



# MYEZO ENVIRONMENTAL MANAGEMENT SERVICES

*Environmental Stewardship*

***GIJIMA – ARBOR RAILWAY SIDING – BASIC ASSESSMENT REPORT***

***UPDATED ENVIRONMENTAL MANAGEMENT PLAN FOR PROPOSED OPERATIONS OF A  
RAIL SIDING TO STORE, HANDLE AND RAIL COAL ON THE SOUTHERN SIDE***

***Document Name: GAB – R – Updated EMPr***

***Date: November 2019***

***Rev 0.2***

***DARDLEA Ref: 1/3/1/16/1N-213***

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## Abbreviations

AQA:	Air Quality Act, 2004 (Act No. 39 of 2004)
AEL:	Atmospheric Emission License
BBBEE:	Broad Based Black Economic Empowerment
CLO:	Community Liaison Officer
DWS:	Department of Water and Sanitation
EMP:	Environmental Management Plan (former DWAF - now Department of Water and Sanitation)
EMPr:	Environmental Management Programme report
EMS:	Environmental Management System
EA:	Environmental Auditor
EAP:	Environmental Assessment Practitioner
ECO:	Environmental Control Officer
EIA:	Environmental Impact Assessment
IAP:	Interested and Affected Party
IAPs:	Interested and Affected Parties
IEM	Integrated Environmental Management
MDARLA:	Mpumalanga Provincial Government Department of Agriculture and Rural Development
HRM:	Human Resource Manager
HSRA:	Health and Safety Risk Assessment
LED:	Light Emitting Diode
MDS:	Market Demand Strategy
MPRDA:	Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
MHSA:	Mine Health and Safety Act, 1996 (Act No. 29 of 1996)
NEMA:	National Environmental Management Act, 1998 (Act No. 104 of 1998)
NDM:	Nkangala District Municipality
OHS:	Occupational Health and Safety
OHSA:	Occupational Health and Safety Act, 1993 (Act No. 85 of 1993)
PCD:	Pollution Control Dam
PPE:	Personal Protective Equipment
SHE:	Safety, Health and Environment
SANS:	South African National Standard
SDM:	Site Development Manager
TFR:	Transnet Freight Rail
VLM	Victor Khanye Local Municipality
WUL:	Water Use License
WULA:	Water Use License Application



## 1. Name, Qualifications And Experience Of EAP Compiling This Environmental Management Plan (EMP)

Myezo Environmental Management Services (Pty) Ltd (Myezo) has been commissioned by Gijima Supply Chain Management Services (Pty) Ltd (Gijima) to compile an Environmental Management Plan for the proposed operations on the Southern side within areas DWX1469J and DWX1471J of their existing rail siding coal loading facility. The project is located on Portion 1 of the Farm Van Dyksput 214 IR, within the Victor Khanye Local Municipality (VLM), under the Emalahleni Magisterial District, Mpumalanga Province.

Babalwa Fatyi, the Environmental Assessment Practitioner (EAP), who is the founder of Myezo, is a Registered Professional Natural Scientist (400123/01). She is also registered with Institute of Environmental Management and Assessment, Lincoln, UK (0025153). She has consulting experience, having worked for an engineering consulting company, after which she also worked for a mining company, responsible for overseeing the company's compliance with its environmental obligations.

She has academic qualifications to back-up her experience, having obtained Master of Science (*cum laude*) and receiving 'SA Association for Advancement of Science Award' for an outstanding MSc Degree in the Faculty of Science. Babalwa has undertaken several environmental management and public consultation projects in terms of the National Environmental Management Act (No 107 of 1998), as well as environmental authorisations, in terms of Mineral and Petroleum Resources Development Act (No 28 of 2002).

Her work experience has allowed her an insight with respect to sector specific environmental requirements ranging from authorizations, implementation and monitoring. She is thus still active in promoting environmental stewardship, through utilisation of a series of integrated environmental management tools, for attainment of long lasting an meaningful economic prosperity.

She has compiled more than 25 Environmental Management Plans (EMPs) and programmes, within the various sectors and industries. A comprehensive illustration of her qualifications is included in the CV and profile attached as Annexure 1.1-1. A profile of Myezo is included as Annexure 1.1-2.

### 1.1 Introduction

Gijima currently has a lease agreement with Transnet Freight Rail on a portion of Arbor Siding No. 740527 – Northern side (DWX1470J, DWX1468J) and seeks to expand their operations to the Southern side (DWX1469J and DWX1471J). The proposed expansion will require developmental activities in order to maximise the operational capacity of the business.

The site is located about 5km west of the Kendal Power Station along the R555 road. It also falls within the Olifants Water Management Area (WMA 4), in the quaternary catchment B20F, draining towards the tributary of the Wilge River.

The Siding is located west of N12 and can be accessed through R555 to Ogies and will be used for loading domestic coal, as well as exporting coal onto rail wagons. The site can also be accessed through off ramping off N12 and turning right to join R545 road towards Balmoral. The next turn to the right with a signage Blesbokfontein and the Arbor and leads directly to join R555 road towards Ogies/ Delmas. The market for this service has been identified as various commodity owners as well as mines. There are no envisaged deviations regarding joining the network. Arbor will be used as a point of entry into the rail network, by road hauling coal from the identified market, stock-piling and loading coal into the rail wagons. The map showing the regional setting is shown in Figure 1.1-1. The site location map is shown in Figure 1.1-2 with the local and site layout settings of the existing Siding shown in Figure 1.1-3 and farm boundaries within which the existing Arbor Railway Siding falls under is shown in Figure 1.1-4.

The operational Northern side of the Arbor has been servicing Eskom with 3 978 201 tons of coal over the 3 year period (June 2013 - September 2016). Eskom has renewed the contract and increased the tonnage to 9,5 000 000 tons over a 4 year period (1 October 2016 - 30 September 2020) which translates to 198 000 tons per month. The copy of the commitment from Eskom in relation to the envisaged monthly tonnage is attached as Annexure 1.1-3. The Northern side operation is said to have reached its maximum operational capacity in terms of stockpiling, receiving trucks and loading the trains. Currently only two trains are operational to service the new Eskom contract and the infrastructure is not enough to fulfil their contractual obligations. The proposed

expansion will require several activities to have the Southern side operating effectively. An application for the expansion of the lease area to Transnet Freight Rail (TFR) has been submitted by Gijima and a recent communique in relation to the progress of the application is attached for easy reference as Annexure 1.1-4.

The proposed expansion to the operation also presents social and economic benefits for the communities surrounding the site, especially Arbor village, which is within a 1 km radius south of the site. The social benefits include the job opportunities for 25 extra people to be employed for the site. The economic benefits will be realised through the implementation of Transnet Road to Rail Strategy in transporting more coal to the power station, whilst reducing both costs and number of human fatalities. The expansion will transport an increased volume of coal material, which may lead to more stable electricity supply.

The expansion is viewed to be in support of the Transnet Freight Rail Strategy which was proposed in 2012 and linked to the budget allocations for rail infrastructure development within the country. Transnet has been looking at ways of investing in new technological developments in relation to Road to Rail Strategy. They have been piloting on an idea to use truck wagons fitted with tyres that can travel on both road and railway surfaces. This would also reduce the amount of time for loading and offloading at Stockpile areas, the traffic of trucks loading and offloading at stockpile areas would be reduced, the emissions from trucks to and from the stockpile areas. The Transnet Freight Road to Rail Strategy is summarised in Section 2 of this report.

This EMP is designed for the Southern Side rail operations and the original EMP was done in December 2010. The Railway Siding currently has an EMPr environmental authorisation from the Mpumalanga Department of Agriculture and Land Administration granted on 08 December 2010. A copy of the authorisation is attached as Annexure 1.1-5.

The proposed Southern Side rail operations will be mirror of the Northern Side rail Siding except for a few infrastructural changes that will be highlighted. Gijima has received a Water Use Licence (WUL) on the 8 December 2015 (Licence No. 04/B20F/G/4009) and the details of the licenced water uses is given in Section 1.3 and a copy of the licence is attached as Annexure 1.1-6.

This EMP intends to deal with the activities to be implemented within the Southern Side Rail siding. It also intends to incorporate the ongoing engagement of stakeholders, prior to the Southern Side site operation. It is prudent that the subsequent concerns of the stakeholders be incorporated into the EMP and that mitigation measures be developed for the raised issues as well as identified impacts. The EMP will also include certain aspects of the operation that are envisaged within the future, for example, increased stockpiling, transportation, installation of a weighbridge and the development of a new Pollution Control Dam (PCD).

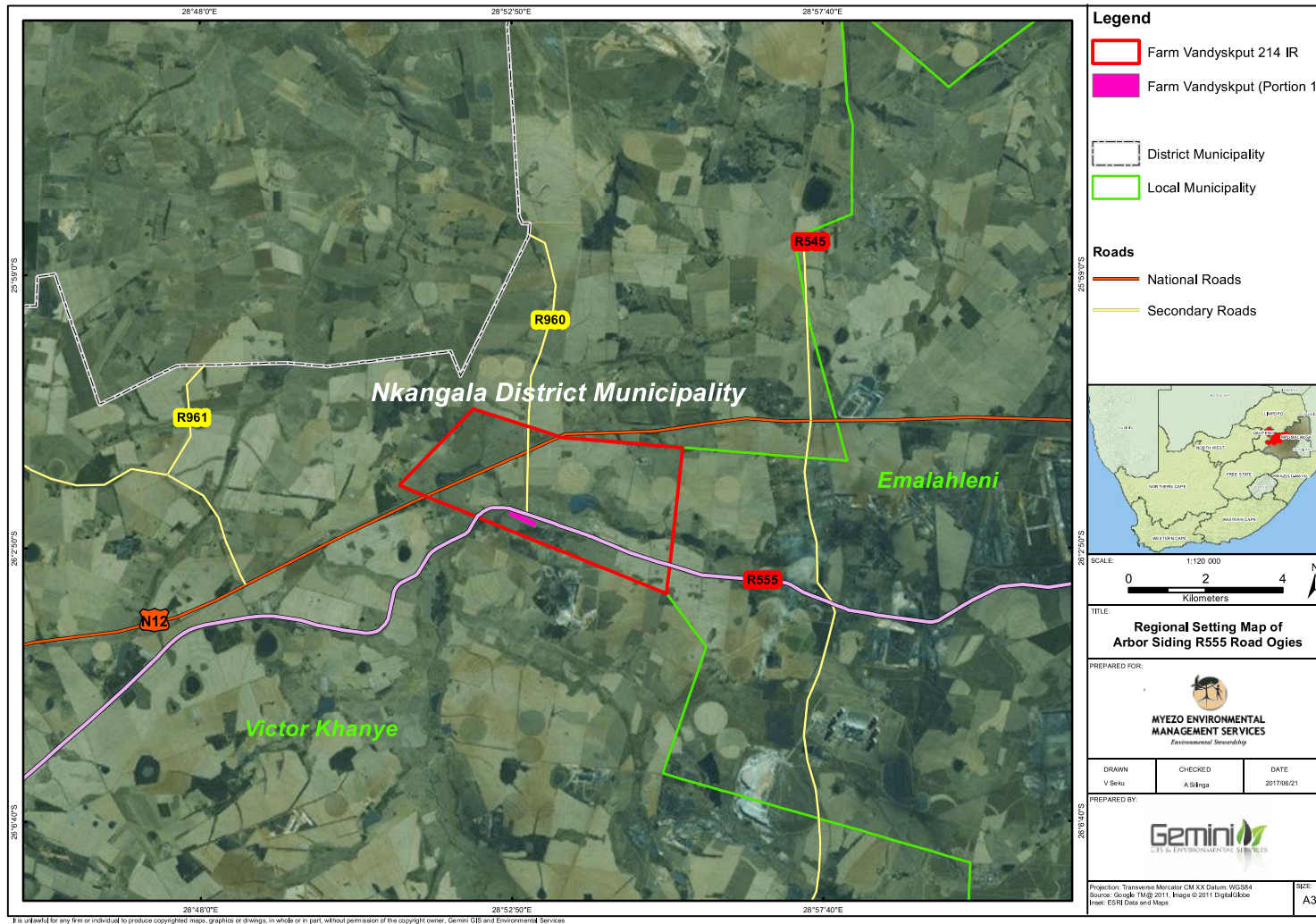


Figure 1.1-1: Regional Setting

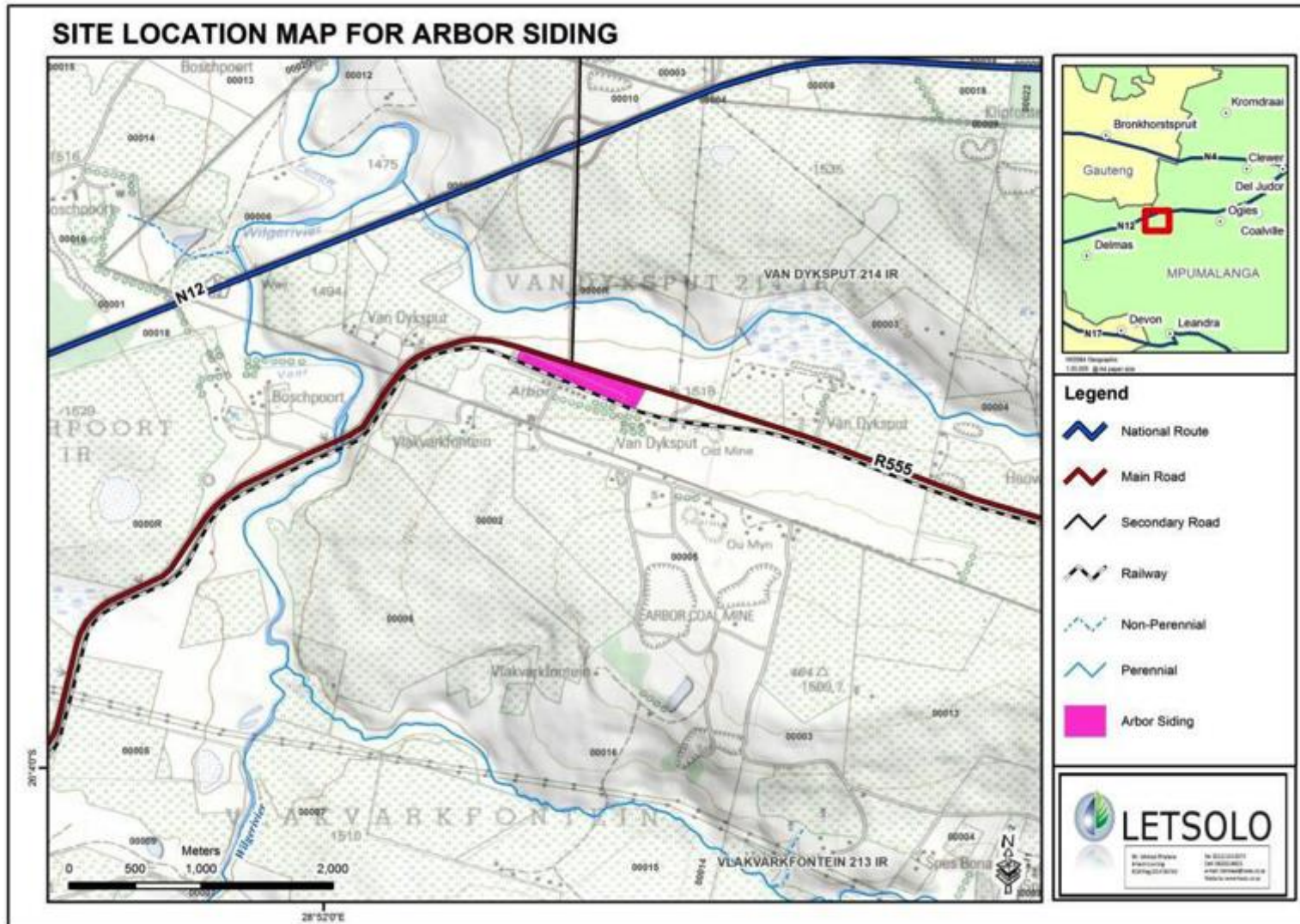


Figure 1.1-2(a): Site Location Map



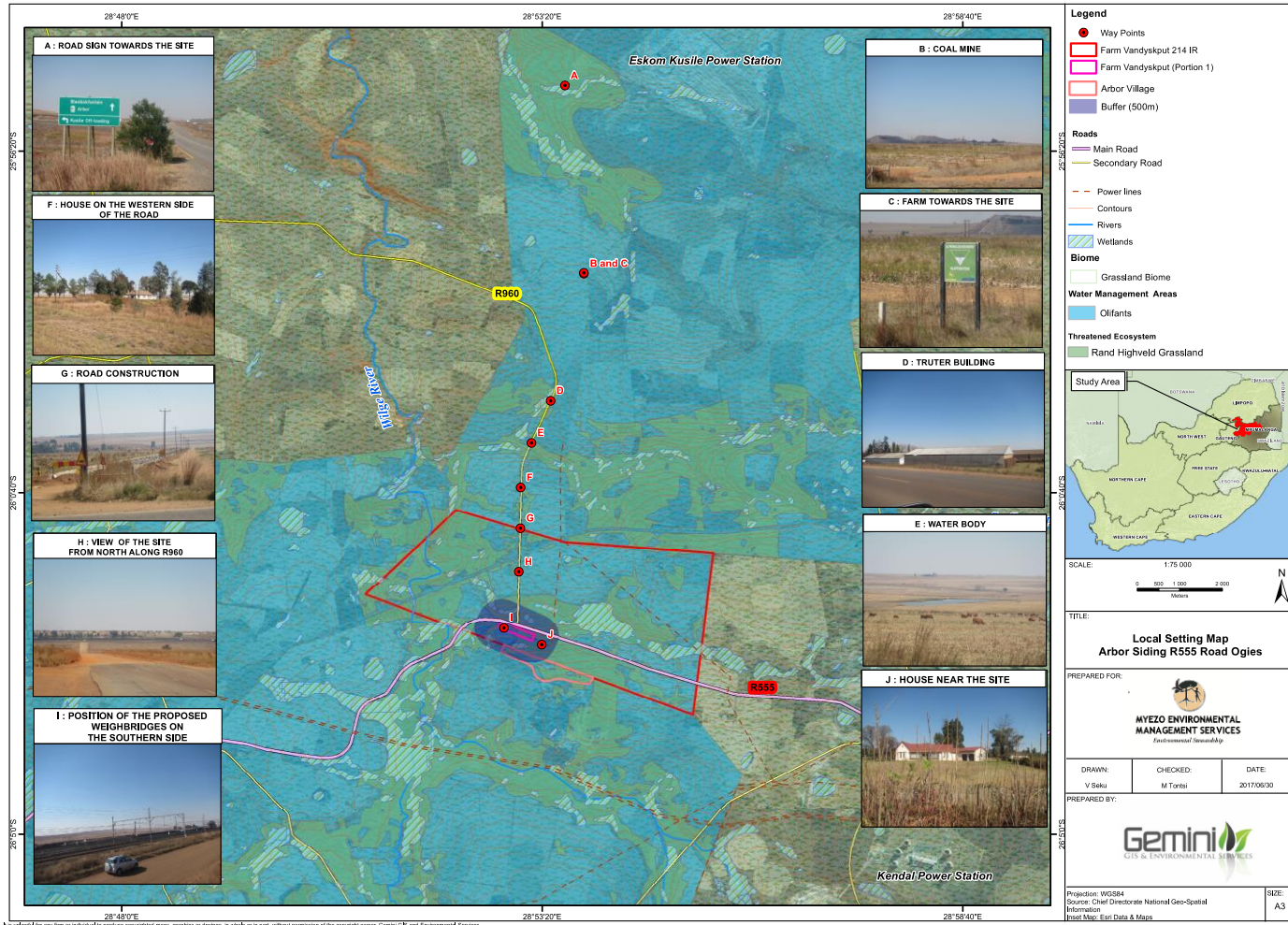


Figure 1.1-2(b): Local Settings

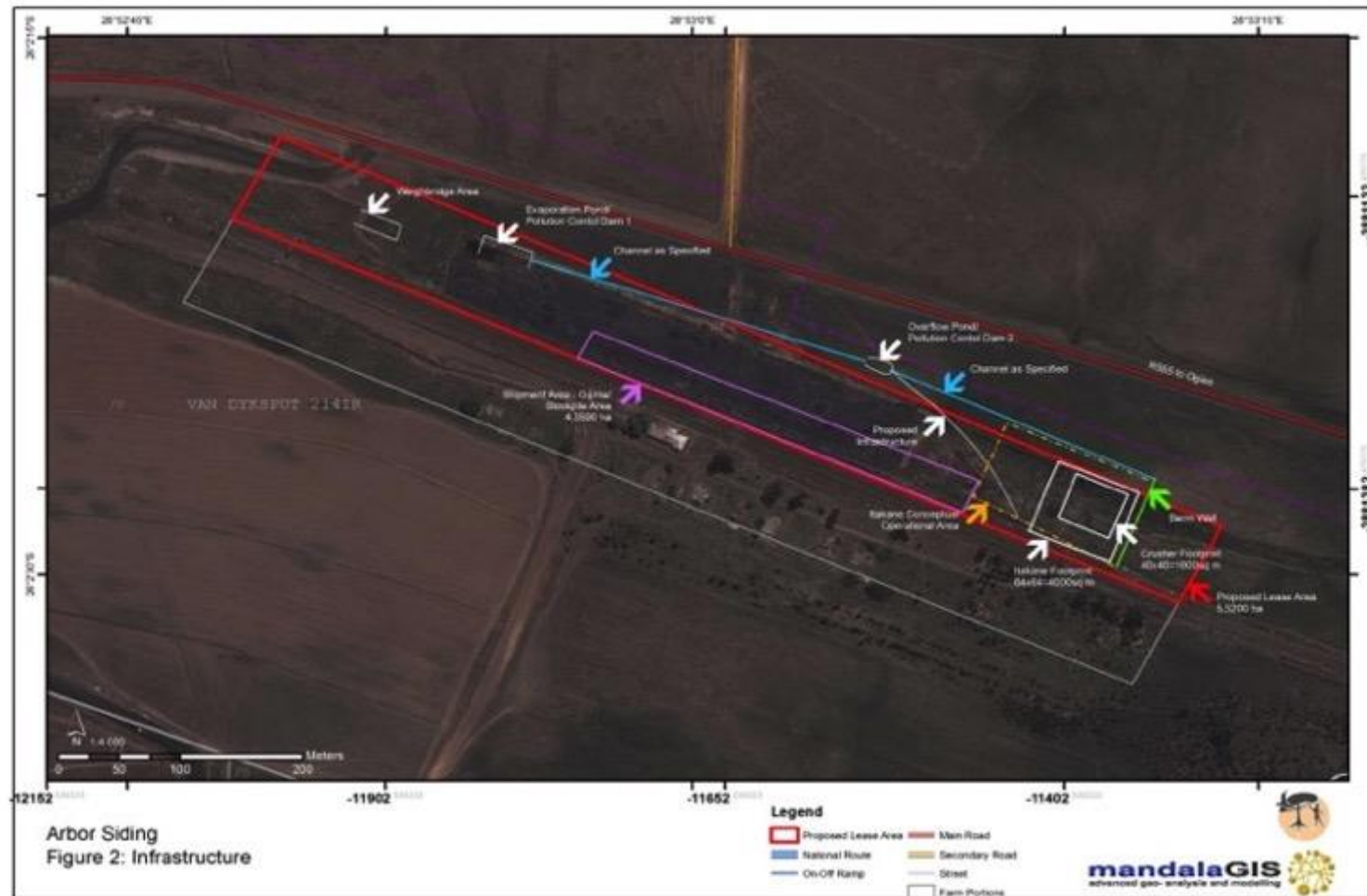


Figure 1.1-3: Current Infrastructure on the Northern side of Siding.



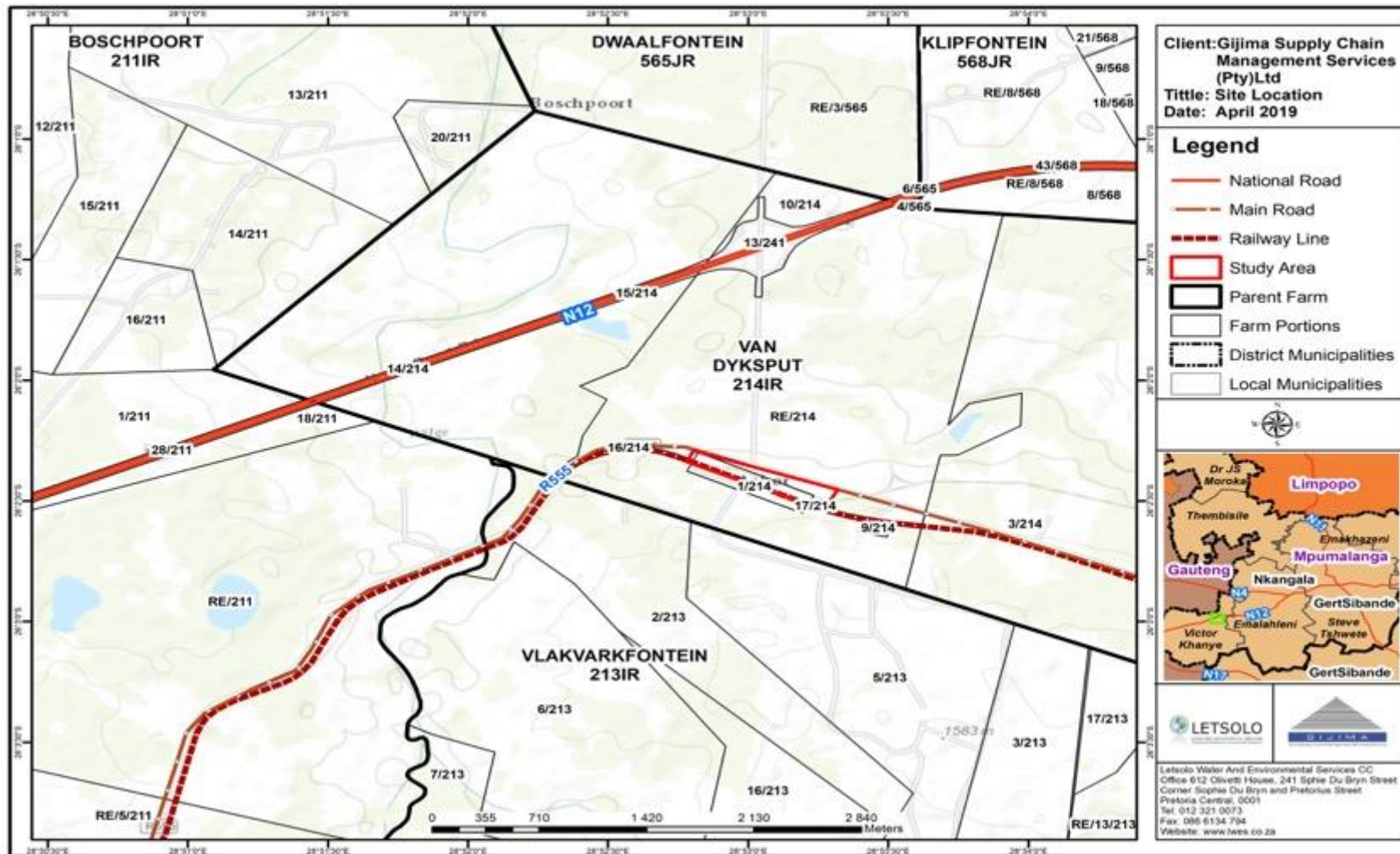


Figure 1.1-4 Farm boundaries

## 1.2 Purpose of the Environmental Management Plan (EMP)

Consultation has been undertaken with the Mpumalanga Department of Agriculture, Rural Development and Land Administration (MDARLA) and it was discovered and agreed that the activity is not listed in terms of Government Notice No. R544, Government Notice No. R 545 and Government Notice No. 546 of 18 June 2010. As such it does not require Environmental Authorisation in terms of Section 24F (1) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended.

However, in terms of Section 28 of the National Environmental Management Act, every person who causes, has caused or may cause significant pollution or degradation of the environment will take reasonable measures to prevent such pollution or degradation from occurring, continuing, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment. In order to ensure that Gijima Supply Chain Management Services (Pty) Ltd is in compliance with the above provision, an Environmental Management Plan (EMP) is being compiled.

This EMP has therefore been compiled by Myezo on behalf of Gijima Supply Chain Management (Pty) Ltd (Gijima) in support of their proposed development of a rail siding to store, handle and rail coal on Arbor Railway Siding. The EMP has been compiled under expert advice and input of a qualified environmentalist and to provide recommendations and guidelines to achieve sustainable development. The EMP provides norms and standards to which compliance and monitoring should be done in all stages of the proposed project, with particular reference to the prevention and mitigation of anticipated potential environmental impacts. All stakeholders should note that obligations imposed by this EMP are legally binding in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998).

The EMP is an implementation tool that will be continuously updated to promote the principles of sustainable development and continual improvement.

The objectives of the EMP are outlined below:

- Identify a range of mitigation measures which could reduce and mitigate the potential impacts to minimal or insignificant levels.
- Detail specific actions deemed necessary to assist in mitigating the environmental impact of the proposed project.
- To create management structures that addresses the concerns and complaints of IAPs with regards to the development.
- To establish a method of monitoring and auditing environmental management practices during all phases of the activity.
- Ensure that the construction and operational phases of the project continues within the principles of Integrated Environmental Management (IEM).
- Ensure compliance to applicable environmental legislation such as National Water Act, 1998 (Act No. 36 of 1998)
- Be alert of the periods within which the measures contemplated in the EMP will be implemented, where appropriate.

## 1.3 Environmental Authorisation and Legal Compliance

The required and existing environmental authorisations for the site are outlined in Table 1.3-1. Gijima will continuously assess any planned developments or expansions to ensure that any triggered environmental listed activities are addressed, should there be any. The Environmental screening table outlines the listed activities that may be triggered by the planned expansion to the Siding. The Siding is already operational on the Northern side of the site and has been granted a lease agreement to operate on the Southern Side. Before the operations may commence on the Southern Side, an environmental authorisation must be applied for should the planned activities trigger any of the listed activities and that is the reason this basic assessment report was compiled. The legislative framework focuses on the Southern Side activities which trigger a need for environmental authorisation. The current operational lease agreement issued by Transnet considers the Arbor Railway Siding both the Southern Side and the Northern Side in its entirety as one development footprint and as such the legislative framework is done for the site. From an environmental perspective, any planned additions, upgrades or expansion will continuously be analysed against the listed activities to determine if there are any triggered listed activities. The new triggered listed



activities for the entire site (Northern Side and Southern Side) are outlined in Table 1.3-2, which demonstrate that there is a requirement to apply for environmental authorisation by undertaking a Basic Assessment as per the Regulation No. 327 (GN 983) Listing Notice 1 as amended in April 2017.

### 1.3.1 Listed and specific activities triggered

The planned activities to increase the scope of operations on site include the following (Please refer to Figure 7.1-1 and 7.1-2):

- a) Upgrade to the existing railway infrastructure.
- b) Extend line 5.
- c) Divert and extend Line 6.
- d) Remove OHTE and platform.
- e) Upgrade to the existing canals as part of the storm water management system for the site. This will include diverting and extending the storm water drainage channel. A berm wall will be constructed on the station side of the channel with the excavated material.
- f) Extend the existing storm water culvert for the full width of the loading area and connect it to the new storm water cut-off drain.
- g) Backfill and compact the old channel where required.
- h) Construct new PCD with an estimated capacity of 2 300 m<sup>3</sup> and a silt trap. Alternatively, upgrade to the existing canals as part of the storm water management system for the site and divert dirty water from the proposed new site, the Southern side, to existing pollution control dam on the Northern side. In this option polluted water will be guided to the existing culvert underneath the rail way line. The PCD will be sealed with HDPE liner and such the target is to comply with "class C" specification for landfills. The silt trap will also be sealed with a 200 mm thick concrete slab.
- i) the new storm water cut-off drain. Subsurface and drains will be lined with 1.5 mm HDPE liner

### 1.3.2 Basic Assessment Process

The activities to be undertaken under this planned application which are triggered under NEMA Regulations include Listed Activities 9(i)(ii), 19(i) 34 (i), 48 (i) (ii) (iv) (i) (ii) – (a) (c), 64 (iii), 67 (ii) (Under Listing Notice - GN R983, as amended in 2017 under GN R327) and Listed Activity 14 [(i) (ii) (iv) (xii)] (i) – (a) (c) (under Listing Notice 3 – GN R985, as amended in 2017 under GN R324 and therefore, basic assessment procedures will be followed. The triggered listed activities are outlined in Table 1.3-3- below.

