



MONTHLY AIR QUALITY REPORT



MOKOLO CROCODILE WATER AUGMENTATION PROJECT PHASE 2 (MCWAP-2)
ENVIRONMENTAL BASELINE AIR QUALITY - MONTHLY MONITORING REPORT.



DOCUMENT CONTROL			
Document Title	Mokolo Crocodile Water Augmentation Project Phase 2 (MCWAP-2) Environmental Baseline Air Quality Monthly Monitoring Report.		
Report Number	MON-AQR-244-20_21 (21-04)		
Version	0.1		
Date	April 2021		
Submitted to	Umeshree Naicker GIBB	Minenhle Luthuli GIBB	Deon Esterhuizen MDT Environmental
Distribution	Gibb Bigen Nyeleti Joint Venture Environmental Assurance (Pty) Ltd.		
QUALITY CONTROL			
	Originated By	Technical Review	
Name	Damon Nell	Anton Botha	
Designation	Environmental Consultant Pr.Sci.Nat 124378	Environmental Consultant Pr.Sci.Nat 122440	
Signature			
Date	14-06-2021	24-06-2021	
DISCLAIMER			
<p><i>Copyright ENVASS. All Rights Reserved - This documentation is considered the intellectual property of ENVASS. Unauthorised reproduction or distribution of this documentation or any portion of it may result in severe civil and criminal penalties, and violators will be prosecuted to the maximum extent possible under law. Any observations, recommendations and actions taken from this report remain the responsibility of the client. Environmental Assurance (Pty) Ltd and authors of this report are protected from any legal action, possible loss, damage or liability resulting from the content of this report. This document is considered confidential and remains so unless requested by a court of law.</i></p>			

Document No:	MON-AQR-244-20_21 (21-04)	GIBB Bigen Nyeleti Joint Venture	Client Restricted
Revision:	0.1	(GBN-JV)	Author: D. Nell
Date:	April 2021		i

EXECUTIVE SUMMARY

Environmental Assurance (Pty) Ltd. (ENVASS) has been appointed by GIBB Bigen Nyeleti Joint Venture (GBN-JV) to design, implement and maintain a monthly Air quality compliance monitoring programme related to the Phase 2 Mokolo Crocodile Water Augmentation Project (MCWAP-2). The monitoring is implemented as baseline monitoring along the proposed pipeline construction route (**hereafter referred to as “the proposed development”**), which is planned to stretch from the Vlieepoort Mountains, west of Thabazimbi, to Medupi and Matimba Power Stations situated between Steenbokpan and Lephalale, Limpopo Province. The monthly passive sampling comprises of gravimetric dust fallout monitoring, as well as future planned Particulate Matter (PM) monitoring at three (3) predetermined localities. The identified localities are monitored on a monthly basis for data collection and interpretation in order to determine possible impacts related to the proposed construction activities, as well as to serve as a baseline condition for monitoring programme refinement as the project progresses.

This report communicates the monthly air quality monitoring and results conducted within April 2021. All monitoring was conducted according to recognised standards and sent to a SANAS accredited laboratory for analysis as further described in this report.

The following findings pertain to the April 2021 air quality monitoring:

- Ninety-five (95) out of one hundred (100) samples were obtained and analysed during the monitoring period;
- Bucket (DB11) was tampered with. The dust stand and bucket was discovered to have been pulled out of the ground and was lying along the fence line approximately 10m from where it was installed. The stand was then reinstalled further away from the fence line in an attempt to prevent this from reoccurring in the future;
- The monitoring comprises of one-hundred (100) Gravimetric Dust Fall-Out Monitoring Localities and three (3) Remote Particulate Matter E-Samplers. It should be noted that the air quality is monitored for baseline determination and impact identification;
- Three (3) dust stands (DB12, DB13, and DB14) could not be installed due to access restrictions, however will be relocated to include the Bierspruit River, Sand River and New Paul Hugo Gauging Weirs;
- The dust stand for monitoring locality DB96 was installed on the 6th of May within the Exxaro property;
- Sample locality DB87 recorded an exceedance in the industrial limit of 1200 mg/m²/day with a recorded value of 2167 mg/m²/day. As this location is situated alongside the D769 public dirt road outside of the Stratford 462 KQ farm, it is assumed that the high levels are attributed to movement of local vehicles on the aforementioned dirt road;
- Sample localities DB86, DB88, and DB99 recorded exceedances in the residential limit of 600 mg/m²/day with values of 886 mg/m²/day, 969 mg/m²/day and 1085 mg/m²/day respectfully. These localities are also situated along the D769 dirt road, further iterating the same conclusion for higher level present in comparison to DB87. The residential exceedance recorded at sample locality DB88 is of most concern as the locality is situated at a small housing community;

Document No:	MON-AQR-244-20_21 (21-04)	GIBB Bigen Nyeleti Joint Venture	Client Restricted
Revision:	0.1	(GBN-JV)	Author: D. Nell
Date:	April 2021		ii

- The remaining monitoring locality results were compliant to the Industrial Limit in terms of gravimetric dust fallout;
- Monitoring locality DB87 presented the highest readings during the March to April 2021 monitoring period at 2167 mg/m²/day (above the Industrial Limit), while the monitoring localities DB50, DB51, and DB59 presented the lowest with a calculated 1 mg/m²/day; and
- The wind direction recorded during the monitoring period originated from the North and to a lesser extent from the North-northeast, East-Northeast, and South-West. Wind speeds reaching a maximum of 1.9 m/s with a total rainfall recorded at 25.8 mm during the monitoring period.

Document No:	MON-AQR-244-20_21 (21-04)	GIBB Bigen Nyeleti Joint Venture (GBN-JV)	Client Restricted
Revision:	0.1		Author: D. Nell
Date:	April 2021		iii

TABLE OF CONTENTS

1.	INTRODUCTION	1
2.	BACKGROUND	1
3.	LEGISLATIVE CONTEXT AND REFERENCES	2
4.	PURPOSE	3
5.	METHODOLOGY	3
5.1	SITE ESTABLISHMENT AND SCOPE OF WORK	3
5.2	ACTIVE INDICATIVE MONITORING	8
5.3	PASSIVE DUST MONITORING	9
6.	EMISSION GENERATION AND POLLUTANT OVERVIEW	11
6.1	PARTICULATE MATTER	11
6.2	ENVIRONMENTAL IMPACT	12
7.	RESULTS AND DISCUSSION	13
7.1.	MONTHLY SAMPLING REGISTER	13
7.2.	PARTICULATE MATTER RESULTS	18
7.3.	GRAVIMETRIC DUST FALLOUT RESULTS	18
7.4.	WEATHER DATA	23
8.	CONCLUSION AND ASPECTS TO CONSIDER	28
9.	PROPOSED MITIGATION AND POLLUTION PREVENTION MEASURES DURING FUTURE CONSTRUCTION..	28
10.	REFERENCES	31
	Appendix A – EQUIPMENT CHECKLIST	32
	Appendix B – ENVASS Chain of Custody (CoC) FORM	33
	Appendix C – MONITORING LOCALITY SUMMARY TABLE	37
	Appendix D – INDEPENDENT FORM AND CV	134

LIST OF FIGURES

Figure 1: GBN-JV Air Quality Monitoring Localities.....	5
Figure 2: GBN-JV Air Quality Monitoring Localities (Northern Region)	6
Figure 3: GBN-JV Air Quality Monitoring Localities (Southern Region)	7
Figure 4: Met One Instruments E-Sampler-9800	8
Figure 5: Wind Direction Frequency Average	25
Figure 6: Windrose Diagram	25
Figure 7: Rainfall for monitoring period	27

LIST OF TABLES

Table 1: Monitoring Resources and Sampling Frequencies.....	4
Table 2: Ambient air quality limits for common pollutants (SANS 1929:2011) (Limit Values in $\mu\text{g}/\text{m}^3$)	9
Table 3: Four-band scale evaluation criteria for dust deposition (SANS 1929: 2011)	10
Table 4: Acceptable dust fallout results (GNR 827)	10
Table 5: April 2021 Monthly Sampling Register	13
Table 6: Gravimetric Dust Fallout Results.....	19
Table 7: Wind Direction	23
Table 8: Average Wind Speeds.....	24
Table 9: Beaufort Wind Force Scale	26
Table 10: Rainfall	27

GLOSSARY

A list of commonly used acronyms, measurement units and definitions are included below for the purpose of ensuring uniformity in the interpretation of this report:

ACRONYMS	
GBN-JV	GIBB Bigen Nyeleti Joint Venture
ASTM	American Society for Testing and Materials
DFFE	Department of Forestry, Fisheries and the Environment (Previously known as DEFF)
ENVASS	Environmental Assurance (Pty) Ltd
NEMA	National Environmental Management Act: Act 109 of 1998.
NEM:AQA	National Environmental Management: Air Quality Act 39 of 2004
PM ₁₀	Particulate Matter of less than 10 microns in diameter
SANS	South African National Standards

MEASUREMENT UNITS	
mg/m ² /day	Milligram per square meter per day
PPM	Parts per million
µg/m ³	Microgram per cubic meter

DEFINITIONS	
Ambient air	Outdoor air in the troposphere, excluding air regulated by the relevant national legislation, where air quality is determined in accordance with this standard.
ASTM D1739	Standard test method for the collection measurement of dust fall (settleable particulate matter).
Average period	Period of time over which the average value is determined.
Dust fallout monitoring programme	Means monitoring of gravimetric dust fallout on a continuous basis.
Monthly basis	Period of 30 days (±2 day) as specified by ASTM D1739.
National Dust Control Regulations	Means the National Dust Control regulations, 2013, as published in the Government Gazette (No. 36974) of 1 November 2013 in terms of the National Environmental Management: Air Quality Act 39 of 2004.
Non-residential area	Means any area not classified for residential use as per local town planning scheme.
Residential area	Means any area classified for residential use in terms of the local town planning scheme.
SANS1929: 2011	South African National Standards, Ambient Air Quality – limits for common pollution.

Document No: Revision: Date:	MON-AQR-244-20_21 (21-04) 0.1 April 2021	GIBB Bigen Nyeleti Joint Venture (GBN-JV)	Client Restricted Author: D. Nell vi
------------------------------------	--	--	--

1. INTRODUCTION

Environmental Assurance (Pty) Ltd. (ENVASS) was appointed by GIBB Bigen Nyeleti Joint Venture (GBN-JV) to undertake the environmental air quality baseline monitoring programme of the Mokolo Crocodile Water Augmentation Project Phase 2 (MCWAP-2) project. The monitoring is implemented based on the proposed construction pipeline associated with the increased water demand required within Lephalale to coal-fired power stations, where water will be transferred from the Crocodile River (West) to the Steenbokpan and Lephalale area. The project infrastructure includes:

- Water Transfer Infrastructure:
 - Vlieepoort abstraction weir and pump station;
 - Low lift rising main;
 - Balancing dams and desilting works;
 - High-lift pump station;
 - High-lift rising main;
 - Break pressure reservoir;
 - Gravity pipeline;
 - Operation reservoir;
 - Electrical infrastructure; and
- Borrow pits for sourcing of construction material.

The monthly air quality monitoring consists of one hundred (100) gravimetric dust fall-out monitoring localities and three (3) remote particulate matter E-Samplers sites. The scope of work (SoW) performed is aligned to the Tender Document Requirements (Reference: MCWAP2: CONTRACT 2A-C-122-8.9), which are included within the report.

2. BACKGROUND

The project area is located within the Limpopo Province (Waterberg District Municipality) and stretches from the Thabazimbi to Lephalale Local Municipalities. The climate is classified as semi-arid with precipitation generally present during the summer season at a maximum from November to March. The current ambient air quality profile is affected through residential traffic on the associated dirt roads, farming and agriculture activities. Planned sources of air pollution from the pipeline construction included as a minimum, infrastructure and equipment use:

- Tracked machinery and equipment;
- Heavy mobile vehicles;
- Dump trucks;
- Haul trucks;
- Light motor vehicles;
- Access roads.

3. LEGISLATIVE CONTEXT AND REFERENCES

Section 28 of the National Environmental Management Act (NEMA, Act 107 of 1998) places a duty of care on any person causing, has caused or may cause significant pollution or degradation of the environment to take reasonable measures to prevent such pollution or degradation from occurring, continuing, or, insofar as such harm to the environment is authorised by law or cannot be reasonably avoided or stopped and rectify such pollution of the environment.

The measures required in terms of subsection (1) may include measures to:

- Investigate, assesses and evaluate the impact on the environment,
- Inform and educate employees on the environmental risk of their work and the manner in which tasks must be performed in order to avoid causing significant pollution or degradation of the environment;
- Cease, modify or control any activity or processes causing pollution or degradation;
- Contain or prevent the movement of pollutants or the cause of degradation;
- Eliminate any source of the pollution or degradation; or
- Remedy the effects of pollution or degradation.

The National Environmental Management: Air Quality Act (Act no. 39 of 2004) (AQA) was developed to give effect to NEMA in order to update air quality legislation to comply with general environmental policies and to ensure that the legislation is in line with local and international standards on air quality and air quality management practices. The main objectives of the act are to:

- Enhance and protect air quality;
- Provide reasonable measures and steps to prevent pollution or environmental degradation; and
- To secure sustainable environmental development in conjunction with economic and social development.

In terms of the AQA certain activities and industries, including mining, have the responsibility to:

- Comply with any relevant standards or bylaws;
- Comply with relevant emission standards;
- **Comply with the Minister's requirement for the** implementation of a pollution prevention plan in respect of a substance declared as a priority air pollutant;
- **Comply with an Air Quality Official's legal request for impact reports;**
- Taking reasonable steps to prevent the emission of any offensive odour caused by any activity on their premises.

Guidelines provide a basis for protecting public health from the adverse effects of air pollution and for eliminating, or reducing to a minimum, those contaminants of air that are known or likely to be hazardous to human health and well-being (WHO, 2000).

The South African Bureau of Standards (SABS), in collaboration with DEA, established ambient air quality standards for criteria

pollutants. The National Ambient Air Quality Standards (Republic of South Africa, 2009a and 2012) provide standards for ambient air quality in terms of criteria pollutants and permitted frequency of exceedances.

4. PURPOSE

The purpose of this assessment is to determine the baseline ambient air quality of the proposed development area. The baseline air quality assessment will measure the current ambient air quality before commencement of construction. The compliance monitoring is based on a pro-active approach to assess air quality on a continuous basis, by measuring the air quality levels.

Generated dust can become a nuisance (or health risk) when it is not properly managed and mitigated. Dust can be a concern to the surrounding land users and receiving environment and it is therefore important to determine the potential of dust generated by the activities.

This report is structured to include the following:

- Purpose / Objective of the study;
- Scope of Works / terms of reference;
- Description of methodologies utilised;
- Limitations and assumptions;
- Results from the baseline results; and
- Summary of findings and recommendations.

This report also aims to give effect to the requirements and legislation as promulgated in South Africa. Please refer to Section 2 for detailed legislative requirements for the study. Key aspects for the purpose of this document is to:

- Describe baseline air quality conditions and how it could be affected;
- Raise relevant air quality concerns of the proposed project; and
 - To recommend, based on the conditions, preventative measures for implementation once the activity commences.

5. METHODOLOGY

5.1 SITE ESTABLISHMENT AND SCOPE OF WORK

An initial desktop site assessment was conducted to determine suitable locations regarding the air quality baseline assessment in conjunction with GBN-JV representatives. The result of the desktop study was the identification of areas to provide a holistic baseline condition of the overall pipeline and associated extent.

Site establishment was implemented in February 2021 followed by monthly passive dust monitoring, while active indicative sampling will be implemented from July 2021.

Sampling occurred as per the scope of work at the identified sampling localities (100 in total) presented in Table 1 and Figure 1 to Figure 3.

