamination of the water body should the eventual perforation and failure of the pipe allow any internal residues to escape. The strategic placement of caps and plugs will also help mitigate this concern by interrupting the movement of potential contaminants through the abandoned pipe.	Transnet		
u	GEN	The risk of pipe exposure is two-fold. First, the pipeline could become exposed if the overlying soil is gradually eroded or washed away because of the dynamics of the water body (e.g. stream bank migration, scour, or flood conditions). Secondly, an empty pipeline crossing a water body or wet area could float toward the surface if buoyancy control mechanisms fail (e.g. if concrete saddle weights slide off). In either case, the probability that the pipeline could become exposed and the impacts that exposure would entail should be assessed.	Transnet		
v	GEN	If the pipeline is to be removed in whole or in part, the issues would be similar in many ways to those associated with initial construction across the water body or wetland. More specifically, many of the same construction techniques and environmental protection measures would apply. Aspects to address include fisheries spawning times, habitat protection, sediment control, vehicle and equipment crossing methods, backfill material specifications, erosion control measures (both short term and long term), and bank restoration. Damage to any existing bank stabilization structures or destabilization of previously stable banks should be considered.	Transnet		

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
w	GEN	It is important that the pipe be as clean as possible prior to excavation to minimize the potential for contamination of the water body should the pipe be damaged and spills occur during the removal procedure.	Transnet		
		Erosion			
x	GEN + SS	Soil erosion is a concern during all phases of the pipeline life-cycle, particularly as it relates to slope stability. Leaving a pipeline in the ground may entail a certain amount of activity along the right-of-way to ensure responsible abandonment, such as excavations to confirm cleaning quality and the installation of caps or plugs. The potential impact of the ensuing right-of-way disturbance will vary greatly with the geographic location of the activity.	Transnet		
y	GEN + SS	If the pipe is to be removed, erosion and slope stability concerns will be similar to those for pipeline construction. For example, traffic, soil compaction, and the water erosion of disturbed soil may be of concern. In addition, the pipeline may have become a structural support to many slopes over time, and its removal may affect the integrity of the slope.	Transnet		
z	GEN + SS	When developing an Abandonment Plan for the pipeline any erosion remediation that has occurred over the operating life of the pipeline should be reviewed. If erosion control measures have been regularly required at specific locations, it may be necessary to implement longer term erosion control measures.	Transnet		
aa	GEN + SS	If the abandonment activities necessitate disturbing erosion-prone areas including slopes, protection measures designed to current standards should be implemented. In addition, the integrity and effectiveness of any existing ditch plugs, sub-drains, berms, or other installations should be reviewed.	Transnet		
bb	GEN	It is usually more appropriate to abandon pipe at unstable slopes in place, due to the potential requirement for extensive remediation if the pipeline is removed.	Transnet		
		Creation of Water Conduits			
cc	GEN	The potential to create water conduits as a result of the abandonment process must be considered as it could lead to concentrated drainage and material transport. This issue is primarily of concern when a pipeline is abandoned in place, since water will eventually infiltrate the pipe through perforations in the pipe wall caused by corrosion.	Transnet		
dd	GEN	Unless water pathways through the pipeline are interrupted, this could lead to the unnatural drainage of areas such as wetlands, thus affecting the natural balance of the ecosystem. Similarly, a previously stable low area could be flooded by volumes of water exiting from a perforated pipeline. If water infiltrates the pipeline, the potential exists for that water to carry any residual contaminants left in the abandoned pipeline to some point of exit. The point of exit could be a watercourse, thereby contaminating the	Transnet		

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		watercourse if contaminant levels are sufficiently great in volume and concentration at the point of exit. The possibility of soil contamination may also exist.			
ee	GEN	Plugs should be considered at appropriate spacers to ensure that changes in surface and ground water conditions will not result in water flow through the pipeline.	Transnet		

Contractor Health and Safety Specification Guidelines

Table of Contents

1. Purpose

This specification development guideline identifies and encompass the working behaviours and safe work practices that are expected of all Transnet SOC Ltd employees, Contractors, Consultant, Visitors and Suppliers, engaged on Transnet managed projects as required by Construction Regulation of 2014, regulation 5(1)(b).
All contractors and service providers must take careful note of these requirements and must ensure that adequate provision has been made to ensure compliance.
This Specification development guideline has been compiled to cover a wide range of construction/ work activities and should serve as a guideline for Safety Agents to develop site specific specifications for construction projects. In order to determine which requirements are applicable, the contractor must conduct a health and safety risk assessment specific to the project and specific to the contractor's scope of work. All applicable requirements must be addressed in the Contractor's Health and Safety Management Plan.

This Specification development guideline will be reviewed and updated periodically as and when necessary) to address and / or include:

- Changes in legislation;
- Client requirements;
- Leading practices; and
- Lessons learnt from incidents.

The specification development guideline provides the minimum requirements for site specific specification and should be used as a guide to develop the site specific specification as it is required by the Construction Regulation of 2014.

2. Scope

This Specification applies to all project sites, and to all persons working on or visiting the Transnet managed projects. The requirements specified in this document are applicable to the contractor as well as any sub-contractors, EPCM Contractors, Consultant, Vendors and Visitors that may be appointed by Transnet as an Employer. It is the contractor's responsibility to ensure that all sub-contractors comply fully with all legal requirements as well as the requirements of this health and safety specification.

3. Definitions

Acceptable Risk
A risk that has been reduced to a level that can be tolerated having regard for the applicable legal requirements and the Health and Safety Policy adopted for the project.

ALARP (As Low As Reasonably Practicable)
The concept of weighing a risk against the sacrifice needed to implement the measures necessary to avoid the risk. With respect to health and safety, it is assumed that the measures should be implemented unless it can be shown that the sacrifice is grossly disproportionate to the benefit.

Applicant (Permit to Work)
A person requesting permission to perform work for which a Permit to Work is required. Applicants must be authorised (in writing) to receive (or accept) Permits to Work and must be competent to do so by virtue of their training, experience and knowledge of the area or plant in which the work is to be performed.

Authorised Person (Permit to Work)
A person (typically a Project employee or an employee of the client) who has been authorised (in writing) by the nominated project management representative to issue Permits to Work within the scope of his designation. A person may only be appointed to issue Permits to Work if he has undergone training and has been assessed and found competent in systems, plant and equipment operation within the scope of his designation.

Barricade
A temporary structure that is erected as a physical barrier to prevent persons from inadvertently coming into contact with an identified hazard.

Battering
Sloping the sides of an excavation to a predetermined angle (usually less than the natural angle of repose) to ensure stability.

Benching
The creation of a series of steps in the sides of an excavation to prevent collapse.

Consequence
The outcome of an event expressed qualitatively or quantitatively.

Contractor
An employer (organisation) or a person who performs **ANY** work and has entered into a legal binding business agreement contract to supply a product or provide services to Transnet. This applies to the Suppliers, Vendors, and Consultants, Service providers or Contractors performing construction work

NB: A Contractor is an employer in his/her own right

Competent Person
A person who has in respect of the work or task to be performed the required knowledge, training, experience and as per act cr2014.

Construction Supervisor
A competent person responsible for supervising construction activities on a construction site

Clearance Certificate
A signed declaration by an Isolation Officer that a specified hazardous energy source associated with a particular system, plant or item of equipment has been isolated in accordance with an approved Isolation and Lockout Procedure.

Discipline Lock (many locks with a restricted number of identical keys)
Attached at a Lockout Station or at a Local Isolation Point in order to lock out a system, plant or equipment. A Discipline Lock (e.g. A Low Voltage Electricity Discipline Lock) is owned by an

Isolation Officer who has been authorised in writing to isolate and lockout a particular hazard (e.g. Low voltage electricity).

Equipment Lock (many locks with one unique key)
Attached directly to pieces of equipment in order to lock them out. Equipment Locks may only be used by Isolation Officers who have been authorised in writing to perform isolation and lockout procedures. The key must have a solid key ring that fits over an Isolation Bar.

Excavation
Any man-made cut, cavity, pit, trench, or depression in the earth's surface formed by removing rock, sand, soil or other material using tools, machinery, and / or explosives. Tunnels, caissons and cofferdams are specifically excluded and are not addressed in this standard.

First-Aid Injury (FA)
A first-aid injury is any one time treatment and any follow up visit for observation of minor scratches, cuts, burns, splinters and the like which do not normally require medical care. Such treatment is considered to be first aid even if administered or supervised by a medical practitioner. First aid includes any hands on treatment given by a first aider. (E.g. Band-Aid, washing, cleansing, pain, relief). The following procedures are generally considered first aid treatment:

- Application of Antiseptics.
- Application of Butterfly adhesive dressing or sterile strips for cuts and lacerations.
- Administration of tetanus shot(s) or booster(s). However, these shots are often given in conjunction with more serious injuries, consequently injuries requiring these shots may be recordable for other reasons.
- Application of bandages during any visit to medical personnel.
- Application of ointments to abrasions to prevent drying or cracking.
- Inhalation of toxic or corrosive gas, limited to the removal of the employee to fresh air or the one time administration of oxygen for several minutes.
- Negative X-Ray diagnosis.
- Removal of foreign bodies not embedded in the eye if only irrigation is required.
- Removal of foreign bodies from a wound if procedure is uncomplicated, for example by tweezers or other simple technique.
- Treatment for first degree burns.
- Use of non-prescription medications and administration of single dose of prescription medication on first visit for any minor injury or discomfort.

Hazard
A source of potential harm in terms of human injury or ill health, or a combination of these.

Hierarchy of Controls
A sequence of control measures, arranged in order of decreasing effectiveness, used to eliminate or minimise exposure to workplace health and safety hazards:

- Elimination – Completely removing a hazard or risk scenario from the workplace.
- Substitution – Replacing an activity, process or substance with a less hazardous alternative.
- Isolation (Engineering) Controls – Isolating a hazard from persons through the provision of mechanical aids, barriers, machine guarding, interlocks, extraction, ventilation or insulation.
- Administrative Controls – Establishing appropriate policies, procedures and work practices to reduce the exposure of persons to a hazard. This may include the provision of specific training and supervision.
- Personal Protective Equipment – Providing suitable and properly maintained PPE to cover and protect persons from a hazard (i.e. Prevent contact with the hazard).

Isolation and Lockout Procedure
A plant or equipment-specific procedure that describes the method, and sequence to be followed, for rendering equipment, plant and systems safe to work on.

Isolation Bar
A device used at a Lockout Station to which anyone is able to attach a Personal Lock making it impossible for an Isolation Officer to remove the key to the Equipment Locks, thus preventing the de-isolation of a system, plant or equipment while it is still being worked on. A Discipline Lock must always be the first lock attached to an Isolation Bar and last to be removed.

Isolation Officer
A person (typically a Project employee or an employee of the client) who has been authorised (in writing) by the nominated project management representative to perform isolation and lockout procedures. A person may only be appointed as an Isolation Officer if he has undergone training and has been assessed and found competent in the isolation and lockout of systems, plant and equipment within the scope of his designation.

Incident
An event (or a continuous or repetitive series of events) that results or has the potential to result in a negative impact on people (employees, contractors and visitors), the environment, operational integrity, assets, community, process, product, legal liability and / or reputation.

Likelihood
A description of probability or frequency, in relation to the chance that an event will occur.

Lost Time Injury (LTI)

Any occurrence that resulted in a permanent disability or time lost from work of one day/shift or more.

If an employee is injured and cannot return to work in the next shift (will ordinarily miss one whole shift), and the department brings the employee in to only receive treatment by the Supervisor/ Return to Work Coordinator in that shift, this is still considered an LTI.

Lost Time Injury Frequency Rate (LTIFR) - Number of LTI's multiplied by 1 million or 200,000 and divided by labour hours worked.

Light Vehicle

A vehicle that:

- Can be licensed and registered for use on a public road;
- Has four or more wheels, and seats a maximum of 12 adults (including the driver);
- Requires the driver to hold only a standard civil driving licence; and
- Does not exceed 4.5 tonnes gross vehicle mass (GVM), which is the maximum loaded mass of the motor vehicle as specified by:
  - The vehicle's manufacturer; or
  - An approved and accredited automotive engineer, if the vehicle has been modified to the extent that the manufacturer's specification is no longer appropriate.

Examples of light vehicles include passenger cars, four-wheel drive vehicles, sports utility vehicles (SUVs), pick-ups, minibuses, and light trucks.

Any vehicle falling outside of this definition must be considered mobile equipment.

Medical Treatment Injury (MTI)

A work injury requiring treatment by a Medical Practitioner and which is beyond the scope of normal first aid including initial treatment given for more serious injuries. The procedure is to be of an invasive nature (e.g. Stitches, removal of foreign body).

The following procedures are generally considered medical treatment:

- Application of sutures (stitches).
- Cutting away dead skin (surgical debridement).
- Loss of consciousness due to an injury or exposure in the work environment.
- Positive X-Ray diagnosis (fractures, broken bones etc.).
- Removal of foreign bodies embedded in the eye.
- Removal of foreign bodies from the wound by a physician due to the depth of embedment, size or shape of object or the location wound.
- Reaction to a preventative shot administered because of an occupational injury.
- Sprains and strains - series (more than one) of hot and cold soaks, use of whirlpools, diathermy treatment or other professional treatment.
- Treatment of infection.
- Treatment for second or third degree burns
- Use of prescription medications (except a single dose administered on first visit for minor injury or discomfort.)

Mobile Equipment

A vehicle (wheeled or tracked) that generally requires:

- The driver to hold a specific state or civil license; or
- The operator to hold a nationally recognized certificate of competency.

Examples of mobile equipment include, but are not limited to, dump trucks, water trucks, graders, dozers, loaders, excavators, forklifts, tractors, back-actors, bobcats, mobile cranes, tele-handlers, drill rigs, buses and road-going trucks.

Near Hit

An incident that has occurred that did not result in any injuries, illnesses, environmental or property damage but had the potential to cause an injury, illness, environmental or property damage.

Personal Lock

A single lock with one unique key controlled by the owner. Used for personal protection.

Regulation

In the context of this guideline, 'Regulation(s)' refers to the Construction Regulations, 2014 required by Section 43 of the Occupational Health and Safety Act 85 of 1993, published under Government Notice R 84 in Government Gazette 37305 of February 2014.

Risk

A combination of the likelihood of an occurrence of a hazardous event or exposure and the severity of injury or ill health that can be caused by the event or exposure.

Risk Assessment

A process of evaluating the risk arising from a hazard, taking into account the adequacy of any existing control measures, and deciding on whether or not the risk is acceptable.

Risk Management
The systematic application of management policies, processes and procedures to identifying hazards, analysing and evaluating the associated risks, determining whether the risks are acceptable, and controlling and monitoring the risks on an ongoing basis.

4. Abbreviations

DSTI - Daily Safety Task Instruction

CR – Construction Regulations

EPC - Engineering Procurement and Construction

EPCM - Engineering Procurement and Construction Management

HIRA - Hazard Identification and Risk Assessment

HEALTH AND SAFETY - Integrated Management System

MS - Management System

OHS Act - Occupational Health and Safety Act

SOC - Safety Observation and Conversation

VFL - Visible Felt Leadership

OHS - Occupational Health and Safety

SACPCMP - The South African Council for Project and Construction Management Professions, here in refer to as they register of Health and Safety Professionals

5. SHE Management Plan

The contractor must prepare, implement and maintain a project-specific SHE Management Plan. The plan must be based on the requirements set out in this specification as well as all applicable legislation. It must cover all activities that will be carried out on the project site(s), from mobilisation and set-up through to rehabilitation and decommissioning.

The plan must demonstrate the contractor's commitment to HEALTH AND SAFETY and must, as a minimum, include the following:

- A copy of the contractor's **Health and Safety Policy**; in terms of the OHS Act section 7
- Procedures concerning **Hazard Identification and Risk Assessment**, including both Baseline and Task-Based Risk Assessments;
- Arrangements concerning the identification of applicable **Legal and Other Requirements**, measures to ensure compliance with these requirements, and measures to ensure that this information is accessible to relevant personnel;
- Details concerning **Health and Safety Objectives** – a process must be in place for setting objectives (and developing associated action plans) to drive continual improvement;
- Details concerning **Resources, Accountabilities and Responsibilities** – this includes the assignment of specific health and safety responsibilities to individuals in accordance with legal or project requirements, including the appointment of a Project Manager, Health and Safety Officers, Supervisors, Health and Safety Representatives, and First Aiders;

- Details concerning **Competence, Training and Awareness** – a system must be in place to ensure that each employee is suitably trained and competent, and procedures must be in place for identifying training needs and providing the necessary training;
- **Communication, Participation and Consultation** arrangements concerning health and safety, including Safety Observations and Coaching, Toolbox Talks, Daily Safe Task Instructions, project health and safety meetings, and notice boards;
- **Documentation and Document Control** – project-specific documentation required for the effective management of health and safety on the project must be developed and maintained, and processes must be in place for the control of these documents;
- Processes and procedures for maintaining **Operational Control**, including rules and requirements (typically contained in Safe Work Procedures) for effectively managing health and safety risks, particularly critical risks associated with working at heights, confined spaces, mobile equipment and light vehicles, lifting operations, hazardous chemical substances, etc.;
- **Emergency Preparedness and Response** procedures;
- **Management of Change** – a process must be in place to ensure that health and safety risks are considered before changes are implemented;
- **Sub-contractor Alignment** procedures – a process must be in place for the assessment of sub-contractors and suppliers with regard to health and safety requirements and performance (before any contract or purchase order is awarded);
- **Measuring and Monitoring** plans, including a plan for the measuring and monitoring of employee exposure to hazardous substances or agents (e.g. Noise, dust, etc.) In order to determine the effectiveness of control measures;
- **Incident Reporting and Investigation** procedures describing the protocols to be followed with regard to incident reporting, recording, investigation and analysis;
- **Non-conformance and Action Management** procedures concerning the management of corrective actions;
- **Performance Assessment and Auditing** procedures concerning health and safety performance reporting, monthly internal audits to assess compliance with the project health and safety requirements, and daily site health and safety inspections; and
- Details concerning the **Management Review** process followed to assess the effectiveness of health and safety management efforts.

Prior to mobilisation, the HEALTH AND SAFETY Management Plan must be forwarded electronically, and as a hard copy, to the nominated project management representative for review. The plan will be audited for completeness and, if found to be adequate, will be accepted (typically "with comments"). Work may not commence until the plan has been accepted.

Once the plan has been accepted, the contractor must action and resolve any issues within 30 days from the start of work.

If the issues requiring corrective action are not resolved within this 30 day period, the contractor will be required to stop any work related to the outstanding actions until they have been resolved.

Any proposed amendments or revisions to the contractor's Health and Safety Management Plan must be submitted to the nominated project management representative for acceptance.

Should it be identified that the contractor has overlooked a high risk activity, and as a result has omitted the activity and associated control measures from the Health and Safety Management Plan, the plan will not be approved.

6. Policy

The contractor must develop, display and communicate a Health and Safety Policy that clearly states the contractor's values and objectives for the effective management of health and safety as required by OHS Act of 1993, 7(3). These values and objectives must be endorsed by the contractor's management representatives and must be consistent with those adopted for the project.

The policy must be signed and dated, and must be reviewed annually.

The policy must commit to:

- Compliance with all applicable legal requirements in the TCP regulatory universe;
- The effective management of health and safety risks;
- The establishment of measurable objectives for improving performance, and the provision of the necessary resources to meet these objectives;
- The prevention of incidents; and
- Achieving continual improvement with regard to health and safety performance.

All employees of the contractor as well as the employees of any sub-contractors that may be appointed by the contractor must be made aware of the policy. This must be done through Health and Safety Induction Training and Toolbox Talks (refer to Sections 10 and 11).

A copy of the policy must be displayed in each meeting room and on each notice board.

7. Hazard Identification and Risk Assessment.

Detailed hazard identification and risk assessment processes must be followed for all work to be performed as well as for all associated equipment and facilities as required by the Construction regulation of 2014, regulation 9(1) – (7).

The client will provide a baseline risk assessment informing contractor on the hazards and risks on site. Contractor must ensure that effective procedures and risk assessment systems are in place to control hazards and to mitigate risks to levels that are as low as is reasonably practicable.

The risk assessment processes must be applied to:

- The full life cycle of the project;
- Routine and non-routine activities;
- Planned or unplanned changes (refer to Section 15);
- All employees, sub-contractors, suppliers and visitors; and
- All infrastructure, equipment and materials.

The risk assessment processes and methodologies must be appropriate for the nature and scale of the risks, and must be implemented by competent persons.

The process of analysing and managing risk must include the following:

- Establishing the context of the risk assessment;

- Identifying hazards and determining possible risk scenarios (unwanted events);
- Evaluating risks and assigning ratings (classification);
- Recording the risk analysis in a risk register;
- Managing risks according to their classification (prioritising for action);
- Identifying and implementing control measures (through the application of the Hierarchy of Controls) to ensure that risks are managed to levels that are as low as is reasonably practicable (ALARP);
- Developing action plans for reducing risk levels (where possible);
- Verifying the completion of actions;
- Re-evaluating the risks and classifications as appropriate; and
- Reviewing and updating the risk register.

7.1 Baseline Risk Assessments

Prior to site establishment, the client must conduct a detailed Baseline Risk Assessment identifying foreseeable hazards and risk scenarios associated with the contractor's scope of work on the project site(s) as required by Construction Regulations of 2014, regulation 5(1)(a) . Details concerning proposed control measures must be included. The risk assessment process must be facilitated by a competent person who has been appointed in writing and must involve the participation of the contractor's site management representatives, supervisory personnel and technical experts (as required). An attendance register must be completed and retained for reference purpose. The Baseline Risk Assessment must be reviewed and approved by the Project Health and Safety Manager and Project Construction Manager.

When carrying out a Baseline Risk Assessment or a Task-Based Risk Assessment (refer to Section 6.2), Hazard (Energy) Types must be specified in accordance with the categorisation detailed in Table 6-1. Risk scenarios must be described indicating the manner in which a person may come into contact with, or be exposed to, a specific hazard.

An initial risk rating must be assigned to each risk scenario without taking any control measures into consideration. Control measures for managing the risks to levels that are as low as is reasonably practicable must then be identified for implementation on the project, and a residual risk rating must be assigned to each risk scenario taking the identified control measures into consideration.

Ratings must be assigned qualitatively using TCP consequence and likelihood scales and descriptors (i.e. TCP 5x5 qualitative risk matrix). Refer to Tables 6-2, 6-3 and 6-4.

Table 7-1: Hazard (Energy) Types

A Risk Register comprised of all significant risks (i.e. Risks rated as major or catastrophic) identified for the project will be compiled using the information contained in the project Baseline Risk Assessment as well as the contractor's Baseline Risk Assessment. Key control measures for managing each of these risks will be specified in the register.

For the significant risks in particular, action plans will be developed for reducing the risk levels (where possible).

The project Risk Register will be reviewed and, if necessary, updated:

- On a quarterly basis during construction;

- When changes are made to a design and / or the construction scope, schedule, methods, etc. That result in a change to the risk profile; and
- Following an incident.

The contractor must ensure that the hazards, risk scenarios and control measures identified in the contractor's Baseline and Task-Based Risk Assessments are taken into consideration when developing, implementing and maintaining the various elements of the contractor's health and safety management system for the project (e.g. Competence, training and awareness requirements).

All persons potentially affected must be made aware of the hazards, risk scenarios and control measures identified in the contractor's risk assessments. This must be done through training, Toolbox Talks, and Daily Safe Task Instructions (refer to Sections 10 and 11).

7.2 Task-Based Risk Assessments

The contractor must carry out detailed project-specific Task-Based Risk Assessments which must be reviewed and approved by the Client's Project Health and Safety Manager and Contract Manager prior to the commencement of any work.

The risk assessment process must be facilitated by a competent person who has been appointed in writing in terms CR 9 sub regulation (1). The contractor's site management representatives, supervisory personnel, technical experts (as required) and workforce personnel directly involved with the task being examined must participate in the risk assessment process. An attendance register must be completed and retained.

Please Note: Under no circumstances may a Contractor Health and Safety Officer perform a risk assessment in isolation. The active participation of all persons referred to above is mandatory.

A Task-Based Risk Assessment must at least:

- Be accompanied by a Work Method Statement (describing in sufficient detail how the specific job or task is to be performed in a logical and sequential manner);
- Provide a breakdown of the job or task into specific steps;
- Identify the hazards and potential risk scenarios associated with each step;
- Include consideration of possible exposure to noise, heat, dust, fumes, vapours, gases, chemicals, radiation, vibration, ergonomic stressors, or any other occupational health hazard or stressor;
- Describe the control measures that will be implemented to ensure that the risks are managed to levels that are as low as is reasonably practicable; and
- Assign an initial risk rating (without taking any control measures into consideration) and a residual risk rating (taking the identified control measures into consideration) to each risk scenario.

A Task-Based Risk Assessment must be reviewed and, if necessary, updated:

- On an annual basis (as a minimum);
- When changes are made to the associated Work Method Statement; and
- Following an incident.

7.3 Pre-Task Hazard Assessments

A pre-task hazard assessment must be completed whenever a change is identified while carrying out an activity. Any deviation from what was discussed during the Daily Safe Task Instruction (prior to the activity commencing), or anything that was not discussed, constitutes a change.

Before carrying out the particular task that involves the identified change, a few minutes must be spent identifying the hazards and risks associated with that task as well as suitable control measures.

8. Legal and Other Requirements

The Contractor must comply with the requirements of all applicable legislation as well as Transnet and project-specific standards and procedures as amended from time to time.

The Contractor must compile and maintain a register of all legal and other requirements applicable to the work that will be carried out and / or services that will be provided. This register must be updated regularly to ensure that it remains relevant.

Applicable laws and standards must be appropriately communicated to all employees of the contractor (as well as the employees of any sub-contractors that may be appointed by the contractor) through training, Toolbox Talks, and Daily Safe Task Instructions (refer to Sections 10 and 11).

9. Objectives

In order to drive continual improvement, the contractor must set project-specific objectives, and must develop improvement action plans to achieve these objectives. The contractor's objectives must be aligned with the objectives set for the project as a whole as required by the Construction regulations of 2014, regulation 7.

Eliminating hazards, minimising risks, preventing incidents, injuries and illnesses, and ensuring legal compliance must be the primary considerations for setting objectives.

When setting objectives, consideration must be given to the following:

- Leading indicators such as inspection findings, audit findings, hazard reporting, and observations;
- Lagging indicators (i.e. Incidents including Near Hits);
- Leading practices and lessons learnt; and
- Injury frequency rates with due understanding that the goal is "no harm".

The objectives must be specific and measurable. The improvement action plans must specify the resources (both human and financial) required to achieve the objectives, the person's responsible, and realistic timeframes for completion. The contractor must ensure that adequate resources are allocated and that progress towards meeting the objectives is monitored regularly.

The objectives and associated improvement action plans must be documented and must be communicated to all contractor employees. Furthermore, to ensure that the objectives remain relevant, they must be reviewed on a quarterly basis and whenever significant change has taken place on the project (i.e. Changes to activities, scope of work, operating conditions, etc.).

Performance reviews must be carried out at quarterly intervals to assess and document performance against these personal or team objectives.

If a reward or incentive scheme is introduced, it must be designed in such a manner that health and safety performance is not compromised in order to maximise financial reward.

10. Resources, Accountabilities and Responsibilities

The Contractor must adequately allocate resources, responsibility and accountability to ensure the effective implementation, maintenance and continual improvement of the contractor's HEALTH AND SAFETY management system on the projects required by Construction regulation 0f 2014, regulation 7(2)(c)

For each role that carries health and safety accountability and / or responsibilities (including legislative requirements), a role description detailing the accountability and / or responsibilities must be documented.

All appointments (i.e. the assignment of specific SHE responsibilities to individuals in accordance with legal or project requirements) must be done in writing. Documented proof of each appointment (i.e. a signed appointment letter) must be retained.

Contractor should not discharge any legal responsibilities to employees who are not legally appointed.

The contractor must comply with the requirements of all applicable legislation concerning health and safety related appointments and delegations for the project.

A Organogram specific to the project must be documented and maintained. All roles that carry SHE accountability and / or responsibilities must be included, and all individuals that carry health and safety appointments must be clearly identified.

The provision of dedicated professionals on the project must be appropriate for the nature and scale of the work to be carried out.

The contractor is solely responsible for carrying out the work under the contract whilst having the highest regard for the health and safety of all persons on the project site(s).

Health and safety is the responsibility of each and every individual on the project site(s), but in particular, it is the responsibility of the contractor's management team who must set the tone.

Visible commitment is essential to providing and maintaining a safe workplace. The contractor's managers and supervisors at all levels must demonstrate their commitment and support by adopting a risk management approach to all health and safety issues. These individuals must consistently take immediate and firm action to address violations of health and safety rules, and must actively participate in day to day activities with the objective of preventing harm.

The contractor's management representatives are responsible and accountable for health and safety performance on the project. Key responsibilities include the following:

- Preparing, implementing and maintaining a risk-based Health and Safety Management Plan specific to the work that will be carried out (refer to Section 4);
- Establishing, implementing and maintaining health and safety programmes and procedures to ensure that all work is carried out in compliance with the requirements of this specification, the contract, and all applicable legislation;
- Establishing, implementing and maintaining effective hazard identification and risk management processes and procedures to ensure that all reasonably foreseeable hazards are controlled in order to minimise risk (refer to Section 6);
- Providing the resources necessary to meet the requirements of this specification (refer to Section 9);

- Ensuring that all contractor employees have clearly defined responsibilities with regard to health and safety, and that these responsibilities are clearly communicated and understood (refer to Section 9);
- Establishing, implementing and maintaining a system for ongoing training and assessment of skills and competence (refer to Section 10);
- Establishing, implementing and maintaining procedures to ensure that only qualified and competent personnel are permitted to work on the project site(s) (refer to Section 10);
- Establishing, implementing and maintaining effective communication and consultative processes concerning health and safety for the duration of the contract (refer to Section 11);
- Maintaining operational control for the protection of all persons on the project site(s) as well as the public (refer to Section 13);
- Establishing, implementing and maintaining effective emergency preparedness and response procedures (refer to Section 14);
- Establishing, implementing and maintaining effective management of change processes and procedures (refer to Section 15);
- Establishing, implementing and maintaining effective incident reporting and investigation processes and procedures (refer to Section 18);
- Establishing, implementing and maintaining effective auditing and inspection processes and procedures (refer to Section 20); and
- Formally reviewing the contractor's Health and Safety Management System annually to ensure that the system continues to be effective in managing health and safety performance and meeting project requirements (refer to Section 21).

All costs associated with meeting these responsibilities shall be borne by the contractor.

Any cost associated with any work stoppage due to non-compliance with a health and safety requirement shall be for the contractor's account.

10.1 Contractor Construction Manager

The Contractor must appoint a competent Construction Manager who shall be responsible for the successful and safe completion of all work to be carried out by the contractor as required by the Construction regulations of 2014, regulation 8(1).

The contractor's Project Manager shall be responsible for:

- Ensuring that a Health and Safety Policy that clearly states the contractor's values and objectives for the effective management of health and safety on the project is in place and is communicated to all contractor and sub-contractor employees;
- Ensuring that all applicable legal and project health and safety requirements are identified and complied with at all times;
- Ensuring that effective hazard identification and risk management processes are established and implemented for all work to be carried out by the contractor;
- Participating in the Baseline Risk Assessment for the contractor's scope of work (prior to site establishment);

- Participating in (and approving) all Task-Based Risk Assessments conducted for the work to be carried out by the contractor;
- Driving the achievement of agreed health and safety objectives;
- Ensuring that the necessary resources are made available for the effective implementation of the contractor's Health and Safety Management Plan;
- Ensuring that all work is adequately and competently supervised;
- Ensuring that all contractor employees have clearly defined responsibilities with regard to health and safety (assigned in writing), and that these responsibilities are clearly communicated and understood;
- Ensuring as far as is reasonably practicable that each contractor and sub-contractor employee is competent to perform his role, and has received appropriate workplace health and safety training and instruction;
- Managing all appointed sub-contractors with regard to health and safety performance;
- Establishing and maintaining effective communication and consultative processes to ensure that all contractor and sub-contractor employees are kept up to date with regard to health and safety information (e.g. Incidents and lessons learnt, leading practices, hazards, risks and control measures, etc.) And that feedback is provided promptly regarding issues and / or concerns raised;
- Participating in the project's Visible Felt Leadership (VFL) programme;
- Chairing monthly Contractor Health and Safety Meetings and attending monthly Site Health and Safety Meetings;
- Implementing programmes that encourage continual improvement and providing recognition for suggestions made by contractor and sub-contractor employees;
- Implementing the contractor's Health and Safety Management Plan and associated Safe Work Procedures;
- Acting consistently and strictly against any contractor or sub-contractor employee who transgresses a health and safety rule or requirement;
- Ensuring that an effective management of change process is in place;
- Implementing, testing and maintaining an effective Emergency Response Plan for all contractor and sub-contractor activities, and ensuring that the plan is adequately resourced;
- Ensuring that workplace exposure of contractor and sub-contractor employees to hazardous substances or agents is measured and monitored to determine the effectiveness of controls and compliance with legal (and project) requirements;
- Ensuring that all incidents are reported without delay and are investigated thoroughly;
- Participating in investigations into significant incidents;
- Ensuring that accurate health and safety statistics are maintained, and that health and safety performance reports are compiled as required;
- Providing the necessary resources for regular health and safety audits and inspections to be conducted, and supporting the auditing process;
- Participating in health and safety audits, and carrying out workplace inspections;

- Ensuring that corrective actions (arising from incident investigations, audits, inspections, etc.) Are implemented, and that adequate resources are provided for this purpose; and
- Participating in an annual review of the contractor's Health and Safety Management System.

10.2 Contractor Health and Safety Officers

The contractor must appoint a full-time Health and Safety Officer for the duration of the contract who is registered with the SACPCMP (The South African Council for Project Construction Management Professions). The project site(s) (directly or through sub-contractors), must at least appoint two full-time Health and Safety Officers depending on the scope, complexity, budget and high risk activities involved, as required by the Construction regulations of 2014, regulation 7(2)(c).

The Health and Safety Officer must be on site when work commences at the start of the day and must remain on site until all activities for that day (including the activities of sub-contractors) have been completed. A Health and Safety Officer must be present during all shifts, so if work is carried out over more than one shift per day, the contractor must make provision for an additional Health and Safety Officer.

Each Contractor Health and Safety Officer shall be responsible for:

- Reviewing all applicable legal and project health and safety requirements and providing guidance to contractor and sub-contractor personnel (particularly the contractor's Project Manager) to help ensure compliance at all times;
- Assisting with the implementation of effective hazard identification and risk management processes for all work to be carried out by the contractor;
- Participating in the Baseline Risk Assessment for the contractor's scope of work (prior to site establishment) and ensuring that identified control measures are implemented;
- Participating in all Task-Based Risk Assessments conducted for the work to be carried out by the contractor and ensuring that identified control measures are implemented;
- Conducting contractor health and safety induction training for all contractor and sub-contractor personnel;
- Compiling and maintaining all health and safety related documents and records required of the contractor;
- Communicating relevant health and safety information to contractor and sub-contractor personnel (e.g. Incidents and lessons learnt, leading practices, hazards, risks and control measures, etc.);
- Carrying out Safety Observations and Coaching (one per day);
- Evaluating (on a daily basis) the content of the Daily Safe Task Instructions (DSTI's) conducted by the contractor's appointed supervisors, and attending at least one DSTI each day;
- Attending monthly Contractor and Site Health and Safety Meetings;
- Assisting with the implementation of the contractor's Health and Safety Management Plan and associated Safe Work Procedures;
- Carrying out Planned Task Observations on an ad hoc basis;
- Assisting with the implementation, testing and maintenance of an effective Emergency Response Plan for all contractor and sub-contractor activities;
- Responding to workplace incidents (as appropriate);

- Participating in incident investigations;
- Maintaining accurate health and safety statistics (for the contractor and all sub-contractors), and compiling health and safety performance reports as required;
- Auditing the health and safety management system and workplace activities of the contractor and each sub-contractor on a monthly basis to assess compliance with the project health and safety requirements; and
- Tracking and reporting on the implementation of corrective actions (arising from incident investigations, audits, inspections, etc.).

The contractor must ensure that each Health and Safety Officer is adequately equipped to enable him to perform his duties effectively. Each Health and Safety Officer must be provided with the following:

- A computer with access to all necessary systems, including access to e-mail and the internet;
- A mobile telephone on contract or with adequate pre-paid airtime; and
- A vehicle where required or instructed by a nominated project management representative (depending on the size and location of the project site(s)).

A Health and Safety Officer must over and above the SACPCMP registration as an Officer; be computer literate, fluent in English, and must have the following minimum qualifications, training and experience:

- At least 5 years' experience as a Health and Safety Officer on construction projects;
- SAMTRAC,NEBOSH or an equivalent training course with accredited health and safety service provider as a minimum qualification ;
- Experience and appropriate training with regard to implementing and maintaining a health and safety management system compliant with national legislation or an international standard;
- Experience and appropriate training with regard to construction related hazard identification and risk management processes;
- Competence, experience and relevant training with regard to incident investigation procedures and causation analysis;
- Health and safety auditing experience and training;
- A valid First Aid certificate of competency;
- Fire prevention and protection training; and
- A valid Driving Licence (light motor vehicle).
- Registered as a Health and Safety Officer or Health and Safety Manager with SACPCMP depending on the size of the project and on the risk.

Before placing a Health and Safety Officer on the project site(s), the contractor must forward a copy of the person's CV to the nominated project management representative or to the Programme Health and Safety manager for review and acceptance. A proposed candidate may be rejected should he not meet the experience and / or qualification requirements, or due to poor work performance on previous projects.

10.3 Contractor Supervisors

The contractor must ensure that all project and / or construction works are supervised at all times by an adequate number of qualified, competent and appointed supervisors who have experience

in the type of work being carried out as required by Construction regulations of 2014, regulation 8(7).

No work may be carried out without an appointed supervisor being physically present in the work area and daily safety task instruction.

Each Contractor Supervisor shall be responsible for:

- Ensuring that all work carried out under his supervision is done so in accordance with the requirements of all applicable legislation, rules, standards, specifications, plans and procedures;
- Participating in Baseline and Task-Based Risk Assessments;
- Ensuring that all employees under his supervision are made aware of the hazards, risk scenarios and control measures identified in relevant risk assessments;
- Ensuring that the control measures stipulated in all relevant risk assessments are in place and are implemented fully for all work carried out under his supervision;
- Ensuring that all employees under his supervision conduct pre-task hazard assessments when necessary;
- Driving the achievement of health and safety objectives set for his team;
- Ensuring that the necessary written appointments are in place for each employee under his supervision (e.g. First aider, mobile crane operator, etc.);
- Ensuring that all employees under his supervision attend all required training;
- Ensuring that no employee carries out any work that he is not competent to perform or has not been appointed to perform;
- Identifying training needs within his team;
- Carrying out Safety Observations and Coaching (one per day);
- Conducting a weekly Toolbox Talk with his team;
- Leading a Daily Safe Task Instruction discussion with his team;
- Attending Health and Safety Meetings as required;
- Maintaining a Health and Safety Management Information Notice Board in the work area for which he is responsible;
- Recording, on a daily basis, a description of the day's activities as well as a breakdown (by occupation) of the personnel on site under his supervision (e.g. 5 bricklayers, 2 carpenters, 3 welders, 22 general workers, and 1 supervisor);
- Ensuring that all Safe Work Procedures applicable to the work carried out under his supervision are adhered to and are fully implemented;
- Maintaining discipline and taking the necessary action whenever an employee under his supervision does not adhere to a rule or requirement;
- Carrying out Planned Task Observations (one per day);
- Ensuring that emergency response procedures are understood by all employees under his supervision and that these procedures are followed in the event of an emergency;

- Reporting all incidents immediately, participating in incident investigations, communicating the lessons learnt to all employees under his supervision, and implementing corrective actions where required; and
- Carrying out workplace health and safety inspections.

Each supervisor must accept these responsibilities in writing as part of his appointment.

Each supervisor must be equipped with a mobile telephone to ensure that effective communication can be maintained for the duration of the contract.

10.4 Health and Safety Representatives

The team of employees on site must have a health and safety representative deployed on the project site(s), a Health and Safety Representative must be elected and appointed. Taking into consideration the number of employees deployed, the geographical area in which the work is taking place, the different work disciplines, and the shift pattern (if applicable), the contractor must ensure that an adequate number of Health and Safety Representatives (at a minimum ratio of one Health and Safety Representative per 50 employees) are elected and appointed to effectively represent all site personnel as required by the OHS Act 85 of 1993, section 17 - 18.

Each Health and Safety Representative must attend an accredited training course for health and safety representatives. The cost of this training shall be for the contractor's account.

The contractor must make the necessary allowances for the Health and Safety Representatives to carry out their duties as specified in the applicable legislation.

The contractor must ensure that an appropriate sticker is affixed to the safety helmet of each Health and Safety Representative for identification purposes.

10.5 First Aiders

If 10 or more employees are deployed on the project site(s), at least one trained and competent First Aider must be in place and must be appointed. Taking into consideration the number of employees deployed, the geographical area in which the work is taking place, the different work disciplines, and the shift pattern (if applicable), the contractor must ensure that an adequate number of First Aiders (at a minimum ratio of one First Aider per 50 employees) are in place and have been appointed to administer first aid treatment should this be required.

First Aid training must be done through an accredited training institution. The cost of this training shall be for the contractor's account.

The contractor must ensure that an appropriate sticker is affixed to the safety helmet of each First Aider for identification purposes.

10.6 Duties of Client

As per the Construction regulations of 2014, regulation 5(1) – (8) a client must—

- Prepare a baseline risk assessment for an intended construction work project;
- Prepare a suitable, sufficiently documented and coherent site specific health and safety specification for the intended construction work based on the baseline risk assessment contemplated in paragraph
- Provide the designer with the health and safety specification contemplated in paragraph (b);
- Ensure that the designer takes the prepared health and safety specification into consideration during the design stage;
- Ensure that the designer carries out all responsibilities contemplated in CR regulation 6;
- Include the health and safety specification in the tender documents;
- Ensure that potential principal contractors submitting tenders have made adequate provision for the cost of health and safety measures;

- Ensure that the principal contractor to be appointed has the necessary competencies and resources to carry out the construction work safely;
- Take reasonable steps to ensure co-operation between all contractors appointed by the client to enable each of those contractors to comply with these Regulations;
- Ensure before any work commences on a site that every principal contractor is registered and in good standing with the compensation fund or with a licensed compensation insurer as contemplated in the Compensation for Occupational Injuries and Diseases Act, 1993 (Act No. 130 of 1993);
- Appoint every principal contractor in writing for the project or part thereof on the construction site;
- Discuss and negotiate with the principal contractor the contents of the principal contractor's health and safety plan contemplated in CR regulation 7(1), and must thereafter finally approve that plan for implementation;
- Ensure that a copy of the principal contractor's health and safety plan is available on request to an employee, inspector or contractor;
- Take reasonable steps to ensure that each contractor's health and safety plan contemplated in
- CR Regulation 7(1)(a) is implemented and maintained;
- Ensure that periodic health and safety audits and document verification are conducted at intervals mutually agreed upon between the principal contractor and any contractor, but at least once every 30 days;
- Ensure that a copy of the health and safety audit report contemplated in paragraph (o) is provided to the principal contractor within seven days after the audit;
- Stop any contractor from executing a construction activity which poses a threat to the ensure that a copy of the health and safety audit report contemplated in paragraph (o) is provided to the principal contractor within seven days after the audit;
- Stop any contractor from executing a construction activity which poses a threat to the health and safety of persons which is not in accordance with the client's health and safety specifications and the principal contractor's health and safety plan for the site;
- Where changes are brought about to the design or construction work, make sufficient health and safety information and appropriate resources available to the principal contractor to execute the work safely; and
- Ensure that the health and safety file contemplated in CR regulation 7(1) (b) is kept and maintained by the Principal contractor.

Where a client requires additional work to be performed as a result of a design change or an error in Construction due to the actions of the client, the client must ensure that sufficient safety information and appropriate additional resources are available to execute the required work safely.
Where a fatality or permanent disabling injury occurs on a construction site, the client must ensure that the contractor provides the provincial director with a report contemplated in section 24 of the Act, in accordance with regulations 8 and 9 of the General Administrative Regulations, 2013, and that the report includes the measures that the contractor intends to implement to ensure a safe construction site as far as is reasonably practicable.

Where more than one principal contractor is appointed as contemplated in sub-regulation CR 5(1) (k), the client must take reasonable steps to ensure co-operation between all principal contactors and Contractors in order to ensure compliance with these Regulations.

Where a construction work permit is required as contemplated in CR 3(1), the client must, without derogating from his or her health and safety responsibilities or liabilities, appoint

a competent person in writing as an agent to act as his or her representative, and where such an appointment is made the duties that are imposed by these Regulations upon a client, apply as far as reasonably practicable to the agent so appointed.

Were notification of construction work is required as contemplated in CR regulation 4(1), the client may, without derogating from his or her health and safety responsibilities or liabilities, appoint a competent person in writing as an agent to act as his or her representative, and where such an appointment is made the duties that are imposed by these Regulations upon a client, apply as far as reasonably practicable to the agent so appointed: Provided that, where the question arises as to whether an Agent is necessary, the decision of an inspector is decisive.

An agent contemplated in CR sub-regulations (5) and (6) must—
Manage the health and safety on a construction project for the client; and
Be registered with a statutory body approved by the Chief Inspector as qualified to perform the required functions;

When the chief inspector has approved a statutory body as contemplated in CR sub-regulation (7) (b), he or she must give notice of that approval in the Gazette.

10.7 Duties of the Designer

As per the Construction regulations of 2014, regulation 6(1) – (2) a designer must –

- Ensure that the applicable safety standards incorporated into these Regulations under section 44 of the Act are compiled within the design;
- Take into consideration the health and safety specification submitted by the client;
- Before the contract is put out to tender, make available in a report to the client—
- All relevant health and safety information about the design of the relevant structure that may affect the pricing of the construction work;
- The geotechnical-science aspects, where appropriate; and
- The loading that the structure is designed to withstand;
- Inform the client in writing of any known or anticipated dangers or hazards relating to the construction work, and make available all relevant information required for the safe execution of the work upon being designed or when the design is subsequently altered;
- When modifying the design or substituting materials; take into account the hazards relating to any subsequent maintenance of the relevant structure and must make provision in the design for that work to be performed to minimize the risk;
- When mandated by the client to do so, carry out the necessary inspections at appropriate stages to verify that the construction of the relevant structure is carried out in accordance with his design: Provided that if the designer is not so mandated, the client's appointed agent in this regard is responsible to carry out such inspections;
- When mandated stop any contractor from executing any construction work which is not in accordance with the relevant design's health and safety aspects: Provided that if the designer is not so mandated, the client's appointed agent in that regard must stop that contractor from executing that construction work;
- When mandated in his or her final inspection of the completed structure in accordance with the National Building Regulations, include the health and safety aspects of the structure as far as reasonably practicable, declare the structure safe for use, and issue a completion certificate to the client and a copy thereof to the contractor; and
- During the design stage, take cognisance of ergonomic design principles in order to minimize ergonomic related hazards in all phases of the life cycle of a structure.

The designer of temporary works must ensure that -

- All temporary works are adequately designed so that it will be capable of supporting all anticipated vertical and lateral loads that may be applied;
- The designs of temporary works are done with close reference to the structural;
- The designs of temporary works are done with close reference to the structural design drawings issued by the contractor, and in the event of any uncertainty consult the contractor;
- All drawings and calculations pertaining to the design of temporary works are kept at the office of the temporary works designer and are made available on request by an inspector; and
- The loads caused by the temporary works and any imposed loads are clearly indicated in the design.

10.8 Duties of Principal Contractor

As per the Construction regulations of 2014, regulation 7(1) – (8) a Principal Contractor and Contractor must

- Provide and demonstrate to the client a suitable, sufficiently documented and coherent site specific health and safety plan, based on the client's documented health and safety specifications contemplated in CR 5(1)(b), which plan must be applied from the date of commencement of and for the duration of the construction work and which must be reviewed and updated by the principal contractor as work progresses;
- Open and keep on site a health and safety file, which must include all documentation required in terms of the Act and these Regulations, which must be made available on request to an inspector, the client, the client's agent or a contractor; and
- On appointing any other contractor, in order to ensure compliance with the provisions of the Act-
- Provide contractors who are tendering to perform construction work for the principal contractor, with the relevant sections of the health and safety specifications contemplated in CR regulation 5(1)(b) pertaining to the construction work which has to be performed;
- Ensure that potential contractors submitting tenders have made sufficient provision for health and safety measures during the construction process;
- Ensure that no contractor is appointed to perform construction work unless the principal contractor is reasonably satisfied that the contractor that he or she intends to appoint, has the necessary competencies and resources to perform the construction work safely;
- Ensure prior to work commencing on the site that every contractor is registered and in good standing with the compensation fund or with a licensed compensation insurer as contemplated in the Compensation for Occupational Injuries and Diseases Act, 1993;
- Appoint each contractor in writing for the part of the project on the construction site
- Ensure that a copy of his or her health and safety plan contemplated in paragraph (a),
- As well as the contractor's health and safety plan contemplated in CR 7 sub-regulation (2)(a), is available on request to an employee, an inspector, a contractor, the client or the client's agent;
- Hand over a consolidated health and safety file to the client upon completion of the construction work and must, in addition to the documentation referred to in CR 7 sub-regulation (2)(b), include a record of all drawings, designs, materials used and other similar information concerning the completed structure;

- In addition to the documentation required in the health and safety file in terms of paragraph (c)(v) and CR 7 sub-regulation (2)(b), include and make available a comprehensive and updated list of all the contractors on site accountable to the principal contractor, the agreements between the parties and the type of work being

principal contractor, the agreements between the parties and the type of work being done; and

- Ensure that all his or her employees have a valid medical certificate of fitness specific to the Construction work to be performed and issued by an occupational health practitioner in the form of Annexure 3.

10.9 Duties of Contractor

A contractor must -

- Prior to performing any construction work provide and demonstrate to the principal contractor a suitable and sufficiently documented health and safety plan, based on the relevant sections of the client's health and safety specification) and provided by the principal contractor), which plan must be applied from the date of commencement of and for the duration of the construction work and which must be reviewed and updated by the contractor as work progresses;
- Open and keep on site a health and safety file, which must include all documentation required and must be made available on request to an inspector, the client, the client's agent or the principal contractor;
- Before appointing another contractor to perform construction work be reasonably satisfied that the contractor that he or she intends to appoint has the necessary competencies and resources to perform the construction work safely;
- Co-operate with the principal contractor as far as is necessary to enable each of them to comply with the provisions of the Act; and
- As far as is reasonably practicable, promptly provide the principal contractor with any information which might affect the health and safety of any person at work carrying out construction work on the site, any person who might be affected by the work of such a person at work, or which might justify a review of the health and safety plan.

Where a contractor appoints another contractor to perform construction work, the duties that apply to the principal contractor apply to the contractor as if he or she were the principal contractor.

A contractor must take reasonable steps to ensure co-operation between all contractors appointed by the principal contractor to enable each of those contractors to comply with these Regulations.

No contractor may allow or permit any employee or person to enter any site, unless that employee or person has undergone health and safety induction training pertaining to the hazards prevalent on the site at the time of entry.

A contractor must ensure that all visitors to a construction site undergo health and A contractor must ensure that all visitors to a construction site undergo health and safety induction pertaining to the hazards prevalent on the site and must ensure that such visitors have the necessary personal protective equipment.

A contractor must at all times keep on his or her construction site records of the health and safety induction training and such records must be made available on request to an inspector, the client, the client's agent or the principal contractor;.

A contractor must ensure that all his or her employees have a valid medical certificate of fitness specific to the construction work to be performed and issued by an occupational health practitioner in the form of Annexure 3.

10.10 Management and supervision of Construction work

A principal contractor must in writing appoint one full-time competent person as the construction manager with the duty of managing all the construction work on a single site, including the duty of ensuring occupational health and safety compliance, and in the absence of the construction manager an alternate must be appointed by the principal contractor.

A principal contractor must upon having considered the size of the project, in writing appoint one or more assistant construction managers for different sections thereof: Provided that the designation of any such person does not relieve the construction manager of any personal accountability for failing in his or her management duties in terms of this regulation.

Where the construction manager has not appointed assistant construction managers as in the opinion of an inspector, a sufficient number of such assistant construction managers have not been appointed, that inspector must direct the construction manager in writing to appoint the number of assistant construction managers indicated by the inspector,

No construction manager appointed may manage any construction work on or in any construction site other than the site in respect of which he or she has been appointed.

A contractor must, after consultation with the client and having considered the size of the project, the degree of danger likely to be encountered or the accumulation of hazards or risks on the site, appoint a full-time or part-time construction health and safety officer in writing to assist in the control of all health and safety related aspects on the site: Provided that, where the question arises as to whether a construction health and safety officer is necessary, the decision of an inspector is decisive.

No contractor may appoint a construction health and safety officer to assist in the control of health and safety related aspects on the site unless he or she is reasonably satisfied that the construction health and safety officer that he or she intends to appoint is registered with a statutory body approved by the Chief Inspector and has necessary competencies and resources to assist the contractor

A construction manager must in writing appoint construction supervisors responsible for construction activities and ensuring occupational health and safety compliance on the construction site.

A contractor must, upon having considered the size of the project, in writing appoint one or more competent employees for different sections thereof to assist the construction supervisor and every such employee has, to the extent clearly defined by the contractor in the letter of appointment, the same duties as the construction supervisor: Provided that the designation of any such employee does not relieve the construction supervisor of any personal accountability for failing in his or her supervisory duties in terms of this regulation.

No construction supervisor appointed under may supervise any construction work on or in any construction site other than the site in respect of which he or she has been appointed: Provided that if a sufficient number of competent employees have been appropriately designated on all the relevant construction sites, the appointed construction supervisor may supervise more than one site.

10.11 Construction Health and Safety Agent

A Construction Health and Safety Agent, based on their experience, knowledge and capabilities, as prescribed in the registration requirements for the Construction Health

and Safety Agent. A person will obtain registration once they have submitted the required documentation and met the registration criteria in full.
Construction Health and Safety Agent an applicant must provide proof of:

- Recognized and appropriate health and safety qualifications
- Relevant experience in the health and safety industry, with specific detail on construction experience
- Knowledge, skill and experience by attending and passing a professional interview
- Registration letter with SACPCMP

A Construction Health and Safety Agent is required to comply with the Continuing Professional Development (CPD) Policy Framework. A Construction Health and Safety Agent shall be expected to demonstrate detailed knowledge of health and safety requirements at all levels, with the capability to design, compile, implement and manage the health and safety requirements for a construction project from Initiation and Briefing to Project Close-out. A Construction Health and Safety Agent shall also be required to show ability to mentor, coach and guide Construction Health and Safety Managers and Construction Health and Safety Officers.

Construction project health and safety management systems.

A Construction Health and Safety Agent is expected to be experienced and knowledgeable in:

- Identifying and developing an appropriate health and safety legal framework for a construction project
- Principles of cause and effect analysis and its application to hazard identification and risk management on a construction project
- Identifying leading construction health and safety practice and applying such to a construction project
- Construction project health and safety risk profiling
- Designing and developing a construction project health and safety management system
- Construction project health and safety policy and standards
- Design risk management

10.12 Operational legal appointment letters

The contractor must ensure other legal appointment letter are compiled and be submitted with the Contractor compliance plan, below is some appointment required as per the legislation, the appointment letters varies based on the project;

- OHSA Sec 16(2)
- Sec 17,18,19 SHE Representative
- GSR 3(4) First Aider
- GAR 9(2) Incident investigator
- GMR 2(1) Supervisor of machinery
- GMR 2(7) Assistant Supervisor of machinery
- CR 4(1)(c) Principal Contractor
- CR 8(1) Construction Manager
- CR 8(2) Assistant Construction Manager
- CR 8(7) Construction Supervisor
- CR 8(8) Assistant Supervisor of construction work
- CR 8(5) Construction Health and Safety Officer
- CR 9(1) Construction Risk Assessor

- CR 10(1)(a),(b) Fall protection plan
- Developer
- CR 10(2)(d) Inspector of fall arrest system
- CR 14(2) Scaffolding Supervisor
- DMR 17(2),18 Inspector of lifting machinery
- CR17(8) Material hoist Inspector
- CR 19(2)(g)(i) Explosive powered tool issuer
- CR 23(1)(k) Construction vehicle and mobile plant Inspector
- CR 24(d) Temporary Electrical Installation Controller
- CR 24(e) Temporary Electrical Installation Inspector
- CR 28(a) Stacking and storage Supervisor
- CR 29(h) Fire extinguisher inspector
- EMR 8(8) Appointment for electrical installation in hazardous location- Master Electrician (Inspector)
- EIR 9 Installation Electrician appointment

11. Safety Agents in Project Stages

The safety agent, must be involved in all stages of project management and take charge of all the health and safety related matters.

11.1 Stage 1 – Project Initiation and Briefing

The deliverables at this stage shall include agreeing client requirements and preferences, assessing user needs and options, appointment of necessary consultants in establishing project brief, objections, priorities, constraints, assumptions and strategies in consultation with client.

Standard Services:

- Demonstrate the Construction Health and Safety Agent competency and resource;
- Assist in developing a clear construction project health and safety brief;
- Attend the construction project initiation meetings;
- Conclude the terms of the agreement with the client;
- Advise on the necessary surveys, analyses, tests and site or other investigations where such information will be required for the next stage of the project;
- Advise the client on the adequacy of health and safety competency and resources of the other consultants
- Identify construction project health and safety risk profile
- Provide necessary information within the agreed scope of the construction project to the other consultants;
- Define the Construction Health and Safety Agent scope of work and services;

11.2 Stage 2 – Concept and Feasibility

Finalisation of the project concept and feasibility.

Standard Services:

- Agree the documentation programme with the principal consultant and other consultants
- Attend design and consultants meetings;
- Review and evaluate design concepts and advise on construction project health and safety in conjunction with the other consultants;

- Review, update and agree the construction project health and safety risk profile and prepare the construction health and safety policy for the construction project;
- Advise on preliminary cost estimates/budgets for construction project health and safety
- Prepare draft construction project baseline risk assessment;
- Assist the client and principal consultant in the procurement of the necessary and appropriate specialists, including a clear definition of their roles, responsibilities and liabilities;
- Advise the client on the adequacy of the health and safety competency and resources of the appropriate specialists;
- Assess and approve the appropriate specialists health and safety plans;
- Monitor the implementation of the appropriate specialists health and safety plans, including periodic audits;
- Prepare the draft construction project health and safety specification;
- Agree the format and procedures for health, safety and hygiene construction project control
- Advise and agree with the other consultants regarding their construction project health and safety requirements and related design risk management responsibilities;
- Liaise, co-operate and provide necessary information to the client/principal consultant and the other consultants;

Construction Health and Safety Agent Deliverables

- Updated construction project health and safety risk profile;
- Agreed construction project health and safety policy for the project;
- Draft construction project baseline risk assessment;
- Draft construction project health and safety specification;
- Record of appropriate specialists health and safety competency and resource assessments;
- Schedule of required surveys, tests and other investigations and related reports;
- Record of construction project health and safety risk communication;
- Design risk management process;
- Preliminary cost estimates/budgets for construction project health and safety;
- Approved specialists health and safety plans;
- Specialists health and safety audit reports and records;

11.3 Stage 3 – Design Development

Manage, coordinate and integrate the detail design development process within the project scope, time, cost and quality parameters.

Standard Services

- Review the documentation programme with the principal consultant and the other consultants
- Attend design and consultants meetings;
- Finalise the construction project health and safety risk profile;
- Advise designers of their health and safety legal liabilities and responsibilities for constructability, maintainability and operation ability of the structure;
- Manage, co-ordinate, integrate and record the design risk management process with the other consultants in a sequence to suit the documentation programme;
- Monitor the integration of health and safety aspects for constructability, maintainability and operation ability of the structure during the design process and finalise the construction project baseline risk assessment;

- Identify and implement precautions necessary for construction project health and safety control and update the construction project tender health and safety specifications;
- Agree on a format for the health and safety file;
- Assess and approve necessary construction project health and safety plans for early works;
- Monitor the implementation of necessary construction health and safety plans, including periodic audits for early works;
- Assist the cost consultant with detailed information for initial construction project health and safety cost estimates/budgets;
- Liaise, co-operate and provide necessary construction project health and safety information to the client, principal consultant and the other consultants;
- Construction Health and Safety Agent Deliverables;
- Final construction project health and safety risk profile
- Record of construction project health and safety risk communication;
- Final construction project health and safety baseline risk assessment;
- Updated draft construction project health and safety specification;
- Design risk management records;
- Schedule of precautions necessary for construction project health, safety and hygiene control;
- Approved early works health and safety plans;
- Early works audit reports and records;
- Initial schedule of construction project health and safety cost estimates/budgets;
- Template for health and safety file.

11.4 Stage 4 - Tender Documentation and Procurement

The process of establishing and implementing procurement strategies and procedures, including the preparation of necessary documentation for effective and timeous execution of the project.

Standard Services

- Attend design and consultants meetings;
- Assist in developing a clear construction project health and safety procurement process;
- Finalise construction project tender health and safety specifications and integrate with procurement documentation;
- Provide and record construction project health, safety, hygiene and design risk information to the principal consultant and other consultants;
- Prepare construction project health and safety documentation for submission to authorities;
- Participate in construction project tender clarification meetings;
- Assist with the evaluation of tenders and verify the contractors competencies, knowledge and resources to carry out the construction works in a safe and healthy manner;
- Assist the cost consultant in the finalisation of the construction project health and safety cost estimate/budget;
- Assist with the preparation of contract documentation for signature;
- Prepare construction project health and safety mobilisation and access plans for the construction work;
- Assess samples, mock-ups and products for construction project, structural maintainability and operability health and safety compliance.

Construction Health and Safety Agent Deliverables

- Final construction project tender health and safety specifications;

- Records of construction project health and safety procurement process;
- Construction project health and safety tender evaluation and records;
- Finalised schedule of construction project health and safety cost estimate/budget;
- Construction project health and safety contract documentation;
- Construction project health and safety mobilisation and access plans;
- Design risk management records;
- Record of construction project health and safety risk;
- Construction project health and safety documentation for authorities;
- Evaluation schedule of samples/mock-ups and products.

11.5 Stage 5 - Construction Documentation and Management

The management and administration of the construction contracts and processes, including the preparation and coordination of the necessary documentation to facilitate effective execution of the works

Standard Services

- Assess, discuss, negotiate and approve the contractor(s) construction project health and safety plans;
- Submit necessary construction health and safety documentation to authorities and facilitate permits that may be required to commence the construction work;
- Attend site handover meetings and lead construction project health and safety mobilisation and access plans;
- Attend regular site, technical and progress meetings;
- Prepare revised construction project health and safety risk profile, specifications and cost estimates/budgets where there is scope of work changes;
- Monitor the implementation of the construction project health and safety plans in accordance with the construction project health and safety specification and further scope of work changes and recommend stop work orders where necessary;
- Monitor design risk management;
- Perform incident and accident investigations where necessary;
- Audit compliance with the construction project health and safety plans and brief the project management team and contractor(s) following site audits;
- Conduct construction health and safety management system audits;
- Facilitate construction health and safety system and plans reviews for continual improvement;
- Monitor the compilation of the construction project health and safety file by the contractor(s)
- Prepare and maintain the consolidated health and safety file;
- Prepare the structure commissioning health and safety plans.

Construction Health and Safety Agent Deliverables

- Approved contractor(s) construction project health and safety plans, including all construction health and safety appointments;
- Permits to commence construction work;
- Record of meetings, including all construction health and safety matters to be actioned;

- Record of revised changes to the construction project health and safety risk profiles;
- Record of revised changes to the construction project health and safety specifications;
- Record of revised changes and commissioning of the construction project health and safety plans;
- Record of revised construction project health and safety cost estimate/budget;
- Records of design risk management;
- Record of construction project health and safety audit reports;
- Record of contractor(s) construction health and safety performance;
- Record of construction project health and safety work stoppage reports;
- Record of incident and accident investigations and corrective actions;
- Record of interactions with the Compensation Commissioner or similar;
- Record of construction health and safety system and plans reviews;
- Record of construction project health and safety risk communication;
- Interim health and safety file;
- Structure commissioning health and safety plans.

11.6 Stage 6 - Project Close - Out

The process of managing and administering the project close out, including preparation and co – ordination of the necessary documentation to facilitate the effective operation of the project.

Standard Services

- Review, discuss and approve the health and safety file with the contractor(s) and manage the construction project health and safety during the defects liability period;
- Cancel all construction project health and safety legal appointments;
- Prepare the health and safety operations and maintenance report;
- Prepare the consolidated construction project health and safety close - out report;
- Construction Health and Safety Agent Deliverables;
- Record of audits during the defects liability period;
- Record of construction health and safety risk communication;
- Report on approved health and safety file;
- Health and safety operations and maintenance report;
- Consolidated construction project health and safety close-out report;

11.7 Additional Related Services

- Provide advice to the Client on health and safety competence and resources of up to [number] proposed designers prior to arrangements being made for design work to begin.
- Prepare [number] additional copies of the health and safety file.
- Prepare [number] copies of abstracts of the health and safety file for delivery to tenants by the Client/Owner's (The contents of the abstracts to be determined in consultation with the Client/Owner's legal advisors).
- Seek the co - operation of and co – operate with anyone else involved in a construction project at an adjoining site so far as necessary to enable them to perform their duties under the Construction Regulations.
- Facilitate co – operation and co – ordination in relation to duty holders on adjoining construction sites as it may affect the project; ensuring that suitable arrangements are made and implemented for the co – ordination of health and safety measures during planning and preparation for the construction phase.

- Keep a record of the health and safety file.
- Convert the health and safety files on other projects to match Client/ Owner's electronic format.
- Carry out necessary inspections at the appropriate stages to verify that the construction of the relevant structure is carried out in accordance with the design.
- To stop any contractor from executing any construction work that is not in accordance with the relevant design's health and safety aspects.
- Assist in the development of maintenance schedules for the Client/Owners completed structure.
- Inspect the structure on behalf of the Client/Owner once every six (6) months for the first two (2) years on completion of the structure and then yearly thereafter, to ensure the structure remains safe for continued use and records are kept of such in the structures health and safety file.

12. Competence, Training and Awareness

Each employee (including sub-contractor employees) must be suitably trained and competent, and must understand the health and safety hazards, risks and control measures associated with his work as required by the OHS Act 85 of 1993,(14)

The contractor must implement systems and procedures to ensure that:

- The necessary competencies required by employees are identified (by occupation), along with selection, placement and any training requirements;

Please Note: Specific competency profiles and selection criteria (fitness for work) must be developed for all roles where significant health or safety risk exists.

Please Note: A formal training needs analysis must be carried out based on the competency profiles and a training matrix must be developed for the project.

Roles requiring technical certification, registration or licensing are identified and documented, and these roles are filled only by suitably qualified personnel;

- Minimum core health and safety skills required by employees in leadership and supervisory roles are identified and suitable training is provided including hazard identification and risk assessment, incident investigation, and health and safety interactions (i.e. Observation and coaching techniques);
- Competency-based training is provided and it includes operational controls (procedures and work instructions), management of change, and emergency response;
- All employees hold and maintain the required competencies (including appropriate qualifications, certificates and licences) and are under competent supervision;
- A site-specific induction and orientation programme that highlights health and safety requirements, procedures, and significant hazards, risks and associated control measures is in place for all new employees and visitors (understanding must be assessed);
- Personnel are trained and / or briefed on new or amended standards, rules, safe work procedures, risk assessments, etc.;
- Refresher training is carried out as required (e.g. Re-induction following an absence from site);
- Records of education, qualifications, training, experience and competency assessments are maintained on site for all employees; and
- The effectiveness of training is reviewed and evaluated.

Prior to the commencement of any work, including mobilisation and site set-up activities, the contractor must provide, to the satisfaction of the nominated project management representative, current documentation verifying that the contractor's employees, as well as the employees of any appointed sub-contractors, are competent and have the necessary qualifications, certificates, licences, job skills, training and experience (as required by this specification and applicable legislation) to safely carry out the work that is to be performed.

The Contractor and sub-contractor must ensure that the following training takes place:

- health and safety induction training pertaining to the hazards prevalent on the site at the time of entry
- training for all persons required to erect, move or dismantle temporary works structures and instruction to perform those operations safely
- training of employees working from a fall risk position
- training to work or to be suspended on a platform which includes at least:
    - how to access and egress the suspended platform safely;
    - how to correctly operate the controls and safety devices of the equipment;
    - information on the dangers related to the misuse of safety devices; and
    - information on the procedures to be followed in the case of-
        - an emergency;
        - the malfunctioning of equipment; and
        - the discovery of a suspected defect in the equipment;
        - an instructions on the proper use of body harnesses.

- Training for all operators of construction vehicles and mobile plant.

A contractor must at all times keep on his or her construction site records of the health and safety induction training and such records must be made available on request to an inspector, the client, the client's agent or the principal contractor;.

Please Note: Only certified copies of certificates, licences, etc. Will be accepted.

An Employee Profile (dossier) must be completed for each employee who will be performing work on site. All documentation pertaining to an employee's competence (i.e. certified copies of qualifications, certificates and licences as well as proof of job skills, training and experience) must be maintained in this dossier.

If it is determined through observation that an employee is not yet competent to carry out a particular task in a safe and capable manner, the employee will be required to cease work immediately and must either be reassigned or be retrained at the contractor's expense.

The contractor must provide proof that the training institutions and trainers that are used are appropriately registered with a governing authority (a trainer's registration certificate or registration number alone will not be adequate). The following must be made available for verification purposes:

- Proof of registration of the training institution including the training programmes that the institution is accredited to provide; and

- For each trainer, proof of competency and registration for the specific training programmes presented.

Foreign qualifications held by employees in health and safety critical roles must be verified against the requirements of local legislation.

12.1 Induction Training

Each employee must attend all mandatory Induction Training applicable to the project. No employee will be permitted to enter any project work site until he has attended this training. Each employee must carry proof that he has completed the induction training and may be removed from a site if such proof cannot be produced on request, this as required by the Construction regulations of 2014, regulation 7(5).

Furthermore, employees must attend (where applicable) Area-Specific Training pertaining to the particular hazards identified in the area(s) where the employees will be working. No employee will be permitted to enter a work area until he has attended the relevant area-specific training.

All visitors must receive a visitor induction briefing before entering any project work site. However, this induction does not permit a visitor to enter a site unescorted. Visitors must be accompanied at all times by an appropriately senior employee who has been fully inducted.

12.2 Specific Training and Competency Requirements

The following specific training and competency requirements must be complied with.

Please Note: An employee must be trained, assessed and found competent before he will be given authorisation to perform certain tasks or fill certain roles.

Table 11-1: Specific Training and Competency Requirements

Training	Applicable To
Health and Safety Induction	All employees
Safety Observations and Coaching (Safety Interactions)	All employees
Risk Assessment	All managers and supervisors
Incident Investigation	All managers and supervisors
Safety Leadership	All managers and supervisors
Legal Liability*	All managers and supervisors
Health and Safety Rep*	All elected Health and Safety Representatives
First Aid Levels 1, 2 and 3*	All nominated First Aiders
Fire Fighting (Fire Extinguisher Use)*	All employees
Working at Height*	All employees using a safety harness
Confined Spaces	All Confined Space Entry Officers and Standby Persons
Permit to Work	All Authorised Persons (i.e. Permit issuers) and all Applicants (i.e. Employees who will be applying for permits)
Isolation and Lockout	All Authorised Persons (i.e. Persons who authorise work that requires Isolation and Lockout), all Isolation Officers, and all Applicants (i.e. Persons who request permission to work on systems or equipment requiring Isolation and Lockout)

Training	Applicable To
Defensive Driving*	All drivers of light motor vehicles (for work purposes)
Gravel Road Driving*	All drivers of light motor vehicles driven on gravel roads (for work purposes)
Off Road Driving*	All drivers of four-wheel drive vehicles driven off road (for work purposes)
Mobile Equipment Site Licence	All mobile equipment operators

Training requirements marked with an * must be arranged through accredited external training institutions by the contractor. All other training will be provided by Transnet.

13. Communication, Participation and Consultation

The contractor must establish and maintain effective communication and consultative processes (allowing for a two-way dialogue) for the duration of the project to ensure that:

- All personnel are kept up to date with regard to health and safety matters (e.g. Hazards and risks, incidents and lessons learnt, leading practices, performance against objectives, etc.);
- General health and safety awareness levels are kept high;
- Prompt feedback is given to personnel with regard to health and safety issues or concerns that they raise; and
- Relevant, and often critical, health and safety related information (e.g. Design changes, instructions, reporting of hazardous conditions or situations, etc.) Is effectively disseminated.

This must be achieved as follows:

conditions.

13.1 Toolbox Talks

The contractor must prepare a Toolbox Talk on a weekly basis and must share it with all personnel for which the contractor is responsible (including all sub-contractors). Toolbox Talks must address health and safety issues that are relevant to the work performed on the project site(s) and must include information and / or knowledge sharing, lessons learnt from incidents that have occurred, information concerning specific hazards and / or risks and control measures to prevent injury, etc.

Attendance records must be kept and maintained in the contractor's health and safety file.

13.2 Daily Safe Task Instructions (DSTI's)

A Daily Safe Task Instruction (DSTI) is a pre-start discussion amongst the members of a work team, led by the appointed supervisor, aimed at anticipating hazards and potential risks associated with the activities planned for the day or shift, and ensuring that the necessary control measures are in place to prevent incidents.

At the start of each day or shift, prior to the start of any work, each appointed supervisor must inspect the work area for which he is responsible and ensure that it is safe. He must then conduct a DSTI with his work team specifically concerning the tasks that they will be performing during the course of the day or shift. The relevant Task-Based Risk Assessment for the activity must be used as the basis for the discussion. The correct work method must be reiterated and the identified hazards, risks and control measures must be

discussed with the team (each team member must be given the opportunity to contribute and participate in the discussion).

Any team member arriving late must first be taken through the information that was discussed (work method, hazards, risks and control measures) before being permitted to start working. If the work method changes after activities have already begun, the DSTI must be revisited and updated with the team, and the changes must be signed off by the relevant Contractor Health and Safety Officer.

Every member of the work team must sign the DSTI attendance register. The attendance records must be kept and maintained in the contractor's health and safety file.

The contractor's Health and Safety Officer must evaluate the content of the DSTI's daily to ensure that they are task-specific. Furthermore, the Health and Safety Officer must attend at least one DSTI per day prior to the start of work. The Health and Safety Officer may not lead the DSTI discussions, as this is the responsibility of the appointed supervisor.

13.3 Suggestions

All employees must be encouraged to submit suggestions to enhance health and safety management on the project site(s). A process must be in place for documenting, evaluating, implementing (as appropriate), archiving and recognising the improvement ideas.

13.4 Meetings

13.5.1 Contractor health and safety (OHS Act Section 19)

The contractor must schedule and consistently hold monthly health and safety meetings. These meetings must be chaired by the contractor's Project Manager and the following persons must be in attendance:

- Contractor and sub-contractor management representatives;
- Contractor and sub-contractor supervisors;
- Contractor and sub-contractor appointed Health and Safety (Employee) Representatives;
- Contractor and sub-contractor Health and Safety Officers; and
- The relevant Project Health and Safety Advisor.

The meeting must address the following as a minimum:

- New incidents for the period and corrective actions taken or to be taken;
- Implementation status of outstanding actions associated with previous incidents;
- SOC's, PTO's and DSTI's carried out for the period and action required to correct trends identified;
- Results of any audits, inspections (including H&S Rep inspections) or site visits carried out;
- A look ahead to ensure that appropriate health and safety planning and preparation is done for upcoming work;
- Risk Assessments, Safe Work Procedures, etc. That are outstanding or due for review (as well as the quality of these documents); and
- Any other health and safety related matter.

The contractor must compile minutes of each meeting and attendance records must be kept. These records must be maintained in the contractor's health and safety file.

13.5.2 Site Meetings

In addition to the Contractor Meetings, the Project will schedule monthly Site Meetings that the contractor must attend. These meetings will be chaired by the Contract Manager and the following persons must be in attendance:

- Contractor management representatives;
- Contractor Health and Safety Officers;
- Contractor Environmental Officer
- Contractor Quality Management
- The Project Health and Safety Manager;
- Project Health and Safety Advisors; and
- Client representatives (ad hoc).

The meeting will address the following as a minimum:

- Feedback from the contractor concerning health and safety performance for the period;
- New incidents for the period and corrective actions taken or to be taken;
- Implementation status of outstanding actions associated with previous incidents;
- SOC's, PTO's and DSTI's carried out for the period and action required to correct trends identified;
- Results of any audits, inspections or site visits carried out;
- A look ahead to ensure that appropriate health and safety planning and preparation
  Is done for upcoming work;
- Risk Assessments, Safe Work Procedures, etc. That are outstanding or due for review (as well as the quality of these documents); and
- Any other health and safety related matter.

13.5 Performance Boards

The contractor must provide and maintain a Performance Board to be approved by the nominated project management representative and to be positioned at the entrance to the contractor's site office area. This board must display the following information as a minimum:

- The contractor's logo;
- Current manpower (heads) on site;
- Man-hours worked for the current month and project to date;
- Lost Time Injury Frequency Rate (LTIFR);
- Dates of last injuries (FAI, MTI and LTI);
- Number of hours worked since the last recorded LTI; and
- Names and contact telephone numbers for the appointed Project Manager and the Health and Safety Officers.

13.6 Management Information Notice Boards

The contractor must provide, for each appointed supervisor, a portable Health and Safety Management Information Notice Board to be placed in the work area. The following information and documentation, as a minimum, must be posted on these boards:

- The relevant Method Statements, Risk Assessments and Safe Work Procedures for the work that is being performed that day;
- The DSTI for the day;
- The most recent Toolbox Talk;
- Where applicable, all required permits and permissions for the work that is being performed;

- Material Safety Data Sheets (MSDS's) for any chemical substances being used;
- The health and safety objectives for the work team;
- Details of the last incident involving the work team;
- The most recent weekly health and safety report (refer to Section 20);
- Emergency procedures;
- A site plan indicating evacuation routes and emergency assembly point locations;
- First Aider names and contact telephone numbers; and
- The appointed supervisor's contact details.

13.7 Involvement (Other)

The participation of all contractor (and sub-contractor) employees in activities that promote improvements in health and safety performance must be encouraged. In particular, this must include their appropriate involvement in:

- Hazard identification, risk analysis and determining control measures;
- Incident investigation; and
- Reviewing policy and objectives.

All regulations, instructions, signage, etc. Must be communicated in a language understood by all employees.

Health and safety personnel must be actively involved in planning activities so that they have the opportunity to highlight hazards and risks associated with upcoming work well in advance to ensure sufficient time to arrange and / or implement the necessary control measures.

14. Documentation and Document Control

The contractor must develop and maintain project-specific documentation required for the effective management of health and safety on the project.

All documents related to the contractor's health and safety management system must be effectively controlled.

The document control process must:

- Provide for the review, revision and version control of documents;
- Uniquely identify documents (as appropriate) to control their use and function;
- Require approval of the documents for adequacy prior to issue;
- Clearly identify changes and record the status of any revisions to documents; and
- Provide for the effective distribution of documents to, and where necessary the timely removal of obsolete documents from, all points of issue and use.

The contractor must establish a process for the systematic control of health and safety records and related data. Controls must be in place for the creation, receipt, secure storage, maintenance, accessing, use and disposal of such records and data.

Each record must be legible, identifiable and traceable, and must contain adequate information and data for its purpose.

The confidentiality and security of records and data must be maintained in a manner that is appropriate for the nature of the records and data, and in accordance with any applicable data or privacy protection legislation.

Personal information originating

From medical surveillance and occupational hygiene monitoring must be reported in a form that respects the privacy of the individual, but enables management to fulfil their

duty of care obligations to employees. The names of individuals must not be disclosed without their written authorisation.

Retention periods for all records (based on legal requirements and / or knowledge preservation considerations) must be established and documented in accordance with applicable legislation.

14.1 Contractor compliance File Requirements

The contractor must compile and maintain a file containing all necessary compliance related documentation. The client should provide construction work permit and to be kept on site at all times. The contents of the file will be audited by a Project SHE Advisor on a monthly basis.
Required documentation includes, but is not limited to, the following:

- Letter of Good Standing from the Workman's Compensation Commissioner (where applicable) must have dol stamp;
- Proof of Public Liability Insurance;
- Scope of Work under the contract;
- List of Contacts and their Telephone Numbers;
- Health and Safety Policy;
- SHE Management Plan;
- Legal Register;
- Organisational Chart for the project;
- Appointment Letters (appointment of the contracting company, and appointments for all persons with health and safety related responsibilities);
- Notifications to the relevant authorities that construction work is in progress;
- Baseline and Task-Based Risk Assessments;
- Health and Safety Objectives, and associated Improvement Action Plans;
- Safe Work Procedures, Work Instructions and Work Method Statements;
- Planned Task Observations;
- Fall Protection Plan (for work at height);
- A dossier (Equipment Profile) for each fuel-driven vehicle or machine;
- Inspection Registers, Forms and Checklists (e.g. For portable electrical tools, ladders, safety harnesses, light vehicles, mobile equipment, lifting equipment and lifting tackle, first aid boxes, fire extinguishers, etc.);
- PPE Issue Registers;
- Material Safety Data Sheets;
- Emergency Response Procedures;
- Incident Records;
- A dossier (Employee Profile) for each employee containing:
- A copy of the employee's Identity Document or Passport;
- Certificate of Fitness (Pre-Employment Medical Examination);
- Proof of Induction Training;
- Other Training Records;
- Copies of Qualification Certificates and / or Certificates of Competency; and
- Copies of Licences;
- Meeting Minutes;
- HEALTH AND SAFETY Performance Reports;
- Copies of Inspection and Audit Reports; and
- Daily Safe Task Instructions (DSTI's) and Toolbox Talks.

The contractor must ensure that an equivalent file is compiled and maintained by each appointed sub-contractor.

15. Notification of Construction Work

A contractor who intends to carry out any construction work other than work contemplated in CR regulation 3(1), must at least 7 days before that work is to be carried out notify the provincial director in writing in a form similar to Annexure 2 if the intended construction work will—

- include excavation work;
- include working at a height where there is risk of falling;
- include the demolition of a structure; or
- include the use of explosives to perform construction work.

A contractor who intends to carry out construction work that involves construction of a single storey dwelling for a client who is going to reside in such dwelling upon completion, must at least 7 days before that work is to be carried out notify the provincial director in writing in a form similar to Annexure 2 of the CR regulations.

16. Operational Control

For project operations and activities, the contractor shall implement and maintain:

- Operational controls, as applicable to the organization and its activities;
- The organization shall integrate those operational controls into its overall OH&S Management System;
- Controls related to purchased goods, equipment and services;
- Controls related to contractors and other visitors to the workplace;
- Documented procedures, to cover situations where their absence could lead to deviations from the OH&S policy and the objectives;
- Stipulated operating criteria where their absence could lead to deviations from the OH&S policy and objectives.

16.1 Project-Specific SHE Standards

For all site health and participation specific this will serve as a guideline

Project-specific SHE standards, incorporating leading practices, legal requirements, and client requirements will be developed and implemented to manage critical risks on the project.

The contractor must comply fully with the requirements of these standards.

The Safe Work Procedures required of the contractor must be aligned with the requirements of these standards.

16.2 Safe Work Procedures

Procedures to be developed and maintained on site

The contractor must develop, document and implement Safe Work Procedures for all activities involving significant health or safety risk. These procedures must detail the control measures required to effectively manage the health and safety risks associated with the work activities.

Each Safe Work Procedure must be consistent with the Task-Based Risk Assessment completed for the activity.

Every person engaged in an activity for which a Safe Work Procedure has been developed must receive suitable training on the procedure.

Furthermore, the contractor must develop, document, communicate and implement formal procedures, work instructions and / or programmes for the operation, maintenance, inspection and testing of all plant and equipment (including protective systems and devices) brought onto the project site(s).

16.3 Management Participation and involvement CR 8

16.4 Planned Task Observations

All contractor, management supervisors must perform Planned Task Observations (PTO's) to verify that the control measures that have been identified in Safe Work Procedures (and associated Risk Assessments) are being adhered to and are being properly implemented, and to provide guidance where deviations are noted.

Each supervisor must complete at least one PTO per day involving one or more employees in his work team.

When an unsafe act or condition is identified, the supervisor must coach the work team to correct the act or condition in line with the Safe Work Procedure.

Where valid changes to the work method are identified, the supervisor must ensure that the Safe Work Procedure and Risk Assessment are updated to reflect the current practice.

Project representatives will carry out PTO's on contractor employees on an ad hoc basis. Should deviations from the contractor's Safe Work Procedures be observed, the work may be stopped until these deviations are rectified.

16.5 General Rules of Conduct

All persons are required to conform to the following rules of conduct while on the site.

The following acts are prohibited:

- Engaging in practical jokes, horseplay, scuffling, wrestling, fighting, or gambling;
- Assault, intimidation, or abuse of any person;
- Insubordination towards any supervisor or manager;
- Refusing to carry out a reasonable and lawful instruction concerning health and safety;
- Entry into any restricted area (including barricaded areas), unless authorised to do so by the responsible person;
- Unauthorised use / operation of any equipment or machinery;
- Negligently, carelessly or wilfully causing damage to any property;
- Destroying or tampering with safety devices, signs, or signals;
- The use of water from fire hydrants or hose reels for any purpose other than extinguishing a fire;
- The wilful and unnecessary discharging of fire extinguishers;
- Refusing to give evidence or deliberately making false statements during incident investigations;
- Bringing alcohol, drugs, or any other intoxicating substance onto site;
- Bringing a firearm, ammunition, or any other offensive weapon onto site;
- Bringing animals onto site;
- Running, except in an emergency;
- The use of an ipod (or similar) whilst working on site;

- Sleeping on the job;
- Building fires on site, unless in a suitably constructed barbequing facility; and
- Pouring / pumping / flushing any substance (chemical / hydrocarbon / waste water) into a storm water drain, onto bare soil, or into any area where the substance is not effectively contained.

Any of the above actions may result in the temporary or permanent removal of the offending person(s) from site, as well as possible prosecution. The decision of the nominated project management representative shall be final and binding in respect of any dispute that may arise from the interpretation of these requirements.

Transnet will not get involved in contractor disciplinary rules and procedures. The contractor will simply be informed (with reasons) that the offending employee(s) will be denied access to the project site. Once the contractor has been informed, the employee(s) must be removed from the site immediately.

16.6 Site Access

The contractor may not hire any security services for the project site unless authorisation has been obtained in writing from a nominated project management representative.

16.6.1 Access Control

The contractor must comply with all access control, procedures and systems applicable to the project site.

Failure to comply with these requirements will be viewed as a serious safety breach and may result in the permanent removal of the individual(s) / contracting company from site or suspension without payment.

Access will be controlled as follows:

- The access will be strictly controlled and managed
- Contract period access – an access card valid for the full contract period will be issued to an individual once the following requirements have been met:
  - Completion of a pre-employment medical examination;
  - Completion of all required project induction training;
  - Completion of special training / licensing if applicable (e.g. Driving/operating Licence); and
  - Provision of proof of job / trade-specific qualifications, licences, training, Experience and competency (as required).

Note: No access card will be issued unless proof of identification is provided (i.e. an identity document or a valid passport). For foreign labour, an access card will only be issued if a valid work visa is produced.

Note: A driving licence will not be accepted as proof of identification.

16.6.2 Trespassing

The contractor must ensure that no employee (including sub-contractor employees) trespasses on any land lying beyond the boundaries of the project site.

If instructed by a nominated project management representative to do so, the contractor must remove any employee who fails to comply with this requirement from the project.

The contractor's activities must be confined to the specified construction areas, and access to these areas may only be by means of specified routes.

All required barricading (fencing) must be erected and maintained by the contractor.

16.6.3 Visitors

Visitors (including reps and suppliers) must be advised in advance of the mandatory Personal Protective Equipment (PPE) requirements for the site, and must arrive with all of this PPE.

Upon arrival, all visitors must report to the Security Office where they must sign in.

All visitors must undergo a visitor induction briefing before entering the site.

A visitor access card will be issued to each visitor on conclusion of the induction briefing.

Whilst on site, visitors must be accompanied at all times by an appropriately senior employee who has been inducted fully. The visitor(s) must be met at the Security Office, and when the visit is over, must be escorted back to the Security Office.

When leaving the site, each visitor must return his or her visitor access card to the security personnel posted at the entrance / exit. A visitor will not be permitted to leave the site until he or she produces the access card that was issued.

Note: Visitors are not permitted to perform any work on site.

Note: Any request (typically made by a government official) to carry out a site inspection must be referred to the nominated project management representative. The contractor must not arrange any such inspection without prior approval from the nominated project management representative.

16.6.4 Alcohol, Drugs and Other Intoxicating Substances

The contractor must ensure that all personnel under his authority do not at any time enter the site or perform any work whilst under the influence of alcohol, a drug, or any other intoxicating substance.

Selling or possessing drugs, alcoholic beverages or any other intoxicating substance on the site is strictly prohibited.

A drugs and alcohol testing program will be implemented. Persons entering the site will be randomly tested. Any person who tests positive for alcohol or drug consumption will be subject to disciplinary action and shall be permanently removed from the site.

Any person have the opportunity to rather report that he/she is under the influence before accessing the project site – in these case the employee may only be send home for the day by the responsible project manager representative but will then be tested for the following five days (each day) on his return to the project site. If it is found that the same person is frequently reporting that he/she is under the influence before even accessing the project site. It shall be the responsibility of the nominated project management representative to take disciplinary action and remove such a person's form the project site.

Should the actions and / or demeanour of an employee suggest possible narcosis or drunkenness, the employee must be removed from the site. This may be done without testing.

Note: All personnel involved in an incident / accident must immediately be subjected to an alcohol test and a drug test as part of the investigation.

16.6.5 Firearms, Ammunition and Offensive Weapons

Firearms, ammunition, and offensive weapons of any kind are strictly prohibited. No person may enter /shall not be permitted to enter the site carrying any such item.

16.6.6 Vehicles

All vehicles brought onto site must meet the safety requirements stipulated in Section 14.6.

Each vehicle to be used on site must be inspected and approved by the nominated project management representative before a site access permit will be issued for the vehicle / equipment.

No vehicle shall be permitted to enter the site unless it is duly authorised. Access permits are vehicle-specific and may not be transferred between vehicles.

The contractor must allow any vehicle that is brought onto site (including privately owned vehicles) to be searched at any time while on the premises, or when entering or leaving the premises.

The contractor is solely responsible for the safety and security of all vehicles (including private vehicles) that he brings onto the site.

All road-going vehicles used by the contractor on the site must be roadworthy and registered with the relevant traffic authority.

A vehicle will not be permitted to enter the site in an un-roadworthy condition. Access will be denied if, for example:

- The vehicle has a defective exhaust system;
- A serious oil or fuel leak is evident;
- The vehicle has unsafe bodywork or is carrying an unsafe load;
- The vehicle is fitted with extraneous or non-standard equipment;
- Passengers are not seated properly;
- The vehicle is not fitted with a seat belt for each occupant; or
- The vehicle has any obvious mechanical defect;
- Pre-inspection requirements are not met.

Overloaded vehicles will not be permitted to enter the site.

The driver / operator of any vehicle / mobile equipment must carry a copy of his appointment with him at all times. Each driver / operator must:

- Comply with all site / project rules and regulations pertaining to traffic and the safe operation of vehicles / mobile equipment;
- Obey all road signs;
- Obey all instructions given by security or emergency services personnel;
- Remain within the boundaries of the site; and
- Ensure that the vehicle that he is operating is never overloaded, and that loads are always properly secured.

In the interest of safety, only the minimum number of vehicles required by the contractor to complete the work under the contract will be permitted to enter the site.

When not in operation, the contractor's vehicles / mobile equipment must be parked within the boundaries of his lay-down area or yard.

Parking is only permitted in designated parking areas.

All cars are parked on site at the owner's risk.

In the event of a vehicle accident on site, the driver(s) must report the incident immediately and must remain at the scene until a nominated project management

representative arrives, or until a nominated project management representative authorises him to leave (unless, of course, the driver requires medical attention).

16.7 Mobile Equipment and Light Vehicles

All Contractors must ensure all applicable legislation concerning mobile equipment and light vehicles are complied with at all times.

Each contractor must provide evidence to the nominated project management representative that all light vehicles and mobile equipment to be used on the project (including, but not limited to, lift and carry cranes (or mobi-lifts), mobile cranes, forklifts, mobile elevating work platforms (e.g. Cherry pickers), tractors, dozers, dump trucks, haul trucks, graders, excavators, loaders, back-actors, drill rigs, and road-going cars, light delivery vehicles, and trucks) comply with the requirements of all applicable legislation. This evidence must be provided prior to the equipment being brought onto the project site. The contractor remains responsible for meeting this requirement even if the equipment to be used is leased or provided by a sub-contractor (i.e. not owned directly by the contractor).

An Equipment Profile (dossier) must be compiled for each light vehicle and each item of mobile equipment to be used on the project site.
All mobile equipment and light vehicles (used for work purposes) must be subject to a risk assessment compiled. The assessment must:

- Involve operators and maintenance personnel who will use and work on the equipment; and
- Address all aspects of safe operation including handling, driver vision, brake failure, tyre blow out, and access and egress for operators and maintenance personnel.

Each light vehicle and each item of mobile equipment must be serviced and maintained as prescribed by the manufacturer of the vehicle or equipment.
No major repairs or services may be carried out on site.
No repairs may be carried out by a driver or operator. Only suitably qualified and competent persons may carry out repair work.
An appropriate pre-operation safety check based on a risk assessment must be carried out for each light vehicle or item of mobile equipment driven or operated for work purposes. For each vehicle or equipment type, an approved checklist must be in place (and must be used). The pre-operation check must include, but not be limited to, inspection and / or testing of the following safety critical features:

- Brakes (testing method must be provided);
- Wheels and tyres (including the spare);
- Lights and indicators;
- Steering;
- Seats and seat belts; and
- Windscreen and windows, including windscreen wipers and washers.

Should any critical feature be defective or damaged, the vehicle or equipment may not be operated until it has been fully repaired.

Supervisors must review the completed checklists on a daily basis to satisfy themselves that there are no major deficiencies that could place a driver or operator at risk.
No person may drive or operate any light vehicle or item of mobile equipment without authorisation.
All drivers and operators must be appointed in writing by the contractor's Project Manager.

No driver or operator may be appointed without proof that the individual has been trained, tested and found competent, or is currently licensed.

The appointment letter must specify the type of vehicle or equipment for which authorisation is being given and must clearly confirm that the driver or operator:

- Is 18 (eighteen) years of age or older;
- Has undergone a medical examination and has been declared fit for work by an occupational medical practitioner; and
- Has received suitable training and has been found competent, or is in possession of a valid driving licence issued by a state, provincial or civil authority that is applicable to the class of vehicle or equipment that is to be driven or operated.

The principal accountability for preventing accidents and incidents lies with the driver or operator of a light vehicle or item of mobile equipment, as he is in full control of any given situation at any given time. It must be stressed to each driver and each operator that safety is his prime responsibility – this must be clearly instructed and understood.

Drivers and operators must be empowered to stop driving or operating immediately should an unsafe condition arise, and refuse to drive or operate any light vehicle or item of mobile equipment that is defective and / or has any inoperative safety features. Similarly, a supervisor must never force a driver or operator to drive or operate a defective vehicle or item of equipment.

If a driver or operator does not adhere to the site rules and regulations, his appointment must be withdrawn and he must not be permitted to continue with his duties. If necessary, site access will be denied (either temporarily or permanently) to any driver or operator who is deemed to not be adhering to site requirements.

No person may drive or operate a light vehicle or item of mobile equipment if he suffers from a medical condition that places both him and those around him at risk of injury.
A fit-for-work policy must be in place, incorporating clearly defined maximum levels of drugs (including prescribed medication) and alcohol permitted in the system of a driver or operator.
Daily alcohol testing and random drug testing must be carried out.

Supervisors must regularly check on the physical condition of drivers and operators during the course of a shift.
A system must be in place to manage driver fatigue.
No eating or drinking is permitted while driving or operating a light vehicle or item of mobile equipment.
A mobile phone, whether hands-free or not, may only be used by the driver or operator of a light vehicle or item of mobile equipment when the vehicle or equipment is stationary and in a safe location.
Behaviour-based observations and coaching must include the operation of light vehicles and mobile equipment.

A site-specific traffic management plan must be compiled and submitted to the nominated project management representative for approval. The plan must include, but not be limited to, the following:

- Segregation of pedestrians, light vehicles, and mobile equipment where possible (using barriers where feasible);
- Systems to control the movement of mobile equipment in areas accessible to pedestrians, the movement of mobile equipment into and out of workshops, and pedestrian and light vehicle movement around mobile equipment;
- Setting of appropriate speed limits for vehicle types, road surfaces and environmental conditions;
- Installation and maintenance of road traffic control signs;
- Right-of-way rules (including overtaking restrictions);
- Overtaking protocols;
- Clear communication protocols for interactions between all vehicles and equipment;
- Procedures for light vehicles and / or mobile equipment entering hazardous or restricted areas;
- Standards for safe following distances based on operational circumstances, environmental conditions and near sight (blind spot) limitations of mobile equipment;
- The minimum safe distance to be maintained between light vehicles and mobile equipment (i.e. 50 metres unless positive contact is made);
- Designated parking areas for mobile equipment and light vehicles, including parking associated with maintenance areas;
- Parking procedures (e.g. Safe parking distances, safe parking locations, requirements for reverse parking, etc.);
- Systems to control approaching, refuelling, parking, boarding and disembarking mobile equipment (a driver or operator must exit the cabin and must disembark the vehicle or equipment entirely when his direct involvement with maintenance or servicing is not required);
- Guidelines for abnormal road conditions (e.g. Heavy rain, fog, or high winds) providing "go / no go" criteria and contact details for the person(s) responsible for making the "go / no go" decisions;
- Truck loading and unloading procedures to avoid material or objects falling from the vehicle;
- Guidelines for wide or abnormal loads including offsite transport; and
- Systems to control mobile equipment use in the vicinity of overhead power lines.

The design and layout of the road system (including entrance and exit points, intersections and other potential points of interaction between pedestrians, light vehicles and mobile equipment) must be reviewed periodically.

A risk assessment must be carried out prior to any changes being made to traffic movements or road systems.

Designated walkways (both indoors and outdoors) must be provided for pedestrians, and pedestrians must make use of these walkways. Good lighting must be provided along all walkways, particularly at road junctions. Wherever possible, rigid barricading must be used to separate pedestrians from moving light vehicles and / or mobile equipment.

No pedestrians are permitted on haul roads (or as far as this can reasonably be achieved in situations where a haul road runs through an area occupied by a local community). All personnel must be transported to site and must be dropped off at a designated area.

Controls must be in place to ensure the safety of people working on roads, including those working on broken-down vehicles.

High visibility clothing must be worn by all persons at all times whilst on the project site.
Speed limits and traffic rules must be reviewed regularly and must be rigorously enforced.
Local traffic rules must be complied with at all times.

Pedestrians and cyclists must give way to light vehicles and / or mobile equipment except at pedestrian crossings.

All light vehicles and mobile equipment must give way to emergency vehicles.
Pedestrians and light vehicle drivers must be made aware of the blind spots associated with mobile equipment.

The driver or operator of a light vehicle or item of mobile equipment must stop the vehicle or equipment and sound the horn before proceeding at blind corners, where his view of the path or intended path is obstructed, and when entering or leaving a building.
Whenever a light vehicle or item of mobile equipment is stopped or parked, the handbrake (if applicable) must be applied.

Measures (such as chocking or the use of ditches or trenches) must be in place for the immobilisation of parked mobile equipment.
A parked light vehicle must be chocked in situations where the vehicle would roll forwards or backwards if placed in neutral with the handbrake disengaged.

No light vehicle or item of mobile equipment may be left unattended with the engine running or with a key in the ignition.
No light vehicle or item of mobile equipment may be parked so as to cause an obstruction to any roadway, passage or access way.

No light vehicle or item of mobile equipment may be parked within 50 metres of a loading or off-loading point.

Light vehicles and mobile equipment must be loaded safely. All loads must be secure and must be within the load limit of the vehicle or equipment. A load must be properly secured before the vehicle or equipment is set in motion. Adequate precautions must be taken for any overhanging load.
No unauthorised light vehicle or item of mobile equipment may enter a restricted area or building.

16.7.1 Light Vehicles

All Contractors must ensure that Light vehicles have the following minimum safety features:

- Fixed seats and suitable seat (safety) belts for all occupants (i.e. Driver and all passengers);
- Roll-over protection for all vehicles intended to be driven on dirt or steep roads;
- Cargo barriers and load restraints for all vehicles designed for carrying loads (other than passengers), or that are unable to have cargo separated from the occupant-carrying space of the vehicle; and
- An air bag on the driver's side, and where available as a manufacturer fitted item, a passenger's air bag;
- A Reverse Alarm.

All Contractors must ensure that Light vehicles that interact with mobile equipment are equipped or fitted with:

- Systems that enable positive communication with the equipment operators (e.g. A two-way radio);
- A high visibility flag (e.g. A whip flag or buggy whip);
- An amber flashing light (revolving or strobe);
- Reflective taping; and
- High visibility signage (i.e. Vehicle call numbers) facilitating easy and positive identification from a reasonable distance.

Note: Call number signs and reflective tape (magnetic or adhesive) must be applied to the front, back and sides of each vehicle.

All Contractors must ensure that Light vehicles carry:

- Emergency roadside triangles or beacons (three of either);
- Chock blocks for preventing uncontrolled movement of the vehicle when parked;
- A flashlight;
- A fire extinguisher (2.5kg DCP);
- A first aid kit; and
- Survival or emergency equipment (e.g. a vehicle recovery kit) suitable for the operating environment.

A change management process must accompany all vehicle modifications, including the attachment of any equipment. Examples of changes or modifications include, but are not limited to, any change or modification:

- Made to the overall structure or design of the vehicle body;
- Made to the original manufacturer-fitted type of tyres or wheels;
- Made to the suspension system of the vehicle;
- Made to the mechanical system of the vehicle;
- That may adversely alter the centre of gravity of the vehicle;
- That alters the load carrying capacity of the vehicle; and
- That may affect the ability of the vehicle to withstand a crash (e.g. the fitment of a "bull bar").

Vehicle selection must be based on a risk assessment where consideration is given to the tasks, the application, the environment, roll-over protection and the rating of sturdiness in the event of a crash.

All Contractors must have a formal inspection and preventative maintenance system in place to ensure that vehicles are maintained in a safe and roadworthy condition at all times and, as a minimum, are serviced in line with the vehicle manufacturer's service schedule.

Should any safety critical feature be defective or damaged, the vehicle must be withdrawn from service until it has been fully repaired. Inspection and maintenance must be undertaken on critical features such as:

- Wheels and tyres (including the spare);
- Steering, suspension and braking systems;
- Seats and seat belts;
- Lights, indicators and reflectors;
- Windscreen and windows, including windscreen wipers and washers;

- The vehicle structure itself; and
- Other safety-related items on the vehicle body, chassis or engine, including instrumentation.

Persons may only be transported in vehicles equipped with manufacturer fitted or approved seats and seat belts.
Seat belts must be worn by all occupants of a light vehicle (i.e. the driver and all passengers) at all times.

Only the driver and one passenger are permitted in the cab (front) of a light delivery vehicle.
No personnel may be transported in the load-bin of a light delivery vehicle, even if the vehicle is fitted with a canopy. Only tools and equipment may be transported in the load-bin. Furthermore, no persons may be transported in a trailer behind a vehicle.

A pre-operation vehicle safety check and familiarisation system must be in place and must be used by the driver. An approved checklist must be used. All vehicle faults that are recorded must be attended to immediately.

All Contractors must have systems in place to ensure that risks associated with vehicle journeys are managed and controlled. The systems must include, but not be limited to:
- Formulation of journey management plans prior to the commencement of new or changed travel activities;
- Identification and monitoring of the risks associated with the various routes, intersections, etc. In order to minimise the overall exposure;
- Assessment and communication of changed environmental and road conditions at the time of travel;
- Outlining of actions required in the event of an emergency (e.g. Collision or breakdown); and
- Provision to manage driver fatigue.

Light vehicle running lights (low-beam headlights) must be switched on at all times when the vehicle is in operation.

All Contractors must have a system is in place to ensure that drivers receive adequate training to ensure that the vehicle intended to be operated or driven can be operated or driven safely. As a minimum, training must include:
- Behaviour-based defensive driving principles;
- Vehicle familiarisation, taking into account the handling dynamics of the vehicle, maximum number of passengers, load limits and various features;
- Loading and restraining principles where the vehicle to be operated is designed for carrying cargo loads;
- Education and awareness concerning driving and travel risks that may be encountered within the environment where the vehicle may be operated or driven, and the requirements pertaining to traffic rules and speed limits;
- Securing (locking) equipment to prevent unauthorised use;
- Emergency crash and breakdown procedures; and
- Basic mechanical principles, including how to change a tyre and perform an adequate pre-operation check.

A system must be in place to ensure that persons operating any equipment associated with a light vehicle (e.g. Vehicle-mounted cranes and winches) are suitably trained and competent.

16.7.2 Mobile Equipment

All Contractors must ensure that Mobile equipment have the following minimum safety specifications:

- Fixed seats and seat belts for all occupants;
- Adequate lighting, including headlights, tail, turn and brake lights, and an amber flashing light (revolving or strobe);
- An identified isolation and lockout point;
- Adequate walkways, railings, steps and grab handle combinations, and boarding facilities including an alternative path of disembarking in the event of an emergency;
- Collision-avoidance technology and / or procedures;
- A reversing alarm or warning device;
- Chock blocks for preventing uncontrolled movement of rubber-tyred equipment when parked;
- A horn;
- Effective windscreen wipers;
- Effective guarding on accessible moving parts;
- A speedometer (if the mobile equipment is capable of exceeding the lowest applicable speed limit);
- High visibility signage (i.e. Mobile equipment call numbers) facilitating easy and positive identification from a reasonable distance; and
- A security system to prevent unauthorised operation.

Mobile equipment must have the following minimum safety specifications, unless a risk assessment stipulates otherwise:

- Approved or certified roll-over protection;
- Fail-to-safe brakes;
- A fire detection and suppression system capable of being activated from both ground level and cabin level (for certain types of mobile equipment, a suitably sized fire extinguisher may be adequate);
- A non-handheld two-way radio or another form of communication;
- Falling object protection (a protective structure over the operator cabin);
- An enclosed and tight-sealing air-conditioned cabin with suitable protective glass; and
- A means of moving supplies and personal items into and out of the operator cabin that enables an operator to continuously maintain three points of contact while boarding and disembarking the equipment (e.g. A backpack or shoulder strap bag).

When purchasing or hiring equipment, the ergonomics of the cabin must be considered, specifically with regard to the seating, operator controls and retrofitted devices.

Fleet and control consistency must be considered in order to minimise the possibility of operator error when changing machines.

For all new (to site) and modified mobile equipment, a formal risk-based selection and acceptance process must be followed prior to the equipment being used on site.

Selection of equipment, and any modification, must be subject to a rigorous change management process.

An inspection and maintenance programme must be in place for all mobile equipment. A procedure and checklist system, including a brake functionality test, must be in place for pre-operation inspection by the operator. Registers must be maintained and audited, and must be kept on the machine.

Procedures must be in place to ensure that mobile equipment is only operated on sufficiently stable surfaces and on gradients that are within the limits of safe operation.

Seat belts must be used in all cases, by all occupants. Apart from the driver or operator, only an appointed flagman may be transported in mobile equipment (with the exception of buses) and **only if** the equipment is fitted with a passenger seat. No passengers are permitted on a lift and carry crane (or mobi-lift), mobile crane, forklift, mobile elevating work platform (e.g. A cherry picker), tractor, dozer, dump truck, grader, excavator, loader, back-actor, drill rig, or similar.

Risk assessments must be carried out as part of the planning process for mobile equipment operations and associated activities, and must consider the following:

- Maintenance activities;
- Risks associated with loading, unloading, towing and recovering mobile equipment; and
- The risk of fire.

Procedures must be in place for the safe isolation and lockout of mobile equipment.

Where two or more items of mobile equipment must be operated in proximity to each other, or where an item of mobile equipment must be operated in proximity to persons on foot, a risk assessment involving all persons who will be working in the area must be conducted prior to the work commencing. The risk assessment must be approved by the nominated project management representative. In such a work area:

- No item of mobile equipment may be driven to within 5 metres of another item of mobile equipment without the operator first making eye contact with, and signalling his intentions to, the other operator who must acknowledge that he understands and that it is safe to proceed.
- No person on foot may work or be positioned within 5 metres of an item of mobile equipment that is in operation. Before approaching mobile equipment on foot, a person must make eye contact with, and clearly signal his intentions to, the operator of the equipment. The operator must cease to operate the equipment, and must indicate that he understands and that it is safe to approach.

In certain circumstances (determined through risk assessment), mobile equipment may only move and operate with dedicated flagmen in place:

- Where flagmen are used, it must be ensured that the flagmen, mobile equipment operators, and all other personnel working in the vicinity of the mobile equipment, receive suitable training with regard to signals and signalling to ensure effective communication. The training must be formal and recorded, and competency must be tested.

- A flagman and the mobile equipment operator that he is directing must maintain eye contact. The flagman must never position hhealth and safetyelf where the equipment operator cannot see him.
- Should a mobile equipment operator lose sight of his flagman, he must stop his activities immediately until contact has been re-established.

A tyre management system must be in place to address issues including fire, heating, explosion, electrical contact, separations, maintenance, tyre changes, etc.

Site-specific induction must be carried out prior to a mobile equipment operator starting work on site. Area-specific induction must be carried out prior to an operator starting work in a new area on site.

Operators must report conditions and practices that do not conform to procedure.

16.7.3 Training and Licensing

No person may drive a light vehicle or operate an item of mobile equipment unless he has been trained, tested and found competent, or is currently licensed to drive or operate that specific vehicle or item of equipment.
The training must address hazards and risks assessed for:

- That vehicle; and
- The tasks for which it is to be used.
-

No person may be appointed to drive a light vehicle or operate an item of mobile equipment unless he is in possession of a valid medical certificate of fitness (issued by an occupational medical practitioner).

Each person required to drive a light vehicle or operate an item of mobile equipment on the project site must have a project-specific site licence or appointment to drive or operate that vehicle or item of equipment.

A system must be in place to ensure that the renewal of licences is based on an assessment of competency to drive and / or operate the vehicle or equipment. The frequency of assessment must either be annual, or derived from a risk assessment for each vehicle or equipment type.
No training of drivers or operators may be carried out on site unless authorised by a nominated project management representative.

Each person working on or visiting the project site must receive appropriate project-specific induction training concerning road safety and site vehicle hazards.
Driver must be in position of valid certificate, licence and trained by an accredited service provider.

16.7.4 Tyre and Rim Safety

These requirements apply to tyres and rhealth and safety with a rim diameter of 60cm (24 inches) or greater.
A Tyre Management Plan must be established and reviewed every twelve months.
Safe Work Procedures must be in place for all tyre maintenance and servicing activities and for tyre fire emergency response.

All persons who will be carrying out tyre maintenance and servicing work and / or responding (potentially) to tyre fire emergencies on site must be certified against the

requirements of job-specific competency standards for the project, which must address job-specific Safe Work Procedures.
No person may approach a light vehicle or item of mobile equipment within 24 hours of:

- The vehicle or equipment being struck by lightning;
- The vehicle or equipment making contact with high voltage electricity; or
- A tyre fire.

In the event of a tyre fire, an exclusion zone of 300 metres must be established and may only be accessed by emergency services personnel who are shielded while fighting the fire.

Restricted Work Zones must be established for tyre installation, removal and handling processes.
All tyre and rim handling equipment must have fall back prevention in place prior to anyone entering the Restricted Work Zone.

Tyres with split rhealth and safety must be deflated to zero and other tyres to a nominal pressure no greater than 5psi prior to removal of any retaining devices. In a dual assembly both tyres must be deflated.

Tyre inflation is subject to the following requirements:

- All tyre inflation must be carried out remotely;
- Where the risk of ejection of components exists, barricading must be in place;
- A tyre must not be left unattended during inflation; and
- Tyres that have run at less than 80% cold inflation pressure must not be re-inflated. Both tyres in a dual assembly must be dismounted and inspected.

No hot work (e.g. Welding or cutting) may be carried out on a rim (wheel) while the rim is fitted with a tyre – whether inflated or deflated.
A periodic testing and / or inspection regime must be in place for tyres, rhealth and safety (wheels), and assemblies.

All tyres and rhealth and safety (wheels) must be made unserviceable when deemed unfit for service or before being sent off site for disposal.
A tracking system must be in place to track the lifecycle of tyres and rhealth and safety (wheels).

16.7.5 Roads

Design, inspection and maintenance requirements must be in place for all roadways.
Every haul road must have two dedicated and clearly demarcated lanes so that vehicles travelling in opposite directions are safely separated (lane demarcation is not applicable to dirt roads).
Systems (such as safety berms) must be in place along roadways and around excavations, dump areas, etc. To prevent vehicles from leaving a roadway or entering a dangerous area.

A storm water management plan must be in place for the site and, in particular, for all roads. Extreme wet weather must be considered. Contractors must ensure that all roads are equipped with drainage system.

Roads with high risks activities and traffic interface shall be controlled by trained flagman

A dust control plan must be in place for the site and, in particular, for all roads. Where required, contractors must ensure that roads are wetted (using a water cart) at regular intervals and whenever instructed by a nominated project management representative. The over-watering of roads must be prevented.

No road may be closed without permission from a nominated project management representative.
Any large rocks in a roadway must be removed immediately. Any spillage in a roadway must be cleaned up immediately.

Ground pollution (e.g. Oil, diesel or hydraulic fluid spillages) must not, and will not, be tolerated. If substances are spilled on a road or any other portion of the site, the contaminated ground must be dug out and the resulting hole back-filled with clean material which must be suitably compacted. The contaminated soil must be disposed of as required by the applicable legislation.

16.8 Signs and Notices

The contractor must ensure that all required safety signs and notices are prominently displayed in accordance with the applicable legislation and good safety practice.
Signs and notices must be in English as well as any other language(s) commonly spoken on the project site.

All symbolic signs must comply with the applicable national standards.
No person may deface or damage any safety sign or notice. No person may remove or alter any safety sign or notice unless authorised to do so.

16.9 Machinery

The contractor must ensure that all plant and equipment brought onto the site is:

- Appropriate for the type of work to be performed
- Approved, inspected, tested, numbered and tagged (if appropriate) before being brought onto site
- Properly maintained in accordance with the manufacturer's recommendations; and
- Placed on a register and checked at least once per month or as required by the applicable legislation.

The contractor must supply, at his cost, all items of plant and equipment necessary to perform the work and must maintain all items in good working order.
Should any plant or equipment become inoperable for a period that is having or will have a significant impact on the work schedule, the contractor must, on instruction from the nominated project management representative, remove the out of service plant or equipment and replace it with similar fully operational plant or equipment at no additional cost.

No item of plant or equipment delivered to site for use on the contract may be removed from the site prior to the completion of the contract without approval in writing from the nominated project management representative.

Items of plant or equipment brought onto site by the contractor or his sub-contractors may be inspected by a nominated project management representative. Should the nominated project management representative determine that any item is inadequate, faulty, unsafe or in any other way unsuitable for the safe and satisfactory execution of the work for which it is intended, the contractor must, on instruction from the nominated

project management representative, immediately remove the item from the site and replace it with a safe and adequate substitute. In such a case, the contractor or his sub-contractor shall not be entitled to additional payments or deadline extensions in respect of any delay caused.

16.10 Barricading

All applicable legislation concerning barricading must be complied with at all times.

Each contractor required to erect barricading on the project site(s) must develop, document and implement Safe Work Procedures that are aligned with the requirements of this standard.

Barricading must be erected to:

- Prevent persons from making contact with an identified hazard;
- Provide warning of the existence of a hazard;
- Prevent unauthorised access (by people, vehicles and mobile equipment) into an area where a hazard exists or where a hazardous activity is being carried out;
- Define the boundaries of a hazardous location and / or restricted area; and
- Allow a work team to perform hazardous tasks without persons unfamiliar with the hazard(s) accessing the area.

Although not limited to these situations, barricading must be erected or installed:

- Around excavations (trenches, pits, etc.) (refer to the Excavation Standard);
- To protect openings and edges (to prevent persons from falling, all openings and edges associated with floors, stairs, and the open sides of buildings and structures during the course of construction must be protected by sturdy, rigid barriers capable of withstanding a force of at least 110 kilograms applied in any direction at any point) (refer to the Working at Heights Standard);
- To prevent access into areas where overhead work is in progress;
- To route vehicles safety through (or around) construction areas; and
- To protect members of the public who may be in the vicinity of a work or construction site (by preventing access).

In all cases, the erection of barricading must be a temporary measure. It must only remain in place until the hazard is eliminated or the potentially dangerous situation is rectified.

A barricade must present a sturdy physical barrier to entering an area. Therefore, plastic cones, post and chain systems, "danger tape" and "snow netting" will not be accepted as barricading and may only be used for the purposes of low risk demarcation.

For example, snow netting may be used for the demarcation of lay down areas.

Acceptable forms of barricading include:

- Hoarding panels (no less than one metre in height) that can be securely fastened together to form a fence line may be used. Hoarding panels may be constructed from a variety of materials (e.g. wooden board, steel sheeting, wire mesh on a steel frame, etc.)
- Wire mesh fencing (no less than one metre in height with sturdy posts spaced at intervals of no more than 3 metres) may be used in certain circumstances, e.g. Around excavations.
- Sturdy, rigid, and securely fixed (i.e. bolted, welded, clamped, etc.) Metal guard rails may be used, particularly for protecting openings, holes and edges associated with

floors, platforms, walkways, etc. The top rail must be positioned at a height of one metre above the working surface, and a mid-rail must be provided.
- Concrete Jersey barriers must be used for the routing of traffic and when work is being conducted in or alongside a roadway.

Regardless of the type of barricade used, the following requirements must be met:
- The installation, alteration and removal of barricades must be supervised by a competent person;
- The barricading must be uniformly and intelligently configured;
- The barricading must be stable, conspicuous and effective;
- The barricading must completely surround the work or hazardous area;
- General access requirements around the work or hazardous area (such as pedestrian walkways, operational access, or general thoroughfares) must be taken into consideration when erecting a barricade;
- The extent of the area that is barricaded must be kept to a minimum so as not to unnecessarily restrict access to other areas. If access routes to other areas are blocked by the barricade, alternative routes must be identified and signposted
- All barricaded areas must have properly designated points of entry and exit for persons and / or vehicles. Each pedestrian access point must be fitted with a self-closing gate. A sign indicating, "DESIGNATED ACCESS POINT – AUTHORISED PERSONNEL ONLY", must be fitted to each gate;
- Additional signage providing warning of specific hazards (e.g. falling objects, electricity, etc.) Including, "NO UNAUTHORISED ENTRY", must be attached to all gates and, where required, to the barricading itself. The signage must be visible from all angles and must be large enough to be read from a distance of 10 metres;
- Barricading must be clearly visible at all times (day and night). If necessary, flashing warning lights must be used;
- Tags must be attached to the barricading displaying the name and cell phone number of the person responsible for the barricade, and specifying the reason for the barricading and the date on which it is scheduled to be removed;
- Should a person require access to a barricaded area, authorisation must be obtained from the person responsible for the erection of the barricade. The hazards that are present and the Personal Protective Equipment that must be worn within the barricaded area must be communicated to the person seeking access;
- Each barricade must be listed in a register, and each must be inspected daily to ensure that it is still intact and that its positioning is still effective;
- All barricades must be properly maintained and repaired as required;
- When the work has been completed and the hazard has been eliminated, all barricading must be removed without delay. A barricade may not be left in place if no hazard exists;
- Before a barricade is removed (allowing general access), the area must be inspected by the person responsible for the work that was carried out, to ensure that the area is once again safe. If applicable, the person accepting the area back for general use shall do so on completion of his own safety inspection;
- Authorisation to remove (or modify) a barricade may only be granted by the person responsible for the erection of the barricade.

16.11 Excavations

All applicable legislation concerning excavation work must be complied with at all times.

Each contractor carrying out excavation work on the project site(s) must develop, document and implement Safe Work Procedures that are aligned with the requirements of this standard.
All excavation work must be properly planned. Site-specific conditions and hazards must be considered, including traffic, overhead and buried utilities, proximity to nearby structures, soil properties, presence of surface and / or ground water, position of the water table, and weather conditions.

Excavation work may only be carried out under the personal supervision of a competent Excavation Supervisor who has been appointed in writing.

Before any excavation work is carried out, a Permit to Work authorising the activities must be obtained.

Similarly, no person may enter an excavation unless a Permit to Work has been issued providing authorisation for specific tasks to be carried out within the excavation.

Before issuing a Permit to Work for excavation works, the Authorised Person (i.e. Permit issuer) must verify that:

- A detailed Risk Assessment has been conducted for the work to be performed;
- A Safe Work Procedure is in place; and
- No buried services are present in the area where the excavation works are to be carried out.

As a minimum, the Risk Assessment must consider hazards and risks associated with:

- A person being trapped or buried as a result of an excavation collapsing;
- A person being struck by an object falling into an excavation;
- A person falling into an excavation;
- A person being exposed to a hazardous atmosphere within an excavation (i.e. An oxygen deficiency, explosive or flammable gases, and / or harmful concentrations of a contaminant);
- Contact with belowground services; and
- Mobile equipment and / or light vehicle movement in proximity to an excavation.

On a plan (drawing) of the work area, the contractor must accurately indicate the position and dimensions of each intended excavation in order for it to be determined whether or not buried services would (or may) be encountered, such as electrical cabling, communications cabling, gas, fuel, potable water, fire water, effluent, sewage, or storm water pipelines.

In addition to a desk top review of existing drawings, a field survey must be carried out to verify the presence or absence of buried services. The positioning of all known belowground services must be accurately demarcated in the field before any excavation work commences.
Should there be any uncertainty, a pipe or cable locator must be used to determine if buried services are present, and if so, the positioning of the services.

If buried services are identified (or are suspected to be present) then the excavation plan must be altered if necessary to avoid these services. If the excavation plan cannot be altered then safe work methods (e.g. careful excavation by hand) must be specified and

measures (e.g. Isolation and lockout of the service) must be put in place to minimise risk to personnel and prevent damage to the service(s).

Machinery may not be used to excavate material lying within one metre of any belowground service (i.e. Cable or pipe).

Excavation work that is carried out must be limited to what is described in the Permit to Work. All controls, precautions and restrictions identified in the Permit to Work (and Risk Assessment) must be strictly observed and fully implemented. The Excavation Supervisor must discuss these controls, precautions and restrictions with all persons who will be carrying out the work.
All excavation work must be carried out by persons who have been trained and are competent to perform the work.

All personnel working in or near any excavation must wear high visibility protective clothing.
Unexpected structures (e.g. Tanks, brick work, concrete work, etc.) Or services (e.g. Cables, pipe lines, etc.) As well as unusual conditions (e.g. inconsistent materials, voids, etc.) That are encountered during excavation work must be reported immediately. All work must cease until the nominated project management representative provides authorisation to continue.

If an excavation is more than 1.2 metres deep and people have to enter it, then the sides of the excavation must be suitably battered, benched, or shored, unless a registered professional geo-technical engineer confirms in writing that there is no risk of the excavation collapsing (i.e. That the sides of the excavation are stable without battering, benching or shoring).

If the sides of an excavation are battered (sloped), then this must be done at an angle that is suitable for the given soil conditions (to be determined by a registered professional geo-technical engineer).

When it is not possible to batter (or bench) the sides of an excavation to a safe angle, then the sides of the excavation must be suitably shored. Shoring may only be installed, altered or removed under the personal supervision of a competent person using a predetermined safe method. Only approved shoring systems and equipment may be used. Shoring requirements must always be determined and designed by a competent person for the specific conditions encountered at the excavation site.

All material removed from an excavation (spoil) must be placed no closer than three times the depth of the excavation away from the edges of the excavation.

The profile of this spoil must be flattened out to prevent the material from being washed back into the excavation by rain water.
Scaling must be carried out on the sides of all excavations to remove loose material.
Protective shields or barriers must be erected (when required) between the sides of an excavation and the work area in order to protect employees from falling, rolling or slumping rock, soil, or materials.

Persons may not work on the faces (sides) of battered (sloped) or benched excavations at levels above other persons.

Tools, equipment and materials may not be placed within two metres of the edges of an excavation. Alternatively, a suitable retaining device may be used to prevent tools, equipment and materials from falling, rolling or sliding into an excavation.
No vehicle or item of mobile equipment is permitted near an edge of an excavation.
Mobile equipment may not operate in or near an excavation whilst persons are working within the excavation.

To ensure that adjacent structures (such as buildings, walls, or sidewalks) remain stable during excavation work, support systems such as shoring, bracing, or underpinning must be provided if required. Excavation below or near the base or footing of any foundation or retaining wall is prohibited unless:

- A support system (designed by a registered professional geo-technical or Structural engineer) is provided, such as underpinning; or
- A registered professional geo-technical engineer determines that the structure is far enough away from the excavation that no hazard exists.

To prevent persons and / or mobile equipment from accidentally falling into an excavation and to prevent unauthorised entry into an excavation, rigid barricading must be erected around every excavation that is deeper than 500mm. Warning signage must be prominently displayed and, if necessary, flashing warning lights must be used at night.

The barricading must remain in place for as long as the hazard (i.e. the excavation) exists. Sections of barricading around an excavation may only be removed (and then only temporarily) to enable excavation work to continue (refer to the Barricading Standard).

For each excavation more than 1.2 metres deep, safe means of access and egress (e.g. Ladders, steps or ramps) must be provided for persons working in the excavation. Safe entry and exit points must be located every 15 metres along the side(s) of an excavation (i.e. an exit point must not be more than 7.5 metres away from any person working in the excavation).

If a hazardous atmosphere exists within any excavation (i.e. an oxygen deficiency, the presence of explosive or flammable gases, and / or harmful concentrations of a contaminant) or if there is a possibility that a hazardous atmosphere may develop, then the excavation must be declared a confined space. Furthermore, an excavation must be considered a confined space if any risk of entrapment or engulfment exists. If an excavation is declared a confined space then all precautions and requirements pertaining to confined spaces must be implemented and complied with (refer to the Confined Spaces Standard).

Internal combustion engines may not be used in or near the edge of an excavation unless the exhaust emissions are ducted away or suitable mechanical (forced air) ventilation is used to maintain a safe atmosphere within the excavation.
Any water and / or sludge present within an excavation must be removed completely before any work commences in the excavation.

Using ditches, dykes, sumps and pumps, or other suitable means, surface water must be prevented from entering an excavation and areas lying adjacent to an excavation must be adequately drained.

If equipment is used to prevent water from entering an excavation or to prevent water accumulation within an excavation, then the equipment must be monitored by a competent person to ensure that it remains operational and effective.

Suitable lighting must be provided in and around any excavation in which work must be carried out at night.
A high standard of housekeeping must be maintained in and around all excavations.
Tools that are not in use, and materials that are no longer required, must be removed from an excavation to prevent these items from causing injury or being lost (buried).
A register of all excavations must be compiled and maintained.

A competent person (i.e. an appointed Excavation Supervisor) must inspect each excavation as well as the areas around it:

- At the start of each day (or shift) before work commences within the excavation;
- After any alteration is made to the excavation or shoring;
- After rainfall;
- After any blasting activity carried out in the vicinity of the excavation; and
- After any event that may have affected the strength or stability of the excavation or the shoring.

An excavation must be inspected for collapses, signs of instability, failures or signs of overloading of protective systems and equipment, hazardous atmospheres, water accumulation, and any other hazardous condition that may arise.

The sides of an excavation as well as the surface of the ground around the excavation must be carefully inspected for signs of instability including fissures (cracks), slumping, and bulging. Shoring must be carefully inspected for signs of overloading (e.g. Distortion).

If a hazardous condition is identified, no person may enter the excavation until suitable corrective actions have been taken and / or suitable controls have been put in place to either eliminate the hazard or reduce the risks to acceptable levels.

A record of each inspection (including date, time, findings, and signature of the Excavation Supervisor who carried out the inspection) must be captured in the excavations register.
Each inspection record must include a declaration as to whether the excavation is safe to work in or not.
All excavations must be monitored closely throughout each work day (or shift) by the Excavation Supervisor.

If an excavation has been declared a confined space, a safety observer (who will be able to initiate emergency response procedures if required and identify the location of any trapped or buried persons in the event of a collapse) must be stationed at ground level outside of the excavation whenever work is being carried out in the excavation.

If a hazardous condition is identified while work is being carried out in an excavation, then all persons in the excavation must be evacuated to safety without delay.
Under no circumstances may a person work alone in an excavation that is more than 1.2 metres deep without at least one other person being present in the immediate vicinity of where the work is being carried out.

Excavations must be backfilled as soon as possible, and the material used (usually the original material) must be properly compacted.

Where belowground services are present, the material used to backfill an excavation must be such that the services will not be damaged.
A layer of a material that is dissimilar to the general backfill material must be placed immediately above any buried service.

An excavated area must be restored to its original condition if at all possible.

Use of Explosives

All excavation work must be carried out without the use of explosives.
Explosives may not be brought onto the site or be used without written authorisation from the nominated project management representative.

If blasting operations are unavoidable, the contractor must:

- Provide a justification and obtain approval from the nominated project management representative;
- Strictly observe the provisions of all applicable legislation; and
- Carry out a detailed risk assessment covering the transportation, handling, storage and use of the explosives.

No explosives or detonators may be stored on site.
Detonators and other explosives must never be carried in the same box.

16.12 Cranes and Lifting Equipment

All applicable legislation concerning cranes and lifting equipment must be complied with at all times.
Each contractor carrying out lifting operations on the project site(s) must develop, document and implement Safe Work Procedures that are aligned with the requirements of this standard.

16.12.1 Design, Manufacturing and Safety Features

Before any crane or hoist is operated on the project premises (i.e. New to site), it must be formally accepted (authorised) by the nominated project management representative. The acceptance process must be based on an inspection and risk assessment, and must take the crane's or hoist's safety features and cabin ergonomics (if applicable) into account. The same process must be followed before any crane or hoist is returned to service following any modification or repair.

Note: An Equipment Profile (dossier) must be compiled for each crane.

As a minimum, the design and manufacturing of each crane or hoist used on the project premises must comply with the requirements of the relevant ISO standard. In countries where the requirements of a national standard are more stringent than the requirements of the relevant ISO standard, the national standard must apply.
The Safe Working Load (SWL) must be clearly indicated on each crane, hoist, and item of lifting equipment.

If the safe working load (rated capacity) of a crane varies with the conditions of use (i.e. varies with the angle of the boom and the boom length) then the manufacturer's load chart(s) indicating the crane's rated capacity at various boom lengths and angles must be available in the crane cabin. If the crane has a single load chart, it must be displayed in a

position visible to the crane operator. If the crane has numerous load charts, they must be easily accessible to the operator.

For each crane or hoist, the manufacturer's operating manual must be available to the operator.
The load chart(s) and operating manual for a crane or hoist must be in a language understood by the operator.

All lifting hooks must be fitted with a safety latch to prevent the load from accidentally detaching.
Each crane or hoist must be fitted with a load cell (with the mass of the load displayed in the visual range of the operator) and a load limiting device to prevent the crane or hoist from being operated outside of its safe working limits.

Where practicable, each crane must be equipped with an upper hoist limit switch (or anti two-block device) to prevent the hook block from colliding with the drum, and a lower hoist limit switch to prevent the rope on the drum from unwinding completely. These systems must provide both a visual and an audible alarm to the operator.

Under no circumstances may any limit switch or warning device be bypassed, disconnected, or adjusted in order to lift a load higher (or to lower a load lower) than the respective switches allow. Limit switches MAY NOT be adjusted to stop the hoist at a particular height under normal operating conditions – these are safety devices, and as such, should not be used as operating tools.

Under no circumstances may a load limiting device be bypassed or disconnected in order to lift a load that exceeds the rated capacity of the crane. Load limiting devices MAY NOT be used to "measure" or "test" the mass of a load – these are safety devices, and as such, should not be used as operating tools.

Each overhead travelling crane (including cranes operated using a manual chain drive) must be fitted with an audible travel alarm or an equivalent warning device.
Anti-collision devices must be fitted to prevent motorised overhead travelling cranes from colliding with each other (where two or more cranes run on the same track) and from colliding with the track end stops or other structures.

For a vehicle-mounted crane, the operator control station must be located in a position protected from swinging loads and from the crane jib.

A fall protection system must be provided for the assembly, dismantling, operation, maintenance and inspection of any crane where falling from height is identified as a hazard.

Each crane should be fitted with a stability monitoring device to prevent it from toppling over.

Only items of lifting equipment (tackle) that have been designed and manufactured with adequate factors of safety may be used on site. The following minimum factors of safety (with respect to the Safe Working Load) must be met:

- Ten (10) for natural-fibre ropes;
- Six (6) for synthetic-fibre ropes or woven webbing;
- Six (6) for steel-wire ropes;

- Five (5) for steel chains; and
- Four (4) for high-tensile or alloy steel chains.

Note: An excavator may not be used to lift a load unless all of the requirements of this standard (as would apply to a crane) have been met, and authorisation has been granted by the relevant Project Manager and Health and Safety Manager.

16.12.2 Planning and Risk Assessment

For each critical lift that must be carried out on site, a documented and detailed lift plan and risk assessment must be prepared to address all associated hazards.

Only suitably qualified, competent and experienced persons (lift planners) may evaluate critical lifts and prepare lift plans.

The lifting supervisor, crane operators, riggers and spotters responsible for carrying out a critical lift must have input into the lift plan and risk assessment and must be consulted before these documents are finalised.

All lift planners, lifting supervisors, crane operators, riggers and spotters (safety observers) must be appointed in writing.
No critical lift may commence until the lift plan and risk assessment have been authorised by the nominated project management representative and a Permit to Work has been issued.

Critical lifts include:

- All multiple (including dual) crane lifts;
- Lifts where the operational arcs of two or more cranes can overlap;
- Lifts over operating facilities where this may endanger personnel;
- Lifts over or adjacent to power lines;
- Any lift carried out in close proximity to equipment or a vessel containing a flammable or toxic substance;
- Lifts where the centre of gravity of the load could change;
- Any lift where the total weight on the hook exceeds 20 tonnes;
- Lifts near the rated capacity of the crane (i.e. Exceeding 85% of the rated capacity at the working radius);
- Any lift when the wind speed (including gusting) exceeds 30 kilometres per hour;
- Lifts involving a man basket (safety cage);
- Lifts to and from water;
- Lifts requiring specialised equipment or involving complicated lifting or rigging configurations;
- Lifts requiring non-standard rigging or slinging techniques;
- Lifts involving the simultaneous use of more than one hoist on the same crane; and
- Any other lift deemed to be critical by the nominated project management representative, or assessed as critical during a risk assessment.

The lift plan for a critical lift must include:

- General Information – crane manufacturer, crane model, items to be lifted, and reason for lift;
- Lift Data – load weight, lifting block and hook weight, hoist rope weight, rigging weight, total weight, height of lift, radius of lift, surface area of load, and centre of gravity of load;

- Rigging Data – sling material (chain, wire rope, or synthetic), sling diameter, sling length, sling configuration, sling capacity, hook type, shackle size and capacity;
- Lift Computation – boom length, jib length, radius of lift, crane capacity as configured, size of outrigger footplates, and wind speed;
- Proximity to Power Lines and Process Areas – mobile cranes working in proximity to energised power lines must operate under a Permit to Work, which must define exclusion zones and spotter duties;
- Local Hazards and Controls – including the route for the crane, ground stability, proximity of people or equipment, and agreed communication method; and
- Diagrams (sketches) – a rigging diagram, and a crane set-up diagram illustrating the positioning of the crane(s) in relation to surrounding structures and the initial and final positions of the load (including crane boom movement).

Lifts that are not subject to detailed lift plans (i.e. Lifts that are not considered critical) must nevertheless be subject to a risk assessment, and be properly planned and executed. The use of a crane-suspended man basket (safety cage) may only be considered when all other avenues to safely perform the work (e.g. Scaffolding, mobile elevating work platform, etc.) Have been exhausted (refer to the Working at Heights Standard).

Cranes used to lift or suspend personnel must be approved as suitable for this purpose. If a crane must be operated in proximity to energised overhead power lines (or any other exposed electrical conductors) then minimum clearance distances (specified by the electrical power utility or the nominated project management representative) must be observed. Whenever possible, power lines must be de-energised and isolated while lifting operations are carried out (refer to the Electrical Safety Standard).

16.12.3 Operation

At the start of every day or shift, the operator of a crane or hoist must carry out a pre-operation safety check using a prescribed checklist.
The specific requirements of the pre-operation safety check (and associated checklist) must be based on:

- A risk assessment that addresses all aspects of safe operation of the crane or hoist; and
- The inspection recommendations of the manufacturer.

As a minimum, the pre-operation safety check must include:

- A thorough visual inspection of all wire ropes, chains, hooks and safety latches, hook blocks, sheaves, hydraulic hoses, electrical cables, and the general condition of the crane or hoist;
- Checks to confirm the serviceability of the operating controls;
- Tests to confirm the correct operation of all limit switches, emergency shutdowns, load indicators, alarms and other safety devices; and
- A thorough visual inspection of all lifting equipment (tackle) to be used.

The operator must:

- Check for any loose or missing parts;
- Make sure that the wire rope (or chain) of the hoist is properly seated in its drum and sheave grooves without any slack or overlapping;
- Operate each control to make sure it functions properly, releases immediately, and does not stick. Each control must be labelled to indicate its function;

- Listen for any unusual mechanical noises and look for any jerky movements while operating the crane and / or hoist several feet in each direction that it travels;
- Check the functionality of the upper and lower hoist limit switches (if applicable) by slowly raising and then lowering the block to trip the respective switches;
- Check all hooks. Hooks must not be cracked, stretched, bent or twisted. Each hook must have a safety latch that automatically closes the throat of the hook. If the latch is bent, has a broken spring, or is otherwise damaged, it must be repaired before use. Hooks must rotate freely in the block assembly without any "grinding" felt or heard;
- Check the wire rope by lowering the block to its lowest level and looking for the following signs of damage:
  - Reduced rope diameter. This may indicate that the rope has been stretched, has lost its inner core support, or has worn outside wires;
  - Broken wire strands (any number);
  - Kinked, crushed, cut, or "bird caged" wiring, or wiring with heat damage.
- Check all chains for damage including wear at contact points, cracks, or distorted links (bent, twisted or stretched). All mechanical coupling links must be inspected to ensure that the linking pins are secure and in good condition. The capacity rating of each chain must be adequate for the load and the attachment method;
- Check the condition and capacity of wire rope and synthetic web slings. Capacity ratings must be legible on the manufacturer's label. The capacity of the sling being used must be adequate for the load and the attachment method. A sling must be replaced immediately if it is excessively worn.

The operator must report any fault, defect or damage to his supervisor immediately.
A crane or hoist must not be operated if any safety device is out of order or defective, or if any rope, chain, hook or other component is worn or damaged.

Completed checklists must be made available (on request) for inspection by the nominated project management representative. Wherever possible, these checklists must be kept with the crane or hoist.

All lifting operations must be supervised by suitably qualified, competent and experienced supervisors.

An effective method of communication between the crane operator and those assisting with the lift must be in place. This must be documented and approved by the nominated project management representative.

Documented Safe Work Procedures must be in place to ensure the following:

- Access into an area where lifting operations are being carried out must be restricted. Such an area (i.e. where there is a risk of a load falling and striking a person) must be barricaded and only authorised persons may enter (i.e. those directly involved with the lifting operations). Warning signage must be conspicuously displayed;
- Where a load is being moved from one location to another (i.e. The lifting operations are not being carried out in a discrete area that can be barricaded), measures must be taken to ensure that all persons in the path of the suspended load are made aware of the approaching hazard and that they move, and remain, well clear of it. All persons potentially affected must be given warning before the load is lifted;
- A lift must be directed and controlled by a single person (a suitably qualified, competent and experienced rigger);

- Dedicated spotters must be in place during lifting operations to observe and provide warning (if necessary) to prevent incidents and ensure that safety protocols are adhered to;
- Before commencing with a lift, it must be verified that the load being lifted is both within the rated capacity of the crane (or hoist) and lifting equipment and within the limits set out in the lift plan and / or risk assessment. The rated load capacities of the crane, hoist, rope, chains, slings or other components may never be exceeded;
- Only certified lifting equipment (tackle) may be used to lift a load;
- No equipment (tackle) that has been used for towing may be used for lifting operations;
- Only an approved material box (skip box) may be used for lifting loose items or materials;
- Before commencing with a lift, it must be verified that no safety devices (including load limiting devices) have been bypassed, overridden or disconnected;
- To prevent the load from swinging as it is lifted, the hoist must be centred over the load (when using slings or chains) or positioned directly above the lifting point of the load;
- Hoisting ropes must be kept vertical. No side loading of a crane boom is permitted (i.e. A crane may not be used to make a side pull);
- Two full wraps of rope must remain on the hoisting drum at all times. If a lower hoist limit switch has been fitted, and it is working correctly, it should not be possible to lower the block below the point where less than two full wraps of rope are on the drum;
- Before commencing with a lift, it must be verified that all rigging connections are correct and secure. Slings, chains, or other lifting devices must be fully and securely seated in the saddle of the hook;
- Slack must be removed from the slings, chains and / or hoisting ropes before lifting the load. It must be ensured that multiple lines are not twisted around each other and that the hoist rope is not wrapped around the load;
- To ensure that the load is properly secured and balanced, it must initially only be lifted a few centimetres. Slings must be repositioned if required;
- Before moving a suspended load, it must be lifted high enough to clear all obstructions. The load must only be lifted to the height necessary to clear obstructions, and no higher;
- Directional movement must be made smoothly and deliberately (there must be no sudden acceleration or deceleration of the moving load). Abrupt, jerky movements of the load in any direction must be avoided;
- Tag lines must be used in situations where a load needs to be steadied or guided while suspended;
- When using tag lines to steady or guide a suspended load that is being moved using a mobile crane, personnel on foot must remain in sight of and in communication with the crane operator at all times, must never walk between the crane and the load, and must remain clear of the load and the crane at all times (at least 5 metres). The load must be moved at a slow walking speed;
- A suspended load must be monitored closely at all times;
- If a crane operator's view of a suspended load is unavoidably obscured (completely or partially), or if a suspended load is unavoidably obscuring (completely or partially) a crane operator's view, then suitably positioned spotters must be in place to provide guidance to the crane operator;

- A load MAY NOT be moved over, or be suspended above, any person or any occupied building. No person may walk beneath, or position hhealth and safetyelf below, a suspended load;
- No person may pass or work beneath the boom of a crane;
- No person may be positioned between a suspended load and a solid object where there is a risk of being crushed should the load swing;
- No person may be positioned within the radius of the boom of a crane unless directly involved with the lift;
- Under no circumstances may any person ride on a crane's hook or on a load;
- No load may be left suspended unless the operator is at the controls and is monitoring the load. In such a situation, the load must be kept as close as possible to the ground or floor to minimise the possibility of injury should the load drop;
- The controls of a crane or hoist may never be left unattended while a load is suspended. If it becomes necessary to leave the controls, the operator must lower the load to the ground or floor;
- With the exception of pick-up and carry operations, no lifting may be carried out using a mobile crane unless the outriggers have been deployed and are locked in position;
- Load spreaders or packing under the outriggers must be used irrespective of the underfoot conditions;
- Before a mobile crane is moved into position to carry out a lift, the area must be inspected by a suitably qualified person who must verify that the underfoot conditions are satisfactory;
- When using a mobile crane, slewing to test the effectiveness of the outriggers must be carried out prior to commencing with a lift;
- Slew pins must be securely in place while a mobile crane is travelling;
- Unauthorised use of a crane or hoist must be prevented by removing the keys, locking the cabin, isolating the controls, etc. When lifting operations have been completed;
- When not in use, lifting equipment must be stored off the ground and must be protected from the elements (rain, harsh sunlight, etc.) And contamination (dust, solvents and other chemicals) in order to prevent damage and / or deterioration.

A crane or hoist or an item of lifting equipment may only be used for the purposes for which it was designed.

16.12.4 Inspection, Testing and Maintenance

Any crane or hoist brought onto the project premises must have a current test certificate and record of inspection as well as a suitable checklist (derived from the crane or hoist manufacturer's inspection recommendations) for use by the operator(s) when carrying out pre-operation safety checks.

An Equipment Profile (dossier) must be compiled for each crane.
A register of all cranes, hoists and lifting equipment (tackle) brought onto the project premises must be compiled and maintained.

Each crane, hoist and item of lifting equipment must have a unique identification code or number, which must be referenced in the register.

For each crane, hoist and item of lifting equipment, the following documentation must be kept on site and must be made available (on request) to the nominated project management representative for inspection:

- Test records and certificates;
- Inspection records;
- Maintenance records; and

- Details of any modifications or repairs made.

All cranes, hoists and lifting equipment must be inspected, tested and confirmed fit for purpose (i.e. Safe for use):

- Before being operated or put into service;
- Before being returned to service following any repair or modification; and
- Periodically as follows (unless local regulations require examination more frequently):
  - Each crane or hoist (including all ropes, chains, hooks or other attaching devices, sheaves, brakes and safety devices that form an integral part of the crane or hoist) must be thoroughly examined by a competent, experienced and appointed person every 6 months;
  - Each crane or hoist must be subjected to an annual performance test (i.e. A load test) by a competent, experienced and appointed person; and
  - All lifting equipment (tackle) must be thoroughly inspected by a competent, experienced and appointed person every 3 months.
  - The system of inspection and testing must provide verification that each crane or hoist is able to function to its design specifications, and must verify the integrity of:
- Mechanical and electrical components;
- Controls;
- Cables and all lifting attachments;
- Structural components including boom, hoist, brakes, wheels, hooks, baskets, out-riggers, hook-blocks and rails; and
- Load limiting devices, hoist limit switches, alarms or warning devices, and other safety devices and control systems (including independent fail-safe braking systems, devices to stop the crane or hoist such as a dead man's switch, and emergency shut-off switches).

A preventative maintenance system must be in place to ensure that all cranes and hoists are maintained in a safe and serviceable condition.

For any crane or hoist, all inspections, testing, maintenance and repairs must, as a minimum, be carried out in compliance with the requirements and specifications of the manufacturer as well as all applicable regulatory requirements (in terms of both the frequency of inspection, testing and maintenance, and the physical condition of the crane or hoist).

Repairs to a crane or hoist may only be carried out by competent persons. After repairs have been made, the crane or hoist must be tested and recertified fit for purpose (unless the repairs did not affect the integrity of the lifting mechanism).

Any modification to a crane or hoist must be subject to the approval of the original equipment manufacturer and a rigorous change management process.
Each item of lifting equipment (tackle) must be tagged following each quarterly (3-monthly) inspection. Details of these inspections must be recorded in the lifting equipment register which must be made available to the nominated project management representative on request.

The following colour coding system must be used for the tagging of all lifting equipment:

Table 16-1 colour coding system for lifting equipment

Quarter	Tag colour
January – march	Blue
April – June	Red
July – September	Green
October – December	Yellow

The tag placed on an item of lifting equipment must be traceable to an entry in the lifting equipment register where the following information concerning the inspection of that item of equipment must be recorded:

- Item description;
- Unique item identification code or number;
- Item owner;
- Item location;
- Date of inspection;
- Name and signature of competent person who carried out the inspection; and
- Any comments concerning the inspection.

Any item of lifting equipment that is found to be damaged or defective must be removed from service (and tagged, "out of service") immediately and must then either be repaired and recertified (if possible) or destroyed to prevent further use.
Similarly, any lifting equipment that is known (or is suspected) to have been overloaded must be removed from service immediately and destroyed to prevent further use.
If an item of lifting equipment is removed from service or destroyed (scrapped), this must be indicated in the lifting equipment register.
Any item of lifting equipment without a tag or with an out-of-date inspection may not be used.

16.12.5 Training and competency

Only suitably trained, competent and experienced persons who have been authorised in writing by the contractor's project manager are permitted to:

- Evaluate and plan critical lifts;
- Supervise lifting operations;
- Operate cranes and hoists;
- Use lifting equipment, and rig (sling) loads;
- Provide signals for controlling lifts; and
- Inspect, maintain or test cranes, hoists and lifting equipment.

Each operator must meet the competency requirements for the particular class or type of crane or hoist to be operated. Depending on the project location and applicable legislation, operators may need to hold a certificate of competency issued by a recognised training institution.

16.13 Working at heights

All applicable legislation concerning work performed from an elevated position must be complied with at all times.
Fall prevention or fall protection measures must be in place whenever the potential exists for a person to fall 2 metres or more.

16.13.1 Fall prevention

16.13.1.1 Work platforms

Wherever practical, a safe working area must be provided in the form of a work platform with fixed edge protection. This may include:

- a permanent work platform or walkway (i.e. A fixed steel structure);
- a fixed or mobile scaffold; or
- an elevating work platform such as a scissor lift, man lift, boom lift or cherry picker.

All work platforms and walkways elevated one metre or more must have complete floors, and edge protection must be in place in the form of toe boards and sturdy guard rails properly secured (i.e. bolted, welded, clamped, etc.) To prevent accidental displacement. Safe means of access and egress must be provided.

Guard rails must be capable of withstanding a force of at least 100 kilograms applied in any direction at any point.
The top rail must be positioned at a height of one metre above the working surface, and a mid-rail must be provided.

16.13.1.2 Floor openings, holes and edges

Any opening or hole (temporary or permanent) in a floor, platform or walkway must be protected by sturdy guard rails (removable if required) or a cover to prevent a person from stepping into or falling through the gap. Covers must be strong enough to support the loads that will be imposed on them and must be secured to prevent accidental displacement.

Ladder way floor openings and platforms must be protected by guard rails of standard construction and toe boards must be fitted along all edges, except at the entrance to an opening where a gate must be installed and so arranged that a person cannot walk directly into the opening.

When open, hatchways and floor openings must be protected by removable guard rails and toe boards of standard construction. When these openings are not in use, covers of adequate strength must be put in place and must be secured to prevent accidental displacement.

Where doors or gates open directly onto a stairway, a platform must be provided and the swing of the door or gate must not reduce the effective width of the platform to less than 500mm.

16.13.1.3 Wall openings

Wall openings, from which there is a drop of more than one metre, must be guarded as follows:

- When the height and position of the opening in relation to the working surface is such that standard guard rails will effectively eliminate the risk of accidentally falling through the opening, then these must be provided. The bottom edge of the opening must be fitted with a toe board. The guard rails and toe board may be removable if required;
- Alternatively, the opening may be closed using a screen. Wall opening screens must be of such construction and mounting that they are capable of withstanding a force of at least 100 kilograms applied horizontally at any point on the near side of the screen. A screen may be of solid construction, of grillwork, or of slat work.

An extension platform outside a wall opening, onto which materials can be hoisted, must have sturdy guard rails (or equivalent edge protection) on all sides. One side of the extension platform may have removable railings in order to facilitate the handling of materials.

16.13.1.4 Stairways

Each flight of stairs having four or more risers must be fitted with handrails.
Handrails must be installed on both sides of every stairway.
Riser height and tread width must be uniform throughout any flight of stairs, including any foundation structure used as one or more treads.

Stairways must be free of hazardous projections, such as protruding nails. No materials, equipment or waste may be placed on or beneath any stairway.
All stairways must be well lit.

16.13.2 Fall protection

Whenever there is a risk of falling 2 metres or more, whenever there is a risk of falling onto dangerous equipment or machinery even if the potential fall distance is less than 2 metres, or whenever work must be carried out within 2 metres of an opening through which (or an edge over which) a person could fall, no work may commence unless:

- a fall protection (and rescue) plan is in place (prepared by a competent person, approved by the nominated project management representative, and implemented by the contractor);
- A detailed task-specific risk assessment has been carried out;
- A safe work procedure is in place for the task to be performed;
- A permit to work has been obtained; and
- Each person has been provided with suitable fall protection equipment.

Fall protection equipment (either fall restraint or fall arrest equipment) must be used at all times whilst the work is being carried out.
To prevent persons from falling, fall restraint equipment must be used whenever work must be carried out within 2 metres of an opening through which (or an edge over which) a person could fall.
Fall arrest equipment must be used whenever the potential exists for a person to fall 2 metres or more.

A person has been provided with suitable fall protection equipment if he is secured by means of an approved full body harness (well fitted) with two shock absorbing lanyards or an inertia reel (when fall arrest equipment is required) or two short restraining lanyards (when fall restraint equipment is required), double or triple action snap hooks (or karabiner type rings), and secure anchorage points (a person's lanyard may be attached either directly to an anchorage point or indirectly through the use of a variety of systems that incorporate a lifeline).

A dual lanyard system must be used to ensure that at least one connection point is maintained at all times.
Note: When selecting fall arrest equipment, care must be taken to ensure that the potential fall distance is greater than the height of the person plus the length of the lanyard with its shock absorber deployed (taking the height of attachment into account).

Anchorage points must, where practical, be above the head of the person, and must ensure that in the event of a fall the person will neither swing nor touch the ground.

All permanent anchorage points must be designed and approved by a professional structural engineer.

All anchorage points must be periodically inspected and tested by a competent person to ensure that they are secure and can support the required load. A system must be in place to identify anchorage points as authorised for use.
Temporary anchorage points (and lifeline systems) may only be used if a competent person has certified them safe to use.

If an elevating work platform is used, such equipment must be fitted with a fixed anchorage point for the attachment of fall protection equipment.

The use of fall protection (fall restraint or fall arrest) systems must be avoided wherever and whenever possible through design, the installation of physical barriers that protect persons from falling, and employing alternative methods of working.
Only if physical barriers protecting against free falls cannot be installed must fall protection equipment be used.

Fall protection (fall restraint or fall arrest) systems are items of personal protective equipment and, if required, must be purchased, installed and provided to employees.
Prior to commencing with any work at height, an assessment must be conducted to determine if the work requires the use of fall protection equipment, and if so, which fall protection system is the most appropriate for the work.

There must be a system for ensuring that fall protection equipment is:

- Tested and certified for use;
- Inspected by the user before use; and
- Destroyed following a fall or where inspection has shown evidence of excessive wear or mechanical malfunction.

All persons that are required to work at height (in order to carry out routine or non-routine tasks) must first be trained and certified competent to do so. Furthermore, each person must be in possession of a valid medical certificate of fitness specifically indicating that the person is fit to work at height.

All persons required to use personal fall protection equipment must be trained and certified competent in the correct selection, use, maintenance and inspection of such equipment.

All fall protection equipment must be thoroughly inspected on a monthly basis by competent persons appointed in writing and each item of equipment must be tagged to show when it was last inspected. All inspections must be recorded in a register.
On finding defective or damaged equipment, appropriate action must be taken by the competent person (i.e. the destruction of the equipment to prevent further use).

Persons making use of personal fall protection equipment must do so in strict accordance with the instructions or requirements specified by the manufacturer or supplier of the equipment or system.
Specific pre-use inspection, maintenance and fitting protocols must be established in accordance with the manufacturer's requirements or guidelines and these protocols must be followed by all users of the fall protection equipment.

Solvents may not be used to clean fall protection equipment. Only manufacturer-approved cleaning solutions may be used.

No person required to use personal fall protection equipment may work in isolation (a minimum of two persons working together is required).
Competent supervision must be in place at all times for all work carried out at height. Supervisors must be appointed in writing.

Emergency response (rescue) procedures for the rapid retrieval of suspended persons in the event of a fall from height must be prepared and tested.

Note: Even though there is no risk of free fall, fall protection equipment may be required in situations where there is a risk of falling, slipping or sliding down a slope of more than 45 degrees.

Note: The maximum service life of fall protection equipment manufactured of synthetic fibre shall be 5 years from the date of first use and / or manufacture unless otherwise specified by the manufacturer.

A person may climb or descend a ladder without fall protection provided that he is able to use both hands and legs to do so, faces the ladder, and uses one step at a time. The ladder must be tied off or supported at its base.

Prior to any roof work being performed, or prior to persons accessing a roof, a structural engineer must verify that the roof is of sound construction and that it is capable of supporting the weight of the persons as well as any equipment that may be required. Should the engineer's findings be to the contrary, alternative methods of performing the work must be found. Particular care must be taken when work is carried out on an asbestos cement roof or a fibreglass roof.

16.13.3 Risk Assessment and Permitting

The following documentation is required for any work where fall protection is required (i.e. where a risk of falling exists):

- A Fall Protection (and Rescue) Plan;
- A Risk Assessment for the task to be performed;
- A Safe Work Procedure for the task to be performed; and
- A Permit to Work.

As part of the Risk Assessment and planning processes, the following must be considered:

- Hazards relating to accessing the location at height;
- The nature of the work location;
- The nature of the work activities to be undertaken at height;
- Environmental and weather conditions;
- The presence of nearby persons who may be at risk due to falling objects (potentially) or who's activities may be affected by the work being performed at height;
- The selection of fall protection equipment (considering fall clearances) and / or access equipment;
- The selection of anchorage points;
- The load ratings of access platforms, work areas, anchorage points, etc.;
- The condition of supporting structures such as roofs;

- The need for the work to be carried out by multiple persons and the means of communication;
- A rescue plan that addresses retrieval or rescue contingencies;
- Working above open furnaces or molten metal;
- Exposure to heat sources;
- The use of a mobile elevating work platform, man basket, suspended scaffold or boatswain's chair; and
- Any other conditions that may affect the safe execution of the task.

16.13.4 Elevating Work Platforms

Before hiring or purchasing an elevating work platform (e.g. a scissor lift, man lift, boom lift, cherry picker or similar equipment), the certification of the equipment (with regard to suitability of design and construction) must be verified.

Before using an elevating work platform, it must be verified that the equipment is in good working order and has been serviced regularly. The service record and instruction manual must be kept on site. A system must be in place to ensure that the equipment is maintained and inspected as required by the manufacturer and / or local regulations.

Persons (operators) must be formally trained through an accredited training provider and certified competent in the operation of the equipment. Once a person has been issued with the necessary licence or qualification as required under local regulations, he must be appointed in writing to operate the equipment.

Before using an elevating work platform, the operator must inspect the equipment and a pre-use checklist must be completed.
The operator of an elevating work platform must be in the "basket" unless it can be demonstrated to the satisfaction of the nominated project management representative that this is not possible or practical.

Every person in the "basket" must keep his feet on the floor at all times.
Every person in the "basket" must be secured at all times by means of personal fall protection equipment attached to an approved anchorage point, and systems must be in place to prevent tools and equipment from falling.

A mobile elevating work platform must not be driven unless the "basket" has been lowered and secured in a stable position.
Every elevating work platform that is used must be equipped with a dead man's switch or foot pedal at the operator controls.
An elevating work platform must only be operated on a firm surface with the outriggers extended (where fitted).

An elevating work platform must not be operated on a grade or slope beyond the capability of the machine (every mobile elevating work platform that is used must be fitted with an inclinometer which sounds an audible alarm before the maximum safe incline has been reached).

The area beneath the "basket" and the boom must be barricaded.
A second competent operator of the mobile elevated work platform to be in place on the ground level – to ensure that the elevated work platform could be lowered in case of an emergency.

A spotter must be used at all times when moving a mobile elevating work platform and when the "basket" is in an elevated position.

16.13.5 Man Baskets, Suspended Scaffolds and Boatswain's Chairs

The use of a man basket, suspended scaffold or a boatswain's chair may only be considered when all other avenues to safely perform the work (e.g. ladder, scaffolding, mobile elevating work platform, etc.) have been exhausted. Authorisation to use a man basket, suspended scaffold or a boatswain's chair must be obtained from the nominated project management representative. If permission is granted, the use of such equipment must be in strict compliance with all applicable legislation.

A person working from a man basket or a suspended scaffold must remain within the basket and must keep his feet on the floor at all times.

Each person working from a man basket, suspended scaffold or a boatswain's chair must be in possession of a valid medical certificate of fitness and must be trained (and assessed competent) in the Safe Work Procedures pertaining to the use of the equipment, as well as the Fall Protection Plan.

Each person working from within a man basket or suspended scaffold or from a boatswain's chair must wear personal fall protection equipment at all times (i.e. an approved full body harness connected by means of a shock absorbing lanyard to an anchorage point or lifeline that does not form part of the basket or chair).

If suspended using a crane, the man basket, suspended scaffold or boatswain's chair must be visible to the crane operator at all times. A suitable means of communication must be in place to ensure that the suspended person(s) are able to communicate with the crane operator and personnel on the ground.