### 1.3.3 EMPr Authorisation

The Railway Siding currently has an EMPr environmental authorisation from the Mpumalanga Department of Agriculture and Land Administration granted on 08 December 2010. A copy of the authorisation is attached as Annexure 1.1-5..

### 1.3.4 Water Use Licence Existing Authorisations and Licences

Gijima has a Water Use Licence (WUL) on 08 December 2015 (Licence No. 04/B20F/G/4009) and accepted on the 6 January 2016 by Gijima team. The WULA conditions listed within the licence include the following:

- General Conditions of the Licence
- Conditions for Construction and Operation
- Dust Suppression
- Pollution Control Dam
- Quality of Waste Water to be disposed of the Waste Water Containment Facility
- Monitoring of Waste Water, Surface Water Quality and Groundwater Quality
- Storm Water Management

- Access Control
- Contingencies
- Reporting
- Auditing
- Integrated Water and Waste Management (IWWMP) and Rehabilitation Strategy and Implementation Programme (RSIP).

The comprehensive conditions of compliance for the WULA are provided within the licence is attached as Annexure 1.1-6.

Table 1.3-1 Applicable legislation and guidelines

Title of legislation, policy or guideline	Administering Authority	Approvals and licences which might be required by authorities	Applicable to Project
Constitution of the Republic of South Africa (Act 108 of 1996, Section 24)	National & Provincial Department of Justice and Constitutional Development	No licence but general respect for the environment and people’s rights to a healthy and clean environment during construction and operation of the site.	Every employer and employee have a right to a healthy and clean environment. The management and employees of the railway siding have the responsibility to protect the environment and their own health by keeping their workplace and surrounding environment healthy, safe and clean.
National Environmental Management Act, (Act 107 of 1998)	National and Provincial Department of Environmental Affairs (DEA)	<p>Environmental authorisation was issued to ensure environmental protection and mitigation against negative impacts the development or rehabilitation might present (see Annexure 1.1-5 for a copy of the existing environmental authorisation). The EMPr compiled to ensure overall protection of the environment including the monitoring plan for the site operations.</p> <p>An environmental authorisation is required for the activities which trigger listed activities in terms of the EIA regulations.</p>	Environmental authorisation is required for the identified listed activities triggered by the project. The Impacts of planned activities will affect various environmental aspects such as the soil during the establishment and clearing of vegetation, dust generation, noise levels, water quality, water use and energy use.
National Environmental Management: Air Quality Act (Act 39 of 2004)	National and Provincial Department of Environmental Affairs (DEA)	No licence is required.	Stockpile storage capacity study illustrating status in relation to legislated threshold.was undertaken.
National Waste Act (Act 59 of 2008)	National and Provincial Department of Environmental Affairs (DEA)	No licence required.	There is no requirement for a waste licence. improper waste management and disposal behaviour or lack of proper waste management processes and systems will be mitigated in the EMPr..There will be waste generation, management and disposal for the establishment, operational, decommissioning and rehabilitation phases of the projects.
National Environmental Management: Biodiversity Act (Act 10 of 2004.)	National and Provincial Department of Environmental Affairs (DEA)		There is a need to develop mitigation measures to minimise potential disturbance to the existing artificial wetland located on the Northern Side of the railway siding.

Title of legislation, policy or guideline	Administering Authority	Approvals and licences which might be required by authorities	Applicable to Project
National Forest Act(Act of 84 of 1998 )	National and Provincial Department of Environmental Affairs (DEA)	Tree cutting permit should there be listed trees identified on site.	The triggered activities will be undertaken on an area that has already been cleared as part of the existing operations on site.
National Water Act (Act 36 of 1998)	National and Provincial Department of Water and Sanitation (DWS)	There is an existing water use licence which was issued to provide for aspects relating to water use and coal stockpiling, to take reasonable measures to prevent any pollution of water resources. EMPr compiled to ensure overall protection of the environment and water resources including the monitoring plan for the site operations.	Planned upgrade to the existing pollution control dam on the Northern Side and and the construction of the new pollution control dam on the Souther Side will require a water use licence.

**Table 1.3-3: List of Activities (Yellow shaded sections, refer to the listed activities which are being applied for under that specific activity number)**

Act	Number and date of relevant Notice (Regulations)	Activity No.	Listed activity and described in the regulations (highlighted sections indicate the triggered activities)	Implications for site or motivation/reason for interpretation
National Environmental Management Act, Act 107 of 1998	GN R 327 (GN R983) as amended in April 2017 (Listing Notice 1)	Activity 9:	<p>The development of infrastructure exceeding 1 000 metres in length for the bulk transportation of water or storm water—</p> <p>(i) with an internal diameter of 0,36 metres or more; or</p> <p>(ii) with a peak throughput of 120 litres per second or more; excluding where—</p> <p>(a) such infrastructure is for bulk transportation of water or storm water or storm water drainage inside a road reserve or railway line reserve; or</p> <p>(b) where such development will occur within an urban area.</p>	Development of infrastructure. The length of the storm water drain and the canals to be connected might exceed 1 000 metres in length.
National Environmental Management Act, Act 107 of 1998	GN R 327 (GN R983) as amended in April 2017 (Listing Notice 1)	Activity 19:	<p>The infilling or depositing of any material of more than [5] 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than [5] 10 cubic metres from</p> <p>[-(i) a watercourse;</p> <p>[(ii) the seashore; or</p> <p>(iii)the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or estuary, whichever distance is the greater—] but excluding where such infilling, depositing, dredging, excavation, removal or moving—</p> <p>(a) will occur behind a development setback;</p> <p>(b) is for maintenance purposes undertaken in accordance with a maintenance management plan; [or]</p> <p>(c) falls within the ambit of activity 21 in this Notice, in which case that activity applies;</p> <p>(d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or</p> <p>where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.</p>	The proximity of the watercourse to the PCD located on the Northern side triggers the activity 19 (i)
National Environmental Management Act, Act 107 of 1998	GN R 327 (GN R983) as amended in April 2017 (Listing Notice 1)	Activity 34	<p>The expansion [or changes to] of existing facilities or infrastructure for any process or activity where such expansion [or changes] will result in the need for a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the release of emissions, effluent or pollution, excluding—</p> <p>(i) where the facility, infrastructure, process or activity is included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the National Environmental Management: Waste Act, 2008 applies</p>	A water use licence will be required for release of pollution.

Act	Number and date of relevant Notice (Regulations)	Activity No.	Listed activity and described in the regulations (highlighted sections indicate the triggered activities)	Implications for site or motivation/reason for interpretation
National Environmental Management Act, Act 107 of 1998	GN R 327 (GN R983) as amended in April 2017 (Listing Notice 1)	Activity 48:	<p>The expansion of—</p> <p>[(i) canals where the canal is expanded by 100 square metres or more in size; (ii) channels where the channel is expanded by 100 square metres or more in size;</p> <p>(iii) bridges where the bridge is expanded by 100 square metres or more in size;</p> <p>(iv) dams, where the dam, including infrastructure and water surface area, is expanded by 100 square metres or more in size;</p> <p>(v) weirs, where the weir, including infrastructure and water surface area, is expanded by 100 square metres or more in size;</p> <p>(vi) bulk storm water outlet structures where the bulk storm water outlet structure is expanded by 100 square metres or more in size; or</p> <p>(vii) marinas where the marina is expanded by 100 square metres or more in size;]</p> <p>(i) infrastructure or structures where the physical footprint is expanded by 100 square metres or more; or</p> <p>dams or weirs, where the dam or weir, including infrastructure and water surface area, is expanded by 100 square metres or more; where such expansion [or expansion and related operation] occurs— within a watercourse; setback; or ment</p> <p>Listing</p> <p>(c) in front of a development</p> <p>(d) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; excluding—</p> <p>(aa) the expansion of infrastructure or structures within existing ports or harbours that will not increase the develop footprint of the port or harbour;</p> <p>This gazette is also</p> <p>(bb) where such expansion activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;</p> <p>(cc) activities listed in activity 14 in Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies;</p> <p>(dd) where such expansion occurs within an urban area; or</p>	<p>The expansion of the canals for connecting the Northern and Southern side might or might not exceed the threshold of 100 m<sup>2</sup> or more in size.</p> <p>Activity 48 (iv) is triggered due to the planned expansion of the existing pollution control dam from 90 m<sup>2</sup> to 450 m<sup>2</sup> in size.</p> <p>The activity is also triggered due to the existence of the watercourse on the Northern side of the site adjacent to the PCD.</p>

Act	Number and date of relevant Notice (Regulations)	Activity No.	Listed activity and described in the regulations (highlighted sections indicate the triggered activities)	Implications for site or motivation/reason for interpretation
			where such expansion occurs within existing roads, road reserves or railway line reserves.	
National Environmental Management Act, Act 107 of 1998	GN R 327 (GN R983) as amended in April 2017 (Listing Notice 1)	Activity 64:	The expansion of railway lines, stations or shunting yards where there will be an increased development footprint, excluding— (i) railway lines, shunting yards and railway stations in industrial complexes or zones; underground railway lines in mines; or (iii) additional railway lines within the railway line reserve.	Upgrade of existing railway line infrastructure: Addition of Line 6 and extension of Line 5 and others.
National Environmental Management Act, Act 107 of 1998	GN R 327 (GN R983) as amended in April 2017 (Listing Notice 1)	Activity 67:	Phased activities for all activities— (i) listed in this Notice, which commenced on or after the effective date of this Notice [;] or [(ii)] similarly listed in any of the previous NEMA notices, which commenced on or after the effective date of such previous NEMA Notices; [where any phase of the activity may be below a threshold but where a combination of the phases, including expansions or extensions, will exceed a specified threshold;] excluding the following activities listed in this Notice- 17(i)(a-d); 17(ii)(a-d); 17(iii)(a-d); 17(iv)(a-d); 17(v)(a-d); 20; 21; 22; 24(i); 29; 30; 31; 32; 34; 54(i)(a-d); 54(ii)(a-d); 54(iii)(a-d); 54(iv)(a-d); 54(v)(a-d); 55; 61; [62]; 64; and 65; or (ii) listed as activities 5, 7, 8(ii), 11, 13, 16, 27(i) or 27(ii) in Listing Notice 2 of 2014 or similarly listed in any of the previous NEMA notices, which commenced on or after the effective date of such previous NEMA Notices; where any phase of the activity was below a threshold but	The existing operations on the Northern side will be implemented as Phase 2 on the Southern side as part of the planned upgrade activities. The upgrade to the existing pollution control dam and the connection of canals are some of the activities that make this a phased development.  The existing PCD is currently 90 m2 and is planned to be upgraded to 450 m2 which exceeds the threshold of 100 m2 for Activity 12.

Act	Number and date of relevant Notice (Regulations)	Activity No.	Listed activity and described in the regulations (highlighted sections indicate the triggered activities)	Implications for site or motivation/reason for interpretation
			where a combination of the phases, including expansions or extensions, will exceed a specified threshold.	
National Environmental Management Act, Act 107 of 1998	GN R 324 (GN R985) as amended in April 2017 (Listing Notice 3)	Activity 14:	Activity 14: The development of- [(i) canals exceeding 10 square metres in size; (ii) channels exceeding 10 square metres in size; (iii) bridges exceeding 10 square metres in size; (iv) dams, where the dam, including infrastructure and water surface area exceeds 10 square metres in size; (v) weirs, where the weir, including infrastructure and water surface area exceeds 10 square metres in size; (vi) bulk storm water outlet structures exceeding 10 square metres in size; (vii) marinas exceeding 10 square metres in size; (viii) jetties exceeding 10 square metres in size; (ix) slipways exceeding 10 square metres in size; (x) buildings exceeding 10 square metres in size; (xi) boardwalks exceeding 10 square metres in size; or (xii) infrastructure or structures with a physical footprint of 10 square metres or more;] (i) dams or weirs, where the dam or weir, including infrastructure and water surface area exceeds 10 square metres; or (ii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs— (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.  f. Mpumalanga i. Outside urban areas: (aa) A protected area identified in terms of NEMPAA, excluding conservancies; (bb) National Protected Area Expansion Strategy Focus areas;	The planned activities are within an area delineated as artificial wetlands which is a watercourse. For Mpumalanga, in areas outside urban areas, dd) Sensitive areas as identified in an environmental management framework. and (ee) applicable as wetlands are sites /areas listed in terms of Ramsar Convention 1971.



Act	Number and date of relevant Notice (Regulations)	Activity No.	Listed activity and described in the regulations (highlighted sections indicate the triggered activities)	Implications for site or motivation/reason for interpretation
			<p>(cc) World Heritage Sites;</p> <p>(dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</p> <p>(ee) Sites or areas identified in terms of an international convention;</p> <p>(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</p> <p>) Core areas in biosphere reserves; or</p> <p>) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve, where such areas comprise indigenous vegetation; or</p> <p>ii. Inside urban areas:</p> <p>(aa) Areas zoned for use as public open space; or</p> <p>) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, zoned for a conservation purpose.</p>	

**1.3.1 Water Use Licence (WUL) Conditions**

The WULA license was approved on the 18 December 2015 and accepted on the 6 January 2016 by Gijima team. The WULA conditions listed within the licence include the following:

- General Conditions of the Licence
- Conditions for Construction and Operation
- Dust Suppression
- Pollution Control Dam
- Quality of Waste Water to be disposed of the Waste Water Containment Facility
- Monitoring of Waste Water, Surface Water Quality and Groundwater Quality
- Storm Water Management
- Access Control
- Contingencies
- Reporting
- Auditing
- Integrated Water and Waste Management (IWWMP) and Rehabilitation Strategy and Implementation Programme (RSIP).

The comprehensive conditions of compliance for the WULA are provided within the licence attached as Annexure 1.1-6.

**1.4 Legal Compliance**

**1.4.1 Compliance with Environmental Development**

The EMP forms part of the contract documentation that Gijima will establish, and is thus a legally binding document. It is also necessary for the contractor to make provisions as part of their budgets for the implementation of the EMP. In terms of the National Environmental Management Act (Act No. 107 of 1998), (NEMA) Section 28, an individual responsible for environmental damage will pay costs both to the environment and human health and the preventative measures to reduce or prevent additional pollution and/or environmental damage from occurring. This is referred to as the *Polluter Pays Principle*. Section 28 of the NEMA embodies the polluter pays principle. Gijima holds ultimate responsibility for environmental compliance on their site but will ensure that all their contractors demonstrate responsibility to ensure attainment of such compliance.

The contractor to Gijima is deemed not to have complied with the Environmental Specification/EMP if:

- There is evidence of contravention of clauses within the boundaries of the site, site extensions and haul/access roads;
- Environmental damage ensues due to negligence;
- Ignores or fails to comply with corrective or other instructions issued by the developer, Siding Supervisor or engineer within a specified time; and
- Fails to respond adequately to complaints from the public.
- Fails to address any of the commitment outlined in this EMP.

Legal Compliance			
Responsibility	Developer	Frequency/time frames	Planning and design until closure
	Engineer		
	Contractor		

**Objectives**

1. To facilitate compliance with conditions of approval and overall environmental management legal requirements and best practice guidelines

### **Mitigation Measures**

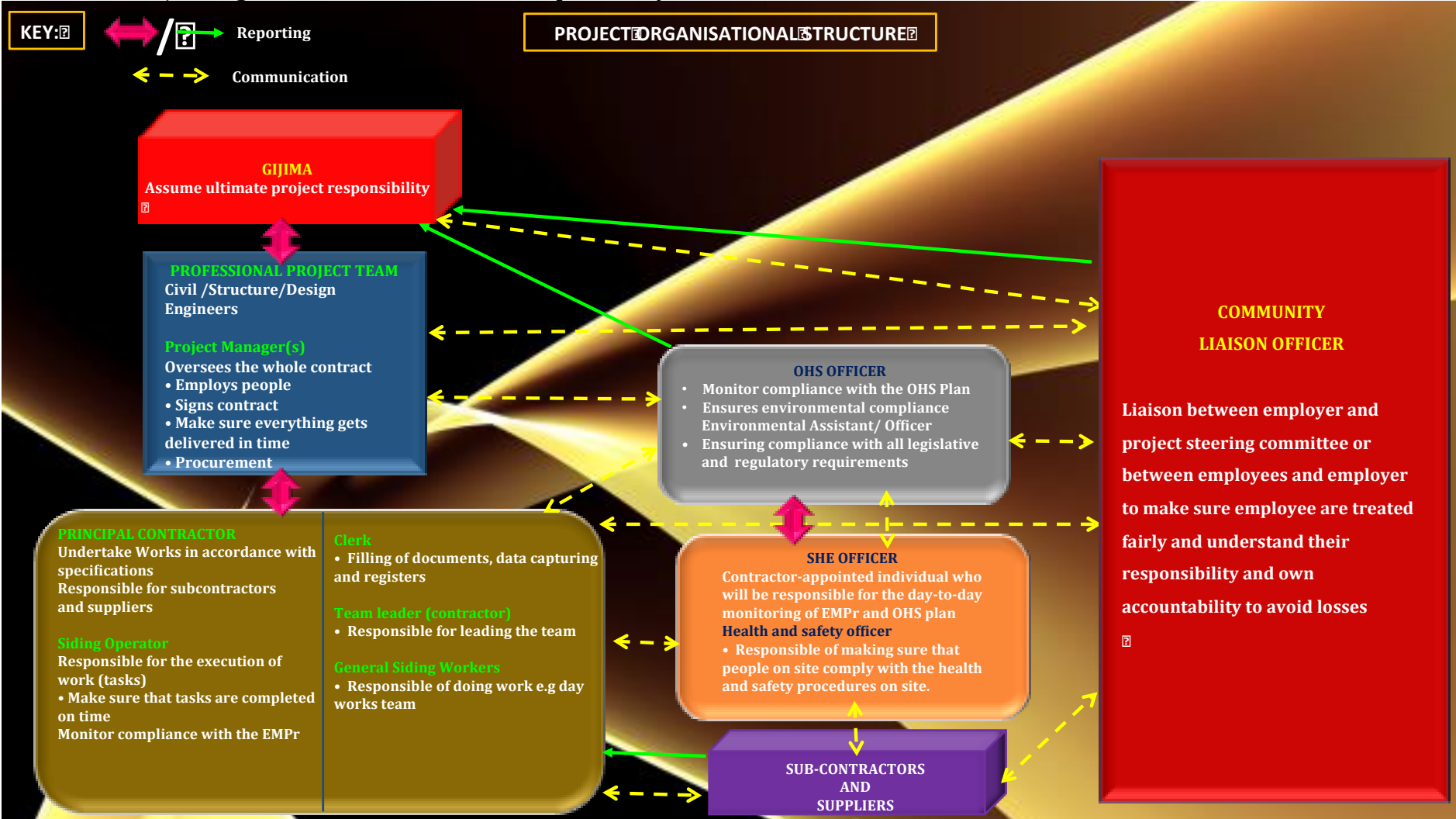
1. Keep the legal register for the site updated.
2. Legal register to include an assessment of the legal implications of various sections of acts for which environmental authorisation are required.
3. Reconcile all permit conditions and have a separate register detailing:
  - i.Environmental requirements;
  - ii.Water authorizations and
  - iii.Any other authorizations that might be required should there be any future expansions.
4. Adhere to permit/licence conditions,
5. Conduct/monitoring and report to regulatory authorities according to set time frames stipulated in various conditions of authorization,
6. Distribute and utilize legal register optimally at all operations,
7. Register with legal update firms to ensure that regular legal updates are received and incorporated into the legal register and implications of such new statutes understood and complied with.

## **1.5 Management and Monitoring Procedures**

### **1.5.1 Organisational Structure and Responsibility**

This Chart 1.5-1 provides an indication of the organisational and team structure for the project and the various roles and responsibility of the people with environmental responsibility are outline in the succeeding text or sub-headings for each position or role..

**Chart 1.5-1: Project Organisational Structure and Responsibility**



## **The Siding Supervisor**

The developer is ultimately responsible for ensuring compliance with the environmental specification and upholding the team to environmental commitment to compliance with all national, provincial and local legislation that relates to management of this environment.

The developer will through community liaison officer:

- Arrange information meetings for or consult with Interested and Affected Parties (IAPs) about the operational activities, wherever necessary;
- May on the recommendation of the engineer and/or and Community Liaison Officer (CLO) order the contractor to suspend any or all works on site if the contractor or his sub-contractor/supplier fails to comply with the said specifications; and
- Maintain a register of complaints and queries by members of the public at the site office and records of how issues raised are address.

More specifically Gijima shall:

- Ensure that it complies with the requirements of this operational EMP.
- Designate a staff member as , who will on a monthly basis visit the study area site and assess compliance with the EMP.
- Maintain a record of environmental management activities relating to the site (including all environmental reports and complaints made by the public.
- Appoint an independent Environmental Auditor (EA) to undertake annual operational phase environmental audits into perpetuity to determine compliance with the operational EMP.
- Transfer the legal obligation of ongoing environmental management of the site to any future property owners through an appropriately formulated sale agreement/s.

## **The engineer**

The engineer will:

- Enforce the environmental specification on site;
- Monitor compliance with the requirements of the specification;
- Assess the contractor's environmental performance in consultation with the Siding Supervisor, from which a brief monthly statement of environmental performance is drawn up for record purposes and to be reported to project meetings; and
- Ensure the documentation, in conjunction with the contractor, the state of the site prior to construction activities commencing. This documentation will be in the form of photographs or video record.

## **The contractor (including sub-contractors)**

The contractor is required to:

- Be fully conversant with the EMP and all conditions of the EA;
- Provide information on previous environmental management experience and company environmental policy in terms of the relevant forms contained in the contract document;
- Supply method statements timeously for all activities requiring special attention as specified and/or requested by the developer, and/or engineer during the duration of the contract;
- Be conversant with the requirements of this environmental specification/EMP. Brief all his/her staff about the requirements of the environmental specification;
- Comply with requirements of the Siding Supervisor in terms of this specification and the project specification, as applicable, within the time period specified;
- Ensure any sub-contractors/suppliers who are utilised within the context of the contract comply with the environmental requirements of the project, in terms of the specifications. The contractor will be held responsible for non-compliance on their behalf;
- Bear the cost of any delays, with no extension of time granted, should he or his sub-contractors/suppliers contravene the said specifications such that the engineer orders a suspension of work. The suspension will be enforced until such time as the offending party(ies), procedure, or equipment is corrected;
- Be conversant with the requirements of this environmental specification/ EMP. Brief all his/her staff about the requirements of the environmental specification;

- Comply with requirements of the in terms of this specification and the project specification, as applicable, within the time period specified;
- Ensure any sub-contractors/suppliers who are utilized within the context of the contract comply with the environmental requirements of the project, in terms of the specifications. The contractor will be held responsible for non-compliance on their behalf;
- Bear the cost of any delays, with no extension of time granted, should he or his sub-contractors/suppliers contravene the said specifications such that the engineer orders a suspension of work. The suspension will be enforced until such time as the offending party/parties procedure, or equipment is corrected.

### **The Siding Supervisor**

The Siding Supervisor shall be an employee or a qualified environmental professional or professional firm with the relevant environmental expertise and shall be responsible for:

- Informing key, on-site staff through initial environmental awareness training of their roles and responsibilities in terms of the EMP;
- Undertaking site inspections to determine compliance with the EMP;
- Identifying areas of non-compliance, and recommending measures to rectify them;
- Compiling a checklist of areas of non-compliance/non-conformances;
- Ensuring follow-up and resolution of all non-compliance/none conformances;

The Siding Supervisor will:

- Be fully conversant with the EMP;
- Be familiar with the recommendations and mitigation measures of the associated EMP for the project;
- Monitor the implementation of the EMP during the operational phases;
- Conduct monthly audits of the site according to the EMP, and report findings to the developer/contractor;
- Attend monthly site meetings or prepare reports for discussion at monthly Project Executive meetings;
- Recommend corrective action for any environmental non-compliance at the site;
- Compile a monthly report highlighting any non-compliance issues as well as progress and compliance with the EMP prescriptions.
- Conduct once-off training with the contractor on the EMP and general environmental awareness as outlined in Table 1.6-1.
- It will be noted that the responsibility of the is to monitor compliance and give advice on the implementation of the EMP and not to enforce compliance. Ensuring compliance is the responsibility of the developer and the Safety, Health and Environment (SHE) Officer.

### **Occupational Health and Safety Officer**

The Occupational Health and Safety (OHS) Officer will be responsible for undertaking of the following:

- Compilation of a comprehensive project Health and Safety Risk Assessment (HSRA);
- Compilation of health and safety specifications based on risks identified;
- Reviewing and approval of health and safety plan(s) submitted by appointed principal contractor(s);
- Conducting monthly health and safety inspections and compiling monthly OHS reports;
- Conducting monthly health and safety audits with audit reports;
- Assisting the developer/contractor in the investigation of major accident/incidents;
- Monitoring of site activities for compliance to the Occupational Health and Safety Act, (Act No. 85 of 1993) (OHSA) and Regulations;
- Establishment and monitoring of project health and safety file;
- Monitoring the principal contractor(s') health and safety performance; and
- Preparation of project close-out reports and submission of project health and safety files to the Client.

### **Safety, Health and Environmental (SHE) Officer**

The Safety, Health and Environmental Officer will:

- Be fully conversant with the EMP;

- Be fully conversant with relevant environmental legislation applicable to the project, and ensure compliance with them;
- Compilation of method statements together with the principal contractor that will specify how potential environmental impacts in line with the requirements of the EMP will be managed, and, where relevant environmental best practice and how they will practically ensure that the objectives of the EMP are achieved;
- Convey the contents of this EMP to the construction site staff and discuss the contents in detail with the contractor;
- Undertake regular and comprehensive inspection of the site and surrounding areas in order to monitor compliance with the EMP;
- Take appropriate action if the specifications contained in the EMP are not followed;
- Monitor and verify that environmental impacts are kept to a minimum, as far as possible;
- Order the removal from the construction site of any person(s) and/or equipment in contravention of the specifications of the EMP;
- Report any non-compliance or remedial measures that need to be applied to the appropriate environmental authorities, in line with the requirements of the EMP;
- Submitting a report at each site meeting which will document all incidents that have occurred during the period before the site meeting;
- Ensuring that the list of transgressions issued by the is available on request; and
- Maintain an environmental register together with other health and safety registers, which keep a record of all incidents which occur on the site during construction. These incidents include:
  - Public involvement/complaints.
  - Health and safety incidents.
  - Incidents involving hazardous materials stored on site.

Construction staff will be adequately educated by the ECO, and the SHE Officer, as to the provisions included in the EMP and general environmentally friendly practice.

The EA and EMP forms part of the formal site induction for all contractors, sub-contractors and casual labors, preferably in their native language. The induction training will, as a minimum, include the following:

- The importance of conformance with all environmental policies;
- The environmental impacts, actual or potential, of their work activities;
- The environmental benefits of improved personal performance;
- Their roles and responsibilities in achieving conformance with the environmental policy and procedures and with the requirement of the consultant’s Environmental Management Systems (EMS), including emergency preparedness and response requirements; and
- The mitigation measures required to be implemented when carrying out their work activities.

All contractors, sub-contractors and casual labors will acknowledge their understanding of the EMP and environmental responsibilities by signing an induction attendance record. The contractor is expected to have “tool box” talks. These talks will be in accordance with the risks and trends associated with the project. Proof of these talks will be kept on site.

## 1.6 Environmental Awareness Plan

Table 1.6-1: Table of Environmental Awareness Plan

<b>Environmental Awareness Plan</b>
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Responsibility	Safety Health and Environmental Manager	Frequency/Time Frame	Planning and design and throughout the operation on a quarterly basis.
	Environmental Control Officer		
	Human Resources Manager		

**Objectives:**

To ensure that:

- All employees who will perform work that will potentially impact on the environment are identified and trained such that they are competent or aware of the potential impact of their activities.
- The level of expertise and training needs of the identified personnel is determined.
- All employees are aware of the impact of their activities.
- Procedures are established and maintained to make appropriate employees aware of their environmental responsibilities.

Construction staff will be adequately educated by the Siding Supervisor and the SHE Officer, as to the provisions included in the EMP and general environmentally friendly practice.

The EA and EMP forms part of the formal site induction for all contractors, sub-contractors and casual labours, preferably in their native language. The induction training will, as a minimum, include the following:

- The importance of conformance with all environmental policies;
- The environmental impacts, actual or potential, of their work activities;
- The environmental benefits of improved personal performance;
- Their roles and responsibilities in achieving conformance with the environmental policy and procedures and with the requirement of the consultant’s Environmental Management Systems (EMS), including emergency preparedness and response requirements; and
- The mitigation measures required to be implemented when carrying out their work activities.

All contractors, sub-contractors and casual labors will acknowledge their understanding of the EMP and environmental responsibilities by signing an induction attendance record. The contractor is expected to have “tool box” talks. These talks will be in accordance with the risks and trends associated with the project. Proof of these talks will be kept on site.



## 2. Project Description

### 2.1 Transnet and Eskom Road to Rail Strategy Overview

The Arbor Rail Siding operations form part of a broader vision to reduce the number of trucks on the road network established by Transnet and Eskom. In summary the Road to Rail Strategy aims to achieve the following:

#### The Transnet and Eskom Road to Rail Strategy

- The Transnet Freight Rail Strategy is a 7 year Strategy that developed in 2012 after the announcement made by President Jacob Zuma during the State of the Nation Address (SONA) of allocating R300 billion in infrastructure development to rejuvenate the economy. The allocation was meant to also create jobs and address poverty including inequalities. Of the R300 billion, R200 billion would be channeled to Transnet Freight Rail (TRF) to expand the rail infrastructure to create capacity and increase cargo volumes.
- Transnet Freight Rail has developed and is currently implementing a new Strategy called the "Market Demand Strategy (MDS), which focuses mainly on a shift of traffic from road to rail.
- In their June 2015 progress report TFR reported to have six pillars for its MDS -- market development, operational efficiency, capital investment, regional integration, safety and people. Its goals were to be among the top five railways of the world, to be financially sustainable, to be the employer of choice and to reach a "gold standard" in its operations and capital executions.
- It was reported that in the next few months, from June 2015, TFR would be piloting a road-rail solution. This was a truck/trailer which had rail wheels and rubber wheels, which meant it could go on both rail and road. TFR had purchased new locomotives to the value of R250 billion, as part of the strategy was to improve the rail networks. TFR was also committed to improving cross-border traffic, focusing on the north-south corridor which would reduce the asset cycle time from 20 days to six days. It was in negotiations to move copper from Zambia to Richards Bay and Durban by rail, and was also working very closely with **Eskom** on customer collaboration and capacity creation for the road to rail shift.

As such Eskom implemented a road to rail strategy in order to minimise trucks carrying coal on road with the aim of addressing the safety hazards caused by trucks on the road improving the public safety on roads. The other aspect of rail strategy is to reduce logistics costs involved, which in turn influence the price of electricity.

#### **Eskom Road to Rail Strategy**

In support of the Road to Rail Strategy initiated by Transnet, Eskom reported their intention to increase the percentage of rail transportation use over the next five to ten years (Mining Online, September 2016). Mr Singh explained that the road-to-rail migration strategy is a “national strategic imperative” for several reasons. These include the following:

- the need to reduce fatalities on South Africa’s roads significantly;
- reduce damage and congestion on limited road infrastructure; and
- minimise the negative health impact of coal haulage on towns and communities near coal mining centres.

Economic advantages include reducing coal transportation costs (which will enable the optimisation of electricity tariffs), and boosting South Africa’s economy through significant rail infrastructure upgrade programmes, creating many new job opportunities in the process.

The strategy is said to also have environmental benefits such as reducing carbon emissions, and eradicating spillages and the illegal dumping of coal by hauliers.

**Source: Mining Online article, September 2016.**

## **2.2 Activity Description**

The operation process involves haulage of coal from various mines, stockpiling and loading onto railway wagons for transportation to the markets. Currently VVF mine is supplying Majuba Power Station by road.

The total storage capacity of the existing site is 21 204 tons. The current active operational side herewith, referred to the Northern Side of the Arbor Railway Siding, has been servicing Eskom with 3,8 million tons of coal, over the three-year period, which ended in September 2016.

Subsequently, Gijima targets the export market and Eskom renewed the contract and increased the tonnage to 9 5 000 000 tons over a 4-year period ending in 30 September 2020. This translates to 198 000 tons per month. There will be challenges in achieving this current contractual demand, since the current active operational area has reached its maximum operational capacity in terms of stockpiling, receiving trucks and loading the trains.