Table 1: Monitoring Resources and Sampling Frequencies

Description	Locality Count	Monitoring Frequency
Dust Stand Monitoring Points: <ul style="list-style-type: none"> Along Pipeline Alignment; Selected positions at the Weir, Balancing dams, Break Pressure Reservoir and Points of Supply; Monitoring Weirs; Along Gravel Access Roads; Borrow Pits and Spoil Areas; and Sensitive Receptors. 	100	Monthly
PM10 E-Sampler <ul style="list-style-type: none"> Kesarona Primary School, Medupi Power Station & Balancing Reservoir 	3	Monthly (6 Month Programme) To be initiated in July 2021

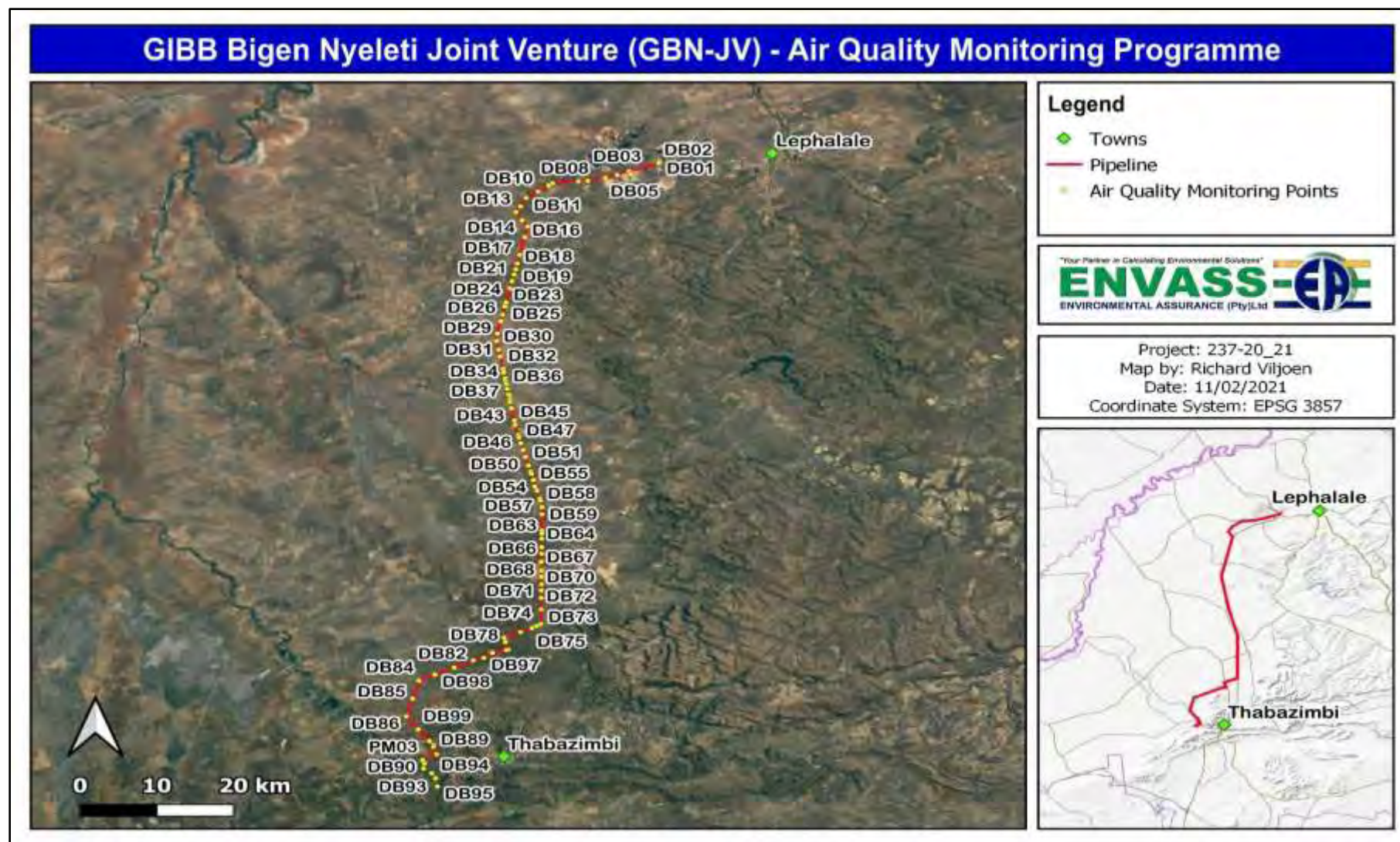


Figure 1: GBN-JV Air Quality Monitoring Localities

Document No:	MON-AQR-244-20_21 (21-05)	 Environmental Assurance (Pty) Ltd	Client Restricted
Revision:	0.1		Author: D Nell
Date:	April 2021		5

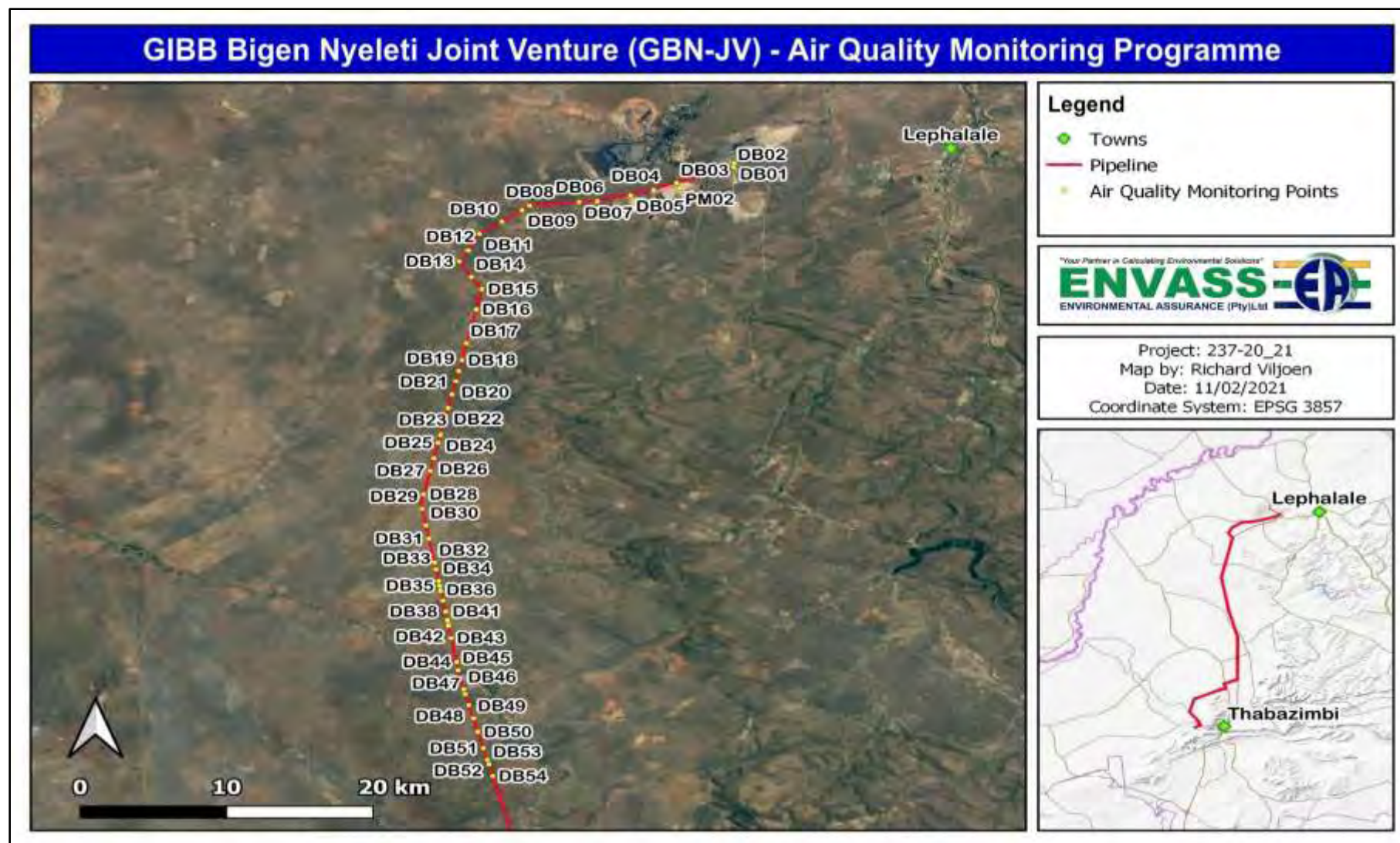


Figure 2: GBN-JV Air Quality Monitoring Localities (Northern Region)

Document No:	MON-AQR-244-20_21 (21-05)	 Environmental Assurance (Pty) Ltd	Client Restricted
Revision:	0.1		Author: D Nell
Date:	April 2021		6

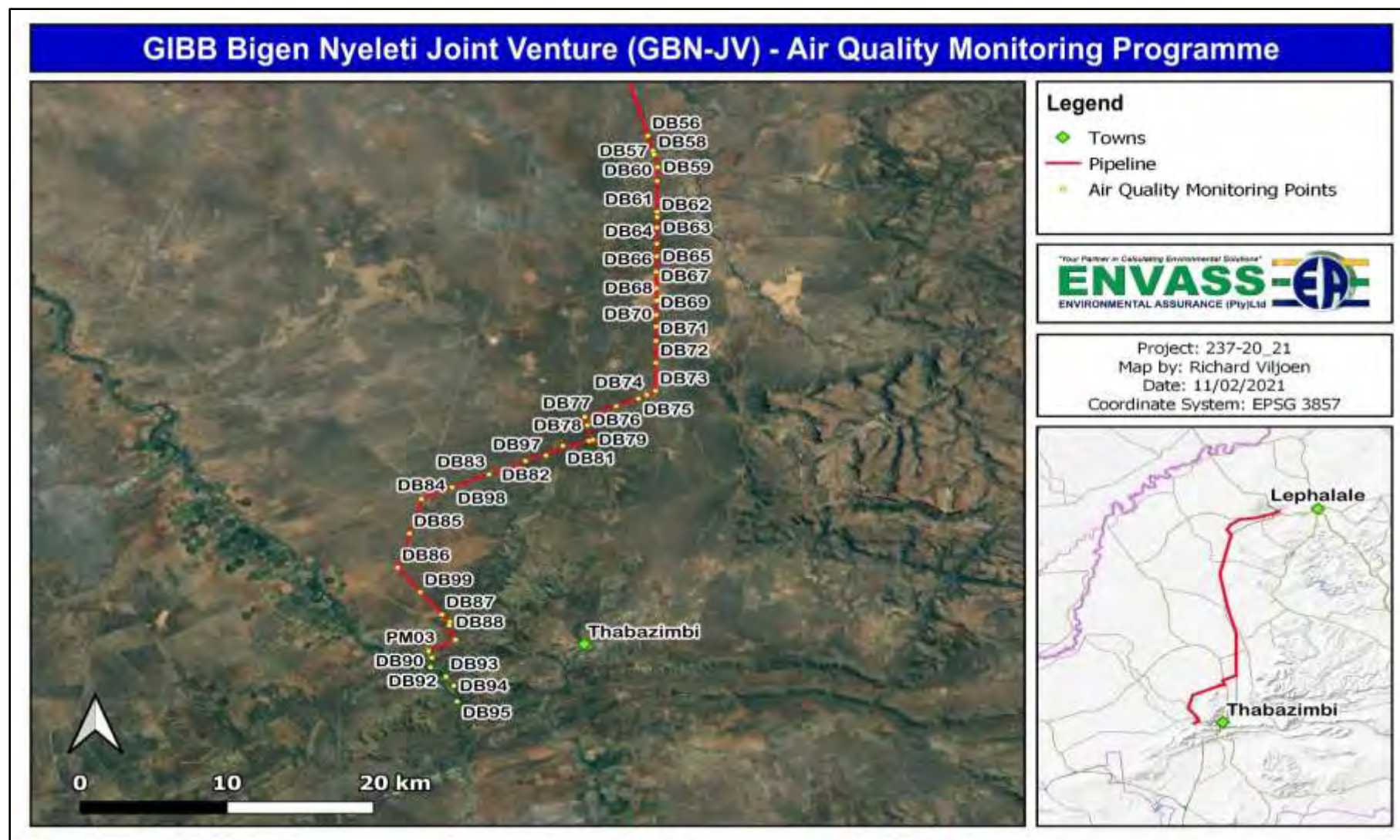


Figure 3: GBN-JV Air Quality Monitoring Localities (Southern Region)

Document No:	MON-AQR-244-20_21 (21-05)	 Environmental Assurance (Pty) Ltd	Client Restricted
Revision:	0.1		Author: D Nell
Date:	April 2021		7

5.2 ACTIVE INDICATIVE MONITORING

The Met One Instruments, Inc. model E-Sampler is a type of nephelometer which automatically measures and records real-time airborne PM₁₀, PM_{2.5}, or TSP particulate concentration levels using the principle of forward laser light scatter. In addition, the E-Sampler has a built-in 47 mm filter sampler which can optionally be used to collect the particulate for subsequent gravimetric mass or laboratory evaluation.

Laser Light Scatter System

Sample air is drawn into the E-Sampler and through the laser optical module, where the particulate in the sample air stream scatters the laser light through reflective and refractive properties. This scattered light is collected onto a photodiode detector at a near-forward angle, and the resulting electronic signal is processed to determine a continuous, real-time measurement of airborne particulate mass concentrations.

Gravimetric Filter Sampler System

After the sample air stream has been measured by the E-Sampler and exits the optical engine, it passes through the built-in 47 mm filter sampler system. This system allows the particulate to optionally be collected on a filter disc as a second method to obtain airborne particulate mass data, or for laboratory analysis of the particulate. The 47 mm filter system can also be used to determine a gravimetric K-factor (slope multiplier) to correct the E-Sampler real-time signal to match the local particulate type. In this case, a filter disc is weighed on a microbalance before and after being run in the E-Sampler for a period of time. The resulting mass of the dust on the filter is correlated with the concentrations that the E-Sampler recorded over the same time period, and a correction factor is calculated. The E-Sampler can be used with no correction factor in applications where relative particulate trending is appropriate.



Figure 4: Met One Instruments E-Sampler-9800

Additional details of the apparatus:

- Model: E-Sampler-9800
- Key Features: Real Time Particulate Monitor
- Description: Particulate and air quality monitoring combined in one instrument.

Results obtained from active indicative sampling is evaluated against ambient air quality limits for any common pollutants (SANS 1929:2011) as represented in Table 1 below:

Table 2: Ambient air quality limits for common pollutants (SANS 1929:2011) (Limit Values in $\mu\text{g}/\text{m}^3$)

Pollutant	Averaging Period	Limit Value	Frequency of Exceedance	Compliance Date
Particulate Matter PM10	24 – hour average	120	4	Immediate – 31 December 2014
	24 – hour average	75	4	1 January 2015
	Annual average	50	0	Immediate – 31 December 2014
	Annual average	40	0	1 January 2015

5.3 PASSIVE DUST MONITORING

Dust buckets of a standard size and shape are prepared and set up at locations within the servitude of the pipeline and ancillary infrastructure, in order for dust to settle for periods of 30 (± 2) days. The dust buckets are collected and sealed on site and sent to a SANAS accredited laboratory for analysis. The masses of the water-soluble and insoluble components of the material collected are then determined and results are reported as $\text{mg}/\text{m}^2/\text{day}$. This methodology is described according to South African National Standards 1929:2011 and the American Society for Testing and Materials (ASTM) Designation: D 1739-98 (2017) standards. The results for this method of testing are obtained by gravimetric weighing. The apparatus required for this type of monitoring include open-top buckets/containers no less than 150mm in diameter with a height of no less than twice its diameter. The buckets must be placed on a stand at a height of 2 (± 0.2) m above the ground.