The crane operator must remain at the controls at all times while the man basket, suspended scaffold or boatswain's chair is occupied.
Where feasible (and if it is safe to do so), tag lines must be used to stabilise the man basket, suspended scaffold or boatswain's chair.

A man basket or suspended scaffold (including the suspension system) must be designed by a qualified engineer.
Only an approved and certified man basket or suspended scaffold may be used. Regulations may require approval by an authority or certification to a national or international standard. The manufacturer's procedures and conditions for use must be strictly complied with at all times.
Each man basket or suspended scaffold must be fitted with an information plate indicating the maximum weight and number of persons that may be lifted. Copies of the welding x-rays and engineering drawings must be kept on site.

Any work involving the use of a man basket, suspended scaffold or boatswain's chair must be carried out under the supervision of a competent person who has been appointed in writing.
A man basket, suspended scaffold or boatswain's chair must be thoroughly inspected (examined for damage) by a competent person prior to use (every time the equipment is used) and the results of each inspection must be recorded in a register. The crane or hoist as well as all lifting equipment (tackle) that is used to suspend the man basket, suspended

scaffold or boatswain's chair must be tested and inspected as stipulated in the Cranes and Lifting Equipment Standard.

All suspended scaffold erectors, operators and inspectors must be appointed in writing and proof of competency must be provided.

Persons carrying out welding or flame cutting work from within a man basket or suspended scaffold or from a boatswain's chair must take precautions to ensure that they do not accidentally cut or burn through the cables or wire ropes that are suspending them.

16.13.6 Falling Objects

In the process of planning work activities, the risks associated with falling objects (i.e. materials, tools or equipment) must be assessed and appropriate control measures must be identified, implemented, and monitored taking the following hierarchy of controls into consideration:

- Preventing objects from falling – by using containment sheeting, toe boards, lanyards to secure tools (to a person or to the structure), ropes or chains to secure equipment (to the structure), lift boxes, brick cages, etc. and by properly securing loads when lifted by crane or hoist;
- Protecting people from falling objects – by establishing barricaded exclusion zones, installing catch platforms or catch nets, displaying warning signage, and posting safety watchers and / or traffic controllers; and
- Personal Protective Equipment (particularly safety helmets and safety boots) – protective equipment is a last line of defence and must be worn.

Where overhead work is being carried out, barricading must be erected around the work area (at the level at which the work is taking place and at every level below including ground level) to prevent persons from entering such an area and potentially being struck by falling objects.
Wherever hazards related to falling objects exist, appropriate warning signage (i.e. "Overhead Work In Progress" and "No Unauthorised Access") must be prominently displayed.

No items are permitted to lie loose in elevated positions (e.g. nuts and bolts must be securely stored) and good housekeeping standards must be maintained at all times.
No tools, equipment, material, debris, waste, etc. may be dropped from height. Objects must be lowered or chuted to ground level in a safe and controlled manner.

16.13.7 Scaffolding

16.13.7.1 Training, Competency and Supervision

Scaffolding may only be erected, maintained, altered or dismantled under the strict personal supervision of a competent Scaffolding Supervisor (or Scaffolding Inspector) who has been appointed in writing.

Scaffolding may only be erected, maintained, altered or dismantled by competent and appointed Scaffolding Erectors (or Scaffolding Builders). It is the Scaffolding Supervisor's responsibility to ensure that all persons carrying out such work are suitably trained and experienced.
A certificate of competency issued by a reputable (i.e. accredited and approved) training provider must be produced for each Scaffolding Supervisor and each Scaffolding Erector.

16.13.7.2 Erection and Dismantling of Scaffolding

Only approved scaffolding components may be used to erect a scaffold. Scaffolding must be erected, modified and used in accordance with the manufacturer's guidelines or recommendations, and in strict compliance with all applicable legislation and standards.

A free-standing scaffold must not exceed a height of three times the smallest dimension of its base.
Scaffolds with a height to base width ratio of more than 3:1 must be restrained from tipping over by guying, tying, or bracing.
Guy wires and ties prevent scaffolding from tipping away from the building or structure, and braces are rigid supports that prevent the scaffolding from tipping into the building or structure.

Scaffolding must be secured to the structure every 6 metres vertically and every 9 metres horizontally (as a minimum). Adequate underpinning, sills or footplates must be provided for scaffolds erected on filled or otherwise soft ground (including sand or gravel).

If the scaffolding is to be load bearing (i.e. other than normal access and workplace storage) then full calculations and a design must be prepared and authorised in writing by a structural engineer. The load limits specified by the scaffolding manufacturer may not be exceeded under any circumstances.

Scaffolds must be plumb and level at all times.
All scaffolding components must be in good condition (i.e. undamaged and free of corrosion).
All scaffolding components must be properly connected or secured and scaffolding must be effectively braced (diagonal bracing).

Each person erecting, maintaining, altering or dismantling scaffolding must use fall protection at all times (i.e. a full body safety harness with two shock absorbing lanyards fitted with scaffold hooks). The work must be planned to enable every Scaffolding Erector to be securely anchored at all times. A suitable lanyard length (not exceeding 2 metres) must be selected taking the potential fall distance and height of attachment (height of anchorage point) into account. If the lanyard is too long or the anchorage point is too low, the person may hit the ground, a platform, or objects below him before the lanyard is able to break his fall.

The area around the base of a scaffold must be barricaded to prevent unauthorised access into the work area. When scaffolding is erected or dismantled on a level, platform, or floor lying above ground level and the potential exists for components to fall to levels below the level on which the scaffolding is positioned, then the area directly below the scaffolding on each of those levels must also be barricaded. Appropriate warning signage (i.e. "Overhead Work In Progress" and "No Unauthorised Access") must be prominently displayed.

Hoists, lifts and approved material baskets must be used (where available) to lift scaffolding components to elevated positions.

Where components are passed from hand to hand during the erection or dismantling of a scaffold, each Scaffolding Erector must always stand on three boards and not directly above the person below him. During this process, each Scaffolding Erector must remain within the confines of the scaffold and must expose as little of his body as possible to

minimise the risk of being struck by a falling component. Good communication between team members must be maintained at all times.
No scaffolding components, tools, or any other material may be dropped from height or thrown from one level to another. Components, tools and materials must be lowered or lifted in a controlled manner. Use may be made of a chute.

Each tool must be secured to the wrist, harness or structure by means of a lanyard. A tool bag (around the waist or over the shoulder) may be used for carrying tools up and down a scaffold structure. Tools or equipment may not be carried by hand up or down a structure, as both hands must be used for climbing. If necessary, a rope must be used for lifting or lowering tools or equipment.

While a scaffold is being erected or dismantled, no scaffolding components may be stacked on the scaffold structure unless it has been designed for that purpose. Any loading of a scaffold structure must be authorised in writing by a structural engineer.

For special scaffolding, a design must be prepared by the appointed Scaffolding Supervisor and this design must be authorised in writing by a structural engineer before the scaffolding is erected.
Scaffolding may not stand on steel grating unless the grating is adequately supported from below. Scaffolding must rather stand on the structure that supports the grating.

Empty drums, crates or bricks may not be used to prop up, support or anchor scaffolding. Before scaffolding is erected in close proximity to an electrical installation or live conductors, an electrical engineer (employed by Project or the client) must inspect the area and determine whether or not the scaffolding must be earthed. Should the scaffolding require earthing, this must be done as soon as possible while the scaffolding is being erected.

Scaffolding may not be erected if it is raining or in winds stronger than 32 km/h.

A green tag (displaying the words, "Scaffold Safe for Use") or a red tag (displaying the words, "Danger: Do Not Use Scaffold") must be prominently displayed on each scaffold at all times. The tag must be positioned close to the base of the ladder or staircase provided for safe access. The wording on the tags must be in English and any other language commonly used on site.
As a minimum, a green tag must display the Scaffolding Supervisor's name, the date that the scaffold was erected, and the date that the scaffold was last inspected.
Only an appointed Scaffolding Supervisor may attach, change, update the information on, or remove these tags.

Scaffolding must not be:

- Left partially erected or partially dismantled except for normal work stoppages (for example, over weekends);
- Left in an unsafe condition (if scaffolding is unavoidably in an unsafe condition, barricading must be in place to prevent unauthorised access and the required red tags must be prominently displayed on the scaffold structure); or
- Moved or altered while work is in progress.
-

Mobile scaffolding must be equipped with brakes, which must be engaged at all times when the scaffolding is in use. A scaffold may not be moved if any person is on the structure.

16.13.7.3 Safe Access

Safe and convenient access must be provided to every scaffold platform by means of properly installed ladders or approved stairways, which must remain unobstructed at all times. Climbing up or down a scaffold on the braces or ledgers is forbidden.

All ladders used to access scaffolding must be securely attached to the scaffold structure. Hook-on and attachable ladders must be specifically designed for use with the type of scaffolding being used.

If a ladder is used to access a scaffold platform at a height greater than 1.5 metres above the ground, then the ladder must be secured internally (i.e. within the scaffold structure) and there must be an opening (closed with a trap-door) in the platform at the top of the ladder.

If the scaffold platform is at a height of less than 1.5 metres above the ground, then the ladder may be attached externally provided the guard rails around the platform are modified to allow access (the opening in the guard rails must be kept closed using a self-closing gate). No person may climb over or through the guard rails to gain access to a platform.

If a vertical ladder used on scaffolding is more than 5 metres in length it must be equipped with a ladder cage extending from a point 2 metres from the base of the ladder to a height of 1 metre above the platform (or the uppermost platform) that the ladder is providing access to.
Circular ladder cages must have an internal diameter of no more than 700mm. Square ladder cages must have internal dimensions of no more than 700mm by 700mm.

The requirement for a ladder cage may be waived if platforms are provided at height intervals not exceeding 4 metres, with the vertical ladder secured on the inside of the scaffolding framework and an opening (closed with a trap-door) in each platform.
Vertical ladders must be braced at three metre intervals (as a minimum) to prevent undue movement.

All vertical ladders providing access to a platform must be left in place for as long as the scaffold remains in place and must be inspected as part of the scaffold structure.
Any deviation from the requirements stipulated above must be subjected to a risk assessment and the nominated project management representative must authorise the deviation in writing.

16.13.7.4 Scaffolding Platforms

Safe work platforms must be provided.

Every work platform must be complete (i.e. from ledger to ledger and from transom to transom without any gaps) in order to prevent personnel, materials, tools, etc. from falling through the platform.

Every work platform must be constructed from manufactured steel scaffold boards (planks) of equal thickness (height). Timber boards are not permitted under any circumstances.

Each steel scaffold board must be securely hooked (fastened) onto the ledgers or transoms that support it.

On all sides except the one facing the structure, every scaffold platform must be provided with:

- Sturdy guard rails positioned 500mm above the platform floor (the mid rail) and 1000mm above the platform floor (the top rail); and
  Steel toe boards that are at least 150mm high and securely attached such that no gap exists between the toe boards and the platform floor.
-

Note: Wire mesh infill panels incorporating a toe board may be used instead of a mid-rail.

Scaffold platforms must be as close to the structure as is practicable (but not closer than 75mm) except where personnel need to sit on the edge of the platform while they work in which case the distance may be increased to no more than 300mm.

Scaffold platforms must, at all times, be kept free of waste, protruding objects, and any other obstructions. Platforms must be cleaned if necessary to ensure that they are maintained in a non-slip state.

16.13.7.5 Inspection of Scaffolding

Every scaffold structure must be inspected by a competent Scaffolding Supervisor:

- Prior to use after erection, and at least weekly thereafter;
- After inclement weather (heavy rain, strong winds, etc.);
- After any incident resulting in jarring, tilting or overloading;
- After any alteration is made; and
- Before being dismantled.

On completion of an inspection, the Scaffolding Supervisor must update the information on the scaffold tag.

A record of each inspection (date and time of inspection, location of scaffolding, findings, etc.) must be captured in a register. The register(s) must be maintained by the Scaffolding Supervisor(s) carrying out the inspections.

16.13.7.6 Using Scaffolding

The user of a scaffold (i.e. the responsible supervisor) must inspect the erected structure prior to acceptance and must ensure, as far as is reasonably possible, that the scaffold is safe and fit for purpose before allowing his team to make use of the scaffold.

In particular, the user must ensure that:

- The scaffold and the platforms have been constructed to meet the loading requirements of the work that is to be carried out (the Scaffolding Supervisor must be consulted in this regard);
- The Scaffolding Supervisor has checked that adequate ties and braces are in place;
- The work platforms are in the correct positions and are complete with toe boards and guard rails;
- Safe and convenient access has been provided (ladders and / or stairways); and
- A green ("Scaffold Safe for Use") tag has been attached to the scaffold by the Scaffolding Supervisor.

Use of an incomplete or unsafe scaffold is prohibited.
Unsteady or non-rigid scaffolds must not be used and inadequacies must be reported to, and rectified by, the responsible Scaffolding Supervisor.

The user of a scaffold must ensure that every person in his team is aware that no alterations to the scaffold may be made by the team during the course of their work, and that if any alterations are required, they must be made by competent Scaffolding Erectors under the supervision of an appointed Scaffolding Supervisor.

A scaffold may not be used:

- If a red tag is displayed indicating that the scaffold is not safe to use; or
- During inclement weather, defined as wind speeds greater than 40km/h, thunderstorms, or heavy rain (in excess of 40mm/h).

Note: With due consideration of possible educational limitations, the contractor must ensure that all persons understand what green and red tags mean.

The area around the base of a scaffold must be appropriately barricaded to prevent unauthorised access into the work area. Appropriate warning signage (i.e. "Overhead Work In Progress" and "No Unauthorised Access") must be prominently displayed.

Loose tools and / or materials on scaffold platforms must be secured using lanyards, wire or fibre rope, or must be placed in secured containers.
Where appropriate, "catch nets" deemed may be installed as an additional safety measure to prevent materials or tools from falling to the ground.

The storage or placement of materials on scaffolding platforms must be kept to a minimum. Debris as well as tools and materials that are no longer required must be removed from all working platforms at least once per day.

Scaffolding platforms must be cleaned regularly.

A heavy load may not be placed on a scaffolding platform unless the scaffold has been designed and constructed specifically for that purpose. Any loading of a scaffold structure must be authorised in writing by a structural engineer.

Scaffolds may not be used as hoisting towers or to support piping or equipment.
Each person working from scaffolding must wear fall protection (i.e. a full body safety harness with two shock absorbing lanyards fitted with scaffold hooks) and must be securely anchored at all times.

All work must be carried out from properly constructed work platforms. Standing on railings or braces in order to perform work is forbidden.
Drums, boxes and other makeshift substitutes for scaffolding may not be used under any circumstances.

Where work on an electrical system is to be undertaken from a scaffold, an electrical engineer (employed by Project or the client) must determine whether or not the scaffolding structure requires bonding and earthing. The scaffolding may not be used until this has been determined, and if required, until the structure has been bonded and earthed.

16.13.7.7 Identification and Inspection of Scaffolding Components

All scaffolding components belonging to a contractor must be properly marked or uniquely coloured to enable positive identification.

Prior to erecting a scaffold, all scaffolding components must be carefully inspected by a competent Scaffolding Supervisor.

Components found to be defective during an inspection must be conspicuously marked and removed to a suitably demarcated quarantine area for destruction, repair, refurbishment or removal from site. Deformed and bent wedges must be straightened and inspected for cracks before being put back into service.

16.13.7.8 Storage of Scaffolding Components

All scaffolding components must be stored in a demarcated storage area in such a manner that they are not exposed to environmental extremes and will not cause injury to persons. Suitable barricading or fencing must be erected and warning signage must be posted (e.g. No Unauthorised Entry).

Within a storage area, scaffolding components must be stacked such that pathways (750mm in width) are maintained between the stacks. Each stack must be stable and components must be neatly placed to ensure that no ends protrude into any pathway. The various components must be stacked separately.

The weight of scaffolding components must be considered when stacking them in elevated positions.

Any storage area for scaffolding components must be positioned such that it will not interfere with any onsite activity (including the operation of any plant or equipment), block any access way, or obstruct access to any plant or equipment. Before establishing a storage area, the location must be agreed with the nominated project management representative.

16.13.8 Ladders

All ladders used on site must be of sound construction and adequate strength.
Only non-conductive ladders made of wood or fibreglass may be used for electrical work or work being performed in proximity to energised electrical equipment. Metal ladders and ladders with metal reinforcing may not be used.

The use of makeshift ladders is forbidden.
All ladders must be numbered, listed in a register, and inspected by a competent person on a monthly basis (the results of each inspection must be recorded in the register).
Before using a ladder, the user must inspect it for damage.

Ladders with missing, broken, cracked or loose rungs, split stiles, missing or broken spreaders (stepladders) or any other form of damage or defect may not be used.
A damaged ladder must be removed from service (and tagged, "Out of Service") without delay and must then either be repaired (if possible) or destroyed to prevent further use.
Persons must receive instruction in the correct use and proper care of ladders.

Ladders may only be used as a means of access and egress. The use of ladders as working platforms is prohibited, except for inspection and carrying out minor tasks (i.e. light work and short duration) such as changing a light bulb.

Ladders may not be positioned horizontally and used as walkways or runways or as scaffolding.
All portable ladders must be fitted with non-skid safety feet (or some other means to prevent the base of the ladder from slipping) and the feet must always be placed (stand) on a firm level surface.
The use of bricks, stones, wood or any other material to level the stiles of a ladder is prohibited.
Ladders may not be placed on movable bases such as boxes, tables, trucks, etc.

The base or foot of a ladder must always be secured to prevent it from slipping. The ladder must be held by an assistant if the base cannot be secured in any other way (e.g. tied off).
A straight ladder must extend at least one metre above its support (or above the working platform that it is providing access to). The top of the ladder must be tied off (or otherwise secured to its support) to prevent accidental movement.

A straight ladder must be placed at a safe angle, i.e. tilted at a ratio of approximately 4:1, meaning that the base of the ladder must be one metre away from the wall (or other vertical surface) for every four metres of height to the point of support.

A stepladder may never be used as a straight ladder. A stepladder must be opened fully and the spreaders must be locked securely.
When using an extension ladder, at least four rungs must always overlap at the centre of the ladder.
Ladders may not be joined together unless they have been specifically designed and manufactured for that purpose.

A suspended ladder (i.e. not standing on a base) must be attached in a secure manner to prevent undue swinging or swaying, and to ensure that it cannot be displaced.

A ladder may not be placed against a window, glass or any other material which is unlikely to withstand the force exerted on it by the top of the ladder.

A ladder may not be placed in front of a door or window that opens towards the ladder unless the door or window has been locked or barricaded.

When a ladder is used near an entrance or exit, the base of the ladder must be barricaded.
Materials and / or equipment may not be placed in close proximity to the base or landing of any ladder.

When ascending or descending a ladder, a person must always face the ladder and use both hands (i.e. maintain three points of contact).

Nothing may be carried up or down a ladder if it prevents the person from holding on to the ladder with both hands. Tools must always be properly secured. This can be achieved by attaching them to the wrist using lanyards or placing them in a tool belt around the waist. Tools and materials may also be carried in a bag over the shoulder or hoisted to the landing using a tool bag and rope.
Only one person at a time may use (i.e. be positioned on) a ladder.

No person may stand or step above the third rung from the top of a straight ladder or above the second highest step of a stepladder.

Overreaching from a ladder is prohibited. If the target is not within comfortable reach, the person must climb down and reposition the ladder.
No person may run up or down a ladder, or jump from the lower rungs or steps to the ground.
All ladders must be properly maintained and cared for.
Ladders must be stored under cover and should be hung in a horizontal position from several brackets.

No ladder may be left lying on the ground or be left exposed to the weather. A ladder left lying on the ground presents a tripping hazard and it may be damaged by vehicles running over it.
No ladder may be left in such a position where it may fall over, be accidentally knocked over, or be blown over by the wind.

Ladders may not be painted, as the paint may conceal damage, defects, labels or other markings.
Instead of paint, clear varnish or wood oil may be used to preserve wooden ladders.
Ladders must be kept clean, as dirt may conceal damage or defects. Oil or grease accumulation on the rungs of a ladder may cause a person to slip.

Before making use of a ladder, each person must make an effort to remove mud, oil, grease, etc. from his boots.

16.14 Permit to Work

All personnel must comply with the Permit to Work system applicable to the project.
A Permit to Work must be obtained before carrying out any work that involves:

- A hazardous energy source or system, including electricity, compressed fluids (e.g. hydraulics and pneumatics), chemical substances (e.g. toxic, corrosive, flammable or explosive gases and liquids), heat (e.g. steam), radiation, and machinery or materials with potential energy (gravitational and elastic) – isolation and lockout may be required;
- Confined space entry;
- Working at height;
- A critical lift;
- Hot work outside of designated workshops;
- Excavation; or
- A service (e.g. water supply, fire suppression systems, etc.).

Note: A Permit to Work may only be issued by an Authorised Person, and may only be received (or accepted) by an appointed Applicant (see Definitions).

Each Permit to Work that is issued must make reference to an approved Task-Based Risk Assessment for the work that is to be carried out.

The Permit to Work system that is employed must incorporate the following basic procedures:

- Prior to meeting with the Authorised Person, the Applicant must familiarise hhealth and safetyelf with all of the hazards associated with the system, plant, equipment, structure or area on or in which the work must be performed. He must

also consider the risks that may arise as a result of the tasks that will be carried out. A Task-Based Risk Assessment must be in place;

- The Applicant must then request permission to carry out the work and must meet with the Authorised Person to discuss and document the scope of the work as well as the hazards, risks and associated control measures. Isolation and lockout requirements must be identified (if applicable). The isolation and lockout process must be initiated by the Authorised Person who must contact the necessary Isolation Officers.

Note: The Applicant must ensure his own safety and that of his team, and has the right to accompany the Isolation Officers to verify that all of the necessary locks have been fitted to all of the isolation and lockout points in accordance with the applicable plant or equipment-specific Isolation and Lockout Procedure.

- Once all of the necessary isolations have been completed and the necessary Clearance Certificates have been issued by the Isolation Officer(s) (if applicable), and the Authorised Person is satisfied that the system, plant, equipment, structure or area is safe to work on or in provided all identified precautions are observed by the Applicant, then he must issue (sign) the Permit to Work to the Applicant;
- The Applicant must accept (sign) the Permit to Work. If equipment has been isolated, the Applicant must attach his Personal Lock to the relevant Isolation Bar (or Local Isolation Point) and must ensure that every other person working on the isolated equipment also attaches his or her Personal Lock to the Isolation Bar (or Local Isolation Point) before starting any work;
- Before commencing with any work, the Applicant must discuss the hazards, risks, control measures, precautions and limitations as stated in the Permit to Work (and associated Task-Based Risk Assessment) with all personnel who will be carrying out the work. A register must be kept and all persons must sign the register once they have been briefed by the Applicant;
- The work performed must be limited to what is described in the Permit to Work;
- When a particular employee has completed his work, he must sign the personnel register to this effect and (if applicable) must remove his Personal Lock from the Isolation Bar (or Local Isolation Point);
- Once all work is complete, the Applicant must:
  - Ensure that all machine guards have been replaced;
  - Ensure that all tools and materials have been removed from the work area;
  - Ensure that the work area is clean and tidy;
  - Ensure that all Personal Locks (including his) have been removed from the Isolation Bar or Local Isolation Point (if applicable);
  - Inform the Authorised Person that the work has been completed; and
  - Sign off the Permit to Work.
- Once the work is complete and the Applicant has signed off the Permit to Work, the Authorised Person must:
  - Ensure that the relevant Isolation Officers perform all of the necessary de-isolations (if applicable);
  - On completion of the de-isolations, sign off the Permit to Work accepting the system, plant, equipment, structure or area back for service; and
  - Inform all relevant personnel that the system, plant, equipment, structure or area is ready to use.

- Where the work must continue over more than one shift, the Permit to Work must be reviewed at every shift change by an Authorised Person. If the scope of work has changed, the permit must be cancelled and a new permit must be issued.

If any of the original conditions or precautions pertaining to the work is not being complied with, is no longer adequate or is no longer applicable, the Authorised Person must cancel the Permit to Work and must ensure that all work stops until full compliance with either the original or amended (as required) conditions and precautions is achieved and a new permit has been issued.

The Applicant must ensure that the Permit to Work (including the personnel register) is kept where the work is being carried out (i.e. posted on a portable Health and Safety Management Information Notice Board) and that the work is monitored against the permit conditions.

All Permit to Work records must be retained and must be made available for inspection when required.

The implementation of the Permit to Work system applicable to the project must be audited on a regular basis by a nominated project management representative. Furthermore, planned task observations must be carried out periodically.

Note: In addition to obtaining Permits to Work as and when required for specific hazardous activities (identified in this standard), each contractor must obtain a General Work Authorisation from a nominated project management representative on a monthly basis. A General Work Authorisation is valid for one calendar month and authorises the contractor's planned work activities. In order to obtain a General Work Authorisation, the contractor must provide a documented work plan for the month together with the necessary Task-Based Risk Assessments.

16.15 Isolation and Lockout

Isolation and lockout procedures that make it impossible to inadvertently energise any system, plant or equipment so isolated, must be in place for all work where hazardous energy sources exist, including electricity, compressed fluids (e.g. hydraulics and pneumatics), chemical substances (e.g. toxic, corrosive, flammable or explosive gases and liquids), heat (e.g. steam), radiation, and machinery or materials with potential energy (gravitational and elastic). These procedures must be strictly enforced.

All personnel must comply with the isolation and lockout system and procedures applicable to the project.

All Isolation and Lockout Procedures must incorporate the following basic requirements:

- The issuing of a formal Permit to Work for any work that requires the isolation of any system, plant or equipment;
- The use of defined Equipment, Discipline and Personal Locks (see Definitions), and multiple lockout systems (i.e. Isolation Bars and lockout hasps);
- Clear identification of all isolation and lockout points ensuring there is no duplication;
- Isolation of the main energy source;
- The use of slip plates or the blanking off of pipelines or ducting, in addition to the chaining and locking of valves, as determined by a risk assessment;
- Suitable methods of preventing the movement of equipment; and
- Methods to test the effectiveness or completeness of the isolation.

Note: No work may commence on a system, plant or equipment until a Permit to Work has been issued by an Authorised Person.

Note: A Permit to Work may only be issued by an Authorised Person once all required Clearance Certificates have been issued by appointed Isolation Officers.

The isolation and lockout system that is employed must incorporate the following basic procedures:

- In accordance with a system, plant or equipment-specific Isolation and Lockout Procedure, an appointed Isolation Officer(s) must isolate all points that need to be isolated in order to render the system, plant or equipment safe to work on. An Equipment Lock (and a suitable, highly visible warning tag) must be attached to each isolation point;
- On completion of an isolation (and lockout), the Isolation Officer must clear the area of all persons and must then carry out tests to ensure that the isolation is effective. This may be done by pressing a start button or by asking a control room operator to try to start the equipment. Special care must be taken to ensure that the attempted starting of the equipment has not been deactivated by another interlock forming part of the system, or by a different up-stream isolation. Alternatively, appropriate equipment may be used to test for energy (e.g. voltage verification or continuity tests).

Note: In the case of electrical isolation, a test for voltage must be carried out, after the switching device, to ensure the absence of voltage.

- The Isolation Officer must place the key to the Equipment Locks on an Isolation Bar (at a Lockout Station) and must then attach a Discipline Lock (to prevent the key from being removed) before issuing a Clearance Certificate;
- The Discipline Lock must remain in place when handing over to subsequent shifts. All Discipline Locks for a particular discipline (e.g. low voltage electricity) must be keyed-alike so that any Isolation Officer appointed for that discipline (and issued with a key) can open any of the Discipline Locks used for that discipline.
  This enables an Isolation Officer to de-isolate equipment that may have been isolated by another Isolation Officer during an earlier shift. Appointed Isolation Officers for a particular discipline are the only persons permitted to hold keys to the Discipline Locks used for that discipline.

Note: Local isolations do not require the use of Equipment Locks (a Discipline Lock may be attached to the Local Isolation Point by the Isolation Officer, followed by the necessary Personal Locks).

Note: For local isolations, if the Isolation Officer is the only person who will be working on the isolated equipment, then he must attach his Personal Lock to the Local Isolation Point.

- Once all required Discipline Locks are in place (i.e. attached to the Isolation Bar) and all Clearance Certificates have been issued, the Permit to Work may be issued by the Authorised Person;

- Each person who will be working on the isolated system, plant or equipment must then attach his or her Personal Lock to the Isolation Bar before starting any work (including the Isolation Officer, if he intends to work on the isolated unit);
- The attachment of a Personal Lock to the Isolation Bar prevents the removal of the key to the Equipment Locks even if the Discipline Lock is removed;
- When called (by an Authorised Person) to de-isolate the system, plant or equipment (on completion of the work under the Permit to Work), the Isolation Officer must ensure that all Personal Locks have been removed from the Isolation Bar before removing the Discipline Lock and the key to the Equipment Locks;
- Before removing the Equipment Locks and de-isolating the energy source, the Isolation Officer must inspect the system, plant or equipment that was worked on to ensure that it is safe to perform the de-isolation. This includes guard inspections, housekeeping, ensuring that all doors and covers are in place, and most importantly, ensuring that no persons are present;
- Once all Equipment Locks have been removed and the system, plant or equipment is safe for use, the Isolation Officer must cancel the Clearance Certificate and inform the Authorised Person that the unit has been de-isolated.

Where a system, plant or equipment is sequence interlocked and a hazard could be created through the inadvertent start up or shut down of a system, plant or equipment lying before or after the unit to be worked on, then that system, plant or equipment must also be isolated and locked out.
Redundant or out of service equipment must, in addition to being isolated and locked out using the relevant Discipline Lock, be fitted with a tag indicating why it is out of service, who performed the lockout, and the hazards associated with that equipment.

Where it is necessary to work on live equipment for the purposes of commissioning, testing, adjusting and sampling, such work must be carried out in accordance with a written Safe Work Procedure and controls must be in place to prevent unauthorised access into the work area.
The implementation of the isolation and lockout system and procedures applicable to the project must be audited on a regular basis by a nominated project management representative. Furthermore, planned task observations must be carried out periodically.

16.15.1 Personal Locks

A Personal Lock must be such that it can only be unlocked by the person to whom it belongs. Combination locks may not be used.

A Personal Lock, as well as the key(s) to the lock, must be kept under the exclusive control of the person to whom the lock belongs.

A Personal Lock must be issued to each person who requires one, and the person's details must be clearly and permanently engraved directly onto his Personal Lock. Alternatively, a thick durable plastic identification tag may be used that clearly displays the company's name, the employee's name, the employee's company number, and a contact telephone number (the tag must be securely fastened to the Personal Lock). Where the above is hand written, it must be done using a permanent marker pen and it must be legible.

Each person issued with a Personal Lock must be trained and certified competent in the correct use of such a lock.

A Personal Lock may NEVER be removed by anyone other than the person to whom it belongs, except if the removal (cutting) of the lock is authorised by the nominated project management representative (in the absence of this person, authorisation can only escalate upwards). Furthermore, the removal of the lock must be done under the personal supervision of the nominated project management representative, and in accordance with a written procedure. The removal (cutting) of a Personal Lock may be required if the person who applied the lock is unable or unavailable to remove it on completion of the work (e.g. lost his key, failed to remove his lock before going home, etc.).

16.16 Electrical Safety

All electrical work must be carried out by competent personnel in accordance with all legal requirements, codes, design criteria and safety standards applicable to the project.
Each contractor carrying out electrical work on the project site(s) must develop, document and implement Safe Work Procedures that are aligned with the requirements of this standard.
All persons who will be carrying out electrical work must be certified against the requirements of job and equipment-specific electrical competency standards for the project, which must address job and equipment-specific Safe Work Procedures.

Each person potentially exposed to electrical hazards must receive electrical hazard training at the commencement of his employment on site and thereafter on an annual basis. The training must address the equipment and conditions specific to the area where the individual will be working. The training material must be documented and training records must be kept.

16.16.1 Electrical Installations

Each electrical installation (temporary or permanent) installed or worked on by a contractor must be inspected by a nominated project management representative to ensure that the installation complies with all statutory requirements, codes, design criteria and safety standards applicable to the project.

A nominated project management representative must approve all electrical work before the installation is energised. Any installation deemed unsatisfactory by a nominated project management representative must be removed, repaired or modified by the contractor at his expense.

For every permanent or temporary electrical installation, a certificate of compliance must be issued by a competent and appropriately qualified electrician. These certificates must be available for inspection.

Single line diagrams (with supporting documentation) must be produced and maintained for all electrical installations. This information must include system fault calculations, equipment details, electrical protection discrimination curves, and cable ratings.

Work on electrical installations (new installations, and modifications or repairs to existing installations) may only be carried out by qualified and authorised personnel (i.e. electricians).
Electrical safety devices (specifically, earth leakage protection and overcurrent protection) must be installed on all distribution circuits and the settings must be established by suitably qualified personnel.

A suitable numbering and / or labelling system must be used so that each circuit breaker or earth leakage device can be clearly and readily matched with the outlet or equipment that it protects.
To ensure the safety of the user, each distribution panel must be completely enclosed, must be of the dead-front type, and must be properly constructed and earthed.

All electrical cabling must be covered (e.g. in cable trenches) or elevated (in cable trays) to protect it from damage and to eliminate tripping hazards.

All permanent and temporary electrical installations (cabling, sockets, distribution panels, transformers, switchgear, etc.) must be inspected and tested by a competent and suitably qualified electrician on a monthly basis. The testing must include a grounding (earthing) continuity test and testing of the electrical safety devices. Details of these inspections and tests must be recorded in a register which must be made available to the nominated project management representative for inspection.

A rigorous Isolation, Lockout and Permit to Work system must be applied to all electrical work (i.e. work on electrical installations, machinery or equipment). All personnel must comply with the system and procedures applicable to the project.

Before any work on an electrical installation or equipment is carried out, the installation or equipment must be de-energised.

No electrical work may be performed live, regardless of the voltage, unless written approval is obtained from the nominated project management representative (a

justification as to why it is necessary for the work to be carried out with the equipment in an energised state must be provided).
For all energised electrical work, a Safe Work Procedure must be in place and, with the exception of voltage testing and where no tools are used, a Permit to Work (specifically authorising energised electrical work) must be issued.
When carrying out any energised electrical work, approved electrically insulated gloves, blankets, mats and other protective equipment must be used.

Control centres, switchgear rooms, substations, generators, transformers, capacitor banks, and other similar electrical plant and equipment must be appropriately guarded and labelled and, with the exception of emergency shut-off mechanisms, must be made inaccessible to unauthorised personnel (i.e. plant or equipment of this nature must be positioned within rooms or fenced enclosures which must be kept locked).

Appropriate warning signage must be prominently displayed within, and at all entrances to, these rooms or enclosures. The signage must indicate that unauthorised persons are prohibited from entering, that unauthorised persons are prohibited from handling or interfering with any electrical plant or equipment, the procedure to be followed in the event of a fire, and the first aid procedure to be followed should a person suffer electric shock. Suitable fire-fighting equipment must be provided in all such rooms or enclosures.

All electrical panels must be kept locked (using keyed-alike padlocks). Keys may only be issued to authorised personnel.

All un-insulated (bare) or partially insulated conductors must be enclosed and protected to prevent accidental contact therewith. Measures must be taken to prevent unauthorised access and appropriate warning signage must be conspicuously displayed.

Only authorised persons may enter rooms or enclosures housing electrical plant or equipment, and only authorised persons may access electrical panels or cabinets, and cable ducts or trenches. If any work must be carried out in such an area or on such equipment, a Permit to Work must first be obtained from the nominated project management representative.

No connection to any electrical system may be made without prior approval and a valid Permit to Work from the nominated project management representative.

No electrical equipment or apparatus may be modified without written authorisation from the nominated project management representative.

Conductive ladders may not be used in proximity to non-insulated electrically energised lines or equipment.
All permanent and temporary electrical cables, whether energised or not, must at all times be handled as if they are energised.

Only appropriately certified intrinsically safe electrical equipment may be used in flammable or potentially explosive atmospheres such as in confined spaces.
Any equipment or structure on which electric charges may accumulate (such as storage tanks) must be grounded (earthed).

Lightning protection must be provided on all tall structures and buildings.

Grounding (earthing) and lightning protection systems and devices must be designed, engineered, selected and installed based on site-specific requirements.
Before carrying out any excavation work, a Permit to Work (specifically authorising the excavation activities) must be obtained from the nominated project management representative. Such a permit must not be issued until it has been verified that no buried hazards or services exist where the excavation work is to be carried out (refer to the Excavation Standard).

16.16.2 Arc Flash Safety

Depending on the scope and nature of the work, a documented arc flash protection programme must be in place that specifies:

- The methodology for calculating incident energies and determining flash protection boundaries; and
- The PPE required (specific to a task and the equipment on which the task is performed) and associated procedures to mitigate the hazard.

The method of calculation must be based on regional electrical code requirements, or if none exist, the Institute of Electrical and Electronics Engineers (IEEE) Standard 1584, or the United States National Fire Protection Association "Standard for Electrical Safety in the Workplace" (NFPA 70E), or published equivalent.

An Arc Flash Hazard Assessment must be carried out based on accurate and current data. All electrical cabinets where the potential for an arc flash hazard exists must be labelled in accordance with the hazard assessment and the potential incident energies calculated.

A process must be in place for updating the Arc Flash Hazard Assessment and labelling as changes and electrical upgrades occur that might affect the available short circuit current on the system.
In order to mitigate the hazard, Safe Work Procedures must be in place and all persons potentially exposed to arc flash hazards must be trained in these Safe Work Procedures and must be supplied with appropriate arc flash PPE.

16.16.3 High Voltage Power Lines

Before any mobile equipment (such as a crane, bulldozer, back-actor, boom truck or drill rig) is mobilised to a work site, an assessment must be carried out (including a thorough inspection of the work site and the access route) in order to clearly identify any overhead or underground power lines.

A system must be in place to mitigate the risks associated with working in close proximity to power lines and suitable measures must be taken to prevent personnel or equipment from coming into contact with power lines. Extreme caution must be exercised.
Where possible, exclusion zones (based on minimum clearance distances specified by the electrical power utility or the nominated project management representative) must be created with rigid barriers and warning signs.

Only in exceptional circumstances, and then only after a detailed method statement and risk assessment has been approved, all necessary mitigation or control measures are in place (including the use of a spotter), and a Permit to Work has been issued by the nominated project management representative, may equipment be operated within one boom length of energised overhead power lines. Suitable protective insulating barriers may need to be used.

If possible, the power lines must be de-energised and isolated while the work is carried out.
All equipment operators and rigging personnel must be trained in the hazards and the applicable safe approach distances (exclusions zones) associated with overhead power lines.

A procedure must be in place for the evacuation of mobile equipment or a vehicle in the event of accidental contact with power lines. All operators must be trained in this procedure and must follow it implicitly.

Scaffolding may not be erected within 5 metres of power lines or overhead track equipment.

16.16.4 Portable Electrical Equipment

Prior to site establishment, each contractor must provide a complete inventory of all portable electrical equipment that he and his sub-contractors intend to use on the site (including plant, machines, appliances, generators, hand tools, lighting, extension cords, etc.). The nameplate data for each item of equipment must be included.

All portable electrical equipment to be used on the site must be supplied and maintained in a serviceable condition.
Any electrical equipment that is in poor condition or is not in proper operating order may not be used. Any electrical equipment that a nominated project management representative deems to be unsafe or unsuitable must be removed from site.

Electrical repair work or diagnostic work on electrical equipment may only be performed by personnel who are competent and authorised to perform this work (i.e. qualified electricians).
With the exception of double-insulated equipment, all electrical equipment must have an equipment grounding (earthing) conductor that connects the frame of the equipment being utilised to the grounding (earthing) conductor of the electricity supply system.

All electrical equipment and all electricity supply systems used (including generators) must be inspected and tested by a registered and competent electrician to ensure that all equipment is properly grounded (earthed).

All electrical equipment used on site must be supplied electricity through (i.e. must be protected by) an approved and tested residual current device (or earth leakage device or unit). If a socket outlet does not have a residual current device in the circuit, a portable residual current device must be used. Outlets without residual current device protection must be labelled as such.
Any electrical equipment that causes an earth leakage device to trip or deactivate the circuit may not be used again until an electrician has inspected and tested the equipment and has recorded in a register that the equipment is safe to use.

Interlocks may never be removed or modified, and fuse terminals may never be bypassed to keep current flowing in any circuit.
All generators must be fitted with suitable overcurrent protective devices (i.e. circuit breakers or fuses).
All generators must be used in compliance with the manufacturer's requirements. Any proposed modification to a generator must be authorised in writing by the manufacturer prior to the modification being made.

Each welding machine used on site must be fitted with a Voltage Reduction Device (VRD). If this is not practical (i.e. for arc welding processes other than stick welding), a dead man's (isolation) switch in the electrode circuit (operated by a trained observer) may be used as an alternative. All welding machines must be properly grounded (earthed).

All portable electrical hand tools used on the site must be double-insulated.
Electrical equipment must be disconnected or unplugged when not in use.
Portable lights must be stable and each light bulb must be protected by a substantial guard.
Temporary festoon lighting must be double-insulated and must be supported at least 2.5 metres above the floor, if possible.

Handheld lights must be of the all-insulated type and must be extra low voltage (i.e. not exceeding 32V). 120V or 240V handheld lights are not permitted.
Any lighting used in hazardous locations (i.e. potentially explosive atmospheres, confined spaces, and damp or wet areas) must be operated at a maximum of 32 volts, unless earthed and protected by earth leakage devices.
No person may wear a watch or any jewellery, or carry any metal objects such as a lighter or keys, while working on any electrical system or equipment.
No person may work on or use electrical equipment if his clothing is wet or any part of his body is in contact with water.

No person may handle electrical equipment, equipment cords or extension cords with wet hands or if the floor or ground surface is wet.
Fire extinguishers filled with carbon dioxide must be used to fight electrical equipment fires (water may never be used). If possible, the electrical equipment should be de-energised before fire-fighting activities commence (refer to the Fire Protection and Prevention Standard).
When cleaning or performing maintenance work on an item of electrical equipment, the equipment must be unplugged.

Equipment may not be unplugged while that equipment is switched on. Nor may equipment be plugged into a receptacle (socket) with the equipment's switch turned on.
Electrical equipment that has a defective plug or wiring may not be used. Repair work to defective or damaged electrical equipment may only be carried out by a qualified electrician.
Extension cords may be used for temporary applications only. Permanent cabling must be installed for long-term needs.

Extension cords may not be run through doors, windows, ceilings or holes in walls.
An extension cord must be uncoiled completely before it is used.
An extension cord must be of sufficient current-carrying capacity to power the equipment that it is supplying electricity to. Cords must not be overloaded.
Extension cords must be unbroken and continuous (i.e. no joins or splices in the cord are permitted).

Extension cords may not be daisy-chained (i.e. one extension cord plugged into another extension cord).
Extension cords and equipment cords may not be modified to fit a receptacle (socket).

Two-conductor extension cords may not be used. A three-conductor extension cord (i.e. a grounded or earthed cord) must be used even if the equipment that it is supplying electricity to uses a two-prong plug.

Extension cords that are frayed, have insulation tears, cracks or abrasions, have exposed conductors, or have bent, broken or "spread" plug prongs may not be used.
Extension cords that will be used outdoors must have heavy duty insulation and must be weather and UV resistant.

All electrical equipment cords and extension cords must be covered or elevated to protect them from damage and to eliminate tripping hazards.
Each contractor is responsible for protecting his electrical equipment from the weather and from possible mechanical damage.

All portable electrical equipment (including generators) must be inspected, tested and tagged by a competent and appropriately qualified electrician on a monthly basis. Details of these inspections and tests must be recorded in a register which must be made available to the nominated project management representative for inspection.

The inspection and testing must include a continuity test of the grounding (earthing) conductor (as applicable) and a complete examination of the equipment or system to assure safe use.
The following colour coding system must be used for the tagging of all electrical equipment:

Table 16-2 Colour Coding System for Electrical Equipment

Month		Tag Colour	Month	Tag Colour
January		Red	July	Red
February		Blue	August	Blue
March		Orange	September	Orange
April		Green	October	Green
May		White	November	White
June		Yellow	December	Yellow

The tag placed on a piece of equipment must be traceable to an entry in a register where the following information concerning the inspection and testing of that piece of equipment must be recorded:

- Date of inspection and testing;
- Equipment description;
- Equipment owner;
- Equipment location;
- Name, signature and licence number of the electrician who carried out the inspection and testing; and
- Comments concerning the inspection and testing, and details of any repair work carried out or required.

Any item of electrical equipment that does not pass an inspection or test must be removed from service (and tagged, "Out of Service") immediately and must then either be repaired (if possible) or removed from site.
Any item of electrical equipment without a tag or with an out-of-date inspection or test may not be used.

Any item of electrical equipment found without a tag or with an out-of-date inspection or test must be removed from service until it has been inspected and tested. If it is found that more than one item of equipment being used by a contractor has not been inspected and tested as required, all work with electrical equipment must be stopped until it can be demonstrated to the satisfaction of the nominated project management representative that the contractor's systems and controls are adequate and fully implemented.

In addition to the formal monthly inspections and testing carried out by an electrician, electrical equipment (particularly extension cords, portable hand tools, welding machines, compressors and pumps) must be visually inspected by the user on a daily basis prior to use. Users must be trained to look for cracks in casings, loose casings, outer cord sheathing that is not being held firmly in position at the equipment, cuts or cracks in cord or cable insulation, exposed conductors, damaged plugs or sockets, and missing covers. Damage and / or defects must be reported immediately.

Personnel must immediately stop using and report any electrical equipment or machinery that is shocking, sparking, overheating or smoking. Corroded outlets, switches and junction boxes must also be reported.

16.17 Confined Spaces

Entry into a confined space occurs when a person's whole body, upper body or head is within the confined space. This is not intended to prevent an authorised, competent person from inserting only his arm into the space to test for hazards using appropriate monitoring equipment. Precautions must be taken to prevent persons from being overcome by atmosphere escaping from the confined space.

Before any person enters a confined space, a detailed risk assessment must be carried out, including the need for an authorised person to assess such things as oxygen levels, contaminants, temperature extremes and concentration of flammable substances.

As a minimum the risk assessment shall address the following:

- Isolation and lockout procedures required for chemical substances, mechanical or electrical energy, steam, pressure, heat, gases, liquids and solids;
- Venting, purging, draining and cleaning prior to entering the confined space;
- Hazards created by carrying out particular tasks or through the use of chemical substances in the confined space. Task-Based (or Issue-Based) Risk Assessments and/or Written Safe Work Procedures must be available for work in confined spaces
  - in particular for abrasive blasting, welding, flame cutting, grinding, chemical/steam cleaning, rubber lining and painting;
- Entry, exit and escape routes as well as barricading;
- The electrical safety, intrinsic safety and other safety specifications of equipment to be used in the confined space (explosive atmospheres must be considered);
- The need to test for presence of toxic/asphyxiant substances, radioactivity, oxygen, temperature extremes and flammable substances prior to entry and during the performance of work;
- Provision of suitable mechanical ventilation and personal protective equipment e.g. lifejackets etc. and in particular the use of respiratory protection such as compressed air breathing apparatus; and
- A ventilation rate suitable for general use must take into account factors such as air contaminant type, rate of generation, rate of oxygen depletion, temperature,

efficiency of ventilation distribution and contaminant removal from the breathing zone. Therefore each situation needs to be evaluated on its own merit by a risk assessment that will select a combination of ventilation method and respiratory protection that suits the particular circumstances. This must be achieved by consultation between competent operations personnel, engineers and a ventilation specialist.

Entry and work inside a permitted confined space must be controlled and regulated by the project Isolation / Lockout and Permit to Work control systems. The Authorised Person issuing the Permit to Work may only do so if the conditions applying to the specific confined space entry have been satisfied and documented.

As a minimum, the following must be included in the permitting process:

- Access barriers to prevent unauthorised entry;
- Isolation procedures for contaminants and other energy sources;
- The need for breathing apparatus / ventilation requirements;
- The sign-in and sign-out of all persons entering the confined space;
- Display of the permit;
- Communication procedures and/or equipment;
- Safety specifications of equipment to be taken into the confined space;
- Barricading of entrances and exits;
- Rescue plan and equipment;
- Standby person(s); and
- A completion and lock-in procedure (to ensure that space is evacuated and adequately secured).

The Permit to Work process must require competent rescue persons with suitable communication, rescue and firefighting equipment to be present where any of the following may exist:

- Compressed air breathing apparatus is required;
- There is a high risk of fires or explosions;
- The atmosphere can rapidly become unsafe for breathing purposes if the mechanical ventilation fails;
- There is a high risk of flooding or engulfment;
- Narrow tunnels or pipes are entered or where exit or escape routes cannot readily be accessed
- Work is done in remote areas; and
- A single person, who cannot be observed directly or is isolated from other workers, does the work.

Where testing for toxic/asphyxiate substances, radioactivity, oxygen, temperature extremes and other health hazards as well as for flammable substances is carried out, it may only be done by persons trained, tested and certified competent in writing to do so. The ventilation method and quantity must be adequate to ensure oxygen levels and explosive or toxic gas levels remain within acceptable defined limits. Where ventilation is required, this must be covered by an approved documented procedure.

As a minimum standard, the volume of air pumped in and circulated in a confined space needs to be equivalent to 20 times the volume of the space per hour.

Where breathing apparatus or respiratory equipment is required, the contractor's Health and Safety Officer must be consulted with regard to the specification and selection of suitable equipment.
All persons required to use respiratory protection must be medically fit and trained in the correct use of the equipment.

Safe and convenient entry, exit and escape routes from the confined space must be provided where possible and practical. Where this cannot be achieved effectively, the risk assessment must determine if a competent rescue person must be on duty at the confined space when work is in progress.

Where a standby/rescue person is required, they will have no other duties and will be positioned outside the confined space entry point at all times while personnel are within the space.

16.18 Conveyors

The contractor must ensure that no person attempts to cross / climb over or under any conveyor. Instead, a safe passageway (a crossover or an underpass fitted with safeguards) must be used.
No person may climb onto, sit on, stand on, or walk on a conveyor at any time. Riding a conveyor belt is strictly forbidden.

No person may operate a conveyor other than trained, competent and appointed conveyor operators.

Only authorised maintenance personal are permitted to work on conveyors and only if all energy sources have been effectively isolated and locked out and a Permit to Work has been issued by an Authorised Person.

Working on an operational conveyor is strictly prohibited.
No work may be carried out within three metres of an operational conveyor.

16.19 Arc Welding

All welding machines must be fitted with voltage reducers.

The supply cable to every welding machine must be correctly rated and fitted with an approved plug to be used only with an approved matching plug socket.
The electrical circuit to every plug socket must be protected by a correctly rated circuit breaker and a supply voltage rated earth leakage unit.

Welding cables must be properly insulated and correctly rated for the welding machines on which they are to be used.

Welding cable terminals must either be covered with a properly designed, constructed and installed cover so that inadvertent human contact with the terminals is impossible, whether the cables are connected or not, or the welding cables must be fitted with insulated plugs so that inadvertent human contact with any live part is impossible when the cables are plugged into the machine. Also the plug socket should be such that when the cables are not plugged in, inadvertent contact with a live part of the socket is impossible.

Earth cable clamps and electrode holders must be of an approved type. Earth clamps and electrode holders must be fixed to welding cables with eye terminals and bolts.

All welding machines and safety devices must be subjected to regular planned maintenance and a monthly electrical inspection. The inspection must include a test to ensure that the voltage reducer is functioning properly, by measuring and confirming that the open circuit output voltage is reduced.

Before using a welding machine, the welder must ensure that he is wearing all the required and approved protective clothing and equipment:

- Persons assisting the welder must also wear all of the required personal protective Welding hood;
- Leather welding gloves;
- Safety boots with steel toe protection;
- Flame resistant overalls; and
- Any other clothing or equipment necessary to perform his work safely and efficiently.
- equipment.

When changing electrodes or moving the earth clamp, the welder or his helpers must wear gloves to avoid possible skin contact with live electrical parts and to prevent burns. When attaching welding cables to the terminals of the welding machine, the welder or his helpers must wear gloves, or preferably, the machine should be switched off to avoid possible electric shock.

Helpers who may be holding the work piece being welded must wear gloves and protective goggles.
Where practicable the welder should place protective screens around the area where he is welding, to prevent injury to the eyes of passers-by.

The welder must ensure that the earth cable follows the shortest practical route between the welding machine and the work piece. The earth connection must be directly between the welding machine and the work piece and no building or other structure must form part of the earth return path.

As far as is practicable, the welder should avoid welding under wet or damp conditions. If this is unavoidable, the following precautions should be taken:

- Use only oil filled or other watertight type welding machine;
- Keep the electrode holder as dry as is practical;
- Keep as dry as possible. Stand on an elevated surface out of the water and wear watertight boots and a rain suit. Also ensure that the gloves are in good condition, free of holes.
- Under conditions that result in high perspiration levels, the following measures should be implemented:
- Use an insulated electrode holder;
- Change clothing regularly (if possible);
- Use insulated material like rubber mats and/or timber tuck board to separate yourself from the work piece;
- Wear dry gloves on both hands during welding;
- Use fans and air-conditioning to reduce humidity and temperature; and
- Use an observer capable of responding in an emergency.

When working inside metal vessels or under other conditions where parts of his body may come into contact with conducting surfaces, the welder must take precautions to insulate hhealth and safetyelf from such surfaces.

When working in confined spaces, the welder must take steps to ventilate the area to prevent inhalation of fumes, which may endanger his health and the health of any assistants.
Engine powered welding machines must not be used in any place that is not very well ventilated since the welder and his helpers may be overcome by carbon monoxide fumes.

The welder should take the necessary precautions when welding objects that may catch alight, explode or release poisonous fumes or gases.

16.20 Gas Welding and Burning

Welding or cutting torches and hoses shall not be connected to cylinders when stored.
When work is stopped and equipment is unattended, all valves at the gas and oxygen cylinders shall be closed. The hoses shall be bled and a check shall be made later for possible pressure build-up. Torches shall be removed from the hoses prior to putting them into the toolbox. Smoking SHALL NOT be permitted during this stopping procedure.

Special care shall be taken during overhead cutting and welding operations to safeguard and prevent falling sparks from starting a fire.
Warning signs shall be posted around and at each level below the area of each overhead welding or burning operation. Fire extinguishers shall be available and fire blankets shall be used for protection.

When welding or cutting, adequate ventilation must be ensured / provided.
Hoses shall be kept clear from passageways, ladders and stairs. When hoses are subject to damage, they shall be properly protected. Hoses shall be inspected daily.
Fire extinguishers shall be ready for instant use in locations where cutting is performed.

Flash-back arrestors must be fitted to all cutting torches at the torch and at the bottle (a total of four arrestors).
Lighting of the cutting and welding torches must only be done using a striker and not an open flame.

Soap Leak tests must be performed on all flash-back arrestors.

Hoses may only be secured using approved hose clips, and not by wire, cable ties or any other means.
Special care shall be taken when welding with respect to piping that has been painted, as toxic fumes may be emitted in some cases. The supervisor's advice should be sought prior to the above welding operations being carried out.

16.21 Compressed Gas Cylinders

The contractor must establish a suitable storage area for oxygen, acetylene, LPG and argon cylinders in compliance with the following requirements:

- The storage area must be located at least 10 metres away from any building, and must be well ventilated;
- The storage area must have a concrete floor;
- The storage area must be enclosed using wire mesh fencing (as this will ensure adequate ventilation). This enclosure must be kept locked. Access into the storage area must be limited and controlled;
- A protective covering or roof must be fitted to the enclosure to provide shade;

- The enclosure may not be used for the storage of any other materials / equipment, and must be kept completely free of all combustible materials at all times;
- Appropriate warning signage (i.e. "No Smoking" and "No Naked Flames") must be prominently displayed on the enclosure;
- A 9kg dry chemical powder fire extinguisher must be mounted near the entrance to the enclosure
- If electrical lighting is required, it must be of an approved intrinsically safe type;
- Oxygen, acetylene, argon and LPG cylinders must be stored separately in the enclosure. Furthermore, full and empty cylinders must be separated. Separate storage sections must be clearly designated within the enclosure for the different gas types, and for full and empty cylinders, i.e. oxygen – full, oxygen – empty, acetylene – full, acetylene – empty, etc.;
- When a cylinder is empty, the cylinder cap must be replaced to protect the valve. Empty cylinders must be clearly marked (there must be no need to open valves to check if cylinders are full or empty);
- All cylinders must be stored in an upright position and must be secured in this position by chaining, strapping or clamping them individually to a wall, a cylinder trolley, rack or carrier, or some other rigid structure;
- Cylinders must be stored in rows (when necessary due to the number of cylinders) with aisles between the rows to facilitate easy and rapid removal in the event of a fire;
- Oxygen cylinders may never be stored near highly combustible materials, particularly oil and grease, or near fuel gas cylinders. When in storage, oxygen cylinders must be separated from fuel gas (LPG and acetylene) cylinders by a distance of 6 metres or by a 2 metre high wall made of fire-resistant material;
- The total quantity of gases stored on site must be limited to a 2 week supply.

Compressed gas cylinders must always stand upright (i.e. when being used, stored or transported) and must be properly and individually secured to prevent them from falling over.
Cylinders must be protected from flame, heat and from being struck by moving equipment and falling objects.

When handling gas cylinders (whether full or empty), care must be taken to prevent sudden impacts.
Whenever a cylinder is not in use, the protective cap must be in place to prevent the valve from being damaged.
Gas cylinders may not be carried, dragged, rolled or slid across a floor or surface.
When gas cylinders are to be moved / used, they must be placed in a proper cylinder trolley fitted with a 1.5kg dry chemical powder fire extinguisher.

Gas cylinders may not, under any circumstances, be used as rollers or work supports.
If transported by crane, hoist or derrick, compressed gas cylinders must be placed in a suitable cradle, net or skip box. Cylinders may NEVER be lifted using wire rope, fibre rope, a web sling or a chain sling. Before moving / transporting a gas cylinder, the regulator must be removed and the protective valve cap must be replaced.

Gas cylinders may not be taken into a confined space. Gas hoses that are run into a confined space must be removed during breaks.
Gas cylinders may not be placed on scaffolding.

Cylinder valve keys must be in place. If no suitable valve key is available then the cylinder may not be used. Nothing but the manufacturer-supplied key may be used to open the valve.
A flashback arrestor and a check valve (non-return valve) must be installed between the regulator and the hose and between the hose and the torch on the oxygen line and on the fuel (acetylene) line.

Connection fittings may not be forced and safety devices associated with cylinder valves or regulators may not be altered / tampered with.
Gas hoses may not be joined. Only approved hose connectors of the crimp type are permitted. Wire and jubilee clamps are prohibited.
Only high quality ancillary equipment may be used. This includes flashback arrestors, hoses, clamps, spindle keys, nozzles and torches.
Only trained and competent personnel may operate gas welding / cutting equipment and appliances.

When an employee opens the valve to a cylinder, he must stand to one side and open it slowly. Valves may never be left partly open – they must either be closed or be opened fully.
Leaking cylinders must immediately be removed from service and the workplace (if it is safe to do so).

Suitable firefighting equipment must be at hand wherever gas cylinders containing oxygen and / or fuel gas are being used.
Gas cylinders must be prevented from coming into contact with electrical circuits, e.g. welding leads. Never strike an arc on a cylinder.
Oxygen may only be used for the purpose for which it is provided. Do not use oxygen in pneumatic tools or tyres, as an explosion may occur.
Empty cylinders must immediately be marked as such and must be removed to the cylinder storage area at the end of each day / shift.

16.22 Electrically Powered Tools and Equipment

All powered hand tools, such as circular saws, drills, chainsaws, percussion tools, jigsaws etc., must be equipped with a constant pressure switch that will shut off the power when the pressure is released. (Exception: this requirement does not apply to concrete vibrators, concrete breakers, powered tampers, jack hammers, rock drills, and similar hand operated power tools).

Electrical power tools must be of the approved double-insulated type. The electric cord, pneumatic or hydraulic supply line of powered tools must not be used for hoisting or lowering of the tool.
Loose clothing, jewellery or gloves that could get caught in the tool must not be worn when operating powered tools. Operators of powered tools who have long hair must keep their hair tied up.

The power source must be disconnected from the tool before making any repairs, servicing, adjustments, or replacing attachments such as drill bits.

16.22.1 Angle Grinders

The following personal protective equipment must be worn when using angle grinders:

- Safety helmet;
- Gloves;

- Safety glasses (or safety goggles) and a full face shield (i.e. double eye protection);
- Overalls with long sleeves and long pants, avoid any form of loose clothing;
- Safety boots with steel toe protection;
- Hearing protection;
- Breathing apparatus where dust or fumes may be generated;
- Where grinding machines are used, a face shield is to be worn as extra protection to the safety glasses; and
- Certain tasks may require the use of a leather apron as determined by a risk assessment.

A 230mm angle grinder may not be used for free cutting purposes. Exceptions may be approved only if alternative methods evaluated proved more hazardous or no alternative exists. The risk assessment for the task must then specifically include mitigating measures to ensure the safest possible way of performing the task.

The use of 230mm angle grinders for grinding purposes is acceptable, however should this form of grinding be required, the 115mm or 125mm grinders would be preferable.
All angle grinders must have a dead man switch incorporated, with a pressure switch in the handle.
A 230mm electrical angle grinder unit must incorporate a soft start to reduce the starting strain and a braking system to reduce run on after the unit has been switched off.

All angle grinders must have a spindle lock to assist with changing the disc or grinding wheel.
Anti-vibration handles are recommended to further reduce the stress if used for extended periods.
Angle grinders must be equipped and operated with disc guarding at all times.
Angle grinder must not be stored with fitted discs, as this will lead to damaging of the discs.

Before use and mounting of discs it is essential to check the safety codes and specifications printed on the upper side of the disc. Such specifications include the following:

- Revolutions per minute (RPM). The allowable speed of the disc must be equal to or greater than the maximum achievable speed of the grinder;
- Physical dimensions of the disc must meet grinder specification; and
- The disc must be suitable for the material type to be cut / ground as indicated on the disk. Cutting discs must never be used for grinding and vice versa.

It is critical that the correct disc mounting procedure is followed:

- Check that the machine is plugged out;
- Check the machine spindle, backup washer and thread;
- Check the condition of spindle nut - ensure spanner drive holes are not elongated;
- Ensure spindle nut spanner is the tool recommended by machine manufacturers;
- Do not use a hammer, pipe or chisel to tighten the nut, or apply additional mechanical advantage to nut torque. A firm "nip" is sufficient to retain the disc;
- Ensure the spindle diameter is suited to disc bore. Excessive clearance will cause the machine to vibrate due to eccentricity;
- Check to see that the nut and backup washer do not "bottom out". This will result in the disc not being correctly clamped on the spindle;

- Ensure the spindle speed is marked on the grinder and that it is less than the allowable disc speed; and
- Fit the disc, with the metal ring or writing to the nut side.

16.23 Pneumatically Powered Tools and Equipment

Pneumatic powered tools must only be driven by filtered compressed air with an in-line lubrication system, or be lubricated prior to use if there is no in-line lubrication system. When using pneumatic powered tools the designated tool pressure must be attained by the use of a regulator.

Pneumatic powered tools must be disconnected when not in use. They must not be disconnected from the air supply until all the residual pressure has been released or contained by a shut-off device. Hoses must not be kinked as a means of containment.

Employees operating pneumatic powered tools, and any potentially affected employee in the vicinity of use, must wear suitable personal protective equipment.
All rotary compressed air tools (e.g. drills) must have the rated revolution per minute (RPM) permanently marked on the casing. Only attachments of compatible RPM must be used with these machines.

The actual RPM of the tool must be checked every three months to ensure that the speed is as rated to manufacture specifications.

Pneumatic powered tools must be secured to the air supply hose by an approved positive means to prevent the tool from becoming accidentally disconnected. Safety clips or retainers must be securely installed and maintained on pneumatic impact (percussion) tools to prevent attachments from being accidentally expelled.

All pneumatically driven nailers, staplers, and other similar equipment provided with automatic fastener feed, which operate at more than 100 kPa pressure at the tool, must have a safety device on the muzzle to prevent the tool from ejecting fasteners unless the muzzle is in contact with the work surface.
Compressed air must not be used for cleaning purposes except where reduced to less than 30 kPa, and then only with effective chip guarding and personal protective equipment in place. The 30 kPa requirement does not apply to concrete form, mill scale and similar cleaning purposes. The use of compressed air for cleaning purposes must be approved by the nominated project management representative. Compressed air must not be pointed at any part of the body or used for cleaning clothing.

Airless spray guns of the type which atomize paints and fluids at high pressures must be equipped with automatic or visible manual safety devices which will prevent pulling of the trigger to prevent release of the paint or fluid until the safety device is manually released. A diffuser nut which will prevent high pressure, high velocity release while the nozzle tip is removed, plus a nozzle tip guard which will prevent the tip from coming into contact with the operator, or other equivalent protection must be provided in lieu of the above.

Abrasive cleaning nozzles must be equipped with an operating valve, which must be held open manually to enable operation. A support must be provided on which the nozzle may be mounted when it is not in use.

16.24 Fuel Powered Tools and Equipment

Fuel powered tools must be shut down and allowed to cool before being refuelled, serviced, or maintained. Fuel must be transported, handled, and stored in approved fuel

containers. Where possible, diesel driven engines must be used in preference to petrol driven engines. All fuel powered tools must be included on the contractor's Equipment Register and the register must be submitted to the nominated project management representative prior to the relevant work commencing.

When fuel powered tools are used in enclosed spaces, the space must be ventilated and the atmosphere monitored to measure toxic gas concentrations. Persons in the space must wear the necessary personal protective equipment. Confined Space Entry clearance may apply. This type of activity must only be undertaken in exceptional circumstances and requires the approval of the nominated project management representative.

16.25 Hydraulically Powered Tools and Equipment

Hydraulic powered tools must use only approved fluid that retains its operating characteristics at the most extreme temperatures to which it will be exposed. The manufacturer's stated safe operating pressures for hoses, valves, pipes, filters and fittings must not be exceeded.
Only manufacturer approved hoses, valves, pipes, filters and fittings must be used.

16.26 Explosive Powered Tools

All operators shall be trained by the contractor.
The contractor shall ascertain that the explosive charges to be used are of the correct strength for the purpose.

Projectiles from explosive powered tools shall NOT be driven into:

- Tile, terracotta, glazed brick, glass, marble, granite, thin slate or other brittle substances;
- High tensile steel, cast iron or steel hardened by heat treatment; or
- Concrete that contains aggregate that will not pass wholly through 25mm mesh screens.

Under no circumstances shall a tool be fired in such a manner as to cause the projectile to fly free.
Suitable safety glasses and hearing protection shall be worn by operators when firing an explosive powered tool.

At all times when a tool is being used, the operator shall display clearly legible signs at or near the place where the tool is in use. Sign should read: WARNING: EXPLOSIVE POWERED TOOL IN USE – KEEP CLEAR.
The operator shall warn all other employees in the vicinity of the area in which the tool is about to be used.

Tools shall never be stored in a loaded state. Cartridges and tools shall be stored separately in lockable containers.
A logbook must be kept of the number of cartridges used and returned.

16.27 Hand Tools

Employees required to use hand tools must receive training relevant to the tool and have their competency assessed in the operation, inspection and maintenance of the tool. Where necessary, additional applicable personal protective equipment must be worn when using hand tools.

Wrenches, including adjustable, pipe, end, and socket wrenches, must not be used when the jaws are sprung to a point where slippage occurs. Impact tools such as drift pins,

wedges and chisels, must be kept free of mushroomed heads. The wooden handles of tools must be kept free of splinters or cracks.

Adjustable wrenches must not be used in lieu of ring or open-end type spanners, unless a risk assessment has been conducted and the use of the adjustable wrench is approved by the nominated project management representative. Wherever possible, ring spanners must be used in preference to open end spanners.

Correct hand tools for the job must be used, e.g. screwdrivers must not be used as chisels, and pliers must not be used as hammers.
All wedges and drifts that may spring, fly or fall to lower levels upon impact must be fitted with an attachment which attaches a safety "lanyard" to a solid structure to restrain the impact tool from becoming a projectile.

All hand tools used in elevated areas, that may be dropped or fall to lower levels must be fitted with safety lanyards and attached to solid structures or in the case of podges, scaffold keys etc., attached by wrist lanyard to the user.
Purpose built tools and equipment may not be used unless a risk assessment has been conducted and authorised by the nominated project management representative.

16.27.1 Stanley Knives / Utility Knives

A utility knife must be used as a last resort, when it is the safest tool to use. Always consider alternatives that pose less of a risk to the operator.

Whenever a utility knife is used, ensure that a complete risk assessment is done and that all possible hazards have been addressed.
Only utility knives with retractable blades are to be used. The blade is to be retracted at all times when the knife is not in use or is being stored.

Before using the utility knife, ensure that the tool is in a good condition and the blade is secure in the holder (seated correctly and that there is no play).
Ensure that the blade is always sharp and in good condition. This will prevent the use of excessive force.

Always wear cut resistant gloves and safety glasses when using a utility knife. There is always a risk of the blade breaking under tension and becoming a projectile.
Always ensure that you cut away from your body, and that no part of your body is in the firing line.
Always ensure cleanliness of all equipment in use during the cutting operations.

16.28 Inspection of Equipment and Tools

All tools must be inspected by the user before, during and after use. If any faults are identified, the tool must be taken out of service and not used until repaired. Faulty tools that are not able to be repaired must be tagged "out of service" and removed from site.

16.29 Manual Handling and Vibration

Any handling or lifting task that can only be done manually must be planned and rehearsed before the task is done.
If more than one person is involved in a task a communication procedure must be agreed in advance. Lowering the load must be done in a controlled manner. Dropping a load is dangerous and must be avoided.

As a guideline 25 kg is considered to be the limit of what a person can safely handle. Where there are loads exceeding 25 kg the risk of handling the load must be mitigated to assure minimal potential for any injury.
When mechanical lifting aids are provided, they should be used.
Extra care should be taken when lifting awkwardly shaped objects.

Position the feet correctly. The feet should be placed hip-width apart to provide a large base. One foot should be put forward and to the side of the object, which gives better balance.
Bend or 'unlock' the knees and crouch to the load. The weight will then be safely taken down the spine and the strong leg muscles will do the work.

Get a firm grip. The roots of the fingers and the palm of the hand should grip the load. This keeps the load under control and permits it to be distributed more evenly.

The following should be considered with conducting the Risk Assessment with regards Manual Handling and also take into consideration the task factors, physical demands and tools involved in the task:

- Load weight/frequency;
- Hand distance from lower back;
- Asymmetrical trunk/load;
- Postural constraints;
- Grip on the load;
- Floor surface;
- Environmental factors;
- Carry distance; and
- Obstacles en route.

Team Manual Handling:

- Load weight;
- Hand distance from lower back;
- Vertical lift region;
- Trunk twisting/sideways bending;
- Postural constraints;
- Grip on the load;
- Floor surface;
- Environmental factors; and
- Communication, co-ordination and control.

As far as possible, exposure to vibration must be eliminated.
However, if this is not possible, short-term solutions to decrease exposure include:

- Reducing the vibration levels;
- Removing the person from the vibrating equipment / tools;
- Reducing the period of time that the person works with the vibrating equipment / tools (at least 40 minutes break after 20 minutes working with a machine that vibrates excessively).

In order to reduce exposure to vibration:

- Consider buying equipment that operates effectively at lower speeds;
- Buy equipment with built-in damping materials;

- Buy lighter tools if they are available - they require less of a grip;
- Maintain the equipment;
- Make sure equipment is balanced and there are no worn parts;
- Use remote controls when they are available;
- Reduce your grip on the equipment when it is safe. The less time you actually have your hands on the equipment the better. Relax your hands during these brief breaks;
- Take scheduled breaks; and
- Do other tasks that allow you to move away from vibrating tools and equipment.

The workplace must be assessed by a competent person for compliance with good design, layout and practice, to avoid or minimise adverse health consequences due to manual handling and vibration issues.

Quantitative evaluations of vibration produced by specific equipment must include the following measurement parameters: direction of movement, frequency, intensity, and variation with time and duration, as per documented methods.

Employees and contractors must be informed of the results of assessments and instructed in appropriate manual handling techniques, where the risk assessment indicates a need.
Workplace vibration sources that could contribute to the exceedance of an Occupational Exposure Limit (hence potential for impact on worker musculo-skeletal fitness) must be identified and adequately characterised.
Manual handling tasks assessed as having the potential to cause a Lost Time Injury (i.e. with potential for impact on worker musculo-skeletal fitness) must be identified and adequately characterised.
Workplace manual / materials handling tasks risk rated as "significant" must be assessed and recorded to include biomechanical factors (e.g. posture, bending, twisting, repetitive motions, working overhead, and exerting force away from the body).

16.30 Personal Protective Equipment

All applicable legislation concerning Personal Protective Equipment (PPE) must be complied with at all times.

As a minimum, the following PPE must be worn by all persons (including visitors) at all times whilst on a project site:

- Safety footwear with steel toe protection;
- Safety glasses (individuals who wear prescription spectacles must be provided with either over-spec safety glasses or prescription safety glasses);
- Safety helmet (hard hat); and
- High visibility protective clothing with reflective taping (long trousers and long-sleeved shirts with collars and cuffs).
- Additional PPE requirements must be determined through hazard identification and risk assessment. This hazard-specific PPE (such as hand protection, hearing protection and respiratory protection) must be worn as required (e.g. when in a certain area, when performing a certain task, or when working with a certain substance);
- The correct PPE must always be worn:
- In accordance with site requirements (as indicated at the entrances to a project site and at the entrances to buildings and / or designated areas on the premises);
- In zoned areas (e.g. noise zones and respirator zones); or
- As required by a Safe Work Procedure, a risk assessment, or a Material Safety Data Sheet (MSDS).

Each contractor must provide each of his employees with all required PPE (at no cost to the employee). The specific PPE that is provided to a particular employee must be based on the nature of that employee's work and the location in which the work is performed (i.e. must be based on the hazards to which the employee is exposed). PPE requirements for a particular job or for a particular area must be determined through a risk assessment for that job or area.

Any employee who does not have all of the PPE that is required for him to perform his duties safely will not be permitted to work.

Each employee must care for his PPE, maintain it in good condition, and inspect it on a daily basis.
If an item of PPE has worn out, has become damaged, or is found to be defective in any way, it must be replaced by the contractor.

PPE must be stored in accordance with the manufacturer's requirements and / or recommendations.

Each employee must receive training in the use, maintenance and limitations of the PPE that is provided to him, and must be made aware of why the PPE is necessary as well as the consequences of not wearing it as instructed (i.e. the potential for injury and / or disciplinary action). Training records must be retained.

Any person who refuses to wear PPE as required must be removed from the site.
Symbolic signs indicating mandatory PPE requirements must be prominently displayed at the entrances to a project site and at the entrances to buildings and / or designated areas on the premises where additional PPE is required. These signs must comply with the applicable national standard (if one exists).

Each contractor must appoint an employee to:

- Control the issuing and replacement of PPE;
- Keep an up-to-date register as proof that items of PPE have been issued to individuals (an employee must sign for the items that he receives);
- Ensure that there is an adequate supply of all required PPE (i.e. maintain PPE stock levels on site); and
- Carry out regular inspections to ensure that PPE is being used correctly, is being maintained in a good, serviceable and hygienic state, and is not being shared between employees.

A safety helmet (or hard hat) worn correctly will help protect the head in the event of:

- An employee being struck on the head by a falling or flying object;
- An employee striking his head against a fixed or protruding object; or
- Accidental head contact being made with an electrical hazard.

A safety helmet must be worn at all times on a project site, with the following exceptions:

- Vehicle and equipment operators inside enclosed cabs;
- In offices and in office or administration buildings; and
- At designated lunch and break areas (provided that no work is in progress in the immediate break area).

A safety helmet must be worn in accordance with the manufacturer's requirements.
A safety helmet must be worn directly on the head. The wearing of a cap or other headgear beneath a safety helmet is prohibited unless the items have been specifically designed to be used in combination (i.e. the arrangement is approved by the safety helmet manufacturer).

The suspension system inside a safety helmet (that acts as a shock absorber) may not be removed.
The painting of safety helmets is prohibited.
Safety helmets may only be cleaned using a mild detergent and water. No solvents may be used.

16.30.1 Eye Protection

If an employee is carrying out, assisting with, or working adjacent to any activity where sparks or projectile particles are being generated, where chemical mists or fumes are being generated, where liquids may splash or spray, where harmful electromagnetic radiation (heat or light) is being generated, or where there is a risk of wind-blown particles entering the eyes, then suitable protective eyewear must be worn at all times (i.e. safety glasses, safety goggles, a face shield, a welding helmet, or a combination of these).

Such activities include:

- Working with rotating equipment (e.g. grinders, drills, mills, lathes, and saws);
- Welding and cutting;
- Chipping, chiselling or caulking;
- Using explosive powered tools;
- Abrasive blasting;
- Sanding; and
- Working with chemical substances (e.g. drilling fluids, acids, solvents, paints, pesticides, etc.).

For certain activities, special eye protection is required (e.g. a heat-resistant face shield is required when working near molten metal).
Double eye protection is required for activities such as:

- Grinding, cutting, chipping, chasing and reaming (employees must wear both a full face shield and safety glasses or goggles); and
- Arc welding (welders must wear both safety glasses and a welding helmet).

Screens must be erected to protect passers-by, where practical.

Safety glasses must be worn at all times on a project site, with the following exceptions:

- Vehicle and equipment operators inside enclosed cabs with the windows fully closed;
- In offices and in office or administration buildings;
- At designated lunch and break areas (provided that no work is in progress in the immediate break area); and
- When another form of eye protection is required (e.g. safety goggles).

All safety glasses used on site must have suitable permanent side protection.

In strong sunlight, dark safety glasses should be worn to reduce eyestrain and fatigue. However, caution must be exercised when employees are required to frequently move between outdoor and indoor environments. Dark safety glasses may not be worn indoors or in poor daylight conditions. Prescription spectacles with tinted lenses are prohibited inside buildings or other structures with limited illumination unless the lenses are light-sensing and adjust to changing illumination levels.

Employees who wear prescription spectacles (i.e. require corrective lenses) must make use of either:

- Prescription safety glasses (with permanent fixed side shields) that conform to the requirements of a recognised national or international standard (e.g. CSA, ANSI, or equivalent); or
- Over-spec safety glasses or goggles.

The use of contact lenses in certain areas may not be suitable because of increased risk to the eye due to dust or heat.

16.30.2 Hearing Protection

Local regulations concerning occupational exposure to noise and the use of hearing protection must be complied with as a minimum.
"Low noise" tools and machinery must be used wherever possible to reduce noise levels. Where noise cannot be reduced to an acceptable level through engineering and work practice controls, measures must be put in place to minimise the exposure of employees to the noise (i.e. administrative controls and personal hearing protection).

Areas where it is likely that the 95% upper confidence limit of an eight hour L_{eq} mean exceeds 85dB(A), or areas where impulse noise exceeds 140dB(C), must be designated as noise zones. These noise zones must be clearly demarcated and mapped, signs must be posted, and all employees must be made aware of the requirements for working in such an area.

Suitable hearing protection must be worn in all designated noise zones and when carrying out (or working in the vicinity of) any activity where the noise level exceeds 85dB(A).

Where hearing protection is required, a hearing conservation programme (applicable to all personnel and visitors) must be implemented. The programme must include training in the correct use and proper storage of hearing protection devices as well as replacement requirements. Training must be provided when hearing protection is first issued to an employee and refresher training must be carried out at least annually thereafter. Training records must be retained.

At least two types of personal hearing protection must be made available to employees. The hearing protection devices provided must have adequate noise reduction ratings (i.e. must be able to attenuate the noise level to below 85dB(A)).

Personal hearing protection must be issued on an individual basis and must not be shared. In addition to personally issued hearing protection, suitable disposable hearing protection must be made available at the entrances to all noise zones.
All Hearing Protection Devices (except for disposable hearing protection) must be properly inspected and cleaned on a regular basis.

16.30.3 Respiratory Protection

Designated areas (respirator zones) must be established where:

- It is likely that the 95% upper confidence limit of a Similar Exposure Group's mean exposure concentration exceeds the relevant Occupational Exposure Limit (OEL) for agents resulting in chronic effects, such as total inhalable dust, respirable dust, respirable crystalline silica, PAH, fluorides, lead, mercury, asbestos or non-asbestos fibrous materials; or
- The concentration of an agent (particulate, vapour or gas) with an acute effect exceeds 50% of the relevant OEL.

Note: For a particular hazardous agent, the OEL to be adopted must be either the client's OEL or the OEL specified in local legislation, whichever is the most stringent.

These areas must be clearly demarcated and mapped, signs must be posted, and all employees must be made aware of the requirements for working in such an area.

Suitable Respiratory Protection Devices (RPDs) must be worn in all designated respirator zones and when carrying out (or working in the vicinity of) any activity where the risk assessment has identified the need for respiratory protection.

RPD's must be selected based on:

- The type(s) of airborne contaminants that are present (gases, vapours, and particulates and aerosols including dusts, fumes, sprays, mists, and smoke);
- The potential particulate size distribution;
- Substance toxicity; and
- The likely concentrations.

Compatibility with the work tasks and other PPE, comfort (as it affects wear-time), and the ability to communicate adequately, must also be considered.

The risk assessment and method statement for the work to be performed, the information contained in the relevant Material Safety Data Sheets (MSDSs), and the results of any air monitoring associated with the substances to be worked with or activities to be carried out, must be used to ensure that the most suitable RPD is selected.

Only RPDs certified to a recognised standard and approved by the nominated project management representative may be used.

Where respiratory protection is required, a respiratory protection programme (applicable to all personnel and visitors) must be implemented.

The respiratory protection programme must include:

- Periodic inspection of RPDs, including before each use;
- Periodic evaluation (by competent persons) of cleaning, sanitising, maintenance and storage practices;
- Performance of positive pressure and negative pressure fit checks by RPD wearers before each use to ensure that the respirator is functioning properly; and
- Training at first issue of a RPD and regular refresher training thereafter in accordance with regulatory requirements or at least once every two years (the training must cover fit testing, use, cleaning, maintenance, filter cartridge replacement, and storage). Training records must be retained.

RPDs must be used, maintained, and stored in compliance with the manufacturer's requirements as well as the respiratory protection programme.

Suitable facilities must be provided for the cleaning and sanitary storage of RPD's.

As a minimum, qualitative and documented fit testing must be carried out (although quantitative fit testing is preferred) to ensure that the use of negative pressure RPDs (including disposable RPDs) is effective. Fit testing must be performed by a competent person when an RPD is first issued and must be repeated periodically in accordance with legal requirements or every two years as a minimum. A policy must be in place requiring a clean shaven face when using a negative or neutral pressure RPD for routine tasks (otherwise a positive pressure RPD must be used). A medical evaluation including a pulmonary function test may be required to determine whether or not an individual is medically fit to wear a respirator.

For air-supplied RPDs, breathing air must be effectively filtered and / or isolated from plant and instrument air, and isolated from sources of potential contaminants. The supplied air must be tested to determine if the air quality complies with the requirements of applicable standards for breathing air.

For nuisance dust, dust masks with a protection level of at least FFP2 must be worn.

16.30.4 Hand and Arm Protection

Gloves must be worn when handling or working with equipment, materials or substances with the potential to cause injury or illness.
Suitable gloves must be selected based on the task to be performed and the specific hazard against which the employee requires protection, such as:

- Sharp edges;
- Sharp points and splinters;
- Abrasive surfaces;
- Hazardous chemical substances (toxic, corrosive, sensitising, etc.);
- Extreme temperatures; and
- Viruses, bacteria and parasites.

16.30.5 Foot Protection

Safety boots must be worn at all times whilst on a project site, with the exception of offices and office or administration buildings in which closed athletic, business or similar shoes may be worn.
Sandals, slops, slippers, open-toed and high-heeled shoes are not permitted on any project premises.

Safety boots must provide the following protection:

- Steel toe cap to protect against crushing (impact and compression forces);

- Leather uppers that provide resistance against water penetration and water absorption;
- Slip resistant soles;

And where a risk assessment identifies the need:

- Puncture resistant soles (i.e. steel midsoles) for protection against sharp objects;
- Chemical resistant soles for protection against spilt chemical substances (such as solvents, hydrocarbons, acids, and alkalis);
- Heat resistant soles for protection against hot surfaces or molten metal; or
- Electrical shock resistant soles for protection (insulation) against live electrical conductors.
- Gumboots with steel toe caps must be worn when working in water or very wet conditions.

16.30.6 Clothing

All employees working on a project site must wear high visibility protective clothing with reflective taping. Trousers must be long and shirts must be long-sleeved. Shirts must be buttoned at the neck and wrists.

Protective clothing must preferably be made of natural fibres.
Short pants, short-sleeved shirts, sleeveless shirts, and vests are prohibited as outer garments (with the exception of a high visibility vest worn over a long-sleeved shirt).

Loose clothing may not be worn where it may become caught in moving machinery or equipment.
For hot work (e.g. welding, cutting, etc.), work in the vicinity of molten metal, and any work carried out in the vicinity of an open flame, the protective clothing worn (shirt and trousers) must be made of a suitable fire retardant fabric. Underwear and socks must be made of natural fibres (preferably wool) or fire retardant fabric.

No employee may tuck his trousers into his boots when working in the vicinity of molten metal.

16.30.7 Body Protection

Suitable body protection must be provided as required to protect employees against specific hazards. A range of work activities require body protection in one form or another, including but not limited to:

- Working in extremes of temperature, such as firefighting, attending to a heating furnace, working with molten metal, working in refrigerated environments, etc.;
- Hot work (e.g. welding, burning, cutting and grinding);
- Working with hazardous chemical substances (e.g. acids, solvents, pesticides, etc.); and
- Clean up and disposal of hazardous materials and wastes (e.g. asbestos, hydrocarbons, etc.).

A wide variety of protective garments are available, such as firefighting suits, furnace suits, freezer jackets, leather aprons, leather spats, laboratory coats, chemical resistant aprons, chemical resistant (or hazmat) suits, and disposable coveralls. Suitable items must be selected to provide protection against the specific hazard(s) to which an employee is exposed. Hazards must be carefully identified and characterised to ensure that the correct protection is used.

Body protection must be sized properly to prevent tearing, the parting of seams, tripping, or restriction of movement.

16.30.8 Electrical Protective Equipment

To reduce the risk of electric shock, electrical insulating equipment appropriate for the voltage that may be encountered must be worn when working on energised electrical installations and when working within two metres of exposed energised conductors.

All rubber electrical insulating equipment (including gloves, sleeves, matting, covers, blankets, and line hoses) must be inspected for damage prior to and after each use, and immediately following any incident that can reasonably be suspected of having caused damage.

Rubber insulating equipment with any of the following defects and / or damage may not be used:

- A cut, rip, tear, hole, or puncture;
- Ozone cutting or ozone checking (i.e. the cutting action of ozone on rubber under mechanical stress causing a series of interlacing cracks);
- An embedded foreign object;
- Chemical deterioration (texture changes) such as swelling, softening, hardening, or becoming sticky or inelastic; or
- Any other defect that damages the insulating properties.

Rubber insulating gloves must be electrically tested before first issue and every 12 months thereafter as a minimum. Insulating gloves must also be given an air test along with the daily inspection. Essentially, this involves filling a glove with air and checking for any holes or leakage.

Insulating equipment that fails an inspection or electrical test may be repaired only as follows:

- Rubber insulating line hose may be used in shorter lengths with the defective portion(s) cut off;
- A rubber insulating blanket may be repaired using a compatible patch that results in the patched area having electrical and physical properties equal to those of the blanket;
- A rubber insulating blanket may be salvaged by cutting the defective area off the undamaged portion of the blanket;
- Rubber insulating gloves and sleeves with minor physical defects, such as small cuts, tears, or punctures, may be repaired by applying compatible patches. The patched areas must have electrical and physical properties equal to those of the surrounding material.

Repairs to gloves are permitted only in the area between the wrist and the reinforced edge of the opening.

Repaired insulating equipment must be retested before it is put back into use.

Insulating equipment must be cleaned as required to remove foreign substances (using a mild detergent).

Insulating equipment must be stored in such a location and in such a manner so as to protect it from light, temperature extremes, excessive humidity, ozone, and other damaging substances and conditions.

Leather protective gloves must be worn over rubber insulating gloves to provide mechanical protection against cuts, abrasions, and punctures.

Suitable arc flash PPE (e.g. voltage rated gloves, fire retardant clothing, arc rated face shield, arc flash hood, arc flash suit, etc.) must be worn whenever an employee is potentially exposed to an arc flash hazard. The appropriate level of PPE must be worn depending on the task and the potential energy exposure. These PPE requirements must be clearly specified as part of a project-specific arc flash protection programme (refer to the Electrical Safety Standard).

16.30.9 Jewellery

Necklaces, dangling earrings, and bracelets may not be worn on a project site.
No ring or watch may be worn where there is a risk that it may become caught in machinery or equipment.

No jewellery or other conductive apparel (such as a key chain or watch) may be worn when carrying out energised electrical work.

16.30.10 Hair

Scalp hair that is longer than the top of the shoulders must be tied up and restrained within the person's safety helmet or within the collar of his or her overalls, shirt or jacket.

For negative or neutral pressure Respiratory Protection Devices, facial hair must not cause the seal between the respirator and facial skin to be broken (or prevent a seal from being formed in the first place).

16.30.11 Task-Specific PPE

In addition to the standard PPE required for a project site (including a safety helmet, safety glasses, safety boots, and high visibility protective clothing), the following task-specific PPE must be used as a minimum by any person carrying out or assisting with such a task:

- Arc Welding – safety glasses and welding helmet (i.e. double eye protection), respiratory protection against the specific airborne contaminants being generated (fumes, gases, dusts, etc.), leather welding gloves, leather apron, leather spats, leather yoke (for work above shoulder height), and knee pads for welders in kneeling positions;
- Gas Welding, Cutting or Brazing – gas cutting or welding goggles with shade 4 filter lenses and full face shield (i.e. double eye protection), respiratory protection against the specific airborne contaminants being generated (fumes, gases, dusts, etc.), leather gloves (long cuff for welding and cutting, short cuff may be used for brazing), leather apron, leather spats, and leather yoke (for work above shoulder height);
- Grinding – safety glasses or goggles and full face shield (i.e. double eye protection), hearing protection, respiratory protection where dust or fumes may be generated, leather gloves, leather apron, and leather spats;
- Abrasive Blasting – respiratory protection (air-supplied hood), hearing protection, leather gloves, and leather apron;
- Spray Painting – respiratory protection (air-supplied hood for confined spaces), safety goggles (if the respirator design does not provide this protection), hearing protection (where air compressors are used), chemical resistant gloves, and chemical resistant disposable coveralls.

16.31 Sun Protection

The contractor must ensure that all personnel are protected in sunlight through the use of long sleeve shirts, long trousers, brhealth and safety to safety helmets and UV factored sunscreen. Shade structures must also be made available to all employees.

The contractor must conduct training and awareness sessions with his employees, advising on the risks associated with working in the heat (including dehydration) and the precautions to be taken (e.g. ensuring adequate fluid intake).

16.32 Fuel / Flammable Liquid Storage and Refuelling

No fuel (diesel, petrol, paraffin, etc.) or any other flammable liquid (paints, solvents, etc.) may be stored on site unless approved in writing by the nominated project management representative.

If the on-site storage of a fuel or a flammable liquid is approved, the contractor must ensure the following:

- The quantity of fuel / flammable liquid to be stored on site must be kept to the minimum that is required;
- The storage area must be located in a well ventilated area at least 10 metres away from any building, drain, boundary or any combustible material;
- If more than 200 litres of fuel / flammable liquid is to be stored, the tank must be installed / the containers must be positioned within a bund (see Definitions);
- If the fuel / flammable liquid are to be stored in bulk tanks / vessels, then the minimum capacity of the bund must be 110% of the volume of the largest tank / vessel. If many small containers (e.g. 210 litre drums) are to be stored, the bund must be able to contain 25% of the total volume of the stored products;
- The bund must be impermeable. It must have a solid concrete floor and the walls must be constructed out of brick and must be plastered on the inside;
- The bund must be fitted with a lockable drain valve (for draining away rainwater), which must remain locked in the closed position. The valve may only be opened under supervision and in accordance with a written procedure;
- The fuel / flammable liquid storage area may not be used for the storage of any other materials / equipment, and must be kept completely free of all combustible materials (including rubbish, brush and long grass) at all times;
- Access to the storage area must be controlled (wire mesh fencing and gate);
- Appropriate warning signage (i.e. "Flammable Liquid", "No Smoking" and "No Naked Flames") must be prominently displayed at the storage area. The contents and volume of each tank must be indicated;
- In order to contain spillages, the offloading / refuelling bay at the fuel / flammable liquid storage area must have a solid concrete base surrounded by bund walls, ramps or humps and / or spill trenches (covered with steel grating) that lead into a sump;
- Fuel dispensing pumps must be protected against impact damage;
- All fuel / flammable liquid storage tanks and dispensing equipment must be electrically bonded and properly earthed;
- All electrical installations and fittings must be of an approved intrinsically safe type;
- Two 9kg dry chemical powder fire extinguishers must be mounted in an easily accessible position near the entrance gate to the fuel / flammable liquid storage area. Depending on the size of the storage area, additional fire extinguishers may be required to ensure that an extinguisher is no further than 15 metres away from any point on the perimeter of the storage area;

- A fire extinguisher must be at hand wherever refuelling is carried out;
- Smoking or open flames within 10 metres of a fuel / flammable liquid storage / refuelling area is strictly prohibited;
- No petrol or diesel powered vehicle or equipment may be refuelled while the engine / motor is running;
- Cellular phones must be switched off in fuel / flammable liquid storage / refuelling areas;
- Spill clean-up kits (containing a suitable absorbent fibre product) must be provided;
- Any spillages must be cleaned up immediately and all contaminated cleaning materials must be disposed of in accordance with the applicable legislation;
- If a flammable liquid is spilt or is leaking from a container / vessel, the area must be cordoned off and appropriate warning signage must be displayed to keep unauthorised personnel away from the affected area. Every effort must be made to contain the spillage. All hot work in the vicinity must be stopped immediately. If the spilt product is volatile and the possibility exists that a vapour cloud may form, or if the leak or spillage cannot be contained or stopped, then appropriate emergency response procedures must be activated (refer to Section 14) including the evacuation of all persons in the vicinity. Suitable firefighting equipment must be positioned ready for use should the spilt product ignite;
- The manual decanting of fuel or a flammable liquid from a large container should only be done using a stirrup pump (or similar) or a purpose-made frame which allows the container / drum to tilt for decanting and then return to the upright position;
- Drip trays must be used wherever required;
- All tanks, drums, cans, etc. containing flammable liquids must be tightly closed and properly sealed except for when a container is being filled or when a product is being decanted;
- The transport or storage of corrosive or flammable liquids in open containers is strictly prohibited
- Daily-use quantities of fuel (up to a maximum of 20 litres) must be handled in an approved safety can with a flash arresting screen, spring closing lid and spout cover that will safely relieve internal pressure if the can is exposed to fire;
- Where safety cans may be impracticable, only approved metal containers with screw caps may be used. Each container must be clearly labelled to indicate its contents;
- Only small quantities of flammable liquids (paints, solvents, etc.) may be stored within a building. Each product must be kept either in its original container or in an approved container which must be properly sealed. Each container must be clearly labelled to indicate its contents. When not in use, all such containers must be stored in a well-ventilated steel cabinet which must be kept locked to prevent unauthorised access;
- Not even small quantities of flammable liquids may be stored or dispensed in buildings or places of public assembly, in general warehouses, or in buildings containing sources of ignition such as space heaters, cooking devices, open electric motors, motor vehicles, or where welding, cutting, or grinding activities are being carried out;
- Safe Work Procedures must be compiled for the transportation (including delivery), offloading, storage, handling and use of any fuel / flammable liquid on site;
- All personnel that will be required to work with or may come into contact with a flammable liquid must be made aware of the hazards associated with the product

and must be thoroughly trained in the safe transportation, use, handling and storage thereof.

16.33 Fire Protection and Prevention

The contractor must compile a Fire Protection and Prevention Plan for the work that will be carried out on site.

The contractor must assess / survey his area of responsibility and identify locations where the risk of fire is high. Cognisance must be taken of the fact that certain locations may need to be designated as high risk due to the presence of large quantities of flammable or combustible materials / substances. For all high risk areas, the contractor must ensure that additional precautions are taken to prevent fires and strict control is exercised over any hot work (i.e. welding, cutting, grinding, etc.) that is carried out.

The contractor must supply and maintain all required firefighting equipment. The type, capacity, positioning, and number of firefighting appliances must be to the satisfaction of the nominated project management representative and must meet the requirements of the applicable legislation. Fire mains, hydrants and hose reels will rarely be available on site, so use must primarily be made of portable fire extinguishers.

Firefighting equipment, fixed and portable, must be strategically located with a view to being able to rapidly deploy the equipment in order to bring potentially dangerous and destructive fires under control while still in their infancy.

All fire extinguishers (and any other firefighting equipment) placed on site must be:

- Conspicuously numbered;
- Recorded in a register;
- Visually inspected by a competent person on a monthly basis (the results of each inspection must be recorded in the register and the competent person must sign off on the entries made); and
- Inspected and serviced by an accredited service provider every six months (the nominated project management representative may require that this frequency be increased depending on the environmental conditions (e.g. high dust levels, water, heat, etc.) to which the fire extinguishers are exposed).

Any fire extinguisher that has a broken seal, has depressurised, or shows any sign of damage must be sent to an accredited service provider for repair and / or recharging. Details must be recorded in the register.

Firefighting equipment may not be used for any purpose other than fighting fires. Disciplinary action must be taken against any person who misuses or wilfully damages any firefighting equipment.

Access to firefighting equipment, fixed or portable, must be kept unobstructed at all times. Approved signage must be in place to clearly indicate the location of each permanently mounted fire extinguisher, fire hose reel, etc.
The contractor must ensure that all persons working in / entering his area of responsibility are made aware of where all firefighting appliances and alarm points are located.
The contractor must ensure that his employees (and those of any appointed sub-contractors) are trained in firefighting procedures and the use of firefighting equipment.

The contractor must compile an emergency response procedure detailing the actions that must be taken in the event of a fire or a fire / evacuation alarm (see Section 14).
All personnel working within the contractor's area of responsibility must be trained, and all visitors must be instructed, on this procedure. Copies of the procedure must be prominently displayed in the workplace in all languages commonly used on the site.

A person discovering a fire must extinguish the fire if he can do so safely, and then immediately report the incident to his supervisor. If the person cannot extinguish the fire, he must raise the nearest alarm and then report the fire as quickly as possible to his supervisor, the person responsible for the area, and / or Security.
On hearing a fire / evacuation alarm, all persons must make any operational plant or equipment safe, and then proceed to the nearest emergency assembly point and await instructions.
All incidents of fire (including the use or misuse of any firefighting equipment) must be reported to the nominated project management representative immediately. Used fire extinguishers must be replaced by the contractor without delay.

No hot work (i.e. welding, cutting, grinding, etc.) or any other activity that could give rise to a fire may be performed outside of a designated workshop without a Permit to Work having been issued.
Wherever hot work is being carried out, a fire extinguisher must be at hand. Where the risk assessment determents that it is necessary, a fire watch must be stationed.
Supervisors must carry out workplace inspections regularly to ensure adherence to fire prevention measures and procedures.

At the end of every working period (i.e. before each tea / lunch break and at the end of every shift / day), the workplace must be thoroughly inspected to ensure that no material is left smouldering and no condition / situation exists that could give rise to a fire.

The contractor must ensure that all supervisors and all employees carrying out or assisting with any hot work or any other activity that could give rise to a fire have been trained in firefighting procedures and the use of firefighting equipment. The training must be conducted by an accredited training provider.

When using electrical equipment, all cables must be in good condition and the nearest convenient socket must be used.
No power socket may be loaded beyond its rated capacity through the use of adaptors, etc.
Makeshift electrical connections are not permitted under any circumstances.
Water-based firefighting equipment must not be used on electrical equipment or burning liquids.
Refer to Section 13.16 – Electrical Safety.

Each vehicle used on site for work purposes and each item of mobile equipment with a diesel or petrol engine must be fitted with a permanently mounted fire extinguisher.
Smoking is only permitted in designated smoking areas. Cigarette ends / butts must be properly stubbed out in the ashtrays provided and never thrown into waste bins.

The contractor must ensure that good housekeeping practices are enforced, as this is crucial to the prevention of fires.

All combustible waste materials must be removed from the workplace on a daily basis (at the end of each shift) and placed in waste receptacles located at least 5 metres away from any structure.
The accumulation of waste materials in out-of-the-way places is prohibited.
Offices, desks, cabinets, etc. must always be kept tidy and uncluttered. Waste paper bins must be emptied regularly.

The storage of combustible materials under stairways or in attics is prohibited.
The storage of any materials against the exterior of a building or any other structure is prohibited.
All walkways, passages and stairways must be kept clear (i.e. must be unobstructed) at all times, as they may need to be used as a means of escape.
The areas around and the routes to all exits, fire escape doors, fire hydrants, fire hose reels and fire extinguishers must be kept clear (i.e. must be unobstructed) at all times.
"No Smoking" signs must be conspicuously displayed in and around all storage areas / rooms.
Waste may not be burned under any circumstances.

No flammable liquid (such as petrol, acetone, alcohol, benzene, etc.) may be used for starting fires or as a solvent for cleaning clothes, tools, equipment, etc. Only solvents approved by the nominated project management representative may be used for cleaning purposes.

Whenever any work is carried out involving the use of a flammable substance / material, the area must be cordoned off and appropriate warning signage (i.e. "No Unauthorised Entry", "No Smoking" and "No Naked Flames") must be displayed.
Refer to Section 13.32 – Fuel / Flammable Liquid Storage and Refuelling.

16.34 Smoking

The contractor must not permit smoking on site except within designated smoking areas selected in accordance with the applicable legislation. Such an area must be clearly demarcated and the required signage must be displayed.

Any person found smoking or discarding a cigarette butt outside of a designated smoking area may be removed (temporarily or permanently) from site.
In all designated smoking areas, adequate non-combustible commercial ashtrays and / or cigarette butt receptacles (butt cans) must be provided.

Ashtrays and other receptacles provided for the disposal of smoking materials must not be emptied into rubbish bins or any other container holding combustible materials.
"No Smoking" signs must be strictly observed.

16.35 Housekeeping

The contractor must maintain all work areas in a tidy state, free of debris and rubbish. Unless directed otherwise, the contractor must dispose of all debris, rubbish, spoil and hazardous waste off site in a designated and authorised area or facility. The contractor must familiarise hhealth and safetyelf with the waste management plan for the site including collection and disposal arrangements, and must align his waste management activities accordingly.

In cases where an inadequate standard of housekeeping has developed and compromised safety and cleanliness, a nominated project management representative may instruct the contractor to cease work until the area has been tidied up and made safe.

Neither additional costs nor contract deadline extensions will be allowed as a result of such a stoppage. Failure to comply will result in a clean-up being arranged through another service provider at the cost of the non-complying contractor.

The contractor must carry out housekeeping inspections on a weekly basis to ensure maintenance of satisfactory standards. The contractor must document the results of each inspection. These records must be maintained and must be made available to the nominated project management representative on request.
The contractor must implement a housekeeping plan for the duration of the contract ensuring that the site housekeeping is maintained. Furthermore, at the end of every shift, the contractor must ensure that all work areas are cleaned, all tools and equipment are properly stored, and construction rubble is removed.

Where the contractor fails to maintain housekeeping standards, the nominated project management representative may instruct the contractor to appoint a dedicated housekeeping team for the duration of the project at the contractor's expense.
Littering is prohibited.

16.36 Waste Management

Waste may not be disposed of unless the disposal of that waste is authorised by law. The contractor must therefore ensure that all waste that is generated is handled, stored, transported and disposed of in accordance with the requirements of the applicable legislation / local authority.

No waste may be removed from the project site to a waste storage or disposal facility unless that facility has been approved for use by the nominated project management representative.
An adequate number of waste bins and skips must be provided by the contractor and suitable arrangements must be made to ensure that these bins and skis are emptied regularly.
Hazardous wastes must be kept separate from general wastes.

Waste disposal service providers must be approved by the nominated project management representative before any waste is removed from site. These service providers must be audited on a two-yearly basis (or more frequently if deemed necessary based on risk) in order to ensure compliance with legislation and to help ensure that no liabilities accrue to the project.

16.37 Stacking and Storage

All irregular shaped items will be stacked at floor / ground level in designated stacking areas on a level, firm base capable of withstanding the weight of the commodities being stacked and stacked in such a manner that the items do not topple over or change position due to subsidence or weight transfer when being moved.

Where these commodities are stacked on shelves or racks, the shelves or racks must be designed to carry the weight of the commodity being stacked.
All racks or shelves where heavy material or commodities are stacked will have a weight carrying limitation clearly marked on the structure and have a safety factor of at least +10% of maximum total carrying capacity.

All materials, commodities or articles, which could be damaged due to inclement weather, must be stored under cover.
Waste material that is combustible must not be allowed to accumulate in sufficient quantities to create a hazard.

No commodities or equipment may be stacked or stored within 500mm of rolling stock tracks or where mobile equipment travels.
The storage of material, small equipment, tools, files and general items in cupboards and on shelves must be neat and controlled at all times. Incompatible substances must not be stored in or on the same cupboard or shelf.

No equipment, tools, files or documents may be stored or stacked on top of cupboards which are higher than 1.5 metres in height.

16.38 Demarcation

No demarcation of floors is required inside offices, training centres and the like.
Where it is impractical to paint floors, yellow lines will be deemed adequate e.g. where heavy traffic necessitates the continual painting of floors.

Temporary demarcation in the form of hazard tape (red and white) may be used to demarcate areas where there is, for relatively simple reasons, restricted access.
Where hazards exist and entry must be specifically excluded for safety or health reasons, hazard tape in any form must not be used in isolation. A robust and substantial barrier of timber, rope or other material must be used in conjunction with barrier tape, to prevent entry to unauthorised persons.

Outside storage areas where it is impractical to use floor demarcation, demarcation may take the form of creosote poles and wire rope or similar. Spans between uprights should be painted yellow.

16.39 Facilities

Sanitary conveniences must be provided and maintained at a rate of at least one shower facility for every 30 workers, at least one toilet facility for every 20 workers, separate male and female changing facilities and sheltered eating areas. (Check SANS 10400 Part F).

Where chemical toilets are provided, one toilet for every twenty five employees must be allocated.
All toilets must be cleaned daily, disinfected and provided with toilet paper.
All employees making use of these facilities have the responsibility to help keep the facilities neat, clean and hygienic.

Washing facilities, including soap and towels, must be made available for use by the contractor's employees.

Drainage from all washing / toilet facilities must be properly designed and constructed to prevent employee exposure to waste water (and the associated biological hazards). Waste water may not accumulate or stand in pools at any location on the project site.
Change rooms must be provided and must be kept clean and free from odours at all times.
No chemicals, except those normally used for domestic cleaning of these facilities, may be stored in the facilities.

No equipment or items (other than those normally associated with hygiene facilities) may be stored in the facilities.

All entrances must be constructed in a way to afford privacy to users.
Drinking water must be provided.
A sheltered (covered) area must be set aside on site to be used as a dining facility (eating area). Adequate seating must be provided for the maximum number of employees. The facility must be kept clean and tidy.

A suitably sized, impervious receptacle (bin) must be provided for the disposal of waste food and other refuse generated at the dining facility. This bin must be emptied and cleaned regularly (i.e. promptly after meal times).

Food may only be consumed in authorised sheltered areas.
Adequate refrigerated storage must be provided to the contractor's employees for the storage of food and drinks. Fridges must not be overstocked and must maintain sufficiently low temperatures.

16.40 Occupational Hygiene

The contractor must ensure that the exposure or potential exposure of his employees to any of the following stressors is assessed and measured (a baseline survey must be carried out by an Approved Inspection Authority - this services to be provided by TCP):

- Noise;
- Thermal stress (heat and cold);
- Particulates (dust);
- Silica (free crystalline silica);
- Asbestos;
- Gases or vapours;
- Lead;
- Chemicals;
- Ionising radiation;
- Non-ionising radiation;
- Vibration (hand / arm vibration and whole body vibration);
- Ergonomics; and
- Illumination.

If it is determined that exposure levels for a particular stressor are unacceptable, then a monitoring and control plan must be implemented to manage any risk of overexposure.

Note: Where chemical substances are to be used as part of the construction process, the contractor must ensure that the chemical composition of each substance is known.

Carcinogenic (cancer-causing) ingredients must be specifically identified with due understanding that no chemical known to cause cancer will be permitted for use on site (an alternative will need to be sourced).

16.41 Lighting

For all work areas and access ways, if the natural lighting available is inadequate it must be supplemented by artificial lighting to meet the minimum levels required.
A lighting survey to determine luminance must be conducted for all work areas, at least once every two years and prior to work commencing for the first time in any area.
Emergency lighting must be provided in all indoor workplaces that do have adequate natural lighting or in which persons work at night. The emergency sources of lighting that are provided must be such that, when activated, an illuminance of not less than 0.3 lux is obtained at floor level, to enable employees to evacuate safely.

Where it is necessary to stop machinery or shut down plant or processes before evacuating the workplace, or where dangerous materials are present or dangerous processes are carried out, the illuminance must be not less than 20 lux.

Windows and translucent sheeting must be kept adequately clean and clear of obstructions as far as reasonably practicable. Light fittings, i.e. lenses and reflectors must be kept clean.
If a light intensity meter is used, a valid calibration certificate must be available.

Neon lights must not be installed in areas where moving parts of machinery or equipment cannot be fully guarded, i.e. lathes, bench grinders, etc. in order to eliminate the stroboscopic effect.
No person may use a portable electrical light where the operating voltage exceeds 50 volts, unless:

- It is fitted with a non-hydroscopic, non-conducting handle;
- All metal parts which may become live are protected against accidental contact;
- The lamp is protected by means of a guard firmly attached to the handle; and
- The cable can withstand rough use.
-

No person may use a portable electric light in damp or wet conditions or in closely confined spaces, inside metal vessels or when in contact with large masses of metal, unless:

- The lamp is connected to a source incorporating an earth leakage; and
- The operating voltage of the lamp does not exceed 50 volts. Hearing Conservation

A hearing conservation program must be implemented and protection against the effects of noise exposure must be provided when the noise exposures equal or exceed an 8-hour time-weighted average sound level of 85 decibels measured on the A-weighted scale of a standard sound level meter at slow response.

For the hearing conservation program to be effective it must include as a minimum:

- Monitoring of the workplace to determine the representative exposure of employees to excessive noise levels;
- An audiometric testing program for employees, which must include:
  - A baseline audiogram for all employees exposed to noise levels equal to or in excess of the standard;
  - Annual audiograms for each overexposed employee;
  - Analysis of audiogram results with retesting and/or referral to an otolaryngologist or qualified physician when a significant threshold shift (STS) occurs; and
  - Written employee notification of the STS.
- A training program for all employees exposed to noise;
- Provision of personal protective equipment to all affected employees when administrative or engineering controls fail to reduce sound levels to within the levels of the standards.

Monitoring of employee exposures to noise shall be conducted by an Approved inspection Authority.

The monitoring requirement may be met by either area monitoring or personal monitoring that is representative of employee exposures. Personal monitoring is preferred, and may be required based on the type(s) of noise sources.

For purposes of the hearing conservation program, employee noise exposures shall be computed in accordance with local legislation.
A person-task specification shall be available for every job category and shall be submitted with an employee for audiometric testing.

Audiometric testing and an annual audiogram shall be provided as part of the regular medical examinations.
Audiometric test results obtained from the pre-employment medical examination for a new employee shall be used as the baseline audiogram.

Testing to establish a baseline audiogram shall be preceded by at least 14 hours without exposure to workplace noise.

Hearing protectors shall not be used as a substitute for the requirement that baseline audiograms be preceded by 14 hours without exposure to workplace noise.
Employees shall be notified of the need to avoid high levels of non-occupational noise exposure during this 14-hour period.

Record-keeping for the audiogram shall include:
- Name and job classification of the employee;
- Date of the audiogram;
- The examiner's name;
- Date of the last acoustic or exhaustive calibration of the audiometer;
- Employee's most recent noise exposure assessment.

Audiometric test results shall be maintained in the employee's medical file.
To control noise exposure, its three basic elements shall be examined, i.e. source of the sound, travel path, and effect on receiver or listener. Solution of a given noise problem might require alteration or modification of any or all of these three basic elements.

2) Controlling noise at the noise source can be achieved by the following:
- Select quiet equipment initially. In selecting quiet equipment the following features shall be considered:
- Low-noise certification;
- Advertisement of "quiet" operation, evidence of noise control design;
- Evidence of "lower" and "slower" operating characteristics;
- Side-by-side noise testing of equipment; and
- "On-site" or "in operation" inspection of mechanical equipment before purchase.
- Reduce operating noise by considering the following control measures:
- Reduce impact or impulse noise by reducing weight, size, or height of fall of impacting mass;
- Reduce speed in machines and flow velocities and pressure in fluid systems;
- Balance rotating parts – to control machinery noise and vibration of fans, fly wheels, pulleys, cams, etc.
- Reduce frictional resistance between rotating, sliding or moving parts in mechanical systems: frequent lubrication, proper alignment of moving parts; static and dynamic balancing of rotating parts; correction of eccentricity or "out-of-roundness" of wheels, gears, rollers, pulley, etc.;
- Reduce resistance in air or fluid systems: use of low flow velocities, smooth boundary surfaces of duct or pipe systems, and long-radius turns and flared sections in pipes, etc., to reduce turbulence noise;

- Isolate vibration elements in machinery; install motors, pumps, etc. on most massive part of machine; use belt or roller drives in place of gear trains; use flexible hoses and wiring instead of rigid piping and stiff wiring, etc.
- Apply vibration damping materials such as liquid mastic; pads of rubber, felt, foam or fibrous blankets; or sheet metal visco-elastic laminates or composites to vibrating machine surfaces; and;
- Reduce noise leakage from the interior of machines such as compressors by sealing or covering all openings or applying acoustical materials to machine interiors.

3) Controlling noise in the transmission path can be achieved by the following:
- Separate the noise source and receiver as much as possible;
- Use sound-absorbing materials on ceiling, floor or wall surfaces as close to the machine as possible;
- Use sound barriers and deflectors in the noise path;
- Use acoustical lining on inside surfaces of such passageways as ducts, pipe chases, or electrical channels;
- Use mufflers, silencers or snubbers on all gasoline or diesel engines, regardless of size; and particularly on equipment when large quantities of high-pressure, high-velocity gases, liquids, steam or air are discharged into the open air; and
- Use vibration isolators and flexible couplers where the noise transmission path is structure borne in character.

4) Protection for the receiver – when engineering controls fail to reduce the levels to within the levels specified in local legislation, the following measures shall be implemented:
- Personal protective equipment shall be provided and replaced as necessary at no cost to employees;
- Supervisors shall ensure that hearing protective devices are worn by all employees who are exposed to a time-weighted average of 85 decibels or greater and who have experienced a significant threshold shift;
- Employees shall be given the opportunity to select their hearing protectors from a variety of suitable protectors; and

Noise zones shall be indicated my means of signs at every entrance to such zones.
When noise levels exceed 100 dB(A), a combination of earplug and earmuff may be required to achieve protection of the worker.
It is important to note that using double protection will add only 5 to 10 dB of extra attenuation above that of a single Hearing Protection Device.
Where an earmuff and earplugs are used together, OSHA recommends using this simple calculation: Take the higher rating of the two devices, and add five.
Hearing Protection Devices should be worn for the full noise exposure period.

Where an audiometry programme is required, it must meet the following standards:
- All testing must be by pure tone audiometry in an audiometry booth or quiet room, with measured noise levels less than 40 dB(A);
- The initial audiogram must be taken prior (minimum of 24 hours) to exposure to significant noise. Further audiograms must be taken periodically; annually where exposures are over 85 dB(A) Leq or where continued deterioration to hearing is occurring;
- Testing must be performed by trained and competent personnel;

- Audiometers must be calibrated according to the manufacturer's guidelines. As a minimum these will be a weekly biological calibration using an employee unexposed to noise, or a bio-acoustic simulator, and an annual quantitative check. All results must be documented; and
- Audiograms must be read by trained persons who will identify any increasing hearing loss and then determine if this is noise induced. Any employee with a significant downward shift in one or both ears (measured as an average non age-adjusted loss from baseline of 10 dB at 2, 3 or 4 kHz) must be retested following removal from noise for a minimum of 24 hours, usually after a days-off period. If the downward shift persists the employee must be reviewed by a physician and improved hearing protection considered.

16.42 Particulate and Gas / Vapour Exposures

Designated areas must be created where:

- It is likely that the 95 per cent upper confidence limit of a Specific Exposure Group's (SEG) mean exposure concentration for agents resulting in chronic effects (such as total inhalable dust, respirable dust, respirable crystalline silica, PAH, fluorides, lead, mercury, asbestos or non-asbestos fibrous materials) exceeds the relevant OEL; and
- Agents with an acute effect, such as particulate hazards, or gases (e.g. CO, SO2, NH3, HF, etc.), or vapours exceed 50 per cent of the relevant OEL.

Designated areas must:

- Be identified and mapped, signposted or otherwise clearly communicated to employees working in the area. Signposting, where necessary, must use appropriate wording or symbols on signs to identify the hazard;
- Have a documented respiratory protection programme based on suitable risk assessment and standards, which is applied to employees, contractors and visitors;
- Have regular monitoring of SEGs working in the area; and
- Have a formal review of the practicality of engineering controls at least every two years, or less where it is a critical control for a significant risk.

Particulate and gas / vapour monitoring must be appropriate to the exposure conditions and toxicants, and based on the use of equipment approved by local regulatory authorities, as per documented methods.

Where risk assessment indicates the possible presence of levels of gas or vapour sufficient to cause health effects in less than one shift (e.g. confined space entry), continuous monitoring is required as long as the potential for harm exists.

Employees and contractors must be covered by a medical surveillance programme when:

- Their Specific Exposure Group TWA mean exposure to respirable crystalline silica, total inhalable dust, respirable dust, lead or asbestos is greater than 50 per cent of the relevant OEL;
- The medical adviser considers that it is advisable; or
- There is a legal requirement for medical monitoring.

Where risk assessment indicates a risk of a respiratory condition, assessment programmes must include chest x-rays and / or lung function tests. The test or tests chosen must enable the earliest detection of adverse effects from the exposure of concern. Where indicated, they must meet the following standards:

- High quality chest x-rays will be taken every five years, unless local legislation requires these to be more frequent;

- All chest x-rays for pneumoconiosis surveillance will be read to International Labour Organisation (ILO) standards by an ILO B reader, wherever possible, and if not, by a competent radiologist using verifiable quality criteria;
- Any progression of more than one step on the ILO extended scheme to a reading above 1/0 will be reviewed by a physician;
- Any reading suggesting active lung disease will be reviewed by a physician; and
- All spirometry will be performed by trained staff following the American Thoracic Society guidelines or equivalent and be offered at a frequency determined by the likely rate of detectable change in lung function.

Controls must be of an adequate standard such that surfaces are adequately cleaned to avoid:

- Dust generation due to material dislodgment (e.g. windblown), where practicable; or
- Fume generation from accumulated dust during welding / heating or cutting operations.

Where risk assessment indicates the need to reduce exposures to toxic substances for employees or their families, good personal hygiene must be enforced. The programme must include:

- No smoking, eating or drinking in designated hazard areas;
- Washing of hands and face prior to drinking, eating or smoking;
- Showering at work post shift or after exposure to 'dirty' conditions; and
- Laundering of contaminated clothing by the contractor.

Abrasive blast cleaning must be conducted so as to protect worker health and minimise dust emissions. Substitutes must be used whenever practicable for abrasives containing crystalline silica. However, if such abrasives are used, workers must be aware of the hazards and exposure monitoring conducted. The hazardous properties of alternative materials must be considered before use.

Where required, training in the recognition of signs and symptoms of hazardous particulate and gas / vapour exposure, emergency procedures and preventative measures must be provided.

16.42.1 Respiratory Protection Devices

The selection of Respiratory Protection Devices (RPD's) must be based on:

- The potential particulate size distribution, gas / vapour types, substance toxicity and likely concentrations;
- Compatibility with the work tasks and other PPE; and
- Comfort (as it affects wear-time) and allowance for adequate communication.

Only RPD's approved by the nominated project management representative may be used. Suitable facilities must be available for cleaning and sanitary storage of RPD's.

Half-mask and full-face air-purifying respirators must NOT be used where:

- The atmosphere is oxygen deficient (< 19.5 per cent);
- The atmosphere is immediately dangerous to life or health (e.g. in areas where CO concentrations are > 1500 ppm, HF > 30 ppm or NH4 > 300 ppm);
- Gases and vapours are more than ten times their OEL or greater than 1000 ppm for half-mask respirators, or more than 100 times their OEL for full-face respirators; or

- Particulates are more than five times their OEL for half-mask respirators, or more than 50 times their OEL for full-face respirators.

For atmospheres that are oxygen deficient, or contain unknown hazards, or have concentrations of gases and vapours that are unknown, or could potentially exceed levels that are immediately dangerous to life or health, an air-supplied type respirator must be worn.

For effective use of negative pressure RPD's (including disposable RPD's), fit testing must be qualitative and documented as a minimum, although quantitative fit testing is preferred. Fit testing must be performed by a competent person when RPD's are first issued and must be repeated periodically according to legal requirements or two-yearly as a minimum frequency. There must be a policy requiring a clean shaven face when using a negative or neutral pressure RPD for routine tasks, or the use of a positive pressure RPD will be required. A pulmonary function test and medical evaluation may be required to determine whether or not an individual is medically fit to wear a respirator.

For air-supplied RPD's, breathing air must be effectively filtered and / or isolated from plant and instrument air, and isolated from sources of potential contaminants. The quality of the breathing air must be checked for conformance with applicable standards.

The respiratory protection programme must include:

- Periodic inspection of RPD's, including before each use;
- Periodic evaluation of cleaning, sanitising, maintenance and storage practices by competent persons;
- Performance of positive and negative fit checks before each use by RPD wearers to ensure that the respirator is functioning properly; and
- Training at first issue of a RPD and regular refresher training thereafter in accordance with regulatory requirements or at least once every two years.

16.42.2 Asbestos and Non-asbestos Fibrous Silicates

This section applies to asbestos and bio-persistent non-asbestos fibrous silicates that may display asbestos-like toxicity, related to fibre diameter and length. Local regulations must be followed as a minimum. The following requirements must be met:

- A management program must be in place and actively pursued;
- No new products containing these materials may be purchased;
- Installed materials of this type must be identified and assessed annually for current safety. Where 'safe in place', it should not be removed, unless there is an opportunity for removal during renovation or construction of buildings or equipment;
- Work areas must be barricaded off and signposted to restrict entry; and
- Contaminated material must be promptly placed in appropriate marked plastic disposal bags or covered containers for disposal to an approved landfill.

All workers exposed to these materials must be on a register. "Exposed" means working on or near such material that has been disturbed, abraded or cut. The register must contain details of their annual medical examination and the results of occupational hygiene monitoring.

Asbestos contractors must be competent, registered and have adequate equipment, procedures and monitoring.

Where required, the asbestos / bio-persistent non-asbestos fibrous silicates management programme must cover work practices, training, monitoring, medical surveillance, and waste handling and disposal.

Maintenance operations must be made aware of potential cristobalite exposure hazards when disturbing non-asbestos fibrous silicates that have undergone high temperature conditions.
The potential for occurrence of naturally occurring asbestiform materials in exploration or mining production activities must be assessed, the risk of exposure determined and appropriate control measures implemented where required.

16.43 Hazardous Chemical Substances

No chemical substance may be brought onto site unless it has been approved for use by the nominated project management representative and it appears on the Approved Chemical Substances Register which will be made available to all contractors.
The register will contain the following information:

- Trade name / product name of substance;
- Manufacturer / supplier of substance;
- Maximum inventory;
- Storage requirements and precautions;
- Inventory of special emergency items held for handling spillages, fires, etc. (e.g. reagents to neutralise spillages, firefighting foam, etc.); and
- Approved disposal methods.

If the contractor wishes to make use of a chemical substance that does not appear on the register, then the contractor must provide the following information to the nominated project management representative for review PRIOR to bringing the substance onto site:

- A detailed 16-point Material Safety Data Sheet (MSDS) issued by the manufacturer / supplier of the substance;
- The reason for wanting to bring the substance onto site (i.e. the intended use of the substance);
- The proposed method of transportation;
- The proposed arrangements for the safe storage of the substance;
- The quantity to be stored on site;
- The proposed methods for handling / using the substance (including PPE);
- The proposed method of disposal of the waste;
- Proof that the contractor is able to readily provide the necessary first aid measures as specified in the MSDS; and
- A risk assessment covering the transportation, use, handling, storage and disposal of the substance with specific reference to the substance's compatibility with other chemicals.

This information must be provided at least five (5) working days prior to the date on which the contractor intends to bring the substance onto site for use.
Any chemical substance brought onto site without adherence to the requirements stipulated above shall be removed from site immediately.

If the nominated project management representative approves the substance for use, the contractor must ensure that all necessary precautions are taken concerning the transportation, use, handling, storage and disposal of the substance, and that all required PPE and first aid materials / equipment (as stipulated in the MSDS) are readily available on site.

The contractor must ensure that a Material Safety Data Sheet (MSDS) is obtained for each chemical substance brought onto site. A file, or files, containing all of the MSDS's must be maintained and must be readily available to all personnel on site (particularly first aiders) as well as other potentially affected parties (e.g. emergency services personnel, persons from the local community, etc.). The MSDS's must be in the language(s) commonly used on site.

The contractor must appoint a trained and competent Hazardous Chemical Substances Coordinator who understands and is able to evaluate the risks associated with a wide variety of substances. This person shall be responsible for:

- Assessing the hazardous properties and risks associated with all chemical substances brought onto site by the contractor and appointed sub-contractors (using the MSDS's);
- Determining precautions and safe practices for transportation, use, handling, storage and disposal (including PPE requirements) (using the MSDS's);
- Determining first aid and emergency response requirements / procedures (using the MSDS's);
- Maintaining the MSDS file;
- Managing and monitoring the consumption of inventory; and
- Providing an "as needed" service to site personnel and suppliers.

The risks associated with the transportation, use, handling, storage and disposal of all hazardous chemical substances brought onto site must be assessed and managed by the contractor through a process that incorporates risk reduction using the hierarchy of controls as described in Section 6.
Whenever a task-based risk assessment is carried out, consideration must be given to the use of chemical substances (e.g. greases, solvents, etc.).

The contractor must provide Safe Work Procedures for the transportation, use, handling, storage and disposal of all hazardous chemical substances to be used on site.

The contractor must provide his employees with all of the Personal Protective Equipment that is necessary to prevent exposure / injury while handling / using the hazardous chemical substances that they will be required to work with. Appropriate PPE must be selected with consideration given to the potential hazards, permeability, penetration, resistance to damage and compatibility with the work tasks.

The contractor's employees must be trained in the safe transportation, use, handling, storage and disposal of the hazardous chemical substances that they will be required to work with or may come into contact with. The training must specifically address PPE requirements (including the correct selection, fitment and use thereof).
All personnel must be trained to understand the potential health effects associated with exposure to hazardous chemical substances and therefore the importance of Safe Work Procedures and PPE. All personnel must be trained on emergency response procedures and first aid measures.
Behaviour-based observations and coaching must include the use / handling of hazardous chemical substances.

An appropriate occupational exposure monitoring and medical surveillance programme must be in place for all personnel potentially exposed to hazardous chemical substances which have the potential to cause immediate or long-term harm.

Emergency showers and eyewash stations must be provided where required by law, or where a risk assessment indicates a need. The emergency showers and eyewash stations must be appropriately located, signposted, and regularly tested and maintained. Employees must receive training on the location and use of the showers / eyewash stations.

An emergency response plan for incidents involving hazardous chemical substances must be in place. Regular and appropriately staged emergency drills (possibly involving external spill response and ambulance support services) must be held and lessons learnt must be incorporated into the emergency response plan.

The contractor must provide appropriate storage facilities for all hazardous chemical substances to be used on site. The storage facilities must be secure and protected from damage. They must also be designed for easy access for firefighting purposes. Where applicable, the storage facility must protect chemical containers from physical damage due to temperature extremes, moisture, corrosive mists or vapours, and vehicles.

The inventory of hazardous chemical substances stored on site must be kept to a minimum. The quantity of each chemical stored must be justifiable.

Storage and segregation requirements for all hazardous chemical substances to be used on site must be based on:

- The quantities of the substances stored;
- The physical state of the substances (solid, liquid or gas);
- The degree of incompatibility; and
- The known behaviour of the substances.

Access to areas where hazardous chemical substances are stored and handled must be limited and controlled.

Every chemical substance container must be adequately and clearly labelled to identify its contents, to indicate precautionary requirements for the substance, and to indicate the date of expiry (if applicable). Pipes used to transfer / convey / distribute chemical substances must be clearly identified (e.g. colour coding). Directional flow must be indicated where practical.
Before any item, equipment or empty container containing a chemical residue is disposed of as general waste, it must be properly decontaminated (where applicable). Before being disposed of, empty chemical containers must also be rendered unusable for carrying water (by puncturing, cutting or crushing them).

Hazardous chemical substance waste (i.e. redundant / expired hazardous chemical substances, containers containing residues, contaminated items / materials, etc.) must be disposed of in accordance with the applicable legislation.

Maintenance, inspection and testing schedules and procedures must be in place for critical equipment associated with hazardous chemical substances.

A system must be in place to ensure that the risks are assessed before any changes are made to equipment and / or processes for the transportation, storage, handling, use or disposal of a hazardous chemical substance.

A programme must be in place to continually investigate possibilities / opportunities for replacing hazardous substances with safer alternatives.

16.44 Radiation

The risks associated with ionising (from naturally occurring radioactive minerals (NORM), radon, and man-made sources), ultra violet (UV) and electromagnetic field (EMF) radiation exposure must be assessed by a competent person.

There must be an inventory of all radiation sources that have the potential to cause adverse health effects. For each radiation source, the type of radiation (e.g. radioisotope, radon, x-ray, EMF, laser, etc.), the strength of the radiation, and the location must be recorded.

Where risk assessment indicates the need, a documented radiation management programme must be developed such that:

- All types of radiation sources are adequately characterised and described;
- Exposures are eliminated or reduced to as low as reasonably practicable (ALARP);
- A clearly defined chain of responsibility (with duties) is provided; and
- Education is provided for employees regarding radiation safety, including the radiation management programme elements.

The ionising radiation management programme must meet all applicable regulatory requirements, and as a minimum must include the following elements (as applicable):

- Surveyed radiation areas and quantification of exposure sources / levels;
- Exposure and medical monitoring programmes based on established investigation levels;
- Transport of radioactive materials in compliance with international radiation transport regulations, when no local regulations are in place;
- Waste monitoring and disposal programmes;
- Feedstock and equipment checks for naturally-occurring ionising radiation;
- Clearance and control procedures for all contaminated materials and equipment leaving or arriving at site (including scrap);
- Leak (wipe) tests on sealed radioactive containment equipment;
- Lock-out procedures for vessels and equipment containing radioactive sources and radon decay product measurement prior to entry;
- Emergency procedures;
- Environmental impact risk assessment (air, water, waste, foods, etc.);
- Product / waste life cycle control; and
- Dose assessment for employees and critical exposure groups, according to documented methods and by a competent person.

Areas with ionising radiation with annual doses greater than 5 milli Sieverts (mSv) must be designated as restricted access or controlled areas. These areas must be identified and mapped, signposted or otherwise clearly communicated to employees working in the area.

Each person whose potential exposure exceeds 5 mSv per annum or who is a designated radiation worker must undergo periodic personal radiation monitoring and medical surveillance designed to show continued fitness for radiation work.

All sources of ionising radiation must be managed in use and when they are either disposed of or securely stored in accordance with local regulations. Each operation where individual worker's exposures could exceed 5 mSv per annum must have a trained radiation protection adviser or ready access to a trained protection consultant.

There must be documented procedures for the inspection, assessment and maintenance of the controls, and emergency procedures to deal with incidents involving ionising radiation sources (including fire and explosions). All controls must be reassessed annually to ensure their continued effectiveness and that operating practices are in accordance with written procedures.

16.45 Thermal Stress

Hot areas or activities where employees have experienced or could experience excessive fatigue, muscle cramp, dehydration, dizziness and other symptoms of heat stress must be identified and described.

Where a risk of thermal stress is determined, a competent person must conduct monitoring surveys on site, in consultation with workers.

For defined extreme thermal conditions and job activities, medical examinations must include information about the operator's physiological and biomedical aspects, and an assessment of fitness for the working conditions.
Cold areas or activities where employees have experienced or could experience pain or loss of feeling in extremities, frostbite, severe shivering, excessive fatigue and other symptoms of cold stress must be identified and described.

Workplace thermal stress levels (temperature, air movement, humidity, etc.), activities (work level, etc.) and conditions (clothing, health, etc.) that have the potential to exacerbate thermal stress effects must be adequately characterised and described. Workplace exposure assessment must be repeated according to regulatory requirements or whenever there is a change in production, work organisation, process or equipment which may impact thermal stress levels.

Detailed heat stress assessment of identified tasks or jobs must be tiered to:

- Commence with the use of a simple heat stress index as a screening tool; then, if necessary;
- Use rational heat stress indices in an iterative manner to determine the 'best' control methods for alleviating potential heat stress; and
- Undertake physiological monitoring when exposure times are calculated to be less than 30 minutes, or where high level PPE that limits heat loss must be worn.

Detailed cold stress assessment of identified tasks or jobs must be conducted according to current appropriate guidelines that incorporate a cold stress index, to determine the 'best' control methods for alleviating potential cold stress.

When a risk of thermal stress is identified, the following exposure controls must be implemented:

- An acclimatisation period for new workers and those returning from extended leave or sickness;
- Training in the recognition of signs and symptoms of heat or cold stress, emergency procedures and preventative measures;

- Protective observation (buddy system or supervision); and
- A requirement for self-paced working.

The following exposure controls must be considered by a competent person:

- Work / rest regimes and job rotation based on measurements conducted;
- Suitable rest areas with a provision of cool drinking water and cool conditions for high temperatures, or provision of warm drinks and warm conditions for cold temperatures;
- Selection of appropriate clothing or other PPE for extreme temperature conditions;
- The use of engineering controls; and
- Undertake hot / cold tasks during a cooler / warmer time of the day.

Where thermal stress is assessed to be a risk, the operation must develop a suitable emergency response plan.

16.46 Fitness for Work

The contractor must develop and implement a programme to manage employee fitness for work. All employees working on site for whom the contractor is responsible (i.e. direct employees of the contractor as well as the employees of any appointed sub-contractors) must be subject to this programme.

All safety critical jobs (i.e. roles where fatigue or other causes of reduced fitness for work could lead to serious injury, illness or death to employees, significant equipment / plant damage, or significant environmental impact) must be identified and the risks associated with reduced fitness for work in these roles must be assessed.

A programme to manage these risks must be implemented, and it must include:

- Mechanisms for managing fatigue, stress and lack of fitness;
- An alcohol and other (including prescription, pharmaceutical or illicit) drugs policy that includes testing;
- An Employee Assistance Programme providing confidential access to resources and counsellors; and
- Training and awareness programmes.

Each employee has an obligation to present hhealth and safetyelf fit for work at the start of the day / shift, and to remain fit for work throughout the work period. Reporting for work under the influence of alcohol or any other intoxicating substance will not be tolerated. Any transgression concerning the alcohol and other drugs policy applicable to the project may result in the offending employee's access to the project premises being temporarily or permanently withdrawn.

Alcohol and drug testing on the project premises will be carried out randomly (as employees report for duty and during the course of the day / shift), following significant incidents (all persons involved), and whenever there is reasonable suspicion. Alcohol and drug testing may also be carried out as part of a Pre-Employment Medical Examination.

Sleep deprivation during shift work or from excessive working hours is a known cause of fatigue. Fatigued employees are at increased risk of accidents. Shift system design must consider:

- The effect on worker fatigue;
- The effects of activities carried out during scheduled and overtime hours;
- The impact on sleep cycles of activities such as commuting to and from site; and

- The monitoring and control of working hours.

The contractor is responsible for the administration of the working hours of his employees as well as the employees of any appointed sub-contractors. The maximum working hours per day and the minimum rest times between shifts must be specified in the contractor's Health and Safety Management Plan and must comply with all applicable legislation.

All employees engaged in safety critical jobs must undergo fitness assessments (medical examinations) which must be carried out prior to the commencement of employment on the project, prior to a change in role, periodically based on an employee's individual risk profile, and on termination of employment on the project:

- Pre-Employment Medical Examination – to assess the physical suitability of the person for the role and environment in which he will work (carried out prior to the commencement of employment on the project and prior to induction);
- Periodic (Surveillance) Medical Examination – to assess the ongoing physical condition of an employee to determine if his role is impacting on his health and whether the employee's fitness level is still adequate for the role he holds (these medical examinations are "risk driven" – the specific protocol followed and the frequency of the examinations will depend on the applicable legal requirements and the employee's individual risk profile as determined by his personal fitness, the nature of his role / duties, and the environment in which he works / occupational health hazards to which he is exposed). The periodic medical assessment programme must include:
  - The identification of modifiable risk factors that may impact fitness for work;
  - Education and support to maintain health or address identified risk factors; and
  - Education and support to help employees regain their fitness for work.
- Role Change Medical Examination – to assess an employee's physical suitability for a different role and work environment (carried out prior to a change in role / duties);
- Exit (Post-Employment) Medical Examination – to determine the total physical impact of the work the employee performed (carried out on termination of employment on the project if the employee worked on the project site for more than six months).

Note: The results of an Exit Medical Examination from previous employment will not be accepted as a Pre-Employment Medical Examination.

Note: The medical examinations described above may only be carried out by an occupational medical practitioner (i.e. a medical doctor who holds a qualification in occupational medicine).

A detailed job (role) description and an exposure profile (noise, dust, heat, fumes, vapours, etc.) must be provided for each employee or group of employees. The medical examinations that an employee undergoes must be based on (i.e. the employee's fitness must be assessed against) the information contained in these documents as well as the baseline risk assessment for the work. This information must be made available to the occupational medical practitioner performing the medical examination.

For each role, the medical criteria for fitness must be documented and these must be based on an evaluation of the physical and medical requirements for the role.

Depending on the circumstances, certain vaccinations may need to be provided to employees.
The medical examinations carried out for all drivers and operators must include testing / assessment for medical conditions that could affect the safe operation of vehicles or equipment.

Specific testing / questioning must be carried out to determine if an individual:

- Suffers from epilepsy or any other medical condition deemed to be a risk by the occupational medical practitioner;
- Makes use of chronic medication that could affect performance;
- Is colour-blind; or
- Has poor day or night vision.

The medical examinations carried out for employees that are required to work at height must include testing / questioning to determine if an individual suffers from epilepsy, hypertension (high blood pressure) or any other medical condition deemed to be a risk (with regard to working at height) by the occupational medical practitioner.
Electricians must be tested for colour-blindness.

With regard to the placement of new employees:

- Prospective employees must be referred to a suitable occupational medical practitioner (doctor) for a "Pre-Employment Medical Examination";
- If an individual is found to be medically "unfit for placement", the doctor will indicate which work activities cannot be performed by the person;
- The individual may still be employed on the project if his medical restrictions can be accommodated and provided that no legislation is transgressed.

A process must be established to manage medical restrictions that may be placed on an employee. For every employee with a medical restriction, regular follow up visits with the occupational medical practitioner must be arranged to ensure that each case is proactively managed.

An employee in a safety critical job must report (to his supervisor) any condition that might impair his ability to safely perform the duties associated with his role. A mechanism must be in place for such reports to be referred to an occupational medical practitioner to determine if the employee is fit to continue with his work.
Proof of all medical examinations (i.e. certificates of fitness signed by an occupational medical practitioner) must be kept on site and these records must be readily available for inspection by the nominated project management representative.

An employee's certificates of fitness must be included in his Personal Profile (dossier). If an Employee Personal Profile (dossier) hasn't already been compiled for a particular employee, then this must be done without delay following the employee's Pre-Employment Medical Examination.
No employee in a safety critical role may commence work on site without proof that he has undergone a Pre-Employment Medical Examination.

Occupational medical examinations and data interpretation may only be carried out by medical practitioners that are appropriately qualified and certified to do so.

Occupational medical data contained in reports to management must be grouped and summarised to ensure that the confidentiality rights of each individual employee are maintained.
All occupational medical data and records must be retained for at least 40 years.

16.47 Legionnaires Disease

All equipment with the potential for generating Legionella (such as cooling towers and associated equipment, air-handling systems, hot water services and showers) must be identified and the risks of contamination and aerosol generation assessed.

Where there is an assessed risk that Legionella could grow in the system and cause harm, a programme must be in place such that:

- All such equipment is identified on a register. The register must contain details of the regular maintenance, cleaning and checking programmes;
- Control measures are in place to minimise aerosol emissions;
- There must be a documented water treatment programme, including procedures for inspection, assessment and maintenance of the controls; and
- New or retrofitted equipment is designed and constructed to minimise the risk of Legionella growth.
-

Where available, the Legionella plate count test should be used if more effective methods are not available.

Good maintenance procedures must be followed to minimise the risk of significant contamination of equipment with other bacteria and microbial organisms.

Adequate procedures must be available for disinfecting systems if significant concentrations of Legionella bacteria are present. Once disinfected, systems must be retested to confirm effectiveness of treatment.

16.48 HIV / AIDS

The contractor must assess the risks posed by HIV. Appropriate mitigation strategies must be implemented as required.
Discrimination towards employees on the basis of actual or perceived HIV status is forbidden.
All information on the HIV status and condition of employees and community members, including that relating to counselling, care and treatment and receipt of benefits, must be maintained in medical confidence.

HIV / AIDS screening may not be a requirement for recruitment or a condition of employment.

17. Occupational Hygiene

These services are to be provided by TCP):

- Chemical agents =Gases, vapours, solids, fibres, liquids, dusts, mists, fumes, etc.
- Physical agents =Noise, Vibration, Heat, Cold, Electromagnetic fields, lighting etc.
- Biological agents =Bacteria, fungi, etc.
- Ergonomic factors =Lifting, stretching, and repetitive motion.
- Psychosocial factors =Stress, workload and work organisation

TCP Occupational health must provide the contractor with the health risk assessment in respect of existing Occupational Health Risk on Sites

Additionally an Occupational Health Program for monitoring the existing Occupational health Risk will be given to the Contractor

The contractor must conduct an Occupational Health Risk Assessment in respect of their trade.
The contractor must appoint an Approved Inspection Authority (AIA) for Occupational Hygiene to conduct the identified Occupational hygiene Surveys.

17.1 Lighting

- Should be measured once-off within 6 months of new installations prior to work commencing for the first time in any area
- The installations should be placed on a maintenance/ repair/ replacement schedule by management. Proof of this should be available
- Lighting and ventilation shall comply with the National Building Regulations (SANS 10400-O: Lighting and Ventilation) before occupancy is established
- Measurements do not need to be conducted by an Approved Inspection Authority for Occupational Hygiene

17.2 Particulate and Gas/ Vapour Exposures (page 127)

The concentration of an HCS in the air is, or maybe, such that the exposure of employees working in that workplace exceeds the recommended limit without the wearing of respiratory protective equipment, is zoned as a respirator zone

17.3 Thermal Stress

Hot areas or activities where employees have experienced or could experience excessive fatigue, muscle cramp, dehydration, dizziness and other symptoms of heat stress must be identified and described.
Where a risk of thermal stress is determined, a competent person must conduct monitoring surveys on site, in consultation with workers.
For defined extreme thermal conditions and job activities, medical examinations must include information about the operator's physiological and biomedical aspects, and an assessment of fitness for the working conditions.

Cold areas or activities where employees have experienced or could experience pain or loss of feeling in extremities, frostbite, severe shivering, excessive fatigue and other symptoms of cold stress must be identified and described.
Workplace thermal stress levels (temperature, air movement, humidity, etc.), activities (work level, etc.) and conditions (clothing, health, etc.) that have the potential to exacerbate thermal stress effects must be adequately characterised and described. Workplace exposure assessment must be repeated according to regulatory requirements or whenever there is a change in production, work organisation, process or equipment which may impact thermal stress levels.
Detailed heat stress assessment of identified tasks or jobs must be tiered to:
• Commence with the use of a simple heat stress index as a screening tool; then, if necessary;

• Use rational heat stress indices in an iterative manner to determine the 'best' control methods for alleviating potential heat stress; and

• Undertake physiological monitoring when exposure times are calculated to be less than 30
minutes, or where high level PPE that limits heat loss must be worn.

Detailed cold stress assessment of identified tasks or jobs must be conducted according to current appropriate guidelines that incorporate a cold stress index, to determine the 'best' control methods for alleviating potential cold stress.
When a risk of thermal stress is identified, the following exposure controls must be implemented:
• An acclimatisation period for new workers and those returning from extended leave or sickness;

• Training in the recognition of signs and symptoms of heat or cold stress, emergency procedures and preventative measures;

• Protective observation (buddy system or supervision); and

• A requirement for self-paced working.

The following exposure controls must be considered by a competent person:
• Work / rest regimes and job rotation based on measurements conducted;

• Suitable rest areas with a provision of cool drinking water and cool conditions for high temperatures, or provision of warm drinks and warm conditions for cold temperatures;

• Selection of appropriate clothing or other PPE for extreme temperature conditions;

• The use of engineering controls; and

• Undertake hot / cold tasks during a cooler / warmer time of the day.

Where thermal stress is assessed to be a risk, the operation must develop a suitable emergency response plan.

17.4 Measuring and Monitoring

The workplace exposure (or potential exposure) of persons to occupational health stressors must be measured and monitored to determine the effectiveness of control measures as well as compliance with legal and other requirements, particularly Occupational Exposure Limits.
All such measuring and monitoring must be carried out by an Approved Inspection Authority (i.e. a specialist service provider that is appropriately registered with a governing authority).
A plan for measuring and monitoring occupational exposure must be developed and it must include:
• Detail of what must be measured and monitored, based on a risk assessment and / or identified legal or other requirements;

• The frequency of measurement and monitoring;

• A description of the necessary equipment;

• Data quality requirements and controls (including details on the sample size for statistical validation and any rejection criteria);

• The sampling and analysis method(s) including any laboratory certification requirements; and

• The competency requirements for persons carrying out workplace monitoring.

Each instrument and item of equipment used for occupational exposure measurement and / or monitoring must be:

• Properly maintained to ensure compliance with legislative requirements;

• Controlled and safeguarded from unintentional adjustments;

• Suitably stored and protected from damage; and

• Calibrated or verified against a traceable standard at specific intervals (calibration records must be retained).

Each analytical laboratory service that is used must have implemented a credible quality assurance or quality control programme.
All monitoring results obtained must be analysed on a regular basis to:
• Identify trends and potential exceedances of legal or other requirements (such as Occupational Exposure Limits);

• Identify inconsistent or unusual results;

• Evaluate the effectiveness of existing control measures;

• Measure performance against stated objectives; and Identify continual improvement opportunities.

Each exceedance of a specified requirement or limit must be recorded, investigated and reported. Appropriate corrective actions must be identified and implemented.

18. Temporary works

A contractor must appoint a temporary works designer in writing to design, inspect and approve the erected temporary works on site before use.

A contractor must ensure that all temporary works operations are carried out under the supervision of a competent person who has been appointed in writing for that purpose.
A contractor must ensure that all temporary works structures are adequately erected, supported, braced; and
A contractor must ensure that, all temporary works structures are adequately erected, supported, braced and maintained by a competent person so that they are capable of supporting all anticipated vertical and lateral loads that may be applied to them, and that no loads are imposed onto the structure that the structure is not designed to withstand;

All temporary works structures are done with close reference to the structural design drawings, and where any uncertainty exists the structural designer should be consulted; detailed activity specific drawings pertaining to the design of temporary works structures are kept on the site and are available on request to an inspector, other contractors, the client, the client's agent or any employee;

All persons required to erect, move or dismantle temporary works structures are provided with adequate training and instruction to perform those operations safely;
all equipment used in temporary works structure are carefully examined and checked for suitability by a competent person, before being used;

All temporary works structures are inspected by a competent person
all temporary works structures are inspected by a competent person immediately before, during and after the placement of concrete, after inclement weather or any other imposed load and at least on a daily basis until the temporary works structure has been removed and the results have been recorded in a register and made available on site;

No person may cast concrete, until authorization in writing has been given by the competent person; if, after erection, any temporary works structure is found to be damaged or weakened to such a degree that its integrity is affected, it is safely removed or reinforced immediately;

- adequate precautionary measures are taken in order to—
- secure any deck panels against displacement; and
- prevent any person from slipping on temporary works due to the application of release agents;
- as far as is reasonably practicable, the health of any person is not affected through the use of solvents or oils or any other similar substances;
- upon casting concrete, the temporary works structure is left in place until the concrete has acquired sufficient strength to safely support its own weight and any imposed load, and is not removed until authorization in writing has been given by the competent person contemplated in paragraph (a);
- The foundation conditions are suitable to withstand the loads caused by the temporary works structure and any imposed load in accordance with the temporary works design.
- provision is made for safe access by means of secured ladders or staircases for
- a temporary works drawing or any other relevant document includes construction sequences and methods statements;
- the temporary works designer has been issued with the latest revision of any relevant structural design drawing;
- a temporary works design and drawing is used only for its intended purpose and for a specific portion of a construction site; and
- The temporary works drawings are approved by the temporary works designer before the erection of any temporary works.

No contractor may use a temporary works design and drawing for any work other than its intended purpose.

19. Structure

A contractor must ensure that,
all reasonably practicable steps are taken to prevent the uncontrolled collapse of any new or existing structure or any part thereof, which may become unstable or is in a temporary state of weakness or instability due to the carrying out of construction work;

No structure or part of a structure is loaded in a manner which would render it unsafe; and
all drawings pertaining to the design of the relevant structure are kept on site and are available on request to an inspector, other contractors, the client and the client's agent or employee.
An owner of a structure must ensure that;
Inspections of that structure are carried out periodically by competent persons in order to render the structure safe for continued use;
That the inspections contemplated in paragraph (a) are carried out at least once every six months for the first two years and thereafter yearly;
The structure is maintained in such a manner that it remains safe for continued use;
The records of inspections and maintenance are kept and made available on request to an inspector.

20. Emergency Preparedness and Response

The contractor must develop, implement, test and maintain an Emergency Response Plan (incorporating emergency evacuation procedures) that focuses specifically on the contractor's team and work activities. The plan must be risk-based and must detail the procedures that must be followed when responding to all potential emergency scenarios such as a medical emergency (including first aid response), a fire, an explosion, a hazardous substance spill, flooding, rescue from height, rescue from a confined space, etc.

The contractor's Emergency Response Plan must be aligned with the Emergency Response Plan developed for the project.
Potential off-site emergency scenarios must be included (e.g. emergency scenarios related to the transport of personnel, the transport of hazardous materials, and personnel performing work in remote locations).

Consideration must be given to neighbours, and to the availability and capability of local emergency services. Details of any arrangements with external emergency response service providers must be included.
The Emergency Response Plan must satisfy and comply with all applicable legal requirements.
The plan must be adequately resourced to ensure effective implementation. These resources must include appropriate personnel, external emergency response service providers, emergency response equipment, and warning devices. All equipment and warning devices must be identified, maintained and tested to ensure availability at all times.

Accountability for the Emergency Response Plan must be clearly defined. An Emergency Response Team (ERT) responsible for the implementation, management and execution of the Emergency Response Plan must be established. The roles and responsibilities of each team member must be clearly defined in the plan. Each team member must receive appropriate training to ensure that each role is performed competently.

The process for managing incident communication, notification, and reporting must be incorporated into the Emergency Response Plan. The responsible person(s) must be clearly identified, and the protocols for communicating with internal and external stakeholders must be defined.
Emergency evacuation procedures must be developed and included in the Emergency Response Plan.
A copy of the plan must be provided to the nominated project management representative for approval prior to site establishment.
The Emergency Response Plan must be formally reviewed (and amended if necessary) on at least an annual basis, and following any emergency situation, to ensure that it remains appropriate and effective.
At each project work site:

- A suitable evacuation alarm (siren) must be provided. If work is to be carried out in proximity to an existing operational plant, the alarm provided by the contractor must be distinctly different (in terms of the sound that it generates) to any alarm installed in the operational plant. All persons working in an area where an evacuation alarm is sounded must respond to it immediately.
- Suitable fire-fighting equipment must be provided and maintained, and personnel must be trained in fire-fighting procedures and the use of fire-fighting equipment.

- Suitable first aid equipment and supplies must be provided and maintained, and an adequate number of appropriately trained First Aiders must be in place (refer to Section 14.2).
- Emergency assembly points positioned in safe locations away from buildings, plant and equipment must be designated (and conspicuously signposted). In the event of an evacuation, all persons (i.e. personnel and visitors) must assemble and be accounted for at these emergency assembly points.
- All personnel must receive awareness training on the applicable emergency response procedures, and all visitors entering the site must be properly instructed in these procedures.
- The emergency response procedures must be displayed on each notice board.
- A diagram (site plan) indicating evacuation routes, emergency assembly point locations, and the positioning of emergency equipment (fire extinguishers, first aid boxes, etc.) must be prominently displayed in all buildings and plants, in all offices, on all notice boards, and in other locations on the site as may be required.
- An up-to-date list of emergency telephone numbers must be compiled and maintained. A copy of this list must be posted at each site entrance, in each office, near each telephone, and on every notice board.
- Emergency response drills must be conducted to test the effectiveness of the emergency procedures and equipment, as well as the knowledge and proficiency of the response personnel. Where appropriate, drills must include liaison with and the involvement of external emergency response service providers. A variety of emergency scenarios must be tested including, but not limited to, medical emergencies, fires, rescues, and hazardous substance spills. A drill must be carried out one month after site establishment and six-monthly thereafter.

Each drill must be monitored and the outcomes (highlights and shortcomings) must be documented. Corrective actions must be identified and implemented to address the shortcomings, and the Emergency Response Plan and associated procedures must be amended as required.

20.1 Fire Fighting

The contractor must ensure that Fire Fighting requirements are met

20.2 First Aid

The contractor must ensure that First Aiders are trained and appointed as described in (Section 9.5)

20.2.1 First Aid Kits

A suitable first aid kit (i.e. appropriate to the level of training) must be readily available to each First Aider. All kits must be provided and maintained by the contractor.

Taking into account the type of injuries that are likely to occur in the workplace, each first aid kit must contain suitable equipment and supplies. First aid equipment and supplies required by applicable legislation must be provided as a minimum.

The contents of each first aid kit must be kept clean and dry. Each kit must be contained in either a portable weatherproof case / bag or a steel box mounted to a fixed structure. Access to first aid equipment / supplies must be limited to train First Aiders only. Access to portable kit bags must be controlled and steel first aid boxes mounted in the workplace must be kept locked.

Approved signage must be in place to indicate the locations of the first aid boxes / bags.

A record of each treatment administered must be kept in a suitable register.

The first aid kits must, as a minimum, contain the following equipment and supplies:

Table 20.2.1-1 Minimum Requirements to be included when equipping first aid boxes

Item 1:	Wound cleaner/ antiseptic – 100ml;
Item 2:	Swabs for cleaning wounds;
Item 3:	Cotton wool for padding – 100g;
Item 4:	Sterile gauze – minimum quantity 10;
Item 5:	1 x Pair of forceps – for splinters;
Item 6:	1 x Pair of scissors – minimum size 100mm
Item 7:	1 x Set of safety pins;
Item 8:	4 x Triangular bandages;
Item 9:	4 x Roller bandages – 75mm x 5m;
Item 10:	4 x Roller bandages – 100mm x 5m;
Item 11:	1 x Roll of elastic adhesive – 25mm x 3m;
Item 12:	1 x Non-allergenic adhesive strip – 25mm x 3m;
Item 13:	1 x Packet of adhesive dressing strips – minimum quantity 10 assorted sizes;
Item 14:	4 x First aid dressings – 75mm x 100mm;
Item 15:	4 x First aid dressings – 150mm x 200mm;
Item 16:	2 x Straight splints;
Item 17:	2 x Pairs large and 2 x pairs medium disposable latex gloves;
Item 18:	2 x CPR mouth pieces or similar devices.

Additional items / supplies may need to be provided depending on the nature of the workplace (specific hazards) and the level of training of the first aider in position of the kit.

21. Management Review

A review of the contractor's Health and Safety Management System must be completed annually to ensure that the system continues to be effective in managing health and safety performance and meeting project requirements.

The review must evaluate if there is any need for change and must identify actions to improve the system.

The review must be led by senior management and the following must be considered:

- The suitability of the policy adopted for the project;
- The impact of changing legislation;
- The management of risk;
- Health and safety objectives and performance indicators;
- Changing expectations and requirements of relevant stakeholders;
- Changes to the contractor's scope, schedule, designs, etc.;

- Changes to the contractor's organisational structure;
- Communication and feedback (particularly from employees, Project representatives, and client representatives);
- The effectiveness of the management of change process;
- Workplace exposure monitoring and medical surveillance;
- The status of corrective actions;
- Performance statistics, including an annual summary of safety statistics, and occupational hygiene monitoring and medical surveillance results;
- Non-conformances (findings) from completed audits;
- Follow up on actions from previous management reviews; and
- Recommendations and opportunities for improving the effectiveness of the management system.

A record of each completed management review must be retained and it must include all decisions and identified actions concerning alterations, modifications or improvements to the management system that demonstrate a commitment to continual improvement.
For occupational hygiene: **Approved Inspection Authority (AIA) for Occupational Hygiene**

22. Management of Change

To ensure that proposed changes do not give rise to unacceptable health or safety risk, the contractor must develop and implement a process for identifying and managing change in the workplace (e.g. changes to scope, schedule, procedures, work methods, site conditions, designs, plans, plant and equipment, materials, processes, etc.) that may impact on health or safety performance.

The management of change process must take into consideration that changes may be planned or unplanned, sudden or gradual, temporary or permanent.

The process must aim to ensure that:

- Changes are identified and assessed before they are implemented;
- Careful consideration is given to managing the risks associated with any change;
- Due diligence can be shown to have taken place;
- The number of unsatisfactory or unnecessary changes is minimised;
- The right people are involved in the change process; and
- All statutory requirements are met.

All risks associated with a proposed change must be evaluated and ranked. The risks that are ranked as moderate or higher must be managed to prevent serious injury or illness.

It must not simply be assumed that a change will not result in significant risks. All proposed changes must be formally evaluated. The evaluation or review must include:

- An appropriate level of technical expertise;
- The involvement of the workforce potentially affected by the proposed change; and
- Approval of the change by a person with at least the same level of authority as those who control the existing process or item being changed.

23. Sub-contractor Alignment / Stakeholder management

Processes must be in place to ensure that the health and safety risks associated with the procurement of materials, equipment, services and labour are identified, evaluated and effectively managed.

A process for evaluating a sub-contractor's (or supplier's) ability to provide materials, equipment, services and labour that meet defined specifications must be in place. A prospective sub-contractor's health and safety management expertise, experience and capability (including previous health and safety performance) must be formally assessed prior to any contract or purchase order being awarded.

Each appointed sub-contractor must develop and implement a detailed Health and Safety Management Plan based on the requirements of the contractor's Health and Safety Management Plan and the Health and Safety Specification for the project. This plan must be reviewed and approved by the contractor prior to the commencement of any work.

The properties of all materials provided to the project must be adequately understood, documented and integrated into operating procedures where exposure to these materials presents a significant health or safety risk.

Procedures, commensurate with the evaluated risk, must be in place for the receiving, storing, dispatching and transporting of all equipment and materials.

Before work commences on any contract, all sub-contractor personnel must receive comprehensive orientation and induction training (refer to Section 11).
All work carried out by a sub-contractor must be managed (activity supervised) throughout the contract period and performance must be reviewed (audited) on a regular basis (refer to Section 21).

24. Measuring and Monitoring

The workplace exposure (or potential exposure) of persons to hazardous substances or agents must be measured and monitored to determine the effectiveness of control measures as well as compliance with legal and other requirements, particularly Occupational Exposure Limits.
All such measuring and monitoring must be carried out by an Approved Inspection Authority (i.e. a specialist service provider that is appropriately registered with a governing authority).

A plan for measuring and monitoring occupational exposure must be developed and it must include:

- Detail of what must be measured and monitored, based on a risk assessment and / or identified legal or other requirements;
- The frequency of measurement and monitoring;
- A description of the necessary equipment;
- Data quality requirements and controls (including details on the sample size for statistical validation and any rejection criteria);
- The sampling and analysis method(s) including any laboratory certification requirements; and
- The competency requirements for persons carrying out workplace monitoring.