Currently, only two trains are operational to service the extended Eskom contract and the current infrastructure is not enough to fulfil Gijima’s contractual obligations. The operational capacity will need to be increased and as such there will be additional activities that will be undertaken such as increased stockpiling areas, and to increase the loading capacity with two trains daily. Increase in the capacity of the pollution control dam and/or have a new additional pollution control dam with a silt trap.

Gijima applied and has received approval from TRF to develop the Southern Side of Arbor into a coal Loading Facility. The motivation behind this development is:

- the creation of jobs,
- reduction in rail crossing movements
- the improvement of rail safe operations.

Currently this area is vacant and as such deemed as a wasted resource which holds a tremendous opportunity for both Transnet and the community. The development of the area has additional socio-economic benefits such as:

- development of opportunities within Delmas Local Municipality
- boosting of local economy through provision/creation of employment opportunities for the local community. The project envisaged to employ a total of 25 extra people excluding the already employed truck drivers and Gijima employees

- positive effect on the broader value chain extending to suppliers of goods and services from nearby towns.
- The operation will contribute positively on livelihoods leading to an increase in the standards of living while causing a reduction in poverty.
- The coal beneficiation industry has a positive impact of regional and local economic setup. The local economy will benefit through salaries paid to employees and tax revenues paid to Government.

In addition to the socio-economic benefits, the proposed development presents some benefits of the land use in respect of rail as follows:

- TFR's growth strategy can be realised because a minimum of 90 000 tons per month of Eskom coal will be loaded on rail;
- Export clients will use Arbor – planned 60 000 - 100 000t/month
- This business further supports the road to rail initiative;
- The benefit is that road haulage will be reduced significantly; increased safety on road
- Reduce truck movements over the railway crossing significantly! (VVF mine will then load at Arbor Southern side, instead of crossing the railway, by road to Majuba) – 5000 rail crossings per month. This is a major Safety improvement for TFR and the community!
- TFR's Objective is to increase shareholders worth, and the natural way of achieving this is by increasing volumes. Our Strategy of growing the tonnages is in support of TFR strategies.

### **2.3 Location of the Current Operations - Northern side**

Gjima currently has a lease agreement with TFR on a portion of Arbor siding – Northern side (DWX1470J, DWX1468J) and seeks to expand their operations to the Southern side (DWX 1469J and DWX 1471J) shown in Figure 2.3-1.

The Northern side is being used as a rail siding and coal stockpile area, with existing electrical and engineering infrastructure such as railway lines, power cables, drainage infrastructure, water supply infrastructure as shown in Figure 2.3-2 below.

The proposed expansion will require developmental activities in order to maximise the operational capacity of the business. It is reported that the current lease area (Northern side) has reached its maximum operational capacity in terms of stockpiling, safely receiving of trucks and loading of trains. However, a challenge has been encountered with meeting the demand as per contractual obligations. In order to meet their contractual obligations to Eskom (Tutuka Power station) as shown in Annexure 1.1-.3, they require 3 trains per day as opposed to the current operational 2 trains per day servicing the Northern side. The proposed expansion is seen to play a significant role in further supporting Transnet's Road to Rail initiative also linked to Eskom's Road to Rail strategy with the key objective being to divert a significant amount of tonnage from road to rail. The strategy also suggests moving into new technological developments within the industry by piloting the use of truck wagons with tyres that can travel on both road and railway track.

#### **2.3.1 Location of the Proposed operations - Southern side**

The proposed operations for the Southern side are within the same site within Farm Portion 1 area numbers (DWX 1469J and DWX 1471J) as shown in (Figure 2.3-1). In order to prepare the Southern side for operations, there are several alternative options proposed for the establishment of the Southern side as a Coal Stock Pile Area and a Loading Area.

#### **2.3.2 Physical Address and Farm name**

Arbor Railway Siding, which is located on Portion 1 of Farm Van Dyksput No. 214 - IR within the Victor Khanye Local Municipality (VKLM), under the Emalahleni Magisterial District, Mpumalanga Province. The farm boundaries are shown in Figure 2.3-2.

#### **2.3.3 Site Address**

Arbor Siding Portion 1 of Farm Van Dyksput No. 214 - IR within the Victor Khanye Local Municipality (VKLM), under the Emalahleni Magisterial District, Mpumalanga Province.

**2.3.4 Wards in Arbor**

The Arbor Railway Siding is located within Ward 9 of the Victor Khanye Local Municipality.

**2.3.5 The 21 digit Surveyor General code**

T	0	I	R	0	0	0	0	0	0	0	0	0	2	1	4	0	0	0	0	1
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

**2.3.6 Geographical Co-ordinates of All External Corner Points of the Site**

Latitude	Longitude
-26.0382137298584	28.8791160583496
-26.0408172607422	28.8874206542969
-26.0423965454102	28.8865623474121
-26.0392551422119	28.8784294128418



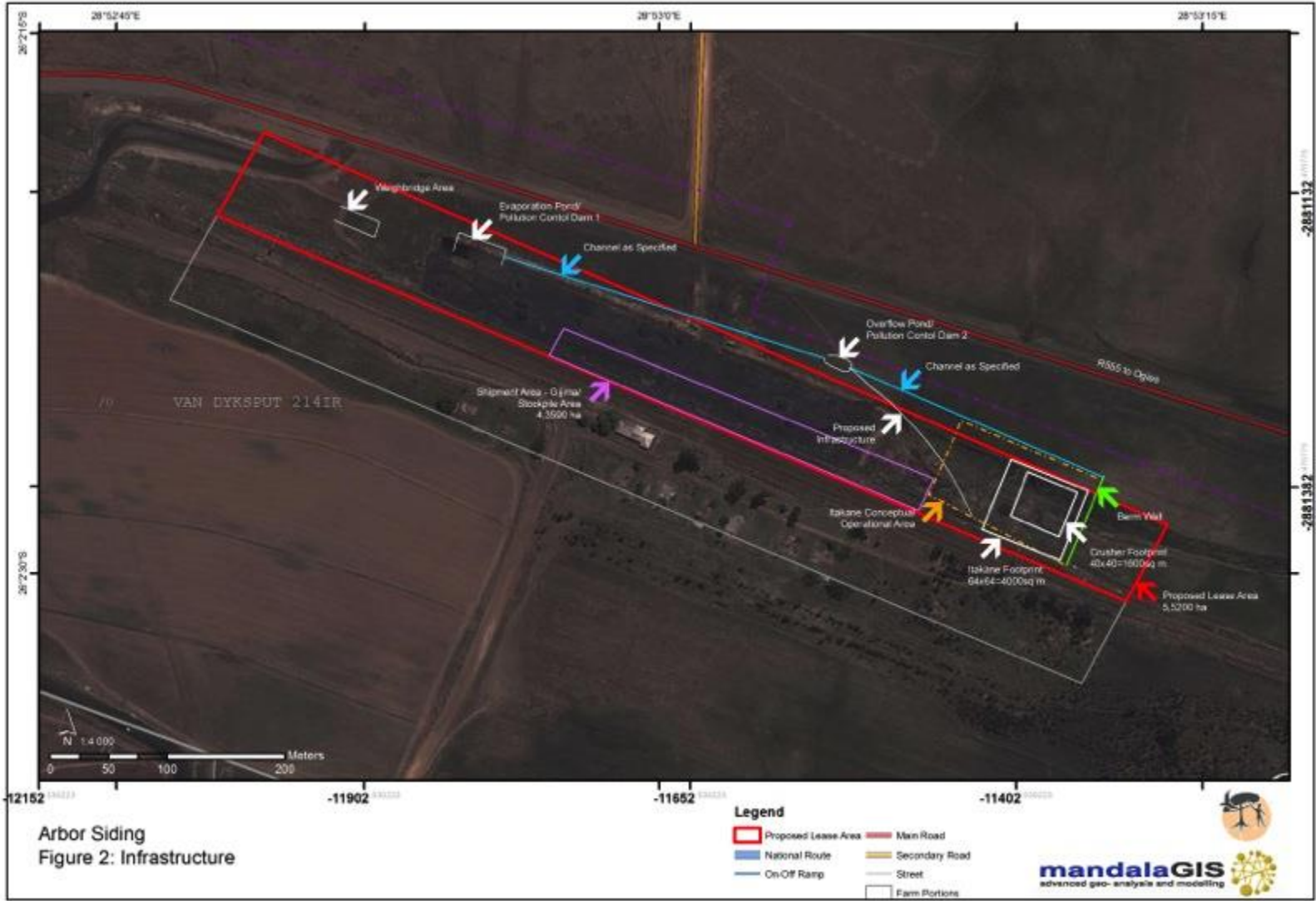


Figure 2.3-2. Infrastructure at the Arbor Siding.

### **2.3.7 Current Surface infrastructure on site**

The current infrastructure is shown below as illustrated in Photograph 2.3-1 to Photograph 2.3-2 and entails the following:

#### **2.3.7.1 Weighbridge area**

A weighbridge is installed next to the office block in the Northern Side and trucks go through it before offloading and after offloading at the stockpile area. Records of tonnage brought in daily are kept in the office for monitoring and reporting purposes.

#### **2.3.7.2 Pollution Control Dam (PCD) -**

- The PCD is set as dirty water catchment area at the siding, to collect and contain dirty stormwater runoff.
- Poor water quality is expected from the monitoring point as this is a dirty water management facility.

#### **2.3.7.3 Office Block and Ablution facility**

There is an office block close to the Weighbridge area. The office block has ablution facilities as well.

#### **2.3.7.4 Upstream Borehole (U/S Borehole) -**

The water quality conducted in the Northern side siding reported results for the U/S and the D/S boreholes as follows:

- Upstream Borehole is situated south of the siding.
- This borehole is not covered and therefore suspended solids are usually picked up during monitoring.
- Colour of collected sample ranges from clear to light brown.

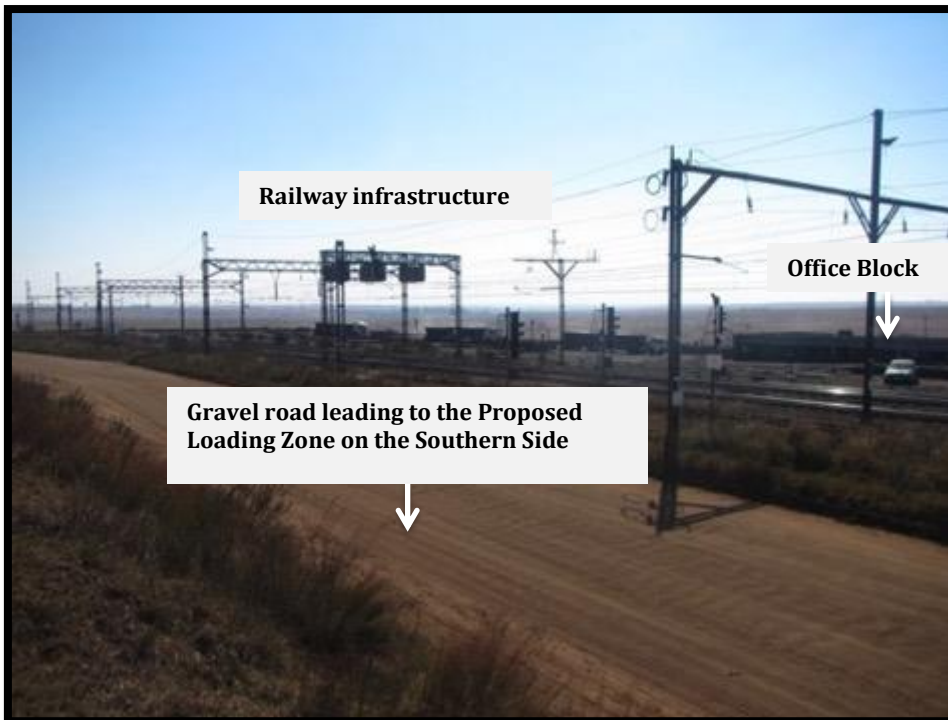
#### **2.3.7.5 Downstream Borehole (D/S Borehole) -**

- A community in the northwest of Arbor Siding uses water from this point for domestic purposes.
- It is a well-protected borehole with clear good quality water.





**Photograph 2.3-3: The infrastructure and machinery on the current operations within the Northern side. The Container is an office and storage, the diesel storage tank and heavy machinery - front end loaders parked behind the soil berm. The Pollution Control Dam (PCD) is also visible fenced in at far right hand side.**



**Photograph 2.3-4: The Northern side infrastructure showing the office block, the railway, the trucks exiting the Arbor. (Photo taken from the proposed Southern side of the siding).**



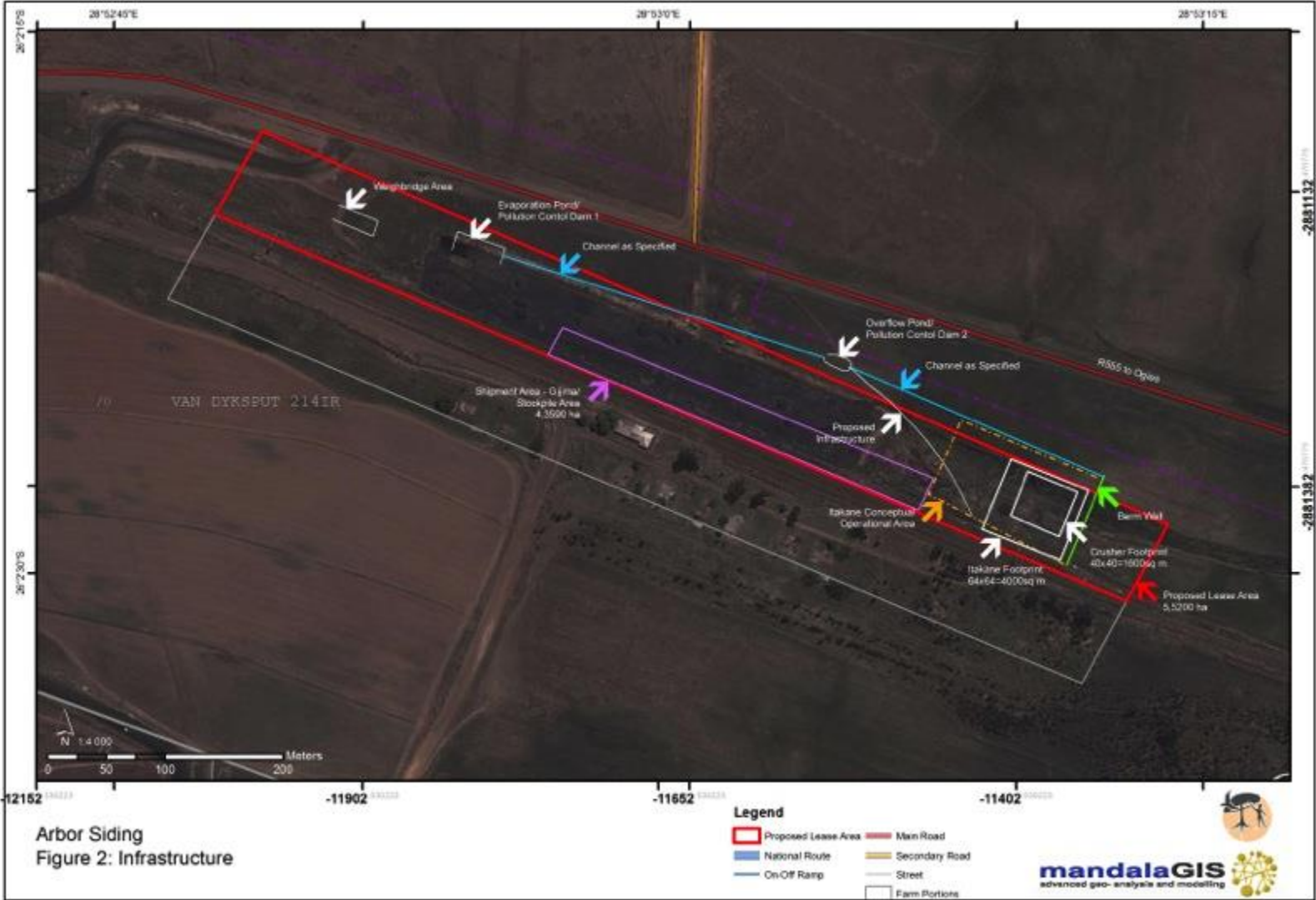


Figure 2.3-5. Infrastructure at the Arbor Siding - Northern side.

## 2.4 Location of the Proposed operations - Southern side

The proposed operations for the Southern side are within the same site within Farm Portion 1 area numbers (DWX 1469J and DWX 1471J) as shown in (Figure 2.3-1). In order to prepare the Southern side for operations, there are several alternative options proposed for the establishment of the Southern side as a Coal Stock Pile Area and a Loading Area. The proposals are as follows:

### Option 1:

The plan is to keep the existing track work as is and cut away the loading area with a slope of 1:40 away from the track. Install a dirty water channel at the back end which will tie up with the evaporation dams. The layer works will consist of the compacted in situ material, 150mm sub-base layer and 150mm of sacrificial coal. A typical cross section of the loading area as proposed is shown in Figure 2.4-1 below.

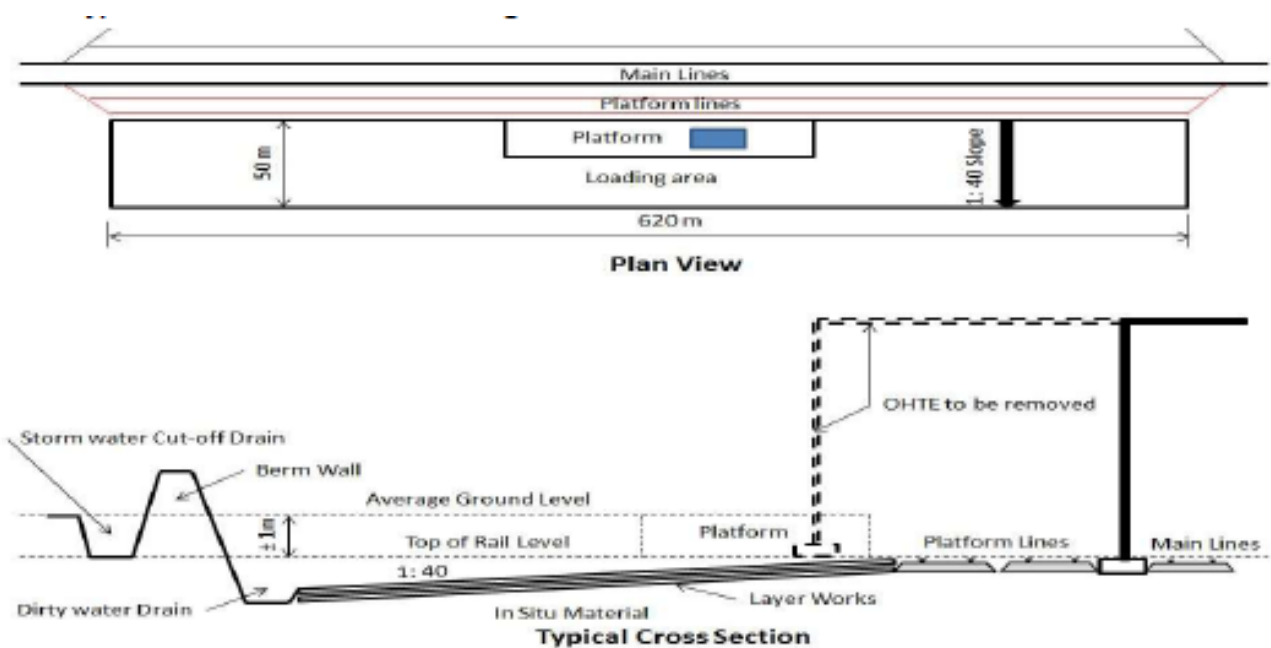


Figure 2.4-1: Option 1 for the Establishment of Loading Area for Southern side.

### Option 2:

This option involves the replacement of the platform line with a Tubular Track System. Cut the loading area with a slope of 1:40 towards the track along the natural ground level. The space between the tubular track beams and the adjacent track structure can be utilized as the dirty water drain. This drain will have to be connected to the evaporation dam at the Delmas end of the siding. The layer works will consist of the compacted in situ material, 150mm sub-base layer and 150mm of sacrificial coal. A typical cross section of the loading area with the tubular track system is shown in the Figure 2.4-2 below.

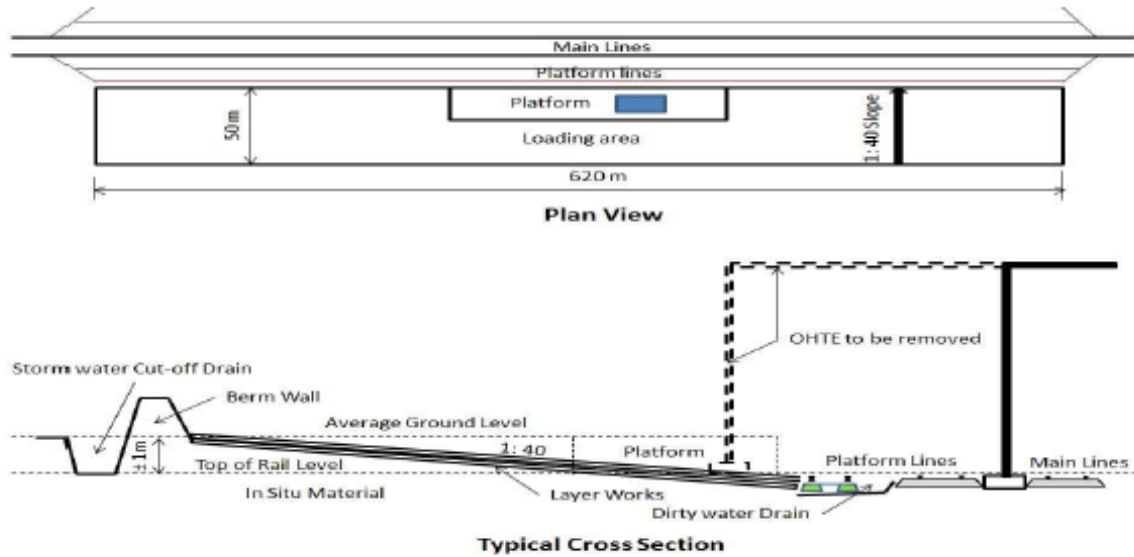


Figure 2.4-2: Option 2 for the Establishment of Loading Area for Southern side.

**Option 3:**

This option entails the diversion of the existing platform line around the platform and cut away the loading area with a slope of 1:40 away from the track. Install a dirty water channel at the back end which will tie up with the evaporation dams. The layer works for the loading area will consist of the compacted in situ material, 150mm sub-base layer and 150mm of sacrificial coal. The 5m wide formation will consist of 150mm sub-base material (G4), then a 200mm A-layer (G6) followed by a 350mm B-layer (G8). The typical cross section is shown in Figure 2.4-3.

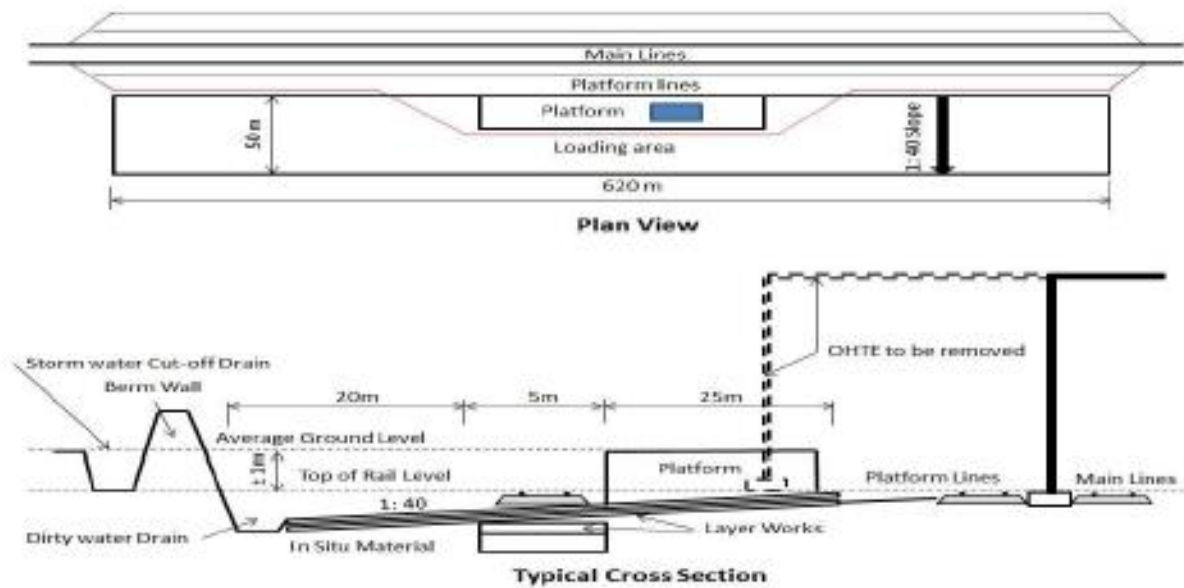


Figure 2.4-3: Option 3 for the Establishment of Loading Area for Southern side.

For all the above mentioned proposed options, there needs to be clear potential impacts for each and mitigation measures for the proposed design. Currently there is one Pollution Control Dam on the Northern side and all the proposed options are on the Southern side are in line with the proposed establishment of an Evaporation dam on the Southern side. However, should the alternative be to link up with the Pollution Control Dam within the Northern side through the use of water channels going under the railway, the designs, impacts and mitigation measures on groundwater will be formulated to ensure minimisation of negative impacts to the environment.

**Option 4:**

Replace the existing platform line with the Tubular Track System and divert it around the platform. Cut away the loading area with a slope of 1: 40 towards the track. Install a dirty water channel between the two platform lines and tie it up with the evaporation dam on the Delmas side of the siding. The layer works for the loading area will consist of the compacted in situ material, 150mm sub-base layer and 150 mm of sacrificial coal. The 4m wide formation will consist of 150mm sub-base material (G4), then a 250mm A-layer (G6) followed by a 400mm B-layer (G8).

## **2.5 Residue and Emissions**

Waste is categorized as either general or hazardous. Within these two categories, waste is categorized according to its source, namely domestic, commercial and industrial. General waste is sub-divided into paper, metals, glass, plastic, organic, and inert materials (which include builder's rubble). Due to its composition and characteristics, general waste does not pose a significant threat to public health or the environment, if managed properly.

### **2.5.1. Waste Stream Identification**

The waste generated can be divided into four groups as characterised in paragraph below.

### **2.5.2. Waste Stream Characterisation**

Waste is characterised as follows:

#### **2.5.2.1. Hazardous Waste**

Hazardous wastes could be generated primarily through the emergency repairs of vehicles and equipment breaking down on site. The wastes to be managed include:

- oils or other material containing hydrocarbons.
- residual chemicals and chemical containers used while repairing vehicles on site

#### **2.5.2.2 Industrial Waste**

Industrial waste on site include various consumables from emergency vehicle and machines repair activities including used tyres and scrap metal (not contaminated by hydrocarbons). The waste includes:

- scrap metal
- used tyres

## **2.6 Waste Management**

### **2.6.1. Domestic Waste**

Domestic waste is generated on site, primarily at the temporal office associated with the consumption of food or drink on site. Normal office type waste is also generated. Typical general waste includes:

- General compactable and non-compactable wastes being primarily cans, paper, plastic packets, food scraps and packaging materials

### **2.6.2. Mine waste**

No mine waste is anticipated or currently generated on site.

### **2.6.3 Waste Management**

Domestic waste is removed by a contractor and disposed at the licensed Town Council waste disposal site.

### **2.6.4. Waste recovery and Reduction**

Correct storage of a particular waste type reduces the risk of environmental impacts and limits the risks of pollution. Waste separation at source is recommended. The proposed methodology is as follows:

- The waste company is contacted when a container is close to full.
- The waste is collected within 48 hours of notification. The full container is replaced with an empty one.
- The contractor separates the waste and transports it to the appropriate licensed facility for disposal. Domestic waste is separated on site and recyclable materials are removed.
- In order to promote waste management awareness and implementation on site all siding workers will be provided with separation of waste at source during environmental awareness training and the clearly labeled waste bins will be strategically labeled for easier and effective use.

## **2.7 Socio-Economic**

The social benefits for the proposed development include positive contribution towards development of opportunities within Delmas Local Municipality. The local economy will be boosted through

provision/creation of employment opportunities for the local community. These opportunities will have a positive effect on the broader value chain extending to suppliers of goods and services from nearby towns. The proposed expansion will employ approximately 25 new jobs at Arbor:

- 1 x Siding Supervisor responsible for planning, leading and execution of the siding operations on a daily basis;
- 4 x team leaders;
- 4 x front-end loader drivers
- 4 x security guards
- 4 x admin clerks/weighbridge operators
- 4 x traffic controllers
- 4 x general worker

The personnel breakdown excludes the already employed truck drivers and Gijima employees. Considering that each employee provides for approximately 5 extra people it then calls to reason the approximately 25 lives will be improved. The operation will contribute positively on livelihoods leading to an increase in the standards of living while causing a reduction in poverty. The economical benefits include coal beneficiation industry with a positive impact of regional and local economic setup. The local economy will benefit through salaries paid to employees and tax revenues paid to Government. At a Regional level, Gijima supplies Eskom with coal and thus has to meet the growing demand in order for Eskom to produce electricity. New coal reserves need to be exploited to supply the growing needs of Eskom as there are serious socioeconomic impacts associated with unreliable and interrupted electrical supply as observed during the regular power outages experienced in previous years and recent months (2016/2017).

### 3. Current Site Operations - Arbor Rail Siding Northern Side

The operation process involves haulage of coal from various mines, stockpiling and loading onto railway wagons for transportation to the markets. Currently VVF mine is supplying Majuba Power Station by road.

The total storage capacity of the existing site is 21 204 tons. The current active operational side herewith, referred to the Northern Side of the Arbor Railway Siding, has been servicing Eskom with 3,8 million tons of coal, over the three-year period, which ended in September 2016.

Subsequently, Gijima targets the export market and Eskom renewed the contract and increased the tonnage to 9 5 000 000 tons over a 4-year period ending in 30 September 2020. This translates to 198 000 tons per month. There will be challenges in achieving this current contractual demand, since the current active operational area has reached its maximum operational capacity in terms of stockpiling, receiving trucks and loading the trains. Currently, only two trains are operational to service the extended Eskom contract and the current infrastructure is not enough to fulfil Gijima's contractual obligations. The operational capacity will need to be increased and as such there will be additional activities that will be undertaken such as increased stockpiling areas, and to increase the loading capacity with two trains daily. The entrance to the siding is shown as Photograph 3.1-1 and the illustration of operations within the site are shown in Photograph 3.1-2.