Results obtained is evaluated against the four-band scale for dust deposition (SANS 1929:2011) and the National Dust Control Regulation limits (GN827).

Table 3: Four-band scale evaluation criteria for dust deposition (SANS 1929: 2011)

Band Number	Band Description level	Classification	Dust fallout rate (D) (mg/m ² /day, 30-day average)	Comment
1	Residential	Ideal	$D > 600$	Permissible for residential and light commercial
2	Industrial	Acceptable	$600 < D < 1200$	Permissible for heavy commercial and industrial
3	Action	Tolerable	$1200 < D < 2400$	Requires investigation and remediation if two sequential months lie in this band, or more than three occur in a year.
4	Alert	Unacceptable	$2440 < D$	Immediate action and remediation required followed the first incidence of dust fallout rate being exceeded. Incidents report is submitted to the relevant authority.

The National Dust Control Regulations identify the permissible amount of gravimetric dust fallout, as indicated below:

Table 4: Acceptable dust fallout results (GNR 827)

Restriction Areas	Dust fall rate (D) (mg / m ² / day, 30-day average)	Permitted frequency of exceeding dust fall rate
Residential Area	$D < 600$	Two within a year, not sequential months.
Non-residential Area	$600 < D < 1200$	Two within a year, not sequential months.

6. EMISSION GENERATION AND POLLUTANT OVERVIEW

The current dust generating activities at the site include movement of vehicles along the proposed pipeline route.

It is important to predict and determine possible areas of emission generation as early identification can help develop mitigation or prevention plans for the specific emission generating activities. A prediction is made possible by using existing examples of emission generating activities on other sites and its effect and measures in place to mitigate. From the activities proposed for this project the following can be expected to be activities that can cause or lead to the generation of emissions:

Construction Phase:

- Site establishment including fencing and security;
- Site and vegetation clearing;
- Soil stripping, stockpiling, earthworks and diggings;
- Storage of waste and construction materials;
- Materials transport;
- Foundations and constructions;
- Surfacing;
- Tracked machinery and equipment;
- Heavy mobile vehicles;
- Articulated dump trucks;
- Haul trucks;
- Light motor vehicles;
- Access roads; and
- Materials stockpiles.

From the abovementioned activities, exhaust emissions from construction vehicles and equipment will typically include particulates, such as PM₁₀, carbon monoxide (CO), sulphur dioxide (SO₂) and volatile organic compounds (VOCs). Additionally, disturbance of groundcover caused by groundworks and activities will further impact on particulate matter generation.

6.1 PARTICULATE MATTER

Particles can be classified by its aerodynamic properties into coarse particles (gravimetric), PM₁₀ (particulate matter with a diameter of less than or equal to 10 microns), PM₄ (particulate matter with a diameter of less than or equal to 4 microns), very fine particles such as PM_{2.5} (particulate matter with a diameter of less than or equal to 2.5 microns) and PM₁ (particulate matter with a diameter of less than or equal to 1 microns) (Harrison and van Grieken, 1998). The fine particles may contain **aerosols such as sulphates and nitrates (they “cling” to particulate matter), combustion particles and/or recondensed** organic and metal vapours. The coarse particles contain earth crust materials and fugitive dust from roads and industries (Fenger, 2002).

In terms of health impacts, particulate air pollution effects are broad, but are predominately associated with effects of the respiratory and cardiovascular systems (WHO, 2000). Particle size is important for health because it controls where in the respiratory system a given particle deposits. Fine particles have been found to be more damaging to human health than coarse particles as larger particles are less respirable in that they do not penetrate deep into the lungs compared to smaller particles (Manahan, 1991).

Larger particles are deposited into the extra thoracic part of the respiratory tract while smaller particles are deposited into the smaller airways leading to the respiratory bronchioles (WHO, 2000). A study by Pope and Burnett (2002) indicated that PM_{2.5} leads to high plaque deposits in arteries, causing vascular inflammation and atherosclerosis (Kaonga and Kgabi, 2009). As yet, no evidence of a threshold in the relationship between particulate concentrations and adverse human health effects have been determined (Burger and Scorgie, 2001; WHO 2005).

- *Short-term (acute) exposure*

Recent studies suggest that short-term exposure to particulate matter leads to adverse health effects, even at low **concentrations of exposure (below 100 µg/m³)**. Morbidity effects associated with short-term exposure to particulates include increases in lower respiratory symptoms, medication use and small reductions in lung function.

- *Long-term (or chronic) exposure*

Long-term exposure to low concentrations (~10 µg/m³) of particulates is associated with mortality and other chronic effects such as increased rates of bronchitis and reduced lung function (WHO, 2000). Those most at risk include the elderly, individuals with pre-existing heart or lung disease, asthmatics and children; with an increased risk associated with an increase in exposure (WHO 2005).

6.2 ENVIRONMENTAL IMPACT

Trace gases and aerosols impact the climate through the effect on the radiative balance of the earth. Trace gases such as **greenhouse gases absorb and emit infrared radiation which raises the temperature of the earth's surface causing the enhanced greenhouse effect**. Aerosol particles have a direct effect by scattering and absorbing solar radiation and an indirect effect by acting as cloud condensation nuclei. Atmospheric aerosol particles range from dust and smoke to mists, smog and haze (IPCC, 2001). Smog and haze are common in regions where certain geographic features, such as mountains, and weather conditions, such as temperature inversions, contribute to the trapping of air pollutants (Kumar and Mohan, 2002). Smog and haze also contribute to visibility degradation through the absorption and scattering of radiation by gases and particulates (Elsom, 1996).

Other environmental impacts associated with air pollution include loss of biodiversity and damage to sensitive environments.

7. RESULTS AND DISCUSSION

7.1. MONTHLY SAMPLING REGISTER

Table 5 below illustrates the March to April 2021 sampling register as recorded by ENVASS during the monthly monitoring.

Table 5: April 2021 Monthly Sampling Register

GBN-JV Air Quality Monitoring							
Locality ID	Description	Co-ordinates		Sampler Name	Sampling Date	Sampling Time	Comments
		Latitude	Longitude				
DB01	Grootestryd 465 LQ Portion 5	23°40'41.16"S	27°36'4.24"E	Damon Nell/ Enock Machete	5 th May 2021	14:46	Sampled
DB02	Grootestryd 465 LQ Portion 5	23°40'52.25"S	27°36'2.03"E		5 th May 2021	14:43	Sampled
DB03	Along D1675 outside of Turfvlakte 463 LQ farm	23°41'37.30"S	27°33'44.10"E		5 th May 2021	14:34	Sampled
DB04	Along D1675 outside of Hierontrent 460 LQ farm	23°41'57.80"S	27°32'48.26"E		5 th May 2021	14:05	Sampled
DB05	Along D1675 outside of Eenzaamheid 687 LQ farm	23°42'13.03"S	27°31'52.68"E		5 th May 2021	14:08	Sampled
DB06	Along D1675 outside of Eenzaamheid 687 LQ farm	23°42'29.97"S	27°30'32.64"E		5 th May 2021	14:18	Sampled
DB07	Along D1675 outside of Eenzaamheid 687 LQ farm	23°42'32.26"S	27°29'48.38"E		5 th May 2021	14:21	Sampled
DB08	Along D1675 outside of Pontes Estate 744 LQ farm	23°42'43.21"S	27°27'48.78"E		6 th May 2021	11:22	Sampled
DB09	Pontes Estate 744 LQ (Buffels Jag)	23°42'55.98"S	27°27'30.40"E		6 th May 2021	12:38	Sampled
DB10	Pontes Estate 744 LQ (Buffels Jag)	23°43'28.90"S	27°26'41.33"E		6 th May 2021	12:41	Sampled
DB11	Pontes Estates 712 LQ	23°44'4.06"S	27°25'46.60"E	Damon Nell/ Enock Machete	6 th May 2021	11:54	Dust bucket tampered with (Dust stand and bucket was found on the ground approximately 10m away from the installation site)
DB12	Not applicable				Access restrictions present. New localities to be installed during July 2021.		
DB13							
DB14							

Document No:	MON-AQR-244-20_21 (21-05)	 Environmental Assurance (Pty) Ltd	Client Restricted
Revision:	0.1		Author: D Nell
Date:	April 2021		13

GBN-JV Air Quality Monitoring							
Locality ID	Description	Co-ordinates		Sampler Name	Sampling Date	Sampling Time	Comments
		Latitude	Longitude				
DB15	Servitude Road	23°46'41.92"S	27°25'52.99"E		5 th May 2021	13:16	Sampled
DB16	Servitude Road	23°47'39.91"S	27°25'39.16"E		5 th May 2021	13:20	Sampled
DB17	Servitude Road	23°49'17.37"S	27°25'15.13"E	Damon Nell/ Enock Machete	5 th May 2021	13:27	Sampled
DB18	Servitude Road	23°50'5.11"S	27°25'4.54"E		5 th May 2021	12:31	Sampled
DB19	Servitude Road	23°50'36.53"S	27°24'56.77"E		5 th May 2021	12:23	Sampled
DB20	Servitude Road	23°51'5.81"S	27°24'49.59"E		5 th May 2021	12:20	Sampled
DB21	Servitude Road	23°51'43.25"S	27°24'40.22"E		5 th May 2021	12:17	Sampled
DB22	Servitude Road	23°52'22.70"S	27°24'31.05"E		5 th May 2021	12:14	Sampled
DB23	Servitude Road	23°53'36.73"S	27°24'13.40"E		5 th May 2021	12:10	Sampled
DB24	Servitude Road	23°53'39.51"S	27°24'12.55"E	Damon Nell/ Enock Machete	5 th May 2021	12:06	Sampled
DB25	Servitude Road	23°54'1.90"S	27°24'6.76"E		5 th May 2021	12:04	Sampled
DB26	Servitude Road	23°54'46.08"S	27°23'56.64"E		5 th May 2021	12:00	Sampled
DB27	Servitude Road	23°55'22.69"S	27°23'47.77"E		5 th May 2021	11:58	Sampled
DB28	Servitude Road	23°56'29.84"S	27°23'31.71"E		5 th May 2021	11:53	Sampled
DB29	Servitude Road	23°57'11.41"S	27°23'28.14"E	Damon Nell/ Enock Machete	5 th May 2021	11:50	Sampled
DB30	Servitude Road	23°57'58.79"S	27°23'37.97"E		5 th May 2021	11:46	Sampled
DB31	Servitude Road	23°58'36.77"S	27°23'44.50"E		5 th May 2021	11:42	Sampled
DB32	Servitude Road	23°59'45.59"S	27°23'58.25"E		5 th May 2021	11:38	Sampled
DB33	Servitude Road	24° 0'4.67"S	27°24'1.95"E		5 th May 2021	11:35	Sampled
DB34	Servitude Road	24° 0'37.82"S	27°24'8.36"E		5 th May 2021	11:30	Sampled
DB35	Servitude Road	24° 0'51.33"S	27°24'10.07"E	Damon Nell/ Enock Machete	5 th May 2021	11:28	Sampled
DB36	Servitude Road	24° 1'3.54"S	27°24'12.35"E		5 th May 2021	11:24	Sampled
DB37	Servitude Road	24° 1'7.07"S	27°24'13.15"E		5 th May 2021	11:21	Sampled
DB38	Servitude Road	24° 1'34.37"S	27°24'18.32"E		5 th May 2021	11:19	Sampled
DB39	Servitude Road	23°41'35.31"S	27°38'51.43"E		5 th May 2021	11:15	Sampled

GBN-JV Air Quality Monitoring							
Locality ID	Description	Co-ordinates		Sampler Name	Sampling Date	Sampling Time	Comments
		Latitude	Longitude				
DB40	Servitude Road	24° 2'29.74"S	27°24'28.91"E		5 th May 2021	11:13	Sampled
DB41	Servitude Road	24° 2'40.69"S	27°24'31.20"E	Damon Nell/ Enock Machete	5 th May 2021	11:10	Sampled
DB42	Servitude Road	24° 2'46.02"S	27°24'32.19"E		5 th May 2021	11:08	Sampled
DB43	Servitude Road	24° 3'21.38"S	27°24'37.93"E		5 th May 2021	11:04	Sampled
DB44	Servitude Road	24° 4'29.95"S	27°24'51.86"E		5 th May 2021	10:59	Sampled
DB45	Servitude Road	24° 4'53.87"S	27°24'55.26"E		5 th May 2021	10:24	Sampled
DB46	Servitude Road	24° 5'48.56"S	27°25'8.99"E		5 th May 2021	09:37	Sampled
DB47	Servitude Road	24° 6'2.39"S	27°25'12.90"E	Damon Nell/ Enock Machete	5 th May 2021	09:34	Sampled
DB48	Servitude Road	24° 6'33.52"S	27°25'21.12"E		5 th May 2021	09:30	Sampled
DB49	Servitude Road	24° 7'11.42"S	27°25'32.63"E		5 th May 2021	09:26	Sampled
DB50	Servitude Road	24° 7'50.30"S	27°25'43.01"E		5 th May 2021	09:22	Sampled
DB51	Servitude Road	24° 8'36.82"S	27°25'56.47"E		5 th May 2021	09:18	Sampled
DB52	Servitude Road	24° 9'10.22"S	27°26'5.85"E		5 th May 2021	09:15	Sampled
DB53	Servitude Road	24° 9'23.38"S	27°26'10.00"E	Damon Nell/ Enock Machete	5 th May 2021	09:12	Sampled
DB54	Servitude Road	24° 9'56.57"S	27°26'19.10"E		5 th May 2021	09:09	Sampled
DB55	Servitude Road	24°10'32.51"S	27°26'26.49"E		5 th May 2021	09:06	Sampled
DB56	Servitude Road	24°10'55.15"S	27°26'36.17"E		5 th May 2021	08:55	Sampled
DB57	Servitude Road	24°11'38.61"S	27°26'48.79"E		5 th May 2021	08:59	Sampled
DB58	Servitude Road	24°11'49.30"S	27°26'51.53"E		5 th May 2021	06:22	Sampled
DB59	Servitude Road	24°12'25.42"S	27°26'59.45"E	Damon Nell/ Enock Machete	5 th May 2021	08:42	Sampled
DB60	Servitude Road	24°13'6.00"S	27°26'59.07"E		5 th May 2021	08:37	Sampled
DB61	Servitude Road	24°14'34.19"S	27°26'58.48"E		5 th May 2021	08:31	Sampled
DB62	Servitude Road	24°14'49.64"S	27°26'58.86"E		5 th May 2021	08:27	Sampled
DB63	Servitude Road	24°15'19.44"S	27°26'58.33"E		5 th May 2021	08:23	Sampled
DB64	Servitude Road	24°16'6.23"S	27°26'58.26"E		5 th May 2021	08:20	Sampled