Each instrument and item of equipment used for occupational exposure measurement and / or monitoring must be:

- Properly maintained to ensure compliance with legislative requirements;
- Controlled and safeguarded from unintentional adjustments;
- Suitably stored and protected from damage; and
- Calibrated or verified against a traceable standard at specific intervals (calibration records must be retained).

Each analytical laboratory service that is used must have implemented a credible quality assurance or quality control programme.

All monitoring results obtained must be analysed on a regular basis to:

- Identify trends and potential exceedances of legal or other requirements (such as Occupational Exposure Limits);
- Identify inconsistent or unusual results;
- Evaluate the effectiveness of existing control measures;
- Measure performance against stated objectives; and
- Identify continual improvement opportunities.

Each exceedance of a specified requirement or limit must be recorded, investigated and reported. Appropriate corrective actions must be identified and implemented.

25. Incident Reporting and Investigation

The contractor must establish a procedure for the management of all health and safety incidents. This procedure must define the responsibilities, methodologies and processes that must be followed for:

- Reporting an incident;
- Investigating an incident;
- Analysing an incident to determine the root cause;
- Identifying and implementing corrective actions to prevent a recurrence; and
- Communicating information concerning an incident to relevant persons and / or groups.

Please Note: Arrangements must be in place to ensure that proper medical care is provided to any contractor (or sub-contractor) employee that suffers an occupational injury or illness (refer to Section 15). These arrangements must be described in the contractor's Health and Safety Management Plan.

An incident may have multiple impacts. For each impact, the Actual Consequence and the Maximum Reasonable Outcome must be evaluated. Each impact must be evaluated independently, with the most significant classification forming the primary rating of the incident.

A Near Hit is an incident. All Near Hits must be reported.

The Maximum Reasonable Outcome (MRO) is based on a risk evaluation of the maximum reasonable consequence of an impact and the likelihood of the event occurring again given a reasonable failure of existing controls. Using the matrix referred to above, each impact must be evaluated and classified as:

- Low;
- Moderate;
- High; or
- Extreme.

An incident must be reported on the same work day or shift on which it occurs and preliminary details must be recorded

Depending on the Actual Consequence and Maximum Reasonable Potential Outcome of the impact(s), the relevant internal and external parties must be notified in accordance with specified protocols and timeframes, and legislative requirements.

In the event of a significant incident (i.e. an incident with an Actual Consequence of Moderate, Major or Catastrophic, or a Maximum Reasonable Potential Outcome of High or Extreme, work must cease and must only resume once the necessary actions (including the re-evaluation of any relevant risk assessments) have been taken to eliminate or reduce the risk of recurrence. Work must only be permitted to recommence once formal authorisation has been granted by the Project Construction Manager. In the case of incidents with an Actual Consequence of Major or Catastrophic, work must not be permitted to recommence until authorisation has been granted by the relevant government authorities (i.e. the South African Police, the Department of Labour or the Department of Mineral Resources).

The Contract Manager must ensure that an investigation is completed for each incident that occurs, and that appropriately senior personnel participate in, and authorise the outcomes of, each investigation. Incident investigations must be facilitated by competent and experienced persons who have been trained in the appropriate methodology.

All significant incidents (i.e. incidents with an Actual Consequence of Moderate, Major or Catastrophic, or a Maximum Reasonable Outcome of High or Extreme must be investigated using the approved Transnet investigation methodology. Such an investigation must be facilitated by a trained project representative within 7 calendar days.

For all other incidents (i.e. incidents with an Actual Consequence of Insignificant or Minor, or a Maximum Reasonable Outcome of Low or Moderate other methodologies approved by the Project Health and Safety Manager must be used.

Each incident (including Near Hits) must be investigated to a level of detail that is appropriate for the Maximum Reasonable Potential Outcome of the incident.

Each incident must be analysed to determine the root cause, and corrective actions must be identified and prioritised for implementation to eliminate or reduce the risk(s) in order to prevent recurrence of the incident.

For each corrective action, a responsible person must be designated and an appropriate timeframe (target date) for completion of the corrective action must be specified. Progress on implementing corrective actions (i.e. closing incidents) must be monitored and reported on. The implementation of corrective actions must be verified during monthly audits by the Project Health and Safety Advisors but also no later than 30 calendar days after the conclusion of the incident investigation.
The contractor must document the results of each investigation and a report must be submitted to the nominated project management representative within five working days of the incident occurring.

As a minimum, each incident report must include:

- The date, time and location of the incident;
- A detailed description of the incident, including photographs;
- The names of any injured persons;
- Injury details (if applicable);
- A summary of the first aid and / or medical treatment provided (if applicable);

- The current status of any injured persons;
- The root causes of the incident; and
- Detailed corrective actions, including responsible persons and target dates for implementation.

Each significant incident must be summarised for its lessons learnt following the investigation. This information must be reviewed by the contractor's Project Manager to assure completeness, accuracy and relevance before it is shared with (communicated to) all project personnel.

26. Non-conformance and Action Management

The contractor must establish a process for identifying and recording corrective actions arising from:

- Incident investigations;
- Hazard identification and risk assessment;
- Measurement and monitoring;
- Improvement plans and suggestions;
- Managing change;
- Audits and inspections; and
- Safety observations and coaching (safety interactions).

The contractor must establish a procedure for managing actions that addresses:

- Identification, categorisation and prioritisation of actions;
- Formal evaluation and approval of actions (management of change process);
- Assignment of responsibilities, resources and schedules for implementation;
- Implementation of actions;
- Tracking and reporting on implementation status; and
- Monitoring and verifying the effectiveness of the actions.

27. Performance Assessment and Auditing

The contractor must establish and maintain programmes for measuring and monitoring HEALTH AND SAFETY performance on a regular basis. Metrics must include leading and lagging indicators, and be based on qualitative and quantitative data.

27.1 Reporting on Performance

Reports summarising the contractor's health and safety performance on the project must be compiled on a weekly and a monthly basis.

The contractor must be prepared to discuss the content of these reports at scheduled health and safety meetings.

The reports must contain the following information:

- Number of contractor and sub-contractor employees on site;
- Total hours worked on site by contractor and sub-contractor employees (by company);
- Number of incidents by category (i.e. Near Hit, FAI, MTI and LTI);
- Lost Time Injury Frequency Rate (LTIFR) (project to date and 12-month rolling);
- Details of all new incidents for the reporting period and the corrective actions taken or to be taken;
- Feedback (progress updates) on all open incidents and outstanding corrective actions;
- Status and feedback on any employee that may have been injured and has not yet returned to work;

- Details of all health and safety training carried out during the reporting period;
- Number of SOC's (Safety Observations and Coaching) carried out during the reporting period;
- SOC trends identified and proposed action for the coming week or month to maintain positive trends and / or address negative trends;
- Details of all audits, inspections and site visits carried out during the reporting period, and the corrective actions taken (or to be taken) to address all non-conformances;
- Feedback (progress updates) on all open non-conformances and outstanding corrective actions;
- Number of Toolbox Talks conducted during the reporting period (monthly);
- Number of Planned Task Observations (PTO's) carried out during the reporting period (monthly);
- Details of all active risk assessments and Safe Work Procedures highlighting those that are due for review in the coming month (monthly);
- A look ahead (to the coming week, month or quarter) to ensure that appropriate health and safety planning and preparation is done for upcoming work;
- Challenges faced with regard to health and safety; and
- Any other health and safety related information specific to the project that may be required.

Leading indicators (e.g. audit findings, observations, etc.) must be analysed, and any negative trends identified with regard to unsafe behaviour or conditions must be appropriately addressed to prevent incidents.

Lagging indicators (e.g. injuries, illnesses, near hits, etc.) must be investigated in detail to determine the root causes. Corrective actions must be identified, implemented and integrated into Safe Work Procedures to prevent recurrences.

27.2 Audits and Inspections

On a monthly basis, the health and safety management system and workplace activities of the contractor will be audited by a Project Health and Safety Advisor to assess compliance with the project health and safety requirements. Any deviation from these requirements (i.e. non-conformance) that places the health or safety of any person in immediate danger will result in the specific activity being stopped until the non-conformance is corrected.

For each non-conformance determined during any audit, the contractor must identify and implement appropriate corrective actions.

For each corrective action, a responsible person must be designated and an appropriate timeframe (target date) for completion of the corrective action must be specified. Progress on implementing corrective actions (i.e. closing non-conformances) must be monitored and reported on. The implementation of corrective actions will be verified during the monthly audits.

Should it be determined that the contractor's level of compliance is unsatisfactory, all work being performed by the contractor on the project site may be stopped (at the contractor's expense) until an investigation into the reasons for the poor performance has been carried out, a corrective action plan has been developed, and corrective actions have been implemented.

In addition to the audit carried out by the Project Health and Safety Advisor, the contractor must carry out an internal audit on a monthly basis to assess compliance with the project health and safety requirements (including the requirements of this specification and the contractor's Health and Safety Management Plan). Furthermore, the contractor must ensure that each appointed sub-contractor is audited and measured to the same standard. Copies of these audit reports must be submitted to the Project Health and Safety Advisor on a monthly basis.

The contractor must carry out internal health and safety inspections as follows:

- General site health and safety inspections on a daily basis; and
- Inspections of plant, tools and equipment prior to establishment or use on site, and at least monthly thereafter.

All audits and inspections must be carried out by competent persons who have been appointed in writing.

A schedule of planned audits and inspections must be compiled and maintained ensuring that:

- All work areas and all activities are covered at regular intervals;
- All applicable legal requirements are complied with; and
- Areas or activities with significant associated hazards or risks receive greater attention.

TRANSNET

Transnet Integrated Management System (TIMS)
POLICY COMMITMENT STATEMENT

Transnet is a State-Owned Company that operates as an integrated freight transport company, formed around six core operating division namely Transnet Freight Rail (TFR), Transnet Engineering (TE), Transnet National Ports Authority (TNPA), Transnet Port Terminals (TPT) and Transnet Pipelines (TPL) and Transnet Property (TP) that complement each other.

Transnet has developed and implemented a TIMS that forms an integral part of the core business. We are committed to ***transporting freight, passengers, and provide excellent service*** to our customers along key transport corridors. This is done in order to ***competitively grow our business***, enhance efficiency of South Africa's logistics system and thereby contribute to economic vibrancy.

TIMS is established, implemented and maintained in accordance with recognised best practices that will enable us to:

- Incorporate and comply with applicable ***legislation, regulations, codes, standards, protocols, best practices and customer requirements*** to which we subscribe in order to achieve our business objectives;
- Set and achieve ***objectives and targets*** that address significant enterprise-wide ***strategic, tactical and operational risks, opportunities and mitigate the consequences*** thereof;
- Proactively implement ***waste and pollution prevention strategies*** to prevent ***environmental degradation;***
- Continually promote the prudent and ***sustainable*** use of ***energy and natural resources***;
- Provide ***quality products*** and ***services*** in order to meet our customers' requirements;
- Provide ***safe and secure environment*** for our employees and stakeholder;
- Carry out our business in a manner which ***protects our assets and information*** and ***prevents injuries and ill health*** to our employees and stakeholders;
- Promote ***safe operational principles*** during operations to minimize occurrences of safety incidents;
- Strategically ***source our contractors*** through fair, equitable and transparent processes;
- Provide ***soc-economic development*** as a good corporate citizen;
- Promote ***food safety practices*** in our food preparation and handling environments;
- Ensure ***proficiency and preparedness*** to deal with and ***effectively recover*** from any ***emergency situations***;
- ***Develop, train and manage our employees*** through inspirational leadership, provide the necessary ***organizational information, knowledge and resources*** to achieve the intention of this policy statement;
- ***Communicate***, ***engage*** and ***provide support*** and ***appropriate information*** to relevant stakeholders in order to build relationships based on care, openness, mutual trust and involvement as well as promote a TIMS risks awareness culture;
- Allocate ***responsibilities*** and ***accountabilities*** for meeting the requirements of the TIMS policy statement.
- Drive an ***integrated assurance management programme*** to ensure ***continual improvement*** of TIMS.

The TIMS Policy Commitment Statement shall be ***reviewed every three years*** or ***as circumstances dictate*** to ensure that it remains ***current and relevant***. Our progress on the achievement of the policy statement commitments shall be reported in the respective Governance Structures. Transnet recognises its accountability for TIMS; all employees including contractors have a role to play in delivering on the commitment set out in this policy statement.

Group Chief Executive

Date: 29/07/2020
Next Review Date: 29/06/2023

Copies of the approved TIMS Policy Commitment Statement can be made available to external Stakeholders on request.

CONTRACTOR QUESTIONNAIRE

1.	POLICY, ORGANISATION AND MANAGEMENT INVOLVEMENT	YES	NO	N/A
1.1	Does your company have a SHEQ Policy?			
1.2	Has a copy signed by the Chief Executive Officer / Managing Director been supplied?			
	Provide company organogram.			
1.3	Company Certified? i.e. ISO 14001, ISO 9001, OHSAS 18001 etc.			
	If yes, provide proof of periodical work area inspections and Regular Health and Safety meetings with personnel			
1.4	Does the company have OHSAct 16.2 Appointee?			
1.5	Is your company registered with the Compensation Commissioner (COID Act) or licenses compensation insurer? If so, please provide registration number.			
1.6	Do you have a copy of good standing certificate, confirming that your registration is paid up? If so, please provide copy thereof			
1.7	Does the company comply with the relevant legal appointees for this project i.e. Representatives, Environmental Control Officer, First Aiders, Risk Assessors, etc.?			
2.	**ACCREDITATION**	**YES**	**NO**	
2.1	Does the company have the auditable Management Systems in place?			
	If so, please provide proof of certificate issued by a credible external Assurance Auditor.			
3.	**TRAINING**	**YES**	**NO**	
3.1	Has the training based on risks/hazards that has been identified been done?			
3.2	Is training provided to employees at the following stages?			
	▪ When joining the company			
	▪ When changing jobs within the company			
	▪ When new plant or equipment needs to be operated			
	▪ As a result of experience of and feedback from an accident/incident reports			
3.3	Provide proof of specialist training provided such as training analysis, Certificates, Job Specific Training or Induction Training program?			
3.4	What legal or compliance training is provided specifically to			
	▪ First line supervisors?			
	▪ Middle and top management?			
3.5	Are all employees (including sub-contractors) instructed as to the application of rules and regulations within your organization?			
3.6	Does this training include the selection, use and care of personal protective equipment?			
3.7	What refresher training is provided and at what intervals?			
	Please list examples			
4.	**PURCHASE OF GOODS, MATERIALS AND SERVICES**	**YES**	**NO**	

Contractor Questionnaire

4.1	Do you have a system which ensures that all statutory inspections of plant and equipment are carried out?			
	Give examples of plant/equipment covered:			
4.2	Is there a record of inspections conducted above?			
4.3	Do you carry out plant and equipment inspections prior to work commencing to ensure the hazards are identified?			
	Please provide copies of these inspection reports.			
4.4	Do you evaluate the competence of all sub-contractors?			
	Please describe how this is achieved and how the results are monitored.			
5.	**INSPECTIONS**	**YES**	**NO**	
5.1	Are periodic work inspections carried out by first line supervisors?			
5.2	Are unsafe acts and conditions reported and remedial actions formally monitored?			
6.	**RULES AND REGULATIONS**	**YES**	**NO**	
6.1	Do organisational rules and regulations exist for personnel and subcontractors?			
	Do these cover			
	▪ General rules			
	▪ Project rules			
	▪ Specific task rules			
6.2	Do these rules include a permit to work system (as applicable)?			
6.3	Do you have experience of contractor execution plans?			
	Give examples of where these have been used			
6.4	Do you have a formal company guideline for holding pre-contract progress meetings with the client?			
7.	**RISK MANAGEMENT**	**YES**	**NO**	
7.1	Have you performed assessment of the risks involved in the execution of contract work?			
7.2	Do you have safe work procedure for all high risk/hazards identified?			
7.3	Are employees trained on Safe Work Procedures?			
7.4	Do you have a copy of the PPE needs analysis done and issue records kept?			
8.	**BUSINESS CONTINUITY AND EMERGENCY ARRANGEMENTS**	**YES**	**NO**	
8.1	Do you have an emergency plan AND business continuity plan in place?			
8.2	Are provision made for Trained First Aiders?			
8.3	Are employees trained on the emergency plan/procedure and business continuity plan?			
9.	**FALL PROTECTION**	**YES**	**NO**	
9.1	Are you able to demonstrate that work at heights undertaken under competent supervision, carried out by employees who are trained and medically fit?			
9.2	Does your fall protection plan include rescue plan, risk assessment, inspection, testing and maintenance of fall protection equipment?			
10.	**PROJECT SECURITY**	**YES**	**NO**	
10.1	Has the security assessment for the site been done?			
10.2	Are measures put in place to ensure security of the project personnel and equipment?			
11.	**RECRUITMENT OF PERSONNEL**	**YES**	**NO**	
11.2	Are medical examinations carried prior to employment, in all cases?			

Contractor Questionnaire

11.3	Are exit medicals conducted on staff once they have resigned? e.g. via trade testing, reference checks, etc.			
11.4	How do you assess the competence of staff before an appointment is made?			
11.5	Is the substance abuse policy and testing procedure in place?			
12.	**REPORTING AND INVESTIGATION OF ACCIDENTS, INCIDENTS AND DANGEROUS CONDITIONS**	**YES**	**NO**	
12.1	Do you have a procedure for reporting, investigating and recording accidents and incidents?			
	Supply copy of this procedure and incident register including first aid and medical cases.			
12.2	Is there a standard report/investigation form used? If yes, supply copy.			
12.3	Do you have a formal system for reporting situations/near misses etc.? If yes, provide copy.			

	YEAR-1	**YEAR-2**	**YEAR-3**	**YEAR-4**	**YEAR-5**	
Lost time accidents per 100 employees						
Major/Reportable injuries per 100 employees						
Number of dangerous occurrences						
Lost man days due to accidents						

13.	**COMMUNICATION AND CONSULTATION**	**YES**	**NO**	
13.1	Are progress and other legal meetings held?			
13.2	Are minutes of the meetings recorded and results of these meetings communicated to all employees? If yes, please describe method			
13.3	Are daily talks meetings conducted to discuss hazards on site, incident recall, performance?			
14.	**COSTS**	**YES**	**NO**	
14.1	Has the Contractor made provision for the cost for IMS requirements for the project? Refer to Pricing Schedule Requirements (Annexure 8.4, TRN-IMS-GRP-PROC-014-8.4)			

Name of Transnet Contract Manager/Designated Transnet Person:		
Signature of Transnet Contract Manager/Designated Transnet Person:		
Date of Receipt of Documentation:		
Comments:		
Date of Endorsement of Documentation:		

Transnet SOC Ltd

Standard Operating Procedure (SOP) for Cleaning & Hygiene Services

Document number	TRN-IMS-GRP-SOP 009.001
Business Name	Transnet SOC Ltd
Activity Name	Cleaning of Transnet Office Buildings
Standard Operating Procedure Owner Name	Senior Manager FPMO: Muodzi M. Chipango
Standard Operating Procedure Owner Signature	Signed by:Muodzi-Misheck Chipango Signed at:2021-09-07 19:22:57 +02:00 Reason:I approve this document
Version Number	5.0
Classification	Unclassified
Effective Date	01 May 2020
Review Date	30 April 2023

Stakeholders

	Name	Designation	Approval Signature	Date	E-Mail	Contact Number
Compiled by	Aifheli Lambani	Acting Senior Engineer: FPMO		06/09/2021	Aifheli.Lambani@transnet.net	066 293 6874
Supported by	Richard Mdlalose	Occupational Hygiene Manager		06/09/2021	Richard.Mdlalose@transnet.net	081 032 1836
Supported by	Sipho Mlaudzi	COVID-19 Compliance Officer		06/09/2021	Sipho.Mlaudzi@transnet.net	0839542554
Supported by	Sipho Mlaudzi	General Manager (Acting): Group Occupational Health and Wellness		06/09/2021	Sipho.Mlaudzi@transnet.net	0839542554
Supported by	Muodzi M. Chipango	Senior Manager: FPMO	Signed by Muodzi Misheck Chipango Signed at: 2021-09-08 13:24:07 +02:00 Reason: I approve this document	07/09/2020	Misheck.Chipango@transnet.net	071 889 0721
Approved by	Kapei Phahlamohlaka	Chief Executive: Transnet Property	Signed by Kapei Phahlamohlaka Signed at: 2021-09-12 20:00:56 +02:00 Reason: I approve this document	12/09/21	Kapei.Phahlamohlaka@transnet.net	0113081034

Summary of Version Control

Version Number	Effective Date	Summary of Changes
1.0	15 Jul 2015	Initial document structure for standard.
		Comments from Regions.
2.0	20 April 2020	Including cleaning, decontamination, disinfection activities in response to COVID-19 pandemic.
3.0	11 June 2020	Revision on the methodology of disinfection (Misting/misting)
		Revision of evacuation requirements for positive COVID-19 incident(s)
4.0	10 July 2020	Included Ultraviolent Germicidal Irradiation (UVGI) as one the method for disinfection for COVID-19
5.0	02 September 2021	- Adoption of Cleaning and Disinfection in place of Decontamination, - Update on waiting period after disinfection of building(s) after a COVID-19 positive case report, - Adoption of Manual Cleaning as a recommended method, for COVID-19 disinfection,

Note: Only latest amendments and/or additions are reflected in italics in the body of the document

TRANSNET

TABLE OF CONTENTS

1. PURPOSE

1.1 The purpose of this Standard Operating Procedure (SOP) is to establish a cleaning guideline to enable service providers and Service Managers to ensure adequate cleaning services is provided within Transnet SOC Ltd buildings.

1.2 Provide guidelines for minimum requirements for cleaning and hygiene in Transnet work areas in order to, where reasonably practicable prevent or minimize the transmission of contagious diseases and the spread of bacteria and other hazardous biological agents including COVID-19.

2. DEFINITIONS

In this document covers the interpretation of definitions:

TERMS	DEFINITIONS
Building / centre manager	Means any person appointed by Transnet SOC Ltd from time to time as the person responsible for the management of the Site.
Cleaning	Means removal of gross contamination, organic material, and debris from the premises or respective structures, via mechanical means like sweeping (dry cleaning) and/or the use of water and soap or detergent (wet cleaning). The goal is to minimize organic material so disinfection can be effective.
Confirmed case	Means a person with laboratory confirmation of COVID-19 infection, irrespective of clinical signs and symptoms
Decontamination of building	(Sometimes abbreviated as decon, dcon, or decontam) or deep cleaning means the process of cleansing a building or part of a building to remove contaminants such as microorganisms or hazardous materials.
Disinfection	Means methods used on surfaces to destroy or eliminate a specific species of infectious microorganism

	through physical (e.g. heat) or chemical (e.g. disinfectant) means. A combination of methods may be required. The cleaning involves application of disinfectant to all touch points, working surfaces as well as walls and floors.
Existing equipment	Means all equipment supplied to or made available by Transnet SOC Ltd to the service provider within or on the Premises.
Furniture	Means all items such as chairs, tables, etc.
Litter	Means cans, bottles, paper, plastic, cardboard, cigarette stubs, leaves and all other rubbish left unattended.
Person	Includes, a natural person, a partnership, a business trust, a foundation, any company or close corporation incorporated or registered in terms of any law, and other body of persons corporate or unincorporated.
Premises	Means any site or place regardless of whether it is or forms part of a permanent or temporary structure or building which is the property of, or is occupied or used by, or is under the control and / or management of Transnet SOC Ltd.
Property	Means any movable, immovable or intellectual property or any right to such property.
Visitor	A person who visits a tenant, staff member on the premises or who attends a meeting on the Premises.
Routine cleaning	Is when offices and operational areas are cleaned continually and regularly with the sole purpose of keeping the area neat and clean from visible dirt, dust, spills, hazardous materials.
Personal Protective equipment	Protective equipment required, which the Service Provider is obliged to procure at his own cost and which he is required to utilise or deploy in performing, rendering or supplying the Service.

Service	Means the work, functions, tasks, services to be rendered, and / or goods to be supplied, including any subsequent variations or changes to such work, functions, tasks, services, or goods.
Service equipment	Means all tools, appliances, machinery and equipment which is required to be utilized or deployed in performing, rendering or supplying the Service.
Service manager	Means any person appointed by Transnet SOC Ltd from time to time as the person responsible for the management of the term service contract.
Site	Means any site or place regardless of whether it is or forms part of a permanent or temporary structure or building which is the property of, or is occupied or used by, or is under the control and / or management of Transnet SOC Ltd.
Transnet	Means Transnet State owned Cooperation Limited (Transnet SoC Ltd) which includes Transnet Freight Rail, Transnet Engineering, Transnet Port Terminals, Transnet National Ports Authority, Transnet Pipelines, Transnet Property and Transnet Foundation.
Specifications	Is the detailed description of method and standards, material, etc required in delivering goods and/or services.
Service provider	Means the successful tenderer that has been awarded the term service contract for the period stipulated.
Stakeholder	Means a person or group that can affect, be affected by, or perceive itself to be affected by Transnet decisions or activities (internal and external stakeholder).
Supervisor	Means any person appointed by Transnet or service provider to be on site and be responsible for the supervision of executed services on a frequent or daily basis.

Third party	Means any person other than the Service Provider or Transnet SOC Ltd
Tenant	Means any person with his staff, clients and service providers with whom Transnet SOC Ltd has entered into a lease agreement for the whole or a portion of the Premises
Transnet Property	is an Operating Division of Transnet SOC Ltd, a public company duly incorporated in accordance with the laws of South Africa with registration number 1990/000900/30
year	means 12 consecutive months

2.1 Clause headings are inserted for convenience and shall not be used in its interpretation;
2.2 Where figures are referred to in numerals and in words, if there is any conflict between the two, the words shall prevail;
2.3 Expressions defined in this maintenance standard shall bear the same meanings in the specifications, schedules or annexures to agreements which do not themselves contain definitions;

3. ABBREVIATIONS

ABBREVIATIONS	DEFINITIONS
AIA	Approved Inspection Authority
BCM	Business Continuity Measure
C&D	Cleaning and Disinfection (Cleaning & Hygiene)
COVID-19	Coronavirus Disease
CR	Compliance & Regulatory
DoH	National Department of Health
HC	Human Capital
R&HVAC	Refrigeration, Heating Ventilation & Air Conditioning
IMS	Integrated Management System
MSDS	Material Safety Data Sheet
NICD	National Institute for Communicable Diseases

OD	Operating Division
PPE	Personal Protective Equipment
PROC	Procedure
SHE	Safety, Health & Environment
SOP	Standard Operating Procedure
SU	Specialist Unit
TP	Transnet Property
TFR	Transnet Freight Rail
TE	Transnet Engineering
TPL	Transnet Pipelines
TNPA	Transnet National Port Authority
TPT	Transnet Port Terminal
UVGI	Ultraviolent Germicidal Irradiation
WHO	World Health Organization

4. ACCOUNTABILITY, RESPONSIBILITY AND AUTHORITY

Chief Executive: Transnet Property/Chief Executive of affected OD.	• Declaration of BCM/temporary shutting down of the building/precinct.
Compliance Officer	At Transnet Group Level: • Ensure that there is compliance with all the approved procedures by Transnet SOC Ltd to ensure safety and health of the employees and to prevent any outbreaks. • Ensure compliance to COVID-19 measures • Ensure adherence to COVID-19 hygiene and health protocols • Ensure compliance to COVID-19 workplace plan
Deputy Compliance Officer	At designated OD/Region: • Ensure that there is compliance with all the approved procedures by Transnet SOC Ltd to ensure safety and health of the employees and to prevent any outbreaks. • Ensure compliance to COVID-19 measures

	• Ensure adherence to COVID-19 hygiene and health protocols • Ensure compliance to COVID-19 workplace plan
Compliance Coordinator	At designated Workplaces in OD/Region: • Ensure that there is compliance with all the approved procedures by Transnet SOC Ltd to ensure safety and health of the employees and to prevent any outbreaks. • Ensure compliance to COVID-19 measures • Ensure adherence to COVID-19 hygiene and health protocols • Ensure compliance to COVID-19 workplace plan
Facilities Manager (Transnet representative responsible for C&D)	• Responsible for the delivery of all maintenance activities including cleaning, hygiene, services, etc. at the designated building or region. • Maintain communication between the Cleaning and Disinfection (C & D) contractor and the Transnet SOC Ltd (TP) or Center Management regarding operational activity, maintenance and C & D. • Manage the cleaning contractor, including adherence to performance agreement in line with contractual obligations. • Ensuring compliance with statutory requirements as per Occupational Health and Safety Act and other related regulations/standards. • Responsible for co-ordinating the risk assessment
Cleaning Company (Cleaning & Hygiene (C&D)), R&HVAC Contractors	• Ensure that a Site Manager/ Customer Services Manager and adequate supervisors are appointed to ensure effective management of the cleaning service. Required to adequately staff each Transnet SOC Ltd premise or building with personnel to carry out the cleaning activities. • Maintain the Health and Safety management file. • Provide a cleaning checklist to be used by cleaning personnel to ensure that work is carried out according to specified cleaning scheduled. • Provide Material Safety Data Sheets (MSDS) for cleaning chemicals and materials. • Ensure the induction and orientation of new cleaning personnel, and annual orientation of all cleaning personnel is carried out, by relevant OD.
R&HVAC Contractors	• Ensure availability of cleaning agents for filters and availability of spare filters when needed.

Supervisor for the Cleaning and R&HVAC Contractor	• Be on the premises daily to report and where possible remedy any faults or irregularities which may affect daily operation. • Draw-up daily work schedules for cleaners under their management. • Ensure relevant personnel are registered in the work schedules including areas to which they are assigned. • Ensure the monitoring schedule is displayed on rest room doors and be responsible for the management and sign-off of the schedule during hourly rounds. • Keep accurate records of attendance of personnel and work schedules. • Perform daily walk-about and evaluation of all cleaning operations for areas under their supervision. • Manage the routine and ad-hoc cleaning activities as well as the disinfecting process for Transnet premises.
Supervisor R&HVAC Contractor	• Ensure that filters are cleaned and changed as per OEM requirement in line with the maintenance schedule. • Routine maintenance schedule to be displayed and updated regularly
Cleaner(s)	• Responsible to carry out all cleaning activities in line with contractual requirements.
Employees	• Complying with all the requirements stipulated in this procedure. • Ensuring employees are trained and competent for the work they are required to do in line with any changes. • Take accountability for assigned activities; and • Report any deviations.

5. STANDARD OPERATING PROCEDURE

5.1 This SOP is applicable to all Transnet buildings (owner and tenant occupied) and all its employees (including temporary and contract employees) who are engaged in the establishment and management of cleaning and hygiene services.

5.2 ROUTINE CLEANING

5.2.1 This Service covers the cleaning of offices, auditorium, studio's, lecture / boardroom /s, foyers, lobbies, kitchens, shops, stores, storage areas, workshops, toilets, windows, passages, stairs, glass facades, basement, parking, parking garages, entrance, lifts, sidewalks, paved/tared areas together with all the areas mentioned/listed in the Frequency of Service and the complete hygiene service, **see Annexure 3**.

5.2.2 The cleaning of offices and operational areas continually and regularly with the sole purpose of keeping the area neat, clean and hygienic form - dirt, dust, spills and/or hazardous bodies, including but not limited to the following:

5.2.2.1 Cleaning textile and non-textile floors, e.g. vacuum cleaning, steam cleaning, sweeping, moist and wet wiping and removing - stains,
5.2.2.2 Dusting and wiping surfaces and fixtures,
5.2.2.3 Cleaning and sanitizing washrooms and toilets,
5.2.2.4 Cleaning and polishing furnishings.

5.3 Legislation, standards and regulations are applicable to these services include, but are not limited to:

5.3.1 Occupational Health and Safety Act (Act 85 of 1993).
5.3.2 The Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act (Act 36 of 1947) as amended.
5.3.3 The Hazardous substance Act (Act 15 of 1973).

5.3.4 The Environmental Conservation Act (Act 73 of 1989).

5.3.5 Any other applicable legislation, regulation and standard.

5.4 Transnet SOC Ltd appointed Service Manager shall ensure that:

5.5 The service provider shall only use consumables and or cleaning agents that are SANS approved.

5.6 The service provider shall only use consumables and or cleaning agents that are suitable for the furniture and or equipment installed in the premises.

5.7 The service provider shall be responsible for the provision of all consumables, cleaning agents that might be needed in order to render an efficient service, at his own cost. Transnet SOC Ltd reserves the right to approve or disapprove these consumables and or cleansing agents.

5.8 The service provider shall provide Transnet SOC Ltd with the specification and Material Safety Data sheets of all consumables and cleaning agents to be utilised on or in the premises.

5.9 The service provider shall be responsible but not limited to providing and replacing of the following consumables and cleaning agents:

5.9.1 Toilet-paper;

5.9.2 Paper-towels;

5.9.3 Dish washing soap;

5.9.4 Automatic Deodorisers /and the batteries where applicable;

5.9.5 Disinfectants/Detergents (active ingredient to include sodium hypochlorite);

5.9.6 Furniture/Floor Polish;

5.9.7 Lining bags for bins;

5.9.8 Plastic/Refuse bags;

5.9.9 Toilet Liquid soap;

5.9.10 Automatic Air-fresheners /and the batteries where applicable etc;

5.9.11 She bins / and disinfectants;

5.9.12 Toilet seat wipes.

5.9.13 Foam hand soap

5.9.14 Handsfree soap dispenser/ batteries were applicable

5.10 No scouring powder or rough detergent may be used on glazed or enamel surfaces.

5.11 The service provider shall not use or keep any poisonous or highly flammable materials on the premises without the approval of the service manager and Risk Manager for rendering of this service or for whatever purpose.

5.12 The service provider shall be responsible for the following:

5.13 Ensuring that all employees under his employment wear relevant PPE e.g. gloves, masks and safety shoes for all tasks in cleaning process, including handling trash.

5.13.1 Additional Personnel Protective Equipment (PPE) might be required based on the cleaning/disinfectant products used and whether there is a risk of splash and of the task being executed.

5.14 Ensuring that employees under his or her employment are trained adequately on correct use of the above-mentioned PPE and proof of this placed on safety file.

5.15 Should a toilet, urinal or washbasin get blocked, the service provider must attempt to unblock it by means of a rubber pump or any other domestic equipment.

5.15.1 If his attempts are unsuccessful the service provider's personnel will provide an "out of order" and immediately report this condition to Transnet SOC Ltd.'s Service Manager who will take responsibility for the removal of the obstruction.

5.16 Should water in a building leak due to rain or defective water pipes etc., the service provider must dry it. However, it shall not be expected of the service provider to send personnel to the premises outside normal working hours for such a task, but the personnel of the service provider who are on the premises at that stage, will dry up the water and clean the damage.

5.17 Where and when necessary, curtains or blinds that must be cleaned according to the discretion of the Service Manager.

5.17.1 These curtains or blinds must be removed by the service provider and given to an institution approved by Transnet SOC Ltd for cleaning at the cost of Transnet SOC Ltd.

5.17.2 As soon as the relevant curtains/blinds are returned, they must be hung again properly and in the same position as previously.

5.17.3 Should curtains (lace curtains and linings included) or blinds be damaged during the handling thereof as a result of negligence on the part of the service provider, they must be repaired or replaced (depending on the nature of the damage) at the cost of the Service Provider to the satisfaction of Transnet SOC Ltd.

6. ROUTINE CLEANING EQUIPMENT

6.1 The service provider shall procure, acquire, install and maintain in good and safe working order all service equipment entirely at its own cost and shall have no claim based on enrichment or for compensation, or reimbursement or of any other nature whatsoever, against Transnet SOC Ltd.

6.1.1 The installation of any service equipment in or on the premises shall comply with the relevant manufacturer's specifications and shall comply with all safety laws and regulations pertaining to such service equipment and such installation.

6.1.2 Drilling of any holes in the floors, walls / tiles by the service provider or his sub-service provider will not be done without the prior approval of Transnet SOC Ltd.

6.2 No equipment, tools or instruments that might cause damage to the building, appliances, persons or the contents thereof, may be used.

6.3 The service provider shall not use defective electrical equipment that may cause nuisance tripping of the electricity supply.

6.4 The equipment used by the service provider must, where applicable, in all respects conform to The Occupational Health and Safety Act, 85 of 1993.

7. HYGIENE EQUIPMENT

7.1 The following hygiene equipment amongst others shall be installed:

7.1.1 1 x hand dryer per every four hand basins (except for single toilets)

7.1.2 1 x liquid/foam soap dispenser per every four hand basins (except for single toilets)

7.1.3 1 x Air freshener dispenser per toilet

7.1.4 1 x Sanitiser dispenser at entrance

7.1.5 1 x Triple toilet roll holder per toilet cubicle

7.1.6 1 x She Bin per ladies' toilet cubicle

7.1.7 Toilet seat wipes

7.2 Hygiene equipment for COVID-19 and related pandemic:

7.2.1 Non-contact infrared Thermometer: for temperature screening at the main entrance,

7.2.2 Sanitisers with 70%-90% alcohol concentration at the main entrances, all common areas, kitchen, toilets, boardrooms, etc.

7.2.3 Face masks and hand gloves at every entrance,

7.2.4 Biohazard bags,

7.2.5 Collecting systems,

7.2.6 Dustpans,

7.2.7 Safety cabinets.

8. CLEANING

8.1 The frequency of cleaning for high touch surfaces shall be increased, see table below. High touch surfaces include tables, buttons, doorknobs, countertops, handles, desks, phones, shared keypads, toilets, faucets, sinks, etc. Increased cleaning to these areas will assist in removing bacteria and minimizing the spread of viruses including COVID-19.

8.2 All persons within the precinct shall practice good hand hygiene after cleaning by washing their hands often with soap and water for at least 20 seconds or provided hand sanitizers that contains 70%-90% alcohol concentration.

8.3 CLEANING OF SURFACES:

8.3.1 Surfaces and objects that are visibly dirty shall be cleaned first with soap and water or approved detergent before disinfecting.

8.3.2 Surfaces where there was a person presenting with respiratory symptoms, i.e. coughing, sneezing, etc. shall be disinfected as soon as possible.

8.3.3 Only approved (SANS or equivalent) disinfection agent shall be used against the COVID-19 virus.

8.3.4 A chemical disinfectant meeting the requirements below should be applied after cleaning to kill any remaining microorganisms (recommended requirements for disinfectant by WHO):

8.3.5 Sodium hypochlorite (bleach) should be used at a recommended concentration of 0.1% (1000 ppm).

8.3.6 Alternatively, alcohol with 70%-90% concentration should be used for surface disinfection.

8.3.7 National Regulator for Compulsory Specifications (NRCS) Check website approved list (South Africa) of disinfectants:

8.3.7.1 https://www.nrcs.org.za/siteimgs/CMM/LOA/Disinfectant/Registration%20Database%20Chemical%20Disinfectants%202009-2020.pdf

8.3.7.2 Follow the manufacturer's instruction for safe and effective use of all disinfection products, i.e. dilution concentration, application method and contact time, required ventilation and use of PPE.

8.4 Electronic Equipment:

8.5 Manufacturer's recommendations shall be followed for cleaning of electronics equipment such as keypads, laptops, phones, etc.

8.6 Whenever possible, wipeable covers shall be used for electronic equipment.

8.7 Alcohol based wipes or sprays containing 70%-90% alcohol concentration shall be sprayed on a soft cloth for electronic equipment.

8.8 The surfaces shall be dried thoroughly to avoid pooling of liquids.

8.9 **Non-porous/hard surfaces:**

8.10 For non-porous/hard surfaces, a 0.1% bleach solution or alcohol with 70%-90% concentration and/or an approved COVID-19 disinfectant shall be used.

8.11 Soft/porous surfaces:

8.12 Remove visible contamination and clean with appropriate cleaners indicated for use on such surfaces.

8.13 After cleaning, launder items in accordance with the manufacturer's instructions. Should laundering be impossible, an approved disinfectant for COVID-19 shall be used.

9. DISINFECTION

9.1 Disinfection of facilities for control of Hazardous Biological Agents, COVID-19 in particular; takes place through a recommended manual cleaning and disinfection methods, which entails the following:

9.2 Manual cleaning/disinfection:

9.2.1 A manual process where direct interface of humans is involved not characterised with intense involvement of automation. This may include mopping, sweeping, brushing and wiping.

9.2.2 **Applicable use**: Accessible hard and soft surfaces for direct manual intervention such as garden areas, entertainment areas, balconies and stoops, walls, windows and facades, fire equipment, fire equipment cages, aircons and louvres, reception areas, staircases and passageways, boardrooms, bulk storage areas, workshops, offices, store rooms, toilets & showers, walkways, kitchens.

Advantages	**Disadvantages**
Primary cleaning method and does not require any skills	Labour intensive

Most cleaning chemical are readily available and easy to use	PPE is required for disinfection
	Cannot complete covers all the surfaces of the room.

9.3 This method (manual cleaning and disinfecting) may be applied on a regular basis to keep the facilities free of COVID-19 where necessary and practicable. A risk assessment must precede any cleaning/disinfecting activity in order to determine the extent of cleaning and disinfecting required. The risk assessment session may comprise of Technical/Facilities representative, cleaning and hygiene contractor wellness/HR representative; Deputy Compliance Officer and Risk Manager (regional) must be conducted.

9.4 The risk assessment sessions must produce the following documents/outcomes:

9.4.1 Method statement, clearly showing how the works will be conducted

9.4.2 The safety control measures during cleaning and disinfecting.

NB: *Below (Risk Assessment Guidelines) is an indicative, not exhaustive risk assessment questionnaires. This is meant to guide; further consideration shall be undertaken where required.*

10. CLEANING AND DISINFECTION REGIME IN INSTANCES OF POSITIVE CASES IN TRANSNET OCCUPIED BUILDINGS

10.1.1 In such instances after BCM and wellness guidelines, the building (s) shall be evacuated and the following procedure for cleaning and disinfection will follow:

10.1.2 Several studies have been conducted to establish how long the virus survives on different surfaces, however it is not yet conclusive, literature available shows that the virus can survive between 2 to 3 days.

10.1.3 Transmission is minor after 3 days in an indoor space after a person that tested positive for COVID-19 occupied the indoor space. It is therefore recommended

that there is no need to clean and disinfect in areas that were unoccupied for more than 3 days.

10.1.4 Due to the nature of the virus and the way it spreads from one person to the next, the work area is therefore assumed contaminated.

10.1.5 Routine cleaning should always be done using water and soap/detergent to remove organic matter first, followed by disinfection.

10.1.6 In line with World Health Organization (WHO) preventing and mitigating Covid -19 at work issued in 19 May 2021, (link https://www.who.int/publications/i/item/WHO-2019-nCoV-workplace-actions-policy-brief-2021-1) the use of misting or fumigation or fogging is not recommended for COVID-19. Manual disinfection of a contaminated areas(s) with a 0.1% bleach solution or alcohol with 70%-90% concentration.

10.1.7 The application of disinfectants on Transnet work areas by spraying or fogging (also known as fumigation or misting) is prohibited

10.1.8 High traffic areas and high touch surfaces should be identified for cleaning and disinfection multiple times daily.

10.1.9 In areas where routine cleaning and disinfection is done on a regular basis, there is no additional requirement for disinfection when there is a confirmed positive case.

10.1.10 When there's a confirmed positive case in areas where routine cleaning and disinfection is not done on a regular basis, cleaning and disinfection using a recommended disinfectant shall be done. The cleaning and disinfection shall include touch points that the positive case was in contact with. The disinfection of the work areas will ensure that traces of the virus are eliminated

10.1.11 Once cleaning and disinfection has been completed, the windows and doors should be kept open to promote the ingress of air and drying up of disinfected areas.

10.1.12 Cleaning workers must be provided with regular training on safe chemical handling and appropriate personal protective equipment.

10.1.13 Before a work area is re-occupied, a risk assessment must be conducted by the risk assessment team to ensure that all requirements have been satisfied and all prerequisites are in place.

10.1.14 After the cleaning and disinfection, the building/work area must be allowed to aerate for an acceptable period as determined by the risk assessment which is envisaged not to exceed thirty (30) minutes.

10.1.15 Once the risk assessment team has confirmed the work area(s) to be safe, the work area(s) can be reoccupied, and employees can be requested to return to work area(s) in line with the return to work policy specific to COVID-19 or similar.

10.1.16 Since all information on COVID-19 is not currently known and new information is emerging regularly, new methods of cleaning and disinfection and new chemicals as recommended by the relevant organisations must immediately be implemented in the best interests of Transnet and its employees in consultation with the Transnet representatives. It is acknowledged that this may have cost implications.

Refer to the "Pre And Post Disinfection Process Flow" below.

10.2 RISK ASSESSMENT GUIDELINES

10.2.1.1 When a new covid-19 positive case is identified in any of the Transnet buildings, within the same shift a risk assessment and cleaning & disinfection must follow immediately. The following guidelines provide an indication of a risk assessment that must be conducted prior to cleaning and disinfection:

10.2.1.2 A team comprising of the technical/facilities representative, cleaning and hygiene contractor, wellness/hr representative, deputy compliance officer and risk manager (regional) must conduct the risk assessment based on the case(s) reported.

10.2.1.3 The risk assessment shall establish the following:

Activity	Objective
How many COVID-19 positive cases identified have been reported in the building for that instance? *(Not cumulative number)*	To establish the risk of further infection to other individuals accessing the building and the extent of contamination in the building.

Establish when last the COVID-19 positive individual(s) visited the building and possible areas within the building an individual may have accessed? *This is part of the contact tracing*	To establish the extent of the contamination in the building and the possible presence of the virus on the surfaces.
Establish when last the identified contacts visited the building? *This is part of the contact tracing*	To understand further contamination in the building due to movement of the individual(s) who may be infected as a result of the identified COVID-19 positive case.
Establish the area m^2 that requires disinfection. Also detail the surfaces type, condition etc.	Will manual or disinfection be effective and feasible?
Criticality of the operation carried out in the building.	What is the allowable period to bring the operations to the stand still while disinfecting the building?
Whether the entire work area or a section of the work area will be disinfected?	To determine the feasibility of manual disinfection in case of a section disinfection.
Duration of the evacuation period. This to be informed by method used, chemicals used, etc	

10.2.2 The above is only indicative, the respective building risk assessment team should be able to give an indication of which disinfection method mix must be applied and subsequently the method statement clearly showing how the works will be carried out.

10.2.3 For consideration in the risk assessment:

10.2.4 Recent studies have suggested that COVID-19 can survive on surfaces, such as worktops or door handles, for up to three days. The virus was detected on plastic and stainless steel for up to 72 hours after exposure and on cardboard for up to 24 hours.

10.3 Refer to the "009-TPL-SS-QUAL-4668: Pre and Post Disinfection Evaluation Checklist".

Method Description	Applicable areas to be cleaned	Material	Equipment	PPE	Quality Control
Manual cleaning A manual process where direct interface of humans is involved not characterised with intense involvement of automation. This may include Mopping, Sweeping, Brushing and Wiping.	Accessible hard and soft surfaces for direct manual intervention such as Garden Areas, Entertainment Areas, Balconies and Stoops, Walls, Windows and Facades, Fire Equipment, Fire Equipment Cages, Aircons and Louvres, Reception Areas, Staircases and Passageways, Boardrooms, Bulk Storage Areas, Workshops, Offices, Store Rooms, Toilets & showers, Walkways, Kitchens (List not necessarily exhaustive) (Including all touch points)	Cleaning detergents, with sodium hypochlorite solution. Or an Ethanol based scrub with 70% (min) alcohol content	Brooms, Vacuum Machines, Mops, Buckets, Scrubbers, Dusters, cloths (List is not exhaustive)	Rubber Gloves, Steel Toe Safety Boots/Shoes, Masks and Cotton Overalls	Visual Assessment, check sheet/monitoring schedule and Microbiological Testing

11.3. The cleaning and disinfection activity schedule is indicated at **Annexure 4**.

Cleaning Requirement	Description	Cleaning Materials	Frequency
High touched areas cleaning	Cleaning of such as doors door knobs and locks, door push bars, doors and door casings, window sills and window cranks, stair and ramp hand railings, cupboard handles and drawer pulls, appliance faces and handles, light switches, table and desktops, desk drawer handles, telephones, key boards and mice, monitor frame, elevator buttons, credit card keypads, vending machine buttons, equipment controls, remote controls, chair armrests, bedrails, toilets seats and flush handles, faucets, soap pumps paper dispensers and bathroom stall partitions.	Approved disinfection agent shall be used against the COVID-19 virus or related pandemics.	Daily
Cleaning of HVAC filters	Mechanical cleaning of filters in line with the Original Equipment Manufacturer specification	As per the Original Equipment Manufacture	Monthly or as per approved & updated PM Schedule
Inspection and Pathogenic surveys	Appointing a service provider AIA to carry out hygienic surveys that include pathogenic surveys	N/A	Prior to occupation and 24 months thereafter

Deep cleaning and sanitisation	High pressure vacuum cleaning of the carpeted floors, using low foam chemical. Sanitization of chairs, tables and all contact surfaces.	Sanitizing using SANS approved sanitizer, grouped as class 3 in terms if flammable content, with propanol at 70% alcohol content.	Monthly
Misting (for harmful micro-organisms control)	Dispensing of chemicals by means of a Misting machine over a large area in a short space of time.	All-purpose biocidal cleaner that is water based, non-flammable and safe for Misting appliances.	As required and determined by risk assessment

11. TRAINING AND INDUCTION – SERVICE PROVIDERS AND TRANSNET EMPLOYEES

11.1.1 COVID-19 related induction with critical focus on hygiene maintenance and cleaning must be conducted with all Transnet SOC Ltd/Facilities managers responsible and involved in cleaning and facilities management. This will help to develop and maintain a high level of consciousness and understanding of cleaning importance.

11.1.2 The cleaning service provider should ensure training and regular retraining of the cleaning personnel. This training should be planned and focused on the reasons for cleaning, cleaning methods, personal safety and cleaning chemicals.

11.1.3 Cleaning personnel need to be adequately trained so they understand and respect the procedures that will ensure the effectiveness of the cleaning and disinfecting agents, use the proper personal protective equipment, prevent contamination of other areas and minimize occupational health and safety risks to personnel.

11.2 Records of training should be maintained. Standards of cleaning conducted by staff should be supervised to identify any deviation from the standards early on.

12. RESUMPTION OF BUSINESS

Prior to the resumption of the business post COVID-19, the following minimum requirements shall be put in place or at least be operational:

Minimum Requirements	**Frequency**
Hand sanitisers with a 70%-90% concentration of alcohol at the main entrances, toiles, boardrooms, etc.	Daily
Disinfection of buildings	Prior to occupation and as and when required.
Review and update cleaning and hygiene schedules and implement.	Once-off
Security to screen employees and visitors before accessing the site.	Once-off
Develop a plan for phased return to work	Once-off
Conduct detailed testing of all employees as they return to work.	Once-off

Provision of masks, gloves, thermometers and sanitizers	Once-off
Provide handheld temperature testing equipment at all entrance. Provide thermometers for all employees to conduct regular self-tests.	Once-off
Display and maintain posters promoting hand and respiratory hygiene	Daily
Conduct training on the proper use of PPE and awareness sessions with employees and contractors on prevention & screening methods	As per induction programmes
Put in place rigorous travelling approval. Review agreements with service providers for adequacy on hygiene requirements versus COVID-19 requirements. Pool cars to have disinfecting schedules.	As and when required/As per incident
Ensure each OD and department has the BCM plan in place for possible area infections	As and when required/As per incident
Renegotiate service contracts with service providers to cater for hygiene requirements due to COVI-19	As and when required/As per incident
Optimise space planning in line with physical distance.	As and when required/As per incident
Ensure each HVAC systems are regularly inspected and cleaned	As per the equipment Planned Maintenance Schedule
Conduct mandatory OHS surveys on all buildings	Prior to occupation or Every 24 months or whichever comes first
Promote digital registration of visitors	Before business resumption
Install glass or plastic screens at entrance or reception areas, interview	Before business resumption

rooms	

13.RECORDS

13.1.1 Register of detergent on site

13.1.2 Specifications for packaging

13.1.3 MSDS for all detergents and cleaning chemicals

13.1.4 Record of quantity and location for detergents stored.

13.1.5 All applicable Written Safe Work Procedures

13.1.6 Organogram of the Cleaning Company

13.1.7 Emergency contacts

13.1.8 Medical certificates of staff

13.1.9 Licenses and Permits

13.1.10 Section 37.2 Agreement

13.1.11 Permit to work

13.1.12 Registers of staff on site

13.1.13 Cleaning registers and activity schedules

13.1.14 Safety file

13.1.15 Training records

13.1.16 Cleaning and disinfection specifications

14.REFERENCE DOCUMENTS

NAME	REFERENCE NUMBER	APPLICABLE SECTION
National Department of Health (DOH) directives, guidelines and standards		
National Institute for Communicable Diseases (NICD) directives, guidelines and standards		
World Health Organization (WHO) directives, guidelines and standards		
United States Department of Agriculture directives, guidelines and standards		
Transnet Management Task Teams, Command Centres and Leadership directives		
Contractor Management Procedure	TRN-IMS-GRP-PROC 014	
Operational Planning and Control Procedure	TRN-IMS-GRP-PROC-009	
Document, Data and Records Management Procedure	TRN-IMS-GRP-PROC 010	
Energy Management System	ISO 50001:2011	Clause 4.4.3, 4.4.4, 4.7.2,
Environmental Management System Requirements	ISO 14001: 2015	Clause: Clause A.1.
General Requirements Procedure	TRN-IMS-GRP-PROC 003	
Integrated Risk Management Policy	TG/GRC 1/1/1P	
Objectives, Targets & Programmes Procedure	TRN-IMS-GRP-PROC 006	
Occupational Health and Safety Act 85 of 1993	Act No. 85 of 1993	
Occupational Health and Safety Management Assessment System	ISO 45001:2018	
Occurrence and Non-Conformance Management Procedure	TRN-IMS-GRP-PROC 013	
Operational Risk Management Procedure	TRN-IMS-GRP-PROC-004	
Quality Management System Requirements	SANS 9001:2015	
Risk Management	ISO 31000:2009	
Railway Safety Regulator Determination of Safety	Determination	

NAME	REFERENCE NUMBER	APPLICABLE SECTION
Management System and Safety Management System Reports		
Stakeholder Engagement Management Procedure	TRN-IMS-GRP-PROC-007	
Transnet Information classification Policy 2012		
Transnet Records Management Policy 2013		

15.ANNEXURES

15.1.1 **Annexure 1:** Pre and Post Disinfection Process Flow

15.1.2 REFER ATTACHED DOCUMENT

15.1.3 Annexure 2: Pre and Post Disinfection Evaluation Checklist **(009-TPL-SS-QUAL-4668)**

Refer attached document

16. Annexure 3: Routine Cleaning Activity Schedule

NOTE: The frequency term:

"When Applicable / as necessary" – This work at no additional cost.

"As required / on request" – This work will be undertaken as and when instructed at no additional cost.

1. CLEANING EXTERIOR OF BUILDING:		**Frequency**
1.1 Roads and Sidewalks:		
1.1.1	Sweep **roads, parking area and sidewalks.**	Daily
1.1.2	Sweep **pavement outside boundary** fence, rubbish will not be swept onto the road but must be removed.	Daily
1.1.3	Pick up and remove all **litter** in above areas and store in approved area.	Daily
1.1.4	Scrub/pressure clean above **areas.**	Where Applicable
1.1.5	Damp wipe **building name, information, emergency and route signs.**	Weekly
1.1.6	Empty, damp wipe **refuse bins** and replace inner refuse bags.	Daily
1.1.7	Remove stains and disinfect **refuse bins**, replace inner refuse bags.	Weekly
1.1.8	Remove all **graffiti.**	Where applicable
1.1.9	Clean all **storm water drains** by removing all litter, sand etc.	Daily
1.1.10	Clean and damp wipe **ashtrays.**	2 x Daily
1.1.11	Damp wipe **motor vehicle access control equipment.**	Weekly
1.2	**Garden areas:**	
1.2.1	Sweep **footpaths.**	Daily
1.2.2	Pick up and remove all **litter.**	Daily
1.2.3	Empty, damp wipe **refuse bins** and replace inner refuse bags.	Daily
1.2.4	Remove stains and disinfect **refuse bins**, replace inner refuse bags.	Weekly
1.2.5	Clean all **storm water drains** by removing all litter, sand etc.	Daily
1.2.6	Damp wipe **building name, information, emergency and route signs.**	Monthly
1.2.7	Dust and or damp wipe **garden furniture.**	Daily
1.2.8	Treat **garden furniture.**	Monthly
1.2.9	Dust and or damp wipe **garden light fittings.**	Weekly

1.2.10 Clean and damp wipe **ashtrays.**	2 x Daily
1.2.11 Dust **window frames –sills** on ground and first floor level.	Monthly
1.2.12 Damp wipe **window frames and -sills** on ground level.	Quarterly
1.2.13 Dust **air-conditioning units** on ground and first floor level.	Monthly
1.2.14 Damp wipe **air-conditioning units** on ground level.	Quarterly
1.3 Entertainment areas:	
1.3.1 Dry **floor** after rain.	When applicable
1.3.2 Empty, damp wipe **refuse bins** and replace inner refuse bags.	Daily
1.3.3 Remove stains and disinfect **refuse bins**, replace inner refuse bags.	Weekly
1.3.4 Clean and damp wipe all **work surfaces.**	Daily
1.3.5 Dust and damp wipe all **fire equipment.**	Monthly
1.3.6 Remove and shake out **entrance carpets.**	Daily
1.3.7 Remove spots and stains from **entrance carpets.**	When applicable
1.3.8 Clean and damp wipe **ashtrays.**	2 x Daily
1.3.9 Dust **natural / unsealed wood furniture** (chairs, tables, shelves, etc.).	Daily
1.3.10 Polish **sealed wood, glass, Formica, chrome, steel and plastic furniture** (chairs, tables, shelves, etc.)	When applicable
1.3.11 Damp wipe **electrical switches, plug points and light fittings.**	Monthly
1.3.12 Damp wipe **door handle / push plates.**	Daily
1.3.13 Polish **door handle / push plates.**	Monthly
1.3.14 Dust or damp wipe **doors and doorframes.**	Daily
1.3.15 Spot clean spots on **doors and or frames.**	When Applicable
1.3.16 Damp wipe **building name, information, emergency and route signs.**	Weekly
1.3.17 Polish **building name, information, emergency and route signs.**	Quarterly
1.3.18 Empty, clean and or store **fireplace / braai** after used. This includes braai grid.	When applicable
1.3.19 Wet wipe and dry **sink / prebo bowl.**	Daily
1.3.20 Remove mineral deposits and or stains from **sink / prebo, pipes, taps, gullies, drains.**	Weekly
1.3.21 Polish **sink / prebo and taps.**	Quarterly

1.3.22	Spot clean spots and marks on **walls.**	Where applicable
1.3.23	Clean all rainwater **drains** by removing all litter, sand etc.	Daily
1.3.24	Dust **window frames and -sills** on ground and first floor level.	Monthly
1.3.25	Damp wipe **window frames and -sills** on ground floor level.	Quarterly
1.3.26	Dust and damp wipe **pot plant holders** and remove litter.	Weekly
1.3.27	Dust **air-conditioning units** on ground and first floor level.	Monthly
1.3.28	Remove all **crockery and cutlery** to be washed.	When Applicable
1.3.29	Washed dried and stored **crockery and cutlery.**	When Applicable
1.4	**Balconies and stoops:**	
1.4.1	Remove dust on **hard floors and or skirting** with suitable broom, mop- or disposable cloth sweeper in such a way that it does not raise dust by using the appropriate equipment.	Daily
1.4.2	Damp mop **hard floors and or skirting** to remove soilage.	Monthly
1.4.3	Spray, clean or burnish **hard floors and or skirting** using a mechanised system to remove accumulated soilage.	When Applicable
1.4.4	Treat **floor and surfaces.**	6=Monthly
1.4.5	Dry **floor** after rain.	When Applicable
1.4.6	Remove and shake out **entrance carpets.**	Daily
1.4.7	Remove spots and stains from **entrance carpets.**	When Applicable
1.4.8	Empty, damp wipe **refuse bins** and replace inner refuse bags.	Daily
1.4.9	Remove stains and disinfect **refuse bins**, replace inner refuse bags.	Weekly
1.4.10	Dust and or damp wipe all **fire equipment.**	Monthly
1.4.11	Clean and damp wipe **ashtrays.**	2 x Daily
1.4.12	Damp wipe **electrical switches, plug points and light fittings.**	Monthly
1.4.13	Damp wipe **door handle / push plates.**	Daily
1.4.14	Polish **door handle / push plates.**	Monthly
1.4.15	Dust and damp wipe **doors and doorframes.**	Daily
1.4.16	Spot clean spots on **doors and or frames.**	When Applicable
1.4.17	Spot clean spots and marks on **walls.**	When Applicable
1.4.18	Dust **window frames and -sills** on applicable floors.	Monthly
1.4.19	Damp wipe **window frames and -sills** on applicable floors.	Quarterly
1.4.20	Dust and damp wipe **pot plant holders.**	Monthly
1.4.21	remove litter from **pot plant holders**	Daily

1.4.22	Dust **air-conditioning units** on applicable floors.	Monthly
1.4.23	Damp wipe **air-conditioning units** on applicable floors.	Quarterly
1.4.24	Clean all rainwater **drains** by removing all litter.	Daily
1.5	**Courtyards:**	
1.5.1	Sweep **courtyard areas** loading areas, fire escapes, service passages and service corridors depending upon the finish, in such a way that it does not raise dust by using the appropriate equipment.	Daily
1.5.1	Scrub above **areas** to remove all stain (oil, fuel-, brake fluid-, and any other stains) and where needed reseal.	When Applicable
1.5.2	Dry **floor** after rain.	When Applicable
1.5.3	Empty, damp wipe **refuse bins** and replace inner refuse bags.	Daily
1.5.4	Remove stains and disinfect **refuse bins**, replace inner refuse bags.	Weekly
1.5.5	Empty, clean and disinfect **wet waste bins**.	Daily
1.5.6	Damp wipe **electrical switches, plug points and light fittings.**	Monthly
1.5.7	Damp wipe **door handle / push plates.**	Daily
1.5.8	Polish **door handle / push plates.**	Monthly
1.5.9	Dust and damp wipe **doors and doorframes.**	Monthly
1.5.10	Spot clean spots on **doors and or frames.**	When Applicable
1.5.11	Damp wipe **information, emergency and route signs.**	Monthly
1.5.12	Polish **information, emergency and route signs.**	Quarterly
1.5.13	Remove mineral deposits and or stain from **pipes, taps, gullies, drains.**	Quarterly
1.5.14	Spot clean spots and marks on **walls.**	When Applicable
1.5.15	Dust **window frames and -sills** on ground and first floor level.	Monthly
1.5.16	Damp wipe **window frames and -sills** on ground floor level.	Quarterly
1.5.17	Dust **air-conditioning units** on ground and first floor level.	Monthly
1.5.18	Damp wipe **air-conditioning units** on ground level.	Quarterly
1.5.19	Dust and damp wipe all **fire equipment.**	Monthly
1.5.21	Clean all rainwater **drains** by removing all litter	Daily
1.6	**Walls:**	
1.6.1	Spot clean spots and marks on **walls.**	When Applicable

1.6.2 Remove all **graffiti.**	When Applicable
1.6.3 Damp wipe **building name, emergency, information and route signs.**	Monthly
1.6.4 Polish **building name, emergency, information and route signs.**	Quarterly
1.6.5 Damp wipe electrical **switches, plug points and light fittings** within three meters from ground level.	Monthly
1.6.6 Dust **window frames and -sills** on ground and first floor level.	Monthly
1.6.7 Damp wipe **window frames and -sills** on ground floor level.	Quarterly
1.6.8 Dust **air-conditioning units** on ground and first floor level.	Monthly
1.6.9 Damp wipe **air-conditioning units** on ground level.	Quarterly
1.6.10 Dust and or damp wipe all **fire equipment.**	Monthly
1.7 Windows and Facades:	
1.7.1 Ground floor **windows and frames** (on the outside) must be cleaned.	Monthly
1.7.2 All other floors **windows and frames** (on the outside) that can open must be cleaned from the inside.	6=Monthly
1.7.3 **Windows and frames** (on the inside) must be cleaned.	6=Monthly
1.8 Fire equipment cage:	
1.8.1 Sweep **fire equipment cage** and damp wipe valves, gauges, pipe work and signs.	Monthly
1.10 Delivery area and ramps:	
1.10.1 Sweep **delivery area and ramps** depending upon the finish, in such a way that it does not raise dust by using the appropriate equipment.	Daily
1.10.2 Scrub above **areas** to remove all stain (oil, fuel-, brake fluid-, and any other stains) and where needed reseal.	When Applicable
1.10.3 Dry **floor** after rain.	When Applicable
1.10.4 Empty, damp wipe **refuse bins** and replace inner refuse bags.	Daily

1.10.5 Pick up and remove all **refuse**. No refuse will be store or gathered in this area.	Daily
1.10.6 Remove stains and disinfect **refuse bins**, replace inner refuse bags.	Weekly
1.10.7 Clean and damp wipe **ashtrays.**	2 x Daily
1.10.8 Damp wipe **electrical switches, plug points and light fittings** within three meters from ground floor level.	Monthly
1.10.9 **Entrance doors and frames** must be cleaned.	Daily
1.10.10 Dust **window frames and -sills** on ground floor level.	Monthly
1.10.11 Damp wipe **window frames and -sills** on ground floor level.	Quarterly
1.10.12 Spot clean spots and marks on **walls.**	When Applicable
1.10.13 Remove all **graffiti.**	When Applicable
1.10.14 Damp wipe **electrical light fittings.**	Yearly
1.10.15 Damp wipe **handrails and or banister.**	Daily
1.10.16 Polish **handrails and or banister**.	Quarterly
1.10.17 Polish **door handle / push plates.**	Monthly
1.10.18 Dust and damp wipe **doors and doorframes.**	Monthly
1.10.19 Spot clean spots on **doors and or frames.**	When Applicable
1.11 Air-con and other louvers:	
1.11.1 Dust **air-con and other louvers** from the inside via window openings.	
1.11.2 Damp wipe **air-con and other louvers** from the inside via window openings.	6=Monthly
1.11.3 Spray / wash down **air-con and other louvers** with clean water.	Yearly
2 CLEANING INTERIOR OF BUILDING:	
2.1 Reception areas:	
2.1.1 Remove dust on **resilient and or hard floors** with mop- or disposable cloth sweeper.	Daily
2.1.2 Damp mop **resilient and or hard floors** for soilage.	Daily
2.1.3 Spray, clean or burnish **resilient and or hard floors** using a mechanised system to remove accumulated soilage.	When Applicable

2.1.4 Vacuum clean **rugs / carpets and or carpet floors.**	Weekly
2.1.5 Remove spots and stains from **rugs / carpets and or carpet floors.**	When Applicable
2.1.6 Interim clean **rugs / carpets and or carpet floors.**	When Applicable
2.1.7 Restorative clean **rugs / carpets and or carpet floors.**	When Applicable
2.1.8 Spot clean spots and finger marks on **walls and or partitioning.**	When Applicable
2.1.9 Wet wipe washable surfaces **walls and or partitioning.**	When Applicable
2.1.10 Dust **wooden panels and or partitions.**	Daily
2.1.11 Polish **wooden panels and or partitions.**	6=Monthly
2.1.12 Damp wipe all **information and emergency signs.**	6=Monthly
2.1.13 Damp wipe all **mirrors.**	Weekly
2.1.14 **Entrance doors and frames** must be cleaned.	Daily
2.1.15 **Glass facades** and frames on ground floor level must be cleaned.	Daily
2.1.16 Damp wipe **telephones and fax machines.**	Daily
2.1.17 Dust **skirting and or power skirting.**	Daily
2.1.18 Damp wipe **skirting and or power skirting.**	Monthly
2.1.19 Damp wipe **door handle / push plates.**	Daily
2.1.20 Dust or damp wipe **doors and doorframes.**	Weekly
2.1.21 Spot clean spots on **doors and or frames.**	When Applicable
2.1.22 Dust and damp wipe sealed wood / glass / Formica **reception counters.**	Daily
2.1.23 Polish sealed wood / glass / Formica **reception counters.**	Quarterly
2.1.24 Damp wipe **electrical switches, plug points.**	Monthly
2.1.25 Damp wipe **ceiling mounted electrical light fittings.**	6=Monthly
2.1.26 Dust and damp wipe **ceiling mounted air- con. / vents.**	6=Monthly
2.1.27 Dust **picture frames.**	Weekly
2.1.28 Damp wipe **picture frames.**	Monthly
2.1.29 Clean **glass (pictures).**	Monthly
2.1.30 Dust **painting frames.**	Weekly
2.1.31 Dust **paintings** in appropriate method.	Weekly
2.1.32 Dust **notes boards.**	Weekly
2.1.33 Damp wipe **notes boards.**	Weekly
2.1.34 Dust **railings and or handrails.**	Daily
2.1.35 Damp wipe **railings and or handrails.**	Weekly
2.1.36 Dust **access control accessories and equipment.**	Daily
2.1.37 Damp wipe **access control accessories and equipment.**	Weekly

2.1.38	Empty and damp wipe **dustbins.**	2 x Daily
2.1.39	Remove stains and disinfect **dustbins.**	Weekly
2.1.40	Remove and shake out **entrance carpets.**	Daily
2.1.41	Remove spots and stains from **entrance carpets.**	When Applicable
2.1.42	Dust and damp wipe **sealed wood, glass, Formica, chrome, steel and plastic furniture** (chairs, desks, tables, bookcases, shelves, cupboards, etc.).	Weekly
2.1.43	Polish **sealed wood, glass, Formica, chrome, steel and plastic furniture** (chairs, desks, tables, bookcases, shelves, cupboards, etc.).	Quarterly
2.1.44	Vacuum **furniture covered with cloth** (chairs, etc.).	Weekly
2.1.45	Spot clean **furniture covered with cloth** (chairs, etc.).	When Applicable
2.1.46	Shampoo **furniture covered with cloth** (chairs, etc.).	Yearly
2.1.47	Dust **furniture covered with vinyl and or leather** (chairs, desks, tables, etc.).	Daily
2.1.48	Damp wipe **furniture covered with vinyl and or leather** (chairs, desks, tables, etc.).	Monthly
2.1.49	Dust **ornaments.**	2 x Monthly
2.1.50	Damp wipe **ornaments.**	Quarterly
2.1.51	Dust **lamps.**	Daily
2.1.52	Damp wipe **lamps.**	Monthly
2.2	**Passageways and staircases.**	
2.2.1	Remove dust on **resilient and or hard floors** with mop- or disposable cloth sweeper.	Daily
2.2.2	Damp mop **resilient and or hard floors** for soilage.	Daily
2.2.3	Spray, clean or burnish **resilient and or hard floors** using a mechanised system to remove accumulated soilage.	When Applicable
2.2.4	Strip clean and reseal **resilient floors.**	Yearly
2.2.5	Vacuum clean **rugs / carpets and or carpet floors** (high traffic areas).	Weekly
2.2.6	Remove spots and stains from **rugs / carpets and or carpet floors.**	When Applicable
2.2.7	Interim clean **rugs / carpets and or carpet floors.**	Monthly

2.2.8 Restorative clean **rugs / carpets and or carpet floors.**	Quarterly
2.2.9 Spot clean spots and finger marks on **walls and or partitioning.**	When Applicable
2.2.10 Damp wipe washable surfaces **walls and or partitioning.**	When Applicable
2.2.11 Dust **wooden panels and or partitions.**	Weekly
2.2.12 Polish **wooden panels and or partitions.**	Quarterly
2.2.13 Clean **glass partitioning.**	Daily
2.2.14 Damp wipe all **information and emergency signs.**	Monthly
2.2.15 Polish all **information and emergency signs**, if from metal.	Quarterly
2.2.16 **Entrance doors and frames** must be cleaned.	Daily
2.2.17 Clean **windows** on the inside.	Quarterly
2.2.18 Dust **window frames.**	Weekly
2.2.19 Damp wipe **window frames.**	Quarterly
2.2.20 Dust **windowsills.**	Weekly
2.2.21 Damp wipe and remove marks on **windowsills.**	Monthly
2.2.22 Dust **skirting and or power skirting.**	Daily
2.2.23 Damp wipe **skirting and or power skirting.**	Monthly
2.2.24 Damp wipe **door handle / push plates.**	Daily
2.2.25 Dust and damp wipe **doors and doorframes.**	Monthly
2.2.26 Spot clean spots on **doors and or frames.**	When Applicable
2.2.27 Clean **glass doors.**	Daily
2.2.28 Damp wipe **electrical switches, plug points and wall mounted electrical light fittings.**	Monthly
2.2.29 Damp wipe **ceiling mounted electrical light fittings.**	Yearly
2.2.30 Dust **wall and or door mounted air- con. / vents.**	Weekly
2.2.31 Damp wipe **wall and or door mounted air- con. / vents.**	Monthly
2.2.32 Dust and damp wipe **ceiling mounted air- con. / vents.**	Yearly
2.2.33 Dust **picture frames.**	Weekly
2.2.34 Damp wipe **picture frames.**	Monthly
2.2.35 Clean **glass (pictures).**	Monthly
2.2.36 Dust **painting frames.**	Weekly
2.2.37 Dust **paintings** in appropriate method.	Monthly
2.2.38 Dust **notes boards.**	Weekly
2.2.39 Damp wipe **notes boards.**	Monthly
2.2.40 Dust **railings and or handrails.**	Daily
2.2.41 Damp wipe **railings and or handrails.**	Weekly

2.2.42	Empty and damp wipe **rubbish bins.**	Daily
2.2.43	Remove stains and disinfect **rubbish bins.**	Weekly
2.2.44	Dust **natural / unsealed wood furniture** (chairs, tables, shelves etc.).	Daily
2.2.45	Polish **natural / unsealed wood furniture** (chairs, tables, shelves etc.).	Quarterly
2.2.46	Dust and damp wipe **sealed wood, glass, Formica, chrome, steel and plastic furniture** (chairs, tables, shelves etc.).	Weekly
2.2.47	Polish **sealed wood, glass, Formica, chrome, steel and plastic furniture** (chairs, tables, shelves etc.).	Quarterly
2.2.48	Vacuum **furniture covered with cloth** (chairs, etc.).	Monthly
2.2.49	Spot clean **furniture covered with cloth** (chairs, etc.).	When Applicable
2.2.50	Shampoo **furniture covered with cloth** (chairs, etc.).	Yearly
2.2.51	Dust **furniture covered with vinyl and or leather** (chairs, tables, etc.).	Daily
2.2.52	Damp wipe **furniture covered with vinyl and or leather** (chairs, tables, etc.).	Weekly
2.2.53	Dust **ornaments.**	Weekly
2.2.54	Damp wipe **ornaments.**	2 x Monthly
2.2.55	Dust **lamps.**	Weekly
2.2.56	Damp wipe **lamps.**	Monthly
2.2.67	Dust **Roller shutter doors.**	Daily
2.2.68	Damp wipe roller **shutter doors.**	Weekly
2.3	**Toilets and bathrooms:**	
2.3.1	Damp mop to remove all marks, mineral deposits and dirt and polish on **resilient and or hard floors.**	2 x Daily
2.3.2	Light scrub, dry and apply maintenance coat on **resilient and or hard floors** to remove accumulated soilage.	6=Monthly
2.3.3	Spot clean spots and finger marks on **walls.**	When Applicable
2.3.4	Wet wipe and dry washable surface **walls.**	When Applicable
2.3.5	Damp wipe **door handle / push plates.**	Daily
2.3.6	Dust and damp wipe **doors and doorframes.**	Monthly
2.3.7	Spot clean spots on **doors and or frames.**	When Applicable

2.3.8	Damp wipe **electrical switches, plug points and wall mounted electrical light fittings.**	Monthly
2.3.9	Damp wipe **ceiling mounted electrical light fittings.**	Yearly
2.3.10	Damp wipe **ceiling mounted air- con. / vents.**	6=Monthly
2.3.11	Damp wipe **wall and or door mounted air- con. / vents.**	Weekly
2.3.12	Dust and damp wipe **notes boards.**	Weekly
2.3.13	Clean **notes boards** glass doors.	Weekly
2.3.14	Damp wipe all **mirrors.**	Daily
2.3.15	Dust **mirror frames.**	Daily
2.3.16	Polish **mirror frames.**	Weekly
2.3.17	Dust and damp wipe **vanity slabs.**	2 x Daily
2.3.18	Clean **windows** on the inside.	Quarterly
2.3.19	Dust **window frames.**	Monthly
2.3.20	Damp wipe **window frames.**	Quarterly
2.3.21	Damp wipe and remove marks on **windowsills.**	Daily
2.3.22	Remove dust from **vertical blinds.**	Monthly
2.3.23	Damp wipe **horizontal blinds.**	Monthly
2.3.24	Dust and damp wipe all **electrical equipment** such as (hand-, hair-dryers, heaters etc)	Daily
2.3.25	Remove soilage from **toilet bowls, basins and urinals**, under flushing mechanism and or taps.	Daily
2.3.26	Remove litter from **urinals.**	Daily
2.3.27	Mop floor at **urinals.**	2 x Daily
2.3.28	Remove mineral deposits and or stain from **toilet, basins, urinal, gullies, drains,** flushing mechanism and or taps.	Monthly
2.3.29	Damp wipe **toilet** seat, lid, cistern, pipes, taps, flushing mechanism, etc.	2 x Daily
2.3.30	Dust and damp wipe all **other components / equipment** such as (bins, waste disposer, towel-, soap dispenser, toilet roll holder, aerosol air freshener etc.).	Daily
2.3.31	Ensure usability and **replenish consumables.**	2 x Daily
2.4	**Kitchens:**	

2.4.1	Damp mop to remove all marks, mineral deposits and dirt on **resilient and or hard floors.**	Daily
2.4.2	Light scrub, dry and apply maintenance coat on **resilient and or hard floors** to remove accumulated soilage.	6=Monthly
2.4.3	Spot clean spots and finger marks on **walls.**	When Applicable
2.4.4	Wet wipe and dry washable surface **walls.**	Weekly
2.4.5	Damp wipe **door handle / push plates.**	Daily
2.4.6	Dust and damp wipe **doors and doorframes.**	Daily
2.4.7	Spot clean spots on **doors and or frames.**	When Applicable
2.4.8	Damp wipe **electrical switches, plug points and wall mounted electrical light fittings.**	Weekly
2.4.9	Damp wipe **ceiling mounted electrical light fittings.**	Yearly
2.4.10	Damp wipe **ceiling mounted air- con. / vents.**	6=Monthly
2.4.11	Dust **wall and or door mounted air- con. / vents.**	Monthly
2.4.12	Damp wipe **wall and or door mounted air- con. / vents.**	Weekly
2.4.13	Dust and damp wipe **work tops.**	Daily
2.4.14	Clean **windows** on the inside.	Monthly
2.4.15	Dust **window frames.**	Weekly
2.4.16	Damp wipe **window frames.**	Monthly
2.4.17	Dust **windowsills.**	Weekly
2.4.18	Damp wipe and remove marks on **windowsills.**	Monthly
2.4.19	Dust and damp wipe **refrigerator and or fridge tops.**	Monthly
2.4.20	Damp wipe **refrigerator and or fridge.**	Daily
2.4.21	Remove contents from **refrigerator and or fridge** and damp wipe shelves.	Quarterly
2.4.22	Defrost **refrigerator and or fridge** remove contents and damp wipe shelves.	Quarterly
2.4.23	Dust and damp wipe **stove, oven and or microwave.**	Daily
2.4.24	Damp wipe and clean inside of **oven and or microwave.**	Daily
2.4.25	Dust and damp wipe **dish washer top.**	Monthly
2.4.26	Damp wipe **dish washer.**	Daily
2.4.27	Clean filter inside of **dish washer.**	Weekly
2.4.28	Wet wipe and dry **sink.**	Daily
2.4.29	Remove mineral deposits and or stain from **sink, pipes, taps, gullies, drains.**	Monthly

2.4.30 Empty **waste bins** and damp wipe.	Daily
2.4.31 Remove stains and disinfect **waste bins.**	Daily
2.4.32 Dust cupboards.	Daily
2.4.33 Damp wipe **cupboards.**	Weekly
2.4.34 Damp wipe and clean inside of **cupboards.**	Monthly
2.4.35 Polish outside of **cupboards.**	When Applicable
2.4.36 Wash, dry and store **crockery and cutlery.**	When Applicable
2.4.37 Ensure usability and **replenish consumables.**	2 x Daily
2.5 Broom rooms:	
2.5.1 Damp mop to remove all marks, mineral deposits and dirt and polish on **resilient and or hard floors.**	Daily
2.5.2 Light scrub, dry and apply maintenance coat on **resilient and or hard floors** to remove accumulated soilage.	Yearly
2.5.3 Spot clean spots and finger marks on **walls.**	When Applicable
2.5.4 Damp wipe washable surface **walls**	Quarterly
2.5.5 Damp wipe **door handle / push plates.**	Daily
2.5.6 Dust and damp wipe **doors and doorframes.**	Weekly
2.5.7 Spot clean spots on **doors and or frames.**	When Applicable
2.5.8 Damp wipe **electrical switches, plug points and wall mounted electrical light fittings.**	Monthly
2.5.9 Damp wipe **ceiling mounted electrical light fittings.**	Yearly
2.5.10 Damp wipe **ceiling mounted air- con. / vents.**	Yearly
2.5.11 Dust **wall and or door mounted air- con. / vents.**	Weekly
2.5.12 Damp wipe **wall and or door mounted air- con. / vents.**	Quarterly
2.5.13 Clean **windows** on the inside.	Monthly
2.5.14 Dust **window frames.**	Monthly
2.5.15 Damp wipe **window frames.**	Monthly
2.5.16 Dust **windowsills.**	Monthly
2.5.17 Damp wipe and remove marks on **windowsills.**	Monthly
2.5.18 Wet wipe and dry **washing trough.**	Daily
2.5.19 Remove mineral deposits and or stain from **washing trough, pipes, taps, gullies, drains.**	Monthly

2.6 Offices:	
2.6.1 Remove dust on **resilient and or hard floors** with mop- or disposable cloth sweeper.	Daily
2.6.2 Damp mop **resilient and or hard floors** for soilage.	Weekly
2.6.3 Spray, clean or burnish **resilient and or hard floors** using a mechanised system.	Monthly
2.6.4 Strip clean and reseal **resilient floors**.	Yearly
2.6.5 Vacuum clean **rugs / carpets**.	Weekly
2.6.6 Remove spots and stains from **rugs / carpets.**	When Applicable
2.6.7 Interim clean **rugs / carpets.**	Quarterly
2.6.8 Restorative clean **rugs / carpets.**	When Applicable
2.6.9 Spot clean spots and finger marks on **walls and or partitioning.**	When Applicable
2.6.10 Dust **wooden panels and or partitions**.	Weekly
2.6.11 Clean **glass partitioning.**	Weekly
2.6.12 Damp wipe all **information and emergency signs.**	Quarterly
2.6.13 Damp wipe all **mirrors.**	Weekly
2.6.14 Clean **windows** on the inside.	Quarterly
2.6.15 Dust **window frames**.	Monthly
2.6.16 Damp wipe **window frames.**	Quarterly
2.6.17 Dust **windowsills**.	Weekly
2.6.18 Damp wipe and remove marks on **windowsills.**	Monthly
2.6.19 Remove dust from **vertical blinds.**	Monthly
2.6.20 Dust and or Damp wipe **horizontal blinds.**	Monthly
2.6.21 Dust **skirting and or power skirting**.	Weekly
2.6.22 Damp wipe **skirting and or power skirting.**	Monthly
2.6.23 Damp wipe **electrical switches, plug points and wall mounted electrical light fittings.**	Monthly
2.6.24 Damp wipe **ceiling mounted electrical light fittings.**	Yearly
2.6.25 Dust **consol air-conditioning unit.**	Daily
2.6.26 Damp wipe **consol air-conditioning unit.**	Monthly
2.6.27 Dust and damp wipe **ceiling mounted air- con. / vents.**	6=Monthly
2.6.28 Dust **picture frames**.	Weekly
2.6.29 Damp wipe **picture frames**.	Monthly
2.6.30 Clean **glass (pictures frames).**	Monthly

2.6.31 Dust **painting frames.**	Weekly
2.6.32 Dust **paintings** in appropriate method.	Monthly
2.6.33 Dust **notes boards.**	Weekly
2.6.34 Damp wipe **notes boards.**	Monthly
2.6.35 Dust **natural / unsealed wood furniture** (chairs, tables etc.).	Daily
2.6.36 Polish **natural / unsealed wood furniture** (chairs, tables etc.).	Quarterly
2.6.37 Dust and damp wipe **sealed wood, glass, Formica, chrome, steel and plastic furniture** (chairs, tables etc.).	Daily
2.6.38 Polish **sealed wood, glass, Formica, chrome, steel and plastic furniture** (chairs, tables etc.).	Quarterly
2.6.39 Vacuum **furniture covered with cloth** (chairs, etc.).	Weekly
2.6.40 Spot clean **furniture covered with cloth** (chairs, etc.).	When Applicable
2.6.41 Shampoo **furniture covered with cloth** (chairs, etc.).	Yearly
2.6.42 Dust **furniture covered with vinyl and or leather** (chairs, tables, etc.).	Daily
2.6.43 Damp wipe **furniture covered with vinyl and or leather** (chairs, tables, etc.).	Weekly
2.6.44 Dust **ornaments.**	Weekly
2.6.45 Damp wipe **ornaments.**	2 x Monthly
2.6.46 Dust **lamps.**	Weekly
2.6.47 Damp wipe **lamps.**	Monthly
2.6.48 Dust and damp wipe **work tops.**	Daily
2.6.49 Dust and damp wipe **refrigerator tops.**	Daily
2.6.50 Damp wipe **refrigerator.**	Monthly
2.6.51 Remove contents from **refrigerator** and damp wipe shelves.	Quarterly
2.6.52 Defrost **refrigerator** remove contents and damp wipe shelves.	Quarterly
2.6.53 Empty **waste bins** and damp wipe.	Daily
2.6.54 Remove stains and disinfect **waste bins.**	Weekly
2.7 Bulk storage:	
2.7.1 Remove dust on **resilient and or hard floors** with mop- or disposable cloth sweeper.	Daily
2.7.2 Damp mop **resilient and or hard floors** for soilage.	Monthly

2.7.3	Spray, clean or burnish **resilient and or hard floors** using a mechanised system to remove accumulated soilage and apply maintenance coat.	Quarterly
2.7.4	Strip clean and reseal **resilient floors.**	Yearly
2.7.5	Vacuum clean **rugs / carpets.**	Weekly
2.7.6	Remove spots and stains from **rugs / carpets.**	When Applicable
2.7.7	Interim clean **rugs / carpets.**	Quarterly
2.7.8	Restorative clean **rugs / carpets.**	Yearly
2.7.9	Spot clean spots and finger marks on **walls and or partitioning.**	When Applicable
2.7.10	Damp wipe all **information and emergency signs.**	Quarterly
2.7.11	Clean **windows** on the inside.	Quarterly
2.7.12	Dust **window frames.**	Monthly
2.7.13	Damp wipe **window frames.**	Monthly
2.7.14	Dust **windowsills.**	Weekly
2.7.15	Damp wipe and remove marks on **windowsills.**	Monthly
2.7.16	Dust **skirting and or power skirting.**	Weekly
2.7.17	Damp wipe **skirting and or power skirting.**	Monthly
2.7.18	Damp wipe **electrical switches, plug points and wall mounted electrical light fittings.**	Monthly
2.7.19	Damp wipe **ceiling mounted electrical light fittings.**	Yearly
2.7.20	Dust and damp wipe **ceiling mounted air- con. / vents.**	6 Monthly
2.7.21	Dust **notes boards.**	Weekly
2.7.22	Damp wipe **notes boards.**	Monthly
2.7.23	Dust **natural / unsealed wood furniture** (chairs, tables etc.).	Daily
2.7.24	Polish **natural / unsealed wood furniture** (chairs, tables etc.).	Quarterly
2.7.25	Dust and damp wipe **sealed wood, glass, Formica, chrome, steel and plastic furniture** (chairs, tables etc.).	Monthly
2.7.26	Polish **sealed wood, glass, Formica, chrome, steel and plastic furniture** (chairs, tables etc.).	Quarterly
2.7.27	Vacuum **furniture covered with cloth** (chairs, etc.).	Weekly
2.7.28	Spot clean **furniture covered with cloth** (chairs, etc.).	When Applicable
2.7.29	Shampoo **furniture covered with cloth** (chairs, etc.).	Yearly
2.7.30	Dust or damp wipe **counters.**	Daily
2.7.31	Empty **waste bins** and damp wipe.	Daily
2.7.32	Remove stains and disinfect **waste bins.**	Weekly

2.8 Service ducts:	
2.8.1 Sweep **hard floors.**	Quarterly
2.8.2 Dust and damp wipe **pipes, ducting, fire equipment** etc.	6=Monthly
2.8.3 Spot clean spots and finger marks on **walls.**	When applicable
2.8.4 Damp wipe **electrical switches, plug points and light fittings.**	Quarterly
2.8.5 Damp wipe **door handle / push plates.**	Monthly
2.8.6 Dust and damp wipe **doors and doorframes.**	Monthly
2.8.7 Spot clean spots on **doors and or frames.**	When Applicable
2.9 Board Rooms:	
2.9.1 Vacuum clean **rugs / carpets.**	Daily
2.9.2 Remove spots and stains from **rugs / carpets.**	When applicable
2.9.3 Interim clean **rugs / carpets.**	Quarterly
2.9.4 Restorative clean **rugs / carpets.**	When Applicable
2.9.5 Spot clean spots and finger marks on **walls and or partitioning.**	When Applicable
2.9.6 Damp wipe washable surfaces **walls and or partitioning.**	Monthly
2.9.7 Dust **wooden panels and or partitions.**	Monthly
2.9.8 Polish **wooden panels and or partitions.**	Quarterly
2.9.9 Damp wipe all **information and emergency signs.**	Quarterly
2.9.10 Damp wipe all **mirrors.**	Daily
2.9.11 Clean **windows** on the inside.	Quarterly
2.9.12 Dust **window frames.**	Monthly
2.9.13 Damp wipe **window frames.**	Monthly
2.9.14 Dust **windowsills.**	Daily
2.9.15 Damp wipe and remove marks on **windowsills.**	Monthly
2.9.16 Remove dust from **vertical blinds.**	Monthly
2.9.17 Dust and or Damp wipe **horizontal blinds.**	Monthly
2.9.18 Dust **skirting and or power skirting.**	Weekly
2.9.19 Damp wipe **skirting and or power skirting.**	Monthly
2.9.20 Damp wipe **electrical switches, plug points and wall mounted electrical light fittings.**	Monthly
2.9.21 Damp wipe **ceiling mounted electrical light fittings.**	Yearly

2.9.22 Dust **picture frames.**	Weekly
2.9.23 Damp wipe **picture frames.**	Monthly
2.9.24 Clean **glass (pictures frames).**	Monthly
2.9.25 Dust **painting frames.**	Weekly
2.9.26 Dust **paintings** in appropriate method.	Monthly
2.9.27 Dust **natural / unsealed wood furniture** (chairs, beds, tables etc.).	Daily
2.9.28 Polish **natural / unsealed wood furniture** (chairs, beds, tables etc.).	Quarterly
2.9.29 Dust and or damp wipe **sealed wood, glass, Formica, chrome, steel and plastic furniture** (chairs, tables etc.).	Daily
2.9.30 Polish **sealed wood, glass, Formica, chrome, steel and plastic furniture** (chairs, tables etc.).	Quarterly
2.9.31 Vacuum **furniture covered with cloth** (chairs, etc.).	Weekly
2.9.32 Spot clean **furniture covered with cloth** (chairs, etc.).	When Applicable
2.9.33 Shampoo **furniture covered with cloth** (chairs, etc.).	Yearly
2.9.34 Dust **furniture covered with vinyl and or leather** (chairs, tables, etc.).	Daily
2.9.35 Damp wipe **furniture covered with vinyl and or leather** (chairs, tables, etc.).	Weekly
2.9.36 Dust **ornaments.**	Weekly
2.9.37 Damp wipe **ornaments.**	2 x Monthly
2.9.38 Dust **lamps.**	Daily
2.9.39 Damp wipe **lamps.**	Monthly
2.9.40 Empty **waste bins** and damp wipe.	Daily
2.9.41 Remove stains and disinfect **waste bins.**	Weekly
2.9.42 Remove **linen** to be washed and replace.	Weekly
2.9.43 Make **beds**	Daily
2.10 Moth balled areas:	
2.10.1 All **areas including rooms** to be cleaned and vacuumed	6=Monthly
2.10.2 Sweep Moth Balled Area	6=Monthly
2.10.3 Damp Wipe Moth Balled Area	6=Monthly

3.1	**Waste removal:**	
3.1.1	Without prejudice to the removed contents of wastebaskets and ashtrays, as well as office waste, must be removed tidily in bags, for example, and placed in all the garbage cans that have been made available for this purpose.	Daily
3.1.2	Sort wastepaper (split white paper, brown paper and card boxes), metal cans, plastic and glass in different containers that will be rendered to waste dealers in such a way as will be indicated to him.	Daily
3.1.3	Garbage must be stored temporarily in garbage cans in area supplied by the Transnet SOC Ltd in garbage bags supplied at a place on the relevant premises as indicated.	Daily
3.1.4	Remove refuse to the loading point as prescribed by the Local Council on days when the relevant Local Council removes refuse or where any other refuse collector as organised by Transnet SOC Ltd will collect refuse.	Weekly

17. ANNEXURE 4: COVID-19 AND RELATED PANDEMIC CLEANING AND DISINFECTION ACTIVITY SCHEDULES

Cleaning Requirement	Description	Cleaning Materials	Frequency
High touched areas cleaning	Cleaning of such as doors door knobs and locks, door push bars, doors and door casings, window sills and window cranks, stair and ramp hand railings, cupboard handles and drawer pulls, appliance faces and handles, light switches, table and desktops, desk drawer handles, telephones, key boards and mice, monitor frame, elevator buttons, credit card keypads, vending machine buttons, equipment controls, remote controls, chair armrests, bedrails, toilets seats and flush handles, faucets, soap pumps paper dispensers and bathroom stall partitions.	Approved disinfection agent shall be used against the COVID-19 virus or related pandemics.	Daily
Cleaning of HVAC filters	Mechanical and chemical cleaning of filters in line with the Original Equipment Manufacturer specification	As per the Original Equipment Manufacture	Monthly
Deep cleaning and sanitisation	High pressure vacuum cleaning of the carpeted floors, fabric, or similar surfaces using low foam chemicals. Sanitization of chairs, tables and all contact surfaces.	Sanitizing using SANS approved sanitizer, grouped as class 3 in terms if flammable content, with propanol at 70% alcohol content.	Monthly

Misting (for harmful micro-organisms control)	Dispensing of chemicals by means of a Misting machine over a large area in a short space of time.	All-purpose biocidal cleaner that is water based, non-flammable and safe for Misting appliances.	As determined by risk assessment
Mechanical Cleaning (High pressure and or high temperature > 80 Degrees Celcius)	High temperature and/or pressure cleaning lifts, stubborn dirt, grime, and enables follow up cleaning/wiping to effectively remove all dirt/contaminants. Must only be used as per specification applicable to surfaces concerned. Suitable for cleaning large surfaces that include HVAC equipment, walls, floors etc.	Sanitizing using SANS approved sanitizer, grouped as class 3 in terms if flammable content, with propanol at 70% alcohol content.	Monthly (as a separate intervention or in combination with above
COVID 19 Waste Removal	Gloves, masks and other waste generated in the building should be disposed of in the allocated biohazards bags located at all predetermined positions. All COVID-19 related waste must be separated at the point of generation. Employees must be trained, regularly reminded on the requirements to safely dispose discarded gloves, masks and other waste streams associated with COVID-19.	Biohazards bags	As per maintenance schedule

	Collection, transportation and disposal of waste must only be carried out by a licensed waste disposal company and records pertaining to the disposal thereof must be kept.		

TRANSNET

INTEGRATED MANAGEMENT SYSTEM

ACCESS AND EGRESS CONTROL PROCEDURE

Document number	01
Business Name	TPL Security
Version number	1.0
Process/ Activity Name	Security Access and Egress Control
Effective date	01 March 2021
Review date	01 February 2022

SUMMARY VERSION CONTROL

VERSION NO.	NATURE OF AMENDMENT	PAGE NO.	DATE REVISED
1.0	New Procedure		

Note: Only latest amendments and/or additions are reflected in italics in the body of the document.

DOCUMENTATION SIGN-OFF SHEET

I, the undersigned hereby approve this procedure.

ROLE	CAPACITY/ FUNCTION	SIGNATURE	DATE
Process Owner:	**National Security Manager: Transnet Pipelines**		24/2/2021
Accepts document for adequacy and practicability. Comments:			
Approval Committee:	**TPL Regulatory Forum**		26/03/21
Approves document for use. Comments:			

TRANSNET

TABLE OF CONTENTS

1. PURPOSE

The purpose of this procedure is to provide a basis for security personnel to operate within the access and egress control space across all Transnet Pipelines Critical Infrastructures Facilities, (Previous National Key Points) Hence, the users of this operating procedure need to be familiar with the contents of the document and in particular their individual roles and responsibilities. This will also ensure that they conduct themselves appropriately during security incidents, daily duties and emergencies and thereby contribute to:

- Protection of assets;
- Restoration of the facility to normal operating conditions as soon as possible after an incident;
- Safety of the public, employees and visitors, and
- Protection of the environment

2. APPLICABILITY

This procedure is applicable to all Protection Officers, whether contracted or permanent and Personnel that operate within Transnet Pipelines.

3. REFERENCE DOCUMENTS

NAME	REFERENCE NUMBER	APPLICABLE SECTIONS
Control of Access to Public Premises and Vehicles (As amended)	Act No. 53 of 1985	Section 2
Critical Infrastructure Control Act, 2019	Act No. 8 of 2019	The entire Act
Firearm Control Act 60 of 2000 (As amended) Transnet Firearm & Ammunition control Standard	60 of 2000 Ref 1, 2 May 2017	The Firearm Act The entire standard
Criminal Procedure Act	Act 1977 (As amended)	Section 20, 22, 23(1)(a);37(1)(a);40
Physical Security Industry Regulatory Authority "PSIRA" Act 56 of 2001	Chapter 4 Section 38	Code of conduct Offences and penalties
Transnet Security Policy Framework – 01 April 2019	TG/CMSG12/1/6P	Specific baseline requirement, policy statement

4. DEFINITIONS AD ABBREVIATIONS

Definitions

In this procedure, the following acronyms, words and/or expressions shall, unless otherwise stated or inconsistent with the context in which they appear, bear the same meanings:

- **Authentic Records,** means records that can be proven to be what they purport to be, also considered official records by their creators.
- **Asset,** means any tangible or intangible object/resource/information that has value and owned by a business or an economic entity. It is anything (tangible or intangible) that can be owned or controlled to produce value and that is held by an economic entity and that could produce positive economic value. Assets are made available to authorized entities only.
- **Confidentiality,** means characteristics that apply to information. To protect and to preserve the confidentiality of information is to not be made available or disclosed to unauthorized entities.
- **Conflict of Interest,** a situation in which a person is in a position to derive personal benefit from influence, intellectual property, actions or decisions made in their official capacity. When a person's or entity's vested interests raise a question of whether their actions, judgment, and/or decision-making can be unbiased due to some form of relations.
- **Classified Information**, means sensitive information in any form, in the national interest, is held by, produced or is under the control of the state, or which concerns the state and which must by reasons of its sensitive nature be exempt from disclosure and must enjoy protection against compromise.
- **Critical Infrastructure Protection Act 2019,** means the new Act that replaces the National Key Point Act.
- **CSO**, means Chief Security Officer.
- **Employees,** means an employee of Transnet whether employed on a fixed or indefinite term contract.
- **Facility** means a permanent, semi-permanent, or temporary commercial or industrial property such as a building, plant, or structure, built, established, or installed for the performance of one or more specific activities or functions.

Abbreviations

- **GCSO,** means Group Chief Security Officer.
- **NSM,** means National Security Manager.
- **NOC,** means TPL's National Operations Centre located in Pinetown.
- **NC,** means TPL's Nerve Centre located within NOC.
- **SNC Operator** means security personnel employed within TPL's Nerve Centre.
- **NC Security Supervisor**, means Nerve Centre Security Supervisor that supervises the Nerve Centre Security Operators within the Nerve Centre.
- **NC Manager,** means Nerve Centre Manager that manages the Nerve Centre and team.
- **OB,** means either electronic or manual occurrence book.
- **PO,** means Protection Officer. (Contracted or Transnet Employees)
- **RSS,** means Regional Security Supervisor.
- **Record Keeping,** means making and maintaining complete, accurate and reliable evidence of official business in the form of recorded information.
- **SPO,** means Senior Protection Officer.
- **SP**, means Security Practitioners.
- **Threat,** means a potential unwanted event. When a threat turns into an actual occurrence, it may cause an unwanted occurrence. It is unwanted because the occurrence may harm an organization, system and or process.
- **TRA,** means Threat Risk Assessment.
- **Transnet,** means Transnet SOC Ltd and includes its Operating Divisions and Specialist Units.

5. ACCOUNTABILITY, RESPONSIBILITY AND AUTHORITY

5.1 Chief Executive: Ultimately accountable for the Security of Transnet Pipelines.

5.2 National Security Manager/Chief Security Officer: Accountable for security at TPL. To lead, direct and coordinate security activities within TPL and to use all resources optimally to achieve TPL's security mandate. Shall enforce this standard operating procedures and policies listed in this SOP.

5.3 TPL Regional Security Supervisor: is responsible for daily supervision of Senior Protection Officers (SPO's) and Protection Officers (PO's) and security operations under his Region and jurisdiction. Interphases with Contracted Security Providers and reports directly to the NSM.

5.4 Senior Protection Officers: are responsible for security under their allocated facilities and NKP Clusters. Interphases with the RSS and the Security Provider at his/her level.

5.5 Protection Officers: are responsible for the Access & Egress Control, patrolling and reporting within the area allocated to on TPL Sites and NKP's. Interphases with the SPO, RSS and his contracted reporting structures.

6. PROCEDURE

Conditions of entry at all TPL premises

All persons entering TPL premises shall:

- Be in possession of a valid Transnet Pipelines access card or visitor's card.
- Report to the Security checkpoint upon entry. The Protection Officer will ensure that the entry is recorded and a visitor's access card is issued. (Annexure B – Access Control Register)
- The visitors access card must be displayed in a clearly visible manner at all times when on a Transnet Pipelines site/depots.
- Ensure their visitor access card returned to the guard on duty before leaving TPL site/depot. This may not pass the main gate for any reason whatsoever.
- No firearms are allowed on Transnet Pipelines premises as per Transnet Firearms and Ammunition Control Policy and TPL Instructions. Non declaration

of firearms is viewed as a serious non-compliance and consequent management in terms of relevant policies.

- No employee, visitor or contractor is permitted to take any photographs at any time without written approval from the TPL National Security Manager.
- All Cell phones are to be turned off when entering restricted areas. These restricted areas are clearly marked at all TPL sites.
- Vehicles and persons entering the site/depots are subject to a search.
- All persons entering TPL sites are subject to a Breathalyzer testing, searching, COVID-19 scanning and adhering to all COVID-19 protocols. Refusal will result in access being denied.
- All laptops serial numbers to be recorded in the register provided.
- It shall be the responsibility of the TPL employee requesting access, for visitor to NKP premises to ensure that security clearance obtained, prior to entry.
- The TPL employees requesting access to NKP premises for visitors shall as far as possible notify and/or submit the prescribed application form accompanied by positive identification of the persons to the National Security/Facility Manager or their Representatives at least 24 hours prior to their visit.
- The TPL employee requesting access to NKP premises for non-TPL staff shall inform such visitors of the security & safety requirements and procedures that they must adhere to upon entry.
- All Transnet/TPL Employees must insert the correct/actual time of arrival and departure in the Gate Registers and Protection Officers must monitors this activity closely for non-conformances.

Identification – Access Card

Protection Officers are authorized to request and see the identification of any person on TPL premises, whether that person is an employee or non-employee. Any TPL employee or TPL student who refuses to comply with a Protection Officer's request for identification is subject to disciplinary action by TPL.

The following procedure/process shall apply:

- All access into Transnet Pipelines' facilities is managed using access cards.
- All persons issued with an access card shall ensure that the access card is always displayed in a visible manner on their person and is under their control and safeguarded when not in use.
- In the case of damage of an access card, the concerned person shall produce the damaged access card to the TPL National Security Manager.
- In the case of loss or theft of the access card, the concerned person shall, without delay, report such loss to the TPL National Security Manager and submit a detailed signed report supported by the relevant line manager outlining the circumstances resulting in the loss or theft of the card. In the case of theft a South African Police (SAP) case number must be submitted and included in the report.
- If negligence is found as the root cause for the loss / theft of the access card then the replacement cost of a new card will be for the account of the person in whose custody the card was.

Firearm and related incidents

All care must be taken when handling firearms on TPL Sites. This includes that the firearm in any TPL Site remains **unloaded** at all times until instructions received from TPL NSM or CE. Extreme safety precautions are to be carried out when accepting or handing over firearms. Should a firearm incident occur, the incident must be immediately reported to the Nerve Centre, closest SAPS & Provider Control Room and the following information must be provided:

- Who is reporting the incident? Name & Surname, title, contact numbers (landline telephone / Cell phone, company name, department name, employee / SAP number.
- Who is involved, full details, Name & Surname, title, contact numbers (landline telephone / cell phone, company name, department name, employee / SAP number.
- What exactly transpired, the time of the incident, location and who else was involved?
- If there are victims / injured person should be noted and their extent of injuries.

- Render first aid if necessary.
- Do not contaminate area or touch any evidence relevant to the firearm incident until SAPS/Investigator arrives.
- Update OB and complete and submit relevant report/statement.
- Keep the Nerve Centre constantly updated.

Foot Patrols and general duties at access points

Consistent foot patrols and general duties must be executed at access points of the facility. To ensure compliance the following procedure must be followed:

- Hourly foot patrols and inspections must be conducted to ensure that the facility is secured and free from vandalism and theft. On completion of all physical checks/patrols, the guard monitoring system (GMS) must be activated and occurrence book (OB) updated as evidence.
- Protection Officers must remain vigilant and alert at all times and report all incidents and activities to the Nerve Centre and Provider Control Room timeously.
- Protection Officers must familiarise themselves will all Site Notices and regulations, Safety procedures and Planned Job Observations Checklists in order to be compliant at all times.
- Safeguard completed Registers & Occurrence Books and provide to RSS/SPO.
- Follow Annexure B: Planned Job Observation Checklist that consist of Breathalyser testing, COVD-19 scanning and searching.

Handing over duties

The following procedure must be followed when handing over duties to the next shift:

- During handover all matters still outstanding must be explained and handed over to next shift to follow-up, and recorded as such in the OB.
- Outstanding incidents and Shift Reports must be handed over to follow up were necessary.

- All assets in the Security Kiosks must be handed over in the Occurrence Book from one shift to the other and "acknowledgement of receipt" indicated.

NB: Disaster Management Act, 2002

The above procedure may be amended as and when required to facilitate any reflections or requirements of a National State of Disaster Management Act, 2002.

7. RECORDS

7.1 Stored/ filed Access Control Register

7.2 Stored/ filed Visitors Register

7.3 Stored/ filed Firearm Control Register

7.4 Stored/ filed Occurrence Book

7.5 Stored/ filed Declaration Register

7.6 Stored/ filed After-hours access control register

8. ANNEXURES

8.1 **Annexure A**: Incident and alarm activation process flow.

8.2 **Annexure B**: Planned Job Observation Checklist.

8.3 **Annexure C**: Site Shift Report.

8.4 **Annexure D**: ID Access Card Application Form

8.5 **Annexure E**: Visitors Register/Log Book

8.6 **Annexure F**: Key Control Register

8.7 **Annexure G**: Official Firearms Register

8.8 **Annexure H**: Coronavirus Pandemic Contingency Plan

STANDARD OPERATING PROCEDURE FOR PERSONAL PROTECTIVE EQUIPMENT (PPE)

Document number	009-TPL-OPS-SHEQ-2096
Business Name	Transnet Pipelines
Process/ Activity Name	Personal Protective Equipment
Process Owner Name	Phumi Blose
Process Owner Signature	
Version Number	2.0
Classification	Unclassified
Effective Date	01 June 2023
Review Date	29 May 2026

SUMMARY VERSION CONTROL

VERSION NO.	NATURE OF AMENDMENT	PAGE NO.	DATE REVISED
1.0	New SOP		
2.0	Changed the document from Personal Protective Equipment (PPE) Procedure to Standard Operating Procedure for Personal Protective Equipment (PPE)	All	25 /08/2022
2.0	Heading 3. Reference Documents, divided the documents into internal and external documents	6	25 /08/2022
2.0	Listed PPE specific SANS reference numbers	6 - 7	25 /08/2022
2.0	Inclusion of new heading 6.4 Procurement of PPE	15	25 /08/2022
2.0	Inclusion of new heading 6.5 Issuing of PPE	16	25 /08/2022
2.0	Amend clause 6.8 to include boiler suit (one piece overall)	17	25 /08/2022
2.0	Included new heading 6.9.6.1 Flame Retardant Rain Suits	20	25 /08/2022
2.0	Included new heading 6.9.6.2 Flame Retardant Thermal Jackets	20	25 /08/2022
2.0	Inclusion of the new heading 6.9.6.3 Flame Retardant Reflective Vests / Bibs	20	25 /08/2022
2.0	Revised clause 6.9.7 Respiratory Protection to include A2 Organic Vapour Cartridge respirators to be used for protection against organic vapours	21	25 /08/2022
2.0	Inclusion of the new heading 6.9.8 Arc Flash Protection	21 - 22	25 /08/2022

Note: Only latest amendments and/or additions are reflected in italics in the body of the document

TABLE OF CONTENTS

1. PURPOSE

To ensure appropriate provision and use of personal protective equipment in addition to other forms of control, to further minimize the risk of harm to Transnet Pipelines personnel, customers, contractors, visitors and suppliers.

2. APPLICABILITY

- This procedure is applicable to Transnet Pipelines employees, its contractors, visitors, or any other person needing to enter an area where PPE is identified as a requirement to mitigate against harm to a person.
- This procedure will apply to all sites under the control of Transnet Pipelines inclusive of all depots, workshops, buildings and servitudes where the risk is identified, and PPE is required.

2.1 NOT IN SCOPE

Flame retardant clothing (FRC) requirements do not apply to areas where there is no potential for flash fire exposure, unless specifically indicated, FRC would not apply in the following areas:

- Administrative Buildings
- National Operations Centre (NOC)
- TPL School of Pipelines
- Head Office
- Non – Operational areas of the facility
- Parking areas

PPE free zone will be areas where individuals are unlikely to be exposed to hazardous conditions or substances due to work activity being performed or prevailing environmental conditions and where such signage is displayed.

3. REFERENCE DOCUMENTS

Internal documents:

- Operational Risk Management Procedure: TRN–IMS–GRP–PROC-004
- Compliance Obligation Procedure: TRN–IMS–GRP–PROC-005
- Operational Planning and Control Procedure: TRN-IMS-GRP-PROC-009

External documents:

- Occupational Health and safety Act No. 85 of 1993
- Railway Safety Management System – Part 1, SANS 3000 -1:2016

NAME	REFERENCE NUMBER
Chemical resistant gloves	SANS 416
Work Wear suits	SANS 434
Protective and Safety Gum boots, all made from rubber	SANS 492
Personal protective equipment and protective clothing against the thermal hazards of an electric arc flash.	SANS 724
Barrier creams	SANS 1282
PVC Gumboots: Part 1, Injection-moulded Gumboots	SANS 1320
Sun Brim	SANS 1387
Industrial Safety Helmet	SANS 1397
Equipment (including oculars) for eye, face and neck protection against non-ionizing radiation arising during welding and similar operations - Welding helmets, hand shields, goggles and welding spectacles	SANS 1400
Eye-protectors for industrial and non-industrial use	SANS 1404
Hearing protectors Part 1 Earmuffs	SANS 1451-1
Hearing protectors Part 2 Ear plugs	SANS 1451-2
Hearing protectors Part 3 Earmuffs	SANS 1451-3
Sunscreen products	SANS 1557
Prescription Eyewear	SANS 1644

NAME	REFERENCE NUMBER
Safety Footwear	SANS 20345
Respiratory protective devices – Full face masks - Requirements, testing, marking	SANS 50136
Respiratory protective devices – Half masks and quarter masks – Requirements, testing and marking	SANS 50140
Respiratory protective devices – Mouthpiece assemblies - Requirements, testing and marking	SANS 50142
Respiratory protective devices – Particle filters – Requirements, testing and marking	SANS 50143
Respiratory protective devices – Filtering half masks to protect against particles –Requirements, testing, marking	SANS 50149
Full body harnesses	SANS 50361
Reflective Vests/bibs	SANS 50471

4. DEFINITIONS AND ABBREVIATIONS

4.1 Definitions

Contractor an employer (Organization) or a person who performs any work and has entered into a legal binding business agreement or contract to supply a product or provide services to Transnet.
Employee any person who is on an indefinite (permanent) contract of employment or on a fix term contract or any person who works for Transnet and who receives, or who is entitled to receive any remuneration, and other person who in any manner assist in carrying on or conducting the business of Transnet.
Engineering Controls physical engineering interventions that will create a physical barrier between human interactions and interface with identified hazards.
Hazard a source of or exposure to danger.
Hazard Assessment conducting inspections of workplace or tasks to determine if hazards are present.
IMS Operational Coordinator is an internal appointee tasked with the responsibility of ensuring that the duties of Transnet Pipelines as an employer contemplated in the applicable pieces of legislation such as OHS Act, are properly discharged.
Line Manager is an employee who directly manages other employees and operations – It includes Supervisor, Team Leader, Managers, etc.
Off Site is any other area outside of the defined TPL operating premises where TPL personnel, contractors may be engaged in operating, maintenance and / or repair work.
Personal Protective Equipment is a special type of clothing or devices that are used to protect workers from exposure to a variety of workplace hazards.

PPE Forum

It is a medium where ideas and views on PPE matters are exchanged and experiences with regards PPE matters identified and resolved. The forum is constituted with Labour, HR-EAP, ER, OPS, TECH, Risk, Procurement, SHE Representatives.

Primary Area

Primary Area is the area where pipelines intake, deliveries, receipt, intermixture processing, rail operations, as well as road tankers loading, and offloading operations are taking place. Where products (petrol, jet fuel, diesel, crude oil, intermixture, etc.) are stored, loaded, offloaded, or handled and where exposure to hazardous conditions or substances are likely due to a work activity being performed or prevailing environmental conditions.

These are areas within Intake Stations, Delivery Depots, Booster Pump Stations, Terminals, Pump Station, Through Station, Workshops in operations depots, Intermixture Refractionator Plant fence lines, off site and servitude included where production and storage facilities, pipelines and related equipment are located and operated. The areas include where field work is being performed on behalf of TPL. **These areas generally include but not limited to:**

- Fenced area with vessels or pipes containing hydrocarbons
- Loading gantries
- Rail loading areas
- Plant area
- Manifold
- Pump slabs
- Tank farms and related equipment
- Pipelines or vessels with hydrocarbons
- Offices (with potential for flash fire, hazardous condition or substances exposure)
- Block Valves
- Exposed Pipelines
- Test centers or laboratories

Risk Assessment process of hazard identification, risk analysis, risk evaluation and risk mitigation planned and implemented per task / activity.
Workplace a place where work is carried out for Transnet.

4.2 Abbreviations

dBA	Decibel
EAP	Employee Assistance Programme
EN	European Norms
ER	Employee Relations
EXCO	Executive Committee
IMS	Integrated Management System
ISO	International Organization for Standardization

NOC	National Operations Centre
OHS Act	Occupational Health and Safety Act, Act 85 of 1993
OPS	Operations
PPE	Personal Protective Equipment
SABS	South African Bureau of Standards
SANS	South African National Standards
SHEQ	Safety, Health, Environment and Quality
SOP	Standard Operating Procedure
TECH	Technical
TIMS	Transnet Integrated Management System
TOMS	Transnet Occurrence Management System
TPL	Transnet Pipelines

5. ACCOUNTABILITY, RESPONSIBILITY AND AUTHORITY

EXCO	• Ensure compliance with legislation and ensure that systems are in place to manage potential risks in relation to PPE. • Ensuring that the organization complies with the PPE Procedure and that the appropriate controls are implemented and applied • Ensure that adequate resources are provided to ensure compliance with the PPE procedure requirements.
Line Manager	• Ensure that this procedure is fully implemented. • Ensure that signs are posted in conspicuous locations at the workplace, including on plant and equipment, wherever a requirement is identified and confirmed to use PPE. • Implementing and enforcing PPE use in the workplace. • Providing the required PPE and ensuring that it is available to employees. • Ensuring that employees are trained on the proper use, care and retention of PPE. • Ensuring that defective or damaged PPE is returned, disposed of and immediately replaced. • Ensure contractors and subcontractors supply appropriate PPE for their own workers. • Maintain any PPE records as required by this procedure. • Ensure that PPE is worn by all employees and used correctly • Dispose of PPE in line with procedure. • Inspect and examine employees PPE for wear, damage or failure.

Visitors & Suppliers	• Adhere to TPL PPE requirements for entry into a primary area • Provide own basic PPE i.e., safety boots, flame retardant Conti suits and hard hat • Properly wearing PPE as required
Employees	• Properly wearing PPE as required, ensuring a good fit. • Use appropriate PPE at locations where signage requires its use and or when risk assessment identifies the need • Attending required training sessions, for the safe use of the specific PPE • Perform pre-use inspection for wear, damage, or failure prior to PPE use • Reporting any wear, damage, or failure to line management immediately • Properly caring for, cleaning, maintaining, and inspecting PPE as required • Properly store PPE as per manufacturer's recommendations
Contractors	• Supply all mandatory and other specific PPE to its employees. • Ensure issuance is recorded – PPE register. • Ensure that PPE issued is adequate for the workplace hazards. • Maintain PPE in a clean and reliable condition. • Ensure that PPE is worn by all its employees. • Ensure that PPE is inspected. • Dispose PPE in line with the requirements of this procedure
Procurement	• Acquire instructions on use, fitting and maintenance of PPE from suppliers. • Purchases of PPE made in line with this procedure and predefined standards and specifications.
PPE Forum	• Approve any changes to PPE requirements.

	• Investigate and approves requests for deviation in relation to PPE
SHEQ Team	• Ensure that this procedure is reviewed and updated at planned intervals or upon request as informed by changing circumstances and conditions. • Ensure that the changes to this procedure are widely communicated. • Ensure standardization. • Evaluate the level of compliance to the requirements of this procedure through internal audits.

6. STANDARD OPERATING PROCEDURE

Personal Protective Equipment is considered as the last resort, in instances where the workplace hazard cannot be removed through elimination, substitution, engineering and administrative controls. Full implementation of the elements outlined in the Personal Protective Equipment Procedure will minimize potential injuries as a result of exposure to workplace hazards. Adherence to this SOP is mandatory

6.1 STANDARD

- Transnet Pipelines shall not require or permit any employee and / or contractor to work unless such an employee and / contractor is issued with the required personal protective equipment and makes proper use thereof.
- The correct required PPE must always be worn
- Symbolic signs indicating PPE requirements must be prominently displayed at entrances or designated areas on the premises where additional PPE is required. These signs must comply with the applicable national standard.
- All persons shall comply with and wear the appropriate PPE as specified in work permits, mandatory signs, procedures, specifications, and risk assessments.
- Task specific PPE in addition to standard PPE shall be determined through risk assessment

- No person working in close proximity to moving machinery shall wear any loosely fitting outer clothing, any jewelry or ornament, any watch or key - chain, and loose - hanging hair or anything which may be caught up in the moving parts of such machinery.
- All PPE issued shall comply with the applicable SANS standard
- PPE must be stored in accordance with the manufacturer's requirements and / or recommendations.

6.2 HAZARD ASSESSMENT FOR PPE

- Each facility will perform a hazard assessment of the workplace to determine if hazards are present, or are likely to be present, which necessitate the use of PPE.
- In order to assess the need for PPE, a walk – through assessment must be conducted using the prescribed **PPE Hazard Assessment form, TRN – IMS – TPL – FRM – 001.1** to identify sources of hazards to all persons.
- Each assessment will be documented using the Hazard Assessment Form, **PPE Hazard Assessment form, TRN – IMS – TPL – FRM – 001.1** which identifies the work area assessed, the person conducting the assessment, findings of potential hazards, and date of the assessment, the forms will be kept in the safety files. It will assist to determine proper selection of PPE.
- Hazard assessment information leads to the development of the **PPE matrix** which lists required PPE by task, see **Annexure 8.2, TRN – IMS – TPL – GDL – 001.1.**
- The hazard assessment and resulting PPE matrix is designed to be an evergreen document.

6.3 PPE SELECTION

- PPE requirements for a particular task or for a particular area must be determined through a risk assessment for that task or area.
- PPE is selected based on risk assessment and exposure to a hazard. It is important that a risk assessment be undertaken to ensure that the best PPE is selected for each activity and location.
- Once the hazards of a workplace have been identified, IMS Coordinator will determine if the hazards can first be eliminated or reduced by methods other than PPE, i.e., methods that do not rely on employees' behavior, such as engineering controls.
- All PPE will be of safe design and construction for the work to be performed and will be maintained in a clean, well maintained and reliable condition.
- Careful consideration will be given to the comfort and proper fit of PPE in order to ensure that the right size is selected and that it will be used.

6.4 PROCUREMENT OF PPE

- Procured PPE must be compliant to applicable SANS specifications.
- Where non-complying PPE is delivered, the delivery should not be accepted and in the event that it is picked up late, a nonconformance report must be issued for the Supplier to rectify within 30 days.
- A list of approved alternative PPE suppliers must be at hand should there be quality issues with the quality of PPE.
- Ensure adequacy of PPE supplies at the stores so that it is readily available when required.
- Purchases of PPE made in line with this procedure and Transnet Pipelines PPE specifications.
- All PPE to comply with the relevant SANS standard requirements after being tested against required international standards. Tested as per standards listed in Transnet Pipelines PPE specifications.
- To check the quality of a PPE is to conduct testing to assess compliance with relevant test standards. To ensure that the product is fit for purpose and performs in the manner it is intended to. Supplier must submit the following documents:

ITEMS	REQUIREMENTS
Product description	A description of the product(s) must be provided by the supplier. It must include: o brand or trade name, o model or product reference, o intended use, o a list of the materials used to manufacture the product, o expected lifetime, approximate number of washes o approved storage conditions
Test reports	Official test reports (all pages, in English) originating from accredited test labs. Accredited facilities should be ISO 17025 certified. o Signed Test reports should clearly indicate the accredited laboratory name and accreditation (to be able to check authenticity of test reports). o Test standard must be within the scope of the accreditation of the laboratory. Detailed material technical data sheet from the original material manufacturer

6.5 ISSUING OF PPE

- PPE shall be issued to personnel in line with the Transnet Pipelines PPE Matrix.
- The quantities and the frequency of issuing PPE to personnel is outlined on the Transnet Pipelines PPE Matrix.
- Depending on the activity undertaken or work area, additional PPE may be issued as informed by the risk assessment.
- When issuing PPE, careful consideration must be given to the comfort and proper fit in order to ensure that the right size is selected and used.
- Where PPE is damaged, the employee would return the soiled/contaminated/damaged /worn PPE to their First Line Manager (Supervisor) to be issued with new PPE.
- A log of PPE issued must be kept.

6.6 INFORMATION, INSTRUCTION AND TRAINING

Any employee required to wear PPE shall be provided with information, instruction and training which is appropriate to the PPE being worn. The employee will be instructed in the correct use and care of PPE at point of issue of the PPE.

Periodic retraining will be offered to PPE users as needed. The training will include, but not limited to the following subjects:

- Manufacturer's manuals must be always followed, when in doubt the employee must request information or training as the case may be.
- When PPE needs to be used (per PPE Matrix)
- What PPE needs to be used (per the PPE Matrix)
- How to properly put on, remove, adjust, and wear PPE
- The limitations of PPE
- The proper care, maintenance, useful life, and disposal of PPE

Training of each employee will be documented using the **training attendance register (TRN – IMS – GRP – ATR – 008 – 3)** and **Annexure 8.1 PPE training certification form (TRN – IMS – TPL – FRM – 001.2)**. The document certifies that the employee has received and understood the required training on the specific PPE he / she will be using. Completed documents must be emailed to HR Enquiries (HREnquiries@transnet.net) – To be saved / stored on the employee's file.

6.7 CLEANING, REPLACING AND MAINTENANCE OF PPE

- Employees shall follow necessary guidelines in accordance with the manufacturer to ensure that PPE is always in a good level of cleanliness, well maintained and safe for use.
- Employees must regularly inspect, clean, and maintain their PPE according to the manufacturers' stipulated guidelines.

- If an item of PPE has worn out, has become damaged, or is found to be defective in any way, it must be replaced. Defective PPE must be returned to stores with the knowledge of the line manager or supervisor and disposed of correctly.
- Contaminated and defective PPE shall be properly stored and handled in the same manner as hazardous waste and shall be disposed of as hazardous waste.

6.8 MANDATORY PPE WHEN ENTERING PRIMARY AREAS

As a minimum, the following PPE must always be worn by all persons (including visitors) when accessing Transnet Pipelines Primary areas:

- Dromex DW – D59 FA, 100% cotton, flame retardant and Acid resistant SABS approved conti suit with long sleeves, fully zipped up at all times. Materials meeting the requirements of SANS 434, antistatic properties EN 1149 with silver reflective strip (50mm in width) on each sleeve around upper arm and each leg, meeting the requirements for EN471 conti suit or,
- Dromex DW – D59 FA - O, 100% cotton, flame retardant and Acid resistant SABS approved conti suit with long sleeves, fully zipped up at all times. Materials meeting the requirements of SANS 434, antistatic properties EN 1149 with silver reflective strip (50mm in width) on each sleeve around upper arm and each leg, meeting the requirements for EN471 boiler suit (one piece overall).
- Clothing worn under the overall must be 100% cotton – Compliant Golf shirts are stock items, available at the stores.
- Safety footwear with steel toe cap, oil and hydrocarbon resistant sole, anti-perforation sole, anti-static, anti-slip sole and breathable leather uppers.
- Socks 100% cotton, antistatic used in conjunction with safety boots and / or shoes.
- Hard hat with chin straps meeting requirements of SANS 1397
- Flame retardant clothing shall always be worn in or close to areas where hydrocarbons are present in any pipeline or vessel.
- Flame retardant clothing shall also apply where there is foreseen exposure to hydrocarbons with the potential to produce flash fire.
- Thermal Jackets – Parka Dromex DW D59-SABS Flame retardant acid resistant 100% cotton (inclusive of the lining of the jacket).

6.9 USE OF PPE – DIFFERENT TYPES

This section addresses general PPE requirements, including eye and face, head, foot, leg, hand, arm, body (torso) protection, and protection from drowning and fall protection.

Types of PPE may include overalls, protective footwear, gloves, goggles, face shields, safety glasses, hard hats, safety harnesses, ear plugs and earmuffs or any other similar safety equipment necessary to render persons safe.

6.9.1 Head Protection

- Hard hats should be worn in areas where there is potential for head injuries. Head injuries are commonly caused by impact from falling or flying objects, falling or walking into hard objects, tripping and falling unto sharp or protruding objects.
- All hard hats shall bear the SABS mark and meet the requirements of SANS 1397.
- Hard hats shall have an adjustable three-point webbing chin strap in accordance with SANS 1397.
- All persons working at elevated positions must always wear hard hat with chin strap and shall apply chin strap on their hard hats. This is mandatory for employees when loading rail tankers, dipping bulk trucks, storage tanks.
- Wearing of bucket hat, bandanas or beanies underneath the hard hat is forbidden.
- Individuals who use synthetic hair pieces (wigs, extensions, weaves) or have dreadlocks are always required to wear Fire Retardant Hair Cap and a hard hat with a chin strap secured in areas where the wearing of hard hat is required or dictated.
- Sun brim 100% cotton with fabric that meets the requirements of SANS 1387 – 4, Material type D59, and flame retardant can be used with the hard hat for the protection from the sun.
- Flame retardant winter liner can be used with the hard hat for the protection from the cold weather.

6.9.1.1 Supply and Replacement of Hard Hats

- Hard hat has a limited lifespan from the date of issue to employees. Hard hats must be replaced two years after being issued.
- All hard hats shall be marked with date of issue. The date of issue should be marked on an additional sticker on the inside of the hard hat at the back of the shell.
- Any hard hat showing damage (e.g. dents, cracks or holes etc.) or deterioration (e.g. excessive discoloration or brittleness) shall be removed from service immediately and replaced.

6.9.2 Hearing Protection

- Hearing protection must be worn when entering a workplace with a noise level at or above 85 dBA. An area with a noise level at or above 85 dBA noise rating limits will be identified by an ear protection sign.
- Hearing protection must be worn when using noisy equipment with a noise level at or above 85dBA such as compressors, angle grinders, etc. Equipment with a noise level at or above the 85 dBA noise rating limit will be identified by an ear protection sign.
- Hearing protection must be worn where health risk assessment on the site shows that there is a risk of exceeding the acceptable noise exposure levels and must be indicated with an ear protection sign at the applicable areas.

- Hearing protection in the form of SANS approved ear plugs or earmuffs.
- Earmuffs shall be in accordance to SANS 1451-1
- Earplugs shall be in accordance to SANS 1451-2.

6.9.3 Eye Protection

- If an employee is carrying out, assisting with, or working adjacent to any activity where sparks or projectile particles are being generated, where chemical mists or fumes are being generated, where liquids may splash or spray, where harmful electromagnetic radiation (heat or light) is being generated, or where there is a risk of wind-blown particles entering the eyes, then suitable protective eyewear must be worn at all times.
- Eye protection must be worn by employees, contractors and visitors passing through eye hazard areas.
- All eye protection (Prescription or non-prescription) must have side shield or wrap around protection.
- Approved eye protection, including, or in combination with any prescription eyewear meeting requirements of SANS 1644, normal spectacles may be worn provided the lenses have been toughened with safety glass that meets the requirements of SANS 1644.
- Prescription safety glasses should include side – shield that complies with SANS 1644.
- All components of prescription safety glasses that are being used for eye protection must meet the requirements of SANS 1644.
- Employees requiring prescription safety glasses for verified medical reasons will be provided at the cost of TPL.
- Medical eye examination is at employee's own expense.
- All hazard areas where eye protection is required will be posted with appropriate warning signs.
- Face protection and the welders face protection shall comply to SANS 1404

6.9.4 Hand Protection

- Hand protection (gloves) will be worn when there is a potential for injury to the hands from exposure to hazards such as but not limited to those from skin absorption of harmful substances, cuts or lacerations, severe abrasions, punctures, chemical burns, thermal burns and harmful temperature extremes.
- Suitable gloves must be selected based on the task to be performed and the specific hazard against which the employee requires protection such as sharp edges, sharp points and splinters, abrasive surfaces, Hazardous chemical substances (Toxic, corrosive, sensitizing, etc.)
- The gloves shall comply with SANS 416.

6.9.5 Foot Protection

- Safety boots / Shoes must be worn where there is a potential danger of slipping, electrostatic build-up, falling objects and chemical splashes.
- Non – conductive foot protection will be worn where the employee's feet are exposed to electrical hazards.
- All safety shoes / boots must be SABS approved.
- Safety shoes / boots with steel toe cap, oil and hydrocarbon resistant sole, anti-perforation sole, anti-static, anti-slip sole and breathable leather uppers. Consideration given for standard size and wide size (broad fitting)
- Socks 100% cotton, antistatic used in conjunction with safety boots and / or shoes.
- Boots must be made of leather material
- Safety footwear shall comply with SANS 20345

6.9.6 Skin /Body Protection

- Full body protection must be worn where there is exposure to dermal, chemicals, UV radiation, extreme temperatures, rainy conditions, heat, sparks and flying particles.
- Dromex DW – D59 FA, 100% cotton, flame retardant and Acid resistant SABS approved conti suit with long sleeves. Materials meeting the requirements of SANS 434, antistatic properties EN 1149 with silver reflective strip (50mm in width) on each sleeve around upper arm and leg meeting the requirements for EN471 legs are required for use at Transnet Pipelines.
- Work wear suits shall comply with SANS 434

6.9.6.1 Flame Retardant Rain Suits

- Rain suits must be worn where there is exposure to rain and splashes of petroleum product, liquid chemicals whilst having flame retardant and anti-static properties.
- Two-piece water-resistant rain suit with stow away hood. Reflective: 50 mm silver reflective. Dromex flame retardant rain suit

6.9.6.2 Flame Retardant Thermal Jackets

- Dromex DW D59-SABS Flame retardant acid resistant 100% cotton (inclusive of the lining of the jacket).
- Thermal jacket compliant to SANS 1423 – 1

6.9.6.3 Flame Retardant Reflective Vests / Bibs

- The reflective vests/bibs design shall comply with SANS 50471. Anti-static and flame retardant vest

6.9.7 Respiratory Protection

- Respirators must be worn where there is exposure to air contaminated with harmful dusts, fumes, mists, gases, sprays, or vapours.
- Respiratory protection must be worn where health risk assessment on site shows the risk of exposure to harmful fumes, gases, vapours, etc. and needs to be indicated by a safety sign at the applicable areas.
- Type of respirator to be used may be identified by type of task as risk assessed in the risk assessment and must comply with relevant standard indicated on this SOP.
- A2 Organic vapour cartridge respirators to be used for protection against organic vapours
- Respirators shall comply to SANS 50136

6.9.8 Arc Flash Protection

- Arc flash PPE is a combination of clothing and safety equipment worn for protection from arc flash and shock hazards by a person performing electrical work.
- Underneath arc flash protection, 100% cotton clothing to be worn. Persons wearing bras, such bras shall not have wire support.
- Arc Flash protection shall comply to SANS 724
- Electrical staff performing LV or MV maintenance work at Category 2 pump stations as per table hereunder shall wear arc flash PPE protection for category 2 hazard risk.

PUMP STATIONS MV	PUMP STATIONS LV
Howick (HWR)	Coalbrook (CBK)
Quagga (QGA)	Sasolburg (SBG)
Coalbrook (CBK)	Alrode (ALR)
Island View TM 1 (IVW)	Secunda (SEC)
Twini (TNI)	Island View TM 1 (IVW)
Hilltop (HTP)	Twini (TNI)
Mnambithi (MBT)	Hilltop (HTP)
Jameson Park (JMP)	Mnambithi (MBT)
	Jameson Park (JMP)

Levels of PPE programme recommended for Transnet Pipelines Electrical staff performing LV or MV maintenance work at hazard risk category 2 pump stations i.e., 4 – 8 Cal / Cm2 arc rating or arc rating exceeding the hazard levels of category 2 are worn where work is performed for protection from the arc flash (See table hereunder for details)

Hazard Risk Category	Cal/Cm2	Protective Clothing
1	1.2 – 4 Cal / Cm2	Dromex DW – D59 FA, 100% cotton, flame retardant and Acid resistant SABS approved conti suit with long sleeves.
2	4 – 8 Cal / Cm2	Dromex DW – D59 FA, 100% cotton, flame retardant and Acid resistant SABS approved conti suit with long sleeves. Arc Rated Face Shield: Ergoz face shield Arc Rated Balaclava: Nomex Balaclava in oatmeal colour Arc Rated Gloves: 8 cal Nomex Glove in oatmeal colour. Arc Rated Hard Hat: 18 cal silver hard hat

6.9.9 Sun Protection

- All persons exposed to sunlight must use long sleeve conti suit top, long conti suit trouser, or overall, brims to hard hats, UV factored sunscreen
- Sunscreen products, protective creams shall be in accordance with SANS 1557

6.9.10 Fall Protection - PPE

- Full body safety harnesses must be worn by each person for all elevated work (performing operations, maintenance or construction activities), except if such work is being undertaken on a permanent work platform and that the work is confined within the handrails.
- Where safety harness is being used, harness lanyards must be suitably tied on and secured onto an anchor point whilst work is being undertaken.
- Anti – Static Full Body Harness with anti – static, shock – absorbing double lanyards
- Full body harnesses shall comply to SANS 50361

6.9.11 Flotation Devices / Personal Flotation Devices

- Flotation devices / personal flotation devices must be used / worn when working close to the water's edge of bodies of water such as spill dam/basin, separator pit, etc. without handrails or other approved safeguards.
- Life Buoy (Zero/Novamarine/Viking type) flotation devices could be placed around spill basins where there is a potential of falling into the water and drowning.
- Life jackets of 150N single chamber must be used as a minimum when working within a distance of 1 meter of spill basin, separator pit with no fixed safe railing around it or other approved safeguards.

6.10 MEDICAL CONDITIONS

- Where special conditions of a medical nature need to be accommodated, the employee must declare such to their supervisor and the supervisor will escalate to a Health and Safety committee, which will in turn escalate to the PPE Forum. Appropriate investigation of the condition and subsequent issue of PPE will be facilitated by the PPE forum.
- On a rare occasion, an employee may seek approval to not wear the required PPE. This may be due to a medical condition and must be supported by a medical certificate for approval by the PPE Forum.

6.11 CONTROL

- Employees are to sign acceptance of PPE as per **PPE Issue Register, TRN – IMS – TPL – 001.1**. Conditions of issue must be explained to each employee when PPE is issued, and the employee must sign acknowledgement of the said instruction.
- When PPE is issued, instructions of use, care and where required training in use of the equipment must be given to the wearer and such instruction must be recorded and signed by both the receiver and the issuing officer. The wearer must also be given the legal requirements and implications concerning the wearing of PPE.
- The loss or theft of any PPE must be recorded on TOMS and an investigation must be done to establish the root cause of the loss. Should the loss investigation find that the loss was due to the employee's negligence disciplinary action must be taken in consultation with the Employee Relations Manager.
- Up – to – date register must be kept as proof that items of PPE have been issued to individual employees

6.12 MONITORING

- Employees after pre-use inspections for wear and damage will declare in the **TPL signing on/off declaration fit for duty register, TRN – IMS – TPL – REG – 001.2** that:
  - He / she is wearing all personal protective equipment (PPE) as required
  - All personal protective equipment (PPE) worn is neat and in good condition
- The Depot / Workshop / Site Supervisor resident on site will confirm employees' declarations and sign in the TPL signing on/off declaration fit for duty register.
- Depot / Workshop / Site Supervisor who is not resident on site will on weekly basis check employees' personal protective equipment and endorse the employees' declarations by signing TPL signing on/off declaration fit for duty register.
- Carry out monthly inspections using prescribed **Inspection Checklist: Personal Protective Equipment, TRN – IMS – TPL – CL – 001.1** to ensure that PPE is being used correctly is being maintained in a good, serviceable, clean and well maintained and fit for purpose.

6.13 COMPLIANCE MONITORING

- Regular audits must be undertaken by safety, health, environment and quality department to monitor compliance.

6.14 ENFORCEMENT

- Any individual found violating the requirements shall immediately be directed to put on the required PPE or immediately directed to stop performing the task and leave the area.
- Any person who refuses to wear PPE as required must be removed from site.
- Repeat violations by employees may lead to disciplinary action, and for contractors, may lead to loss of access to the depot/site and loss of future contracts.
- People who do not conform to the procedure may be subject to disciplinary action in terms of the applicable Transnet disciplinary processes and procedures.

7. RECORDS

7.1 TRN–IMS–GRP–ATR–008 3 Training Attendance Register

7.2 TRN–IMS–TPL–REG–001.2 TPL Signing on/off Declaration Fit for Duty Register

7.3 TRN-IMS-TPL-CL-001.1 Inspection Checklist: Personal Protective Equipment

7.4 TRN-IMS-TPL-REG-001.1 Personal Protective Equipment Issue Register

7.5 TRN-IMS-TPL-FRM-001.1 PPE Hazard Assessment Form

8. ANNEXURES

8.1 Transnet Pipelines PPE Matrix

8.1 TRN–IMS–TPL–FRM–001.2 PPE Training Certification Form

8.2 TRN–IMS–TPL–GDL–001.1 Task and Area Specific Hazard Assessment

PART 4: AFFECTED PROPERTY

Core clause 11.2(2) states

"Affected Property is property which

- Is affected by the work of the *Contractor* or used by the *Contractor* in Providing the Service
- is in the documents which the Contract Data states it is in."

In Contract Data, reference has been made to this Part 4 of the contract for the location of the Affected Property.

The Provision of Cleaning and Hygiene Services at Transnet Pipelines Site Offices, Cutler Complex, Island View in Durban for a period of three (3) years. The site consists of the following number and size of Park Homes: Two (2) (9mx3m) Eight (8) (12mx3m) Six (6) (6mx3m) One (1) (12mx6m)

1. Description of the Affected Property and its surroundings

1.1. General description

Transnet Pipelines Site Offices, Cutler Complex, Island View in Durban

ANNEXURE 1-Deat EIA ROD

environment
& tourism

Department:
Environmental Affairs and Tourism
REPUBLIC OF SOUTH AFRICA

Private Bag X 447 · PRETORIA · 0001 · Fedsure Building · 315 Pretorius Street · PRETORIA
Tel (+ 27 12) 310 3911 · Fax (+ 2712) 322 2682

FAX COVER SHEET

DATE : 10 Feb. 09

TO :	Mr Carlos Galego
ORGANISATION :	Transnet Limited
FAX :	(031) 361 1341
FROM :	Lene Grobbelaar
TEL :	(012) 310 3087
ROOM NO :	4th Floor, South Tower, Room 418
FAX :	(012) 320 7539
NO. PAGES :	(including cover page)
SUBJECT :	
MESSAGE : TRANSNET NEW MULTI-PRODUCTS PIPE LINE BETWEEN DURBAN AND JAMESON PARK	

DEAR Mr. Galego

Please receive herein the attached letter for your attention.

Regards,

Signature

environment & tourism
Department:
Environmental Affairs and Tourism
REPUBLIC OF SOUTH AFRICA

Private Bag X447, Pretoria, 0001 • Fedsure Building, 315 Pretorius Street, Pretoria, 0002. Tel: (+27 12) 310 3911 Fax: (+27 12) 322 2882

Reference: 12/12/20/735
Enquiries: Mr John Geeringh
Telephone: (012) 310 3491 **Fax:** (012) 320 7539 **E-mail:** jgeeringh@deat.gov.za

Mr Carlos Galego
Transnet Limited
P O Box 3113
DURBAN
4000

Fax no: (031) 361 1341

PER FACSIMILE / MAIL

Dear Mr Galego

APPLICATION FOR AUTHORISATION: R. 387: TRANSNET NEW MULTI-PRODUCTS PIPE LINE BETWEEN DURBAN AND JAMESON PARK (REFERENCE NUMBER: 12/12/20/735).

The environmental Impact assessment report (EIAR) and draft environmental management plan (EMP), dated November 2008, for the abovementioned project, submitted to the department refers. Please be advised that the Department has accepted the EIAR and EMP in terms of GN R. 385: 35 1(a) of the Environmental Impact Assessment Regulations, 2006, and has decided to grant authorisation. The environmental authorisation and reasons for the decision are attached herewith.

In terms of GN R. 385: 10(2), you are instructed to notify all registered interested and affected parties (IAPs), in writing and within ten (10) calendar days of the date of this letter, of the Department's decision in respect of your application as well as the provisions regarding the making of appeals that are provided for in the regulations.

Your attention is drawn to Chapter 7 of the Regulations which regulates appeal procedures. Attached please find a simplified copy of the appeals procedure to be followed. Kindly include a copy of this procedure with the letter of notification to IAPs.

A copy of the official appeal form can be obtained from:
Mr PKM Retief, Appeals Administrator, Tel: 012 310 3705, pretief@deat.gov.za ; or
Mr H Grové, Appeals Administrator, Tel: 012 310 3070, hgrove@deat.gov.za, at the Department.

Should you wish to appeal any aspect of the decision, you must, *inter alia,* lodge a notice of intention to appeal with the Minister, within 10 days of receiving notice of the decision, by means of one of the following methods:

By facsimile: 012 320 7561;

By post: Private Bag X447, Pretoria, 0001; or
By hand: 2nd Floor, Fedsure Form Building, North Tower, cor. Van der Walt and Pretorius Streets, Pretoria.

Should the applicant decide to appeal, the applicant must serve a copy of its notice of intention to appeal on all registered IAPs as well as a notice indicating where, and for what period, the appeal submission will be available for inspection.

Please include the Department, attention of the Director: Environmental Impact Evaluation, in the list of IAPs, notified through your notification letter of the decision, for record purposes.

The authorised activity may not commence within thirty (30) days of the date of signature of the authorisation. Please further note that the Minister may, on receipt of appeals against the authorisation or conditions thereof suspend the authorisation pending the outcome of the appeals procedure.

Yours sincerely

Ms Nosipho Ngcaba
Director – General
Department of Environmental Affairs and Tourism
Letter signed by: L McCourt
Designation: Chief-Director, Environmental Impact Management

Date: 10/2/2009

CC:	Mr Mark Wood	ZITHOLELE	Fax:	011 447 7018
Copy to:	Mr Herman Grove	DEAT		

APPEALS PROCEDURE IN TERMS OF CHAPTER 7 OF R. 385 OF 2006 TO BE FOLLOWED BY THE APPLICANT AND INTERESTED AND AFFECTED PARTIES UPON RECEIPT OF NOTIFICATION OF AN ENVIRONMENTAL AUTHORISATION

APPLICANT	INTERESTED AND AFFECTED PARTIES (IAPs)
Receive notice of Environmental Authorisation from the relevant Competent Authority	Receive notice of Environmental Authorisation from Applicant/Consultant
Within 10 days of receipt of notification, notify the relevant Competent Authority and all IAPs of intention to appeal	Within 10 days of receipt of notification, notify the relevant Competent Authority of intention to appeal
Notification served by the Applicant must include: . A copy of the notice of intention to appeal; and . A notice indicating where and for what period the appeal submission will be available for inspection by all IAPs	3. Appellant must serve on the Applicant 3.1. A copy of the notice of intention to appeal A notice indicating where and for what period the appeal submission will be available for inspection by the applicant
The appeal must be submitted to the relevant Competent Authority or delegated organ of State within 30 days of lodging of the notice of intention to appeal	The appeal must be submitted to the relevant Competent Authority or delegated organ of State within 30 days of lodging of the notice of intention to appeal
A person or organ of state that receives notice of an appeal may submit a responding statement to the relevant Competent Authority or delegated organ of state within 30 days from the date that the appeal submission was made available for inspection by the appellant	An Applicant that receives notice of an appeal may submit a responding statement to the relevant Competent Authority or delegated organ of State within 30 days from the date the appeal submission was made available for inspection by the appellant

NOTES:

1. An appeal against a decision must be lodged with:-

a) the Minister if the decision was issued by the Director- General (or another official) acting in his/ her capacity as the delegated Competent Authority
b) the MEC if the decision was issued by the Head of Department (or another official) acting in his/ her capacity as the delegated Competent Authority
c) the delegated organ of state where relevant.

2. An appeal lodged with:-

a) the Minister must be submitted to the Department of Environmental Affairs and Tourism
b) the MEC must be submitted to the provincial department responsible for environmental affairs
c) the delegated organ of state, where relevant, must be submitted to the delegated organ of state

3. An appeal must be:-

a) on an official form obtainable or published by the relevant department
b) accompanied by:
   - a statement setting out the grounds of appeal
   - supporting documentation which is referred to in the appeal and is not available to the relevant Competent Authority
   - a statement that the appellant has complied with regulation 62 (2) or (3) together with copies of the notices referred to in regulation 62
   - the prescribed appeal fee, if any.

4. A copy of the official appeal form can be obtained from:

See authorisation cover letter.

environment & tourism

Department:
Environmental Affairs and Tourism
REPUBLIC OF SOUTH AFRICA

Environmental Authorisation

Authorisation register number: *12/12/20/735*
Last amended:
Holder of authorisation: *TRANSNET LIMITED*
Location of activity: *DURBAN TO JAMESON PARK NEAR HEIDELBERG*

Decision

The Department is satisfied, on the basis of information available to it and subject to compliance with the conditions of this environmental authorisation, that the applicant should be authorised to undertake the activity specified below.

Details regarding the basis on which the Department reached this decision are set out in Annexure 1.

Activities authorised

By virtue of the powers conferred on it by the National Environmental Management Act, 1998 (Act No. 107 of 1998) and the Environmental Impact Assessment Regulations, 2006 the Department hereby authorises –

Transnet Limited

with the following contact details –

Mr Carlos Galego
Transnet Limited
Private Bag X 4
GALLO MANOR
2052

Tel no: 011 287 9768
Fax no: 011 258 8846

to undertake the following activities (hereafter referred to as "the development"):

GN R. 387:

1. *The construction of facilities or infrastructure, including associated structures or infrastructure, for –*

(c) the above ground storage of a dangerous good, including petrol, diesel, liquid petroleum gas or paraffin, in containers with a combined capacity of 1000 cubic metres or more at any one location or site including the storage of one or more dangerous goods, in a tank farm;

(e) any process or activity which requires a permit or license in terms of legislation governing the generation or release of emissions, pollution, effluent or waste and which is not identified in Government Notice No. R. 386 of 2006;

(f) the recycling, re-use, handling, temporary storage or treatment of general waste with a throughput capacity of 50 tons or more daily average measured over a period of 30 days;

(g) the use, recycling, handling, treatment, storage or final disposal of hazardous waste;

10/2/09

(j) the bulk transportation of dangerous goods using pipelines, funiculars or conveyors with a throughput capacity of 50 tons or 50 cubic metres or more per day;

(o) the final disposal of general waste covering an area of 100 square metres or more or 200 cubic metres or more of airspace;

(r) the microbial deactivation, chemical sterilisation or non-thermal treatment of waste or effluent;

2. Any development activity, including associated structures and infrastructure, where the total area of the developed area is, or is intended to be, 20 hectares or more.

7. Reconnaissance, exploration, production and mining as provided for in the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), as amended in respect of such permits and rights; and

10. Any process or activity identified in terms of section 53(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).

GN R. 386:

1. The construction of facilities or infrastructure, including associated structures or infrastructure, for –

(m) any purpose in the one in ten year flood line of a river or stream, or within 32 metres from the bank of a river or stream where the flood line is unknown, ..., for the purpose of installing the trunkline;

4 The dredging, excavation, infilling, removal or moving of soil, sand or rock exceeding 5 cubic metres from a river, tidal lagoon, tidal river, lake, in-stream dam, floodplain or wetland;

12. The transformation or removal of indigenous vegetation of 3 hectares or more or of any size where the transformation or removal would occur within a critically endangered or an endangered ecosystem listed in terms of section 52 of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004);

18. The subdivision of portions of land 9 hectares or larger into portions of 5 hectares or less.

20. The transformation of an area zoned for use as public open space or for a conservation purpose to another use; and

25 The expansion of or changes to existing facilities for any process or activity, which requires an amendment of an existing permit or license or a new permit or license in terms of legislation governing the release of emissions, pollution, effluent;

10/2/09

for the construction of the NMPP from Durban to Jameson Park near Heidelberg, as described in the environmental impact assessment report (EIAR), dated November 2008, submitted to the department on 10 November 2008.

The development will take place between Island View at the Port of Durban to Jameson Park near Heidelberg within the jurisdiction of the *eThekwini, UMgungundlovu and Uthukela District Municipalities of KwaZulu Natal, the Fezile Dabi and Thabo Mofutsanyane district Municipalities of the Free State, the Gert Sibande District Municipality of Mpumalanga and the Sedibeng Distric Municipality of Gauteng* hereafter referred to as "the property", as described in the EIAR dated November 2008.

The development of the NMPP will take place along the route corridor with a width of 1000m outside built up areas (to allow for minor adjustment due to localised environmental conditions) as described in the EIAR dated November 2008 and as shown ***on the map set included in the EIAR dated November 2008 appendix 12-1***, and will consist of the following **major components**:

- The 24 inch **pipe line of approximately 555km** in accordance with the provisions of SANS 10089 which will be buried at a minimum depth of 1 metre along its entire length with a fibre optic cable installed with the pipe line as shown in figure 2-23 and 2-24 in the EIAR, The servitude area will be rehabilitated upon completion of construction to its natural condition prior to construction;
- Establishment of associated **construction camps, lay down areas for pipe sections** prior to assembly and installation and an **access road** for construction along the servitude;
- The final pipe line position will be marked with white markers every 300 metres and at points where the pipe line change direction, as well as distance markers and markers visible from the air for aerial inspection by helicopter as indicated on photograph 2-35 on page 60 of the EIAR. Cathodic protection will be installed along the pipe line to prevent corrosion;
- Construction of **eight (8) pump stations** along the route each with associated **buildings, pumps, electrical infrastructure, fire protection and water management structures** within the perimeter fence of the pump station at the approximate locations as shown on the maps included in Chapter 8 of the EIAR dated November 2008 (pump station site 1A is the authorised position for pump station 1) and shown in Figure 2-38 and photo 2-45 on page 83 of the EIAR. The will be a phased implementation of pump

10/2/09

station construction with stations 1, 3 and 5 to be constructed at the start of the project and stations 2, 4 and 6-8 during a later timeframe in the project implementation. During the first phase of the project only valve stations will be constructed at pump station sites 7 and 8;

- A **coastal fuel terminal** at Island View at the Port of Durban with associated infrastructure for operation, fire protection and water management as shown in figures 2-14 and 2-15 in the EIAR implemented in a phased approach in accordance with the provisions of API Standard 2610 and SANS 10089-1; and
- An **inland fuel terminal** at Jameson Park near Heidelberg with associated infrastructure for operation, fire protection and water management, as shown in figures 2-17 and 2-18 in the EIAR implemented in a phased approach in accordance with the provisions of API Standard 2610 and SANS 10089-1.

The granting of this environmental authorisation is subject to the conditions set out below.

Conditions

Scope of authorisation

1.1 Authorisation of the development is subject to the conditions contained in this authorisation, which conditions form part of the environmental authorisation and are binding on the holder of the authorisation.

1.2 The holder of the authorisation shall be responsible for ensuring compliance with the conditions by any person acting on his or her behalf, including but not limited to, an agent, sub-contractor, employee or person rendering a service to the holder of the authorisation.

1.3 The authorised development may only be carried out at the property indicated above and as described in the EIAR dated November 2008 and as shown on the map set included in the EIAR as Appendix 12-1.

1.4 Any substantial changes to the project description set out in the EIAR dated November 2008, and authorised under this authorisation must be approved, in writing, by the Department before such changes may be effected. In assessing whether to grant such approval or not, the Department may request such information as it deems necessary to evaluate the significance and impacts of such changes and it may be necessary for

10/2/09

the holder of the authorisation to apply for further authorisation in terms of the regulations.

1.5 This development must commence within a period of four (4) years from the date of issue. If commencement of the development does not occur within that period, the authorisation lapses and a new application for environmental authorisation must be made in order for the development to be undertaken.

1.6 This authorisation does not negate the holder of the authorisation's responsibility to comply with any other statutory requirements that may be applicable to the development and associated infrastructure.

1.6.1 Relevant legislation that must be complied with by the holder of this authorisation include but is not limited to:

- Compliance with the requirements of Section 38 of the National Heritage Resources Act, Act 25 of 1999, including any comments and recommendations of the relevant heritage resources authority responsible for the area in which the development is proposed.
- All provisions of the Occupational Health and Safety Act, Act 85 of 1993.
- Provisions of the Environment Conservation Act, Act 73 of 1989.
- Provisions of the NEMA Air Quality Management Act, Act 39 of 2004.
- Provisions of the Conservation of Agricultural Resources Act, Act 43 of 1983.
- Provisions of the National Forests Act, Act 84 of 1998.
- Provisions of the National Water Act, Act 36 of 1998.
- All provisions of the Hazardous Substances Act, Act 15 of 1973.
- The National Key Points Act, Act 102 of 1980.
- The Petroleum Pipelines Act, Act 60 of 2003.
- Provisions of the Explosives Act, Act 26 of 1956.
- All provisions of the Fencing Act, Act 31 of 1963.
- Relevant local authority bylaws and regulations.
- Should any activity be planned on site that is a listed activity in terms of the NEMA regulations, 2006, which is not covered by this authorisation, a separate application for such activity must be lodged with the relevant competent authority.

10/2/09

Appeal of authorisation

1.7 The holder of the authorisation must notify every registered interested and affected party (IAP), in writing and within 10 (TEN) calendar days, of receiving notice of the Department's decision to authorise the development.

1.8 The notification referred to in 1.7 must –

1.8.1 Specify the date on which the authorisation was issued;

1.8.2 Inform the interested and affected party of the appeal procedure provided for in Chapter 7 of the regulations;

1.8.3 Advise the interested and affected party that a copy of the authorisation will be furnished on request, and

1.8.4 Give the reasons for the decision.

Management of the activity

1.9 Management during the construction phase:

1.9.1 The environmental management plan (EMP) for the construction phase included in the EIAR dated November 2008 and submitted to the department, is hereby approved for implementation. The mitigation measures proposed in the EIAR dated November 2008 and requirements stipulated in the EMP as included in the EIAR dated November 2008 for environmental management during the construction phase forms part of the conditions of this environmental authorisation and must be implemented by the holder of this authorisation.

1.9.2 The holder of this authorisation must ensure the following measures are implemented during the construction phase of the NMPP development:

- All contractor staff must undergo environmental awareness induction training with regard to protection of the natural environment, the conditions of the environmental authorisation, the requirements of the EMP and the respect of the rights of landowners on whose properties construction takes place.
- Measures for waste avoidance, minimisation and disposal of construction waste at an appropriately registered facility.
- Measures for dust control during the construction phase.

- Measures for noise control during the construction period where construction activities occur close to residences or built-up areas to limit the nuisance factor of noise.
- Measures to ensure public access to any homesteads or amenities must at all times be guaranteed and shall not be restricted due to this development.
- Archaeological remains, features and structures older than 60 years are protected by the National Heritage Resources Act, 1999 (Act No. 25 of 1999). Should any archaeological or palaeontological artefacts be exposed during excavation for the purpose of laying the pipe line, construction in the vicinity of the finding must be stopped. A heritage specialist must be called to the site for inspection. Under no circumstances shall any artefacts be destroyed or removed from the site. The South African Heritage Resource Agency must be informed of any new finds.

1.9.3 The approved construction EMP will be seen as a dynamic document. Should the construction activities exceed any predicted impact levels, the EMP must be amended to include any additional requirements. However, any proposed changes to the EMP must be submitted to the competent authority in writing.

1.9.4 Amendments to the EMP must be approved in writing by the competent authority before such changes can be implemented.

Servitude works area and pipe lay down areas

1.9.5 This development is authorised on condition that Transnet acquires the necessary servitude for the pipe line route. Transnet must negotiate with affected landowners within the authorised corridor alignment prior to the start of construction activities. Proof of such negotiations must be made available to the Department on request should any dispute arise.

1.9.6 In addition, any route adjustment, due to the specific local circumstances, which deviates outside the authorised corridor alignment, should be assessed and reported to the department for acceptance in writing before implementation.

1.9.7 All construction works are limited to the servitude area negotiated with the landowner. The works area must be properly demarcated.

10/4/09

1.9.8 No construction workers shall be allowed to reside on any site unless a written agreement with the affected landowner is obtained.

1.9.9 All work areas must be supplied with proper sanitation facilities.

1.9.10 No open fires are allowed on site for heating or cooking purposes. The applicant shall ensure that the contractor have fire fighting equipment available at all work sites in the event of accidental fires, especially during welding of the pipe line sections.

1.9.11 All pipe lay down areas outside the negotiated servitude area must be negotiated with the affected landowner and written agreement must be obtained. Proof of such negotiations must be made available to the Department on request should any dispute arise.

1.9.12 Servitude vegetation clearing must be done in accordance with the recommendations of the EIAR and a search and rescue operation of protected species should be done. Rescued specimens can be transplanted immediately where possible or be stored in a nursery area for use later during the rehabilitation process.

1.9.13 No protected species of vegetation may be destroyed without the required permit from the provincial nature conservation department.

Construction camps

1.9.14 No construction camp site may be established without written approval from the affected landowner.

1.9.15 The holder of this authorisation must have a specific management plan for management of the day to day operation of the construction camp sites, including measures for waste management, sanitation and water management.

1.9.16 Construction camps must be inspected weekly by the environmental control officer (ECO) for compliance with the management plan for camp sites.

1.9.17 Construction camp sites must be kept neat and the visual impact of camp sites must be mitigated to acceptable levels through screening.