**Photograph 3.1-1: View of Site Activities**

**ARBOR: WORKING OF PRIVATE SIDING NO. 740527 Gijima**

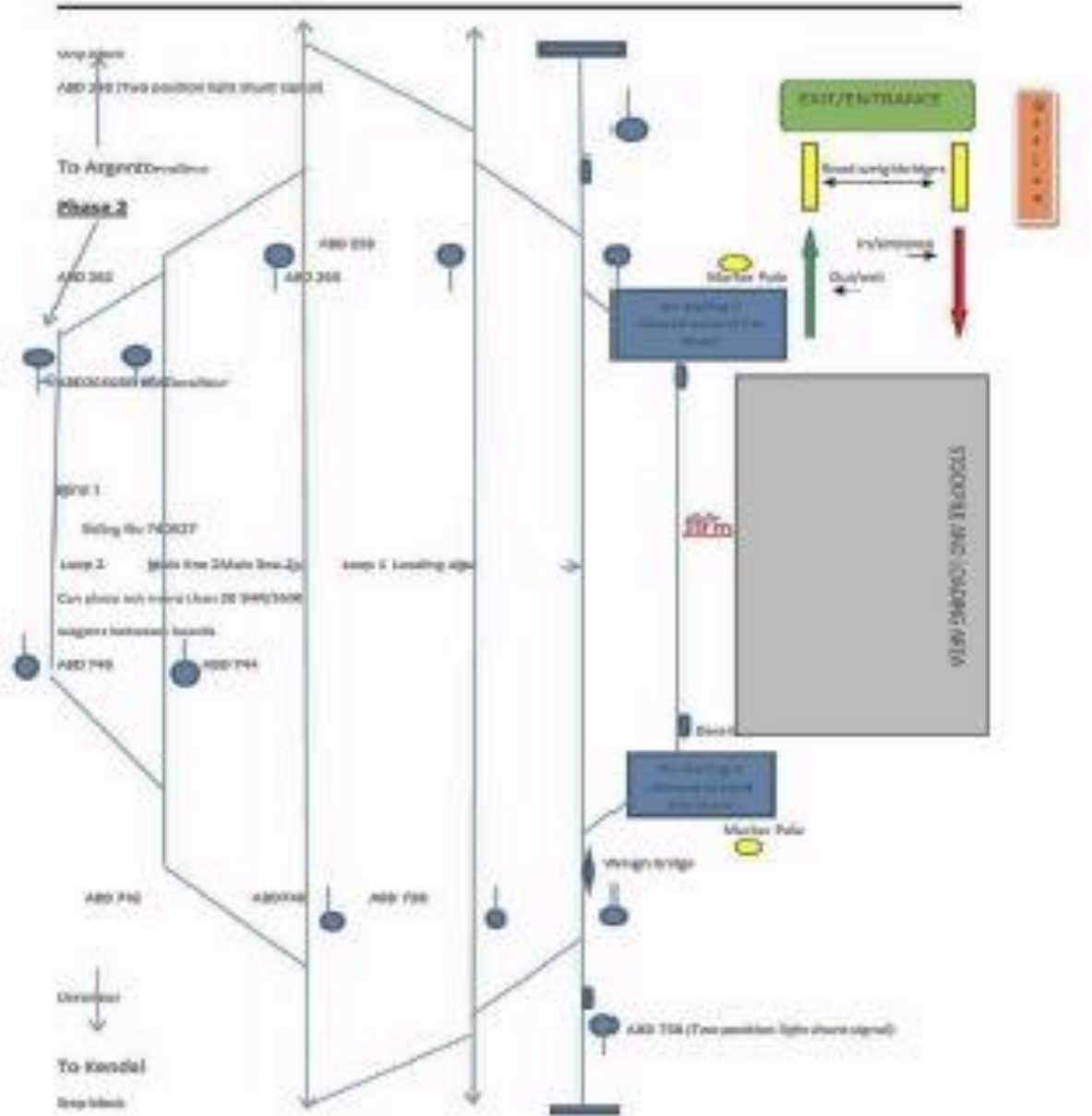


Figure 3.1-2: Illustration of the current operations within the Northern side of the Siding.



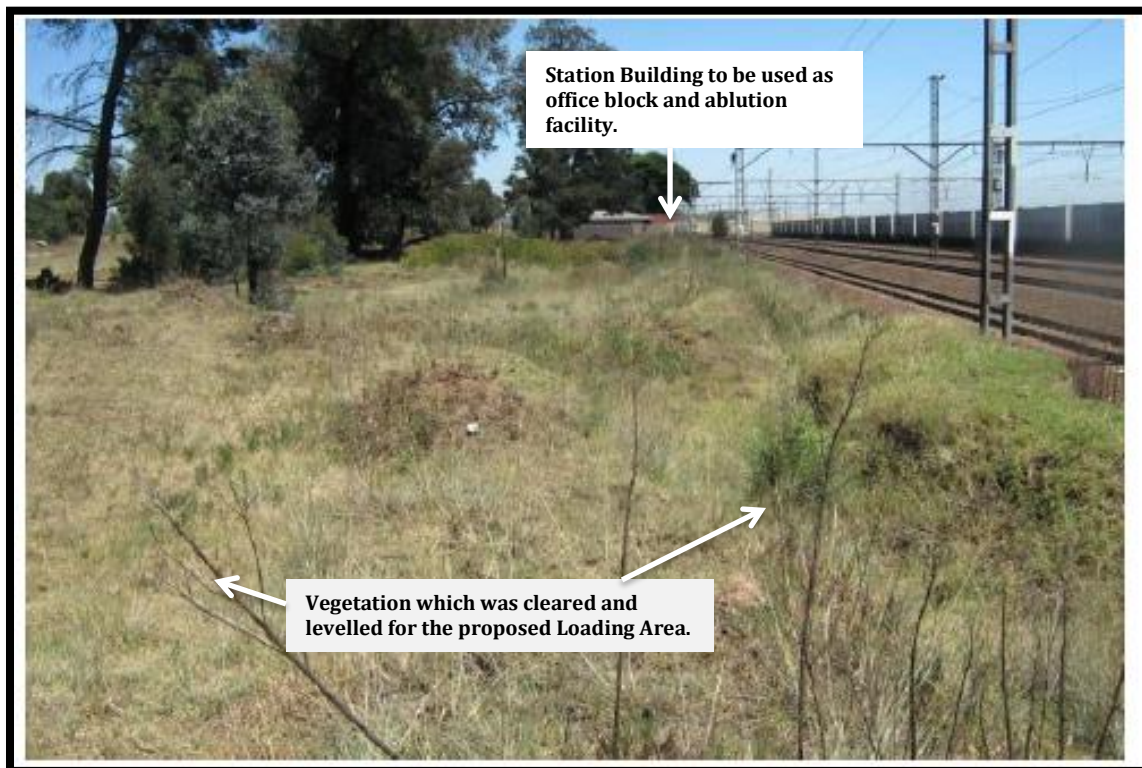
#### 4. Proposed Construction Activities at the Arbor Rail Siding Southern Side

The proposed site for development (Southern side) is currently vacant and is deemed as a wasted resource which holds a tremendous opportunity for both Transnet and the community. The land adjacent to the site is mainly used for residential, mining and coal washing and Poultry farming. The area adjacent to the operating site is mainly used for residential, agriculture and mining activities. The neighbouring area is characterised by several power generation stations including Kendal and New Kusile power stations. There are no major buildings except old derelict Transnet buildings that are on site, which is mentioned under the discussion of the heritage specialist investigation in Section 15. From the Heritage Study conducted the Arbor Station building has been identified as a significant heritage resource.

The proposed development within the Southern side is a mirror image of the Northern side. The view of the proposed Stockpile areas and the use of the Station Building as an office are shown in Photograph 4.1-1.

In order to create space to construct the loading area, an area with a 31000 m<sup>2</sup> (50m x 620m) footprint is proposed for the development of the Southern Side and the following activities will be undertaken:

- Divert and extend the storm water drainage channel. Construct a berm wall on the station side of the channel with the excavated material.
- Backfill and compact the old channel where required.
- Remove the building rubble from the site.
- Remove the Over Head TE from the platform line.
- Extend the existing storm water culvert for the full width of the loading area and connect it to the new storm water cut-off drain.
- Construct new evaporation dams.
- 2 x Weighbridges to be installed.



Photograph 4.1-1: Vacant land/site for the - Southern side where clearing was done for the activities which do not trigger listing as part of the existing lease area developments.



Photograph 4-2: View of the areas that were identified for some of the development activities.

#### 4.1 Current and Proposed Surface infrastructure on site

To provide an overview of the site and differences between the current northern side operations and the proposed operations, Table 4.1-1 below presents this comparison.

Table 4.1-1 The Current and proposed infrastructure for the Northern and Southern side of the site.

Current Operations Infrastructure (Northern Side)	Proposed Operations Infrastructure (Southern Side)
Weighbridge	2 x Rail weighbridges
Office Block	Station Building as Site Offices/ Administration buildings
Parking area	Parking area
Ablution Facility	Ablution Facilities
Diesel storage tank	
Heavy front end loading machinery: <ul style="list-style-type: none"> <li>• 3 x Front end Loaders with weighcells (front end scoop caterpillar)</li> <li>• 1 x water horse truck</li> <li>• 1 x 2 ton Bakkies</li> <li>• 1 x Water bowser</li> <li>• Grader (to hire when necessary)</li> </ul>	Heavy front end loading machinery: <ul style="list-style-type: none"> <li>• 3 x Front end Loaders with weighcells (front end scoop caterpillar)</li> <li>• 1 x water horse truck</li> <li>• 1 x 2 ton Bakkies</li> <li>• 1 x Water bowser</li> <li>• Grader (to hire when necessary)</li> </ul>
Railway infrastructure	Railway infrastructure
2 Trains of 50 wagons with a capacity of 2 x 27 tons containers per day	3 Trains of 50 wagons with a capacity of 2 x 27 tons containers per day
Pollution Control Dam	New Evaporation Dam - WUL will be required
Coal stockpile area	Coal stockpile area
Train slipper stockpile area	Train slipper stockpile area
Waste Storage area	Waste Storage area
Stockpile areas	Stockpile areas
Loading areas	Loading areas
Pipelines and culverts	Pipelines and culverts

## 5. Proposed Operational activities at the Arbor Rail Siding - Southern Side

### 5.1.1 Haulage of coal

The operational activities in the Southern Side of the Siding are presented below.

Gijima's operations from the Southern Side will include haulage of coal from various mines. The coal will be trucked to the siding using 32 ton trucks. Coal is trucked from the nearby mines and off loaded on site

where it will be stockpiled for no more than three days. It will then be stockpiled at the rail siding at a delineated loading area, after which it will then be loaded into the wagons for transportation by train and transported to markets such as the Eskom power stations.

### 5.1.2 Coal Stockpiling area

The existing Northern Side loading area is approximately 9000 square metres. Approximately three stockpiles are placed along the rail length to load a train of  $\pm 60$  carriages carrying tons of coal. Coal is being stock-piled until train arrives. The Southern side siding operation will entail offloading, stockpiling of coal and loading it on the wagons for transportation, with 5,400 tonnage of coal to be moved per day.

### 5.1.3 Dirty Water Channel

A dirty water channel will collect runoff contaminated with coal to the Pollution Control Dam (PCD) as shown in Photograph 5.2.3-1 below. There is currently a channel of approximately 360m long to capture contaminated water on site and to discharge the water into the PCD on the Northern Side. The change in elevation for this channel is approximately 6m. The channel is designed to collect a peak flow of  $1.611\text{m}^3/\text{s}$  without spilling for the Northern Side. The dirty water from the Southern Side will require that a new Pollution Control Dam be constructed which in turn will require application for a Water Use Licence. Another option is to utilise the existing channel system to divert the dirty water from the Southern Side to the Northern Side through the channel system that is designed under the railway line. The later option would require details designs and Environmental assessment studies to ensure that the high risk environmental impacts are minimised and mitigated.



Photograph 5.1.3-1: Pollution Control Dam on site.

## 5.2 Site Operational Timelines

### 5.2.1 Frequency of Operations

It is expected that the Southern Side siding will be a 24/hour operation, with three men shifts and anticipated that there will be more than 2 train-stock-holding to be held at the siding at any given time. Wagon loads of 5 400 tonnage of coal will be moved per day. This means 2 x train loads per day (1 train will be carry about 50-60 wagons with 2 x 27 tons containers).

### 5.2.2 Safety of Operations

- Arbor Siding operations will be planned and operated using TFR guidelines and will adhere to the safe working procedures drafted by TFR;
- All safety and security measures to be applied at all times;

- The train will be placed by TFR in the designated siding as per instructions of the safe working procedures drafted by TFR;
- Shunting, loading and removal of wagons, will be done according to instructions set out in the TFR's safe working procedure document;

### 5.3 Project Proposed Timelines

#### 5.3.1 Short-term goals:

In the short term, TFR has already done a safety assessment of the Operations on the Southern side of Arbor, a test train was placed and operated safely during 2016. Trains can be loaded and both Gijima and TFR have been working on this site to ensure safe working operations.

#### 5.3.2 Medium to Long-term goals:

- For drainage purposes, there is a longitudinal fall of about 5m over the length of the siding that gives a slope of about 1:120 which is ideal. However, the specification for staging lines is a max of 1: 800 and it is assumed that the slope of the existing railway lines through the station does conform to that standard.
- The existing average ground level of the loading area is 1m above the top of the rail level of the platform line at any given point.
- Enough good material will be recovered from the excavations to use as a sub-base layer on the loading area and the formation layer works.
- There are no other hidden services which will need relocation.
- Facilities for earthworks plant will not be required as the use of the existing ones will be sufficient.
- In the long term there are plans to include an Evaporation Dam in the Southern Side of the Siding and a water use licence application is being undertaken concurrently with this application for environmental authorisation.

### 5.4 Waste Quantities

Solid construction waste will be expected from the removal of the existing construction rubble on site, the removal of OHTE, the removal of cleared vegetation for site establishment and for construction. The generated waste will be transported by a registered contractor to the approved disposal facility

The waste generated can be divided into groups as characterised in paragraph below.

Waste is categorized as either general or hazardous. Within these two categories, waste is categorized according to its source, namely domestic, commercial and industrial. General waste is sub-divided into paper, metals, glass, plastic, organic, and inert materials (which include builder's rubble). Due to its composition and characteristics, general waste does not pose a significant threat to public health or the environment, if managed properly.

#### 5.4.1. Waste Stream Identification

The waste generated can be divided into four groups as characterised in paragraph below.

#### 5.4.2. Waste Stream Characterisation

Waste is characterised as follows:

##### 5.4.2.1. Hazardous Waste

Hazardous wastes could be generated primarily through the emergency repairs of vehicles and equipment breaking down on site. The wastes to be managed include:

- oils or other material containing hydrocarbons.
- residual chemicals and chemical containers used while repairing vehicles on site

##### 5.5.2 Industrial Waste

Industrial waste on site include various consumables from emergency vehicle and machines repair activities including used tyres and scrap metal (not contaminated by hydrocarbons). The waste includes:

- scrap metal
- used tyres

## 5.5 Waste Management

### 5.5.1. Domestic Waste

Domestic waste is generated on site, primarily at the temporal office associated with the consumption of food or drink on site. Normal office type waste is also generated. Typical general waste includes:

- General compactable and non-compactable wastes being primarily cans, paper, plastic packets, food scraps and packaging materials

### 5.5.2. Mine waste

No mine waste is anticipated or currently generated on site.

### 5.5.3 Waste Management

Domestic waste is removed and disposed by a contractor and disposed-off to a licensed local municipality site waste disposal site. There are also contractual arrangement with Eskom for the waste to be collected to the nearby powerstation where it is then properly disposed with the general waste from the power station.

### 5.5.4. Waste recovery and Reduction

Correct storage of a particular waste type reduces the risk of environmental impacts and limits the risks of pollution. Waste separation at source is recommended. The proposed methodology is as follows:

- The waste company is contacted when a container is close to full.
- The waste is collected within 48 hours of notification. The full container is replaced with an empty one.
- The contractor separates the waste and transports it to the appropriate licensed facility for disposal. Domestic waste is separated on site and recyclable materials are removed.
- In order to promote waste management awareness and implementation on site all siding workers will be provided with separation of waste at source during environmental awareness training and the clearly labelled waste bins will be strategically labelled for easier and effective use.

### 5.5.5 Wastewater management

Wastewater is used for dust suppression and also for the construction phase of the proposed expansion.

### 5.5.6 Emissions into the atmosphere

Measurement of air pollution in the country is governed by various South African legislation including the **South African Constitution**, which states that everyone has the right:-

(a) To an environment that is not harmful to their health or well-being; and

(b) To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:-

(i) Prevent pollution and ecological degradation;

(ii) Promote conservation; and

(iii) Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

Additional South African legislation and guidelines that deal with environmental management and air quality:-

#### **The National Environmental Management Act, Air Quality Act (NEMAQA) (Act No. 39 of 2004)**

**Schedule 2:** The Act includes margins of tolerance, compliance time frames and permissible frequencies by which the standards may be exceeded;

The South African National Standard 1929 of 2011, Ambient Air Quality – Limits for Common Pollutants;

The South African National Standards (SANS) were established in order to assist the Department of Environmental Affairs and Tourism (DEAT) to develop ambient air quality standards for seven pollutants of concern. These include sulphur dioxide, nitrogen dioxide, carbon monoxide, particulate matter (PM10), ozone, lead and benzene (DEAT, 2006) emission standards, pertaining to inter alia construction and operation activities.

There is a need for monitoring and evaluation of air-related health impacts as well. Air pollution comprises of outdoor (ambient) pollution (i.e. fossil fuel burning or cars, industrial non-fossil fuel emissions; natural emissions; pesticides etc) and indoor pollution (i.e. burning coal, wood, paraffin for heating, cooking and lighting). Adverse health effects range from nausea, difficulty breathing, ARTIs, pneumonia, birth defects and, immunosuppressant and cancer).

#### **NEMAQA 39 of 2004 Listed Activities (2010)**

The Minister signed into law the list of activities which result in atmospheric emissions which have or may have a significant detrimental effect on environment including health, social conditions, economic conditions, ecological conditions or cultural heritage. As a results their impact should be monitored and an Atmospheric Emission License be applied should the air quality standards be triggered by the proposed or existing operation.

#### **Highveld Airshed Priority Area Air Quality Management Plan**

The Highveld Airshed was declared the second priority area by the minister at the end of 2007. This requires that an Air Quality Management Plan for the area be developed. The plan includes the establishment of an emissions reduction strategies and intervention programmes based on the findings of a baseline characterisation of the area. The implication of this is that all contributing sources in the area will be assessed to determine the emission reduction targets to be achieved over the following few years. The Arbor Siding operation falls within the HPA demarcated footprint and as a result emission reduction strategy is required and will be included for the numerous coal mines in the area with specific targets associated with it.

There will be dust generated during the site establishment, construction and decommissioning phase of the proposed activity:

**At site establishment** phase with the clearance of vegetation and removal of trees and concrete/building rubble.

**At construction phase** from the offloading of coal onto the stockpile area and loading of coal into the train wagons.

**At rehabilitation and decommissioning phase** from the demolition of all infrastructure on site. Dust emissions are likely to occur due to vehicular movement as the access roads are gravel. The severity of this impact is anticipated to be low, if mitigation measures such as dampening of the gravel road and adherence to speed limits are observed. Furthermore, the traffic volume is anticipated to be low during this phase of the project, in comparison with the Operational Phase. Wind blown dust also contributes to the dust at the site. Wind-blown dust from unpaved road surface also plays a major role in contributing on the amount of dust and atmospheric emission experienced at the study site.

Air pollution emanating from vehicular emissions is also anticipated to be low if the mitigation measures prescribed in this Environmental Management Plan are adhered to. The cumulative impacts of dust in the overall area within a 1km radius of the Siding must be noted as there are a number of trucks travelling on the gravel road towards R555 Ogies road. There is also an increase in traffic on the R555 road including taxis and private cars.

Additional air pollution sources such as PM<sub>10</sub>, SO<sub>2</sub>, CO and VOC (i.e. NO<sub>x</sub>) that occur in the region include the following:-

- Eskom power stations,
- Industrial emissions (i.e. commercial farming),
- Blasting operations at mines and
- Spontaneous combustion, and
- Vehicle exhausts emissions.

Various local and far-a-field sources are expected to contribute to the suspended fine particulate concentrations in the region. Local sources include:

- Wind erosion from exposed areas,
- Fugitive dust from agricultural and mining operations,
- Particulate releases from industrial operations,
- Vehicle entrainment from roadways and
- Household fuel burning also constitutes a significant local source of low-level emissions

#### 5.5.6.1 Ambient Quality

The Ambient Air Quality study undertaken reported the main sources likely to contribute to cumulative PM<sub>10</sub>, SO<sub>2</sub>, CO and VOC air quality impact are vehicle entrainment on unpaved road surfaces and during loading and off-loading of coal at the site (i.e. mining activity). The predominant *wind direction* within the site is *from the west-northwest* on which during day time there is an increase in these winds velocity. *Less frequent winds are from the southern directions.*

#### 5.5.7 Generation of Noise

There will be noise from the increased traffic along R555 road used by the trucks from various operations that share the entrance to the Arbor Siding. The R555 road is also used by taxis and private cars towards Delmas and Ogies.

**Site establishment phase** - The vehicular movement of heavy machinery during site establishment and clearing of site. Noise from the front-end graders, trucks offloading construction material and loading site establishment rubble for disposal. Noise from the construction workers and site personnel.

**Construction phase** - The vehicular movement of heavy machinery during construction of site infrastructure. Noise from the front-end graders, trucks offloading construction material and loading construction rubble for disposal. Noise from the construction workers and site personnel.

**Operational phase** - Trucks offloading coal at stockpile area and the loading into train wagons by front-end caterpillar with weight cells. The movement of the train in and out of the loading zone.

**Rehabilitation/Decommission phase** - The demolition of all infrastructure on the site and the noise from site workers.

The construction of the structures will only cause a temporal increase in ambient noise levels during construction and decommissioning phase. The noise will only be limited to construction activities. The expected noise caused by these construction vehicles is however, foreseen to be low, as the expected noise will be from the truck engine and generators. The noise will only be experienced during the day and only during construction phase. Therefore, probability of excessive noise is low and will have low intensity. It is anticipated that the noise levels will increase during the Operational phase as the trucks offload to stockpile and the front-end caterpillars load coal into the train wagons and at Decommissioning phase with all the demolition of site infrastructure.

#### 5.6 Socio-economic value of the activity

The social benefits for the proposed development include positive contribution towards development of opportunities within the Municipality. The local economy will be boosted through provision/creation of employment opportunities for the local community. These opportunities will have a positive effect on the broader value chain extending to suppliers of goods and services from nearby towns.



### 5.6.1 Temporal and permanent jobs

- The proposed expansion will employ approximately 25 new jobs at Arbor:
- 1 x Siding Supervisor responsible for planning, leading and execution of the siding operations on a daily basis;
- 4 x team leaders;
- 4 x front-end loader drivers
- 4 x security guards
- 4 x admin clerks/weighbridge operators
- 4 x traffic controllers
- 4 x general worker

The personnel breakdown excludes the already employed truck drivers and Gijima employees. Considering that each employee provides for approximately 5 extra people it then calls to reason the approximately 25 lives will be improved. The operation will contribute positively on livelihoods leading to an increase in the standards of living while causing a reduction in poverty. The economical benefits include coal beneficiation industry with a positive impact of regional and local economic setup. The local economy will benefit through salaries paid to employees and tax revenues paid to Government. At a regional level, Gijima supplies Eskom with coal and thus has to meet the growing demand in order for Eskom to produce electricity. New coal reserves need to be exploited to supply the growing needs of Eskom as there are serious socioeconomic impacts associated with unreliable and interrupted electrical supply as observed during the regular power outages experienced in previous years and recent months in 2019.

### 5.7 Competence to operate site

#### 5.7.1 Technical Competence and Site Management

The site currently has a Siding Manager and a team of personnel overseeing the operational management of the site and also the environmental legal compliance including monitoring as prescribed in both the EMPr conditions and the WUL conditions.

Monthly internal performance assessment audits are undertaken and external environmental performance assessment audits are also conducted by Eskom on a regular basis. Records of monthly progress reports with audit checklists and corrective action registers are kept on site.

Name of responsible person – Mr Velile Ramphele

Velile Ramphele	Gijima Supply Chain Management (Pty) Ltd.	Executive Chairman	Arbor Siding, Portion 1 of the Farm Vandyksput, Delmas, Mpumalanga [province, South Africa. Cellphone: 072 434 5436 e-mail : veliler@gijimasupplychains.co.za
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## 6. Project Activities

### 6.1 Planned project activities

An overview of the planned project activities is provided in this section. It should be noted that the environmental authorisation application does not include all the activities as shown in Figure 8.1-1. Some of the activities were implemented, for example, the vegetation clearance is already done as part of the existing operations. The new application is for only the activities that are triggered. The activities in this figure must be read in conjunction with Table 8.1-1 and Figure 8.1-2. Nevertheless, please note the picture used for areas indicated for loading was pre-existing operation interventions and the site might not currently resemble this picture.



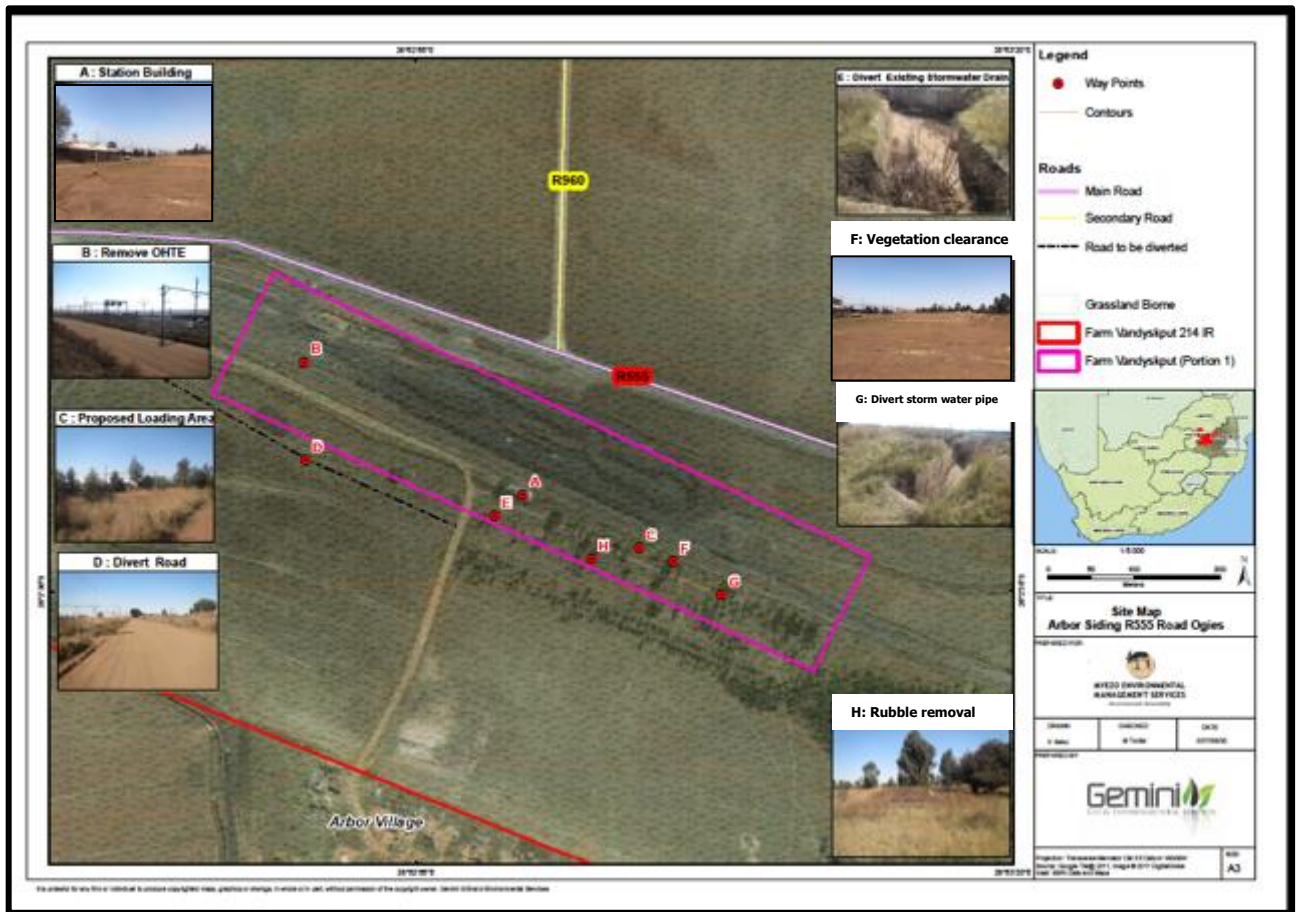


Figure 6.1-1: An overview of project activities for the site

All the proposed activities listed in the Table 6.1.-1 below are illustrated in the Figure 6.1.-2. The detailed description of the planned diversion and alterations to the railway line that will be implemented in a phased approach for Phase 2 and Phase 3 are shown in Figure 6.1-3 and Figure 6.1-4 respectively.

Table 6.1-1: List of proposed Activities for the Southern Side and the photo references.

Activity No.	Proposed Activity	Photo Reference Figure 6.1-1
1.	<ul style="list-style-type: none"> <li>Remove the OHTE from the platform line. For detail on the planned diversion and extension of Line 5 and Line 6 including the deviation and extension of Line 4 (refer to the topographic illustration of the planned activities in Figure 6.1-3 and 6.1-4).</li> </ul>	B
2.	<ul style="list-style-type: none"> <li>Establish loading area</li> </ul>	C
3.	<ul style="list-style-type: none"> <li>Divert gravel road</li> </ul>	D
	<ul style="list-style-type: none"> <li>Divert existing storm water drain and extend the storm water drainage channel. Construct a berm wall on the station side of the channel with the excavated material.</li> </ul>	E
4.	<ul style="list-style-type: none"> <li>Backfill and compact the old channel where required.</li> </ul>	E
5.	<ul style="list-style-type: none"> <li>Clearance of vegetation</li> </ul>	F
5.	<ul style="list-style-type: none"> <li>Divert storm water pipe</li> </ul>	G

4.	<ul style="list-style-type: none"> <li>Remove the entire existing concrete drainage infrastructure.</li> </ul>	<b>F, G</b>
5.	<ul style="list-style-type: none"> <li>Extend the existing storm water culvert for the full width of the loading area and connect it to the new storm water cut-off drain.</li> </ul>	<b>F, G</b>
	<ul style="list-style-type: none"> <li>Rubble Removal</li> </ul>	<b>H</b>
7.	<ul style="list-style-type: none"> <li>Construct new evaporation dam.</li> </ul>	



Figure 6.1-2: Proposed activities for increasing the scope at the Siding





Figure 6.1-3: Proposed new activities which will be undertaken as Phase 2 of the Arbor Railway Siding operations (This environmental authorisation application)



Figure 6.1-4: Proposed new infrastructure to be undertaken as part of this environmental authorisation application (Phase 3)

### 6.1.1 Water management plan

The water management plan highlights the planned activities from a water management perspective and is summarized as follows:

### 6.2.1 Planned Activities

The design of the proposed activities were investigated by a specialist engineer in July 2018 and the water management plan for the proposed expansion of the Arbor Siding is attached as Annexure 6.1-1.

The proposed site for the increased scope of the operations include the utilization of two lines next to the existing platform (indicated in red and yellow line in Figure 6.1-5).



Figure 6.1-5 Proposed site for the future increase in scope of the existing railway siding.

Phasing in of the infrastructure:

The planned intention is to initially use the infrastructure “as is” with the minimum construction possible to modify the site in order to stockpile the coal and load it on to the trains. For the sake of the ease of reference this stage will be referred to as “Phase 1”. The infrastructure which will be constructed in Phase 1 will be in line with the future infrastructure requirement for Phase 2.

The water management calculations were done for the proposed Phase 2 which will represent the completed works to stockpile 17 000 tons of coal and a throughput of about 72 000 tons per month.

### 6.1.2 Proposed Layout for Phase 1

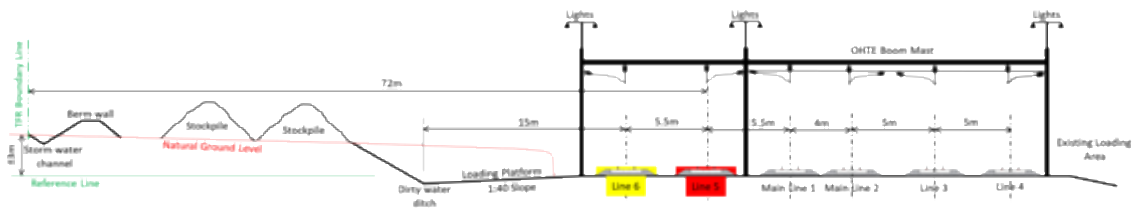
The terrain will only be cleared and leveled and some minor earthworks will be required to enable the front end loaders to get to the rail track structure to load the trasins. Figure 6.1-6 gives the proposed startup layout for phase 1.

A storm water drain and berm wall will also be installed on the TFR boundary line to divert the runoff storm water away from the siding in order to separate the clean and dirty water systems.





Figure 6.1-6: Layout for Phase 1



Cross-section of the siding for phase 1

Figure 6.1-7: Cross Section for Phase 1

### 6.1.3 Proposed Layout for Phase 2

Line 6 will be moved to the TFR boundary which will then encapsulate the dirty area between line 5 and line 6. In order to manage and contain the polluted runoff the following items are added to the basic layout design as illustrated in Figure 6.1-8.