GBN-JV Air Quality Monitoring							
Locality ID	Description	Co-ordinates		Sampler Name	Sampling Date	Sampling Time	Comments
		Latitude	Longitude				
DB65	Servitude Road	24°16'42.57"S	27°26'57.57"E	Damon Nell/ Enock Machete	5 th May 2021	08:17	Sampled
DB66	Servitude Road	24°17'26.82"S	27°26'56.01"E		5 th May 2021	08:13	Sampled
DB67	Servitude Road	24°18'14.46"S	27°26'56.97"E		5 th May 2021	08:09	Sampled
DB68	Servitude Road	24°18'49.52"S	27°26'57.63"E		5 th May 2021	08:05	Sampled
DB69	Servitude Road	24°19'31.03"S	27°26'56.52"E		5 th May 2021	08:02	Sampled
DB70	Servitude Road	24°20'4.26"S	27°26'56.14"E		5 th May 2021	07:58	Sampled
DB71	Servitude Road	24°20'45.70"S	27°26'55.87"E	Damon Nell/ Enock Machete	5 th May 2021	07:55	Sampled
DB72	Servitude Road	24°21'48.85"S	27°26'55.81"E		5 th May 2021	07:50	Sampled
DB73	Servitude Road	24°23'9.52"S	27°26'54.85"E		5 th May 2021	07:44	Sampled
DB74	Between Tarentaalpan 132 KQ portion 2 and Diepkuil 135 Portion 5	24°23'21.10"S	27°26'33.71"E		5 th May 2021	07:41	Sampled
DB75	Between Tarentaalpan 132 KQ portion 2 and Diepkuil 135 Portion 5	24°23'31.60"S	27°26'13.03"E		5 th May 2021	07:38	Sampled
DB76	Between Tarentaalpan 132 KQ portion 2 and Diepkuil 135 Portion 5	24°23'53.46"S	27°25'19.77"E		5 th May 2021	07:34	Sampled
DB77	Along the R510	24°24'24.61"S	27°24'3.45"E	Damon Nell/ Enock Machete	5 th May 2021	07:29	Sampled
DB78	Along the R510	23°41'35.31"S	27°38'51.43"E		5 th May 2021	17:29	Sampled
DB79	Along the R510	24°25'29.93"S	27°24'23.06"E		4 th May 2021	15:48	Sampled
DB80	Between Zondagsuil 137 KQ and Diepkuil 135 KQ portion 1	24°25'33.45"S	27°24'13.50"E		4 th May 2021	15:46	Sampled
DB81	Between Zondagsuil 137 KQ and Diepkuil 135 KQ portion 1	24°25'47.88"S	27°23'10.20"E		4 th May 2021	15:41	Sampled
DB82	Between Buffelsvley 127 KQ and Karoobult 126 KQ	24°26'31.14"S	27°21'39.92"E		4 th May 2021	15:20	Sampled
DB83	Between Buffelsvley 127 KQ and Karoobult 126 KQ	24°27'9.88"S	27°20'11.67"E	Damon Nell/ Enock Machete	4 th May 2021	15:15	Sampled
DB84	Paarl 124 KQ Portion 6	24°28'20.86"S	27°17'27.36"E		4 th May 2021	13:09	Sampled
DB85	Paarl 124 KQ Portion 3	24°30'0.19"S	27°16'58.48"E		4 th May 2021	12:31	Sampled

Document No:
Revision:
Date:

MON-AQR-244-20_21 (21-05)
0.1
April 2021


 Environmental Assurance (Pty) Ltd

Client Restricted
Author: D Nell
16

GBN-JV Air Quality Monitoring							
Locality ID	Description	Co-ordinates		Sampler Name	Sampling Date	Sampling Time	Comments
		Latitude	Longitude				
DB86	D769 dirt road	24°31'38.11"S	27°16'29.83"E		4 th May 2021	11:54	Sampled
DB87	D769 dirt road	24°33'53.16"S	27°18'16.95"E		4 th May 2021	11:44	Sampled
DB88	Within small community near Stratford 462 KQ	24°34'14.79"S	27°18'36.10"E		4 th May 2021	09:14	Sampled
DB89	Near Primary School	24°34'24.25"S	27°18'35.18"E	Damon Nell/ Enock Machete	4 th May 2021	09:20	Sampled
DB90	Mooivallei 342 KQ – Portion 1	24°35'35.70"S	27°17'45.31"E		4 th May 2021	11:30	Sampled
DB91	Mooivallei 342 KQ – Portion 2	24°35'59.20"S	27°17'38.40"E		4 th May 2021	14:00	Sampled
DB92	Mooivallei 342 KQ – Portion 4	24°36'25.02"S	27°17'49.23"E		4 th May 2021	11:11	Sampled
DB93	Mooivallei 342 KQ – Portion 7	24°36'51.37"S	27°18'27.13"E		4 th May 2021	10:52	Sampled
DB94	Mooivallei 342 KQ – Portion 9	24°37'18.10"S	27°18'45.97"E		4 th May 2021	11:00	Sampled
DB95	D729 dirt road	24°38'3.48"S	27°18'54.13"E	Damon Nell/ Enock Machete	4 th May 2021	07:33	Sampled
DB96	Exxaro	23°41'25.22"S	27°34'18.42"E		6 th May 2021	10:59	Stand Installed
DB97	Between Zondagsuil 137 KQ and Diepkuil 135 KQ portion 1	24°26'15.46"S	27°22'29.41"E		4 th May 2021	15:38	Sampled
DB98	Buffelsvley 127 KQ	24°26'48.84"S	27°18'57.38"E		4 th May 2021	15:00	Sampled
DB99	D769 dirt road	24°32'48.86"S	27°17'24.55"E		4 th May 2021	11:50	Sampled
DB100	Mooivallei 342 KQ – Portion 1	24°35'5.76"S	27°18'49.94"E		4 th May 2021	11:58	Sampled

7.2. PARTICULATE MATTER RESULTS

Particulate matter will be measured at the three (3) stationed Met One E-Samplers and compared to the SANS 1929:2011 24-hour limit of 75 mg/m³ for both PM₁₀ and PM_{2.5} to determine compliance. The monitoring results will be presented within the July 2021 Report when monitoring is initiated.

7.3. GRAVIMETRIC DUST FALLOUT RESULTS

It should be noted that the stands were installed end of March 2021 and collected early May 2021. During the monthly monitoring period ninety-six (96) out of the one-hundred (100) samples have been obtained from the dust monitoring programme. Based on the gravimetric dust fallout results, three (3) exceedances of Residential Limit exceedances of 600 mg/m²/day were recorded at DB 86, DB 88 and DB 99, while the Industrial Limit of 1200 mg/m²/day was exceeded at the DB 87 monitoring locality. The highest value was recorded at the DB 87 monitoring point during the March to April 2021 monitoring period, measured at 2167 mg/m²/day. The monthly median was measured at 13 mg/m²/day, well below the residential limit. All sample localities which recorded exceedances during the monitoring period are situated near the D769 dirt road. As sample locality DB88 is situated within a small housing community, exceedances in residential limits of dust fall out should be closely monitored with dust suppression strategies being implemented if exceedances continue. Apart from this, no major activities at the proposed pipeline area, with minimal air pollution.

Gravimetric dust fallout can be classified according to SANS 1929: 2011 standard into four categories or levels. The first category consists of monitoring stand values that are below 600 mg/m²/day and thus can be classified as Ideal namely:

- Ninety-one (91) of the sampled monitoring points fell into this category during the monitoring period.

The second category consists of monitoring points with gravimetric dust fallout between 600 mg/m²/day and 1200 mg/m²/day. This category can be classified as Acceptable to Tolerable.

- Three (3) of the monitoring points (DB 86, DB 88 and DB 99) fell into this category during the monitoring period.

The third category consists of monitoring points with gravimetric dust fallout between 1200 mg/m²/day and 2400 mg/m²/day. This category can be classified as unacceptable and must be reported if it continues for more than two consecutive months or three months in total per year.

- One (1) of the monitoring points (DB 87) fell into this category during the monitoring period.

The fourth category consists of monitoring points exceeding dust fallout of 2400 mg/m²/day. This category is classified as alert, immediate action and remediation required followed the first incident of dust fallout exceedance.

- None of the monitoring points fell into this category during the monitoring period.

Table 6: Gravimetric Dust Fallout Results

GBN-JV Air Quality Results		
Gravimetric Dust Fallout (mg/m ² /day)		
Location	March to April 2021	Median
DB - 1	21	21
DB - 2	170	170
DB - 3	27	27
DB - 4	75	75
DB - 5	127	127
DB - 6	41	41
DB - 7	134	134
DB - 8	61	61
DB - 9	91	91
DB - 10	46	46
DB - 11	No Sample – Dust bucket tampered with (Dust stand and bucket was found on the ground approximately 10m away from the installation site)	-
DB - 12	No access – Newly identified localities to be installed during July 2021	-
DB - 13		-
DB - 14		-
DB - 15	6	6
DB - 16	10	10
DB - 17	11	11
DB - 18	39	39
DB - 19	5	5
DB - 20	14	14
DB - 21	12	12
DB - 22	14	14
DB - 23	2	2
DB - 24	11	11
DB - 25	7	7
DB - 26	4	4
DB - 27	14	14
DB - 28	18	18
DB - 29	4	4
DB - 30	92	92
DB - 31	13	13

GBN-JV Air Quality Results

Gravimetric Dust Fallout (mg/m²/day)

Location	March to April 2021	Median
DB - 32	244	244
DB - 33	10	10
DB - 34	13	13
DB - 35	11	11
DB - 36	2	2
DB - 37	8	8
DB - 38	8	8
DB - 39	5	5
DB - 40	3	3
DB - 41	3	3
DB - 42	10	10
DB - 43	9	9
DB - 44	7	7
DB - 45	14	14
DB - 46	7	7
DB - 47	6	6
DB - 48	15	15
DB - 49	3	3
DB - 50	1	1
DB - 51	1	1
DB - 52	42	42
DB - 53	11	11
DB - 54	13	13
DB - 55	8	8
DB - 56	8	8
DB - 57	6	6
DB - 58	3	3
DB - 59	1	1
DB - 60	6	6
DB - 61	5	5
DB - 62	10	10
DB - 63	4	4
DB - 64	11	11
DB - 65	13	13

GBN-JV Air Quality Results

Gravimetric Dust Fallout (mg/m²/day)

Location	March to April 2021	Median
DB - 66	168	168
DB - 67	14	14
DB - 68	10	10
DB - 69	6	6
DB - 70	85	85
DB - 71	13	13
DB - 72	13	13
DB - 73	48	48
DB - 74	3	3
DB - 75	39	39
DB - 76	16	16
DB - 77	39	39
DB - 78	13	13
DB - 79	133	133
DB - 80	279	279
DB - 81	42	42
DB - 82	12	12
DB - 83	46	46
DB - 84	2	2
DB - 85	15	15
DB - 86	886	886
DB - 87	2167	2167
DB - 88	969	969
DB - 89	119	119
DB - 90	40	40
DB - 91	78	78
DB - 92	315	315
DB - 93	45	45
DB - 94	48	48
DB - 95	142	142
DB - 96	No access. Stand installed during May 2021	-
DB - 97	47	47
DB - 98	34	34

GBN-JV Air Quality Results

Gravimetric Dust Fallout (mg/m²/day)

Location	March to April 2021	Median
DB - 99	1085	1085
DB - 100	138	138
3 Month Median	13	Total Median
Residential Limit	600	
Industrial Limit	1200	13
1 Month average	13	Industrial Limit Exceedances:
Max	2167	
Min	1	

Legend

No Sample	-
Residentially acceptable	
Acceptable for Industrial use	
Industrial Exceedance	
Unacceptable/ Warning	

7.4. WEATHER DATA

The possibility of emissions becoming a nuisance is determined by various factors. Specifically, PM₁₀ (dust) is mostly transported by air movement and as such wind and wind intensity can help determine the effective range of travel of pollutants. To determine possible areas that could be affected the wind rose data must be studied and interpreted. The following section provides an interpretation of the areas that could possibly be affected, by assessing the direction the wind is coming from and the areas the wind would deposit transported dust as reasonably expected.

The following graphs provides an insight into the wind conditions versus the areas which would be affected during the current monitoring period. From Table 7 & 8 and Figure 7 & 8, it is clear that from the average dominating wind direction data that the dominant wind is from a northern direction and to a lesser extent from an north-northeast, east-northeast and southwest directions. Moreover, average wind speeds presented a light air to light breeze (0.6 – 1.9 m/s) during the monitoring period.

Table 7: Wind Direction

Wind Direction: March to May 2021	
Direction	Direction Frequency
North	30
NNE	20
NE	7
ENE	20
East	18
ESE	5
SE	3
SSE	9
South	8
SSW	5
SW	20
WSW	19
West	14
WNW	4
NW	7
NNW	11

Table 8: Average Wind Speeds

Average Wind Speeds: March to May 2021	
Day of Month	Wind Speed (m/s)
29	1.3
30	1.1
31	1.5
1	1.0
2	0.9
3	1.0
4	1.4
5	0.9
6	1.9
7	1.3
8	1.3
9	0.8
10	0.9
11	1.1
12	1.1
13	1.0
14	0.6
15	0.9
16	1.3
17	1.5
18	1.0
19	1.0
20	0.9
21	0.8
22	0.6
23	0.9
24	1.1
25	1.1
26	0.9
27	0.9
28	0.8
29	1.3
30	1.1
1	1.5
2	1.3
3	1.0
4	0.8