1.9.18 No water may be abstracted from or effluent or waste water released into natural sources without the required permits from DWAF and Transnet must have written agreements with landowners for use of any water from private boreholes or dams.

10/2/09

Workshop areas at construction camps

1.9.19 Workshop areas must have a concrete floor area for servicing of vehicles.

1.9.20 All carbon containing fuels and lubricants must be stored inside a bunded area which can accommodate 110 percent of the stored liquids.

1.9.21 All spills of carbon materials shall be contained and cleaned up immediately and polluted soils shall be disposed of in a registered waste site. Minor spills can be treated on site.

1.9.22 Should it be necessary to service any vehicles or equipment in the servitude construction area due to a breakdown, a drip tray shall be used to prevent carbon spills onto the soil.

1.9.23 All carbon waste material generated at the workshop shall be contained in proper storage drums for recycling or disposal at a registered waste site.

Pump stations

1.9.24 Noise abatement measures as proposed in box 8-2 on page 274 of the EIAR must be installed at all pump stations to reduce the impact of noise associated with pumping during the operational phase, especially in pump stations in close proximity to residential areas.

1.9.25 Security lighting installed at pump stations must be designed in such a way that light spill to the surrounding areas is minimised, especially where pump stations are constructed in rural areas with a high visual quality and where light spill may cause a significant aesthetical impact.

1.9.26 Landscaping and design of pump station structures must be done to ensure that the pump station blend in with the surrounding area to minimise the visual impact of the pump station.

Wetland, river and stream crossings

1.9.27 Construction at wetland, river and stream crossings shall be done in accordance with figures 2-25, 2-26, 2-27 and 2-28 of the EIAR dated November 2008.

10/2/09

1.9.28 Where wetland crossings are required, the approval of the Department of Water Affairs and Forestry (DWAF) on the engineering design shall be obtained in writing before any construction commence on such sites.

1.9.29 Special care shall be taken when doing any construction work in wetland areas and the area of disturbance shall be kept to the absolute minimum.

1.9.30 All wetland areas disturbed during construction shall be rehabilitated to the written satisfaction of a representative of DWAF.

1.9.31 All river and stream crossings shall be done in accordance with a DWAF approved design drawing.

1.9.32 Vegetation at river and stream bank crossings may be cut and treated with a suitable registered herbicide to prevent further growth and root development. Under no circumstances will de-stumping of trees on river and stream banks be allowed as this may lead to unacceptable erosion except where DWAF approves an open trench design to cross a river or stream.

1.9.33 River and stream banks must be protected against possible erosion by carefully controlling access and construction activities in such areas.

1.9.34 Measures to ensure prevention of pollution of wetlands or rivers and streams during the construction phase must be implemented by the applicant.

1.9.35 Once construction at river, stream or wetland crossings are completed, the relevant DWAF official must sign a release form indicating that rehabilitation was done satisfactorily at each crossing point. The release forms must be made available to the department on request should any dispute arise.

Rehabilitation of works areas and construction camps

1.9.36 Upon completion of construction the works area must be rehabilitated in accordance with the recommendations of the specialist ecologist.

1.9.37 All areas disturbed during the construction phase of the project excluding those areas where permanent structures are erected must be rehabilitated fully to the satisfaction of the landowner.

1.9.38 Once construction is completed, all landowners must sign a release form indicating that rehabilitation was done satisfactorily and that all outstanding issues or claims have been settled by Transnet. The release forms must be made available to the department on request should any dispute arise.

10/2/09

Service infrastructure

1.9.39 Disruption of service infrastructure must be kept to an absolute minimum. Should it be necessary to disrupt any services during the construction phase, the affected parties must be informed at least two (2) weeks in advance.

1.9.40 Should any accidental damage to service infrastructure take place during construction activities, Transnet must take immediate action to restore such disrupted service in the shortest time possible.

1.9.41 Any claims for damage to service infrastructure due to construction activities by landowners must be addressed within 30 days from such claim being submitted.

1.9.42 Road crossings of the pipe line must be done as shown in figures 2-29 and 2-30. All major and secondary road crossings must be done in accordance with a provincial roads department or SANRAL approved design drawing.

1.9.43 The use of existing roads to gain access to the servitude works area is preferred; however use of any private access roads must be agreed with the landowners in writing. All private roads not to be used for the purpose of construction must be marked clearly with no entry signs.

1.9.44 Transnet must ensure that contractors adhere to an agreed speed limit on private roads to prevent accidents and road damage.

1.9.45 Upon completion of construction all private roads must be rehabilitated to their original condition and to the satisfaction of the landowner.

1.9.46 No fences may be flattened for the purpose of construction without the consent from the landowner. All fence crossings shall be fitted with a proper servitude gate before construction commences to ensure access for the construction teams.

1.9.47 Where required deviations of fences may be done with the written consent of the landowner to allow for construction activities.

1.9.48 Upon completion of construction all damage to fencing shall be properly fixed to the satisfaction of the landowners.

1.10 Management during the operational phase.

1.10.1 The operational management of the NMPP must be included in the Transnet environmental management system (EMS) for pipe line servitudes.

1.10.2 Leak detection systems must be installed under any new tanks installed at both the Island View or Inland terminals and any old tanks upgraded or replaced as part of this project shall also be fitted with leak detection systems.

1.10.3 A monitoring programme for ground water monitoring must be implemented at the coastal and inland terminals to detect any leaking pollutants and ground water pollution that may occur during the operational phase. If ground water pollution is detected, Transnet must implement measures to remedy the situation immediately.

Monitoring of the construction activities

1.11 Monitoring of the activity during construction

1.11.1 The holder of this authorisation must appoint a suitably qualified and responsible person that will act as an Environmental Control Officer (ECO) for the construction period that will have the responsibility of implementing the approved construction EMP as well as the conditions of this authorisation.

- The ECO shall be appointed before the start of construction and the competent authority must be notified of the details and contact numbers of the appointee in writing for record and communication purposes.
- The ECO must compile and present the environmental awareness induction training referred to in 1.9.2 above.
- The ECO shall submit a two-monthly compliance report, in writing, to The Director: Environmental Impact Evaluation and copy the holder of this authorisation with such report. This report shall include a description of all activities on site, problems identified, transgressions noted and remedial action implemented. The report must reflect the reference number of the project on the cover page.
- The ECO must monitor the construction works on a daily basis to ensure the holder of this authorisation complies with the conditions of this authorisation. Records relating to compliance monitoring must be kept on site and made available for inspection to any relevant and competent authority in respect of this development.
- The ECO must compile the compliance audit report referred to in 1.12 below upon completion of the construction phase. The audit report must cover the construction phase that has been completed and handed over to

Transnet for operation by the contractor. The compliance audit report must indicate the DEAT project reference number on the cover page.

- The ECO shall maintain the following on site:
  - A site diary.
  - Copies of all reports submitted to the Department.
  - A complaints register of all public complaints and the remedies applied to such complaints.
- The ECO must compile a report on all rehabilitation measures implemented for future monitoring and measurement of success of the rehabilitation measures during the operational phase of the development.
- The ECO must remain employed until all rehabilitation measures as well as site clean-up are completed, the release forms were signed by the landowners and DWAF and the site is handed over to the holder of the authorisation for operation.

1.11.2 The holder of this authorisation must monitor the operational phase of the development once operation commence as part of the Transnet EMS. The operational phase commence when all construction activities on a phase of the pipe line and associated infrastructure is completed.

1.11.3 Should the responsibility for compliance with this authorisation be transferred to any other juristic person, the transfer of the environmental authorisation from the initial holder of the authorisation to any other juristic person must be formally recorded in writing and a copy of the transfer document indicating the contact details of the juristic person must be submitted to the Director: Environmental Impact Evaluation for record purposes.

Reporting to the Department

1.12 The holder of the authorisation must submit an environmental compliance audit report to the Department: Attention of the Director: Environmental Impact Evaluation, upon completion of the construction activities as planned for the establishment of the NMPP and associated infrastructure. The environmental audit report must –

1.12.1 Indicate the date of the audit, the name of the auditor, the DEAT project reference number and the outcome of the audit in terms of compliance with the Environmental Authorisation conditions as well as the requirements of the EMP.

10/2/04

1.13 Commencement

1.13.1 The authorised activities may not commence within thirty (30) days of date of signature of this authorisation. Commencement includes site establishment.

1.13.2 Should you be notified by the minister of a suspension of the authorisation pending any appeals decision on the authorised activities, you may not commence with the activities unless authorised by the minister in writing.

1.14 Notification to authorities

1.14.1 Thirty (30) days written notice must be given to the Department that construction of the facilities will commence. Commencement for the purposes of this condition includes site preparation. The notice must include a date on which it is anticipated that the construction activity will commence.

1.14.2 Thirty (30) days written notice must be given to the Department that the operational phase of the facilities will commence.

Site closure and decommissioning

1.15 Should the NMPP ever become redundant and have to be decommissioned, the holder of the authorisation shall undertake the required actions as prescribed by legislation at the time and comply with all relevant legal requirements administered by any relevant and competent authority at that time for the decommissioning phase.

General

1.16 A copy of this authorisation must be kept at the site office where the development will be undertaken. The authorisation must be produced to any authorised official of the Department who requests to see it and must be made available for inspection by any employee or agent of the holder of the authorisation who works or undertakes work at the property.

1.17 Where any of the contact details of the holder of this authorisation change, including the name of the responsible person, the physical or postal address and / or telephonic

10/6/09

details, the holder of the authorisation must notify the Department as soon as the new details become known.

1.18 Upon transfer of the management function of the development the future holder of the authorisation must take ownership of the implementation of the conditions of this environmental authorisation.

1.19 The holder of the authorisation must notify the Department, in writing and within 48 (fourty eight) hours, if any condition of this authorisation cannot be or is not adhered to. Any notification in terms of this condition must be accompanied by reasons for the non-compliance. Non-compliance with a condition of this authorisation may result in criminal prosecution or other actions provided for in the National Environmental Management Act, 1998 and the regulations.

1.20 National government, provincial government, local authorities or committees appointed in terms of the conditions of this authorisation or any other public authority shall not be held responsible for any damages or losses suffered by the holder of the authorisation or his successor in title in any instance where construction or operation subsequent to construction be temporarily or permanently stopped for reasons of non-compliance by the holder of the authorisation with the conditions of authorisation as set out in this document or any other subsequent document emanating from these conditions of authorisation.

Date of environmental authorisation: 10 February 2009

Ms Nosipho Ngcaba

Director – General

Department of Environmental Affairs and Tourism

Letter signed by: Lize McCourt

Designation: Chief Director: Environmental Impact Management

Annexure 1: Reasons for Decision

1. Background

The applicant, Transnet Limited, applied for authorisation to undertake the following activities –

GN R. 387:

1. The construction of facilities or infrastructure, including associated structures or infrastructure, for-

(c) the above ground storage of a dangerous good, including petrol, diesel, liquid petroleum gas or paraffin, in containers with a combined capacity of 1000 cubic metres or more at any one location or site including the storage of one or more dangerous goods, in a tank farm;

(h) any process or activity which requires a permit or license in terms of legislation governing the generation or release of emissions, pollution, effluent or waste and which is not identified in Government Notice No. R. 386 of 2006;

(i) the recycling, re-use, handling, temporary storage or treatment of general waste with a throughput capacity of 50 tons or more daily average measured over a period of 30 days;

(j) the use, recycling, handling, treatment, storage or final disposal of hazardous waste;

(j) the bulk transportation of dangerous goods using pipelines, funiculars or conveyors with a throughput capacity of 50 tons or 50 cubic metres or more per day;

(o) the final disposal of general waste covering an area of 100 square metres or more or 200 cubic metres or more of airspace;

(r) the microbial deactivation, chemical sterilisation or non-thermal treatment of waste or effluent;

2. Any development activity, including associated structures and infrastructure, where the total area of the developed area is, or is intended to be, 20 hectares or more.

7. Reconnaissance, exploration, production and mining as provided for in the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), as amended in respect of such permits and rights; and

10. Any process or activity identified in terms of section 53(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).

10/2/09

GN R. 386:

1. The construction of facilities or infrastructure, including associated structures or infrastructure, for –

(m) any purpose in the one in ten year flood line of a river or stream, or within 32 metres from the bank of a river or stream where the flood line is unknown, ..., for the purpose of installing the trunkline;

4 The dredging, excavation, infilling, removal or moving of soil, sand or rock exceeding 5 cubic metres from a river, tidal lagoon, tidal river, lake, in-stream dam, floodplain or wetland;

12. The transformation or removal of indigenous vegetation of 3 hectares or more or of any size where the transformation or removal would occur within a critically endangered or an endangered ecosystem listed in terms of section 52 of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004);

18. The subdivision of portions of land 9 hectares or larger into portions of 5 hectares or less.

20. The transformation of an area zoned for use as public open space or for a conservation purpose to another use; and

25 The expansion of or changes to existing facilities for any process or activity, which requires an amendment of an existing permit or license or a new permit or license in terms of legislation governing the release of emissions, pollution, effluent;

for the construction of the NMPP from Durban to Jameson Park near Heidelberg, as described in the environmental impact assessment report (EIAR), dated November 2008, submitted to the department on 10 November 2008.

In terms of NEMA, section 24 C (2) and regulation GN R. 385: 3 the national department becomes the competent authority to issue an environmental authorisation, as the applicant is a parastatal company, namely Transnet Limited and the activity will take place over four provincial boundaries.

The applicant appointed Zitholele Consulting to undertake a scoping / EIA process and to compile an EIAR as required by regulation GN R. 385: 27. Zitholele appointed various specialists whom compiled specialist studies and assessed the various potential impacts identified. Mitigation measures to mitigate potential impacts were identified and included in the EIAR.

10/2/09

2. Information considered in making the decision

In reaching its decision, the Department took, *inter alia*, the following into consideration -

a) The information contained in the SR and POSEIA dated July 2008 as accepted by the department;
b) The comments and responses document appended to the EIAR in Appendix 4-3 and comments from key interested and affected parties;
c) The information contained in the final EIAR, dated November 2008 and submitted to the department on 10 November 2008;
d) The information contained in the specialist studies as included in the EIAR dated November 2008;
e) Comments received from the provincial departments of KwaZulu Natal, Mpumalanga and the Free State on the final EIAR;
f) Comments received from KZN Ezemvelo on the final EIAR;
g) Comments from Ethekwini Municipality;
h) Comments received from SAHRA, the Free State heritage authority and AMAFA;
i) Comments received from the Directorate: Biodiversity and Heritage;
j) Minutes of meetings held between the consultants and the various authorities in all four affected provinces;
k) Meeting with the consultant held on 19 June 2008 to discuss the way forward for the EIA phase of the study;
l) Route maps as included in the final EIAR;
m) A helicopter site visit on the proposed final route on 16 January 2009 attended by Mr Geeringh of the department; and
(n) The objectives and requirements of relevant legislation, policies and guidelines, including section 2 of the National Environmental Management Act, 1998 (Act No. 107 of 1998).

3. Key factors considered in making the decision

All information presented to the Department was taken into account in the Department's decision on the EIAR and EMP. Factors considered in making the decision are the following:

16/2/09

- The need and desirability for the construction of the NMPP is clearly understood. The demand for fuel inland will soon outstrip the supply capacity of the existing pipe line and the existing pipe line is nearing the end of its life span.
- The potential impacts of the construction, operational and decommissioning of the NMPP is assessed in detail and no fatal flaws were identified on the proposed route of the pipe line, the positions of the pump stations, inland and coastal terminals.
- Feasible and reasonable alternative options including the no-go option were investigated as part of the assessment process.
- A sufficient public participation process was undertaken and the consultant has satisfied the minimum requirements as prescribed in the EIA regulations, 2006 for public involvement.
- The consultant appointed various specialists to assist with the assessment of potential impacts and the specialists have recommended feasible and implement able mitigation measures to minimise potential impacts.
- No significant environmental degradation will result directly from the activities applied for and authorised in this authorisation if the approved EMP and proposed mitigation measures in the EIAR which form part of this authorisation is implemented.
- The applicant has the ability to implement the conditions of this authorisation and the requirements of the EMP.
- The requirements of the Regulations, 2006, have been complied with in respect of this application for authorisation for construction of the proposed NMPP.

A summary of the potential impacts identified which, in the Department's view, were of the most significance is set out below.

Pump stations:

a) The potential impacts on safety, health and security of the people in the surrounding area.
b) The potential impacts on air quality, noise pollution and waste management.
c) The potential social impacts associated with the relocation of people.
d) The potential impacts on land use.
e) Potential impact on property values.
f) The potential noise impact.

10/12/09

g) The potential impacts on heritage resources.
h) The potential impact on sense of place and visual aesthetics.
i) The potential impacts on wetlands and biodiversity.
j) The potential water pollution due to leaks from equipment.

Trunkline:

a) The potential impacts on safety, health and security of the people in the vicinity of the pipe line.
b) The potential impacts on air quality, noise pollution and waste management.
c) The potential social impacts associated with the relocation of people.
d) The potential impacts on land use, eco-tourism and farming operations.
e) Potential impact on property values.
f) The potential noise impact.
g) The potential impacts on heritage resources.
h) The potential impact on sense of place and visual aesthetics.
i) The potential impacts on wetlands, rivers and biodiversity.
j) Potential erosion impacts.
k) The technical constraints to the placement of a pipe line.
l) The potential impacts on water resources due to numerous possible river and stream crossings.
m) The potential groundwater water pollution due to leaks from equipment.

Coastal terminal:

a) The potential impacts on safety, health and security of the people in the surrounding area.
b) The potential impacts on air quality, noise pollution and water quality management.
c) The potential impact of flooding and inundation.
d) The potential impacts on transportation and infrastructure.
e) The potential impact on sense of place and visual aesthetics.
f) The potential water pollution due to leaks from equipment.

Inland terminal:

a) The potential impacts on safety, health and security of the people in the surrounding area.
b) The potential impacts on air quality, noise pollution and water quality management.

10/12/09

c) The potential impact on geo-hydrology.
d) The potential impacts on transportation and infrastructure.
e) The potential impact on sense of place and visual aesthetics.
f) The potential water pollution due to leaks from equipment.
g) The potential impacts on wetlands, ecology and biodiversity.
h) The future development of surrounding land and land use.

All impacts identified were assessed in detail and mitigation measures were proposed to mitigate those impacts that could not be avoided in total to acceptable levels. The implementation of the mitigation measures as part of the EMP is crucial to ensure that the project execution will have the minimum impact of the environment. The mitigation measures have been included in draft EMP submitted with the EIAR dated November 2008 are feasible and can be implemented. No fatal flaws were identified by any specialist in relation to the proposed final route alignment of the NMPP or the positions of the pump stations, coastal and inland terminals. Re-routing of the pipe line route was done regularly throughout the study as information became available to ensure that areas where significant impacts were identified are bypassed.

4. Findings

After consideration of the information and factors listed above, the department made the following findings -

- The proposed development is required to address the fuel supply needs of South Africa, especially the inland regions of the Free State, Gauteng, Mpumalanga and North West into the future. The need for the proposed development is clearly demonstrated and justified.
- The fuel supply line would have a positive impact on securing fuel supply to central South Africa and it would improve supply quantities.
- A detailed public participation process was undertaken and the consultant has satisfied the minimum requirements as prescribed in the EIA Regulations, 2006 for public involvement.
- The procedure followed for the EIA process has been adequate and compliant to the requirements of the Regulations, 2006.
- The information contained in the EIAR is deemed accurate and credible.

10/2/09

- The assessment of impacts is detailed and has indicated no fatal flaws with regard to the final proposed route and pump stations, the inland as well as the coastal terminal positions.
- There area proposed for the development is already somewhat disturbed due to existing infrastructure, servitudes or agricultural activities and the proposed mitigation measures will ensure that the potential impact of the proposed NMPP project is minimised.
- The proposed development is compatible with the proposed site for the development, especially in the light of existing infrastructure in close proximity to the proposed NMPP route, as well as the placement of the coastal and inland terminals next to existing infrastructure.
- Most legal and procedural requirements have been met.
- Comments raised by I&APs are included in the EIAR in a comments and response addendum and the consultant has responded on issues and comments.
- A draft EMP that complies with the requirements of the Regulations, 2006: 34 was included in the EIAR submitted to the department for acceptance.
- The applicant is capable of implementing the proposed conditions of the environmental authorisation and proposed mitigation measures.
- The principles of NEMA can largely be upheld.

In view of the above, the Department is satisfied that, subject to compliance with the conditions contained in the environmental authorisation, the proposed activity will not conflict with the general objectives of integrated environmental management laid down in Chapter 5 of the National Environmental Management Act, 1998 and that any potentially detrimental environmental impacts resulting from the proposed activity can be mitigated to acceptable levels. The application is accordingly authorised.

10/12/08

ANNEXURE 2-Revised Environmental Management Plan (EMP)

TRANSNET

NMPP Alliance

Transnet Limited

New Multi Product Pipeline (NMPP) Project

Revised Environmental Management Plan (EMP) – Trunkline and Facilities

2684358-J-A00-EN-RP-005

REV 5 – Issued for Use

NMPP Alliance

TRANSNET

NMPP Alliance

Transnet Limited

New Multi Product Pipeline (NMPP) Project

Revised Environmental Management Plan (CEMP) – Trunkline and Facilities

12 April 2010

NMPP Alliance Arup Worley Parsons JV
Building 16,
Harrowdene Office Park, Woodmead
Sandton, Gauteng, South Africa
Tel +27 11 287 9700 Fax +27 11 258 8846
www.arup.com

Job number 2684358

Job title	New Multi Product Pipeline (NMPP) Project		Job number 2684358
Document title	Revised Environmental Management Plan (CEMP) – Trunkline and Facilities		File reference
Document ref	2684358-J-A00-EN-RP-005		

Revision	Date				
3	29 Apr 2009	Revision Description	Issued for Internal Review		
			Prepared by	Checked by	Approved by
		Name	Wilna Haarhoff Tim Liversage	Brian Whitfield Marine Lasne	Carol Vosloo
		Signature			
4	3 June 2009	Filename			
		Description	Issued for Use – Incorporated comments from ECO's, CTR and NMPP		
			Prepared by	Checked by	Approved by
		Name	Wilna Haarhoff	Tim Liversage	Carol Vosloo
		Signature			
5	12 April 2010	Filename			
		Description	Issued for Use – Incorporated Annexure F (SAPREF EMP) and Annexure G (Specialist Studies Referenced in the EMP) Minor Changes to Content of the EMP		
			Prepared by	Checked by	Approved by
		Name	Wilna Haarhoff	Carol Vosloo	Andy Robershaw
		Signature			
		Filename			
		Description			
			Prepared by	Checked by	Approved by
		Name			
		Signature			

Issue Document Verification with Document ✓

TRANSNET

NMPP Alliance

Transnet Limited

New Multi Product Pipeline (NMPP) Project

Revised Environmental Management Plan (CEMP) – Trunkline and Facilities

2684358-J-A00-EN-RP-005

REV 5 – Issued for Use

Sign-Off

Organisation	Name	Signature	Date
NMPP Alliance Accepted	Carol Vosloo		
	Andy Robertshaw		
Transnet Pipelines Accepted			
Transnet Capital Projects Accepted	Paul de Ruyter		

Preamble

In Chapter 4 of the EIA, a description is provided of the complexities of integrating the environmental assessment and management (EA&M) process with the project development process. While the EA&M process seeks detailed, site-specific information at an early stage in the project development process, this information may only become available during preliminary and detailed design (which occurs at a later stage in the project development process). The absence of sufficient project information must not undermine the robustness of an EIA, and for this reason EIA practitioners focus strongly on sourcing that information that is required for good decision-making rather than necessarily sourcing all information.

In developing the Environmental Management Programme (EMP), the emphasis is to identify all environmental management requirements. The EMP is more demanding of detailed, site specific information than is the case for the EIA. However, in terms of the National Environmental Management Act (NEMA) regulations, the EMP must be developed and submitted at the same time as the EIA and must also be authorised before construction commences. In addition, there is sometimes a perception that in developing a project, detailed design is completed in its entirety before construction starts. In reality, in EPC projects, construction schedules demand that construction starts shortly after the start of detailed design which for most of the project runs in parallel and only slightly ahead of construction.

This means that detailed design is only completed at any time for those portions of the route that are about to be constructed with detailed information on further parts of the route only becoming available at a later stage when construction progresses to those points. This is a difficult issue to manage on a single site, but is compounded on a linear project such as the NMPP trunkline, where the EMP must be approved (in terms of the Regulations) at an early stage in the project development process, well before detailed design has commenced for other parts of the route. A further complexity is that given the uncertainty of the form of the detailed designs, Contractors are understandably reluctant to accept detailed prescription on what they must do to achieve a given environmental management objective.

Contractors often see prescription as undermining the design process, which incorporates a broader range of issues such as schedule, cost and other things. This does not mean that construction Contractors do not want to implement environmental management requirements, but they prefer an opportunity to develop the best possible approach to addressing the requirement. For example, if the requirement is to ensure that sediment loading in stormwater runoff from the construction site is prevented, then a prescription that an impoundment dam must be built forgoes other ways of meeting the same requirement such as stone gabions, velocity inhibitors, geo-fabrics and other. In these terms, Contractors would rather have

outcomes specified in the EMP than detailed prescription about what they must do to meet the outcomes.

Authorities on the other hand seek prescription because they need the reassurance that the environmental management requirements will be met. It is also often easier to determine whether a prescription (such as an impoundment dam) has been implemented rather than determining whether the outcome has been met (for example if there was a storm in the early hours of the morning). Unfortunately, an EMP that is too prescriptive limits opportunities for improved environmental management. For example, if the EMP prescribes watering three times a day to control dust, there are circumstances where the nature of the surface, low wind conditions and water scarcity require less watering then there is little point (and indeed even potentially negative consequences) of enforcing the watering three times a day requirement.

There will always be circumstances where a particular prescription simply does not work. This can occur for a variety of reasons, but a key driver is where site - specific conditions prove to be different to those that were anticipated. A highly prescriptive EMP does not provide for changes in approach where such circumstances occur. EMPs are often described as 'living' documents which can purportedly be updated and changed to adapt to the new conditions. The difficulty is that the EMP is approved once only by the authorities and there is no regulatory mechanism for an updated EMP to be approved. Even were such a regulatory provision to exist, the pace of construction on a pipeline project dictates that changes need to be made quickly and decisively – there simply cannot be a process of waiting for approval every time a change is needed.

It is for these various reasons that it is proposed here that the principle of adaptive environmental management be recognised and indeed authorised by DEAT as part of the authorisation of the EMP. Adaptive environmental management is an internationally recognised concept (see inter alia Roux, DJ, et al. 1999) that allows for, and indeed demands, that environmental management approaches be changed where they are proving to be ineffective. Adaptive environmental management does not mean a 'trial and error' approach it simply means that if there are better ways of achieving the same objective, or indeed improving the outcome, then these better ways should be allowed to be implemented without being viewed as a contravention of the conditions of authorisation.

The principle of adaptive environmental management must not give carte blanche to proponents and their contractors to change things as they see fit. Consequently, it is proposed that certain specialist supervisory personnel have limited authoritative powers to make decisions "in the field", in response to specific conditions encountered. For this reason it is proposed that the following procedure must be implemented wherever adaptive management principles are utilised:

- Senior qualified environmental personnel must be employed by Transnet on site, which have both the competence and credibility to interpret the recommendations of the EIA and principles specified in the EMP. This would imply Transnet's ECOs be afforded the authority to amend specific mitigation measures or requirements in the EMP in response to situations where they are not applicable or sufficient, provided that these changes are informed by an appropriately qualified and experienced specialist consultant when necessary. To this end the contractor's ELOs will be in constant communication with the appointed Transnet ECOs to ensure that situations are dealt with as soon as is possible;

- Such personnel must be issued a mandate, in writing by the project proponent, to provide guidance and instructions to the Contractors.

- An adaptive environmental management register must be developed for the project by the Contractor;

- Wherever a change from what is presented in the EMP is required, these changes must be detailed in the register including location, date, scope and cause of the condition encountered and reasons for the change;

- A clear statement of the required outcome must be detailed in the register (e.g. to meet a water quality limit, improve rehabilitation and so forth);

- Evidence must be provided and included in the register to show how the required outcome has been met (e.g. presentation of a data record, photographic evidence and so forth);

- The register must be available for audits and if, in the opinion of the authorities conducting the audit, the change resulted in a deterioration rather than an improvement, a compliance notice must be issued; and,

- The adaptive management register must be transmitted weekly via email to the Independent Environmental Auditor and ECO's, as well being presented and discussed at the Environmental Management Committee (EMC) or other similar bodies that may be established as part of the conditions of the authorisation.

References

Roux, DJ, et al. 1999. Adaptive assessment and management of riverine ecosystems: the Crocodile/Elands River case study. Water SA, vol. 25(4), pp 501-511; and,

Glossary, abbreviations and acronyms

Applicant / Owner	Transnet
Bids	Formal proposals by prospective service providers for different components of the design and construction of the project
Cement laden water	Water containing cement or concrete arising from the Contractor's activities
CTR EMS	Contractors' Environmental Management System
Contaminated water	Means water contaminated by the Contractor's activities such as with hazardous substances, hydrocarbons, paints, solvents and runoff from plant, workshop or personnel wash areas but excludes water containing cement/ concrete or silt.
dBA	A-weighted sound pressure level
DE	Design Engineer
DEAT	The National Department of Environmental Affairs and Tourism
DWAF	The Department of Water Affairs and Forestry – both national office and their various regional offices, which are divided across the country on the basis of water catchment areas.
ECA	Environment Conservation Act (Act 73 of 1989)
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment as contemplated in GN R385 of 21 April 2006 ("GN R 385") of the National Environmental Management Act (107 of 1998).
EIR	Environmental Impact Report
EMC	Environmental Monitoring Committee
EO	Environmental Officer (Contractor)
EMI	Environmental Management Inspector ("Green Scorpion")– from DEAT and Provincial Environmental Departments
EMP	Environmental Management Plan
Environment	The Environment is defined in terms of the National Environmental Management Act (Act 107 of 1998) as the surroundings within which humans exist and that are made up of: The land, water and atmosphere of the earth: Micro-organisms Plant and animal life Any part or combination of the first three items and the inter-relationships between them The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing.
Environmental Authorisation	Previously referred to as a Record of Decision (RoD). This constitutes the approval or dismissal of project as issued by the relevant environmental authority
EPCM	Engineering, procurement and construction management - viz. the 'managing' contractor
Fauna	All living biological creatures, usually capable of motion, including insects and predominantly of protein-based consistency.
Fence	A physical barrier in the form of posts and barbed wire or any other concrete construction, ("palisade"- type fencing included), constructed with the purpose of keeping humans and animals within or out of defined boundaries.

Fine	A monetary penalty against the Contractor by the PM as per request from the ECO.
Flood line	The line or mark to which a flood could rise, every 50 (1:50 year flood line), or 100 (1:100 year flood line) years
Flora	All living plants, grasses, shrubs, trees, etc., usually incapable of easy natural motion and capable of photosynthesis.
HSE	Health, safety and environment
I&AP	Interested and Affected Parties
IEA	Independent Environmental Auditor
Induction Training	Training provided to all new employees prior to them being allowed on site
ISO 14001	The environmental management systems standard of the International Standards Organisation
JPCCT	Jameson Park Community Commonage Trust
Key Indicators	Variables that provide a measure (indication) of environmental management performance
LLM	Lesedi Local Municipality
LLO	Landowner Liaison Officer
MPRDA	The Mineral and Petroleum Resources Development Act (Act 28 of 2002)
NEMA	National Environmental Management Act (Act 107 of 1998)
NGO	Non Government Organisation
NHRA	National Heritage Resources Act (Act 25 of 1999)
Non-compliance	Failure to comply with the requirements of the EMP
NWA	National Water Act (Act 36 of 1998)
PM	Project Manager
Potentially hazardous substance	Is a substance, which can have a deleterious effect on the environment. Hazardous Chemical Substances are defined in the Regulations for Hazardous Chemical Substances published in terms of the Occupational Health and Safety Act.
PPE	Personal Protective Equipment
Putrescible Waste	Waste that decomposes
RE	Resident Engineer
RoW	Construction Right of Way
SABS	South African Bureau of Standards
SAHRA	South African Heritage Resource Agency
Silt laden water	Water containing sand and silt arising from the Contractor's activities and/or as a result of natural run-off.
SMME	Small, micro and medium enterprises

Solid waste	All solid waste, including construction debris, chemical waste, excess cement/concrete, wrapping materials, timber, tins, cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers)
Spot Fine	A fine against a labourer by the PM as per request from the ECO. This fine should be used for the labourers' benefit.
Stormwater	Rainfall run-off from the site.
Swale	A depression between slopes that provides for drainage
TLB	Tractor, Load & Backhoe
Topsoil	The layer of soil covering the earth which provides a suitable environment for the germination of seed; allows the penetration of water; is a source of micro-organisms, plant nutrients and in some cases seed; and is not of a depth of more than 0,5 metres or such depth as the Minister may prescribe for a specific prospecting or exploration area or mining area.
Trunkline	For the purposes of this EMP this refers to the NMPP Project for the section between Durban and Jameson Park including the associated infrastructure such as terminals, pump stations, block valves, cathodic protection etc.
Vegetation	Any and all forms of plants, see also Fauna
Wastewater	Water containing cement washings, oil, fuel or other contaminants.
Wetland	A low lying area where the land is saturated with water, either permanently or temporarily and as characterised by specific indicator plant species and soil types
WUL	Water Use License (DWAF)

Contents

1 Environmental Management Framework

1.1 Introduction

The purpose of this Environmental Management Plan (EMP) is to ensure that the environment is properly considered during the design, construction, operations and decommissioning of the NMPP Trunkline and that negative impacts are minimised or prevented and positive impacts enhanced. At the same time the EMP provides a logical extension of the Environmental Impact Assessment (EIA) and ensures that recommendations contained in the EIA are implemented, and that the project does not deviate from the environmental profile that formed the basis of the assessment.
Specific objectives of the EMP are to:

- Summarise the range of potential adverse impacts that have been identified throughout the Environmental Impact Assessment (EIA) process of the project;
- Identify a range of mitigation measures that could reduce the potential adverse effects that the project has to acceptable or minimal levels;
- Detail specific actions, tasks and responses that are or may be required in response to incidents to ensure that environmental impact is minimised and mitigated;
- Where appropriate, specify timeframes within which required actions must take place and identify the required outcome or result of specific measures;
- Identify measures that could optimise the potential beneficial impacts of the project;
- Create a management structure and process through which the concerns of Interested and Affected Parties (I&APs) can be captured or documented and adequately addressed;
- Establish a process for the monitoring and auditing of environmental impacts and assessing the success of mitigation measures employed;
- Ensure that the construction process and operational phase of the project occur within the boundaries and parameters of acceptable practice that have been established;
- Specify actions and practices that will ensure good public relations and safe working conditions.

In order to ensure that these objectives have been properly planned for and integrated with project implementation, the format of the ISO 14001 Environmental Management Systems (EMS) standard has been used to provide a framework for the EMP. The use of this framework ensures that the environmental management requirements on the project are

properly planned for, implementation is effective, and, most importantly perhaps, that the environmental management function is always reviewed in a spirit of continuous improvement. In addition the use of the ISO 14001 EMS standard means that the EMP can be easily extended into a formalised EMS should this be required.

1.1.1 The Structure of the EMP

The EMP has been structured on the major components of the ISO 14001 Environmental Management Systems standard. These components are presented in Figure 1-1 together with a brief written description of what is required for each component in the sections that follow.

1.1.2 Environmental Policy

The importance of an environmental policy lies in the fact that it is principally the organisation itself that defines how it will give effect to environmental management. While there are several sources of specific environmental management and performance requirements including the EIA and other regulatory requirements, it is up to an organisation to define how it will address and manage all these requirements, as well as others that may be identified by the organisation.

1.1.3 Planning

Planning requires the characterisation of the various environmental aspects and related potential impacts that can result from the organisation's activities and defining mitigation to prevent or reduce negative impacts and enhance the benefits. In the case of the NMPP Trunkline the major potential impacts have been characterised through the Environmental Impact Assessment (EIA) process. The EIA is the key (but not exclusive) source of identified impacts and the resultant environmental management requirements that must be implemented during the execution of the project.

1.1.4 Implementation

Implementation is the key to the success of the EMP and arguably one of the most difficult components to achieve. Implementation is the process of ensuring that the planning is effectively implemented and as such is based on a clear delineation of responsibilities, an effective structure for implementation and 'management controls'.

Structure and responsibilities define the key roles that need to be fulfilled in the implementation of the project and the environmental management responsibilities of those roles. These include dedicated environmental management personnel as well as general project personnel because everyone on the project has a role to play in ensuring effective environmental management. Management controls serve to ensure that there is a robust mechanism for implementation of the environmental management requirements.

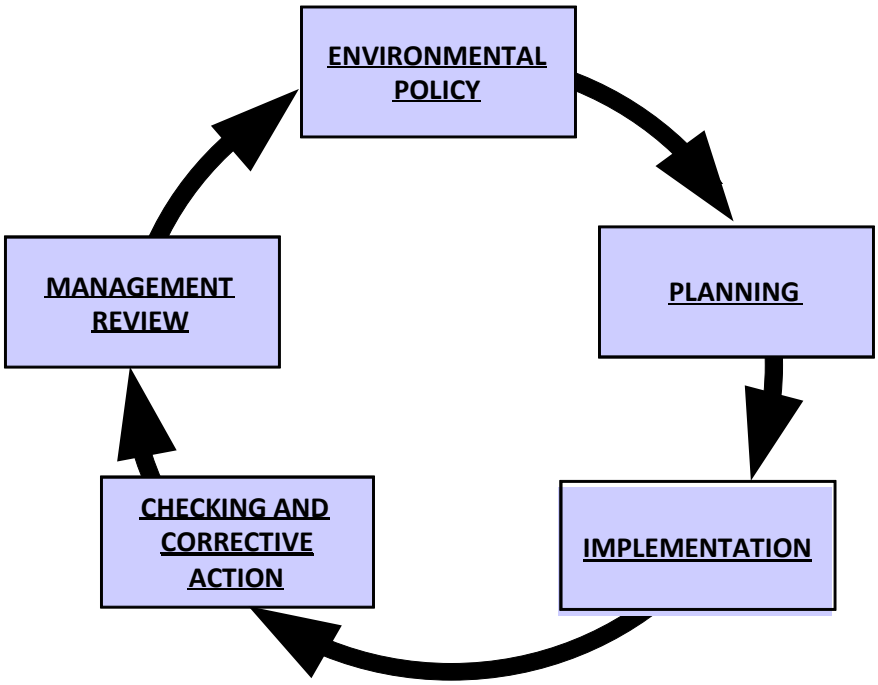


FIGURE 1-1: *Schematic illustration of the environmental management philosophy presented in this document.*
**ISO refers to 'Implementation and Operation'. By operation is meant the 'operationalisation' of planning control measures. Because the project involves distinct phases, which include 'construction' & 'operation', the ISO definition of 'operation' not used here since it causes confusion.*

1.1.5 Checking and preventative corrective action

Checking and corrective action is the process of gathering information on environmental management performance, reviewing that information and deciding on the necessary corrective and preventative actions that are required in response.

1.1.6 Management Review

The final component of the EMP is a formal management review. The review must occur regularly and serves for senior project management to review the environmental

management performance during the preceding period and to propose measures for continually improving that performance.

1.2 Environmental Policy

The Contractor and EPCM will produce an Environmental Policy which is aligned with the Transnet Corporate Responsibilities and Policies.

This Policy will be communicated to all Project personnel and made available to the public.

1.3 Planning

1.3.1 Overview

Planning serves to ensure that all the environmental management requirements that must be implemented for the NMPP Trunkline are identified and mechanisms defined for their implementation. The EIA plays a critical role in highlighting the environmental management requirements which derive from the recommendations for mitigation of impacts presented in the EIA specialist reports as well as legal requirements. The specialist assessments are based in turn on assessing the environmental aspects and impacts of the different project phases of the NMPP and these derive from the facilities and the activities associated with each project phase. In this section, the NMPP is briefly presented together with the facilities and activities associated with each project phase. Thereafter, the environmental management requirements that derive from the EIA are presented. The planning component of the environmental management philosophy is presented schematically in Figure 1-2.

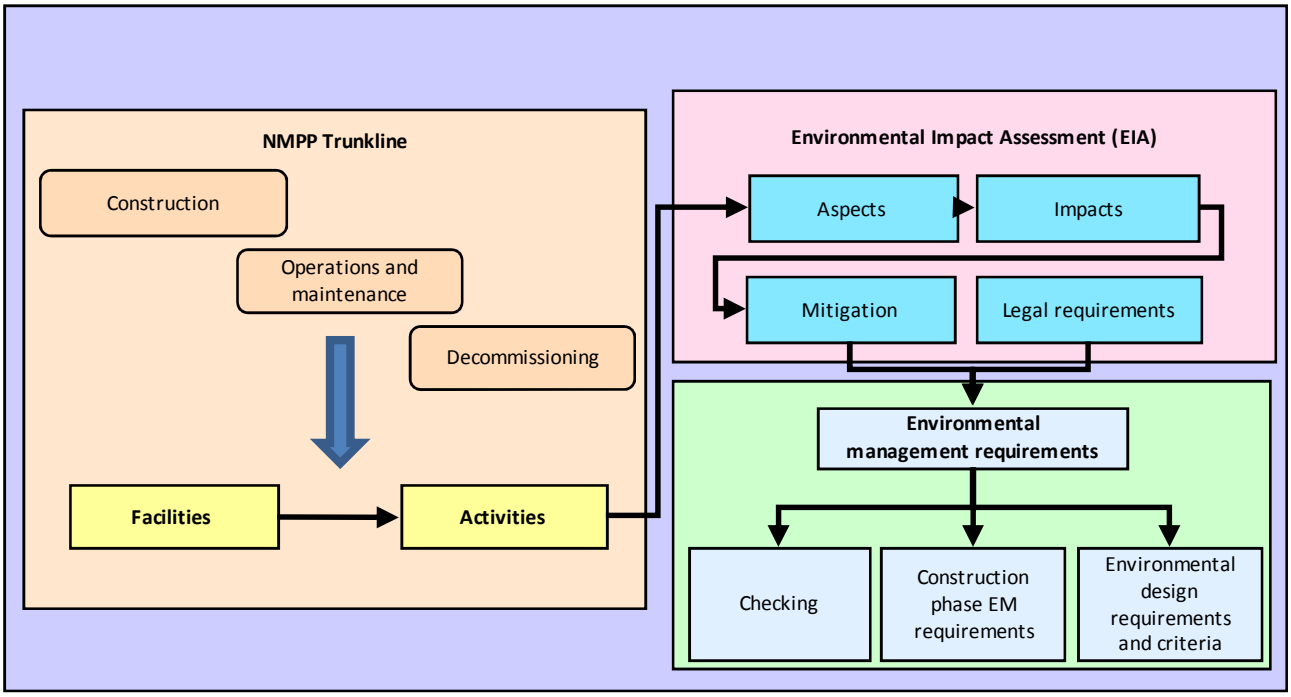


FIGURE 1-2: *Schematic illustration of the planning component of the environmental management philosophy.*

1.3.2 The NMPP Project

Transnet's proposed NMPP project is designed to efficiently transport refined fuels (93 and 95 octane petrol, low and high sulphur diesel and aviation / jet fuel) from Durban to inland South Africa. The project consists of:

- A new 24 inch multi-products liquid fuel pipeline ("trunk line") including eight pump stations along the route from Durban, KwaZulu-Natal to Jameson Park near Heidelberg in Gauteng. The pipeline will be buried for its entire length;
- A coastal fuel terminal to accumulate the fuels prior to their delivery into the pipeline.
- An inland fuel terminal at Jameson Park near Heidelberg, to accumulate fuels received from the trunk lines, prior to distribution into the inland pipeline network.

1.3.3 Project Phases

Design phase

The design process has three major components namely:

- Conceptual design – during which the broad principles of what needs to be established are defined;

- Basic design; and,
- Detailed design

In terms of design the broad principles of what needs to be built are established as conceptual design which are subsequently further detailed through the basic design and detailed design processes. What is constructed is taken directly from the detailed design. It is important to recognise that it is economically important to get the physical construction started as soon as possible after the completion of the design and what this means is that the design process and the construction process run in parallel albeit with a lag between the two.

Construction phase

The construction phase entails a set of activities required for the physical building of the Trunkline and associated infrastructure including;

- Establishment of lay-down areas;
- Construction of temporary facilities;
- Surveying and staking the construction right of way (RoW);
- Removing trees, boulders and debris from the construction RoW;
- Preparing a level working surface for construction equipment;
- Topsoil stripping and stockpiling;
- Pipe transportation;
- Trench excavation;
- Pipe bending;
- Welding, weld quality testing, weld blast cleaning and coating;
- Pipe laying;
- Trench backfilling;
- Reinstatement;
- Hydro-testing; and,
- Pipeline cleaning, gauging and drying.

Special Construction Techniques are employed where difficult or restricted terrain is encountered. These include the following:

- Open-cut river and stream crossings;

- Directional drilling;
- Road, railway line and driveway crossings;
- Other linear infrastructure crossings (pipelines, cables, irrigation systems);
- Tightly spaced or highly populated areas;
- Agricultural areas and significant natural features.

In addition to the establishment of the pipeline, pump stations and terminals, the following temporary facilities will be established:

- Construction camps;
- Access roads;
- Fencing; and,
- Borrow pits.

Operations phase

Operations consist of:

- Product dispatch;
- Inspections;
- Maintenance of pipeline and associated infrastructure;
- Maintenance of servitude.

De-commissioning phase

In the event that the pipeline is decommissioned the following activities would take place, subject to an appropriate environmental investigation:

- Removal of all petroleum products from the pipeline;
- Test integrity of pipeline;
- Fill pipeline with water;
- Maintain cathodic protection;
- Monitor pipeline for leaks and repair.

1.3.4 Environmental Management Requirements

On the basis of the impacts identified and assessed in the EIA, mitigation is presented to minimise or prevent negative impacts and to enhance potential benefits. The mitigation and other recommendations contained in the EIA are collectively referred to here as environmental management requirements. These environmental management requirements include, but are not necessarily limited to the management of:

- Geology and soils (including borrow pits, seismicity, blasting, dolomite and erosion);
- Fauna, flora and habitat (including areas of special sensitivity / conservation value, threatened species, and agricultural areas and activities);
- Water (including surface water features, river and wetland crossings, ground and surface water pollution and hydrology and stormwater);
- Air and noise (including air quality and dust);
- General construction activities (including construction access and traffic, vegetation clearing, topsoil and subsoil, borrow areas, stone and rock waste, waste management, reinstatement, construction right of way and gates and fences);
- The social environment (including archaeological sites and graves, employment, land owner and occupier relations, complaints, community health management and visual impact);
- Recruitment (including promotion of local labour and skills development and training);
- Transportation management (including pedestrian safety, traffic disruption minimisation and abnormal loads);
- Water conservation;
- Ongoing management and maintenance of construction impacts (including warranty of re-vegetation, vegetation maintenance and repair and replacement);
- Emergency and Response (including emergency preparedness and fire prevention and management);
- Materials handling and storage (including leak and spill management and spill remediation and recovery;
- Conditions of authorisation.

These various requirements apply to different project phases, different sections of the project, different facilities, different activities and in some circumstances to the entire project. It is therefore important to structure the environmental management requirements in such a way that they are properly understood, correctly allocated to the component of the project to

which they apply, and that they are effectively implemented during the execution of the project. To this end, and in recognition of the way in which the project will be executed, the environmental management categories have been categorised into environmental design requirements and criteria, construction phase requirements, and checking. Each of these categories is described in more detail in the following section.

Environmental design requirements and criteria

There is a range of environmental management requirements that apply directly to the physical infrastructure that will be created namely the pipeline, terminals and pump stations. Examples of these requirements include vapour recovery at the terminals, noise limitations and others. The mechanism implementing these requirements is ensuring that the requirements are recognised by, and feed into, the design process. In this manner, the environmental management requirements are incorporated in the design and are thus included in the facilities that are constructed. This first category of environmental management requirements is thus environmental design requirements and criteria that must be incorporated in the design of the pipeline.

Construction phase environmental management requirements

The construction phase sees the construction of the pipeline according to the detailed design that is developed. However, in the construction process, there are a range of activities and temporary (construction) facilities that are not directly addressed in the design process. Examples of these activities and temporary facilities include refuelling and servicing of machinery, construction camps, temporary access roads and so forth. There is obviously a range of environmental management requirements that apply thus to the construction phase, that are not incorporated in the design process and these requirements thus form the second category of requirements.

1.3.5 Checking

Checking refers to the mechanisms that serve to check the efficacy of implementation of the environmental management requirements and the outcomes of the environmental management function. These mechanisms include monitoring of selected environmental variables, audits (both internal and external) and inspections. Specific requirements that emerge from the EIA are thus captured in this section.

1.3.6 Legal Requirements

All project activities must adhere to and comply with all South African legislation and regulations and this requirement must also be included in the Contractors' conditions. Should there be changes in legislation and/or regulations then actions will be taken to incorporate

such changes and to pass these requirements on to the Contractors. Specific legislation that must be complied with includes, but is not necessarily limited to:

- Animal Protection Act, 1962 (Act 71 of 1962)
- Atmospheric Pollution Prevention Act, 1965 (Act 45 of 1965)
- Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983)
- Constitution of South Africa (Act 108 of 1996)
- Environmental Conservation Act, 1989 (Act 73 of 1989)
- Hazardous Substances Act (Act 15 of 1973)
- Mine Health and Safety Act, 1996 (Act 29 of 1996)
- Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002)
- Municipal Structures Act, 1998 (Act 117 o 1998)
- Municipal Systems Act, 2000 (Act 32 of 2000)
- National Environmental Management Act, 1998 (Act No. 107 of 1998)
- National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004)
- National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004)
- National Environmental Management: Waste Act, 2008 (Act 59 of 2008)
- National Forests Act (Act No 84 of 1998)
- National Heritage Resources Act, 1999 (Act 25 of 1999)
- National Monuments Act, 1969 (Act 28 of 1969).
- National Parks Act, 1976 (Act 57 of 1976)
- National Veld and Forest Fire Act, 1998 (Act 101 of 1998)
- National Water Act, 1998 (Act 36 of 1998)
- Occupational Health and Safety Act, 1993 (Act 85 of 1993)
- Protected Species – Provincial Ordinances

Standards and Specific Legal Requirements

Specific guidelines and policy requirements include:

- American Society of Mechanical Engineers (ASME) B31.4 Pipeline Transportation
- American Society for Testing Materials (ASTM)
- American Petroleum Institute (API)
- National Association of Corrosion Engineers (NACE)
- National Fire Protection Association (NFPA) standards
- International Standards Organization (ISO) 9000/2000 Quality Systems
- South African standards, codes and regulations, which include:
- South African Occupational Health and Safety Act (OHASA) Act 85 of 1993
- South African National Standard (SANS) 10089 (pertaining to the petroleum industry)
- Petroleum Pipelines Act, Act 60 of 2003
- National Key Points Act, Act 102 of 1980

Development Frameworks

On different parts of the alignment various development frameworks will also apply such as Metropolitan Open Space Systems (MOSS), Integrated Development Plans (IDP) and Spatial Development Frameworks (SDF). These requirements must also be **considered where possible** in the project implementation process during construction.

1.3.7 Objectives and Targets

In order to ensure that environmental management performance follows from the environmental policy and planning, objectives and targets must be developed and prescribed which provide the basis for monitoring of that performance. Objectives and targets must be specified for both leading indicators (i.e. the implementation of the requirements of the EMP) and lagging indicators (environmental performance monitoring).

1.4 Implementation

1.4.1 Overview

Effective implementation of the planning described in the previous section is dependent on ensuring that the environmental management requirements are integrated into the process by which the NMPP Trunkline will be built. Much of what is presented in this section is geared towards meeting that requirement. This is supplemented by the detailing of the responsibilities of the various role players that may have either a direct or an indirect role to play in terms of environmental management together with training and awareness programmes that will be implemented during the execution of the project. The implementation component of the environmental management philosophy is presented in Figure 1-3.

1.4.2 Integration with the Construction Process

The most effective way of ensuring implementation of the environmental management requirements is by integrating those requirements into the construction process. The greater the degree of integration with the construction process the greater the probability that the environmental management requirement will be implemented. For this reason it is necessary to describe key elements of the construction process before presenting how the integration of the environmental management requirements will be effected on the NMPP Trunkline Project.

1.4.3 Management of the Construction Process

The construction management structure is shown schematically in Figure 1-4. It is made up of the project owners (Transnet Pipelines), an engineering, procurement and construction management (EPCM) contractor (the NMPP Alliance), made up of a joint between ARUP and Worley Parsons) principal contractors and a host of sub-contractors. The EPCM contractor also has a design function where conceptual and detailed designs are prepared for construction. The EPCM acts as an agent for the project owners in managing the implementation of the project and ultimately to deliver a functioning trunkline to the project owners at the end of the project period.

The EPCM defines a scope of work for the principal contractors, and facilitates the process of identifying and appointing the contractor. The EPCM then manages the principal contractors in delivering on the scope of work including an ongoing process of developing detailed designs for construction by the principal contractors. The principal contractors will in turn appoint a range of sub-contractors for the completion of various functions within the defined scope of work.

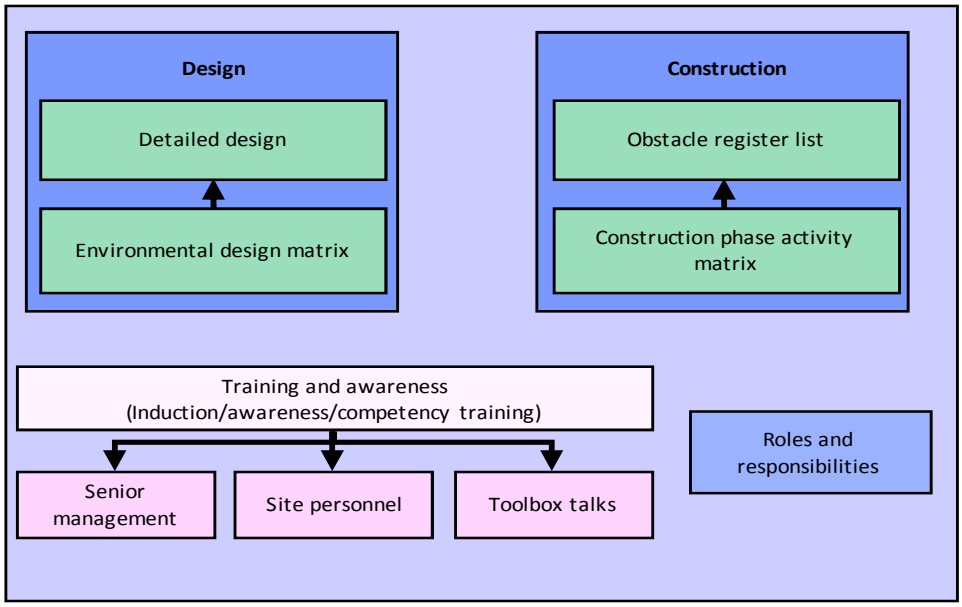


FIGURE 1-3: *Schematic illustration of implementation and operation of the environmental management philosophy.*

The design process

The design process is the ideal mechanism for translating the environmental management requirements into instructions to contractors. As described previously, the environmental management requirements have been divided into different categories including environmental design criteria.

A matrix has been

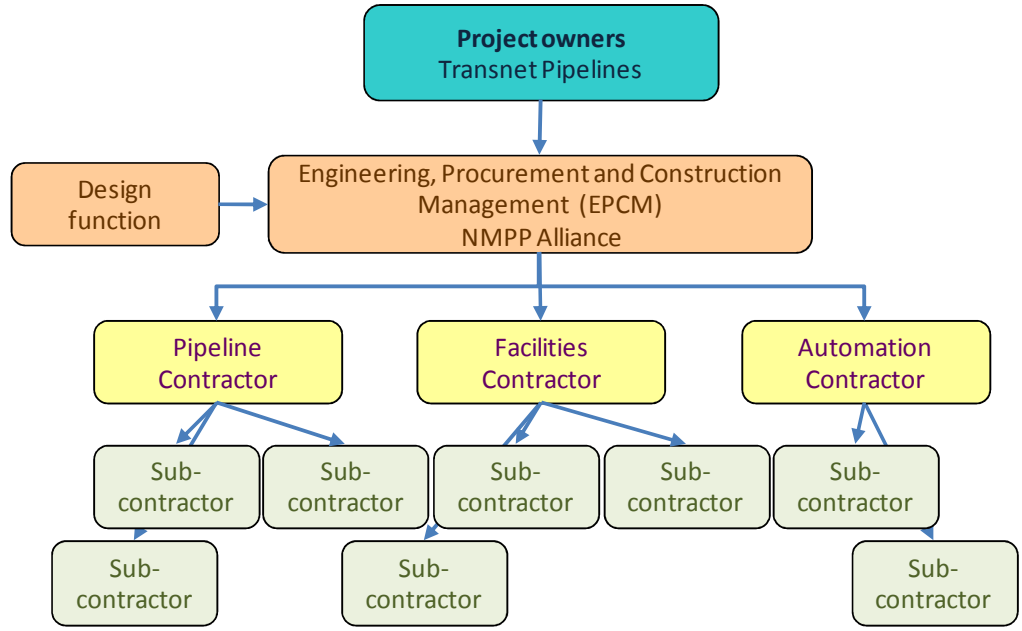


FIGURE 1-4: *Schematic presentation of the management structure that will be used for the execution of the NMPP Trunkline project. .*

n developed to link all the environmental design criteria identified during the planning process to the various facilities that will be established for the NMPP Trunkline. As the conceptual and detailed design is developed the environmental design requirements and criteria must be incorporated. The purpose of the matrix is to provide a clear reference system whereby a design engineer can easily source the environmental requirements that must be included in the design without having to work through the entire EMP. At the same time a review process must also be established to ensure that the detailed designs do in fact contain the environmental design requirements and criteria and that review process must be formally recorded and signed off as part of the design review process.

The construction process

On the basis of the designs that are prepared by the EPCM and in response to the defined scope of work and engineering and construction specifications, the contractors will physically construct the project.

A key mechanism used by the pipeline contractor in the construction process is the Pre-Construction Survey whereby the contractor defines all the tasks that will need to be completed along the different sections of the route. The Pre-Construction Survey could contain direct engineering challenges such as traversing services, difficult geology and so forth, but can also be environmentally related obstacles such as river or wetland crossings.

Design requirements of the pipeline will be presented in the Engineering Alignment Sheets issued to the contractor from the EPCM. Detail requirements such as the listing of all the temporary facilities that will be established will be identified by the contractor according to accepted method statements. Typical drawings issued to the contractor will indicate the various construction activities that will take place such as topsoil stripping, clearing and grubbing, trench excavations and so forth.

A review function must also be established to ensure that the contractor has understood and provided for the environmental management requirements. This can be checked against the Pre-Construction Survey or in the method statements that will be submitted by the contractor to the EPCM for the establishment of temporary facilities. In a similar vein a physical inspection regime must also be established to ensure that the physical construction of the facilities and pipeline infrastructure accords with the environmental management requirements.

1.4.4 Management Controls

Procedures

Although many of the environmental management requirements will be the responsibility of individual contractors, there is a range of environmental management requirements that are the direct responsibility of the EPCM. In order to ensure that these responsibilities are understood and effectively implemented during the execution of the project a range of procedures will be developed that will be managed by the EPCM and Contractor. The following procedures will be developed in support of the implementation of the EMP:

- Requirements of the EPCM in implementing the EMP;
- Audits and inspections;
- Monitoring;
- Recording, logging and reporting incidents;
- Corrective and preventive action;
- Review and approval of the Contractor's EMP (CEMP);
- Environmental awareness;
- HIV/AIDS awareness;
- Fire control and emergency preparedness;
- Materials handling and storage
- Leak and spill management;
- Recruitment and labour;
- SMME development;
- Engineering/design environmental review; and,
- Management review.

Note that the content of these procedures will be drawn to a large extent from the content of the EMP, but with more detailed elaboration of specific implementation requirements.

Contractor management

The most critical element of environmental management on any construction project is ensuring that contractors know what they have to do and then checking that they implement those requirements effectively in the execution of their construction activities. It is extremely

important to recognise that only contractors do any physical construction work on site so that anything that is required must be translated into instructions to contractors.

From an environmental management point of view the main contractor is compelled to submit its detailed Environmental Management System (EMS) documentation, procedures and method statements to the EPCM for acceptance. Contractors are required to detail in their procedures and method statements what their activities are and how they will manage those activities to ensure that the various environmental management requirements are met.

An important philosophy in managing contractors is to ensure that they take ownership of the environmental requirements and one of the ways in which this is promoted is through ensuring that they develop and implement their own procedures and method statements.

All of the environmental management requirements that the owner must uphold, and that are contained in this EMP are presented as contract conditions that are legally enforceable in terms of the contract concluded between the owner and the contractor.

The contract conditions that will be issued will stipulate the requirements for each contractor to develop their own procedures and method statements, the contractor will not be allowed to mobilise until such time as the procedures and / or method statements has been accepted by the EPCM.

1.4.5 Roles and Responsibilities

Effective environmental management during the design and construction of the NMPP Trunkline will be critically dependent on a number of project personnel. The purpose of this section is to define roles for personnel and to detail concomitant responsibilities in the execution of the EMP. Before doing so it is also necessary to define the various organisations that are responsible for implementing the project together with the environmental management responsibilities each carries. Please see Figure 1-4 for a more general description of the relationship between these organisations.

1.4.5.1 Transnet Pipelines

Transnet Limited, through their operating division Transnet Pipelines is the ‘owner’ of the project and as such the environmental authorisation and subsequent operational environmental permits will be issued in the name of Transnet Limited. Transnet Pipelines is thus responsible for ensuring that all the conditions of the environmental authorisation are fully implemented and are the overall custodians of the various environmental management requirements that need to be implemented.

Key Role Players (Transnet pipelines)

Environmental Manager (Transnet)

The Main responsibility of the Transnet Environmental Manager during operations will be to report to Transnet Management on the progress in terms of compliance of the Environmental Management Plan Requirements

Environmental Control Officers (ECOs)

Reporting to the Environmental Manager.

The ECOs will be appointed by Transnet prior to the start of the site preparation and construction phase. Due to the physical extent and complexity of the project and the fact that construction will simultaneously take place in multiple locations, Transnet will be required to appoint a sufficient number of ECOs to adequately and efficiently monitor all areas of construction.

An ECO must be appointed to monitor construction at each of the Terminal complexes, with additional ECOs to be appointed to monitor construction of the pipeline and pump stations.

The Environmental Manager and Project Manager must determine the appropriate number of ECO's required during review of the project schedule presented by the contractor. If at any point during the project it becomes apparent that the number of ECO's is not sufficient, additional ECO's must be appointed for the duration of the remainder of the project. The number of ECO's may be reduced once construction has reached a substantial level of completion.

The appointed ECO's must be sufficiently qualified with a degree in environmental practice or equivalent from a recognised University or Technikon (or recognised equivalent), and a further post-graduate degree in environmental practice or equivalent, from a University or Technikon (or recognised equivalent) in order to understand and perform all tasks required. The ECO's must also be able to effectively communicate and deal with the Contractor as well as affected landowners and members of the public. The resumes of all ECO's to work on the project have to be accepted by Transnet prior to appointment.

It is advisable that an Independent Managing Environmental Consultant / ECO is appointed by the applicant in order to manage all ECO's on site, since it is anticipated that not all ECO's might have appropriate site experience.

This Managing Environmental Consultant / ECO will have a degree in environmental practice or equivalent from a recognised University or Technikon (or recognised equivalent), and a further post-graduate degree in environmental practice or equivalent, from a University or Technikon (or recognised equivalent). Furthermore the Managing Environmental Consultant / ECO shall have a minimum of five years working experience in the field of Environmental Management and in particular have relevant experience as an environmental site officer.

The role of the ECOs is to support the successful implementation of the EMP through:

- Investigating and reporting on major environmental incidents;
- Auditing the implementation of the EMP
- Overseeing the execution of the activities described in the EMP.
- Maintaining and managing the monitoring programme.
- Participating in the Environmental Management Committee (EMC)
- Providing liaison on environmental issues between all other parties, i.e. the Contractor, Project Manager, Resident Engineer, Landowners and Authorities.
- Full familiarisation with the findings and conditions of the EMP and Environmental Authorisation, including any potential amendments or additions to these documents. Having a good working knowledge of all relevant environmental policies, legislation, guidelines and standards.
- Ensuring that all Contractors/ Contractor environmental personnel/sub-Contractors/employees are fully aware of their environmental responsibilities. This will take the form of an initial environmental awareness-training program in which requirements of this document will be explained, as well as follow-up or additional training sessions as required.
- Monitoring the actions of the above parties to ensure that the developer and/or Contractor are adhering to all stipulations of the EMP.
- Conducting site meetings and inspections at regular intervals as stated within the EMP and / or Environmental Authorisation as well as on a case-by-case basis as the conditions of the project may determine. The findings should be documented as part of the site meeting minutes.

- Submitting EMP compliance reports at regular intervals as determined by the EMP and / or Environmental Authorisation and submit these to the Contractor for appropriate and timorous action if required. Copies of the reports will also be submitted to the Project Manager and relevant authorities and any other parties determined by the Environmental Authorisation. The reports must be thorough yet concise, logically structured and understandable.
- Regular liaison with the Construction team, Environmental Officers (Contractor), Land Liaison Officers (LLO's) and Project Manager to ensure that all relevant information is reliably communicated between parties.
- Regular liaison with all Interested and Affected Parties (I&AP) including all landowners.
- Conducting a post construction environmental audit to ensure that all conditions in the EMP have been adhered to.

1.4.5.2 The NMPP Alliance (EPCM)

The NMPP Alliance is a joint venture between Arup and Worley-Parsons and fulfils the role of Engineering, Procurement and Construction Management (EPCM). In other words the EPCM is the managing contractor that takes the requirements of the client and translates these requirements into designs, procures the necessary equipment and services and manages the construction process. The EPCM will be accountable for environmental management during the construction phase and are thus responsible for implementing the EMP under the custodianship of Transnet Pipelines. The EPCM is the representative of Transnet Pipelines during the Engineering and Construction Phase.

Amongst other responsibilities the EPCM must:

- Maintain a register which keeps a record of all incidents which occur on the site, which relate to any aspect of the EMP. These include but are not limited to the following:
- Health and safety incidents;
- Incidents relating to safety and security of the site and construction camps;
- Public complaints and incidents involving third parties;
- Incidents involving hazardous materials or substances; and,
- Ensure that amicable relations with all third parties, including affected landowners and other I&APs are maintained and minimise the disruption and inconvenience suffered by these individuals as a result of construction activities.

Key role-players (EPCM)

Project Manager (PM)

The PM will be responsible for the overall management and overseeing of the contract, from initiation to completion of construction. As such the PM is the ultimate custodian of all elements of the project, from design, construction and commissioning through to operations and ultimately de-commissioning. In these terms the PM is, inter alia, the ultimate custodian of all environmental management requirements and legal obligations for the project. In response to these requirements the PM:

- Will be expected to be familiar with and ensure adherence to the conditions of the EMP and Environmental Authorisation, including any potential amendments or additions to the document;
- Will be responsible for monitoring the site activities, both directly and through appointed agents, in order to ensure compliance;
- Must ensure that sufficient resources are available to the other role players to efficiently perform their tasks in terms of the EMP;
- Must appoint the independent ECOs to ensure strict adherence to the EMP;
- Will be responsible for conducting internal audits of the construction process and conditions on site and compare these with the EMP and will ultimately be responsible for ensuring that remedial steps are taken where non-compliance occurs;
- Will, in consultation with any members of the Project Consultant Team and/or Environmental Manager and/or ECOs as the case may be, be responsible for the approval of the Emergency Response Plan and Fire Prevention and Management Plan;
- Will liaise with the Contractor to obtain the contact details and particulars of the Landowner Liaison Officers and Environmental Liaison Officers. He will submit this information, together with the details of the appointed Environmental Control Officers, Environmental Manager and Approved Inspection Authority (see separate Items below) to DEAT, as well as all relevant provincial and local authorities.

Environmental Manager (EM) (EPCM)

Reports to the Project Manager.

The role of the Environmental Manager is to ensure that all environmental management requirements are recognised and effectively implemented during the execution of the Project. Specific requirements include to:

- Plan and direct the implementation of the Environmental Management Programme;
- Ensure that all the construction procedures and method statements comply with the environmental requirements in this EMP;
- Manage scheduled external audits and inspections on contractors performance on site, with subsequent report back to management;
- Coordinate and oversee the activities of the ECOs;
- Ensure that information is effectively communicated and distributed between all parties;
- Be aware of the environmental issues relating to the project and regularly meet with the ECOs to keep abreast of current events. Should an ECO not be able to respond to a specific query from the Contractor or Contractors environmental personnel or a landowner, the matter must be referred to the Environmental Manager who will take whatever actions are deemed necessary.

Design Engineer

The design engineer is the consultant responsible for the initial design of the project prior to construction commencing. The design engineer is not normally available on site during the construction period, but will be consulted throughout the construction period of the project regarding any issues that fall outside the scope of responsibility of the resident engineer.

Servitude Negotiators

The EPCM will appoint dedicated Servitude Negotiators whose responsibility it will be to liaise on an ongoing basis with all landowners in terms of servitude negotiations and keep them informed of progress and next steps of construction.

The Servitude Negotiators will act as the primary contact affected landowners and will facilitate all negotiations between the Contractor and landowners. It will be the responsibility of the Servitude Negotiators to keep landowners updated and informed of all activities and decisions relating to construction that may affect them and shall ensure that relevant contact

details of the Contractor and ECOs are available in order for landowners to make contact if required;

Approved Inspection Authority (AIA)

An AIA will be appointed by Transnet Pipelines in terms of the Occupational Health and Safety Act (Act 85 of 1993) as well as the API 1104 Code and all relevant national and international quality standards. It will be the responsibility of the AIA to check whether the installations conform to the relevant designs and specifications, as well as the general quality of materials used and construction workmanship. The AIA will provide assessments and recommendations to Transnet as well as the relevant authorities in this regard. The project is to be assessed by an AIA group to ensure quality and compliance.

1.4.5.3 Individual contractors

Three principal contractors will be appointed for the construction of the NMPP Trunkline namely:

- The pipeline contractor;
- The facilities (terminals and pump stations) contractor; and,
- Automation contractor.

The principal contractors will also appoint a number of sub-contractors.

Key role-players (Contractor)

Environmental Manager (EM) (Contractor)

The role of the Environmental Manager is to ensure that all environmental management requirements are recognised and effectively implemented during the execution of the Project.

Specific requirements include to:

- Ensure the implementation of the Environmental Management Programme;
- Development of all the relevant construction procedures and method statements in order to comply with the environmental requirements in this EMP;
- Ensure that contractors on site develop, implement and monitor the environmental management plan, construction procedures and method statements;

- Manage scheduled internal audits and inspections on contractors performance on site, with subsequent report back to management;
- Ensure that information is effectively communicated and distributed between all parties;
- Be aware of the environmental issues relating to the project and regularly meet with the ECOs to keep abreast of current events. Should an ECO not be able to respond to a specific query from the Contractor or Contractors environmental personnel or a landowner, the matter must be referred to the Environmental Manager who will take whatever actions are deemed necessary.

Contractor Environmental Officers (EOs)

The EOs will be appointed by the Contractor to monitor the activities on the site on a daily basis against the EMP conditions. The EOs will liaise on a daily basis with the ECOs on site and will report back to the ECOs on any significant occurrences during all site inspections and site meetings. The Eos will keep the ECOs informed of the contractors planned construction within areas of environmental concern such as wetlands, heritage sites and other sensitive areas. All communication between these parties in this regard will be confirmed in writing via email. The EOs must further immediately report any major incidents or occurrences to the ECOs to ensure immediate remedial action. Each construction site section must have an appointed EO who will be present on site whenever any construction activities are taking place.

Construction Manager (CM)

The role of the CM is to ensure that all contractors on site abide by the requirements of the EMP and that the plant and pipeline is constructed in such a manner that meets all specified contractual and legal environmental requirements.

Site Engineers

The role of the Site Engineers is to ensure that environmental requirements and restraints are passed on to the design engineers and to check that the plant and pipeline is designed to meet all specified environmental parameters and to contractual and legal requirements. A resident engineer acts as a direct, on-site resource for all technical aspects related to the project. He/she is available on the construction site at all times, overseeing all phases of the construction activities. The resident engineer will issue site instructions with regard to minor technical or procedural issues and where significant technical constraints or issues are encountered must liaise with the project design engineer.

1.4.5.4 General

Community / Land Liaison Officers (CLOs / LLO's)

In addition, the Contractor and EPCM will appoint dedicated CLOs / LLO's whose responsibility it will be to liaise on an ongoing basis with landowners and affected parties and keep them informed of progress and next steps of construction.

The CLOs / LLO's must be able to communicate with affected parties in all languages commonly spoken in a specific area and must have good interpersonal skills and communication ability. A sufficient number of CLOs / LLO's must be appointed by the Contractor and EPCM to ensure that all landowners are timeously consulted and informed of any events that may affect them. The CLOs / LLO's must have a good understanding of the project and all construction procedures and the environmental factors and impacts that may occur as a result of construction. Where a CLO / LLO is not able to answer a specific query from a landowner, the matter must be referred to the relevant ECO or otherwise Environmental Manager to resolve in the event that the issue is related to the EMP or environment.

The CLO / LLO will act as a primary contact with I&APs. It will be the responsibility of the CLO / LLO to keep I&APs updated and informed of all activities and decisions relating to construction that may affect them and shall ensure that relevant contact details of the Contractor and ECOs are available in order for I&APs to make contact if required;

1.4.5.5 Training and awareness

All employees will receive suitable environmental training, to ensure they are aware of their responsibilities and are competent to carry out their work in an environmentally acceptable manner. The Main Contractor will lead all environmental training programmes as required by the EMP. Sub-Contractors are compelled through their contract conditions to follow all requirements of the EMP, where the necessary training to their workforce will be essential to ensure that this requirement is met.

The Contractor must ensure that all of his construction staff receive basic training related to environmental matters, as well as acceptable conduct, storage and handling of chemicals and potentially hazardous substances, waste management, and prevention of pollution of natural resources. The Contractor must also ensure foremen and managing site personal receive detailed training with regards to the requirements of the EMP.

Training must be given or otherwise facilitated by the Contractor EO and all staff must be aware of where detailed information relating to any aspect of the EMP or environmental requirements can be obtained.

It is the responsibility of the Contractor to ensure that he is fully familiar with the requirements of this EMP. Should the Contractor require any information or explanation regarding any aspect relating to the EMP it will be his responsibility to contact the ECO for advice. In addition the following personnel will receive specific environmental training:

Informal training of all staff on site is also required on an on-going basis through informal discussions, on-site supervision and through facilitation of day to day activities. This responsibility falls within all that received basic or specialized training.

If it is found through formal reporting structures, informal site inspections and observations of day to day activities that certain training was inadequate, the contractor must ensure that such training is reviewed and revised if necessary and that all staff relevant to such areas are re-trained in order to ensure compliance to this EMP.

Higher level of training for senior management on all relevant environmental issues will be conducted by the Main Contractor. The focus will fall on legislation, EMP philosophy, structure and reporting requirements, permit procedures, application requirements and general environmental management activities.

Individual employees play an essential role in that they are directly involved in the physical construction activities and thus need to understand the limitation, restrictions and/or other environmental requirements in implementing their day to day tasks. It is important to note, however, that individual employees involved in construction activities will principally be under the direct supervision of the contractors.

All general workers will receive induction training which will be presented by the Contractor Health and Safety Manager Representatives. The induction training will include an environmental management component which will be presented where possible by the Contractor Environmental Representitives. The induction training is still to be developed but will address the following themes:

- General introduction to environment management;
- Why environmental management is required on the project;
- Roles and responsibilities of individuals on the project; and.

- Specific issues that need to be managed:
    - Dust;
    - Fire control;
    - Materials handling and storage;
    - Leaks and spills prevention;
    - Noise;
    - Waste;
    - Fauna and flora;
    - Waste water;
    - Transportation; and,
    - Water conservation.
    - Sensitive areas (wetlands, heritage sites etc.)

1.4.5.6 Toolbox talks and awareness campaigns

All workers will receive weekly toolbox talks that will be presented by individual contractors and facilitated by the Contractor EO on specific environmental topics that are relevant to their activities. These toolbox talks will be supplemented by site wide environmental awareness campaigns that will be run by the Main Contractor to promote sensitivity to and understanding of given environmental management issues.

Themes for tool box talks are to be developed but at this stage include:

- What is the environment;
- Why does it need to be protected;
- Environmental aspects and impacts of the NMPP Trunkline construction;
- What can individuals do;
- Water conservation;
- Managing litter;
- Use of ablutions;
- Spillage prevention and reporting;

- Environmentally sensitive areas;
- Careful driving (dangers of speeding, use of defined access routes);
- Not interfere with local inhabitants;
- Condom use; and,

Contractors Environmental Management requirements

1.5 Checking, Preventative and Corrective Action

1.5.1 Overview

Checking and preventative and corrective action is based on a process of gathering information on both leading and lagging indicators, reviewing this information in a systematic manner and making decisions on the basis of the performance reflected by the indicators. Preventative and corrective action can be initiated whenever it is appropriate to do so, for example during an inspection a non-compliance can be communicated to the contractor for immediate action on a major or serious issue, but as a minimum the environmental management performance of the project will be reviewed on a monthly basis and corrective and preventative actions formally documented and implemented. In this section the various mechanisms used to gather information and to take action in response to that information are presented and described. Checking and preventative and corrective action is illustrated schematically in Figure 1-5.

This component consists of four key activities including:

- Monitoring of selected environmental quality variables;
- Daily inspections of the site and activities across the site;
- Formalised audits on individual contractors as well as specific activities where these are identified as being problematic; and,
- Reporting on a monthly basis as an input to the review and management process.

1.5.2 Monitoring

A series of environmental variables that are to be monitored during the Construction phase of the project are listed below. The specific monitoring requirements are described in greater detail in Section 2 and 3. Monitoring results will be presented monthly and compared to the

objectives and targets stated in the EMP. Where the target values are not being met, further mitigation will be pursued.

The following parameters are to be monitored on an ongoing basis during the construction phase by the Contractor:

Parameter	Frequency	Responsibility
Water Monitoring		
Water Supply for Camps	Monthly Quantitative Assessment and Water Quality Testing	CTR / EO
Sewage Waste Water	Monthly Quantitative Assessment and Water Quality Testing	CTR / EO
Waste Water from Oil / waste water separators	Weekly Visual Inspections / 3 Monthly Lab Analysis	CTR / EO
Water Discharge	Before and During Construction / Weekly Lab Analysis	CTR / EO
Water Quality of water course crossings	Before and During Construction / Weekly Lab Analysis	CTR / EO
Water Supply	Quantitative / Water Abstraction Records	CTR / EO
Dust Monitoring		
Dust Control	Visual Inspection / Daily	CTR / EO
Dust Fallout	Visual Inspection / Daily	CTR / EO
Blasting		
Vibration	Once During Actual Blasting	CTR / EO
Noise	During Actual Blasting	CTR / EO
Construction Activities		
Noise	Before and During Work / At least once a month	CTR / EO

It should be noted that Noise and Vibration monitoring during blasting and other construction activities will only be conducted in areas of close proximity of dwellings, housing or within towns / cities. There is a further requirement to monitor noise and vibration in areas where sensitive receptors are present such as for example areas where sensitive threatened species occur such as the Oribi.

1.5.3 Inspections

Due to the transient nature of the Project phase, the greatest source of information is that sourced through ongoing visual inspection. This will be the function of firstly the contractors Environmental Officers and secondly the ECOs who will spend the bulk of their time on site monitoring compliance to the EMP and noting any activities that transgress the requirements specified in the EMP.

At the same time some potential impacts are difficult to monitor quantitatively, such as soil erosion and waste management. The ongoing inspections by the ECO's and EO's, provides valuable qualitative information on effects such as these so that action can be taken to mitigate against further potential effects.

These inspections must take place daily, weekly and monthly and must be adequately documented for record purposes. In addition, these reports must be sent via official communication channels to ECO's. In this way ECO's can evaluate the effectivity of the contractors EO's monitoring procedures and provide specific input as to aspects of the EMP or unforeseen issues on site that require additional attention.

1.5.4 Internal Audits

Two types of internal audits will be conducted by the Independant Environmental Auditor. These will be formal scheduled audits that follow a defined programme and that are continued across all the contractors that are on site. The second type of audit is where the monitoring data and the inspection reports highlight problems and the response will be to initiate an internal audit focussed on that specific problem area highlighted. The

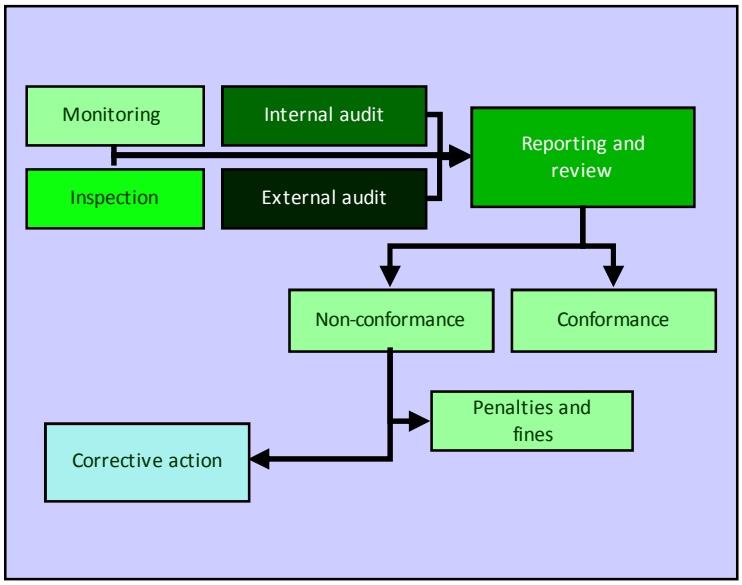


FIGURE 1-5: *Schematic illustration indicating checking and preventative and corrective action within the environmental management philosophy.*

purpose of the audit will be to ascertain the source of the problem and to define what action must be taken to prevent its recurrence.

1.5.5 Reporting

A bi-monthly environmental audit report will be prepared by the Independent Auditor and tabled in the Environmental Management Committee meeting. The report must include a description of at least the following:

- Incidents and complaints;
- Implementation of the EMP
    - Inspections
    - Audits
    - Approvals
- Key corrective actions.

A monthly environmental performance report will be prepared by the Contractor and also tabled in the Environmental Management Committee meeting. The report must include a description of at least the following:

- Incidents and complaints;
- Implementation of the EMP
    - Inspections
    - Audits
    - Approvals
- Performance against targets;
- Selected environmental monitoring results; and,
- Key corrective actions.

Note that compliance / non-compliance and incident records must be kept by the both the EPCM and Contractor and shall be made available on request from the authorities. These records should be made available to ECO's on request as they are present on site daily and can monitor the progress of corrective actions objectively as an independent party. It is particularly important that the ECO's are involved in the process of the close-out of open non-conformances.

1.5.6 Preventative and Corrective Action

Where preventative and corrective action is identified, this can be implemented as follows.

Verbal instruction

Verbal instructions are likely to be the most frequently used form of corrective action and are given in response to minor transgressions that are evident during routine site inspections. Verbal instructions are also used to create further awareness amongst contractors, as often the transgressions are a function of ignorance rather than vindictiveness.

If required verbal instructions are to be followed up by whomever issued them as written instructions as stipulated as per the contractual agreements.

Response times are at the discretion of the person/s that provided the verbal instruction and should be documented.

Written instructions

Written instructions will be given following site visits, audits or as result of discussion sessions with the contractor. These written instructions could be made electronic via for example email, meeting minutes, action registers etc. The written instructions will indicate the source or sources of the problems and proposed solutions to those problems. The implementation of these solutions will be assessed in a follow-up site visit, audit or discussion session and further written instructions issued if required.

Response times are at the discretion of the person/s that provided the written instruction and should be documented.

Project Management Instructions – PMI's

In cases where written instructions deem to be inadequately addressed or constitute a change of scope to the Contractor as per the signed contract, a PMI will be issued which must be resolved as specified in the PMI. The PMI will indicate the source or sources of the problems and proposed solutions to those problems. The Contractor will have to reply in writing as required by the contract to demonstrate implementation of the PMI if necessary.

Response times are at the discretion of the person/s that provided the written instruction and should be documented.

Contract notice

A contract notice is a more extreme form of written notice because it reflects the transgressions as a potential breach of contract. If there is not an adequate response to a contract notice then the next step can be to have the contractor removed from the site and the contract cancelled.

Response times are at the discretion of the person/s that provided the contract notice and should be documented.

Work stoppage

When, in the opinion of the Environmental Manager (Transnet), a construction activity will result in environmental damage, the Environmental Manager will formally advise the PM, who will in turn order the Contractor to halt the activity. The Contractor will keep written records of instructions received from the ECO and PM concerning environmental matters.

Only written instructions for stoppages that have been issued as per the contractual agreement and that have been signed off by the Project Manager will be considered a valid instruction to the Contractor.

1.5.7 Stakeholder Engagement

Throughout the project ongoing liaison should be maintained with authorities and communities alike to ensure that the following is effected:

- Timeous advanced warning of any project activities that may have some impact on surrounding communities;
- Ongoing feedback on the project and environmental performance; and,
- A continuous conduit is established whereby complaints can be lodged and speedily and efficiently resolved.

The public is to be kept informed with regard to the project in general and its environmental performance during the construction and operational phases. Mechanisms to facilitate communication between Transnet Pipelines and the public are to be established which include as a minimum:

Ad hoc consultation meetings

The public is to be kept informed with regard to environmental performance during the construction and operational phases of the project. The following two forums will be used as mechanisms to facilitate communication between Transnet and the public.

Focus Groups

Transnet has a communications department which is responsible for stakeholder engagement. This department will engage all willing and available NGOs, especially environmental NGOs.

Interested and Affected Parties (I&APs)

Community / Land Liaison Officers will engage in face to face meetings with the public. I&APs will be informed about the progress of the project at meetings that will be held at pre-determined venues.

Participation in the Environmental Monitoring Committee (EMC)

A procedure will be established by the EPCM in terms of the setting up and operation of an EMC.

1.5.8 Complaints

A complaints procedure will be developed by the EPCM.

The procedure will include the development for a complaints register that will be used to record and track all complaints that are received regarding the activities on the project. A dedicated telephone number and an email address will be established and advertised as a means of lodging complaints. Complaints will be addressed as per the procedure.
The nature of the complaint, the source, the turn-around time and the remedial action implemented will all be recorded in the complaints register. Complaints will be reviewed during Environmental Coordination Meetings as a performance indicator.

All complaints from the public should immediately be dealt with and recommendations or instructions will be issued through the Project Manager to the Contractor if required, as soon as is practical. In all cases the complaints procedure developed by the EPCM must be followed.

The Contractor is to take remedial action as soon as is practical to ensure that issues are dealt with timeously. Timeframes for rectification of non-compliance as specified by the Environmental Authorisation should be considered to be a minimum and where possible the Contractor must endeavour to respond sooner.

Compliance and record-keeping

Through an ongoing review of information from the inspections, audits, monitoring and incident reporting, non-compliances with the requirements of the EMP and conditions of authorisation, will be identified by the EPCM. Reporting thresholds will be as per the Environmental Authorisation conditions as specified by the authorities to ensure that non-compliances are identified and reported to the authorities timeously.

A register will also be kept of all non-compliances together with the responses received from the authorities. All records related to the implementation of the EMP (e.g. ECO diary, methods statements etc.) must be kept together in the site office in a safe but accessible manner. Records will be kept as per the Project Document Control Procedures, and should at any time be made available for scrutiny by any relevant authority if requested.

The EMP, including all annexure as well as the Environmental Authorisation must be kept on site at all times. Whenever additions or revisions to any of the above documentation are issued these must be issued to the Contractor immediately and must replace redundant versions. It is the responsibility of the Contractor to ensure that the relevant documents are kept on site and the responsibility of the EPCM to ensure that the Contractor is issued with the most updated and relevant documents. Furthermore the EMP will be included into the Contractual Clauses of the construction contract and will be made binding on all Contractors operating on or affecting the site.

The Contractor and ECO will keep written and photographic records of the site surroundings before, during and after construction on the site. The photos will be clearly annotated to include a description of the exact date and location when and where they were taken, as well as any specific issues that need to be highlighted. Note must be made of what party was responsible for damage caused to ensure liability for damage. The Contractor shall be held liable for all preventable damage to the environment and shall be responsible for the cost and implementation of all remedial actions to be taken.

1.6 Management Review

In keeping with the ISO 14001 requirements, a formal management review will be conducted regularly. The purpose of the review will be to critically examine what is working and what is not in respect of the EMP and its implementation and to decide on modifications to the EMP

as necessary. The process of management review is in keeping with the principle of continual improvement. Given the period of construction it is envisaged that a management review will take place at 6-monthly intervals. The management review requires the participation of the following as a minimum:

1.6.1 Contractor Representatives

- Environmental Manager
- Contractor Project Manager
- Environmental Officers
- Construction Manager

1.6.2 EPCM Representatives

- Project Manager
- Environmental Manager
- Construction Manager
- Independent Inspection Authority

1.6.3 Transnet Representatives

- Project Manager
- Environmental Manager
- Environmental Control Officers

1.6.4 Independents

- Independent Auditor.

A formal agenda is to be tabled and minutes kept of the meeting which must detail the continual improvement interventions decided in the management review.

The Management Review meeting will be organized and chaired by the EPCM.

1.7 Summary

The environmental management philosophy presented in this document is based on the ISO14001 Environmental Management Systems standard. The management philosophy is thus based on 5 key components namely policy, planning, implementation and operation, checking and corrective action and management review. Each of these individual components has been described in this section of the EMP. The overall environmental management philosophy is best presented schematically to show how all the components piece together. That schematic presentation is given in Figure 6. The report was prepared after almost seven months of public and authority consultation during the Scoping Phase of the EIA between Mid January and 7 July 2008. In accordance with Regulation 31 of the EIA Process Regulations, the National Department of Environmental Affairs and Tourism (DEAT) approved the Final Scoping Report and EIA Plan of Study on 8 August 2008. The Draft EIA and the Draft EMP were available for public review between 22 September 2008 and 27 October 2008. The Final EIA was submitted to DEAT on 6 November 2008. This EMP is considered the revised EMP which is to be submitted to the DEAT for review and approval during June 2009.

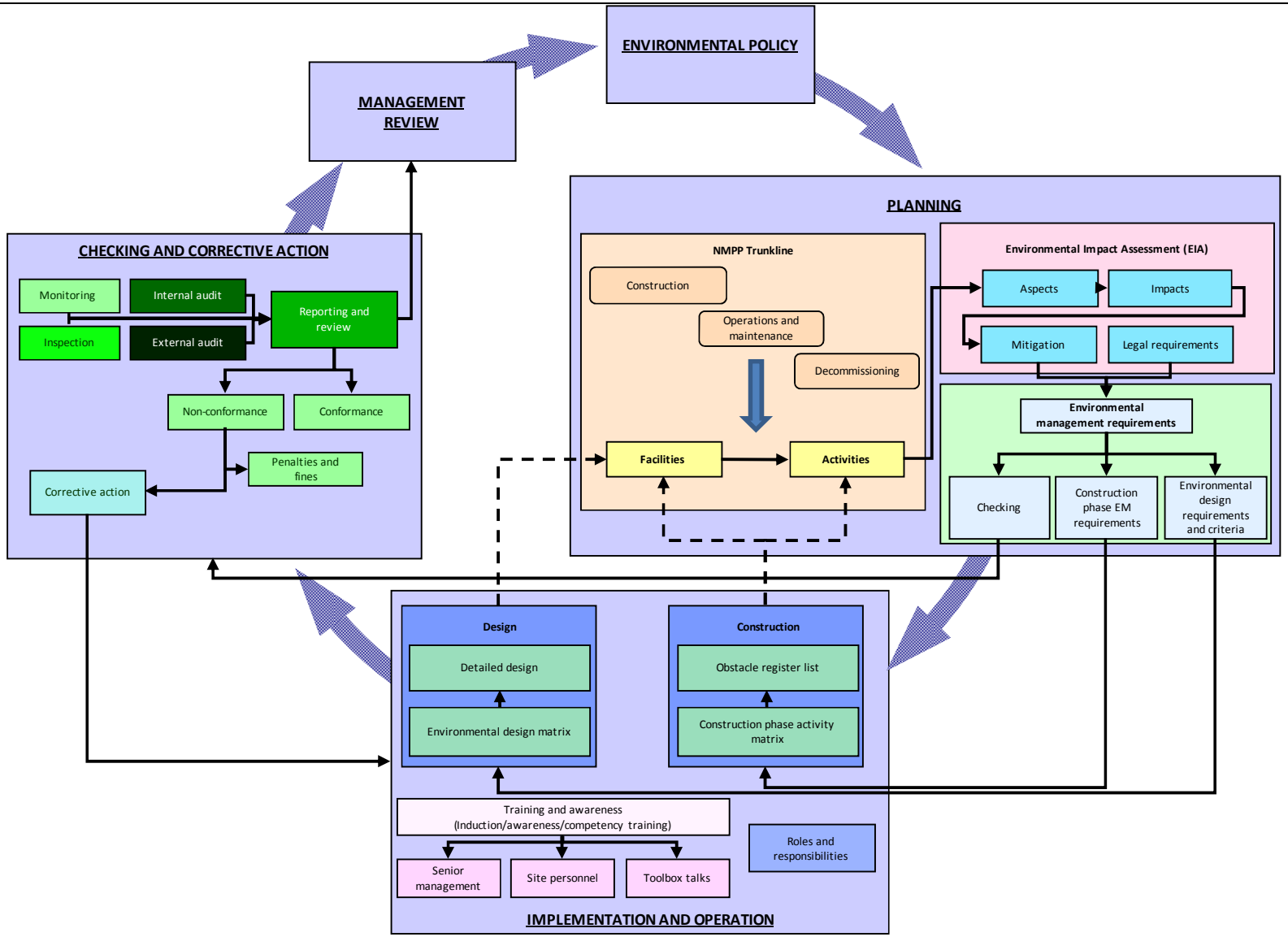


FIGURE 1-6: *Schematic illustration indicating checking and preventative and corrective action within the environmental management philosophy.*

2 Construction Phase

2.1 General Conduct and Site Management

2.1.1 Construction Camps

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a	GEN	The landowner and Contractor must enter into a written contractual agreement regarding the specific terms and conditions of the use of the land and the Contractor may not erect any structure prior to a signed agreement having been reached. The chosen site, as well as a Method Statement for the establishment of the Construction Camp will then be submitted to the NMPP Alliance for approval.	CTR	EPCM	√
b	GEN	The Contractor shall ensure that Construction Camp site selection is done in consultation with local authorities, traditional leaders and the community to ensure that a mutually acceptable site is chosen.	CTR	ECO	
c	SS	Temporary Construction Camps must not be situated near remote areas that are likely to constitute important faunal refuges	CTR	ECO	
d	GEN	The Contractor shall not, regardless of the above provisions, locate campsites in any area in which vegetation is pristine, or that is from an environmental perspective deemed unsuitable for this purpose, nor within 100m of any watercourse, nor in any area that could cause nuisance or safety hazards to surrounding landowners, inhabitants or the general public. Prior to the commencement of construction, the Contractor shall also prepare documentation for each proposed campsite which contains, but is not limited to, details of: • site layout including access points and material storage areas; • topsoil management; • cuts and fills; • sewage treatment; • erosion control; • fencing; • general waste management; • provision for vehicle and plant servicing; • management of hazardous materials, • water supply; • management of veld fire risk;	CTR	ECO EPCM	√

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		• rehabilitation. The documentation shall be submitted to the ECO and NMPP Alliance for acceptance prior to establishment on site.			
e	GEN	All Construction Camps are to be fenced off in such a manner that unlawful entry is prevented and access is controlled. Signage shall be erected at all access points in compliance with all applicable occupational health and safety requirements. All access points to the Construction Camp should be controlled by a guard or otherwise monitored, to prevent unlawful access.	CTR	EPCM	
f	GEN	The Contractor must minimise the footprint of the Construction Camp and ensure that vegetation is only cleared where absolutely necessary.	CTR	ECO	
g	GEN	Site activities that may result in nuisance (e.g. noise) to adjacent landowners must be located on the site in a way that serves to minimise the risk of such nuisance.	CTR		
h	GEN	Surface drainage measures must be established in the Construction Camps so as to prevent • Ponding of water; • Erosion as a result of accelerated runoff; and, • Uncontrolled discharge of polluted runoff. • Damage to Contractor Access Roads	CTR	ECO	
i	GEN	Where the Construction Camp may be construed as a visual intrusion by adjacent landowners or users, sufficient visual screening must be erected around the perimeter of the camp. The screening shall be designed so as not to constitute a further visual intrusion.	CTR		√
j	GEN	A waste transition area must be established on site that is properly demarcated and fenced and provides for the segregation of different waste types (domestic waste, scrap metal, hazardous waste). The waste transition area must be covered (roofed) to prevent water ingress.	CTR		√
k	GEN	The waste transition area must be maximised in order to facilitate waste separation into recyclable and non-recyclable items. Recyclable items shall be further separated into glass, various plastics, paper and bio-degradable items. Recycling efforts shall be maximised to the greatest extent possible within the context of the project.	CTR		√
l	GEN	An area for the storage of hazardous materials must be established that conforms to the relevant safety requirements and that provides for spillage prevention and containment.	CTR		√
m	GEN	All Construction Camps shall be provided with portable fire extinguishing equipment, in accordance with all relevant legislation and must be readily accessible.	CTR		
n	GEN	Specific areas for the batching of concrete and mixing of other construction materials must be designated and bunded to prevent contamination of surface water and soil contamination, or otherwise be done on temporary liner materials which can be removed afterwards. This also applies for any work that is necessitated outside of the Construction Camp.	CTR		
o	GEN	Designated vehicle and construction machinery servicing areas must be established within the	CTR		

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		Construction Camp and must be bunded and hard surfaced (concrete) to prevent surface water and soil contamination, or otherwise be done on temporary liner materials which can be removed afterwards. This also applies for any work that is necessitated outside of the Construction Camp.			
p	GEN	Temporary refuse collection and material storage areas shall take into consideration the prevailing wind direction, surface runoff patterns, topography and visual context and shall be so situated to cause the minimum of nuisance to adjacent properties.	CTR		
q	GEN	The Contractor shall ensure that adequate potable water provision is made to all Construction Camps and that all water-dependent sanitary requirements (washing, showering, etc) are adequately facilitated.	CTR		
r	GEN	The Contractor must provide sufficient ablution facilities, in the form of portable / VIP toilets, at the Construction Camps and along construction sites, and shall conform to all relevant health and safety standards and codes. No pit latrines, French drain systems or soak away systems shall be allowed and toilets may not be situated within 100 meters of any surface water body or 1:100 year flood line. A sufficient number of toilets shall be provided to accommodate the number of personnel working in any given area.	CTR		
s	GEN	The Contractor shall ensure that adequate sanitation services in the form of showers are available to accommodate the amount of workers to be housed in the Construction Camps and shall ensure that these are provided with effective drainage facilities and systems.	CTR		
t	GEN	The Contractor must take preventative measures to reduce pressure on municipal service provision capacity. If services for a Construction Camp are to be sourced from the local municipality, the latter must be informed well in advance.	CTR		
u	GEN	Municipal water, or where required agreements with landowners should be reached with regards to their water use rights, shall be used for all activities such as washing of equipment or disposal of any type of waste, dust suppression, concrete mixing, compacting, etc. Necessary WUL shall be obtained from DWAF if required.	CTR		
v	GEN	Any discharge from the Construction Camps into municipal storm water systems shall comply with the applicable municipal and / or DWAF standards.	CTR		
w	GEN-	Monitoring points shall be established wherever so required by either municipal authorities or DWAF and water quality results shall be provided to these bodies upon request.	CTR	ECO	
x	GEN	The Contractor shall comply with all applicable laws, regulations, permit and approval conditions and requirements relevant to the storage, use, and proper disposal of hazardous materials.	CTR		
y	GEN	The Contractor shall manage all hazardous materials and wastes in a safe and responsible manner, and shall prevent contamination of soils, pollution of water and/or harm to people or animals as a result of the use of these materials.	CTR		

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
z	GEN	All hazardous substances shall be stored in designated areas that are bunded and provided with a hard, impervious surface, as well as sufficient roof cover to prevent the ingress of water. All bunded areas will be provided with a catchment sump that drains to a separator unit that prevents runoff from entering and contaminating any adjacent areas. Bund walls must be of a sufficient height to contain at least 110% of the volume of any materials stored within the bunded area.	CTR		
aa	GEN	The hazardous materials storage area must be locked and access restricted to authorised personnel, and must be clearly marked as such.	CTR		
bb	GEN	The Contractor shall at all times have a skip on site for the disposal of hazardous waste and polluted soil, which will be cleaned regularly. Waste shall have a turnaround cycle that will ensure that the skips never exceed their maximum carrying capacity.	CTR		
cc	GEN	The Contractor shall not construct fixed fuel storage or service or refuel any vehicle or equipment within 100 metres of a watercourse or wetland, within a floodplain, or where there is the potential for spilled fuel to enter a watercourse.	CTR		
dd	GEN	The Contractor may not store in above ground containers a combined volume of fuel equal to or greater than 30 cubic meters on the site without the appropriate Environmental Authorisation. All fuel storage areas will be bunded to contain at least 110 % of the volume stored and will be provided with a hard impervious surface.	CTR		
ee	GEN	If a batching plant is necessary, run-off should be managed effectively to avoid contamination of any adjacent areas and must be contained within a bunded area.	CTR		
ff	GEN	The Contractor shall prepare Construction Camp Management Plan/s which is to be submitted to Transnet for approval.	CTR		
gg	GEN	The Contractor shall keep Construction Camps in a clean and tidy condition at all times.	CTR		
hh	GEN	The Construction Camps shall be maintained in accordance with the relevant procedures and documentation accepted by the EPCM and Transnet.	CTR		
ii	GEN	The Contractor shall maintain an effective waste management regime that ensures that there is adequate provision for waste disposal (in the form of bins), segregation and frequent removal (at least weekly) for permanent disposal at a licensed waste disposal facility.	CTR		
jj	GEN	The waste management regime must be supplemented by awareness raising and training amongst workers to ensure that the regime is properly implemented.	CTR	ECO	
kk	GEN	No permanent waste disposal shall be permitted at the campsites.	CTR		
ll	GEN	No fires will be allowed and the Contractor must make alternative arrangements for heating. LP Gas may be used, provided that all required safety measures are in place. The Contractor shall take specific measures to prevent the spread of veld fires, caused by activities at the campsites. These measures may include appropriate instruction of employees about fire risks and the construction of firebreaks around the site perimeter.	CTR		

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
mm	GEN / SS	For emergency repairs drip trays and or suitable absorbent material shall be placed under vehicles that must be repaired outside of the Construction Camp designated area, which shall be emptied in a suitable container and transported to the Construction Camp.	CTR		√
nn	GEN	All major spills as specified in the contractor emergency response procedure of any materials, chemicals, fuels or other potentially hazardous or pollutant substances must be cleaned immediately and the cause of the spill investigated. Preventative measures must be identified and submitted to the EPCM and ECO for information. Emergency response procedures to be followed and implemented	CTR	ECO	
oo	GEN	The Incident / Investigation reports from the Contractor will be submitted to the authorities if required by the EPCM and Transnet	EPCM	Transnet / ECO	
pp	GEN	Construction workers and site staff shall not be permitted to use any other open water body or natural water source adjacent to or within the designated site for the purposes of bathing, washing of clothing or for any construction or related activities without the necessary DWAF approval.	CTR		
qq	GEN + SS	The Contractor shall prepare a Hazardous Materials and Waste Management Plan for inclusion in the site specific Environmental Plans to be submitted to Transnet prior to establishment on site. This plan shall include, but shall not be limited to, measures to prevent: • contamination of soils; • pollution of water; • accidental fires; • risk/injury to people or animals.	CTR		√
rr	GEN	The Contractor shall classify all hazardous materials to be used on site according to recognised Codes of Practice such as SABS Code 0228 for the Identification and Classification of Dangerous Substances and Goods and the Department of Water Affairs and Forestry *Minimum Requirements for the Handling, Classification and Disposal of Hazardous Waste*, and shall ensure that the handling, storage, transport and disposal of these materials meets the requirements of these Codes.	CTR		
ss	GEN	Material Safety Data Sheets (MSDS) Information and records of all materials stored must be available and strict control of the volumes stored and removed must be kept.	CTR		
tt	GEN	Staff must be trained in the hazards and required precautionary measures for dealing with these substances.	CTR		
uu	GEN	All Waste within the designated waste skips (hazardous or general) may only be disposed at a licensed disposal site to receive such materials. The Contractor shall keep written record of materials dumped and shall provide such proof to Transnet when requested.	CTR		√
vv	GEN	Concrete mixing must only take place within designated area, subject to suitable environmental protection measures.	CTR		

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
ww	GEN	The Contractor shall use ready mixed concrete wherever possible.	CTR		
xx	GEN	No vehicles transporting concrete to the site may be washed outside of designated and runoff-isolated areas, which shall be rehabilitated as soon as no longer in use.	CTR		
yy	GEN	Any soil that has been contaminated with concrete shall be removed and disposed of at a licensed disposal site.	CTR		
zz	GEN	The Contractor shall remove all waste concrete, building sand and gravel as far as possible from the Construction Right of Way as well as any other area where it may occur as a result of construction activities and dispose thereof at a licensed dumpsite. The Contractor shall repair any environmental damage caused in the process.	CTR		

2.1.2 Security

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL MANAGEMENT REQUIREMENT	Main Responsibility	Support	Method Statement / Procedure
a	GEN	A third party security firm shall be appointed to oversee security and access control for the entire construction phase of the project. A Security Management Plan shall be submitted to Transnet for approval.	CTR	EPCM	√
b	GEN	The security management plan as well as conduct on site must be in accordance with all applicable legislation and standards, notwithstanding any of the requirements specified in this EMP.	CTR	EPCM	
c	GEN	Construction workers are not allowed to collect firewood from areas adjacent to the site and poaching is strictly prohibited.	CTR	EPCM	
d	GEN	Trespassing by any project personnel onto any adjacent property is strictly forbidden and offenders may be summarily disciplined.	CTR	EPCM	
e	GEN	Where an existing fence must be taken down due to its interference with construction activities, the relevant landowner must be informed beforehand and the affected area secured to ensure that security is not compromised. As soon as work is completed, the fence shall be reinstated to its original condition or better by the Contractor at no cost to the landowner.	CTR	EPCM	√

2.1.3 Construction Access

ITEM NO.	GENERAL/SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	The Contractor shall survey the limits of the Construction Right of Way for the pipeline construction and of any additional workspace areas required for construction and shall clearly demarcate the limits of the Construction Right of Way in such a manner (stakes, fencing etc) that it can clearly be identified. These stakes shall be preserved throughout the work under contract.	CTR	NMPP	
b	GEN	The Contractor will be responsible for the development of a Pre-Construction Survey Plan and will present this plan to Transnet for acceptance	CTR	ECO / NMPP	
c	SS	In areas defined by the alignment sheets, where sensitive areas or pristine habitat is affected, fencing or stakes painted in a conspicuous colour is required in order to protect these environments, The use of these measures must be discussed and agreed with the ECO's, in order to establish access control, protection of sensitive environments and protection of areas outside the Construction Right of Way (RoW).	CTR	ECO	
d	GEN	During the Survey of the Pipeline Route and Construction RoW, the ECOs and EO's (Contractor), with the assistance of any of the specialist project consultants if required, must conduct a pre-construction survey of the entire alignment prior to construction commencing. This survey shall be properly documented and photographed by the ECO's. As part of the inventory, wetlands and other environmentally significant areas must be physically pegged on site in such a manner that they are clearly visible. The inventory shall include specific records of, but not be limited to, the following: • Delineation of wetlands. • All areas that have specifically been earmarked or identified for "search and rescue" operations for certain species • Areas of untransformed grassland or pristine vegetation • Possible and confirmed graves and heritage sites • Any other environmental features as specified in the alignment sheets	ECO	CTR	√
e	GEN + SS	In certain special cases, such as game farms, the Construction Right of Way will be fenced off by the Contractor during construction if required and will be negotiated with the land owner beforehand. This also applies in agricultural areas where cattle cannot realistically be relocated for the duration of construction. The fence to be erected must be securely anchored to the ground and be able to prevent animals from pushing it over.	CTR	EPCM	
f	GEN	In urban / high-density areas, or in any areas where the pipeline will pass close to human settlements in rural areas, community facilities, schools or other places where people will be at risk or where access control is deemed to be a problem, the Contractor shall also erect fencing for the duration of construction. Warning signage in English and all applicable local languages must be erected along the fencing, in clearly visible locations.	CTR	EPCM	√

ITEM NO.	GENERAL/SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
g	GEN	In all instances where fencing of the pipeline Construction Right of Way is required, the Contractor shall submit a Method Statement including the design specification of the fence to be used, for approval by Transnet and the affected landowner/s, prior to commencing.	CTR	EPCM	√
h	GEN	The width of the pipe line Construction Right of Way and working areas are indicated on the alignment sheets and will be issued to the Contractor for Construction.	EPCM	Transnet	
i	GEN	If the Contractor identify any areas where deviations of the pipeline route as stipulated in the alignment sheets is required, such deviation requests must be submitted to the Pipeline Engineering Department (Includes the Environmental Department) for Approval	CTR	EPCM	
j	GEN	If any deviations are identified as result of Land Liaison negotiations, such deviations must be communicated to the Pipeline Engineering Department (Includes the Environmental Department) for Approval.	EPCM		
k	Trunkline	In instances where physical constraints are imposed on the normal construction procedure, be it by existing buildings, services, residences, roads, dams and reservoirs, excessively restrictive terrain or any other significant permanent structures, the Contractor shall use “street works” whereby a reduced Construction Right of Way is used, as described in the Final EIA report, or any suitable variation thereof. The Contractor shall identify all areas where “street works” are to be employed and shall clearly and accurately demarcate such areas on a map. The contractor shall produce a Method Statement for the various methodologies proposed and shall receive written approval from the relevant engineers and ECO before commencing with construction.	CTR	EPCM	√
l	Terminals	The construction sites for the two Terminal complexes and eight Pump Stations shall be fully enclosed by a security fence, with the minimum amount of access points required for operations to occur effectively.	CTR	EPCM	
m	All	All access points to enclosed construction sites shall be controlled and a register of all persons entering and exiting shall be kept, which shall be controlled at the end of every day to ensure all persons not authorised to remain within the construction site have been vacated. Only authorised security personnel may be present on site after normal construction hours, except for emergency situations.	CTR	EPCM /ECO	
n	All	Access to and along any construction site shall be obtained - • on a public road; • on an existing private road or track with the consent of the relevant owner or occupier of land; • along the pipeline and Construction Right of Way; and • along a “specially approved route” as defined below. Access to and along the Construction Right of Way explicitly excludes access to land	CTR	EPCM / ECO	

ITEM NO.	GENERAL/SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		other than the access routes referred to above, unless otherwise agreed to with the relevant landowner.			
o	GEN	In all areas where construction requires gravelling or other methods of improving existing roads or access points, the Contractor shall completely remove these materials after construction and prior to rehabilitation of the area. However where such improvements were effected on an adjacent landowner's property, the Contractor should leave them in place if the landowner so desires.	CTR	EPCM / ECO	
p	GEN	All damage to access roads or access points caused by the Contractor as a result of construction activities shall be repaired as soon as possible. This includes the removal of any litter, soil heaps, building rubble and other elements that were not there prior to construction. All areas that were cleared of vegetation shall be rehabilitated as soon as construction activities have been completed in the affected area.	CTR	EPCM / ECO	√
q	GEN	The Contractor shall ensure that contractor employees remain within the Construction Right of Way or on approved roads providing access to the Construction Right of Way.	CTR		
r	GEN	The Contractor shall plan and manage his construction operations in such a manner that the minimum amount of vehicle trips and vehicles are used.	CTR		
s	GEN	The Contractor shall liaise with the local municipality and traffic authorities in an area prior to construction commencing and if so required, shall prepare a Transport Management Plan to be approved by the relevant municipality prior to construction commencing.	CTR		
t	GEN	Planning of material and equipment delivery must be done in advance by the Contractor so that the minimum disruption is caused to traffic in the area and nuisance to adjacent landowners is kept to a minimum.	CTR		
u	GEN	The Contractor shall ensure that all transport companies are provided with guidelines or speed and access restrictions to ensure that main access roads are not deviated from in order to deliver goods.	CTR	EPCM	
v	GEN monitoring	The Contractor shall ensure that utilising local rural village roads not constructed for large vehicles is restricted to the minimum possible. The Contractor shall monitor the impact of heavy duty vehicles on local secondary roads and any damage shall be addressed timeously in consultation with the relevant authorities.	CTR	EPCM	
w	GEN	Where particularly large vehicles will be required to move on public roads, the Contractor must notify local traffic authorities well in advance so that the necessary safety arrangements can be made. All relevant traffic regulations must also be adhered to in this regard.	CTR		
x	GEN	The Contractor shall employ suitable warning methods wherever required during construction process to ensure that safety measures are adhered to. Warning signage shall be erected according to applicable traffic regulations.	CTR		
y	GEN	Damage caused to roads as result of the Contractor activities shall be repaired either	CTR	EPCM	

ITEM NO.	GENERAL/SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		immediately, if instructed to do so, or timeously as stipulated in the contractual agreements between the Contractor and Transnet, or as required by any landowners and local municipalities. All roads that have been used or are being used by the Contractor will be inspected on a regular basis in order to establish the status of any possible damages caused by the Contractor Activities. Potholes, ruts, areas of surface water ponding and other damage to roads which can be proven to have been caused by the Contractor will be continually repaired to avoid damage to vehicles of other road users.			
z	GEN	The Contractor must limit dust pollution from dirt roads wherever required by wetting or watering down road surfaces.	CTR		
aa	GEN	The Contractor shall prevent trespassing on the site. Public entry to the site shall be prohibited and signs to this effect shall be erected at points of potential public entry.	CTR		
bb	GEN	The Contractor shall restrict the number of entry and exit points to the properties of adjacent landowners to the minimum required for operations to occur, for security reasons. The Contractor shall take sufficient measures to ensure that his activities do not compromise the landowners or occupiers security, and to reduce the loss, injury or death of any farm animals or game to the greatest extent possible and using measures in agreement with the affected landowners.	CTR		
cc	GEN	The dismantling of gates and fences shall be subject to any special conditions reached in the Landowner Servitude / Consent Agreements between Transnet and the Affected Landowners.	CTR	EPCM	
dd	GEN	The Contractor must reinstate all existing fences and gates that have been dismantled during the course of construction to their original state and design specifications, or better as required by the affected landowners	CTR	EPCM	
ee	GEN	Fencing requirements will be agreed to with the landowners prior to fences being changed. Reinstatement of fences also needs to be accepted and signed off by the landowner.	CTR	EPCM	
ff	GEN	Where the Contractor has installed temporary gates in fences of adjacent landowners, these must be removed and the fences be replaced as soon as construction has been completed in the area, unless the owner wishes for the gate to remain.	CTR	EPCM	
gg	GEN	Wherever electrified security fencing has to be temporarily taken down for construction purposes, the Contractor shall provide a security guard to patrol the affected area or shall reach a written agreement with the affected landowner before fences are disturbed or removed. All fences disturbed are to be repaired or reinstated to a similar or better condition as soon as is practicable afterwards.	CTR	EPCM	
hh	GEN	The Contractor's LLOs shall inform adjacent landowners when construction workers are most likely to enter their land through existing gates and fences or use their access roads and shall to whatever extent possible stick to these schedules.	CTR	EPCM	√

ITEM NO.	GENERAL/SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
ii	GEN	The Contractor shall ensure that every one of his construction workers are thoroughly sensitised to the need for all gates to adjacent land to be closed whenever the gate is not in use. The Contractor must ensure that this requirement is adhered to at all times and will be solely responsible for any financial or other loss suffered by adjacent landowners due to the Contractor's failure to adhere to this requirement.	CTR		
jj	GEN	Where livestock or animals do escape as a result of gates being left open it will be the responsibility of the Contractor to ensure that they are safely rounded up again. The Contractor must immediately inform the relevant landowner should this occur and must assist the landowner in whatever way required to ensure that the animals are safely rounded up.	CTR		
kk	GEN	Where informal footpaths exist, the Contractor shall establish temporary crossings wherever these cross the Construction Right of Way. The placement of temporary crossing is to be decided in consultation with landowners to minimise disruption of people's movement patterns.	CTR		
ll		The Contractor shall set up and maintain a register of all gates and fences erected which specifies the type of fence and/or gate/s, length, date erected and removed for each individual landowner, which shall be used for possible dispute resolution. The LLO shall regularly inspect the register to ensure that it is complete and up to date.	CTR	ECO	

2.2 Geotechnical Stability and Contamination

2.2.1 Seismicity and Geological Instability

ITEM NO.	GENERAL/ SITE SPECIFIC	IRONMENTAL MANAGEMENT REQUIREMENTS	Main Responsibility	Support	Method Statement / Procedure
a	GEN	In areas where potentially unstable geologic conditions are encountered, such as fault lines in rock formations, potential instability of underlying rock, potential slip circles or embankment failure etc., the Contractor shall take all necessary measures to ensure the safety of workers.	CTR	EPCM	
b	GEN	Engineering solutions to address specific risks as result of potentially unstable geologic conditions shall be obtained if required.	EPCM	CTR	

2.2.2 Induced Instability

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL MANAGEMENT REQUIREMENTS	Main Responsibility	Support	Method Statement / Procedure
a	GEN + SS monitoring	Ongoing monitoring shall be conducted by the Contractor at any areas identified as being potentially unstable to ascertain whether any further mitigation will then need to be implemented. This may include localized re-alignment of the route or stabilizing the slope by measures such as rock anchors, temporary retaining structures, de-watering and the like.	CTR	EPCM	

2.2.3 Dispersive Soils

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a	GEN	Dispersion testing must be undertaken during the detailed geotechnical investigation, especially in areas of steep slopes situated within the Karoo Supergroup. The best indication of the dispersive nature of a soil is usually obtained by subjecting the material to a range of dispersion tests which can be performed by commercial soils laboratories.	CTR	EPCM	
b	GEN	Typical and practical measures that are used to mitigate the effect of dispersive soils include: • Compaction of soils at a moisture content slightly wet of the optimum moisture content, • Treatment of the backfilled soils with a suitable agent prior to compaction.	CTR	EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		• If the suggested laboratory testing highlight particular areas of highly dispersive soils, compaction of the backfill material can be undertaken at a slightly higher than normal moisture content.			

2.2.4 Soil Creep

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a	SS	The following potentially unstable talus slopes have been identified and must be further investigated to establish if creep is likely to occur. • Along the Durban – Umlaas Road section • Approaching and slightly beyond the Transnet Pipelines pump station at Van Reenen. • Between Umlaas Road and Van Reenen • The Alignment Sheets must be consulted for the exact locations of these areas.	EPCM	CTR	
b	GEN	Where possible, localised deviations of the pipeline shall be employed to avoid areas of specific risk identified during the detailed assessment of these areas.	EPCM	CTR	
c	GEN	Where feasible the Contractor shall, where soil creep may occur, lay the pipeline at a depth where intact, stable slope conditions prevail, i.e. below the colluvium (or talus) and residual soils into underlying geological formation. Alternatively appropriate engineering solutions such as slope stabilisation by means of rock anchoring may also be employed.	EPCM	CTR	

2.2.5 Unstable Steep Side Slopes

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a	SS	The Contractor shall employ where necessary mitigation measures to stabilise side slopes of excavations where steep side slope conditions are encountered. The following areas of concern have been identified: • The crossing of the Meul River valley • The Alignment Sheets must be consulted for the exact locations of these areas.	CTR	EPCM	
b	GEN	Where feasible the Contractor, where unstable side slopes may occur, may propose to locally adjust or slightly deviate the alignment of the pipeline within the Construction Right of Way to avoid these conditions.	CTR	EPCM	

2.2.6 Landslides

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a	SS	The Contractor must take cognisance of the following potential landslide risk areas: • Natal Group sandstone/Dwyka Tillite. South East inferred movement direction - coordinates X+33 19201.59; Y+22 840.23 • Natal Group sandstone. West inferred movement direction – coordinates X+33 18919.82; Y+30 494.07. • The Alignment Sheets must be consulted for the exact locations of these areas.	CTR	EPCM	
b	SS	If re-routing is not practical in the above cases the Contractor shall dig out the landslide and stabilise the slope before embedding the pipeline. Alternatively appropriate engineering solutions such as slope stabilisation by means of rock anchoring may also be employed.	EPCM	CTR	

2.2.7 Liquefaction

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a	GEN	The Pipeline Engineering Team and the Contractor must be aware of the potential for liquefaction as per the alignment sheets.	EPCM	CTR	
b	SS	A loose horizon of fine sand (colluvium) overlying hard impervious Natal Group sandstone on even a fairly gentle slope is vulnerable to 'liquefaction'. Should such ground conditions be encountered along the route, the pipeline shall be embedded into the sandstone bedrock and not supported entirely within the sandy colluvium. The Alignment Sheets must be consulted for the exact locations of these areas.	EPCM	CTR	

2.2.8 Expansive Clays

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a	GEN	Pipeline appropriately designed so as to prevent rupturing and distress. Design measures from detailed geotechnical investigation.	EPCM	CTR	

a	SS	Pollution potential assessed by detailed geohydrological study with appropriate mitigation measures.	EPCM	CTR	
c	GEN	Monitoring of pipeline via the long term to continually check for leaks.	EPCM	CTR	
d	GEN	Should leaks occur then pipeline appropriately repaired and / or remedial measures implemented to prevent repeat of problem.	EPCM	CTR	
e	SS	In areas where expansive clays are present it is recommended that the expansive clay be removed where it is shallow and replaced with an inert soil or that the pipe be supported upon a suitably designed ground beam.	CTR	EPCM	
f	GEN	The pipe should be designed for the predicted total heave/shrinkage movement at a particular affected section of the pipe	EPCM	CTR	

2.2.9 Contaminated Soils

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a	SS	The Contractor must take cognisance of the fact that localised soil contamination has been identified in the following localities and may be encountered elsewhere: • Ash fill has been used along parts of the alluvial and estuarine flats of the southern corridor. This fill is highly alkaline with very appreciable levels of salts, which could adversely affect the pipeline coating over the design life of the pipe. • Chromium waste sites have been identified to the north of the Umlaas Canal and around the Lanxess premises. • Illegal dumping of chemical waste has been observed at the Mbokodweni River. • Some of the aeolian sands in the AECI area of Umbogintwini have been contaminated by chemicals used in the former ammunition, explosives and fertilizer industries.	CTR	EPCM	
b	GEN	If and where chemical contamination and corrosion levels are considered to be unacceptably high, additional coating or measures (concrete encasement) or other appropriate engineering solutions should be provided to ensure the integrity of the pipeline.	EPCM	CTR	√
c	GEN	The Contractor shall take all reasonable measures to ensure that existing contaminated soil excavated during construction does not cause contamination of adjacent, uncontaminated areas. Contaminated soil removed from the construction area shall be dumped at a licensed dumpsite.	CTR	EPCM	√
d	GEN	The Contractor is to employ soil sampling techniques in areas where localized soil contamination has been identified. Results of the samples is to be presented to the Engineering Teams.	CTR	EPCM	√
e	GEN	Where in the opinion of the Engineer, material is not suitable for use as backfill it shall be removed to a licensed disposal area and not be used for any other purpose.	EPCM	CTR	

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
f	GEN	Where in the opinion of the Engineer, material is not suitable for use as backfill it shall be removed to a licensed disposal area and not be used for any other purpose.	EPCM	CTR	

2.3 Threatened Plants

2.3.1 Search and Rescue

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a	GEN	Damage or harm to threatened plant species is illegal in terms of the National Environmental Management: Biodiversity Act (Act 10 of 2004). Threatened species are defined in terms of the most recent Red Data list of Southern African Plants. While every effort has been made to ensure that the pipeline route does not impact on threatened species, the Contractor shall be responsible for any action necessary to ensure the prevention of harm to such species found during construction.	CTR	ECO	
b		The Contractor with the assistance of the ECO or suitable botanical specialist should review the vegetation specialist studies issued, indicating all sensitive areas where possible Red Data Species could be found. The RoW should then be inspected before and during construction in order to identify as far as possible any such species which must be protected and/or relocated	CTR	ECO	
c		Any Red Data species found to be impacted or possibly damaged by the pipeline construction activities during the above inspections must be reported immediately to the ECO's and EPCM in writing. The Contractor should put measures in place such as demarcation of the area, in order to protect such species, until the necessary permits have been obtained through the ECO's	CTR	ECO	
d		Thus the ECO's will be responsible for reporting such finds to the relevant Departments, Conservation or Park Boards Authorities, on behalf of Transnet and will also be responsible for obtaining all the necessary permits for relocation of a Red Data specie(s)	ECO	CTR / EPCM	
e		The ECO will be responsible to call upon a suitably qualified botanical expert to oversee: • Rescue of the plant(s) and transplantation in a suitable local habitat in a conserved area or in a recognised botanical garden; or, where this is not possible • The collection of seeds and cuttings for use at botanical gardens and for storage in seed banks (if authorised by the relevant authority).	ECO	CTR / EPCM	
f	GEN	The Contractor shall prohibit and actively prevent the harvesting of endangered, significant or medicinal or any other plants by his employees. Construction workers shall only assist with the removal of significant vegetation if requested to do so by a specialist and agreed to by the Contractor. All plants removed in this fashion will be handed over to the appropriate specialist and shall not be kept by the Contractor or his staff.	CTR	ECO	

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
g	SS	The Threatened Species Study must be consulted in order to identify and mark species for removal if necessary within the construction sites. (**Annexure A**).	ECO	CTR	
h	GEN	The CLO / LLO shall also ensure that local people are advised when construction is about to commence so that they can harvest any plants which are of traditional value before they are destroyed.	CTR	ECO	
i	SS	Between Curry's Post and Kiesbeen, sites were identified as being potentially suitable for important species requiring 'search-and-rescue' actions; These have been indicated on the alignment sheets and below are a summary of the areas listed: The Alignment Sheets must be consulted for exact KP's • Boulder grasslands with interspersed wetlands and high species diversity. Possible habitat for *Syncolostemon latidens* and *Stachys rivularis*). • Near Griffin's Hill. Themeda grasslands with wetlands, high species diversity. Note: These areas are adjacent to the existing pipeline, but has possible habitat for *Bowiea volublis* and *Stachys rivularis*. • Dolerite hills with possible habitat for *Bowiea volubilis*. • North of Wyford farm. Pipeline route lies adjacent to the eastern edge of the historically important wagon track (vegetation is disturbed, with *Hyparrhenia hirta* dominant), but the western side of the wagon track has a long, narrow remnant of high-diversity *Themeda triandra* grassland on a sandstone ridge. There is very little of this habitat left in the vicinity, so the 30m construction corridor boundary should be strictly enforced by confining all disturbance to the east of the wagon trail (which in any case needs to be protected during construction). The grassland strip to the west of the wagon trail should not be driven on, used for stockpiling materials of any sort, or damaged in any other way during construction. • North of Van Reenen. Moist grassland dominated by *Themeda triandra* and *Monocymbium ceresiiforme*, with extensive seeps. Possibly good habitat for *Kniphofia typhoides*; other endangered species possibly occur (also see de Castro vegetation report on the Free State sector). This section of pipeline is not adjacent to existing roads and therefore access to the pipeline needs to be carefully planned and demarcated to avoid unnecessary driving through the grasslands and seeps. Access in this area should be strictly controlled and access points agreed with the ECO's. All traffic for construction should be confined to the pipeline RoW and controlled by the CTR and ECO's	CTR	ECO	
j	SS	In Mpumalanga - the 12.5 km of semi transformed and untransformed habitat affected in Mpumalanga, not along existing roads and inclusive of intervening wetlands, was checked for threatened species by a botanist during November 2008. All threatened or Near-Threatened species that were found were mapped (**Annexure A**).Appropriate in situ and/or ex situ	ECO	CTR	

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		conservation measures shall be developed and implemented with the involvement of the Mpumalanga Parks Board.			
k	SS	In Gauteng, the crossing point of the Blesbokspruit floodplain near the inland terminal site in Gauteng was searched for *T. erythrorrhiza* in November 2008. Any species of signifance that were found was mapped, appropriate in situ and/or ex situ conservation measures should be developed and implemented, with the involvement of the Gauteng Directorate of Nature Conservation. In addition, the 600m of untransformed habitat affected, not along existing roads, were checked for threatened species by a botanist during November 2009. (**Annexure A**).	ECO	CTR	

2.3.2 Training of Contract Staff

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a	GEN	Environmental awareness training is required for all contractor staff on site, working in the RoW or any construction area, regarding the preservation of endangered, significant, medicinal or any other plants of significant importance.	CTR	ECO	
b	GEN	The Contractor shall ensure that all construction workers receive basic Environmental Awareness Training appropriate to their field of expertise which is to be accepted by the ECO, and shall ensure that staff members are continuously updated on any environmental issues related to the project. This training may take the form of information posters and pamphlets, “toolbox talks” and other easily accessible methods of information communication. The contractor shall ensure that all staff is educated regarding basic principles of environmental awareness and responsibility and that supervisors or foremen, or the EO’s, are sufficiently trained.	CTR	ECO	
c	GEN	It is the responsibility of the Contractor to ensure that he is familiar with the fauna or flora species, habitat types, landforms, natural processes or any other component or process of the natural environment described or listed in this EMP. Should any uncertainty arise the Contractor shall immediately consult with the ECO.	CTR	ECO	

2.4 Threatened Animals

2.4.1 Mammals

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a	SS	The Contractor is alerted to the fact that locations have been identified as sites were specific endangered Oribi may occur. The Contractor shall ensure that all personnel receive relevant ongoing environmental training in the form of "toolbox" talks, pamphlets etc. in order to be aware of their environmental responsibilities. The Contractor shall furthermore ensure that all personnel working in these locations respect and do not disturb these animals: The locations has been indicated on the Alignment Sheets and if any such species are found to be disturbed by the construction activities the ECO's should be notified. The ECO's should also be consulted to confirm these possible locations as indicated on the alignment sheets. The CTR will also ensure that there is no damage if possible to the Oribi preferred diet species. The ECO's shall be consulted in the identification of the locations of preferred diet species.	CTR	ECO	
b	GEN	The following measures apply to Oribi conservation in all areas earmarked as possible habitat for this species:			
		• Construction and post-construction work in areas where Oribi occur must be completed as quickly as possible in order to minimise risk.	CTR	ECO	
		• Onsite labour accommodation must be prohibited in areas where Oribi occur. Labour to be transported to site daily from camps approved for labour construction housing.	CTR	ECO	
		• Subject to agreement with the landowners, the construction servitude must be fenced through those farms where Oribi occur and shade cloth installed where possible to minimize visibility of the construction site from Oribi habitat.	CTR	ECO	√
		• The above conditions must be discussed with the ECO's. Discussion must also be facilitated with authorities if necessary. Landowners should also be involved. It is important for all parties to agree to the controls to be put into place. It will be necessary to define these controls on a farm by farm basis and to discuss and agree to these with the environmental authorities and the affected landowners.	ECO	CTR / EPCM	√
c		Noise levels in the vicinity of threatened mammal species, particularly Oribi (as identified in this EMP) are to be limited where possible. If blasting is required, adequate notification must be provided to the landowner beforehand, so that animals can be moved if required.	CTR	ECO	

2.4.2 Birds

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a		The construction team must be briefed about the importance of threatened birds and how to avoid their disturbance. An Environmental Management Procedure is to be compiled, prior to construction, which guides the contract team with respect to the management of construction in areas where threatened birds occur.	CTR	ECO / EPCM	√
b		Any individual found deliberately harassing any wildlife in any way should face disciplinary measures, following which the possibility of immediate dismissal from the contract. The construction teams must be warned about the penalties for harassing, trapping or hunting the threatened bird species.	CTR	ECO / EPCM	
c		The Contractor is informed that threatened crane species were identified during the EIA Phase and are noted within the Alignment Sheets and also noted in the (**Annexure A**)., The ECO's should be consulted in terms of the significance of these species and the preservation of their habitat as far as possible. When any of these species are noted or seen in the vicinity of the Construction Areas, the ECO's must be notified.	CTR	ECO	√
d		In the event that the ECO requires guidance about the management of a particular situation with respect to cranes then he is to have access to assistance from an ornithologist.	ECO	CTR /EPCM	
e		Construction of the pipeline in the route sections within 3000 m of the known Wattled Crane breeding sites must be done outside of the Crane breeding season (construction permissible inside the 3000 m buffer between September and April). Thus no construction between May to August. These sections include the two breeding sites (shown on alignment sheets) on the farm Oaklands (1000 m west of pipeline), and the farm Rondebosch (1300 m west of pipeline). (**Annexure A**).	CTR	ECO	
f		The ECO's shall consult with the Crane Foundation (contact person Mr. Andre Rossouw 072391 9750) when the contractor is planning construction at these points listed above and indicated on the alignment sheets.	ECO	CTR /EPCM	
g	SS	The alignment shall be searched by an ornithologist between approxemately KP120. and KP122. and any distance beyond this for the purposes of a buffer, to confirm that no Blue Swallow occur. While the pipeline does not traverse any confirmed Blue Swallow foraging and nesting areas, the owner of the property between KP 123 and KP 123.8, just south of Howick, believes that Blue Swallows forage in the KZN Mistbelt Grassland on his property. No nesting sites were found during the walk-through survey during the EIA Phase, but the presence of the birds need to be confirmed during the summer season before any decisions about mitigation are made and communicated to the contractor.	EPCM	ECO	
h	GEN	The occurrence of threatened cliff nesting species must be checked by an ornithologist prior to construction at KP 344 near Tafelberg, some 50 km north of Van Reenen. In the event that threatened raptors or other threatened species are nesting on these cliffs, then reduced blasting charges and blast matts must be used to lesson blast noise in the event that blasting	EPCM	ECO	

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		is necessary between KP341 and KP347. This must be communicated to the Contractor.			

2.4.3 Reptiles

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a	GEN	The Contractor shall ensure that no African Rock Pythons or any other snakes are killed or otherwise harassed and shall contact the ECO should a python be found within or near a construction site. The CTR shall as a minimum provide basic snake awareness training to all employees and sub-contractors.	CTR	ECO	
b		The Contractor shall prior to clearance commencing in any areas identified as suitable habitat for chameleon species notify the EPCM and ECO's at least 2 weeks prior to construction activities to commence in these areas in writing.	CTR	EPCM / ECO	
c		The above notification is to allow that a suitably qualified expert to search the alignment within this section, so as to rescue and relocate any Drakensberg Dwarf Chameleon and other endangered species found here.	ECO	EPCM	
d	SS	Valuable habitat for endangered chameleon species has been identified between KP143.5 and KP151 and is indicated on the alignment sheets.	EPCM	ECO	
e	SS	It is the responsibility of the ECO to familiarize themselves with the location of suitable habitats for chameleon species as described in the ***FINAL EIA Specialist Studies 10A and 10B***.	ECO	CTR	
f	SS	The Contractor shall on instruction from the ECO's ensure that all dolerite sills and boulders occurring as indicated on the alignment sheets are protected. The areas of protection are described in the ***FINAL EIA Specialist Studies 10A and 10B***. It is the Contractor's responsibility to ensure that these areas are protected against damage to the greatest extent possible as these constitute suitable habitat for chameleon species as stated above.	CTR	ECO	
g	SS	Search and rescue of threatened chameleon species must be undertaken by a suitable qualified specialist immediately prior to construction in the 9 locations (Approx KP11.9) defined in the EIA Specialist Studies as potentially suitable habitat for the Black Headed Dwarf Chameleon and Midlands Dwarf Chameleon.	ECO	EPCM	
h		The Contractor will be required to fence all areas identified as suitable habitats for endangered chameleon species on instruction from the ECO's. A bufferzone will be agreed with the ECO's.	CTR	ECO	
i		The route has been aligned to avoid the known burrows of the threatened Girdled Lizard, which is found in the Free State. The ECOs and EO's should familiarise themselves with	ECO	CTR / EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		species (before construction starts) to recognise the burrows of the Girdled Lizard. In the event that burrows of this species are found along the route, prior to construction, then construction in the area must be halted until such time as the colony can be surveyed by a suitable qualified expert and a re-route devised to avoid them if necessary.			

2.4.4 Invertebrates (Millipedes and Earthworms, Snails and Slugs)

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a	SS	It is the responsibility of the ECO to familiarize themselves with the locations of where significant invertebrates could be found on the Trunkline route and should notify the CTR of these locations in writing. These are described in the ***FINAL EIA Specialist Studies 10A and 10B***.	ECO	CTR	
b	SS	The Contractor shall notify the EPCM two weeks in advance in writing before any work is to commence in areas as indicated on the alignment sheets where significant invertebrates could occur as described in the ***FINAL EIA Specialist Studies 10A and 10B***.	CTR	EPCM / ECO	
c	SS	The EPCM shall ensure that the appropriate specialists in KZN be afforded the opportunity to inspect the proposed route alignment in these areas indicated on the alignment sheets. [D. Herbert (molluscs), J. Plisko (earthworms) – both of the Natal Museum, Pietermaritzburg - and Prof. M. Hamer or Dr Friederike Voight (millipedes) of UKZN, Pietermaritzburg during Construction.	EPCM	ECO	
d	SS	The Specialists will be afforded the opportunity to 'rescue' any representatives of these groups (mentioned above) and/or retrieve specimens which may fall into the trench while it is open, for study purposes.	ECO's	CTR	
e	GEN	The ECO's and EO's (CTR) will be trained on the significance of identifying and recovery of specimens of invertebrates disturbed by construction activities.	EPCM	ECO	
f	GEN + SS	Dr. D. Herbert of the Natal Museum, and Prof. M. Hamer (UKZN) should be informed of construction progress and timeously notified in order to search sub-sectors of the route prior to the construction corridor being cleared so that any snail species and other invertebrates with very localised distributions that are present, can be relocated.	ECO	EPCM	

2.4.5 General

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a	GEN	If any potentially dangerous, particularly fragile or any animal is discovered in a trench or within the construction servitude, operations in the direct vicinity of the animal shall be halted if necessary, and if feasible, the area of the trench or RoW in which it is found shall be temporarily blocked off. The EO shall immediately inform the ECO, who shall issue instructions for further actions that need to be taken.	CTR	ECO	
b	GEN	The Contractor shall cover the exposed open ends of all sections of pipe at the end of each day with DPC or other similar sheeting, which shall be tightly fitting over the pipe opening to prevent animals from entering the pipe at night.	CTR	EPCM	
c	GEN	The Contractor shall specifically ensure that no antelope are poached, killed, injured or harassed along any section of the alignment or any area adjacent to a construction site where they occur.	CTR	ECO	
d		The Contractor shall ensure that all of his construction workers receive training, developed by the Contractor and accepted by the ECO, as to the procedure that should be followed if any animals, including mammals, reptiles, amphibians, birds and invertebrates are discovered in an open trench or any other excavation area.	CTR	ECO	
e	GEN	The Contractor shall ensure that all construction workers receive basic Environmental Awareness Training appropriate to their field of expertise which is to be accepted by the ECO, and shall ensure that staff members are continuously updated on any environmental issues related to the project. This training may take the form of information posters and pamphlets, “toolbox talks” and other easily accessible methods of information communication. The contractor shall ensure that all staff are educated regarding basic principles of environmental awareness and responsibility and that supervisors or foremen, or the EOs, are sufficiently trained to oversee general environmental compliance.	CTR	ECO	

2.5 Conservation Areas

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a	SS	Special Care should be taken in conservation areas in terms of any wild animals which may be affected by construction activities. Proper awareness training should be done by the Contractor accepted by the ECO, to inform all persons on the construction site about the sigficance of the areas that they are working in.	CTR	ECO	
b	SS	The Contractor should take note of the following listed Private and Nature Conservation areas that may be affected by Construction Activities. These areas are indicated on the alignment sheets • Umbogovango Nature Reserve • Mphafa Private Nature Reserve • Eston Conservancy • Acacia Fields Game Farm • Lower Mpushini Conservancy • Umgenyana Conservancy • Arboretum and Mamba Valley 'Nature Reserves' occur on opposite sides of the railway tracks between	CTR	ECO	
c	SS	The Contractor is to adhere to any special conditions as specified in the Landowner Agreements in areas where any Private of other Nature Reserves are affected by the Pipeline Construction Activities.	CTR	ECO	

2.6 Other Areas of Conservation Significance

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a	SS	The Contractor shall ensure that where it is unavoidable that the route has to cut across wetlands in which Swamp Forests occur as indicated on the alignment sheets – the mitigation recommendations for wetland rehabilitation as described in this EMP be implemented.	CTR	ECO	
b	SS	In the area of Coastal Lowland Forest as indicated on alignment sheets, the Contractor shall where the route passes between the railway embankment and the Amanzimtoti Treatment Works narrow the construction corridor to the greatest extent possible. The Contractor must remove the existing fence, replace it on the east side with a temporary fence during construction, construct the pipeline inside the railway reserve, then erect a new fence where the existing fence is. There are a few trees (*Albizzia sp., Chaetacme sp., Trema sp.*) in the railway reserve and in the construction path. The contractor shall ensure that the canopies of trees east of the sewer and projecting west into the railway reserve that protrude into the construction Right of Way are carefully trimmed and damaged as little as possible. Another possible impact resulting from this recommendation is that disturbing the forest margin on the sewer servitude could lead to alien plant incursion,	CTR	ECO	
c	SS	Transnet should undertake to control alien plants on the sewer servitude and forest margin until forest margin stability is re-attained (a few years).	Transnet		
d	SS	Where the route runs in the railway reserve between the two forests known as Mamba Valley and Arboretum as indicated on the alignment sheets these forest areas shall be fenced off for the duration of construction to prevent the forests from being used as shade rest areas, littering and toilets.	CTR	ECO	
e	SS	Where the route runs very closely adjacent to wetland dominated by *Phragmites* sp. The Contractor shall ensure that all applicable measures pertaining to wetland damage prevention and mitigation are employed. (This is indicated on the alignment sheets)	CTR	ECO	
f	SS	Horizontal drilling should not be used to cross Old Main Road as this is likely to result in profound disturbance to the wetland.	CTR	NMPP / ECO	
g	SS	Care must also be exercised as indicated on the alignment sheets where the proposed route runs closely adjacent to the boundary of the Umbogovango Nature Reserve.	CTR	ECO	
h	SS	As indicated on the alignment sheets the excavation of the trench could cause an increase in the volume of water which may be leaking beneath the berm from the adjacent wetland and end up flowing along the bottom of the trench. In the light of these concerns the Contractor shall assess the significance of the issue described above using a suitably qualified specialist	CTR	ECO	

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		and ensure that excavation of this section of the route be undertaken in accordance with the recommendations of the specialist, so as to minimize risk to the wetland. Dewatering and silt traps – erosion control			

2.7 River Crossings

2.7.1 Management of Water / River Crossings

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a	GEN	The Contractor is responsible for controlling riparian and in-stream damage to the river systems through which the pipeline is routed. In the event of aquatic organism stress caused by the works which, in the judgement of Transnet and the ECO, could have irreversible effects on the river ecosystem or individual species, the Contractor shall be instructed by Transnet to halt construction at the river crossing until adequate controls are put in place.	CTR	ECO / EPCM	
b	SS	The Contractor shall prepare a detailed method statement for review by the EPCM, in accordance with DWAF WUL (if available). The method statement shall include but not be limited to: • A biophysical description of the site (profile, depth and width of channel(s), geo-technical drawings, large trees, reed beds, etc); • The proposed timing and duration of river crossing construction; • A list of the typical types of equipment that will be used for the excavation, laying of pipe, backfilling of the trench and control of water; • Measures that will be used to control suspended sediment and turbidity (e.g. berms, hay bales, bidem curtains, river diversions, settling ponds), damage to riparian vegetation, spillage of fuels and oils, cement and other foreign materials and a monitoring program to provide rapid feedback on the effectiveness of controls. • Measures that will be used to ensure that identified and surveyed trees in the riparian fringe within the construction right of way, that are scheduled for protection, shall not be damaged during construction • Measures that will be used to stabilize river embankments after construction and to return the channel to its pre-construction profile or to a more stable profile. • Measures that will be used to minimize the impact of blasting on aquatic species in the event that construction under submerged conditions is necessary. • Methods used to remove alien and invader plant species within the Construction Right Of Way at major river crossings.	CTR	EPCM / ECO	√

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
c	SS	Major river crossings for the purpose of this EMP shall be defined as 3rd order streams and higher. The following 3rd to 6th order river crossings are applicable to this EMP: **Upper Vaal Water Management Area:** Gauteng (Stream ID 0) - Blesbokspruit (-26.47830; 28.42573) Gauteng/Mpumalanga border (Stream ID 5) - Suikerbosrand River (-26.60630; 28.49510) Mpumalanga (Stream ID 15) Molspruit (-26.76319; 28.63873) Mpumalanga (Stream ID 19) Silverbankspruit (-26.80779; 28.68192) Mpumalanga (Stream ID 29) - Waterval River (-26.94900; 28.76282) Mpumalanga (Stream ID 32) - Bossiesspruit (-27.00247; 28.81091) Free State (Stream ID 33) - Vaal River(-27.03821; 28.82225) Free State (Stream ID 36) - Skoonspruit (-27.10891; 28.88281) Free State (Stream ID 41) - Brakspruit (-27.18719; 28.95679) Free State (Stream ID 44) - Skulpspruit (-27.26004; 29.00236) Free State (Stream ID 49) - Venterspruit (-27.33950; 29.04701) Free State (Stream ID 50) - Venterspruit (-27.35701; 29.06416) Free State (Stream ID 76) - Holspruit (-27.68740; 29.12953) Free State (Stream ID 87) - Rondawelspruit (-27.81029; 29.16120) Free State (Stream ID 91) - Cornelis River (-27.86114; 29.16498) Free State (Stream ID 117) - Wilge River(-28.28508; 29.37774) Free State (Stream ID 118) - Meul River(-28.00867; 29.22635) **Thukela Water Management Area:** KwaZulu Natal (Stream ID 133) - Sandspruit (-28.44220; 29.48943) KwaZulu Natal (Stream ID 140) - Sand River (-28.52474; 29.56952) KwaZulu Natal (Stream ID 143) - Dewdrop Stream(-28.57673; 29.61215) KwaZulu Natal (Stream ID 155) - Tugela River (-28.75417; 29.66578) KwaZulu Natal (Stream ID 156) - Doringspruit (-28.83515; 29.74549) KwaZulu Natal (Stream ID 157) - Bloukrans River(-28.88645; 29.77135) KwaZulu Natal (Stream ID 160) - Drakespruit (-28.91746; 29.80329) KwaZulu Natal (Stream ID 165) - Boesmans River (-29.00634; 29.89603) KwaZulu Natal (Stream ID 180) - Mooi River(-29.18408; 30.03757) **Mvoti to Umzimkulu Water Management Area:** KwaZulu Natal (Stream ID 190) - uMngeni River (-29.49027; 30.20813) KwaZulu Natal 1(Stream ID 94) - Gwen's Spruit (-29.51519; 30.28703) KwaZulu Natal (Stream ID 197) - Doringspruit (-29.52226; 30.32776) KwaZulu Natal (Stream ID 198) - Doringspruit (-29.52169; 30.33038)	INFO		

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		KwaZulu Natal (Stream ID 205) - uMsunduze River(-29.61910; 30.45394) KwaZulu Natal (Stream ID 206) - uMsunduze River (-29.63333; 30.45681) KwaZulu Natal (Stream ID 207) - uMsunduze River(-29.63448; 30.45773) KwaZulu Natal (Stream ID 208) - Mpushini River (-29.65160; 30.46904) KwaZulu Natal (Stream ID 211) - uMlazi River (-29.80121; 30.52061) KwaZulu Natal (Stream ID 217) - Klipspruit (-29.97923; 30.64945) KwaZulu Natal (Stream ID 236) - Mbokodweni (-30.00453; 30.92320) KwaZulu Natal (Stream ID 237) - uMlazi River (-29.95514; 30.94851)			
d	GEN	The Contractor shall comply with any conditions of approval set by the DWAF.	CTR	EPCM / ECO	
e	SS + GEN	During construction the Contractor shall make provision to maintain the natural flow of any drainage line affected by construction.	CTR	ECO	
f	SS + GEN	In excavating the bed of the water body for the pipeline, the Contractor shall comply with the following: • Backfill will be done in accordance with the specifications and typical drawings issued to the Contractor. The Contractor together with the ECO's will review and assess the appropriateness of the drawings and specifications issued and will inform the EPCM if changes are required. • Where blasting takes place, the rock replaced in the trench at the surface is to give the trench as natural an appearance as possible, so that in low flow periods, a linear scar is not obvious.	CTR	ECO / EPCM	
g	SS + GEN	Where isolating the location of works, the following measures, among others, must be considered by the Contractor or as instructed by the ECO, as per the method statement in order to minimise the risk of increased suspended sediment in the water column downstream of the works: • Elimination of surface flow through the construction site; • The use of non-erodible materials for the construction of any berms, coffer dams or other isolation structures used in a works within a flowing watercourse. The use of non-earthen dam structures, such as aquadams, are possible options; • In cases where the entire flow of water of a water body is diverted around the water crossing site, it must be returned to the water body immediately downstream of the crossing site; • The use of silt fences or hay bales to isolate the construction area from the water body in situations where the flow velocities and volumes are low; • The removal and temporary storage of any material excavated from the bed or banks of the water body to a location out of the water body until the materials are permanently removed from the location or backfilled into the water body. Where sufficient space exists, and where the storage will not cause any environmental	CTR	ECO	√

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		damage, this may be within the macro-channel banks of the river. • The treatment of any water removed from the isolation area, prior to discharge back into the downstream river course, to remove suspended sediment.			
h	SS + GEN monitoring	The Contractor shall monitor the effect of construction on downstream sediment loads. The monitoring programme shall include sampling in the river upstream and downstream of the works during the period when construction in the river is taking place. The details of the sampling programme shall include, as a minimum, provision for daily samples as agreed with the ECO's for each crossing point for the duration of the river crossing works. The samples shall be analysed on site for total suspended solids and turbidity, using recognised methods of determination, and the results shall be presented to Transnet at least on a monthly basis, or on request by Transnet when required. Sampling times shall be selected to correspond with any periods of higher sediment generation. At its sole discretion, Transnet may reduce the sampling rate at times when sediment is not being generated by the works. The Contractor shall at all times remain responsible for keeping accurate and updated records of suspended sediment and turbidity measured during construction.	CTR	ECO / EPCM	√
i	SS + GEN monitoring	The ECO or other specialist consultant appointed by Transnet shall undertake periodic independent audits of sediment generation caused by the construction works in the rivers in order to verify the results of the sediment monitoring maintained by the Contractor.	ECO	EPCM / CTR	
j	SS + GEN	During the carrying out of the works, the Contractor shall remove any fish that are found within the isolated portion of the watercourse crossing site, without harm to the fish. The Contractor shall obtain advice from the ECO on the relocation of the fish.	CTR	ECO	
k	SS + GEN	Where pipeline construction through river channels involves excavation of submerged rock, the contractor shall give preference to methods that do not involve underwater blasting. In the event that the Contractor adjudges underwater blasting methods to be the only practical method this shall be fully motivated and all necessary plans shall be prepared to demonstrate that the work can be conducted without significant risk to aquatic organisms. Such plans shall be submitted to Transnet for approval and acceptance as a part of the method statements for each major river crossing prior to implementation of the works. The plans shall include all information as listed below: **Measures to reduce blast shock, such as:** • Minimising the size of explosive charges per delay and the number of days of explosive exposure. • Subdividing the explosives deployment, using electric detonating caps with delays to reduce total pressure. • Use of decking in drill holes to reduce total pressure. • Use of shaped charges at surfaces to focus blast energy.	CTR	EPCM	√

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		• Use of angular stemming material in drill holes to reduce energy dispersal to the aquatic environment. • Use of energy absorbers upstream and downstream of the blast, such as temporary gabion structures. **Measures to reduce impact on spawning fish, such as:** • Limiting the season of explosive use from March to September (non-spawning season). • Use of non-explosive scare techniques to move fish from the immediate blast zone (Use of small repelling explosive charges are not considered to be an effective means of driving fish from a blast area. Acoustic repellent devices and/or bubble curtains may need to be considered).			
l	SS + GEN monitoring	The Contractor shall notify the EPCM and Transnet in advance of any underwater blasting scheduled for the major river crossings. The Contractor shall monitor the effect of underwater blasts upstream and downstream of the blast zone. If any fish mortality results from a blast, the Contractor shall record the species and size and shall immediately notify the ECO / Transnet and the DWAF.	CTR	EPCM	
m	SS + GEN monitoring	The EPCM and Transnet will inform DWAF in advance of any underwater blasting scheduled for the major river crossings.	EPCM	CTR	
n	SS + GEN	Where rehabilitating the water / river crossing works, the Contractor shall comply with the following (this will be included in the Rehabilitation Plan) • The Contractor and ECO's shall maintain a photographic record of all river / water crossings prior to construction, during construction and after rehabilitation • The river channel embankments shall be returned to the pre-existing (or a more stable) profile than that which existed prior to construction as per the river / water crossing method statements • River embankments shall be stabilised, using any necessary protection measures, including re-vegetation, rip rap, reno mattresses and other measures, to ensure that the banks are protected against erosion; • Measures using indigenous grasses to permanently stabilise disturbed areas shall be fully effective as described in the re-vegetation sections of this EMP; • Debris disposal and clean up shall be carried out to return the river course to its pre-existing condition prior to the works.	CTR	ECO	√
o	GEN + SS	In rehabilitating the river crossings, the Contractor shall, in addition to the requirements specified in the re-vegetation specification, include the re-planting of indigenous trees in the riparian fringe, removed during construction and shall plant two trees of the same or similar species for each tree removed. All trees at each river crossing shall be alive and healthy at the	CTR	EPCM / Transnet	

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		end of the construction liability period. All trees are to be purchased from a reputable commercial supplier and are to be supplied with a phyto-sanitary certificate which certifies that the soil in which they were propagated is weed free.			
p	GEN + SS	The precise location of the trees as stipulated above in the riparian zone shall be provided to the Contractor by the ECO's	ECO	CTR	
q	GEN + SS	Where legally required if water within a stream / wetland is to be diverted by means of dams, the construction of dams must be authorised by DWAF as part of the permitting process for the proposed NMPP under the National Water Act (Act 36 of 1998). In addition, any EIA authorisation requirements, in terms of the regulations promulgated on the 1st July 2006 under Section 24 and 24D of the National Environmental Management Act, Act No. 107 of 1998 must be complied with.	CTR	EPCM / Transnet	
r	GEN + SS	The EPCM (for Transnet) will apply for DWAF WUL for the following: Impeding or Diversion of flow and the Altering of the Beds and Banks of a water course	EPCM	Transnet	
s	GEN	Any dam / impoundment constructed should only be a temporary structure and must be completely removed once the construction of the pipeline has been completed. The area covered by the dam wall, and by any water impounded behind this structure, including any vegetation that is disturbed must be completely rehabilitated.	CTR	ECO	
t	GEN	The CTR will be responsible to comply to all relevant legislation pertained to the use and protection of water resources.	CTR	ECO	
u	GEN	The pipeline must be designed to take into account the potential occurrence of severe year flood events and to ensure the stability of the pipeline as it crosses rivers.	EPCM	CTR	√

2.7.2 Pollution Prevention (Including River / Water / Wetland Crossings)

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	No dumping of any building rubble, soil, litter, organic matter or chemical substances may occur within any drainage line or area of standing water. Dumping and temporary storage of the above shall only occur at predetermined locations.	CTR	ECO	
b	GEN	The Contractor shall ensure that construction workers do not use any water body for washing, cleaning or as latrine area.	CTR	ECO	
c	GEN	Access of people and vehicles to wetlands and any other water bodies along the pipeline construction servitude must be restricted as far as possible. Signage must remain for the duration of construction activities.	CTR	ECO	
d	GEN	The contractor shall ensure that the placing of silt fences / silt barriers adjacent to all water bodies occurs to prevent discharge of silt into the water bodies, and the inclusion of buffer	CTR	ECO	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		zones as required by Legislation in which no stockpiles, machinery, chemicals or construction camps must be included to prevent pollution into the wetland. Where no specific standards exists or have not been identified in this EMP a minimum boundary of 32 meters shall apply or otherwise specified in the Water Use License (WUL).			
e	GEN	In cases where any seepage water is removed from the pipeline trench (including from wetlands) as part of a dewatering process, this water may contain a high silt load, which could have a detrimental effect if discharged back into the wetland. It is thus recommended that water from dewatering operations be cleaned of silt as far as possible prior to the water being discharged into the wetland. Advanced notice of intended construction with these areas is to be provided to ECO'S, EO's and wetland specialist. Erosion and silt control mechanisms must be in place prior to the onset of construction within any wetland or river crossing. EO's must liaise with ECO's and Engineers (or specialist wetland crossing team foremen) as to where these measures should be placed to ensure adequate and reasonable distances for access to the de-watering points. Since de-watering points are often dependent on site conditions that can change rapidly, EO's and the erosion control team should be present at all times within these areas, ready to mobilize new measures for erosion and silt control as when necessary upon request of the ECO's.	CTR	ECO	

2.7.3 Horizontal Directional Drilling

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a	SS	The Contractor shall prepare a detailed Method Statement for all HDD sites for approval by the EPCM and Transnet prior to commencing with Construction.	CTR	Transnet / EPCM	√
b	SS	The Contractor shall take all expected measures required to prevent risks typically associated with HDD methods of construction including but not limited to ground subsidence during drilling operations, inadvertent spills of bentonite and final disposal of the grout.	CTR	Transnet / EPCM	
c	SS	If any sensitive environments are expected to be affected by HDD Activities such as wetlands, river, water crossings or any other environments classified as sensitive as part of this EMP, mitigation measures will be stipulated in the method statements issued to the EPCM and Transnet.	CTR	Transnet / EPCM	√
d	SS + GEN monitoring	As part of the method statements to be provided by the contractor prior to construction, procedures for monitoring the flow and recycling of bentonite will be submitted and reviewed. This will include emergency measures to deal with unwanted spillages. Details will also be required of where and how the bentonite grout is finally disposed of. Although this grout is non-toxic, it has the consistency of mud and disposal thereof will have to be carefully controlled to avoid any adverse environmental impacts.	CTR	Transnet / EPCM	√

2.7.4 Blasting Operations

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL MANAGEMENT REQUIREMENT	Main Responsibility	Support	Method Statement / Procedure
a	GEN	The Contractor shall employ industry standard methods to control the impact of blasting and limit the risk of damage to buildings and structures by reducing blast vibrations induced in the rock mass, eliminating fly rock and limiting air-blast and noise to acceptable levels.	CTR	EPCM	
b	GEN	To limit damage to structures, even old buildings, to only very slight damage (less than 5%) The Contractor shall adhere to all published PPV limits for built-up or potential risk areas and strictly enforced. Regular peak particle velocity (PPV) measurements shall be taken along the route where blasting is being carried out close to buildings, using a velocity seismograph. The Contractor shall submit the results to the EPCM at agreed-upon intervals.	CTR	EPCM	
c	GEN + SS	The Contractor shall use blast mats wherever fly-rock may result in damage to adjacent buildings, power lines or other built structures, or sensitive ecological areas.	CTR	EPCM	
d	GEN	The Contractor shall apply due diligence and all industry-accepted methods to limit factors contributing to the development of an airblast and noise, which include overcharged blast holes, poor stemming, uncovered detonating cord, venting of explosive gasses and inadequate burden giving rise to cratering.	CTR	EPCM	
e	GEN	The Contractor shall control blasting operations to ensure sound pressure levels are kept below the generally accepted 'no damage' level of 140 decibels. The Contractor must investigate local area requirements and enforce these if different from the latter stated.	CTR	EPCM	
f	GEN + SS	Where blasting is disallowed due to any reason, only pneumatic tools or chemical breaking of the rock should be permitted.	CTR	EPCM	
g	GEN	The Contractor will be responsible to enforce any special conditions as stipulated in the Land Owner agreements in terms of blasting operations in close proximity to boreholes, the recommended mitigation measures shall be employed upon consultation with the affected landowner and could include the following: • Pump test to establish existing reliability of borehole supply, prior to construction, so that this may serve as a benchmark against which change can be measured. • Use of special methods to limit potential damage to boreholes if blasting is to be used. • Use of controlled blasting or mechanical excavation on those properties where it is agreed that there is a potential risk to boreholes due to normal blasting methods. • Monitoring of blast shock using standard monitoring practices.	CTR	EPCM	√
h	GEN	Notwithstanding any information provided within the EMP or any other report, the Contractor shall ensure that appropriate mitigation is employed wherever hard rock is encountered and blasting is required.	CTR	EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL MANAGEMENT REQUIREMENT	Main Responsibility	Support	Method Statement / Procedure
i	GEN + SS	Homesteads and structures • Prepare a photographic survey (including a crack survey) of all structures in proximity to the pipeline so as to manage issues relating construction damage, including damage caused by blasting and vibration. The survey intent must be well communicated and agreed with householders. Proper documentation should be kept in the form of a database or similar. • This database will serve as a baseline for determining the impact of construction-related blasting and vibration on buildings. The intent of this survey must be communicated to all stakeholders, and must be conducted with their consent. Where impacts on structures are unavoidable as result of blasting operations, Contractor shall compensate owners for damages based on a valuation by a certified valuer.	CTR	EPCM	√
j	GEN	Complaints regarding blasting-damage to structures must be lodged with the Land Liaison Officers	EPCM	ECO / CTR	
k	GEN	Such complaints will be investigated by the contractor and their validity determined by comparing the post-construction state of structures with their state as recorded in the photographic survey. A register must be kept of all construction-related complaints (including those that are not specifically related to building damage). The register must be designed in such a way as to capture: • The name of the person lodging the complaint, • The nature of the complaint, • The date on which it was lodged, • What action was taken, and by whom, to address the complaint, • The date on which this action was taken, and • The outcome of this action.	CTR	EPCM	
l	GEN	In addition to the complaints register, a record must be kept of all communication with communities.	EPCM	ECO / CTR	
m	GEN	The Contractor shall submit Method Statements for all methods of blasting mitigation for approval by the EPCM prior to commencing with such activities and shall comply with all relevant ISO standards and health and safety legislation.	CTR	EPCM	√

2.8 Waste Management and Littering

2.8.1 General Waste

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL MANAGEMENT REQUIREMENT	Main Responsibility	Support	Method Statement / Procedure
a	GEN	The Contractor shall prevent littering and the random discard of solid waste on the site. The Contractor shall not dispose of any waste in the pipeline trench. The trench shall be inspected on a daily basis and all foreign objects shall be removed and properly disposed of.	CTR	ECO	
b	GEN	It is recommended that Litter collection points are to be provided along the RoW and Construction Sites. It is also advisable that the Contractor establishes central waste collection and sorting sites where litter and other waste will be stored temporarily for sorting purposes and collection. A waste recycling mindset should be encouraged. Collected waste may only be disposed of at licensed dumpsites and the Contractor shall keep written proof of materials disposed.	CTR	ECO / EPCM	
c	GEN	The Contractor is to prepare a method statement in terms of waste management to be accepted by Transnet.	CTR	ECO / EPCM	√

2.8.2 Hazardous Waste

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL MANAGEMENT REQUIREMENT	Main Responsibility	Support	Method Statement / Procedure
a	GEN	All necessary precaution measures shall be taken to prevent soil or surface water pollution from hazardous materials used during construction and any spills shall immediately be cleaned up and all affected areas rehabilitated.	CTR	ECO	
b	SS	An area for the storage of hazardous materials must be established within construction camps that conforms to the relevant safety requirements and that provides for spillage prevention and containment	CTR	ECO	
c	GEN	The Contractor shall comply with all applicable laws, regulations, permit and approval conditions and requirements relevant to the storage, use, and proper disposal of hazardous materials.	CTR	ECO	
d	SS	All hazardous substances shall be stored in designated areas within the construction camps that are bunded and provided with a hard, impervious surface, as well as sufficient roof cover to prevent the ingress of water. All bunded areas will be provided with a catchment sump that	CTR	ECO	

		drains to a separator unit that prevents runoff from entering and contaminating any adjacent areas. Bund walls must be of a sufficient height to contain at least 110% of the volume of any materials stored within the bunded area.			
e	SS	The hazardous materials storage area must be locked and access restricted to authorised personnel, and must be clearly marked as such.	CTR	ECO	
f	SS	The Contractor shall at all times have a skip on site (Construction Camps) for the disposal of hazardous waste and polluted soil, which will be cleaned regularly. Waste shall have a turnaround cycle that will ensure that the skips never exceed their maximum carrying capacity.	CTR	ECO	
g	GEN	All major spills as specified in the contractor emergency response procedure of any materials, chemicals, fuels or other potentially hazardous or pollutant substances must be cleaned immediately and the cause of the spill investigated. Preventative measures must be identified and submitted to the EPCM and ECO for information.	CTR	ECO	
h	GEN	The Contractor shall prepare a Hazardous Materials and Waste Management Plan for inclusion in the site specific Environmental Plans to be submitted to Transnet prior to establishment on site. This plan shall include, but shall not be limited to, measures to prevent: • contamination of soils; • pollution of water; • accidental fires; • risk/injury to people or animals.	CTR	EPCM / ECO	√
i	GEN	The Contractor shall classify all hazardous materials to be used on site according to recognised Codes of Practice such as SABS Code 0228 for the Identification and Classification of Dangerous Substances and Goods and the Department of Water Affairs and Forestry *Minimum Requirements for the Handling, Classification and Disposal of Hazardous Waste*, and shall ensure that the handling, storage, transport and disposal of these materials meets the requirements of these Codes.	CTR	ECO	
j	GEN	Material Safety Data Sheets (MSDS) Information and records of all materials stored must be available and strict control of the volumes stored and removed must be kept.	CTR	ECO	
k	GEN	Staff must be trained in the hazards and required precautionary measures for dealing with these substances.	CTR	ECO	
l	SS	All Waste within the designated waste skips (hazardous or general) may only be disposed at a licensed disposal site to receive such materials. The Contractor shall keep written record of materials dumped and shall provide such proof to Transnet when requested.	CTR	ECO	
m	GEN	The Contractor shall manage all hazardous materials and wastes in a safe and responsible manner, and shall prevent contamination of soils, pollution of water and/or harm to people or animals as a result of the use of these materials.	CTR	ECO	
n	GEN	Construction equipment and vehicles are not to be serviced within the Construction Right of Way or any other area outside of the Construction Camps as a matter of course and this practice should be limited to breakdowns and unavoidable maintenance only. In such	CTR	ECO	

		instances drip trays or other absorbent material shall be placed underneath the serviced vehicle, the contents of which shall only be disposed of in the hazardous materials skip at the Construction Camp, or otherwise a dumping site licensed to receive such waste. No dumping of any broken parts, oils, grease or any other material in the Construction Right of Way or adjacent areas will be tolerated under any circumstances and strict action shall be taken against any offenders.			