- Redirecting the contaminated water flow
- Adding a silt trap
- Adding a Pollution Control Dam (PCD)



Figure 6.1-8 Layout for Phase 1

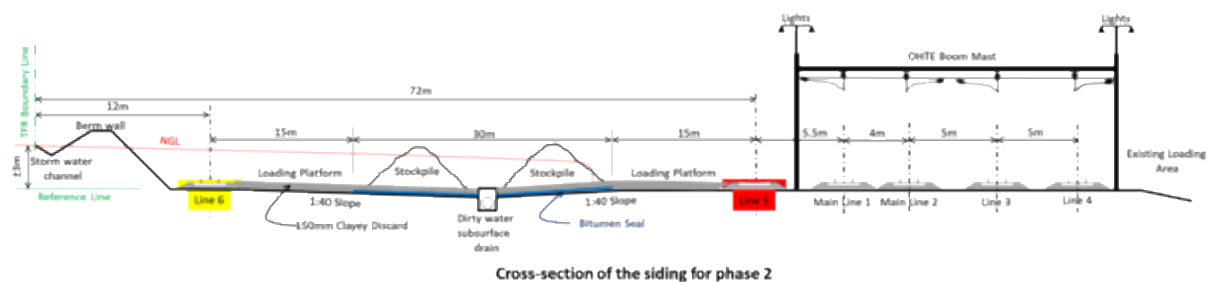


Figure 6.1-9. Cross Section for Phase 2

### Water Management Strategy

The proposed water management strategy is summarized as follows:

- Storm water runoff from the catchment area will be guided around the siding by means of the storm water drain and the berm wall.
- For phase 1 the polluted water will be guided to the existing culvert underneath the railway tracks on the eastern side of the siding. From there the existing dirty water channel will discharge it into the existing PCD.
- After completion of phase 2 the entire siding will slope westwards with a fall of 1:100 and then the polluted water will flow that way by means of drainage channels and culverts to be discharged into the silt trap and the new PCD.
- Water will be extracted from the PCD at a rate of 90 000 liters per day (about 27 000m<sup>3</sup> per year) for mainly dust suppression purposes.

- There is no need for the supply of potable water due to the infrastructure which already exists on the northern siding.

**Soil sealing arrangements:**

No soil sealing will be performed for the phase 1 layout because this setup will only be in place temporarily. Any pollution that might occur during this period will physically be removed when the phase 2 layout is being constructed. This is evident when comparing the natural ground level line (red line) with the stockpile levels on Figures 6.1-10 & Figure 6.1-11.

The following methodologies will be used for the phase 2 layout in order to comply with the “Class C” specification for landfills in providing a double seal:

**The Pollution Control Dam (PCD):**

Spray a 1mm thick bitumen emulsion seal / binder on the floor and the sidewalls and then cover it with a 1.5mm thick HDPE membrane. The advantage of this methodology is that the bitumen will “glue” to the HDPE liner and thereby strengthen it. Due to its “gluing” effect it will also localize and inhibits any leakage through the plastic liner.

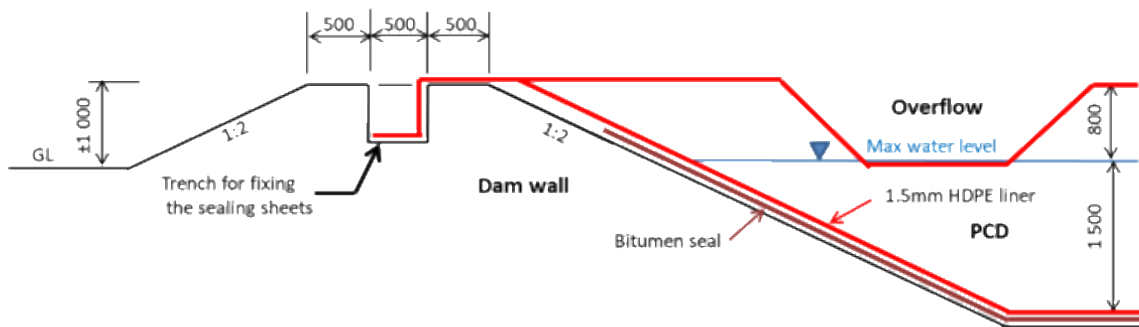
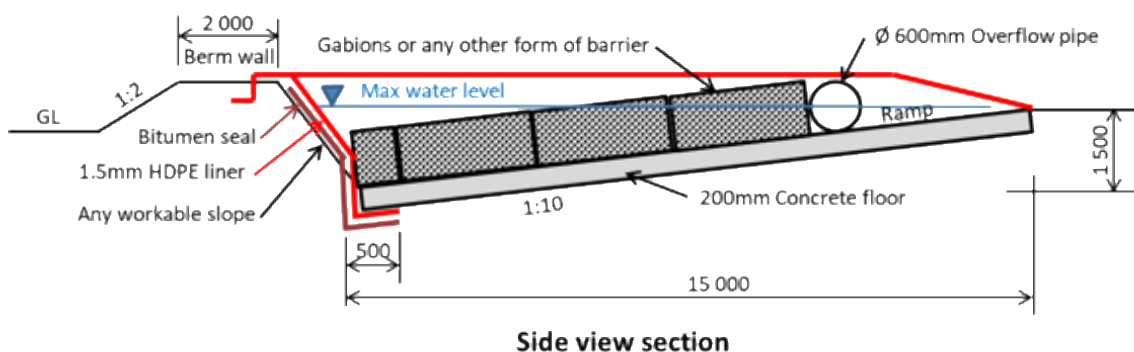


Figure 6.1-10: Sealing arrangement for the PCD

**The Silt trap**

Sealing the silt trap is similar to the PCD except that the floor or ramp will be covered with a 200mm thick concrete slab.



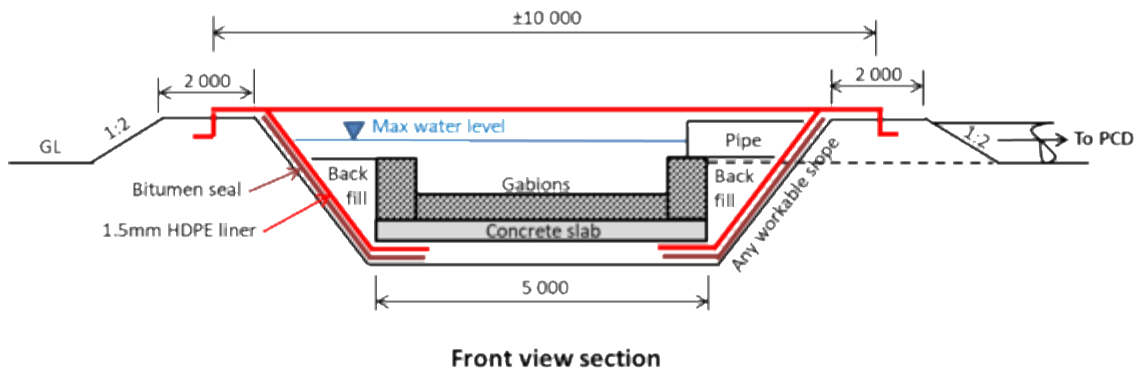


Figure 6.1-11: Sealing arrangements for the silt trap

**The Stockpile areas**

Spray a 1mm thick bitumen layer on top of the prepared surface area for the stockpiles and cover it with a 150mm low permeable material (such as a clayey discard layer). As soon as water is added (which will be daily) the very fine particles will settle at the bottom of the layer to form a very effective natural seal. This seal will “grow” over time as the vehicle wheels pulverize the surface particles and the seal will become even more effective (Figure 6.1-12).

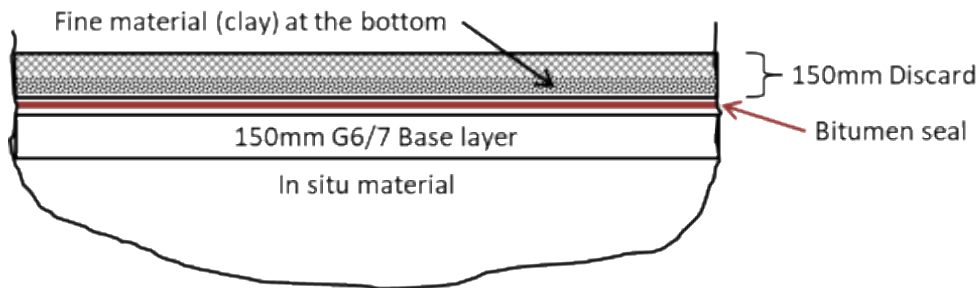


Figure 6.1-12: Sealing arrangement for the stockpiles

**The dirty water channels:**

**Subsurface drains:**

Unfortunately the dirty water catchment drains have to run through the centre line of the stockpile areas for this specific kind of loading area layout. For maintenance and safety reasons it would be better to install subsurface drains to collect and discharge the dirty water in this case.

The subsurface drains will effectively be 500mm x 500mm in size. The drains will be lined with a 1.5mm HDPE liner and the water will permeate to the drainpipe by means of a thick geo-fabric and a coarse sand fill at the top as shown in Figure 6.1-13. The slope of all the subsurface drains will be 1:1000.



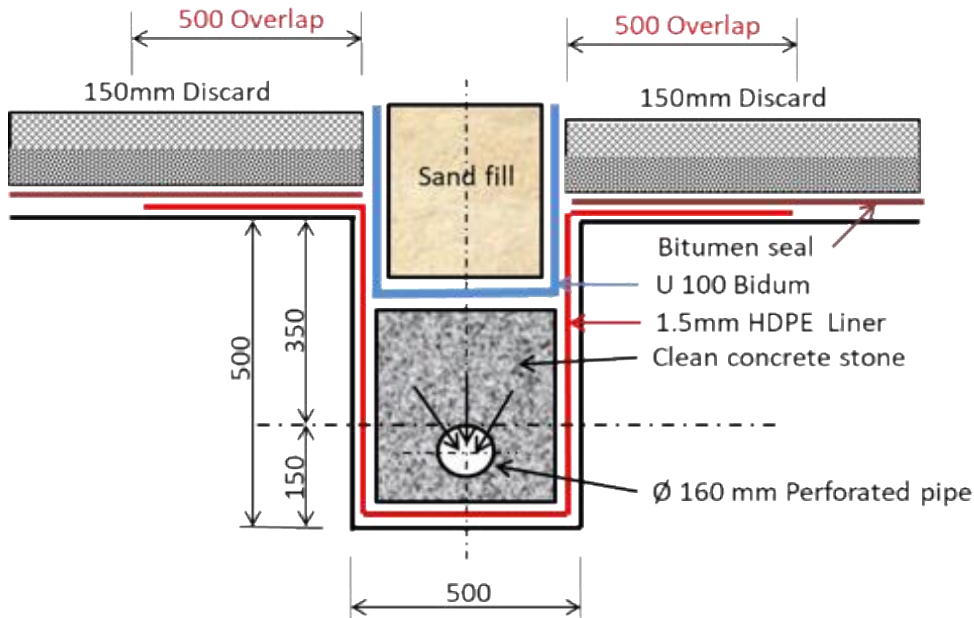


Figure 6.1-13: Layout for the subsurface drains

**Surface drains:**

Open drains will be lined with a 1.5mm HDPE liner and weighed down at the bottom by means of either sand bags, hand stone or even coarse gravel.

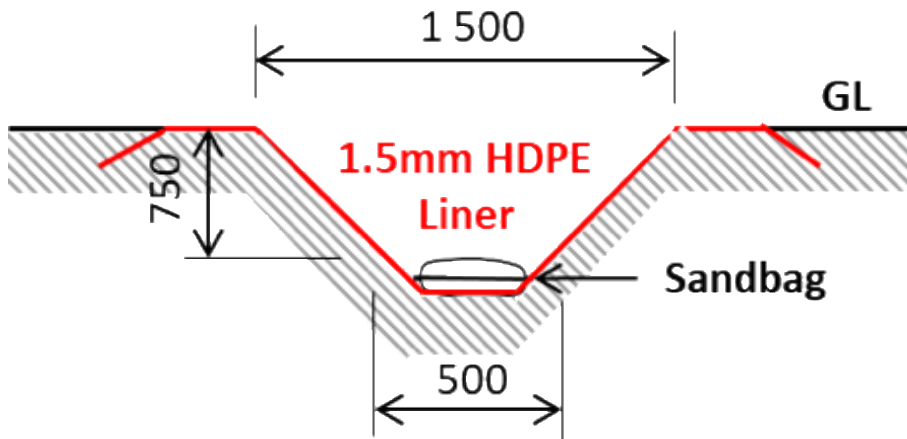


Figure 6.1-14: Sealing of the open drains

**Underfloor drainage:**

According to the “Class C” specification for landfills subsurface drains have to be installed below the floor of the PCD for monitoring purposes. Due to the relatively small size of the PCD a single ring drain at the floor edges will suffice (Figure 6.1-15). Although the final ground levels for phase 2 are yet unknown it will be assumed that the outlet of the ring drain will daylight inside the storm water channel. These drains are indicated on Figure 6.1-16 by the red lines.

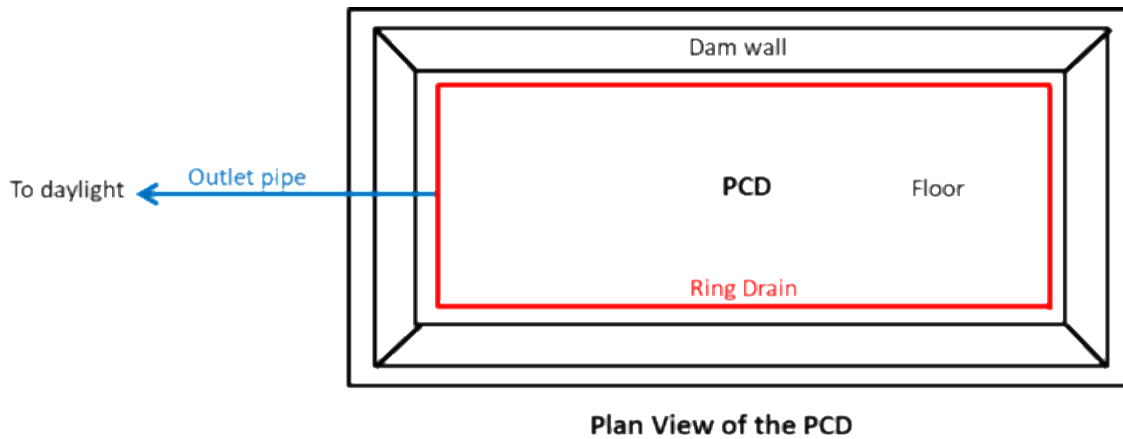


Figure 6.1-15: Layout of the underfloor drains

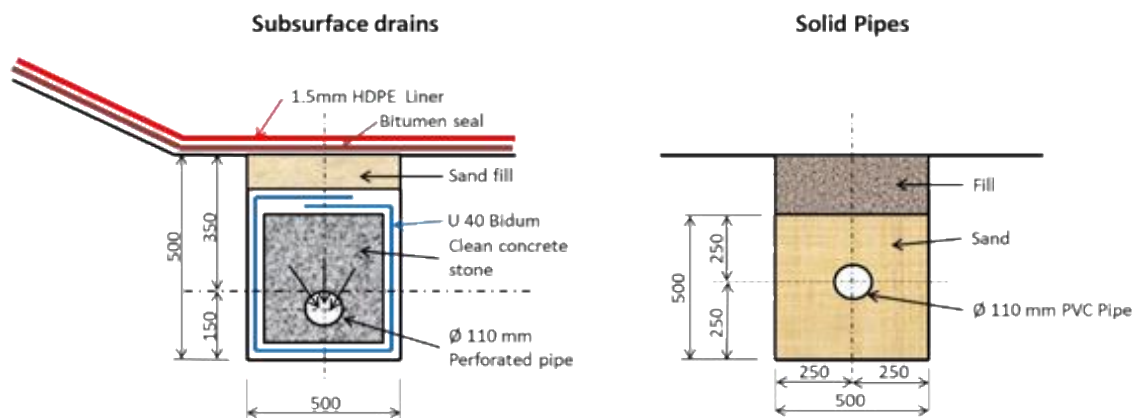


Figure 6.1-16: Layout of the drains and pipes

#### 6.1.4 Energy Use

A diesel truck arrives on site to refuel the Water Bowser and equipment on site. There is no diesel storage tank on site. Use of generator for use during normal services maintenance or load shedding schedules from Eskom.

#### Metrological data:

The following metrological data were used to calculate the expected runoff volumes for the relevant areas and infrastructure:

- Rainstorm with a 1:50 year return period
- 2 hour storm duration
- Precipitation of 650mm per year
- Evaporation =  $1.5 \times \text{Area} \times \text{temperature} / 20$  in  $\text{m}^3$  per year
- Average temperature is  $18^\circ \text{C}$
- Runoff factor of 0.2 for the storm water due the agricultural nature for most of the catchment area
- Runoff factor of 0.4 for the dirty water runoff on the siding

#### Water runoff calculations:

Storm water catchment area:

The size of the catchment area according to Google Earth is about 49.6ha – see the blue shaded area on Figure 6.1-17.



Figure 6.1-17: Storm water catchment area

**Dirty water catchment area for Phase 1:**

The size of the polluted area will be about 3.8ha – see purple shaded area on Figure 6.1-18.



Figure 6.1-18: Polluted area for Phase 1



**Dirty water catchment area for Phase 2:**

The size of the polluted area will be about 5.0ha – see purple shaded area on Figure 6.1-19.



Figure 6.1-19: Polluted area for Phase 2

## **7. Motivation for the need and desirability for the proposed development**

The total storage capacity of the existing site is 21 204 tons. The current active operational side herewith, referred to the Northern Side of the Arbor Railway Siding, has been servicing Eskom with 3,8 million tons of coal, over the three-year period, which ended in September 2016.

Subsequently, Gijima targets the export market and Eskom renewed the contract and increased the tonnage to 95 000 000 tons over a 4-year period ending in 30 September 2020. This translates to 198 000 tons per month. There will be challenges in achieving this current contractual demand, since the current active operational area has reached its maximum operational capacity in terms of stockpiling, receiving trucks and loading the trains. Currently, only two trains are operational to service the extended Eskom contract and the current infrastructure is not enough to fulfil Gijima's contractual obligations. The operational capacity will need to be increased and as such there will be additional activities that will be undertaken such as increased stockpiling areas, and to increase the loading capacity with two trains daily. Increase in the capacity of the pollution control dam and/or have a new additional pollution control dam with a silt trap.

The proposed expansion to the operation also presents social and economic benefits for the communities surrounding the site, especially Arbor village, which is within a 1 km radius south of the site. The social benefits include the job opportunities for 25 extra people to be employed for the site. The economic benefits will be realised through the implementation of Transnet Road to Rail Strategy in transporting more coal to the power station, whilst reducing both costs and number of human fatalities. The expansion will transport an increased volume of coal material, which may lead to more stable electricity supply.

The expansion is viewed to be in support of the Transnet Freight Rail Strategy which was proposed in 2012 and linked to the budget allocations for rail infrastructure development within the country. Transnet has been looking at ways of investing in new technological developments in relation to Road to Rail Strategy. They have been piloting on an idea to use truck wagons fitted with tyres that can travel on both road and railway surfaces. This would also reduce the amount of time for loading and offloading at Stockpile areas, the traffic of trucks loading and offloading at stockpile areas would be reduced, the emissions from trucks to and from the stockpile areas. The Transnet Freight Road to Rail Strategy is summarised in Section 2 of this report.

## **8. Motivation for the preferred site, activity and technology alternative**

### **8.1 Alternatives**

#### **8.1.1 Design alternatives**

There are several proposed alternatives considered for the site, particularly for the Pollution Control Dam:

- The Construction of a Pollution control dam on the Southern side. This will require a Water Use Licence.
- Divert all the dirty water from the Southern side to the Northern side. An environmental impact assessment to be conducted base on the Engineering designs and layout plans to be finalised and approved.
- Impact assessment of both alternatives to be conducted and mitigation measures to be recommended as per of the monitoring plan for the site.

## 8.1.2 Technology Alternatives

### Technology Alternatives

There are several options considered for the proposed increase in scope for the operations at the Arbor Siding.

#### Technology Alternative T1 (preferred technology method)

In order to prepare the Southern side for operations, there are several alternative options proposed for the establishment of the Southern side as a Coal Stock Pile Area and a Loading Area. The proposals are as follows:

##### Option 1:

The plan is to keep the existing track work as is and cut away the loading area with a slope of 1:40 away from the track. Install a dirty water channel at the back end which will tie up with the evaporation dams. The layer works will consist of the compacted in situ material, 150mm sub-base layer and 150mm of sacrificial coal. A typical cross section of the loading area as proposed is shown in Figure 8.1-1 below.

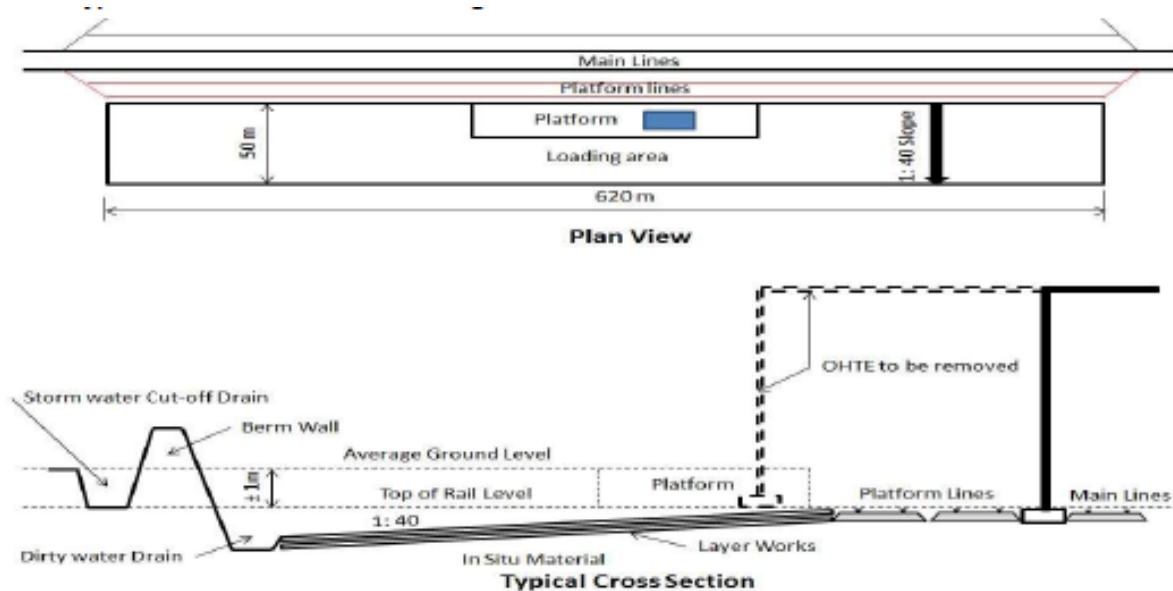


Figure 8.1-1: Option 1 for the Establishment of Loading Area for Southern side.

##### Option 2:

This option involves the replacement of the platform line with a Tubular Track System. Cut the loading area with a slope of 1:40 towards the track along the natural ground level. The space between the tubular track beams and the adjacent track structure can be utilized as the dirty water drain. This drain will have to be connected to the evaporation dam at the Delmas end of the siding. The layer works will consist of the compacted in situ material, 150mm sub-base layer and 150mm of sacrificial coal. A typical cross section of the loading area with the tubular track system is shown in the Figure 8.1-2 below.

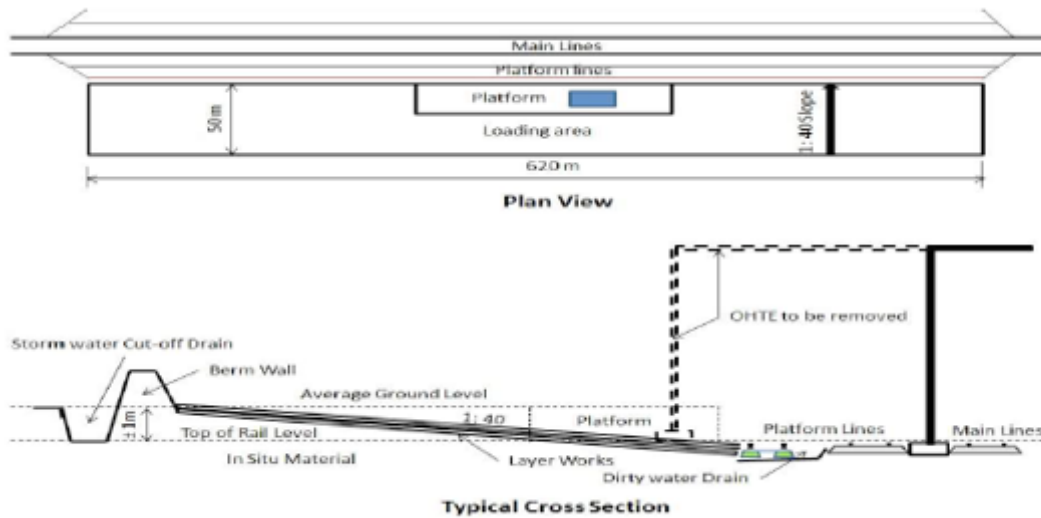


Figure 8.1-2: Option 2 for the Establishment of Loading Area for Southern side.

Option 3:

This option entails the diversion of the existing platform line around the platform and cut away the loading area with a slope of 1:40 away from the track. Install a dirty water channel at the back end which will tie up with the evaporation dams. The layer works for the loading area will consist of the compacted in situ material, 150mm sub-base layer and 150mm of sacrificial coal. The 5m wide formation will consist of 150mm sub-base material (G4), then a 200mm A-layer (G6) followed by a 350mm B-layer (G8). The typical cross section is shown in Figure 8.1-3.

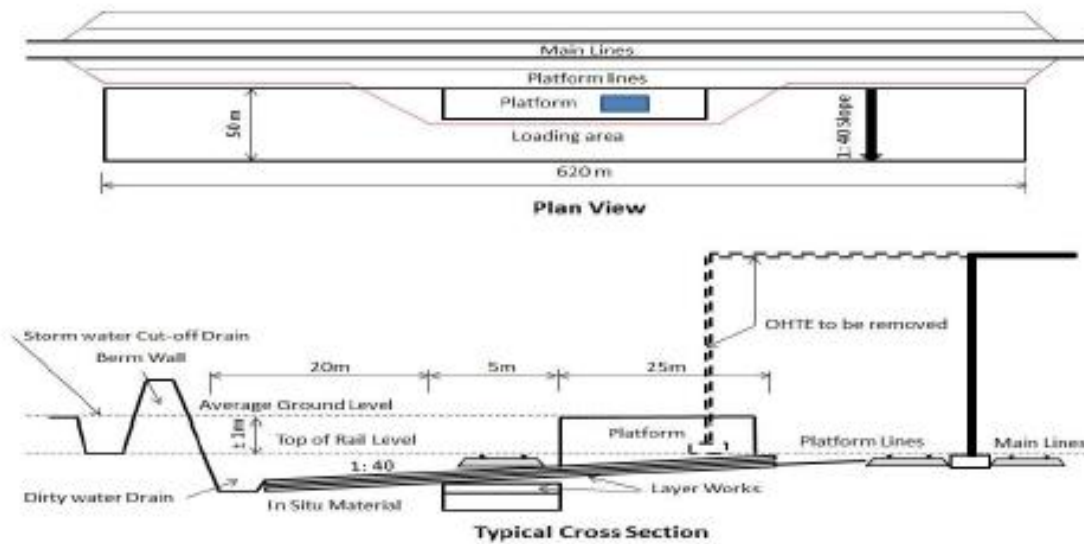


Figure 8.1-3: Option 3 for the Establishment of Loading Area for Southern side.



For all the above mentioned proposed options, there needs to be clear potential impacts for each and mitigation measures for the proposed design. Currently there is one Pollution Control Dam on the Northern side and all the proposed options are on the Southern side are in line with the proposed establishment of an Evaporation dam on the Southern side. However, should the alternative be to link up with the Pollution Control Dam within the Northern side through the use of water channels going under the railway, the designs, impacts and mitigation measures on groundwater will be formulated to ensure minimisation of negative impacts to the environment.

Option 4:

Replace the existing platform line with the Tubular Track System and divert it around the platform. Cut away the loading area with a slope of 1: 40 towards the track. Install a dirty water channel between the two platform lines and tie it up with the evaporation dam on the Delmas side of the siding. The layer works for the loading area will consist of the compacted in situ material, 150mm sub-base layer and 150 mm of sacrificial coal. The 4m wide formation will consist of 150mm sub-base material (G4), then a 250mm A-layer (G6) followed by a 400mm B-layer (G8).

### **8.1.3 No-Go Alternative**

Should the development not be approved the benefit discussed under Section 4.2-1 and 4.2-2 will not materialise.

Critically, since the new triggered listed activities are about increasing capacity to meet the Eskom contractual obligations and demand, the efficient delivery of coal to the powerstations to ensure electricity generation will be affected and this will impact on the south African economy which is powered by access to energy.

## **8.2 Details of all the alternative considered**

### **8.2.1 Site Alternatives**

All site alternatives that have been considered as the proposed increase in scope are located within the Transnet's land as per the agreed and signed lease agreement with Gijima. The detailed discussion of consideration for the preferred site alternative are provided under Section 13 of this report.

## 9. Environmental Settings of the Site (current and proposed)

### 9.1 Current Land Use

The land adjacent to the site (north, north east, east, north west and west) is currently being used for variety of purposes. The land use settings discussed in this section are also illustrated in Figure 69.1-1.

The activities observed range from farming i.e maize crop production (as shown in Photograph 9.1-1 below), cattle breeding and farming on the north east of the site (as shown in Photograph 9.1-2) i.e JC Prinsloo Boerdery and TRUTER on the north western side of the site (as shown as Photograph 9.1-3). There is residential area close to the farming community (as shown in Photograph 9.1-6). The other land uses that occur within a 2 km radius northwards from the site include a Conference Resort (Khaya Resort and Conference Centre, north east of the site (as shown in Photograph 9.1-4), Kusile Power Station, north east of site (as shown in Photograph 9.1-7), new coal mine Operations (i.e Iyanga Mining - Klipfontein Mine)(as shown in Photograph 9.1-9 - 9.1-10). There is also an established network and infrastructure in terms of electricity power lines and telephone lines within the area (as shown in Photographs 9.1-11) and road infrastructure upgrade by the Mpumalanga Provincial Government Department of Public Works, Roads and Transport in Nkangala is in progress (as shown in Photograph 9.1-12). The road works have created an unpleasant sight by impeding on the wetland with the disposal of soil and rubble on the edges of the wetland (as shown in Photograph 9.1-15). The wetland still supports fauna and flora species observed during the site visit as shown in Photograph 9.1-16, however, no identification of the species were undertaken.

The land use activities within the vicinity of the site will be also considered in the terms of cumulative environmental impacts that might result to the additional proposed expansion of the operation within the Arbor Siding. For example, the number of trucks travelling on the R960 road towards the Arbor Siding, create a lot of dust within the incomplete road works project (gravel road) as shown in Photograph 9.1-13 towards the T-junction before the site. The Cumulative effect of the dust pollution in the area will need to be addressed.



**Photograph 9.1-1: Farming i.e maize crop production. (25° 57' 887" S; 0,28° 53' 862" E).**



Photograph 9.1-2: Cattle breeding and farming on the north east of the site (JC Prinsloo Boerdery)





**Photograph 9.1-3 (A & B): TRUTER Boerdery on the north western side of the site (25° 59' 500" S; 0,28° 53' 441" E).**



**Photograph 9.1-4: Livestock grazing close to the Truter Boerdery and a natural water body in the background on the north western side of the site.**





**Photograph 9.1-5: Natural Water Body along the road on the north east side of the site.**



**Photograph 9.1-6: Residential area close to the farming community (26° 00' 602" S; 0,28° 53' 061" E).**



Photograph 9.1-7: Khaya Resort and Conference Centre (26° 01' 118" S; 0,28° 53' 057" E).



Photograph 9.1-8: Kusile Power Station north east of the Arbor Siding (25° 59' 073" S; 0,28° 53' 063" E).