5	0.9
6	0.6
Max	1.9
Min	0.6

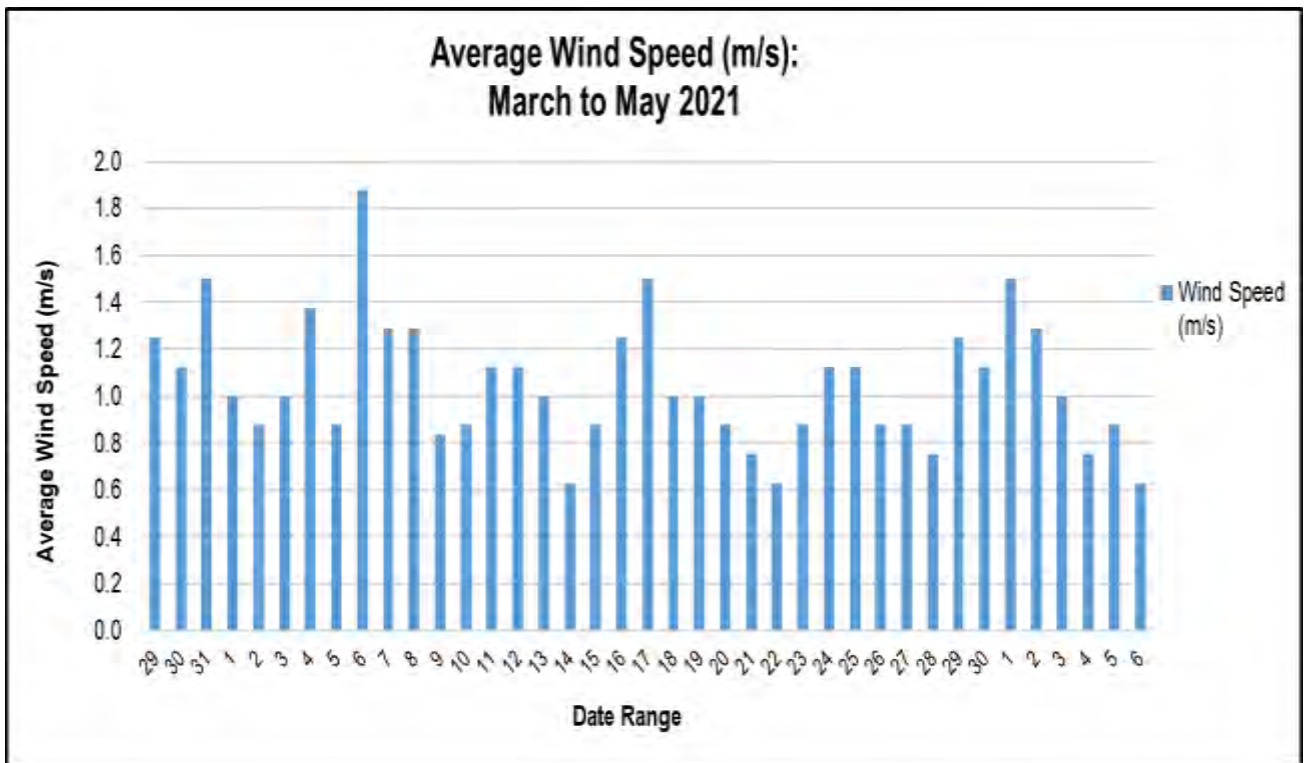


Figure 5: Wind Direction Frequency Average

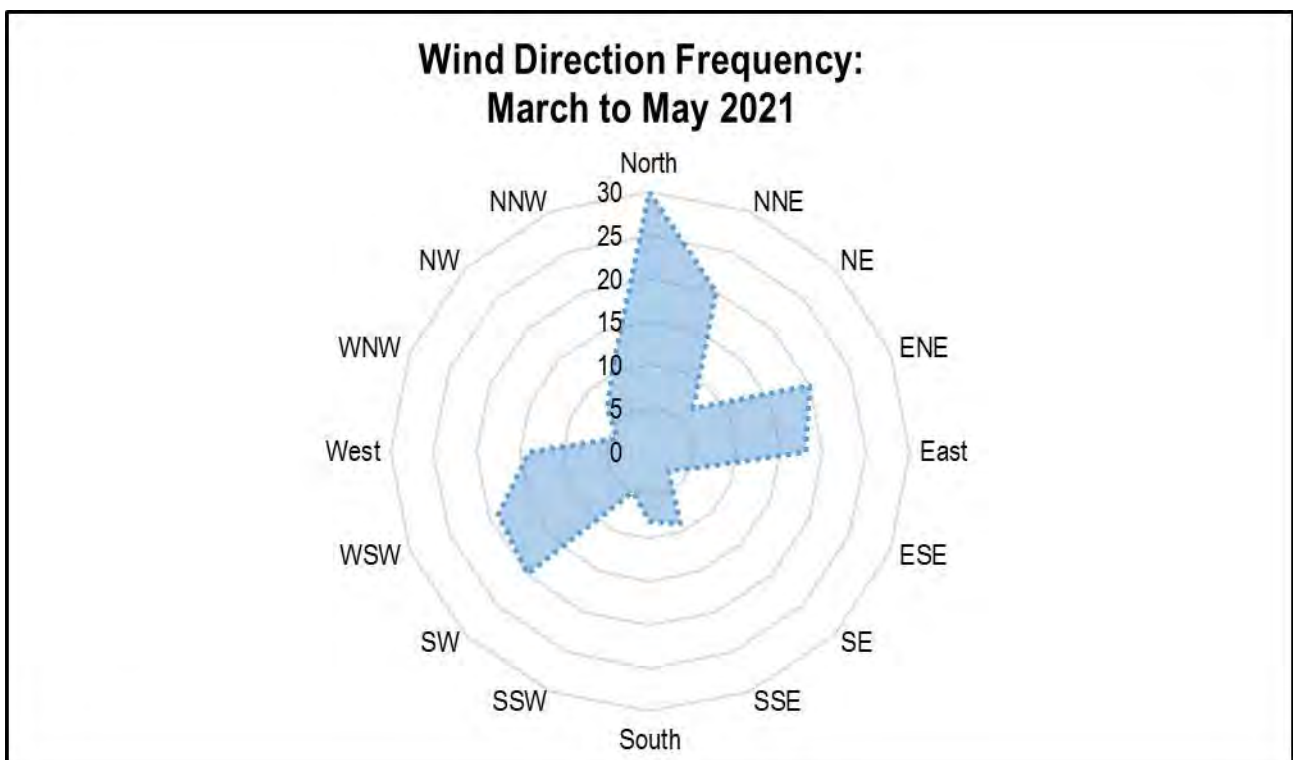


Figure 6: Windrose Diagram

Table 9: Beaufort Wind Force Scale

Beaufort Wind Force Scale			
Number	Wind speed (m/s)	Description	Land Conditions
0	<0.3 m/s	Calm	Calm. Smoke rises vertically
1	0.3–1.5 m/s	Light air	Wind motion visible in smoke.
2	1.6–3.3 m/s	Light breeze	Wind felt on exposed skin. Leaves rustle.
3	3.4–5.5 m/s	Gentle breeze	Leaves and smaller twigs in constant motion.
4	5.5–7.9 m/s	Moderate breeze	Dust and loose paper raised. Small branches begin to move.
5	8.0–10.7 m/s	Fresh breeze	Branches of a moderate size move. Small trees begin to sway.
6	10.8–13.8 m/s	Strong breeze	Large branches in motion. Whistling heard in overhead wires. Umbrella use becomes difficult. Empty plastic garbage cans tip over.
7	13.9–17.1 m/s	High wind, moderate gale, near gale	Whole trees in motion. Effort needed to walk against the wind. Swaying of skyscrapers may be felt, especially by people on upper floors.
8	17.2–20.7 m/s	Fresh gale	Twigs broken from trees. Cars veer on road.
9	20.8–24.4 m/s	Strong gale	Larger branches break off trees, and some small trees blow over. Construction/temporary signs and barricades blow over. Damage to circus tents and canopies.
10	24.5–28.4 m/s	Whole gale, storm	Trees are broken off or uprooted, saplings bent and deformed, poorly attached asphalt shingles and shingles in poor condition peel off roofs.
11	28.5–32.6 m/s	Violent storm	Widespread vegetation damage. More damage to most roofing surfaces, asphalt tiles that have curled up and/or fractured due to age may break away completely.
12	≥32.7 m/s	Hurricane force	Considerable and widespread damage to vegetation, a few windows broken, structural damage to mobile homes and poorly constructed sheds and barns. Debris may be hurled about.

Table 10: Rainfall

Rainfall Summary: March to May 2021	
Day of Month	Rainfall (mm)
9	0.4
10	0.4
30	19.0
1	6.0
Total	25.8

*Rainfall was not recorded on the omitted days

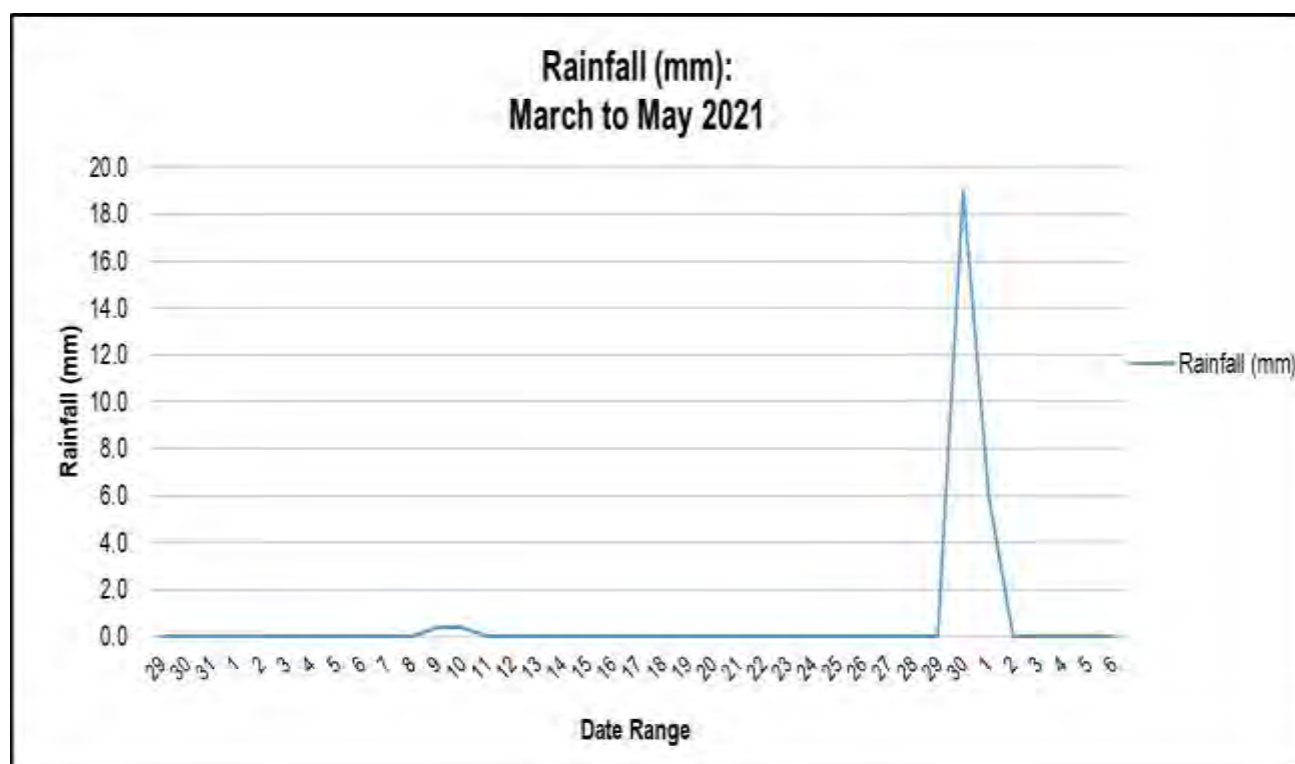


Figure 7: Rainfall for monitoring period

8. CONCLUSION AND ASPECTS TO CONSIDER

The air quality measured in the proposed area is considered in general fair condition as per the results obtained, while it should be noted that currently operations are not present and the levels representative of the non-disturbed ambient air quality conditions.

It is assumed that the construction of the planned pipeline will contribute to the total suspended load in the atmosphere, although off-site impacts are not expected and the impact is anticipated to be largely local and centralised within the site area. From the sampling and meteorological data obtained, exceedances may be present within the construction and operational phase in terms of dust generation within the core activity. In order to ensure and prevent this possible outcome, pertinent measures are provided in this report to enable the proposed development to minimise the impact.

9. PROPOSED MITIGATION AND POLLUTION PREVENTION MEASURES DURING FUTURE CONSTRUCTION

Aspect: Stakeholder Communication	
1	Implement a programme of stakeholder communication that includes community engagement before and during work undertaken on site.
2	Provide a complaints register on site where complaints can be made. This register should enable effective communication of complaints where these are reasonably addressed.
3	Clearly display the contact details of the environmental site office and manager at the construction camps.
Aspect: Dust Management	
4	Implement and maintain a Dust and Emission Management Plan which provides clear details on preventing, maintaining and improving the air quality in terms of site-specific activities.
Aspect: Site Management	
5	All complaints should be logged in the complaints register and should be available on the site at all times. All complaints regarding air quality should be adequately investigated and actions taken to reduce the impact in a timely manner should it be required.
6	Note must be taken of incidents that cause air emissions and this must be recorded to ensure that these are resolved and prevented from reoccurring.
Aspect: Monitoring	
7	Weekly site inspections should be undertaken in the vicinity of sensitive receptors. Records should be made of these routine inspections.
8	Should activities be undertaken during dry and windy conditions, special focus must be taken on the impact and results of the conditions to ensure that minimal impact is occurring.
Aspect: Preparing and maintaining the site	

9	Plan the site layout in such a manner as to ensure that emission generating activities occur as far as possible from sensitive receptors. Make use of site offices and large natural barriers.
10	Should the conditions require it, erect screens and barriers around the sensitive receptors.
11	Ensure that all areas, fencing, barriers and scaffolding is kept clear of debris and dust.
12	Remove any accumulating matter that could serve as emission generator from the site as soon as possible.
Aspect: Operating vehicle/machinery and sustainable travel	
13	Ensure that all vehicles are maintained in good working condition and that they are serviced on regular intervals.
14	Ensure that all vehicles are switched off when stationary – no vehicles should be idling for extended period.
15	Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable.
16	Impose and regulate a speed limit.
Aspect: Operations	
17	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
18	Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible.
19	Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
Waste management	
20	Only use registered waste carriers to take waste off-site.
21	No bonfires and burning of waste materials. No incineration to take place on site except if authorised by the relevant competent authority.
Measures specific to earthworks	
22	Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable. Use Hessian, mulches or tackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable. Only remove the cover in a small area during work and not all at once.
Aspect: Measures specific to construction	
23	Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
24	Ensure cement and other fine powder materials are delivered in enclosed tankers and stored in appropriate storage with suitable emission control systems to prevent escape of material and overfilling during delivery.
25	For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust.
Aspect: Measures specific to track-out	
26	Use water-assisted dust sweeper(s) on the access roads (where practical) to remove, as soon as practicable any material tracked out of the site.


27	Avoid dry sweeping of large areas.
28	Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
29	Record all inspections of haul routes and any subsequent action in a site log book.
30	Install hard surfaced routes (compaction), which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowzers and regularly cleaned.
31	Inspect surfaced routes for integrity and instigate necessary repairs to the surface as soon as practicable.

Aspects	Management action or objective	Responsible Person(s)	Timeframe
Removal of Vegetation	<ul style="list-style-type: none"> Spray areas to be cleared with water. Ensure minimum travel distance between working areas and stockpiles. Ensure that topsoil for stockpiles is sprayed with water before tipping to prevent dust generation. Ensure graded areas are sprayed with water. Minimise the amount of graded areas. Ensure that shortest routes are used for material transport. Load and offload material, as far as possible, downwind of stockpiles. Actively monitor dust fallout generated on the borders of the site. Implement monthly site inspection to check for possible areas of dust generation not addressed or not effectively managed. 	Environmental Site Officer Contractors & Sub-Contractor Safety and Environmental Officers	Duration of the construction phase
Land clearing			
Excavation			
Material Transport			
Material Handling			
Construction			

10. REFERENCES

- ASTM Standard (1739-98). 2004 (Reapproved 2017). Standard Test Method for Collection and Measurement of Dustfall (Settleable Particulate Matter). United States.
- GNR 827. 2013. National Environmental Management: Air Quality Act, Act No. 39 of 2004. Government Gazette 36974.
- South African National Standards (SANS) 1929. 2011. Ambient Air Quality- Limits for Common Pollutants. Ed. 2. ISBN 978-0-626-26919-7. South Africa.