2.9 Boreholes and Springs

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL MANAGEMENT REQUIREMENT	Main Responsibility	Support	Method Statement / Procedure
a	SS	The Contractor is to take note of any special conditions listed within landowner agreements with landowners within the Curry's Post Area. It was noted that 2 springs and 1 borehole in the Curry's Post area in KZN Midlands, are located either within or immediately adjacent to the construction zone of the trunk line route. • Spring No. 755-S1: To minimise any possible negative impacts on the vulnerable water sources, it is recommended that where alternate potable water supply sources are available, that these water sources are checked prior to, during and after construction of the pipeline to ensure that flow rates/ water quality remain unaffected. • Spring No. 757-S1: It is recommended that the pipeline route is moved to the eastern side of the proposed route to reduce the possibility of the spring being disturbed/ effected. If blasting is to be undertaken in this vicinity, alternate water supply options, such as drilling and equipping of a borehole should be investigated. • Borehole No. 792-1: The pipeline route is moved to the western side of the proposed route. If blasting is to be undertaken in this vicinity, it is recommended that this borehole is pump tested under the supervision of a Geohydrologist. The borehole should then be sleeved with 140mm Class 12 factory slotted casing to ensure the stability of the borehole, before being re-pump tested to re-confirm the yield after the installation of the casing to ensure that the borehole remains operational, as this borehole forms the only source of potable water to the school. (**Annexure B**).	CTR	ECO / EPCM	
b	GEN	In all cases, the Land Liaison Officers (LLO's) must verify with landowners whether they make use of any water supply boreholes or springs within 200 m of the pipeline.	EPCM	ECO	
c	GEN	If any boreholes or groundwater sources are identified, over and above those listed in (**Annexure B**), these should be logged by the Contractor.	CTR	ECO	
d	GEN	In the event that blasting is required in a section of route which is within 200 m of a borehole or shallow groundwater source, the yield is to be tested prior to and after blasting has taken place.	CTR	EPCM	√

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL MANAGEMENT REQUIREMENT	Main Responsibility	Support	Method Statement / Procedure
		Any damage to yields which is incurred as a result of pipeline construction is to be fully compensated for, if necessary, by means of drilling an additional borehole or using the other means to supply water to the affected landowner.			
e	GEN	In the case of identification of any additional farm water supply from springs and seeps, close to the alignment, these should be reviewed by the ECOs and an appropriate course of action determined.	CTR	ECO / EPCM	√

2.10 Veld Fires

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL MANAGEMENT REQUIREMENT	Main Responsibility	Support	Method Statement / Procedure
a	GEN	The Contractor shall minimise the risk of bush or veld fires caused by any activity on the site. Where adjacent areas are at risk of fire, the Contractor shall produce Method Statements indicating how the spread of fires will be prevented. These are to be accepted by the affected adjacent landowner/s, ECO and local Fire Departments and/or Fire Protection Agencies (FPA).	CTR	ECO / EPCM	√
b	GEN	The Contractor shall ensure through fire breaks and other appropriate measures that all Construction Camps are protected from the risk of oncoming veld fires that have originated on adjacent properties.	CTR	ECO / EPCM	
c	GEN+SS	Where construction sites, specifically the Pump Station and Terminal sites are at risk of oncoming fires the Contractor shall also provide firebreaks and shall where necessary coordinate fire prevention efforts with adjacent landowners and local FPA.	CTR	ECO / EPCM	

2.11 Soil and Erosion Management

2.11.1 Vegetation Clearing

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	Where possible, trees existing within the Construction right of Way that are not interfering with the operation of construction (either individual specimens or groups) shall be left undisturbed, and shall be clearly marked.	CTR	ECO	
b	GEN	When entering areas of predominantly indigenous vegetation the ECO's will be consulted in terms of the possibilities of transplantation of any specimens that are of ecological significance within the RoW to outside of the Construction RoW.	CTR	ECO	
c		The ECO's and LLO's will consult with all landowners where the above stated is relevant in order to reach land owner agreements.	ECO	EPCM / CTR	
d		The Contractor shall notify the ECO's of any protected or endangered species which requires removal found within the construction RoW or any other construction area.	CTR	ECO	
e	GEN	The ECO will be responsible for permits to be obtained for the removal of any protected or endangered species, as required by the National Environmental Management: Biodiversity Act (Act 10 of 2004) and any other related legislation or local ordinances. Such species shall be photographically recorded and inventoried, and their position indicated on the site plan prior to removal. Removal of plants shall be the responsibility of the appointed dedicated permitting officials.	ECO	CTR / EPCM	
f	GEN	The Contractor may not remain in possession of any endangered plants and shall be fined as per any relevant legislation. All specimens removed must be relinquished to the relevant conservation authorities.	CTR	ECO	
g	GEN	The Contractor shall remove all alien invader plant species from the construction site as directed by the ECO.	CTR	ECO	
h	GEN	The Contractor will agree with the ECO on site appropriate weed control measures to be put in place, in order to develop a weed control management plan. The plan will be dependant on the species encountered and the location of their occurrence. The plan will also take into account areas where weed infestation cannot be appropriately managed as result of surrounding area weed infestation, which might limit the success of weed control on the construction sites. Such areas will be mapped and noted in the Weed Control Management Plan and communicated to the ECO's.	CTR	ECO	√
i	GEN	Herbicides and pesticides may only be used for vegetation clearance and alien plant species eradication with the prior approval of Transnet and the ECO. Wherever the Contractor	CTR	ECO / EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		proposes to use these measures he shall submit a Method Statement for approval. The use of these measures shall only be considered if it can be demonstrated that alternative measures are not feasible or practicable.			
j	GEN	No soil stripping or vegetation removal shall take place on areas within any site that the Contractor does not require for construction works.	CTR	ECO	

2.11.2 Topsoil and Subsoil Management

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	The Contractor shall prior to commencement of Topsoil Stripping determine the average depth of topsoil for each construction spread. This will be agreed in consultation with the ECO. Typically topsoil constitutes the top 150mm of soil including organic matter, however the depth may vary from virtually zero to 300mm.	CTR	ECO	
b	GEN	Topsoil shall be stripped in the presence of the ECO. Once the Contractor has demonstrated to the satisfaction of the ECO that the topsoil in a specific area is being sufficiently stripped and stockpiled, these activities may then subject to agreement of the ECO, take place unsupervised. However this in no way absolves the Contractor of any responsibility in this regard and the Contractor will be expected to act with due diligence at all times.	CTR	ECO	
c	GEN	The Contractor shall take care not to mix topsoil and subsoil during stripping operations.	CTR	ECO	
d	GEN	The Contractor shall separately stockpile topsoil and subsoil and shall ensure that all construction workers are able to distinguish between the different stockpiles. All construction workers shall be educated about the importance and correct methodology of soil management.	CTR	ECO	
e	GEN	The Contractor shall ensure that no littering, waste disposal, fuel or chemical contamination, plant matter dumping or other activity occurs that may introduce pollutants or foreign plant species into stockpiled soils.	CTR	ECO	
f	GEN	If significant contamination or pollution of topsoil occurs, the Contractor shall ensure that the entire depth of affected soil is carefully removed and shall dispose thereof at a licensed hazardous waste site. Written proof of disposal shall be kept and forwarded to the ECO and Transnet on request.	CTR	ECO / EPCM	√
g	GEN	The Contractor shall replace all polluted or contaminated soils that have been contaminated as a result of his construction activities at own expense with soil that is of a standard acceptable to the ECO and that conforms to all relevant topsoil specifications of the National Department of Agriculture.	CTR	ECO	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
h	GEN	All soil stockpiles shall be kept free of any weeds or alien invader plant species through regular weeding. Through instruction from the ECO's weeds, where practicable shall be removed completely from the RoW.	CTR	ECO	
i	GEN	To the greatest extent possible topsoil and subsoil shall be handled twice only-once to get it off of the trench alignment and a second time to replace it.	CTR	ECO	
j	GEN	The process of returning topsoil to the servitude must be undertaken using equipment that limits compacting of the topsoil to a minimum.	CTR	ECO	
k	GEN	The Contractor shall endeavour to minimise the period during which topsoil is stockpiled to the greatest extent possible, so as not to diminish its plant support capacity.	CTR	ECO	
l	GEN	Topsoil shall be used for rehabilitation purposes only and shall only be placed on top of all other subsoil. Under no circumstances shall topsoil be used for filling of the pipe trench or any other excavations.	CTR	ECO	
m	GEN	The Contractor shall remove topsoil from the full width of the construction corridor where required	CTR	ECO	
n	GEN	All soil stockpiles shall be so positioned that they are not in any way impacted upon by vehicular movement, other materials storage or construction activities in general.	CTR	ECO	
o	GEN	Soil stockpiles shall not be so positioned that they obstruct any water drainage line or area of concentrated runoff.	CTR	ECO	
p	GEN	Where stockpiles are necessarily positioned along any sloped area, diversion berms or rock packs shall be constructed around their uphill sides to prevent scouring of the stockpile. Extreme care must be taken that runoff does not concentrate around the edges of the diversion structures and straw mulch should be spread around the edges of the structures to prevent erosion.	CTR	ECO	
q	GEN	Soil stockpiles shall not exceed 2 metres in height, unless prior approval has been obtained from the ECO.	CTR	ECO	
r	GEN	At all Terminal and Pump Station construction sites, all stockpiled topsoil shall be conserved by limiting the surface area to volume ratio of stockpiles. Fewer, larger stockpiles should be used in preference over more, smaller stockpiles. However this should not be done at the cost of greater areas of vegetation clearance.	CTR	ECO	
s	GEN	Topsoil shall be windrowed along the construction Right of Way along the pipeline construction site, in such a manner and position that it is not driven over by construction vehicles or trampled by workers. Topsoil shall be turned during stripping and left undisturbed until it is reinstated during rehabilitation.	CTR	ECO	
t	GEN	The full depth of topsoil must be stripped from all areas that will be affected by construction-related activities and shall include the construction footprint, working and storage areas as well as any other operational spaces.	CTR	ECO	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
u	GEN	All soils must be reinstated in the reverse order of that in which they have been removed. Extreme care should be taken so that intermixing of soils does not occur during reinstatement. After the completion of the backfilling, re-contouring and erosion control works, the Contractor shall spread the topsoil evenly at uniform depth over the areas from which it was removed.	CTR	ECO	
v	GEN	Any Construction Vehicle movement over topsoil stockpiles shall be prohibited.	CTR	ECO	
w	GEN + SS	A fixed-point photo survey shall be undertaken of all sections of the pipeline that crosses through agricultural land to allow for a comparison between the state of the landscape after rehabilitation and what it was before. In order to identify any reduction in soil fertility, it is recommended that soil tests be conducted at regular intervals along the route through all affected communities. These tests must be conducted before construction, once the route has been pegged, with a repeat test from the same location six months after soil reinstatement. These tests should include tests of organic soil content.	CTR	ECO	

2.11.3 Erosion prevention and mitigation

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN + SS	The following generic measures are provided to limit the occurrence of and mitigate existing erosion. The Contractor is furthermore referred to the Procedures for Arresting Gully Erosion supplied in this EMP, as derived from the "Erosion Risk Assessment Report" compiled for the NMPP project by Mentis (June 2008) (***FINAL EIA Specialist Study 10C***). While the Contractor may implement these and / or alternative methods of erosion prevention and rehabilitation, the Contractor remains liable for environmental compliance and shall ensure that erosion is prevented and successfully mitigated, notwithstanding any provision or methodology described in this EMP. Wherever so required, the Contractor shall obtain specialist input in the interpretation and application of specific methods and if so required, shall provide Method Statements for approval by the ECOs and / or consulting engineer prior to commencing with their installation.	CTR	EPCM / ECO	√
b	GEN	On cultivated land the Contractor shall backfill the pipeline trench to approximately the same compaction density as the existing soil nearby, and/or hump backfill over the trench and allow it to settle before handing back for farm use.	CTR	ECO	
c	GEN	The Contractor shall construct berms at frequent intervals to divert and disperse runoff and / or develop contour bank systems to divert runoff flowing down slope along the backfilled trench. The berms are to be constructed before a dense perennial grass cover is to be established.	CTR	EPCM / ECO	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
d	GEN	The Contractor shall mulch soils on steep and long slopes and on erodible soils where deemed necessary, as a precaution to limit erosion in the event of unseasonal rains, before a dense perennial grass cover has been established. Mulch obtained from any alien plant species matter is not to be used for this purpose.	CTR	EPCM / ECO	√
e	GEN	The Contractor shall lay out stone packs on the contour on bare expanses of earth where deemed necessary, especially where there are slaking shale's present. Stone packs shall be frequently spaced and must be long enough to prevent lateral erosion around the structures.	CTR	ECO	
f	GEN	The Contractor shall construct drop weirs or gabion structures to prevent susceptible slopes against knicks. The Contractor may consult a suitably qualified and experienced agricultural engineer and shall submit Method Statements for their design to the ECO prior to construction commencing.	CTR	ECO	√
g	GEN	The Contractor shall take diligent aftercare for the duration of the contract whereby all sites that have been rehabilitated are visited after every storm, in order to ascertain whether erosion has occurred. The Contractor is reminded of the fact that his responsibilities do not end with the implementation of initial rehabilitation measures and shall repair rills or gullies that have formed. Erosion damage is to be filled with suitable soil, smoothed to match the adjacent topography and re-grassed.	CTR	EPCM / ECO	
h	GEN	Where highly erodible soils with high proportions of silt and fine sand, or low proportions of clay are encountered the Contractor shall employ mulch before grassing. Grass establishment and maintenance must be done to a high standard – refer to re-vegetation guidelines provided in this EMP in section 2.13.2	CTR	ECO	√
i	GEN	Where duplex soils are encountered grass establishment and maintenance must be done to a high standard– refer to re-vegetation guidelines provided in this EMP.	CTR	ECO	
j	GEN	Where dispersive soils are encountered the Contractor shall either apply gypsum to displace excess sodium, or incorporate mulch to permit sodium infiltration and leaching out with rainwater. Soil amelioration shall be done where required in order to establish grass cover– refer to re-vegetation guidelines provided in this EMP.	CTR	ECO	
k	GEN	Where the pipeline traverses sections of slaking shale, all areas of exposed shale are to be covered with soil which is then properly grassed. The Contractor shall take special precautions to prevent incision and to stabilise gully sides - refer to the Guideline Procedure for Arresting Gully Erosion.	CTR	ECO	
l	GEN	Wherever the pipeline traverses long or steep slopes, the Contractor shall reinstate the original topographical profile as soon as the pipe has been placed in the trench and covered. Berms, rock stacks and other soil conservation measures should be employed to divert runoff from the Construction Right of Way which will initially not have attained any vegetative cover. A dense perennial grass cover should be established as soon as possible - refer to re-vegetation guidelines provided in this EMP.	CTR	ECO	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
m	GEN	In sections of the alignment where a low degree of existing plant cover is encountered prior to construction, the Contractor shall undertake grass establishment as soon after construction as possible. Soil fertilisation shall be done and fertiliser-responsive grass species must be used. Proper aftercare of at least two years shall be done by the servitude maintenance teams, to ensure that sufficient vegetative cover is attained - refer to re-vegetation guidelines provided in this EMP.	CTR	ECO	
n	GEN	The Contractor shall take the necessary measures to prevent trench subsidence, which may lead to severe gully erosion and possible pipe exposure. Wherever the pipeline traverses slopes, the Contractor shall construct trench-breakers in the trench to prevent subsurface flow. Backfill shall be properly compacted and slightly heaped, so that the soil surface of the trench, once settling has occurred, is not lower than the surrounding soil levels. However the backfilled trench should not be less permeable than surrounding soils, which may lead to underground damming of water. Contour banks should be developed over the Construction Right of Way which will prevent preferred runoff channels from developing along the backfilled trench. The Contractor shall establish suitable natural vegetation cover over all disturbed areas and such cover must be to a degree where the erosion potential is minimised.	CTR	ECO	
o	GEN	Wherever the pipeline crosses a watercourse the Contractor shall ensure that all excess spoils are removed from the watercourse and that adequate care is taken that the profile of the stream channel is not altered. Where temporary alteration of the stream channel profile is required the Contractor shall reinstate the stream channel to as close to its original profile as possible. The Contractor shall where feasible establish plant cover by selectively procuring native plants form upstream and downstream areas and transplanting on the disturbed sections.	CTR	ECO	
p	GEN + SS	Where temporary vehicle crossings are required over watercourses, the Contractor shall either construct a low drift in the watercourse that flow passes over; or a temporary bridge structure that the flow passes under. Neither structure shall be so constructed that the flow of water is impeded. This will be subject to the approval and issue of the WUL.	CTR	ECO	
q		The Contractor shall submit a Method Statement for the design of all temporary stream crossings for acceptance by the EPCM prior to its construction.	CTR	EPCM / ECO	√
r	GEN	Wherever berms are constructed, these will be installed as per the typical drawings. The contractor shall submit method statements for the installation of berms. (refer to Guideline Procedure for Arresting Gully Erosion.	CTR	EPCM / ECO	√
s	GEN	The Contractor shall take preventative measures to prevent severe erosion of un-vegetated steep slopes, caused by unseasonal rain. Hessian bags or other degradable cloth shall be pegged down over exposed surfaces. These measures shall be done where bare slopes may be at risk of erosion.	CTR	EPCM / ECO	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
t	GEN	*Guideline Procedure for Arresting Gully Erosion General* • Identify the causes of gully initiation & growth • Neutralize the cause of gully erosion • Adapt designs and procedures to arrest gully growth and fit each specific case • Important: Start gully reclamation work at the upslope end and work down-slope • If there is excess water entering and enlarging a gully, divert and disperse the water • Fence of all rehabilitation areas to exclude livestock during reclamation operation *Drop weirs to arrest gullies* • Construct with rock in gabions, or concrete, or bricks and mortar • Preferably locate the structures across wide (not narrow) sections of the gully • Key weirs into the gully sides and gully floor • Line gabions underneath, upslope and on sides with geofabric • Weirs must be lower at gully centre than at gully sides to provide an overflow • Weir sides must be flush with and not project above the gully banks • Many small weirs are preferable to a few big weirs • Build weirs on grade-line (the top of one structure is level with the bottom of the next upslope structure) • For very steep gradients a gabion staircase is warranted • At the foot of the weir, build a dissipation structure (stilling pond or apron underlain with geofabric) • Moist gully floors can be planted to indigenous reeds (*Phragmites spp*) • Inspect at least annually and after big storm events. Repair damage immediately *Rock packs to protect & reclaim bare areas* • Use biodegradeable hessian on soil surface and rocks laid along contour to reclaim large bare sloping areas (e.g. slaking shales) • Many modest rock packs at close intervals down a slope are preferable to a few big packs • Construct on the grade-line (top of one structure to be level with the bottom of the next structure upslope)	CTR	EPCM / ECO	
u	SS	The Contractor shall be expected to employ mitigation measures as required wherever soil erosion risk areas are encountered. These areas has been captured in the alignment sheets as far as possible. The Contractor is to take note of the potential high risk soil erosion areas as identified in the geotechnical assessment reports carried out for the project located in the ***FINAL EIA Specialist Study 7A, 7B and 7C***, these are listed below: • Erosion of the unconsolidated Berea type sand is a medium-level risk, which will	CTR	EPCM / ECO	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		however be aggravated where the vegetation on slopes steeper than 1:5 (20%) is removed over extensive lengths. • Vertical slopes range up to 1:2.9 (35%), which is steep and approaching the internal friction angle of the soils. • Steep topography where rainfall is fairly high, hillsides and valley lines are generally stable, with minimal evidence of long-term erosion. • The presence of dispersive and erodible soils has however resulted in significant and extensive erosion of the lower-slope stratified colluvial pedisediment soils, creating erosion gulleys (dongas). • Crossing of the Wilge River • Vaalkop • Crossing of the Verkykerskop-Harrismith Road • Crossing of the Meul River Valley • Long steep slopes near Tafelkop • Ascent of the Draaihoek scarp • Steep rise north of Holspruit Stream • Langverwag • Crossing of Brakspruit • Crossing of the Vaal River			
v	SS	The Contractor is to take note of the risk areas as identified in the Erosion Risk Assessment Report (***FINAL EIA Specialist Study 10C***) All risk areas are indicated on the alignment sheets	CTR	ECO	

2.12 Waste Rock

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	The Contractor may move surface stone and rock to facilitate pipeline construction, but shall not stockpile or dispose of this material off the Construction Right of Way without landowner consent	CTR	ECO	
b	GEN	Waste rock excavated during the construction process shall be replaced in the trench to whatever extent possible, to reduce the amount of rock that has to be transported from the site.	CTR	ECO	
c	GEN	No permanent dumping or spreading of rock spoil over the construction right of way to be permitted	CTR	ECO	
d	GEN	The Contractor shall prepare a Method Statement detailing the proposed locations and method of disposing of excess spoil excavated from the pipeline trench or construction sites. As a general rule, windrowing of excavated material along the perimeter of the trench shall be allowed. Excavated spoil and other granular material shall be collected and transported to a suitable licensed disposal site if considered to be waste and where such material cannot be re-used. The Contractor shall identify erosion gullies or old borrow pits for preferential rehabilitation of such areas with the excess spoil and other granular material. The Method Statement shall include the measures that are proposed to stabilise and rehabilitate any such sites (erosion gullies and old borrow pits).	CTR	ECO	√
e	GEN	The Contractor shall under no circumstance dump rocks or stone waste into adjacent veld areas, pastures or agricultural land, or in any natural area or river or water body. Rock waste shall be disposed of at a dumping facility licensed to receive such waste and the Contractor shall keep written record of all materials dumped.	CTR	ECO	

2.13 Rehabilitation

2.13.1 Reinstatement

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	A detailed reinstatement database shall be developed for the entire pipeline route per KP section, detailing the condition to which rehabilitation must be done and any specific rehabilitation objectives that are to be achieved.	CTR	ECO	
b	GEN	The Contractor shall remove all temporary works along the Construction Right of Way and fences and private roads disturbed by construction shall be restored to their original condition unless another agreement is reached with the applicable landowner.	CTR	ECO	
c	GEN	On arable land, the Contractor shall ensure that stone and rock unearthed during construction does not constrain use of the land or adjacent land after rehabilitation. Rock Spoil within ploughing depths must be prevented in areas where this rock did not previously occur.	CTR	ECO	
d	GEN	Rehabilitation shall establish a grass cover. The Contractor is to consult with a vegetation specialist to advise on the best grass and plant species (planting methodology) that should be used for rehabilitation. The Contractor will include the recommendations of the vegetation specialist in the reinstatement database for review and acceptance by the ECO's and Transnet. This reinstatement database will be in compliance with the re-vegetation guidelines specified in this EMP in section 2.13.2.	CTR	ECO	
e	GEN	The Contractor shall ensure that this grass cover is maintained for the duration of the rehabilitation period. Areas where the vegetation does not establish shall be re-vegetated within the 1 year rehabilitation period. The Contractor shall be responsible for topsoil shaping, ensuring the required drainage patterns and main soil engineering works. However a specialist rehabilitation contractor may be appointed or otherwise consulted for seeding and vegetation establishment	CTR	ECO	
f	GEN	The Contractor shall prepare a rehabilitation plan, prior to re-vegetation, detailing the method of preparation, soil amelioration, fertilising and seeding to be used in rehabilitating each area of the works and the post-establishment maintenance regime to be implemented. The Contractor shall consider the guideline presented in this EMP in this regard. While the Contractor may implement alternative methods of grass establishment and fertiliser and maintenance regimes, compliance with this EMP re-vegetation guidelines will be judged strictly in accordance with the species composition and cover established at the end of the maintenance period	CTR	ECO	√

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
g	GEN	The Contractor shall maintain and submit to the ECO detailed records of the method used to re-establish grass in each area of the contract. These records shall include the following and / or any other relevant items: • Subsoil preparation (scarifying/ripping/disking) • Soil tests (Fertility Testing – Agricultural Land, or as required by any landowner) • Volume of soil spread • Soil amelioration applied • Fertiliser application • Seed source, mixture and quantity • Date of seeding • Method of seeding (hydro-seeding, hand-seeding, sodding) • Post-establishment maintenance (fertilising, weeding, mowing/slashing)	CTR	ECO	
h	GEN	The Contractor shall restore the trench and Construction Right of Way to the natural contours of the ground and shall allow normal surface drainage.	CTR	ECO	
i	GEN	The Contractor shall loosen compacted soils along the Construction Right of Way by means of a plough or scarifier. Scarifying areas where topsoil has been removed shall be carried out prior to the replacement of topsoil. Care shall be taken to avoid topsoil inversion if scarifying is carried out in areas where topsoil has not been removed. Any ploughing or scarifying operation shall not exceed a depth of 100mm.	CTR	ECO	
j	GEN	The Contractor shall prevent concentrated run-off along, or next to, the Construction Right of Way, and shall do so by shaping the land, establishing vegetation, and taking other appropriate measures to absorb and disperse runoff.	CTR	ECO	
k	GEN	The Contractor shall, cover the backfilled pipeline trench evenly with topsoil to a minimum depth of 150mm. Where the natural topsoil depth is less the applied topsoil shall be adjusted accordingly. If necessary, hostile sub-soils shall be ameliorated by liming, fertilisation and incorporation of organic matter. If any sections of the route exist where sufficient topsoil could not be stripped during vegetation clearing,	CTR	ECO	
l	GEN	If required, although not encouraged, the Contractor shall import topsoil with the same soil properties as where it must be used as far as possible in order not to change the local soil properties. The soil should be of the same general type as the soil being supplemented as far as possible and which shall be free of all invasive alien and invader plant species.	CTR	ECO	
m	GEN	Where the land is naturally armoured with surface rock or stone, the Contractor shall, after construction, replace the armouring rock over the Construction Right of Way to protect against erosion, in a manner similar to its original condition.	CTR	ECO	

2.13.2 Re-Vegetation Guidelines

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	**Rehabilitation procedure** The long term objective for rehabilitation is as follows: Rehabilitation must ensure that in the long term, re-establishment of the vegetation that existed prior to the construction of the line is facilitated to the greatest extent possible. • Site - specific conditions must be established and characterised so as to provide a detailed basis for the choice of rehabilitation approach; • Detailed information must be sourced on how best to rehabilitate, drawing on landowners and other stakeholders' experience and preferences, as well as an understanding (as far as this may be possible) of why rehabilitation efforts in the area have either succeeded or failed; • Based on the above the appointed rehabilitation specialist must detail the rehabilitation approach that will be used in that specific section of the line and communicate the same to the affected landowners; • The specific rehabilitation approach must draw also on the recommendations contained below and these should be used as is appropriate to the specific requirements for that section of the line and upholding the preferences of the landowners; • The rehabilitation approach must detail the full extent of the rehabilitation requirements, the time required for the same, monitoring and corrective action and allocation of responsibilities between the contractors, construction manager and Transnet; • Supervision and monitoring of the rehabilitation must be ensured for the entire duration of the rehabilitation and must not be limited to the construction phase only; • The approach must be carefully documented so that is clear as to the approaches that have been used in specific areas so that the learning can be carried forward to other parts of the line, or indeed other projects.	Transnet		√
b	GEN + SS monitoring	**Task** • If the site of application is a planted pasture, determine the pre-construction soil fertility at a reputable soil fertility lab. • For all sites to be grassed, determine soil fertility of soil/spoil material to be grassed by resort to soil sampling & testing at a reputed soil fertility lab. • Exclude domestic livestock from the area to be rehabilitated, by fencing construction Right of Way if necessary.	CTR	ECO	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		• Reinstate the land to pre-construction profile, as closely as possible. • Apply mulch (hay, straw, kraal manure or chicken litter) at 5 t/ha & incorporate to 10 cm if (a) the land is steeper than 1 in 5 and construction was completed between 1 Feb & 31 Aug or (b) very high soil erodibility exists. • If acid saturation >20% then apply calcitic lime to reduce acid saturation to 2% OR If acid saturation > 10% & Mg < 100 mg/kg then apply dolomitic lime at ≥1 t/ha. Lime should be applied 2 months before grassing & incorporated to 10 cm depth. • Undertake grass establishment between 1 Oct & 31 Jan only or as agreed by the landowner and/or specialist where required.			
c	GEN	In order to ensure that re-vegetation efforts are successfully undertaken and that the desired end results are obtained a specialist contractor may be appointed or consulted with for this purpose. Re-vegetation efforts of pristine grassland areas and planted pasture cannot be left to the individual landowners as they do not have the means, or the technical experience to oversee that it is successfully executed.	CTR	ECO	
e	GEN	The use of alien invasive species such as Pennisetum clandestinum (kikuyu grass) for re-vegetation shall be strictly avoided unless where existing kikuyu pasture is being re-instated.	CTR	ECO	

2.13.3 Control of Alien Plants

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	In consultation with the ECO's and where practicable areas where the pipeline construction train passes through stands of any alien invasive plant species as defined in the latest published official invasive alien plant species lists, all vehicles must be thoroughly cleaned to ensure that no propagules of these species cling to the construction vehicles and are thus dispersed into surrounding habitats. Of particular concern in this regard are the following alien invader species: black wattle (*Acacia mearnsii*), silver poplar (*Populus X canescens*), black locust (*Robinnia pseudoacacia*) and kikuyu grass (*Pennisetum clandestinum*).	CTR	ECO	√

2.13.4 Warranty of re-vegetation

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	Once the grass has been established and an 'acceptable cover' has been achieved, as defined in the Re-vegetation guidelines found in this EMP, the rehabilitation period shall commence. This period shall extend for a minimum period of one calendar year. If the vegetation is still compliant with the definition of acceptable cover after one calendar year, then the requirements of the re-grassing specification shall be deemed to have been met. Transnet, in consultation with the ECO, shall determine whether acceptable cover has been achieved.	CTR	ECO	√
b	GEN	Re-vegetation shall be done on the pipeline Right of Way including, but not limited to, all borrow areas, temporary access roads, spoil sites, camp sites and the like.	CTR	ECO	√

2.14 Prevention of Nuisance

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	The Contractor shall comply with the legal requirements for the management of noise impact specified in the Noise Regulations under the Environment Conservation Act (Act 79 of 1989). If instructed to do so by the ECO, the Contractor shall demonstrate compliance with the noise regulations by means of measurement of residual noise levels at receiver points specified by the ECO. Measurement shall be in accordance with the requirements of the noise regulations.	CTR	ECO	
b	GEN	Wherever local authorities have determined maximum allowable ceiling noise levels for certain areas, these levels shall be adhered to.	CTR	ECO	
c	GEN	All construction equipment, machinery and vehicles shall be in good working order and maintained regularly.	CTR	ECO	
d	GEN	The Contractor shall notify all landowners and inhabitants within 200m of a blast zone of the dates and times at which blasting is scheduled to occur. Blasting shall not be undertaken outside of the hours as contractually agreed upon without the agreement of the affected landowners and occupiers.	CTR	ECO	
e	GEN	The Contractor's employees shall not make recreational use of all-terrain / 4x4 vehicles or motorcycles on the site.	CTR	ECO	
f	GEN	Wherever possible the Contractor shall limit the clearing of the full Construction Right of Way as much as possible so that unnecessary vegetation loss is avoided and to prevent unnecessary dust nuisance.	CTR	ECO	
g	GEN	The rehabilitation and stabilisation of vegetation of all rehabilitated areas, buffer strips and new landforms shall be done as soon as the forms are complete in order to minimize dust nuisance. Dust suppression to be applied in all areas.	CTR	ECO	
h	GEN	The liberation of dust into the surrounding environment shall be effectively controlled by the use of water spraying and/or other dust-allaying agents, such as dust nets. Regular and effective damping down of all working areas and exposed surfaces (especially during dry and windy periods) must be carried out to avoid dust pollution that will have a negative impact on the surrounding environment. When necessary, these working areas should be damped down as far as necessary as warranted by the conditions encountered on site as instructed by the ECO. Where practical or required due to construction occurring within water-constrained areas, alternative means of dust suppression agreed upon may also be employed.	CTR	ECO	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
i	GEN	When working close to residential areas nuisance in terms of dust and noise will be controlled as far as possible and adjacent landowners will be notified in advance of planned working hours and duration of works.	CTR	ECO	
j	GEN	The Contractor shall regularly consult the Complaints Register and shall immediately attend to any complaints emanating from adjacent landowners or the public in general.	CTR	EPCM / ECO	
k	GEN	The Contractor shall not burn any waste in a Construction Camp or on site.	CTR	ECO	
l	GEN	The Contractor shall ensure that all litter and refuse collection points are so situated that they do not cause nuisance to adjacent landowners or the general public en sure that regular collection of all waste is carried out. The Contractor shall immediately attend to any complaints emanating from adjacent landowners or the public in general.	CTR	ECO	
m	GEN	The Contractor shall regularly service and clean out all site toilets to avoid odours.	CTR	ECO	

2.15 Construction Contract Employment

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	The Contractor is to strictly abide by all applicable labour legislation. Any transgression of labour legislation must be reported to Transnet or the Department of Labour.	CTR	EPCM / Transnet	
b	GEN	Where farm workers are employed as casual labourers on the project, this shall be done in liaison with landowners. Any persons applying for jobs with the construction Contractor are to be informed that such jobs are temporary and do not offer any security of employment. Local labour employed in this fashion must enter into a limited duration contract that clearly stipulate the duration of the contract period.	CTR	EPCM / Transnet	
c	GEN	Where necessary in areas where communities are affected, the CLOs (Contractor) shall consult with the communities in terms of job creation and other aspects that may affect these communities during construction.	CTR	EPCM / Transnet	
d	GEN	The Contractor shall where applicable establish local “labour and employment desks” as a contact point for local community members who wish to seek employment on the project. These locations of these points must be communicated to the public as part of the Construction Awareness Creation and Education Programme and may be undertaken at the site offices.	CTR	EPCM / Transnet	
e	GEN	The Contractor shall where applicable use the services of local SMMEs (Small, micro and medium enterprises). The Contractor shall establish the types of goods and services provided by them in accordance with the project contract requirements.	CTR	EPCM / Transnet	
f	GEN	Where potentially feasible such as at the Terminal and Pump Station construction sites the Contractor shall establish linkages with other institutions involved in skills development and SMME development, such as the community development programme of the local municipality and non-governmental organisations (NGOs) active in the area. The performance indicator of this measure shall be minutes of meetings conducted with representatives of these institutions.	CTR	EPCM / Transnet	
g	GEN	The Contractor shall endeavour to maximise local employment opportunities through training and capacity building to enhance benefits to the local communities.	CTR	EPCM / Transnet	
h	GEN	In order to promote the creation of employment opportunities for the communities that will be affected by the construction process of the pipeline, the Contractor shall to the greatest extent possible employ persons living within the District Municipality or within 100km of the construction site for general labour and construction activities. Employment of non-local labour for the purposes of general construction activities shall only be considered if it can be demonstrated that sufficient numbers of local labourers could not be obtained. The	CTR	EPCM / Transnet	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		appointment of higher level construction activities shall be done on the basis of skill and experience in the specific engineering requirements of these tasks. Preference shall be given to local labour and these positions may only be filled with non-local persons if it can be demonstrated that no suitable persons are recorded in the skills register to fill these positions. The performance indicator for the promotion of employment of women and youth would be the number of local persons who are employed in the construction phase of the project.			
i	GEN	Transnet shall include Training of emerging BEE companies as part of its overall Corporate Social Responsibility programme and include conditions in the NMPP construction contract to involve and train emerging BEE companies. Conditions shall be included in the construction contract to utilise BEE companies in procurement of goods and services.	CTR	EPCM / Transnet	
j	GEN	Provide training/ skills development initiative under the auspices of the Corporate Social Responsibility programme of Transnet to develop local entrepreneurial skills.	CTR	EPCM / Transnet	
k	GEN	The Contractor shall prepare employment policy compliance reports to be submitted to Transnet at regular intervals, as agreed to between both parties beforehand, illustrating how the Contractor is honouring the various employment policies.	CTR	EPCM / Transnet	

2.16 Social and Land Use Impacts

2.16.1 Construction Awareness

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	A Method Statement shall be submitted to Transnet for approval for a community Construction Awareness Creation and Education Programme, which will be aimed at informing and educating I&APs about the manner of construction and related activities that will be occurring in their area.	EPCM	Transnet / CTR	√
b	GEN	The Construction Awareness Creation and Education Programme shall be done in accordance with Transnet Communication Policies and within this framework consist of a variety of media relevant to each affected area which could include, but not be limited to: • Toll-free phone-in system • Posters • Information brochures • Handout leaflets • Newspaper and radio advertisements • Open days or presentation at local community centres, libraries and other public facilities.	EPCM	Transnet / CTR	
c	GEN	The Construction Awareness Creation and Education Programme should provide I&APs with information on when construction will start in a particular area, how long it will last, the contact details of servitude negotiators and then contact details of the contractor LLOs, the dangers of construction such as open trenches, large construction vehicles, etc. and information on how to stay safe with construction taking place in the area. All potentially hazardous working areas are to be demarcated as such with signage English and locally spoken languages and barrier tape.	EPCM	Transnet / CTR	
d	GEN	The Construction Awareness Creation and Education Programme shall sensitise community members to the need to prevent children and animals from wandering into the Construction Right of Way and shall specifically highlight and identify the various dangers associated with the construction process.	EPCM	Transnet / CTR	
e	GEN	The Construction Awareness Creation and Education Programme shall be extended into the operational phase to sensitise community members to safety issues related to trunkline operation.	EPCM	Transnet / CTR	
f	GEN	As part of the Construction Awareness Creation and Education Programme the Contractor shall furnish all adjacent landowners with the contact details of all relevant emergency	EPCM	Transnet / CTR	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		response bodies and local authorities to be notified in the event of a fire, hazardous material spill or environmental incident. Such information shall also be contained in all distributed media and advertisements.			
g	GEN	Any changes in the arranged construction schedules must be communicated to affected landowners in a timeous manner.	EPCM	Transnet / CTR	

2.16.2 Landowner and Occupier Relations

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	The Contractor shall strive to ensure good lines of communication with landowners prior and during the entire construction period, as well as during construction phase impact management.	CTR	EPCM / Transnet	
b	GEN	The Contractor shall appoint dedicated Land Owner Liaison Officers (LLOs) to liaise on an ongoing basis with landowners and keep them informed of construction progress and any specific activities that may influence them.	CTR	EPCM / Transnet	
c	GEN	Dedicated LLOs must be appointed for each construction spread and must be fluent in the languages spoken in the area. LLOs must also have good inter-personal skills and must be effective communicators with the ability to clearly and understandably communicate matters relating to the project to affected parties.	CTR	EPCM / Transnet	
d	GEN	LLO's will be employed to discuss all matters in terms of this EMP and Construction with all affected landowners	EPCM	Transnet	
e	GEN	Notification on the start of construction activities on a particular area will be provided to all affected landowners. Such notification shall occur well enough in advance for landowners to consult any third parties and make required arrangements prior to any activity commencing on their property. Typically a minimum period of two weeks should be allowed.	CTR	EPCM / Transnet	
f	GEN	Landowners should be notified by the LLOs of the Contractor's name and contact details, the number and type of construction workers on site, the construction schedule and all other relevant information so that affected landowners are able to make any necessary arrangements prior to construction commencing.	CTR	EPCM / Transnet	
g	GEN	Where the land users are not the current owners they should receive copies of these servitude agreements and be informed of the owners' approval that construction can commence. Occupation certificates need to be signed by the current tenants.	EPCM	Transnet	
h	GEN	If any activities are required to be outside the proposed construction area, the Contractor shall enter into Landowner Consent Agreements with all affected landowners prior to any activity commencing on their land. In these agreements, the affected landowner will stipulate	CTR	EPCM / Transnet	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		any special conditions that the Contractor will adhere to whilst occupying the affected landowner's land. The agreements must be signed by both the Contractor and landowner before any activities may take place on the affected landowner's property. The CTR shall supply copies of such documentation to the LLO and it must be kept on property file together with all other relevant documentation.			
i	GEN	All construction workers that will access an adjacent property must be fully briefed on the requirements of the Landowner Consent Agreements prior to construction taking place. Thus the Construction team is to be aware of all specific conditions of land owner agreements	CTR	EPCM / Transnet	
j	GEN	Where possible the LLOs must assist the landowner, if he/she so requires, with any arrangements that must be made in order for construction to take place.	EPCM	Transnet	
k	GEN	Transnet shall continue to negotiate with landowners and accommodate, where reasonable, any further requests for minor adjustment of the alignment where affected landowners request it. While this process is already well advanced as a result of the EIA process, it is likely that there will be such requests during negotiations for servitudes.	EPCM	Transnet	
l	GEN	A database of complaints regarding damage to structures must be maintained by the Contractor. Such complaints will be investigated and their validity determined by comparing the post-construction state of structures with their state as recorded in the photographic survey. A register must be kept of all construction-related complaints (including those that are not specifically related to building damage). The register must be designed in such a way as to capture: • The name of the person lodging the complaint, • His or her domicile and contact details • The nature of the complaint, • The date on which it was lodged, • What action was taken, and by whom, to address the complaint, • The date on which this action was taken, and • The outcome of this action.	CTR	EPCM / Transnet	
m		A General Complaints Register for periodic review by Transnet that logs all complaints raised by landowners, occupiers or the general public about construction activities will be developed. This Complaints Register will be regularly updated.	EPCM	ECO / Transnet / CTR	
n	GEN	An investigation shall also be launched into the cause of every complaint lodged in order to take remedial action and prevent recurrence. The findings of these investigations will be communicated to Transnet.	EPCM	ECO / Transnet / CTR	
o	GEN	A method of communication with I&AP will be established. This could include the development of Community Liaison Forums (CLF's) specifically in areas where Farmers Associations exist, the CLOs shall liaise directly with the organisations to set up a Forum where affected landowners can register their comments and complaints. A Method Statement	EPCM	ECO / Transnet / CTR	√

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		for approval by Transnet for how the Forum is to operate and how responses received through it is to be included in the Complaints Register. The LLOs shall inform all adjacent landowners of the Forum and the relevant contact details and procedures. However comments from individual landowners must still be facilitated by the Complaints Register.			
p	GEN + SS monitoring	In instances where Community Monitoring Committees or Liaison Forums have been requested by the affected communities, the LLOs are to assist the relevant communities to set up and establish such committees. These committees will then act as a forum where affected communities can register their comments and complaints. This Forum will operate in the same manner as contemplated above.	EPCM	ECO / Transnet / CTR	
q	GEN	The Contractor shall specifically ascertain from all adjacent landowners whether there are any potentially hazardous conditions or dangerous materials storage on their property that may be affected by construction. These should be accurately surveyed before construction commences and indicated on a map and all relevant information captured. The landowner must sign off that all such sites or structures and information has been captured.	CTR	EPCM	
r	GEN	The Contractor shall prepare individual Method Statements for every occurrence involving potentially hazardous conditions or materials, indicating what the particular risk/s are that have been identified, how they are to be mitigated and if required, what specialist inputs will be obtained in the process. All Method Statements are to be accepted by Transnet and the affected landowner prior to any related action being taken.	CTR	EPCM	√
s	GEN	The Contractor must also determine from the affected landowners whether there are any dams, permanent paved roads, buildings, driveways, servitudes, underground services, building foundations or other underground structures that may be affected by construction. Notwithstanding any information provided by the various landowners, it remains the responsibility of the Contractor to locate and survey all services and structures.	CTR	EPCM	
t	GEN	Where services or servitudes do not belong to the landowner of the property on which they occur, the Contractor shall determine to whom the services belong. The Contractor shall submit his Method Statement and obtain written permission from the owner of the service, prior to commencing with crossing operations.	CTR	EPCM	√
u	GEN	The Contractor shall take all reasonable measures to ensure that the power supply to adjacent landowners is not disrupted. Where this may potentially occur the Contractor shall have a back-up power supply at hand to ensure that power can be restored as soon as possible, should an interruption occur.	CTR	EPCM	
v	GEN	The Contractor shall in all instances request permission to access adjacent landowners' land and may not commence with any vegetation or land clearance without having a written agreement with the relevant landowners.	CTR	EPCM	
w	GEN	The Contractors responsibility towards affected landowners, in terms of reinstatement and rehabilitation, shall only end once written approval and sign-off for the work has been	CTR	EPCM / ECO	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		received from both the ECO and the relevant landowner.			
x	GEN	Payment of retention moneys to the Contractor, the amounts or percentages to be determined by Transnet, shall be contractually tied to sign-off on the reinstatement of the Construction Right of Way and shall only be released to the Contractor once write-off has been received.	CTR	EPCM	
y	GEN + SS	Wherever the pipeline route passes through arable agricultural land, a fixed-point photo survey shall be undertaken, and soil fertility tests shall be conducted at regular intervals along the route before and after construction as required in previous sections of this EMP.	CTR	EPCM / ECO	
z	GEN	After construction, where the alignment passes through pasture and grazing land the disturbed area of veld must be fenced for at least two seasons to allow the veld to re-establish itself before livestock is re-introduced. This must only be done with the consent of the relevant landowner, however the importance of these measures in terms of erosion prevention and land capacity rejuvenation must be clearly communicated to the landowner.	CTR	EPCM / ECO	
aa	GEN	Where irrigation and fertilisers are required to ensure the re-establishment of rooigras veld, such will be negotiated with the landowner and implemented by Transnet.	CTR	EPCM / ECO	
bb	GEN	Where possible, the pipeline design shall be so aligned that surface markers are placed on the edges of agricultural crop fields, so as to minimise their nuisance to farming activities.	CTR	EPCM / ECO	
cc	GEN	Where possible, other surface infrastructure (such as the block valves and CP marker posts) must be located at points where they do not impact directly on cultivation.	CTR	EPCM / ECO	
dd	GEN	Where possible, the pipeline route should be adjusted to avoid impact on agricultural irrigation systems. Adequate compensation must be paid to farmers for disruption of or loss to irrigation systems that will include provision to re-establish or move the systems.	CTR	EPCM / ECO	
ee	GEN	Noise levels in the vicinity of threatened mammal species, particularly Oribi (as identified in this EMP and indicated on the Alignment Sheets) are to be limited where possible. If blasting is required, adequate notification must be provided to the landowner beforehand, so that animals can be moved if required.	CTR	EPCM / ECO	
ff	GEN	The Contractor shall endeavour not to disrupt water supply to game and livestock and shall, where water supply installations are in place, ensure that alternative water provision is ensured prior to any disruption to water supply is caused.	CTR	EPCM / ECO	
gg	GEN	Wherever possible, the Contractor shall ensure that the construction schedule is to be planned so that construction on game farms does not take place during the hunting season. Where this is not possible the Contractor shall ensure that all coordination and safety measures required are taken to ensure the safety of his workers. The Contractor's LLOs shall liaise with all relevant landowners well in advance in this regard to ensure that information regarding the hunting season and activities is accurate and that all required planning and scheduling takes place beforehand.	CTR	EPCM / ECO	

2.17 Subsistence farming

2.17.1 Loss of Fertility and Soil Productivity

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN monitoring	**Handling of topsoil to reduce the risk of reduced productivity:** • The contractor must ensure that stone and rock within the soil profile and at the surface do not constrain use of agricultural land. • In order to reduce the risk of damage to soil structure, the process of returning topsoil to the servitude must be undertaken using equipment that limits compacting of soil to a minimum. This precaution is particularly relevant to clay soils. • Mitigation measures as outlined in the erosion management section of the EMP must be implemented to ensure that drainage patterns are properly reinstated.	CTR	EPCM / ECO	
b	GEN	**Pre- and post-construction audits:** • A fixed-point photo survey should be undertaken in areas where subsistence farming is practices to allow for a comparison between the state of the landscape before and after rehabilitation.	CTR	EPCM / ECO	
c	GEN	**Minimizing risk to building infrastructure:** • In areas where building structures are potentially impacted, the construction servitude shall be narrowed, as far as possible, in order to avoid the need for relocation • A database shall be maintained, with records including photographs, GPS coordinates and owner details of all structures potentially affected by construction. An appropriate distance for record keeping would be around 50 m from the pipeline centreline.	CTR	EPCM / ECO	
d	GEN	**Livelihood support to subsistence farmer communities:** It is acknowledged that, even if these measures are implemented, the possibility remains that disturbed land might not be completely reinstated to its former productive capacity. In order to account for this possibility, it is recommended that the following additional measures be implemented to minimise potential impacts on the livelihoods and food security of poor rural communities: • A livelihood restoration team should be established to undertake support activities.	EPCM	Transnet	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		• The team will use the expertise of an agricultural specialist, in order to advice on appropriate rehabilitation techniques. • Workers who are familiar with the area and can speak the local languages will be employed. • The team will be responsible to assist project-affected communities in dealing with construction-related impacts and to minimise any impacts on restored land after the construction period. • It is recommended that the livelihood restoration team consists of at least two extension workers who will be dedicated to the project for six months after implementation. • In order to reduce the communities' dependence on subsistence agriculture, the possibility must be investigated to implementing community development programmes in the area.			
e	GEN	**Implementation monitoring and evaluation programme: Post Construction** • A programme must be implemented to monitor long-term impact of the project on the livelihoods of poor communities in this Ngonyama Trust Area and to evaluate the effectiveness of livelihood restoration measures. • Aspects to be monitored as part of this programme include the condition of soils and crops, as well as progress and results of livelihood restoration activities (to be assessed using standard Input-Output-Outcome-Impact methodology), • The activities and findings of the monitoring and evaluation programme must be documented in reports at regular intervals (e.g. yearly). These reports shall document the effectiveness of management measures designed to minimise the long-term impact of the project on the livelihoods of poor rural communities, as well as problem areas and remedial actions proposed.	Transnet		
f	GEN	**Disruption of daily movement patterns** • Establishment of temporary crossing points is recommended. The recommendations for the placement of temporary crossings are based on the assumption that the spacing of temporary crossings should limit the additional distance that people have to walk to about 500 metres.	CTR	EPCM / ECO	
g	GEN	• Once the Trunkline route for construction has been finalised and surveyed, meetings should be held with local community leaders to confirm where temporary access points should be located	CTR	EPCM / ECO	
h	GEN	• Mechanisms should be established to ensure that problems are dealt with promptly. It is recommended that a team of community liaison officers (CLO) be appointed. The CLOs should be local residents, and should comprise a representative sample of	CTR	EPCM / ECO	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		communities along this section of the trunkline route. • The CLOs will serve as points of contact between the ECO and the communities, ensuring that residents are kept informed on a day-to-day basis of construction progress and when access will be blocked. It is also recommended that the CLOs assist in circulating a printed timetable of the construction schedule. • It is recommended that measures be implemented to address pedestrian safety at crossing points and in the vicinity of construction works			
i	GEN	**Loss of Crops and fruit trees** • Once the final route alignment has been established and the construction RoW marked, a survey must be conducted to compile a complete inventory of all crops and other community resources that will be lost within the construction servitude. For compensation purposes, this inventory must include the details of the household owning those crops. • A certified valuer should be appointed to conduct the survey and assess the value of losses incurred. Values will vary according to the soil and climatic conditions along the length of the pipeline; hence, it is not possible to specify a "generic" value for all instances of a particular crop. The valuer shall be assisted by skilled social scientists versed in methods used to determine the extent and value of resource losses in subsistence communities. • The valuer would need to undertake the survey at the time of disturbance to calculate the compensation amount, which should take account of the "food value" of the crop (subsistence value) rather than the commercial value. • Compensation for lost crops should be in kind rather than cash, where practical. Payments will mainly be in the form of grain payments rather than fresh produce. • Any individual fruit trees that are lost during construction must be inventoried and replaced, if necessary, adjacent to the servitude. If fruit trees are used for subsistence purposes, it is recommended that two saplings be provided for each fruit tree that is lost. If trees are used for commercial purposes, commercial compensation rates will apply. • The fact that about one-third of the fields surveyed in KwaMakhuta and one-half of those in Ingonyama Trust were fallow at the time of the survey (which was in March, towards the end of the rainy season) indicates that a large proportion of arable land in these areas is not under permanent cultivation. This raises the issue of whether and how compensation should be provided for the loss of fallow land. Households may argue that they did not prepare land for cultivation because they were prevented from doing so, or because they anticipated that their work would be lost to the project anyway, and that they should be compensated for foregone opportunities for	EPCM	Transnet	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		cultivation. In this regard, it must be clearly communicated to communities well in advance that they should in no way alter their agricultural activities in view of the project. • Where land is fallow at the time construction commences, but is possibly being used from grazing of livestock on weeds or the previous season's crop residue, this must be assessed and suitable compensation provided. This compensation must be paid to the owner of the field (where ownership can be established) or to the traditional authority (where communal grazing occurs). The value of this compensation should take account of local market rates of leasing grazing, with adjustments being made to allow for the condition of grazing and the subsistence value of livestock. The policy and procedure for determining this value would be negotiated with the Compensation Determination Committee (CDC). • With regard to the timing of compensation payments, it is recommended that payments be made before construction commences. It is recognised that such an approach deviates from Transnet's existing policy of making compensation payments after construction is complete. However, this deviation is considered essential to ensure that the loss of arable land does not impact on affected households' food security.			

2.17.2 Loss of Land

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	A Compensation Determination Committee (CDC) should be established that represents project-affected households, the traditional authority, local government and the project proponent. The function of the CDC would be to serve as a platform for negotiation of all matters related to compensation for losses incurred through the project, including the methods by which values will be attached to these losses and the methods by which compensation will be provided. The main function of the CDC will be to negotiate and give final sign-off on an Entitlement Framework describing: • Which categories of project-affected persons will be entitled to compensation; • How the compensation amount for each project-affected person will be calculated, based on the his or her current assets that will be affected by the project; and • The form in which compensation will be provided.	EPCM	Transnet	
b	GEN	The values for the various types of land as set out in the Entitlement Framework will be negotiated in the CDC, taking account of the subsistence value of land types (as opposed to	EPCM	Transnet	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		their commercial value). The same process will apply to the various classes of veld (rangeland).			
c	GEN	Once the CDC has given final sign-off on the Entitlement Framework, the procedure set out in the framework for calculating compensation amounts shall be employed to calculate the amount due to each project-affected person. This compensation amount will be reflected in a compensation agreement set up for each project-affected household, and signed by the household and an authorised representative of the CDC.	EPCM	Transnet	
d	GEN	The possibility should be investigated of adding a solatium to compensate for inconvenience suffered by affected households. It is recommended that the value of this solatium be set at 10% of the value of compensation for land within the six-metre permanent servitude.	EPCM	Transnet	
e	GEN	Systems and support must be established to facilitate the process of affected land owners obtaining alternative land, either through long-term lease agreements with those with surplus land or through new allocations by the Chief.	EPCM	Transnet	
f	GEN	Servitude agreements to be signed with land owners prior to commencement of construction. Where the land users are not the current owners they should receive copies of these servitude agreements and be informed of the owners' approval that construction can commence. Individual landowners are to be compensated for the loss of permanent servitude. In cases of communal land the means of compensation for the permanent servitude lost must be established in consultation with the local authorities, the traditional authority (if relevant) and the current land users.	EPCM	Transnet	

2.17.3 Social Investment in poor rural communities

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	Trunkline	As a part of Social Investment in poor rural communities through which the trunkline is routed, Transnet shall investigate the possibility of initiating and contributing to community development and education programmes.	Transnet		

2.18 Commercial Farming

2.18.1 Loss of Land

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	**Compensation for the loss of land:** Compensation must be paid for the servitude as if the land were lost to the owner, despite the fact that the owner will still have access to and use of the land. Compensation will be undertaken based on Transnet's Servitude and Land Acquisition Principles: • Servitude acquisition based on negotiations with landowners and an amicable agreement being reached. Expropriation shall not be used unless all other reasonable avenues have been exhausted. • Appointment of a professional valuer to compile an evaluation of the land lost under the 6-metre servitude, based on prevailing market conditions. • 100% compensation for the servitude area based on the strip valuation on registration of the servitude. • Land required for the pump stations will be purchased from landowners at market-related prices. In addition, it is recommended that provision be made for the payment of a solatium on the value of the property, to the value of 10% of total consideration amount if the consideration amount does not exceed R100 000, 5% if the consideration does not exceed R100 000, 3% if the consideration does not exceed R500 000 and 1% if the consideration exceeds R1million.	EPCM	Transnet	
b	GEN	**Continued use of land within the servitude:** Most farming activities can still take place over the servitude; farmers would therefore continue to have the benefit of the land.	EPCM	Transnet	
c	GEN	**Loss of crops and grazing land:** The approximate extent and value of crop and other obvious losses should be quantified by a certified valuer, based on substantiated information assuming a certain proportion of standing crops at the time of construction. Compensation should be calculated as the full value of any losses incurred by the farmer. If it can be clearly established that there was opportunity for cultivation lost because of construction activities, compensation for uncultivated fields will be reviewed on this basis.	EPCM	Transnet	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
d		**Loss of rooigras veld:** The value of compensation for the loss of rooigras veld will include provision for reestablishment, where practical.	EPCM	Transnet	
e		**Disruption of planting cycles:** The following mitigation measures are recommended: • Transnet is to advise farmers to continue with normal farming activities, as they will be compensated for any loss they may incur due to crop damage through construction, whatever the stage of production at the time construction commences.	EPCM	Transnet	
f		• If feasible, construction should be planned in such a way that construction activities occur outside of the critical agricultural phases. • A clear and efficient communication channel must be established between the construction management team and all affected farms. • Farmers should be provided with adequate notification of the construction schedule. • The construction contractor must make every effort to keep to the prior arranged and communicated schedules.	CTR	EPCM	
g		**Disproportionate impact on small properties, and fragmentation of farm land:** Wherever possible, the trunkline route should be aligned to avoid small properties where a large proportion (more than a pre-determined %) of the property would be temporarily lost to the servitude, and also to avoid the creation of small, unusable residual pieces of land cut off from the remainder of a farm. Alternatively, full compensation must be paid, determined by a certified valuer.	EPCM	Transnet	
h	GEN	**Loss of deep-rooted crops:** Where possible, the trunkline route should be aligned so as to avoid cutting through orchards or plantations. Where this is not practical, the compensation principles outlined above for the loss of land and the temporary loss of crops will also apply to the permanent loss of trees.	EPCM	Transnet	

2.18.2 Loss of Soil Productivity

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	Rigorous soil management and erosion prevention and management principles as outlined in this EMP are to be adhered to at all times.	CTR	EPCM	
b	GEN	**Servitude agreements:** • The land owner has the right to specify and negotiate conditions related to the	EPCM	Transnet	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		pipeline construction into the servitude agreement with Transnet under 'Special Conditions' • Landowners are to be informed by Transnet's servitude negotiators that landowners have the power to negotiate servitude agreements. • A sign-off system should be implemented between the Contractor and landowners, and retention payments to the Contractor be tied to sign-off on servitude agreements. • Compensation payments for agreed construction damages should not be withheld from the landowner in cases where the landowner is not willing to sign off rehabilitation and re-instatement activities.			
c		**Pre- and post-construction audits:** The following measures are recommended: • A fixed-point photo survey should be undertaken, and soil tests be conducted at regular intervals along the route before and after construction as defined by the ECO. This should be undertaken by specialists if required;. Areas where fertiliser is required to improve soil productivity should be identified on the basis of soil tests.	CTR	EPCM / ECO	
d	GEN	**Reduction in the quality of grazing land:** A similar approach must be adopted as for the loss of crops: • Compensation must be paid to the value of grazing land that is lost to construction. • After construction , the disturbed area of veld should be fenced for at least two seasons subject to agreement with the farmer/landowner to allow the veld to re-establish itself before livestock is re-introduced, while ensuring that the farmer has access to other parts of the farm traversed by the fenced-off area. • Where Themeda veld exists on a property the area affected by the construction servitude is to be estimated and the farmer is to be paid additional compensation for the assumed reduction in grazing capability after construction. A reasonable rate for compensation is to be calculated on the basis of the difference in price between range land which is semi-transformed and range land which is untransformed (pristine).	EPCM	CTR / ECO / Transnet	
e	GEN	**Game** • Maintain water supply to game farms in cases where watering points are cut of from the remainder of the farm during construction. • Discuss scheduling with landowners and where possible, accommodate requests which avoid construction during peak hunting season.	CTR	EPCM / ECO	
f		• Where the above stated is not possible, the game farmer is to be compensated for any demonstrable loss of income that will be incurred due to lost sales, based on records of previous 2 years.	EPCM	CTR / ECO / Transnet	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
g	GEN	**Irrigation Systems** • Where possible, the trunkline route should be adjusted to avoid impact on irrigation systems. • Compensation should be paid to farmers for disruption of or loss to irrigation systems that will include provision to re-establish or move the systems. • Where disruption of irrigation systems would result in inability to irrigate crops outside the construction servitude, the farmer is to be compensated to the full value of either being able to water such crops by alternative means until the irrigation system is re-installed, or for the full value of the standing crop should the crop be lost due to lack of irrigation.	EPCM	CTR / ECO / Transnet	
h	GEN	**Feedlots** • Pipeline construction may take place in close proximity (within a few metres) of a feedlot. Temporary relocation of the feedlot should be undertaken at Transnet's cost to a distance where cattle would not be stressed by the noise and activity of construction. • The landowner should be compensated for any loss of or injury to cattle during temporary relocation and returning cattle to the property. • Appropriate security measures should be provided to safeguard the cattle while in the temporary feedlot.	EPCM	CTR / ECO / Transnet	
i	GEN	**Impacts on water sources, water pipelines and electricity lines** • The pipeline should be rerouted wherever possible to avoid impacts to water sources on farms. Where this is not possible, the source of water should be rehabilitated to the same condition as prior to the impact, if the latter is not possible Transnet should compensate the landowner to the extent of being able to replace the volume of water from such a water source. • Transnet's servitude negotiators should make it clear to landowners that landowners should detail all water sources, water pipelines, electricity lines and other such infrastructure under 'Special Conditions' in the servitude agreement. • All damages should be communicated by the Contractor to the landowner. • Any interruption of or damages to existing infrastructure should be fully repaired by the Contractor to the satisfaction of the landowner.	EPCM	CTR / ECO / Transnet	
j	GEN	**Loss of access to land and roads** • Once the line has been pegged, and to make final decisions on access points, the Contractor should discuss access with landowners, their workers, tenants and other inhabitants. • Timetables of when access points would be blocked, provided elsewhere or shifted	CTR	EPCM / ECO	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		should be developed and communicated. • In the case of informal footpaths, a temporary, safe crossing point should be established at 500 m intervals. The dangers of construction should be well communicated to users. • In the case of roads, the placement of temporary crossings is to be decided in consultation with landowners to minimise disruption of people's movement patterns. • Landowners are to be consulted to identify essential access routes (e.g. access to cattle for feed or water). Once these are identified, construction activities are to be planned in such a way as to minimise disruption of these access routes, and where unavoidable, temporary access should be provided. • Where the Contractor requires access roads to the construction servitude, such access roads should be planned in consultation with the landowner, and follow the recommendations of the Natural Heritage Specialist Study. • Should a landowner wish to retain the construction access road, this should be granted. Where the landowner does not wish to retain the road, the road should be de-compacted and rehabilitated following the recommendations of the Natural Heritage Specialist Study.			
k	GEN	**Impact on farm workers and non-landowning tenants** • In cases where tenants lease parts of a farm from its owner, the lease should be terminated according to the conditions specified in the lease agreement. • In cases where labour tenants have acquired rights to parts of a farm, they should be compensated for the impact on their land in the same way as farm owners. • Where labour tenants are partly reliant on subsistence agriculture for food security, it may be necessary to provide additional support after the construction phase to ensure full re-establishment of agricultural production.	EPCM	CTR / ECO / Transnet	
l	GEN	Loss of *Themeda* climax grassveld: In grazing areas, the main risk relating to soil productivity is the potential loss of Rooigras (*Themeda triandra*). Rooigras is a climax grass with a high carrying capacity. A total of approximately 299 ha of Rooigras will be impacted by the proposed pipeline route. While the rehabilitation of the pipeline construction servitude to Rooigras may be achieved in some instances, in the view of the specialist team this cannot be guaranteed. In most cases, a more realistic assumption would be rehabilitation to semi-transformed vegetation consisting of a mix of pioneer and other seral species. The socio-economic consequences of this will be a decrease in the carrying capacity of the veld in these areas. An estimate of the loss in value is in the order of R2000 per hectare. While this does not result in large scale depreciation in value – a total of R598 000 for the entire pipeline route - it will represent a significant long term loss to individual stock farmers unless it is compensated for.	EPCM	CTR / ECO / Transnet	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		• Align the route to avoid climax Themeda grassveld wherever possible. • Determine the quality of grazing land and the area of Rooigras that will be affected on each landowner's property, based on the database prepared for the EIA. Use this as a basis for discussion with the landowner and for compensation calculations. • Rehabilitate areas of climax grassland to as high a standard as is reasonably practical, with a view to creating stable conditions, free of erosion and invasive plants, and encouraging the return of Themeda grassveld. Follow the principles set out in the Natural Heritage Erosion Study. • For the purposes of compensation, accept that Themeda cannot be re-established in the foreseeable future and compensate farmers who lose Themeda veld accordingly. It can be assumed that in all cases, a minimum of Mtshiki veld will be re-established on the pipeline construction right of way. Compensation rates are to be determined by an independent land valuer by establishing the difference in value between farms that are predominantly Mtshiki veld versus farms that are predominantly Themeda veld. The order of magnitude difference is expected to be in the range of R2000/ha. • Where stock is present in the camp, fence off the construction right of way for a period of up to two seasons in order to facilitate establishment of the vegetation. Where necessary, and based on negotiations with the farmer, provide access across the right of way.			
m	GEN	Transnet are to consider a reasonable increase in the negotiated value of compensation in those agricultural smallholdings where there is a risk of property depreciation. As far as possible, all property acquisition is to be based on Transnet's stated principles of willing buyer / willing seller, and expropriation is not to be considered except as a final resort when all other reasonable measures have been exhausted. Smallholdings are defined in the report as properties less than 2 ha and there are about 45 along the route.	EPCM	Transnet	

2.19 Community and Worker health management

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	The Contractor shall prepare and implement a programme to minimise the spread of HIV infection as a result of the construction contract. The programme shall be prepared with the assistance of a medical doctor with experience of HIV prevention and treatment. A typical programme would include, among other things, the implementation of the following measures: • An HIV/AIDS training course and on-going education on transmission of HIV/AIDS and STDs to employees, through workshops, posters and informal information sessions. • Undertaking an HIV/AIDS and STD prevalence survey amongst all workers on a regular basis through voluntary testing. • Encouragement of employees to determine their HIV status. • Supply of condoms at the project site. • Encouragement of the early treatment of STDs in employees, to minimise the risk of HIV infection. • Encouragement of early treatment and monitoring of secondary/opportunistic infections such as coughs, influenza and pneumonia. • Promotion of an HIV/AIDS stigma free environment by means of an open and non-discriminatory approach to the epidemic at all levels of employment. • Development of a comprehensive Construction Camp management plan including rules for on-site behaviour, entrance and exit policies, and prohibition of the sex worker trade.	CTR	EPCM	
b	GEN	The Contractor shall take appropriate steps to prevent the contamination of farmers' livestock with 'measles'. This would typically involve the administration of antihelminthics to contract employees for the control of tapeworm, as well as strict enforcement of the use of site mobile toilets to prevent contamination.	CTR	EPCM	
c	GEN	The Contractor shall ensure that his workers are treated for worms as well as any other infectious diseases or conditions that may be relevant to a specific region.	CTR	EPCM	
d	GEN	Where feasible the Contractor shall align his Community and Worker Health Programme with those of other organisations in the area (i.e. the Local Municipality etc.).	CTR	EPCM	
e	GEN	The Contractor shall ensure that sufficient recreation space is provided within the Construction Camp to facilitate the number of workers housed and shall provide entertainment facilities where possible. The Contractor is furthermore encouraged to provide	CTR	EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		shuttle transportation for workers to and from local entertainment venues and shall ensure strict adherence to Construction Camp entry and closing time procedures.			

2.20 Cultural Heritage

2.20.1 General

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	A Heritage Awareness Program must be initiated as part of the construction induction of the NMPP, which can take place as a series of toolbox talks and utilising a variety of other media, so that all persons are informed about the heritage sites that have been identified, and aware that future heritage artefacts may be found on-site. The Contractor is to ensure that his workforce is aware of the necessity of reporting any possible historical or archaeological finds to the EO or ECO.	CTR	EPCM	
b	GEN	The Contractor will be responsible to prepare a Heritage Management Plan which incorporates all information from the Heritage Specialist Studies and relevant provincial heritage resources authorities	CTR	EPCM	
c	GEN	Any finds of possible palaeontological, archaeological or historical significance identified during survey or construction must immediately be reported to the EPCM and Transnet in writing before any construction commences in the area.	CTR	ECO / EPCM	
d	GEN	Permits for the construction, destruction, damage or alteration of the heritage sites shall be obtained prior to such activities taking place.	ECO	CTR / EPCM	
e	GEN	Where relevant, the ECO's will be responsible to inform the relevant specialist consultant and local heritage resources authority as well as SAHRA, in order to be in compliance with the National Heritage Resources Act (Act 25 of 1999).	ECO	CTR / EPCM	
f	GEN	Discovered artefacts or any item of potential significance shall not be moved or tampered with under any circumstances until the necessary permits has been obtained by the ECO's	CTR	ECO / EPCM	
g	GEN	The Contractor will be responsible for the preservation of any finds (including existing documented heritage sites / graves) through the use of appropriate measures such as fencing of the area on instruction from the ECO/heritage specialist.	CTR	ECO / EPCM	

2.20.2 Palaeontological Sites

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
h	GEN	A palaeontology workshop shall be presented to the field managers and Contractor staff involved with the construction in order to sensitise them to the fossils that may be encountered en route. This is to enable them to contact the palaeontologist if anything of major significance is discovered and they need advice in how to continue.	EPCM	ECO / CTR	
a	GEN	Transnet shall appoint a qualified consulting palaeontologist, who is registered with SACNAS to advise and assist wherever fossils are encountered within the Construction Right of Way. Palaeontology awareness, as part of regular “toolbox” talks and by means of other appropriate media should be encouraged whereby key personnel are trained to identify items or palaeontological significance.	EPCM	ECO / CTR	
b	GEN	The ECO shall wherever fossils are encountered notify the palaeontologist, who shall apply for a permit from the South African Heritage Resource Agency (SAHRA) to salvage the fossils. According to the stipulations of the permit, with permission of the land owner, the palaeontologist shall collect (and excavate if necessary) fossils found on the route. These fossils must then be taken to, and stored at a recognised fossil repository as stipulated in the permit. It is acknowledged, by SAHRA, that in the case of palaeontological remains, the permitting of removal of fossils must often be post-facto.	ECO	EPCM	
c	GEN	The appointed consultant shall conduct a palaeontological surface survey after the pegging of the route has been completed in areas where fossils are known to occur. A Heritage Management Plan will be developed by the palaeontologist. It is recommended that this be done in sections, i.e. for individual or groups of construction spreads at a time. During this survey fossil localities shall be marked by means of a GPS and topographical map and after obtaining a permit from SAHRA, removed.	EPCM	ECO / CTR	
d	GEN + SS	The Contractor is notified of the fact that the section of the pipeline alignment from Howick to Heidelberg is palaeontologically significant. The Contractor shall take particular care in identifying plant fossils, of which leaf imprints is the predominant palaeontological feature, through the sections extending from Howick to Ladysmith and between Villiers and Heidelberg. Animal fossils have been found in: • Rosetta, • Bergville, • Van Reenen, • Harrismith and • Warden regions. Petrified tree trunks have been found in the • Tarkastad Subgroup in Harrismith, • Warden and	CTR	ECO / EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		• Van Reenen regions The Contractor shall implement any special precautionary measures that the palaeontologist may specify along these sections.			
e	GEN	Where possible the Contractor shall ensure that excavated material, in areas where plant fossils have previously been found, are left in undisturbed piles adjacent to the trench. The palaeontologist or assistant trained by the palaeontologist shall be allowed to collect any fossil-bearing material unhindered. This shall be done so as not to hold up the trenching operations. In the case of the plant fossils, the appointed palaeontologist should collect samples from the excavated material for storage at a fossil repository.	CTR	ECO / EPCM	
f	GEN	In the case of plant fossil sites, which shall be documented in the Heritage Management Plan, which normally are found in shales and are less sensitive to excavation than the mudstone where animal fossils may occur, the appointed palaeontologist should collect samples from the excavated trench material for storage at a fossil repository. Fossil wood is common in the sandstones of the escarpment and Harrismith region. Petrified tree trunks should also be removed with care and long sections will have to be excavated.	EPCM	ECO	√
g	GEN	In the case of animal skeletons, the fossils should be excavated by a suitably qualified palaeontologist with more care, using standard excavation techniques. Site visits along the Rosetta to Warden sections of the pipeline alignment should be done more frequently by a palaeontologist to assist in the removal of animal fossils.	EPCM	ECO	
h	GEN	The only major palaeontological obstruction that may be encountered is a palaeosurface. These are very scarce and of high scientific value and therefore irreplaceable. There are known palaeosurfaces to the east of Mooi River, but the possibility exists that others may be encountered. The appointed palaeontologist shall conduct a survey of areas of the pipeline route between Pietermaritzburg and Heidelberg where surface rock outcrops and where there is a possibility of palaeosurfaces being encountered. This survey should be done once the pipeline route has been pegged in the field by the project surveyors but before vegetation clearing takes place. In the event that a palaeosurface along the route is found, then slight realignment of the pipeline will need to be negotiated with the landowner or the surface must be removed, under the supervision of the palaeontologist, for safekeeping by a recognised heritage institution, after obtaining a permit from SAHRA.	EPCM	ECO	

2.20.3 Archaeological and Historic Sites

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	In Areas where the RoW is not fenced off, all archaeological and historical sites that occur within 100 meters of the centre of the Construction Right of Way shall be demarcated and fenced so that they are clearly visible and shall be pointed out to all construction workers by the EO or resident archaeologist.	CTR	ECO / EPCM	
b	GEN	In General all sites of archaeological and historical sites that occur within the Construction RoW or any other construction site, shall be demarcated and fenced	CTR	ECO / EPCM	
c	GEN	A Heritage Specialist shall be appointed by Transnet to develop a Heritage Management Plan. This plan will be issued to the Contractor for reference.	EPCM	ECO	
d	GEN	All such sites shall be photographed and measured before construction takes place as directed by a heritage specialist.	EPCM	ECO	
e	GEN	Buildings, stone walling, and other features may only be damaged if mitigation as prescribed by the ECO or resident archaeologist occurs and if duly permitted by the relevant Heritage Conservation authority.	EPCM	ECO / CTR	
f	GEN monitoring	On-site supervision during the construction phase reserves the right to 'circumvent construction' in a specific area where material may need to be salvaged. 'Circumvent Construction' will mean that work can continue further along the pipeline until the salvage operation is complete.	ECO	EPCM / CTR	
g	GEN	Some sites extend over a large area. If a currently undiscovered portion of the site is affected, the entire site should be mapped to obtain all the information of importance so a true assessment of the site can be undertaken. Trial sections of trench should be dug beforehand (and in the presence of a suitably qualified archaeologist) in sections of the alignment where it is anticipated that additional sites of significance may be encountered, so that these may be discovered before the construction train reaches these areas.	EPCM	ECO	
h	GEN	Mapping and/or excavating sites must where possible be undertaken during the winter or early summer months when grass and/ or vegetation are not too dense. Grass shall otherwise be cut in order for sites to be properly mapped.	EPCM	ECO	
i	GEN	Visual impacts from pipeline markers along sections of the alignment that have been identified as being of historical or heritage significance must be counteracted by laying the markers flat on the ground and pointing in the direction of the next marker.	CTR	ECO / EPCM	
j	GEN	In some instances excavating and mapping a site prior to disruption would be a preferable form of preservation of the heritage site. In this way information is not lost but rather recorded for future use.	EPCM	ECO	

2.21 Safety and Emergency Planning and Response

2.21.1 Emergency Preparedness

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	The Contractor shall develop an Emergency Plan that will enable rapid and effective spill response as well as to all other expected types of environmental emergencies, in accordance with recognised international standards and as per the tender requirements and conditions of contract.	CTR	ECO / EPCM	√
b	GEN	The Emergency Plan shall in accordance with the National Environmental Management Act (Act 107 of 1998) Section 30(3) notify the Director General, the relevant provincial head of the Department in which the incident occurred, the local municipal authorities and police, traffic police, fire departments, local medical and ambulance. Further measures should include the establishment of a network of communication between the Contractor and farmers associations, conservancies, farmer neighbourhood watches, etc. Where emergency incidents related to water resources occur such shall be reported to the above agencies as well as DWAF, in accordance with Section 20 of the National Water Act (Act 36 of 1998).	CTR	ECO / EPCM	
c	GEN	The Emergency Plan shall be submitted to the Project Manager for approval, who must in turn consult with the Environmental Manager and various consulting project engineers for their inputs and approval.	CTR	ECO / EPCM	
d	GEN	The Contractor shall test emergency preparedness with drill operations and shall review drills, conduct mock emergencies and remedy shortcomings to ensure a high level of emergency readiness to deal with environmental and third party incidents. The Contractor shall submit a concise but thorough summary report of each emergency response drill held, to the Project Manager for record keeping purposes. All emergency preparedness drill and reporting procedures shall comply with the requirements of the Occupational Health and Safety Act (Act 85 of 1993).	CTR	ECO / EPCM	
e	GEN	The Contractor's Emergency Plan must make specific contractual provision for a major spill of any hazardous material, where either substantial environmental damage or potential danger to members of the public or his construction workers is possible. Service level agreements with suitably qualified and experienced specialist cleanup and rehabilitation contractors must be built into the plan, so that in the event of a major incident occurring, immediate and effective response will be possible.	CTR	ECO / EPCM	

2.21.2 Fire Prevention and Management

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	The Contractor shall prepare a Fire Prevention and Fire Emergency Management Plan as a part of the Environmental Plan to be submitted to the Project Manager prior to establishment on site. The plan shall include, but not be limited to, the following: • Sources of fire risk; • Measures to comply with any requirements of local authority fire departments; • Measures to minimise the risk of accidental veld fires caused by any activity related to the works; • Measures to control an accidental veld fire.	CTR	ECO / EPCM	√
b	GEN	The Fire Prevention and Fire Emergency Management Plan shall outline all necessary precautions to prevent the ignition of veld fires, caused either deliberately or accidentally as a result of the work being performed. This plan should also outline precautions to prevent construction teams from being trapped by runaway veld fires.	CTR	ECO / EPCM	
c	GEN	The Contractor shall provide adequate fire fighting equipment at specified localities on any construction site and Construction Camp, to meet any emergency resulting from ignition of a veld fire. This equipment should include, but not be limited to, fire extinguishers, fire resistant clothing for fire fighters and fire fighting flails.	CTR	ECO / EPCM	
d	GEN + SS	The areas of commercial plantations as well as agricultural cropland through which the pipeline is routed are particularly sensitive to fire hazard and fires will result in substantial financial loss to the affected landowners. The Contractor shall strictly comply with all fire management requirements set by the owners of these plantations. The Contractor may expect that hot work will be strictly halted under specified meteorological conditions. Certain “low risk” hot works such as welding and oxy acetylene flame work may be carried out under windy conditions, provided that a fire watchman with appropriate and adequate fire fighting equipment be on standby at all times when such work is being carried out.	CTR	ECO / EPCM	
e	GEN	The Fire Prevention and Management Plan shall in accordance with the National Environmental Management Act (Act 107 of 1998) Section 30(3) notify the Director General, the relevant provincial head of the Department in once any incidents occurred, the local municipal authorities and police, traffic police, fire departments, local medical and ambulance. Further measures should include the establishment of a network of communication between the Contractor and farmers associations, conservancies, farmer neighbourhood watches, etc.	CTR	ECO / EPCM	

2.21.2 Health and Safety Management

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL MANAGEMENT REQUIREMENT	Main Responsibility	Support	Method Statement / Procedure
a	GEN	A Health and Safety plan must be drawn up by the Contractor that is in accordance with the Occupational Health and Safety Act (Act 85 of 1993) and all other relevant legislation and best practice standards and which must be accepted by Transnet.	CTR	ECO / EPCM	√
b	GEN	The Health and Safety plan as well as conduct on site must be in accordance with all applicable legislation and standards, notwithstanding any of the requirements specified in this EMP.	CTR	ECO / EPCM	

2.22 Hydrotesting

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	Once the details of the proposed hydrotesting programme have been established, the Contractor must develop a treatment programme for the water at each site, prior to disposal. Record must be kept of this programme, with treatment methods and, where necessary, specific test results supporting the methods. This information must be made available on request from the Department of Water Affairs and Forestry (DWAF). All relevant permits/authorisations must be obtained prior to abstraction or discharge of water.	CTR	ECO / EPCM	√
b	GEN	The following specific recommendations are made to manage the impact of NMPP trunk line hydrotesting: • Exercise caution when selecting a water source and verify that the quality of the water is such that, in itself, it does not present a disposal problem in another environment (eg: high salinity, SRB presence, sewerage effluent, etc). • Design the quantity of oxygen scavenger on a stochiometric basis plus a small residual - excessive addition of scavenger does not improve corrosion control, but does increase TDS. Excess oxygen scavenger is readily deactivated by aeration, and the water is readily re-oxygenated by the same method. Disposal water is to be re-oxygenated before release into natural ecosystems • If disposal into an aquatic ecosystem is considered, increased concentrations of Zn, Cu and Mn are to be considered and may warrant further investigation of the ecosystem tolerance and site specific conditions of the waterway used for disposal. • Consider contaminant levels in the disposal water in the context of the local aquatic ecosystem prior to discharge. While the contaminant levels are generally not toxic and do not contain significant levels of plant or aquatic nutrients, turbidity tends to increase due to iron compounds introduced into water by hydrostatic testing. This is not a significant risk to land or marine ecosystems and can be readily managed, but it may need to be managed in order to avoid a reduction in light transmission and any detrimental impact to aquatic life. • If flushing is used to pre-clean the pipeline, special consideration needs to be given to the disposal of flushing water. Although of small volume, flushing water may contain higher levels of contaminants than test water. • If the source water is heavily contaminated, or if the water must be treated with	CTR	ECO / EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		biocide, the foregoing conclusions are not relevant, and project-specific testing, including eco-toxicity testing, is required to determine the contaminant level and the treatment process.			
c	GEN	It is further recommended that a monitoring programme be implemented before, during and after the pipeline testing procedure. The monitoring programme should comprise the following: • Chemical sampling. The ecological assessment should be complemented with analyses of chemical grab samples.	CTR	ECO / EPCM	√

2.23 De-Commissioning of Construction Facilities

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL MANAGEMENT REQUIREMENTS	Main Responsibility	Support	Method Statement / Procedure
a	GEN	Once the construction phase has been completed all temporary Construction Camps and other infrastructure is to be completely dismantled and the entire area completely rehabilitated. All physical structures are to be removed, and where possible materials should be recycled, re-used or given to locals or adjacent landowners for their use.	CTR	ECO / EPCM	√
b	GEN	All waste must be removed to appropriate licensed waste disposal facilities.	CTR	ECO / EPCM	
c	GEN	No polluted soil or remnants of concrete batching may remain once the area has been vacated by the Contractor.	CTR	ECO / EPCM	
d	GEN	The Construction Camp site shall be rehabilitated to resemble the natural topography as closely as possible.	CTR	ECO / EPCM	
e	GEN	All compacted areas are to be ripped, levelled and re-vegetated. All erosion damage that may have occurred will be repaired and made good. Wetland areas will be rehabilitated as directed by the Wetland Specialist employed by the developer (Transnet).	CTR	ECO / EPCM	
f	GEN	Rehabilitation of such sites will not be deemed complete until the ECO has indicated that rehabilitation is sufficient and sign-off from both Transnet and landowner has been received.	CTR	ECO / EPCM	

3 Construction Phase – Monitoring and Auditing

3.3 General

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	The ECO's shall monitor and inspect the Contractors' written records to demonstrate compliance with this EMP, and the Contractor shall make available each record for this purpose.	ECO	CTR / EPCM	
b	GEN	The ECOs shall undertake audits to assess the Contractor's compliance with the EMP. Intensive auditing may be anticipated for sensitive sections of the route such as river and stream crossings, game ranches and the pristine sections of the route. The Contractor shall participate in the environmental audits, and shall answer questions and provide information as the ECOs may require.	ECO	CTR / EPCM	

3.4 Water Analysis

3.4.1 Point Source (waste water released from a specific point)

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	Point source water monitoring standards and practices are to be implemented in all areas where waste water is released into the environment at a specific source.	CTR	ECO / EPCM	
b	GEN	Sampling should take place on a regular basis, approximately once a week where there is a regular flow of discharge into the environment. If testing can not take place due to no discharge being released this should be recorded.	CTR	ECO / EPCM	
c	GEN	Water from external sources such as the municipal water supply system and boreholes may be monitored from time to time to provide a set of baseline data to compare samples to. This is to determine exactly what the impact of the water use activities are on the quality of the discharge.	CTR	ECO / EPCM	
d	GEN	The exact location and regularity of monitoring points is to be agreed by the environmental representatives of the Contractor and the ECO's and must be documented.	CTR	ECO / EPCM	
e	GEN	Records of all sampling locations and data should be kept and submitted to Transnet on a Monthly Basis.	CTR	ECO / EPCM	
f	GEN	As a general rule, parameters to be measured are to comply with the "General Limit" as presented in the DWAF Water Quality Standards and Guidelines	CTR	ECO / EPCM	

3.4.2 Diffuse Source Water

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	Diffuse source water testing is recommended for areas where disturbance to a water body or course has been the direct result of construction activities.	CTR	ECO / EPCM	
b	GEN	This monitoring should be undertaken both up and down stream of the construction works to enable the results to be compared. The up and down stream samples are to be taken during the same monitoring period each time so that they can be compared. Sampling points are to be identified and agreed with the Engineer and should be situated approximately 50m upstream and 50m downsteam of the project activities. The same sampling points should be used each time sampling is done. The location and frequency of sampling must be agreed with the ECO;s and records of all sampling data must be kept and submitted to Transnet.	CTR	ECO / EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
c	GEN	It is further recommended that in conjunction with this monitoring fixed point photographs are taken to record changed in the stream over time. These are also to be used for rehabilitation of stream crossings after construction activities haven ended.	CTR	ECO / EPCM	

3.4.3 Sampling Protocols

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	The Contractor will prepare a Sampling Protocol as part of the Monitoring Method Statement for review and acceptance by Transnet.	CTR	ECO / EPCM	√
b	GEN	**Method A:** The bottles are all numbered with permanent markers to identify where the samples were taken. Stickers may become wet or peel off, thus potentially confusing to the person required to do the testing.	CTR	ECO / EPCM	
c	GEN	**Procedure:** • 250 ml plastic sample bottles will be rinsed using clean water • The sample bottles will then be rinsed using sample water from the sampling site • Samples are to be taken as close as possible to the centre line of the river. These sites are to be used as fixed sampling sites for the duration of the contract • The bottles must be submerged below water level to allow for the water to enter the bottles and to circulate, ensuring foreign objects are not trapped up in the bottled but are allowed to escape. • The bottle is immediately capped and the outside dried • The relevant information is recorded onto the monitoring sheet • The samples are placed in a box, kept cool and outside of direct sunlight and transported to the lab • It is then placed in a cooler box and maintained cold and transported to a suitable laboratory within 24 hours of collection • The results of which are submitted to the engineer and entered into the data base	CTR	ECO / EPCM	
d	GEN	**Method B: Monitoring is conducted in the field using hand held monitoring equipment.** These tests include diffuse monitoring in the river, whereby samples are taken at four equi-distant points across the river channel, fifty meters above and below the feature / monitoring site or disturbance. The tests are required for the settlement pond/s, sewerage retention pond/s, dewatering operation/s and all those areas contaminated by construction activities on	CTR	ECO / EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		site.			
e	GEN	**Procedure** • All handheld equipment will be calibrated at a regular basis to ensure accurate results are being achieved. • The samples sites will be at the same location to maintain accurate data collection. • It will be attempted to conduct the sampling at the same time each day to relay similar results • Probes will be placed and not thrown in the water, to ensure no damage to the equipment • Readings will be transferred at the sampling location to the data collection sheet • These readings will be captured on the data base to be submitted to the Engineer	CTR	ECO / EPCM	
f	GEN	Sampling sites The point source monitoring is to occur where effluent is emanating from settlement ponds, sewerage treatment works, batch and crusher plants, washing areas and any other area where water or effluent is discharged into the environment. The water will be monitored as agreed with the ECO's	CTR	ECO / EPCM	

3.5 Noise Monitoring

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	The Contractor shall prepare a noise monitoring procedure.	CTR	ECO / EPCM	√
b	GEN	Noise monitoring shall be carried out using integrated sound level meters the calibration certificate of which shall be attached to this document once the unit is available.	CTR	ECO / EPCM	
c	GEN	Noise monitoring shall respect the following requirements: • Monitoring is to take place at points of impact where there is expected to be disturbance to the public or landowners form construction activities and at worksite boundaries if applicable; • Monitoring points are to be agreed with the ECO's on site and are to be recorded and referenced properly. • This data will be submitted to Transnet on a monthly basis.	CTR	ECO / EPCM	
d	GEN	Noise baselines: • Baseline noise monitoring shall be conducted so that the real Impact caused by construction activities could be effectively measured; • Baseline noise monitoring should take place for at least 2 weeks but preferably 1 month prior to construction activities in an area and should continue for at least 2 weeks but preferably one month after the major construction activities have ended.	CTR	ECO / EPCM	
e	GEN	Monitoring along the construction activities: • During construction activities noise levels are to be monitored at all points as agreed with the ECO's at least once per week. • The monitoring points are to remain constant and are to be monitored during a variety of times during working hours. • These periods are to be times during which construction activities are taking place and should not fall over lunch breaks, on public holidays or other periods of reduced activities. • Data recorded is to reflect the ambient average noise level for the monitoring period. • The data is to reflect the ambient average noise level for the monitoring period. • The data is to be recorded onto field data sheets and is to be captured on a central database. • The reporting of all noise monitoring data is to be done via the relevant reporting	CTR	ECO / EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		channels to Transnet.			
f	GEN	Calibration certificates are to be provided for all new equipment and regular field calibration is to be done as per the manufacturer's specifications. These calibrations are also to be recorded on a register.	CTR	ECO / EPCM	
g	GEN	The measurement and rating of environmental noise with respect to land use, health, annoyance and to speech communication shall be as per SANS 10103:2004. The contractor is to monitor noise in relation to the type of area in which activities are taking place.	CTR	ECO / EPCM	

3.6 Dust Monitoring

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	The Contractor is required to implement a dust management programme, the aim of which is to ensure that the air quality on site does not impact negatively on the health or environment of the persons, animals and plants that are living and working in close proximity to the construction activities. The primary purpose of the dust management programme is to be able to measure the efficiency of the dust management programme. As dust is an immediate problem which results in loss of visibility "at the present moment" so visual monitoring of dust conditions is considered to be the most effective means of monitoring this.	CTR	ECO / EPCM	
b	GEN	Should there be areas where the management of dust suppression is not effective it is recommended that a quantifiable system is implemented. • The Contractor shall agree with the ECO's the areas of greatest importance in terms of managing dust on site. • A number of meters for measurement of dust are to be placed thought the works areas during the work activities. • As far as possible dust monitoring stations will be active for at least 1 month prior to the onset of construction in the dry season in areas as directed by the ECO's. • The meters will be placed in representative areas in such a way that they will not be impacted on by construction activities. • The location of the meters is to be agreed based on the closest points of impact such as schools, houses, dangerous bends on roads and at businesses. • The meters will collect fall out dust either in a single bucket unit or in a directional dust collection device with four removable dust collection cups. • The agreement of the preferred collection device for each area is to be agreed on site with the ECO's. the determination of this will be based on the potential dust sources. • In areas where dust is from sources other than construction are expected the directional meters are recommended. • All meters are to be at a height of 2m above the ground and are to be firmly planted or weighed down to prevent wind damage. • Monthly collection of the samples is to be done. • Where readings are unacceptably high the areas will be classified as a hot spot and weekly monitoring may be advised until such time as the dust problem has been	CTR	ECO / EPCM	

<table>
<tr><th>ITEM NO.</th><th>GENERAL/ SITE SPECIFIC</th><th>MITIGATION MEASURES</th><th>Main Responsibility</th><th>Support</th><th>Method Statement / Procedure</th></tr>
<tr><td></td><td></td><td>rectified.</td><td></td><td></td><td></td></tr>
<tr><td>c</td><td>GEN</td><td>The classification of dust levels is indicated in the table below and is based on the Department of Environmental Affairs and Department of Minerals and Energy definition of dust levels.

<table><tr><th>Dust level</th><th>Quality)g/m²/day)</th><th>Action required</th></tr><tr><td>Slight</td><td>> 250</td><td>No additional action</td></tr><tr><td>Moderate</td><td>250 to 500</td><td>Investigate cause of increase and upgrade dust management efforts with water carts</td></tr><tr><td>Heavy</td><td>500 to 800</td><td>Increase dust management efforts with water carts or binding agents</td></tr><tr><td>Very heavy</td><td>800 to 1200</td><td>Use of additional agents for dust management</td></tr></table></td><td>CTR</td><td>ECO / EPCM</td><td></td></tr>
<tr><td>d</td><td>GEN</td><td>Areas considered to be “active areas” where dust can be expected include:
All areas were trenching, drilling, blasting and backfilling are taking place.
Where the above activities are taking place including areas were hauling is actively being undertaken.
Note that rehabilitation areas are not considered to require monitoring.
It is also noted that other material will from time to time skew results. This other material includes ash from veld fires, sand, grass and other seeds.
These will not be totally eliminated by the design of the meters and the interpretation of the results are to take these factors into account</td><td>CTR</td><td>ECO / EPCM</td><td></td></tr>
</table>

4 Post-Construction / Operational Phase– Monitoring and Auditing

4.1 Re-establishment of livelihoods in poor communities

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a		Transnet shall monitor the re-establishment of the livelihoods of all households in the traditional authority areas and other areas that are affected by temporary disruption of farming production due to construction of the trunkline. The monitoring indices shall be finalized once the inventory or resources that will be affected during construction has been completed (refer Section 2.20.3 above). Monitoring shall be continued for a period of 5 years after construction.	Transnet		√
b		Aspects to be monitored as part of this monitoring programme shall include the condition of soils and crops, as well as progress and results of livelihood restoration activities (to be assessed using standard Input-Output-Outcome-Impact methodology), The activities and findings of the monitoring and evaluation programme shall be documented in reports at regular intervals (e.g. yearly). These reports shall document the effectiveness of management measures designed to minimise the long-term impact of the project on the livelihoods of poor rural communities, as well as problem areas and remedial actions proposed.	Transnet		

4.2 Monitoring of Rehabilitation

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	Pipeline	A detailed post-construction rehabilitation monitoring plan shall be developed which includes all monitoring required to evaluate the success of rehabilitation along the trunkline right of way and to specify remedial measures, where necessary. The monitoring shall be undertaken along the trunkline for a minimum of 5 years, whereafter the programme may be modified or discontinued, being replaced by standard maintenance management of the servitude in some or all areas of the right of way.	Transnet		√

4.3 Monitoring of River Crossings

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	SS	A baseline SASS-5 inventory / survey is to be carried out at all major river and stream crossings as identified in this EMP (3rd to 6th order) before construction activities commence. This survey is to include an assessment of the occurrence of fish and aquatic invertebrate species and shall be compared with post-construction surveys carried out for the same sections. The post-construction surveys shall be carried out twice per year initially, and annually thereafter, as recommended by a suitably qualified aquatic ecologist. The annual surveys shall be carried out for a period of 3 years after construction, following which SASS-5 monitoring may be discontinued at all of the streams where, in the opinion of the aquatic ecologist, the crossings have fully stabilized. Continued monitoring of the other streams shall be as determined on the recommendation of the aquatic ecologist.	EPCM	Transnet / CTR / ECO	

5 Design and Operational Phase

The environmental management requirements detailed in this section include both activities that will need to be conducted during the design and operation of the project.

5.1 Site Locations of Facilities

<table>
<tr><th>ITEM NO.</th><th>PROJECT COMPONENT</th><th>MITIGATION MEASURES</th><th>Main Responsibility</th><th>Support</th><th>Method Statement / Procedure</th></tr>
<tr><td>a</td><td>Trunkline</td><td>The Final EIA Route for the trunkline, as specified as Shape File DNR_JMP_200908 shall be implemented, except in cases where changes can be motivated on the grounds of landowner reluctance or refusal to grant servitudes or any other material grounds that have a proven safety, ecological or cultural advantage, to the satisfaction of Transnet's EPCM team including the environmental manager.</td><td>EPCM</td><td>Transnet</td><td></td></tr>
<tr><td>b</td><td>Trunkline</td><td>Any route changes required after the Construction Team reviewed the Servitude which is made subsequent to the Final EIA Route (and the route changes described in item d) below, shall be fully documented, and shall be verified as acceptable by the EPCM if within the 1000m approved corridor (Thus a deviation of more than 500m from the EIA Final Route)</td><td>CTR</td><td>EPCM / ECO</td><td></td></tr>
<tr><td>c</td><td>Trunkline</td><td>If any route changes made subsequent to the Final EIA Route falls outside the 1000m corridor approved as part of the Environmental Authorisation, Amendment Applications shall b e communicated to the relevant Authority which could include additional specialist ecological consultant or cultural historian input as required.</td><td>EPCM</td><td>Transnet</td><td></td></tr>
<tr><td>d</td><td>Trunkline</td><td>The four route changes at river crossings that have been recommended subsequent to the Final EIA Route (the EIA Final Route as published in Appendix 12-1 and Appendix 12-2 of the FINAL EIA, Shape File DNR_JMP_200908) shall be incorporated in the route design. Precise river crossing locations shall only be finalized only after the geotechnical surveys at rivers have been completed, but the general location of the following crossings, as the basis for the geotechnical investigation, shall be altered as follows:

<table><tr><th>River</th><th>Approximate Realignment</th></tr><tr><td>Mpushini</td><td>30 m downstream</td></tr><tr><td>Bushmans</td><td>400 m upstream</td></tr><tr><td>Tugela</td><td>50 m downstream</td></tr><tr><td>Venterspruit</td><td>20 m upstream above bridge (or alternative stabilization)</td></tr></table></td><td>EPCM</td><td>Transnet</td><td></td></tr>
<tr><td>e</td><td>Inland Terminal</td><td>The revised location for the Inland Terminal, as illustrated in Figure 7-8 in the Final EIA, should be implemented in preference to the original layout.</td><td>EPCM</td><td>Transnet</td><td></td></tr>
</table>

5.2 Risk Management

5.2.1 General

ITEM NO.	PROJECT COMPONENT	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	All	Transnet shall operate the pipeline in accordance with the standards of a recognised international Code of Practice for the Operation and Maintenance of Pipelines, such as the American Society of Mechanical Engineers (ASME).	Transnet	EPCM	
b	All	Transnet shall implement a recognised environmental management system for the project for the management of environmental impacts associated with the operation of the pipeline.	Transnet		√
c	All	Transnet shall prepare a Maintenance Plan for the operation of the pipeline. This plan shall meet the requirements of ASME B31.8 and shall include, but not be limited to, the following: • Detailed instructions for employees covering maintenance procedures for the pipeline during normal operations and repairs. • Details of pipeline surveillance requirements including methods, personnel frequency and record keeping. • Particular reference to those portions of the pipeline presenting the greatest hazard to the public in the event of an emergency or because of extraordinary maintenance requirements. • Procedures for monitoring of the pipeline for evidence of accelerated erosion or invasion of the servitude by noxious weeds during the rehabilitation period.	Transnet		√
d	Pipeline	Transnet shall establish an ongoing programme of communication and education within the various affected communities around the terminals, pump stations and trunkline to ensure that people are aware of risks associated with the pipeline so as to prevent the digging of pit latrines or other excavations over the pipeline.	Transnet		
e	Pipeline	Transnet shall enhance the safety of the trunkline through the commercial, industrial, urban, suburban and peri-urban areas (eThekwini and environs, Umlaas Road to Howick) by on-going education of local authorities and communities on the risks of, and precautions to be taken.	Transnet		
f	Pipeline	Along the entire length of the trunkline, on-going surveillance must be undertaken of pipeline integrity particularly with respect to erosion and scouring, and especially from the foot of Griffins Hill, across the Tugela Basin, up the Low Drakensberg at Van Reenen and across the eastern Free State to Vrede.	Transnet		

5.2.2 Trunkline – Quantified risk Assessment Mitigation

ITEM NO.	PROJECT COMPONENT	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	Pipeline	Risk reduction is to be effected along those sections of the pipeline where sensitive developments exist within defined risk isopleths, as determined by Core Risk (Pty) Ltd, and where risk mitigating measures are thus required. These requirements are detailed in the following document: ***Risk Review and Evaluation NMPP Trunkline, 2684358-B-PL1-RM-RP-011***	Transnet	EPCM	
b	All	Transnet shall comply with all statutory requirements for hazardous installations	Transnet	EPCM	
c	Pipeline	Transnet shall implement the mitigation described in Table 10-13 in the Environmental Impact Report (EIR) (**Annexure C**) to ensure that the risks associated with the pipeline are reduced to levels considered to be acceptable according to the Risk Review and Evaluation NMPP Trunkline 2684358 B-PL1-RM-RP-011 system.	Transnet	EPCM	
d	All	Transnet shall conduct a recognised Process Hazard Analysis (HAZOP, FMEA) for the proposed pipeline prior to construction. This is to ensure that all design and operational hazards have been identified and adequate mitigation put in place. It would be preferable if the study could be facilitated by an independent party who cannot benefit financially from offering services, equipment or instrumentation for the project.	Transnet	EPCM	
e	Pipeline	As part of the HAZOP, Transnet should assess the reduction in risk caused by the recent proposals for sections of Horizontal Directional Drilling (HDD) in eThekwini.	Transnet	EPCM	
f	All	Transnet shall prepare a safety document detailing safety and design features that would reduce the impacts from fires, explosions and flammable atmospheres and issue to the HAZOP assessment body at the time of the HAZOP assessment. The built facility can be audited against the safety document to ensure compliance with the EIA Authorisation. Codes such as IEC 61511 can be used to achieve these requirements. Transnet and their contractors must demonstrate that sufficient mitigation has been included in the designs to ensure the safe continued operation of the pipeline.	Transnet	EPCM	√
g	All	Transnet shall finalise emergency response documentation to ensure appropriate preparedness to deal quickly and effectively with spillages that have the potential to impact significantly on the health and safety of surrounding communities.	Transnet	EPCM	√
h	Pipeline	The leak detection system of the trunkline must be regularly maintained to ensure continuous functionality.	Transnet		
i	Pipeline	In addition to the design, construction, operation and maintenance of the pipeline as well as the electronic monitoring devices (ATMOS Leak Detection, pressure and flow monitoring etc), patrols as per the ASME B31.4 Code of 2006 must take place at intervals as specified in that Code or as agreed to with the regulating authority (NERSA). Quarterly foot patrols along the pipeline of one (1) kP length must take place opposite to sensitive groundwater areas such as existing boreholes situated within 500 m of the pipeline servitude and in the	Transnet		

ITEM NO.	PROJECT COMPONENT	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		groundwater flow direction that are used for the supply of potable groundwater to the farming activities, whether domestic consumption or irrigation. In the event of a leak being detected during these patrols, Transnet shall immediately activate their emergency plan and notify the relevant authorities within 24 hours of such an incident.			

5.2.3 Trunkline – Ecological Risk Assessment

ITEM NO.	PROJECT COMPONENT	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	SS	Transnet shall consider decreasing the interval between block valves installed along sections of the pipeline with a higher risk of environmental damage (i.e. Island View to Howick and especially from chainage 0 to 50 kP) due to third party interference. The interval distance in such instances shall be finalized by means of the Quanititative Risk Assessment (QRA) study on a case-to-case basis by a qualified risk assessor, the project engineer in consultation with Transnet, an experienced ecologist and any other party deemed relevant.	Transnet	EPCM	
b	GEN	The design and positioning of block valves shall ensure that they are accessible under worst case scenarios, such as 1:100 year flood conditions.	Transnet	EPCM	
c	GEN	The placement of block and check valves specified in NMPP Alliance report 'Valve Location Report for the DNR-JMP Trunkline' (Doc. No. 2684358-J-PL1-PL-RP-002) shall not be modified except on the basis of a Quantitative Risk Assessment.	Transnet	EPCM	

5.2.4 Coastal Terminal – Quantified Risk Assessment

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a	GEN	All Emergency Plans and Procedures developed by Transnet must be compiled to deal with the potential incidents outlined in the independent specialist risk assessments and other potential emergencies identified as part of the Transnet Risk management policies and procedures.	Transnet	EPCM	√
b	SS	The on-site emergency plan at the Island View Terminal TM1 will have to be compiled to enable it to fit into the Cutler Projects emergency plan for the entire Island View Complex. It is important that the Cutler Project are consulted to ensure that they can provide the necessary levels of fire fighting capability for the additional risk brought by the Transnet Island View Coastal Terminal.	Transnet	EPCM	√
c	SS	The potential consequences of the incidents identified in this assessment should be discussed	Transnet	EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		with the Cutler Project and the eThekwini Fire and Disaster Services who would be expected to render emergency services to the Terminal. The Transnet Coastal Terminal, if it will be established at Island View would also have to be integrated into the Cutler Projects fire fighting systems. The latter is to be upgraded as required in order to have sufficient capacity to deal with risks identified.			

5.2.5 Buncefield Incident Recommendations

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a	SS	The following recommendations that have been developed as a result of the Buncefield Incident in the United Kingdom, shall be critically reviewed and implementation strategies relevant to the specific context of the Coastal and Inland Terminals shall be developed:	Transnet	EPCM	
b	SS - monitoring	1.) The Competent Authority and operators of Buncefield-type sites should develop and agree a common methodology to determine Safety Integrity Level (SIL) requirements for overfill prevention systems in line with the principles set out in Part 3 of B3 EN 61511 ref 3) This methodology should take account of: • the existence of nearby sensitive resources or populations; • the nature and intensity of depot operations; • realistic reliability expectations for tank gauging systems; and the extent / rigour of operator monitoring. Application of the methodology should be clearly demonstrated in the COMAH safety report submitted to the Competent Authority for each applicable site. Existing safety reports will need to be reviewed to ensure this methodology is adopted. **Process Action**: SIL Review **Instrumentation Action**: SIL Review – The Engineering Contractor proposes that the independent level switch be an analogue level transmitter, not a digital switch. The independent level transmitter will enable the control system to identify a division between the two level transmitters and thus give a division alarm indicating a faulty level signal.	Transnet	EPCM	
c	SS – monitoring	2.) Operators of Buncefield-type sites should, as a priority, review and amend as necessary their management systems for maintenance of equipment and systems to ensure their continuing integrity in operations. This should include, but not be limited to reviews of the following: • the arrangements and procedures for periodic proof testing of storage tank overfill	Transnet	EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		prevention systems to minimise the likelihood of any failure that could result in loss of containment; any revisions identified pursuant to this review should be put into immediate effect; • the procedures for implementing changes to equipment and systems to ensure any such changes do not impair the effectiveness of equipment and systems in preventing loss of containment or in providing emergency response. **Instrumentation Action**: The above proposal will enable the system to perform a self verification. In addition it is recommended that a periodic trip test procedure is implemented.			
d	SS – monitoring	3.) Operators of Buncefield-type sites should protect against loss of containment of petrol and other highly flammable liquids by filling a high integrity, automatic operating overfill prevention system (or a number of such systems, as appropriate) that is physically and electrically operated and independent from the tank gauging system. Such systems should meet the requirements of Part 1 of B8 EN 615111 for the required safety integrity level, as determined by the agreed methodology (see Recommendation 1). Where independent automatic overfill prevention systems are already provided, their efficacy and reality should be reappraised in line with the principles of Part 1 of B8 EN 615111 and for the required safety integrity level, as determined by the agreed methodology (see Recommendation 1). **Process Action:** High level trips are installed as per SIL review outcomes. **Instrumentation Action**: To be determined by the SIL review. However, the implementation of the proposed system noted in recommendation one should satisfy the SIL review.	Transnet	EPCM	
e	SS – monitoring	4.) The overfill prevention system (comprising means of level detection, logic control equipment and independent means of flow control) should be engineered, operated and maintained to achieve and maintain an appropriate level of safety integrity in accordance with the requirements of the recognised industry standard for safety instrumented systems, Part 1 of B8 EN 61511. **Process Action**: Implement SIL review recommendations. **Instrumentation action**: To be determined by the SIL review. However, the inclusion of level alarms and level set points should be linked to the tank inlet flow control valve thereby slowing the flow down as the vessel reaches a high level state. Failing this the independent levels transmitter should trip an independent and dedicated fall safe inlet on/off valve which is located as close to the tank as possible.	Transnet	EPCM	
f	SS	5.) All elements of an overfill prevention system should be proof tested in accordance with the	Transnet	EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		validated arrangements and procedures sufficiently frequently to ensure the specified safety integrity level is maintained in practice in accordance with the requirements of Part 1 of BS EN 61511. **Instrumentation Action**: Comment as per recommendation two.			
g	SS	6.) The sector should put in place arrangements to ensure the receiving site (as opposed to the transmitting location) has ultimate control of tank filling. The receiving site should be able to safely terminate or divert a transfer (to prevent loss of containment or other dangerous conditions) without depending on the actions of a remote third party, or on the availability of communications to a remote location. These arrangements will need to consider upstream implications for the pipeline network, other facilities on the system and refiners. **Process Action**: The design of the system and the Operating Procedure must ensure that the receiving site is able to safely terminate or divert a transfer without depending on the actions of a remote third party, or on the availability of communications to a remote location. These arrangements will need to consider upstream implications for the pipeline network, other facilities on the system and refineries specify the necessary interlocks to prevent overfilling of tanks. **Instrumentation Action**: As per the Process description and possible inclusion of the following – TM1 – The control system should verify and batch the product via the custody valve, flow meter and the vessel flow control valve. In the event of a high level condition, the flow control valve should reduce flow, if the independent “High High” level is reached the fail safe valve on the tank and the Custody valve should be tripped. The feeder lines should be sized to accept possible surge conditions or the suppliers should have a spill back or antisurge system installed. The TM 2 control system should control the flow into the terminal having the ability to shut down the down stream VSD’s. In the event of a high level condition, the flow control valve should reduce flow, if the independent “High High” level is reached the fail safe valve on the tank and the down stream VSD’s should be tripped. Both options should allow for possible flow diversion into alternative tanks.	Transnet	EPCM	
h	SS	7.) In conjunction with Recommendation 6, the sector and the Competent Authority should undertake a review of the adequacy of existing safety arrangements, including communications, employed by those responsible for pipeline transfers of fuel. This work should be signed with implementing Recommendations 19 and 20 on high reliability organisations to ensure major hazard risk controls address the management of critical organisational interfaces.	Transnet	EPCM	
i	SS	8.) The Competent Authority and the sector should jointly review existing standards for secondary and tertiary containment with a view to the Competent Authority producing revised	Transnet	EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		guidance by the end of 2007. The review should include, but not be limited to the following: • developing a minimum level of performance specification of secondary containment (typically this will be bunding); • developing suitable means for assessing risk so as to prioritise the programme of engineering work in response to the new specification; • formally specifying standards to be achieved so that they may be insisted upon in the event of lack of progress with improvements; • improving firewater management and the installed capability to transfer containment and fires; • providing greater assurance of tertiary containment measures to prevent escape of liquids from site and threatening a major accident to the environment. **Civils Action**: Main bund walls to accommodate credible failure of largest tank in impoundment with freeboard of all fire weir applications for one hour, intermediate bund walls to contain minimum of 110% within the subdivision. All discharges from the impoundment will pass through an effluent treatment system prior to release into either an effluent trade system or containment and waste land system or into a commercial sewer treatment system or for transport to refinery for re-processing. If required the under flow weir system between the intermediate bunds will allow for early off take of contaminated fire water.			
j	SS	9.) Revised standards should be applied in full to new build sites and to new partial installations. On existing sites, it may not be practicable to fully upgrade building and site drainage. Where this is so operators should develop and agree with the Competent Authority risk-based plans for phased upgrading as close to new plant standards as is reasonable practicable.	Transnet	EPCM	
k	SS - monitoring	10.) The sector should work with the Competent Authority to prepare guidance and/or standards on how to achieve a high reliability industry through placing emphasis on the assurance of human and organisational factors in design, operation, maintenance, and testing. Of particular importance are: • understanding and defining the role and responsibilities of the control room operators (including in automated systems) in ensuring safe transfer processes; • providing suitable information and system interfaces for front line staff to enable them to reliably detect, diagnose and respond to potential incidents; • training, experience and competence assurance of staff for safety critical and environmental protection activities; • defining appropriate workload, staffing levels and working conditions for front line personnel; • ensuring robust communications management within and between sites and	Transnet	EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		contractors and with operators of distribution systems and transmitting sites (such as refineries); • prequalification auditing and operational monitoring of contractors' capabilities to supply, support and maintain high integrity equipment **Process Action**: The roles and responsibilities of the control room operators will be included in the Operating Manual. **Instrumentation Action**: Certified Operator training on the control system.			
l	SS	11.) The sector should ensure that the resulting guidance and/or standards is/are implemented fully throughout the sector, including where necessary with the refining and distribution sectors. The Competent Authority should check that this is done.	Transnet	EPCM	
m	SS	12.) The sector should put in place arrangements to ensure that good practice in these areas, incorporating experience from other high hazard sectors, is shared openly between organisations.	Transnet	EPCM	
n	SS	13.) The Competent Authority should ensure that safety reports submitted under the COMAH Regulations contain information to demonstrate that good practice in human and organisation design, operation, maintenance and testing is implemented as rigorously as for control and environmental protection engineering systems.	Transnet	EPCM	
o	SS	14.) The sector should set up arrangements to collate incident data on high potential incidents including overfilling, equipment failure, spills and alarm system defects, evaluate trends, and communicate information on risks, their related solutions and control measures to the industry. **Instrumentation Action**: The control system Alarming and reporting philosophy should be reviewed during the Safety Integrity Level (SIL) review.	Transnet	EPCM	
p	SS	15.) The arrangements set up to meet Recommendation 23 should include, but not be limited to, the following: • thorough investigation of root causes of failures and malfunctions of safety and environmental protection critical elements during testing or maintenance, or in service; • developing incident databases that can be shared across the entire sector, subject to data protection and other legal requirements. Examples exist of effective voluntary systems that could provide suitable models; • collaboration between the workforce and its representatives, duty holders and regulators to ensure lessons are learned from incidents, and best practices are shared.	Transnet	EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		Instrumentation Action: Ensure that first up Alarming, time stamping and recording philosophies are adhered to during the implementation of the control system. This will enable accurate and timely reporting of any incident.			
q	SS	16.) In particular, the sector should draw together current knowledge of major hazard events, failure histories of safety and environmental protection critical elements, and developments in new knowledge and innovation to continuously improve the control of risks. This should take advantage of the experience of other high hazard sectors such as chemical processing offshore oil and gas operations, nuclear processing and railways. Instrumentation Action: Ensure that the instrumentation and implementation meets BIL and world best practice recommendations.			

5.2.6 Fire Fighting Capacity coastal Terminal at Island View Complex

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		Water Supply:			
a	SS	The water supply to TM 1 will be provided by the existing “Cutler” seawater pump sets and reticulation. There is a high pressure storm water system with large bore (Ø 20”) reticulation routed throughout the Island View complex.	Transnet	EPCM	
b	SS	A Ø 15” spur of the Cutler reticulation terminates at the intersection of Trinidad Road and Bahrain Road, adjacent to TM 1. The water supply to TM 1 will be taken from this point.	Transnet	EPCM	
c	SS	The Cutler system is able to supply the maximum required flow rate at the desired pressure.	Transnet	EPCM	
d	SS	The maximum design water demand has been based on the largest credible fire event. This has been taken to be a fire in one of the large bunds and cooling of half of the circumference of two adjacent tanks.	Transnet	EPCM	
		Premix (Foam Concentrate / Water) Supply:			
e	SS	While the Cutler reticulation is normally filled with water, foam premix can be fed into the reticulation when required. This is achieved using the foam concentrate and variable flow proportioners located in the Cutler pump stations. This concentrate is currently AFFF which is suitable for use with the products to be stored at TM 1. Consideration is currently being given to replacing the AFFF with Alcoseal.	Transnet	EPCM	
f	SS	As a result of the distance between the Cutler pump stations and the various depots, the Cutler	Transnet	EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		committee has provided a 40,000 litre mobile foam injection unit. This comprises a foam tank and variable flow proportioner which is connected in-line in the line feeding the depot. The injection of foam is thus achieved locally until such time as the premix supplied by the Cutler pump stations reaches the depot.			
g	SS	As a result of the arrangement, the same feed lines will be used to supply both water demand (tank cooling) and foam premix demand (bund foam and tank foam). Once premix is being supplied to the site, it will also be used for tank cooling.	Transnet	EPCM	
		Hydrant Ring main"			
h	SS	A 16" ring main with 4-header fire hydrants strategically located not more than 90m apart has been provided around the tank farm and manifolds. This ring main also feeds tank cooling facilities and bund and tank foam facilities.	Transnet	EPCM	
i	SS	The ring main has been provided with isolating valves to permit a section of the main to be isolated in the event of damage to a portion of the ring.	Transnet	EPCM	
j	SS	The pressure available at each hydrant will be 10 bar.	Transnet	EPCM	
k	SS	Above-ground steel piping installed on the product piping pipe racks, is proposed. As the system is operating with seawater, the ring main should be internally lined with concrete or epoxy.	Transnet	EPCM	
		Foam Concentrate Supply:			
l	SS	As foam premix is supplied to the site from the Cutler system, foam stocks and injection facilities are not provided at the depot.	Transnet	EPCM	
		Bund Protection			
m	SS	Sufficient Medium Expansion bund foam pourers are provided to ensure an application rate of 4,1 litres / m2 / min, as per SANS 10089, to each bund.	Transnet	EPCM	
n	SS	The flow to each bund area will be controlled by actuated valves which can be operated locally or remotely at the fire pump station. It is proposed that these valves be located above-ground with heat shields.	Transnet	EPCM	
o	SS	The piping feeding the individual pourers will be run "below ground" within the earth bund walls. Below-ground piping will be externally wrapped steel. As the system is operating with seawater, the bund foam lines should be internally lined with epoxy.	Transnet	EPCM	
p	SS	The maximum foam travel distance on the largest bunds is 30 metres which is acceptable.	Transnet	EPCM	
q	SS	The flow from the bund pourers will be via a gentle slope or directed to the bund to prevent pickup of product as it falls to the ground. The bund walls will be protected from scour.	Transnet	EPCM	
		Tank Foam Protection			
r	SS	Fixed top foam pourers supplying medium expansion foam into the storage tanks are proposed. An adequate number of pourers have been provided to ensure an application rate of 4,1 litres / m2 / min as per NFPA for all fixed roof tanks (with or without internal floating	Transnet	EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		blankets).			
s	SS	Control of foam to the tank foam pourers will be by manually operated valves located at a safe distance from the tank. A single valve will control the flow to each tank while each pourer will be fed by an individual riser.	Transnet	EPCM	
t	SS	As the system is operating with seawater, the steel tank foam lines should be internally lined with epoxy.	Transnet	EPCM	
Tank Cooling					
u	SS	Fixed cooling spray rings are proposed for all tanks.	Transnet	EPCM	
v	SS	The cooling facilities proposed would comprise a fixed cooling ring at the top of the tank shell.	Transnet	EPCM	
w	SS	The application rate for the shell protection is 30 litres / metre of circumference, as per SANS 10089.	Transnet	EPCM	
x	SS	Flow control to the tank cooling ring would be by an actuated valve which can be operated locally or remotely at the fire pump station. It is proposed that these valves be located above ground with heat shields to permit manual operation. A second (alternative) supply to these facilities on the other side of the bund is not proposed.	Transnet	EPCM	
y	SS	As the system is operating with seawater, the steel tank cooling lines should be internally lined with epoxy.	Transnet	EPCM	
Manifold protection					
z	SS	4500 l/min oscillating foam monitors are provided to distribute low expansion foam to the bunded manifold and pump bay areas in the event of a fire. A single hydrant head is provided upstream of the isolating valve on the riser pipe to each monitor.	Transnet	EPCM	
aa	SS	The application rate is 6,5 l/m2 per NFPA requirements for shallow spill fires.	Transnet	EPCM	
bb	SS	Each pair of monitors is each fed by a separate foam premix line and can be activated by push button in the fire station.	Transnet	EPCM	
cc	SS	The monitors will also protect the small slops tank in the manifold area	Transnet	EPCM	
Tanker Loading Area Protection					
dd	SS	A manually directed 1800 l/min foam monitor (normally mounted towards the tanker area) has been provided to protect the tanker loading area.	Transnet	EPCM	
ee	SS	This monitor can be manually activated by push-button in the fire pump station.	Transnet	EPCM	
Portable Equipment					
ff	SS	The following foam equipment has been allowed for at each pump station: • Four portable 4,500 litre/min foam monitors • Four portable 4,500 litre/min ground water monitors	Transnet	EPCM	
Building Protection					

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
gg	SS	The form of fire suppression for the buildings has not yet been confirmed.	Transnet	EPCM	
hh	SS	Detection sensors will be provided in the Control Room and the Generator Building, but not the workshop.	Transnet	EPCM	
ii	SS	Hose reels and extinguishers will be provided for all buildings as required by Building Regulations.	Transnet	EPCM	
		Alarm System			
jj	SS	Starting the main fire pumps will activate an audible and visual alarm.	Transnet	EPCM	
kk	SS	Any alarm conditions will be linked to the local SCADA system as well as being relayed to the Master Control Centre in Durban.	Transnet	EPCM	

5.2.7 Coastal Terminal at Island View Complex – Associated Infrastructure

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
r	SS	A detailed EMP was developed for the installation of the new pipelines and associated infrastructure to Link Engen's Island View B (IVB), Island View C (IVC) and the Island View D (IVD) storage facilities in order to supply fuel products to Transnet's NMPP. The details of the installation of this infrastructure is attached together with the EMP (**Annexure E**)	Transnet	EPCM	
s	SS	Shell and BP South African Petroleum Refineries (Pty.) Ltd. (SAPREF) currently has a number of fuel storage facilities and associated infrastructure at the Island View Complex, Port of Durban, KwaZulu-Natal. The development of Transnet's New Multi Product Pipeline (NMPP) requires that SAPREF undertakes changes to their storage and transfer facilities at Island View. The activities will entail the relocation of SAPREF's Bayhead B tanks to Bayhead A, and the installation of associated piping; as well as the replacement of the current Mogas, AGO and Jet feeder lines to the NMPP Island View Terminal with above ground lines.(**Annexure F**)	Transnet	EPCM	

5.2.8 Pump Stations – Quantified Risk Assessment Mitigation

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		General			
a	SS	The Emergency Plans for the different Pump Stations must be compiled to deal with the potential incidents outlined in the specialist risk assessment and other potential emergencies identified as part of the Transnet Risk management policies and procedures.	Transnet	EPCM	√
b	SS	It is critical that the Local Authorities in whose areas the Pump Stations are located, and who would be expected to render emergency services to the Transnet Pump Station in the event of an incident are fully conversant with the risks on these Pump Stations.	Transnet	EPCM	
c	SS	As far as fire fighting is concerned on each of the Pump Stations, the Engineering Contractor will propose a fire fighting capability method:	Transnet	EPCM	
		Water Supply			
d	SS	Water storage facilities to provide for one hour's supply at the maximum design demand have been provided. Once the source(s) of supply and potential rate of make-up supplies have been determined, a risk assessment is to be carried out to determine if the volume of water to be stored should be increased. An open reinforced concrete water reservoir is proposed, all necessary authorisations and permits should be in place.	Transnet	EPCM	
e	SS	The maximum design water demand has been based on the largest credible fire event. This has been taken to be all four monitors at the manifold operating simultaneously, but not the spill basin protection concurrently.	Transnet	EPCM	
f	SS	A single, diesel engine driven fire water pump capable of delivering the design flow rate at the required pressure has been proposed. It will be housed in a blast resistant (structure) fire pump station building.	Transnet	EPCM	
g	SS	Fire fighting pump start signals may be generated: • By push-button in the fire pump station. • By push-button in the control room. • By push-button in the security kiosk. • On activation of the detection system in the manifold area.	Transnet	EPCM	
h	SS	The fire fighting pump set can only be stopped in the fire pump station.	Transnet	EPCM	
i	SS	A Fire Department connection has been allowed for.	Transnet	EPCM	
		Hydrant Ring main			
j	SS	A 4" firewater ring main with 2-header fire hydrants strategically located not more than 90m apart has been provided. Below ground HDPE piping is proposed.	Transnet	EPCM	
k	SS	The ring main has been provided with isolating valves to permit a section of the main to be isolated in the event of damage to a portion of the ring.	Transnet	EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
l	SS	The pressure available at each hydrant will be 10 bar.	Transnet	EPCM	
		Foam Concentrate Supply			
m	SS	Sufficient foam concentrate storage for one hour of operation of foam facilities at the design flow rate has been allowed for. In the event that the water storage volume is increased to more than one hour, consideration should be given to increasing the volume of foam concentrate stored. A steel foam concentrate tank is proposed.	Transnet	EPCM	
n	SS	The maximum foam concentrate demand has been based on all four manifold monitors operating simultaneously, but not the spill basin concurrently. The foam induction ratio allowed for is 3%.	Transnet	EPCM	
o	SS	Multi-purpose foam (suitable for products containing alcohol or polar solvents) will be used. This will be suitable for fuels with up to 5% alcohol content. If it is possible that the alcohol content could exceed 5% in the future the proportioner(s) must be ordered with a 3% / 6% selector and the foam stocks would have to be increased when these fuels are handled.	Transnet	EPCM	
p	SS	A progressive cavity positive displacement foam pump is provided to deliver foam concentrate at the correct flow rate and pressure, to the balanced pressure proportioner (BPP) which then supplies foam premix to the manifold monitors, tanker loading monitor and spill basin pourers. A suction strainer has not been provided as the type of pump proposed is able to deal with solids.	Transnet	EPCM	
q	SS	In order to ensure that a backflow of water via the BPP to the foam concentrate tank does not occur, a motorized trunnion mounted ball valve with automatic body bleed is provided in addition to the check valve in the foam concentrate feed to the BPP. A “test” button will be provided to ensure that this valve remains closed when the system is being tested.	Transnet	EPCM	
r	SS	The foam concentrate tank, pump and BPP will be located in the fire pump station building.	Transnet	EPCM	
		Manifold Protection			
s	SS	Four 3000 l/min oscillating foam monitors are provided to distribute low expansion foam to the bunded manifold area in the event of a fire. A single hydrant head is provided upstream of the isolating valve on the riser pipe to each monitor.	Transnet	EPCM	
t	SS	The application rate is 6.5l/m2 per NFPA requirements for shallow spill fires.	Transnet	EPCM	
u	SS	The two pairs of monitors are each fed by a separate foam premix line. Either of these pairs of monitors (or both pairs) can be activated (started and stopped): • By push-button in the fire pump station. • By push-button in the control room. • By push-button in the security kiosk. • On activation of the detection system in the manifold area (start only).	Transnet	EPCM	
v	SS	The monitors should be connected in diagonal pairs so that if one system fails there is still effective fire fighting even if there is wind.	Transnet	EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
w	SS	The monitors should also protect the small slops tank in the manifold area.	Transnet	EPCM	
		Tanker Loading Area Protection			
x	SS	A manually directed 1800 l/min foam monitor (normally mounted towards the tanker area) has been provided to protect the tanker loading area.	Transnet	EPCM	
y	SS	This monitor can be manually activated (started and stopped): By push-button in the fire pump station. By push-button in the control room. By push-button in the security kiosk.	Transnet	EPCM	
		Spill Basin Protection			
z	SS	Two medium expansion (MEX) powers have been provided to protect the spill basin, one MEX 1800 for the main chamber and one MEX 450 for the two small chambers.	Transnet	EPCM	
aa	SS	The application rate is 6,5 l/m2/min as per NFPA and SANS 10089.	Transnet	EPCM	
bb	SS	The MEX pourers can be manually activated (started and stopped): • By push-button in the fire pump station. • By push-button in the control room. • By push-button in the security kiosk.	Transnet	EPCM	
cc	SS	In the event of the manifold monitors being activated while the spill basin MEX pourers are operating, the MEX pourers will be shut down.	Transnet	EPCM	
		Portable Equipment			
dd	SS	The following foam equipment has been allowed for at each pump station: • Two portable 4,500 litre/min foam monitors. • Two portable 4,500 litre/min ground water monitors.	Transnet	EPCM	
		Building Protection			
ee	SS	The form of fire suppression for the buildings has not yet been confirmed.	Transnet	EPCM	
ff	SS	Building detection sensors will be provided in the Control Room and the Generator Building, but not the workshop.	Transnet	EPCM	
gg	SS	Hose reels and extinguishers will be provided for all buildings as required by Building Regulations.	Transnet	EPCM	
		Detection System			
hh	SS	Ultra-violet / Infra-red (UV/IR) fire detection sensors are proposed. In order to activate any of the fire fighting systems or alarms, a “double knock” will be required. This will be achieved by requiring two sensors to be activated in order to start the fire fighting system and a single knock to sound an alarm. The sensors will be located taking cognizance of the equipment installed in the area.	Transnet	EPCM	
ii	SS	The detectors in the manifold area will start the fire pumps, activate both pairs of foam monitors and sound an alarm.	Transnet	EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
jj	SS	The detectors at the spill basin and tanker loading area will merely sound an alarm.	Transnet	EPCM	
kk	SS	In the event of the detectors in the manifold area being activated while the foam pourers at the spill basin are operating, the valve controlling foam premix flow to the spill basin will be closed, giving priority to the manifold protection.	Transnet	EPCM	
ll	SS	A fire detection system will be provided in the Control Room and the Generator Building. These systems will sound an alarm.	Transnet	EPCM	
mm	SS	Any alarm conditions will be linked to the local SCADA system as well as being relayed to the Master Control Centre in Durban.	Transnet	EPCM	

5.2.9 Emergency Response Capability

ITEM NO.	PROJECT COMPONENT	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	All	Transnet shall establish an Operational Emergency Plan that will govern all activities related to the response to an emergency. The Emergency Plan shall in accordance with the National Environmental Management Act (Act 107 of 1998) Section 30(3) notify the Director General, the relevant provincial head of the Department in which the incident occurred, the local municipal authorities and police, traffic police, fire departments, local medical and ambulance. Further measures should include the establishment of a network of communication between Transnet and farmers associations, conservancies, farmer neighbourhood watches, etc. Where emergency incidents related to water resources occur such shall be reported to the above agencies as well as DWAF, in accordance with Section 20 of the National Water Act (Act 36 of 1998).	Transnet		√
b	All	Furthermore the plan shall: • Establish a system for receiving, identifying and classifying emergencies which require immediate response by the operating company; • Identify specific emergency response authorities along the route, with all emergency contact details and the procedures necessary to ensure rapid and effective response from these authorities. • Identify emergency response resources, including specialised equipment and materials, to be deployed to assist emergency response authorities in the case of an accident. • Establish a procedure to ensure prompt and adequate handling of all calls which concern emergencies whether they are from customers, the public, company employees, or other sources.	Transnet		

ITEM NO.	PROJECT COMPONENT	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		• Establish a procedure to ensure the prompt and effective response to a notice of each type of emergency including the action to be taken by all personnel involved and the first employee at the scene; • Indicate clearly the responsibility for training employees to respond effectively and in accordance with the emergency procedures; • Indicate clearly those responsible for updating the information contained in the emergency plan; • Establish a procedure for responding to community and media enquiries and to the disseminate information to the public; • Establish reporting procedures for documenting an emergency.			
c	All	The emergency preparedness plan must be ready for implementation at all times should an emergency situation arise.	Transnet		
d	All	An awareness campaign must be undertaken to inform landowners/residents affected by the pipeline of the existence of the pipeline and of the emergency contact details.	Transnet		
e	Pipeline	Pipeline Monitoring shall be supported by the ATMOS leak detection system. Remote controlled and/or manual shut off valves placed at regular intervals along the pipeline will be activated to limit the hazard and damage from an accidental discharge.	Transnet		
f	All	In the event of an accidental spillage or discharge, all free product must immediately be recovered. In the event of a major spill a geo-hydrologist specialist must assess the spill site and conduct a risk assessment of the affected area. If considered to be necessary by the geohydrologist, other specialists shall also be involved in order to make a proper assessment of the impact and remediation requirements. If indicated to be necessary by the risk assessment, all contaminated soil must be excavated and be disposed of at a licensed hazardous waste disposal facility. All further measures required by the assessment must be implemented as soon as is possible and the site must be rehabilitated to the satisfaction of DWAF. All organisations and emergency services as required by the National Environmental Management Act (Act 107 of 1998) Section 30(3) .The opportunity for the onsite remediation and reuse of contaminated soil must be investigated prior to disposal and DWAF informed in this regard. Monitoring boreholes must be installed at such sites to monitor whether the spill has resulted in groundwater contamination and all private boreholes within a radius of 500 metres from the spill should be monitored bi-annually for the presence of organic substances.	Transnet		
g	All	Excavation of contaminated soil must involve careful removal of soil using appropriate tools/machinery to storage containers until treated or disposed of at a licensed hazardous landfill site.	Transnet		
h	All	The Environmental Managers must determine the precise method of treatment of polluted soil. This could involve the application of soil absorbent materials as well as oil-digestive	Transnet		

ITEM NO.	PROJECT COMPONENT	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		powders to the contaminated soil. Transnet could also employ a reliable company who specialise in spill remediation.			
i	All	If a spill occurs on an impermeable surface such as cement or concrete, the surface spill must be contained using oil absorbent material.	Transnet		
j	All	If necessary, oil absorbent sheets or pads must be attached to leaky machinery or infrastructure.	Transnet		
k	All	Materials used for the remediation of petrochemical spills must be used according to product specifications and guidance for use.	Transnet		
l	All	Contaminated remediation materials must be carefully removed from the area of the spill so as to prevent further release of petrochemicals to the environment, and stored in adequate containers until appropriate disposal.	Transnet		

5.2.10 Noise

ITEM NO.	PROJECT COMPONENT	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	Pump stations Terminals	Mitigation implemented to reduce the impact of sound generated by the pumps at the eight pump stations and the two terminals shall be in accordance with the requirements specified Attached in the Noise Specialist Study (***FINAL EIA Specialist Study 11***) with reference to the findings in the EIA.	Transnet	EPCM	
b	Pump stations Terminals	The effectiveness of acoustic mitigation shall be verified, once each facility is operational, by means of acoustic monitoring of sound levels at the sensitive receptors around the pumps stations and terminals. The monitoring is to be conducted by an independent acoustician using recognised acoustic methodologies (CONCAWE, SANS 10103).	Transnet	EPCM	

5.2.11 Aesthetics

ITEM NO.	PROJECT COMPONENT	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	SS	All of the site specific measures described in Visual Aesthetics Study (***FINAL EIA Specialist Study 17***) shall be implemented for each pump station and terminal and shall be considered in consultation with the relevant Local Municipalities if necessary, prior to construction commencing.	Transnet	EPCM	

ITEM NO.	PROJECT COMPONENT	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
b	GEN	The cut and fill slopes of all embankments that are to be constructed at all Terminal and Pump Station sites shall be shaped to angles and forms that are reflected in the adjacent landscape in order to reduce the visual impact. The edges of embankments shall be blended with the existing landforms, in order to reduce the impression that the project has been 'engineered' through the landscape. Due to the multitude of different scenarios that will be required, the engineer will be required to provide on-site direction wherever required. In specific areas of application, a qualified landscape architect shall be appointed to design contextually appropriate mitigation measures. These may include, but not necessarily be limited to, all sections where the alignment passes through residential areas, sections that are highly visible or regularly frequented by a large number of people.	Transnet	EPCM	
c	GEN	The materials selected for all building roofing and walls shall be of a nature which does not reflect or deflect sunlight or artificial light during the day or night due to their colour or texture. All building surfaces shall, within the bounds of financial and operational practicality and which shall be demonstrated by the Contractor, have matt-textured finished, and shall not be glossy, so as to reduce reflection and glare from the surfaces. Roof material shall not be a silver colour (e.g. unpainted galvanised corrugated iron) or be glossy to the extent that it can reflect the sun or artificial light.	Transnet	EPCM	
d	GEN	The colours of all building and structures surfaces shall be complementary to the colours in the surrounding landscape, and shall, within the bounds of financial and operational practicality and which shall be demonstrated by the Contractor, be olive green with buff trim, light grey, grey green, blue grey, dark buff, rust, ochre or any other natural tones such as variations of tan to be accepted by the Transnet. Furthermore the existing blue roofs of Pump Station 6 at Van Reenen should be painted a more neutral colour such as tan.	Transnet	EPCM	
e	GEN	The building forms should be broken by roof overhangs and steps in the façade. This will create shadow lines which, in turn, assist in the mottling or breaking up of the visible building form.	Transnet	EPCM	
f	GEN	Large and long shed-like structures must be designed to have their bulk visually broken up by vertical bands or blocks of appropriate colour. Alternatively the façade could be made visually less imposing by the placement of other smaller buildings in front of it, the creation of shadows from roof overhangs and the stepping of the surface to accommodate other necessary elements of the buildings function.	Transnet	EPCM	
g	GEN	Transnet shall ensure that the minimum amount of light required to ensure safety at night is utilised at all new pump station sites. Lights shall be so positioned and directed that they do not cause light pollution into adjacent properties.	Transnet	EPCM	
h	GEN	Where allowable, security lighting that is movement activated rather than permanently switched on, shall be utilized to prevent unnecessary constant illumination.	Transnet	EPCM	
i	GEN	All security lighting shall have 'blinkers' or be specifically designed to ensure light is	Transnet	EPCM	

ITEM NO.	PROJECT COMPONENT	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		directed downwards while preventing side spill. Manufacturers have such lights in their catalogues. This may require that light pole numbers will increase to give the required illumination on the ground. Lighting for security and safety must be directed downwards and towards the structures to reduce light spill beyond the property boundary.			
j	GEN	Area lighting on tall masts should be confined to the lower landform elevations. Tall structures such as towers will by law (aviation requirements) have to be fitted with a red flashing light if they exceed a certain height. These structures should be limited to a minimum height to reduce having to comply with aviation requirements.	Transnet	EPCM	
k	GEN	To limit the visual impact of the facilities on the adjacent community and from the roads close to the site, screening berms should be constructed from material removed from the site. These berms must be of sufficient height and be vegetated with indigenous vegetation. To be effective, the berms should be constructed as close as possible to the viewer. The forms of the berms should be organic (non-geometric). A geometrically-shaped berm will impose an additional visual impact on the landscape by contrasting with the flowing forms of the landscape, thereby defeating its purpose.	Transnet	EPCM	
l	GEN	The Contractor shall ensure that all existing large trees, if any are present, which fall outside the earthworks area on any construction site, are retained, to act as visual screening element.	Transnet	EPCM	
m	GEN	Wherever possible, existing vegetation beyond the site's perimeter should be supplemented if it will improve the screening of the Terminals and Pump Stations from the adjacent land uses. This should be considered, particularly where the land use is residential.	Transnet	EPCM	
n	GEN	The colour of the visible portion of the tanks at the Pump Stations and Terminal sites shall be two-tone, subject to approval from Transnet. The top portion seen against the sky shall be grey or light grey while the lower portion shall be olive green or rust coloured.	Transnet	EPCM	
o	GEN monitoring	The rehabilitation and stabilisation by vegetation of all new landforms e.g. platform side slopes, road fill or cut slopes must be done as soon as the forms are complete. The monitoring and management of the vegetation programme is important to ensure that problems (erosion, die back and lack of grass cover) are identified early so that corrective measures can be taken.	Transnet	EPCM	

5.2.12 Groundwater Pollution – Inland Terminal

ITEM NO.	PROJECT COMPONENT	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	Inland terminal	Catastrophic failure of the storage facilities resulting in leakage of hydrocarbon fuels is a potentially severe impact to groundwater surrounding ecosystems. The facility should be designed in such a way that any leakage is contained, or in the event of total failure, does not flow towards or seep into the pan situated to the north of the site.	Transnet	EPCM	
b	Inland terminal	Before borehole BH 1 (**Annexure D**) is included for long-term systematic monitoring purposes, it is recommended that it is purged by pumping it dry repeatedly to ensure that all the contingent contamination is flushed out.	Transnet	EPCM	
c	Inland terminal	An additional monitoring borehole should be drilled up-gradient from the site in order to compare up-gradient concentrations with the concentrations obtained in boreholes BH1 and BH6 (newly drilled borehole). (**Annexure D**). Monitoring of the boreholes will verify the existing water quality within the aquifer and will also identify any alteration of water quality over time.	Transnet	EPCM	
d	Inland terminal	Monitoring of the boreholes should be undertaken on a quarterly basis to verify the efficiency of the secondary containment structures, as discussed in the relevant specialist report. The hydrocarbon contaminants for which monitoring should be undertaken are listed in Specialist Study 6 of the Final EIA.	Transnet		√

5.2.13 Surface Water Pollution – Inland Terminal

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
a	SS	Transnet shall ensure that the design of the water management facilities includes sufficient storage in the final spill basin to permit a reduction in the release rate of treated effluent to less than the maximum proposed rate of 30l/s, should this prove to be necessary once operational monitoring is underway.	Transnet	EPCM	
b	SS	Transnet shall ensure that the outlet from the final spilling basin to the environment makes provision to vary the release at intervals below the maximum flow rate.	Transnet	EPCM	
c	SS	Design an artificial wetland into which the discharge is proposed with the involvement of an expert thoroughly familiar with the functioning of such systems. It is important that this wetland is managed and its effectiveness monitored and not seen as a walk away technology.	Transnet	EPCM	
d	SS	Transnet shall develop a detailed water and waste management plan in which the approach, control methods and day to day management and monitoring commitments are clearly specified. This should include details of the proposals specified in the Effluent Management Philosophy to capture oils and grease products to be stored, treat them to an acceptable water	Transnet	EPCM	

ITEM NO.	GENERAL/ SITE SPECIFIC	ENVIRONMENTAL DESIGN REQUIREMENTS AND CRITERIA	Main Responsibility	Support	Method Statement / Procedure
		quality, and remove the residue to an appropriate waste site or for reprocessing. The proposed philosophy for Transnet's inland terminal (NMPP Alliance, Drainage and Effluent Philosophy, 28 July 2008, Doc. No. 2684358-U-AA00-PR-PH-005) will need to be refined and thereafter form the basis of detailed design and management requirements. Details needed: • expected discharge rates from the site (daily time step); • volumes of the storage facility including the final; • water treatment options; and • release strategies (where, when and how including details of the artificial wetland).			
e	SS	Prior to first operation of the terminal, Transnet shall conduct a series of definitive ecotoxicity tests, based on the most representative sample possible, including traces of any other possible contaminants such as foam products used for fire fighting. The tests are to be prepared by an accredited laboratory and submitted to DWAF.	Transnet	EPCM	
f	SS Monitoring	Transnet shall undertake quarterly in-stream bio-monitoring (ecotoxicity monitoring), both upstream and downstream of the discharge point once the terminal is operational. Include site observations of sediment and water appearance for possible oil contamination. Bio-monitoring is to be undertaken by an accredited laboratory. Results are to be analysed and evaluated and the full reports submitted to DWAF, the local municipality, Gauteng Nature Conservation and the Rivers database on a monthly basis.	Transnet		
g	SS Monitoring	Transnet shall develop a record of the relationship between releases from the terminal's final spilling basin and flows in the Blesbokspruit. This will necessitate the development of rating curves and regular measurement of flows at a convenient point in the Blesbokspruit, such as the river bridge on the Poortjie Road. It will also require records to be kept of the rate of release of effluent from the final spilling basin. This release monitoring programme should be continued for a minimum of 3 years and until there is sufficient data to determine a flow dilution curve that can be used to minimise potential ecological impacts in the Blesbokspruit. Subject to an absence of significant impact the monitoring can be discontinued at this point.	Transnet		
h	SS Monitoring	Transnet shall consider the use of biological indicators, such as Daphnia, as a quick method of checking water quality in the final spilling basin prior to release. This will obviate the need for extensive laboratory testing, since portable instruments are not available to test as low as concentrations as 2.5mg/l. The possibility of using this method is to be developed further and included within the final operational water and waste management plan for the terminal.	Transnet		

5.2.14 Inland Terminal – Conservation Offsets

ITEM NO.	PROJECT COMPONENT	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	Inland Terminal	Due to the combined impacts of current and proposed developments at the Inland Terminal, an area between the R42, the road to Poortje, the Blesbokspruit and a tributary of the Blesbokspruit in the east is proposed as a conservation offset to accommodate the Giant Bullfrogs and associated amphibians and reptiles. The conservation offset is intended as a means of ensuring the survival of a viable population of the threatened species in this area, as well as providing a refuge for other important wildlife The offset area is approximately 300 ha which includes the Terminal area. It is proposed that this area should be protected.	Transnet		
b	Inland Terminal	If it is made available for the grazing of livestock, stocking capacity must be strictly controlled to increase above ground plant biomass. No termite mounds that occur outside of the terminal construction area should be destroyed. In order to be effective, cultivation around the pan which is the Bullfrog breeding site must cease. This is important for both juvenile and adult frogs, but perhaps more so for the former which may not burrow as deep as the adult.	Transnet		
c	Inland Terminal	Transnet shall continue to negotiate with the Lesedi Local Municipality and GDACE and come to an agreement as to how the conservation may be implemented and managed. It is understood that there are some constraints affecting the alienation of the land which would require the approval of the Premier of the province to alter. The negotiations necessary to settle this matter with the Provincial Authorities, the Lesedi Municipality and the lessees of the Commonage are not a part of this EIA. However, the benefits of such a land management proposal, with agreed compensation for lost agricultural land would be: • A guarantee of conservation of the Bullfrog breeding colony at the pan. • Much improved ecological conditions between the pan and the Blesbokspruit, with a guarantee of conserved habitat for threatened species such as the Grass Owl. • An opportunity to create linkages between the conservation area and other areas along the Blesbokspruit, which is an objective of the Lesedi Environmental Management Framework. • An occupant (Transnet) to assist in the maintenance of the conservation area, which would help resolve one of the problems GDACE faces in respect of the management of a small but important conservation areas. • Fair replacement of the lost agricultural land and farming infrastructure or other agreed means of ensuring the Department of Land Affairs and Municipal goals for expansion of community agriculture are not compromised and that the current lessees of the land are not placed at any disadvantage compared with	Transnet		

ITEM NO.	PROJECT COMPONENT	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		their current circumstances. It is emphasised that the above proposals are made as a basis for discussion between the major parties and are not intended as binding requirements of a Record of Decision. It is understood that Transnet, Lesedi Municipality and GDACE have recently determined that a final agreement will be entered into, based on a Memorandum of Understanding (MOU) between the three parties. In support of the MOU, it will be necessary to: • Determine the critical factors that are required to make this conservation scheme a success (an Environmental Sustainability Study). Such a study must include an assessment of the carrying capacity of the land proposed for conservation purposes, a review of management requirements for the conservation area with particular reference to actions necessary to facilitate a reduction in threat to the Bullfrog community, and determination of ways of encouraging grass owls and other threatened species. • Establish the final parameters of the environmental offset required by GDACE, including the obligations of each party to the scheme and its administration and management, and all other requirements to make the proposal workable and sustainable. • Define the most appropriate way of compensating the Municipality for the loss of land and of providing alternative means of meeting Municipal objectives to provide grazing and arable land to previously disadvantaged communities. The MOU shall also establish appropriate means of compensating existing leaseholders for any losses incurred as a result of the Transnet NMPP facility and the establishment of the larger conservation area.			
d	Inland Terminal	The breeding success of the African Bullfrog and Grass Owl occurrence and breeding in the Conservation Area shall be monitored at intervals that are agreed with Lesedi Municipality and GDACE. The schedule shall be included in the Management Framework for the Conservation Area, to be determined through discussion between the three parties. Monitoring should be undertaken as a part of the range management and stocking programme, managed by an ecologist.	Transnet		

5.3 Servitude Maintenance and Repairs

5.3.1 Soil, Surface and Groundwater

ITEM NO.	PROJECT COMPONENT	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	Pipeline	Transnet shall maintain a full record of landowner communications after construction during the operational phase. If any complaints are logged about lost soil productivity, prepare a follow-up audit and record the nature of the problem and whether it has been resolved. These records are to be made available for independent audit.	Transnet		
b	All	If water within a stream / wetland is to be diverted for operational maintenance or repair reasons, the construction of dams and the impeding of flow must be authorised by the Department of Water Affairs and Forestry as part of the permitting process under the National Water Act (Act 36 of 1998).	Transnet		
c	All	Any dam / impoundment constructed should only be a temporary structure and must be completely removed once the repair of the pipeline has been completed. The area covered by the dam wall, and by any water impounded behind this structure, including any vegetation that is disturbed must be completely rehabilitated.	Transnet		
d	All	Transnet shall undertake diligent aftercare with maintenance crews visiting the site after every major storm, at least in the first summer and until stability and resilience are attained, and damage is repaired (ie rills and gullies are filled, smoothed and re-grassed).	Transnet		

5.3.2 Air Quality and Noise

ITEM NO.	PROJECT COMPONENT	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	All	Dust suppression shall be employed wherever maintenance or repair of any component of the project, including the pipeline and associated installations, Pump Stations or Terminals require vegetation removal. Dust levels shall be controlled to the extent that adjacent parties are not adversely affected. Where complaints are received immediate remedial action shall be taken to ensure that the problem does not persist.	Transnet		
b	All	Transnet Pipelines must ensure that noise levels at the Pump Stations and Terminals adhere to the relevant noise regulations. Ambient operational noise levels must be within the operational parameters established for the project and all applicable legislation pertaining to noise must be adhered to. Wherever local authorities have determined maximum allowable ceiling noise levels for certain areas, these levels shall be adhered to.	Transnet		

5.3.3 Biodiversity

ITEM NO.	PROJECT COMPONENT	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	Pipeline	Transnet shall be responsible to the implementation of a Rehabilitation Plan for the Construction Right of Way after the Contractor defects period is over. This Plan shall include a detailed 'monitoring programme' intended to monitor the success of re-vegetation and enable the recommendation of management interventions were necessary. Such monitoring should be conducted over a period of at least 5 years. Annual site inspections carried out by suitably qualified specialists and photographic surveys summarised in periodic assessment reports shall be carried out.	Transnet		√
b	Pipeline	In accordance with the document entitled 'GDACE Requirements for Biodiversity Assessments' (GDACE, 2006), an ongoing monitoring and eradication programme for all invasive plant species growing within the pipeline servitude must be implemented by Transnet.	Transnet		
c	Pipeline	Indigenous vegetation must be maintained within the permanent pipeline servitude. Any area that is disturbed by Transnet Pipelines must be re-vegetated and rehabilitated. A vegetation / rehabilitation specialist might be used to advice on the most appropriate measures for re-vegetation. Natural vegetative conditions should be encouraged.	Transnet		
d	All	No roads related to operational maintenance of the pipeline should be constructed through wetlands.	Transnet		
e	All	Rehabilitation must be executed in such a manner that surface run-off will not cause erosion of disturbed areas during and following rehabilitation.	Transnet		

ITEM NO.	PROJECT COMPONENT	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
f	All	No faunal species occurring either within the permanent pipeline servitude or on adjacent properties may be intentionally harmed by maintenance staff during any routine maintenance of the pipeline. The setting of snares will be strictly prohibited and Transnet shall take stringent actions against any individual found to be guilty of such offence.	Transnet		

5.3.4 Wetlands

ITEM NO.	PROJECT COMPONENT	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	Pipeline	As a general principle, wetland soils should not be disturbed through any maintenance or repairs work. However, if the pipeline section within a wetland needs to be accessed for emergency repairs, the mitigation below must be applied: **Erosion Control** • Where possible, silt barriers or other relevant measures shall be installed along the edge of streams and wetlands, to prevent soil erosion and sedimentation from the maintenance works into the adjacent water body. • If any signs of erosion develop wherever the pipeline passes through a wetland or riparian area, the maintenance and repair Contractor or Transnet shall immediately refer the matter to an agricultural engineer. • Every effort must be taken to ensure that wherever a trench is excavated, it is backfilled and vegetation blocks re-instated in as short a time as possible. **Trenching** • Where trenching is done, soils removed must be separately stored and returned in the reverse order as they were removed to reinstate any subsurface layering of the profiles. All soils shall be stored in such a manner and position that it is not disturbed by construction activities. • Topsoil shall be protected from wash away and shall be covered with Hessian sheets or similar acceptable cover if it will be stockpiled for a period of two weeks or longer. • Where trenches are dug through seasonal and permanent sections of wetlands (where seepage is thus likely to be a factor) the sides of trenches should be stabilised through shoring up or battering back, to ensure that the trenches do not collapse. • Where they occur within wetlands, impermeable clay layers or hard plinthites must be restored to ensure that perched water tables supporting wetland habitats are	Transnet		

ITEM NO.	PROJECT COMPONENT	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		kept intact. Impermeable layers encountered within the wetland, and their depths must be noted. In the event of the need to disrupt a previously impermeable layer such as ferricrete, measures must be taken to ensure that the non-permeability of this layer is restored. • All trench breakers that are temporarily disturbed as a result of maintenance and / or repair activities shall be reinstated prior to back filling. Where trenching required for maintenance may potentially increase the risk of preferential subsurface drainage routes, additional trench breakers shall be installed. • Clay material for clay plugs (if these are used) shall not be sourced from the servitude, adjacent areas or wetland / riparian habitat, but from a commercial source. • The working right of way limit must be restricted to the minimum required to complete the work. This will limit compaction of the soils by the heavy machinery and prevent the vehicles from sinking in to the wet/moist soil			
b	Pipeline	Where possible, any required pipeline rehabilitation during operation and maintenance in wetland and rivers should occur during dry (winter months) when water levels and seepage are at their lowest.	Transnet		
c	Pipeline	Vegetation removal within any wetland or riparian habitat area shall be done as described in elsewhere in this the DEMP.	Transnet		

5.3.5 Waste Management

ITEM NO.	PROJECT COMPONENT	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	Pump stations, Terminals	Transnet shall ensure that to whatever extent is practicable, solid waste generated at all Pump Station and Terminals installations is separated into recyclable and non-recyclable items and that recycling takes place.	Transnet		
b	Pump stations, Terminals	Transnet shall ensure that solid waste collection and sanitation is managed effectively at all Pump Stations and Terminals in order to avoid the possibility of ground and surface water pollution.	Transnet		

6 Decommissioning Phase– Generic

6.1 Pipeline Decommissioning

6.1.1 Abandonment Plan

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	Transnet shall prepare an Abandonment Plan for submission to the regulatory authorities, at least three years ahead of abandonment. The appropriate authorities and the laws that must be complied with shall be those applicable at the time.	Transnet		√

6.1.2 Abandonment Options

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	Transnet shall determine whether there are any practical options to re-use the pipeline in preference to abandoning it. These shall be discussed with the regulatory authority(s). Assuming that there are no such options, the specifications below shall apply.	Transnet		
b	GEN	Two basic options that Transnet shall consider are: • abandonment-in-place and • pipeline removal. In the former case, the cathodic protection of the pipeline shall be removed. In addition to these options, any further options that are relevant at the time shall be considered, taking into account existing and future land use around the pipeline. These may include the opportunity to re-use the pipeline for other purposes.	Transnet		
c	GEN	The abandonment techniques described in this EMP are confined to those possible using currently available technology. As pipeline abandonment's become more prevalent, improved abandonment methods will probably be developed. Transnet shall comply with the prevailing best practice in the petroleum industry to determine and implement abandonment options.	Transnet		

6.1.3 Development and Implementation of an Abandonment Plan

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	Transnet shall prepare a site specific analysis in order to develop the Abandonment Plan. The analysis shall include an assessment of any relevant environmental and land use issues applicable at the time.	Transnet		
b	GEN	Transnet shall consider whether cost-effective alternatives are feasible for the various sections of pipeline. One abandonment technique may not be employed for the entire pipeline, and Transnet shall determine whether different options exist for the various sections of pipe.	Transnet		
c	GEN	Transnet shall provide an opportunity for meaningful input into the planning process by the affected stakeholders, as defined by the scope of the project. In particular, landowners and land managers shall be consulted in this process, in accordance with a recognized guideline such as the Department of Environmental Affairs and Tourism Guideline Series on Integrated Environmental Management (1992).	Transnet		
d	GEN	Transnet shall review the legal framework under which the pipeline is operated at the time. Beyond the requirements of the principal regulatory authorities, Transnet shall determine any other legislation that may affect the abandonment project (for example, municipal requirements) and this shall be considered and complied with.	Transnet		
e	GEN	Transnet shall review the servitude agreements with landowners to verify whether any terms and conditions in the agreements have a bearing on the abandonment decision-making process.	Transnet		
f	GEN	Transnet shall secure landowner and authority approvals, as required at the time, for the pipeline abandonment and site rehabilitation and shall implement the Abandonment Plan, the scope of which should include post-abandonment responsibilities.	Transnet		
g	GEN	On completion of the abandonment project, Transnet shall secure final authority release.	Transnet		

6.1.4 Post - Abandonment Responsibilities

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN monitoring	Once the pipeline has been abandoned, Transnet may retain a number of responsibilities. These may include responsibility for ensuring that the right-of-way and any facilities left in place remain free of problems associated with the abandonment. If required by the regulatory authorities, a Right-of-Way monitoring program shall be included in the Post-Abandonment Plan and accounted for in the abandonment budget.	Transnet		
b	GEN monitoring	In developing a monitoring plan, Transnet shall consider the effects of each abandonment issue for each segment of the pipeline being abandoned. Specific monitoring requirements shall be included for potentially sensitive areas.	Transnet		

6.1.5 Key environmental issues during Pipeline Abandonment

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
a	GEN	Abandonment issues arise from the need to address public safety, environmental protection, and future land use. The primary environmental issues that typically need to be considered are as follows: • land use management; • ground subsidence; • soil and groundwater contamination; • pipe cleanliness; • water crossings; • erosion; • creation of water conduits.	Transnet		
b	GEN	Most issues are not unique to the abandonment phase of the pipeline life-cycle, but could involve an altered scope, varied timeline, or additional stakeholders when compared to the issues of pipeline installation and operation. In order to responsibly abandon a pipeline, the owner must consider all of the issues and determine how they relate to the pipeline under consideration, in addition to addressing stakeholder concerns and incorporating collected input.	Transnet		
c	GEN	It is possible that a combination of both the abandonment-in-place and removal options will be used, based on site-specific requirements. Thus, it is important that all aspects	Transnet		

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		of the abandonment issues be considered. The abandonment in-place option does not necessarily eliminate the need for land disturbance or field activity, while pipeline removal need not necessarily encompass the same level of disturbance or activity as that of pipeline construction.			
		Land Use Management			
d	GEN	Land use is the most important factor to consider in determining whether a pipeline section should be abandoned in place or removed. Therefore, an understanding of the current and potential land uses along the pipeline Right-of-Way is necessary to make informed decisions about available abandonment options.	Transnet		
e	GEN	Of particular concern with respect to land use management are areas sensitive to land disturbance, such as pristine natural habitat, parks, unstable or highly erodible slopes, areas susceptible to severe wind erosion and irrigated land, particularly flood irrigation systems. Additionally, land improvements such as the installation of drainage systems, landscaping, and permanent structure installations could be affected by a proponent's decision to abandon a line.	Transnet		
f	GEN	Future land use should be considered because a pipeline abandoned in place could become a physical obstruction to development, such as excavation for foundations, pilings, or ongoing management practices such as deep ploughing or the installation of sub-drains. It is important that input be gathered from appropriate sources such as landowners, land managers, and local authority's sites to support the decision to abandon in place. In addition, sufficient documentation must be kept to allow for detailed location information for future developers or owners.	Transnet		
g	GEN	The decision to abandon in place or through removal should be made on the basis of a comprehensive site-specific assessment. In this context, the land management characteristics that may be better suited to pipeline abandonment-in-place include: • natural areas; • unstable or highly erodible surfaces; • river crossings; • flood irrigated fields; • road and railway crossings; • foreign pipeline crossings; • areas of pristine habitat; • wetlands; • areas exhibiting poor and/or limited access.	Transnet		
h	GEN	The key environmental protection measures to be considered when a pipeline is to be	Transnet		

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
	monitoring	abandoned in place are as follows: • minimal disruption to ongoing or future land management activities; • a complete and documented pipeline cleaning procedure; • the clean-up of any spills or contaminated sites to prevailing regulatory requirements; • a re-vegetation strategy to achieve pre-abandonment conditions, keeping erosion control and soil stability as a priority; • topsoil conservation for all areas disturbed during the abandonment process; • reclamation of all site access roads; • documented as-built information for future reference; and • a monitoring program acceptable to all affected parties to ensure a process to complete remediation.			
i	GEN	Proper environmental protection measures should be implemented, including appropriate soil handling procedures and contingency plans (e.g. for spills and wind or water erosion), protection of cultural features, weed control, and site reclamation.	Transnet		
j	GEN	Prior to the commencement of field activity, rehabilitation criteria should be agreed upon with the regulatory authorities and landowners. The rehabilitation programme will normally be designed to ensure that the condition of the right-of-way land surface is made at least equivalent to that existing just prior to the commencement of abandonment activities, and as close as circumstances permit to the condition of the land that existed prior to pipeline installation, and may entail: • removing, storing, and replacing topsoil; • soil contamination analysis and-clean up, if required; • contouring disturbed land to control drainage; • seeding affected areas to prevent erosion and establish vegetation; • removal of all structures to a minimum depth of one metre below final contour elevation; • scarifying and/or compacting excavated areas to compensate for future settlement; and • site-specific environmental requirements.	Transnet		
k	GEN monitoring	A right-of-way monitoring plan should be developed to ensure that reclamation efforts are successful and that no problems arise.	Transnet		

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		Ground Subsidence			
l	GEN	The long-term structural deterioration of a pipeline abandoned in place may lead to some measure of ground subsidence. This is a primary issue to consider for larger-diameter pipelines because of potential environmental and safety concerns. More particularly, ground subsidence could create the potential for water channelling and subsequent erosion, lead to topsoil loss, impact on land use and land aesthetics, and/or pose a safety hazard.	Transnet		
m	GEN	The acceptable subsidence limits and the potential factors affecting those limits are significant areas requiring attention in the development of any abandonment plan. Erosion may cause direct siltation to a watercourse, or cause slope failures and subsequent siltation. Where potential siltation is an issue, the owner must be prepared to deal with protection measures for aquatic species.	Transnet		
		Soil and Groundwater Contamination			
n	GEN	The Abandonment Plan should address the potential for contamination associated with the abandonment activities, as well as the need to eliminate any contamination that may already exist, and include the appropriate pipe cleaning or pigging procedure. Any contamination noted prior to abandonment activity should be cleaned up to the applicable legal standards prior to full project disturbance, unless it is more economical to include the cleanup in the scope of abandonment activity and it can be demonstrated that environmental damage will not be amplified.	Transnet		
o	GEN	Typical sources of contamination that need to be considered are: • the substances produced from the reservoir in the hydrocarbon stream and deposited on the walls of the pipeline; • pipeline coatings and their degradation products • historical leaks and spills of product that were not cleaned to current standards	Transnet		
		Pipe Cleanliness			
p	GEN	In light of potential contamination concerns, the cleanliness of the pipeline is an issue for both abandonment techniques. Pipe that is to be removed should be cleaned to a level where any remaining residues will not cause harm in any future intended use of the pipe. Removed pipe that may eventually be put to some alternative use (e.g. pilings) may require more study to determine the appropriate cleanliness requirements for the future use. For pipe that is targeted for disposal, existing disposal or land filling guidelines will determine the required cleanliness of the pipe.	Transnet		
q	GEN	For pipe that will be abandoned in place, the issue of pipe cleanliness is related to corrosion and the creation of water conduits. Eventually the pipe will corrode until perforated and the structural integrity of the pipe will suffer. Whether the rate of	Transnet		

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		deterioration will be greater than the life of the contaminants left as internal residue of the pipe will depend on local circumstances and will need to be considered. Similarly, the rate and structural location of any corrosion must be considered, in that it may allow water to infiltrate the abandoned pipe and transport pipe residues to some other exit point.			
		Water Crossings			
r	GEN + SS	There are many factors to consider in deciding whether a section of pipeline crossing a water body or wetland should be abandoned in place or removed. More specifically, the risks associated with abandoning the pipeline in place, including the potential for contamination and pipe exposure, have to be weighed against the cost and environmental impact of removal.	Transnet		
s	GEN	These trade-offs should be assessed on a site-specific basis, taking into account the size and dynamics of the water body, the design of the pipeline crossing, soil characteristics, slope stability, and environmental sensitivities. While these issues must be evaluated, in most cases it can be expected that abandonment-in-place will be the preferred option.	Transnet		
t	GEN	If the pipeline crossing is to be abandoned in place, the pipe should be left in as clean a state as possible to minimize the potential for contamination of the water body should the eventual perforation and failure of the pipe allow any internal residues to escape. The strategic placement of caps and plugs will also help mitigate this concern by interrupting the movement of potential contaminants through the abandoned pipe.	Transnet		
u	GEN	The risk of pipe exposure is two-fold. First, the pipeline could become exposed if the overlying soil is gradually eroded or washed away because of the dynamics of the water body (e.g. stream bank migration, scour, or flood conditions). Secondly, an empty pipeline crossing a water body or wet area could float toward the surface if buoyancy control mechanisms fail (e.g. if concrete saddle weights slide off). In either case, the probability that the pipeline could become exposed and the impacts that exposure would entail should be assessed.	Transnet		
v	GEN	If the pipeline is to be removed in whole or in part, the issues would be similar in many ways to those associated with initial construction across the water body or wetland. More specifically, many of the same construction techniques and environmental protection measures would apply. Aspects to address include fisheries spawning times, habitat protection, sediment control, vehicle and equipment crossing methods, backfill material specifications, erosion control measures (both short term and long term), and bank restoration. Damage to any existing bank stabilization structures or destabilization of previously stable banks should be considered.	Transnet		

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
w	GEN	It is important that the pipe be as clean as possible prior to excavation to minimize the potential for contamination of the water body should the pipe be damaged and spills occur during the removal procedure.	Transnet		
		Erosion			
x	GEN + SS	Soil erosion is a concern during all phases of the pipeline life-cycle, particularly as it relates to slope stability. Leaving a pipeline in the ground may entail a certain amount of activity along the right-of-way to ensure responsible abandonment, such as excavations to confirm cleaning quality and the installation of caps or plugs. The potential impact of the ensuing right-of-way disturbance will vary greatly with the geographic location of the activity.	Transnet		
y	GEN + SS	If the pipe is to be removed, erosion and slope stability concerns will be similar to those for pipeline construction. For example, traffic, soil compaction, and the water erosion of disturbed soil may be of concern. In addition, the pipeline may have become a structural support to many slopes over time, and its removal may affect the integrity of the slope.	Transnet		
z	GEN + SS	When developing an Abandonment Plan for the pipeline any erosion remediation that has occurred over the operating life of the pipeline should be reviewed. If erosion control measures have been regularly required at specific locations, it may be necessary to implement longer term erosion control measures.	Transnet		
aa	GEN + SS	If the abandonment activities necessitate disturbing erosion-prone areas including slopes, protection measures designed to current standards should be implemented. In addition, the integrity and effectiveness of any existing ditch plugs, sub-drains, berms, or other installations should be reviewed.	Transnet		
bb	GEN	It is usually more appropriate to abandon pipe at unstable slopes in place, due to the potential requirement for extensive remediation if the pipeline is removed.	Transnet		
		Creation of Water Conduits			
cc	GEN	The potential to create water conduits as a result of the abandonment process must be considered as it could lead to concentrated drainage and material transport. This issue is primarily of concern when a pipeline is abandoned in place, since water will eventually infiltrate the pipe through perforations in the pipe wall caused by corrosion.	Transnet		
dd	GEN	Unless water pathways through the pipeline are interrupted, this could lead to the unnatural drainage of areas such as wetlands, thus affecting the natural balance of the ecosystem. Similarly, a previously stable low area could be flooded by volumes of water exiting from a perforated pipeline. If water infiltrates the pipeline, the potential exists for that water to carry any residual contaminants left in the abandoned pipeline to some point of exit. The point of exit could be a watercourse, thereby contaminating the	Transnet		

ITEM NO.	GENERAL/ SITE SPECIFIC	MITIGATION MEASURES	Main Responsibility	Support	Method Statement / Procedure
		watercourse if contaminant levels are sufficiently great in volume and concentration at the point of exit. The possibility of soil contamination may also exist.			
ee	GEN	Plugs should be considered at appropriate spacers to ensure that changes in surface and ground water conditions will not result in water flow through the pipeline.	Transnet		

ANNEXURE 3-Contractor Health & Safety Specification Guidelines

Contractor Health and Safety Specification Guidelines

Table of Contents

1. Purpose

This specification development guideline identifies and encompass the working behaviours and safe work practices that are expected of all Transnet SOC Ltd employees, Contractors, Consultant, Visitors and Suppliers, engaged on Transnet managed projects as required by Construction Regulation of 2014, regulation 5(1)(b).
All contractors and service providers must take careful note of these requirements and must ensure that adequate provision has been made to ensure compliance.
This Specification development guideline has been compiled to cover a wide range of construction/ work activities and should serve as a guideline for Safety Agents to develop site specific specifications for construction projects. In order to determine which requirements are applicable, the contractor must conduct a health and safety risk assessment specific to the project and specific to the contractor's scope of work. All applicable requirements must be addressed in the Contractor's Health and Safety Management Plan.