**Photograph 9.1-9: New Coal Mine Operations i.e Iyanga Mining - Klipfontein Mine (25° 59' 073" S; 0,28° 53' 063" E).**



**Photograph 9.1-10: View of the Operations of a Coal Mine (Iyanga Mining - Klipfontein Mine).**





**Photographs 9.1-11: Eskom electricity power lines and telephone within the area - north western side of the site along R960 road.**



**Photograph 9.1-12: Road infrastructure upgrade by the Mpumalanga Provincial Government Department of Public Works, Roads and Transport in Nkangala (26° 01' 118" S; 0,28° 53' 058" E).**



**Photograph 9.1-13: The view of the Arbor Siding about 200m away. The beginning of the gravel road stretch towards the Site.**



**Photograph 9.1-14: A close up view of the truck entering and exiting the Arbor Siding (26° 01' 671" S; 0,28° 53' 038" E).**



**Photograph 9.1-15: The road works have created a visual intrusion and impeding on the wetland with the disposal of soil and rubble on the edges of the as wetland (north east side) (26° 02' 097" S; 0,28° 53' 027" E).**



**Photograph 9.1-16: The road works have created an unpleasant sight in the impeding of the wetland with the disposal of soil and rubble on the edges of the as wetland (north west side).**



**Photograph 9.1-17: The T-Junction section before the entrance to the Arbor Siding on the R555 road to Delmas (to the right) or Ogies (to the left) (26° 02' 343" S; 0,28° 53' 020" E).**



Photograph 9.1-18: The entrance to the Arbor Siding on the R555 road towards Delmas.

## 9.2 Climate

Summers are at their hottest during January with temperatures reaching 30°C. Winters are characterised by low temperatures falling below 20°C sometimes. The mean daily maximum temperature exceeds 25 °C between November and March, the hottest months. Average maximum temperatures in the winter months (May-August) range from 18.0°C to 21.3°C. The mean minimum summer temperatures range from 11.7°C (March) to 14.2°C (January) with winter mean minima ranging from -1.6°C to 2.9°C. An extreme maximum temperature of 33.8°C was recorded at Ogies, on 12 November 1990 and an extreme minimum temperature of -8.8°C on 9 June 1988.

The average annual rainfall is 700mm with a maximum of 800mm while the minimum is 600mm. The site falls in a summer rainfall region with high rainfall events between November and March. The rainfall occurs mainly as showers and thunderstorms are a common phenomenon. Winters are generally characterised by dry weather. The nearest reliable rainfall station is station Delmas Pannar station located about 20 km south of the proposed Klipfontein wash plant. The calculated Mean Annual Precipitation (Map) for this rainfall station is 705mm. Evaporation data for site was obtained using the WR90 manual. Mean annual evaporation is 1,400mm and is more than twice the MAP of the project area. The high evaporation rates will result in high losses of water from the pollution control dams within the site. High levels of evaporation will serve as major water loss mechanism.

## 9.3 Geology And Soil

The site is characterised by sandstone, shales and coal beds of the Vryheid formation of the Karoo Supergroup. Intercalations of siltstone and mudstone are common in the sandstone especially in the upper part of the formation. Lenses of calcareous sandstone and sandy limestone are also common. The Karoo Supergroup consists of a sedimentary succession that overlies a glaciated pre Karoo basement known as the Dwyka overlain by the Ecca and Beaufort Groups. There is no evidence of linear geological structures in the immediate vicinity of the site. The soils found on site are generally fertile with very low water-soluble metal concentrations (most metals were below the detection limit). The implication in terms of the mining activities is that if soils are correctly stripped ahead of mining and the topsoil adequately managed, the stockpiled material has the potential to be an adequate growth medium in areas where it is replaced during rehabilitation. The land capability associated with the site is defined as arable, with the soils in the landscape having the potential to support agriculture.

## 9.4 Hydrology

The study area falls within Water Management Area 4 (WMA4), Olifants, specifically along the watershed between the quaternary catchments B20F (Wilge River). The Olifants River is the most significant River in WMA4 and one of the main tributaries of the Limpopo River. The Olifants Catchment covers about 54 570 km<sup>2</sup>. The upper reaches of the Olifants River Catchment are characterized mainly by mining, agricultural and nature conservation activities. The mean annual runoff (MAR) for the WMA4 is 2 042 million m<sup>3</sup>/a. Several surface and underground monitoring points were sampled and their water quality assessed. The monitoring points assessed are shown in Figure 3.4-1 below. The uncontrolled stormwater from the Arbor Siding activities present potential impacts to the sensitive ecosystems adjacent to the site. Some of the impacts are discussed in detail in Section 4 of this report. The current water use at the Northern Side include a coal stockpile area, a dirty water catchment and two pollution control dams.

**The stockpile area** has two sections; a section for coal that is transported locally and for coal that is exported. The area results in a huge amount of dust. Water from the Pollution Control Dam (PCD) is used for dust suppression.

**The dirty water channel** is a channel of approximately 360m long to capture contaminated water on site and to discharge the water into the PCD. The change in elevation for this channel is approximately 6m. The channel is designed to collect a peak flow of 1.611m<sup>3</sup>/s without spilling.

**The Pollution Control Dams** has sufficient capacity to handle all dirty water emanating from the dirty water areas of the siding. The PCD is designed to hold the 1 in 50 year storm event and allow for a 0.8 m freeboard and is lined. A silt trap has been constructed upstream of the PCD to prevent silt build-up in the pollution control dam.

### 9.4.1 Surface Water

The site is located in the B20E quaternary catchment of the Olifants Water Management Area. There are no tributary that occurs adjacent to the site. The water quality monitoring points are shown in Figure 9.4-1 below. Water quality on the Northern Side of the site was assessed and the generic findings are summarise as follows:

- The annual average concentration for the Jojo Tank indicates good water quality; no excessive contaminations analysed throughout the year and water quality strictly fall within the standards set for domestic usages.
- The Pollution Control Dam operated as a dirty water catchment area within the site and therefore poor water quality might be expected.
- The concentration for all surface monitoring points is slightly acidic, neutral and slightly alkaline, ranging from 6 to 8. The South African Water Quality Guideline for Domestic Use shows the targeted water quality range is between 6.0 - 9.0 and 6.5 - 8.4 for Irrigational Use.
- Any form of deterioration analysed in monitoring points SW2 and SW3 is not associated with the ongoing activities at Arbor Siding, due to their location.





Figure 9.4-1: Water Quality Monitoring Points Map.

#### **9.4.2 Groundwater**

The geological setting determines the types of aquifers present in an area. Only one aquifer system has been determined within the local hydrogeological environment namely: - Intergranular and fractured aquifers within the Vryheid formation. According to Vegter (2001) this area falls within the Eastern Highveld Hydrogeological Region that predominantly fractures argillaceous and arenaceous deposits. Its principal water bearing rocks are of a secondary nature. In general groundwater accumulation occurs in intergranular and fractured aquifers overlying most of the area. Groundwater accumulation is related to joints, fractures and faults in competent arenaceous rocks. The groundwater development potential is considered low to medium with borehole yields averaging between 0.1 and 0.5 l/s according to the South African Hydrogeological Map series, (1999). According to the Groundwater Resources Map of South Africa (1995) the general groundwater level depth ranges between 10m and 25m below surface.

According to the findings of a Groundwater quality does not change as rapid as surface water quality. Groundwater contains minerals dissolved from soil particles, sediments, and rocks as the water flows at different directions along aquifers. Some other forms of ground water contaminations come from improper disposal of chemical wastes, leachates from solid waste disposal sites and infiltration of stormwater discharges. Samples were collected from both the Upstream and Downstream Boreholes for analyses of the quality. These boreholes supply portable water to the communities around Arbor Siding.

The findings are summarized as follows:

- The water quality from both boreholes is very good, there is no contamination related to activities at the Siding.
- The average pH concentration is neutral to slightly alkaline for the two boreholes ranging between 6.2 to 8.2 mg/l, falling within standards set for domestic, agricultural and livestock use.
- All variables analysed to determine the water quality fall within the standards set by the Department of Water Affairs and Forestry (DWAF) South African Water Quality Guidelines.
- No microbiological monitoring was conducted at all the boreholes.

#### **9.4.3 Groundwater Recharge**

Recharge represents the portion of rainfall reaching an aquifer regardless of which pathways it follows (Bredenkamp et. al. 1995). It occurs either through preferential pathways (fractures), drainage through soil or infiltration from river channels and “stationary” water bodies. The key benefit in groundwater recharge investigations is an acquisition of a better understanding of patterns of infiltration and processes thereof. Recharge often shows more importance in aspects of groundwater supply, aquifer management as well as mining activities like mine dewatering. It plays a crucial role as a controlling factor in alleviating environmental problems resulting in groundwater pollution, by acting as a natural dilution process normally over prolonged periods of time. Best recharge results are most achievable with a good data set preferably collected over long periods.

### **9.5 Water Management**

#### **9.5.1. Water Balance**

A water balance was prepared in order to determine the amount of water required to sustain the operation. It is also key towards identification of areas of high water consumption and definition of water management strategies. Individual water management units were broken down into individual subcategories for better expression of water uses. These include the

- domestic water intake systems
- process water intake systems
- effluent disposal systems
- pollution control dams
- dust suppression

##### **9.5.1.1. Potable Water supply**

Potable water will be sourced from a Transnet mains connection

##### **9.5.1.2. Process water supply**

There will be no process water abstraction as the operation will entail only coal stockpiling.

##### **9.5.1.3. Pollution control dam**

Dirty water from that runs off the stockpiling area will be channelled to a pollution control dam. The



pollution control dam will also act an evaporation pond. Taking in to account that the area falls within a pollution control dam is 9000 square meters. It is expected that a volume of 700 m<sup>3</sup> will evaporate from the pollution control dam.

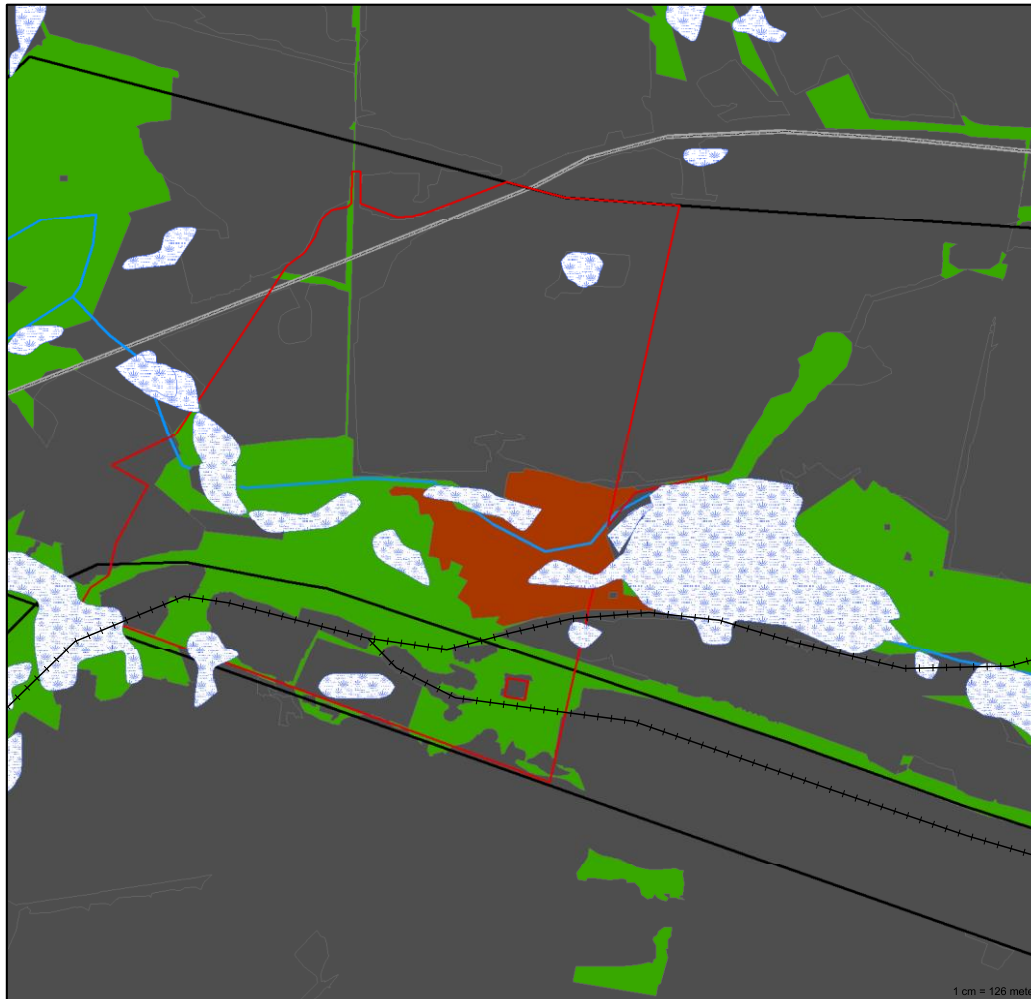
## 9.6 Topography

Arbor is located within the Eastern Highveld Grassland within the grassland biome of South Africa. The grassland biome is one of the most threatened biomes due to agriculture and mining activities with 60% of the grassland biome already having been transformed and only 2% under formal conservation. The Eastern Highveld Grassland is described as occurring on slightly to moderately undulating plains including some low hills and pan depressions. The vegetation is short dense grassland dominated by the usual highveld grass composition with small scattered rocky outcrops with wiry sour grasses and some woody species. This vegetation unit is considered to be endangered. The proposed project site is lying in the B20 tertiary drainage region the area is drained by the Olifants river and is characterized by a gently rolling topography on a slope of about 1: 120.

## 9.7 Flora And Fauna

The site was assessed for fauna and flora ecosystems occurring on the site. Faunal species were observed visually and avi-fauna observed was verified using a checklist obtained from a desktop studies and also used the Sasol Birds of Southern Africa (Sinclair et. al., 2002), South African Bird Atlas Phase 2 and Bird Life South Africa for Avian species occurring in the area for further identification. Animals and small mammals were identified within the study site using observation, spoor, tracts, signs and droppings as well as burrows and nesting sites on the ground where feasible. Arbor Siding is highly disturbed and transformed due to the coal handling and storage operation. The study site is located in a Highveld part of Mpumalanga province which commonly known for its wetlands and grass plains with variety of flora species. The Grassland biome is the heavily impacted and disturbed biome in the country and its associated wetlands and rivers continually get affected as a result. Within the Arbor Siding area, the availability of flora is restricted to alien invasive plants, thus the vegetation is transformed in the edges of the site. No critical flora species of conservation importance within the site was recorded. Furthermore, with the exception of random encounters with fauna, no faunal species of importance were observed or recorded within the site as the site is highly disturbed to carry faunal species. With the exception of one transformed wetland and dam constructed to support the activity, there were no natural or functioning wetlands observed and recorded within Arbor Siding boundary. The operational site is highly transformed and with exception of Eucalyptus species randomly occurring on the boundaries of the site and serve as screening method; the site is unable to carry and sustain any flora species as a habitat due to coal dust footprint. However, outside the boundaries of the study site on the east side there are thriving ecosystems such as wetlands and rivers located on the north of the site. These ecosystem supports variety of species such as Grass Owl. Arbor Siding activities only affect these ecosystems due to the uncontrolled storm water as a result it is recommended that the proponent put in place proper storm water measures that could prevent it from draining into the nearest freshwater ecosystems.

### Vandykput 214 IR Portion 1 Environmental Sensitivity Map



GIJIMA SUPPLY CHAIN (PTY) LTD-ARBOR SIDING

**Legend**

- RAILWAY\_LINES
- NFEPA
- PORTION 1
- Vandykspu 214

**RIVER**

- PERENNIAL RIVER

**ROAD\_NAME**

- N12
- 555

**MBSP\_terrestrial\_2014**

**Category**

- Critical Biodiversity Area
- Ecological Support Area
- Heavily or moderately modified
- Other Natural Areas



Figure 9.7-1: Environmental Sensitivity Map.

## 9.8 Ambient Air Quality

The Ambient Air Quality study undertaken comprised of a baseline description and impact assessment study. The baseline study encompassed the analysis of meteorological data such as local temperature, relative humidity, rainfall, wind speed and wind direction. The impact assessment study investigated the pollution particulate concentrations that represent the main pollutant of concern given the nature of the operations. The assessed pollutants were classified as criteria pollutants, with ambient air quality guidelines and standards having been established by various countries to regulate ambient concentrations.

The limitations and assumptions of the study included:

The study was restricted to the Gijima Supply Chain Arbor Siding operations and surrounding operation within the proponent's operational site.

The information required for calculating emissions from fugitive dust sources for the operation were assumed to be correct and accurate to model routine emission for the site.

It is recommended that a minimum of one year of meteorological data is be used in atmospheric dispersion modeling for air quality impact assessment purposes.

The assessment at Arbor operational siding was limited to airborne particulates which are the total suspended particulates (TSP) and particulate matter of less than 10µm in diameter (PM10).

The main findings from the baseline assessment were as follows:

The main sources likely to contribute to cumulative PM<sub>10</sub>, SO<sub>2</sub>, CO and VOC air quality impact are vehicle entrainment on unpaved road surfaces and during loading and off-loading of coal at the site (i.e. mining activity); The predominant *wind direction* within the site is *from the west- northwest* on which during day time there is an increase in these winds velocity. *Less frequent winds are from the southern directions.*

With exception of Sulphur dioxide, the pollutants recorded within the site falls within the NAAQ air quality threshold targets.

Recorded ambient air quality results shows that Sulphur dioxide levels exceeds the target threshold as determined by AQA and SANA 1929:2005 standards in all four sites.

Modelled ambient PM<sub>10</sub> concentrations exceed the daily NAAQ PM<sub>10</sub> limit applicable from 1 January 2015.

For cumulative impacts, the contribution of Arbor Siding operations is intermediate with cumulative impacts really due to baseline conditions of the site as such that the SO<sub>2</sub> concentrations for cumulative impacts were high and in non-compliance with NAAQ.

### Recommendations from the study:

1. It is recommended that four dust buckets stands be strategically erected to the main areas or sensitive receptor area to verify predicted cumulative impacts and refine controls accordingly. Dust samples from the dust buckets will be taken to analyse the Gravimetric Dust Fallout content,
2. The PM<sub>10</sub>, SO<sub>2</sub>, CO and VOC concentrations determined through active sampling in order to measure these variables against national ambient air quality guidelines should be conducted in a monthly basis in order verify predicted cumulative impacts and refine the operational site impacts with the aim of lowering the exceeding SO<sub>2</sub> concentrations.
3. Dust suppression in the form of water spraying the areas of frequent vehicular movement should be done in a three hours interval to minimize the generated dust whilst avoiding water accumulation to the surface.

The four (4) buckets are strategically placed as follows:

SAMPLING POINT	SOUTH			EAST		
	DEGREES	MINUTES	SECONDS	DEGREES	MINUTES	SECONDS
NORTH	26	2	18.72	28	52	45.14
EAST	26	2	19.03	28	52	50.98
SOUTH	26	2	27.80	28	53	6.80
WEST	26	2	25.22	28	52	57.96

The recent air quality scheduled monitoring and report for the site for April/May revealed the following:

The results of **this monitoring** are **within DAE targets**, which is good, however **exceeds** the **National SANS 1929 Standards**. This means that once this becomes a regular occurrence on the monitorings, Gijima will be required to do an **Air Quality Licence**. The current monitoring results are higher than the 2016 monitoring results, this means the 2016 Aug/Sept recorded average was 512 mg/m<sup>2</sup>/day and the 2017 April/May recorded average is 736.33 mg/m<sup>2</sup>/day. One of the common reasons why there is an increase, is due to the **winter beginning in May** in Mpumalanga and therefore the monitoring occurred in a windy and dry season. The other reason is that the access road (R960 road) going towards Eskom Kusile Power Station, this impacts negatively on the results because that access road generates a lot of dust from the vehicular movement of other road users including trucks.

Please also note that the **West point results** were not taken and not included in the analysis due to last years incident where the pole and bucket were **stolen**, but the **South point** also **caters** for the **West activities** which are the off-loading and loading of coal. The West equipment need to be replaced so that on the next air quality monitoring, we than have the results for West side alone.

Even though the monitoring was within the DAE target and exceeded the National SANS 1929 standards as shown in Table 6.8-1 below, it is recommended that the applicant obtain an Atmospheric Emission Licence (AEL) permit due to the likelihood that the dust generated at the site will reach the **ALERT** threshold that will require notification of Authorities and subsequent permit application.

**Table 6.8-1:** Two months dust fallout comparison for Arbor Siding (period 2015 - 2019).

Monitoring Point	Dust levels measured in mg/m <sup>2</sup> /day					DEA AQ targets	SANS 1929:2011 targets	ACTIONS OR CONDITIONS OF THE GUIDELINES TO SOUGHT OUT AEL
	Aug/Sept 2015	Aug/Sept 2016	Apr/May 2017	Dec'17-Jan'18	Aug/Sept 18			
North	789	609	712	896	436	600<D<1200	300<D<600	Three within any year not two Sequential months
East	418	648	682	695	537	600<D<1200	300<D<600	
South	665	279	815	776	576	600<D<1200	300<D<600	
West	Equipment stolen					600<D<1200	300<D<600	
Average	624	512	736.33	789	516			
Residential	624	512	736.33	789	516	D<600	600	Three within any year not two Sequential months. However, it is recommended that the applicant obtain an Atmospheric Emission Licence (AEL) permit due to likelihood that the dust generated at the site will reach the ALERT threshold that will require notification of Authorities and subsequent permit application.
Industrial						600<D<1200	1 200	

## 10. Stakeholder Involvement - Stakeholder Engagement

### 10.1 Authorities

The Mpumalanga Department of Agriculture, Rural Development and Land Administration (MDARLA) has been consulted, and preliminary meetings were held with them.

An application for environmental authorization enquiry was lodged with the Mpumalanga Department of Agriculture, Rural Development and Land Administration, on which they responded on 8 December 2010, that the EMP to undertake 50 0000 tons coal loading operations of Portion 1 of the Fam Vandykspruit 214 1R was no longer a listed activity not require an environmental authorization. However, even though the EMP was approved, the application for the WULA was advised. Observation of heritage and cultural significance material were to be reported to SAHRA. The letter also stated the responsibility to comply with the provision for "Duty of Care" and remediation of damage contained in Section 28 of NEMA.

The Ward Councilor was firstly informed about the operation in a letter dated 20 August 2013. The letter also served to update was provided on the developments relating to the operations at the siding. The update also highlighted the approval of the EMP by the then Mpumalanga Department of Agriculture, Rural Development and Land Administration and the application for a Water use licence. A follow up later was sent to Ward Councillor Mkhabela on the 5th June 2015 to provide an update on the operations.

On the 4th June 2015, communication was sent to Department of Economic, Development, Environment and Tourism to inform them about the commencement of the operations at the facility.

The Mpumalanga Department of Agriculture, Rural Development and Land and Environmental Affairs was consulted in a letter dated 6 April 2016, to inform them about the extension of the operational footprint at the existing Arbor Railway Siding Coal Loading on Portion 1 of Farm Van Dyksput 214 IR, Kendal/Ogies. This letter forwarded the intention of the client to extend the operational footprint area. The approved EMP and the approval of the Water Use Licence Application on the 18 Dec 2015 was also included.

### 10.2 Interested and affected parties

Notifications about the proposed operations were erected on site and notification letters were given out to the community on the 05 June 2015. Stakeholders were identified and were notified by means of notification letters, which were delivered to them from household to household. Site notices were erected on site the same day. IAP Register for the delivery notices was signed by the neighbours (attached as Annexure 10.2-1).

The key stages of the public participation will involve the following process:

- Compilation of stakeholder database.
- Consultation with key stakeholders.
- Distribution of project related information to key stakeholders, IAPs, Ward Councilor, land owner and adjacent land owners.
- Compilation of Public Participation Report.

A more detailed on the development of the Project Stakeholder Approach to inform the Public participation and involvement process for the BID is outlined in the Table 10.2-1 below. The detailed process undertaken during the BAR process entailing the review of the Background Information Document is outlined in detailed in the draft BAR. The key issues of concern raised during the various key stakeholder engagements for the BID review process are outlined in Table 10.2-2.

Table 10.2-1 A detailed approach for the Public Involvement and Participation Process.

Activity/Task	Objectives	Execution Process	Deliverable
<p>1. Stakeholder profiling, data collection and identification of relevant stakeholders and Interested and Affected Parties (IAPs).</p>	<ul style="list-style-type: none"> <li>• To ensure that all the relevant stakeholders and Interested and Affected Parties (IAPs) are identified in accordance with the National Environmental Management Act (NEMA), EIA Regulations, 2014.</li> <li>• To understand the socio-economic and geographic environment and key role players within these sectors.                             <ul style="list-style-type: none"> <li>➤ IDENTIFICATION OF RELEVANT STAKEHOLDERS AND IAPS. THE STAKEHOLDER PROFILING WAS DONE TO IDENTIFY ALL THE RELEVANT STAKEHOLDERS UPFRONT, FROM VARIOUS STAKEHOLDER SECTORS, AS GUIDED BY THE NEMA REGULATIONS, INCLUDING THE FOLLOWING:</li> <li>➤ MINING SECTOR INCLUDING OTHER MINING COMPANIES UNDERTAKING MINING ACTIVITIES IN ADJACENT AREA E.G. VLAKVARKFONTEIN MINE, WESCOAL MINE, INTIBANE COLLIERY,</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• The stakeholder engagement was commenced to alert key stakeholders about the proposed continuation of the mining activities at the application area. The following approach was employed:</li> <li>• Understanding of scope of works from applicant.</li> <li>• Sourcing project maps from the Title Deeds office and Geographic Information Systems (GIS) database sources; Identification of project locality and neighbouring activities and uses.</li> <li>• Understanding of the site                             <ul style="list-style-type: none"> <li>➤ Delineating municipal boundaries and associated ward details.</li> <li>➤ Literature review of existing documents and reports including the Municipal Integrated Development Plan (IDP), Environmental Framework, Local Economic Development Plans, Municipal by-laws, and Provincial ordinances.</li> </ul> </li> <li>• Literature review of specialists /experts reports that have contributed to the vegetation</li> </ul>	<ul style="list-style-type: none"> <li>• Interested and Affected Parties Register (IAPR) Annexure 11.1-1 of the Public Participation Report</li> <li>• Project locality plans.</li> <li>• Municipal boundary maps. (Figure 3.1-2).</li> <li>• Updated IAPR</li> <li>• Preliminary engagement emails.</li> </ul>



Activity/Task	Objectives	Execution Process	Deliverable
	<p>INYANGA MINING (PTY) LTD.</p> <ul style="list-style-type: none"> <li>➤ FORESTRY AND FISHERIES</li> <li>➤ SCIENCE AND BOTANICAL RESEARCH INSTITUTIONS SUCH AS THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE (SANBI)</li> <li>➤ TELECOMMUNICATIONS, WHERE APPLICABLE (TELKOM), ELECTRICITY (ESKOM); WATER SUPPLY; WASTE MANAGEMENT.</li> <li>➤ TRANSPORT SUCH AS (DEPARTMENT OF TRANSPORT).</li> <li>➤ COMMUNITY DEVELOPMENT AND SOCIAL SERVICE (E.G. MUNICIPALITIES), NON-GOVERNMENTAL ORGANISATIONS (NGO'S).</li> <li>➤ RELEVANT PRIVATE COMPANIES.</li> <li>➤</li> </ul>	<p>and their conservation status in the area.</p> <ul style="list-style-type: none"> <li>• Information sourced from specialist studies undertaken in the area.</li> <li>• Analysis and review of applicable legislation;</li> <li>• Utilising regional and local setting maps to identify:             <ul style="list-style-type: none"> <li>➤ LANDOWNERS, ADJACENT LANDOWNERS AND OCCUPIERS OF LAND ADJACENT TO THE PROPOSED MINING ACTIVITIES AND ASSOCIATED PROCESSING AREAS;</li> <li>➤ MUNICIPAL COUNCILLORS OF VICTOR KHANYE LOCAL MUNICIPALITY AND ARBOR VILLAGE COMMUNITY, WHICH IS THE WARD IN WHICH THE PROJECT ACTIVITIES ARE LOCATED, AS WELL AS THE MUNICIPALITIES IN WHICH HAS</li> </ul> </li> </ul>	

Activity/Task	Objectives	Execution Process	Deliverable
		<p style="text-align: center;">JURISDICTION IN THE AREA.</p> <ul style="list-style-type: none"> <li>National and provincial government departments were sourced from previous experience and knowledge of the government departments, who administer law relating to matters affecting the environmental aspects relevant to an application for this environmental authorisation. As such the Departments of Agriculture, Forestry, and Fisheries (DAFF); Department of Environment, Department of Environmental Affairs (DEA), Department of Public Works, Department of Agriculture, Transport and Roads (DPWTR) and Department of Water and Sanitation (DWS) were preliminarily identified as well as other government structures such as the Competent Authority, Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA), statutory bodies such as the South African National Biodiversity Institute (SANBI) and National and regional South African Heritage Resource Agency (SAHRA), Non-profit government</li> </ul>	

Activity/Task	Objectives	Execution Process	Deliverable
		<p>organisations and community based organisations, and business and industry. Therefore, care was taken to include organs of the state, which have jurisdiction in respect of the activity to which the application relates.</p>	
<p>1.1 Data Verification</p>	<ul style="list-style-type: none"> <li>To validate the preliminary collected data and check credibility to ensure that the relevant Stakeholders and IAPs are contacted</li> </ul>	<ul style="list-style-type: none"> <li>Validation of collated information was done and will still be done through the next project stages such as screening and data analysis through literature review of existing documents and reports including the Municipal IDP, existing Environmental Management Programmes (EMPr), Social Impact Assessment studies and Social and Labour Plans.</li> <li>Contacting key stakeholders to preliminarily introduce the project and verify collected data.</li> </ul>	
<p>2. Stakeholder engagement:                      The information collected during stakeholder profiling was used to determine the best engagement strategies. The literacy levels and circumstances that could hinder effective participation had been noted during these stages. As such it was determined that the</p>	<p>The main objectives of the stakeholder engagement were as follows:</p> <ul style="list-style-type: none"> <li>To inform stakeholder authorities about the proposed project;</li> <li>To clarify legislative and administrative requirements;</li> </ul>	<p>The strategy for stakeholder engagement is planned as follows:</p> <ul style="list-style-type: none"> <li>Pre-consultation meetings before submission of the application form;</li> <li>Adverts and site notices to engage stake holders during the scoping process;</li> </ul>	<ul style="list-style-type: none"> <li>Submitted written issues and concerns.</li> <li>Agendas of meetings</li> <li>Outcomes of the stakeholder meetings as shown in Annexure 10.1-2 of the Public Participation Report (Outcomes of Stakeholders Meetings). The minutes of the</li> </ul>

Activity/Task	Objectives	Execution Process	Deliverable
<p>common language isiZulu is the main language to engage the community. It was discovered that not all community members understand isiZulu and to cater for all community members, Setwana translated leaflets were also distributed.</p>	<ul style="list-style-type: none"> <li>• To gather issues and concerns regarding the project and ensure that they are addressed in the Basic Assessment Report;</li> <li>• To facilitate review and informed input into the scoping report;</li> <li>• To organise meeting and do a presentation of the project to the stakeholders;</li> <li>• To compile the minutes of the meeting;</li> <li>• To ensure incorporation of issues in the draft and final BAR and EMPr;</li> <li>• To facilitate compilation of Comments and Response Report.</li> </ul>	<ul style="list-style-type: none"> <li>• Notification of stakeholders about the report and adverts during the BAR phase.</li> </ul> <p>To date the activities outlined below were executed:</p> <ul style="list-style-type: none"> <li>• There were pre-consultation meetings held with key stakeholder. The meetings were held as follows:                             <ul style="list-style-type: none"> <li>➢ Ward Councillor on 15 November 2018 and</li> <li>➢ Arbor Primary School Principal on 29 November 2018.</li> </ul> </li> </ul>	<p>meeting with Ward Councillor (Annexure 10.1-2a of the Public Participation Report) and school principal (Annexure 10.1-2b of the Public Participation Report).</p> <ul style="list-style-type: none"> <li>• Site Notices (English, isiZulu and Setswana translation) as shown in Annexure 10.2-1 of the Public Participation Report.</li> <li>• Background Information Document as shown in Annexure 10.3-1 of the Public Participation Report.</li> </ul>
		<ul style="list-style-type: none"> <li>• The meeting organisation entailed telephonic communication to organise meetings, sending emails to confirm the dates and confirmation of meetings.</li> <li>• The ward councillors were preliminary notified about the project via telephonic contact and subsequent emails and were engaged as well during the distribution of the BID and Site notices.</li> </ul>	
		<p>Distribution of leaflets and emails also worked effectively in this</p>	

Activity/Task	Objectives	Execution Process	Deliverable
		region. Site Notices were also placed at strategic places to allow access.	
<p>3. Notification of stakeholders (adverts and site notices)</p>	<ul style="list-style-type: none"> <li>• To ensure that stakeholders are notified about the project and as such are given an opportunity to provide comments and suggested solutions for some of the identified issues.</li> <li>• To ensure that the BID and BAR and EMPr are reviewed by the stakeholders</li> </ul>	<p>The advert proof sheet was received on 15 Nov 2018 and the final advert was published in the Witbank News on the 16 November 2018.</p> <p>A 610 mm x 420 mm main Site Notice (vinyl print applied to an ABS Board) and A3 sized site notices were printed, laminated and placed on site on the 15 Nov 2018. Site notices were strategically placed on communal notice boards, on the perimeter fence of the site office for the mobile clinic and two Zola Mini markets on the 15 Nov 2018. Additional site notices were placed at the Arbor Primary School notice board, entrance gate and on the perimeter fence and communal notice board on the 29 Nov 2018. Photos and site coordinates were taken. The team discovered that the originally placed site notices were removed on the 29 Nov 2018 and replacement site notices were placed. Photos and site coordinates of the replacements were taken. At the Stop sign at the T-Junction of R960 and R555 roads, the Site notice placed on the 15 November 2018 was removed. No sign of the poles of the sign were observed. The 610 mm x 420 mm Site Notice placed at the centre of the site next to the Station Building was also</p>	<ul style="list-style-type: none"> <li>• Proof of advert (Annexure 10.5-1 of the Public Participation Report).</li> <li>• Proof of site notices (Annexure 11.5-2 of the draft BAR).</li> <li>• Reply slip (English) (Annexure 11.5-3 of the draft BAR).</li> <li>• Site Notice distribution record (Annexure 11.5-4 of the draft BAR Notification email to authorities and IAPs (Annexure 11.5-5 of the draft BAR).</li> <li>• Notification Letter about the BID and advert to authorities) (Annexure 10.4-6 of the draft BAR).</li> <li>• Notification Letter to IAPs (English, isiZulu and Setswana) (Annexure 10.4-7 of the draft BAR).</li> <li>• IAP Site notice distribution register (Annexure 10.4-8 of the draft BAR).</li> <li>• Comments received (Annexure 10.4-9 of the draft BAR).</li> </ul>

Activity/Task	Objectives	Execution Process	Deliverable
		<p>removed, no poles or the sign were observed in surrounding areas. Photographs were taken of where the Site Notice was placed on the 15th November 2019 and also at the same spot on the 29 November 2018 to illustrate the removed Site Notice (as at 29 November 2018). The date and reason for the removal of the Site notices cannot be motivated</p> <p>Copies of the BID and advert were sent to authorities on 21 November 2018, via an email web link. The email was structured as follows:</p> <ol style="list-style-type: none"> <li>1. Notification Letter.</li> <li>2. Background Information Document (BID)</li> <li>3. Site Notice</li> <li>4. Reply Slip</li> </ol> <p>An email notifying the stakeholders about the BID and advert was emailed to Ward Councillor and other key stakeholders on 21 November 2018.</p> <p>An IAP distribution register was signed by the households and community members engaged and provided with the leaflets. The IAP distribution register will form part of the Issues and Response report and attached as an Annexure in the application form including the draft and final BAR to be submitted to the Competent Authority.</p>	



Activity/Task	Objectives	Execution Process	Deliverable
		The comments that will be received either, faxed or emailed to the EAP will be incorporated into the draft BA report that will be provided to stakeholders for review.	