APPENDIX A – EQUIPMENT CHECKLIST

Description	Serial No.	Quantity	Date Checked	Checked By
COVID-19				
Gloves		1 x Box	4-May-21	DN
Disinfectant		1 x 2 Liter Bottle	4-May-21	DN
Covid-19 Mask		1 x Person	4-May-21	DN
DOCUMENTS				
Project specific sampling field form		1	4-May-21	DN
Project specific Laboratory Analysis Request Form and Chain or Custody Form		1	4-May-21	DN
Project Specific monitoring localities and co-ordinates		1	4-May-21	DN
SAMPLING EQUIPMENT				
Sampling Containers				
5 Liter Dust Bucket		100	4-May-21	DN
Signatures:				
				

APPENDIX B – ENVASS CHAIN OF CUSTODY (COC) FORM

GBN-JV 2A-C-8.9 Air Monitoring				
No	Sample ID	Installation Date	Installation Time	Comment
1	DB01	5/5/21	16:46	P ₁₂ = 128
2	DB02	5/5/21	14:43	P ₁₂ = 127
3	DB03	5/5/21	14:34	P ₁₂ = 126
4	DB04	5/5/21	16:05	P ₁₂ = 122
5	DB05	5/5/21	16:08	P ₁₂ = 123
6	DB06	5/5/21	14:18	P ₁₂ = 126
7	DB07	5/5/21	16:21	P ₁₂ = 123
8	DB08	6/5/21	11:22	P ₁₂ = 131
9	DB09	6/5/21	12:38	P ₁₂ = 133
10	DB10	6/5/21	12:41	P ₁₂ = 134
11	DB11	6/5/21	11:56	P ₁₂ = 132
12	DB12			
13	DB13			
14	DB14			
15	DB15	5/5/21	13:16	P ₁₂ = 119
16	DB16	5/5/21	13:20	P ₁₂ = 120
17	DB17	5/5/21	13:27	P ₁₂ = 121
18	DB18	5/5/21	12:31	P ₁₂ = 118
19	DB19	5/5/21	12:23	P ₁₂ = 117
20	DB20	5/5/21	12:20	P ₁₂ = 116
21	DB21	5/5/21	12:17	P ₁₂ = 115
22	DB22	5/5/21	12:14	P ₁₂ = 114
23	DB23	5/5/21	12:10	P ₁₂ = 113
24	DB24	5/5/21	12:06	P ₁₂ = 112
25	DB25	5/5/21	12:04	P ₁₂ = 111
26	DB26	5/5/21	12:00	P ₁₂ = 110
27	DB27	5/5/21	11:58	P ₁₂ = 109
28	DB28	5/5/21	11:53	P ₁₂ = 108
29	DB29	5/5/21	11:50	P ₁₂ = 107
30	DB30	5/5/21	11:46	P ₁₂ = 106
31	DB31	5/5/21	11:42	P ₁₂ = 105
32	DB32	5/5/21	11:38	P ₁₂ = 104
33	DB33	5/5/21	11:35	P ₁₂ = 103
34	DB34	5/5/21	11:30	P ₁₂ = 102
35	DB35	5/5/21	11:28	P ₁₂ = 101
36	DB36	5/5/21	11:24	P ₁₂ = 100
37	DB37	5/5/21	11:21	P ₁₂ = 99
38	DB38	5/5/21	11:19	P ₁₂ = 98
39	DB39	5/5/2021	11:18	P ₁₂ = 97

GBN-JV 2A-C-8.9 Air Monitoring				
No	Sample ID	Installation Date	Installation Time	Comment
40	DB40	5/5/21	11:13	Pic = 96
41	DB41	5/5/21	11:10	Pic = 95
42	DB42	5/5/21	11:08	Pic = 94
43	DB43	5/5/21	11:04	Pic = 93
44	DB44	5/5/21	10:59	Pic = 92
45	DB45	5/5/21	10:24	Pic = 89
46	DB46	5/5/21	9:37	Pic = 89
47	DB47	5/5/21	9:34	Pic = 88
48	DB48	5/5/21	9:30	Pic = 87
49	DB49	5/5/21	9:26	Pic = 86
50	DB50	5/5/21	9:22	Pic = 85
51	DB51	5/5/21	9:18	Pic = 84
52	DB52	5/5/21	9:15	Pic = 83
53	DB53	5/5/21	9:12	Pic = 82
54	DB54	5/5/21	9:09	Pic = 81
55	DB55	5/5/21	9:06	Pic = 80
56	DB56	5/5/2021	8:55	Pic = 78
57	DB57	5/5/2021	8:54	Pic = 79
58	DB58	5/5/2021	6:22	Pic = 58
59	DB59	5/5/21	8:42	Pic = 77
60	DB60	5/5/21	8:37	Pic = 76
61	DB61	5/5/21	8:31	Pic = 75
62	DB62	5/5/21	8:27	Pic = 74
63	DB63	5/5/21	8:25	Pic = 73
64	DB64	5/5/21	8:20	Pic = 72
65	DB65	5/5/21	8:17	Pic = 71
66	DB66	5/5/21	8:13	Pic = 70
67	DB67	5/5/21	8:09	Pic = 69
68	DB68	5/5/21	8:05	Pic = 68
69	DB69	5/5/21	8:02	Pic = 67
70	DB70	5/5/21	7:58	Pic = 66
71	DB71	5/5/21	7:55	Pic = 65
72	DB72	5/5/21	7:50	Pic = 64
73	DB73	5/5/21	7:44	Pic = 63
74	DB74	5/5/21	7:41	Pic = 62
75	DB75	5/5/21	7:38	Pic = 61
76	DB76	5/5/21	7:34	Pic = 60
77	DB77	5/5/21	7:29	Pic = 59
78	DB78	5/5/21	17:29	Pic = 129

GBN-JV 2A-C-8.9 Air Monitoring				
No	Sample ID	Installation Date	Installation Time	Comment
79	DB79	4/5/21	15:48	Pic = 57
80	DB80	4/5/21	15:46	Pic = 51
81	DB81	4/5/21	15:41	Pic = 52
82	DB82	4/5/21	15:20	Pic = 30
83	DB83	4/5/21	15:15	Pic = 55
84	DB84	4/5/21	13:09	Pic = 45
85	DB85	4/5/21	12:51	Pic = 44 (Hand)
86	DB86	4/5/21	11:54	Pic = 54
87	DB87	4/5/21	11:44	Pic = 47
88	DB88	4/5/21	9:34	Pic = 42
89	DB89 - 789	4/5/21	9:20	Pic = 43
90	DB90	4/5/21	11:30	Pic = 40
91	DB91	4/5/21	14:00	Pic = 47 (P)
92	DB92	4/5/21	11:11	Pic = 39
93	DB93	4/5/21	10:52	Pic = 38
94	DB94	4/5/21	11:00	Pic = 37
95	DB95	4/5/21	7:33	Pic = 53 ✓
96	DB96	05-05-2021	14:25 10:57	No Access
97	DB97	4/5/21	15:38	Pic = 36
98	DB98	4/5/21	15:00	Pic = 44 (Hand)
99	DB99	4/5/21	11:50	Pic = 46 (Hand)
100	DB100	4/5/21	11:48	Pic = 41

YANKA LABORATORIES

PROM 103442020/AND/MSGL/BRAND 1001 TEL: 010 002 8448 FAX: 000211 079

SAMPLE CONDITION REPORT

CLIENT: Envasa

GBN-JV Monthly Dust

EO:

JOBNO: W18/

Adv. Note

ATTENTION: Damon, Antoni and Carl

DATE RECEIVED:

LABORATORY NUMBER	SAMPLE DESCRIPTION	SAMPLED	IL CHEMISTRY SAMPLE	500mL MICROBIOLOGY SAMPLE	SDB	BOD & COD	COMMENTS
SpEnvasa 1	DB 1	3-5-2021					36 DAYS
SpEnvasa 2	DB 2	"					"
SpEnvasa 3	DB 3	"					"
SpEnvasa 4	DB 4	"					"
SpEnvasa 5	DB 5	"					"
SpEnvasa 6	DB 6	"					"
SpEnvasa 7	DB 7	"					"
SpEnvasa 8	DB 8	6-5-2021					87 DAYS
SpEnvasa 9	DB 9	"					"
SpEnvasa 10	DB 10	"					"
SpEnvasa 11	DB 11	-					Temporal with
SpEnvasa 12	DB 12	-					No Access
SpEnvasa 13	DB 13	-					No Access
SpEnvasa 14	DB 14	-					No Access
SpEnvasa 15	DB 15	5-5-2021					36 DAYS
SpEnvasa 16	DB 16	"					"
SpEnvasa 17	DB 17	"					"
SpEnvasa 18	DB 18	"					"
SpEnvasa 19	DB 19	"					"
SpEnvasa 20	DB 20	"					"
SpEnvasa 21	DB 21	"					"
SpEnvasa 22	DB 22	"					"
SpEnvasa 23	DB 23	"					"
SpEnvasa 24	DB 24	"					"
SpEnvasa 25	DB 25	"					"
SpEnvasa 26	DB 26	"					"
SpEnvasa 27	DB 27	"					"
SpEnvasa 28	DB 28	"					"
SpEnvasa 29	DB 29	"					"
SpEnvasa 30	DB 30	"					"
		TOTAL SAMPLES					4

Analysis Required: Domestic (General)

Sample:

MB

Selected:

RECEIVED BY: *Nadine Higgs on 10/05/21*

DELIVERED BY:

W:\Forms\SampleConditionReport.docx

PAGE 1 OF 1

APPENDIX C – MONITORING LOCALITY SUMMARY TABLE

Air Quality Monitoring Localities:

DB 01	
<p>Location: 23°40'41.16"S; 27°36'4.24"E</p> <p>Farm: Grootestryd 465 LQ Portion 5</p> <p>Description: Near Matimba Power Station</p>	
March 2021	Date Installed: 31 st March 2021
April 2021	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>

Location: 23°40'52.25"S; 27°36'2.03"E

Farm: Grootestryd 465 LQ Portion 5

Description: Near Matimba Power Station



March 2021

Date Installed: 31st March 2021

April 2021

Date Sampled: 5th May 2021

Sample Status: Sampled

Air Quality Class: Ideal

<p>Location: 23°41'37.30"S; 27°33'44.10"E</p> <p>Farm: Turfvlakte 463 LQ</p> <p>Description: Next to D1675</p>	
<p>March 2021</p>	<p>Date Installed: 31st March 2021</p>
<p>April 2021</p>	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>

Location: 23°41'57.80"S; 27°32'48.26"E

Farm: Hierontrent 460 LQ

Description: Next to D1675



March 2021

Date Installed: 31st March 2021

April 2021

Date Sampled: 5th May 2021

Sample Status: Sampled

Air Quality Class: Ideal

<p>Location: 23°42'13.03"S, 27°31'52.68"E</p> <p>Farm: Eenzaamheid 687 LO</p> <p>Description: Next D1675</p>	
<p>March 2021</p>	<p>Date Installed: 31st March 2021</p>
<p>April 2021</p>	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>

<p>Location: 23°42'29.97"S, 27°30'32.64"E</p> <p>Farm: Eenzaamheid 687 LO</p> <p>Description: Next to D1675</p>	
<p>March 2021</p>	<p>Date Installed: 31st March 2021</p>
<p>April 2021</p>	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>

<p>Location: 23°42'32.26"S, 27°29'48.38"E</p> <p>Farm: Eenzaamheid 687 LO</p> <p>Description: Next to D1675</p>	
<p>March 2021</p>	<p>Date Installed: 31st March 2021</p>
<p>April 2021</p>	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>

Location: 23°42'43.21"S, 27°27'48.78"E Farm: Pontes Estate 744 LQ Description: Outside farm gate next D1675		
March 2021	Date Installed: 31 st March 2021	
April 2021	Date Sampled: 6 th May 2021 Sample Status: Sampled Air Quality Class: Ideal	

Location: 23°42'55.98"S, 27°27'30.40"E

Farm: Pontes Estate 744 LQ (Buffels Jag)



March 2021

Date Installed: 31st March 2021

April 2021

Date Sampled: 6th May 2021

Sample Status: Sampled

Air Quality Class: Ideal

DB 10

<p>Location: 23°43'28.90"S, 27°26'41.33"E</p> <p>Farm: Pontes Estate 744 LQ (Buffels Jag)</p>	
March 2021	Date Installed: 31 st March 2021
April 2021	<p>Date Sampled: 6th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>

DB 11	
<p>Location: 23°44'4.06"S, 27°25'46.60"E</p> <p>Farm: Pontes Estates 712 LQ</p> <p>Description: Border fence of Enkeldraai 718 LQ</p>	
March 2021	Date Installed: 31 st March 2021
April 2021	<p>Date Sampled: 6th May 2021</p> <p>Sample Status: Tampered with (Attempted theft)</p> <p>Air Quality Class: Ideal</p>

DB 12	
<p>Location: N/A</p> <p>Farm: N/A</p> <p>Description: N/A</p>	Required to be relocated during July 2021

DB 13	
<p>Location: N/A</p> <p>Farm: N/A</p> <p>Description: N/A</p>	Required to be relocated during July 2021

DB 14	
Location: N/A Farm: N/A Description: N/A	Required to be relocated during July 2021

DB 15	
Location: 23°46'41.92"S, 27°25'52.99"E Farm: Zandnek 358 LQ Portion 1 Description: Servitude Road	
March 2021	Date Installed: 31 st March 2021
April 2021	Date Sampled: 5 th May 2021 Sample Status: Sampled Air Quality Class: Ideal

<p>Location: 23°47'39.91"S, 27°25'39.16"E</p> <p>Farm: Renosterpan 361 Portion 6</p> <p>Description: Servitude Road</p>	
<p>March 2021</p>	<p>Date Installed: 31st March 2021</p>
<p>April 2021</p>	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>

<p>Location: 23°49'17.37"S, 27°25'15.13"E</p> <p>Farm: Renosterpan 361 Portion 3</p> <p>Description: Servitude Road</p>	
<p>March 2021</p>	<p>Date Installed: 31st March 2021</p>
<p>April 2021</p>	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>

<p>Location: 23°50'5.11"S, 27°25'4.54"E</p> <p>Farm: Renosterpan 361 Portion 4</p> <p>Description: Servitude Road</p>		
March 2021	Date Installed: 30 th March 2021	
April 2021	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>	

<p>Location: 23°50'36.53"S, 27°24'56.77"E</p> <p>Farm: Renosterpan 361 Portion 4</p> <p>Description: Servitude Road</p>	
<p>March 2021</p>	<p>Date Installed: 30th March 2021</p>
<p>April 2021</p>	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>

<p>Location: 23°51'5.81"S, 27°24'49.59"E</p> <p>Farm: Renosterpan 361 Portion 5</p> <p>Description: Servitude Road</p>		
March 2021	Date Installed: 30 th March 2021	
April 2021	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>	

<p>Location: 23°51'43.25"S, 27°24'40.22"E</p> <p>Farm: Naauwpoort 365 LQ</p> <p>Description: Servitude Road</p>	
<p>March 2021</p>	<p>Date Installed: 30th March 2021</p>
<p>April 2021</p>	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>

<p>Location: 23°52'22.70"S, 27°24'31.05"E</p> <p>Farm: Naauwpoort 365 LQ</p> <p>Description: Servitude Road</p>	
<p>March 2021</p>	<p>Date Installed: 30th March 2021</p>
<p>April 2021</p>	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>

<p>Location: 23°53'36.73"S, 27°24'13.40"E</p> <p>Farm: Rooipan 357 LQ Portion 2</p> <p>Description: Servitude Road</p>	
<p>March 2021</p>	<p>Date Installed: 30th March 2021</p>
<p>April 2021</p>	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>

<p>Location: 23°53'39.51"S, 27°24'12.55"E</p> <p>Farm: Rooipan 357 LQ Portion 4</p> <p>Description: Servitude Road</p>		
March 2021	Date Installed: 29 th March 2021	
April 2021	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>	

<p>Location: 23°54'1.90"S, 27°24'6.76"E</p> <p>Farm: Rooipan 357 LQ Portion 4</p> <p>Description: Servitude Road</p>		
March 2021	Date Installed: 29 th March 2021	
April 2021	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>	

<p>Location: 23°54'46.08"S, 27°23'56.64"E</p> <p>Farm: Rooipan 357 LQ Portion 4</p> <p>Description: Servitude Dam</p>	
<p>March 2021</p>	<p>Date Installed: 29th March 2021</p>
<p>April 2021</p>	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>

Location: 23°55'22.69"S, 27°23'47.77"E

Farm: Zandfontein Portion 2

Description: Servitude Road



March 2021

Date Installed: 29th March 2021

April 2021

Date Sampled: 5th May 2021

Sample Status: Sampled

Air Quality Class: Ideal

Location: 23°56'29.84"S, 27°23'31.71"E

Farm: Zandfontein Portion 2

Description: Servitude Road



March 2021

Date Installed: 29th March 2021

April 2021

Date Sampled: 5th May 2021

Sample Status: Sampled

Air Quality Class: Ideal

<p>Location: 23°57'11.41"S, 27°23'28.14"E</p> <p>Farm: Diepspruit 386 LQ</p> <p>Description: Servitude Road</p>	
<p>March 2021</p>	<p>Date Installed: 29th March 2021</p>
<p>April 2021</p>	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>

<p>Location: 23°57'58.79"S, 27°23'37.97"E</p> <p>Farm: Diepspruit 386 LQ</p> <p>Description: Servitude Road</p>		
March 2021	Date Installed: 29 th March 2021	
April 2021	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>	