This Specification development guideline will be reviewed and updated periodically as and when necessary) to address and / or include:

- Changes in legislation;
- Client requirements;
- Leading practices; and
- Lessons learnt from incidents.

The specification development guideline provides the minimum requirements for site specific specification and should be used as a guide to develop the site specific specification as it is required by the Construction Regulation of 2014.

2. Scope

This Specification applies to all project sites, and to all persons working on or visiting the Transnet managed projects. The requirements specified in this document are applicable to the contractor as well as any sub-contractors, EPCM Contractors, Consultant, Vendors and Visitors that may be appointed by Transnet as an Employer. It is the contractor's responsibility to ensure that all sub-contractors comply fully with all legal requirements as well as the requirements of this health and safety specification.

3. Definitions

Acceptable Risk
A risk that has been reduced to a level that can be tolerated having regard for the applicable legal requirements and the Health and Safety Policy adopted for the project.

ALARP (As Low As Reasonably Practicable)
The concept of weighing a risk against the sacrifice needed to implement the measures necessary to avoid the risk. With respect to health and safety, it is assumed that the measures should be implemented unless it can be shown that the sacrifice is grossly disproportionate to the benefit.

Applicant (Permit to Work)
A person requesting permission to perform work for which a Permit to Work is required. Applicants must be authorised (in writing) to receive (or accept) Permits to Work and must be competent to do so by virtue of their training, experience and knowledge of the area or plant in which the work is to be performed.

Authorised Person (Permit to Work)
A person (typically a Project employee or an employee of the client) who has been authorised (in writing) by the nominated project management representative to issue Permits to Work within the scope of his designation. A person may only be appointed to issue Permits to Work if he has undergone training and has been assessed and found competent in systems, plant and equipment operation within the scope of his designation.

Barricade
A temporary structure that is erected as a physical barrier to prevent persons from inadvertently coming into contact with an identified hazard.

Battering
Sloping the sides of an excavation to a predetermined angle (usually less than the natural angle of repose) to ensure stability.

Benching
The creation of a series of steps in the sides of an excavation to prevent collapse.

Consequence
The outcome of an event expressed qualitatively or quantitatively.

Contractor
An employer (organisation) or a person who performs **ANY** work and has entered into a legal binding business agreement contract to supply a product or provide services to Transnet. This applies to the Suppliers, Vendors, and Consultants, Service providers or Contractors performing construction work

NB: A Contractor is an employer in his/her own right

Competent Person
A person who has in respect of the work or task to be performed the required knowledge, training, experience and as per act cr2014.

Construction Supervisor
A competent person responsible for supervising construction activities on a construction site

Clearance Certificate
A signed declaration by an Isolation Officer that a specified hazardous energy source associated with a particular system, plant or item of equipment has been isolated in accordance with an approved Isolation and Lockout Procedure.

Discipline Lock (many locks with a restricted number of identical keys)
Attached at a Lockout Station or at a Local Isolation Point in order to lock out a system, plant or equipment. A Discipline Lock (e.g. A Low Voltage Electricity Discipline Lock) is owned by an

Isolation Officer who has been authorised in writing to isolate and lockout a particular hazard (e.g. Low voltage electricity).

Equipment Lock (many locks with one unique key)
Attached directly to pieces of equipment in order to lock them out. Equipment Locks may only be used by Isolation Officers who have been authorised in writing to perform isolation and lockout procedures. The key must have a solid key ring that fits over an Isolation Bar.

Excavation
Any man-made cut, cavity, pit, trench, or depression in the earth's surface formed by removing rock, sand, soil or other material using tools, machinery, and / or explosives. Tunnels, caissons and cofferdams are specifically excluded and are not addressed in this standard.

First-Aid Injury (FA)
A first-aid injury is any one time treatment and any follow up visit for observation of minor scratches, cuts, burns, splinters and the like which do not normally require medical care. Such treatment is considered to be first aid even if administered or supervised by a medical practitioner. First aid includes any hands on treatment given by a first aider. (E.g. Band-Aid, washing, cleansing, pain, relief). The following procedures are generally considered first aid treatment:

- Application of Antiseptics.
- Application of Butterfly adhesive dressing or sterile strips for cuts and lacerations.
- Administration of tetanus shot(s) or booster(s). However, these shots are often given in conjunction with more serious injuries, consequently injuries requiring these shots may be recordable for other reasons.
- Application of bandages during any visit to medical personnel.
- Application of ointments to abrasions to prevent drying or cracking.
- Inhalation of toxic or corrosive gas, limited to the removal of the employee to fresh air or the one time administration of oxygen for several minutes.
- Negative X-Ray diagnosis.
- Removal of foreign bodies not embedded in the eye if only irrigation is required.
- Removal of foreign bodies from a wound if procedure is uncomplicated, for example by tweezers or other simple technique.
- Treatment for first degree burns.
- Use of non-prescription medications and administration of single dose of prescription medication on first visit for any minor injury or discomfort.

Hazard
A source of potential harm in terms of human injury or ill health, or a combination of these.

Hierarchy of Controls
A sequence of control measures, arranged in order of decreasing effectiveness, used to eliminate or minimise exposure to workplace health and safety hazards:

- Elimination – Completely removing a hazard or risk scenario from the workplace.
- Substitution – Replacing an activity, process or substance with a less hazardous alternative.
- Isolation (Engineering) Controls – Isolating a hazard from persons through the provision of mechanical aids, barriers, machine guarding, interlocks, extraction, ventilation or insulation.
- Administrative Controls – Establishing appropriate policies, procedures and work practices to reduce the exposure of persons to a hazard. This may include the provision of specific training and supervision.
- Personal Protective Equipment – Providing suitable and properly maintained PPE to cover and protect persons from a hazard (i.e. Prevent contact with the hazard).

Isolation and Lockout Procedure
A plant or equipment-specific procedure that describes the method, and sequence to be followed, for rendering equipment, plant and systems safe to work on.

Isolation Bar
A device used at a Lockout Station to which anyone is able to attach a Personal Lock making it impossible for an Isolation Officer to remove the key to the Equipment Locks, thus preventing the de-isolation of a system, plant or equipment while it is still being worked on. A Discipline Lock must always be the first lock attached to an Isolation Bar and last to be removed.

Isolation Officer
A person (typically a Project employee or an employee of the client) who has been authorised (in writing) by the nominated project management representative to perform isolation and lockout procedures. A person may only be appointed as an Isolation Officer if he has undergone training and has been assessed and found competent in the isolation and lockout of systems, plant and equipment within the scope of his designation.

Incident
An event (or a continuous or repetitive series of events) that results or has the potential to result in a negative impact on people (employees, contractors and visitors), the environment, operational integrity, assets, community, process, product, legal liability and / or reputation.

Likelihood
A description of probability or frequency, in relation to the chance that an event will occur.

Lost Time Injury (LTI)

Any occurrence that resulted in a permanent disability or time lost from work of one day/shift or more.

If an employee is injured and cannot return to work in the next shift (will ordinarily miss one whole shift), and the department brings the employee in to only receive treatment by the Supervisor/ Return to Work Coordinator in that shift, this is still considered an LTI.

Lost Time Injury Frequency Rate (LTIFR) - Number of LTI's multiplied by 1 million or 200,000 and divided by labour hours worked.

Light Vehicle

A vehicle that:

- Can be licensed and registered for use on a public road;
- Has four or more wheels, and seats a maximum of 12 adults (including the driver);
- Requires the driver to hold only a standard civil driving licence; and
- Does not exceed 4.5 tonnes gross vehicle mass (GVM), which is the maximum loaded mass of the motor vehicle as specified by:
  - The vehicle's manufacturer; or
  - An approved and accredited automotive engineer, if the vehicle has been modified to the extent that the manufacturer's specification is no longer appropriate.

Examples of light vehicles include passenger cars, four-wheel drive vehicles, sports utility vehicles (SUVs), pick-ups, minibuses, and light trucks.

Any vehicle falling outside of this definition must be considered mobile equipment.

Medical Treatment Injury (MTI)

A work injury requiring treatment by a Medical Practitioner and which is beyond the scope of normal first aid including initial treatment given for more serious injuries. The procedure is to be of an invasive nature (e.g. Stitches, removal of foreign body).

The following procedures are generally considered medical treatment:

- Application of sutures (stitches).
- Cutting away dead skin (surgical debridement).
- Loss of consciousness due to an injury or exposure in the work environment.
- Positive X-Ray diagnosis (fractures, broken bones etc.).
- Removal of foreign bodies embedded in the eye.
- Removal of foreign bodies from the wound by a physician due to the depth of embedment, size or shape of object or the location wound.
- Reaction to a preventative shot administered because of an occupational injury.
- Sprains and strains - series (more than one) of hot and cold soaks, use of whirlpools, diathermy treatment or other professional treatment.
- Treatment of infection.
- Treatment for second or third degree burns
- Use of prescription medications (except a single dose administered on first visit for minor injury or discomfort.)

Mobile Equipment

A vehicle (wheeled or tracked) that generally requires:

- The driver to hold a specific state or civil license; or
- The operator to hold a nationally recognized certificate of competency.

Examples of mobile equipment include, but are not limited to, dump trucks, water trucks, graders, dozers, loaders, excavators, forklifts, tractors, back-actors, bobcats, mobile cranes, tele-handlers, drill rigs, buses and road-going trucks.

Near Hit

An incident that has occurred that did not result in any injuries, illnesses, environmental or property damage but had the potential to cause an injury, illness, environmental or property damage.

Personal Lock

A single lock with one unique key controlled by the owner. Used for personal protection.

Regulation

In the context of this guideline, 'Regulation(s)' refers to the Construction Regulations, 2014 required by Section 43 of the Occupational Health and Safety Act 85 of 1993, published under Government Notice R 84 in Government Gazette 37305 of February 2014.

Risk

A combination of the likelihood of an occurrence of a hazardous event or exposure and the severity of injury or ill health that can be caused by the event or exposure.

Risk Assessment

A process of evaluating the risk arising from a hazard, taking into account the adequacy of any existing control measures, and deciding on whether or not the risk is acceptable.

Risk Management
The systematic application of management policies, processes and procedures to identifying hazards, analysing and evaluating the associated risks, determining whether the risks are acceptable, and controlling and monitoring the risks on an ongoing basis.

4. Abbreviations

DSTI - Daily Safety Task Instruction

CR – Construction Regulations

EPC - Engineering Procurement and Construction

EPCM - Engineering Procurement and Construction Management

HIRA - Hazard Identification and Risk Assessment

HEALTH AND SAFETY - Integrated Management System

MS - Management System

OHS Act - Occupational Health and Safety Act

SOC - Safety Observation and Conversation

VFL - Visible Felt Leadership

OHS - Occupational Health and Safety

SACPCMP - The South African Council for Project and Construction Management Professions, here in refer to as they register of Health and Safety Professionals

5. SHE Management Plan

The contractor must prepare, implement and maintain a project-specific SHE Management Plan. The plan must be based on the requirements set out in this specification as well as all applicable legislation. It must cover all activities that will be carried out on the project site(s), from mobilisation and set-up through to rehabilitation and decommissioning.

The plan must demonstrate the contractor's commitment to HEALTH AND SAFETY and must, as a minimum, include the following:

- A copy of the contractor's **Health and Safety Policy**; in terms of the OHS Act section 7
- Procedures concerning **Hazard Identification and Risk Assessment**, including both Baseline and Task-Based Risk Assessments;
- Arrangements concerning the identification of applicable **Legal and Other Requirements**, measures to ensure compliance with these requirements, and measures to ensure that this information is accessible to relevant personnel;
- Details concerning **Health and Safety Objectives** – a process must be in place for setting objectives (and developing associated action plans) to drive continual improvement;
- Details concerning **Resources, Accountabilities and Responsibilities** – this includes the assignment of specific health and safety responsibilities to individuals in accordance with legal or project requirements, including the appointment of a Project Manager, Health and Safety Officers, Supervisors, Health and Safety Representatives, and First Aiders;

- Details concerning **Competence, Training and Awareness** – a system must be in place to ensure that each employee is suitably trained and competent, and procedures must be in place for identifying training needs and providing the necessary training;
- **Communication, Participation and Consultation** arrangements concerning health and safety, including Safety Observations and Coaching, Toolbox Talks, Daily Safe Task Instructions, project health and safety meetings, and notice boards;
- **Documentation and Document Control** – project-specific documentation required for the effective management of health and safety on the project must be developed and maintained, and processes must be in place for the control of these documents;
- Processes and procedures for maintaining **Operational Control**, including rules and requirements (typically contained in Safe Work Procedures) for effectively managing health and safety risks, particularly critical risks associated with working at heights, confined spaces, mobile equipment and light vehicles, lifting operations, hazardous chemical substances, etc.;
- **Emergency Preparedness and Response** procedures;
- **Management of Change** – a process must be in place to ensure that health and safety risks are considered before changes are implemented;
- **Sub-contractor Alignment** procedures – a process must be in place for the assessment of sub-contractors and suppliers with regard to health and safety requirements and performance (before any contract or purchase order is awarded);
- **Measuring and Monitoring** plans, including a plan for the measuring and monitoring of employee exposure to hazardous substances or agents (e.g. Noise, dust, etc.) In order to determine the effectiveness of control measures;
- **Incident Reporting and Investigation** procedures describing the protocols to be followed with regard to incident reporting, recording, investigation and analysis;
- **Non-conformance and Action Management** procedures concerning the management of corrective actions;
- **Performance Assessment and Auditing** procedures concerning health and safety performance reporting, monthly internal audits to assess compliance with the project health and safety requirements, and daily site health and safety inspections; and
- Details concerning the **Management Review** process followed to assess the effectiveness of health and safety management efforts.

Prior to mobilisation, the HEALTH AND SAFETY Management Plan must be forwarded electronically, and as a hard copy, to the nominated project management representative for review. The plan will be audited for completeness and, if found to be adequate, will be accepted (typically "with comments"). Work may not commence until the plan has been accepted.

Once the plan has been accepted, the contractor must action and resolve any issues within 30 days from the start of work.

If the issues requiring corrective action are not resolved within this 30 day period, the contractor will be required to stop any work related to the outstanding actions until they have been resolved.

Any proposed amendments or revisions to the contractor's Health and Safety Management Plan must be submitted to the nominated project management representative for acceptance.

Should it be identified that the contractor has overlooked a high risk activity, and as a result has omitted the activity and associated control measures from the Health and Safety Management Plan, the plan will not be approved.

6. Policy

The contractor must develop, display and communicate a Health and Safety Policy that clearly states the contractor's values and objectives for the effective management of health and safety as required by OHS Act of 1993, 7(3). These values and objectives must be endorsed by the contractor's management representatives and must be consistent with those adopted for the project.

The policy must be signed and dated, and must be reviewed annually.

The policy must commit to:

- Compliance with all applicable legal requirements in the TCP regulatory universe;
- The effective management of health and safety risks;
- The establishment of measurable objectives for improving performance, and the provision of the necessary resources to meet these objectives;
- The prevention of incidents; and
- Achieving continual improvement with regard to health and safety performance.

All employees of the contractor as well as the employees of any sub-contractors that may be appointed by the contractor must be made aware of the policy. This must be done through Health and Safety Induction Training and Toolbox Talks (refer to Sections 10 and 11).

A copy of the policy must be displayed in each meeting room and on each notice board.

7. Hazard Identification and Risk Assessment.

Detailed hazard identification and risk assessment processes must be followed for all work to be performed as well as for all associated equipment and facilities as required by the Construction regulation of 2014, regulation 9(1) – (7).

The client will provide a baseline risk assessment informing contractor on the hazards and risks on site. Contractor must ensure that effective procedures and risk assessment systems are in place to control hazards and to mitigate risks to levels that are as low as is reasonably practicable.

The risk assessment processes must be applied to:

- The full life cycle of the project;
- Routine and non-routine activities;
- Planned or unplanned changes (refer to Section 15);
- All employees, sub-contractors, suppliers and visitors; and
- All infrastructure, equipment and materials.

The risk assessment processes and methodologies must be appropriate for the nature and scale of the risks, and must be implemented by competent persons.

The process of analysing and managing risk must include the following:

- Establishing the context of the risk assessment;

- Identifying hazards and determining possible risk scenarios (unwanted events);
- Evaluating risks and assigning ratings (classification);
- Recording the risk analysis in a risk register;
- Managing risks according to their classification (prioritising for action);
- Identifying and implementing control measures (through the application of the Hierarchy of Controls) to ensure that risks are managed to levels that are as low as is reasonably practicable (ALARP);
- Developing action plans for reducing risk levels (where possible);
- Verifying the completion of actions;
- Re-evaluating the risks and classifications as appropriate; and
- Reviewing and updating the risk register.

7.1 Baseline Risk Assessments

Prior to site establishment, the client must conduct a detailed Baseline Risk Assessment identifying foreseeable hazards and risk scenarios associated with the contractor's scope of work on the project site(s) as required by Construction Regulations of 2014, regulation 5(1)(a) . Details concerning proposed control measures must be included. The risk assessment process must be facilitated by a competent person who has been appointed in writing and must involve the participation of the contractor's site management representatives, supervisory personnel and technical experts (as required). An attendance register must be completed and retained for reference purpose. The Baseline Risk Assessment must be reviewed and approved by the Project Health and Safety Manager and Project Construction Manager.

When carrying out a Baseline Risk Assessment or a Task-Based Risk Assessment (refer to Section 6.2), Hazard (Energy) Types must be specified in accordance with the categorisation detailed in Table 6-1. Risk scenarios must be described indicating the manner in which a person may come into contact with, or be exposed to, a specific hazard.

An initial risk rating must be assigned to each risk scenario without taking any control measures into consideration. Control measures for managing the risks to levels that are as low as is reasonably practicable must then be identified for implementation on the project, and a residual risk rating must be assigned to each risk scenario taking the identified control measures into consideration.

Ratings must be assigned qualitatively using TCP consequence and likelihood scales and descriptors (i.e. TCP 5x5 qualitative risk matrix). Refer to Tables 6-2, 6-3 and 6-4.

Table 7-1: Hazard (Energy) Types

A Risk Register comprised of all significant risks (i.e. Risks rated as major or catastrophic) identified for the project will be compiled using the information contained in the project Baseline Risk Assessment as well as the contractor's Baseline Risk Assessment. Key control measures for managing each of these risks will be specified in the register.

For the significant risks in particular, action plans will be developed for reducing the risk levels (where possible).

The project Risk Register will be reviewed and, if necessary, updated:

- On a quarterly basis during construction;

- When changes are made to a design and / or the construction scope, schedule, methods, etc. That result in a change to the risk profile; and
- Following an incident.

The contractor must ensure that the hazards, risk scenarios and control measures identified in the contractor's Baseline and Task-Based Risk Assessments are taken into consideration when developing, implementing and maintaining the various elements of the contractor's health and safety management system for the project (e.g. Competence, training and awareness requirements).

All persons potentially affected must be made aware of the hazards, risk scenarios and control measures identified in the contractor's risk assessments. This must be done through training, Toolbox Talks, and Daily Safe Task Instructions (refer to Sections 10 and 11).

7.2 Task-Based Risk Assessments

The contractor must carry out detailed project-specific Task-Based Risk Assessments which must be reviewed and approved by the Client's Project Health and Safety Manager and Contract Manager prior to the commencement of any work.

The risk assessment process must be facilitated by a competent person who has been appointed in writing in terms CR 9 sub regulation (1). The contractor's site management representatives, supervisory personnel, technical experts (as required) and workforce personnel directly involved with the task being examined must participate in the risk assessment process. An attendance register must be completed and retained.

Please Note: Under no circumstances may a Contractor Health and Safety Officer perform a risk assessment in isolation. The active participation of all persons referred to above is mandatory.

A Task-Based Risk Assessment must at least:

- Be accompanied by a Work Method Statement (describing in sufficient detail how the specific job or task is to be performed in a logical and sequential manner);
- Provide a breakdown of the job or task into specific steps;
- Identify the hazards and potential risk scenarios associated with each step;
- Include consideration of possible exposure to noise, heat, dust, fumes, vapours, gases, chemicals, radiation, vibration, ergonomic stressors, or any other occupational health hazard or stressor;
- Describe the control measures that will be implemented to ensure that the risks are managed to levels that are as low as is reasonably practicable; and
- Assign an initial risk rating (without taking any control measures into consideration) and a residual risk rating (taking the identified control measures into consideration) to each risk scenario.

A Task-Based Risk Assessment must be reviewed and, if necessary, updated:

- On an annual basis (as a minimum);
- When changes are made to the associated Work Method Statement; and
- Following an incident.

7.3 Pre-Task Hazard Assessments

A pre-task hazard assessment must be completed whenever a change is identified while carrying out an activity. Any deviation from what was discussed during the Daily Safe Task Instruction (prior to the activity commencing), or anything that was not discussed, constitutes a change.

Before carrying out the particular task that involves the identified change, a few minutes must be spent identifying the hazards and risks associated with that task as well as suitable control measures.

8. Legal and Other Requirements

The Contractor must comply with the requirements of all applicable legislation as well as Transnet and project-specific standards and procedures as amended from time to time.

The Contractor must compile and maintain a register of all legal and other requirements applicable to the work that will be carried out and / or services that will be provided. This register must be updated regularly to ensure that it remains relevant.

Applicable laws and standards must be appropriately communicated to all employees of the contractor (as well as the employees of any sub-contractors that may be appointed by the contractor) through training, Toolbox Talks, and Daily Safe Task Instructions (refer to Sections 10 and 11).

9. Objectives

In order to drive continual improvement, the contractor must set project-specific objectives, and must develop improvement action plans to achieve these objectives. The contractor's objectives must be aligned with the objectives set for the project as a whole as required by the Construction regulations of 2014, regulation 7.

Eliminating hazards, minimising risks, preventing incidents, injuries and illnesses, and ensuring legal compliance must be the primary considerations for setting objectives.

When setting objectives, consideration must be given to the following:

- Leading indicators such as inspection findings, audit findings, hazard reporting, and observations;
- Lagging indicators (i.e. Incidents including Near Hits);
- Leading practices and lessons learnt; and
- Injury frequency rates with due understanding that the goal is "no harm".

The objectives must be specific and measurable. The improvement action plans must specify the resources (both human and financial) required to achieve the objectives, the person's responsible, and realistic timeframes for completion. The contractor must ensure that adequate resources are allocated and that progress towards meeting the objectives is monitored regularly.

The objectives and associated improvement action plans must be documented and must be communicated to all contractor employees. Furthermore, to ensure that the objectives remain relevant, they must be reviewed on a quarterly basis and whenever significant change has taken place on the project (i.e. Changes to activities, scope of work, operating conditions, etc.).

Performance reviews must be carried out at quarterly intervals to assess and document performance against these personal or team objectives.

If a reward or incentive scheme is introduced, it must be designed in such a manner that health and safety performance is not compromised in order to maximise financial reward.

10. Resources, Accountabilities and Responsibilities

The Contractor must adequately allocate resources, responsibility and accountability to ensure the effective implementation, maintenance and continual improvement of the contractor's HEALTH AND SAFETY management system on the projects required by Construction regulation 0f 2014, regulation 7(2)(c)

For each role that carries health and safety accountability and / or responsibilities (including legislative requirements), a role description detailing the accountability and / or responsibilities must be documented.

All appointments (i.e. the assignment of specific SHE responsibilities to individuals in accordance with legal or project requirements) must be done in writing. Documented proof of each appointment (i.e. a signed appointment letter) must be retained.

Contractor should not discharge any legal responsibilities to employees who are not legally appointed.

The contractor must comply with the requirements of all applicable legislation concerning health and safety related appointments and delegations for the project.

A Organogram specific to the project must be documented and maintained. All roles that carry SHE accountability and / or responsibilities must be included, and all individuals that carry health and safety appointments must be clearly identified.

The provision of dedicated professionals on the project must be appropriate for the nature and scale of the work to be carried out.

The contractor is solely responsible for carrying out the work under the contract whilst having the highest regard for the health and safety of all persons on the project site(s).

Health and safety is the responsibility of each and every individual on the project site(s), but in particular, it is the responsibility of the contractor's management team who must set the tone.

Visible commitment is essential to providing and maintaining a safe workplace. The contractor's managers and supervisors at all levels must demonstrate their commitment and support by adopting a risk management approach to all health and safety issues. These individuals must consistently take immediate and firm action to address violations of health and safety rules, and must actively participate in day to day activities with the objective of preventing harm.

The contractor's management representatives are responsible and accountable for health and safety performance on the project. Key responsibilities include the following:

- Preparing, implementing and maintaining a risk-based Health and Safety Management Plan specific to the work that will be carried out (refer to Section 4);
- Establishing, implementing and maintaining health and safety programmes and procedures to ensure that all work is carried out in compliance with the requirements of this specification, the contract, and all applicable legislation;
- Establishing, implementing and maintaining effective hazard identification and risk management processes and procedures to ensure that all reasonably foreseeable hazards are controlled in order to minimise risk (refer to Section 6);
- Providing the resources necessary to meet the requirements of this specification (refer to Section 9);

- Ensuring that all contractor employees have clearly defined responsibilities with regard to health and safety, and that these responsibilities are clearly communicated and understood (refer to Section 9);
- Establishing, implementing and maintaining a system for ongoing training and assessment of skills and competence (refer to Section 10);
- Establishing, implementing and maintaining procedures to ensure that only qualified and competent personnel are permitted to work on the project site(s) (refer to Section 10);
- Establishing, implementing and maintaining effective communication and consultative processes concerning health and safety for the duration of the contract (refer to Section 11);
- Maintaining operational control for the protection of all persons on the project site(s) as well as the public (refer to Section 13);
- Establishing, implementing and maintaining effective emergency preparedness and response procedures (refer to Section 14);
- Establishing, implementing and maintaining effective management of change processes and procedures (refer to Section 15);
- Establishing, implementing and maintaining effective incident reporting and investigation processes and procedures (refer to Section 18);
- Establishing, implementing and maintaining effective auditing and inspection processes and procedures (refer to Section 20); and
- Formally reviewing the contractor's Health and Safety Management System annually to ensure that the system continues to be effective in managing health and safety performance and meeting project requirements (refer to Section 21).

All costs associated with meeting these responsibilities shall be borne by the contractor.

Any cost associated with any work stoppage due to non-compliance with a health and safety requirement shall be for the contractor's account.

10.1 Contractor Construction Manager

The Contractor must appoint a competent Construction Manager who shall be responsible for the successful and safe completion of all work to be carried out by the contractor as required by the Construction regulations of 2014, regulation 8(1).

The contractor's Project Manager shall be responsible for:

- Ensuring that a Health and Safety Policy that clearly states the contractor's values and objectives for the effective management of health and safety on the project is in place and is communicated to all contractor and sub-contractor employees;
- Ensuring that all applicable legal and project health and safety requirements are identified and complied with at all times;
- Ensuring that effective hazard identification and risk management processes are established and implemented for all work to be carried out by the contractor;
- Participating in the Baseline Risk Assessment for the contractor's scope of work (prior to site establishment);

- Participating in (and approving) all Task-Based Risk Assessments conducted for the work to be carried out by the contractor;
- Driving the achievement of agreed health and safety objectives;
- Ensuring that the necessary resources are made available for the effective implementation of the contractor's Health and Safety Management Plan;
- Ensuring that all work is adequately and competently supervised;
- Ensuring that all contractor employees have clearly defined responsibilities with regard to health and safety (assigned in writing), and that these responsibilities are clearly communicated and understood;
- Ensuring as far as is reasonably practicable that each contractor and sub-contractor employee is competent to perform his role, and has received appropriate workplace health and safety training and instruction;
- Managing all appointed sub-contractors with regard to health and safety performance;
- Establishing and maintaining effective communication and consultative processes to ensure that all contractor and sub-contractor employees are kept up to date with regard to health and safety information (e.g. Incidents and lessons learnt, leading practices, hazards, risks and control measures, etc.) And that feedback is provided promptly regarding issues and / or concerns raised;
- Participating in the project's Visible Felt Leadership (VFL) programme;
- Chairing monthly Contractor Health and Safety Meetings and attending monthly Site Health and Safety Meetings;
- Implementing programmes that encourage continual improvement and providing recognition for suggestions made by contractor and sub-contractor employees;
- Implementing the contractor's Health and Safety Management Plan and associated Safe Work Procedures;
- Acting consistently and strictly against any contractor or sub-contractor employee who transgresses a health and safety rule or requirement;
- Ensuring that an effective management of change process is in place;
- Implementing, testing and maintaining an effective Emergency Response Plan for all contractor and sub-contractor activities, and ensuring that the plan is adequately resourced;
- Ensuring that workplace exposure of contractor and sub-contractor employees to hazardous substances or agents is measured and monitored to determine the effectiveness of controls and compliance with legal (and project) requirements;
- Ensuring that all incidents are reported without delay and are investigated thoroughly;
- Participating in investigations into significant incidents;
- Ensuring that accurate health and safety statistics are maintained, and that health and safety performance reports are compiled as required;
- Providing the necessary resources for regular health and safety audits and inspections to be conducted, and supporting the auditing process;
- Participating in health and safety audits, and carrying out workplace inspections;

- Ensuring that corrective actions (arising from incident investigations, audits, inspections, etc.) Are implemented, and that adequate resources are provided for this purpose; and
- Participating in an annual review of the contractor's Health and Safety Management System.

10.2 Contractor Health and Safety Officers

The contractor must appoint a full-time Health and Safety Officer for the duration of the contract who is registered with the SACPCMP (The South African Council for Project Construction Management Professions). The project site(s) (directly or through sub-contractors), must at least appoint two full-time Health and Safety Officers depending on the scope, complexity, budget and high risk activities involved, as required by the Construction regulations of 2014, regulation 7(2)(c).

The Health and Safety Officer must be on site when work commences at the start of the day and must remain on site until all activities for that day (including the activities of sub-contractors) have been completed. A Health and Safety Officer must be present during all shifts, so if work is carried out over more than one shift per day, the contractor must make provision for an additional Health and Safety Officer.

Each Contractor Health and Safety Officer shall be responsible for:

- Reviewing all applicable legal and project health and safety requirements and providing guidance to contractor and sub-contractor personnel (particularly the contractor's Project Manager) to help ensure compliance at all times;
- Assisting with the implementation of effective hazard identification and risk management processes for all work to be carried out by the contractor;
- Participating in the Baseline Risk Assessment for the contractor's scope of work (prior to site establishment) and ensuring that identified control measures are implemented;
- Participating in all Task-Based Risk Assessments conducted for the work to be carried out by the contractor and ensuring that identified control measures are implemented;
- Conducting contractor health and safety induction training for all contractor and sub-contractor personnel;
- Compiling and maintaining all health and safety related documents and records required of the contractor;
- Communicating relevant health and safety information to contractor and sub-contractor personnel (e.g. Incidents and lessons learnt, leading practices, hazards, risks and control measures, etc.);
- Carrying out Safety Observations and Coaching (one per day);
- Evaluating (on a daily basis) the content of the Daily Safe Task Instructions (DSTI's) conducted by the contractor's appointed supervisors, and attending at least one DSTI each day;
- Attending monthly Contractor and Site Health and Safety Meetings;
- Assisting with the implementation of the contractor's Health and Safety Management Plan and associated Safe Work Procedures;
- Carrying out Planned Task Observations on an ad hoc basis;
- Assisting with the implementation, testing and maintenance of an effective Emergency Response Plan for all contractor and sub-contractor activities;
- Responding to workplace incidents (as appropriate);

- Participating in incident investigations;
- Maintaining accurate health and safety statistics (for the contractor and all sub-contractors), and compiling health and safety performance reports as required;
- Auditing the health and safety management system and workplace activities of the contractor and each sub-contractor on a monthly basis to assess compliance with the project health and safety requirements; and
- Tracking and reporting on the implementation of corrective actions (arising from incident investigations, audits, inspections, etc.).

The contractor must ensure that each Health and Safety Officer is adequately equipped to enable him to perform his duties effectively. Each Health and Safety Officer must be provided with the following:

- A computer with access to all necessary systems, including access to e-mail and the internet;
- A mobile telephone on contract or with adequate pre-paid airtime; and
- A vehicle where required or instructed by a nominated project management representative (depending on the size and location of the project site(s)).

A Health and Safety Officer must over and above the SACPCMP registration as an Officer; be computer literate, fluent in English, and must have the following minimum qualifications, training and experience:

- At least 5 years' experience as a Health and Safety Officer on construction projects;
- SAMTRAC,NEBOSH or an equivalent training course with accredited health and safety service provider as a minimum qualification ;
- Experience and appropriate training with regard to implementing and maintaining a health and safety management system compliant with national legislation or an international standard;
- Experience and appropriate training with regard to construction related hazard identification and risk management processes;
- Competence, experience and relevant training with regard to incident investigation procedures and causation analysis;
- Health and safety auditing experience and training;
- A valid First Aid certificate of competency;
- Fire prevention and protection training; and
- A valid Driving Licence (light motor vehicle).
- Registered as a Health and Safety Officer or Health and Safety Manager with SACPCMP depending on the size of the project and on the risk.

Before placing a Health and Safety Officer on the project site(s), the contractor must forward a copy of the person's CV to the nominated project management representative or to the Programme Health and Safety manager for review and acceptance. A proposed candidate may be rejected should he not meet the experience and / or qualification requirements, or due to poor work performance on previous projects.

10.3 Contractor Supervisors

The contractor must ensure that all project and / or construction works are supervised at all times by an adequate number of qualified, competent and appointed supervisors who have experience

in the type of work being carried out as required by Construction regulations of 2014, regulation 8(7).

No work may be carried out without an appointed supervisor being physically present in the work area and daily safety task instruction.

Each Contractor Supervisor shall be responsible for:

- Ensuring that all work carried out under his supervision is done so in accordance with the requirements of all applicable legislation, rules, standards, specifications, plans and procedures;
- Participating in Baseline and Task-Based Risk Assessments;
- Ensuring that all employees under his supervision are made aware of the hazards, risk scenarios and control measures identified in relevant risk assessments;
- Ensuring that the control measures stipulated in all relevant risk assessments are in place and are implemented fully for all work carried out under his supervision;
- Ensuring that all employees under his supervision conduct pre-task hazard assessments when necessary;
- Driving the achievement of health and safety objectives set for his team;
- Ensuring that the necessary written appointments are in place for each employee under his supervision (e.g. First aider, mobile crane operator, etc.);
- Ensuring that all employees under his supervision attend all required training;
- Ensuring that no employee carries out any work that he is not competent to perform or has not been appointed to perform;
- Identifying training needs within his team;
- Carrying out Safety Observations and Coaching (one per day);
- Conducting a weekly Toolbox Talk with his team;
- Leading a Daily Safe Task Instruction discussion with his team;
- Attending Health and Safety Meetings as required;
- Maintaining a Health and Safety Management Information Notice Board in the work area for which he is responsible;
- Recording, on a daily basis, a description of the day's activities as well as a breakdown (by occupation) of the personnel on site under his supervision (e.g. 5 bricklayers, 2 carpenters, 3 welders, 22 general workers, and 1 supervisor);
- Ensuring that all Safe Work Procedures applicable to the work carried out under his supervision are adhered to and are fully implemented;
- Maintaining discipline and taking the necessary action whenever an employee under his supervision does not adhere to a rule or requirement;
- Carrying out Planned Task Observations (one per day);
- Ensuring that emergency response procedures are understood by all employees under his supervision and that these procedures are followed in the event of an emergency;

- Reporting all incidents immediately, participating in incident investigations, communicating the lessons learnt to all employees under his supervision, and implementing corrective actions where required; and
- Carrying out workplace health and safety inspections.

Each supervisor must accept these responsibilities in writing as part of his appointment.

Each supervisor must be equipped with a mobile telephone to ensure that effective communication can be maintained for the duration of the contract.

10.4 Health and Safety Representatives

The team of employees on site must have a health and safety representative deployed on the project site(s), a Health and Safety Representative must be elected and appointed. Taking into consideration the number of employees deployed, the geographical area in which the work is taking place, the different work disciplines, and the shift pattern (if applicable), the contractor must ensure that an adequate number of Health and Safety Representatives (at a minimum ratio of one Health and Safety Representative per 50 employees) are elected and appointed to effectively represent all site personnel as required by the OHS Act 85 of 1993, section 17 - 18.

Each Health and Safety Representative must attend an accredited training course for health and safety representatives. The cost of this training shall be for the contractor's account.

The contractor must make the necessary allowances for the Health and Safety Representatives to carry out their duties as specified in the applicable legislation.

The contractor must ensure that an appropriate sticker is affixed to the safety helmet of each Health and Safety Representative for identification purposes.

10.5 First Aiders

If 10 or more employees are deployed on the project site(s), at least one trained and competent First Aider must be in place and must be appointed. Taking into consideration the number of employees deployed, the geographical area in which the work is taking place, the different work disciplines, and the shift pattern (if applicable), the contractor must ensure that an adequate number of First Aiders (at a minimum ratio of one First Aider per 50 employees) are in place and have been appointed to administer first aid treatment should this be required.

First Aid training must be done through an accredited training institution. The cost of this training shall be for the contractor's account.

The contractor must ensure that an appropriate sticker is affixed to the safety helmet of each First Aider for identification purposes.

10.6 Duties of Client

As per the Construction regulations of 2014, regulation 5(1) – (8) a client must—

- Prepare a baseline risk assessment for an intended construction work project;
- Prepare a suitable, sufficiently documented and coherent site specific health and safety specification for the intended construction work based on the baseline risk assessment contemplated in paragraph
- Provide the designer with the health and safety specification contemplated in paragraph (b);
- Ensure that the designer takes the prepared health and safety specification into consideration during the design stage;
- Ensure that the designer carries out all responsibilities contemplated in CR regulation 6;
- Include the health and safety specification in the tender documents;
- Ensure that potential principal contractors submitting tenders have made adequate provision for the cost of health and safety measures;

- Ensure that the principal contractor to be appointed has the necessary competencies and resources to carry out the construction work safely;
- Take reasonable steps to ensure co-operation between all contractors appointed by the client to enable each of those contractors to comply with these Regulations;
- Ensure before any work commences on a site that every principal contractor is registered and in good standing with the compensation fund or with a licensed compensation insurer as contemplated in the Compensation for Occupational Injuries and Diseases Act, 1993 (Act No. 130 of 1993);
- Appoint every principal contractor in writing for the project or part thereof on the construction site;
- Discuss and negotiate with the principal contractor the contents of the principal contractor's health and safety plan contemplated in CR regulation 7(1), and must thereafter finally approve that plan for implementation;
- Ensure that a copy of the principal contractor's health and safety plan is available on request to an employee, inspector or contractor;
- Take reasonable steps to ensure that each contractor's health and safety plan contemplated in
- CR Regulation 7(1)(a) is implemented and maintained;
- Ensure that periodic health and safety audits and document verification are conducted at intervals mutually agreed upon between the principal contractor and any contractor, but at least once every 30 days;
- Ensure that a copy of the health and safety audit report contemplated in paragraph (o) is provided to the principal contractor within seven days after the audit;
- Stop any contractor from executing a construction activity which poses a threat to the ensure that a copy of the health and safety audit report contemplated in paragraph (o) is provided to the principal contractor within seven days after the audit;
- Stop any contractor from executing a construction activity which poses a threat to the health and safety of persons which is not in accordance with the client's health and safety specifications and the principal contractor's health and safety plan for the site;
- Where changes are brought about to the design or construction work, make sufficient health and safety information and appropriate resources available to the principal contractor to execute the work safely; and
- Ensure that the health and safety file contemplated in CR regulation 7(1) (b) is kept and maintained by the Principal contractor.

Where a client requires additional work to be performed as a result of a design change or an error in Construction due to the actions of the client, the client must ensure that sufficient safety information and appropriate additional resources are available to execute the required work safely.
Where a fatality or permanent disabling injury occurs on a construction site, the client must ensure that the contractor provides the provincial director with a report contemplated in section 24 of the Act, in accordance with regulations 8 and 9 of the General Administrative Regulations, 2013, and that the report includes the measures that the contractor intends to implement to ensure a safe construction site as far as is reasonably practicable.

Where more than one principal contractor is appointed as contemplated in sub-regulation CR 5(1) (k), the client must take reasonable steps to ensure co-operation between all principal contactors and Contractors in order to ensure compliance with these Regulations.

Where a construction work permit is required as contemplated in CR 3(1), the client must, without derogating from his or her health and safety responsibilities or liabilities, appoint

a competent person in writing as an agent to act as his or her representative, and where such an appointment is made the duties that are imposed by these Regulations upon a client, apply as far as reasonably practicable to the agent so appointed.

Were notification of construction work is required as contemplated in CR regulation 4(1), the client may, without derogating from his or her health and safety responsibilities or liabilities, appoint a competent person in writing as an agent to act as his or her representative, and where such an appointment is made the duties that are imposed by these Regulations upon a client, apply as far as reasonably practicable to the agent so appointed: Provided that, where the question arises as to whether an Agent is necessary, the decision of an inspector is decisive.

An agent contemplated in CR sub-regulations (5) and (6) must—
Manage the health and safety on a construction project for the client; and
Be registered with a statutory body approved by the Chief Inspector as qualified to perform the required functions;

When the chief inspector has approved a statutory body as contemplated in CR sub-regulation (7) (b), he or she must give notice of that approval in the Gazette.

10.7 Duties of the Designer

As per the Construction regulations of 2014, regulation 6(1) – (2) a designer must –

- Ensure that the applicable safety standards incorporated into these Regulations under section 44 of the Act are compiled within the design;
- Take into consideration the health and safety specification submitted by the client;
- Before the contract is put out to tender, make available in a report to the client—
- All relevant health and safety information about the design of the relevant structure that may affect the pricing of the construction work;
- The geotechnical-science aspects, where appropriate; and
- The loading that the structure is designed to withstand;
- Inform the client in writing of any known or anticipated dangers or hazards relating to the construction work, and make available all relevant information required for the safe execution of the work upon being designed or when the design is subsequently altered;
- When modifying the design or substituting materials; take into account the hazards relating to any subsequent maintenance of the relevant structure and must make provision in the design for that work to be performed to minimize the risk;
- When mandated by the client to do so, carry out the necessary inspections at appropriate stages to verify that the construction of the relevant structure is carried out in accordance with his design: Provided that if the designer is not so mandated, the client's appointed agent in this regard is responsible to carry out such inspections;
- When mandated stop any contractor from executing any construction work which is not in accordance with the relevant design's health and safety aspects: Provided that if the designer is not so mandated, the client's appointed agent in that regard must stop that contractor from executing that construction work;
- When mandated in his or her final inspection of the completed structure in accordance with the National Building Regulations, include the health and safety aspects of the structure as far as reasonably practicable, declare the structure safe for use, and issue a completion certificate to the client and a copy thereof to the contractor; and
- During the design stage, take cognisance of ergonomic design principles in order to minimize ergonomic related hazards in all phases of the life cycle of a structure.

The designer of temporary works must ensure that -

- All temporary works are adequately designed so that it will be capable of supporting all anticipated vertical and lateral loads that may be applied;
- The designs of temporary works are done with close reference to the structural;
- The designs of temporary works are done with close reference to the structural design drawings issued by the contractor, and in the event of any uncertainty consult the contractor;
- All drawings and calculations pertaining to the design of temporary works are kept at the office of the temporary works designer and are made available on request by an inspector; and
- The loads caused by the temporary works and any imposed loads are clearly indicated in the design.

10.8 Duties of Principal Contractor

As per the Construction regulations of 2014, regulation 7(1) – (8) a Principal Contractor and Contractor must

- Provide and demonstrate to the client a suitable, sufficiently documented and coherent site specific health and safety plan, based on the client's documented health and safety specifications contemplated in CR 5(1)(b), which plan must be applied from the date of commencement of and for the duration of the construction work and which must be reviewed and updated by the principal contractor as work progresses;
- Open and keep on site a health and safety file, which must include all documentation required in terms of the Act and these Regulations, which must be made available on request to an inspector, the client, the client's agent or a contractor; and
- On appointing any other contractor, in order to ensure compliance with the provisions of the Act-
- Provide contractors who are tendering to perform construction work for the principal contractor, with the relevant sections of the health and safety specifications contemplated in CR regulation 5(1)(b) pertaining to the construction work which has to be performed;
- Ensure that potential contractors submitting tenders have made sufficient provision for health and safety measures during the construction process;
- Ensure that no contractor is appointed to perform construction work unless the principal contractor is reasonably satisfied that the contractor that he or she intends to appoint, has the necessary competencies and resources to perform the construction work safely;
- Ensure prior to work commencing on the site that every contractor is registered and in good standing with the compensation fund or with a licensed compensation insurer as contemplated in the Compensation for Occupational Injuries and Diseases Act, 1993;
- Appoint each contractor in writing for the part of the project on the construction site
- Ensure that a copy of his or her health and safety plan contemplated in paragraph (a),
- As well as the contractor's health and safety plan contemplated in CR 7 sub-regulation (2)(a), is available on request to an employee, an inspector, a contractor, the client or the client's agent;
- Hand over a consolidated health and safety file to the client upon completion of the construction work and must, in addition to the documentation referred to in CR 7 sub-regulation (2)(b), include a record of all drawings, designs, materials used and other similar information concerning the completed structure;

- In addition to the documentation required in the health and safety file in terms of paragraph (c)(v) and CR 7 sub-regulation (2)(b), include and make available a comprehensive and updated list of all the contractors on site accountable to the principal contractor, the agreements between the parties and the type of work being

principal contractor, the agreements between the parties and the type of work being done; and

- Ensure that all his or her employees have a valid medical certificate of fitness specific to the Construction work to be performed and issued by an occupational health practitioner in the form of Annexure 3.

10.9 Duties of Contractor

A contractor must -

- Prior to performing any construction work provide and demonstrate to the principal contractor a suitable and sufficiently documented health and safety plan, based on the relevant sections of the client's health and safety specification) and provided by the principal contractor), which plan must be applied from the date of commencement of and for the duration of the construction work and which must be reviewed and updated by the contractor as work progresses;
- Open and keep on site a health and safety file, which must include all documentation required and must be made available on request to an inspector, the client, the client's agent or the principal contractor;
- Before appointing another contractor to perform construction work be reasonably satisfied that the contractor that he or she intends to appoint has the necessary competencies and resources to perform the construction work safely;
- Co-operate with the principal contractor as far as is necessary to enable each of them to comply with the provisions of the Act; and
- As far as is reasonably practicable, promptly provide the principal contractor with any information which might affect the health and safety of any person at work carrying out construction work on the site, any person who might be affected by the work of such a person at work, or which might justify a review of the health and safety plan.

Where a contractor appoints another contractor to perform construction work, the duties that apply to the principal contractor apply to the contractor as if he or she were the principal contractor.

A contractor must take reasonable steps to ensure co-operation between all contractors appointed by the principal contractor to enable each of those contractors to comply with these Regulations.

No contractor may allow or permit any employee or person to enter any site, unless that employee or person has undergone health and safety induction training pertaining to the hazards prevalent on the site at the time of entry.

A contractor must ensure that all visitors to a construction site undergo health and A contractor must ensure that all visitors to a construction site undergo health and safety induction pertaining to the hazards prevalent on the site and must ensure that such visitors have the necessary personal protective equipment.

A contractor must at all times keep on his or her construction site records of the health and safety induction training and such records must be made available on request to an inspector, the client, the client's agent or the principal contractor;.

A contractor must ensure that all his or her employees have a valid medical certificate of fitness specific to the construction work to be performed and issued by an occupational health practitioner in the form of Annexure 3.

10.10 Management and supervision of Construction work

A principal contractor must in writing appoint one full-time competent person as the construction manager with the duty of managing all the construction work on a single site, including the duty of ensuring occupational health and safety compliance, and in the absence of the construction manager an alternate must be appointed by the principal contractor.

A principal contractor must upon having considered the size of the project, in writing appoint one or more assistant construction managers for different sections thereof: Provided that the designation of any such person does not relieve the construction manager of any personal accountability for failing in his or her management duties in terms of this regulation.

Where the construction manager has not appointed assistant construction managers as in the opinion of an inspector, a sufficient number of such assistant construction managers have not been appointed, that inspector must direct the construction manager in writing to appoint the number of assistant construction managers indicated by the inspector,

No construction manager appointed may manage any construction work on or in any construction site other than the site in respect of which he or she has been appointed.

A contractor must, after consultation with the client and having considered the size of the project, the degree of danger likely to be encountered or the accumulation of hazards or risks on the site, appoint a full-time or part-time construction health and safety officer in writing to assist in the control of all health and safety related aspects on the site: Provided that, where the question arises as to whether a construction health and safety officer is necessary, the decision of an inspector is decisive.

No contractor may appoint a construction health and safety officer to assist in the control of health and safety related aspects on the site unless he or she is reasonably satisfied that the construction health and safety officer that he or she intends to appoint is registered with a statutory body approved by the Chief Inspector and has necessary competencies and resources to assist the contractor

A construction manager must in writing appoint construction supervisors responsible for construction activities and ensuring occupational health and safety compliance on the construction site.

A contractor must, upon having considered the size of the project, in writing appoint one or more competent employees for different sections thereof to assist the construction supervisor and every such employee has, to the extent clearly defined by the contractor in the letter of appointment, the same duties as the construction supervisor: Provided that the designation of any such employee does not relieve the construction supervisor of any personal accountability for failing in his or her supervisory duties in terms of this regulation.

No construction supervisor appointed under may supervise any construction work on or in any construction site other than the site in respect of which he or she has been appointed: Provided that if a sufficient number of competent employees have been appropriately designated on all the relevant construction sites, the appointed construction supervisor may supervise more than one site.

10.11 Construction Health and Safety Agent

A Construction Health and Safety Agent, based on their experience, knowledge and capabilities, as prescribed in the registration requirements for the Construction Health

and Safety Agent. A person will obtain registration once they have submitted the required documentation and met the registration criteria in full.
Construction Health and Safety Agent an applicant must provide proof of:

- Recognized and appropriate health and safety qualifications
- Relevant experience in the health and safety industry, with specific detail on construction experience
- Knowledge, skill and experience by attending and passing a professional interview
- Registration letter with SACPCMP

A Construction Health and Safety Agent is required to comply with the Continuing Professional Development (CPD) Policy Framework. A Construction Health and Safety Agent shall be expected to demonstrate detailed knowledge of health and safety requirements at all levels, with the capability to design, compile, implement and manage the health and safety requirements for a construction project from Initiation and Briefing to Project Close-out. A Construction Health and Safety Agent shall also be required to show ability to mentor, coach and guide Construction Health and Safety Managers and Construction Health and Safety Officers.

Construction project health and safety management systems.

A Construction Health and Safety Agent is expected to be experienced and knowledgeable in:

- Identifying and developing an appropriate health and safety legal framework for a construction project
- Principles of cause and effect analysis and its application to hazard identification and risk management on a construction project
- Identifying leading construction health and safety practice and applying such to a construction project
- Construction project health and safety risk profiling
- Designing and developing a construction project health and safety management system
- Construction project health and safety policy and standards
- Design risk management

10.12 Operational legal appointment letters

The contractor must ensure other legal appointment letter are compiled and be submitted with the Contractor compliance plan, below is some appointment required as per the legislation, the appointment letters varies based on the project;

- OHSA Sec 16(2)
- Sec 17,18,19 SHE Representative
- GSR 3(4) First Aider
- GAR 9(2) Incident investigator
- GMR 2(1) Supervisor of machinery
- GMR 2(7) Assistant Supervisor of machinery
- CR 4(1)(c) Principal Contractor
- CR 8(1) Construction Manager
- CR 8(2) Assistant Construction Manager
- CR 8(7) Construction Supervisor
- CR 8(8) Assistant Supervisor of construction work
- CR 8(5) Construction Health and Safety Officer
- CR 9(1) Construction Risk Assessor

- CR 10(1)(a),(b) Fall protection plan
- Developer
- CR 10(2)(d) Inspector of fall arrest system
- CR 14(2) Scaffolding Supervisor
- DMR 17(2),18 Inspector of lifting machinery
- CR17(8) Material hoist Inspector
- CR 19(2)(g)(i) Explosive powered tool issuer
- CR 23(1)(k) Construction vehicle and mobile plant Inspector
- CR 24(d) Temporary Electrical Installation Controller
- CR 24(e) Temporary Electrical Installation Inspector
- CR 28(a) Stacking and storage Supervisor
- CR 29(h) Fire extinguisher inspector
- EMR 8(8) Appointment for electrical installation in hazardous location- Master Electrician (Inspector)
- EIR 9 Installation Electrician appointment

11. Safety Agents in Project Stages

The safety agent, must be involved in all stages of project management and take charge of all the health and safety related matters.

11.1 Stage 1 – Project Initiation and Briefing

The deliverables at this stage shall include agreeing client requirements and preferences, assessing user needs and options, appointment of necessary consultants in establishing project brief, objections, priorities, constraints, assumptions and strategies in consultation with client.

Standard Services:

- Demonstrate the Construction Health and Safety Agent competency and resource;
- Assist in developing a clear construction project health and safety brief;
- Attend the construction project initiation meetings;
- Conclude the terms of the agreement with the client;
- Advise on the necessary surveys, analyses, tests and site or other investigations where such information will be required for the next stage of the project;
- Advise the client on the adequacy of health and safety competency and resources of the other consultants
- Identify construction project health and safety risk profile
- Provide necessary information within the agreed scope of the construction project to the other consultants;
- Define the Construction Health and Safety Agent scope of work and services;

11.2 Stage 2 – Concept and Feasibility

Finalisation of the project concept and feasibility.

Standard Services:

- Agree the documentation programme with the principal consultant and other consultants
- Attend design and consultants meetings;
- Review and evaluate design concepts and advise on construction project health and safety in conjunction with the other consultants;

- Review, update and agree the construction project health and safety risk profile and prepare the construction health and safety policy for the construction project;
- Advise on preliminary cost estimates/budgets for construction project health and safety
- Prepare draft construction project baseline risk assessment;
- Assist the client and principal consultant in the procurement of the necessary and appropriate specialists, including a clear definition of their roles, responsibilities and liabilities;
- Advise the client on the adequacy of the health and safety competency and resources of the appropriate specialists;
- Assess and approve the appropriate specialists health and safety plans;
- Monitor the implementation of the appropriate specialists health and safety plans, including periodic audits;
- Prepare the draft construction project health and safety specification;
- Agree the format and procedures for health, safety and hygiene construction project control
- Advise and agree with the other consultants regarding their construction project health and safety requirements and related design risk management responsibilities;
- Liaise, co-operate and provide necessary information to the client/principal consultant and the other consultants;

Construction Health and Safety Agent Deliverables

- Updated construction project health and safety risk profile;
- Agreed construction project health and safety policy for the project;
- Draft construction project baseline risk assessment;
- Draft construction project health and safety specification;
- Record of appropriate specialists health and safety competency and resource assessments;
- Schedule of required surveys, tests and other investigations and related reports;
- Record of construction project health and safety risk communication;
- Design risk management process;
- Preliminary cost estimates/budgets for construction project health and safety;
- Approved specialists health and safety plans;
- Specialists health and safety audit reports and records;

11.3 Stage 3 – Design Development

Manage, coordinate and integrate the detail design development process within the project scope, time, cost and quality parameters.

Standard Services

- Review the documentation programme with the principal consultant and the other consultants
- Attend design and consultants meetings;
- Finalise the construction project health and safety risk profile;
- Advise designers of their health and safety legal liabilities and responsibilities for constructability, maintainability and operation ability of the structure;
- Manage, co-ordinate, integrate and record the design risk management process with the other consultants in a sequence to suit the documentation programme;
- Monitor the integration of health and safety aspects for constructability, maintainability and operation ability of the structure during the design process and finalise the construction project baseline risk assessment;

- Identify and implement precautions necessary for construction project health and safety control and update the construction project tender health and safety specifications;
- Agree on a format for the health and safety file;
- Assess and approve necessary construction project health and safety plans for early works;
- Monitor the implementation of necessary construction health and safety plans, including periodic audits for early works;
- Assist the cost consultant with detailed information for initial construction project health and safety cost estimates/budgets;
- Liaise, co-operate and provide necessary construction project health and safety information to the client, principal consultant and the other consultants;
- Construction Health and Safety Agent Deliverables;
- Final construction project health and safety risk profile
- Record of construction project health and safety risk communication;
- Final construction project health and safety baseline risk assessment;
- Updated draft construction project health and safety specification;
- Design risk management records;
- Schedule of precautions necessary for construction project health, safety and hygiene control;
- Approved early works health and safety plans;
- Early works audit reports and records;
- Initial schedule of construction project health and safety cost estimates/budgets;
- Template for health and safety file.

11.4 Stage 4 - Tender Documentation and Procurement

The process of establishing and implementing procurement strategies and procedures, including the preparation of necessary documentation for effective and timeous execution of the project.

Standard Services

- Attend design and consultants meetings;
- Assist in developing a clear construction project health and safety procurement process;
- Finalise construction project tender health and safety specifications and integrate with procurement documentation;
- Provide and record construction project health, safety, hygiene and design risk information to the principal consultant and other consultants;
- Prepare construction project health and safety documentation for submission to authorities;
- Participate in construction project tender clarification meetings;
- Assist with the evaluation of tenders and verify the contractors competencies, knowledge and resources to carry out the construction works in a safe and healthy manner;
- Assist the cost consultant in the finalisation of the construction project health and safety cost estimate/budget;
- Assist with the preparation of contract documentation for signature;
- Prepare construction project health and safety mobilisation and access plans for the construction work;
- Assess samples, mock-ups and products for construction project, structural maintainability and operability health and safety compliance.

Construction Health and Safety Agent Deliverables

- Final construction project tender health and safety specifications;

- Records of construction project health and safety procurement process;
- Construction project health and safety tender evaluation and records;
- Finalised schedule of construction project health and safety cost estimate/budget;
- Construction project health and safety contract documentation;
- Construction project health and safety mobilisation and access plans;
- Design risk management records;
- Record of construction project health and safety risk;
- Construction project health and safety documentation for authorities;
- Evaluation schedule of samples/mock-ups and products.

11.5 Stage 5 - Construction Documentation and Management

The management and administration of the construction contracts and processes, including the preparation and coordination of the necessary documentation to facilitate effective execution of the works

Standard Services

- Assess, discuss, negotiate and approve the contractor(s) construction project health and safety plans;
- Submit necessary construction health and safety documentation to authorities and facilitate permits that may be required to commence the construction work;
- Attend site handover meetings and lead construction project health and safety mobilisation and access plans;
- Attend regular site, technical and progress meetings;
- Prepare revised construction project health and safety risk profile, specifications and cost estimates/budgets where there is scope of work changes;
- Monitor the implementation of the construction project health and safety plans in accordance with the construction project health and safety specification and further scope of work changes and recommend stop work orders where necessary;
- Monitor design risk management;
- Perform incident and accident investigations where necessary;
- Audit compliance with the construction project health and safety plans and brief the project management team and contractor(s) following site audits;
- Conduct construction health and safety management system audits;
- Facilitate construction health and safety system and plans reviews for continual improvement;
- Monitor the compilation of the construction project health and safety file by the contractor(s)
- Prepare and maintain the consolidated health and safety file;
- Prepare the structure commissioning health and safety plans.

Construction Health and Safety Agent Deliverables

- Approved contractor(s) construction project health and safety plans, including all construction health and safety appointments;
- Permits to commence construction work;
- Record of meetings, including all construction health and safety matters to be actioned;

- Record of revised changes to the construction project health and safety risk profiles;
- Record of revised changes to the construction project health and safety specifications;
- Record of revised changes and commissioning of the construction project health and safety plans;
- Record of revised construction project health and safety cost estimate/budget;
- Records of design risk management;
- Record of construction project health and safety audit reports;
- Record of contractor(s) construction health and safety performance;
- Record of construction project health and safety work stoppage reports;
- Record of incident and accident investigations and corrective actions;
- Record of interactions with the Compensation Commissioner or similar;
- Record of construction health and safety system and plans reviews;
- Record of construction project health and safety risk communication;
- Interim health and safety file;
- Structure commissioning health and safety plans.

11.6 Stage 6 - Project Close - Out

The process of managing and administering the project close out, including preparation and co – ordination of the necessary documentation to facilitate the effective operation of the project.

Standard Services

- Review, discuss and approve the health and safety file with the contractor(s) and manage the construction project health and safety during the defects liability period;
- Cancel all construction project health and safety legal appointments;
- Prepare the health and safety operations and maintenance report;
- Prepare the consolidated construction project health and safety close - out report;
- Construction Health and Safety Agent Deliverables;
- Record of audits during the defects liability period;
- Record of construction health and safety risk communication;
- Report on approved health and safety file;
- Health and safety operations and maintenance report;
- Consolidated construction project health and safety close-out report;

11.7 Additional Related Services

- Provide advice to the Client on health and safety competence and resources of up to [number] proposed designers prior to arrangements being made for design work to begin.
- Prepare [number] additional copies of the health and safety file.
- Prepare [number] copies of abstracts of the health and safety file for delivery to tenants by the Client/Owner's (The contents of the abstracts to be determined in consultation with the Client/Owner's legal advisors).
- Seek the co - operation of and co – operate with anyone else involved in a construction project at an adjoining site so far as necessary to enable them to perform their duties under the Construction Regulations.
- Facilitate co – operation and co – ordination in relation to duty holders on adjoining construction sites as it may affect the project; ensuring that suitable arrangements are made and implemented for the co – ordination of health and safety measures during planning and preparation for the construction phase.

- Keep a record of the health and safety file.
- Convert the health and safety files on other projects to match Client/ Owner's electronic format.
- Carry out necessary inspections at the appropriate stages to verify that the construction of the relevant structure is carried out in accordance with the design.
- To stop any contractor from executing any construction work that is not in accordance with the relevant design's health and safety aspects.
- Assist in the development of maintenance schedules for the Client/Owners completed structure.
- Inspect the structure on behalf of the Client/Owner once every six (6) months for the first two (2) years on completion of the structure and then yearly thereafter, to ensure the structure remains safe for continued use and records are kept of such in the structures health and safety file.

12. Competence, Training and Awareness

Each employee (including sub-contractor employees) must be suitably trained and competent, and must understand the health and safety hazards, risks and control measures associated with his work as required by the OHS Act 85 of 1993,(14)

The contractor must implement systems and procedures to ensure that:

- The necessary competencies required by employees are identified (by occupation), along with selection, placement and any training requirements;

Please Note: Specific competency profiles and selection criteria (fitness for work) must be developed for all roles where significant health or safety risk exists.

Please Note: A formal training needs analysis must be carried out based on the competency profiles and a training matrix must be developed for the project.

Roles requiring technical certification, registration or licensing are identified and documented, and these roles are filled only by suitably qualified personnel;

- Minimum core health and safety skills required by employees in leadership and supervisory roles are identified and suitable training is provided including hazard identification and risk assessment, incident investigation, and health and safety interactions (i.e. Observation and coaching techniques);
- Competency-based training is provided and it includes operational controls (procedures and work instructions), management of change, and emergency response;
- All employees hold and maintain the required competencies (including appropriate qualifications, certificates and licences) and are under competent supervision;
- A site-specific induction and orientation programme that highlights health and safety requirements, procedures, and significant hazards, risks and associated control measures is in place for all new employees and visitors (understanding must be assessed);
- Personnel are trained and / or briefed on new or amended standards, rules, safe work procedures, risk assessments, etc.;
- Refresher training is carried out as required (e.g. Re-induction following an absence from site);
- Records of education, qualifications, training, experience and competency assessments are maintained on site for all employees; and
- The effectiveness of training is reviewed and evaluated.

Prior to the commencement of any work, including mobilisation and site set-up activities, the contractor must provide, to the satisfaction of the nominated project management representative, current documentation verifying that the contractor's employees, as well as the employees of any appointed sub-contractors, are competent and have the necessary qualifications, certificates, licences, job skills, training and experience (as required by this specification and applicable legislation) to safely carry out the work that is to be performed.

The Contractor and sub-contractor must ensure that the following training takes place:

- health and safety induction training pertaining to the hazards prevalent on the site at the time of entry
- training for all persons required to erect, move or dismantle temporary works structures and instruction to perform those operations safely
- training of employees working from a fall risk position
- training to work or to be suspended on a platform which includes at least:
    - how to access and egress the suspended platform safely;
    - how to correctly operate the controls and safety devices of the equipment;
    - information on the dangers related to the misuse of safety devices; and
    - information on the procedures to be followed in the case of-
        - an emergency;
        - the malfunctioning of equipment; and
        - the discovery of a suspected defect in the equipment;
        - an instructions on the proper use of body harnesses.

- Training for all operators of construction vehicles and mobile plant.

A contractor must at all times keep on his or her construction site records of the health and safety induction training and such records must be made available on request to an inspector, the client, the client's agent or the principal contractor;.

Please Note: Only certified copies of certificates, licences, etc. Will be accepted.

An Employee Profile (dossier) must be completed for each employee who will be performing work on site. All documentation pertaining to an employee's competence (i.e. certified copies of qualifications, certificates and licences as well as proof of job skills, training and experience) must be maintained in this dossier.

If it is determined through observation that an employee is not yet competent to carry out a particular task in a safe and capable manner, the employee will be required to cease work immediately and must either be reassigned or be retrained at the contractor's expense.

The contractor must provide proof that the training institutions and trainers that are used are appropriately registered with a governing authority (a trainer's registration certificate or registration number alone will not be adequate). The following must be made available for verification purposes:

- Proof of registration of the training institution including the training programmes that the institution is accredited to provide; and

- For each trainer, proof of competency and registration for the specific training programmes presented.

Foreign qualifications held by employees in health and safety critical roles must be verified against the requirements of local legislation.

12.1 Induction Training

Each employee must attend all mandatory Induction Training applicable to the project. No employee will be permitted to enter any project work site until he has attended this training. Each employee must carry proof that he has completed the induction training and may be removed from a site if such proof cannot be produced on request, this as required by the Construction regulations of 2014, regulation 7(5).

Furthermore, employees must attend (where applicable) Area-Specific Training pertaining to the particular hazards identified in the area(s) where the employees will be working. No employee will be permitted to enter a work area until he has attended the relevant area-specific training.

All visitors must receive a visitor induction briefing before entering any project work site. However, this induction does not permit a visitor to enter a site unescorted. Visitors must be accompanied at all times by an appropriately senior employee who has been fully inducted.

12.2 Specific Training and Competency Requirements

The following specific training and competency requirements must be complied with.

Please Note: An employee must be trained, assessed and found competent before he will be given authorisation to perform certain tasks or fill certain roles.

Table 11-1: Specific Training and Competency Requirements

Training	Applicable To
Health and Safety Induction	All employees
Safety Observations and Coaching (Safety Interactions)	All employees
Risk Assessment	All managers and supervisors
Incident Investigation	All managers and supervisors
Safety Leadership	All managers and supervisors
Legal Liability*	All managers and supervisors
Health and Safety Rep*	All elected Health and Safety Representatives
First Aid Levels 1, 2 and 3*	All nominated First Aiders
Fire Fighting (Fire Extinguisher Use)*	All employees
Working at Height*	All employees using a safety harness
Confined Spaces	All Confined Space Entry Officers and Standby Persons
Permit to Work	All Authorised Persons (i.e. Permit issuers) and all Applicants (i.e. Employees who will be applying for permits)
Isolation and Lockout	All Authorised Persons (i.e. Persons who authorise work that requires Isolation and Lockout), all Isolation Officers, and all Applicants (i.e. Persons who request permission to work on systems or equipment requiring Isolation and Lockout)

Training	Applicable To
Defensive Driving*	All drivers of light motor vehicles (for work purposes)
Gravel Road Driving*	All drivers of light motor vehicles driven on gravel roads (for work purposes)
Off Road Driving*	All drivers of four-wheel drive vehicles driven off road (for work purposes)
Mobile Equipment Site Licence	All mobile equipment operators

Training requirements marked with an * must be arranged through accredited external training institutions by the contractor. All other training will be provided by Transnet.

13. Communication, Participation and Consultation

The contractor must establish and maintain effective communication and consultative processes (allowing for a two-way dialogue) for the duration of the project to ensure that:

- All personnel are kept up to date with regard to health and safety matters (e.g. Hazards and risks, incidents and lessons learnt, leading practices, performance against objectives, etc.);
- General health and safety awareness levels are kept high;
- Prompt feedback is given to personnel with regard to health and safety issues or concerns that they raise; and
- Relevant, and often critical, health and safety related information (e.g. Design changes, instructions, reporting of hazardous conditions or situations, etc.) Is effectively disseminated.

This must be achieved as follows:

conditions.

13.1 Toolbox Talks

The contractor must prepare a Toolbox Talk on a weekly basis and must share it with all personnel for which the contractor is responsible (including all sub-contractors). Toolbox Talks must address health and safety issues that are relevant to the work performed on the project site(s) and must include information and / or knowledge sharing, lessons learnt from incidents that have occurred, information concerning specific hazards and / or risks and control measures to prevent injury, etc.

Attendance records must be kept and maintained in the contractor's health and safety file.

13.2 Daily Safe Task Instructions (DSTI's)

A Daily Safe Task Instruction (DSTI) is a pre-start discussion amongst the members of a work team, led by the appointed supervisor, aimed at anticipating hazards and potential risks associated with the activities planned for the day or shift, and ensuring that the necessary control measures are in place to prevent incidents.

At the start of each day or shift, prior to the start of any work, each appointed supervisor must inspect the work area for which he is responsible and ensure that it is safe. He must then conduct a DSTI with his work team specifically concerning the tasks that they will be performing during the course of the day or shift. The relevant Task-Based Risk Assessment for the activity must be used as the basis for the discussion. The correct work method must be reiterated and the identified hazards, risks and control measures must be

discussed with the team (each team member must be given the opportunity to contribute and participate in the discussion).

Any team member arriving late must first be taken through the information that was discussed (work method, hazards, risks and control measures) before being permitted to start working. If the work method changes after activities have already begun, the DSTI must be revisited and updated with the team, and the changes must be signed off by the relevant Contractor Health and Safety Officer.

Every member of the work team must sign the DSTI attendance register. The attendance records must be kept and maintained in the contractor's health and safety file.

The contractor's Health and Safety Officer must evaluate the content of the DSTI's daily to ensure that they are task-specific. Furthermore, the Health and Safety Officer must attend at least one DSTI per day prior to the start of work. The Health and Safety Officer may not lead the DSTI discussions, as this is the responsibility of the appointed supervisor.

13.3 Suggestions

All employees must be encouraged to submit suggestions to enhance health and safety management on the project site(s). A process must be in place for documenting, evaluating, implementing (as appropriate), archiving and recognising the improvement ideas.

13.4 Meetings

13.5.1 Contractor health and safety (OHS Act Section 19)

The contractor must schedule and consistently hold monthly health and safety meetings. These meetings must be chaired by the contractor's Project Manager and the following persons must be in attendance:

- Contractor and sub-contractor management representatives;
- Contractor and sub-contractor supervisors;
- Contractor and sub-contractor appointed Health and Safety (Employee) Representatives;
- Contractor and sub-contractor Health and Safety Officers; and
- The relevant Project Health and Safety Advisor.

The meeting must address the following as a minimum:

- New incidents for the period and corrective actions taken or to be taken;
- Implementation status of outstanding actions associated with previous incidents;
- SOC's, PTO's and DSTI's carried out for the period and action required to correct trends identified;
- Results of any audits, inspections (including H&S Rep inspections) or site visits carried out;
- A look ahead to ensure that appropriate health and safety planning and preparation is done for upcoming work;
- Risk Assessments, Safe Work Procedures, etc. That are outstanding or due for review (as well as the quality of these documents); and
- Any other health and safety related matter.

The contractor must compile minutes of each meeting and attendance records must be kept. These records must be maintained in the contractor's health and safety file.

13.5.2 Site Meetings

In addition to the Contractor Meetings, the Project will schedule monthly Site Meetings that the contractor must attend. These meetings will be chaired by the Contract Manager and the following persons must be in attendance:

- Contractor management representatives;
- Contractor Health and Safety Officers;
- Contractor Environmental Officer
- Contractor Quality Management
- The Project Health and Safety Manager;
- Project Health and Safety Advisors; and
- Client representatives (ad hoc).

The meeting will address the following as a minimum:

- Feedback from the contractor concerning health and safety performance for the period;
- New incidents for the period and corrective actions taken or to be taken;
- Implementation status of outstanding actions associated with previous incidents;
- SOC's, PTO's and DSTI's carried out for the period and action required to correct trends identified;
- Results of any audits, inspections or site visits carried out;
- A look ahead to ensure that appropriate health and safety planning and preparation
  Is done for upcoming work;
- Risk Assessments, Safe Work Procedures, etc. That are outstanding or due for review (as well as the quality of these documents); and
- Any other health and safety related matter.

13.5 Performance Boards

The contractor must provide and maintain a Performance Board to be approved by the nominated project management representative and to be positioned at the entrance to the contractor's site office area. This board must display the following information as a minimum:

- The contractor's logo;
- Current manpower (heads) on site;
- Man-hours worked for the current month and project to date;
- Lost Time Injury Frequency Rate (LTIFR);
- Dates of last injuries (FAI, MTI and LTI);
- Number of hours worked since the last recorded LTI; and
- Names and contact telephone numbers for the appointed Project Manager and the Health and Safety Officers.

13.6 Management Information Notice Boards

The contractor must provide, for each appointed supervisor, a portable Health and Safety Management Information Notice Board to be placed in the work area. The following information and documentation, as a minimum, must be posted on these boards:

- The relevant Method Statements, Risk Assessments and Safe Work Procedures for the work that is being performed that day;
- The DSTI for the day;
- The most recent Toolbox Talk;
- Where applicable, all required permits and permissions for the work that is being performed;

- Material Safety Data Sheets (MSDS's) for any chemical substances being used;
- The health and safety objectives for the work team;
- Details of the last incident involving the work team;
- The most recent weekly health and safety report (refer to Section 20);
- Emergency procedures;
- A site plan indicating evacuation routes and emergency assembly point locations;
- First Aider names and contact telephone numbers; and
- The appointed supervisor's contact details.

13.7 Involvement (Other)

The participation of all contractor (and sub-contractor) employees in activities that promote improvements in health and safety performance must be encouraged. In particular, this must include their appropriate involvement in:

- Hazard identification, risk analysis and determining control measures;
- Incident investigation; and
- Reviewing policy and objectives.

All regulations, instructions, signage, etc. Must be communicated in a language understood by all employees.

Health and safety personnel must be actively involved in planning activities so that they have the opportunity to highlight hazards and risks associated with upcoming work well in advance to ensure sufficient time to arrange and / or implement the necessary control measures.

14. Documentation and Document Control

The contractor must develop and maintain project-specific documentation required for the effective management of health and safety on the project.

All documents related to the contractor's health and safety management system must be effectively controlled.

The document control process must:

- Provide for the review, revision and version control of documents;
- Uniquely identify documents (as appropriate) to control their use and function;
- Require approval of the documents for adequacy prior to issue;
- Clearly identify changes and record the status of any revisions to documents; and
- Provide for the effective distribution of documents to, and where necessary the timely removal of obsolete documents from, all points of issue and use.

The contractor must establish a process for the systematic control of health and safety records and related data. Controls must be in place for the creation, receipt, secure storage, maintenance, accessing, use and disposal of such records and data.

Each record must be legible, identifiable and traceable, and must contain adequate information and data for its purpose.

The confidentiality and security of records and data must be maintained in a manner that is appropriate for the nature of the records and data, and in accordance with any applicable data or privacy protection legislation.

Personal information originating

From medical surveillance and occupational hygiene monitoring must be reported in a form that respects the privacy of the individual, but enables management to fulfil their

duty of care obligations to employees. The names of individuals must not be disclosed without their written authorisation.

Retention periods for all records (based on legal requirements and / or knowledge preservation considerations) must be established and documented in accordance with applicable legislation.

14.1 Contractor compliance File Requirements

The contractor must compile and maintain a file containing all necessary compliance related documentation. The client should provide construction work permit and to be kept on site at all times. The contents of the file will be audited by a Project SHE Advisor on a monthly basis.
Required documentation includes, but is not limited to, the following:

- Letter of Good Standing from the Workman's Compensation Commissioner (where applicable) must have dol stamp;
- Proof of Public Liability Insurance;
- Scope of Work under the contract;
- List of Contacts and their Telephone Numbers;
- Health and Safety Policy;
- SHE Management Plan;
- Legal Register;
- Organisational Chart for the project;
- Appointment Letters (appointment of the contracting company, and appointments for all persons with health and safety related responsibilities);
- Notifications to the relevant authorities that construction work is in progress;
- Baseline and Task-Based Risk Assessments;
- Health and Safety Objectives, and associated Improvement Action Plans;
- Safe Work Procedures, Work Instructions and Work Method Statements;
- Planned Task Observations;
- Fall Protection Plan (for work at height);
- A dossier (Equipment Profile) for each fuel-driven vehicle or machine;
- Inspection Registers, Forms and Checklists (e.g. For portable electrical tools, ladders, safety harnesses, light vehicles, mobile equipment, lifting equipment and lifting tackle, first aid boxes, fire extinguishers, etc.);
- PPE Issue Registers;
- Material Safety Data Sheets;
- Emergency Response Procedures;
- Incident Records;
- A dossier (Employee Profile) for each employee containing:
- A copy of the employee's Identity Document or Passport;
- Certificate of Fitness (Pre-Employment Medical Examination);
- Proof of Induction Training;
- Other Training Records;
- Copies of Qualification Certificates and / or Certificates of Competency; and
- Copies of Licences;
- Meeting Minutes;
- HEALTH AND SAFETY Performance Reports;
- Copies of Inspection and Audit Reports; and
- Daily Safe Task Instructions (DSTI's) and Toolbox Talks.

The contractor must ensure that an equivalent file is compiled and maintained by each appointed sub-contractor.

15. Notification of Construction Work

A contractor who intends to carry out any construction work other than work contemplated in CR regulation 3(1), must at least 7 days before that work is to be carried out notify the provincial director in writing in a form similar to Annexure 2 if the intended construction work will—

- include excavation work;
- include working at a height where there is risk of falling;
- include the demolition of a structure; or
- include the use of explosives to perform construction work.

A contractor who intends to carry out construction work that involves construction of a single storey dwelling for a client who is going to reside in such dwelling upon completion, must at least 7 days before that work is to be carried out notify the provincial director in writing in a form similar to Annexure 2 of the CR regulations.

16. Operational Control

For project operations and activities, the contractor shall implement and maintain:

- Operational controls, as applicable to the organization and its activities;
- The organization shall integrate those operational controls into its overall OH&S Management System;
- Controls related to purchased goods, equipment and services;
- Controls related to contractors and other visitors to the workplace;
- Documented procedures, to cover situations where their absence could lead to deviations from the OH&S policy and the objectives;
- Stipulated operating criteria where their absence could lead to deviations from the OH&S policy and objectives.

16.1 Project-Specific SHE Standards

For all site health and participation specific this will serve as a guideline

Project-specific SHE standards, incorporating leading practices, legal requirements, and client requirements will be developed and implemented to manage critical risks on the project.

The contractor must comply fully with the requirements of these standards.

The Safe Work Procedures required of the contractor must be aligned with the requirements of these standards.

16.2 Safe Work Procedures

Procedures to be developed and maintained on site

The contractor must develop, document and implement Safe Work Procedures for all activities involving significant health or safety risk. These procedures must detail the control measures required to effectively manage the health and safety risks associated with the work activities.

Each Safe Work Procedure must be consistent with the Task-Based Risk Assessment completed for the activity.

Every person engaged in an activity for which a Safe Work Procedure has been developed must receive suitable training on the procedure.

Furthermore, the contractor must develop, document, communicate and implement formal procedures, work instructions and / or programmes for the operation, maintenance, inspection and testing of all plant and equipment (including protective systems and devices) brought onto the project site(s).

16.3 Management Participation and involvement CR 8

16.4 Planned Task Observations

All contractor, management supervisors must perform Planned Task Observations (PTO's) to verify that the control measures that have been identified in Safe Work Procedures (and associated Risk Assessments) are being adhered to and are being properly implemented, and to provide guidance where deviations are noted.

Each supervisor must complete at least one PTO per day involving one or more employees in his work team.

When an unsafe act or condition is identified, the supervisor must coach the work team to correct the act or condition in line with the Safe Work Procedure.

Where valid changes to the work method are identified, the supervisor must ensure that the Safe Work Procedure and Risk Assessment are updated to reflect the current practice.

Project representatives will carry out PTO's on contractor employees on an ad hoc basis. Should deviations from the contractor's Safe Work Procedures be observed, the work may be stopped until these deviations are rectified.

16.5 General Rules of Conduct

All persons are required to conform to the following rules of conduct while on the site.

The following acts are prohibited:

- Engaging in practical jokes, horseplay, scuffling, wrestling, fighting, or gambling;
- Assault, intimidation, or abuse of any person;
- Insubordination towards any supervisor or manager;
- Refusing to carry out a reasonable and lawful instruction concerning health and safety;
- Entry into any restricted area (including barricaded areas), unless authorised to do so by the responsible person;
- Unauthorised use / operation of any equipment or machinery;
- Negligently, carelessly or wilfully causing damage to any property;
- Destroying or tampering with safety devices, signs, or signals;
- The use of water from fire hydrants or hose reels for any purpose other than extinguishing a fire;
- The wilful and unnecessary discharging of fire extinguishers;
- Refusing to give evidence or deliberately making false statements during incident investigations;
- Bringing alcohol, drugs, or any other intoxicating substance onto site;
- Bringing a firearm, ammunition, or any other offensive weapon onto site;
- Bringing animals onto site;
- Running, except in an emergency;
- The use of an ipod (or similar) whilst working on site;

- Sleeping on the job;
- Building fires on site, unless in a suitably constructed barbequing facility; and
- Pouring / pumping / flushing any substance (chemical / hydrocarbon / waste water) into a storm water drain, onto bare soil, or into any area where the substance is not effectively contained.

Any of the above actions may result in the temporary or permanent removal of the offending person(s) from site, as well as possible prosecution. The decision of the nominated project management representative shall be final and binding in respect of any dispute that may arise from the interpretation of these requirements.

Transnet will not get involved in contractor disciplinary rules and procedures. The contractor will simply be informed (with reasons) that the offending employee(s) will be denied access to the project site. Once the contractor has been informed, the employee(s) must be removed from the site immediately.

16.6 Site Access

The contractor may not hire any security services for the project site unless authorisation has been obtained in writing from a nominated project management representative.

16.6.1 Access Control

The contractor must comply with all access control, procedures and systems applicable to the project site.

Failure to comply with these requirements will be viewed as a serious safety breach and may result in the permanent removal of the individual(s) / contracting company from site or suspension without payment.

Access will be controlled as follows:

- The access will be strictly controlled and managed
- Contract period access – an access card valid for the full contract period will be issued to an individual once the following requirements have been met:
  - Completion of a pre-employment medical examination;
  - Completion of all required project induction training;
  - Completion of special training / licensing if applicable (e.g. Driving/operating Licence); and
  - Provision of proof of job / trade-specific qualifications, licences, training, Experience and competency (as required).

Note: No access card will be issued unless proof of identification is provided (i.e. an identity document or a valid passport). For foreign labour, an access card will only be issued if a valid work visa is produced.

Note: A driving licence will not be accepted as proof of identification.

16.6.2 Trespassing

The contractor must ensure that no employee (including sub-contractor employees) trespasses on any land lying beyond the boundaries of the project site.

If instructed by a nominated project management representative to do so, the contractor must remove any employee who fails to comply with this requirement from the project.

The contractor's activities must be confined to the specified construction areas, and access to these areas may only be by means of specified routes.

All required barricading (fencing) must be erected and maintained by the contractor.

16.6.3 Visitors

Visitors (including reps and suppliers) must be advised in advance of the mandatory Personal Protective Equipment (PPE) requirements for the site, and must arrive with all of this PPE.

Upon arrival, all visitors must report to the Security Office where they must sign in.

All visitors must undergo a visitor induction briefing before entering the site.

A visitor access card will be issued to each visitor on conclusion of the induction briefing.

Whilst on site, visitors must be accompanied at all times by an appropriately senior employee who has been inducted fully. The visitor(s) must be met at the Security Office, and when the visit is over, must be escorted back to the Security Office.

When leaving the site, each visitor must return his or her visitor access card to the security personnel posted at the entrance / exit. A visitor will not be permitted to leave the site until he or she produces the access card that was issued.

Note: Visitors are not permitted to perform any work on site.

Note: Any request (typically made by a government official) to carry out a site inspection must be referred to the nominated project management representative. The contractor must not arrange any such inspection without prior approval from the nominated project management representative.

16.6.4 Alcohol, Drugs and Other Intoxicating Substances

The contractor must ensure that all personnel under his authority do not at any time enter the site or perform any work whilst under the influence of alcohol, a drug, or any other intoxicating substance.

Selling or possessing drugs, alcoholic beverages or any other intoxicating substance on the site is strictly prohibited.

A drugs and alcohol testing program will be implemented. Persons entering the site will be randomly tested. Any person who tests positive for alcohol or drug consumption will be subject to disciplinary action and shall be permanently removed from the site.

Any person have the opportunity to rather report that he/she is under the influence before accessing the project site – in these case the employee may only be send home for the day by the responsible project manager representative but will then be tested for the following five days (each day) on his return to the project site. If it is found that the same person is frequently reporting that he/she is under the influence before even accessing the project site. It shall be the responsibility of the nominated project management representative to take disciplinary action and remove such a person's form the project site.

Should the actions and / or demeanour of an employee suggest possible narcosis or drunkenness, the employee must be removed from the site. This may be done without testing.

Note: All personnel involved in an incident / accident must immediately be subjected to an alcohol test and a drug test as part of the investigation.

16.6.5 Firearms, Ammunition and Offensive Weapons

Firearms, ammunition, and offensive weapons of any kind are strictly prohibited. No person may enter /shall not be permitted to enter the site carrying any such item.

16.6.6 Vehicles

All vehicles brought onto site must meet the safety requirements stipulated in Section 14.6.

Each vehicle to be used on site must be inspected and approved by the nominated project management representative before a site access permit will be issued for the vehicle / equipment.

No vehicle shall be permitted to enter the site unless it is duly authorised. Access permits are vehicle-specific and may not be transferred between vehicles.

The contractor must allow any vehicle that is brought onto site (including privately owned vehicles) to be searched at any time while on the premises, or when entering or leaving the premises.

The contractor is solely responsible for the safety and security of all vehicles (including private vehicles) that he brings onto the site.

All road-going vehicles used by the contractor on the site must be roadworthy and registered with the relevant traffic authority.

A vehicle will not be permitted to enter the site in an un-roadworthy condition. Access will be denied if, for example:

- The vehicle has a defective exhaust system;
- A serious oil or fuel leak is evident;
- The vehicle has unsafe bodywork or is carrying an unsafe load;
- The vehicle is fitted with extraneous or non-standard equipment;
- Passengers are not seated properly;
- The vehicle is not fitted with a seat belt for each occupant; or
- The vehicle has any obvious mechanical defect;
- Pre-inspection requirements are not met.

Overloaded vehicles will not be permitted to enter the site.

The driver / operator of any vehicle / mobile equipment must carry a copy of his appointment with him at all times. Each driver / operator must:

- Comply with all site / project rules and regulations pertaining to traffic and the safe operation of vehicles / mobile equipment;
- Obey all road signs;
- Obey all instructions given by security or emergency services personnel;
- Remain within the boundaries of the site; and
- Ensure that the vehicle that he is operating is never overloaded, and that loads are always properly secured.

In the interest of safety, only the minimum number of vehicles required by the contractor to complete the work under the contract will be permitted to enter the site.

When not in operation, the contractor's vehicles / mobile equipment must be parked within the boundaries of his lay-down area or yard.

Parking is only permitted in designated parking areas.

All cars are parked on site at the owner's risk.

In the event of a vehicle accident on site, the driver(s) must report the incident immediately and must remain at the scene until a nominated project management

representative arrives, or until a nominated project management representative authorises him to leave (unless, of course, the driver requires medical attention).

16.7 Mobile Equipment and Light Vehicles

All Contractors must ensure all applicable legislation concerning mobile equipment and light vehicles are complied with at all times.

Each contractor must provide evidence to the nominated project management representative that all light vehicles and mobile equipment to be used on the project (including, but not limited to, lift and carry cranes (or mobi-lifts), mobile cranes, forklifts, mobile elevating work platforms (e.g. Cherry pickers), tractors, dozers, dump trucks, haul trucks, graders, excavators, loaders, back-actors, drill rigs, and road-going cars, light delivery vehicles, and trucks) comply with the requirements of all applicable legislation. This evidence must be provided prior to the equipment being brought onto the project site. The contractor remains responsible for meeting this requirement even if the equipment to be used is leased or provided by a sub-contractor (i.e. not owned directly by the contractor).

An Equipment Profile (dossier) must be compiled for each light vehicle and each item of mobile equipment to be used on the project site.
All mobile equipment and light vehicles (used for work purposes) must be subject to a risk assessment compiled. The assessment must:

- Involve operators and maintenance personnel who will use and work on the equipment; and
- Address all aspects of safe operation including handling, driver vision, brake failure, tyre blow out, and access and egress for operators and maintenance personnel.

Each light vehicle and each item of mobile equipment must be serviced and maintained as prescribed by the manufacturer of the vehicle or equipment.
No major repairs or services may be carried out on site.
No repairs may be carried out by a driver or operator. Only suitably qualified and competent persons may carry out repair work.
An appropriate pre-operation safety check based on a risk assessment must be carried out for each light vehicle or item of mobile equipment driven or operated for work purposes. For each vehicle or equipment type, an approved checklist must be in place (and must be used). The pre-operation check must include, but not be limited to, inspection and / or testing of the following safety critical features:

- Brakes (testing method must be provided);
- Wheels and tyres (including the spare);
- Lights and indicators;
- Steering;
- Seats and seat belts; and
- Windscreen and windows, including windscreen wipers and washers.

Should any critical feature be defective or damaged, the vehicle or equipment may not be operated until it has been fully repaired.

Supervisors must review the completed checklists on a daily basis to satisfy themselves that there are no major deficiencies that could place a driver or operator at risk.
No person may drive or operate any light vehicle or item of mobile equipment without authorisation.
All drivers and operators must be appointed in writing by the contractor's Project Manager.

No driver or operator may be appointed without proof that the individual has been trained, tested and found competent, or is currently licensed.

The appointment letter must specify the type of vehicle or equipment for which authorisation is being given and must clearly confirm that the driver or operator:

- Is 18 (eighteen) years of age or older;
- Has undergone a medical examination and has been declared fit for work by an occupational medical practitioner; and
- Has received suitable training and has been found competent, or is in possession of a valid driving licence issued by a state, provincial or civil authority that is applicable to the class of vehicle or equipment that is to be driven or operated.

The principal accountability for preventing accidents and incidents lies with the driver or operator of a light vehicle or item of mobile equipment, as he is in full control of any given situation at any given time. It must be stressed to each driver and each operator that safety is his prime responsibility – this must be clearly instructed and understood.

Drivers and operators must be empowered to stop driving or operating immediately should an unsafe condition arise, and refuse to drive or operate any light vehicle or item of mobile equipment that is defective and / or has any inoperative safety features. Similarly, a supervisor must never force a driver or operator to drive or operate a defective vehicle or item of equipment.

If a driver or operator does not adhere to the site rules and regulations, his appointment must be withdrawn and he must not be permitted to continue with his duties. If necessary, site access will be denied (either temporarily or permanently) to any driver or operator who is deemed to not be adhering to site requirements.

No person may drive or operate a light vehicle or item of mobile equipment if he suffers from a medical condition that places both him and those around him at risk of injury.
A fit-for-work policy must be in place, incorporating clearly defined maximum levels of drugs (including prescribed medication) and alcohol permitted in the system of a driver or operator.
Daily alcohol testing and random drug testing must be carried out.

Supervisors must regularly check on the physical condition of drivers and operators during the course of a shift.
A system must be in place to manage driver fatigue.
No eating or drinking is permitted while driving or operating a light vehicle or item of mobile equipment.
A mobile phone, whether hands-free or not, may only be used by the driver or operator of a light vehicle or item of mobile equipment when the vehicle or equipment is stationary and in a safe location.
Behaviour-based observations and coaching must include the operation of light vehicles and mobile equipment.

A site-specific traffic management plan must be compiled and submitted to the nominated project management representative for approval. The plan must include, but not be limited to, the following:

- Segregation of pedestrians, light vehicles, and mobile equipment where possible (using barriers where feasible);
- Systems to control the movement of mobile equipment in areas accessible to pedestrians, the movement of mobile equipment into and out of workshops, and pedestrian and light vehicle movement around mobile equipment;
- Setting of appropriate speed limits for vehicle types, road surfaces and environmental conditions;
- Installation and maintenance of road traffic control signs;
- Right-of-way rules (including overtaking restrictions);
- Overtaking protocols;
- Clear communication protocols for interactions between all vehicles and equipment;
- Procedures for light vehicles and / or mobile equipment entering hazardous or restricted areas;
- Standards for safe following distances based on operational circumstances, environmental conditions and near sight (blind spot) limitations of mobile equipment;
- The minimum safe distance to be maintained between light vehicles and mobile equipment (i.e. 50 metres unless positive contact is made);
- Designated parking areas for mobile equipment and light vehicles, including parking associated with maintenance areas;
- Parking procedures (e.g. Safe parking distances, safe parking locations, requirements for reverse parking, etc.);
- Systems to control approaching, refuelling, parking, boarding and disembarking mobile equipment (a driver or operator must exit the cabin and must disembark the vehicle or equipment entirely when his direct involvement with maintenance or servicing is not required);
- Guidelines for abnormal road conditions (e.g. Heavy rain, fog, or high winds) providing "go / no go" criteria and contact details for the person(s) responsible for making the "go / no go" decisions;
- Truck loading and unloading procedures to avoid material or objects falling from the vehicle;
- Guidelines for wide or abnormal loads including offsite transport; and
- Systems to control mobile equipment use in the vicinity of overhead power lines.

The design and layout of the road system (including entrance and exit points, intersections and other potential points of interaction between pedestrians, light vehicles and mobile equipment) must be reviewed periodically.

A risk assessment must be carried out prior to any changes being made to traffic movements or road systems.

Designated walkways (both indoors and outdoors) must be provided for pedestrians, and pedestrians must make use of these walkways. Good lighting must be provided along all walkways, particularly at road junctions. Wherever possible, rigid barricading must be used to separate pedestrians from moving light vehicles and / or mobile equipment.

No pedestrians are permitted on haul roads (or as far as this can reasonably be achieved in situations where a haul road runs through an area occupied by a local community). All personnel must be transported to site and must be dropped off at a designated area.

Controls must be in place to ensure the safety of people working on roads, including those working on broken-down vehicles.

High visibility clothing must be worn by all persons at all times whilst on the project site.
Speed limits and traffic rules must be reviewed regularly and must be rigorously enforced.
Local traffic rules must be complied with at all times.

Pedestrians and cyclists must give way to light vehicles and / or mobile equipment except at pedestrian crossings.

All light vehicles and mobile equipment must give way to emergency vehicles.
Pedestrians and light vehicle drivers must be made aware of the blind spots associated with mobile equipment.

The driver or operator of a light vehicle or item of mobile equipment must stop the vehicle or equipment and sound the horn before proceeding at blind corners, where his view of the path or intended path is obstructed, and when entering or leaving a building.
Whenever a light vehicle or item of mobile equipment is stopped or parked, the handbrake (if applicable) must be applied.

Measures (such as chocking or the use of ditches or trenches) must be in place for the immobilisation of parked mobile equipment.
A parked light vehicle must be chocked in situations where the vehicle would roll forwards or backwards if placed in neutral with the handbrake disengaged.

No light vehicle or item of mobile equipment may be left unattended with the engine running or with a key in the ignition.
No light vehicle or item of mobile equipment may be parked so as to cause an obstruction to any roadway, passage or access way.

No light vehicle or item of mobile equipment may be parked within 50 metres of a loading or off-loading point.

Light vehicles and mobile equipment must be loaded safely. All loads must be secure and must be within the load limit of the vehicle or equipment. A load must be properly secured before the vehicle or equipment is set in motion. Adequate precautions must be taken for any overhanging load.
No unauthorised light vehicle or item of mobile equipment may enter a restricted area or building.

16.7.1 Light Vehicles

All Contractors must ensure that Light vehicles have the following minimum safety features:

- Fixed seats and suitable seat (safety) belts for all occupants (i.e. Driver and all passengers);
- Roll-over protection for all vehicles intended to be driven on dirt or steep roads;
- Cargo barriers and load restraints for all vehicles designed for carrying loads (other than passengers), or that are unable to have cargo separated from the occupant-carrying space of the vehicle; and
- An air bag on the driver's side, and where available as a manufacturer fitted item, a passenger's air bag;
- A Reverse Alarm.

All Contractors must ensure that Light vehicles that interact with mobile equipment are equipped or fitted with:

- Systems that enable positive communication with the equipment operators (e.g. A two-way radio);
- A high visibility flag (e.g. A whip flag or buggy whip);
- An amber flashing light (revolving or strobe);
- Reflective taping; and
- High visibility signage (i.e. Vehicle call numbers) facilitating easy and positive identification from a reasonable distance.

Note: Call number signs and reflective tape (magnetic or adhesive) must be applied to the front, back and sides of each vehicle.

All Contractors must ensure that Light vehicles carry:

- Emergency roadside triangles or beacons (three of either);
- Chock blocks for preventing uncontrolled movement of the vehicle when parked;
- A flashlight;
- A fire extinguisher (2.5kg DCP);
- A first aid kit; and
- Survival or emergency equipment (e.g. a vehicle recovery kit) suitable for the operating environment.

A change management process must accompany all vehicle modifications, including the attachment of any equipment. Examples of changes or modifications include, but are not limited to, any change or modification:

- Made to the overall structure or design of the vehicle body;
- Made to the original manufacturer-fitted type of tyres or wheels;
- Made to the suspension system of the vehicle;
- Made to the mechanical system of the vehicle;
- That may adversely alter the centre of gravity of the vehicle;
- That alters the load carrying capacity of the vehicle; and
- That may affect the ability of the vehicle to withstand a crash (e.g. the fitment of a "bull bar").

Vehicle selection must be based on a risk assessment where consideration is given to the tasks, the application, the environment, roll-over protection and the rating of sturdiness in the event of a crash.

All Contractors must have a formal inspection and preventative maintenance system in place to ensure that vehicles are maintained in a safe and roadworthy condition at all times and, as a minimum, are serviced in line with the vehicle manufacturer's service schedule.

Should any safety critical feature be defective or damaged, the vehicle must be withdrawn from service until it has been fully repaired. Inspection and maintenance must be undertaken on critical features such as:

- Wheels and tyres (including the spare);
- Steering, suspension and braking systems;
- Seats and seat belts;
- Lights, indicators and reflectors;
- Windscreen and windows, including windscreen wipers and washers;

- The vehicle structure itself; and
- Other safety-related items on the vehicle body, chassis or engine, including instrumentation.

Persons may only be transported in vehicles equipped with manufacturer fitted or approved seats and seat belts.
Seat belts must be worn by all occupants of a light vehicle (i.e. the driver and all passengers) at all times.

Only the driver and one passenger are permitted in the cab (front) of a light delivery vehicle.
No personnel may be transported in the load-bin of a light delivery vehicle, even if the vehicle is fitted with a canopy. Only tools and equipment may be transported in the load-bin. Furthermore, no persons may be transported in a trailer behind a vehicle.

A pre-operation vehicle safety check and familiarisation system must be in place and must be used by the driver. An approved checklist must be used. All vehicle faults that are recorded must be attended to immediately.

All Contractors must have systems in place to ensure that risks associated with vehicle journeys are managed and controlled. The systems must include, but not be limited to:
- Formulation of journey management plans prior to the commencement of new or changed travel activities;
- Identification and monitoring of the risks associated with the various routes, intersections, etc. In order to minimise the overall exposure;
- Assessment and communication of changed environmental and road conditions at the time of travel;
- Outlining of actions required in the event of an emergency (e.g. Collision or breakdown); and
- Provision to manage driver fatigue.

Light vehicle running lights (low-beam headlights) must be switched on at all times when the vehicle is in operation.

All Contractors must have a system is in place to ensure that drivers receive adequate training to ensure that the vehicle intended to be operated or driven can be operated or driven safely. As a minimum, training must include:
- Behaviour-based defensive driving principles;
- Vehicle familiarisation, taking into account the handling dynamics of the vehicle, maximum number of passengers, load limits and various features;
- Loading and restraining principles where the vehicle to be operated is designed for carrying cargo loads;
- Education and awareness concerning driving and travel risks that may be encountered within the environment where the vehicle may be operated or driven, and the requirements pertaining to traffic rules and speed limits;
- Securing (locking) equipment to prevent unauthorised use;
- Emergency crash and breakdown procedures; and
- Basic mechanical principles, including how to change a tyre and perform an adequate pre-operation check.

A system must be in place to ensure that persons operating any equipment associated with a light vehicle (e.g. Vehicle-mounted cranes and winches) are suitably trained and competent.

16.7.2 Mobile Equipment

All Contractors must ensure that Mobile equipment have the following minimum safety specifications:

- Fixed seats and seat belts for all occupants;
- Adequate lighting, including headlights, tail, turn and brake lights, and an amber flashing light (revolving or strobe);
- An identified isolation and lockout point;
- Adequate walkways, railings, steps and grab handle combinations, and boarding facilities including an alternative path of disembarking in the event of an emergency;
- Collision-avoidance technology and / or procedures;
- A reversing alarm or warning device;
- Chock blocks for preventing uncontrolled movement of rubber-tyred equipment when parked;
- A horn;
- Effective windscreen wipers;
- Effective guarding on accessible moving parts;
- A speedometer (if the mobile equipment is capable of exceeding the lowest applicable speed limit);
- High visibility signage (i.e. Mobile equipment call numbers) facilitating easy and positive identification from a reasonable distance; and
- A security system to prevent unauthorised operation.

Mobile equipment must have the following minimum safety specifications, unless a risk assessment stipulates otherwise:

- Approved or certified roll-over protection;
- Fail-to-safe brakes;
- A fire detection and suppression system capable of being activated from both ground level and cabin level (for certain types of mobile equipment, a suitably sized fire extinguisher may be adequate);
- A non-handheld two-way radio or another form of communication;
- Falling object protection (a protective structure over the operator cabin);
- An enclosed and tight-sealing air-conditioned cabin with suitable protective glass; and
- A means of moving supplies and personal items into and out of the operator cabin that enables an operator to continuously maintain three points of contact while boarding and disembarking the equipment (e.g. A backpack or shoulder strap bag).

When purchasing or hiring equipment, the ergonomics of the cabin must be considered, specifically with regard to the seating, operator controls and retrofitted devices.

Fleet and control consistency must be considered in order to minimise the possibility of operator error when changing machines.

For all new (to site) and modified mobile equipment, a formal risk-based selection and acceptance process must be followed prior to the equipment being used on site.

Selection of equipment, and any modification, must be subject to a rigorous change management process.

An inspection and maintenance programme must be in place for all mobile equipment. A procedure and checklist system, including a brake functionality test, must be in place for pre-operation inspection by the operator. Registers must be maintained and audited, and must be kept on the machine.

Procedures must be in place to ensure that mobile equipment is only operated on sufficiently stable surfaces and on gradients that are within the limits of safe operation.

Seat belts must be used in all cases, by all occupants. Apart from the driver or operator, only an appointed flagman may be transported in mobile equipment (with the exception of buses) and **only if** the equipment is fitted with a passenger seat. No passengers are permitted on a lift and carry crane (or mobi-lift), mobile crane, forklift, mobile elevating work platform (e.g. A cherry picker), tractor, dozer, dump truck, grader, excavator, loader, back-actor, drill rig, or similar.

Risk assessments must be carried out as part of the planning process for mobile equipment operations and associated activities, and must consider the following:

- Maintenance activities;
- Risks associated with loading, unloading, towing and recovering mobile equipment; and
- The risk of fire.

Procedures must be in place for the safe isolation and lockout of mobile equipment.

Where two or more items of mobile equipment must be operated in proximity to each other, or where an item of mobile equipment must be operated in proximity to persons on foot, a risk assessment involving all persons who will be working in the area must be conducted prior to the work commencing. The risk assessment must be approved by the nominated project management representative. In such a work area:

- No item of mobile equipment may be driven to within 5 metres of another item of mobile equipment without the operator first making eye contact with, and signalling his intentions to, the other operator who must acknowledge that he understands and that it is safe to proceed.
- No person on foot may work or be positioned within 5 metres of an item of mobile equipment that is in operation. Before approaching mobile equipment on foot, a person must make eye contact with, and clearly signal his intentions to, the operator of the equipment. The operator must cease to operate the equipment, and must indicate that he understands and that it is safe to approach.

In certain circumstances (determined through risk assessment), mobile equipment may only move and operate with dedicated flagmen in place:

- Where flagmen are used, it must be ensured that the flagmen, mobile equipment operators, and all other personnel working in the vicinity of the mobile equipment, receive suitable training with regard to signals and signalling to ensure effective communication. The training must be formal and recorded, and competency must be tested.

- A flagman and the mobile equipment operator that he is directing must maintain eye contact. The flagman must never position hhealth and safetyelf where the equipment operator cannot see him.
- Should a mobile equipment operator lose sight of his flagman, he must stop his activities immediately until contact has been re-established.

A tyre management system must be in place to address issues including fire, heating, explosion, electrical contact, separations, maintenance, tyre changes, etc.

Site-specific induction must be carried out prior to a mobile equipment operator starting work on site. Area-specific induction must be carried out prior to an operator starting work in a new area on site.

Operators must report conditions and practices that do not conform to procedure.

16.7.3 Training and Licensing

No person may drive a light vehicle or operate an item of mobile equipment unless he has been trained, tested and found competent, or is currently licensed to drive or operate that specific vehicle or item of equipment.
The training must address hazards and risks assessed for:

- That vehicle; and
- The tasks for which it is to be used.
-

No person may be appointed to drive a light vehicle or operate an item of mobile equipment unless he is in possession of a valid medical certificate of fitness (issued by an occupational medical practitioner).

Each person required to drive a light vehicle or operate an item of mobile equipment on the project site must have a project-specific site licence or appointment to drive or operate that vehicle or item of equipment.

A system must be in place to ensure that the renewal of licences is based on an assessment of competency to drive and / or operate the vehicle or equipment. The frequency of assessment must either be annual, or derived from a risk assessment for each vehicle or equipment type.
No training of drivers or operators may be carried out on site unless authorised by a nominated project management representative.

Each person working on or visiting the project site must receive appropriate project-specific induction training concerning road safety and site vehicle hazards.
Driver must be in position of valid certificate, licence and trained by an accredited service provider.

16.7.4 Tyre and Rim Safety

These requirements apply to tyres and rhealth and safety with a rim diameter of 60cm (24 inches) or greater.
A Tyre Management Plan must be established and reviewed every twelve months.
Safe Work Procedures must be in place for all tyre maintenance and servicing activities and for tyre fire emergency response.

All persons who will be carrying out tyre maintenance and servicing work and / or responding (potentially) to tyre fire emergencies on site must be certified against the

requirements of job-specific competency standards for the project, which must address job-specific Safe Work Procedures.
No person may approach a light vehicle or item of mobile equipment within 24 hours of:

- The vehicle or equipment being struck by lightning;
- The vehicle or equipment making contact with high voltage electricity; or
- A tyre fire.

In the event of a tyre fire, an exclusion zone of 300 metres must be established and may only be accessed by emergency services personnel who are shielded while fighting the fire.

Restricted Work Zones must be established for tyre installation, removal and handling processes.
All tyre and rim handling equipment must have fall back prevention in place prior to anyone entering the Restricted Work Zone.

Tyres with split rhealth and safety must be deflated to zero and other tyres to a nominal pressure no greater than 5psi prior to removal of any retaining devices. In a dual assembly both tyres must be deflated.

Tyre inflation is subject to the following requirements:

- All tyre inflation must be carried out remotely;
- Where the risk of ejection of components exists, barricading must be in place;
- A tyre must not be left unattended during inflation; and
- Tyres that have run at less than 80% cold inflation pressure must not be re-inflated. Both tyres in a dual assembly must be dismounted and inspected.

No hot work (e.g. Welding or cutting) may be carried out on a rim (wheel) while the rim is fitted with a tyre – whether inflated or deflated.
A periodic testing and / or inspection regime must be in place for tyres, rhealth and safety (wheels), and assemblies.

All tyres and rhealth and safety (wheels) must be made unserviceable when deemed unfit for service or before being sent off site for disposal.
A tracking system must be in place to track the lifecycle of tyres and rhealth and safety (wheels).

16.7.5 Roads

Design, inspection and maintenance requirements must be in place for all roadways.
Every haul road must have two dedicated and clearly demarcated lanes so that vehicles travelling in opposite directions are safely separated (lane demarcation is not applicable to dirt roads).
Systems (such as safety berms) must be in place along roadways and around excavations, dump areas, etc. To prevent vehicles from leaving a roadway or entering a dangerous area.

A storm water management plan must be in place for the site and, in particular, for all roads. Extreme wet weather must be considered. Contractors must ensure that all roads are equipped with drainage system.

Roads with high risks activities and traffic interface shall be controlled by trained flagman

A dust control plan must be in place for the site and, in particular, for all roads. Where required, contractors must ensure that roads are wetted (using a water cart) at regular intervals and whenever instructed by a nominated project management representative. The over-watering of roads must be prevented.

No road may be closed without permission from a nominated project management representative.
Any large rocks in a roadway must be removed immediately. Any spillage in a roadway must be cleaned up immediately.

Ground pollution (e.g. Oil, diesel or hydraulic fluid spillages) must not, and will not, be tolerated. If substances are spilled on a road or any other portion of the site, the contaminated ground must be dug out and the resulting hole back-filled with clean material which must be suitably compacted. The contaminated soil must be disposed of as required by the applicable legislation.

16.8 Signs and Notices

The contractor must ensure that all required safety signs and notices are prominently displayed in accordance with the applicable legislation and good safety practice.
Signs and notices must be in English as well as any other language(s) commonly spoken on the project site.

All symbolic signs must comply with the applicable national standards.
No person may deface or damage any safety sign or notice. No person may remove or alter any safety sign or notice unless authorised to do so.

16.9 Machinery

The contractor must ensure that all plant and equipment brought onto the site is:

- Appropriate for the type of work to be performed
- Approved, inspected, tested, numbered and tagged (if appropriate) before being brought onto site
- Properly maintained in accordance with the manufacturer's recommendations; and
- Placed on a register and checked at least once per month or as required by the applicable legislation.

The contractor must supply, at his cost, all items of plant and equipment necessary to perform the work and must maintain all items in good working order.
Should any plant or equipment become inoperable for a period that is having or will have a significant impact on the work schedule, the contractor must, on instruction from the nominated project management representative, remove the out of service plant or equipment and replace it with similar fully operational plant or equipment at no additional cost.

No item of plant or equipment delivered to site for use on the contract may be removed from the site prior to the completion of the contract without approval in writing from the nominated project management representative.

Items of plant or equipment brought onto site by the contractor or his sub-contractors may be inspected by a nominated project management representative. Should the nominated project management representative determine that any item is inadequate, faulty, unsafe or in any other way unsuitable for the safe and satisfactory execution of the work for which it is intended, the contractor must, on instruction from the nominated

project management representative, immediately remove the item from the site and replace it with a safe and adequate substitute. In such a case, the contractor or his sub-contractor shall not be entitled to additional payments or deadline extensions in respect of any delay caused.

16.10 Barricading

All applicable legislation concerning barricading must be complied with at all times.

Each contractor required to erect barricading on the project site(s) must develop, document and implement Safe Work Procedures that are aligned with the requirements of this standard.

Barricading must be erected to:

- Prevent persons from making contact with an identified hazard;
- Provide warning of the existence of a hazard;
- Prevent unauthorised access (by people, vehicles and mobile equipment) into an area where a hazard exists or where a hazardous activity is being carried out;
- Define the boundaries of a hazardous location and / or restricted area; and
- Allow a work team to perform hazardous tasks without persons unfamiliar with the hazard(s) accessing the area.

Although not limited to these situations, barricading must be erected or installed:

- Around excavations (trenches, pits, etc.) (refer to the Excavation Standard);
- To protect openings and edges (to prevent persons from falling, all openings and edges associated with floors, stairs, and the open sides of buildings and structures during the course of construction must be protected by sturdy, rigid barriers capable of withstanding a force of at least 110 kilograms applied in any direction at any point) (refer to the Working at Heights Standard);
- To prevent access into areas where overhead work is in progress;
- To route vehicles safety through (or around) construction areas; and
- To protect members of the public who may be in the vicinity of a work or construction site (by preventing access).

In all cases, the erection of barricading must be a temporary measure. It must only remain in place until the hazard is eliminated or the potentially dangerous situation is rectified.

A barricade must present a sturdy physical barrier to entering an area. Therefore, plastic cones, post and chain systems, "danger tape" and "snow netting" will not be accepted as barricading and may only be used for the purposes of low risk demarcation.

For example, snow netting may be used for the demarcation of lay down areas.

Acceptable forms of barricading include:

- Hoarding panels (no less than one metre in height) that can be securely fastened together to form a fence line may be used. Hoarding panels may be constructed from a variety of materials (e.g. wooden board, steel sheeting, wire mesh on a steel frame, etc.)
- Wire mesh fencing (no less than one metre in height with sturdy posts spaced at intervals of no more than 3 metres) may be used in certain circumstances, e.g. Around excavations.
- Sturdy, rigid, and securely fixed (i.e. bolted, welded, clamped, etc.) Metal guard rails may be used, particularly for protecting openings, holes and edges associated with

floors, platforms, walkways, etc. The top rail must be positioned at a height of one metre above the working surface, and a mid-rail must be provided.
- Concrete Jersey barriers must be used for the routing of traffic and when work is being conducted in or alongside a roadway.

Regardless of the type of barricade used, the following requirements must be met:
- The installation, alteration and removal of barricades must be supervised by a competent person;
- The barricading must be uniformly and intelligently configured;
- The barricading must be stable, conspicuous and effective;
- The barricading must completely surround the work or hazardous area;
- General access requirements around the work or hazardous area (such as pedestrian walkways, operational access, or general thoroughfares) must be taken into consideration when erecting a barricade;
- The extent of the area that is barricaded must be kept to a minimum so as not to unnecessarily restrict access to other areas. If access routes to other areas are blocked by the barricade, alternative routes must be identified and signposted
- All barricaded areas must have properly designated points of entry and exit for persons and / or vehicles. Each pedestrian access point must be fitted with a self-closing gate. A sign indicating, "DESIGNATED ACCESS POINT – AUTHORISED PERSONNEL ONLY", must be fitted to each gate;
- Additional signage providing warning of specific hazards (e.g. falling objects, electricity, etc.) Including, "NO UNAUTHORISED ENTRY", must be attached to all gates and, where required, to the barricading itself. The signage must be visible from all angles and must be large enough to be read from a distance of 10 metres;
- Barricading must be clearly visible at all times (day and night). If necessary, flashing warning lights must be used;
- Tags must be attached to the barricading displaying the name and cell phone number of the person responsible for the barricade, and specifying the reason for the barricading and the date on which it is scheduled to be removed;
- Should a person require access to a barricaded area, authorisation must be obtained from the person responsible for the erection of the barricade. The hazards that are present and the Personal Protective Equipment that must be worn within the barricaded area must be communicated to the person seeking access;
- Each barricade must be listed in a register, and each must be inspected daily to ensure that it is still intact and that its positioning is still effective;
- All barricades must be properly maintained and repaired as required;
- When the work has been completed and the hazard has been eliminated, all barricading must be removed without delay. A barricade may not be left in place if no hazard exists;
- Before a barricade is removed (allowing general access), the area must be inspected by the person responsible for the work that was carried out, to ensure that the area is once again safe. If applicable, the person accepting the area back for general use shall do so on completion of his own safety inspection;
- Authorisation to remove (or modify) a barricade may only be granted by the person responsible for the erection of the barricade.

16.11 Excavations

All applicable legislation concerning excavation work must be complied with at all times.

Each contractor carrying out excavation work on the project site(s) must develop, document and implement Safe Work Procedures that are aligned with the requirements of this standard.
All excavation work must be properly planned. Site-specific conditions and hazards must be considered, including traffic, overhead and buried utilities, proximity to nearby structures, soil properties, presence of surface and / or ground water, position of the water table, and weather conditions.

Excavation work may only be carried out under the personal supervision of a competent Excavation Supervisor who has been appointed in writing.

Before any excavation work is carried out, a Permit to Work authorising the activities must be obtained.

Similarly, no person may enter an excavation unless a Permit to Work has been issued providing authorisation for specific tasks to be carried out within the excavation.

Before issuing a Permit to Work for excavation works, the Authorised Person (i.e. Permit issuer) must verify that:

- A detailed Risk Assessment has been conducted for the work to be performed;
- A Safe Work Procedure is in place; and
- No buried services are present in the area where the excavation works are to be carried out.

As a minimum, the Risk Assessment must consider hazards and risks associated with:

- A person being trapped or buried as a result of an excavation collapsing;
- A person being struck by an object falling into an excavation;
- A person falling into an excavation;
- A person being exposed to a hazardous atmosphere within an excavation (i.e. An oxygen deficiency, explosive or flammable gases, and / or harmful concentrations of a contaminant);
- Contact with belowground services; and
- Mobile equipment and / or light vehicle movement in proximity to an excavation.

On a plan (drawing) of the work area, the contractor must accurately indicate the position and dimensions of each intended excavation in order for it to be determined whether or not buried services would (or may) be encountered, such as electrical cabling, communications cabling, gas, fuel, potable water, fire water, effluent, sewage, or storm water pipelines.

In addition to a desk top review of existing drawings, a field survey must be carried out to verify the presence or absence of buried services. The positioning of all known belowground services must be accurately demarcated in the field before any excavation work commences.
Should there be any uncertainty, a pipe or cable locator must be used to determine if buried services are present, and if so, the positioning of the services.

If buried services are identified (or are suspected to be present) then the excavation plan must be altered if necessary to avoid these services. If the excavation plan cannot be altered then safe work methods (e.g. careful excavation by hand) must be specified and

measures (e.g. Isolation and lockout of the service) must be put in place to minimise risk to personnel and prevent damage to the service(s).

Machinery may not be used to excavate material lying within one metre of any belowground service (i.e. Cable or pipe).

Excavation work that is carried out must be limited to what is described in the Permit to Work. All controls, precautions and restrictions identified in the Permit to Work (and Risk Assessment) must be strictly observed and fully implemented. The Excavation Supervisor must discuss these controls, precautions and restrictions with all persons who will be carrying out the work.
All excavation work must be carried out by persons who have been trained and are competent to perform the work.

All personnel working in or near any excavation must wear high visibility protective clothing.
Unexpected structures (e.g. Tanks, brick work, concrete work, etc.) Or services (e.g. Cables, pipe lines, etc.) As well as unusual conditions (e.g. inconsistent materials, voids, etc.) That are encountered during excavation work must be reported immediately. All work must cease until the nominated project management representative provides authorisation to continue.

If an excavation is more than 1.2 metres deep and people have to enter it, then the sides of the excavation must be suitably battered, benched, or shored, unless a registered professional geo-technical engineer confirms in writing that there is no risk of the excavation collapsing (i.e. That the sides of the excavation are stable without battering, benching or shoring).

If the sides of an excavation are battered (sloped), then this must be done at an angle that is suitable for the given soil conditions (to be determined by a registered professional geo-technical engineer).

When it is not possible to batter (or bench) the sides of an excavation to a safe angle, then the sides of the excavation must be suitably shored. Shoring may only be installed, altered or removed under the personal supervision of a competent person using a predetermined safe method. Only approved shoring systems and equipment may be used. Shoring requirements must always be determined and designed by a competent person for the specific conditions encountered at the excavation site.

All material removed from an excavation (spoil) must be placed no closer than three times the depth of the excavation away from the edges of the excavation.

The profile of this spoil must be flattened out to prevent the material from being washed back into the excavation by rain water.
Scaling must be carried out on the sides of all excavations to remove loose material.
Protective shields or barriers must be erected (when required) between the sides of an excavation and the work area in order to protect employees from falling, rolling or slumping rock, soil, or materials.

Persons may not work on the faces (sides) of battered (sloped) or benched excavations at levels above other persons.

Tools, equipment and materials may not be placed within two metres of the edges of an excavation. Alternatively, a suitable retaining device may be used to prevent tools, equipment and materials from falling, rolling or sliding into an excavation.
No vehicle or item of mobile equipment is permitted near an edge of an excavation.
Mobile equipment may not operate in or near an excavation whilst persons are working within the excavation.

To ensure that adjacent structures (such as buildings, walls, or sidewalks) remain stable during excavation work, support systems such as shoring, bracing, or underpinning must be provided if required. Excavation below or near the base or footing of any foundation or retaining wall is prohibited unless:

- A support system (designed by a registered professional geo-technical or Structural engineer) is provided, such as underpinning; or
- A registered professional geo-technical engineer determines that the structure is far enough away from the excavation that no hazard exists.

To prevent persons and / or mobile equipment from accidentally falling into an excavation and to prevent unauthorised entry into an excavation, rigid barricading must be erected around every excavation that is deeper than 500mm. Warning signage must be prominently displayed and, if necessary, flashing warning lights must be used at night.

The barricading must remain in place for as long as the hazard (i.e. the excavation) exists. Sections of barricading around an excavation may only be removed (and then only temporarily) to enable excavation work to continue (refer to the Barricading Standard).

For each excavation more than 1.2 metres deep, safe means of access and egress (e.g. Ladders, steps or ramps) must be provided for persons working in the excavation. Safe entry and exit points must be located every 15 metres along the side(s) of an excavation (i.e. an exit point must not be more than 7.5 metres away from any person working in the excavation).

If a hazardous atmosphere exists within any excavation (i.e. an oxygen deficiency, the presence of explosive or flammable gases, and / or harmful concentrations of a contaminant) or if there is a possibility that a hazardous atmosphere may develop, then the excavation must be declared a confined space. Furthermore, an excavation must be considered a confined space if any risk of entrapment or engulfment exists. If an excavation is declared a confined space then all precautions and requirements pertaining to confined spaces must be implemented and complied with (refer to the Confined Spaces Standard).

Internal combustion engines may not be used in or near the edge of an excavation unless the exhaust emissions are ducted away or suitable mechanical (forced air) ventilation is used to maintain a safe atmosphere within the excavation.
Any water and / or sludge present within an excavation must be removed completely before any work commences in the excavation.

Using ditches, dykes, sumps and pumps, or other suitable means, surface water must be prevented from entering an excavation and areas lying adjacent to an excavation must be adequately drained.

If equipment is used to prevent water from entering an excavation or to prevent water accumulation within an excavation, then the equipment must be monitored by a competent person to ensure that it remains operational and effective.

Suitable lighting must be provided in and around any excavation in which work must be carried out at night.
A high standard of housekeeping must be maintained in and around all excavations.
Tools that are not in use, and materials that are no longer required, must be removed from an excavation to prevent these items from causing injury or being lost (buried).
A register of all excavations must be compiled and maintained.

A competent person (i.e. an appointed Excavation Supervisor) must inspect each excavation as well as the areas around it:

- At the start of each day (or shift) before work commences within the excavation;
- After any alteration is made to the excavation or shoring;
- After rainfall;
- After any blasting activity carried out in the vicinity of the excavation; and
- After any event that may have affected the strength or stability of the excavation or the shoring.

An excavation must be inspected for collapses, signs of instability, failures or signs of overloading of protective systems and equipment, hazardous atmospheres, water accumulation, and any other hazardous condition that may arise.

The sides of an excavation as well as the surface of the ground around the excavation must be carefully inspected for signs of instability including fissures (cracks), slumping, and bulging. Shoring must be carefully inspected for signs of overloading (e.g. Distortion).

If a hazardous condition is identified, no person may enter the excavation until suitable corrective actions have been taken and / or suitable controls have been put in place to either eliminate the hazard or reduce the risks to acceptable levels.

A record of each inspection (including date, time, findings, and signature of the Excavation Supervisor who carried out the inspection) must be captured in the excavations register.
Each inspection record must include a declaration as to whether the excavation is safe to work in or not.
All excavations must be monitored closely throughout each work day (or shift) by the Excavation Supervisor.

If an excavation has been declared a confined space, a safety observer (who will be able to initiate emergency response procedures if required and identify the location of any trapped or buried persons in the event of a collapse) must be stationed at ground level outside of the excavation whenever work is being carried out in the excavation.

If a hazardous condition is identified while work is being carried out in an excavation, then all persons in the excavation must be evacuated to safety without delay.
Under no circumstances may a person work alone in an excavation that is more than 1.2 metres deep without at least one other person being present in the immediate vicinity of where the work is being carried out.

Excavations must be backfilled as soon as possible, and the material used (usually the original material) must be properly compacted.

Where belowground services are present, the material used to backfill an excavation must be such that the services will not be damaged.
A layer of a material that is dissimilar to the general backfill material must be placed immediately above any buried service.

An excavated area must be restored to its original condition if at all possible.

Use of Explosives

All excavation work must be carried out without the use of explosives.
Explosives may not be brought onto the site or be used without written authorisation from the nominated project management representative.

If blasting operations are unavoidable, the contractor must:

- Provide a justification and obtain approval from the nominated project management representative;
- Strictly observe the provisions of all applicable legislation; and
- Carry out a detailed risk assessment covering the transportation, handling, storage and use of the explosives.

No explosives or detonators may be stored on site.
Detonators and other explosives must never be carried in the same box.

16.12 Cranes and Lifting Equipment

All applicable legislation concerning cranes and lifting equipment must be complied with at all times.
Each contractor carrying out lifting operations on the project site(s) must develop, document and implement Safe Work Procedures that are aligned with the requirements of this standard.

16.12.1 Design, Manufacturing and Safety Features

Before any crane or hoist is operated on the project premises (i.e. New to site), it must be formally accepted (authorised) by the nominated project management representative. The acceptance process must be based on an inspection and risk assessment, and must take the crane's or hoist's safety features and cabin ergonomics (if applicable) into account. The same process must be followed before any crane or hoist is returned to service following any modification or repair.

Note: An Equipment Profile (dossier) must be compiled for each crane.

As a minimum, the design and manufacturing of each crane or hoist used on the project premises must comply with the requirements of the relevant ISO standard. In countries where the requirements of a national standard are more stringent than the requirements of the relevant ISO standard, the national standard must apply.
The Safe Working Load (SWL) must be clearly indicated on each crane, hoist, and item of lifting equipment.

If the safe working load (rated capacity) of a crane varies with the conditions of use (i.e. varies with the angle of the boom and the boom length) then the manufacturer's load chart(s) indicating the crane's rated capacity at various boom lengths and angles must be available in the crane cabin. If the crane has a single load chart, it must be displayed in a

position visible to the crane operator. If the crane has numerous load charts, they must be easily accessible to the operator.

For each crane or hoist, the manufacturer's operating manual must be available to the operator.
The load chart(s) and operating manual for a crane or hoist must be in a language understood by the operator.

All lifting hooks must be fitted with a safety latch to prevent the load from accidentally detaching.
Each crane or hoist must be fitted with a load cell (with the mass of the load displayed in the visual range of the operator) and a load limiting device to prevent the crane or hoist from being operated outside of its safe working limits.

Where practicable, each crane must be equipped with an upper hoist limit switch (or anti two-block device) to prevent the hook block from colliding with the drum, and a lower hoist limit switch to prevent the rope on the drum from unwinding completely. These systems must provide both a visual and an audible alarm to the operator.

Under no circumstances may any limit switch or warning device be bypassed, disconnected, or adjusted in order to lift a load higher (or to lower a load lower) than the respective switches allow. Limit switches MAY NOT be adjusted to stop the hoist at a particular height under normal operating conditions – these are safety devices, and as such, should not be used as operating tools.

Under no circumstances may a load limiting device be bypassed or disconnected in order to lift a load that exceeds the rated capacity of the crane. Load limiting devices MAY NOT be used to "measure" or "test" the mass of a load – these are safety devices, and as such, should not be used as operating tools.

Each overhead travelling crane (including cranes operated using a manual chain drive) must be fitted with an audible travel alarm or an equivalent warning device.
Anti-collision devices must be fitted to prevent motorised overhead travelling cranes from colliding with each other (where two or more cranes run on the same track) and from colliding with the track end stops or other structures.

For a vehicle-mounted crane, the operator control station must be located in a position protected from swinging loads and from the crane jib.

A fall protection system must be provided for the assembly, dismantling, operation, maintenance and inspection of any crane where falling from height is identified as a hazard.

Each crane should be fitted with a stability monitoring device to prevent it from toppling over.

Only items of lifting equipment (tackle) that have been designed and manufactured with adequate factors of safety may be used on site. The following minimum factors of safety (with respect to the Safe Working Load) must be met:

- Ten (10) for natural-fibre ropes;
- Six (6) for synthetic-fibre ropes or woven webbing;
- Six (6) for steel-wire ropes;

- Five (5) for steel chains; and
- Four (4) for high-tensile or alloy steel chains.

Note: An excavator may not be used to lift a load unless all of the requirements of this standard (as would apply to a crane) have been met, and authorisation has been granted by the relevant Project Manager and Health and Safety Manager.

16.12.2 Planning and Risk Assessment

For each critical lift that must be carried out on site, a documented and detailed lift plan and risk assessment must be prepared to address all associated hazards.

Only suitably qualified, competent and experienced persons (lift planners) may evaluate critical lifts and prepare lift plans.

The lifting supervisor, crane operators, riggers and spotters responsible for carrying out a critical lift must have input into the lift plan and risk assessment and must be consulted before these documents are finalised.

All lift planners, lifting supervisors, crane operators, riggers and spotters (safety observers) must be appointed in writing.
No critical lift may commence until the lift plan and risk assessment have been authorised by the nominated project management representative and a Permit to Work has been issued.

Critical lifts include:

- All multiple (including dual) crane lifts;
- Lifts where the operational arcs of two or more cranes can overlap;
- Lifts over operating facilities where this may endanger personnel;
- Lifts over or adjacent to power lines;
- Any lift carried out in close proximity to equipment or a vessel containing a flammable or toxic substance;
- Lifts where the centre of gravity of the load could change;
- Any lift where the total weight on the hook exceeds 20 tonnes;
- Lifts near the rated capacity of the crane (i.e. Exceeding 85% of the rated capacity at the working radius);
- Any lift when the wind speed (including gusting) exceeds 30 kilometres per hour;
- Lifts involving a man basket (safety cage);
- Lifts to and from water;
- Lifts requiring specialised equipment or involving complicated lifting or rigging configurations;
- Lifts requiring non-standard rigging or slinging techniques;
- Lifts involving the simultaneous use of more than one hoist on the same crane; and
- Any other lift deemed to be critical by the nominated project management representative, or assessed as critical during a risk assessment.

The lift plan for a critical lift must include:

- General Information – crane manufacturer, crane model, items to be lifted, and reason for lift;
- Lift Data – load weight, lifting block and hook weight, hoist rope weight, rigging weight, total weight, height of lift, radius of lift, surface area of load, and centre of gravity of load;

- Rigging Data – sling material (chain, wire rope, or synthetic), sling diameter, sling length, sling configuration, sling capacity, hook type, shackle size and capacity;
- Lift Computation – boom length, jib length, radius of lift, crane capacity as configured, size of outrigger footplates, and wind speed;
- Proximity to Power Lines and Process Areas – mobile cranes working in proximity to energised power lines must operate under a Permit to Work, which must define exclusion zones and spotter duties;
- Local Hazards and Controls – including the route for the crane, ground stability, proximity of people or equipment, and agreed communication method; and
- Diagrams (sketches) – a rigging diagram, and a crane set-up diagram illustrating the positioning of the crane(s) in relation to surrounding structures and the initial and final positions of the load (including crane boom movement).

Lifts that are not subject to detailed lift plans (i.e. Lifts that are not considered critical) must nevertheless be subject to a risk assessment, and be properly planned and executed. The use of a crane-suspended man basket (safety cage) may only be considered when all other avenues to safely perform the work (e.g. Scaffolding, mobile elevating work platform, etc.) Have been exhausted (refer to the Working at Heights Standard).

Cranes used to lift or suspend personnel must be approved as suitable for this purpose. If a crane must be operated in proximity to energised overhead power lines (or any other exposed electrical conductors) then minimum clearance distances (specified by the electrical power utility or the nominated project management representative) must be observed. Whenever possible, power lines must be de-energised and isolated while lifting operations are carried out (refer to the Electrical Safety Standard).

16.12.3 Operation

At the start of every day or shift, the operator of a crane or hoist must carry out a pre-operation safety check using a prescribed checklist.
The specific requirements of the pre-operation safety check (and associated checklist) must be based on:

- A risk assessment that addresses all aspects of safe operation of the crane or hoist; and
- The inspection recommendations of the manufacturer.

As a minimum, the pre-operation safety check must include:

- A thorough visual inspection of all wire ropes, chains, hooks and safety latches, hook blocks, sheaves, hydraulic hoses, electrical cables, and the general condition of the crane or hoist;
- Checks to confirm the serviceability of the operating controls;
- Tests to confirm the correct operation of all limit switches, emergency shutdowns, load indicators, alarms and other safety devices; and
- A thorough visual inspection of all lifting equipment (tackle) to be used.

The operator must:

- Check for any loose or missing parts;
- Make sure that the wire rope (or chain) of the hoist is properly seated in its drum and sheave grooves without any slack or overlapping;
- Operate each control to make sure it functions properly, releases immediately, and does not stick. Each control must be labelled to indicate its function;

- Listen for any unusual mechanical noises and look for any jerky movements while operating the crane and / or hoist several feet in each direction that it travels;
- Check the functionality of the upper and lower hoist limit switches (if applicable) by slowly raising and then lowering the block to trip the respective switches;
- Check all hooks. Hooks must not be cracked, stretched, bent or twisted. Each hook must have a safety latch that automatically closes the throat of the hook. If the latch is bent, has a broken spring, or is otherwise damaged, it must be repaired before use. Hooks must rotate freely in the block assembly without any "grinding" felt or heard;
- Check the wire rope by lowering the block to its lowest level and looking for the following signs of damage:
  - Reduced rope diameter. This may indicate that the rope has been stretched, has lost its inner core support, or has worn outside wires;
  - Broken wire strands (any number);
  - Kinked, crushed, cut, or "bird caged" wiring, or wiring with heat damage.
- Check all chains for damage including wear at contact points, cracks, or distorted links (bent, twisted or stretched). All mechanical coupling links must be inspected to ensure that the linking pins are secure and in good condition. The capacity rating of each chain must be adequate for the load and the attachment method;
- Check the condition and capacity of wire rope and synthetic web slings. Capacity ratings must be legible on the manufacturer's label. The capacity of the sling being used must be adequate for the load and the attachment method. A sling must be replaced immediately if it is excessively worn.

The operator must report any fault, defect or damage to his supervisor immediately.
A crane or hoist must not be operated if any safety device is out of order or defective, or if any rope, chain, hook or other component is worn or damaged.

Completed checklists must be made available (on request) for inspection by the nominated project management representative. Wherever possible, these checklists must be kept with the crane or hoist.

All lifting operations must be supervised by suitably qualified, competent and experienced supervisors.

An effective method of communication between the crane operator and those assisting with the lift must be in place. This must be documented and approved by the nominated project management representative.

Documented Safe Work Procedures must be in place to ensure the following:

- Access into an area where lifting operations are being carried out must be restricted. Such an area (i.e. where there is a risk of a load falling and striking a person) must be barricaded and only authorised persons may enter (i.e. those directly involved with the lifting operations). Warning signage must be conspicuously displayed;
- Where a load is being moved from one location to another (i.e. The lifting operations are not being carried out in a discrete area that can be barricaded), measures must be taken to ensure that all persons in the path of the suspended load are made aware of the approaching hazard and that they move, and remain, well clear of it. All persons potentially affected must be given warning before the load is lifted;
- A lift must be directed and controlled by a single person (a suitably qualified, competent and experienced rigger);

- Dedicated spotters must be in place during lifting operations to observe and provide warning (if necessary) to prevent incidents and ensure that safety protocols are adhered to;
- Before commencing with a lift, it must be verified that the load being lifted is both within the rated capacity of the crane (or hoist) and lifting equipment and within the limits set out in the lift plan and / or risk assessment. The rated load capacities of the crane, hoist, rope, chains, slings or other components may never be exceeded;
- Only certified lifting equipment (tackle) may be used to lift a load;
- No equipment (tackle) that has been used for towing may be used for lifting operations;
- Only an approved material box (skip box) may be used for lifting loose items or materials;
- Before commencing with a lift, it must be verified that no safety devices (including load limiting devices) have been bypassed, overridden or disconnected;
- To prevent the load from swinging as it is lifted, the hoist must be centred over the load (when using slings or chains) or positioned directly above the lifting point of the load;
- Hoisting ropes must be kept vertical. No side loading of a crane boom is permitted (i.e. A crane may not be used to make a side pull);
- Two full wraps of rope must remain on the hoisting drum at all times. If a lower hoist limit switch has been fitted, and it is working correctly, it should not be possible to lower the block below the point where less than two full wraps of rope are on the drum;
- Before commencing with a lift, it must be verified that all rigging connections are correct and secure. Slings, chains, or other lifting devices must be fully and securely seated in the saddle of the hook;
- Slack must be removed from the slings, chains and / or hoisting ropes before lifting the load. It must be ensured that multiple lines are not twisted around each other and that the hoist rope is not wrapped around the load;
- To ensure that the load is properly secured and balanced, it must initially only be lifted a few centimetres. Slings must be repositioned if required;
- Before moving a suspended load, it must be lifted high enough to clear all obstructions. The load must only be lifted to the height necessary to clear obstructions, and no higher;
- Directional movement must be made smoothly and deliberately (there must be no sudden acceleration or deceleration of the moving load). Abrupt, jerky movements of the load in any direction must be avoided;
- Tag lines must be used in situations where a load needs to be steadied or guided while suspended;
- When using tag lines to steady or guide a suspended load that is being moved using a mobile crane, personnel on foot must remain in sight of and in communication with the crane operator at all times, must never walk between the crane and the load, and must remain clear of the load and the crane at all times (at least 5 metres). The load must be moved at a slow walking speed;
- A suspended load must be monitored closely at all times;
- If a crane operator's view of a suspended load is unavoidably obscured (completely or partially), or if a suspended load is unavoidably obscuring (completely or partially) a crane operator's view, then suitably positioned spotters must be in place to provide guidance to the crane operator;

- A load MAY NOT be moved over, or be suspended above, any person or any occupied building. No person may walk beneath, or position hhealth and safetyelf below, a suspended load;
- No person may pass or work beneath the boom of a crane;
- No person may be positioned between a suspended load and a solid object where there is a risk of being crushed should the load swing;
- No person may be positioned within the radius of the boom of a crane unless directly involved with the lift;
- Under no circumstances may any person ride on a crane's hook or on a load;
- No load may be left suspended unless the operator is at the controls and is monitoring the load. In such a situation, the load must be kept as close as possible to the ground or floor to minimise the possibility of injury should the load drop;
- The controls of a crane or hoist may never be left unattended while a load is suspended. If it becomes necessary to leave the controls, the operator must lower the load to the ground or floor;
- With the exception of pick-up and carry operations, no lifting may be carried out using a mobile crane unless the outriggers have been deployed and are locked in position;
- Load spreaders or packing under the outriggers must be used irrespective of the underfoot conditions;
- Before a mobile crane is moved into position to carry out a lift, the area must be inspected by a suitably qualified person who must verify that the underfoot conditions are satisfactory;
- When using a mobile crane, slewing to test the effectiveness of the outriggers must be carried out prior to commencing with a lift;
- Slew pins must be securely in place while a mobile crane is travelling;
- Unauthorised use of a crane or hoist must be prevented by removing the keys, locking the cabin, isolating the controls, etc. When lifting operations have been completed;
- When not in use, lifting equipment must be stored off the ground and must be protected from the elements (rain, harsh sunlight, etc.) And contamination (dust, solvents and other chemicals) in order to prevent damage and / or deterioration.

A crane or hoist or an item of lifting equipment may only be used for the purposes for which it was designed.

16.12.4 Inspection, Testing and Maintenance

Any crane or hoist brought onto the project premises must have a current test certificate and record of inspection as well as a suitable checklist (derived from the crane or hoist manufacturer's inspection recommendations) for use by the operator(s) when carrying out pre-operation safety checks.

An Equipment Profile (dossier) must be compiled for each crane.
A register of all cranes, hoists and lifting equipment (tackle) brought onto the project premises must be compiled and maintained.

Each crane, hoist and item of lifting equipment must have a unique identification code or number, which must be referenced in the register.

For each crane, hoist and item of lifting equipment, the following documentation must be kept on site and must be made available (on request) to the nominated project management representative for inspection:

- Test records and certificates;
- Inspection records;
- Maintenance records; and

- Details of any modifications or repairs made.

All cranes, hoists and lifting equipment must be inspected, tested and confirmed fit for purpose (i.e. Safe for use):

- Before being operated or put into service;
- Before being returned to service following any repair or modification; and
- Periodically as follows (unless local regulations require examination more frequently):
  - Each crane or hoist (including all ropes, chains, hooks or other attaching devices, sheaves, brakes and safety devices that form an integral part of the crane or hoist) must be thoroughly examined by a competent, experienced and appointed person every 6 months;
  - Each crane or hoist must be subjected to an annual performance test (i.e. A load test) by a competent, experienced and appointed person; and
  - All lifting equipment (tackle) must be thoroughly inspected by a competent, experienced and appointed person every 3 months.
  - The system of inspection and testing must provide verification that each crane or hoist is able to function to its design specifications, and must verify the integrity of:
- Mechanical and electrical components;
- Controls;
- Cables and all lifting attachments;
- Structural components including boom, hoist, brakes, wheels, hooks, baskets, out-riggers, hook-blocks and rails; and
- Load limiting devices, hoist limit switches, alarms or warning devices, and other safety devices and control systems (including independent fail-safe braking systems, devices to stop the crane or hoist such as a dead man's switch, and emergency shut-off switches).

A preventative maintenance system must be in place to ensure that all cranes and hoists are maintained in a safe and serviceable condition.

For any crane or hoist, all inspections, testing, maintenance and repairs must, as a minimum, be carried out in compliance with the requirements and specifications of the manufacturer as well as all applicable regulatory requirements (in terms of both the frequency of inspection, testing and maintenance, and the physical condition of the crane or hoist).

Repairs to a crane or hoist may only be carried out by competent persons. After repairs have been made, the crane or hoist must be tested and recertified fit for purpose (unless the repairs did not affect the integrity of the lifting mechanism).

Any modification to a crane or hoist must be subject to the approval of the original equipment manufacturer and a rigorous change management process.
Each item of lifting equipment (tackle) must be tagged following each quarterly (3-monthly) inspection. Details of these inspections must be recorded in the lifting equipment register which must be made available to the nominated project management representative on request.

The following colour coding system must be used for the tagging of all lifting equipment:

Table 16-1 colour coding system for lifting equipment

Quarter	Tag colour
January – march	Blue
April – June	Red
July – September	Green
October – December	Yellow

The tag placed on an item of lifting equipment must be traceable to an entry in the lifting equipment register where the following information concerning the inspection of that item of equipment must be recorded:

- Item description;
- Unique item identification code or number;
- Item owner;
- Item location;
- Date of inspection;
- Name and signature of competent person who carried out the inspection; and
- Any comments concerning the inspection.

Any item of lifting equipment that is found to be damaged or defective must be removed from service (and tagged, "out of service") immediately and must then either be repaired and recertified (if possible) or destroyed to prevent further use.
Similarly, any lifting equipment that is known (or is suspected) to have been overloaded must be removed from service immediately and destroyed to prevent further use.
If an item of lifting equipment is removed from service or destroyed (scrapped), this must be indicated in the lifting equipment register.
Any item of lifting equipment without a tag or with an out-of-date inspection may not be used.

16.12.5 Training and competency

Only suitably trained, competent and experienced persons who have been authorised in writing by the contractor's project manager are permitted to:

- Evaluate and plan critical lifts;
- Supervise lifting operations;
- Operate cranes and hoists;
- Use lifting equipment, and rig (sling) loads;
- Provide signals for controlling lifts; and
- Inspect, maintain or test cranes, hoists and lifting equipment.

Each operator must meet the competency requirements for the particular class or type of crane or hoist to be operated. Depending on the project location and applicable legislation, operators may need to hold a certificate of competency issued by a recognised training institution.

16.13 Working at heights

All applicable legislation concerning work performed from an elevated position must be complied with at all times.
Fall prevention or fall protection measures must be in place whenever the potential exists for a person to fall 2 metres or more.

16.13.1 Fall prevention

16.13.1.1 Work platforms

Wherever practical, a safe working area must be provided in the form of a work platform with fixed edge protection. This may include:

- a permanent work platform or walkway (i.e. A fixed steel structure);
- a fixed or mobile scaffold; or
- an elevating work platform such as a scissor lift, man lift, boom lift or cherry picker.

All work platforms and walkways elevated one metre or more must have complete floors, and edge protection must be in place in the form of toe boards and sturdy guard rails properly secured (i.e. bolted, welded, clamped, etc.) To prevent accidental displacement. Safe means of access and egress must be provided.

Guard rails must be capable of withstanding a force of at least 100 kilograms applied in any direction at any point.
The top rail must be positioned at a height of one metre above the working surface, and a mid-rail must be provided.