Table 10.2-2: Summary of key issues identified and concerns raised

ISSUE/COMMENT	RAISED BY	RESPONSE	SECTION WITHIN BAR ADDRESSING ISSUE
<b>Meeting with Adi Environmental CC – EAPs for the proposed development of Arbor Village in Vlakvarkfontein 213 IR – 7th November 2018</b>			
Arbor Siding: Risks for Arbor Siding in terms of proposed project: What risks were identified in terms of the development being located adjacent to the siding and will the development and siding be able to co-exist?	Adi Environmental cc	The further away the development, the fewer risks for Arbor Siding.  The Arbor community identified dust and noise as issues of concern.  The development and siding can co-exist if management measures are implemented to reduce potential impacts.	Section 12 Table 12.5-2. Minutes of the meeting attached as Annexure 7.1-1 and comments attached as Annexure 7.1-2 of the BAR.
Dust	Gijima team	The trucks from Vlakvarkfontein Colliery and Wescoal are mainly responsible for the dust. The siding itself does not create a lot of dust. It is thus an indirect issue affecting their operations and monitoring results.  There is a possibility that coal could be obtained from Vlakvarkfontein Colliery. This would reduce the number of trucks on the road as the trucks will only travel from the mine to the siding resulting in a shorter haul. This would have a positive impact in terms of dust and traffic	Section 12 Table 12.5-2; Impact 1.2 on Air Pollution and Table 12.5-3 of the BAR.

ISSUE/COMMENT	RAISED BY	RESPONSE	SECTION WITHIN BAR ADDRESSING ISSUE
		Dust suppression measures are in place. An ambient air quality study was done, focusing on the operational activities of the siding.	
<p>Dust:                      The trucks from Vlakvarkfontein Colliery and Wescoal are mainly responsible for the dust. The siding itself does not create a lot of dust. It is thus an indirect issue affecting their operations and monitoring results. Suggested that the mines spray chemical solutions (dust suppressants) on the road entering and exiting the railway crossing as part of their dust suppression measures. An air quality study (including modelling) should be considered for the proposed development taking into account dust from the gravel road and siding.</p>	Gijima team	<p><b>Adi Environmental cc</b>                      Noted.                      Requested that monitoring results (e.g. air quality) be made available.                      To be investigated as part of the EIA phase.</p>	Section 12 Table 12.5-2 and 12.5-3
<p>Noise impact (trains):                      The trains travelling past the site are an existing source of noise. The railway line has been there for many years. This noise source cannot be stopped - trains are running 24/7.</p>	Gijima team	<p><b>Adi Environmental cc</b>                      Noted. The proposed development is not a greenfields project and existing activities must therefore be taken into account.</p>	Section 12 Table 12.5-2 and 12.5-3
<p>Waste                      Waste licence application: Will a waste licence application be submitted with the EIA application?                      Location of waste collection area: Who drafted the layout plan and was there any particular reason why the waste collection area was placed in the centre of the site?</p>	Gijima team	<p>A waste licence application will be submitted as part of the process, depending on the waste management measures to be implemented at the village.</p> <p>The town planners, Urban Dynamics, compiled the layout plan. The waste collection area (transfer station) was placed in the centre of the site at an old borrow pit. The location of the waste transfer station is still being discussed with the community. The intention is to place skips in the borrow pit, into which the community can dump their waste.</p>	Section 12 Table 12.5-2 and 12.5-3

ISSUE/COMMENT	RAISED BY	RESPONSE	SECTION WITHIN BAR ADDRESSING ISSUE
		<p>The skips will then be removed by the Victor Khanye Local Municipality and emptied at their waste disposal site.</p>	
<p>Access Road (railway crossing; gravel road to Arbor Village and access from the R555)</p>	<p>Adi Environmental cc</p>	<p><b>Gijima:</b>                      The railway crossing is located on Transnet property, outside of the lease area, and is thus not manned by Gijima. Wescoal installed the guardhouse and employs people from the community to man the crossing. However, the people are not properly trained. This has already led to several incidents. It is very risky for the community to use this crossing. An alternative access road should be used. The crossing on the eastern side near the Eskom substation is safer and preferable. The existing access road to Arbor Village extends through the Arbor Siding lease area. The existing gravel road is not mentioned in our lease agreement with Transnet. It is an unofficial road with no right-of-way servitude registered. The layout plan drafted for the proposed development did not take this into account</p> <p><b>Adi Environmental cc</b></p> <p>Noted.</p> <p>Information forwarded to the town planners (Urban Dynamics) and the civil engineer (BTW &amp; Associates).</p> <p>To be addressed as part of the EIA phase and feedback will be provided in the EIA Report.</p>	<p>Section 12                      Table 12.5-2 and 12.5-3</p>

ISSUE/COMMENT	RAISED BY	RESPONSE	SECTION WITHIN BAR ADDRESSING ISSUE
<p>A layout plan was drafted for the expansion of the siding in which the existing gravel road was diverted around the siding. Meetings were held with Truter Boerdery to obtain permission for this diversion. The town planner (Urban Dynamics) must be made aware of the intended road diversion and indicate it as such on the layout plan. A copy of the layout plan drafted for the siding will be forwarded to Adi Environmental.</p>	<p>Gijima team</p>	<p>Noted. Information forwarded to the town planner (Urban Dynamics).</p> <p>To be addressed as part of the EIA phase and feedback will be provided in the EIA Report. A copy of the layout plan for the siding was received and forwarded to the town planners (Urban Dynamics).</p> <p>To be addressed as part of the EIA phase and feedback will be provided in the EIA Report.</p>	<p>Section 7.1-1. Minutes of meeting attached as Annexure 7.1-1.</p>
<p>Access from the R555 to the village is a risk since the access road is located near a dangerous curve in the R555. In addition, trucks tend to speed along this road.</p> <p>Recommended that speed humps be installed to force trucks to reduce speed.</p>	<p>Gijima team</p>	<p>Access from the R555 to the village is a risk since the access road is located near a dangerous curve in the R555. In addition, trucks tend to speed along this road.</p> <p>Recommended that speed humps be installed to force trucks to reduce speed.</p>	<p>Section 12 Table 12.5-2 and 12.5-3</p>
<p><b>Meeting with Ward Councillor – 15 November 2018</b></p>			
<ul style="list-style-type: none"> <li>• Lack of consultation and follow up on request for a meeting from the applicant</li> <li>• Lack of communication in relation to the clearing done on site</li> <li>• Dust generated by the operations on site.</li> <li>• Commendation of the siding for providing employment opportunities to the Arbor community members and for uplifting the community.</li> </ul> <p>1. Commented that the planned activities present positive opportunities for additional jobs and empowerment for the community.</p>	<p>Ward Councillor Masilela</p>	<p>The concerns of the Ward Councillor are noted and they will be incorporated into the Comments and Response register and report. The concerns raised will also be addressed in the BA report and EMPr.</p>	<ul style="list-style-type: none"> <li>• Minutes of the meeting (Annexure 11.1-2(a)) and IAP Site notice distribution register (Annexure 11.4-7)</li> <li>• Section 12 and Table 12.5-2 and 12.5-3</li> </ul>
<p><b>Meeting with Arbor Primary School Principal – 29 November 2018</b></p>			
<ul style="list-style-type: none"> <li>• Dust generated by the operations on site.</li> <li>• Safety issue at the railway crossing</li> </ul>	<p>School Principal</p>	<p>The concerns raised during the meeting with Arbor Primary School principal held on the 29</p>	<p>Section 12 Table 12.5-2 and 12.5-3</p>

ISSUE/COMMENT	RAISED BY	RESPONSE	SECTION WITHIN BAR ADDRESSING ISSUE
		<p>Nov 2018 are noted. The comments will be included in the Comments Register, Comments and Response report and addressed in the draft Basic Assessment report.</p>	
<p><b>Distribution of site notice leaflets and engagement with Arbor community members – Household visits</b></p>			
<p>Dust from the site during the offloading and loading of coal especially during windy conditions.</p> <p>Safety issue of crossing the railway line Support for Nodite Cooperative in terms of training and development opportunities to grow the business and serve a broader number of customers and businesses in the area. Opportunities for provision of services for businesses such as Gijima can help them grow further as well</p>	<p>Arbor Village community members</p>	<p>Cooperative needs proper training and development opportunities to grow the business and serve a broader number of customers and businesses in the area. Opportunities for provision of services for businesses such as Gijima can help them grow further as well.</p> <p>Additional Site Notices (English and Setswana and Zulu translation) were placed on the notice board towards the entrance/ exit of the Arbor Village.</p> <p>An A3 size English Site Notice was placed at the spot where the 610 mm x 420 mm Site Notice was removed.</p> <p>The comments and concerns raised during the engagement with the community members are noted. The comments and concerns received will be included in the Comments Register, Comments and Response report and addressed in the draft Basic Assessment report.</p>	<p>Section 12 Table 12.5-2 and 12.5-3</p>
<p><b>Meeting with Arbor Village Chief Simon Mahlangu - 22 February 2019</b></p>			
<p>Chief SM raised issues as follows:</p> <p>Site operations</p>	<p>Chief Simon Mahlangu</p>	<p>The issues raised are noted and will be addressed as part of the BAR process.</p>	<p>Section 12 Table 12.5-2 and 12.5-3</p>

ISSUE/COMMENT	RAISED BY	RESPONSE	SECTION WITHIN BAR ADDRESSING ISSUE
<p>The planned extension on the Southern Side and</p> <p>The lack of stakeholder engagement. The structure of the community is no longer managed in isolation from each other but is consolidated into one which maximises representation for the greater good of the community. This means that when engaging, the Chief, Ward Councillor; Mr Oupa Masilela and the associated forums/associations need to be present</p> <p>The tombstones located close to the Transnet house,</p>		<p>A public meeting is scheduled for later in the afternoon of the 22 February 2019 to capture the community's issues of concern.</p> <p>The matter is noted and will be investigated as Gijima was not aware of this and that it would need urgent attention as it might have serious implications.</p> <p>A Heritage study has since been commissioned and the report shared with Chief Mahlangu on the 02 April 2019 and his response of no comments was received on the 05 April 2019.</p>	<p>The Heritage Specialist Study Report summary of the findings are outlined in Section 16.2.2 and the full Specialist Study is attached as Annexure 16.2-5.</p>



## 11. Identified Potential Impacts And Impact Assessment

The potential impacts have been preliminarily identified for each stage of the project, from construction, operational and decommissioning. The impact assessment undertaken is based on the identification of environmental activities/aspects, anticipated impacts and the impact rating. The significance of the impact is then assessed by rating each variable numerically according to defined criteria as outlined Table 10.1-1 below. The potential impacts associated with the activities on site and their significance ranking are provided in Table 11.1-2.

The identified impacts are divided into Direct Impacts and Cumulative Impacts.

The proposed increased scope to the operations, also presents positive impacts, in the form of social and economic benefits for the communities surrounding the site. The site currently employs 30 locals and the proposed phased development introduces social benefits, which include job opportunities for about 25 extra local people. The economic benefits are also realised through the implementation of Transnet Road to Rail Strategy in transporting more coal directly to the power station, whilst reducing both costs and number of human fatalities on the road. The increased scope to the operation will transport an increased volume of coal material, which may lead to more stable electricity supply.

### 11.1 Construction Phase

#### 11.1.1 Direct impacts

- Soil disturbance during site establishment for construction of new listed activities.
- Soil pollution due to leakages and spills of oil and diesel.
- Soil erosion due to the loss of soil during clearing, ripping, grading and from storm water runoff etc.
- Noise pollution due to vehicular movement and site workers on site during construction.
- Air quality due to dust generated by all movement of vehicles and personnel on site.
- Water quality due to reduced water quality from soil erosion and sedimentation.
- Potential road accidents.
- Mistrust due to the lack of communication channels.

#### 11.1.2 Cumulative impacts

The potential cumulative indirect impacts include:

- Air Quality and deterioration of road infrastructure due to – Vehicular movement of other trucks outside the boundary of the site generate a lot of dust on the gravel road leading to the site. The increased truck traffic on R555 for haulage of coal has potential to increase dust in the air and impact on the air quality of the area.

### 11.2 Operational Phase

#### 11.2.1 Direct Impacts

- Deterioration of air quality due to the generation of dust fall out during the loading and off-loading of coal.
- Surface water resources: Contamination of water due to coal spillage from haul trucks; Contamination of water of hydraulic fluid from machinery and trucks.
- Groundwater resources: Contamination of water due to coal stockpile seepage; Contamination of water from pollution control dam seepage.
- Impacts on health and safety personnel and potential road accidents.

#### 11.2.2 Cumulative Impacts

The cumulative impacts include:

- Generation of dust from vehicular movement and air pollution from vehicular emissions.

- Dust emissions are likely to occur due to vehicular movement. The severity of this impact is anticipated to be medium, if mitigation measures such as dust suppression and adherence to speed limits are observed.

### 11.3 Decommissioning Phase

The direct impacts identified during the decommissioning due to the dismantling of operational structures and associated infrastructure are:

- Impacts on soil resources include loss of land capability, disturbance to soil structure from the ripping of the surface.
- Potential contamination of soil due to hydrocarbon spillages.
- Air pollution – generation of dust.
- Dust will be generated during the dismantling of structure and infrastructure.

### 11.4 Rehabilitation Phase

The direct impacts include:

- After the dismantling of infrastructure, revegetation of the site will be undertaken. This impact is considered positive and its significance is medium, as it will result in the restoration of the site.
- Socio-economic – loss of income will impact on the social and economic status of the community especially Abor village.

#### 11.4.1 Cumulative impacts

The cumulative impacts include:

- Job losses that add to the current high rate of unemployment in the country and produces non-productivity in the area resulting to Social Instability

The impact assessment undertaken is based on the identification of environmental activities/aspects, anticipated impacts and the impact rating. The significance of the impact is then assessed by rating each variable numerically according to defined criteria as outlined Table 11.1-1 below.

The EMP provides management principles for the all the project phases. Environmental actions, procedures and responsibilities as required during these phases are specified. These specifications will form part of the contract documentation and therefore the Contractor will be required to comply with these specifications to the satisfaction of the Safety, Health and Environmental Manager and/or Environmental Control Officer. The potential impacts of the proposed project are discussed in the table below and the mitigation measures are given in Section 11 of the EMP.

Table 11.1-1: Table for Impact Assessment Criteria

Weight	Hazard Effect or Severity		Scope/Extent	Duration			
6	Disastrous/can cause irreplaceable damage		Trans-boundary effects	Residual			
5	Catastrophic/major and cannot be mitigated		National/Severe environmental damage	Residual			
4	High/Critical/serious but can be mitigated		Regional effect	Decommissioning			
3	Medium/ slightly harmful /can be mitigated		Immediate surroundings / local/outside	Life of operation			

				site/project area fencing				
	2	Minimal/potentially harmful/can be mitigated		slight permit deviation/on-site	Short term/construction (6 months-1yrs)			
	1	Insignificant/non-harmful /can be reversed		Activity specific/No effect /Controlled	Immediate (0-6 months)			
Weight number		1		2	3	4	5	6
	Frequency of impact	Highly unlikely		Rare	Low likelihood	Probable/possible	Regular/almost likely	
	Probability of impact	Practically impossible		Conceivable but very unlikely	Only remotely possible (has happened somewhere)	Unusual but possible	Quite possible (50/50)/Certain	Is the most likely and expected (has and foresee it happen again)
	Frequency of activity	Annually or less		6 monthly/temporarily	Infrequent/monthly	Weekly/regularly / Life of operation	Daily/permanent	Residual

Activity: a distinct process or task undertaken by an organisation for which a responsibility can be assigned.  
 Environmental aspect: an element of an organisation’s activities, products or services which can interact with the environment or cause an environmental impact.

Environmental impacts: consequences of these aspects on environmental resources or receptors.

Receptors: comprise, but are not limited to people or man-made structures.

Resources: include components of the biophysical environment.

Frequency of activity: refers to how often the proposed activity will take place.

Frequency of impact: refers to the frequency with which a stressor will impact on the receptor.

Severity: refers to the degree of change to the receptor status in terms of the reversibility of the impact; sensitivity of receptor to stressor; duration of impact (increasing or decreasing with time); controversy potential and precedent setting; threat to environmental and health standards.

Spatial scope: refers to the geographical scale of the impact.

Duration: refers to the length of time over which the stressor will cause a change in the resource or receptor.

		CONSEQUENCE (Severity + Spatial Scope + Duration)														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LIKELIHOOD (Frequency of activity + Frequency of impact)	1	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30
	2	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60
	3	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
	4	8	16	24	32	40	48	56	64	72	80	88	96	104	112	120
	5	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
	6	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180
	7	14	28	42	56	70	84	98	112	126	140	154	168	182	196	210
	8	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
	9	18	36	54	72	90	108	126	144	162	180	198	216	234	252	270
	10	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300

Potential impact = Consequence \* Likelihood

**Degree to which the impact can be mitigated (e.g. 40 % reduction in oils spillage when the management measure is applied and 70% reduction in contamination of soils).**

**0-40%; 40%-70%; 80%-100%**

<b>Colour Code</b>	<b>Significance Rating</b>	<b>Value</b>	<b>Negative Impact Management Recommendation</b>	<b>Positive Impact Management Recommendation</b>
	VERY HIGH	60-150	Improve current management and implement more specific measures to make it tolerable	Maintain current management
	MEDIUM	21-59	Maintain and add special measures to improve current management	Improve current management
	LOW	1-20	Maintain and monitor current management	Improve current management

The interpretation of the status of the impact

<b>IMPACT STATUS</b>	<b>CRITERIA</b>
Positive	The impact benefits the environment.
Negative	The impact results in a cost to the environment.
Neutral	The impact has no effect on the environment.

Once the significance of an impact has been determined, the CONFIDENCE in the assessment of the significance rating is ascertained using the rating systems outlined in below.

Definition of Confidence Ratings

<b>CONFIDENCE RATINGS*</b>	<b>CRITERIA</b>
High	Wealth of information on and sound understanding of the environmental factors potentially influencing the impact. Greater than 70% sure of impact prediction.
Medium	Reasonable amount of useful information on and relatively sound understanding of the environmental factors potentially influencing the impact. Between 35% and 70% sure of impact prediction.
Low	Limited useful information on and understanding of the environmental factors potentially influencing this impact. Less than 35% sure of impact prediction.

The level of confidence in the prediction is based on specialist knowledge of that particular field and the reliability of data used to make the prediction. The degree to which the impact can be reversed is estimated using the rating system outlined in below.

Definition of Reversibility Ratings

<b>REVERSIBILITY RATINGS</b>	<b>CRITERIA</b>
Irreversible	Where the impact is permanent.
Partially Reversible	Where the impact can be partially reversed.
Fully Reversible	Where the impact can be completely reversed.

The degree to which there will be a loss of resources, table below refers to the degree to which a resource is permanently affected by the activity, i.e. the degree to which a resource is irreplaceable.

Definition of Loss of Resources

<b>LOSS OF RESOURCES</b>	<b>CRITERIA</b>
Low	Where the activity results in a loss of a particular resource but where the natural, cultural and social functions and processes are not affected.
Medium	Where the loss of a resource occurs, but natural, cultural and social functions and processes continue, albeit in a modified way.
High	Where the activity results in an irreplaceable loss of a resource.

Lastly, the degree to which the impact can be mitigated or enhanced is described below:

Degree to which impact can be mitigated

DEGREE TO WHICH IMPACT CAN BE MITIGATED	CRITERIA
None	No change in impact after mitigation.
Very Low	Where the significance rating stays the same, but where mitigation will reduce the intensity of the impact.
Low	Where the significance rating drops by one level, after mitigation.
Medium	Where the significance rating drops by two to three levels, after mitigation.
High	Where the significance rating drops by more than three levels, after mitigation.



Table 11.1-2: Potential impacts associated with the activities on site

Activity / Aspect	Potential Impact	Project Phase	Type of Impact	Impact Rating																																								
<b>PHASE: PRE-CONSTRUCTION (PLANNING AND DESIGN)</b>																																												
Availability of Permits and legal authorisations that are in order	Potential Illegal operation of the site should the required permits not be available	<ul style="list-style-type: none"> <li>• Planning &amp; Design</li> <li>• Construction</li> <li>• Operational</li> <li>• Decommissioning</li> </ul>	Direct	<table border="1"> <thead> <tr> <th>Severity</th> <th>Spatial Scope</th> <th>Duration</th> <th>Consequence (sub-total)</th> </tr> </thead> <tbody> <tr> <td>Serious (3) (PM-2)</td> <td>National (5) (PM- 1)</td> <td>Residual (1) (PM-2)</td> <td>8 (PM-5)</td> </tr> <tr> <td>Frequency of impact</td> <td>Probable 3 PM (2 )</td> <td colspan="2">PROBABILITY 6 (PM-4)</td> </tr> <tr> <td>Frequency of activity</td> <td>Infrequent 3 PM (2 )</td> <td colspan="2"></td> </tr> <tr> <td colspan="2">SIGNIFICANCE OF IMPACT (pre-mitigation)</td> <td colspan="2">SIGNIFICANCE OF IMPACT (post-mitigation)</td> </tr> <tr> <td colspan="2">Medium (48)</td> <td colspan="2">Low (20)</td> </tr> <tr> <td colspan="2">Impact status</td> <td colspan="2">Negative</td> </tr> <tr> <td colspan="2">Confidence rating</td> <td colspan="2">Medium</td> </tr> <tr> <td colspan="2">Reversibility</td> <td colspan="2">Partially reversible</td> </tr> <tr> <td colspan="2">Loss of resources</td> <td colspan="2">Medium</td> </tr> </tbody> </table>	Severity	Spatial Scope	Duration	Consequence (sub-total)	Serious (3) (PM-2)	National (5) (PM- 1)	Residual (1) (PM-2)	8 (PM-5)	Frequency of impact	Probable 3 PM (2 )	PROBABILITY 6 (PM-4)		Frequency of activity	Infrequent 3 PM (2 )			SIGNIFICANCE OF IMPACT (pre-mitigation)		SIGNIFICANCE OF IMPACT (post-mitigation)		Medium (48)		Low (20)		Impact status		Negative		Confidence rating		Medium		Reversibility		Partially reversible		Loss of resources		Medium	
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Site establishment and assembling of temporary structures <ul style="list-style-type: none"> <li>• Clearance of vegetation</li> <li>• Demarcation of operational zones</li> <li>• Site clearance for stockpiling and loading areas.</li> </ul>	1.1 Impacts on soil resources <ul style="list-style-type: none"> <li>1.1.1 Potential for soil erosion</li> <li>1.1.2 Potential for soil pollution due to oil and chemical spillages; temporal ablation facilities.</li> <li>1.1.3 Disturbance of topsoil and vegetation</li> <li>1.1.4 Potential for soil compaction</li> <li>1.15 Loss of vegetation cover</li> </ul>	Pre-construction	Direct/ Cumulative	<p>The impact on topsoil removal will be low as the site has already been disturbed and is highly transformed. It is further recommended that all machinery to be used should be serviced and inspected daily before and after use Installation of storm water management system to reduce the risk of flooding, a silt trap to be installed with the pollution control dam to be constructed.</p> <table border="1"> <thead> <tr> <th>Severity</th> <th>Spatial Scope</th> <th>Duration</th> <th>Consequence (sub-total)</th> </tr> </thead> <tbody> <tr> <td>Medium(3) (PM-2)</td> <td>On-site (2) (PM- 1)</td> <td>Immediate (1) (PM-2)</td> <td>6 (PM-5)</td> </tr> <tr> <td>Frequency of impact</td> <td>Probable 3 PM (2 )</td> <td colspan="2">PROBABILITY 6 (PM-4)</td> </tr> <tr> <td>Frequency of activity</td> <td>Infrequent 3 PM (2 )</td> <td colspan="2"></td> </tr> <tr> <td colspan="2">SIGNIFICANCE OF IMPACT (pre-mitigation)</td> <td colspan="2">SIGNIFICANCE OF IMPACT (post-mitigation)</td> </tr> <tr> <td colspan="2">Medium (36)</td> <td colspan="2">Low (20)</td> </tr> <tr> <td colspan="2">Impact status</td> <td colspan="2">Negative</td> </tr> <tr> <td colspan="2">Confidence rating</td> <td colspan="2">Medium</td> </tr> <tr> <td colspan="2">Reversibility</td> <td colspan="2">Partially reversible</td> </tr> </tbody> </table>	Severity	Spatial Scope	Duration	Consequence (sub-total)	Medium(3) (PM-2)	On-site (2) (PM- 1)	Immediate (1) (PM-2)	6 (PM-5)	Frequency of impact	Probable 3 PM (2 )	PROBABILITY 6 (PM-4)		Frequency of activity	Infrequent 3 PM (2 )			SIGNIFICANCE OF IMPACT (pre-mitigation)		SIGNIFICANCE OF IMPACT (post-mitigation)		Medium (36)		Low (20)		Impact status		Negative		Confidence rating		Medium		Reversibility		Partially reversible					
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Activity / Aspect	Potential Impact	Project Phase	Type of Impact	Impact Rating			
				Loss of resources	Medium		
				Degree to which the impact can be mitigated	High		
1.2 Air pollution 1.2.1 Generation of dust from vehicular movement during site establishment	<ul style="list-style-type: none"> <li>Pre-construction</li> <li>Construction</li> <li>Operational</li> <li>Decommissioning</li> </ul>	Direct/ Cumulative	Generation of dust during the site establishment, construction , operational and decommissioning phases of the project. Implementation of mitigation measures such as dust suppression will reduce the significance of the impact to low.				
				Severity	Spatial Scope	Duration	Consequence (sub-total)
				Medium(3) (PM-2)	On-site (2) (PM- 1)	Construction (2) (PM-2)	7 (PM-5)
				Frequency of impact	Probable 3 PM (2)	PROBABILITY 8 (PM-4)	
				Frequency of activity	Daily 5 PM (2)		
				SIGNIFICANCE OF IMPACT (pre-mitigation)		SIGNIFICANCE OF IMPACT (post-mitigation)	
				Medium (35)		Low (20)	
				Impact status		Negative	
				Confidence rating		High	
				Reversibility		Partially reversible	
				Loss of resources		Medium	
				Degree to which the impact can be mitigated		High	
1.3 Impacts on faunal species 1.3.1 Impacts on faunal habitat 1.3.2 Impacts on faunal diversity		Direct	Impacts on faunal species are anticipated to be low due to the existence of previous rail siding infrastructure therefore limiting the occurrence of faunal species as the area is already disturbed. The operational site is highly transformed and with exception of Eucalyptus species randomly occurring on the boundaries of the site and serve as screening method, the site is unable to carry and sustain any flora species as a habitat due to coal dust footprint.				
				Severity	Spatial Scope	Duration	Consequence (sub-total)
				Medium(3) (PM-1)	Immediate surroundings (3) (PM- 1)	Life of operation(3) (PM-2)	9 (PM-4)
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1.4 Impacts on flora species 1.4.1 Loss of vegetation cover 1.4.2 Loss of flora species diversity	<ul style="list-style-type: none"> <li>Pre-construction</li> <li>Construction</li> <li>Operational Decommissioning</li> </ul>	Direct/ Cumulative	Loss of vegetation cover and flora species diversity could occur during the site clearance, however, it should be noted that the proposed development site is an existing rail siding therefore clearance of vegetation cover and other associated impacts such as loss of species diversity will be low. The operational site is highly transformed and unable to carry and sustain any flora species as a habitat due to coal dust footprint.	<table border="1"> <thead> <tr> <th>Severity</th> <th>Spatial Scope</th> <th>Duration</th> <th>Consequence (sub-total)</th> </tr> </thead> <tbody> <tr> <td>Minimal (2) (PM-1)</td> <td>On-site (2) (PM- 1)</td> <td>Life operation(2) of (PM-2)</td> <td>6 (PM-4)</td> </tr> <tr> <td>Frequency of impact</td> <td>Probable 3 PM (2 )</td> <td colspan="2">PROBABILITY 6 (PM-4)</td> </tr> <tr> <td>Frequency of activity</td> <td>Infrequent 3 PM (2 )</td> <td colspan="2"></td> </tr> <tr> <td colspan="2">SIGNIFICANCE OF IMPACT (pre-mitigation)</td> <td colspan="2">SIGNIFICANCE OF IMPACT (post-mitigation)</td> </tr> <tr> <td colspan="2">Medium (36)</td> <td colspan="2">Low (20)</td> </tr> <tr> <td colspan="2">Impact status</td> <td colspan="2">Negative</td> </tr> <tr> <td colspan="2">Confidence rating</td> <td colspan="2">Medium</td> </tr> <tr> <td colspan="2">Reversibility</td> <td colspan="2">Partially reversible</td> </tr> <tr> <td colspan="2">Loss of resources</td> <td colspan="2">Medium</td> </tr> <tr> <td colspan="2">Degree to which the impact can be mitigated</td> <td colspan="2">High</td> </tr> </tbody> </table>	Severity	Spatial Scope	Duration	Consequence (sub-total)	Minimal (2) (PM-1)	On-site (2) (PM- 1)	Life operation(2) of (PM-2)	6 (PM-4)	Frequency of impact	Probable 3 PM (2 )	PROBABILITY 6 (PM-4)		Frequency of activity	Infrequent 3 PM (2 )			SIGNIFICANCE OF IMPACT (pre-mitigation)		SIGNIFICANCE OF IMPACT (post-mitigation)		Medium (36)		Low (20)		Impact status		Negative		Confidence rating		Medium		Reversibility		Partially reversible		Loss of resources		Medium		Degree to which the impact can be mitigated		High	
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1.5 Surface water resources 1.5.1 Deterioration of water quality		Direct	Based on the South African Water Quality Guidelines, developed by the Department of Water Affairs and Forestry (DWAF) (now known as Department of Water and Sanitation), the water quality at the siding has no negative potential impacts for all uses as it falls within the set standards.  Water for domestic use at the siding is supplied by Eskom and the analyses results show good water quality.																																													