<p>Location: 23°58'36.77"S, 27°23'44.50"E</p> <p>Farm: Mabulskop 406 LQ</p> <p>Description: Servitude Road</p>	
<p>March 2021</p>	<p>Date Installed: 29th March 2021</p>
<p>April 2021</p>	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>

<p>Location: 23°59'45.59"S, 27°23'58.25"E</p> <p>Farm: Mabulskop 406 LQ</p> <p>Description: Servitude Road</p>		
March 2021	Date Installed: 29 th March 2021	
April 2021	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>	

<p>Location: 24° 0'4.67"S, 27°24'1.95"E</p> <p>Farm: Groenland 397 LQ Portion 2</p> <p>Description: Servitude Road</p>	
<p>March 2021</p>	<p>Date Installed: 29th March 2021</p>
<p>April 2021</p>	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>

Location: 24° 0'37.82"S, 27°24'8.36"E Farm: Groenland 397 LQ Portion 2 Description: Servitude Road		
March 2021	Date Installed: 29 th March 2021	
April 2021	Date Sampled: 5 th May 2021 Sample Status: Sampled Air Quality Class: Ideal	

<p>Location: 24° 0'51.33"S, 27°24'10.07"E</p> <p>Farm: Inkerman 10 KQ Portion 2</p> <p>Description: Servitude Road</p>	
<p>March 2021</p>	<p>Date Installed: 29th March 2021</p>
<p>April 2021</p>	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>

<p>Location: 24° 1'3.54"S, 27°24'12.35"E</p> <p>Farm: Inkerman 10 KQ portion 3</p> <p>Description: Servitude Road</p>	
<p>March 2021</p>	<p>Date Installed: 29th March 2021</p>
<p>April 2021</p>	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>

<p>Location: 24° 1'7.07"S, 27°24'13.15"E</p> <p>Farm: Inkerman 10 KQ portion 3</p> <p>Description: Servitude Road</p>		
March 2021	Date Installed: 29 th March 2021	
April 2021	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>	

<p>Location: 24° 1'34.37"S, 27°24'18.32"E</p> <p>Farm: Inkerman 10 KQ Portion 3</p> <p>Description: Servitude Road</p>	
<p>March 2021</p>	<p>Date Installed: 29th March 2021</p>
<p>April 2021</p>	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>

<p>Location: 23°41'35.31"S; 27°38'51.43"E</p> <p>Farm: Rietfontein 820 KO</p> <p>Description: Servitude Road</p>	
March 2021	Date Installed: 29 th March 2021
April 2021	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>

Location: 24° 2'29.74"S, 27°24'28.91"E Farm: Rietfontein 820 KO Description: Servitude Road		
March 2021	Date Installed: 29 th March 2021	
April 2021	Date Sampled: 5 th May 2021 Sample Status: Sampled Air Quality Class: Ideal	

<p>Location: 24° 2'40.69"S, 27°24'31.20"E</p> <p>Farm: Rietfontein 820 KO</p> <p>Description: Servitude Road</p>	
<p>March 2021</p>	<p>Date Installed: 29th March 2021</p>
<p>April 2021</p>	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>

<p>Location: 24° 2'46.02"S, 27°24'32.19"E</p> <p>Farm: Rietfontein 15 KQ Portion 4</p> <p>Description: Servitude Road</p>		
March 2021	Date Installed: 29 th March 2021	
April 2021	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>	

<p>Location: 24° 3'21.38"S, 27°24'37.93"E</p> <p>Farm: Rietfontein 15 KQ Portion 4</p> <p>Description: Servitude Road</p>		
March 2021	Date Installed: 29 th March 2021	
April 2021	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>	

<p>Location: 24° 4'29.95"S, 27°24'51.86"E</p> <p>Farm: Schoonwater 14 KQ Portion 1</p> <p>Description: Servitude Road</p>		
March 2021	Date Installed: 29 th March 2021	
April 2021	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>	

<p>Location: 24° 4'53.87"S, 27°24'55.26"E</p> <p>Farm: Schoonwater 14 KQ Portion 1</p> <p>Description: Servitude Road</p>	
March 2021	Date Installed: 29 th March 2021
April 2021	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>

Location: 24° 5'48.56"S, 27°25'8.99"E Farm: Welgewonden 16 KQ portion 6 Description: Servitude Road		
March 2021	Date Installed: 29 th March 2021	
April 2021	Date Sampled: 5 th May 2021 Sample Status: Sampled Air Quality Class: Ideal	

<p>Location: 24° 6'2.39"S, 27°25'12.90"E</p> <p>Farm: Welgewonden 16 KQ portion 9</p> <p>Description: Servitude Road</p>	
March 2021	Date Installed: 29 th March 2021
April 2021	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>

<p>Location: 24° 6'33.52"S, 27°25'21.12"E</p> <p>Farm: Welgewonden 949 KQ</p> <p>Description: Servitude Road</p>		
March 2021	Date Installed: 29 th March 2021	
April 2021	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>	

Location: 24° 7'11.42"S, 27°25'32.63"E

Farm: Welgewonden 949 KQ

Description: Servitude Road



March 2021

Date Installed: 29th March 2021

April 2021

Date Sampled: 5th May 2021

Sample Status: Sampled

Air Quality Class: Ideal

<p>Location: 24° 7'50.30"S, 27°25'43.01"E</p> <p>Farm: Welgewonden 949 KQ</p> <p>Description: Servitude Road</p>		
March 2021	Date Installed: 29 th March 2021	
April 2021	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>	

<p>Location: 24° 8'36.82"S, 27°25'56.47"E</p> <p>Farm: Welgewonden 949 KQ</p> <p>Description: Servitude Road</p>	
<p>March 2021</p>	<p>Date Installed: 29th March 2021</p>
<p>April 2021</p>	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>

Location: 24° 9'10.22"S, 27°26'5.85"E

Farm: Welgewonden 949 KQ

Description: Servitude Road



March 2021

Date Installed: 29th March 2021

April 2021

Date Sampled: 5th May 2021

Sample Status: Sampled

Air Quality Class: Ideal

Location: 24° 9'23.38"S, 27°26'10.00"E

Farm: Harlemoost 51 KQ portion 13

Description: Servitude Road



March 2021

Date Installed: 29th March 2021

April 2021

Date Sampled: 5th May 2021

Sample Status: Sampled

Air Quality Class: Ideal

<p>Location: 24° 9'56.57"S, 27°26'19.10"E</p> <p>Farm: Harlemoost 51 KQ portion 13</p> <p>Description: Servitude Road</p>	
<p>March 2021</p>	<p>Date Installed: 29th March 2021</p>
<p>April 2021</p>	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>

Location: 24°10'32.51"S, 27°26'26.49"E Farm: Harlemoost 51 KQ portion 16 Description: Servitude Road		
March 2021	Date Installed: 29 th March 2021	
April 2021	Date Sampled: 5 th May 2021 Sample Status: Sampled Air Quality Class: Ideal	

<p>Location: 24°10'55.15"S, 27°26'36.17"E</p> <p>Farm: Harlemoost 51 KQ portion 15</p> <p>Description: Servitude Road</p>		
March 2021	Date Installed: 29 th March 2021	
April 2021	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>	

<p>Location: 24°11'38.61"S, 27°26'48.79"E</p> <p>Farm: Harlemoost 51 KQ portion 15</p> <p>Description: Servitude Road</p>		
March 2021	Date Installed: 29 th March 2021	
April 2021	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>	

Location: 24°11'49.30"S, 27°26'51.53"E

Farm: Matlabas 94 KQ Portion 2

Description: Servitude Road



March 2021

Date Installed: 29th March 2021

April 2021

Date Sampled: 5th May 2021

Sample Status: Sampled

Air Quality Class: Ideal

<p>Location: 24°12'25.42"S, 27°26'59.45"E</p> <p>Farm: Matlabas 94 KQ Portion 2</p> <p>Description: Servitude Road</p>	
<p>March 2021</p>	<p>Date Installed: 29th March 2021</p>
<p>April 2021</p>	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>

<p>Location: 24°13'6.00"S, 27°26'59.07"E</p> <p>Farm: Matlabas 94 KQ Portion 2</p> <p>Description: Servitude Road</p>	
<p>March 2021</p>	<p>Date Installed: 29th March 2021</p>
<p>April 2021</p>	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>

<p>Location: 24°14'34.19"S, 27°26'58.48"E</p> <p>Farm: Matsulan 98 KQ Portion 37</p> <p>Description: Servitude Road</p>	
March 2021	Date Installed: 29 th March 2021
April 2021	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>

<p>Location: 24°14'49.64"S, 27°26'58.86"E</p> <p>Farm: Matsulan 98 KQ Portion 37</p> <p>Description: Servitude Road</p>		
March 2021	Date Installed: 29 th March 2021	
April 2021	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>	

<p>Location: 24°15'19.44"S, 27°26'58.33"E</p> <p>Farm: Witklip 665 KQ Portion 4</p> <p>Description: Servitude Road</p>	
<p>March 2021</p>	<p>Date Installed: 29th March 2021</p>
<p>April 2021</p>	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>

Location: 24°16'6.23"S, 27°26'58.26"E

Farm: Witklip 665 KQ Portion 4

Description: Servitude Road



March 2021

Date Installed: 29th March 2021

April 2021

Date Sampled: 5th May 2021

Sample Status: Sampled

Air Quality Class: Ideal

<p>Location: 24°16'42.57"S, 27°26'57.57"E</p> <p>Farm: Witklip 665 KQ Portion 4</p> <p>Description: Servitude Road</p>		
March 2021	Date Installed: 29 th March 2021	
April 2021	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>	

<p>Location: 24°17'26.82"S, 27°26'56.01"E</p> <p>Farm: Witklip 665 KQ Portion 4</p> <p>Description: Servitude Road</p>		
March 2021	Date Installed: 29 th March 2021	
April 2021	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>	

Location: 24°18'14.46"S, 27°26'56.97"E Farm: Rugtevley 97 KQ Portion 5 Description: Servitude Road		
March 2021	Date Installed: 29 th March 2021	
April 2021	Date Sampled: 5 th May 2021 Sample Status: Sampled Air Quality Class: Ideal	

<p>Location: 24°18'49.52"S, 27°26'57.63"E</p> <p>Farm: Rugtevley 97 KQ Portion 5</p> <p>Description: Servitude Road</p>		
March 2021	Date Installed: 29 th March 2021	
April 2021	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>	

<p>Location: 24°19'31.03"S, 27°26'56.52"E</p> <p>Farm: Rugtevley 97 KQ Portion 6</p> <p>Description: Servitude Road</p>		
March 2021	Date Installed: 29 th March 2021	
April 2021	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>	

<p>Location: 24°20'4.26"S, 27°26'56.14"E</p> <p>Farm: Rugtevley 97 KQ Portion 6</p> <p>Description: Servitude Road</p>	
March 2021	Date Installed: 29 th March 2021
April 2021	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>

<p>Location: 24°20'45.70"S, 27°26'55.87"E</p> <p>Farm: Blaauwpan 133 KQ</p> <p>Description: Servitude Road</p>	
<p>March 2021</p>	<p>Date Installed: 29th March 2021</p>
<p>April 2021</p>	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>

<p>Location: 24°21'48.85"S, 27°26'55.81"E</p> <p>Farm: Blaauwpan 133 KQ</p> <p>Description: Servitude Road</p>	
<p>March 2021</p>	<p>Date Installed: 29th March 2021</p>
<p>April 2021</p>	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>

<p>Location: 24°23'9.52"S, 27°26'54.85"E</p> <p>Farm: Blaauwpan 133 KQ</p> <p>Description: Servitude Road</p>	
March 2021	Date Installed: 29 th March 2021
April 2021	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>

Location: 24°23'21.10"S, 27°26'33.71"E

Description: Dirt road between Tarentaalpan 132 KQ portion 2 and
Diepkuil 135 Portion 5



March 2021

Date Installed: 29th March 2021

April 2021

Date Sampled: 5th May 2021

Sample Status: Sampled

Air Quality Class: Ideal

Location: 24°23'31.60"S, 27°26'13.03"E

Description: Dirt road between Tarentaalpan 132 KQ portion 2 and
Diepkuil 135 Portion 5



March 2021

Date Installed: 30th March 2021

April 2021

Date Sampled: 5th May 2021

Sample Status: Sampled

Air Quality Class: Ideal

<p>Location: 24°23'53.46"S, 27°25'19.77"E</p> <p>Description: Dirt road between Tarentaalpan 132 KQ portion 2 and Diepkuil 135 Portion 3</p>	
March 2021	Date Installed: 30th March 2021
April 2021	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>

<p>Location: 24°24'24.61"S, 27°24'3.45"E</p> <p>Farm: Diepkuil 135 KQ Portion 3</p> <p>Description: Along the R510</p>		
March 2021	Date Installed: 30th March 2021	
April 2021	<p>Date Sampled: 5th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>	

Location: 23°41'35.31"S; 27°38'51.43"E

Farm: Diepkuil Portion 3

Description: Along the R510



March 2021

Date Installed: 30th March 2021

April 2021

Date Sampled: 5th May 2021

Sample Status: Sampled

Air Quality Class: Ideal

<p>Location: 24°25'29.93"S, 27°24'23.06"E</p> <p>Farm: Diepkuil 135 KQ Portion 1</p> <p>Description: Along the R510</p>	
<p>March 2021</p>	<p>Date Installed: 30th March 2021</p>
<p>April 2021</p>	<p>Date Sampled: 4th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>

Location: 24°25'33.45"S, 27°24'13.50"E

Description: Along Dirt road between Zondagsuil 137 KQ and Diepkuil 135 KQ portion 1



March 2021

Date Installed: 30th March 2021

April 2021

Date Sampled: 4th May 2021

Sample Status: Sampled

Air Quality Class: Ideal

Location: 24°25'47.88"S, 27°23'10.20"E

Description: Along Dirt road between Zondagsuil 137 KQ and Diepkuil 135 KQ portion 1



March 2021

Date Installed: 30th March 2021

April 2021

Date Sampled: 4th May 2021

Sample Status: Sampled

Air Quality Class: Ideal

<p>Location: 24°26'31.14"S, 27°21'39.92"E</p> <p>Description: Along Dirt road between Buffelsvley 127 KQ and Karoobult 126 KQ</p>	
<p>March 2021</p>	<p>Date Installed: 30th March 2021</p>
<p>April 2021</p>	<p>Date Sampled: 4th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>

Location: 24°27'9.88"S, 27°20'11.67"E

Description: Along Dirt road between Buffelsvley 127 KQ and Karoobult 126 KQ



March 2021

Date Installed: 30th March 2021

April 2021

Date Sampled: 4th May 2021

Sample Status: Sampled

Air Quality Class: Ideal

Location: 24°28'20.86"S, 27°17'27.36"E

Farm: Paarl 124 KQ Portion 6

Description: Beneath power line



March 2021

Date Installed: 30th March 2021

April 2021

Date Sampled: 4th May 2021

Sample Status: Sampled

Air Quality Class: Ideal

Location: 24°30'0.19"S, 27°16'58.48"E

Farm: Paarl 124 KQ Portion 3

Description: Beneath powerlines near eastern boundary line



March 2021

Date Installed: 29th March 2021

April 2021


Date Sampled: 4th May 2021

Sample Status: Sampled

Air Quality Class: Ideal


<p>Location: 24°31'38.11"S, 27°16'29.83"E</p> <p>Farm: Stratford 462 KO</p> <p>Description: Along D769 dirt road</p>		
March 2021	Date Installed: 29 th March 2021	
April 2021	<p>Date Sampled: 4th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Exceeded Residential Limit</p>	

<p>Location: 24°33'53.16"S, 27°18'16.95"E</p> <p>Farm: Stratford 462 KQ</p> <p>Description: Along D769 dirt road</p>	
<p>March 2021</p>	<p>Date Installed: 29th March 2021</p>
<p>April 2021</p>	<p>Date Sampled: 4th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Exceeded both Residential and Industrial limits</p>