16.13.1.2 Floor openings, holes and edges

Any opening or hole (temporary or permanent) in a floor, platform or walkway must be protected by sturdy guard rails (removable if required) or a cover to prevent a person from stepping into or falling through the gap. Covers must be strong enough to support the loads that will be imposed on them and must be secured to prevent accidental displacement.

Ladder way floor openings and platforms must be protected by guard rails of standard construction and toe boards must be fitted along all edges, except at the entrance to an opening where a gate must be installed and so arranged that a person cannot walk directly into the opening.

When open, hatchways and floor openings must be protected by removable guard rails and toe boards of standard construction. When these openings are not in use, covers of adequate strength must be put in place and must be secured to prevent accidental displacement.

Where doors or gates open directly onto a stairway, a platform must be provided and the swing of the door or gate must not reduce the effective width of the platform to less than 500mm.

16.13.1.3 Wall openings

Wall openings, from which there is a drop of more than one metre, must be guarded as follows:

- When the height and position of the opening in relation to the working surface is such that standard guard rails will effectively eliminate the risk of accidentally falling through the opening, then these must be provided. The bottom edge of the opening must be fitted with a toe board. The guard rails and toe board may be removable if required;
- Alternatively, the opening may be closed using a screen. Wall opening screens must be of such construction and mounting that they are capable of withstanding a force of at least 100 kilograms applied horizontally at any point on the near side of the screen. A screen may be of solid construction, of grillwork, or of slat work.

An extension platform outside a wall opening, onto which materials can be hoisted, must have sturdy guard rails (or equivalent edge protection) on all sides. One side of the extension platform may have removable railings in order to facilitate the handling of materials.

16.13.1.4 Stairways

Each flight of stairs having four or more risers must be fitted with handrails.
Handrails must be installed on both sides of every stairway.
Riser height and tread width must be uniform throughout any flight of stairs, including any foundation structure used as one or more treads.

Stairways must be free of hazardous projections, such as protruding nails. No materials, equipment or waste may be placed on or beneath any stairway.
All stairways must be well lit.

16.13.2 Fall protection

Whenever there is a risk of falling 2 metres or more, whenever there is a risk of falling onto dangerous equipment or machinery even if the potential fall distance is less than 2 metres, or whenever work must be carried out within 2 metres of an opening through which (or an edge over which) a person could fall, no work may commence unless:

- a fall protection (and rescue) plan is in place (prepared by a competent person, approved by the nominated project management representative, and implemented by the contractor);
- A detailed task-specific risk assessment has been carried out;
- A safe work procedure is in place for the task to be performed;
- A permit to work has been obtained; and
- Each person has been provided with suitable fall protection equipment.

Fall protection equipment (either fall restraint or fall arrest equipment) must be used at all times whilst the work is being carried out.
To prevent persons from falling, fall restraint equipment must be used whenever work must be carried out within 2 metres of an opening through which (or an edge over which) a person could fall.
Fall arrest equipment must be used whenever the potential exists for a person to fall 2 metres or more.

A person has been provided with suitable fall protection equipment if he is secured by means of an approved full body harness (well fitted) with two shock absorbing lanyards or an inertia reel (when fall arrest equipment is required) or two short restraining lanyards (when fall restraint equipment is required), double or triple action snap hooks (or karabiner type rings), and secure anchorage points (a person's lanyard may be attached either directly to an anchorage point or indirectly through the use of a variety of systems that incorporate a lifeline).

A dual lanyard system must be used to ensure that at least one connection point is maintained at all times.
Note: When selecting fall arrest equipment, care must be taken to ensure that the potential fall distance is greater than the height of the person plus the length of the lanyard with its shock absorber deployed (taking the height of attachment into account).

Anchorage points must, where practical, be above the head of the person, and must ensure that in the event of a fall the person will neither swing nor touch the ground.

All permanent anchorage points must be designed and approved by a professional structural engineer.

All anchorage points must be periodically inspected and tested by a competent person to ensure that they are secure and can support the required load. A system must be in place to identify anchorage points as authorised for use.
Temporary anchorage points (and lifeline systems) may only be used if a competent person has certified them safe to use.

If an elevating work platform is used, such equipment must be fitted with a fixed anchorage point for the attachment of fall protection equipment.

The use of fall protection (fall restraint or fall arrest) systems must be avoided wherever and whenever possible through design, the installation of physical barriers that protect persons from falling, and employing alternative methods of working.
Only if physical barriers protecting against free falls cannot be installed must fall protection equipment be used.

Fall protection (fall restraint or fall arrest) systems are items of personal protective equipment and, if required, must be purchased, installed and provided to employees.
Prior to commencing with any work at height, an assessment must be conducted to determine if the work requires the use of fall protection equipment, and if so, which fall protection system is the most appropriate for the work.

There must be a system for ensuring that fall protection equipment is:

- Tested and certified for use;
- Inspected by the user before use; and
- Destroyed following a fall or where inspection has shown evidence of excessive wear or mechanical malfunction.

All persons that are required to work at height (in order to carry out routine or non-routine tasks) must first be trained and certified competent to do so. Furthermore, each person must be in possession of a valid medical certificate of fitness specifically indicating that the person is fit to work at height.

All persons required to use personal fall protection equipment must be trained and certified competent in the correct selection, use, maintenance and inspection of such equipment.

All fall protection equipment must be thoroughly inspected on a monthly basis by competent persons appointed in writing and each item of equipment must be tagged to show when it was last inspected. All inspections must be recorded in a register.
On finding defective or damaged equipment, appropriate action must be taken by the competent person (i.e. the destruction of the equipment to prevent further use).

Persons making use of personal fall protection equipment must do so in strict accordance with the instructions or requirements specified by the manufacturer or supplier of the equipment or system.
Specific pre-use inspection, maintenance and fitting protocols must be established in accordance with the manufacturer's requirements or guidelines and these protocols must be followed by all users of the fall protection equipment.

Solvents may not be used to clean fall protection equipment. Only manufacturer-approved cleaning solutions may be used.

No person required to use personal fall protection equipment may work in isolation (a minimum of two persons working together is required).
Competent supervision must be in place at all times for all work carried out at height. Supervisors must be appointed in writing.

Emergency response (rescue) procedures for the rapid retrieval of suspended persons in the event of a fall from height must be prepared and tested.

Note: Even though there is no risk of free fall, fall protection equipment may be required in situations where there is a risk of falling, slipping or sliding down a slope of more than 45 degrees.

Note: The maximum service life of fall protection equipment manufactured of synthetic fibre shall be 5 years from the date of first use and / or manufacture unless otherwise specified by the manufacturer.

A person may climb or descend a ladder without fall protection provided that he is able to use both hands and legs to do so, faces the ladder, and uses one step at a time. The ladder must be tied off or supported at its base.

Prior to any roof work being performed, or prior to persons accessing a roof, a structural engineer must verify that the roof is of sound construction and that it is capable of supporting the weight of the persons as well as any equipment that may be required. Should the engineer's findings be to the contrary, alternative methods of performing the work must be found. Particular care must be taken when work is carried out on an asbestos cement roof or a fibreglass roof.

16.13.3 Risk Assessment and Permitting

The following documentation is required for any work where fall protection is required (i.e. where a risk of falling exists):

- A Fall Protection (and Rescue) Plan;
- A Risk Assessment for the task to be performed;
- A Safe Work Procedure for the task to be performed; and
- A Permit to Work.

As part of the Risk Assessment and planning processes, the following must be considered:

- Hazards relating to accessing the location at height;
- The nature of the work location;
- The nature of the work activities to be undertaken at height;
- Environmental and weather conditions;
- The presence of nearby persons who may be at risk due to falling objects (potentially) or who's activities may be affected by the work being performed at height;
- The selection of fall protection equipment (considering fall clearances) and / or access equipment;
- The selection of anchorage points;
- The load ratings of access platforms, work areas, anchorage points, etc.;
- The condition of supporting structures such as roofs;

- The need for the work to be carried out by multiple persons and the means of communication;
- A rescue plan that addresses retrieval or rescue contingencies;
- Working above open furnaces or molten metal;
- Exposure to heat sources;
- The use of a mobile elevating work platform, man basket, suspended scaffold or boatswain's chair; and
- Any other conditions that may affect the safe execution of the task.

16.13.4 Elevating Work Platforms

Before hiring or purchasing an elevating work platform (e.g. a scissor lift, man lift, boom lift, cherry picker or similar equipment), the certification of the equipment (with regard to suitability of design and construction) must be verified.

Before using an elevating work platform, it must be verified that the equipment is in good working order and has been serviced regularly. The service record and instruction manual must be kept on site. A system must be in place to ensure that the equipment is maintained and inspected as required by the manufacturer and / or local regulations.

Persons (operators) must be formally trained through an accredited training provider and certified competent in the operation of the equipment. Once a person has been issued with the necessary licence or qualification as required under local regulations, he must be appointed in writing to operate the equipment.

Before using an elevating work platform, the operator must inspect the equipment and a pre-use checklist must be completed.
The operator of an elevating work platform must be in the "basket" unless it can be demonstrated to the satisfaction of the nominated project management representative that this is not possible or practical.

Every person in the "basket" must keep his feet on the floor at all times.
Every person in the "basket" must be secured at all times by means of personal fall protection equipment attached to an approved anchorage point, and systems must be in place to prevent tools and equipment from falling.

A mobile elevating work platform must not be driven unless the "basket" has been lowered and secured in a stable position.
Every elevating work platform that is used must be equipped with a dead man's switch or foot pedal at the operator controls.
An elevating work platform must only be operated on a firm surface with the outriggers extended (where fitted).

An elevating work platform must not be operated on a grade or slope beyond the capability of the machine (every mobile elevating work platform that is used must be fitted with an inclinometer which sounds an audible alarm before the maximum safe incline has been reached).

The area beneath the "basket" and the boom must be barricaded.
A second competent operator of the mobile elevated work platform to be in place on the ground level – to ensure that the elevated work platform could be lowered in case of an emergency.

A spotter must be used at all times when moving a mobile elevating work platform and when the "basket" is in an elevated position.

16.13.5 Man Baskets, Suspended Scaffolds and Boatswain's Chairs

The use of a man basket, suspended scaffold or a boatswain's chair may only be considered when all other avenues to safely perform the work (e.g. ladder, scaffolding, mobile elevating work platform, etc.) have been exhausted. Authorisation to use a man basket, suspended scaffold or a boatswain's chair must be obtained from the nominated project management representative. If permission is granted, the use of such equipment must be in strict compliance with all applicable legislation.

A person working from a man basket or a suspended scaffold must remain within the basket and must keep his feet on the floor at all times.

Each person working from a man basket, suspended scaffold or a boatswain's chair must be in possession of a valid medical certificate of fitness and must be trained (and assessed competent) in the Safe Work Procedures pertaining to the use of the equipment, as well as the Fall Protection Plan.

Each person working from within a man basket or suspended scaffold or from a boatswain's chair must wear personal fall protection equipment at all times (i.e. an approved full body harness connected by means of a shock absorbing lanyard to an anchorage point or lifeline that does not form part of the basket or chair).

If suspended using a crane, the man basket, suspended scaffold or boatswain's chair must be visible to the crane operator at all times. A suitable means of communication must be in place to ensure that the suspended person(s) are able to communicate with the crane operator and personnel on the ground.

The crane operator must remain at the controls at all times while the man basket, suspended scaffold or boatswain's chair is occupied.
Where feasible (and if it is safe to do so), tag lines must be used to stabilise the man basket, suspended scaffold or boatswain's chair.

A man basket or suspended scaffold (including the suspension system) must be designed by a qualified engineer.
Only an approved and certified man basket or suspended scaffold may be used. Regulations may require approval by an authority or certification to a national or international standard. The manufacturer's procedures and conditions for use must be strictly complied with at all times.
Each man basket or suspended scaffold must be fitted with an information plate indicating the maximum weight and number of persons that may be lifted. Copies of the welding x-rays and engineering drawings must be kept on site.

Any work involving the use of a man basket, suspended scaffold or boatswain's chair must be carried out under the supervision of a competent person who has been appointed in writing.
A man basket, suspended scaffold or boatswain's chair must be thoroughly inspected (examined for damage) by a competent person prior to use (every time the equipment is used) and the results of each inspection must be recorded in a register. The crane or hoist as well as all lifting equipment (tackle) that is used to suspend the man basket, suspended

scaffold or boatswain's chair must be tested and inspected as stipulated in the Cranes and Lifting Equipment Standard.

All suspended scaffold erectors, operators and inspectors must be appointed in writing and proof of competency must be provided.

Persons carrying out welding or flame cutting work from within a man basket or suspended scaffold or from a boatswain's chair must take precautions to ensure that they do not accidentally cut or burn through the cables or wire ropes that are suspending them.

16.13.6 Falling Objects

In the process of planning work activities, the risks associated with falling objects (i.e. materials, tools or equipment) must be assessed and appropriate control measures must be identified, implemented, and monitored taking the following hierarchy of controls into consideration:

- Preventing objects from falling – by using containment sheeting, toe boards, lanyards to secure tools (to a person or to the structure), ropes or chains to secure equipment (to the structure), lift boxes, brick cages, etc. and by properly securing loads when lifted by crane or hoist;
- Protecting people from falling objects – by establishing barricaded exclusion zones, installing catch platforms or catch nets, displaying warning signage, and posting safety watchers and / or traffic controllers; and
- Personal Protective Equipment (particularly safety helmets and safety boots) – protective equipment is a last line of defence and must be worn.

Where overhead work is being carried out, barricading must be erected around the work area (at the level at which the work is taking place and at every level below including ground level) to prevent persons from entering such an area and potentially being struck by falling objects.
Wherever hazards related to falling objects exist, appropriate warning signage (i.e. "Overhead Work In Progress" and "No Unauthorised Access") must be prominently displayed.

No items are permitted to lie loose in elevated positions (e.g. nuts and bolts must be securely stored) and good housekeeping standards must be maintained at all times.
No tools, equipment, material, debris, waste, etc. may be dropped from height. Objects must be lowered or chuted to ground level in a safe and controlled manner.

16.13.7 Scaffolding

16.13.7.1 Training, Competency and Supervision

Scaffolding may only be erected, maintained, altered or dismantled under the strict personal supervision of a competent Scaffolding Supervisor (or Scaffolding Inspector) who has been appointed in writing.

Scaffolding may only be erected, maintained, altered or dismantled by competent and appointed Scaffolding Erectors (or Scaffolding Builders). It is the Scaffolding Supervisor's responsibility to ensure that all persons carrying out such work are suitably trained and experienced.
A certificate of competency issued by a reputable (i.e. accredited and approved) training provider must be produced for each Scaffolding Supervisor and each Scaffolding Erector.

16.13.7.2 Erection and Dismantling of Scaffolding

Only approved scaffolding components may be used to erect a scaffold. Scaffolding must be erected, modified and used in accordance with the manufacturer's guidelines or recommendations, and in strict compliance with all applicable legislation and standards.

A free-standing scaffold must not exceed a height of three times the smallest dimension of its base.
Scaffolds with a height to base width ratio of more than 3:1 must be restrained from tipping over by guying, tying, or bracing.
Guy wires and ties prevent scaffolding from tipping away from the building or structure, and braces are rigid supports that prevent the scaffolding from tipping into the building or structure.

Scaffolding must be secured to the structure every 6 metres vertically and every 9 metres horizontally (as a minimum). Adequate underpinning, sills or footplates must be provided for scaffolds erected on filled or otherwise soft ground (including sand or gravel).

If the scaffolding is to be load bearing (i.e. other than normal access and workplace storage) then full calculations and a design must be prepared and authorised in writing by a structural engineer. The load limits specified by the scaffolding manufacturer may not be exceeded under any circumstances.

Scaffolds must be plumb and level at all times.
All scaffolding components must be in good condition (i.e. undamaged and free of corrosion).
All scaffolding components must be properly connected or secured and scaffolding must be effectively braced (diagonal bracing).

Each person erecting, maintaining, altering or dismantling scaffolding must use fall protection at all times (i.e. a full body safety harness with two shock absorbing lanyards fitted with scaffold hooks). The work must be planned to enable every Scaffolding Erector to be securely anchored at all times. A suitable lanyard length (not exceeding 2 metres) must be selected taking the potential fall distance and height of attachment (height of anchorage point) into account. If the lanyard is too long or the anchorage point is too low, the person may hit the ground, a platform, or objects below him before the lanyard is able to break his fall.

The area around the base of a scaffold must be barricaded to prevent unauthorised access into the work area. When scaffolding is erected or dismantled on a level, platform, or floor lying above ground level and the potential exists for components to fall to levels below the level on which the scaffolding is positioned, then the area directly below the scaffolding on each of those levels must also be barricaded. Appropriate warning signage (i.e. "Overhead Work In Progress" and "No Unauthorised Access") must be prominently displayed.

Hoists, lifts and approved material baskets must be used (where available) to lift scaffolding components to elevated positions.

Where components are passed from hand to hand during the erection or dismantling of a scaffold, each Scaffolding Erector must always stand on three boards and not directly above the person below him. During this process, each Scaffolding Erector must remain within the confines of the scaffold and must expose as little of his body as possible to

minimise the risk of being struck by a falling component. Good communication between team members must be maintained at all times.
No scaffolding components, tools, or any other material may be dropped from height or thrown from one level to another. Components, tools and materials must be lowered or lifted in a controlled manner. Use may be made of a chute.

Each tool must be secured to the wrist, harness or structure by means of a lanyard. A tool bag (around the waist or over the shoulder) may be used for carrying tools up and down a scaffold structure. Tools or equipment may not be carried by hand up or down a structure, as both hands must be used for climbing. If necessary, a rope must be used for lifting or lowering tools or equipment.

While a scaffold is being erected or dismantled, no scaffolding components may be stacked on the scaffold structure unless it has been designed for that purpose. Any loading of a scaffold structure must be authorised in writing by a structural engineer.

For special scaffolding, a design must be prepared by the appointed Scaffolding Supervisor and this design must be authorised in writing by a structural engineer before the scaffolding is erected.
Scaffolding may not stand on steel grating unless the grating is adequately supported from below. Scaffolding must rather stand on the structure that supports the grating.

Empty drums, crates or bricks may not be used to prop up, support or anchor scaffolding. Before scaffolding is erected in close proximity to an electrical installation or live conductors, an electrical engineer (employed by Project or the client) must inspect the area and determine whether or not the scaffolding must be earthed. Should the scaffolding require earthing, this must be done as soon as possible while the scaffolding is being erected.

Scaffolding may not be erected if it is raining or in winds stronger than 32 km/h.

A green tag (displaying the words, "Scaffold Safe for Use") or a red tag (displaying the words, "Danger: Do Not Use Scaffold") must be prominently displayed on each scaffold at all times. The tag must be positioned close to the base of the ladder or staircase provided for safe access. The wording on the tags must be in English and any other language commonly used on site.
As a minimum, a green tag must display the Scaffolding Supervisor's name, the date that the scaffold was erected, and the date that the scaffold was last inspected.
Only an appointed Scaffolding Supervisor may attach, change, update the information on, or remove these tags.

Scaffolding must not be:

- Left partially erected or partially dismantled except for normal work stoppages (for example, over weekends);
- Left in an unsafe condition (if scaffolding is unavoidably in an unsafe condition, barricading must be in place to prevent unauthorised access and the required red tags must be prominently displayed on the scaffold structure); or
- Moved or altered while work is in progress.
-

Mobile scaffolding must be equipped with brakes, which must be engaged at all times when the scaffolding is in use. A scaffold may not be moved if any person is on the structure.

16.13.7.3 Safe Access

Safe and convenient access must be provided to every scaffold platform by means of properly installed ladders or approved stairways, which must remain unobstructed at all times. Climbing up or down a scaffold on the braces or ledgers is forbidden.

All ladders used to access scaffolding must be securely attached to the scaffold structure. Hook-on and attachable ladders must be specifically designed for use with the type of scaffolding being used.

If a ladder is used to access a scaffold platform at a height greater than 1.5 metres above the ground, then the ladder must be secured internally (i.e. within the scaffold structure) and there must be an opening (closed with a trap-door) in the platform at the top of the ladder.

If the scaffold platform is at a height of less than 1.5 metres above the ground, then the ladder may be attached externally provided the guard rails around the platform are modified to allow access (the opening in the guard rails must be kept closed using a self-closing gate). No person may climb over or through the guard rails to gain access to a platform.

If a vertical ladder used on scaffolding is more than 5 metres in length it must be equipped with a ladder cage extending from a point 2 metres from the base of the ladder to a height of 1 metre above the platform (or the uppermost platform) that the ladder is providing access to.
Circular ladder cages must have an internal diameter of no more than 700mm. Square ladder cages must have internal dimensions of no more than 700mm by 700mm.

The requirement for a ladder cage may be waived if platforms are provided at height intervals not exceeding 4 metres, with the vertical ladder secured on the inside of the scaffolding framework and an opening (closed with a trap-door) in each platform.
Vertical ladders must be braced at three metre intervals (as a minimum) to prevent undue movement.

All vertical ladders providing access to a platform must be left in place for as long as the scaffold remains in place and must be inspected as part of the scaffold structure.
Any deviation from the requirements stipulated above must be subjected to a risk assessment and the nominated project management representative must authorise the deviation in writing.

16.13.7.4 Scaffolding Platforms

Safe work platforms must be provided.

Every work platform must be complete (i.e. from ledger to ledger and from transom to transom without any gaps) in order to prevent personnel, materials, tools, etc. from falling through the platform.

Every work platform must be constructed from manufactured steel scaffold boards (planks) of equal thickness (height). Timber boards are not permitted under any circumstances.

Each steel scaffold board must be securely hooked (fastened) onto the ledgers or transoms that support it.

On all sides except the one facing the structure, every scaffold platform must be provided with:

- Sturdy guard rails positioned 500mm above the platform floor (the mid rail) and 1000mm above the platform floor (the top rail); and
  Steel toe boards that are at least 150mm high and securely attached such that no gap exists between the toe boards and the platform floor.
-

Note: Wire mesh infill panels incorporating a toe board may be used instead of a mid-rail.

Scaffold platforms must be as close to the structure as is practicable (but not closer than 75mm) except where personnel need to sit on the edge of the platform while they work in which case the distance may be increased to no more than 300mm.

Scaffold platforms must, at all times, be kept free of waste, protruding objects, and any other obstructions. Platforms must be cleaned if necessary to ensure that they are maintained in a non-slip state.

16.13.7.5 Inspection of Scaffolding

Every scaffold structure must be inspected by a competent Scaffolding Supervisor:

- Prior to use after erection, and at least weekly thereafter;
- After inclement weather (heavy rain, strong winds, etc.);
- After any incident resulting in jarring, tilting or overloading;
- After any alteration is made; and
- Before being dismantled.

On completion of an inspection, the Scaffolding Supervisor must update the information on the scaffold tag.

A record of each inspection (date and time of inspection, location of scaffolding, findings, etc.) must be captured in a register. The register(s) must be maintained by the Scaffolding Supervisor(s) carrying out the inspections.

16.13.7.6 Using Scaffolding

The user of a scaffold (i.e. the responsible supervisor) must inspect the erected structure prior to acceptance and must ensure, as far as is reasonably possible, that the scaffold is safe and fit for purpose before allowing his team to make use of the scaffold.

In particular, the user must ensure that:

- The scaffold and the platforms have been constructed to meet the loading requirements of the work that is to be carried out (the Scaffolding Supervisor must be consulted in this regard);
- The Scaffolding Supervisor has checked that adequate ties and braces are in place;
- The work platforms are in the correct positions and are complete with toe boards and guard rails;
- Safe and convenient access has been provided (ladders and / or stairways); and
- A green ("Scaffold Safe for Use") tag has been attached to the scaffold by the Scaffolding Supervisor.

Use of an incomplete or unsafe scaffold is prohibited.
Unsteady or non-rigid scaffolds must not be used and inadequacies must be reported to, and rectified by, the responsible Scaffolding Supervisor.

The user of a scaffold must ensure that every person in his team is aware that no alterations to the scaffold may be made by the team during the course of their work, and that if any alterations are required, they must be made by competent Scaffolding Erectors under the supervision of an appointed Scaffolding Supervisor.

A scaffold may not be used:

- If a red tag is displayed indicating that the scaffold is not safe to use; or
- During inclement weather, defined as wind speeds greater than 40km/h, thunderstorms, or heavy rain (in excess of 40mm/h).

Note: With due consideration of possible educational limitations, the contractor must ensure that all persons understand what green and red tags mean.

The area around the base of a scaffold must be appropriately barricaded to prevent unauthorised access into the work area. Appropriate warning signage (i.e. "Overhead Work In Progress" and "No Unauthorised Access") must be prominently displayed.

Loose tools and / or materials on scaffold platforms must be secured using lanyards, wire or fibre rope, or must be placed in secured containers.
Where appropriate, "catch nets" deemed may be installed as an additional safety measure to prevent materials or tools from falling to the ground.

The storage or placement of materials on scaffolding platforms must be kept to a minimum. Debris as well as tools and materials that are no longer required must be removed from all working platforms at least once per day.

Scaffolding platforms must be cleaned regularly.

A heavy load may not be placed on a scaffolding platform unless the scaffold has been designed and constructed specifically for that purpose. Any loading of a scaffold structure must be authorised in writing by a structural engineer.

Scaffolds may not be used as hoisting towers or to support piping or equipment.
Each person working from scaffolding must wear fall protection (i.e. a full body safety harness with two shock absorbing lanyards fitted with scaffold hooks) and must be securely anchored at all times.

All work must be carried out from properly constructed work platforms. Standing on railings or braces in order to perform work is forbidden.
Drums, boxes and other makeshift substitutes for scaffolding may not be used under any circumstances.

Where work on an electrical system is to be undertaken from a scaffold, an electrical engineer (employed by Project or the client) must determine whether or not the scaffolding structure requires bonding and earthing. The scaffolding may not be used until this has been determined, and if required, until the structure has been bonded and earthed.

16.13.7.7 Identification and Inspection of Scaffolding Components

All scaffolding components belonging to a contractor must be properly marked or uniquely coloured to enable positive identification.

Prior to erecting a scaffold, all scaffolding components must be carefully inspected by a competent Scaffolding Supervisor.

Components found to be defective during an inspection must be conspicuously marked and removed to a suitably demarcated quarantine area for destruction, repair, refurbishment or removal from site. Deformed and bent wedges must be straightened and inspected for cracks before being put back into service.

16.13.7.8 Storage of Scaffolding Components

All scaffolding components must be stored in a demarcated storage area in such a manner that they are not exposed to environmental extremes and will not cause injury to persons. Suitable barricading or fencing must be erected and warning signage must be posted (e.g. No Unauthorised Entry).

Within a storage area, scaffolding components must be stacked such that pathways (750mm in width) are maintained between the stacks. Each stack must be stable and components must be neatly placed to ensure that no ends protrude into any pathway. The various components must be stacked separately.

The weight of scaffolding components must be considered when stacking them in elevated positions.

Any storage area for scaffolding components must be positioned such that it will not interfere with any onsite activity (including the operation of any plant or equipment), block any access way, or obstruct access to any plant or equipment. Before establishing a storage area, the location must be agreed with the nominated project management representative.

16.13.8 Ladders

All ladders used on site must be of sound construction and adequate strength.
Only non-conductive ladders made of wood or fibreglass may be used for electrical work or work being performed in proximity to energised electrical equipment. Metal ladders and ladders with metal reinforcing may not be used.

The use of makeshift ladders is forbidden.
All ladders must be numbered, listed in a register, and inspected by a competent person on a monthly basis (the results of each inspection must be recorded in the register).
Before using a ladder, the user must inspect it for damage.

Ladders with missing, broken, cracked or loose rungs, split stiles, missing or broken spreaders (stepladders) or any other form of damage or defect may not be used.
A damaged ladder must be removed from service (and tagged, "Out of Service") without delay and must then either be repaired (if possible) or destroyed to prevent further use.
Persons must receive instruction in the correct use and proper care of ladders.

Ladders may only be used as a means of access and egress. The use of ladders as working platforms is prohibited, except for inspection and carrying out minor tasks (i.e. light work and short duration) such as changing a light bulb.

Ladders may not be positioned horizontally and used as walkways or runways or as scaffolding.
All portable ladders must be fitted with non-skid safety feet (or some other means to prevent the base of the ladder from slipping) and the feet must always be placed (stand) on a firm level surface.
The use of bricks, stones, wood or any other material to level the stiles of a ladder is prohibited.
Ladders may not be placed on movable bases such as boxes, tables, trucks, etc.

The base or foot of a ladder must always be secured to prevent it from slipping. The ladder must be held by an assistant if the base cannot be secured in any other way (e.g. tied off).
A straight ladder must extend at least one metre above its support (or above the working platform that it is providing access to). The top of the ladder must be tied off (or otherwise secured to its support) to prevent accidental movement.

A straight ladder must be placed at a safe angle, i.e. tilted at a ratio of approximately 4:1, meaning that the base of the ladder must be one metre away from the wall (or other vertical surface) for every four metres of height to the point of support.

A stepladder may never be used as a straight ladder. A stepladder must be opened fully and the spreaders must be locked securely.
When using an extension ladder, at least four rungs must always overlap at the centre of the ladder.
Ladders may not be joined together unless they have been specifically designed and manufactured for that purpose.

A suspended ladder (i.e. not standing on a base) must be attached in a secure manner to prevent undue swinging or swaying, and to ensure that it cannot be displaced.

A ladder may not be placed against a window, glass or any other material which is unlikely to withstand the force exerted on it by the top of the ladder.

A ladder may not be placed in front of a door or window that opens towards the ladder unless the door or window has been locked or barricaded.

When a ladder is used near an entrance or exit, the base of the ladder must be barricaded.
Materials and / or equipment may not be placed in close proximity to the base or landing of any ladder.

When ascending or descending a ladder, a person must always face the ladder and use both hands (i.e. maintain three points of contact).

Nothing may be carried up or down a ladder if it prevents the person from holding on to the ladder with both hands. Tools must always be properly secured. This can be achieved by attaching them to the wrist using lanyards or placing them in a tool belt around the waist. Tools and materials may also be carried in a bag over the shoulder or hoisted to the landing using a tool bag and rope.
Only one person at a time may use (i.e. be positioned on) a ladder.

No person may stand or step above the third rung from the top of a straight ladder or above the second highest step of a stepladder.

Overreaching from a ladder is prohibited. If the target is not within comfortable reach, the person must climb down and reposition the ladder.
No person may run up or down a ladder, or jump from the lower rungs or steps to the ground.
All ladders must be properly maintained and cared for.
Ladders must be stored under cover and should be hung in a horizontal position from several brackets.

No ladder may be left lying on the ground or be left exposed to the weather. A ladder left lying on the ground presents a tripping hazard and it may be damaged by vehicles running over it.
No ladder may be left in such a position where it may fall over, be accidentally knocked over, or be blown over by the wind.

Ladders may not be painted, as the paint may conceal damage, defects, labels or other markings.
Instead of paint, clear varnish or wood oil may be used to preserve wooden ladders.
Ladders must be kept clean, as dirt may conceal damage or defects. Oil or grease accumulation on the rungs of a ladder may cause a person to slip.

Before making use of a ladder, each person must make an effort to remove mud, oil, grease, etc. from his boots.

16.14 Permit to Work

All personnel must comply with the Permit to Work system applicable to the project.
A Permit to Work must be obtained before carrying out any work that involves:

- A hazardous energy source or system, including electricity, compressed fluids (e.g. hydraulics and pneumatics), chemical substances (e.g. toxic, corrosive, flammable or explosive gases and liquids), heat (e.g. steam), radiation, and machinery or materials with potential energy (gravitational and elastic) – isolation and lockout may be required;
- Confined space entry;
- Working at height;
- A critical lift;
- Hot work outside of designated workshops;
- Excavation; or
- A service (e.g. water supply, fire suppression systems, etc.).

Note: A Permit to Work may only be issued by an Authorised Person, and may only be received (or accepted) by an appointed Applicant (see Definitions).

Each Permit to Work that is issued must make reference to an approved Task-Based Risk Assessment for the work that is to be carried out.

The Permit to Work system that is employed must incorporate the following basic procedures:

- Prior to meeting with the Authorised Person, the Applicant must familiarise hhealth and safetyelf with all of the hazards associated with the system, plant, equipment, structure or area on or in which the work must be performed. He must

also consider the risks that may arise as a result of the tasks that will be carried out. A Task-Based Risk Assessment must be in place;

- The Applicant must then request permission to carry out the work and must meet with the Authorised Person to discuss and document the scope of the work as well as the hazards, risks and associated control measures. Isolation and lockout requirements must be identified (if applicable). The isolation and lockout process must be initiated by the Authorised Person who must contact the necessary Isolation Officers.

Note: The Applicant must ensure his own safety and that of his team, and has the right to accompany the Isolation Officers to verify that all of the necessary locks have been fitted to all of the isolation and lockout points in accordance with the applicable plant or equipment-specific Isolation and Lockout Procedure.

- Once all of the necessary isolations have been completed and the necessary Clearance Certificates have been issued by the Isolation Officer(s) (if applicable), and the Authorised Person is satisfied that the system, plant, equipment, structure or area is safe to work on or in provided all identified precautions are observed by the Applicant, then he must issue (sign) the Permit to Work to the Applicant;
- The Applicant must accept (sign) the Permit to Work. If equipment has been isolated, the Applicant must attach his Personal Lock to the relevant Isolation Bar (or Local Isolation Point) and must ensure that every other person working on the isolated equipment also attaches his or her Personal Lock to the Isolation Bar (or Local Isolation Point) before starting any work;
- Before commencing with any work, the Applicant must discuss the hazards, risks, control measures, precautions and limitations as stated in the Permit to Work (and associated Task-Based Risk Assessment) with all personnel who will be carrying out the work. A register must be kept and all persons must sign the register once they have been briefed by the Applicant;
- The work performed must be limited to what is described in the Permit to Work;
- When a particular employee has completed his work, he must sign the personnel register to this effect and (if applicable) must remove his Personal Lock from the Isolation Bar (or Local Isolation Point);
- Once all work is complete, the Applicant must:
  - Ensure that all machine guards have been replaced;
  - Ensure that all tools and materials have been removed from the work area;
  - Ensure that the work area is clean and tidy;
  - Ensure that all Personal Locks (including his) have been removed from the Isolation Bar or Local Isolation Point (if applicable);
  - Inform the Authorised Person that the work has been completed; and
  - Sign off the Permit to Work.
- Once the work is complete and the Applicant has signed off the Permit to Work, the Authorised Person must:
  - Ensure that the relevant Isolation Officers perform all of the necessary de-isolations (if applicable);
  - On completion of the de-isolations, sign off the Permit to Work accepting the system, plant, equipment, structure or area back for service; and
  - Inform all relevant personnel that the system, plant, equipment, structure or area is ready to use.

- Where the work must continue over more than one shift, the Permit to Work must be reviewed at every shift change by an Authorised Person. If the scope of work has changed, the permit must be cancelled and a new permit must be issued.

If any of the original conditions or precautions pertaining to the work is not being complied with, is no longer adequate or is no longer applicable, the Authorised Person must cancel the Permit to Work and must ensure that all work stops until full compliance with either the original or amended (as required) conditions and precautions is achieved and a new permit has been issued.

The Applicant must ensure that the Permit to Work (including the personnel register) is kept where the work is being carried out (i.e. posted on a portable Health and Safety Management Information Notice Board) and that the work is monitored against the permit conditions.

All Permit to Work records must be retained and must be made available for inspection when required.

The implementation of the Permit to Work system applicable to the project must be audited on a regular basis by a nominated project management representative. Furthermore, planned task observations must be carried out periodically.

Note: In addition to obtaining Permits to Work as and when required for specific hazardous activities (identified in this standard), each contractor must obtain a General Work Authorisation from a nominated project management representative on a monthly basis. A General Work Authorisation is valid for one calendar month and authorises the contractor's planned work activities. In order to obtain a General Work Authorisation, the contractor must provide a documented work plan for the month together with the necessary Task-Based Risk Assessments.

16.15 Isolation and Lockout

Isolation and lockout procedures that make it impossible to inadvertently energise any system, plant or equipment so isolated, must be in place for all work where hazardous energy sources exist, including electricity, compressed fluids (e.g. hydraulics and pneumatics), chemical substances (e.g. toxic, corrosive, flammable or explosive gases and liquids), heat (e.g. steam), radiation, and machinery or materials with potential energy (gravitational and elastic). These procedures must be strictly enforced.

All personnel must comply with the isolation and lockout system and procedures applicable to the project.

All Isolation and Lockout Procedures must incorporate the following basic requirements:

- The issuing of a formal Permit to Work for any work that requires the isolation of any system, plant or equipment;
- The use of defined Equipment, Discipline and Personal Locks (see Definitions), and multiple lockout systems (i.e. Isolation Bars and lockout hasps);
- Clear identification of all isolation and lockout points ensuring there is no duplication;
- Isolation of the main energy source;
- The use of slip plates or the blanking off of pipelines or ducting, in addition to the chaining and locking of valves, as determined by a risk assessment;
- Suitable methods of preventing the movement of equipment; and
- Methods to test the effectiveness or completeness of the isolation.

Note: No work may commence on a system, plant or equipment until a Permit to Work has been issued by an Authorised Person.

Note: A Permit to Work may only be issued by an Authorised Person once all required Clearance Certificates have been issued by appointed Isolation Officers.

The isolation and lockout system that is employed must incorporate the following basic procedures:

- In accordance with a system, plant or equipment-specific Isolation and Lockout Procedure, an appointed Isolation Officer(s) must isolate all points that need to be isolated in order to render the system, plant or equipment safe to work on. An Equipment Lock (and a suitable, highly visible warning tag) must be attached to each isolation point;
- On completion of an isolation (and lockout), the Isolation Officer must clear the area of all persons and must then carry out tests to ensure that the isolation is effective. This may be done by pressing a start button or by asking a control room operator to try to start the equipment. Special care must be taken to ensure that the attempted starting of the equipment has not been deactivated by another interlock forming part of the system, or by a different up-stream isolation. Alternatively, appropriate equipment may be used to test for energy (e.g. voltage verification or continuity tests).

Note: In the case of electrical isolation, a test for voltage must be carried out, after the switching device, to ensure the absence of voltage.

- The Isolation Officer must place the key to the Equipment Locks on an Isolation Bar (at a Lockout Station) and must then attach a Discipline Lock (to prevent the key from being removed) before issuing a Clearance Certificate;
- The Discipline Lock must remain in place when handing over to subsequent shifts. All Discipline Locks for a particular discipline (e.g. low voltage electricity) must be keyed-alike so that any Isolation Officer appointed for that discipline (and issued with a key) can open any of the Discipline Locks used for that discipline.
  This enables an Isolation Officer to de-isolate equipment that may have been isolated by another Isolation Officer during an earlier shift. Appointed Isolation Officers for a particular discipline are the only persons permitted to hold keys to the Discipline Locks used for that discipline.

Note: Local isolations do not require the use of Equipment Locks (a Discipline Lock may be attached to the Local Isolation Point by the Isolation Officer, followed by the necessary Personal Locks).

Note: For local isolations, if the Isolation Officer is the only person who will be working on the isolated equipment, then he must attach his Personal Lock to the Local Isolation Point.

- Once all required Discipline Locks are in place (i.e. attached to the Isolation Bar) and all Clearance Certificates have been issued, the Permit to Work may be issued by the Authorised Person;

- Each person who will be working on the isolated system, plant or equipment must then attach his or her Personal Lock to the Isolation Bar before starting any work (including the Isolation Officer, if he intends to work on the isolated unit);
- The attachment of a Personal Lock to the Isolation Bar prevents the removal of the key to the Equipment Locks even if the Discipline Lock is removed;
- When called (by an Authorised Person) to de-isolate the system, plant or equipment (on completion of the work under the Permit to Work), the Isolation Officer must ensure that all Personal Locks have been removed from the Isolation Bar before removing the Discipline Lock and the key to the Equipment Locks;
- Before removing the Equipment Locks and de-isolating the energy source, the Isolation Officer must inspect the system, plant or equipment that was worked on to ensure that it is safe to perform the de-isolation. This includes guard inspections, housekeeping, ensuring that all doors and covers are in place, and most importantly, ensuring that no persons are present;
- Once all Equipment Locks have been removed and the system, plant or equipment is safe for use, the Isolation Officer must cancel the Clearance Certificate and inform the Authorised Person that the unit has been de-isolated.

Where a system, plant or equipment is sequence interlocked and a hazard could be created through the inadvertent start up or shut down of a system, plant or equipment lying before or after the unit to be worked on, then that system, plant or equipment must also be isolated and locked out.
Redundant or out of service equipment must, in addition to being isolated and locked out using the relevant Discipline Lock, be fitted with a tag indicating why it is out of service, who performed the lockout, and the hazards associated with that equipment.

Where it is necessary to work on live equipment for the purposes of commissioning, testing, adjusting and sampling, such work must be carried out in accordance with a written Safe Work Procedure and controls must be in place to prevent unauthorised access into the work area.
The implementation of the isolation and lockout system and procedures applicable to the project must be audited on a regular basis by a nominated project management representative. Furthermore, planned task observations must be carried out periodically.

16.15.1 Personal Locks

A Personal Lock must be such that it can only be unlocked by the person to whom it belongs. Combination locks may not be used.

A Personal Lock, as well as the key(s) to the lock, must be kept under the exclusive control of the person to whom the lock belongs.

A Personal Lock must be issued to each person who requires one, and the person's details must be clearly and permanently engraved directly onto his Personal Lock. Alternatively, a thick durable plastic identification tag may be used that clearly displays the company's name, the employee's name, the employee's company number, and a contact telephone number (the tag must be securely fastened to the Personal Lock). Where the above is hand written, it must be done using a permanent marker pen and it must be legible.

Each person issued with a Personal Lock must be trained and certified competent in the correct use of such a lock.

A Personal Lock may NEVER be removed by anyone other than the person to whom it belongs, except if the removal (cutting) of the lock is authorised by the nominated project management representative (in the absence of this person, authorisation can only escalate upwards). Furthermore, the removal of the lock must be done under the personal supervision of the nominated project management representative, and in accordance with a written procedure. The removal (cutting) of a Personal Lock may be required if the person who applied the lock is unable or unavailable to remove it on completion of the work (e.g. lost his key, failed to remove his lock before going home, etc.).

16.16 Electrical Safety

All electrical work must be carried out by competent personnel in accordance with all legal requirements, codes, design criteria and safety standards applicable to the project.
Each contractor carrying out electrical work on the project site(s) must develop, document and implement Safe Work Procedures that are aligned with the requirements of this standard.
All persons who will be carrying out electrical work must be certified against the requirements of job and equipment-specific electrical competency standards for the project, which must address job and equipment-specific Safe Work Procedures.

Each person potentially exposed to electrical hazards must receive electrical hazard training at the commencement of his employment on site and thereafter on an annual basis. The training must address the equipment and conditions specific to the area where the individual will be working. The training material must be documented and training records must be kept.

16.16.1 Electrical Installations

Each electrical installation (temporary or permanent) installed or worked on by a contractor must be inspected by a nominated project management representative to ensure that the installation complies with all statutory requirements, codes, design criteria and safety standards applicable to the project.

A nominated project management representative must approve all electrical work before the installation is energised. Any installation deemed unsatisfactory by a nominated project management representative must be removed, repaired or modified by the contractor at his expense.

For every permanent or temporary electrical installation, a certificate of compliance must be issued by a competent and appropriately qualified electrician. These certificates must be available for inspection.

Single line diagrams (with supporting documentation) must be produced and maintained for all electrical installations. This information must include system fault calculations, equipment details, electrical protection discrimination curves, and cable ratings.

Work on electrical installations (new installations, and modifications or repairs to existing installations) may only be carried out by qualified and authorised personnel (i.e. electricians).
Electrical safety devices (specifically, earth leakage protection and overcurrent protection) must be installed on all distribution circuits and the settings must be established by suitably qualified personnel.

A suitable numbering and / or labelling system must be used so that each circuit breaker or earth leakage device can be clearly and readily matched with the outlet or equipment that it protects.
To ensure the safety of the user, each distribution panel must be completely enclosed, must be of the dead-front type, and must be properly constructed and earthed.

All electrical cabling must be covered (e.g. in cable trenches) or elevated (in cable trays) to protect it from damage and to eliminate tripping hazards.

All permanent and temporary electrical installations (cabling, sockets, distribution panels, transformers, switchgear, etc.) must be inspected and tested by a competent and suitably qualified electrician on a monthly basis. The testing must include a grounding (earthing) continuity test and testing of the electrical safety devices. Details of these inspections and tests must be recorded in a register which must be made available to the nominated project management representative for inspection.

A rigorous Isolation, Lockout and Permit to Work system must be applied to all electrical work (i.e. work on electrical installations, machinery or equipment). All personnel must comply with the system and procedures applicable to the project.

Before any work on an electrical installation or equipment is carried out, the installation or equipment must be de-energised.

No electrical work may be performed live, regardless of the voltage, unless written approval is obtained from the nominated project management representative (a

justification as to why it is necessary for the work to be carried out with the equipment in an energised state must be provided).
For all energised electrical work, a Safe Work Procedure must be in place and, with the exception of voltage testing and where no tools are used, a Permit to Work (specifically authorising energised electrical work) must be issued.
When carrying out any energised electrical work, approved electrically insulated gloves, blankets, mats and other protective equipment must be used.

Control centres, switchgear rooms, substations, generators, transformers, capacitor banks, and other similar electrical plant and equipment must be appropriately guarded and labelled and, with the exception of emergency shut-off mechanisms, must be made inaccessible to unauthorised personnel (i.e. plant or equipment of this nature must be positioned within rooms or fenced enclosures which must be kept locked).

Appropriate warning signage must be prominently displayed within, and at all entrances to, these rooms or enclosures. The signage must indicate that unauthorised persons are prohibited from entering, that unauthorised persons are prohibited from handling or interfering with any electrical plant or equipment, the procedure to be followed in the event of a fire, and the first aid procedure to be followed should a person suffer electric shock. Suitable fire-fighting equipment must be provided in all such rooms or enclosures.

All electrical panels must be kept locked (using keyed-alike padlocks). Keys may only be issued to authorised personnel.

All un-insulated (bare) or partially insulated conductors must be enclosed and protected to prevent accidental contact therewith. Measures must be taken to prevent unauthorised access and appropriate warning signage must be conspicuously displayed.

Only authorised persons may enter rooms or enclosures housing electrical plant or equipment, and only authorised persons may access electrical panels or cabinets, and cable ducts or trenches. If any work must be carried out in such an area or on such equipment, a Permit to Work must first be obtained from the nominated project management representative.

No connection to any electrical system may be made without prior approval and a valid Permit to Work from the nominated project management representative.

No electrical equipment or apparatus may be modified without written authorisation from the nominated project management representative.

Conductive ladders may not be used in proximity to non-insulated electrically energised lines or equipment.
All permanent and temporary electrical cables, whether energised or not, must at all times be handled as if they are energised.

Only appropriately certified intrinsically safe electrical equipment may be used in flammable or potentially explosive atmospheres such as in confined spaces.
Any equipment or structure on which electric charges may accumulate (such as storage tanks) must be grounded (earthed).

Lightning protection must be provided on all tall structures and buildings.

Grounding (earthing) and lightning protection systems and devices must be designed, engineered, selected and installed based on site-specific requirements.
Before carrying out any excavation work, a Permit to Work (specifically authorising the excavation activities) must be obtained from the nominated project management representative. Such a permit must not be issued until it has been verified that no buried hazards or services exist where the excavation work is to be carried out (refer to the Excavation Standard).

16.16.2 Arc Flash Safety

Depending on the scope and nature of the work, a documented arc flash protection programme must be in place that specifies:

- The methodology for calculating incident energies and determining flash protection boundaries; and
- The PPE required (specific to a task and the equipment on which the task is performed) and associated procedures to mitigate the hazard.

The method of calculation must be based on regional electrical code requirements, or if none exist, the Institute of Electrical and Electronics Engineers (IEEE) Standard 1584, or the United States National Fire Protection Association "Standard for Electrical Safety in the Workplace" (NFPA 70E), or published equivalent.

An Arc Flash Hazard Assessment must be carried out based on accurate and current data. All electrical cabinets where the potential for an arc flash hazard exists must be labelled in accordance with the hazard assessment and the potential incident energies calculated.

A process must be in place for updating the Arc Flash Hazard Assessment and labelling as changes and electrical upgrades occur that might affect the available short circuit current on the system.
In order to mitigate the hazard, Safe Work Procedures must be in place and all persons potentially exposed to arc flash hazards must be trained in these Safe Work Procedures and must be supplied with appropriate arc flash PPE.

16.16.3 High Voltage Power Lines

Before any mobile equipment (such as a crane, bulldozer, back-actor, boom truck or drill rig) is mobilised to a work site, an assessment must be carried out (including a thorough inspection of the work site and the access route) in order to clearly identify any overhead or underground power lines.

A system must be in place to mitigate the risks associated with working in close proximity to power lines and suitable measures must be taken to prevent personnel or equipment from coming into contact with power lines. Extreme caution must be exercised.
Where possible, exclusion zones (based on minimum clearance distances specified by the electrical power utility or the nominated project management representative) must be created with rigid barriers and warning signs.

Only in exceptional circumstances, and then only after a detailed method statement and risk assessment has been approved, all necessary mitigation or control measures are in place (including the use of a spotter), and a Permit to Work has been issued by the nominated project management representative, may equipment be operated within one boom length of energised overhead power lines. Suitable protective insulating barriers may need to be used.

If possible, the power lines must be de-energised and isolated while the work is carried out.
All equipment operators and rigging personnel must be trained in the hazards and the applicable safe approach distances (exclusions zones) associated with overhead power lines.

A procedure must be in place for the evacuation of mobile equipment or a vehicle in the event of accidental contact with power lines. All operators must be trained in this procedure and must follow it implicitly.

Scaffolding may not be erected within 5 metres of power lines or overhead track equipment.

16.16.4 Portable Electrical Equipment

Prior to site establishment, each contractor must provide a complete inventory of all portable electrical equipment that he and his sub-contractors intend to use on the site (including plant, machines, appliances, generators, hand tools, lighting, extension cords, etc.). The nameplate data for each item of equipment must be included.

All portable electrical equipment to be used on the site must be supplied and maintained in a serviceable condition.
Any electrical equipment that is in poor condition or is not in proper operating order may not be used. Any electrical equipment that a nominated project management representative deems to be unsafe or unsuitable must be removed from site.

Electrical repair work or diagnostic work on electrical equipment may only be performed by personnel who are competent and authorised to perform this work (i.e. qualified electricians).
With the exception of double-insulated equipment, all electrical equipment must have an equipment grounding (earthing) conductor that connects the frame of the equipment being utilised to the grounding (earthing) conductor of the electricity supply system.

All electrical equipment and all electricity supply systems used (including generators) must be inspected and tested by a registered and competent electrician to ensure that all equipment is properly grounded (earthed).

All electrical equipment used on site must be supplied electricity through (i.e. must be protected by) an approved and tested residual current device (or earth leakage device or unit). If a socket outlet does not have a residual current device in the circuit, a portable residual current device must be used. Outlets without residual current device protection must be labelled as such.
Any electrical equipment that causes an earth leakage device to trip or deactivate the circuit may not be used again until an electrician has inspected and tested the equipment and has recorded in a register that the equipment is safe to use.

Interlocks may never be removed or modified, and fuse terminals may never be bypassed to keep current flowing in any circuit.
All generators must be fitted with suitable overcurrent protective devices (i.e. circuit breakers or fuses).
All generators must be used in compliance with the manufacturer's requirements. Any proposed modification to a generator must be authorised in writing by the manufacturer prior to the modification being made.

Each welding machine used on site must be fitted with a Voltage Reduction Device (VRD). If this is not practical (i.e. for arc welding processes other than stick welding), a dead man's (isolation) switch in the electrode circuit (operated by a trained observer) may be used as an alternative. All welding machines must be properly grounded (earthed).

All portable electrical hand tools used on the site must be double-insulated.
Electrical equipment must be disconnected or unplugged when not in use.
Portable lights must be stable and each light bulb must be protected by a substantial guard.
Temporary festoon lighting must be double-insulated and must be supported at least 2.5 metres above the floor, if possible.

Handheld lights must be of the all-insulated type and must be extra low voltage (i.e. not exceeding 32V). 120V or 240V handheld lights are not permitted.
Any lighting used in hazardous locations (i.e. potentially explosive atmospheres, confined spaces, and damp or wet areas) must be operated at a maximum of 32 volts, unless earthed and protected by earth leakage devices.
No person may wear a watch or any jewellery, or carry any metal objects such as a lighter or keys, while working on any electrical system or equipment.
No person may work on or use electrical equipment if his clothing is wet or any part of his body is in contact with water.

No person may handle electrical equipment, equipment cords or extension cords with wet hands or if the floor or ground surface is wet.
Fire extinguishers filled with carbon dioxide must be used to fight electrical equipment fires (water may never be used). If possible, the electrical equipment should be de-energised before fire-fighting activities commence (refer to the Fire Protection and Prevention Standard).
When cleaning or performing maintenance work on an item of electrical equipment, the equipment must be unplugged.

Equipment may not be unplugged while that equipment is switched on. Nor may equipment be plugged into a receptacle (socket) with the equipment's switch turned on.
Electrical equipment that has a defective plug or wiring may not be used. Repair work to defective or damaged electrical equipment may only be carried out by a qualified electrician.
Extension cords may be used for temporary applications only. Permanent cabling must be installed for long-term needs.

Extension cords may not be run through doors, windows, ceilings or holes in walls.
An extension cord must be uncoiled completely before it is used.
An extension cord must be of sufficient current-carrying capacity to power the equipment that it is supplying electricity to. Cords must not be overloaded.
Extension cords must be unbroken and continuous (i.e. no joins or splices in the cord are permitted).

Extension cords may not be daisy-chained (i.e. one extension cord plugged into another extension cord).
Extension cords and equipment cords may not be modified to fit a receptacle (socket).

Two-conductor extension cords may not be used. A three-conductor extension cord (i.e. a grounded or earthed cord) must be used even if the equipment that it is supplying electricity to uses a two-prong plug.

Extension cords that are frayed, have insulation tears, cracks or abrasions, have exposed conductors, or have bent, broken or "spread" plug prongs may not be used.
Extension cords that will be used outdoors must have heavy duty insulation and must be weather and UV resistant.

All electrical equipment cords and extension cords must be covered or elevated to protect them from damage and to eliminate tripping hazards.
Each contractor is responsible for protecting his electrical equipment from the weather and from possible mechanical damage.

All portable electrical equipment (including generators) must be inspected, tested and tagged by a competent and appropriately qualified electrician on a monthly basis. Details of these inspections and tests must be recorded in a register which must be made available to the nominated project management representative for inspection.

The inspection and testing must include a continuity test of the grounding (earthing) conductor (as applicable) and a complete examination of the equipment or system to assure safe use.
The following colour coding system must be used for the tagging of all electrical equipment:

Table 16-2 Colour Coding System for Electrical Equipment

Month		Tag Colour	Month	Tag Colour
January		Red	July	Red
February		Blue	August	Blue
March		Orange	September	Orange
April		Green	October	Green
May		White	November	White
June		Yellow	December	Yellow

The tag placed on a piece of equipment must be traceable to an entry in a register where the following information concerning the inspection and testing of that piece of equipment must be recorded:

- Date of inspection and testing;
- Equipment description;
- Equipment owner;
- Equipment location;
- Name, signature and licence number of the electrician who carried out the inspection and testing; and
- Comments concerning the inspection and testing, and details of any repair work carried out or required.

Any item of electrical equipment that does not pass an inspection or test must be removed from service (and tagged, "Out of Service") immediately and must then either be repaired (if possible) or removed from site.
Any item of electrical equipment without a tag or with an out-of-date inspection or test may not be used.

Any item of electrical equipment found without a tag or with an out-of-date inspection or test must be removed from service until it has been inspected and tested. If it is found that more than one item of equipment being used by a contractor has not been inspected and tested as required, all work with electrical equipment must be stopped until it can be demonstrated to the satisfaction of the nominated project management representative that the contractor's systems and controls are adequate and fully implemented.

In addition to the formal monthly inspections and testing carried out by an electrician, electrical equipment (particularly extension cords, portable hand tools, welding machines, compressors and pumps) must be visually inspected by the user on a daily basis prior to use. Users must be trained to look for cracks in casings, loose casings, outer cord sheathing that is not being held firmly in position at the equipment, cuts or cracks in cord or cable insulation, exposed conductors, damaged plugs or sockets, and missing covers. Damage and / or defects must be reported immediately.

Personnel must immediately stop using and report any electrical equipment or machinery that is shocking, sparking, overheating or smoking. Corroded outlets, switches and junction boxes must also be reported.

16.17 Confined Spaces

Entry into a confined space occurs when a person's whole body, upper body or head is within the confined space. This is not intended to prevent an authorised, competent person from inserting only his arm into the space to test for hazards using appropriate monitoring equipment. Precautions must be taken to prevent persons from being overcome by atmosphere escaping from the confined space.

Before any person enters a confined space, a detailed risk assessment must be carried out, including the need for an authorised person to assess such things as oxygen levels, contaminants, temperature extremes and concentration of flammable substances.

As a minimum the risk assessment shall address the following:

- Isolation and lockout procedures required for chemical substances, mechanical or electrical energy, steam, pressure, heat, gases, liquids and solids;
- Venting, purging, draining and cleaning prior to entering the confined space;
- Hazards created by carrying out particular tasks or through the use of chemical substances in the confined space. Task-Based (or Issue-Based) Risk Assessments and/or Written Safe Work Procedures must be available for work in confined spaces
  - in particular for abrasive blasting, welding, flame cutting, grinding, chemical/steam cleaning, rubber lining and painting;
- Entry, exit and escape routes as well as barricading;
- The electrical safety, intrinsic safety and other safety specifications of equipment to be used in the confined space (explosive atmospheres must be considered);
- The need to test for presence of toxic/asphyxiant substances, radioactivity, oxygen, temperature extremes and flammable substances prior to entry and during the performance of work;
- Provision of suitable mechanical ventilation and personal protective equipment e.g. lifejackets etc. and in particular the use of respiratory protection such as compressed air breathing apparatus; and
- A ventilation rate suitable for general use must take into account factors such as air contaminant type, rate of generation, rate of oxygen depletion, temperature,

efficiency of ventilation distribution and contaminant removal from the breathing zone. Therefore each situation needs to be evaluated on its own merit by a risk assessment that will select a combination of ventilation method and respiratory protection that suits the particular circumstances. This must be achieved by consultation between competent operations personnel, engineers and a ventilation specialist.

Entry and work inside a permitted confined space must be controlled and regulated by the project Isolation / Lockout and Permit to Work control systems. The Authorised Person issuing the Permit to Work may only do so if the conditions applying to the specific confined space entry have been satisfied and documented.

As a minimum, the following must be included in the permitting process:

- Access barriers to prevent unauthorised entry;
- Isolation procedures for contaminants and other energy sources;
- The need for breathing apparatus / ventilation requirements;
- The sign-in and sign-out of all persons entering the confined space;
- Display of the permit;
- Communication procedures and/or equipment;
- Safety specifications of equipment to be taken into the confined space;
- Barricading of entrances and exits;
- Rescue plan and equipment;
- Standby person(s); and
- A completion and lock-in procedure (to ensure that space is evacuated and adequately secured).

The Permit to Work process must require competent rescue persons with suitable communication, rescue and firefighting equipment to be present where any of the following may exist:

- Compressed air breathing apparatus is required;
- There is a high risk of fires or explosions;
- The atmosphere can rapidly become unsafe for breathing purposes if the mechanical ventilation fails;
- There is a high risk of flooding or engulfment;
- Narrow tunnels or pipes are entered or where exit or escape routes cannot readily be accessed
- Work is done in remote areas; and
- A single person, who cannot be observed directly or is isolated from other workers, does the work.

Where testing for toxic/asphyxiate substances, radioactivity, oxygen, temperature extremes and other health hazards as well as for flammable substances is carried out, it may only be done by persons trained, tested and certified competent in writing to do so. The ventilation method and quantity must be adequate to ensure oxygen levels and explosive or toxic gas levels remain within acceptable defined limits. Where ventilation is required, this must be covered by an approved documented procedure.

As a minimum standard, the volume of air pumped in and circulated in a confined space needs to be equivalent to 20 times the volume of the space per hour.

Where breathing apparatus or respiratory equipment is required, the contractor's Health and Safety Officer must be consulted with regard to the specification and selection of suitable equipment.
All persons required to use respiratory protection must be medically fit and trained in the correct use of the equipment.

Safe and convenient entry, exit and escape routes from the confined space must be provided where possible and practical. Where this cannot be achieved effectively, the risk assessment must determine if a competent rescue person must be on duty at the confined space when work is in progress.

Where a standby/rescue person is required, they will have no other duties and will be positioned outside the confined space entry point at all times while personnel are within the space.

16.18 Conveyors

The contractor must ensure that no person attempts to cross / climb over or under any conveyor. Instead, a safe passageway (a crossover or an underpass fitted with safeguards) must be used.
No person may climb onto, sit on, stand on, or walk on a conveyor at any time. Riding a conveyor belt is strictly forbidden.

No person may operate a conveyor other than trained, competent and appointed conveyor operators.

Only authorised maintenance personal are permitted to work on conveyors and only if all energy sources have been effectively isolated and locked out and a Permit to Work has been issued by an Authorised Person.

Working on an operational conveyor is strictly prohibited.
No work may be carried out within three metres of an operational conveyor.

16.19 Arc Welding

All welding machines must be fitted with voltage reducers.

The supply cable to every welding machine must be correctly rated and fitted with an approved plug to be used only with an approved matching plug socket.
The electrical circuit to every plug socket must be protected by a correctly rated circuit breaker and a supply voltage rated earth leakage unit.

Welding cables must be properly insulated and correctly rated for the welding machines on which they are to be used.

Welding cable terminals must either be covered with a properly designed, constructed and installed cover so that inadvertent human contact with the terminals is impossible, whether the cables are connected or not, or the welding cables must be fitted with insulated plugs so that inadvertent human contact with any live part is impossible when the cables are plugged into the machine. Also the plug socket should be such that when the cables are not plugged in, inadvertent contact with a live part of the socket is impossible.

Earth cable clamps and electrode holders must be of an approved type. Earth clamps and electrode holders must be fixed to welding cables with eye terminals and bolts.

All welding machines and safety devices must be subjected to regular planned maintenance and a monthly electrical inspection. The inspection must include a test to ensure that the voltage reducer is functioning properly, by measuring and confirming that the open circuit output voltage is reduced.

Before using a welding machine, the welder must ensure that he is wearing all the required and approved protective clothing and equipment:

- Persons assisting the welder must also wear all of the required personal protective Welding hood;
- Leather welding gloves;
- Safety boots with steel toe protection;
- Flame resistant overalls; and
- Any other clothing or equipment necessary to perform his work safely and efficiently.
- equipment.

When changing electrodes or moving the earth clamp, the welder or his helpers must wear gloves to avoid possible skin contact with live electrical parts and to prevent burns. When attaching welding cables to the terminals of the welding machine, the welder or his helpers must wear gloves, or preferably, the machine should be switched off to avoid possible electric shock.

Helpers who may be holding the work piece being welded must wear gloves and protective goggles.
Where practicable the welder should place protective screens around the area where he is welding, to prevent injury to the eyes of passers-by.

The welder must ensure that the earth cable follows the shortest practical route between the welding machine and the work piece. The earth connection must be directly between the welding machine and the work piece and no building or other structure must form part of the earth return path.

As far as is practicable, the welder should avoid welding under wet or damp conditions. If this is unavoidable, the following precautions should be taken:

- Use only oil filled or other watertight type welding machine;
- Keep the electrode holder as dry as is practical;
- Keep as dry as possible. Stand on an elevated surface out of the water and wear watertight boots and a rain suit. Also ensure that the gloves are in good condition, free of holes.
- Under conditions that result in high perspiration levels, the following measures should be implemented:
- Use an insulated electrode holder;
- Change clothing regularly (if possible);
- Use insulated material like rubber mats and/or timber tuck board to separate yourself from the work piece;
- Wear dry gloves on both hands during welding;
- Use fans and air-conditioning to reduce humidity and temperature; and
- Use an observer capable of responding in an emergency.

When working inside metal vessels or under other conditions where parts of his body may come into contact with conducting surfaces, the welder must take precautions to insulate hhealth and safetyelf from such surfaces.

When working in confined spaces, the welder must take steps to ventilate the area to prevent inhalation of fumes, which may endanger his health and the health of any assistants.
Engine powered welding machines must not be used in any place that is not very well ventilated since the welder and his helpers may be overcome by carbon monoxide fumes.

The welder should take the necessary precautions when welding objects that may catch alight, explode or release poisonous fumes or gases.

16.20 Gas Welding and Burning

Welding or cutting torches and hoses shall not be connected to cylinders when stored.
When work is stopped and equipment is unattended, all valves at the gas and oxygen cylinders shall be closed. The hoses shall be bled and a check shall be made later for possible pressure build-up. Torches shall be removed from the hoses prior to putting them into the toolbox. Smoking SHALL NOT be permitted during this stopping procedure.

Special care shall be taken during overhead cutting and welding operations to safeguard and prevent falling sparks from starting a fire.
Warning signs shall be posted around and at each level below the area of each overhead welding or burning operation. Fire extinguishers shall be available and fire blankets shall be used for protection.

When welding or cutting, adequate ventilation must be ensured / provided.
Hoses shall be kept clear from passageways, ladders and stairs. When hoses are subject to damage, they shall be properly protected. Hoses shall be inspected daily.
Fire extinguishers shall be ready for instant use in locations where cutting is performed.

Flash-back arrestors must be fitted to all cutting torches at the torch and at the bottle (a total of four arrestors).
Lighting of the cutting and welding torches must only be done using a striker and not an open flame.

Soap Leak tests must be performed on all flash-back arrestors.

Hoses may only be secured using approved hose clips, and not by wire, cable ties or any other means.
Special care shall be taken when welding with respect to piping that has been painted, as toxic fumes may be emitted in some cases. The supervisor's advice should be sought prior to the above welding operations being carried out.

16.21 Compressed Gas Cylinders

The contractor must establish a suitable storage area for oxygen, acetylene, LPG and argon cylinders in compliance with the following requirements:

- The storage area must be located at least 10 metres away from any building, and must be well ventilated;
- The storage area must have a concrete floor;
- The storage area must be enclosed using wire mesh fencing (as this will ensure adequate ventilation). This enclosure must be kept locked. Access into the storage area must be limited and controlled;
- A protective covering or roof must be fitted to the enclosure to provide shade;

- The enclosure may not be used for the storage of any other materials / equipment, and must be kept completely free of all combustible materials at all times;
- Appropriate warning signage (i.e. "No Smoking" and "No Naked Flames") must be prominently displayed on the enclosure;
- A 9kg dry chemical powder fire extinguisher must be mounted near the entrance to the enclosure
- If electrical lighting is required, it must be of an approved intrinsically safe type;
- Oxygen, acetylene, argon and LPG cylinders must be stored separately in the enclosure. Furthermore, full and empty cylinders must be separated. Separate storage sections must be clearly designated within the enclosure for the different gas types, and for full and empty cylinders, i.e. oxygen – full, oxygen – empty, acetylene – full, acetylene – empty, etc.;
- When a cylinder is empty, the cylinder cap must be replaced to protect the valve. Empty cylinders must be clearly marked (there must be no need to open valves to check if cylinders are full or empty);
- All cylinders must be stored in an upright position and must be secured in this position by chaining, strapping or clamping them individually to a wall, a cylinder trolley, rack or carrier, or some other rigid structure;
- Cylinders must be stored in rows (when necessary due to the number of cylinders) with aisles between the rows to facilitate easy and rapid removal in the event of a fire;
- Oxygen cylinders may never be stored near highly combustible materials, particularly oil and grease, or near fuel gas cylinders. When in storage, oxygen cylinders must be separated from fuel gas (LPG and acetylene) cylinders by a distance of 6 metres or by a 2 metre high wall made of fire-resistant material;
- The total quantity of gases stored on site must be limited to a 2 week supply.

Compressed gas cylinders must always stand upright (i.e. when being used, stored or transported) and must be properly and individually secured to prevent them from falling over.
Cylinders must be protected from flame, heat and from being struck by moving equipment and falling objects.

When handling gas cylinders (whether full or empty), care must be taken to prevent sudden impacts.
Whenever a cylinder is not in use, the protective cap must be in place to prevent the valve from being damaged.
Gas cylinders may not be carried, dragged, rolled or slid across a floor or surface.
When gas cylinders are to be moved / used, they must be placed in a proper cylinder trolley fitted with a 1.5kg dry chemical powder fire extinguisher.

Gas cylinders may not, under any circumstances, be used as rollers or work supports.
If transported by crane, hoist or derrick, compressed gas cylinders must be placed in a suitable cradle, net or skip box. Cylinders may NEVER be lifted using wire rope, fibre rope, a web sling or a chain sling. Before moving / transporting a gas cylinder, the regulator must be removed and the protective valve cap must be replaced.

Gas cylinders may not be taken into a confined space. Gas hoses that are run into a confined space must be removed during breaks.
Gas cylinders may not be placed on scaffolding.

Cylinder valve keys must be in place. If no suitable valve key is available then the cylinder may not be used. Nothing but the manufacturer-supplied key may be used to open the valve.
A flashback arrestor and a check valve (non-return valve) must be installed between the regulator and the hose and between the hose and the torch on the oxygen line and on the fuel (acetylene) line.

Connection fittings may not be forced and safety devices associated with cylinder valves or regulators may not be altered / tampered with.
Gas hoses may not be joined. Only approved hose connectors of the crimp type are permitted. Wire and jubilee clamps are prohibited.
Only high quality ancillary equipment may be used. This includes flashback arrestors, hoses, clamps, spindle keys, nozzles and torches.
Only trained and competent personnel may operate gas welding / cutting equipment and appliances.

When an employee opens the valve to a cylinder, he must stand to one side and open it slowly. Valves may never be left partly open – they must either be closed or be opened fully.
Leaking cylinders must immediately be removed from service and the workplace (if it is safe to do so).

Suitable firefighting equipment must be at hand wherever gas cylinders containing oxygen and / or fuel gas are being used.
Gas cylinders must be prevented from coming into contact with electrical circuits, e.g. welding leads. Never strike an arc on a cylinder.
Oxygen may only be used for the purpose for which it is provided. Do not use oxygen in pneumatic tools or tyres, as an explosion may occur.
Empty cylinders must immediately be marked as such and must be removed to the cylinder storage area at the end of each day / shift.

16.22 Electrically Powered Tools and Equipment

All powered hand tools, such as circular saws, drills, chainsaws, percussion tools, jigsaws etc., must be equipped with a constant pressure switch that will shut off the power when the pressure is released. (Exception: this requirement does not apply to concrete vibrators, concrete breakers, powered tampers, jack hammers, rock drills, and similar hand operated power tools).

Electrical power tools must be of the approved double-insulated type. The electric cord, pneumatic or hydraulic supply line of powered tools must not be used for hoisting or lowering of the tool.
Loose clothing, jewellery or gloves that could get caught in the tool must not be worn when operating powered tools. Operators of powered tools who have long hair must keep their hair tied up.

The power source must be disconnected from the tool before making any repairs, servicing, adjustments, or replacing attachments such as drill bits.

16.22.1 Angle Grinders

The following personal protective equipment must be worn when using angle grinders:

- Safety helmet;
- Gloves;

- Safety glasses (or safety goggles) and a full face shield (i.e. double eye protection);
- Overalls with long sleeves and long pants, avoid any form of loose clothing;
- Safety boots with steel toe protection;
- Hearing protection;
- Breathing apparatus where dust or fumes may be generated;
- Where grinding machines are used, a face shield is to be worn as extra protection to the safety glasses; and
- Certain tasks may require the use of a leather apron as determined by a risk assessment.

A 230mm angle grinder may not be used for free cutting purposes. Exceptions may be approved only if alternative methods evaluated proved more hazardous or no alternative exists. The risk assessment for the task must then specifically include mitigating measures to ensure the safest possible way of performing the task.

The use of 230mm angle grinders for grinding purposes is acceptable, however should this form of grinding be required, the 115mm or 125mm grinders would be preferable.
All angle grinders must have a dead man switch incorporated, with a pressure switch in the handle.
A 230mm electrical angle grinder unit must incorporate a soft start to reduce the starting strain and a braking system to reduce run on after the unit has been switched off.

All angle grinders must have a spindle lock to assist with changing the disc or grinding wheel.
Anti-vibration handles are recommended to further reduce the stress if used for extended periods.
Angle grinders must be equipped and operated with disc guarding at all times.
Angle grinder must not be stored with fitted discs, as this will lead to damaging of the discs.

Before use and mounting of discs it is essential to check the safety codes and specifications printed on the upper side of the disc. Such specifications include the following:

- Revolutions per minute (RPM). The allowable speed of the disc must be equal to or greater than the maximum achievable speed of the grinder;
- Physical dimensions of the disc must meet grinder specification; and
- The disc must be suitable for the material type to be cut / ground as indicated on the disk. Cutting discs must never be used for grinding and vice versa.

It is critical that the correct disc mounting procedure is followed:

- Check that the machine is plugged out;
- Check the machine spindle, backup washer and thread;
- Check the condition of spindle nut - ensure spanner drive holes are not elongated;
- Ensure spindle nut spanner is the tool recommended by machine manufacturers;
- Do not use a hammer, pipe or chisel to tighten the nut, or apply additional mechanical advantage to nut torque. A firm "nip" is sufficient to retain the disc;
- Ensure the spindle diameter is suited to disc bore. Excessive clearance will cause the machine to vibrate due to eccentricity;
- Check to see that the nut and backup washer do not "bottom out". This will result in the disc not being correctly clamped on the spindle;

- Ensure the spindle speed is marked on the grinder and that it is less than the allowable disc speed; and
- Fit the disc, with the metal ring or writing to the nut side.

16.23 Pneumatically Powered Tools and Equipment

Pneumatic powered tools must only be driven by filtered compressed air with an in-line lubrication system, or be lubricated prior to use if there is no in-line lubrication system. When using pneumatic powered tools the designated tool pressure must be attained by the use of a regulator.

Pneumatic powered tools must be disconnected when not in use. They must not be disconnected from the air supply until all the residual pressure has been released or contained by a shut-off device. Hoses must not be kinked as a means of containment.

Employees operating pneumatic powered tools, and any potentially affected employee in the vicinity of use, must wear suitable personal protective equipment.
All rotary compressed air tools (e.g. drills) must have the rated revolution per minute (RPM) permanently marked on the casing. Only attachments of compatible RPM must be used with these machines.

The actual RPM of the tool must be checked every three months to ensure that the speed is as rated to manufacture specifications.

Pneumatic powered tools must be secured to the air supply hose by an approved positive means to prevent the tool from becoming accidentally disconnected. Safety clips or retainers must be securely installed and maintained on pneumatic impact (percussion) tools to prevent attachments from being accidentally expelled.

All pneumatically driven nailers, staplers, and other similar equipment provided with automatic fastener feed, which operate at more than 100 kPa pressure at the tool, must have a safety device on the muzzle to prevent the tool from ejecting fasteners unless the muzzle is in contact with the work surface.
Compressed air must not be used for cleaning purposes except where reduced to less than 30 kPa, and then only with effective chip guarding and personal protective equipment in place. The 30 kPa requirement does not apply to concrete form, mill scale and similar cleaning purposes. The use of compressed air for cleaning purposes must be approved by the nominated project management representative. Compressed air must not be pointed at any part of the body or used for cleaning clothing.

Airless spray guns of the type which atomize paints and fluids at high pressures must be equipped with automatic or visible manual safety devices which will prevent pulling of the trigger to prevent release of the paint or fluid until the safety device is manually released. A diffuser nut which will prevent high pressure, high velocity release while the nozzle tip is removed, plus a nozzle tip guard which will prevent the tip from coming into contact with the operator, or other equivalent protection must be provided in lieu of the above.

Abrasive cleaning nozzles must be equipped with an operating valve, which must be held open manually to enable operation. A support must be provided on which the nozzle may be mounted when it is not in use.

16.24 Fuel Powered Tools and Equipment

Fuel powered tools must be shut down and allowed to cool before being refuelled, serviced, or maintained. Fuel must be transported, handled, and stored in approved fuel

containers. Where possible, diesel driven engines must be used in preference to petrol driven engines. All fuel powered tools must be included on the contractor's Equipment Register and the register must be submitted to the nominated project management representative prior to the relevant work commencing.

When fuel powered tools are used in enclosed spaces, the space must be ventilated and the atmosphere monitored to measure toxic gas concentrations. Persons in the space must wear the necessary personal protective equipment. Confined Space Entry clearance may apply. This type of activity must only be undertaken in exceptional circumstances and requires the approval of the nominated project management representative.

16.25 Hydraulically Powered Tools and Equipment

Hydraulic powered tools must use only approved fluid that retains its operating characteristics at the most extreme temperatures to which it will be exposed. The manufacturer's stated safe operating pressures for hoses, valves, pipes, filters and fittings must not be exceeded.
Only manufacturer approved hoses, valves, pipes, filters and fittings must be used.

16.26 Explosive Powered Tools

All operators shall be trained by the contractor.
The contractor shall ascertain that the explosive charges to be used are of the correct strength for the purpose.

Projectiles from explosive powered tools shall NOT be driven into:

- Tile, terracotta, glazed brick, glass, marble, granite, thin slate or other brittle substances;
- High tensile steel, cast iron or steel hardened by heat treatment; or
- Concrete that contains aggregate that will not pass wholly through 25mm mesh screens.

Under no circumstances shall a tool be fired in such a manner as to cause the projectile to fly free.
Suitable safety glasses and hearing protection shall be worn by operators when firing an explosive powered tool.

At all times when a tool is being used, the operator shall display clearly legible signs at or near the place where the tool is in use. Sign should read: WARNING: EXPLOSIVE POWERED TOOL IN USE – KEEP CLEAR.
The operator shall warn all other employees in the vicinity of the area in which the tool is about to be used.

Tools shall never be stored in a loaded state. Cartridges and tools shall be stored separately in lockable containers.
A logbook must be kept of the number of cartridges used and returned.

16.27 Hand Tools

Employees required to use hand tools must receive training relevant to the tool and have their competency assessed in the operation, inspection and maintenance of the tool. Where necessary, additional applicable personal protective equipment must be worn when using hand tools.

Wrenches, including adjustable, pipe, end, and socket wrenches, must not be used when the jaws are sprung to a point where slippage occurs. Impact tools such as drift pins,

wedges and chisels, must be kept free of mushroomed heads. The wooden handles of tools must be kept free of splinters or cracks.

Adjustable wrenches must not be used in lieu of ring or open-end type spanners, unless a risk assessment has been conducted and the use of the adjustable wrench is approved by the nominated project management representative. Wherever possible, ring spanners must be used in preference to open end spanners.

Correct hand tools for the job must be used, e.g. screwdrivers must not be used as chisels, and pliers must not be used as hammers.
All wedges and drifts that may spring, fly or fall to lower levels upon impact must be fitted with an attachment which attaches a safety "lanyard" to a solid structure to restrain the impact tool from becoming a projectile.

All hand tools used in elevated areas, that may be dropped or fall to lower levels must be fitted with safety lanyards and attached to solid structures or in the case of podges, scaffold keys etc., attached by wrist lanyard to the user.
Purpose built tools and equipment may not be used unless a risk assessment has been conducted and authorised by the nominated project management representative.

16.27.1 Stanley Knives / Utility Knives

A utility knife must be used as a last resort, when it is the safest tool to use. Always consider alternatives that pose less of a risk to the operator.

Whenever a utility knife is used, ensure that a complete risk assessment is done and that all possible hazards have been addressed.
Only utility knives with retractable blades are to be used. The blade is to be retracted at all times when the knife is not in use or is being stored.

Before using the utility knife, ensure that the tool is in a good condition and the blade is secure in the holder (seated correctly and that there is no play).
Ensure that the blade is always sharp and in good condition. This will prevent the use of excessive force.

Always wear cut resistant gloves and safety glasses when using a utility knife. There is always a risk of the blade breaking under tension and becoming a projectile.
Always ensure that you cut away from your body, and that no part of your body is in the firing line.
Always ensure cleanliness of all equipment in use during the cutting operations.

16.28 Inspection of Equipment and Tools

All tools must be inspected by the user before, during and after use. If any faults are identified, the tool must be taken out of service and not used until repaired. Faulty tools that are not able to be repaired must be tagged "out of service" and removed from site.

16.29 Manual Handling and Vibration

Any handling or lifting task that can only be done manually must be planned and rehearsed before the task is done.
If more than one person is involved in a task a communication procedure must be agreed in advance. Lowering the load must be done in a controlled manner. Dropping a load is dangerous and must be avoided.

As a guideline 25 kg is considered to be the limit of what a person can safely handle. Where there are loads exceeding 25 kg the risk of handling the load must be mitigated to assure minimal potential for any injury.
When mechanical lifting aids are provided, they should be used.
Extra care should be taken when lifting awkwardly shaped objects.

Position the feet correctly. The feet should be placed hip-width apart to provide a large base. One foot should be put forward and to the side of the object, which gives better balance.
Bend or 'unlock' the knees and crouch to the load. The weight will then be safely taken down the spine and the strong leg muscles will do the work.

Get a firm grip. The roots of the fingers and the palm of the hand should grip the load. This keeps the load under control and permits it to be distributed more evenly.

The following should be considered with conducting the Risk Assessment with regards Manual Handling and also take into consideration the task factors, physical demands and tools involved in the task:

- Load weight/frequency;
- Hand distance from lower back;
- Asymmetrical trunk/load;
- Postural constraints;
- Grip on the load;
- Floor surface;
- Environmental factors;
- Carry distance; and
- Obstacles en route.

Team Manual Handling:

- Load weight;
- Hand distance from lower back;
- Vertical lift region;
- Trunk twisting/sideways bending;
- Postural constraints;
- Grip on the load;
- Floor surface;
- Environmental factors; and
- Communication, co-ordination and control.

As far as possible, exposure to vibration must be eliminated.
However, if this is not possible, short-term solutions to decrease exposure include:

- Reducing the vibration levels;
- Removing the person from the vibrating equipment / tools;
- Reducing the period of time that the person works with the vibrating equipment / tools (at least 40 minutes break after 20 minutes working with a machine that vibrates excessively).

In order to reduce exposure to vibration:

- Consider buying equipment that operates effectively at lower speeds;
- Buy equipment with built-in damping materials;

- Buy lighter tools if they are available - they require less of a grip;
- Maintain the equipment;
- Make sure equipment is balanced and there are no worn parts;
- Use remote controls when they are available;
- Reduce your grip on the equipment when it is safe. The less time you actually have your hands on the equipment the better. Relax your hands during these brief breaks;
- Take scheduled breaks; and
- Do other tasks that allow you to move away from vibrating tools and equipment.

The workplace must be assessed by a competent person for compliance with good design, layout and practice, to avoid or minimise adverse health consequences due to manual handling and vibration issues.

Quantitative evaluations of vibration produced by specific equipment must include the following measurement parameters: direction of movement, frequency, intensity, and variation with time and duration, as per documented methods.

Employees and contractors must be informed of the results of assessments and instructed in appropriate manual handling techniques, where the risk assessment indicates a need.
Workplace vibration sources that could contribute to the exceedance of an Occupational Exposure Limit (hence potential for impact on worker musculo-skeletal fitness) must be identified and adequately characterised.
Manual handling tasks assessed as having the potential to cause a Lost Time Injury (i.e. with potential for impact on worker musculo-skeletal fitness) must be identified and adequately characterised.
Workplace manual / materials handling tasks risk rated as "significant" must be assessed and recorded to include biomechanical factors (e.g. posture, bending, twisting, repetitive motions, working overhead, and exerting force away from the body).

16.30 Personal Protective Equipment

All applicable legislation concerning Personal Protective Equipment (PPE) must be complied with at all times.

As a minimum, the following PPE must be worn by all persons (including visitors) at all times whilst on a project site:

- Safety footwear with steel toe protection;
- Safety glasses (individuals who wear prescription spectacles must be provided with either over-spec safety glasses or prescription safety glasses);
- Safety helmet (hard hat); and
- High visibility protective clothing with reflective taping (long trousers and long-sleeved shirts with collars and cuffs).
- Additional PPE requirements must be determined through hazard identification and risk assessment. This hazard-specific PPE (such as hand protection, hearing protection and respiratory protection) must be worn as required (e.g. when in a certain area, when performing a certain task, or when working with a certain substance);
- The correct PPE must always be worn:
- In accordance with site requirements (as indicated at the entrances to a project site and at the entrances to buildings and / or designated areas on the premises);
- In zoned areas (e.g. noise zones and respirator zones); or
- As required by a Safe Work Procedure, a risk assessment, or a Material Safety Data Sheet (MSDS).

Each contractor must provide each of his employees with all required PPE (at no cost to the employee). The specific PPE that is provided to a particular employee must be based on the nature of that employee's work and the location in which the work is performed (i.e. must be based on the hazards to which the employee is exposed). PPE requirements for a particular job or for a particular area must be determined through a risk assessment for that job or area.

Any employee who does not have all of the PPE that is required for him to perform his duties safely will not be permitted to work.

Each employee must care for his PPE, maintain it in good condition, and inspect it on a daily basis.
If an item of PPE has worn out, has become damaged, or is found to be defective in any way, it must be replaced by the contractor.

PPE must be stored in accordance with the manufacturer's requirements and / or recommendations.

Each employee must receive training in the use, maintenance and limitations of the PPE that is provided to him, and must be made aware of why the PPE is necessary as well as the consequences of not wearing it as instructed (i.e. the potential for injury and / or disciplinary action). Training records must be retained.

Any person who refuses to wear PPE as required must be removed from the site.
Symbolic signs indicating mandatory PPE requirements must be prominently displayed at the entrances to a project site and at the entrances to buildings and / or designated areas on the premises where additional PPE is required. These signs must comply with the applicable national standard (if one exists).

Each contractor must appoint an employee to:

- Control the issuing and replacement of PPE;
- Keep an up-to-date register as proof that items of PPE have been issued to individuals (an employee must sign for the items that he receives);
- Ensure that there is an adequate supply of all required PPE (i.e. maintain PPE stock levels on site); and
- Carry out regular inspections to ensure that PPE is being used correctly, is being maintained in a good, serviceable and hygienic state, and is not being shared between employees.

A safety helmet (or hard hat) worn correctly will help protect the head in the event of:

- An employee being struck on the head by a falling or flying object;
- An employee striking his head against a fixed or protruding object; or
- Accidental head contact being made with an electrical hazard.

A safety helmet must be worn at all times on a project site, with the following exceptions:

- Vehicle and equipment operators inside enclosed cabs;
- In offices and in office or administration buildings; and
- At designated lunch and break areas (provided that no work is in progress in the immediate break area).

A safety helmet must be worn in accordance with the manufacturer's requirements.
A safety helmet must be worn directly on the head. The wearing of a cap or other headgear beneath a safety helmet is prohibited unless the items have been specifically designed to be used in combination (i.e. the arrangement is approved by the safety helmet manufacturer).

The suspension system inside a safety helmet (that acts as a shock absorber) may not be removed.
The painting of safety helmets is prohibited.
Safety helmets may only be cleaned using a mild detergent and water. No solvents may be used.

16.30.1 Eye Protection

If an employee is carrying out, assisting with, or working adjacent to any activity where sparks or projectile particles are being generated, where chemical mists or fumes are being generated, where liquids may splash or spray, where harmful electromagnetic radiation (heat or light) is being generated, or where there is a risk of wind-blown particles entering the eyes, then suitable protective eyewear must be worn at all times (i.e. safety glasses, safety goggles, a face shield, a welding helmet, or a combination of these).

Such activities include:

- Working with rotating equipment (e.g. grinders, drills, mills, lathes, and saws);
- Welding and cutting;
- Chipping, chiselling or caulking;
- Using explosive powered tools;
- Abrasive blasting;
- Sanding; and
- Working with chemical substances (e.g. drilling fluids, acids, solvents, paints, pesticides, etc.).

For certain activities, special eye protection is required (e.g. a heat-resistant face shield is required when working near molten metal).
Double eye protection is required for activities such as:

- Grinding, cutting, chipping, chasing and reaming (employees must wear both a full face shield and safety glasses or goggles); and
- Arc welding (welders must wear both safety glasses and a welding helmet).

Screens must be erected to protect passers-by, where practical.

Safety glasses must be worn at all times on a project site, with the following exceptions:

- Vehicle and equipment operators inside enclosed cabs with the windows fully closed;
- In offices and in office or administration buildings;
- At designated lunch and break areas (provided that no work is in progress in the immediate break area); and
- When another form of eye protection is required (e.g. safety goggles).

All safety glasses used on site must have suitable permanent side protection.

In strong sunlight, dark safety glasses should be worn to reduce eyestrain and fatigue. However, caution must be exercised when employees are required to frequently move between outdoor and indoor environments. Dark safety glasses may not be worn indoors or in poor daylight conditions. Prescription spectacles with tinted lenses are prohibited inside buildings or other structures with limited illumination unless the lenses are light-sensing and adjust to changing illumination levels.

Employees who wear prescription spectacles (i.e. require corrective lenses) must make use of either:

- Prescription safety glasses (with permanent fixed side shields) that conform to the requirements of a recognised national or international standard (e.g. CSA, ANSI, or equivalent); or
- Over-spec safety glasses or goggles.

The use of contact lenses in certain areas may not be suitable because of increased risk to the eye due to dust or heat.

16.30.2 Hearing Protection

Local regulations concerning occupational exposure to noise and the use of hearing protection must be complied with as a minimum.
"Low noise" tools and machinery must be used wherever possible to reduce noise levels. Where noise cannot be reduced to an acceptable level through engineering and work practice controls, measures must be put in place to minimise the exposure of employees to the noise (i.e. administrative controls and personal hearing protection).

Areas where it is likely that the 95% upper confidence limit of an eight hour L_{eq} mean exceeds 85dB(A), or areas where impulse noise exceeds 140dB(C), must be designated as noise zones. These noise zones must be clearly demarcated and mapped, signs must be posted, and all employees must be made aware of the requirements for working in such an area.

Suitable hearing protection must be worn in all designated noise zones and when carrying out (or working in the vicinity of) any activity where the noise level exceeds 85dB(A).

Where hearing protection is required, a hearing conservation programme (applicable to all personnel and visitors) must be implemented. The programme must include training in the correct use and proper storage of hearing protection devices as well as replacement requirements. Training must be provided when hearing protection is first issued to an employee and refresher training must be carried out at least annually thereafter. Training records must be retained.

At least two types of personal hearing protection must be made available to employees. The hearing protection devices provided must have adequate noise reduction ratings (i.e. must be able to attenuate the noise level to below 85dB(A)).

Personal hearing protection must be issued on an individual basis and must not be shared. In addition to personally issued hearing protection, suitable disposable hearing protection must be made available at the entrances to all noise zones.
All Hearing Protection Devices (except for disposable hearing protection) must be properly inspected and cleaned on a regular basis.

16.30.3 Respiratory Protection

Designated areas (respirator zones) must be established where:

- It is likely that the 95% upper confidence limit of a Similar Exposure Group's mean exposure concentration exceeds the relevant Occupational Exposure Limit (OEL) for agents resulting in chronic effects, such as total inhalable dust, respirable dust, respirable crystalline silica, PAH, fluorides, lead, mercury, asbestos or non-asbestos fibrous materials; or
- The concentration of an agent (particulate, vapour or gas) with an acute effect exceeds 50% of the relevant OEL.

Note: For a particular hazardous agent, the OEL to be adopted must be either the client's OEL or the OEL specified in local legislation, whichever is the most stringent.

These areas must be clearly demarcated and mapped, signs must be posted, and all employees must be made aware of the requirements for working in such an area.

Suitable Respiratory Protection Devices (RPDs) must be worn in all designated respirator zones and when carrying out (or working in the vicinity of) any activity where the risk assessment has identified the need for respiratory protection.

RPD's must be selected based on:

- The type(s) of airborne contaminants that are present (gases, vapours, and particulates and aerosols including dusts, fumes, sprays, mists, and smoke);
- The potential particulate size distribution;
- Substance toxicity; and
- The likely concentrations.

Compatibility with the work tasks and other PPE, comfort (as it affects wear-time), and the ability to communicate adequately, must also be considered.

The risk assessment and method statement for the work to be performed, the information contained in the relevant Material Safety Data Sheets (MSDSs), and the results of any air monitoring associated with the substances to be worked with or activities to be carried out, must be used to ensure that the most suitable RPD is selected.

Only RPDs certified to a recognised standard and approved by the nominated project management representative may be used.

Where respiratory protection is required, a respiratory protection programme (applicable to all personnel and visitors) must be implemented.

The respiratory protection programme must include:

- Periodic inspection of RPDs, including before each use;
- Periodic evaluation (by competent persons) of cleaning, sanitising, maintenance and storage practices;
- Performance of positive pressure and negative pressure fit checks by RPD wearers before each use to ensure that the respirator is functioning properly; and
- Training at first issue of a RPD and regular refresher training thereafter in accordance with regulatory requirements or at least once every two years (the training must cover fit testing, use, cleaning, maintenance, filter cartridge replacement, and storage). Training records must be retained.

RPDs must be used, maintained, and stored in compliance with the manufacturer's requirements as well as the respiratory protection programme.

Suitable facilities must be provided for the cleaning and sanitary storage of RPD's.

As a minimum, qualitative and documented fit testing must be carried out (although quantitative fit testing is preferred) to ensure that the use of negative pressure RPDs (including disposable RPDs) is effective. Fit testing must be performed by a competent person when an RPD is first issued and must be repeated periodically in accordance with legal requirements or every two years as a minimum. A policy must be in place requiring a clean shaven face when using a negative or neutral pressure RPD for routine tasks (otherwise a positive pressure RPD must be used). A medical evaluation including a pulmonary function test may be required to determine whether or not an individual is medically fit to wear a respirator.

For air-supplied RPDs, breathing air must be effectively filtered and / or isolated from plant and instrument air, and isolated from sources of potential contaminants. The supplied air must be tested to determine if the air quality complies with the requirements of applicable standards for breathing air.

For nuisance dust, dust masks with a protection level of at least FFP2 must be worn.

16.30.4 Hand and Arm Protection

Gloves must be worn when handling or working with equipment, materials or substances with the potential to cause injury or illness.
Suitable gloves must be selected based on the task to be performed and the specific hazard against which the employee requires protection, such as:

- Sharp edges;
- Sharp points and splinters;
- Abrasive surfaces;
- Hazardous chemical substances (toxic, corrosive, sensitising, etc.);
- Extreme temperatures; and
- Viruses, bacteria and parasites.

16.30.5 Foot Protection

Safety boots must be worn at all times whilst on a project site, with the exception of offices and office or administration buildings in which closed athletic, business or similar shoes may be worn.
Sandals, slops, slippers, open-toed and high-heeled shoes are not permitted on any project premises.

Safety boots must provide the following protection:

- Steel toe cap to protect against crushing (impact and compression forces);

- Leather uppers that provide resistance against water penetration and water absorption;
- Slip resistant soles;

And where a risk assessment identifies the need:

- Puncture resistant soles (i.e. steel midsoles) for protection against sharp objects;
- Chemical resistant soles for protection against spilt chemical substances (such as solvents, hydrocarbons, acids, and alkalis);
- Heat resistant soles for protection against hot surfaces or molten metal; or
- Electrical shock resistant soles for protection (insulation) against live electrical conductors.
- Gumboots with steel toe caps must be worn when working in water or very wet conditions.

16.30.6 Clothing

All employees working on a project site must wear high visibility protective clothing with reflective taping. Trousers must be long and shirts must be long-sleeved. Shirts must be buttoned at the neck and wrists.

Protective clothing must preferably be made of natural fibres.
Short pants, short-sleeved shirts, sleeveless shirts, and vests are prohibited as outer garments (with the exception of a high visibility vest worn over a long-sleeved shirt).

Loose clothing may not be worn where it may become caught in moving machinery or equipment.
For hot work (e.g. welding, cutting, etc.), work in the vicinity of molten metal, and any work carried out in the vicinity of an open flame, the protective clothing worn (shirt and trousers) must be made of a suitable fire retardant fabric. Underwear and socks must be made of natural fibres (preferably wool) or fire retardant fabric.

No employee may tuck his trousers into his boots when working in the vicinity of molten metal.

16.30.7 Body Protection

Suitable body protection must be provided as required to protect employees against specific hazards. A range of work activities require body protection in one form or another, including but not limited to:

- Working in extremes of temperature, such as firefighting, attending to a heating furnace, working with molten metal, working in refrigerated environments, etc.;
- Hot work (e.g. welding, burning, cutting and grinding);
- Working with hazardous chemical substances (e.g. acids, solvents, pesticides, etc.); and
- Clean up and disposal of hazardous materials and wastes (e.g. asbestos, hydrocarbons, etc.).

A wide variety of protective garments are available, such as firefighting suits, furnace suits, freezer jackets, leather aprons, leather spats, laboratory coats, chemical resistant aprons, chemical resistant (or hazmat) suits, and disposable coveralls. Suitable items must be selected to provide protection against the specific hazard(s) to which an employee is exposed. Hazards must be carefully identified and characterised to ensure that the correct protection is used.

Body protection must be sized properly to prevent tearing, the parting of seams, tripping, or restriction of movement.

16.30.8 Electrical Protective Equipment

To reduce the risk of electric shock, electrical insulating equipment appropriate for the voltage that may be encountered must be worn when working on energised electrical installations and when working within two metres of exposed energised conductors.

All rubber electrical insulating equipment (including gloves, sleeves, matting, covers, blankets, and line hoses) must be inspected for damage prior to and after each use, and immediately following any incident that can reasonably be suspected of having caused damage.

Rubber insulating equipment with any of the following defects and / or damage may not be used:

- A cut, rip, tear, hole, or puncture;
- Ozone cutting or ozone checking (i.e. the cutting action of ozone on rubber under mechanical stress causing a series of interlacing cracks);
- An embedded foreign object;
- Chemical deterioration (texture changes) such as swelling, softening, hardening, or becoming sticky or inelastic; or
- Any other defect that damages the insulating properties.

Rubber insulating gloves must be electrically tested before first issue and every 12 months thereafter as a minimum. Insulating gloves must also be given an air test along with the daily inspection. Essentially, this involves filling a glove with air and checking for any holes or leakage.

Insulating equipment that fails an inspection or electrical test may be repaired only as follows:

- Rubber insulating line hose may be used in shorter lengths with the defective portion(s) cut off;
- A rubber insulating blanket may be repaired using a compatible patch that results in the patched area having electrical and physical properties equal to those of the blanket;
- A rubber insulating blanket may be salvaged by cutting the defective area off the undamaged portion of the blanket;
- Rubber insulating gloves and sleeves with minor physical defects, such as small cuts, tears, or punctures, may be repaired by applying compatible patches. The patched areas must have electrical and physical properties equal to those of the surrounding material.

Repairs to gloves are permitted only in the area between the wrist and the reinforced edge of the opening.

Repaired insulating equipment must be retested before it is put back into use.

Insulating equipment must be cleaned as required to remove foreign substances (using a mild detergent).

Insulating equipment must be stored in such a location and in such a manner so as to protect it from light, temperature extremes, excessive humidity, ozone, and other damaging substances and conditions.

Leather protective gloves must be worn over rubber insulating gloves to provide mechanical protection against cuts, abrasions, and punctures.

Suitable arc flash PPE (e.g. voltage rated gloves, fire retardant clothing, arc rated face shield, arc flash hood, arc flash suit, etc.) must be worn whenever an employee is potentially exposed to an arc flash hazard. The appropriate level of PPE must be worn depending on the task and the potential energy exposure. These PPE requirements must be clearly specified as part of a project-specific arc flash protection programme (refer to the Electrical Safety Standard).

16.30.9 Jewellery

Necklaces, dangling earrings, and bracelets may not be worn on a project site.
No ring or watch may be worn where there is a risk that it may become caught in machinery or equipment.

No jewellery or other conductive apparel (such as a key chain or watch) may be worn when carrying out energised electrical work.

16.30.10 Hair

Scalp hair that is longer than the top of the shoulders must be tied up and restrained within the person's safety helmet or within the collar of his or her overalls, shirt or jacket.

For negative or neutral pressure Respiratory Protection Devices, facial hair must not cause the seal between the respirator and facial skin to be broken (or prevent a seal from being formed in the first place).

16.30.11 Task-Specific PPE

In addition to the standard PPE required for a project site (including a safety helmet, safety glasses, safety boots, and high visibility protective clothing), the following task-specific PPE must be used as a minimum by any person carrying out or assisting with such a task:

- Arc Welding – safety glasses and welding helmet (i.e. double eye protection), respiratory protection against the specific airborne contaminants being generated (fumes, gases, dusts, etc.), leather welding gloves, leather apron, leather spats, leather yoke (for work above shoulder height), and knee pads for welders in kneeling positions;
- Gas Welding, Cutting or Brazing – gas cutting or welding goggles with shade 4 filter lenses and full face shield (i.e. double eye protection), respiratory protection against the specific airborne contaminants being generated (fumes, gases, dusts, etc.), leather gloves (long cuff for welding and cutting, short cuff may be used for brazing), leather apron, leather spats, and leather yoke (for work above shoulder height);
- Grinding – safety glasses or goggles and full face shield (i.e. double eye protection), hearing protection, respiratory protection where dust or fumes may be generated, leather gloves, leather apron, and leather spats;
- Abrasive Blasting – respiratory protection (air-supplied hood), hearing protection, leather gloves, and leather apron;
- Spray Painting – respiratory protection (air-supplied hood for confined spaces), safety goggles (if the respirator design does not provide this protection), hearing protection (where air compressors are used), chemical resistant gloves, and chemical resistant disposable coveralls.

16.31 Sun Protection

The contractor must ensure that all personnel are protected in sunlight through the use of long sleeve shirts, long trousers, brhealth and safety to safety helmets and UV factored sunscreen. Shade structures must also be made available to all employees.

The contractor must conduct training and awareness sessions with his employees, advising on the risks associated with working in the heat (including dehydration) and the precautions to be taken (e.g. ensuring adequate fluid intake).

16.32 Fuel / Flammable Liquid Storage and Refuelling

No fuel (diesel, petrol, paraffin, etc.) or any other flammable liquid (paints, solvents, etc.) may be stored on site unless approved in writing by the nominated project management representative.

If the on-site storage of a fuel or a flammable liquid is approved, the contractor must ensure the following:

- The quantity of fuel / flammable liquid to be stored on site must be kept to the minimum that is required;
- The storage area must be located in a well ventilated area at least 10 metres away from any building, drain, boundary or any combustible material;
- If more than 200 litres of fuel / flammable liquid is to be stored, the tank must be installed / the containers must be positioned within a bund (see Definitions);
- If the fuel / flammable liquid are to be stored in bulk tanks / vessels, then the minimum capacity of the bund must be 110% of the volume of the largest tank / vessel. If many small containers (e.g. 210 litre drums) are to be stored, the bund must be able to contain 25% of the total volume of the stored products;
- The bund must be impermeable. It must have a solid concrete floor and the walls must be constructed out of brick and must be plastered on the inside;
- The bund must be fitted with a lockable drain valve (for draining away rainwater), which must remain locked in the closed position. The valve may only be opened under supervision and in accordance with a written procedure;
- The fuel / flammable liquid storage area may not be used for the storage of any other materials / equipment, and must be kept completely free of all combustible materials (including rubbish, brush and long grass) at all times;
- Access to the storage area must be controlled (wire mesh fencing and gate);
- Appropriate warning signage (i.e. "Flammable Liquid", "No Smoking" and "No Naked Flames") must be prominently displayed at the storage area. The contents and volume of each tank must be indicated;
- In order to contain spillages, the offloading / refuelling bay at the fuel / flammable liquid storage area must have a solid concrete base surrounded by bund walls, ramps or humps and / or spill trenches (covered with steel grating) that lead into a sump;
- Fuel dispensing pumps must be protected against impact damage;
- All fuel / flammable liquid storage tanks and dispensing equipment must be electrically bonded and properly earthed;
- All electrical installations and fittings must be of an approved intrinsically safe type;
- Two 9kg dry chemical powder fire extinguishers must be mounted in an easily accessible position near the entrance gate to the fuel / flammable liquid storage area. Depending on the size of the storage area, additional fire extinguishers may be required to ensure that an extinguisher is no further than 15 metres away from any point on the perimeter of the storage area;

- A fire extinguisher must be at hand wherever refuelling is carried out;
- Smoking or open flames within 10 metres of a fuel / flammable liquid storage / refuelling area is strictly prohibited;
- No petrol or diesel powered vehicle or equipment may be refuelled while the engine / motor is running;
- Cellular phones must be switched off in fuel / flammable liquid storage / refuelling areas;
- Spill clean-up kits (containing a suitable absorbent fibre product) must be provided;
- Any spillages must be cleaned up immediately and all contaminated cleaning materials must be disposed of in accordance with the applicable legislation;
- If a flammable liquid is spilt or is leaking from a container / vessel, the area must be cordoned off and appropriate warning signage must be displayed to keep unauthorised personnel away from the affected area. Every effort must be made to contain the spillage. All hot work in the vicinity must be stopped immediately. If the spilt product is volatile and the possibility exists that a vapour cloud may form, or if the leak or spillage cannot be contained or stopped, then appropriate emergency response procedures must be activated (refer to Section 14) including the evacuation of all persons in the vicinity. Suitable firefighting equipment must be positioned ready for use should the spilt product ignite;
- The manual decanting of fuel or a flammable liquid from a large container should only be done using a stirrup pump (or similar) or a purpose-made frame which allows the container / drum to tilt for decanting and then return to the upright position;
- Drip trays must be used wherever required;
- All tanks, drums, cans, etc. containing flammable liquids must be tightly closed and properly sealed except for when a container is being filled or when a product is being decanted;
- The transport or storage of corrosive or flammable liquids in open containers is strictly prohibited
- Daily-use quantities of fuel (up to a maximum of 20 litres) must be handled in an approved safety can with a flash arresting screen, spring closing lid and spout cover that will safely relieve internal pressure if the can is exposed to fire;
- Where safety cans may be impracticable, only approved metal containers with screw caps may be used. Each container must be clearly labelled to indicate its contents;
- Only small quantities of flammable liquids (paints, solvents, etc.) may be stored within a building. Each product must be kept either in its original container or in an approved container which must be properly sealed. Each container must be clearly labelled to indicate its contents. When not in use, all such containers must be stored in a well-ventilated steel cabinet which must be kept locked to prevent unauthorised access;
- Not even small quantities of flammable liquids may be stored or dispensed in buildings or places of public assembly, in general warehouses, or in buildings containing sources of ignition such as space heaters, cooking devices, open electric motors, motor vehicles, or where welding, cutting, or grinding activities are being carried out;
- Safe Work Procedures must be compiled for the transportation (including delivery), offloading, storage, handling and use of any fuel / flammable liquid on site;
- All personnel that will be required to work with or may come into contact with a flammable liquid must be made aware of the hazards associated with the product

and must be thoroughly trained in the safe transportation, use, handling and storage thereof.

16.33 Fire Protection and Prevention

The contractor must compile a Fire Protection and Prevention Plan for the work that will be carried out on site.

The contractor must assess / survey his area of responsibility and identify locations where the risk of fire is high. Cognisance must be taken of the fact that certain locations may need to be designated as high risk due to the presence of large quantities of flammable or combustible materials / substances. For all high risk areas, the contractor must ensure that additional precautions are taken to prevent fires and strict control is exercised over any hot work (i.e. welding, cutting, grinding, etc.) that is carried out.

The contractor must supply and maintain all required firefighting equipment. The type, capacity, positioning, and number of firefighting appliances must be to the satisfaction of the nominated project management representative and must meet the requirements of the applicable legislation. Fire mains, hydrants and hose reels will rarely be available on site, so use must primarily be made of portable fire extinguishers.

Firefighting equipment, fixed and portable, must be strategically located with a view to being able to rapidly deploy the equipment in order to bring potentially dangerous and destructive fires under control while still in their infancy.

All fire extinguishers (and any other firefighting equipment) placed on site must be:

- Conspicuously numbered;
- Recorded in a register;
- Visually inspected by a competent person on a monthly basis (the results of each inspection must be recorded in the register and the competent person must sign off on the entries made); and
- Inspected and serviced by an accredited service provider every six months (the nominated project management representative may require that this frequency be increased depending on the environmental conditions (e.g. high dust levels, water, heat, etc.) to which the fire extinguishers are exposed).

Any fire extinguisher that has a broken seal, has depressurised, or shows any sign of damage must be sent to an accredited service provider for repair and / or recharging. Details must be recorded in the register.

Firefighting equipment may not be used for any purpose other than fighting fires. Disciplinary action must be taken against any person who misuses or wilfully damages any firefighting equipment.

Access to firefighting equipment, fixed or portable, must be kept unobstructed at all times. Approved signage must be in place to clearly indicate the location of each permanently mounted fire extinguisher, fire hose reel, etc.
The contractor must ensure that all persons working in / entering his area of responsibility are made aware of where all firefighting appliances and alarm points are located.
The contractor must ensure that his employees (and those of any appointed sub-contractors) are trained in firefighting procedures and the use of firefighting equipment.

The contractor must compile an emergency response procedure detailing the actions that must be taken in the event of a fire or a fire / evacuation alarm (see Section 14).
All personnel working within the contractor's area of responsibility must be trained, and all visitors must be instructed, on this procedure. Copies of the procedure must be prominently displayed in the workplace in all languages commonly used on the site.

A person discovering a fire must extinguish the fire if he can do so safely, and then immediately report the incident to his supervisor. If the person cannot extinguish the fire, he must raise the nearest alarm and then report the fire as quickly as possible to his supervisor, the person responsible for the area, and / or Security.
On hearing a fire / evacuation alarm, all persons must make any operational plant or equipment safe, and then proceed to the nearest emergency assembly point and await instructions.
All incidents of fire (including the use or misuse of any firefighting equipment) must be reported to the nominated project management representative immediately. Used fire extinguishers must be replaced by the contractor without delay.

No hot work (i.e. welding, cutting, grinding, etc.) or any other activity that could give rise to a fire may be performed outside of a designated workshop without a Permit to Work having been issued.
Wherever hot work is being carried out, a fire extinguisher must be at hand. Where the risk assessment determents that it is necessary, a fire watch must be stationed.
Supervisors must carry out workplace inspections regularly to ensure adherence to fire prevention measures and procedures.

At the end of every working period (i.e. before each tea / lunch break and at the end of every shift / day), the workplace must be thoroughly inspected to ensure that no material is left smouldering and no condition / situation exists that could give rise to a fire.

The contractor must ensure that all supervisors and all employees carrying out or assisting with any hot work or any other activity that could give rise to a fire have been trained in firefighting procedures and the use of firefighting equipment. The training must be conducted by an accredited training provider.

When using electrical equipment, all cables must be in good condition and the nearest convenient socket must be used.
No power socket may be loaded beyond its rated capacity through the use of adaptors, etc.
Makeshift electrical connections are not permitted under any circumstances.
Water-based firefighting equipment must not be used on electrical equipment or burning liquids.
Refer to Section 13.16 – Electrical Safety.

Each vehicle used on site for work purposes and each item of mobile equipment with a diesel or petrol engine must be fitted with a permanently mounted fire extinguisher.
Smoking is only permitted in designated smoking areas. Cigarette ends / butts must be properly stubbed out in the ashtrays provided and never thrown into waste bins.

The contractor must ensure that good housekeeping practices are enforced, as this is crucial to the prevention of fires.

All combustible waste materials must be removed from the workplace on a daily basis (at the end of each shift) and placed in waste receptacles located at least 5 metres away from any structure.
The accumulation of waste materials in out-of-the-way places is prohibited.
Offices, desks, cabinets, etc. must always be kept tidy and uncluttered. Waste paper bins must be emptied regularly.

The storage of combustible materials under stairways or in attics is prohibited.
The storage of any materials against the exterior of a building or any other structure is prohibited.
All walkways, passages and stairways must be kept clear (i.e. must be unobstructed) at all times, as they may need to be used as a means of escape.
The areas around and the routes to all exits, fire escape doors, fire hydrants, fire hose reels and fire extinguishers must be kept clear (i.e. must be unobstructed) at all times.
"No Smoking" signs must be conspicuously displayed in and around all storage areas / rooms.
Waste may not be burned under any circumstances.

No flammable liquid (such as petrol, acetone, alcohol, benzene, etc.) may be used for starting fires or as a solvent for cleaning clothes, tools, equipment, etc. Only solvents approved by the nominated project management representative may be used for cleaning purposes.

Whenever any work is carried out involving the use of a flammable substance / material, the area must be cordoned off and appropriate warning signage (i.e. "No Unauthorised Entry", "No Smoking" and "No Naked Flames") must be displayed.
Refer to Section 13.32 – Fuel / Flammable Liquid Storage and Refuelling.

16.34 Smoking

The contractor must not permit smoking on site except within designated smoking areas selected in accordance with the applicable legislation. Such an area must be clearly demarcated and the required signage must be displayed.

Any person found smoking or discarding a cigarette butt outside of a designated smoking area may be removed (temporarily or permanently) from site.
In all designated smoking areas, adequate non-combustible commercial ashtrays and / or cigarette butt receptacles (butt cans) must be provided.

Ashtrays and other receptacles provided for the disposal of smoking materials must not be emptied into rubbish bins or any other container holding combustible materials.
"No Smoking" signs must be strictly observed.

16.35 Housekeeping

The contractor must maintain all work areas in a tidy state, free of debris and rubbish. Unless directed otherwise, the contractor must dispose of all debris, rubbish, spoil and hazardous waste off site in a designated and authorised area or facility. The contractor must familiarise hhealth and safetyelf with the waste management plan for the site including collection and disposal arrangements, and must align his waste management activities accordingly.

In cases where an inadequate standard of housekeeping has developed and compromised safety and cleanliness, a nominated project management representative may instruct the contractor to cease work until the area has been tidied up and made safe.

Neither additional costs nor contract deadline extensions will be allowed as a result of such a stoppage. Failure to comply will result in a clean-up being arranged through another service provider at the cost of the non-complying contractor.

The contractor must carry out housekeeping inspections on a weekly basis to ensure maintenance of satisfactory standards. The contractor must document the results of each inspection. These records must be maintained and must be made available to the nominated project management representative on request.
The contractor must implement a housekeeping plan for the duration of the contract ensuring that the site housekeeping is maintained. Furthermore, at the end of every shift, the contractor must ensure that all work areas are cleaned, all tools and equipment are properly stored, and construction rubble is removed.

Where the contractor fails to maintain housekeeping standards, the nominated project management representative may instruct the contractor to appoint a dedicated housekeeping team for the duration of the project at the contractor's expense.
Littering is prohibited.

16.36 Waste Management

Waste may not be disposed of unless the disposal of that waste is authorised by law. The contractor must therefore ensure that all waste that is generated is handled, stored, transported and disposed of in accordance with the requirements of the applicable legislation / local authority.

No waste may be removed from the project site to a waste storage or disposal facility unless that facility has been approved for use by the nominated project management representative.
An adequate number of waste bins and skips must be provided by the contractor and suitable arrangements must be made to ensure that these bins and skis are emptied regularly.
Hazardous wastes must be kept separate from general wastes.

Waste disposal service providers must be approved by the nominated project management representative before any waste is removed from site. These service providers must be audited on a two-yearly basis (or more frequently if deemed necessary based on risk) in order to ensure compliance with legislation and to help ensure that no liabilities accrue to the project.

16.37 Stacking and Storage

All irregular shaped items will be stacked at floor / ground level in designated stacking areas on a level, firm base capable of withstanding the weight of the commodities being stacked and stacked in such a manner that the items do not topple over or change position due to subsidence or weight transfer when being moved.

Where these commodities are stacked on shelves or racks, the shelves or racks must be designed to carry the weight of the commodity being stacked.
All racks or shelves where heavy material or commodities are stacked will have a weight carrying limitation clearly marked on the structure and have a safety factor of at least +10% of maximum total carrying capacity.

All materials, commodities or articles, which could be damaged due to inclement weather, must be stored under cover.
Waste material that is combustible must not be allowed to accumulate in sufficient quantities to create a hazard.

No commodities or equipment may be stacked or stored within 500mm of rolling stock tracks or where mobile equipment travels.
The storage of material, small equipment, tools, files and general items in cupboards and on shelves must be neat and controlled at all times. Incompatible substances must not be stored in or on the same cupboard or shelf.

No equipment, tools, files or documents may be stored or stacked on top of cupboards which are higher than 1.5 metres in height.

16.38 Demarcation

No demarcation of floors is required inside offices, training centres and the like.
Where it is impractical to paint floors, yellow lines will be deemed adequate e.g. where heavy traffic necessitates the continual painting of floors.

Temporary demarcation in the form of hazard tape (red and white) may be used to demarcate areas where there is, for relatively simple reasons, restricted access.
Where hazards exist and entry must be specifically excluded for safety or health reasons, hazard tape in any form must not be used in isolation. A robust and substantial barrier of timber, rope or other material must be used in conjunction with barrier tape, to prevent entry to unauthorised persons.

Outside storage areas where it is impractical to use floor demarcation, demarcation may take the form of creosote poles and wire rope or similar. Spans between uprights should be painted yellow.

16.39 Facilities

Sanitary conveniences must be provided and maintained at a rate of at least one shower facility for every 30 workers, at least one toilet facility for every 20 workers, separate male and female changing facilities and sheltered eating areas. (Check SANS 10400 Part F).

Where chemical toilets are provided, one toilet for every twenty five employees must be allocated.
All toilets must be cleaned daily, disinfected and provided with toilet paper.
All employees making use of these facilities have the responsibility to help keep the facilities neat, clean and hygienic.

Washing facilities, including soap and towels, must be made available for use by the contractor's employees.

Drainage from all washing / toilet facilities must be properly designed and constructed to prevent employee exposure to waste water (and the associated biological hazards). Waste water may not accumulate or stand in pools at any location on the project site.
Change rooms must be provided and must be kept clean and free from odours at all times.
No chemicals, except those normally used for domestic cleaning of these facilities, may be stored in the facilities.

No equipment or items (other than those normally associated with hygiene facilities) may be stored in the facilities.

All entrances must be constructed in a way to afford privacy to users.
Drinking water must be provided.
A sheltered (covered) area must be set aside on site to be used as a dining facility (eating area). Adequate seating must be provided for the maximum number of employees. The facility must be kept clean and tidy.

A suitably sized, impervious receptacle (bin) must be provided for the disposal of waste food and other refuse generated at the dining facility. This bin must be emptied and cleaned regularly (i.e. promptly after meal times).

Food may only be consumed in authorised sheltered areas.
Adequate refrigerated storage must be provided to the contractor's employees for the storage of food and drinks. Fridges must not be overstocked and must maintain sufficiently low temperatures.

16.40 Occupational Hygiene

The contractor must ensure that the exposure or potential exposure of his employees to any of the following stressors is assessed and measured (a baseline survey must be carried out by an Approved Inspection Authority - this services to be provided by TCP):

- Noise;
- Thermal stress (heat and cold);
- Particulates (dust);
- Silica (free crystalline silica);
- Asbestos;
- Gases or vapours;
- Lead;
- Chemicals;
- Ionising radiation;
- Non-ionising radiation;
- Vibration (hand / arm vibration and whole body vibration);
- Ergonomics; and
- Illumination.

If it is determined that exposure levels for a particular stressor are unacceptable, then a monitoring and control plan must be implemented to manage any risk of overexposure.

Note: Where chemical substances are to be used as part of the construction process, the contractor must ensure that the chemical composition of each substance is known.

Carcinogenic (cancer-causing) ingredients must be specifically identified with due understanding that no chemical known to cause cancer will be permitted for use on site (an alternative will need to be sourced).

16.41 Lighting

For all work areas and access ways, if the natural lighting available is inadequate it must be supplemented by artificial lighting to meet the minimum levels required.
A lighting survey to determine luminance must be conducted for all work areas, at least once every two years and prior to work commencing for the first time in any area.
Emergency lighting must be provided in all indoor workplaces that do have adequate natural lighting or in which persons work at night. The emergency sources of lighting that are provided must be such that, when activated, an illuminance of not less than 0.3 lux is obtained at floor level, to enable employees to evacuate safely.

Where it is necessary to stop machinery or shut down plant or processes before evacuating the workplace, or where dangerous materials are present or dangerous processes are carried out, the illuminance must be not less than 20 lux.

Windows and translucent sheeting must be kept adequately clean and clear of obstructions as far as reasonably practicable. Light fittings, i.e. lenses and reflectors must be kept clean.
If a light intensity meter is used, a valid calibration certificate must be available.

Neon lights must not be installed in areas where moving parts of machinery or equipment cannot be fully guarded, i.e. lathes, bench grinders, etc. in order to eliminate the stroboscopic effect.
No person may use a portable electrical light where the operating voltage exceeds 50 volts, unless:

- It is fitted with a non-hydroscopic, non-conducting handle;
- All metal parts which may become live are protected against accidental contact;
- The lamp is protected by means of a guard firmly attached to the handle; and
- The cable can withstand rough use.
-

No person may use a portable electric light in damp or wet conditions or in closely confined spaces, inside metal vessels or when in contact with large masses of metal, unless:

- The lamp is connected to a source incorporating an earth leakage; and
- The operating voltage of the lamp does not exceed 50 volts. Hearing Conservation

A hearing conservation program must be implemented and protection against the effects of noise exposure must be provided when the noise exposures equal or exceed an 8-hour time-weighted average sound level of 85 decibels measured on the A-weighted scale of a standard sound level meter at slow response.

For the hearing conservation program to be effective it must include as a minimum:

- Monitoring of the workplace to determine the representative exposure of employees to excessive noise levels;
- An audiometric testing program for employees, which must include:
  - A baseline audiogram for all employees exposed to noise levels equal to or in excess of the standard;
  - Annual audiograms for each overexposed employee;
  - Analysis of audiogram results with retesting and/or referral to an otolaryngologist or qualified physician when a significant threshold shift (STS) occurs; and
  - Written employee notification of the STS.
- A training program for all employees exposed to noise;
- Provision of personal protective equipment to all affected employees when administrative or engineering controls fail to reduce sound levels to within the levels of the standards.

Monitoring of employee exposures to noise shall be conducted by an Approved inspection Authority.

The monitoring requirement may be met by either area monitoring or personal monitoring that is representative of employee exposures. Personal monitoring is preferred, and may be required based on the type(s) of noise sources.

For purposes of the hearing conservation program, employee noise exposures shall be computed in accordance with local legislation.
A person-task specification shall be available for every job category and shall be submitted with an employee for audiometric testing.

Audiometric testing and an annual audiogram shall be provided as part of the regular medical examinations.
Audiometric test results obtained from the pre-employment medical examination for a new employee shall be used as the baseline audiogram.

Testing to establish a baseline audiogram shall be preceded by at least 14 hours without exposure to workplace noise.

Hearing protectors shall not be used as a substitute for the requirement that baseline audiograms be preceded by 14 hours without exposure to workplace noise.
Employees shall be notified of the need to avoid high levels of non-occupational noise exposure during this 14-hour period.

Record-keeping for the audiogram shall include:
- Name and job classification of the employee;
- Date of the audiogram;
- The examiner's name;
- Date of the last acoustic or exhaustive calibration of the audiometer;
- Employee's most recent noise exposure assessment.

Audiometric test results shall be maintained in the employee's medical file.
To control noise exposure, its three basic elements shall be examined, i.e. source of the sound, travel path, and effect on receiver or listener. Solution of a given noise problem might require alteration or modification of any or all of these three basic elements.

2) Controlling noise at the noise source can be achieved by the following:
- Select quiet equipment initially. In selecting quiet equipment the following features shall be considered:
- Low-noise certification;
- Advertisement of "quiet" operation, evidence of noise control design;
- Evidence of "lower" and "slower" operating characteristics;
- Side-by-side noise testing of equipment; and
- "On-site" or "in operation" inspection of mechanical equipment before purchase.
- Reduce operating noise by considering the following control measures:
- Reduce impact or impulse noise by reducing weight, size, or height of fall of impacting mass;
- Reduce speed in machines and flow velocities and pressure in fluid systems;
- Balance rotating parts – to control machinery noise and vibration of fans, fly wheels, pulleys, cams, etc.
- Reduce frictional resistance between rotating, sliding or moving parts in mechanical systems: frequent lubrication, proper alignment of moving parts; static and dynamic balancing of rotating parts; correction of eccentricity or "out-of-roundness" of wheels, gears, rollers, pulley, etc.;
- Reduce resistance in air or fluid systems: use of low flow velocities, smooth boundary surfaces of duct or pipe systems, and long-radius turns and flared sections in pipes, etc., to reduce turbulence noise;

- Isolate vibration elements in machinery; install motors, pumps, etc. on most massive part of machine; use belt or roller drives in place of gear trains; use flexible hoses and wiring instead of rigid piping and stiff wiring, etc.
- Apply vibration damping materials such as liquid mastic; pads of rubber, felt, foam or fibrous blankets; or sheet metal visco-elastic laminates or composites to vibrating machine surfaces; and;
- Reduce noise leakage from the interior of machines such as compressors by sealing or covering all openings or applying acoustical materials to machine interiors.

3) Controlling noise in the transmission path can be achieved by the following:
- Separate the noise source and receiver as much as possible;
- Use sound-absorbing materials on ceiling, floor or wall surfaces as close to the machine as possible;
- Use sound barriers and deflectors in the noise path;
- Use acoustical lining on inside surfaces of such passageways as ducts, pipe chases, or electrical channels;
- Use mufflers, silencers or snubbers on all gasoline or diesel engines, regardless of size; and particularly on equipment when large quantities of high-pressure, high-velocity gases, liquids, steam or air are discharged into the open air; and
- Use vibration isolators and flexible couplers where the noise transmission path is structure borne in character.

4) Protection for the receiver – when engineering controls fail to reduce the levels to within the levels specified in local legislation, the following measures shall be implemented:
- Personal protective equipment shall be provided and replaced as necessary at no cost to employees;
- Supervisors shall ensure that hearing protective devices are worn by all employees who are exposed to a time-weighted average of 85 decibels or greater and who have experienced a significant threshold shift;
- Employees shall be given the opportunity to select their hearing protectors from a variety of suitable protectors; and

Noise zones shall be indicated my means of signs at every entrance to such zones.
When noise levels exceed 100 dB(A), a combination of earplug and earmuff may be required to achieve protection of the worker.
It is important to note that using double protection will add only 5 to 10 dB of extra attenuation above that of a single Hearing Protection Device.
Where an earmuff and earplugs are used together, OSHA recommends using this simple calculation: Take the higher rating of the two devices, and add five.
Hearing Protection Devices should be worn for the full noise exposure period.

Where an audiometry programme is required, it must meet the following standards:
- All testing must be by pure tone audiometry in an audiometry booth or quiet room, with measured noise levels less than 40 dB(A);
- The initial audiogram must be taken prior (minimum of 24 hours) to exposure to significant noise. Further audiograms must be taken periodically; annually where exposures are over 85 dB(A) Leq or where continued deterioration to hearing is occurring;
- Testing must be performed by trained and competent personnel;

- Audiometers must be calibrated according to the manufacturer's guidelines. As a minimum these will be a weekly biological calibration using an employee unexposed to noise, or a bio-acoustic simulator, and an annual quantitative check. All results must be documented; and
- Audiograms must be read by trained persons who will identify any increasing hearing loss and then determine if this is noise induced. Any employee with a significant downward shift in one or both ears (measured as an average non age-adjusted loss from baseline of 10 dB at 2, 3 or 4 kHz) must be retested following removal from noise for a minimum of 24 hours, usually after a days-off period. If the downward shift persists the employee must be reviewed by a physician and improved hearing protection considered.

16.42 Particulate and Gas / Vapour Exposures

Designated areas must be created where:

- It is likely that the 95 per cent upper confidence limit of a Specific Exposure Group's (SEG) mean exposure concentration for agents resulting in chronic effects (such as total inhalable dust, respirable dust, respirable crystalline silica, PAH, fluorides, lead, mercury, asbestos or non-asbestos fibrous materials) exceeds the relevant OEL; and
- Agents with an acute effect, such as particulate hazards, or gases (e.g. CO, SO2, NH3, HF, etc.), or vapours exceed 50 per cent of the relevant OEL.

Designated areas must:

- Be identified and mapped, signposted or otherwise clearly communicated to employees working in the area. Signposting, where necessary, must use appropriate wording or symbols on signs to identify the hazard;
- Have a documented respiratory protection programme based on suitable risk assessment and standards, which is applied to employees, contractors and visitors;
- Have regular monitoring of SEGs working in the area; and
- Have a formal review of the practicality of engineering controls at least every two years, or less where it is a critical control for a significant risk.

Particulate and gas / vapour monitoring must be appropriate to the exposure conditions and toxicants, and based on the use of equipment approved by local regulatory authorities, as per documented methods.

Where risk assessment indicates the possible presence of levels of gas or vapour sufficient to cause health effects in less than one shift (e.g. confined space entry), continuous monitoring is required as long as the potential for harm exists.

Employees and contractors must be covered by a medical surveillance programme when:

- Their Specific Exposure Group TWA mean exposure to respirable crystalline silica, total inhalable dust, respirable dust, lead or asbestos is greater than 50 per cent of the relevant OEL;
- The medical adviser considers that it is advisable; or
- There is a legal requirement for medical monitoring.

Where risk assessment indicates a risk of a respiratory condition, assessment programmes must include chest x-rays and / or lung function tests. The test or tests chosen must enable the earliest detection of adverse effects from the exposure of concern. Where indicated, they must meet the following standards:

- High quality chest x-rays will be taken every five years, unless local legislation requires these to be more frequent;

- All chest x-rays for pneumoconiosis surveillance will be read to International Labour Organisation (ILO) standards by an ILO B reader, wherever possible, and if not, by a competent radiologist using verifiable quality criteria;
- Any progression of more than one step on the ILO extended scheme to a reading above 1/0 will be reviewed by a physician;
- Any reading suggesting active lung disease will be reviewed by a physician; and
- All spirometry will be performed by trained staff following the American Thoracic Society guidelines or equivalent and be offered at a frequency determined by the likely rate of detectable change in lung function.

Controls must be of an adequate standard such that surfaces are adequately cleaned to avoid:

- Dust generation due to material dislodgment (e.g. windblown), where practicable; or
- Fume generation from accumulated dust during welding / heating or cutting operations.

Where risk assessment indicates the need to reduce exposures to toxic substances for employees or their families, good personal hygiene must be enforced. The programme must include:

- No smoking, eating or drinking in designated hazard areas;
- Washing of hands and face prior to drinking, eating or smoking;
- Showering at work post shift or after exposure to 'dirty' conditions; and
- Laundering of contaminated clothing by the contractor.

Abrasive blast cleaning must be conducted so as to protect worker health and minimise dust emissions. Substitutes must be used whenever practicable for abrasives containing crystalline silica. However, if such abrasives are used, workers must be aware of the hazards and exposure monitoring conducted. The hazardous properties of alternative materials must be considered before use.

Where required, training in the recognition of signs and symptoms of hazardous particulate and gas / vapour exposure, emergency procedures and preventative measures must be provided.

16.42.1 Respiratory Protection Devices

The selection of Respiratory Protection Devices (RPD's) must be based on:

- The potential particulate size distribution, gas / vapour types, substance toxicity and likely concentrations;
- Compatibility with the work tasks and other PPE; and
- Comfort (as it affects wear-time) and allowance for adequate communication.

Only RPD's approved by the nominated project management representative may be used. Suitable facilities must be available for cleaning and sanitary storage of RPD's.

Half-mask and full-face air-purifying respirators must NOT be used where:

- The atmosphere is oxygen deficient (< 19.5 per cent);
- The atmosphere is immediately dangerous to life or health (e.g. in areas where CO concentrations are > 1500 ppm, HF > 30 ppm or NH4 > 300 ppm);
- Gases and vapours are more than ten times their OEL or greater than 1000 ppm for half-mask respirators, or more than 100 times their OEL for full-face respirators; or

- Particulates are more than five times their OEL for half-mask respirators, or more than 50 times their OEL for full-face respirators.

For atmospheres that are oxygen deficient, or contain unknown hazards, or have concentrations of gases and vapours that are unknown, or could potentially exceed levels that are immediately dangerous to life or health, an air-supplied type respirator must be worn.

For effective use of negative pressure RPD's (including disposable RPD's), fit testing must be qualitative and documented as a minimum, although quantitative fit testing is preferred. Fit testing must be performed by a competent person when RPD's are first issued and must be repeated periodically according to legal requirements or two-yearly as a minimum frequency. There must be a policy requiring a clean shaven face when using a negative or neutral pressure RPD for routine tasks, or the use of a positive pressure RPD will be required. A pulmonary function test and medical evaluation may be required to determine whether or not an individual is medically fit to wear a respirator.

For air-supplied RPD's, breathing air must be effectively filtered and / or isolated from plant and instrument air, and isolated from sources of potential contaminants. The quality of the breathing air must be checked for conformance with applicable standards.

The respiratory protection programme must include:

- Periodic inspection of RPD's, including before each use;
- Periodic evaluation of cleaning, sanitising, maintenance and storage practices by competent persons;
- Performance of positive and negative fit checks before each use by RPD wearers to ensure that the respirator is functioning properly; and
- Training at first issue of a RPD and regular refresher training thereafter in accordance with regulatory requirements or at least once every two years.

16.42.2 Asbestos and Non-asbestos Fibrous Silicates

This section applies to asbestos and bio-persistent non-asbestos fibrous silicates that may display asbestos-like toxicity, related to fibre diameter and length. Local regulations must be followed as a minimum. The following requirements must be met:

- A management program must be in place and actively pursued;
- No new products containing these materials may be purchased;
- Installed materials of this type must be identified and assessed annually for current safety. Where 'safe in place', it should not be removed, unless there is an opportunity for removal during renovation or construction of buildings or equipment;
- Work areas must be barricaded off and signposted to restrict entry; and
- Contaminated material must be promptly placed in appropriate marked plastic disposal bags or covered containers for disposal to an approved landfill.

All workers exposed to these materials must be on a register. "Exposed" means working on or near such material that has been disturbed, abraded or cut. The register must contain details of their annual medical examination and the results of occupational hygiene monitoring.

Asbestos contractors must be competent, registered and have adequate equipment, procedures and monitoring.

Where required, the asbestos / bio-persistent non-asbestos fibrous silicates management programme must cover work practices, training, monitoring, medical surveillance, and waste handling and disposal.

Maintenance operations must be made aware of potential cristobalite exposure hazards when disturbing non-asbestos fibrous silicates that have undergone high temperature conditions.
The potential for occurrence of naturally occurring asbestiform materials in exploration or mining production activities must be assessed, the risk of exposure determined and appropriate control measures implemented where required.

16.43 Hazardous Chemical Substances

No chemical substance may be brought onto site unless it has been approved for use by the nominated project management representative and it appears on the Approved Chemical Substances Register which will be made available to all contractors.
The register will contain the following information:

- Trade name / product name of substance;
- Manufacturer / supplier of substance;
- Maximum inventory;
- Storage requirements and precautions;
- Inventory of special emergency items held for handling spillages, fires, etc. (e.g. reagents to neutralise spillages, firefighting foam, etc.); and
- Approved disposal methods.

If the contractor wishes to make use of a chemical substance that does not appear on the register, then the contractor must provide the following information to the nominated project management representative for review PRIOR to bringing the substance onto site:

- A detailed 16-point Material Safety Data Sheet (MSDS) issued by the manufacturer / supplier of the substance;
- The reason for wanting to bring the substance onto site (i.e. the intended use of the substance);
- The proposed method of transportation;
- The proposed arrangements for the safe storage of the substance;
- The quantity to be stored on site;
- The proposed methods for handling / using the substance (including PPE);
- The proposed method of disposal of the waste;
- Proof that the contractor is able to readily provide the necessary first aid measures as specified in the MSDS; and
- A risk assessment covering the transportation, use, handling, storage and disposal of the substance with specific reference to the substance's compatibility with other chemicals.

This information must be provided at least five (5) working days prior to the date on which the contractor intends to bring the substance onto site for use.
Any chemical substance brought onto site without adherence to the requirements stipulated above shall be removed from site immediately.

If the nominated project management representative approves the substance for use, the contractor must ensure that all necessary precautions are taken concerning the transportation, use, handling, storage and disposal of the substance, and that all required PPE and first aid materials / equipment (as stipulated in the MSDS) are readily available on site.

The contractor must ensure that a Material Safety Data Sheet (MSDS) is obtained for each chemical substance brought onto site. A file, or files, containing all of the MSDS's must be maintained and must be readily available to all personnel on site (particularly first aiders) as well as other potentially affected parties (e.g. emergency services personnel, persons from the local community, etc.). The MSDS's must be in the language(s) commonly used on site.

The contractor must appoint a trained and competent Hazardous Chemical Substances Coordinator who understands and is able to evaluate the risks associated with a wide variety of substances. This person shall be responsible for:

- Assessing the hazardous properties and risks associated with all chemical substances brought onto site by the contractor and appointed sub-contractors (using the MSDS's);
- Determining precautions and safe practices for transportation, use, handling, storage and disposal (including PPE requirements) (using the MSDS's);
- Determining first aid and emergency response requirements / procedures (using the MSDS's);
- Maintaining the MSDS file;
- Managing and monitoring the consumption of inventory; and
- Providing an "as needed" service to site personnel and suppliers.

The risks associated with the transportation, use, handling, storage and disposal of all hazardous chemical substances brought onto site must be assessed and managed by the contractor through a process that incorporates risk reduction using the hierarchy of controls as described in Section 6.
Whenever a task-based risk assessment is carried out, consideration must be given to the use of chemical substances (e.g. greases, solvents, etc.).

The contractor must provide Safe Work Procedures for the transportation, use, handling, storage and disposal of all hazardous chemical substances to be used on site.

The contractor must provide his employees with all of the Personal Protective Equipment that is necessary to prevent exposure / injury while handling / using the hazardous chemical substances that they will be required to work with. Appropriate PPE must be selected with consideration given to the potential hazards, permeability, penetration, resistance to damage and compatibility with the work tasks.

The contractor's employees must be trained in the safe transportation, use, handling, storage and disposal of the hazardous chemical substances that they will be required to work with or may come into contact with. The training must specifically address PPE requirements (including the correct selection, fitment and use thereof).
All personnel must be trained to understand the potential health effects associated with exposure to hazardous chemical substances and therefore the importance of Safe Work Procedures and PPE. All personnel must be trained on emergency response procedures and first aid measures.
Behaviour-based observations and coaching must include the use / handling of hazardous chemical substances.

An appropriate occupational exposure monitoring and medical surveillance programme must be in place for all personnel potentially exposed to hazardous chemical substances which have the potential to cause immediate or long-term harm.

Emergency showers and eyewash stations must be provided where required by law, or where a risk assessment indicates a need. The emergency showers and eyewash stations must be appropriately located, signposted, and regularly tested and maintained. Employees must receive training on the location and use of the showers / eyewash stations.

An emergency response plan for incidents involving hazardous chemical substances must be in place. Regular and appropriately staged emergency drills (possibly involving external spill response and ambulance support services) must be held and lessons learnt must be incorporated into the emergency response plan.

The contractor must provide appropriate storage facilities for all hazardous chemical substances to be used on site. The storage facilities must be secure and protected from damage. They must also be designed for easy access for firefighting purposes. Where applicable, the storage facility must protect chemical containers from physical damage due to temperature extremes, moisture, corrosive mists or vapours, and vehicles.

The inventory of hazardous chemical substances stored on site must be kept to a minimum. The quantity of each chemical stored must be justifiable.

Storage and segregation requirements for all hazardous chemical substances to be used on site must be based on:

- The quantities of the substances stored;
- The physical state of the substances (solid, liquid or gas);
- The degree of incompatibility; and
- The known behaviour of the substances.

Access to areas where hazardous chemical substances are stored and handled must be limited and controlled.

Every chemical substance container must be adequately and clearly labelled to identify its contents, to indicate precautionary requirements for the substance, and to indicate the date of expiry (if applicable). Pipes used to transfer / convey / distribute chemical substances must be clearly identified (e.g. colour coding). Directional flow must be indicated where practical.
Before any item, equipment or empty container containing a chemical residue is disposed of as general waste, it must be properly decontaminated (where applicable). Before being disposed of, empty chemical containers must also be rendered unusable for carrying water (by puncturing, cutting or crushing them).

Hazardous chemical substance waste (i.e. redundant / expired hazardous chemical substances, containers containing residues, contaminated items / materials, etc.) must be disposed of in accordance with the applicable legislation.

Maintenance, inspection and testing schedules and procedures must be in place for critical equipment associated with hazardous chemical substances.

A system must be in place to ensure that the risks are assessed before any changes are made to equipment and / or processes for the transportation, storage, handling, use or disposal of a hazardous chemical substance.

A programme must be in place to continually investigate possibilities / opportunities for replacing hazardous substances with safer alternatives.

16.44 Radiation

The risks associated with ionising (from naturally occurring radioactive minerals (NORM), radon, and man-made sources), ultra violet (UV) and electromagnetic field (EMF) radiation exposure must be assessed by a competent person.

There must be an inventory of all radiation sources that have the potential to cause adverse health effects. For each radiation source, the type of radiation (e.g. radioisotope, radon, x-ray, EMF, laser, etc.), the strength of the radiation, and the location must be recorded.

Where risk assessment indicates the need, a documented radiation management programme must be developed such that:

- All types of radiation sources are adequately characterised and described;
- Exposures are eliminated or reduced to as low as reasonably practicable (ALARP);
- A clearly defined chain of responsibility (with duties) is provided; and
- Education is provided for employees regarding radiation safety, including the radiation management programme elements.

The ionising radiation management programme must meet all applicable regulatory requirements, and as a minimum must include the following elements (as applicable):

- Surveyed radiation areas and quantification of exposure sources / levels;
- Exposure and medical monitoring programmes based on established investigation levels;
- Transport of radioactive materials in compliance with international radiation transport regulations, when no local regulations are in place;
- Waste monitoring and disposal programmes;
- Feedstock and equipment checks for naturally-occurring ionising radiation;
- Clearance and control procedures for all contaminated materials and equipment leaving or arriving at site (including scrap);
- Leak (wipe) tests on sealed radioactive containment equipment;
- Lock-out procedures for vessels and equipment containing radioactive sources and radon decay product measurement prior to entry;
- Emergency procedures;
- Environmental impact risk assessment (air, water, waste, foods, etc.);
- Product / waste life cycle control; and
- Dose assessment for employees and critical exposure groups, according to documented methods and by a competent person.

Areas with ionising radiation with annual doses greater than 5 milli Sieverts (mSv) must be designated as restricted access or controlled areas. These areas must be identified and mapped, signposted or otherwise clearly communicated to employees working in the area.

Each person whose potential exposure exceeds 5 mSv per annum or who is a designated radiation worker must undergo periodic personal radiation monitoring and medical surveillance designed to show continued fitness for radiation work.

All sources of ionising radiation must be managed in use and when they are either disposed of or securely stored in accordance with local regulations. Each operation where individual worker's exposures could exceed 5 mSv per annum must have a trained radiation protection adviser or ready access to a trained protection consultant.

There must be documented procedures for the inspection, assessment and maintenance of the controls, and emergency procedures to deal with incidents involving ionising radiation sources (including fire and explosions). All controls must be reassessed annually to ensure their continued effectiveness and that operating practices are in accordance with written procedures.

16.45 Thermal Stress

Hot areas or activities where employees have experienced or could experience excessive fatigue, muscle cramp, dehydration, dizziness and other symptoms of heat stress must be identified and described.

Where a risk of thermal stress is determined, a competent person must conduct monitoring surveys on site, in consultation with workers.

For defined extreme thermal conditions and job activities, medical examinations must include information about the operator's physiological and biomedical aspects, and an assessment of fitness for the working conditions.
Cold areas or activities where employees have experienced or could experience pain or loss of feeling in extremities, frostbite, severe shivering, excessive fatigue and other symptoms of cold stress must be identified and described.

Workplace thermal stress levels (temperature, air movement, humidity, etc.), activities (work level, etc.) and conditions (clothing, health, etc.) that have the potential to exacerbate thermal stress effects must be adequately characterised and described. Workplace exposure assessment must be repeated according to regulatory requirements or whenever there is a change in production, work organisation, process or equipment which may impact thermal stress levels.

Detailed heat stress assessment of identified tasks or jobs must be tiered to:

- Commence with the use of a simple heat stress index as a screening tool; then, if necessary;
- Use rational heat stress indices in an iterative manner to determine the 'best' control methods for alleviating potential heat stress; and
- Undertake physiological monitoring when exposure times are calculated to be less than 30 minutes, or where high level PPE that limits heat loss must be worn.

Detailed cold stress assessment of identified tasks or jobs must be conducted according to current appropriate guidelines that incorporate a cold stress index, to determine the 'best' control methods for alleviating potential cold stress.

When a risk of thermal stress is identified, the following exposure controls must be implemented:

- An acclimatisation period for new workers and those returning from extended leave or sickness;
- Training in the recognition of signs and symptoms of heat or cold stress, emergency procedures and preventative measures;

- Protective observation (buddy system or supervision); and
- A requirement for self-paced working.

The following exposure controls must be considered by a competent person:

- Work / rest regimes and job rotation based on measurements conducted;
- Suitable rest areas with a provision of cool drinking water and cool conditions for high temperatures, or provision of warm drinks and warm conditions for cold temperatures;
- Selection of appropriate clothing or other PPE for extreme temperature conditions;
- The use of engineering controls; and
- Undertake hot / cold tasks during a cooler / warmer time of the day.

Where thermal stress is assessed to be a risk, the operation must develop a suitable emergency response plan.

16.46 Fitness for Work

The contractor must develop and implement a programme to manage employee fitness for work. All employees working on site for whom the contractor is responsible (i.e. direct employees of the contractor as well as the employees of any appointed sub-contractors) must be subject to this programme.

All safety critical jobs (i.e. roles where fatigue or other causes of reduced fitness for work could lead to serious injury, illness or death to employees, significant equipment / plant damage, or significant environmental impact) must be identified and the risks associated with reduced fitness for work in these roles must be assessed.

A programme to manage these risks must be implemented, and it must include:

- Mechanisms for managing fatigue, stress and lack of fitness;
- An alcohol and other (including prescription, pharmaceutical or illicit) drugs policy that includes testing;
- An Employee Assistance Programme providing confidential access to resources and counsellors; and
- Training and awareness programmes.

Each employee has an obligation to present hhealth and safetyelf fit for work at the start of the day / shift, and to remain fit for work throughout the work period. Reporting for work under the influence of alcohol or any other intoxicating substance will not be tolerated. Any transgression concerning the alcohol and other drugs policy applicable to the project may result in the offending employee's access to the project premises being temporarily or permanently withdrawn.

Alcohol and drug testing on the project premises will be carried out randomly (as employees report for duty and during the course of the day / shift), following significant incidents (all persons involved), and whenever there is reasonable suspicion. Alcohol and drug testing may also be carried out as part of a Pre-Employment Medical Examination.

Sleep deprivation during shift work or from excessive working hours is a known cause of fatigue. Fatigued employees are at increased risk of accidents. Shift system design must consider:

- The effect on worker fatigue;
- The effects of activities carried out during scheduled and overtime hours;
- The impact on sleep cycles of activities such as commuting to and from site; and

- The monitoring and control of working hours.

The contractor is responsible for the administration of the working hours of his employees as well as the employees of any appointed sub-contractors. The maximum working hours per day and the minimum rest times between shifts must be specified in the contractor's Health and Safety Management Plan and must comply with all applicable legislation.

All employees engaged in safety critical jobs must undergo fitness assessments (medical examinations) which must be carried out prior to the commencement of employment on the project, prior to a change in role, periodically based on an employee's individual risk profile, and on termination of employment on the project:

- Pre-Employment Medical Examination – to assess the physical suitability of the person for the role and environment in which he will work (carried out prior to the commencement of employment on the project and prior to induction);
- Periodic (Surveillance) Medical Examination – to assess the ongoing physical condition of an employee to determine if his role is impacting on his health and whether the employee's fitness level is still adequate for the role he holds (these medical examinations are "risk driven" – the specific protocol followed and the frequency of the examinations will depend on the applicable legal requirements and the employee's individual risk profile as determined by his personal fitness, the nature of his role / duties, and the environment in which he works / occupational health hazards to which he is exposed). The periodic medical assessment programme must include:
  - The identification of modifiable risk factors that may impact fitness for work;
  - Education and support to maintain health or address identified risk factors; and
  - Education and support to help employees regain their fitness for work.
- Role Change Medical Examination – to assess an employee's physical suitability for a different role and work environment (carried out prior to a change in role / duties);
- Exit (Post-Employment) Medical Examination – to determine the total physical impact of the work the employee performed (carried out on termination of employment on the project if the employee worked on the project site for more than six months).

Note: The results of an Exit Medical Examination from previous employment will not be accepted as a Pre-Employment Medical Examination.

Note: The medical examinations described above may only be carried out by an occupational medical practitioner (i.e. a medical doctor who holds a qualification in occupational medicine).

A detailed job (role) description and an exposure profile (noise, dust, heat, fumes, vapours, etc.) must be provided for each employee or group of employees. The medical examinations that an employee undergoes must be based on (i.e. the employee's fitness must be assessed against) the information contained in these documents as well as the baseline risk assessment for the work. This information must be made available to the occupational medical practitioner performing the medical examination.

For each role, the medical criteria for fitness must be documented and these must be based on an evaluation of the physical and medical requirements for the role.

Depending on the circumstances, certain vaccinations may need to be provided to employees.
The medical examinations carried out for all drivers and operators must include testing / assessment for medical conditions that could affect the safe operation of vehicles or equipment.

Specific testing / questioning must be carried out to determine if an individual:

- Suffers from epilepsy or any other medical condition deemed to be a risk by the occupational medical practitioner;
- Makes use of chronic medication that could affect performance;
- Is colour-blind; or
- Has poor day or night vision.

The medical examinations carried out for employees that are required to work at height must include testing / questioning to determine if an individual suffers from epilepsy, hypertension (high blood pressure) or any other medical condition deemed to be a risk (with regard to working at height) by the occupational medical practitioner.
Electricians must be tested for colour-blindness.

With regard to the placement of new employees:

- Prospective employees must be referred to a suitable occupational medical practitioner (doctor) for a "Pre-Employment Medical Examination";
- If an individual is found to be medically "unfit for placement", the doctor will indicate which work activities cannot be performed by the person;
- The individual may still be employed on the project if his medical restrictions can be accommodated and provided that no legislation is transgressed.

A process must be established to manage medical restrictions that may be placed on an employee. For every employee with a medical restriction, regular follow up visits with the occupational medical practitioner must be arranged to ensure that each case is proactively managed.

An employee in a safety critical job must report (to his supervisor) any condition that might impair his ability to safely perform the duties associated with his role. A mechanism must be in place for such reports to be referred to an occupational medical practitioner to determine if the employee is fit to continue with his work.
Proof of all medical examinations (i.e. certificates of fitness signed by an occupational medical practitioner) must be kept on site and these records must be readily available for inspection by the nominated project management representative.

An employee's certificates of fitness must be included in his Personal Profile (dossier). If an Employee Personal Profile (dossier) hasn't already been compiled for a particular employee, then this must be done without delay following the employee's Pre-Employment Medical Examination.
No employee in a safety critical role may commence work on site without proof that he has undergone a Pre-Employment Medical Examination.

Occupational medical examinations and data interpretation may only be carried out by medical practitioners that are appropriately qualified and certified to do so.

Occupational medical data contained in reports to management must be grouped and summarised to ensure that the confidentiality rights of each individual employee are maintained.
All occupational medical data and records must be retained for at least 40 years.

16.47 Legionnaires Disease

All equipment with the potential for generating Legionella (such as cooling towers and associated equipment, air-handling systems, hot water services and showers) must be identified and the risks of contamination and aerosol generation assessed.

Where there is an assessed risk that Legionella could grow in the system and cause harm, a programme must be in place such that:

- All such equipment is identified on a register. The register must contain details of the regular maintenance, cleaning and checking programmes;
- Control measures are in place to minimise aerosol emissions;
- There must be a documented water treatment programme, including procedures for inspection, assessment and maintenance of the controls; and
- New or retrofitted equipment is designed and constructed to minimise the risk of Legionella growth.
-

Where available, the Legionella plate count test should be used if more effective methods are not available.

Good maintenance procedures must be followed to minimise the risk of significant contamination of equipment with other bacteria and microbial organisms.

Adequate procedures must be available for disinfecting systems if significant concentrations of Legionella bacteria are present. Once disinfected, systems must be retested to confirm effectiveness of treatment.

16.48 HIV / AIDS

The contractor must assess the risks posed by HIV. Appropriate mitigation strategies must be implemented as required.
Discrimination towards employees on the basis of actual or perceived HIV status is forbidden.
All information on the HIV status and condition of employees and community members, including that relating to counselling, care and treatment and receipt of benefits, must be maintained in medical confidence.

HIV / AIDS screening may not be a requirement for recruitment or a condition of employment.

17. Occupational Hygiene

These services are to be provided by TCP):

- Chemical agents =Gases, vapours, solids, fibres, liquids, dusts, mists, fumes, etc.
- Physical agents =Noise, Vibration, Heat, Cold, Electromagnetic fields, lighting etc.
- Biological agents =Bacteria, fungi, etc.
- Ergonomic factors =Lifting, stretching, and repetitive motion.
- Psychosocial factors =Stress, workload and work organisation

TCP Occupational health must provide the contractor with the health risk assessment in respect of existing Occupational Health Risk on Sites

Additionally an Occupational Health Program for monitoring the existing Occupational health Risk will be given to the Contractor

The contractor must conduct an Occupational Health Risk Assessment in respect of their trade.
The contractor must appoint an Approved Inspection Authority (AIA) for Occupational Hygiene to conduct the identified Occupational hygiene Surveys.

17.1 Lighting

- Should be measured once-off within 6 months of new installations prior to work commencing for the first time in any area
- The installations should be placed on a maintenance/ repair/ replacement schedule by management. Proof of this should be available
- Lighting and ventilation shall comply with the National Building Regulations (SANS 10400-O: Lighting and Ventilation) before occupancy is established
- Measurements do not need to be conducted by an Approved Inspection Authority for Occupational Hygiene

17.2 Particulate and Gas/ Vapour Exposures (page 127)

The concentration of an HCS in the air is, or maybe, such that the exposure of employees working in that workplace exceeds the recommended limit without the wearing of respiratory protective equipment, is zoned as a respirator zone

17.3 Thermal Stress

Hot areas or activities where employees have experienced or could experience excessive fatigue, muscle cramp, dehydration, dizziness and other symptoms of heat stress must be identified and described.
Where a risk of thermal stress is determined, a competent person must conduct monitoring surveys on site, in consultation with workers.
For defined extreme thermal conditions and job activities, medical examinations must include information about the operator's physiological and biomedical aspects, and an assessment of fitness for the working conditions.

Cold areas or activities where employees have experienced or could experience pain or loss of feeling in extremities, frostbite, severe shivering, excessive fatigue and other symptoms of cold stress must be identified and described.
Workplace thermal stress levels (temperature, air movement, humidity, etc.), activities (work level, etc.) and conditions (clothing, health, etc.) that have the potential to exacerbate thermal stress effects must be adequately characterised and described. Workplace exposure assessment must be repeated according to regulatory requirements or whenever there is a change in production, work organisation, process or equipment which may impact thermal stress levels.
Detailed heat stress assessment of identified tasks or jobs must be tiered to:
• Commence with the use of a simple heat stress index as a screening tool; then, if necessary;

• Use rational heat stress indices in an iterative manner to determine the 'best' control methods for alleviating potential heat stress; and

• Undertake physiological monitoring when exposure times are calculated to be less than 30
minutes, or where high level PPE that limits heat loss must be worn.

Detailed cold stress assessment of identified tasks or jobs must be conducted according to current appropriate guidelines that incorporate a cold stress index, to determine the 'best' control methods for alleviating potential cold stress.
When a risk of thermal stress is identified, the following exposure controls must be implemented:
• An acclimatisation period for new workers and those returning from extended leave or sickness;

• Training in the recognition of signs and symptoms of heat or cold stress, emergency procedures and preventative measures;

• Protective observation (buddy system or supervision); and

• A requirement for self-paced working.

The following exposure controls must be considered by a competent person:
• Work / rest regimes and job rotation based on measurements conducted;

• Suitable rest areas with a provision of cool drinking water and cool conditions for high temperatures, or provision of warm drinks and warm conditions for cold temperatures;

• Selection of appropriate clothing or other PPE for extreme temperature conditions;

• The use of engineering controls; and

• Undertake hot / cold tasks during a cooler / warmer time of the day.

Where thermal stress is assessed to be a risk, the operation must develop a suitable emergency response plan.

17.4 Measuring and Monitoring

The workplace exposure (or potential exposure) of persons to occupational health stressors must be measured and monitored to determine the effectiveness of control measures as well as compliance with legal and other requirements, particularly Occupational Exposure Limits.
All such measuring and monitoring must be carried out by an Approved Inspection Authority (i.e. a specialist service provider that is appropriately registered with a governing authority).
A plan for measuring and monitoring occupational exposure must be developed and it must include:
• Detail of what must be measured and monitored, based on a risk assessment and / or identified legal or other requirements;

• The frequency of measurement and monitoring;

• A description of the necessary equipment;

• Data quality requirements and controls (including details on the sample size for statistical validation and any rejection criteria);

• The sampling and analysis method(s) including any laboratory certification requirements; and

• The competency requirements for persons carrying out workplace monitoring.

Each instrument and item of equipment used for occupational exposure measurement and / or monitoring must be:

• Properly maintained to ensure compliance with legislative requirements;

• Controlled and safeguarded from unintentional adjustments;

• Suitably stored and protected from damage; and

• Calibrated or verified against a traceable standard at specific intervals (calibration records must be retained).

Each analytical laboratory service that is used must have implemented a credible quality assurance or quality control programme.
All monitoring results obtained must be analysed on a regular basis to:
• Identify trends and potential exceedances of legal or other requirements (such as Occupational Exposure Limits);

• Identify inconsistent or unusual results;

• Evaluate the effectiveness of existing control measures;

• Measure performance against stated objectives; and Identify continual improvement opportunities.

Each exceedance of a specified requirement or limit must be recorded, investigated and reported. Appropriate corrective actions must be identified and implemented.

18. Temporary works

A contractor must appoint a temporary works designer in writing to design, inspect and approve the erected temporary works on site before use.

A contractor must ensure that all temporary works operations are carried out under the supervision of a competent person who has been appointed in writing for that purpose.
A contractor must ensure that all temporary works structures are adequately erected, supported, braced; and
A contractor must ensure that, all temporary works structures are adequately erected, supported, braced and maintained by a competent person so that they are capable of supporting all anticipated vertical and lateral loads that may be applied to them, and that no loads are imposed onto the structure that the structure is not designed to withstand;

All temporary works structures are done with close reference to the structural design drawings, and where any uncertainty exists the structural designer should be consulted; detailed activity specific drawings pertaining to the design of temporary works structures are kept on the site and are available on request to an inspector, other contractors, the client, the client's agent or any employee;

All persons required to erect, move or dismantle temporary works structures are provided with adequate training and instruction to perform those operations safely;
all equipment used in temporary works structure are carefully examined and checked for suitability by a competent person, before being used;

All temporary works structures are inspected by a competent person
all temporary works structures are inspected by a competent person immediately before, during and after the placement of concrete, after inclement weather or any other imposed load and at least on a daily basis until the temporary works structure has been removed and the results have been recorded in a register and made available on site;

No person may cast concrete, until authorization in writing has been given by the competent person; if, after erection, any temporary works structure is found to be damaged or weakened to such a degree that its integrity is affected, it is safely removed or reinforced immediately;

- adequate precautionary measures are taken in order to—
- secure any deck panels against displacement; and
- prevent any person from slipping on temporary works due to the application of release agents;
- as far as is reasonably practicable, the health of any person is not affected through the use of solvents or oils or any other similar substances;
- upon casting concrete, the temporary works structure is left in place until the concrete has acquired sufficient strength to safely support its own weight and any imposed load, and is not removed until authorization in writing has been given by the competent person contemplated in paragraph (a);
- The foundation conditions are suitable to withstand the loads caused by the temporary works structure and any imposed load in accordance with the temporary works design.
- provision is made for safe access by means of secured ladders or staircases for
- a temporary works drawing or any other relevant document includes construction sequences and methods statements;
- the temporary works designer has been issued with the latest revision of any relevant structural design drawing;
- a temporary works design and drawing is used only for its intended purpose and for a specific portion of a construction site; and
- The temporary works drawings are approved by the temporary works designer before the erection of any temporary works.