<p>Location: 24°34'14.79"S, 27°18'36.10"E</p> <p>Farm: Stratford 462 KO</p> <p>Description: Situated between the houses of the small community</p>	
March 2021	Date Installed: 29 th March 2021
April 2021	<p>Date Sampled: 4th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Exceeded Residential Limit</p>

<p>Location: 24°34'24.25"S, 27°18'35.18"E</p> <p>Farm: Stratford 462 KO</p> <p>Description: Situated within Primary School Property</p>	
<p>March 2021</p>	<p>Date Installed: 29th March 2021</p>
<p>April 2021</p>	<p>Date Sampled: 4th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>

<p>Location: 24°35'35.70"S, 27°17'45.31"E</p> <p>Farm: Mooivallei 342 KQ – Portion 1</p> <p>Description: Situated next to the farmhouse property fence</p>	
March 2021	Date Installed: 29 th March 2021
April 2021	<p>Date Sampled: 4th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>

<p>Location: 24°35'59.20"S, 27°17'38.40"E</p> <p>Farm: Mooivallei 342 KQ – Portion 2</p> <p>Description: Situated Within the farmhouse boundary fence</p>	
March 2021	Date Installed: 29 th March 2021
April 2021	<p>Date Sampled: 4th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>

Location: 24°36'25.02"S, 27°17'49.23"E

Farm: Mooivallei 342 KQ – Portion 4

Description: Situated near the farmhouse



March 2021

Date Installed: 29th March 2021

April 2021

Date Sampled: 4th May 2021

Sample Status: Sampled

Air Quality Class: Ideal

<p>Location: 24°36'51.37"S, 27°18'27.13"E</p> <p>Farm: Mooivallei 342 KQ – Portion 7</p> <p>Description: Situated next to the farm work shed</p>		
March 2021	Date Installed: 29 th March 2021	
April 2021	Date Sampled: 4 th May 2021	
	Sample Status: Sampled	
	Air Quality Class: Ideal	

Location: 24°37'18.10"S, 27°18'45.97"E

Farm: Mooivallei 342 KQ – Portion 9

Description: Situated within horse paddock



March 2021

Date Installed: 29th March 2021

April 2021

Date Sampled: 4th May 2021

Sample Status: Sampled

Air Quality Class: Ideal

<p>Location: 24°38'3.48"S, 27°18'54.13"E</p> <p>Farm: NA</p> <p>Description: Along D727 dirt road</p>		
March 2021	Date Installed: 29 th March 2021	
April 2021	<p>Date Sampled: 4th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>	

Location: 23°41'25.22"S, 27°34'18.42"E

Farm: NA

Description: Along unnamed dirt road on the fence line of Exxaro coal mine



March 2021

Access Restrictions

April 2021

Date Installed: 6th May 2021

Location: 24°26'15.46"S, 27°22'29.41"E

Description: Along Dirt road between Zondagsuil 137 KQ and Diepkuil 135 KQ portion 1



March 2021

Date Installed: 29th March 2021

April 2021

Date Sampled: 4th May 2021

Sample Status: Sampled

Air Quality Class: Ideal

<p>Location: 24°26'48.84"S, 27°18'57.38"E</p> <p>Farm: Buffelsvley 127 KQ</p> <p>Description: Next to workshop/ homestead</p>		
March 2021	Date Installed: 29 th March 2021	
April 2021	<p>Date Sampled: 4th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Ideal</p>	

<p>Location: 24°32'48.86"S, 27°17'24.55"E</p> <p>Farm: Stratford 462 KO</p> <p>Description: Along D769 dirt road</p>		
March 2021	Date Installed: 29 th March 2021	
April 2021	<p>Date Sampled: 4th May 2021</p> <p>Sample Status: Sampled</p> <p>Air Quality Class: Exceeded residential limits</p>	

Location: 24°35'5.76"S, 27°18'49.94"E

Farm: Mooivallei 342 KQ – Portion 1

Description: Near the D1649 Road



March 2021

Date Installed: 29th March 2021

April 2021

Date Sampled: 4th May 2021

Sample Status: Sampled


Air Quality Class: Ideal

APPENDIX D – INDEPENDENT FORM AND CV

STATEMENT OF OBJECTIVENESS AND COMPETENCE

The author(s) of this document hereby declare that he/she/they:

- Act as an independent and objective consultant/s;
- Does not have any financial interest in the undertaking of this project or projects, other than remuneration for the work performed in terms of relevant legislation;
- Has and will not have a vested interest in the current and/or proposed activity, nor will engage in any directly conflicting interest associated with this project;
- Undertakes to function transparently and provide any information to a competent authority if compelled to do so by law or by consent of the involved parties;
- Based on the information provided by the client, due diligence studies or any other source or sources, have presented the results, discussion and conclusion, as applicable to the project concerned, to the best of his/her/their professional ability;
- Reserves the right to modify aspects pertaining to this study should additional information become available through ongoing research and further work on the relevant field/s;
- Undertakes to have the work peer reviewed on a regular basis by a competent specialist in the field/s of study;
- Is duly qualified and experienced to undertake the work at hand; and
- Adheres to the code of conduct as stipulated under Section 28 (3) of the Natural Scientific Professions Act 27 of 2003 as observed by the South African Council for Natural Scientific Professions (SACNASP).
- Signed by Anton Botha:



Date: 23-06-2021

Environmental Auditor	Relevant expertise
Anton Botha Pr. Sci.Nat Registration No 122440	Has completed a B.Sc. in Environmental Sciences, followed by a B.Sc. (Hons) and M.Sc. specialising in Hydrogeology and Hydrology. Anton has comprehensive experience and knowledge on compliance monitoring, project management and specialist reporting. As an environmental consultant, Anton has provided numerous environmental monitoring assessments, specialist input services, mine closure quantum's and environmental audits. monitoring assessments, specialist input services and environmental audits.



ENVIRONMENTAL ASSURANCE (PTY) LTD

Anton Botha

ENVIRONMENTAL CONSULTANT & DIVISIONAL MANAGER

394 Tram Street, New Muckleneuk, Pretoria, 0181

T : 012 460 9768 ; M : 083 555 4354; F : 012 460 3071 ; E mail : anton@envass.co.za

Date of Birth : 25 July 1991; Place of Birth : South Africa

Ethnic Group and Gender : White Male ; Disabilities : None

AREAS OF EXPERTISE

- Compliance Monitoring
- Data Analysis & Interpretation
- Potable, Ground and Surface Water Quality
- Compliance Monitoring
- Data Analysis & Interpretation
- Hydrogeology
- Ambient Air and Particulate Matter Quality
- Water and Salt Balance Development and Assessment
- Hydrogeology
- Ambient Air and Particulate Matter Quality
- Customer Relationships
- Site Audits and Inspections
- Field Sampling of dust, soil, ambient air and water
- Customer Relationships
- Site Audits and Inspections

CAREER HISTORY

Employer
Period
Position
Responsibilities

ENVIRONMENTAL ASSURANCE (PTY) LTD

Anton holds a B.Sc. in Environmental Sciences, followed by a B.Sc. (Hons) and M.Sc. specializing in Hydrogeology and Hydrology. He has comprehensive experience and knowledge on compliance monitoring, project management and specialist reporting. As an environmental consultant, Anton has provided several environmental monitoring assessments, audits, mine closure assessments and specialist input services.

BUSINESS UNIT HEAD: COMPLIANCE MONITORING, SPECIALIST AND MINE CLOSURE

Environmental Consultant and Auditor

October 2018 – Current

- Develop and maintain environmental compliance monitoring programmes in conjunction with site audits and assessments. Monitoring co-ordination and planning of all relevant projects. Maintaining data and results from monitoring programmes and databases. Conduct compliance audits, determine compliance ratings and report on conditions. Determining financial provision of mine closures. Compile and overseeing reports on water-, soil-, air-quality and site findings, with interpretation of results and possible recommendations. Maintain and build customer relationships with guidance on environmental matters and updates on environmental legislation. Market to potential clients with site specific marketing material

EDUCATION AND QUALIFICATIONS

North-West University; Masters (MSc.) Hydrogeology - 2018
 North-West University; Honours BSc. Hydrogeology and Hydrology - 2013
 North-West University; Degree BSc. Environmental Science Geology and Geography – 2012

PROFESSIONAL STATUS

Registration
 Membership

Registered as a Professional Natural Scientist (122440) with the South African Council of Natural Scientific Professions (SACNASP)

PROJECT EXPERIENCE

PROJECT DESCRIPTION	CLIENT
Water and Air Quality Monitoring programme co-ordination, management and reporting	Afrimat Lyttleton
	Afrimat Delfsand
	Assmang Black Rock
	Assmang Dwarsrivier
	Barloworld Slurry
	Blue Diamond Mine
	Exxaro Base Metals Zincor
	Lonmin Marikana
	Kimberly Ekapa Mining
	Kimberley Ekapa Mining Joint Venture
	Kudumane Manganese Resources
	Mooikloof Heights
	Polokwane Smelter
	PPC Dwaalboom
	PPC Slurry
	Rolfes Silica
	TC Smelter
	Makoya Binkpan
	Makoya Highveld
	SACMH Umlabu
	SACMH Voorslag
	Ocon Brick
	Group 5 Everite
	Locksand
	Samancor WCM
	Samancor ECM
	Rosema Olifantsfontein
	Rosema Delmas
	Sublime
	SABrix Boekenhoutkloof
	SABrix Zandfontein
	Tubatse Chrome
	Infrabuild
	Federale Stene
	Tronox
	Canyon Coal
	Lynca Meats
	Ankerlig
	Lafarge
	SACMH Voorslag
Water and Salt Balances	PPC Dwaalboom
	Kimberly Ekapa Mining (De Beers)

	SABrix Zandfontein
	SABrix Boekenhoutkloof
	Lynca Meats
	Ilangabi Brikor Plant 1
	Kudumane Manganese
	Tronox Namakwa Sands Smelter
Specialist Noise, Air, Odour Assessments	Numerous
Odour Assessment	Lafarge Geocycle
Regulation 34 EMPr Audits	Several
Technical AEL, WML and WUL Audits	Numerous

REFERENCES

CONTACT NAME	COMPANY	RELATIONSHIP	CONTACT
Emile van Druten	ENVASS	Director	012 460 9768
Carl Schoeman	ENVASS	Consultant	012 460 9768



herewith certifies that

Anton Botha

Registration Number: 122440

is a registered scientist

in terms of section 20(3) of the Natural Scientific Professions Act, 2003
(Act 27 of 2003)

in the following field(s) of practice (Schedule 1 of the Act)

Environmental Science (Professional Natural Scientist)

Effective **11 September 2019**

Expires **31 March 2022**



A handwritten signature in black ink, appearing to read 'Botha'.

Chairperson

A handwritten signature in black ink, appearing to read 'R. Botha'.

Chief Executive Officer



To verify this certificate scan this code

STATEMENT OF OBJECTIVENESS AND COMPETENCE

The author(s) of this document hereby declare that he/she/they:

- Act as an independent and objective consultant/s;
- Does not have any financial interest in the undertaking of this project or projects, other than remuneration for the work performed in terms of relevant legislation;
- Has and will not have a vested interest in the current and/or proposed activity, nor will engage in any directly conflicting interest associated with this project;
- Undertakes to function transparently and provide any information to a competent authority if compelled to do so by law or by consent of the involved parties;
- Based on the information provided by the client, due diligence studies or any other source or sources, have presented the results, discussion and conclusion, as applicable to the project concerned, to the best of his/her/their professional ability;
- Reserves the right to modify aspects pertaining to this study should additional information become available through ongoing research and further work on the relevant field/s;
- Undertakes to have the work peer reviewed on a regular basis by a competent specialist in the field/s of study;
- Is duly qualified and experienced to undertake the work at hand; and
- Adheres to the code of conduct as stipulated under Section 28 (3) of the Natural Scientific Professions Act 27 of 2003 as observed by the South African Council for Natural Scientific Professions (SACNASP).
- Signed by Damon Nell:



Date: 13-06-2021

Environmental Auditor	Relevant expertise
Damon Nell Cand.Sci.Nat Registration No 124378	Has completed a B.Sc. in Environmental Sciences, followed by a B.Sc. (Hons) in Plant Science. Damon has comprehensive experience and knowledge on compliance monitoring, project management and specialist reporting. As an environmental consultant, Damon has provided numerous environmental monitoring assessments, and specialist input services.



ENVIRONMENTAL ASSURANCE (PTY) LTD

Damon Nell

ENVIRONMENTAL CONSULTANT & FIELD TECHNICIAN

394 Tram Street, New Muckleneuk, Pretoria, 0181

T : 012 460 9768 ; M : 072 506 9692; F : 012 460 3071 ; E mail : damon@envass.co.za

Date of Birth : 01 June 1997; Place of Birth : South Africa

Ethnic Group and Gender : White Male ; Disabilities : None

AREAS OF EXPERTISE

- Compliance Monitoring
- Ambient Air and Particulate Matter Quality
- Customer Relationships
- Data Analysis & Interpretation
- Potable, Ground and Surface Water Quality
- Field Sampling of dust, soil, ambient air and water
- Water and Salt Balance Development and Assessment

CAREER HISTORY

Employer
Period
Position
Responsibilities

ENVIRONMENTAL ASSURANCE (PTY) LTD

Damon holds a B.Sc. in Environmental Sciences, followed by a B.Sc. (Hons) in Plant Science from the University of Pretoria. He has comprehensive experience and knowledge on compliance monitoring, project management and specialist reporting. As an environmental consultant, Damon has provided several environmental monitoring assessments, and specialist input services.

Environmental Consultant and Field Technician.
February 2021 – Current

- Conduct specialist studies and reports in the field of Visual Impacts, and Terrestrial Vegetation, and conduct compliance monitoring with regards to surface water, ground water, air quality and site findings, with interpretation of results and possible recommendations. Maintain and build customer relationships with guidance on environmental matters and updates on environmental legislation. Market to potential clients with site specific marketing material.

EDUCATION AND QUALIFICATIONS

University of Pretoria: Honours (Hons) BSc. Plant Science and Plant Diversity – 2019
University of Pretoria: Degree BSc. Environmental Science - 2018

PROFESSIONAL STATUS

Registration
Membership

Registered as a Candidate Natural Scientist (124378) with the South African Council of Natural Scientific Professions (SACNASP)

PROJECT EXPERIENCE

PROJECT DESCRIPTION	CLIENT
Water and Air Quality Monitoring program reporting	Tronox Fairbreeze
	Tronox Hillendale
	Hercules Bricks
	Sublime
	Silica Quartz
	SA Brix
	Rosema
Specialist Visual Impact and Vegetation Assessments	Victoria Bricks
	Samancor Ferrometals
	Goldfields – Deep South
	Samancor Eastern Chrome Mines
	Kephri Innovations

REFERENCES

CONTACT NAME	COMPANY	RELATIONSHIP	CONTACT
Emile van Druten	ENVASS	Director	012 460 9768
Carl Schoeman	ENVASS	Consultant	012 460 9768



herewith certifies that

Damon Travis Nell

Registration Number: 124378

is a registered scientist

in terms of section 20(3) of the Natural Scientific Professions Act, 2003
(Act 27 of 2003)

in the following field(s) of practice (Schedule 1 of the Act)

Ecological Science (Candidate Natural Scientist)
Botanical Science (Candidate Natural Scientist)

Effective **9 September 2020**

Expires **31 March 2021**



A handwritten signature in black ink, appearing to read 'Botha'.

Chairperson

A handwritten signature in black ink, appearing to read 'R. J. J. J.'.

Chief Executive Officer



To verify this certificate scan this code