No contractor may use a temporary works design and drawing for any work other than its intended purpose.

19. Structure

A contractor must ensure that,
all reasonably practicable steps are taken to prevent the uncontrolled collapse of any new or existing structure or any part thereof, which may become unstable or is in a temporary state of weakness or instability due to the carrying out of construction work;

No structure or part of a structure is loaded in a manner which would render it unsafe; and
all drawings pertaining to the design of the relevant structure are kept on site and are available on request to an inspector, other contractors, the client and the client's agent or employee.
An owner of a structure must ensure that;
Inspections of that structure are carried out periodically by competent persons in order to render the structure safe for continued use;
That the inspections contemplated in paragraph (a) are carried out at least once every six months for the first two years and thereafter yearly;
The structure is maintained in such a manner that it remains safe for continued use;
The records of inspections and maintenance are kept and made available on request to an inspector.

20. Emergency Preparedness and Response

The contractor must develop, implement, test and maintain an Emergency Response Plan (incorporating emergency evacuation procedures) that focuses specifically on the contractor's team and work activities. The plan must be risk-based and must detail the procedures that must be followed when responding to all potential emergency scenarios such as a medical emergency (including first aid response), a fire, an explosion, a hazardous substance spill, flooding, rescue from height, rescue from a confined space, etc.

The contractor's Emergency Response Plan must be aligned with the Emergency Response Plan developed for the project.
Potential off-site emergency scenarios must be included (e.g. emergency scenarios related to the transport of personnel, the transport of hazardous materials, and personnel performing work in remote locations).

Consideration must be given to neighbours, and to the availability and capability of local emergency services. Details of any arrangements with external emergency response service providers must be included.
The Emergency Response Plan must satisfy and comply with all applicable legal requirements.
The plan must be adequately resourced to ensure effective implementation. These resources must include appropriate personnel, external emergency response service providers, emergency response equipment, and warning devices. All equipment and warning devices must be identified, maintained and tested to ensure availability at all times.

Accountability for the Emergency Response Plan must be clearly defined. An Emergency Response Team (ERT) responsible for the implementation, management and execution of the Emergency Response Plan must be established. The roles and responsibilities of each team member must be clearly defined in the plan. Each team member must receive appropriate training to ensure that each role is performed competently.

The process for managing incident communication, notification, and reporting must be incorporated into the Emergency Response Plan. The responsible person(s) must be clearly identified, and the protocols for communicating with internal and external stakeholders must be defined.
Emergency evacuation procedures must be developed and included in the Emergency Response Plan.
A copy of the plan must be provided to the nominated project management representative for approval prior to site establishment.
The Emergency Response Plan must be formally reviewed (and amended if necessary) on at least an annual basis, and following any emergency situation, to ensure that it remains appropriate and effective.
At each project work site:

- A suitable evacuation alarm (siren) must be provided. If work is to be carried out in proximity to an existing operational plant, the alarm provided by the contractor must be distinctly different (in terms of the sound that it generates) to any alarm installed in the operational plant. All persons working in an area where an evacuation alarm is sounded must respond to it immediately.
- Suitable fire-fighting equipment must be provided and maintained, and personnel must be trained in fire-fighting procedures and the use of fire-fighting equipment.

- Suitable first aid equipment and supplies must be provided and maintained, and an adequate number of appropriately trained First Aiders must be in place (refer to Section 14.2).
- Emergency assembly points positioned in safe locations away from buildings, plant and equipment must be designated (and conspicuously signposted). In the event of an evacuation, all persons (i.e. personnel and visitors) must assemble and be accounted for at these emergency assembly points.
- All personnel must receive awareness training on the applicable emergency response procedures, and all visitors entering the site must be properly instructed in these procedures.
- The emergency response procedures must be displayed on each notice board.
- A diagram (site plan) indicating evacuation routes, emergency assembly point locations, and the positioning of emergency equipment (fire extinguishers, first aid boxes, etc.) must be prominently displayed in all buildings and plants, in all offices, on all notice boards, and in other locations on the site as may be required.
- An up-to-date list of emergency telephone numbers must be compiled and maintained. A copy of this list must be posted at each site entrance, in each office, near each telephone, and on every notice board.
- Emergency response drills must be conducted to test the effectiveness of the emergency procedures and equipment, as well as the knowledge and proficiency of the response personnel. Where appropriate, drills must include liaison with and the involvement of external emergency response service providers. A variety of emergency scenarios must be tested including, but not limited to, medical emergencies, fires, rescues, and hazardous substance spills. A drill must be carried out one month after site establishment and six-monthly thereafter.

Each drill must be monitored and the outcomes (highlights and shortcomings) must be documented. Corrective actions must be identified and implemented to address the shortcomings, and the Emergency Response Plan and associated procedures must be amended as required.

20.1 Fire Fighting

The contractor must ensure that Fire Fighting requirements are met

20.2 First Aid

The contractor must ensure that First Aiders are trained and appointed as described in (Section 9.5)

20.2.1 First Aid Kits

A suitable first aid kit (i.e. appropriate to the level of training) must be readily available to each First Aider. All kits must be provided and maintained by the contractor.

Taking into account the type of injuries that are likely to occur in the workplace, each first aid kit must contain suitable equipment and supplies. First aid equipment and supplies required by applicable legislation must be provided as a minimum.

The contents of each first aid kit must be kept clean and dry. Each kit must be contained in either a portable weatherproof case / bag or a steel box mounted to a fixed structure. Access to first aid equipment / supplies must be limited to train First Aiders only. Access to portable kit bags must be controlled and steel first aid boxes mounted in the workplace must be kept locked.

Approved signage must be in place to indicate the locations of the first aid boxes / bags.

A record of each treatment administered must be kept in a suitable register.

The first aid kits must, as a minimum, contain the following equipment and supplies:

Table 20.2.1-1 Minimum Requirements to be included when equipping first aid boxes

Item 1:	Wound cleaner/ antiseptic – 100ml;
Item 2:	Swabs for cleaning wounds;
Item 3:	Cotton wool for padding – 100g;
Item 4:	Sterile gauze – minimum quantity 10;
Item 5:	1 x Pair of forceps – for splinters;
Item 6:	1 x Pair of scissors – minimum size 100mm
Item 7:	1 x Set of safety pins;
Item 8:	4 x Triangular bandages;
Item 9:	4 x Roller bandages – 75mm x 5m;
Item 10:	4 x Roller bandages – 100mm x 5m;
Item 11:	1 x Roll of elastic adhesive – 25mm x 3m;
Item 12:	1 x Non-allergenic adhesive strip – 25mm x 3m;
Item 13:	1 x Packet of adhesive dressing strips – minimum quantity 10 assorted sizes;
Item 14:	4 x First aid dressings – 75mm x 100mm;
Item 15:	4 x First aid dressings – 150mm x 200mm;
Item 16:	2 x Straight splints;
Item 17:	2 x Pairs large and 2 x pairs medium disposable latex gloves;
Item 18:	2 x CPR mouth pieces or similar devices.

Additional items / supplies may need to be provided depending on the nature of the workplace (specific hazards) and the level of training of the first aider in position of the kit.

21. Management Review

A review of the contractor's Health and Safety Management System must be completed annually to ensure that the system continues to be effective in managing health and safety performance and meeting project requirements.

The review must evaluate if there is any need for change and must identify actions to improve the system.

The review must be led by senior management and the following must be considered:

- The suitability of the policy adopted for the project;
- The impact of changing legislation;
- The management of risk;
- Health and safety objectives and performance indicators;
- Changing expectations and requirements of relevant stakeholders;
- Changes to the contractor's scope, schedule, designs, etc.;

- Changes to the contractor's organisational structure;
- Communication and feedback (particularly from employees, Project representatives, and client representatives);
- The effectiveness of the management of change process;
- Workplace exposure monitoring and medical surveillance;
- The status of corrective actions;
- Performance statistics, including an annual summary of safety statistics, and occupational hygiene monitoring and medical surveillance results;
- Non-conformances (findings) from completed audits;
- Follow up on actions from previous management reviews; and
- Recommendations and opportunities for improving the effectiveness of the management system.

A record of each completed management review must be retained and it must include all decisions and identified actions concerning alterations, modifications or improvements to the management system that demonstrate a commitment to continual improvement.
For occupational hygiene: **Approved Inspection Authority (AIA) for Occupational Hygiene**

22. Management of Change

To ensure that proposed changes do not give rise to unacceptable health or safety risk, the contractor must develop and implement a process for identifying and managing change in the workplace (e.g. changes to scope, schedule, procedures, work methods, site conditions, designs, plans, plant and equipment, materials, processes, etc.) that may impact on health or safety performance.

The management of change process must take into consideration that changes may be planned or unplanned, sudden or gradual, temporary or permanent.

The process must aim to ensure that:

- Changes are identified and assessed before they are implemented;
- Careful consideration is given to managing the risks associated with any change;
- Due diligence can be shown to have taken place;
- The number of unsatisfactory or unnecessary changes is minimised;
- The right people are involved in the change process; and
- All statutory requirements are met.

All risks associated with a proposed change must be evaluated and ranked. The risks that are ranked as moderate or higher must be managed to prevent serious injury or illness.

It must not simply be assumed that a change will not result in significant risks. All proposed changes must be formally evaluated. The evaluation or review must include:

- An appropriate level of technical expertise;
- The involvement of the workforce potentially affected by the proposed change; and
- Approval of the change by a person with at least the same level of authority as those who control the existing process or item being changed.

23. Sub-contractor Alignment / Stakeholder management

Processes must be in place to ensure that the health and safety risks associated with the procurement of materials, equipment, services and labour are identified, evaluated and effectively managed.

A process for evaluating a sub-contractor's (or supplier's) ability to provide materials, equipment, services and labour that meet defined specifications must be in place. A prospective sub-contractor's health and safety management expertise, experience and capability (including previous health and safety performance) must be formally assessed prior to any contract or purchase order being awarded.

Each appointed sub-contractor must develop and implement a detailed Health and Safety Management Plan based on the requirements of the contractor's Health and Safety Management Plan and the Health and Safety Specification for the project. This plan must be reviewed and approved by the contractor prior to the commencement of any work.

The properties of all materials provided to the project must be adequately understood, documented and integrated into operating procedures where exposure to these materials presents a significant health or safety risk.

Procedures, commensurate with the evaluated risk, must be in place for the receiving, storing, dispatching and transporting of all equipment and materials.

Before work commences on any contract, all sub-contractor personnel must receive comprehensive orientation and induction training (refer to Section 11).
All work carried out by a sub-contractor must be managed (activity supervised) throughout the contract period and performance must be reviewed (audited) on a regular basis (refer to Section 21).

24. Measuring and Monitoring

The workplace exposure (or potential exposure) of persons to hazardous substances or agents must be measured and monitored to determine the effectiveness of control measures as well as compliance with legal and other requirements, particularly Occupational Exposure Limits.
All such measuring and monitoring must be carried out by an Approved Inspection Authority (i.e. a specialist service provider that is appropriately registered with a governing authority).

A plan for measuring and monitoring occupational exposure must be developed and it must include:

- Detail of what must be measured and monitored, based on a risk assessment and / or identified legal or other requirements;
- The frequency of measurement and monitoring;
- A description of the necessary equipment;
- Data quality requirements and controls (including details on the sample size for statistical validation and any rejection criteria);
- The sampling and analysis method(s) including any laboratory certification requirements; and
- The competency requirements for persons carrying out workplace monitoring.

Each instrument and item of equipment used for occupational exposure measurement and / or monitoring must be:

- Properly maintained to ensure compliance with legislative requirements;
- Controlled and safeguarded from unintentional adjustments;
- Suitably stored and protected from damage; and
- Calibrated or verified against a traceable standard at specific intervals (calibration records must be retained).

Each analytical laboratory service that is used must have implemented a credible quality assurance or quality control programme.

All monitoring results obtained must be analysed on a regular basis to:

- Identify trends and potential exceedances of legal or other requirements (such as Occupational Exposure Limits);
- Identify inconsistent or unusual results;
- Evaluate the effectiveness of existing control measures;
- Measure performance against stated objectives; and
- Identify continual improvement opportunities.

Each exceedance of a specified requirement or limit must be recorded, investigated and reported. Appropriate corrective actions must be identified and implemented.

25. Incident Reporting and Investigation

The contractor must establish a procedure for the management of all health and safety incidents. This procedure must define the responsibilities, methodologies and processes that must be followed for:

- Reporting an incident;
- Investigating an incident;
- Analysing an incident to determine the root cause;
- Identifying and implementing corrective actions to prevent a recurrence; and
- Communicating information concerning an incident to relevant persons and / or groups.

Please Note: Arrangements must be in place to ensure that proper medical care is provided to any contractor (or sub-contractor) employee that suffers an occupational injury or illness (refer to Section 15). These arrangements must be described in the contractor's Health and Safety Management Plan.

An incident may have multiple impacts. For each impact, the Actual Consequence and the Maximum Reasonable Outcome must be evaluated. Each impact must be evaluated independently, with the most significant classification forming the primary rating of the incident.

A Near Hit is an incident. All Near Hits must be reported.

The Maximum Reasonable Outcome (MRO) is based on a risk evaluation of the maximum reasonable consequence of an impact and the likelihood of the event occurring again given a reasonable failure of existing controls. Using the matrix referred to above, each impact must be evaluated and classified as:

- Low;
- Moderate;
- High; or
- Extreme.

An incident must be reported on the same work day or shift on which it occurs and preliminary details must be recorded

Depending on the Actual Consequence and Maximum Reasonable Potential Outcome of the impact(s), the relevant internal and external parties must be notified in accordance with specified protocols and timeframes, and legislative requirements.

In the event of a significant incident (i.e. an incident with an Actual Consequence of Moderate, Major or Catastrophic, or a Maximum Reasonable Potential Outcome of High or Extreme, work must cease and must only resume once the necessary actions (including the re-evaluation of any relevant risk assessments) have been taken to eliminate or reduce the risk of recurrence. Work must only be permitted to recommence once formal authorisation has been granted by the Project Construction Manager. In the case of incidents with an Actual Consequence of Major or Catastrophic, work must not be permitted to recommence until authorisation has been granted by the relevant government authorities (i.e. the South African Police, the Department of Labour or the Department of Mineral Resources).

The Contract Manager must ensure that an investigation is completed for each incident that occurs, and that appropriately senior personnel participate in, and authorise the outcomes of, each investigation. Incident investigations must be facilitated by competent and experienced persons who have been trained in the appropriate methodology.

All significant incidents (i.e. incidents with an Actual Consequence of Moderate, Major or Catastrophic, or a Maximum Reasonable Outcome of High or Extreme must be investigated using the approved Transnet investigation methodology. Such an investigation must be facilitated by a trained project representative within 7 calendar days.

For all other incidents (i.e. incidents with an Actual Consequence of Insignificant or Minor, or a Maximum Reasonable Outcome of Low or Moderate other methodologies approved by the Project Health and Safety Manager must be used.

Each incident (including Near Hits) must be investigated to a level of detail that is appropriate for the Maximum Reasonable Potential Outcome of the incident.

Each incident must be analysed to determine the root cause, and corrective actions must be identified and prioritised for implementation to eliminate or reduce the risk(s) in order to prevent recurrence of the incident.

For each corrective action, a responsible person must be designated and an appropriate timeframe (target date) for completion of the corrective action must be specified. Progress on implementing corrective actions (i.e. closing incidents) must be monitored and reported on. The implementation of corrective actions must be verified during monthly audits by the Project Health and Safety Advisors but also no later than 30 calendar days after the conclusion of the incident investigation.
The contractor must document the results of each investigation and a report must be submitted to the nominated project management representative within five working days of the incident occurring.

As a minimum, each incident report must include:

- The date, time and location of the incident;
- A detailed description of the incident, including photographs;
- The names of any injured persons;
- Injury details (if applicable);
- A summary of the first aid and / or medical treatment provided (if applicable);

- The current status of any injured persons;
- The root causes of the incident; and
- Detailed corrective actions, including responsible persons and target dates for implementation.

Each significant incident must be summarised for its lessons learnt following the investigation. This information must be reviewed by the contractor's Project Manager to assure completeness, accuracy and relevance before it is shared with (communicated to) all project personnel.

26. Non-conformance and Action Management

The contractor must establish a process for identifying and recording corrective actions arising from:

- Incident investigations;
- Hazard identification and risk assessment;
- Measurement and monitoring;
- Improvement plans and suggestions;
- Managing change;
- Audits and inspections; and
- Safety observations and coaching (safety interactions).

The contractor must establish a procedure for managing actions that addresses:

- Identification, categorisation and prioritisation of actions;
- Formal evaluation and approval of actions (management of change process);
- Assignment of responsibilities, resources and schedules for implementation;
- Implementation of actions;
- Tracking and reporting on implementation status; and
- Monitoring and verifying the effectiveness of the actions.

27. Performance Assessment and Auditing

The contractor must establish and maintain programmes for measuring and monitoring HEALTH AND SAFETY performance on a regular basis. Metrics must include leading and lagging indicators, and be based on qualitative and quantitative data.

27.1 Reporting on Performance

Reports summarising the contractor's health and safety performance on the project must be compiled on a weekly and a monthly basis.

The contractor must be prepared to discuss the content of these reports at scheduled health and safety meetings.

The reports must contain the following information:

- Number of contractor and sub-contractor employees on site;
- Total hours worked on site by contractor and sub-contractor employees (by company);
- Number of incidents by category (i.e. Near Hit, FAI, MTI and LTI);
- Lost Time Injury Frequency Rate (LTIFR) (project to date and 12-month rolling);
- Details of all new incidents for the reporting period and the corrective actions taken or to be taken;
- Feedback (progress updates) on all open incidents and outstanding corrective actions;
- Status and feedback on any employee that may have been injured and has not yet returned to work;

- Details of all health and safety training carried out during the reporting period;
- Number of SOC's (Safety Observations and Coaching) carried out during the reporting period;
- SOC trends identified and proposed action for the coming week or month to maintain positive trends and / or address negative trends;
- Details of all audits, inspections and site visits carried out during the reporting period, and the corrective actions taken (or to be taken) to address all non-conformances;
- Feedback (progress updates) on all open non-conformances and outstanding corrective actions;
- Number of Toolbox Talks conducted during the reporting period (monthly);
- Number of Planned Task Observations (PTO's) carried out during the reporting period (monthly);
- Details of all active risk assessments and Safe Work Procedures highlighting those that are due for review in the coming month (monthly);
- A look ahead (to the coming week, month or quarter) to ensure that appropriate health and safety planning and preparation is done for upcoming work;
- Challenges faced with regard to health and safety; and
- Any other health and safety related information specific to the project that may be required.

Leading indicators (e.g. audit findings, observations, etc.) must be analysed, and any negative trends identified with regard to unsafe behaviour or conditions must be appropriately addressed to prevent incidents.

Lagging indicators (e.g. injuries, illnesses, near hits, etc.) must be investigated in detail to determine the root causes. Corrective actions must be identified, implemented and integrated into Safe Work Procedures to prevent recurrences.

27.2 Audits and Inspections

On a monthly basis, the health and safety management system and workplace activities of the contractor will be audited by a Project Health and Safety Advisor to assess compliance with the project health and safety requirements. Any deviation from these requirements (i.e. non-conformance) that places the health or safety of any person in immediate danger will result in the specific activity being stopped until the non-conformance is corrected.

For each non-conformance determined during any audit, the contractor must identify and implement appropriate corrective actions.

For each corrective action, a responsible person must be designated and an appropriate timeframe (target date) for completion of the corrective action must be specified. Progress on implementing corrective actions (i.e. closing non-conformances) must be monitored and reported on. The implementation of corrective actions will be verified during the monthly audits.

Should it be determined that the contractor's level of compliance is unsatisfactory, all work being performed by the contractor on the project site may be stopped (at the contractor's expense) until an investigation into the reasons for the poor performance has been carried out, a corrective action plan has been developed, and corrective actions have been implemented.

In addition to the audit carried out by the Project Health and Safety Advisor, the contractor must carry out an internal audit on a monthly basis to assess compliance with the project health and safety requirements (including the requirements of this specification and the contractor's Health and Safety Management Plan). Furthermore, the contractor must ensure that each appointed sub-contractor is audited and measured to the same standard. Copies of these audit reports must be submitted to the Project Health and Safety Advisor on a monthly basis.

The contractor must carry out internal health and safety inspections as follows:

- General site health and safety inspections on a daily basis; and
- Inspections of plant, tools and equipment prior to establishment or use on site, and at least monthly thereafter.

All audits and inspections must be carried out by competent persons who have been appointed in writing.

A schedule of planned audits and inspections must be compiled and maintained ensuring that:

- All work areas and all activities are covered at regular intervals;
- All applicable legal requirements are complied with; and
- Areas or activities with significant associated hazards or risks receive greater attention.

ANNEXURE 4- TIMS Policy Commitment Statement.

TRANSNET

Transnet Integrated Management System (TIMS)
POLICY COMMITMENT STATEMENT

Transnet is a State-Owned Company that operates as an integrated freight transport company, formed around six core operating division namely Transnet Freight Rail (TFR), Transnet Engineering (TE), Transnet National Ports Authority (TNPA), Transnet Port Terminals (TPT) and Transnet Pipelines (TPL) and Transnet Property (TP) that complement each other.

Transnet has developed and implemented a TIMS that forms an integral part of the core business. We are committed to ***transporting freight, passengers, and provide excellent service*** to our customers along key transport corridors. This is done in order to ***competitively grow our business***, enhance efficiency of South Africa's logistics system and thereby contribute to economic vibrancy.

TIMS is established, implemented and maintained in accordance with recognised best practices that will enable us to:

- Incorporate and comply with applicable ***legislation, regulations, codes, standards, protocols, best practices and customer requirements*** to which we subscribe in order to achieve our business objectives;
- Set and achieve ***objectives and targets*** that address significant enterprise-wide ***strategic, tactical and operational risks, opportunities and mitigate the consequences*** thereof;
- Proactively implement ***waste and pollution prevention strategies*** to prevent ***environmental degradation;***
- Continually promote the prudent and ***sustainable*** use of ***energy and natural resources***;
- Provide ***quality products*** and ***services*** in order to meet our customers' requirements;
- Provide ***safe and secure environment*** for our employees and stakeholder;
- Carry out our business in a manner which ***protects our assets and information*** and ***prevents injuries and ill health*** to our employees and stakeholders;
- Promote ***safe operational principles*** during operations to minimize occurrences of safety incidents;
- Strategically ***source our contractors*** through fair, equitable and transparent processes;
- Provide ***soc-economic development*** as a good corporate citizen;
- Promote ***food safety practices*** in our food preparation and handling environments;
- Ensure ***proficiency and preparedness*** to deal with and ***effectively recover*** from any ***emergency situations***;
- ***Develop, train and manage our employees*** through inspirational leadership, provide the necessary ***organizational information, knowledge and resources*** to achieve the intention of this policy statement;
- ***Communicate***, ***engage*** and ***provide support*** and ***appropriate information*** to relevant stakeholders in order to build relationships based on care, openness, mutual trust and involvement as well as promote a TIMS risks awareness culture;
- Allocate ***responsibilities*** and ***accountabilities*** for meeting the requirements of the TIMS policy statement.
- Drive an ***integrated assurance management programme*** to ensure ***continual improvement*** of TIMS.

The TIMS Policy Commitment Statement shall be ***reviewed every three years*** or ***as circumstances dictate*** to ensure that it remains ***current and relevant***. Our progress on the achievement of the policy statement commitments shall be reported in the respective Governance Structures. Transnet recognises its accountability for TIMS; all employees including contractors have a role to play in delivering on the commitment set out in this policy statement.

Group Chief Executive

Date: 29/07/2020
Next Review Date: 29/06/2023

Copies of the approved TIMS Policy Commitment Statement can be made available to external Stakeholders on request.

ANNEXURE 5 -Contractor Questionnaire

CONTRACTOR QUESTIONNAIRE

1.	POLICY, ORGANISATION AND MANAGEMENT INVOLVEMENT	YES	NO	N/A
1.1	Does your company have a SHEQ Policy?			
1.2	Has a copy signed by the Chief Executive Officer / Managing Director been supplied?			
	Provide company organogram.			
1.3	Company Certified? i.e. ISO 14001, ISO 9001, OHSAS 18001 etc.			
	If yes, provide proof of periodical work area inspections and Regular Health and Safety meetings with personnel			
1.4	Does the company have OHSAct 16.2 Appointee?			
1.5	Is your company registered with the Compensation Commissioner (COID Act) or licenses compensation insurer? If so, please provide registration number.			
1.6	Do you have a copy of good standing certificate, confirming that your registration is paid up? If so, please provide copy thereof			
1.7	Does the company comply with the relevant legal appointees for this project i.e. Representatives, Environmental Control Officer, First Aiders, Risk Assessors, etc.?			
2.	**ACCREDITATION**	**YES**	**NO**	
2.1	Does the company have the auditable Management Systems in place?			
	If so, please provide proof of certificate issued by a credible external Assurance Auditor.			
3.	**TRAINING**	**YES**	**NO**	
3.1	Has the training based on risks/hazards that has been identified been done?			
3.2	Is training provided to employees at the following stages?			
	▪ When joining the company			
	▪ When changing jobs within the company			
	▪ When new plant or equipment needs to be operated			
	▪ As a result of experience of and feedback from an accident/incident reports			
3.3	Provide proof of specialist training provided such as training analysis, Certificates, Job Specific Training or Induction Training program?			
3.4	What legal or compliance training is provided specifically to			
	▪ First line supervisors?			
	▪ Middle and top management?			
3.5	Are all employees (including sub-contractors) instructed as to the application of rules and regulations within your organization?			
3.6	Does this training include the selection, use and care of personal protective equipment?			
3.7	What refresher training is provided and at what intervals?			
	Please list examples			
4.	**PURCHASE OF GOODS, MATERIALS AND SERVICES**	**YES**	**NO**	

Contractor Questionnaire

4.1	Do you have a system which ensures that all statutory inspections of plant and equipment are carried out?			
	Give examples of plant/equipment covered:			
4.2	Is there a record of inspections conducted above?			
4.3	Do you carry out plant and equipment inspections prior to work commencing to ensure the hazards are identified?			
	Please provide copies of these inspection reports.			
4.4	Do you evaluate the competence of all sub-contractors?			
	Please describe how this is achieved and how the results are monitored.			
5.	**INSPECTIONS**	**YES**	**NO**	
5.1	Are periodic work inspections carried out by first line supervisors?			
5.2	Are unsafe acts and conditions reported and remedial actions formally monitored?			
6.	**RULES AND REGULATIONS**	**YES**	**NO**	
6.1	Do organisational rules and regulations exist for personnel and subcontractors?			
	Do these cover			
	▪ General rules			
	▪ Project rules			
	▪ Specific task rules			
6.2	Do these rules include a permit to work system (as applicable)?			
6.3	Do you have experience of contractor execution plans?			
	Give examples of where these have been used			
6.4	Do you have a formal company guideline for holding pre-contract progress meetings with the client?			
7.	**RISK MANAGEMENT**	**YES**	**NO**	
7.1	Have you performed assessment of the risks involved in the execution of contract work?			
7.2	Do you have safe work procedure for all high risk/hazards identified?			
7.3	Are employees trained on Safe Work Procedures?			
7.4	Do you have a copy of the PPE needs analysis done and issue records kept?			
8.	**BUSINESS CONTINUITY AND EMERGENCY ARRANGEMENTS**	**YES**	**NO**	
8.1	Do you have an emergency plan AND business continuity plan in place?			
8.2	Are provision made for Trained First Aiders?			
8.3	Are employees trained on the emergency plan/procedure and business continuity plan?			
9.	**FALL PROTECTION**	**YES**	**NO**	
9.1	Are you able to demonstrate that work at heights undertaken under competent supervision, carried out by employees who are trained and medically fit?			
9.2	Does your fall protection plan include rescue plan, risk assessment, inspection, testing and maintenance of fall protection equipment?			
10.	**PROJECT SECURITY**	**YES**	**NO**	
10.1	Has the security assessment for the site been done?			
10.2	Are measures put in place to ensure security of the project personnel and equipment?			
11.	**RECRUITMENT OF PERSONNEL**	**YES**	**NO**	
11.2	Are medical examinations carried prior to employment, in all cases?			

Contractor Questionnaire

11.3	Are exit medicals conducted on staff once they have resigned? e.g. via trade testing, reference checks, etc.			
11.4	How do you assess the competence of staff before an appointment is made?			
11.5	Is the substance abuse policy and testing procedure in place?			
12.	**REPORTING AND INVESTIGATION OF ACCIDENTS, INCIDENTS AND DANGEROUS CONDITIONS**	**YES**	**NO**	
12.1	Do you have a procedure for reporting, investigating and recording accidents and incidents?			
	Supply copy of this procedure and incident register including first aid and medical cases.			
12.2	Is there a standard report/investigation form used? If yes, supply copy.			
12.3	Do you have a formal system for reporting situations/near misses etc.? If yes, provide copy.			

	YEAR-1	**YEAR-2**	**YEAR-3**	**YEAR-4**	**YEAR-5**	
Lost time accidents per 100 employees						
Major/Reportable injuries per 100 employees						
Number of dangerous occurrences						
Lost man days due to accidents						

13.	**COMMUNICATION AND CONSULTATION**	**YES**	**NO**	
13.1	Are progress and other legal meetings held?			
13.2	Are minutes of the meetings recorded and results of these meetings communicated to all employees? If yes, please describe method			
13.3	Are daily talks meetings conducted to discuss hazards on site, incident recall, performance?			
14.	**COSTS**	**YES**	**NO**	
14.1	Has the Contractor made provision for the cost for IMS requirements for the project? Refer to Pricing Schedule Requirements (Annexure 8.4, TRN-IMS-GRP-PROC-014-8.4)			

Name of Transnet Contract Manager/Designated Transnet Person:		
Signature of Transnet Contract Manager/Designated Transnet Person:		
Date of Receipt of Documentation:		
Comments:		
Date of Endorsement of Documentation:		

ANNEXURE 6 -Transnet Standard Operating Procedure (SOP) for Cleaning & Hygiene

Transnet SOC Ltd

Standard Operating Procedure (SOP) for Cleaning & Hygiene Services

Document number	TRN-IMS-GRP-SOP 009.001
Business Name	Transnet SOC Ltd
Activity Name	Cleaning of Transnet Office Buildings
Standard Operating Procedure Owner Name	Senior Manager FPMO: Muodzi M. Chipango
Standard Operating Procedure Owner Signature	Signed by:Muodzi-Misheck Chipango Signed at:2021-09-07 19:22:57 +02:00 Reason:I approve this document
Version Number	5.0
Classification	Unclassified
Effective Date	01 May 2020
Review Date	30 April 2023

Stakeholders

	Name	Designation	Approval Signature	Date	E-Mail	Contact Number
Compiled by	Aifheli Lambani	Acting Senior Engineer: FPMO		06/09/2021	Aifheli.Lambani@transnet.net	066 293 6874
Supported by	Richard Mdlalose	Occupational Hygiene Manager		06/09/2021	Richard.Mdlalose@transnet.net	081 032 1836
Supported by	Sipho Mlaudzi	COVID-19 Compliance Officer		06/09/2021	Sipho.Mlaudzi@transnet.net	0839542554
Supported by	Sipho Mlaudzi	General Manager (Acting): Group Occupational Health and Wellness		06/09/2021	Sipho.Mlaudzi@transnet.net	0839542554
Supported by	Muodzi M. Chipango	Senior Manager: FPMO	Signed by Muodzi Misheck Chipango Signed at: 2021-09-08 13:24:07 +02:00 Reason: I approve this document	07/09/2020	Misheck.Chipango@transnet.net	071 889 0721
Approved by	Kapei Phahlamohlaka	Chief Executive: Transnet Property	Signed by Kapei Phahlamohlaka Signed at: 2021-09-12 20:00:56 +02:00 Reason: I approve this document	12/09/21	Kapei.Phahlamohlaka@transnet.net	0113081034

Summary of Version Control

Version Number	Effective Date	Summary of Changes
1.0	15 Jul 2015	Initial document structure for standard.
		Comments from Regions.
2.0	20 April 2020	Including cleaning, decontamination, disinfection activities in response to COVID-19 pandemic.
3.0	11 June 2020	Revision on the methodology of disinfection (Misting/misting)
		Revision of evacuation requirements for positive COVID-19 incident(s)
4.0	10 July 2020	Included Ultraviolent Germicidal Irradiation (UVGI) as one the method for disinfection for COVID-19
5.0	02 September 2021	- Adoption of Cleaning and Disinfection in place of Decontamination, - Update on waiting period after disinfection of building(s) after a COVID-19 positive case report, - Adoption of Manual Cleaning as a recommended method, for COVID-19 disinfection,

Note: Only latest amendments and/or additions are reflected in italics in the body of the document

TRANSNET

TABLE OF CONTENTS

1. PURPOSE

1.1 The purpose of this Standard Operating Procedure (SOP) is to establish a cleaning guideline to enable service providers and Service Managers to ensure adequate cleaning services is provided within Transnet SOC Ltd buildings.

1.2 Provide guidelines for minimum requirements for cleaning and hygiene in Transnet work areas in order to, where reasonably practicable prevent or minimize the transmission of contagious diseases and the spread of bacteria and other hazardous biological agents including COVID-19.

2. DEFINITIONS

In this document covers the interpretation of definitions:

TERMS	DEFINITIONS
Building / centre manager	Means any person appointed by Transnet SOC Ltd from time to time as the person responsible for the management of the Site.
Cleaning	Means removal of gross contamination, organic material, and debris from the premises or respective structures, via mechanical means like sweeping (dry cleaning) and/or the use of water and soap or detergent (wet cleaning). The goal is to minimize organic material so disinfection can be effective.
Confirmed case	Means a person with laboratory confirmation of COVID-19 infection, irrespective of clinical signs and symptoms
Decontamination of building	(Sometimes abbreviated as decon, dcon, or decontam) or deep cleaning means the process of cleansing a building or part of a building to remove contaminants such as microorganisms or hazardous materials.
Disinfection	Means methods used on surfaces to destroy or eliminate a specific species of infectious microorganism

	through physical (e.g. heat) or chemical (e.g. disinfectant) means. A combination of methods may be required. The cleaning involves application of disinfectant to all touch points, working surfaces as well as walls and floors.
Existing equipment	Means all equipment supplied to or made available by Transnet SOC Ltd to the service provider within or on the Premises.
Furniture	Means all items such as chairs, tables, etc.
Litter	Means cans, bottles, paper, plastic, cardboard, cigarette stubs, leaves and all other rubbish left unattended.
Person	Includes, a natural person, a partnership, a business trust, a foundation, any company or close corporation incorporated or registered in terms of any law, and other body of persons corporate or unincorporated.
Premises	Means any site or place regardless of whether it is or forms part of a permanent or temporary structure or building which is the property of, or is occupied or used by, or is under the control and / or management of Transnet SOC Ltd.
Property	Means any movable, immovable or intellectual property or any right to such property.
Visitor	A person who visits a tenant, staff member on the premises or who attends a meeting on the Premises.
Routine cleaning	Is when offices and operational areas are cleaned continually and regularly with the sole purpose of keeping the area neat and clean from visible dirt, dust, spills, hazardous materials.
Personal Protective equipment	Protective equipment required, which the Service Provider is obliged to procure at his own cost and which he is required to utilise or deploy in performing, rendering or supplying the Service.

Service	Means the work, functions, tasks, services to be rendered, and / or goods to be supplied, including any subsequent variations or changes to such work, functions, tasks, services, or goods.
Service equipment	Means all tools, appliances, machinery and equipment which is required to be utilized or deployed in performing, rendering or supplying the Service.
Service manager	Means any person appointed by Transnet SOC Ltd from time to time as the person responsible for the management of the term service contract.
Site	Means any site or place regardless of whether it is or forms part of a permanent or temporary structure or building which is the property of, or is occupied or used by, or is under the control and / or management of Transnet SOC Ltd.
Transnet	Means Transnet State owned Cooperation Limited (Transnet SoC Ltd) which includes Transnet Freight Rail, Transnet Engineering, Transnet Port Terminals, Transnet National Ports Authority, Transnet Pipelines, Transnet Property and Transnet Foundation.
Specifications	Is the detailed description of method and standards, material, etc required in delivering goods and/or services.
Service provider	Means the successful tenderer that has been awarded the term service contract for the period stipulated.
Stakeholder	Means a person or group that can affect, be affected by, or perceive itself to be affected by Transnet decisions or activities (internal and external stakeholder).
Supervisor	Means any person appointed by Transnet or service provider to be on site and be responsible for the supervision of executed services on a frequent or daily basis.

Third party	Means any person other than the Service Provider or Transnet SOC Ltd
Tenant	Means any person with his staff, clients and service providers with whom Transnet SOC Ltd has entered into a lease agreement for the whole or a portion of the Premises
Transnet Property	is an Operating Division of Transnet SOC Ltd, a public company duly incorporated in accordance with the laws of South Africa with registration number 1990/000900/30
year	means 12 consecutive months

2.1 Clause headings are inserted for convenience and shall not be used in its interpretation;
2.2 Where figures are referred to in numerals and in words, if there is any conflict between the two, the words shall prevail;
2.3 Expressions defined in this maintenance standard shall bear the same meanings in the specifications, schedules or annexures to agreements which do not themselves contain definitions;

3. ABBREVIATIONS

ABBREVIATIONS	DEFINITIONS
AIA	Approved Inspection Authority
BCM	Business Continuity Measure
C&D	Cleaning and Disinfection (Cleaning & Hygiene)
COVID-19	Coronavirus Disease
CR	Compliance & Regulatory
DoH	National Department of Health
HC	Human Capital
R&HVAC	Refrigeration, Heating Ventilation & Air Conditioning
IMS	Integrated Management System
MSDS	Material Safety Data Sheet
NICD	National Institute for Communicable Diseases

OD	Operating Division
PPE	Personal Protective Equipment
PROC	Procedure
SHE	Safety, Health & Environment
SOP	Standard Operating Procedure
SU	Specialist Unit
TP	Transnet Property
TFR	Transnet Freight Rail
TE	Transnet Engineering
TPL	Transnet Pipelines
TNPA	Transnet National Port Authority
TPT	Transnet Port Terminal
UVGI	Ultraviolent Germicidal Irradiation
WHO	World Health Organization

4. ACCOUNTABILITY, RESPONSIBILITY AND AUTHORITY

Chief Executive: Transnet Property/Chief Executive of affected OD.	• Declaration of BCM/temporary shutting down of the building/precinct.
Compliance Officer	At Transnet Group Level: • Ensure that there is compliance with all the approved procedures by Transnet SOC Ltd to ensure safety and health of the employees and to prevent any outbreaks. • Ensure compliance to COVID-19 measures • Ensure adherence to COVID-19 hygiene and health protocols • Ensure compliance to COVID-19 workplace plan
Deputy Compliance Officer	At designated OD/Region: • Ensure that there is compliance with all the approved procedures by Transnet SOC Ltd to ensure safety and health of the employees and to prevent any outbreaks. • Ensure compliance to COVID-19 measures

	• Ensure adherence to COVID-19 hygiene and health protocols • Ensure compliance to COVID-19 workplace plan
Compliance Coordinator	At designated Workplaces in OD/Region: • Ensure that there is compliance with all the approved procedures by Transnet SOC Ltd to ensure safety and health of the employees and to prevent any outbreaks. • Ensure compliance to COVID-19 measures • Ensure adherence to COVID-19 hygiene and health protocols • Ensure compliance to COVID-19 workplace plan
Facilities Manager (Transnet representative responsible for C&D)	• Responsible for the delivery of all maintenance activities including cleaning, hygiene, services, etc. at the designated building or region. • Maintain communication between the Cleaning and Disinfection (C & D) contractor and the Transnet SOC Ltd (TP) or Center Management regarding operational activity, maintenance and C & D. • Manage the cleaning contractor, including adherence to performance agreement in line with contractual obligations. • Ensuring compliance with statutory requirements as per Occupational Health and Safety Act and other related regulations/standards. • Responsible for co-ordinating the risk assessment
Cleaning Company (Cleaning & Hygiene (C&D)), R&HVAC Contractors	• Ensure that a Site Manager/ Customer Services Manager and adequate supervisors are appointed to ensure effective management of the cleaning service. Required to adequately staff each Transnet SOC Ltd premise or building with personnel to carry out the cleaning activities. • Maintain the Health and Safety management file. • Provide a cleaning checklist to be used by cleaning personnel to ensure that work is carried out according to specified cleaning scheduled. • Provide Material Safety Data Sheets (MSDS) for cleaning chemicals and materials. • Ensure the induction and orientation of new cleaning personnel, and annual orientation of all cleaning personnel is carried out, by relevant OD.
R&HVAC Contractors	• Ensure availability of cleaning agents for filters and availability of spare filters when needed.

Supervisor for the Cleaning and R&HVAC Contractor	• Be on the premises daily to report and where possible remedy any faults or irregularities which may affect daily operation. • Draw-up daily work schedules for cleaners under their management. • Ensure relevant personnel are registered in the work schedules including areas to which they are assigned. • Ensure the monitoring schedule is displayed on rest room doors and be responsible for the management and sign-off of the schedule during hourly rounds. • Keep accurate records of attendance of personnel and work schedules. • Perform daily walk-about and evaluation of all cleaning operations for areas under their supervision. • Manage the routine and ad-hoc cleaning activities as well as the disinfecting process for Transnet premises.
Supervisor R&HVAC Contractor	• Ensure that filters are cleaned and changed as per OEM requirement in line with the maintenance schedule. • Routine maintenance schedule to be displayed and updated regularly
Cleaner(s)	• Responsible to carry out all cleaning activities in line with contractual requirements.
Employees	• Complying with all the requirements stipulated in this procedure. • Ensuring employees are trained and competent for the work they are required to do in line with any changes. • Take accountability for assigned activities; and • Report any deviations.

5. STANDARD OPERATING PROCEDURE

5.1 This SOP is applicable to all Transnet buildings (owner and tenant occupied) and all its employees (including temporary and contract employees) who are engaged in the establishment and management of cleaning and hygiene services.

5.2 ROUTINE CLEANING

5.2.1 This Service covers the cleaning of offices, auditorium, studio's, lecture / boardroom /s, foyers, lobbies, kitchens, shops, stores, storage areas, workshops, toilets, windows, passages, stairs, glass facades, basement, parking, parking garages, entrance, lifts, sidewalks, paved/tared areas together with all the areas mentioned/listed in the Frequency of Service and the complete hygiene service, **see Annexure 3**.

5.2.2 The cleaning of offices and operational areas continually and regularly with the sole purpose of keeping the area neat, clean and hygienic form - dirt, dust, spills and/or hazardous bodies, including but not limited to the following:

5.2.2.1 Cleaning textile and non-textile floors, e.g. vacuum cleaning, steam cleaning, sweeping, moist and wet wiping and removing - stains,
5.2.2.2 Dusting and wiping surfaces and fixtures,
5.2.2.3 Cleaning and sanitizing washrooms and toilets,
5.2.2.4 Cleaning and polishing furnishings.

5.3 Legislation, standards and regulations are applicable to these services include, but are not limited to:

5.3.1 Occupational Health and Safety Act (Act 85 of 1993).
5.3.2 The Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act (Act 36 of 1947) as amended.
5.3.3 The Hazardous substance Act (Act 15 of 1973).

5.3.4 The Environmental Conservation Act (Act 73 of 1989).

5.3.5 Any other applicable legislation, regulation and standard.

5.4 Transnet SOC Ltd appointed Service Manager shall ensure that:

5.5 The service provider shall only use consumables and or cleaning agents that are SANS approved.

5.6 The service provider shall only use consumables and or cleaning agents that are suitable for the furniture and or equipment installed in the premises.

5.7 The service provider shall be responsible for the provision of all consumables, cleaning agents that might be needed in order to render an efficient service, at his own cost. Transnet SOC Ltd reserves the right to approve or disapprove these consumables and or cleansing agents.

5.8 The service provider shall provide Transnet SOC Ltd with the specification and Material Safety Data sheets of all consumables and cleaning agents to be utilised on or in the premises.

5.9 The service provider shall be responsible but not limited to providing and replacing of the following consumables and cleaning agents:

5.9.1 Toilet-paper;

5.9.2 Paper-towels;

5.9.3 Dish washing soap;

5.9.4 Automatic Deodorisers /and the batteries where applicable;

5.9.5 Disinfectants/Detergents (active ingredient to include sodium hypochlorite);

5.9.6 Furniture/Floor Polish;

5.9.7 Lining bags for bins;

5.9.8 Plastic/Refuse bags;

5.9.9 Toilet Liquid soap;

5.9.10 Automatic Air-fresheners /and the batteries where applicable etc;

5.9.11 She bins / and disinfectants;

5.9.12 Toilet seat wipes.

5.9.13 Foam hand soap

5.9.14 Handsfree soap dispenser/ batteries were applicable

5.10 No scouring powder or rough detergent may be used on glazed or enamel surfaces.

5.11 The service provider shall not use or keep any poisonous or highly flammable materials on the premises without the approval of the service manager and Risk Manager for rendering of this service or for whatever purpose.

5.12 The service provider shall be responsible for the following:

5.13 Ensuring that all employees under his employment wear relevant PPE e.g. gloves, masks and safety shoes for all tasks in cleaning process, including handling trash.

5.13.1 Additional Personnel Protective Equipment (PPE) might be required based on the cleaning/disinfectant products used and whether there is a risk of splash and of the task being executed.

5.14 Ensuring that employees under his or her employment are trained adequately on correct use of the above-mentioned PPE and proof of this placed on safety file.

5.15 Should a toilet, urinal or washbasin get blocked, the service provider must attempt to unblock it by means of a rubber pump or any other domestic equipment.

5.15.1 If his attempts are unsuccessful the service provider's personnel will provide an "out of order" and immediately report this condition to Transnet SOC Ltd.'s Service Manager who will take responsibility for the removal of the obstruction.

5.16 Should water in a building leak due to rain or defective water pipes etc., the service provider must dry it. However, it shall not be expected of the service provider to send personnel to the premises outside normal working hours for such a task, but the personnel of the service provider who are on the premises at that stage, will dry up the water and clean the damage.

5.17 Where and when necessary, curtains or blinds that must be cleaned according to the discretion of the Service Manager.

5.17.1 These curtains or blinds must be removed by the service provider and given to an institution approved by Transnet SOC Ltd for cleaning at the cost of Transnet SOC Ltd.

5.17.2 As soon as the relevant curtains/blinds are returned, they must be hung again properly and in the same position as previously.

5.17.3 Should curtains (lace curtains and linings included) or blinds be damaged during the handling thereof as a result of negligence on the part of the service provider, they must be repaired or replaced (depending on the nature of the damage) at the cost of the Service Provider to the satisfaction of Transnet SOC Ltd.

6. ROUTINE CLEANING EQUIPMENT

6.1 The service provider shall procure, acquire, install and maintain in good and safe working order all service equipment entirely at its own cost and shall have no claim based on enrichment or for compensation, or reimbursement or of any other nature whatsoever, against Transnet SOC Ltd.

6.1.1 The installation of any service equipment in or on the premises shall comply with the relevant manufacturer's specifications and shall comply with all safety laws and regulations pertaining to such service equipment and such installation.

6.1.2 Drilling of any holes in the floors, walls / tiles by the service provider or his sub-service provider will not be done without the prior approval of Transnet SOC Ltd.

6.2 No equipment, tools or instruments that might cause damage to the building, appliances, persons or the contents thereof, may be used.

6.3 The service provider shall not use defective electrical equipment that may cause nuisance tripping of the electricity supply.

6.4 The equipment used by the service provider must, where applicable, in all respects conform to The Occupational Health and Safety Act, 85 of 1993.

7. HYGIENE EQUIPMENT

7.1 The following hygiene equipment amongst others shall be installed:

7.1.1 1 x hand dryer per every four hand basins (except for single toilets)

7.1.2 1 x liquid/foam soap dispenser per every four hand basins (except for single toilets)

7.1.3 1 x Air freshener dispenser per toilet

7.1.4 1 x Sanitiser dispenser at entrance

7.1.5 1 x Triple toilet roll holder per toilet cubicle

7.1.6 1 x She Bin per ladies' toilet cubicle

7.1.7 Toilet seat wipes

7.2 Hygiene equipment for COVID-19 and related pandemic:

7.2.1 Non-contact infrared Thermometer: for temperature screening at the main entrance,

7.2.2 Sanitisers with 70%-90% alcohol concentration at the main entrances, all common areas, kitchen, toilets, boardrooms, etc.

7.2.3 Face masks and hand gloves at every entrance,

7.2.4 Biohazard bags,

7.2.5 Collecting systems,

7.2.6 Dustpans,

7.2.7 Safety cabinets.

8. CLEANING

8.1 The frequency of cleaning for high touch surfaces shall be increased, see table below. High touch surfaces include tables, buttons, doorknobs, countertops, handles, desks, phones, shared keypads, toilets, faucets, sinks, etc. Increased cleaning to these areas will assist in removing bacteria and minimizing the spread of viruses including COVID-19.

8.2 All persons within the precinct shall practice good hand hygiene after cleaning by washing their hands often with soap and water for at least 20 seconds or provided hand sanitizers that contains 70%-90% alcohol concentration.

8.3 CLEANING OF SURFACES:

8.3.1 Surfaces and objects that are visibly dirty shall be cleaned first with soap and water or approved detergent before disinfecting.

8.3.2 Surfaces where there was a person presenting with respiratory symptoms, i.e. coughing, sneezing, etc. shall be disinfected as soon as possible.

8.3.3 Only approved (SANS or equivalent) disinfection agent shall be used against the COVID-19 virus.

8.3.4 A chemical disinfectant meeting the requirements below should be applied after cleaning to kill any remaining microorganisms (recommended requirements for disinfectant by WHO):

8.3.5 Sodium hypochlorite (bleach) should be used at a recommended concentration of 0.1% (1000 ppm).

8.3.6 Alternatively, alcohol with 70%-90% concentration should be used for surface disinfection.

8.3.7 National Regulator for Compulsory Specifications (NRCS) Check website approved list (South Africa) of disinfectants:

8.3.7.1 https://www.nrcs.org.za/siteimgs/CMM/LOA/Disinfectant/Registration%20Database%20Chemical%20Disinfectants%202009-2020.pdf

8.3.7.2 Follow the manufacturer's instruction for safe and effective use of all disinfection products, i.e. dilution concentration, application method and contact time, required ventilation and use of PPE.

8.4 Electronic Equipment:

8.5 Manufacturer's recommendations shall be followed for cleaning of electronics equipment such as keypads, laptops, phones, etc.

8.6 Whenever possible, wipeable covers shall be used for electronic equipment.

8.7 Alcohol based wipes or sprays containing 70%-90% alcohol concentration shall be sprayed on a soft cloth for electronic equipment.

8.8 The surfaces shall be dried thoroughly to avoid pooling of liquids.

8.9 **Non-porous/hard surfaces:**

8.10 For non-porous/hard surfaces, a 0.1% bleach solution or alcohol with 70%-90% concentration and/or an approved COVID-19 disinfectant shall be used.

8.11 Soft/porous surfaces:

8.12 Remove visible contamination and clean with appropriate cleaners indicated for use on such surfaces.

8.13 After cleaning, launder items in accordance with the manufacturer's instructions. Should laundering be impossible, an approved disinfectant for COVID-19 shall be used.

9. DISINFECTION

9.1 Disinfection of facilities for control of Hazardous Biological Agents, COVID-19 in particular; takes place through a recommended manual cleaning and disinfection methods, which entails the following:

9.2 Manual cleaning/disinfection:

9.2.1 A manual process where direct interface of humans is involved not characterised with intense involvement of automation. This may include mopping, sweeping, brushing and wiping.

9.2.2 **Applicable use**: Accessible hard and soft surfaces for direct manual intervention such as garden areas, entertainment areas, balconies and stoops, walls, windows and facades, fire equipment, fire equipment cages, aircons and louvres, reception areas, staircases and passageways, boardrooms, bulk storage areas, workshops, offices, store rooms, toilets & showers, walkways, kitchens.

Advantages	**Disadvantages**
Primary cleaning method and does not require any skills	Labour intensive

Most cleaning chemical are readily available and easy to use	PPE is required for disinfection
	Cannot complete covers all the surfaces of the room.

9.3 This method (manual cleaning and disinfecting) may be applied on a regular basis to keep the facilities free of COVID-19 where necessary and practicable. A risk assessment must precede any cleaning/disinfecting activity in order to determine the extent of cleaning and disinfecting required. The risk assessment session may comprise of Technical/Facilities representative, cleaning and hygiene contractor wellness/HR representative; Deputy Compliance Officer and Risk Manager (regional) must be conducted.

9.4 The risk assessment sessions must produce the following documents/outcomes:

9.4.1 Method statement, clearly showing how the works will be conducted

9.4.2 The safety control measures during cleaning and disinfecting.

NB: *Below (Risk Assessment Guidelines) is an indicative, not exhaustive risk assessment questionnaires. This is meant to guide; further consideration shall be undertaken where required.*

10. CLEANING AND DISINFECTION REGIME IN INSTANCES OF POSITIVE CASES IN TRANSNET OCCUPIED BUILDINGS

10.1.1 In such instances after BCM and wellness guidelines, the building (s) shall be evacuated and the following procedure for cleaning and disinfection will follow:

10.1.2 Several studies have been conducted to establish how long the virus survives on different surfaces, however it is not yet conclusive, literature available shows that the virus can survive between 2 to 3 days.

10.1.3 Transmission is minor after 3 days in an indoor space after a person that tested positive for COVID-19 occupied the indoor space. It is therefore recommended

that there is no need to clean and disinfect in areas that were unoccupied for more than 3 days.

10.1.4 Due to the nature of the virus and the way it spreads from one person to the next, the work area is therefore assumed contaminated.

10.1.5 Routine cleaning should always be done using water and soap/detergent to remove organic matter first, followed by disinfection.

10.1.6 In line with World Health Organization (WHO) preventing and mitigating Covid -19 at work issued in 19 May 2021, (link https://www.who.int/publications/i/item/WHO-2019-nCoV-workplace-actions-policy-brief-2021-1) the use of misting or fumigation or fogging is not recommended for COVID-19. Manual disinfection of a contaminated areas(s) with a 0.1% bleach solution or alcohol with 70%-90% concentration.

10.1.7 The application of disinfectants on Transnet work areas by spraying or fogging (also known as fumigation or misting) is prohibited

10.1.8 High traffic areas and high touch surfaces should be identified for cleaning and disinfection multiple times daily.

10.1.9 In areas where routine cleaning and disinfection is done on a regular basis, there is no additional requirement for disinfection when there is a confirmed positive case.

10.1.10 When there's a confirmed positive case in areas where routine cleaning and disinfection is not done on a regular basis, cleaning and disinfection using a recommended disinfectant shall be done. The cleaning and disinfection shall include touch points that the positive case was in contact with. The disinfection of the work areas will ensure that traces of the virus are eliminated

10.1.11 Once cleaning and disinfection has been completed, the windows and doors should be kept open to promote the ingress of air and drying up of disinfected areas.

10.1.12 Cleaning workers must be provided with regular training on safe chemical handling and appropriate personal protective equipment.

10.1.13 Before a work area is re-occupied, a risk assessment must be conducted by the risk assessment team to ensure that all requirements have been satisfied and all prerequisites are in place.

10.1.14 After the cleaning and disinfection, the building/work area must be allowed to aerate for an acceptable period as determined by the risk assessment which is envisaged not to exceed thirty (30) minutes.

10.1.15 Once the risk assessment team has confirmed the work area(s) to be safe, the work area(s) can be reoccupied, and employees can be requested to return to work area(s) in line with the return to work policy specific to COVID-19 or similar.

10.1.16 Since all information on COVID-19 is not currently known and new information is emerging regularly, new methods of cleaning and disinfection and new chemicals as recommended by the relevant organisations must immediately be implemented in the best interests of Transnet and its employees in consultation with the Transnet representatives. It is acknowledged that this may have cost implications.

Refer to the "Pre And Post Disinfection Process Flow" below.

10.2 RISK ASSESSMENT GUIDELINES

10.2.1.1 When a new covid-19 positive case is identified in any of the Transnet buildings, within the same shift a risk assessment and cleaning & disinfection must follow immediately. The following guidelines provide an indication of a risk assessment that must be conducted prior to cleaning and disinfection:

10.2.1.2 A team comprising of the technical/facilities representative, cleaning and hygiene contractor, wellness/hr representative, deputy compliance officer and risk manager (regional) must conduct the risk assessment based on the case(s) reported.

10.2.1.3 The risk assessment shall establish the following:

Activity	Objective
How many COVID-19 positive cases identified have been reported in the building for that instance? *(Not cumulative number)*	To establish the risk of further infection to other individuals accessing the building and the extent of contamination in the building.

Establish when last the COVID-19 positive individual(s) visited the building and possible areas within the building an individual may have accessed? *This is part of the contact tracing*	To establish the extent of the contamination in the building and the possible presence of the virus on the surfaces.
Establish when last the identified contacts visited the building? *This is part of the contact tracing*	To understand further contamination in the building due to movement of the individual(s) who may be infected as a result of the identified COVID-19 positive case.
Establish the area m^2 that requires disinfection. Also detail the surfaces type, condition etc.	Will manual or disinfection be effective and feasible?
Criticality of the operation carried out in the building.	What is the allowable period to bring the operations to the stand still while disinfecting the building?
Whether the entire work area or a section of the work area will be disinfected?	To determine the feasibility of manual disinfection in case of a section disinfection.
Duration of the evacuation period. This to be informed by method used, chemicals used, etc	

10.2.2 The above is only indicative, the respective building risk assessment team should be able to give an indication of which disinfection method mix must be applied and subsequently the method statement clearly showing how the works will be carried out.

10.2.3 For consideration in the risk assessment:

10.2.4 Recent studies have suggested that COVID-19 can survive on surfaces, such as worktops or door handles, for up to three days. The virus was detected on plastic and stainless steel for up to 72 hours after exposure and on cardboard for up to 24 hours.

10.3 Refer to the "009-TPL-SS-QUAL-4668: Pre and Post Disinfection Evaluation Checklist".

Method Description	Applicable areas to be cleaned	Material	Equipment	PPE	Quality Control
Manual cleaning A manual process where direct interface of humans is involved not characterised with intense involvement of automation. This may include Mopping, Sweeping, Brushing and Wiping.	Accessible hard and soft surfaces for direct manual intervention such as Garden Areas, Entertainment Areas, Balconies and Stoops, Walls, Windows and Facades, Fire Equipment, Fire Equipment Cages, Aircons and Louvres, Reception Areas, Staircases and Passageways, Boardrooms, Bulk Storage Areas, Workshops, Offices, Store Rooms, Toilets & showers, Walkways, Kitchens (List not necessarily exhaustive) (Including all touch points)	Cleaning detergents, with sodium hypochlorite solution. Or an Ethanol based scrub with 70% (min) alcohol content	Brooms, Vacuum Machines, Mops, Buckets, Scrubbers, Dusters, cloths (List is not exhaustive)	Rubber Gloves, Steel Toe Safety Boots/Shoes, Masks and Cotton Overalls	Visual Assessment, check sheet/monitoring schedule and Microbiological Testing

11.3. The cleaning and disinfection activity schedule is indicated at **Annexure 4**.

Cleaning Requirement	Description	Cleaning Materials	Frequency
High touched areas cleaning	Cleaning of such as doors door knobs and locks, door push bars, doors and door casings, window sills and window cranks, stair and ramp hand railings, cupboard handles and drawer pulls, appliance faces and handles, light switches, table and desktops, desk drawer handles, telephones, key boards and mice, monitor frame, elevator buttons, credit card keypads, vending machine buttons, equipment controls, remote controls, chair armrests, bedrails, toilets seats and flush handles, faucets, soap pumps paper dispensers and bathroom stall partitions.	Approved disinfection agent shall be used against the COVID-19 virus or related pandemics.	Daily
Cleaning of HVAC filters	Mechanical cleaning of filters in line with the Original Equipment Manufacturer specification	As per the Original Equipment Manufacture	Monthly or as per approved & updated PM Schedule
Inspection and Pathogenic surveys	Appointing a service provider AIA to carry out hygienic surveys that include pathogenic surveys	N/A	Prior to occupation and 24 months thereafter

Deep cleaning and sanitisation	High pressure vacuum cleaning of the carpeted floors, using low foam chemical. Sanitization of chairs, tables and all contact surfaces.	Sanitizing using SANS approved sanitizer, grouped as class 3 in terms if flammable content, with propanol at 70% alcohol content.	Monthly
Misting (for harmful micro-organisms control)	Dispensing of chemicals by means of a Misting machine over a large area in a short space of time.	All-purpose biocidal cleaner that is water based, non-flammable and safe for Misting appliances.	As required and determined by risk assessment

11. TRAINING AND INDUCTION – SERVICE PROVIDERS AND TRANSNET EMPLOYEES

11.1.1 COVID-19 related induction with critical focus on hygiene maintenance and cleaning must be conducted with all Transnet SOC Ltd/Facilities managers responsible and involved in cleaning and facilities management. This will help to develop and maintain a high level of consciousness and understanding of cleaning importance.

11.1.2 The cleaning service provider should ensure training and regular retraining of the cleaning personnel. This training should be planned and focused on the reasons for cleaning, cleaning methods, personal safety and cleaning chemicals.

11.1.3 Cleaning personnel need to be adequately trained so they understand and respect the procedures that will ensure the effectiveness of the cleaning and disinfecting agents, use the proper personal protective equipment, prevent contamination of other areas and minimize occupational health and safety risks to personnel.

11.2 Records of training should be maintained. Standards of cleaning conducted by staff should be supervised to identify any deviation from the standards early on.

12. RESUMPTION OF BUSINESS

Prior to the resumption of the business post COVID-19, the following minimum requirements shall be put in place or at least be operational:

Minimum Requirements	**Frequency**
Hand sanitisers with a 70%-90% concentration of alcohol at the main entrances, toiles, boardrooms, etc.	Daily
Disinfection of buildings	Prior to occupation and as and when required.
Review and update cleaning and hygiene schedules and implement.	Once-off
Security to screen employees and visitors before accessing the site.	Once-off
Develop a plan for phased return to work	Once-off
Conduct detailed testing of all employees as they return to work.	Once-off

Provision of masks, gloves, thermometers and sanitizers	Once-off
Provide handheld temperature testing equipment at all entrance. Provide thermometers for all employees to conduct regular self-tests.	Once-off
Display and maintain posters promoting hand and respiratory hygiene	Daily
Conduct training on the proper use of PPE and awareness sessions with employees and contractors on prevention & screening methods	As per induction programmes
Put in place rigorous travelling approval. Review agreements with service providers for adequacy on hygiene requirements versus COVID-19 requirements. Pool cars to have disinfecting schedules.	As and when required/As per incident
Ensure each OD and department has the BCM plan in place for possible area infections	As and when required/As per incident
Renegotiate service contracts with service providers to cater for hygiene requirements due to COVI-19	As and when required/As per incident
Optimise space planning in line with physical distance.	As and when required/As per incident
Ensure each HVAC systems are regularly inspected and cleaned	As per the equipment Planned Maintenance Schedule
Conduct mandatory OHS surveys on all buildings	Prior to occupation or Every 24 months or whichever comes first
Promote digital registration of visitors	Before business resumption
Install glass or plastic screens at entrance or reception areas, interview	Before business resumption

rooms	

13.RECORDS

13.1.1 Register of detergent on site

13.1.2 Specifications for packaging

13.1.3 MSDS for all detergents and cleaning chemicals

13.1.4 Record of quantity and location for detergents stored.

13.1.5 All applicable Written Safe Work Procedures

13.1.6 Organogram of the Cleaning Company

13.1.7 Emergency contacts

13.1.8 Medical certificates of staff

13.1.9 Licenses and Permits

13.1.10 Section 37.2 Agreement

13.1.11 Permit to work

13.1.12 Registers of staff on site

13.1.13 Cleaning registers and activity schedules

13.1.14 Safety file

13.1.15 Training records

13.1.16 Cleaning and disinfection specifications

14.REFERENCE DOCUMENTS

NAME	REFERENCE NUMBER	APPLICABLE SECTION
National Department of Health (DOH) directives, guidelines and standards		
National Institute for Communicable Diseases (NICD) directives, guidelines and standards		
World Health Organization (WHO) directives, guidelines and standards		
United States Department of Agriculture directives, guidelines and standards		
Transnet Management Task Teams, Command Centres and Leadership directives		
Contractor Management Procedure	TRN-IMS-GRP-PROC 014	
Operational Planning and Control Procedure	TRN-IMS-GRP-PROC-009	
Document, Data and Records Management Procedure	TRN-IMS-GRP-PROC 010	
Energy Management System	ISO 50001:2011	Clause 4.4.3, 4.4.4, 4.7.2,
Environmental Management System Requirements	ISO 14001: 2015	Clause: Clause A.1.
General Requirements Procedure	TRN-IMS-GRP-PROC 003	
Integrated Risk Management Policy	TG/GRC 1/1/1P	
Objectives, Targets & Programmes Procedure	TRN-IMS-GRP-PROC 006	
Occupational Health and Safety Act 85 of 1993	Act No. 85 of 1993	
Occupational Health and Safety Management Assessment System	ISO 45001:2018	
Occurrence and Non-Conformance Management Procedure	TRN-IMS-GRP-PROC 013	
Operational Risk Management Procedure	TRN-IMS-GRP-PROC-004	
Quality Management System Requirements	SANS 9001:2015	
Risk Management	ISO 31000:2009	
Railway Safety Regulator Determination of Safety	Determination	

NAME	REFERENCE NUMBER	APPLICABLE SECTION
Management System and Safety Management System Reports		
Stakeholder Engagement Management Procedure	TRN-IMS-GRP-PROC-007	
Transnet Information classification Policy 2012		
Transnet Records Management Policy 2013		

15.ANNEXURES

15.1.1 **Annexure 1:** Pre and Post Disinfection Process Flow

15.1.2 REFER ATTACHED DOCUMENT

15.1.3 Annexure 2: Pre and Post Disinfection Evaluation Checklist **(009-TPL-SS-QUAL-4668)**

Refer attached document

16. Annexure 3: Routine Cleaning Activity Schedule

NOTE: The frequency term:

"When Applicable / as necessary" – This work at no additional cost.

"As required / on request" – This work will be undertaken as and when instructed at no additional cost.

1. CLEANING EXTERIOR OF BUILDING:		**Frequency**
1.1 Roads and Sidewalks:		
1.1.1	Sweep **roads, parking area and sidewalks.**	Daily
1.1.2	Sweep **pavement outside boundary** fence, rubbish will not be swept onto the road but must be removed.	Daily
1.1.3	Pick up and remove all **litter** in above areas and store in approved area.	Daily
1.1.4	Scrub/pressure clean above **areas.**	Where Applicable
1.1.5	Damp wipe **building name, information, emergency and route signs.**	Weekly
1.1.6	Empty, damp wipe **refuse bins** and replace inner refuse bags.	Daily
1.1.7	Remove stains and disinfect **refuse bins**, replace inner refuse bags.	Weekly
1.1.8	Remove all **graffiti.**	Where applicable
1.1.9	Clean all **storm water drains** by removing all litter, sand etc.	Daily
1.1.10	Clean and damp wipe **ashtrays.**	2 x Daily
1.1.11	Damp wipe **motor vehicle access control equipment.**	Weekly
1.2	**Garden areas:**	
1.2.1	Sweep **footpaths.**	Daily
1.2.2	Pick up and remove all **litter.**	Daily
1.2.3	Empty, damp wipe **refuse bins** and replace inner refuse bags.	Daily
1.2.4	Remove stains and disinfect **refuse bins**, replace inner refuse bags.	Weekly
1.2.5	Clean all **storm water drains** by removing all litter, sand etc.	Daily
1.2.6	Damp wipe **building name, information, emergency and route signs.**	Monthly
1.2.7	Dust and or damp wipe **garden furniture.**	Daily
1.2.8	Treat **garden furniture.**	Monthly
1.2.9	Dust and or damp wipe **garden light fittings.**	Weekly

1.2.10 Clean and damp wipe **ashtrays.**	2 x Daily
1.2.11 Dust **window frames –sills** on ground and first floor level.	Monthly
1.2.12 Damp wipe **window frames and -sills** on ground level.	Quarterly
1.2.13 Dust **air-conditioning units** on ground and first floor level.	Monthly
1.2.14 Damp wipe **air-conditioning units** on ground level.	Quarterly
1.3 Entertainment areas:	
1.3.1 Dry **floor** after rain.	When applicable
1.3.2 Empty, damp wipe **refuse bins** and replace inner refuse bags.	Daily
1.3.3 Remove stains and disinfect **refuse bins**, replace inner refuse bags.	Weekly
1.3.4 Clean and damp wipe all **work surfaces.**	Daily
1.3.5 Dust and damp wipe all **fire equipment.**	Monthly
1.3.6 Remove and shake out **entrance carpets.**	Daily
1.3.7 Remove spots and stains from **entrance carpets.**	When applicable
1.3.8 Clean and damp wipe **ashtrays.**	2 x Daily
1.3.9 Dust **natural / unsealed wood furniture** (chairs, tables, shelves, etc.).	Daily
1.3.10 Polish **sealed wood, glass, Formica, chrome, steel and plastic furniture** (chairs, tables, shelves, etc.)	When applicable
1.3.11 Damp wipe **electrical switches, plug points and light fittings.**	Monthly
1.3.12 Damp wipe **door handle / push plates.**	Daily
1.3.13 Polish **door handle / push plates.**	Monthly
1.3.14 Dust or damp wipe **doors and doorframes.**	Daily
1.3.15 Spot clean spots on **doors and or frames.**	When Applicable
1.3.16 Damp wipe **building name, information, emergency and route signs.**	Weekly
1.3.17 Polish **building name, information, emergency and route signs.**	Quarterly
1.3.18 Empty, clean and or store **fireplace / braai** after used. This includes braai grid.	When applicable
1.3.19 Wet wipe and dry **sink / prebo bowl.**	Daily
1.3.20 Remove mineral deposits and or stains from **sink / prebo, pipes, taps, gullies, drains.**	Weekly
1.3.21 Polish **sink / prebo and taps.**	Quarterly

1.3.22	Spot clean spots and marks on **walls.**	Where applicable
1.3.23	Clean all rainwater **drains** by removing all litter, sand etc.	Daily
1.3.24	Dust **window frames and -sills** on ground and first floor level.	Monthly
1.3.25	Damp wipe **window frames and -sills** on ground floor level.	Quarterly
1.3.26	Dust and damp wipe **pot plant holders** and remove litter.	Weekly
1.3.27	Dust **air-conditioning units** on ground and first floor level.	Monthly
1.3.28	Remove all **crockery and cutlery** to be washed.	When Applicable
1.3.29	Washed dried and stored **crockery and cutlery.**	When Applicable
1.4	**Balconies and stoops:**	
1.4.1	Remove dust on **hard floors and or skirting** with suitable broom, mop- or disposable cloth sweeper in such a way that it does not raise dust by using the appropriate equipment.	Daily
1.4.2	Damp mop **hard floors and or skirting** to remove soilage.	Monthly
1.4.3	Spray, clean or burnish **hard floors and or skirting** using a mechanised system to remove accumulated soilage.	When Applicable
1.4.4	Treat **floor and surfaces.**	6=Monthly
1.4.5	Dry **floor** after rain.	When Applicable
1.4.6	Remove and shake out **entrance carpets.**	Daily
1.4.7	Remove spots and stains from **entrance carpets.**	When Applicable
1.4.8	Empty, damp wipe **refuse bins** and replace inner refuse bags.	Daily
1.4.9	Remove stains and disinfect **refuse bins**, replace inner refuse bags.	Weekly
1.4.10	Dust and or damp wipe all **fire equipment.**	Monthly
1.4.11	Clean and damp wipe **ashtrays.**	2 x Daily
1.4.12	Damp wipe **electrical switches, plug points and light fittings.**	Monthly
1.4.13	Damp wipe **door handle / push plates.**	Daily
1.4.14	Polish **door handle / push plates.**	Monthly
1.4.15	Dust and damp wipe **doors and doorframes.**	Daily
1.4.16	Spot clean spots on **doors and or frames.**	When Applicable
1.4.17	Spot clean spots and marks on **walls.**	When Applicable
1.4.18	Dust **window frames and -sills** on applicable floors.	Monthly
1.4.19	Damp wipe **window frames and -sills** on applicable floors.	Quarterly
1.4.20	Dust and damp wipe **pot plant holders.**	Monthly
1.4.21	remove litter from **pot plant holders**	Daily

1.4.22	Dust **air-conditioning units** on applicable floors.	Monthly
1.4.23	Damp wipe **air-conditioning units** on applicable floors.	Quarterly
1.4.24	Clean all rainwater **drains** by removing all litter.	Daily
1.5	**Courtyards:**	
1.5.1	Sweep **courtyard areas** loading areas, fire escapes, service passages and service corridors depending upon the finish, in such a way that it does not raise dust by using the appropriate equipment.	Daily
1.5.1	Scrub above **areas** to remove all stain (oil, fuel-, brake fluid-, and any other stains) and where needed reseal.	When Applicable
1.5.2	Dry **floor** after rain.	When Applicable
1.5.3	Empty, damp wipe **refuse bins** and replace inner refuse bags.	Daily
1.5.4	Remove stains and disinfect **refuse bins**, replace inner refuse bags.	Weekly
1.5.5	Empty, clean and disinfect **wet waste bins**.	Daily
1.5.6	Damp wipe **electrical switches, plug points and light fittings.**	Monthly
1.5.7	Damp wipe **door handle / push plates.**	Daily
1.5.8	Polish **door handle / push plates.**	Monthly
1.5.9	Dust and damp wipe **doors and doorframes.**	Monthly
1.5.10	Spot clean spots on **doors and or frames.**	When Applicable
1.5.11	Damp wipe **information, emergency and route signs.**	Monthly
1.5.12	Polish **information, emergency and route signs.**	Quarterly
1.5.13	Remove mineral deposits and or stain from **pipes, taps, gullies, drains.**	Quarterly
1.5.14	Spot clean spots and marks on **walls.**	When Applicable
1.5.15	Dust **window frames and -sills** on ground and first floor level.	Monthly
1.5.16	Damp wipe **window frames and -sills** on ground floor level.	Quarterly
1.5.17	Dust **air-conditioning units** on ground and first floor level.	Monthly
1.5.18	Damp wipe **air-conditioning units** on ground level.	Quarterly
1.5.19	Dust and damp wipe all **fire equipment.**	Monthly
1.5.21	Clean all rainwater **drains** by removing all litter	Daily
1.6	**Walls:**	
1.6.1	Spot clean spots and marks on **walls.**	When Applicable

1.6.2 Remove all **graffiti.**	When Applicable
1.6.3 Damp wipe **building name, emergency, information and route signs.**	Monthly
1.6.4 Polish **building name, emergency, information and route signs.**	Quarterly
1.6.5 Damp wipe electrical **switches, plug points and light fittings** within three meters from ground level.	Monthly
1.6.6 Dust **window frames and -sills** on ground and first floor level.	Monthly
1.6.7 Damp wipe **window frames and -sills** on ground floor level.	Quarterly
1.6.8 Dust **air-conditioning units** on ground and first floor level.	Monthly
1.6.9 Damp wipe **air-conditioning units** on ground level.	Quarterly
1.6.10 Dust and or damp wipe all **fire equipment.**	Monthly
1.7 Windows and Facades:	
1.7.1 Ground floor **windows and frames** (on the outside) must be cleaned.	Monthly
1.7.2 All other floors **windows and frames** (on the outside) that can open must be cleaned from the inside.	6=Monthly
1.7.3 **Windows and frames** (on the inside) must be cleaned.	6=Monthly
1.8 Fire equipment cage:	
1.8.1 Sweep **fire equipment cage** and damp wipe valves, gauges, pipe work and signs.	Monthly
1.10 Delivery area and ramps:	
1.10.1 Sweep **delivery area and ramps** depending upon the finish, in such a way that it does not raise dust by using the appropriate equipment.	Daily
1.10.2 Scrub above **areas** to remove all stain (oil, fuel-, brake fluid-, and any other stains) and where needed reseal.	When Applicable
1.10.3 Dry **floor** after rain.	When Applicable
1.10.4 Empty, damp wipe **refuse bins** and replace inner refuse bags.	Daily

1.10.5 Pick up and remove all **refuse**. No refuse will be store or gathered in this area.	Daily
1.10.6 Remove stains and disinfect **refuse bins**, replace inner refuse bags.	Weekly
1.10.7 Clean and damp wipe **ashtrays.**	2 x Daily
1.10.8 Damp wipe **electrical switches, plug points and light fittings** within three meters from ground floor level.	Monthly
1.10.9 **Entrance doors and frames** must be cleaned.	Daily
1.10.10 Dust **window frames and -sills** on ground floor level.	Monthly
1.10.11 Damp wipe **window frames and -sills** on ground floor level.	Quarterly
1.10.12 Spot clean spots and marks on **walls.**	When Applicable
1.10.13 Remove all **graffiti.**	When Applicable
1.10.14 Damp wipe **electrical light fittings.**	Yearly
1.10.15 Damp wipe **handrails and or banister.**	Daily
1.10.16 Polish **handrails and or banister**.	Quarterly
1.10.17 Polish **door handle / push plates.**	Monthly
1.10.18 Dust and damp wipe **doors and doorframes.**	Monthly
1.10.19 Spot clean spots on **doors and or frames.**	When Applicable
1.11 Air-con and other louvers:	
1.11.1 Dust **air-con and other louvers** from the inside via window openings.	
1.11.2 Damp wipe **air-con and other louvers** from the inside via window openings.	6=Monthly
1.11.3 Spray / wash down **air-con and other louvers** with clean water.	Yearly
2 CLEANING INTERIOR OF BUILDING:	
2.1 Reception areas:	
2.1.1 Remove dust on **resilient and or hard floors** with mop- or disposable cloth sweeper.	Daily
2.1.2 Damp mop **resilient and or hard floors** for soilage.	Daily
2.1.3 Spray, clean or burnish **resilient and or hard floors** using a mechanised system to remove accumulated soilage.	When Applicable

2.1.4 Vacuum clean **rugs / carpets and or carpet floors.**	Weekly
2.1.5 Remove spots and stains from **rugs / carpets and or carpet floors.**	When Applicable
2.1.6 Interim clean **rugs / carpets and or carpet floors.**	When Applicable
2.1.7 Restorative clean **rugs / carpets and or carpet floors.**	When Applicable
2.1.8 Spot clean spots and finger marks on **walls and or partitioning.**	When Applicable
2.1.9 Wet wipe washable surfaces **walls and or partitioning.**	When Applicable
2.1.10 Dust **wooden panels and or partitions.**	Daily
2.1.11 Polish **wooden panels and or partitions.**	6=Monthly
2.1.12 Damp wipe all **information and emergency signs.**	6=Monthly
2.1.13 Damp wipe all **mirrors.**	Weekly
2.1.14 **Entrance doors and frames** must be cleaned.	Daily
2.1.15 **Glass facades** and frames on ground floor level must be cleaned.	Daily
2.1.16 Damp wipe **telephones and fax machines.**	Daily
2.1.17 Dust **skirting and or power skirting.**	Daily
2.1.18 Damp wipe **skirting and or power skirting.**	Monthly
2.1.19 Damp wipe **door handle / push plates.**	Daily
2.1.20 Dust or damp wipe **doors and doorframes.**	Weekly
2.1.21 Spot clean spots on **doors and or frames.**	When Applicable
2.1.22 Dust and damp wipe sealed wood / glass / Formica **reception counters.**	Daily
2.1.23 Polish sealed wood / glass / Formica **reception counters.**	Quarterly
2.1.24 Damp wipe **electrical switches, plug points.**	Monthly
2.1.25 Damp wipe **ceiling mounted electrical light fittings.**	6=Monthly
2.1.26 Dust and damp wipe **ceiling mounted air- con. / vents.**	6=Monthly
2.1.27 Dust **picture frames.**	Weekly
2.1.28 Damp wipe **picture frames.**	Monthly
2.1.29 Clean **glass (pictures).**	Monthly
2.1.30 Dust **painting frames.**	Weekly
2.1.31 Dust **paintings** in appropriate method.	Weekly
2.1.32 Dust **notes boards.**	Weekly
2.1.33 Damp wipe **notes boards.**	Weekly
2.1.34 Dust **railings and or handrails.**	Daily
2.1.35 Damp wipe **railings and or handrails.**	Weekly
2.1.36 Dust **access control accessories and equipment.**	Daily
2.1.37 Damp wipe **access control accessories and equipment.**	Weekly

2.1.38	Empty and damp wipe **dustbins.**	2 x Daily
2.1.39	Remove stains and disinfect **dustbins.**	Weekly
2.1.40	Remove and shake out **entrance carpets.**	Daily
2.1.41	Remove spots and stains from **entrance carpets.**	When Applicable
2.1.42	Dust and damp wipe **sealed wood, glass, Formica, chrome, steel and plastic furniture** (chairs, desks, tables, bookcases, shelves, cupboards, etc.).	Weekly
2.1.43	Polish **sealed wood, glass, Formica, chrome, steel and plastic furniture** (chairs, desks, tables, bookcases, shelves, cupboards, etc.).	Quarterly
2.1.44	Vacuum **furniture covered with cloth** (chairs, etc.).	Weekly
2.1.45	Spot clean **furniture covered with cloth** (chairs, etc.).	When Applicable
2.1.46	Shampoo **furniture covered with cloth** (chairs, etc.).	Yearly
2.1.47	Dust **furniture covered with vinyl and or leather** (chairs, desks, tables, etc.).	Daily
2.1.48	Damp wipe **furniture covered with vinyl and or leather** (chairs, desks, tables, etc.).	Monthly
2.1.49	Dust **ornaments.**	2 x Monthly
2.1.50	Damp wipe **ornaments.**	Quarterly
2.1.51	Dust **lamps.**	Daily
2.1.52	Damp wipe **lamps.**	Monthly
2.2	**Passageways and staircases.**	
2.2.1	Remove dust on **resilient and or hard floors** with mop- or disposable cloth sweeper.	Daily
2.2.2	Damp mop **resilient and or hard floors** for soilage.	Daily
2.2.3	Spray, clean or burnish **resilient and or hard floors** using a mechanised system to remove accumulated soilage.	When Applicable
2.2.4	Strip clean and reseal **resilient floors.**	Yearly
2.2.5	Vacuum clean **rugs / carpets and or carpet floors** (high traffic areas).	Weekly
2.2.6	Remove spots and stains from **rugs / carpets and or carpet floors.**	When Applicable
2.2.7	Interim clean **rugs / carpets and or carpet floors.**	Monthly

2.2.8 Restorative clean **rugs / carpets and or carpet floors.**	Quarterly
2.2.9 Spot clean spots and finger marks on **walls and or partitioning.**	When Applicable
2.2.10 Damp wipe washable surfaces **walls and or partitioning.**	When Applicable
2.2.11 Dust **wooden panels and or partitions.**	Weekly
2.2.12 Polish **wooden panels and or partitions.**	Quarterly
2.2.13 Clean **glass partitioning.**	Daily
2.2.14 Damp wipe all **information and emergency signs.**	Monthly
2.2.15 Polish all **information and emergency signs**, if from metal.	Quarterly
2.2.16 **Entrance doors and frames** must be cleaned.	Daily
2.2.17 Clean **windows** on the inside.	Quarterly
2.2.18 Dust **window frames.**	Weekly
2.2.19 Damp wipe **window frames.**	Quarterly
2.2.20 Dust **windowsills.**	Weekly
2.2.21 Damp wipe and remove marks on **windowsills.**	Monthly
2.2.22 Dust **skirting and or power skirting.**	Daily
2.2.23 Damp wipe **skirting and or power skirting.**	Monthly
2.2.24 Damp wipe **door handle / push plates.**	Daily
2.2.25 Dust and damp wipe **doors and doorframes.**	Monthly
2.2.26 Spot clean spots on **doors and or frames.**	When Applicable
2.2.27 Clean **glass doors.**	Daily
2.2.28 Damp wipe **electrical switches, plug points and wall mounted electrical light fittings.**	Monthly
2.2.29 Damp wipe **ceiling mounted electrical light fittings.**	Yearly
2.2.30 Dust **wall and or door mounted air- con. / vents.**	Weekly
2.2.31 Damp wipe **wall and or door mounted air- con. / vents.**	Monthly
2.2.32 Dust and damp wipe **ceiling mounted air- con. / vents.**	Yearly
2.2.33 Dust **picture frames.**	Weekly
2.2.34 Damp wipe **picture frames.**	Monthly
2.2.35 Clean **glass (pictures).**	Monthly
2.2.36 Dust **painting frames.**	Weekly
2.2.37 Dust **paintings** in appropriate method.	Monthly
2.2.38 Dust **notes boards.**	Weekly
2.2.39 Damp wipe **notes boards.**	Monthly
2.2.40 Dust **railings and or handrails.**	Daily
2.2.41 Damp wipe **railings and or handrails.**	Weekly

2.2.42	Empty and damp wipe **rubbish bins.**	Daily
2.2.43	Remove stains and disinfect **rubbish bins.**	Weekly
2.2.44	Dust **natural / unsealed wood furniture** (chairs, tables, shelves etc.).	Daily
2.2.45	Polish **natural / unsealed wood furniture** (chairs, tables, shelves etc.).	Quarterly
2.2.46	Dust and damp wipe **sealed wood, glass, Formica, chrome, steel and plastic furniture** (chairs, tables, shelves etc.).	Weekly
2.2.47	Polish **sealed wood, glass, Formica, chrome, steel and plastic furniture** (chairs, tables, shelves etc.).	Quarterly
2.2.48	Vacuum **furniture covered with cloth** (chairs, etc.).	Monthly
2.2.49	Spot clean **furniture covered with cloth** (chairs, etc.).	When Applicable
2.2.50	Shampoo **furniture covered with cloth** (chairs, etc.).	Yearly
2.2.51	Dust **furniture covered with vinyl and or leather** (chairs, tables, etc.).	Daily
2.2.52	Damp wipe **furniture covered with vinyl and or leather** (chairs, tables, etc.).	Weekly
2.2.53	Dust **ornaments.**	Weekly
2.2.54	Damp wipe **ornaments.**	2 x Monthly
2.2.55	Dust **lamps.**	Weekly
2.2.56	Damp wipe **lamps.**	Monthly
2.2.67	Dust **Roller shutter doors.**	Daily
2.2.68	Damp wipe roller **shutter doors.**	Weekly
2.3	**Toilets and bathrooms:**	
2.3.1	Damp mop to remove all marks, mineral deposits and dirt and polish on **resilient and or hard floors.**	2 x Daily
2.3.2	Light scrub, dry and apply maintenance coat on **resilient and or hard floors** to remove accumulated soilage.	6=Monthly
2.3.3	Spot clean spots and finger marks on **walls.**	When Applicable
2.3.4	Wet wipe and dry washable surface **walls.**	When Applicable
2.3.5	Damp wipe **door handle / push plates.**	Daily
2.3.6	Dust and damp wipe **doors and doorframes.**	Monthly
2.3.7	Spot clean spots on **doors and or frames.**	When Applicable

2.3.8	Damp wipe **electrical switches, plug points and wall mounted electrical light fittings.**	Monthly
2.3.9	Damp wipe **ceiling mounted electrical light fittings.**	Yearly
2.3.10	Damp wipe **ceiling mounted air- con. / vents.**	6=Monthly
2.3.11	Damp wipe **wall and or door mounted air- con. / vents.**	Weekly
2.3.12	Dust and damp wipe **notes boards.**	Weekly
2.3.13	Clean **notes boards** glass doors.	Weekly
2.3.14	Damp wipe all **mirrors.**	Daily
2.3.15	Dust **mirror frames.**	Daily
2.3.16	Polish **mirror frames.**	Weekly
2.3.17	Dust and damp wipe **vanity slabs.**	2 x Daily
2.3.18	Clean **windows** on the inside.	Quarterly
2.3.19	Dust **window frames.**	Monthly
2.3.20	Damp wipe **window frames.**	Quarterly
2.3.21	Damp wipe and remove marks on **windowsills.**	Daily
2.3.22	Remove dust from **vertical blinds.**	Monthly
2.3.23	Damp wipe **horizontal blinds.**	Monthly
2.3.24	Dust and damp wipe all **electrical equipment** such as (hand-, hair-dryers, heaters etc)	Daily
2.3.25	Remove soilage from **toilet bowls, basins and urinals**, under flushing mechanism and or taps.	Daily
2.3.26	Remove litter from **urinals.**	Daily
2.3.27	Mop floor at **urinals.**	2 x Daily
2.3.28	Remove mineral deposits and or stain from **toilet, basins, urinal, gullies, drains,** flushing mechanism and or taps.	Monthly
2.3.29	Damp wipe **toilet** seat, lid, cistern, pipes, taps, flushing mechanism, etc.	2 x Daily
2.3.30	Dust and damp wipe all **other components / equipment** such as (bins, waste disposer, towel-, soap dispenser, toilet roll holder, aerosol air freshener etc.).	Daily
2.3.31	Ensure usability and **replenish consumables.**	2 x Daily
2.4	**Kitchens:**	

2.4.1	Damp mop to remove all marks, mineral deposits and dirt on **resilient and or hard floors.**	Daily
2.4.2	Light scrub, dry and apply maintenance coat on **resilient and or hard floors** to remove accumulated soilage.	6=Monthly
2.4.3	Spot clean spots and finger marks on **walls.**	When Applicable
2.4.4	Wet wipe and dry washable surface **walls.**	Weekly
2.4.5	Damp wipe **door handle / push plates.**	Daily
2.4.6	Dust and damp wipe **doors and doorframes.**	Daily
2.4.7	Spot clean spots on **doors and or frames.**	When Applicable
2.4.8	Damp wipe **electrical switches, plug points and wall mounted electrical light fittings.**	Weekly
2.4.9	Damp wipe **ceiling mounted electrical light fittings.**	Yearly
2.4.10	Damp wipe **ceiling mounted air- con. / vents.**	6=Monthly
2.4.11	Dust **wall and or door mounted air- con. / vents.**	Monthly
2.4.12	Damp wipe **wall and or door mounted air- con. / vents.**	Weekly
2.4.13	Dust and damp wipe **work tops.**	Daily
2.4.14	Clean **windows** on the inside.	Monthly
2.4.15	Dust **window frames.**	Weekly
2.4.16	Damp wipe **window frames.**	Monthly
2.4.17	Dust **windowsills.**	Weekly
2.4.18	Damp wipe and remove marks on **windowsills.**	Monthly
2.4.19	Dust and damp wipe **refrigerator and or fridge tops.**	Monthly
2.4.20	Damp wipe **refrigerator and or fridge.**	Daily
2.4.21	Remove contents from **refrigerator and or fridge** and damp wipe shelves.	Quarterly
2.4.22	Defrost **refrigerator and or fridge** remove contents and damp wipe shelves.	Quarterly
2.4.23	Dust and damp wipe **stove, oven and or microwave.**	Daily
2.4.24	Damp wipe and clean inside of **oven and or microwave.**	Daily
2.4.25	Dust and damp wipe **dish washer top.**	Monthly
2.4.26	Damp wipe **dish washer.**	Daily
2.4.27	Clean filter inside of **dish washer.**	Weekly
2.4.28	Wet wipe and dry **sink.**	Daily
2.4.29	Remove mineral deposits and or stain from **sink, pipes, taps, gullies, drains.**	Monthly

2.4.30 Empty **waste bins** and damp wipe.	Daily
2.4.31 Remove stains and disinfect **waste bins.**	Daily
2.4.32 Dust cupboards.	Daily
2.4.33 Damp wipe **cupboards.**	Weekly
2.4.34 Damp wipe and clean inside of **cupboards.**	Monthly
2.4.35 Polish outside of **cupboards.**	When Applicable
2.4.36 Wash, dry and store **crockery and cutlery.**	When Applicable
2.4.37 Ensure usability and **replenish consumables.**	2 x Daily
2.5 Broom rooms:	
2.5.1 Damp mop to remove all marks, mineral deposits and dirt and polish on **resilient and or hard floors.**	Daily
2.5.2 Light scrub, dry and apply maintenance coat on **resilient and or hard floors** to remove accumulated soilage.	Yearly
2.5.3 Spot clean spots and finger marks on **walls.**	When Applicable
2.5.4 Damp wipe washable surface **walls**	Quarterly
2.5.5 Damp wipe **door handle / push plates.**	Daily
2.5.6 Dust and damp wipe **doors and doorframes.**	Weekly
2.5.7 Spot clean spots on **doors and or frames.**	When Applicable
2.5.8 Damp wipe **electrical switches, plug points and wall mounted electrical light fittings.**	Monthly
2.5.9 Damp wipe **ceiling mounted electrical light fittings.**	Yearly
2.5.10 Damp wipe **ceiling mounted air- con. / vents.**	Yearly
2.5.11 Dust **wall and or door mounted air- con. / vents.**	Weekly
2.5.12 Damp wipe **wall and or door mounted air- con. / vents.**	Quarterly
2.5.13 Clean **windows** on the inside.	Monthly
2.5.14 Dust **window frames.**	Monthly
2.5.15 Damp wipe **window frames.**	Monthly
2.5.16 Dust **windowsills.**	Monthly
2.5.17 Damp wipe and remove marks on **windowsills.**	Monthly
2.5.18 Wet wipe and dry **washing trough.**	Daily
2.5.19 Remove mineral deposits and or stain from **washing trough, pipes, taps, gullies, drains.**	Monthly

2.6 Offices:	
2.6.1 Remove dust on **resilient and or hard floors** with mop- or disposable cloth sweeper.	Daily
2.6.2 Damp mop **resilient and or hard floors** for soilage.	Weekly
2.6.3 Spray, clean or burnish **resilient and or hard floors** using a mechanised system.	Monthly
2.6.4 Strip clean and reseal **resilient floors**.	Yearly
2.6.5 Vacuum clean **rugs / carpets**.	Weekly
2.6.6 Remove spots and stains from **rugs / carpets.**	When Applicable
2.6.7 Interim clean **rugs / carpets.**	Quarterly
2.6.8 Restorative clean **rugs / carpets.**	When Applicable
2.6.9 Spot clean spots and finger marks on **walls and or partitioning.**	When Applicable
2.6.10 Dust **wooden panels and or partitions**.	Weekly
2.6.11 Clean **glass partitioning.**	Weekly
2.6.12 Damp wipe all **information and emergency signs.**	Quarterly
2.6.13 Damp wipe all **mirrors.**	Weekly
2.6.14 Clean **windows** on the inside.	Quarterly
2.6.15 Dust **window frames**.	Monthly
2.6.16 Damp wipe **window frames.**	Quarterly
2.6.17 Dust **windowsills**.	Weekly
2.6.18 Damp wipe and remove marks on **windowsills.**	Monthly
2.6.19 Remove dust from **vertical blinds.**	Monthly
2.6.20 Dust and or Damp wipe **horizontal blinds.**	Monthly
2.6.21 Dust **skirting and or power skirting**.	Weekly
2.6.22 Damp wipe **skirting and or power skirting.**	Monthly
2.6.23 Damp wipe **electrical switches, plug points and wall mounted electrical light fittings.**	Monthly
2.6.24 Damp wipe **ceiling mounted electrical light fittings.**	Yearly
2.6.25 Dust **consol air-conditioning unit.**	Daily
2.6.26 Damp wipe **consol air-conditioning unit.**	Monthly
2.6.27 Dust and damp wipe **ceiling mounted air- con. / vents.**	6=Monthly
2.6.28 Dust **picture frames**.	Weekly
2.6.29 Damp wipe **picture frames**.	Monthly
2.6.30 Clean **glass (pictures frames).**	Monthly

2.6.31 Dust **painting frames.**	Weekly
2.6.32 Dust **paintings** in appropriate method.	Monthly
2.6.33 Dust **notes boards.**	Weekly
2.6.34 Damp wipe **notes boards.**	Monthly
2.6.35 Dust **natural / unsealed wood furniture** (chairs, tables etc.).	Daily
2.6.36 Polish **natural / unsealed wood furniture** (chairs, tables etc.).	Quarterly
2.6.37 Dust and damp wipe **sealed wood, glass, Formica, chrome, steel and plastic furniture** (chairs, tables etc.).	Daily
2.6.38 Polish **sealed wood, glass, Formica, chrome, steel and plastic furniture** (chairs, tables etc.).	Quarterly
2.6.39 Vacuum **furniture covered with cloth** (chairs, etc.).	Weekly
2.6.40 Spot clean **furniture covered with cloth** (chairs, etc.).	When Applicable
2.6.41 Shampoo **furniture covered with cloth** (chairs, etc.).	Yearly
2.6.42 Dust **furniture covered with vinyl and or leather** (chairs, tables, etc.).	Daily
2.6.43 Damp wipe **furniture covered with vinyl and or leather** (chairs, tables, etc.).	Weekly
2.6.44 Dust **ornaments.**	Weekly
2.6.45 Damp wipe **ornaments.**	2 x Monthly
2.6.46 Dust **lamps.**	Weekly
2.6.47 Damp wipe **lamps.**	Monthly
2.6.48 Dust and damp wipe **work tops.**	Daily
2.6.49 Dust and damp wipe **refrigerator tops.**	Daily
2.6.50 Damp wipe **refrigerator.**	Monthly
2.6.51 Remove contents from **refrigerator** and damp wipe shelves.	Quarterly
2.6.52 Defrost **refrigerator** remove contents and damp wipe shelves.	Quarterly
2.6.53 Empty **waste bins** and damp wipe.	Daily
2.6.54 Remove stains and disinfect **waste bins.**	Weekly
2.7 Bulk storage:	
2.7.1 Remove dust on **resilient and or hard floors** with mop- or disposable cloth sweeper.	Daily
2.7.2 Damp mop **resilient and or hard floors** for soilage.	Monthly

2.7.3	Spray, clean or burnish **resilient and or hard floors** using a mechanised system to remove accumulated soilage and apply maintenance coat.	Quarterly
2.7.4	Strip clean and reseal **resilient floors.**	Yearly
2.7.5	Vacuum clean **rugs / carpets.**	Weekly
2.7.6	Remove spots and stains from **rugs / carpets.**	When Applicable
2.7.7	Interim clean **rugs / carpets.**	Quarterly
2.7.8	Restorative clean **rugs / carpets.**	Yearly
2.7.9	Spot clean spots and finger marks on **walls and or partitioning.**	When Applicable
2.7.10	Damp wipe all **information and emergency signs.**	Quarterly
2.7.11	Clean **windows** on the inside.	Quarterly
2.7.12	Dust **window frames.**	Monthly
2.7.13	Damp wipe **window frames.**	Monthly
2.7.14	Dust **windowsills.**	Weekly
2.7.15	Damp wipe and remove marks on **windowsills.**	Monthly
2.7.16	Dust **skirting and or power skirting.**	Weekly
2.7.17	Damp wipe **skirting and or power skirting.**	Monthly
2.7.18	Damp wipe **electrical switches, plug points and wall mounted electrical light fittings.**	Monthly
2.7.19	Damp wipe **ceiling mounted electrical light fittings.**	Yearly
2.7.20	Dust and damp wipe **ceiling mounted air- con. / vents.**	6 Monthly
2.7.21	Dust **notes boards.**	Weekly
2.7.22	Damp wipe **notes boards.**	Monthly
2.7.23	Dust **natural / unsealed wood furniture** (chairs, tables etc.).	Daily
2.7.24	Polish **natural / unsealed wood furniture** (chairs, tables etc.).	Quarterly
2.7.25	Dust and damp wipe **sealed wood, glass, Formica, chrome, steel and plastic furniture** (chairs, tables etc.).	Monthly
2.7.26	Polish **sealed wood, glass, Formica, chrome, steel and plastic furniture** (chairs, tables etc.).	Quarterly
2.7.27	Vacuum **furniture covered with cloth** (chairs, etc.).	Weekly
2.7.28	Spot clean **furniture covered with cloth** (chairs, etc.).	When Applicable
2.7.29	Shampoo **furniture covered with cloth** (chairs, etc.).	Yearly
2.7.30	Dust or damp wipe **counters.**	Daily
2.7.31	Empty **waste bins** and damp wipe.	Daily
2.7.32	Remove stains and disinfect **waste bins.**	Weekly

2.8 Service ducts:	
2.8.1 Sweep **hard floors.**	Quarterly
2.8.2 Dust and damp wipe **pipes, ducting, fire equipment** etc.	6=Monthly
2.8.3 Spot clean spots and finger marks on **walls.**	When applicable
2.8.4 Damp wipe **electrical switches, plug points and light fittings.**	Quarterly
2.8.5 Damp wipe **door handle / push plates.**	Monthly
2.8.6 Dust and damp wipe **doors and doorframes.**	Monthly
2.8.7 Spot clean spots on **doors and or frames.**	When Applicable
2.9 Board Rooms:	
2.9.1 Vacuum clean **rugs / carpets.**	Daily
2.9.2 Remove spots and stains from **rugs / carpets.**	When applicable
2.9.3 Interim clean **rugs / carpets.**	Quarterly
2.9.4 Restorative clean **rugs / carpets.**	When Applicable
2.9.5 Spot clean spots and finger marks on **walls and or partitioning.**	When Applicable
2.9.6 Damp wipe washable surfaces **walls and or partitioning.**	Monthly
2.9.7 Dust **wooden panels and or partitions.**	Monthly
2.9.8 Polish **wooden panels and or partitions.**	Quarterly
2.9.9 Damp wipe all **information and emergency signs.**	Quarterly
2.9.10 Damp wipe all **mirrors.**	Daily
2.9.11 Clean **windows** on the inside.	Quarterly
2.9.12 Dust **window frames.**	Monthly
2.9.13 Damp wipe **window frames.**	Monthly
2.9.14 Dust **windowsills.**	Daily
2.9.15 Damp wipe and remove marks on **windowsills.**	Monthly
2.9.16 Remove dust from **vertical blinds.**	Monthly
2.9.17 Dust and or Damp wipe **horizontal blinds.**	Monthly
2.9.18 Dust **skirting and or power skirting.**	Weekly
2.9.19 Damp wipe **skirting and or power skirting.**	Monthly
2.9.20 Damp wipe **electrical switches, plug points and wall mounted electrical light fittings.**	Monthly
2.9.21 Damp wipe **ceiling mounted electrical light fittings.**	Yearly

2.9.22 Dust **picture frames.**	Weekly
2.9.23 Damp wipe **picture frames.**	Monthly
2.9.24 Clean **glass (pictures frames).**	Monthly
2.9.25 Dust **painting frames.**	Weekly
2.9.26 Dust **paintings** in appropriate method.	Monthly
2.9.27 Dust **natural / unsealed wood furniture** (chairs, beds, tables etc.).	Daily
2.9.28 Polish **natural / unsealed wood furniture** (chairs, beds, tables etc.).	Quarterly
2.9.29 Dust and or damp wipe **sealed wood, glass, Formica, chrome, steel and plastic furniture** (chairs, tables etc.).	Daily
2.9.30 Polish **sealed wood, glass, Formica, chrome, steel and plastic furniture** (chairs, tables etc.).	Quarterly
2.9.31 Vacuum **furniture covered with cloth** (chairs, etc.).	Weekly
2.9.32 Spot clean **furniture covered with cloth** (chairs, etc.).	When Applicable
2.9.33 Shampoo **furniture covered with cloth** (chairs, etc.).	Yearly
2.9.34 Dust **furniture covered with vinyl and or leather** (chairs, tables, etc.).	Daily
2.9.35 Damp wipe **furniture covered with vinyl and or leather** (chairs, tables, etc.).	Weekly
2.9.36 Dust **ornaments.**	Weekly
2.9.37 Damp wipe **ornaments.**	2 x Monthly
2.9.38 Dust **lamps.**	Daily
2.9.39 Damp wipe **lamps.**	Monthly
2.9.40 Empty **waste bins** and damp wipe.	Daily
2.9.41 Remove stains and disinfect **waste bins.**	Weekly
2.9.42 Remove **linen** to be washed and replace.	Weekly
2.9.43 Make **beds**	Daily
2.10 Moth balled areas:	
2.10.1 All **areas including rooms** to be cleaned and vacuumed	6=Monthly
2.10.2 Sweep Moth Balled Area	6=Monthly
2.10.3 Damp Wipe Moth Balled Area	6=Monthly

3.1	**Waste removal:**	
3.1.1	Without prejudice to the removed contents of wastebaskets and ashtrays, as well as office waste, must be removed tidily in bags, for example, and placed in all the garbage cans that have been made available for this purpose.	Daily
3.1.2	Sort wastepaper (split white paper, brown paper and card boxes), metal cans, plastic and glass in different containers that will be rendered to waste dealers in such a way as will be indicated to him.	Daily
3.1.3	Garbage must be stored temporarily in garbage cans in area supplied by the Transnet SOC Ltd in garbage bags supplied at a place on the relevant premises as indicated.	Daily
3.1.4	Remove refuse to the loading point as prescribed by the Local Council on days when the relevant Local Council removes refuse or where any other refuse collector as organised by Transnet SOC Ltd will collect refuse.	Weekly

17. ANNEXURE 4: COVID-19 AND RELATED PANDEMIC CLEANING AND DISINFECTION ACTIVITY SCHEDULES

Cleaning Requirement	Description	Cleaning Materials	Frequency
High touched areas cleaning	Cleaning of such as doors door knobs and locks, door push bars, doors and door casings, window sills and window cranks, stair and ramp hand railings, cupboard handles and drawer pulls, appliance faces and handles, light switches, table and desktops, desk drawer handles, telephones, key boards and mice, monitor frame, elevator buttons, credit card keypads, vending machine buttons, equipment controls, remote controls, chair armrests, bedrails, toilets seats and flush handles, faucets, soap pumps paper dispensers and bathroom stall partitions.	Approved disinfection agent shall be used against the COVID-19 virus or related pandemics.	Daily
Cleaning of HVAC filters	Mechanical and chemical cleaning of filters in line with the Original Equipment Manufacturer specification	As per the Original Equipment Manufacture	Monthly
Deep cleaning and sanitisation	High pressure vacuum cleaning of the carpeted floors, fabric, or similar surfaces using low foam chemicals. Sanitization of chairs, tables and all contact surfaces.	Sanitizing using SANS approved sanitizer, grouped as class 3 in terms if flammable content, with propanol at 70% alcohol content.	Monthly

Misting (for harmful micro-organisms control)	Dispensing of chemicals by means of a Misting machine over a large area in a short space of time.	All-purpose biocidal cleaner that is water based, non-flammable and safe for Misting appliances.	As determined by risk assessment
Mechanical Cleaning (High pressure and or high temperature > 80 Degrees Celcius)	High temperature and/or pressure cleaning lifts, stubborn dirt, grime, and enables follow up cleaning/wiping to effectively remove all dirt/contaminants. Must only be used as per specification applicable to surfaces concerned. Suitable for cleaning large surfaces that include HVAC equipment, walls, floors etc.	Sanitizing using SANS approved sanitizer, grouped as class 3 in terms if flammable content, with propanol at 70% alcohol content.	Monthly (as a separate intervention or in combination with above
COVID 19 Waste Removal	Gloves, masks and other waste generated in the building should be disposed of in the allocated biohazards bags located at all predetermined positions. All COVID-19 related waste must be separated at the point of generation. Employees must be trained, regularly reminded on the requirements to safely dispose discarded gloves, masks and other waste streams associated with COVID-19.	Biohazards bags	As per maintenance schedule

	Collection, transportation and disposal of waste must only be carried out by a licensed waste disposal company and records pertaining to the disposal thereof must be kept.		

ANNEXURE 7-Access & Egress control procedure TPL

TRANSNET

INTEGRATED MANAGEMENT SYSTEM

ACCESS AND EGRESS CONTROL PROCEDURE

Document number	01
Business Name	TPL Security
Version number	1.0
Process/ Activity Name	Security Access and Egress Control
Effective date	01 March 2021
Review date	01 February 2022

SUMMARY VERSION CONTROL

VERSION NO.	NATURE OF AMENDMENT	PAGE NO.	DATE REVISED
1.0	New Procedure		

Note: Only latest amendments and/or additions are reflected in italics in the body of the document.

DOCUMENTATION SIGN-OFF SHEET

I, the undersigned hereby approve this procedure.

ROLE	CAPACITY/ FUNCTION	SIGNATURE	DATE
Process Owner:	**National Security Manager: Transnet Pipelines**		24/2/2021
Accepts document for adequacy and practicability. Comments:			
Approval Committee:	**TPL Regulatory Forum**		26/03/21
Approves document for use. Comments:			

TRANSNET

TABLE OF CONTENTS

1. PURPOSE

The purpose of this procedure is to provide a basis for security personnel to operate within the access and egress control space across all Transnet Pipelines Critical Infrastructures Facilities, (Previous National Key Points) Hence, the users of this operating procedure need to be familiar with the contents of the document and in particular their individual roles and responsibilities. This will also ensure that they conduct themselves appropriately during security incidents, daily duties and emergencies and thereby contribute to:

- Protection of assets;
- Restoration of the facility to normal operating conditions as soon as possible after an incident;
- Safety of the public, employees and visitors, and
- Protection of the environment

2. APPLICABILITY

This procedure is applicable to all Protection Officers, whether contracted or permanent and Personnel that operate within Transnet Pipelines.

3. REFERENCE DOCUMENTS

NAME	REFERENCE NUMBER	APPLICABLE SECTIONS
Control of Access to Public Premises and Vehicles (As amended)	Act No. 53 of 1985	Section 2
Critical Infrastructure Control Act, 2019	Act No. 8 of 2019	The entire Act
Firearm Control Act 60 of 2000 (As amended) Transnet Firearm & Ammunition control Standard	60 of 2000 Ref 1, 2 May 2017	The Firearm Act The entire standard
Criminal Procedure Act	Act 1977 (As amended)	Section 20, 22, 23(1)(a);37(1)(a);40
Physical Security Industry Regulatory Authority "PSIRA" Act 56 of 2001	Chapter 4 Section 38	Code of conduct Offences and penalties
Transnet Security Policy Framework – 01 April 2019	TG/CMSG12/1/6P	Specific baseline requirement, policy statement

4. DEFINITIONS AD ABBREVIATIONS

Definitions

In this procedure, the following acronyms, words and/or expressions shall, unless otherwise stated or inconsistent with the context in which they appear, bear the same meanings:

- **Authentic Records,** means records that can be proven to be what they purport to be, also considered official records by their creators.
- **Asset,** means any tangible or intangible object/resource/information that has value and owned by a business or an economic entity. It is anything (tangible or intangible) that can be owned or controlled to produce value and that is held by an economic entity and that could produce positive economic value. Assets are made available to authorized entities only.
- **Confidentiality,** means characteristics that apply to information. To protect and to preserve the confidentiality of information is to not be made available or disclosed to unauthorized entities.
- **Conflict of Interest,** a situation in which a person is in a position to derive personal benefit from influence, intellectual property, actions or decisions made in their official capacity. When a person's or entity's vested interests raise a question of whether their actions, judgment, and/or decision-making can be unbiased due to some form of relations.
- **Classified Information**, means sensitive information in any form, in the national interest, is held by, produced or is under the control of the state, or which concerns the state and which must by reasons of its sensitive nature be exempt from disclosure and must enjoy protection against compromise.
- **Critical Infrastructure Protection Act 2019,** means the new Act that replaces the National Key Point Act.
- **CSO**, means Chief Security Officer.
- **Employees,** means an employee of Transnet whether employed on a fixed or indefinite term contract.
- **Facility** means a permanent, semi-permanent, or temporary commercial or industrial property such as a building, plant, or structure, built, established, or installed for the performance of one or more specific activities or functions.

Abbreviations

- **GCSO,** means Group Chief Security Officer.
- **NSM,** means National Security Manager.
- **NOC,** means TPL's National Operations Centre located in Pinetown.
- **NC,** means TPL's Nerve Centre located within NOC.
- **SNC Operator** means security personnel employed within TPL's Nerve Centre.
- **NC Security Supervisor**, means Nerve Centre Security Supervisor that supervises the Nerve Centre Security Operators within the Nerve Centre.
- **NC Manager,** means Nerve Centre Manager that manages the Nerve Centre and team.
- **OB,** means either electronic or manual occurrence book.
- **PO,** means Protection Officer. (Contracted or Transnet Employees)
- **RSS,** means Regional Security Supervisor.
- **Record Keeping,** means making and maintaining complete, accurate and reliable evidence of official business in the form of recorded information.
- **SPO,** means Senior Protection Officer.
- **SP**, means Security Practitioners.
- **Threat,** means a potential unwanted event. When a threat turns into an actual occurrence, it may cause an unwanted occurrence. It is unwanted because the occurrence may harm an organization, system and or process.
- **TRA,** means Threat Risk Assessment.
- **Transnet,** means Transnet SOC Ltd and includes its Operating Divisions and Specialist Units.

5. ACCOUNTABILITY, RESPONSIBILITY AND AUTHORITY

5.1 Chief Executive: Ultimately accountable for the Security of Transnet Pipelines.

5.2 National Security Manager/Chief Security Officer: Accountable for security at TPL. To lead, direct and coordinate security activities within TPL and to use all resources optimally to achieve TPL's security mandate. Shall enforce this standard operating procedures and policies listed in this SOP.

5.3 TPL Regional Security Supervisor: is responsible for daily supervision of Senior Protection Officers (SPO's) and Protection Officers (PO's) and security operations under his Region and jurisdiction. Interphases with Contracted Security Providers and reports directly to the NSM.

5.4 Senior Protection Officers: are responsible for security under their allocated facilities and NKP Clusters. Interphases with the RSS and the Security Provider at his/her level.

5.5 Protection Officers: are responsible for the Access & Egress Control, patrolling and reporting within the area allocated to on TPL Sites and NKP's. Interphases with the SPO, RSS and his contracted reporting structures.

6. PROCEDURE

Conditions of entry at all TPL premises

All persons entering TPL premises shall:

- Be in possession of a valid Transnet Pipelines access card or visitor's card.
- Report to the Security checkpoint upon entry. The Protection Officer will ensure that the entry is recorded and a visitor's access card is issued. (Annexure B – Access Control Register)
- The visitors access card must be displayed in a clearly visible manner at all times when on a Transnet Pipelines site/depots.
- Ensure their visitor access card returned to the guard on duty before leaving TPL site/depot. This may not pass the main gate for any reason whatsoever.
- No firearms are allowed on Transnet Pipelines premises as per Transnet Firearms and Ammunition Control Policy and TPL Instructions. Non declaration

of firearms is viewed as a serious non-compliance and consequent management in terms of relevant policies.

- No employee, visitor or contractor is permitted to take any photographs at any time without written approval from the TPL National Security Manager.
- All Cell phones are to be turned off when entering restricted areas. These restricted areas are clearly marked at all TPL sites.
- Vehicles and persons entering the site/depots are subject to a search.
- All persons entering TPL sites are subject to a Breathalyzer testing, searching, COVID-19 scanning and adhering to all COVID-19 protocols. Refusal will result in access being denied.
- All laptops serial numbers to be recorded in the register provided.
- It shall be the responsibility of the TPL employee requesting access, for visitor to NKP premises to ensure that security clearance obtained, prior to entry.
- The TPL employees requesting access to NKP premises for visitors shall as far as possible notify and/or submit the prescribed application form accompanied by positive identification of the persons to the National Security/Facility Manager or their Representatives at least 24 hours prior to their visit.
- The TPL employee requesting access to NKP premises for non-TPL staff shall inform such visitors of the security & safety requirements and procedures that they must adhere to upon entry.
- All Transnet/TPL Employees must insert the correct/actual time of arrival and departure in the Gate Registers and Protection Officers must monitors this activity closely for non-conformances.

Identification – Access Card

Protection Officers are authorized to request and see the identification of any person on TPL premises, whether that person is an employee or non-employee. Any TPL employee or TPL student who refuses to comply with a Protection Officer's request for identification is subject to disciplinary action by TPL.

The following procedure/process shall apply:

- All access into Transnet Pipelines' facilities is managed using access cards.
- All persons issued with an access card shall ensure that the access card is always displayed in a visible manner on their person and is under their control and safeguarded when not in use.
- In the case of damage of an access card, the concerned person shall produce the damaged access card to the TPL National Security Manager.
- In the case of loss or theft of the access card, the concerned person shall, without delay, report such loss to the TPL National Security Manager and submit a detailed signed report supported by the relevant line manager outlining the circumstances resulting in the loss or theft of the card. In the case of theft a South African Police (SAP) case number must be submitted and included in the report.
- If negligence is found as the root cause for the loss / theft of the access card then the replacement cost of a new card will be for the account of the person in whose custody the card was.

Firearm and related incidents

All care must be taken when handling firearms on TPL Sites. This includes that the firearm in any TPL Site remains **unloaded** at all times until instructions received from TPL NSM or CE. Extreme safety precautions are to be carried out when accepting or handing over firearms. Should a firearm incident occur, the incident must be immediately reported to the Nerve Centre, closest SAPS & Provider Control Room and the following information must be provided:

- Who is reporting the incident? Name & Surname, title, contact numbers (landline telephone / Cell phone, company name, department name, employee / SAP number.
- Who is involved, full details, Name & Surname, title, contact numbers (landline telephone / cell phone, company name, department name, employee / SAP number.
- What exactly transpired, the time of the incident, location and who else was involved?
- If there are victims / injured person should be noted and their extent of injuries.

- Render first aid if necessary.
- Do not contaminate area or touch any evidence relevant to the firearm incident until SAPS/Investigator arrives.
- Update OB and complete and submit relevant report/statement.
- Keep the Nerve Centre constantly updated.

Foot Patrols and general duties at access points

Consistent foot patrols and general duties must be executed at access points of the facility. To ensure compliance the following procedure must be followed:

- Hourly foot patrols and inspections must be conducted to ensure that the facility is secured and free from vandalism and theft. On completion of all physical checks/patrols, the guard monitoring system (GMS) must be activated and occurrence book (OB) updated as evidence.
- Protection Officers must remain vigilant and alert at all times and report all incidents and activities to the Nerve Centre and Provider Control Room timeously.
- Protection Officers must familiarise themselves will all Site Notices and regulations, Safety procedures and Planned Job Observations Checklists in order to be compliant at all times.
- Safeguard completed Registers & Occurrence Books and provide to RSS/SPO.
- Follow Annexure B: Planned Job Observation Checklist that consist of Breathalyser testing, COVD-19 scanning and searching.

Handing over duties

The following procedure must be followed when handing over duties to the next shift:

- During handover all matters still outstanding must be explained and handed over to next shift to follow-up, and recorded as such in the OB.
- Outstanding incidents and Shift Reports must be handed over to follow up were necessary.

- All assets in the Security Kiosks must be handed over in the Occurrence Book from one shift to the other and "acknowledgement of receipt" indicated.

NB: Disaster Management Act, 2002

The above procedure may be amended as and when required to facilitate any reflections or requirements of a National State of Disaster Management Act, 2002.

7. RECORDS

7.1 Stored/ filed Access Control Register

7.2 Stored/ filed Visitors Register

7.3 Stored/ filed Firearm Control Register

7.4 Stored/ filed Occurrence Book

7.5 Stored/ filed Declaration Register

7.6 Stored/ filed After-hours access control register

8. ANNEXURES

8.1 **Annexure A**: Incident and alarm activation process flow.

8.2 **Annexure B**: Planned Job Observation Checklist.

8.3 **Annexure C**: Site Shift Report.

8.4 **Annexure D**: ID Access Card Application Form

8.5 **Annexure E**: Visitors Register/Log Book

8.6 **Annexure F**: Key Control Register

8.7 **Annexure G**: Official Firearms Register

8.8 **Annexure H**: Coronavirus Pandemic Contingency Plan

ANNEXURE 8 -Personal Protective Equipment (PPE) SOP

STANDARD OPERATING PROCEDURE FOR PERSONAL PROTECTIVE EQUIPMENT (PPE)

Document number	009-TPL-OPS-SHEQ-2096
Business Name	Transnet Pipelines
Process/ Activity Name	Personal Protective Equipment
Process Owner Name	Phumi Blose
Process Owner Signature	
Version Number	2.0
Classification	Unclassified
Effective Date	01 June 2023
Review Date	29 May 2026

SUMMARY VERSION CONTROL

VERSION NO.	NATURE OF AMENDMENT	PAGE NO.	DATE REVISED
1.0	New SOP		
2.0	Changed the document from Personal Protective Equipment (PPE) Procedure to Standard Operating Procedure for Personal Protective Equipment (PPE)	All	25 /08/2022
2.0	Heading 3. Reference Documents, divided the documents into internal and external documents	6	25 /08/2022
2.0	Listed PPE specific SANS reference numbers	6 - 7	25 /08/2022
2.0	Inclusion of new heading 6.4 Procurement of PPE	15	25 /08/2022
2.0	Inclusion of new heading 6.5 Issuing of PPE	16	25 /08/2022
2.0	Amend clause 6.8 to include boiler suit (one piece overall)	17	25 /08/2022
2.0	Included new heading 6.9.6.1 Flame Retardant Rain Suits	20	25 /08/2022
2.0	Included new heading 6.9.6.2 Flame Retardant Thermal Jackets	20	25 /08/2022
2.0	Inclusion of the new heading 6.9.6.3 Flame Retardant Reflective Vests / Bibs	20	25 /08/2022
2.0	Revised clause 6.9.7 Respiratory Protection to include A2 Organic Vapour Cartridge respirators to be used for protection against organic vapours	21	25 /08/2022
2.0	Inclusion of the new heading 6.9.8 Arc Flash Protection	21 - 22	25 /08/2022

Note: Only latest amendments and/or additions are reflected in italics in the body of the document

TABLE OF CONTENTS

1. PURPOSE

To ensure appropriate provision and use of personal protective equipment in addition to other forms of control, to further minimize the risk of harm to Transnet Pipelines personnel, customers, contractors, visitors and suppliers.

2. APPLICABILITY

- This procedure is applicable to Transnet Pipelines employees, its contractors, visitors, or any other person needing to enter an area where PPE is identified as a requirement to mitigate against harm to a person.
- This procedure will apply to all sites under the control of Transnet Pipelines inclusive of all depots, workshops, buildings and servitudes where the risk is identified, and PPE is required.

2.1 NOT IN SCOPE

Flame retardant clothing (FRC) requirements do not apply to areas where there is no potential for flash fire exposure, unless specifically indicated, FRC would not apply in the following areas:

- Administrative Buildings
- National Operations Centre (NOC)
- TPL School of Pipelines
- Head Office
- Non – Operational areas of the facility
- Parking areas

PPE free zone will be areas where individuals are unlikely to be exposed to hazardous conditions or substances due to work activity being performed or prevailing environmental conditions and where such signage is displayed.

3. REFERENCE DOCUMENTS

Internal documents:

- Operational Risk Management Procedure: TRN–IMS–GRP–PROC-004
- Compliance Obligation Procedure: TRN–IMS–GRP–PROC-005
- Operational Planning and Control Procedure: TRN-IMS-GRP-PROC-009

External documents:

- Occupational Health and safety Act No. 85 of 1993
- Railway Safety Management System – Part 1, SANS 3000 -1:2016

NAME	REFERENCE NUMBER
Chemical resistant gloves	SANS 416
Work Wear suits	SANS 434
Protective and Safety Gum boots, all made from rubber	SANS 492
Personal protective equipment and protective clothing against the thermal hazards of an electric arc flash.	SANS 724
Barrier creams	SANS 1282
PVC Gumboots: Part 1, Injection-moulded Gumboots	SANS 1320
Sun Brim	SANS 1387
Industrial Safety Helmet	SANS 1397
Equipment (including oculars) for eye, face and neck protection against non-ionizing radiation arising during welding and similar operations - Welding helmets, hand shields, goggles and welding spectacles	SANS 1400
Eye-protectors for industrial and non-industrial use	SANS 1404
Hearing protectors Part 1 Earmuffs	SANS 1451-1
Hearing protectors Part 2 Ear plugs	SANS 1451-2
Hearing protectors Part 3 Earmuffs	SANS 1451-3
Sunscreen products	SANS 1557
Prescription Eyewear	SANS 1644

NAME	REFERENCE NUMBER
Safety Footwear	SANS 20345
Respiratory protective devices – Full face masks - Requirements, testing, marking	SANS 50136
Respiratory protective devices – Half masks and quarter masks – Requirements, testing and marking	SANS 50140
Respiratory protective devices – Mouthpiece assemblies - Requirements, testing and marking	SANS 50142
Respiratory protective devices – Particle filters – Requirements, testing and marking	SANS 50143
Respiratory protective devices – Filtering half masks to protect against particles –Requirements, testing, marking	SANS 50149
Full body harnesses	SANS 50361
Reflective Vests/bibs	SANS 50471

4. DEFINITIONS AND ABBREVIATIONS

4.1 Definitions

Contractor an employer (Organization) or a person who performs any work and has entered into a legal binding business agreement or contract to supply a product or provide services to Transnet.
Employee any person who is on an indefinite (permanent) contract of employment or on a fix term contract or any person who works for Transnet and who receives, or who is entitled to receive any remuneration, and other person who in any manner assist in carrying on or conducting the business of Transnet.
Engineering Controls physical engineering interventions that will create a physical barrier between human interactions and interface with identified hazards.
Hazard a source of or exposure to danger.
Hazard Assessment conducting inspections of workplace or tasks to determine if hazards are present.
IMS Operational Coordinator is an internal appointee tasked with the responsibility of ensuring that the duties of Transnet Pipelines as an employer contemplated in the applicable pieces of legislation such as OHS Act, are properly discharged.
Line Manager is an employee who directly manages other employees and operations – It includes Supervisor, Team Leader, Managers, etc.
Off Site is any other area outside of the defined TPL operating premises where TPL personnel, contractors may be engaged in operating, maintenance and / or repair work.
Personal Protective Equipment is a special type of clothing or devices that are used to protect workers from exposure to a variety of workplace hazards.

PPE Forum

It is a medium where ideas and views on PPE matters are exchanged and experiences with regards PPE matters identified and resolved. The forum is constituted with Labour, HR-EAP, ER, OPS, TECH, Risk, Procurement, SHE Representatives.

Primary Area

Primary Area is the area where pipelines intake, deliveries, receipt, intermixture processing, rail operations, as well as road tankers loading, and offloading operations are taking place. Where products (petrol, jet fuel, diesel, crude oil, intermixture, etc.) are stored, loaded, offloaded, or handled and where exposure to hazardous conditions or substances are likely due to a work activity being performed or prevailing environmental conditions.

These are areas within Intake Stations, Delivery Depots, Booster Pump Stations, Terminals, Pump Station, Through Station, Workshops in operations depots, Intermixture Refractionator Plant fence lines, off site and servitude included where production and storage facilities, pipelines and related equipment are located and operated. The areas include where field work is being performed on behalf of TPL. **These areas generally include but not limited to:**

- Fenced area with vessels or pipes containing hydrocarbons
- Loading gantries
- Rail loading areas
- Plant area
- Manifold
- Pump slabs
- Tank farms and related equipment
- Pipelines or vessels with hydrocarbons
- Offices (with potential for flash fire, hazardous condition or substances exposure)
- Block Valves
- Exposed Pipelines
- Test centers or laboratories

Risk Assessment process of hazard identification, risk analysis, risk evaluation and risk mitigation planned and implemented per task / activity.
Workplace a place where work is carried out for Transnet.

4.2 Abbreviations

dBA	Decibel
EAP	Employee Assistance Programme
EN	European Norms
ER	Employee Relations
EXCO	Executive Committee
IMS	Integrated Management System
ISO	International Organization for Standardization

NOC	National Operations Centre
OHS Act	Occupational Health and Safety Act, Act 85 of 1993
OPS	Operations
PPE	Personal Protective Equipment
SABS	South African Bureau of Standards
SANS	South African National Standards
SHEQ	Safety, Health, Environment and Quality
SOP	Standard Operating Procedure
TECH	Technical
TIMS	Transnet Integrated Management System
TOMS	Transnet Occurrence Management System
TPL	Transnet Pipelines

5. ACCOUNTABILITY, RESPONSIBILITY AND AUTHORITY

EXCO	• Ensure compliance with legislation and ensure that systems are in place to manage potential risks in relation to PPE. • Ensuring that the organization complies with the PPE Procedure and that the appropriate controls are implemented and applied • Ensure that adequate resources are provided to ensure compliance with the PPE procedure requirements.
Line Manager	• Ensure that this procedure is fully implemented. • Ensure that signs are posted in conspicuous locations at the workplace, including on plant and equipment, wherever a requirement is identified and confirmed to use PPE. • Implementing and enforcing PPE use in the workplace. • Providing the required PPE and ensuring that it is available to employees. • Ensuring that employees are trained on the proper use, care and retention of PPE. • Ensuring that defective or damaged PPE is returned, disposed of and immediately replaced. • Ensure contractors and subcontractors supply appropriate PPE for their own workers. • Maintain any PPE records as required by this procedure. • Ensure that PPE is worn by all employees and used correctly • Dispose of PPE in line with procedure. • Inspect and examine employees PPE for wear, damage or failure.

Visitors & Suppliers	• Adhere to TPL PPE requirements for entry into a primary area • Provide own basic PPE i.e., safety boots, flame retardant Conti suits and hard hat • Properly wearing PPE as required
Employees	• Properly wearing PPE as required, ensuring a good fit. • Use appropriate PPE at locations where signage requires its use and or when risk assessment identifies the need • Attending required training sessions, for the safe use of the specific PPE • Perform pre-use inspection for wear, damage, or failure prior to PPE use • Reporting any wear, damage, or failure to line management immediately • Properly caring for, cleaning, maintaining, and inspecting PPE as required • Properly store PPE as per manufacturer's recommendations
Contractors	• Supply all mandatory and other specific PPE to its employees. • Ensure issuance is recorded – PPE register. • Ensure that PPE issued is adequate for the workplace hazards. • Maintain PPE in a clean and reliable condition. • Ensure that PPE is worn by all its employees. • Ensure that PPE is inspected. • Dispose PPE in line with the requirements of this procedure
Procurement	• Acquire instructions on use, fitting and maintenance of PPE from suppliers. • Purchases of PPE made in line with this procedure and predefined standards and specifications.
PPE Forum	• Approve any changes to PPE requirements.

	• Investigate and approves requests for deviation in relation to PPE
SHEQ Team	• Ensure that this procedure is reviewed and updated at planned intervals or upon request as informed by changing circumstances and conditions. • Ensure that the changes to this procedure are widely communicated. • Ensure standardization. • Evaluate the level of compliance to the requirements of this procedure through internal audits.

6. STANDARD OPERATING PROCEDURE

Personal Protective Equipment is considered as the last resort, in instances where the workplace hazard cannot be removed through elimination, substitution, engineering and administrative controls. Full implementation of the elements outlined in the Personal Protective Equipment Procedure will minimize potential injuries as a result of exposure to workplace hazards. Adherence to this SOP is mandatory

6.1 STANDARD

- Transnet Pipelines shall not require or permit any employee and / or contractor to work unless such an employee and / contractor is issued with the required personal protective equipment and makes proper use thereof.
- The correct required PPE must always be worn
- Symbolic signs indicating PPE requirements must be prominently displayed at entrances or designated areas on the premises where additional PPE is required. These signs must comply with the applicable national standard.
- All persons shall comply with and wear the appropriate PPE as specified in work permits, mandatory signs, procedures, specifications, and risk assessments.
- Task specific PPE in addition to standard PPE shall be determined through risk assessment

- No person working in close proximity to moving machinery shall wear any loosely fitting outer clothing, any jewelry or ornament, any watch or key - chain, and loose - hanging hair or anything which may be caught up in the moving parts of such machinery.
- All PPE issued shall comply with the applicable SANS standard
- PPE must be stored in accordance with the manufacturer's requirements and / or recommendations.

6.2 HAZARD ASSESSMENT FOR PPE

- Each facility will perform a hazard assessment of the workplace to determine if hazards are present, or are likely to be present, which necessitate the use of PPE.
- In order to assess the need for PPE, a walk – through assessment must be conducted using the prescribed **PPE Hazard Assessment form, TRN – IMS – TPL – FRM – 001.1** to identify sources of hazards to all persons.
- Each assessment will be documented using the Hazard Assessment Form, **PPE Hazard Assessment form, TRN – IMS – TPL – FRM – 001.1** which identifies the work area assessed, the person conducting the assessment, findings of potential hazards, and date of the assessment, the forms will be kept in the safety files. It will assist to determine proper selection of PPE.
- Hazard assessment information leads to the development of the **PPE matrix** which lists required PPE by task, see **Annexure 8.2, TRN – IMS – TPL – GDL – 001.1.**
- The hazard assessment and resulting PPE matrix is designed to be an evergreen document.

6.3 PPE SELECTION

- PPE requirements for a particular task or for a particular area must be determined through a risk assessment for that task or area.
- PPE is selected based on risk assessment and exposure to a hazard. It is important that a risk assessment be undertaken to ensure that the best PPE is selected for each activity and location.
- Once the hazards of a workplace have been identified, IMS Coordinator will determine if the hazards can first be eliminated or reduced by methods other than PPE, i.e., methods that do not rely on employees' behavior, such as engineering controls.
- All PPE will be of safe design and construction for the work to be performed and will be maintained in a clean, well maintained and reliable condition.
- Careful consideration will be given to the comfort and proper fit of PPE in order to ensure that the right size is selected and that it will be used.

6.4 PROCUREMENT OF PPE

- Procured PPE must be compliant to applicable SANS specifications.
- Where non-complying PPE is delivered, the delivery should not be accepted and in the event that it is picked up late, a nonconformance report must be issued for the Supplier to rectify within 30 days.
- A list of approved alternative PPE suppliers must be at hand should there be quality issues with the quality of PPE.
- Ensure adequacy of PPE supplies at the stores so that it is readily available when required.
- Purchases of PPE made in line with this procedure and Transnet Pipelines PPE specifications.
- All PPE to comply with the relevant SANS standard requirements after being tested against required international standards. Tested as per standards listed in Transnet Pipelines PPE specifications.
- To check the quality of a PPE is to conduct testing to assess compliance with relevant test standards. To ensure that the product is fit for purpose and performs in the manner it is intended to. Supplier must submit the following documents:

ITEMS	REQUIREMENTS
Product description	A description of the product(s) must be provided by the supplier. It must include: o brand or trade name, o model or product reference, o intended use, o a list of the materials used to manufacture the product, o expected lifetime, approximate number of washes o approved storage conditions
Test reports	Official test reports (all pages, in English) originating from accredited test labs. Accredited facilities should be ISO 17025 certified. o Signed Test reports should clearly indicate the accredited laboratory name and accreditation (to be able to check authenticity of test reports). o Test standard must be within the scope of the accreditation of the laboratory. Detailed material technical data sheet from the original material manufacturer

6.5 ISSUING OF PPE

- PPE shall be issued to personnel in line with the Transnet Pipelines PPE Matrix.
- The quantities and the frequency of issuing PPE to personnel is outlined on the Transnet Pipelines PPE Matrix.
- Depending on the activity undertaken or work area, additional PPE may be issued as informed by the risk assessment.
- When issuing PPE, careful consideration must be given to the comfort and proper fit in order to ensure that the right size is selected and used.
- Where PPE is damaged, the employee would return the soiled/contaminated/damaged /worn PPE to their First Line Manager (Supervisor) to be issued with new PPE.
- A log of PPE issued must be kept.

6.6 INFORMATION, INSTRUCTION AND TRAINING

Any employee required to wear PPE shall be provided with information, instruction and training which is appropriate to the PPE being worn. The employee will be instructed in the correct use and care of PPE at point of issue of the PPE.

Periodic retraining will be offered to PPE users as needed. The training will include, but not limited to the following subjects:

- Manufacturer's manuals must be always followed, when in doubt the employee must request information or training as the case may be.
- When PPE needs to be used (per PPE Matrix)
- What PPE needs to be used (per the PPE Matrix)
- How to properly put on, remove, adjust, and wear PPE
- The limitations of PPE
- The proper care, maintenance, useful life, and disposal of PPE

Training of each employee will be documented using the **training attendance register (TRN – IMS – GRP – ATR – 008 – 3)** and **Annexure 8.1 PPE training certification form (TRN – IMS – TPL – FRM – 001.2)**. The document certifies that the employee has received and understood the required training on the specific PPE he / she will be using. Completed documents must be emailed to HR Enquiries (HREnquiries@transnet.net) – To be saved / stored on the employee's file.

6.7 CLEANING, REPLACING AND MAINTENANCE OF PPE

- Employees shall follow necessary guidelines in accordance with the manufacturer to ensure that PPE is always in a good level of cleanliness, well maintained and safe for use.
- Employees must regularly inspect, clean, and maintain their PPE according to the manufacturers' stipulated guidelines.

- If an item of PPE has worn out, has become damaged, or is found to be defective in any way, it must be replaced. Defective PPE must be returned to stores with the knowledge of the line manager or supervisor and disposed of correctly.
- Contaminated and defective PPE shall be properly stored and handled in the same manner as hazardous waste and shall be disposed of as hazardous waste.

6.8 MANDATORY PPE WHEN ENTERING PRIMARY AREAS

As a minimum, the following PPE must always be worn by all persons (including visitors) when accessing Transnet Pipelines Primary areas:

- Dromex DW – D59 FA, 100% cotton, flame retardant and Acid resistant SABS approved conti suit with long sleeves, fully zipped up at all times. Materials meeting the requirements of SANS 434, antistatic properties EN 1149 with silver reflective strip (50mm in width) on each sleeve around upper arm and each leg, meeting the requirements for EN471 conti suit or,
- Dromex DW – D59 FA - O, 100% cotton, flame retardant and Acid resistant SABS approved conti suit with long sleeves, fully zipped up at all times. Materials meeting the requirements of SANS 434, antistatic properties EN 1149 with silver reflective strip (50mm in width) on each sleeve around upper arm and each leg, meeting the requirements for EN471 boiler suit (one piece overall).
- Clothing worn under the overall must be 100% cotton – Compliant Golf shirts are stock items, available at the stores.
- Safety footwear with steel toe cap, oil and hydrocarbon resistant sole, anti-perforation sole, anti-static, anti-slip sole and breathable leather uppers.
- Socks 100% cotton, antistatic used in conjunction with safety boots and / or shoes.
- Hard hat with chin straps meeting requirements of SANS 1397
- Flame retardant clothing shall always be worn in or close to areas where hydrocarbons are present in any pipeline or vessel.
- Flame retardant clothing shall also apply where there is foreseen exposure to hydrocarbons with the potential to produce flash fire.
- Thermal Jackets – Parka Dromex DW D59-SABS Flame retardant acid resistant 100% cotton (inclusive of the lining of the jacket).

6.9 USE OF PPE – DIFFERENT TYPES

This section addresses general PPE requirements, including eye and face, head, foot, leg, hand, arm, body (torso) protection, and protection from drowning and fall protection.

Types of PPE may include overalls, protective footwear, gloves, goggles, face shields, safety glasses, hard hats, safety harnesses, ear plugs and earmuffs or any other similar safety equipment necessary to render persons safe.

6.9.1 Head Protection

- Hard hats should be worn in areas where there is potential for head injuries. Head injuries are commonly caused by impact from falling or flying objects, falling or walking into hard objects, tripping and falling unto sharp or protruding objects.
- All hard hats shall bear the SABS mark and meet the requirements of SANS 1397.
- Hard hats shall have an adjustable three-point webbing chin strap in accordance with SANS 1397.
- All persons working at elevated positions must always wear hard hat with chin strap and shall apply chin strap on their hard hats. This is mandatory for employees when loading rail tankers, dipping bulk trucks, storage tanks.
- Wearing of bucket hat, bandanas or beanies underneath the hard hat is forbidden.
- Individuals who use synthetic hair pieces (wigs, extensions, weaves) or have dreadlocks are always required to wear Fire Retardant Hair Cap and a hard hat with a chin strap secured in areas where the wearing of hard hat is required or dictated.
- Sun brim 100% cotton with fabric that meets the requirements of SANS 1387 – 4, Material type D59, and flame retardant can be used with the hard hat for the protection from the sun.
- Flame retardant winter liner can be used with the hard hat for the protection from the cold weather.

6.9.1.1 Supply and Replacement of Hard Hats

- Hard hat has a limited lifespan from the date of issue to employees. Hard hats must be replaced two years after being issued.
- All hard hats shall be marked with date of issue. The date of issue should be marked on an additional sticker on the inside of the hard hat at the back of the shell.
- Any hard hat showing damage (e.g. dents, cracks or holes etc.) or deterioration (e.g. excessive discoloration or brittleness) shall be removed from service immediately and replaced.

6.9.2 Hearing Protection

- Hearing protection must be worn when entering a workplace with a noise level at or above 85 dBA. An area with a noise level at or above 85 dBA noise rating limits will be identified by an ear protection sign.
- Hearing protection must be worn when using noisy equipment with a noise level at or above 85dBA such as compressors, angle grinders, etc. Equipment with a noise level at or above the 85 dBA noise rating limit will be identified by an ear protection sign.
- Hearing protection must be worn where health risk assessment on the site shows that there is a risk of exceeding the acceptable noise exposure levels and must be indicated with an ear protection sign at the applicable areas.

- Hearing protection in the form of SANS approved ear plugs or earmuffs.
- Earmuffs shall be in accordance to SANS 1451-1
- Earplugs shall be in accordance to SANS 1451-2.

6.9.3 Eye Protection

- If an employee is carrying out, assisting with, or working adjacent to any activity where sparks or projectile particles are being generated, where chemical mists or fumes are being generated, where liquids may splash or spray, where harmful electromagnetic radiation (heat or light) is being generated, or where there is a risk of wind-blown particles entering the eyes, then suitable protective eyewear must be worn at all times.
- Eye protection must be worn by employees, contractors and visitors passing through eye hazard areas.
- All eye protection (Prescription or non-prescription) must have side shield or wrap around protection.
- Approved eye protection, including, or in combination with any prescription eyewear meeting requirements of SANS 1644, normal spectacles may be worn provided the lenses have been toughened with safety glass that meets the requirements of SANS 1644.
- Prescription safety glasses should include side – shield that complies with SANS 1644.
- All components of prescription safety glasses that are being used for eye protection must meet the requirements of SANS 1644.
- Employees requiring prescription safety glasses for verified medical reasons will be provided at the cost of TPL.
- Medical eye examination is at employee's own expense.
- All hazard areas where eye protection is required will be posted with appropriate warning signs.
- Face protection and the welders face protection shall comply to SANS 1404

6.9.4 Hand Protection

- Hand protection (gloves) will be worn when there is a potential for injury to the hands from exposure to hazards such as but not limited to those from skin absorption of harmful substances, cuts or lacerations, severe abrasions, punctures, chemical burns, thermal burns and harmful temperature extremes.
- Suitable gloves must be selected based on the task to be performed and the specific hazard against which the employee requires protection such as sharp edges, sharp points and splinters, abrasive surfaces, Hazardous chemical substances (Toxic, corrosive, sensitizing, etc.)
- The gloves shall comply with SANS 416.

6.9.5 Foot Protection

- Safety boots / Shoes must be worn where there is a potential danger of slipping, electrostatic build-up, falling objects and chemical splashes.
- Non – conductive foot protection will be worn where the employee's feet are exposed to electrical hazards.
- All safety shoes / boots must be SABS approved.
- Safety shoes / boots with steel toe cap, oil and hydrocarbon resistant sole, anti-perforation sole, anti-static, anti-slip sole and breathable leather uppers. Consideration given for standard size and wide size (broad fitting)
- Socks 100% cotton, antistatic used in conjunction with safety boots and / or shoes.
- Boots must be made of leather material
- Safety footwear shall comply with SANS 20345

6.9.6 Skin /Body Protection

- Full body protection must be worn where there is exposure to dermal, chemicals, UV radiation, extreme temperatures, rainy conditions, heat, sparks and flying particles.
- Dromex DW – D59 FA, 100% cotton, flame retardant and Acid resistant SABS approved conti suit with long sleeves. Materials meeting the requirements of SANS 434, antistatic properties EN 1149 with silver reflective strip (50mm in width) on each sleeve around upper arm and leg meeting the requirements for EN471 legs are required for use at Transnet Pipelines.
- Work wear suits shall comply with SANS 434

6.9.6.1 Flame Retardant Rain Suits

- Rain suits must be worn where there is exposure to rain and splashes of petroleum product, liquid chemicals whilst having flame retardant and anti-static properties.
- Two-piece water-resistant rain suit with stow away hood. Reflective: 50 mm silver reflective. Dromex flame retardant rain suit

6.9.6.2 Flame Retardant Thermal Jackets

- Dromex DW D59-SABS Flame retardant acid resistant 100% cotton (inclusive of the lining of the jacket).
- Thermal jacket compliant to SANS 1423 – 1

6.9.6.3 Flame Retardant Reflective Vests / Bibs

- The reflective vests/bibs design shall comply with SANS 50471. Anti-static and flame retardant vest

6.9.7 Respiratory Protection

- Respirators must be worn where there is exposure to air contaminated with harmful dusts, fumes, mists, gases, sprays, or vapours.
- Respiratory protection must be worn where health risk assessment on site shows the risk of exposure to harmful fumes, gases, vapours, etc. and needs to be indicated by a safety sign at the applicable areas.
- Type of respirator to be used may be identified by type of task as risk assessed in the risk assessment and must comply with relevant standard indicated on this SOP.
- A2 Organic vapour cartridge respirators to be used for protection against organic vapours
- Respirators shall comply to SANS 50136

6.9.8 Arc Flash Protection

- Arc flash PPE is a combination of clothing and safety equipment worn for protection from arc flash and shock hazards by a person performing electrical work.
- Underneath arc flash protection, 100% cotton clothing to be worn. Persons wearing bras, such bras shall not have wire support.
- Arc Flash protection shall comply to SANS 724
- Electrical staff performing LV or MV maintenance work at Category 2 pump stations as per table hereunder shall wear arc flash PPE protection for category 2 hazard risk.

PUMP STATIONS MV	PUMP STATIONS LV
Howick (HWR)	Coalbrook (CBK)
Quagga (QGA)	Sasolburg (SBG)
Coalbrook (CBK)	Alrode (ALR)
Island View TM 1 (IVW)	Secunda (SEC)
Twini (TNI)	Island View TM 1 (IVW)
Hilltop (HTP)	Twini (TNI)
Mnambithi (MBT)	Hilltop (HTP)
Jameson Park (JMP)	Mnambithi (MBT)
	Jameson Park (JMP)

Levels of PPE programme recommended for Transnet Pipelines Electrical staff performing LV or MV maintenance work at hazard risk category 2 pump stations i.e., 4 – 8 Cal / Cm2 arc rating or arc rating exceeding the hazard levels of category 2 are worn where work is performed for protection from the arc flash (See table hereunder for details)

Hazard Risk Category	Cal/Cm2	Protective Clothing
1	1.2 – 4 Cal / Cm2	Dromex DW – D59 FA, 100% cotton, flame retardant and Acid resistant SABS approved conti suit with long sleeves.
2	4 – 8 Cal / Cm2	Dromex DW – D59 FA, 100% cotton, flame retardant and Acid resistant SABS approved conti suit with long sleeves. Arc Rated Face Shield: Ergoz face shield Arc Rated Balaclava: Nomex Balaclava in oatmeal colour Arc Rated Gloves: 8 cal Nomex Glove in oatmeal colour. Arc Rated Hard Hat: 18 cal silver hard hat

6.9.9 Sun Protection

- All persons exposed to sunlight must use long sleeve conti suit top, long conti suit trouser, or overall, brims to hard hats, UV factored sunscreen
- Sunscreen products, protective creams shall be in accordance with SANS 1557

6.9.10 Fall Protection - PPE

- Full body safety harnesses must be worn by each person for all elevated work (performing operations, maintenance or construction activities), except if such work is being undertaken on a permanent work platform and that the work is confined within the handrails.
- Where safety harness is being used, harness lanyards must be suitably tied on and secured onto an anchor point whilst work is being undertaken.
- Anti – Static Full Body Harness with anti – static, shock – absorbing double lanyards
- Full body harnesses shall comply to SANS 50361

6.9.11 Flotation Devices / Personal Flotation Devices

- Flotation devices / personal flotation devices must be used / worn when working close to the water's edge of bodies of water such as spill dam/basin, separator pit, etc. without handrails or other approved safeguards.
- Life Buoy (Zero/Novamarine/Viking type) flotation devices could be placed around spill basins where there is a potential of falling into the water and drowning.
- Life jackets of 150N single chamber must be used as a minimum when working within a distance of 1 meter of spill basin, separator pit with no fixed safe railing around it or other approved safeguards.

6.10 MEDICAL CONDITIONS

- Where special conditions of a medical nature need to be accommodated, the employee must declare such to their supervisor and the supervisor will escalate to a Health and Safety committee, which will in turn escalate to the PPE Forum. Appropriate investigation of the condition and subsequent issue of PPE will be facilitated by the PPE forum.
- On a rare occasion, an employee may seek approval to not wear the required PPE. This may be due to a medical condition and must be supported by a medical certificate for approval by the PPE Forum.

6.11 CONTROL

- Employees are to sign acceptance of PPE as per **PPE Issue Register, TRN – IMS – TPL – 001.1**. Conditions of issue must be explained to each employee when PPE is issued, and the employee must sign acknowledgement of the said instruction.
- When PPE is issued, instructions of use, care and where required training in use of the equipment must be given to the wearer and such instruction must be recorded and signed by both the receiver and the issuing officer. The wearer must also be given the legal requirements and implications concerning the wearing of PPE.
- The loss or theft of any PPE must be recorded on TOMS and an investigation must be done to establish the root cause of the loss. Should the loss investigation find that the loss was due to the employee's negligence disciplinary action must be taken in consultation with the Employee Relations Manager.
- Up – to – date register must be kept as proof that items of PPE have been issued to individual employees

6.12 MONITORING

- Employees after pre-use inspections for wear and damage will declare in the **TPL signing on/off declaration fit for duty register, TRN – IMS – TPL – REG – 001.2** that:
  - He / she is wearing all personal protective equipment (PPE) as required
  - All personal protective equipment (PPE) worn is neat and in good condition
- The Depot / Workshop / Site Supervisor resident on site will confirm employees' declarations and sign in the TPL signing on/off declaration fit for duty register.
- Depot / Workshop / Site Supervisor who is not resident on site will on weekly basis check employees' personal protective equipment and endorse the employees' declarations by signing TPL signing on/off declaration fit for duty register.
- Carry out monthly inspections using prescribed **Inspection Checklist: Personal Protective Equipment, TRN – IMS – TPL – CL – 001.1** to ensure that PPE is being used correctly is being maintained in a good, serviceable, clean and well maintained and fit for purpose.

6.13 COMPLIANCE MONITORING

- Regular audits must be undertaken by safety, health, environment and quality department to monitor compliance.

6.14 ENFORCEMENT

- Any individual found violating the requirements shall immediately be directed to put on the required PPE or immediately directed to stop performing the task and leave the area.
- Any person who refuses to wear PPE as required must be removed from site.
- Repeat violations by employees may lead to disciplinary action, and for contractors, may lead to loss of access to the depot/site and loss of future contracts.
- People who do not conform to the procedure may be subject to disciplinary action in terms of the applicable Transnet disciplinary processes and procedures.

7. RECORDS

7.1 TRN–IMS–GRP–ATR–008 3 Training Attendance Register

7.2 TRN–IMS–TPL–REG–001.2 TPL Signing on/off Declaration Fit for Duty Register

7.3 TRN-IMS-TPL-CL-001.1 Inspection Checklist: Personal Protective Equipment

7.4 TRN-IMS-TPL-REG-001.1 Personal Protective Equipment Issue Register

7.5 TRN-IMS-TPL-FRM-001.1 PPE Hazard Assessment Form

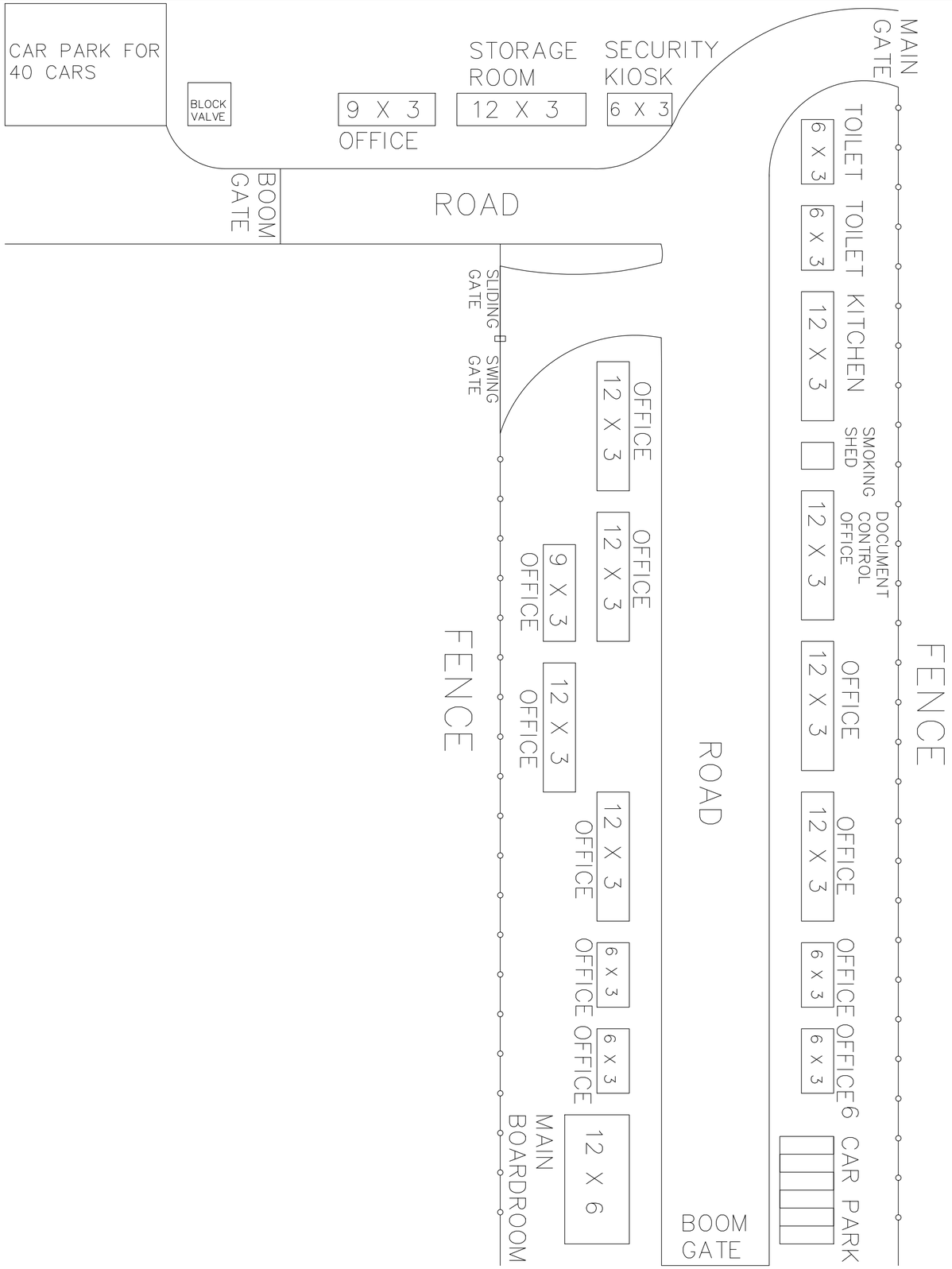
8. ANNEXURES

8.1 Transnet Pipelines PPE Matrix

8.1 TRN–IMS–TPL–FRM–001.2 PPE Training Certification Form

8.2 TRN–IMS–TPL–GDL–001.1 Task and Area Specific Hazard Assessment

ANNEXURE 9- TMI CUTLER OFFICES A2



APPROVAL			
DISCIPLINE	NAME	SIGN	DATE
ELECTRICAL			
MECHANICAL			
MC&I			
PROCESS			
CIVIL			
FIRE			

REVISIONS

REV	BY	DATE	DESCRIPTION	CHK	APP

TRANSNET pipelines

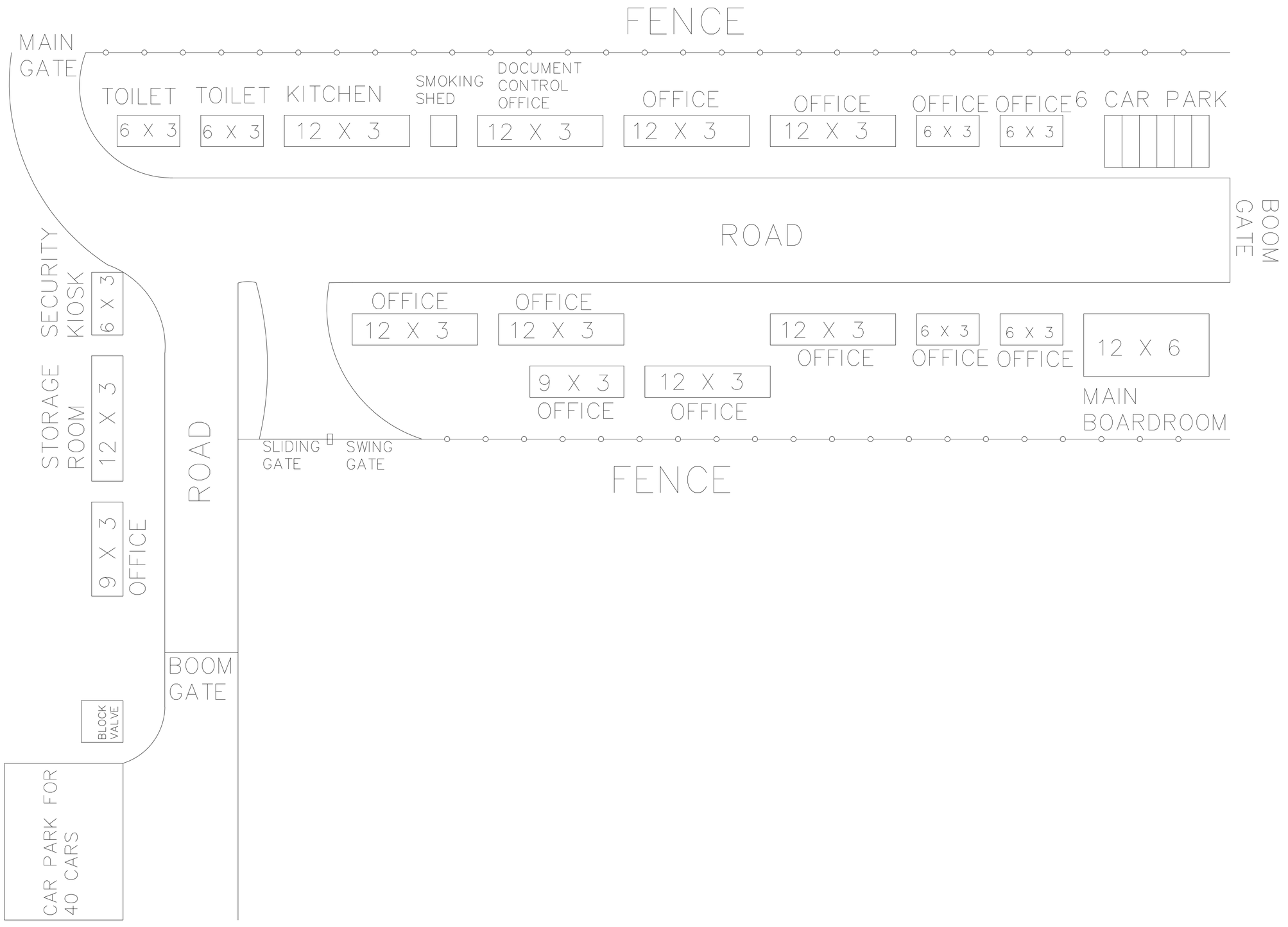
TM1 CUTLER SITE

TM1 Cutler Site Offices Layout

PROJECT NAME	TM1 CUTLER SITE OFFICES		
DRAWN	S.C	REF.	–
TRACED	CAD	DATE	25-01-2024
CHECKED	K.N	APPROVED	Z.M
SCALE	N.T.S.		
DRAWING No.			REV
PL :			A

A2

ANNEXURE 10- TMI CUTLER OFFICES A1



APPROVAL			
DISCIPLINE	NAME	SIGN	DATE
ELECTRICAL			
MECHANICAL			
MC&I			
PROCESS			
CIVIL			
FIRE			

REVISIONS

REV	BY	DATE	DESCRIPTION	CHK	APP

TRANSNET pipelines

TM1 CUTLER SITE OFFICES

TM1 Cutler Site Offices Layout

PROJECT NAME	TM1 CUTLER SITE OFFICES		
DRAWN	S.C	REF.	–
TRACED	CAD	DATE	25-01-2024
CHECKED	K.N	APPROVED	Z.M
SCALE	N.T.S.		
DRAWING No.			REV
PL :			A

A1