Activity / Aspect	Potential Impact	Project Phase	Type of Impact	Impact Rating																																												
	1.5.2 Potential for sedimentation of surface water resources			<p>Contamination of surface water resources, such as the wetland in the close vicinity outside the boundaries of the siding, could result from the uncontrolled storm water drainage system might find its way to surface water resources leading to deterioration of water quality.</p> <table border="1"> <thead> <tr> <th>Severity</th> <th>Spatial Scope</th> <th>Duration</th> <th>Consequence (sub-total)</th> </tr> </thead> <tbody> <tr> <td>Medium (3) (PM-2)</td> <td>Local (3) (PM- 3)</td> <td>Life of operation (3) (PM-2)</td> <td>9 (PM-7)</td> </tr> <tr> <td>Frequency of impact</td> <td>Probable 4 PM (3 )</td> <td colspan="2">PROBABILITY 9 (PM-5)</td> </tr> <tr> <td>Frequency of activity</td> <td>Daily 5 PM (2 )</td> <td colspan="2"></td> </tr> <tr> <td colspan="2">SIGNIFICANCE OF IMPACT (pre-mitigation)</td> <td colspan="2">SIGNIFICANCE OF IMPACT (post-mitigation)</td> </tr> <tr> <td colspan="2">Medium (45)</td> <td colspan="2">Low (20)</td> </tr> <tr> <td colspan="2">Impact status</td> <td colspan="2">Negative</td> </tr> <tr> <td colspan="2">Confidence rating</td> <td colspan="2">High</td> </tr> <tr> <td colspan="2">Reversibility</td> <td colspan="2">Partially reversible</td> </tr> <tr> <td colspan="2">Loss of resources</td> <td colspan="2">Medium</td> </tr> <tr> <td colspan="2">Degree to which the impact can be mitigated</td> <td colspan="2">Medium</td> </tr> </tbody> </table>	Severity	Spatial Scope	Duration	Consequence (sub-total)	Medium (3) (PM-2)	Local (3) (PM- 3)	Life of operation (3) (PM-2)	9 (PM-7)	Frequency of impact	Probable 4 PM (3 )	PROBABILITY 9 (PM-5)		Frequency of activity	Daily 5 PM (2 )			SIGNIFICANCE OF IMPACT (pre-mitigation)		SIGNIFICANCE OF IMPACT (post-mitigation)		Medium (45)		Low (20)		Impact status		Negative		Confidence rating		High		Reversibility		Partially reversible		Loss of resources		Medium		Degree to which the impact can be mitigated		Medium	
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	1.6 Potential for wetland disturbances		Direct	<p>Siltation of wetland system would alter geomorphic functioning, the movement of water through the system (hydrological functioning). Additionally, hardened surfaces and bare areas are likely to increase surface run-off velocities and peak flows received by wetlands unless mitigated.</p> <table border="1"> <thead> <tr> <th>Severity</th> <th>Spatial Scope</th> <th>Duration</th> <th>Consequence (sub-total)</th> </tr> </thead> <tbody> <tr> <td>High (4) (PM-2)</td> <td>Regional (4) (PM- 3)</td> <td>Life of operation (3) (PM-2)</td> <td>9 (PM-7)</td> </tr> <tr> <td>Frequency of impact</td> <td>Probable 4 PM (3 )</td> <td colspan="2">PROBABILITY 9 (PM-6)</td> </tr> <tr> <td>Frequency of activity</td> <td>Daily 5 PM (3 )</td> <td colspan="2"></td> </tr> <tr> <td colspan="2">SIGNIFICANCE OF IMPACT (pre-mitigation)</td> <td colspan="2">SIGNIFICANCE OF IMPACT (post-mitigation)</td> </tr> <tr> <td colspan="2">High (81)</td> <td colspan="2">Low (20)</td> </tr> <tr> <td colspan="2">Impact status</td> <td colspan="2">Negative</td> </tr> <tr> <td colspan="2">Confidence rating</td> <td colspan="2">High</td> </tr> <tr> <td colspan="2">Reversibility</td> <td colspan="2">Partially reversible</td> </tr> <tr> <td colspan="2">Loss of resources</td> <td colspan="2">Medium</td> </tr> <tr> <td colspan="2">Degree to which the impact can be mitigated</td> <td colspan="2">Medium</td> </tr> </tbody> </table>	Severity	Spatial Scope	Duration	Consequence (sub-total)	High (4) (PM-2)	Regional (4) (PM- 3)	Life of operation (3) (PM-2)	9 (PM-7)	Frequency of impact	Probable 4 PM (3 )	PROBABILITY 9 (PM-6)		Frequency of activity	Daily 5 PM (3 )			SIGNIFICANCE OF IMPACT (pre-mitigation)		SIGNIFICANCE OF IMPACT (post-mitigation)		High (81)		Low (20)		Impact status		Negative		Confidence rating		High		Reversibility		Partially reversible		Loss of resources		Medium		Degree to which the impact can be mitigated		Medium	
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<b>PHASE CONSTRUCTION</b>																																														
<p>Construction of new evaporation dams or Alternative:                      To use the existing channels to divert dirty water from the Southern Side the Northern side t link up to Pollution Control Dam through a network of channels under the railway.</p>	<p>2.1 Groundwater resources                       2.1.1 Contamination of groundwater resources from oil and/or chemical oil spillages</p>	<p>Construction Operational Decommissioning</p>	<p>Direct/Cumulative</p>	<p>There is potential for ground water contamination from chemical and/or oil spillage resulting in seepage during the construction phase of the project. It is however anticipated that this impact will be low, after implementation of mitigation measures.</p> <table border="1"> <thead> <tr> <th>Severity</th> <th>Spatial Scope</th> <th>Duration</th> <th>Consequence (sub-total)</th> </tr> </thead> <tbody> <tr> <td>Medium (3) (PM-1)</td> <td>Local (3) (PM- 2)</td> <td>Life of operation (3) (PM-2)</td> <td>9 (PM-5)</td> </tr> <tr> <td>Frequency of impact</td> <td>Probable 4 PM (2 )</td> <td colspan="2" rowspan="2">PROBABILITY 9 (PM-4)</td> </tr> <tr> <td>Frequency of activity</td> <td>Daily 5 PM (2 )</td> </tr> <tr> <td colspan="2">SIGNIFICANCE OF IMPACT (pre-mitigation)</td> <td colspan="2">SIGNIFICANCE OF IMPACT (post-mitigation)</td> </tr> <tr> <td colspan="2">High (81)</td> <td colspan="2">Low (20)</td> </tr> <tr> <td colspan="2">Impact status</td> <td colspan="2">Negative</td> </tr> <tr> <td colspan="2">Confidence rating</td> <td colspan="2">Medium</td> </tr> <tr> <td colspan="2">Reversibility</td> <td colspan="2">Partially reversible</td> </tr> <tr> <td colspan="2">Loss of resources</td> <td colspan="2">Medium</td> </tr> <tr> <td colspan="2">Degree to which the impact can be mitigated</td> <td colspan="2">High</td> </tr> </tbody> </table>	Severity	Spatial Scope	Duration	Consequence (sub-total)	Medium (3) (PM-1)	Local (3) (PM- 2)	Life of operation (3) (PM-2)	9 (PM-5)	Frequency of impact	Probable 4 PM (2 )	PROBABILITY 9 (PM-4)		Frequency of activity	Daily 5 PM (2 )	SIGNIFICANCE OF IMPACT (pre-mitigation)		SIGNIFICANCE OF IMPACT (post-mitigation)		High (81)		Low (20)		Impact status		Negative		Confidence rating		Medium		Reversibility		Partially reversible		Loss of resources		Medium		Degree to which the impact can be mitigated		High	
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<p>Construction/Upgrade of the existing station building into office block and abluion facility.</p>	<p>2.2 Ablution facilities                       Contamination of surface and ground water resources</p>	<p>Construction</p>	<p>Direct</p>	<p>There is potential for ground water contamination from chemical and/or oil spillage resulting in seepage during the construction phase of the project. It is however anticipated that this impact will be low, after implementation of mitigation measures.</p> <table border="1"> <thead> <tr> <th>Severity</th> <th>Spatial Scope</th> <th>Duration</th> <th>Consequence (sub-total)</th> </tr> </thead> <tbody> <tr> <td>Medium (3) (PM-1)</td> <td>Local (3) (PM- 2)</td> <td>Life of operation (3) (PM-2)</td> <td>9 (PM-5)</td> </tr> <tr> <td>Frequency of impact</td> <td>Probable 4 PM (2 )</td> <td colspan="2" rowspan="2">PROBABILITY 9 (PM-4)</td> </tr> <tr> <td>Frequency of activity</td> <td>Daily 5 PM (2 )</td> </tr> <tr> <td colspan="2">SIGNIFICANCE OF IMPACT (pre-mitigation)</td> <td colspan="2">SIGNIFICANCE OF IMPACT (post-mitigation)</td> </tr> <tr> <td colspan="2">High (81)</td> <td colspan="2">Low (20)</td> </tr> <tr> <td colspan="2">Impact status</td> <td colspan="2">Negative</td> </tr> <tr> <td colspan="2">Confidence rating</td> <td colspan="2">Medium</td> </tr> <tr> <td colspan="2">Reversibility</td> <td colspan="2">Partially reversible</td> </tr> <tr> <td colspan="2">Loss of resources</td> <td colspan="2">Medium</td> </tr> <tr> <td colspan="2">Degree to which the impact can be mitigated</td> <td colspan="2">High</td> </tr> </tbody> </table>	Severity	Spatial Scope	Duration	Consequence (sub-total)	Medium (3) (PM-1)	Local (3) (PM- 2)	Life of operation (3) (PM-2)	9 (PM-5)	Frequency of impact	Probable 4 PM (2 )	PROBABILITY 9 (PM-4)		Frequency of activity	Daily 5 PM (2 )	SIGNIFICANCE OF IMPACT (pre-mitigation)		SIGNIFICANCE OF IMPACT (post-mitigation)		High (81)		Low (20)		Impact status		Negative		Confidence rating		Medium		Reversibility		Partially reversible		Loss of resources		Medium		Degree to which the impact can be mitigated		High	
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	2.3 Heritage and archaeological resources Impacts on heritage and archaeological resources during site clearing and establishment	<ul style="list-style-type: none"> <li>Pre-construction</li> <li>Construction</li> <li>Operational</li> <li>Decommissioning</li> </ul>	Direct	<p>There is potential for the discovery of heritage resources such as graves and/ or archaeological artefacts during the construction phase of the project due to the diggings and establishment of structures and infrastructures (Loading and stockpile areas), however as the site is an old established site with some existing infrastructure such as the station building the significance is considered to be low. It should however be noted that contractors and personnel should be alerted on the probability of chance findings of archaeological artefacts throughout the project life cycle.</p> <table border="1"> <thead> <tr> <th>Severity</th> <th>Spatial Scope</th> <th>Duration</th> <th>Consequence (sub-total)</th> </tr> </thead> <tbody> <tr> <td>Medium(2) (PM-1)</td> <td>On-site (2) (PM- 1)</td> <td>Life of operation (2) (PM-2)</td> <td>6 (PM-5)</td> </tr> <tr> <td>Frequency of impact</td> <td>Probable 3 PM (2 )</td> <td colspan="2">PROBABILITY 8 (PM-4)</td> </tr> <tr> <td>Frequency of activity</td> <td>Daily 5 PM (2 )</td> <td colspan="2"></td> </tr> <tr> <td colspan="2">SIGNIFICANCE OF IMPACT (pre-mitigation)</td> <td colspan="2">SIGNIFICANCE OF IMPACT (post-mitigation)</td> </tr> <tr> <td colspan="2">Medium (48)</td> <td colspan="2">Low (20)</td> </tr> <tr> <td colspan="2">Impact status</td> <td colspan="2">Negative</td> </tr> <tr> <td colspan="2">Confidence rating</td> <td colspan="2">Medium</td> </tr> <tr> <td colspan="2">Reversibility</td> <td colspan="2">Irreversible</td> </tr> <tr> <td colspan="2">Loss of resources</td> <td colspan="2">Medium</td> </tr> <tr> <td colspan="2">Degree to which the impact can be mitigated</td> <td colspan="2">High</td> </tr> </tbody> </table>	Severity	Spatial Scope	Duration	Consequence (sub-total)	Medium(2) (PM-1)	On-site (2) (PM- 1)	Life of operation (2) (PM-2)	6 (PM-5)	Frequency of impact	Probable 3 PM (2 )	PROBABILITY 8 (PM-4)		Frequency of activity	Daily 5 PM (2 )			SIGNIFICANCE OF IMPACT (pre-mitigation)		SIGNIFICANCE OF IMPACT (post-mitigation)		Medium (48)		Low (20)		Impact status		Negative		Confidence rating		Medium		Reversibility		Irreversible		Loss of resources		Medium		Degree to which the impact can be mitigated		High	
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Remove the entire existing concrete drainage infrastructure. Remove the building rubble from the site. Remove the OHTE from the platform line.	2.4 Waste management Land, soil and water pollution due to improper waste management	Pre-construction Construction Operational Decommissioning	Direct/ Cumulative	<p>There is potential for pollution of land, soil and water due to improper waste disposal such as littering, overflowing bins, and burning of waste on site. This impact is considered to be low after implementation of mitigation measures. The building rubble will be removed and disposed appropriately.</p> <table border="1"> <thead> <tr> <th>Severity</th> <th>Spatial Scope</th> <th>Duration</th> <th>Consequence (sub-total)</th> </tr> </thead> <tbody> <tr> <td>Medium (2) (PM-1)</td> <td>On-site (2) (PM- 1)</td> <td>Life of Operation (2) (PM-2)</td> <td>6 (PM-4)</td> </tr> <tr> <td>Frequency of impact</td> <td>Probable 3 PM (2)5</td> <td colspan="2">PROBABILITY</td> </tr> </tbody> </table>	Severity	Spatial Scope	Duration	Consequence (sub-total)	Medium (2) (PM-1)	On-site (2) (PM- 1)	Life of Operation (2) (PM-2)	6 (PM-4)	Frequency of impact	Probable 3 PM (2)5	PROBABILITY																																	
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				SIGNIFICANCE OF IMPACT (pre-mitigation)	SIGNIFICANCE OF IMPACT (post-mitigation)
				Medium (35)	Low (20)
				Impact status	Negative
				Confidence rating	Medium
				Reversibility	Partially reversible
				Loss of resources	Medium
				Degree to which the impact can be mitigated	High



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Transportation of equipment, machinery and personnel to the site	2.5 Increase in traffic flow	<ul style="list-style-type: none"> <li>Pre-construction</li> <li>Construction</li> <li>Operational</li> <li>Decommissioning</li> </ul>	Direct/ Cumulative	<p>During the construction phase of the project it is anticipated that the traffic volume generated by the movement of vehicles will have a low impact. This is mainly due to the fact that the site has already been established, therefore the required equipment and machinery will not be as much as those required for the establishment of a non- existent site. The vehicles already servicing the Northern side will be used to clear the site for the Southern side.</p> <table border="1"> <thead> <tr> <th>Severity</th> <th>Spatial Scope</th> <th>Duration</th> <th>Consequence (sub-total)</th> </tr> </thead> <tbody> <tr> <td>Medium (3 (PM-1))</td> <td>Local (3 (PM- 2))</td> <td>Life of operation (3 (PM-2))</td> <td>9 (PM-5)</td> </tr> <tr> <td>Frequency of impact</td> <td>Probable 4 PM (2)</td> <td colspan="2">PROBABILITY 5 (PM-4)</td> </tr> <tr> <td>Frequency of activity</td> <td>Daily 2 PM (2 )</td> <td colspan="2"></td> </tr> <tr> <td colspan="2">SIGNIFICANCE OF IMPACT (pre-mitigation)</td> <td colspan="2">SIGNIFICANCE OF IMPACT (post-mitigation)</td> </tr> <tr> <td colspan="2">Medium (45)</td> <td colspan="2">Low (20)</td> </tr> <tr> <td colspan="2">Impact status</td> <td colspan="2">Negative</td> </tr> <tr> <td colspan="2">Confidence rating</td> <td colspan="2">Medium</td> </tr> <tr> <td colspan="2">Reversibility</td> <td colspan="2">Partially reversible</td> </tr> <tr> <td colspan="2">Loss of resources</td> <td colspan="2">Medium</td> </tr> <tr> <td colspan="2">Degree to which the impact can be mitigated</td> <td colspan="2">High</td> </tr> </tbody> </table>	Severity	Spatial Scope	Duration	Consequence (sub-total)	Medium (3 (PM-1))	Local (3 (PM- 2))	Life of operation (3 (PM-2))	9 (PM-5)	Frequency of impact	Probable 4 PM (2)	PROBABILITY 5 (PM-4)		Frequency of activity	Daily 2 PM (2 )			SIGNIFICANCE OF IMPACT (pre-mitigation)		SIGNIFICANCE OF IMPACT (post-mitigation)		Medium (45)		Low (20)		Impact status		Negative		Confidence rating		Medium		Reversibility		Partially reversible		Loss of resources		Medium		Degree to which the impact can be mitigated		High	
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	2.6 Generation of dust from vehicular movement  2.7 Air pollution from vehicular emissions	<ul style="list-style-type: none"> <li>Pre-construction</li> <li>Construction</li> <li>Operational</li> <li>Decommissioning</li> </ul>	Direct	<p>Dust emissions are likely to occur due to vehicular movement as the access roads are gravel. The severity of this impact is anticipated to be low, if mitigation measures such as dampening of the gravel road and adherence to speed limits are observed. Furthermore, the traffic volume is anticipated to be low during this phase of the project, in comparison with the Operational Phase. Air pollution from emanating from vehicular emissions is also anticipated to be low if the mitigation measures prescribed in this Environmental Management Plan are adhered to. The cumulative impacts of dust in the overall area within a 1 km radius of the Siding is expected as there are a number of trucks travelling on the gravel portion of R960 road towards R555 Ogies road.</p> <table border="1"> <thead> <tr> <th>Severity</th> <th>Spatial Scope</th> <th>Duration</th> <th>Consequence (sub-total)</th> </tr> </thead> <tbody> <tr> <td>Critical (4) (PM-1)</td> <td>Regional (4) (PM- 1)</td> <td>Life of operation (2) (PM-2)</td> <td>10 (PM-4)</td> </tr> <tr> <td>Frequency of impact</td> <td>Probable 3 PM (2)</td> <td colspan="2">PROBABILITY</td> </tr> </tbody> </table>	Severity	Spatial Scope	Duration	Consequence (sub-total)	Critical (4) (PM-1)	Regional (4) (PM- 1)	Life of operation (2) (PM-2)	10 (PM-4)	Frequency of impact	Probable 3 PM (2)	PROBABILITY																																	
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2.8 Impacts on health and safety	<ul style="list-style-type: none"> <li>Pre-construction</li> <li>Construction</li> <li>Operational</li> <li>Decommissioning</li> </ul>	Direct	<p>Due to the nature of the proposed project it is likely that heavy equipment and machinery will be utilized. The potential for accidents and injuries is therefore likely, however the severity of the impact is considered to be medium. The use of PPE and adherence to the site safety rules and guidelines will be ensured at all times.</p> <table border="1"> <thead> <tr> <th>Severity</th> <th>Spatial Scope</th> <th>Duration</th> <th>Consequence (sub-total)</th> </tr> </thead> <tbody> <tr> <td>Medium (2) (PM-1)</td> <td>Local (3) (PM- 1)</td> <td>Life of operation (3) (PM-2)</td> <td>8 (PM-4)</td> </tr> <tr> <td>Frequency of impact</td> <td>Probable 3 PM (2)</td> <td colspan="2">PROBABILITY 8 (PM-4)</td> </tr> <tr> <td>Frequency of activity</td> <td>Daily 5 PM (2 )</td> <td colspan="2"></td> </tr> <tr> <td colspan="2">SIGNIFICANCE OF IMPACT (pre-mitigation)</td> <td colspan="2">SIGNIFICANCE OF IMPACT (post-mitigation)</td> </tr> <tr> <td colspan="2">High (64)</td> <td colspan="2">Low (20)</td> </tr> <tr> <td colspan="2">Impact status</td> <td colspan="2">Negative</td> </tr> <tr> <td colspan="2">Confidence rating</td> <td colspan="2">Medium</td> </tr> <tr> <td colspan="2">Reversibility</td> <td colspan="2">Irreversible</td> </tr> <tr> <td colspan="2">Loss of resources</td> <td colspan="2">Medium</td> </tr> </tbody> </table>	Severity	Spatial Scope	Duration	Consequence (sub-total)	Medium (2) (PM-1)	Local (3) (PM- 1)	Life of operation (3) (PM-2)	8 (PM-4)	Frequency of impact	Probable 3 PM (2)	PROBABILITY 8 (PM-4)		Frequency of activity	Daily 5 PM (2 )			SIGNIFICANCE OF IMPACT (pre-mitigation)		SIGNIFICANCE OF IMPACT (post-mitigation)		High (64)		Low (20)		Impact status		Negative		Confidence rating		Medium		Reversibility		Irreversible		Loss of resources		Medium	
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	2.9 Increase in ambient noise levels due to vehicular movement, usage of machinery, equipment and construction activities.	<ul style="list-style-type: none"> <li>Pre-construction</li> <li>Construction</li> <li>Operational</li> <li>Decommissioning</li> </ul>	Direct	<p>The construction of the structures will only cause a temporal increase in ambient noise levels during construction and decommissioning phase. The noise will only be limited to construction activities. The expected noise caused by these construction vehicles is however, foreseen to be low, as the expected noise will be from the truck engine and generators. The noise will only be experienced during the day and only during construction phase. Therefore, probability of excessive noise is low and will have low intensity. It is anticipated that the noise levels will increase during the Operational phase as the trucks offload to stockpile and the front-end caterpillars load coal into the train wagons.</p> <table border="1"> <thead> <tr> <th>Severity</th> <th>Spatial Scope</th> <th>Duration</th> <th>Consequence (sub-total)</th> </tr> </thead> <tbody> <tr> <td>Medium (2) (PM-1)</td> <td>On-site (2) (PM- 1)</td> <td>Life of operation (3) (PM-3)</td> <td>7 (PM-5)</td> </tr> <tr> <td>Frequency of impact</td> <td>Probable 3 PM (2)</td> <td colspan="2">PROBABILITY 8 (PM-4)</td> </tr> <tr> <td>Frequency of activity</td> <td>Daily 5 PM (2)</td> <td colspan="2"></td> </tr> <tr> <td colspan="2">SIGNIFICANCE OF IMPACT (pre-mitigation)</td> <td colspan="2">SIGNIFICANCE OF IMPACT (post-mitigation)</td> </tr> <tr> <td colspan="2">Medium (56)</td> <td colspan="2">Low (20)</td> </tr> <tr> <td colspan="2">Impact status</td> <td colspan="2">Negative</td> </tr> <tr> <td colspan="2">Confidence rating</td> <td colspan="2">Medium</td> </tr> <tr> <td colspan="2">Reversibility</td> <td colspan="2">Partially reversible</td> </tr> <tr> <td colspan="2">Loss of resources</td> <td colspan="2">Medium</td> </tr> <tr> <td colspan="2">Degree to which the impact can be mitigated</td> <td colspan="2">High</td> </tr> </tbody> </table>	Severity	Spatial Scope	Duration	Consequence (sub-total)	Medium (2) (PM-1)	On-site (2) (PM- 1)	Life of operation (3) (PM-3)	7 (PM-5)	Frequency of impact	Probable 3 PM (2)	PROBABILITY 8 (PM-4)		Frequency of activity	Daily 5 PM (2)			SIGNIFICANCE OF IMPACT (pre-mitigation)		SIGNIFICANCE OF IMPACT (post-mitigation)		Medium (56)		Low (20)		Impact status		Negative		Confidence rating		Medium		Reversibility		Partially reversible		Loss of resources		Medium		Degree to which the impact can be mitigated		High	
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3. Energy	Potential energy wastage	<ul style="list-style-type: none"> <li>Pre-construction</li> <li>Construction</li> <li>Operational Decommissioning</li> </ul>	Indirect	<p>There might be a potential for energy wastage during the construction phase. The impact is anticipated to be low after implementation of mitigation measures.</p> <table border="1"> <thead> <tr> <th>Severity</th> <th>Spatial Scope</th> <th>Duration</th> <th>CONSEQUENCE (sub-total)</th> </tr> </thead> <tbody> <tr> <td>Minimal (2) (PM-1)</td> <td>On-site (2) (PM- 1)</td> <td>Life of operation (3) (PM-3)</td> <td>7 (PM-5)</td> </tr> <tr> <td>Frequency of impact</td> <td>Probable 3 PM (2)</td> <td colspan="2">PROBABILITY 8 (PM-4)</td> </tr> <tr> <td>Frequency of activity</td> <td>Daily 5 PM (2)</td> <td colspan="2"></td> </tr> <tr> <td colspan="2">SIGNIFICANCE OF IMPACT (pre-mitigation)</td> <td colspan="2">SIGNIFICANCE OF IMPACT (post-mitigation)</td> </tr> </tbody> </table>	Severity	Spatial Scope	Duration	CONSEQUENCE (sub-total)	Minimal (2) (PM-1)	On-site (2) (PM- 1)	Life of operation (3) (PM-3)	7 (PM-5)	Frequency of impact	Probable 3 PM (2)	PROBABILITY 8 (PM-4)		Frequency of activity	Daily 5 PM (2)			SIGNIFICANCE OF IMPACT (pre-mitigation)		SIGNIFICANCE OF IMPACT (post-mitigation)																									
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4. Socio-economic	Creation of employment opportunities, SMME development opportunities and capacity building	<ul style="list-style-type: none"> <li>Pre-construction</li> <li>Construction</li> <li>Operational</li> </ul> Decommissioning	Direct (Positive)	<p>There will be creation of job opportunities (25 new jobs) during the construction and operational phase of the project. However, due to the technical nature of the project and the existence of infrastructure on site, the job opportunities will be limited. The proposed development is an extension of an existing operations on the Northern Side.</p> <table border="1"> <thead> <tr> <th>Severity</th> <th>Spatial Scope</th> <th>Duration</th> <th>CONSEQUENCE (sub-total)</th> </tr> </thead> <tbody> <tr> <td>Medium (2) (PM-2)</td> <td>On-site (2) (PM- 2)</td> <td>Life of Operation (2) (PM-1)</td> <td>6 (PM-5)</td> </tr> <tr> <td>Frequency of impact</td> <td>Low 2 PM (4)</td> <td colspan="2">PROBABILITY 6 (PM-7)</td> </tr> <tr> <td>Frequency of activity</td> <td>Life of operation (4) PM (3)</td> <td colspan="2"></td> </tr> <tr> <td colspan="2">SIGNIFICANCE OF IMPACT (pre-mitigation)</td> <td colspan="2">SIGNIFICANCE OF IMPACT (post-mitigation)</td> </tr> <tr> <td colspan="2">Medium (36)</td> <td colspan="2">Low (20)</td> </tr> <tr> <td colspan="2">Impact status</td> <td colspan="2">Negative</td> </tr> <tr> <td colspan="2">Confidence rating</td> <td colspan="2">Medium</td> </tr> <tr> <td colspan="2">Reversibility</td> <td colspan="2">Partially reversible</td> </tr> <tr> <td colspan="2">Loss of resources</td> <td colspan="2">Medium</td> </tr> <tr> <td colspan="2">Degree to which the impact can be mitigated</td> <td colspan="2">High</td> </tr> </tbody> </table>	Severity	Spatial Scope	Duration	CONSEQUENCE (sub-total)	Medium (2) (PM-2)	On-site (2) (PM- 2)	Life of Operation (2) (PM-1)	6 (PM-5)	Frequency of impact	Low 2 PM (4)	PROBABILITY 6 (PM-7)		Frequency of activity	Life of operation (4) PM (3)			SIGNIFICANCE OF IMPACT (pre-mitigation)		SIGNIFICANCE OF IMPACT (post-mitigation)		Medium (36)		Low (20)		Impact status		Negative		Confidence rating		Medium		Reversibility		Partially reversible		Loss of resources		Medium		Degree to which the impact can be mitigated		High	
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Open Channels of Communication and Consultation with Stakeholders 1	Impact Potential arising to lack of transparency in the operation of the site.	<ul style="list-style-type: none"> <li>Pre-construction</li> <li>Construction</li> <li>Operational</li> </ul> Decommissioning	Direct	<p>Open and constant communication between the developer and the key stakeholders is important to enable all parties an opportunity to raise their views and concerns in relation to the proposed development. Key and registered IAPs are to be consulted to ensure their inputs, views and comments are considered and addressed. Consultation on potential practical mitigation measures for identified issues and concerns provide an opportunity for open and transparent communication channels. Consultation with existing key stakeholder forums and Associations will reduce the risk to medium or low.</p>																																												

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1. Operational Activities: <ul style="list-style-type: none"> <li>Haulage of coal</li> <li>Offloading of coal at stockpile areas</li> <li>Loading of coal into rail wagons</li> </ul>	1.1 Impacts on soil resources 1.1.1 Potential for soil erosion 1.1.2 Potential for soil pollution due to oil and chemical spillages 1.1.3 Disturbance of topsoil and vegetation 1.1.4 Potential for soil compaction	Operational	Direct	<table border="1"> <thead> <tr> <th>Severity</th> <th>Spatial Scope</th> <th>Duration</th> <th>CONSEQUENCE (sub-total)</th> </tr> </thead> <tbody> <tr> <td>Serious (4) (PM-2)</td> <td>Regional (4) (PM- 2)</td> <td>Life of operation (3) (PM-1)</td> <td>11 (PM-5)</td> </tr> <tr> <td>Frequency of impact</td> <td>Probable 4 PM (4)</td> <td colspan="2" rowspan="2">PROBABILITY 9 (PM-7)</td> </tr> <tr> <td>Frequency of activity</td> <td>Daily 5 PM (3)</td> </tr> <tr> <td colspan="2">High (99)</td> <td colspan="2">Low (20)</td> </tr> <tr> <td colspan="2">Impact status</td> <td colspan="2">Negative</td> </tr> </tbody> </table>				Severity	Spatial Scope	Duration	CONSEQUENCE (sub-total)	Serious (4) (PM-2)	Regional (4) (PM- 2)	Life of operation (3) (PM-1)	11 (PM-5)	Frequency of impact	Probable 4 PM (4)	PROBABILITY 9 (PM-7)		Frequency of activity	Daily 5 PM (3)	High (99)		Low (20)		Impact status		Negative																	
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1.2 Air pollution 1.2.1 Generation of dust fall out during the loading and offloading of coal	Operational	Directive/ Cumulative	Dust fall out during the loading and offloading of coal and emanating from coal stockpiles is anticipated during the operational phase of the project. This impact is considered to be low after the implementation of mitigation measures.	<table border="1"> <thead> <tr> <th>Severity</th> <th>Spatial Scope</th> <th>Duration</th> <th>Consequence (sub-total)</th> </tr> </thead> <tbody> <tr> <td>Critical (3) (PM-2)</td> <td>National (5) (PM- 1)</td> <td>Operational (2) (PM-2)</td> <td>10 (PM-5)</td> </tr> <tr> <td>Frequency of impact</td> <td>Probable 3 PM (2)</td> <td colspan="2" rowspan="2">PROBABILITY 8 (PM-4)</td> </tr> <tr> <td>Frequency of activity</td> <td>Daily 5 PM (2)</td> </tr> <tr> <td colspan="3">SIGNIFICANCE OF IMPACT (pre-mitigation)</td> <td>SIGNIFICANCE OF IMPACT (post-mitigation)</td> </tr> <tr> <td colspan="3">High 80</td> <td>(Low (18))</td> </tr> <tr> <td colspan="2">Impact status</td> <td colspan="2">Negative</td> </tr> <tr> <td colspan="2">Confidence rating</td> <td colspan="2">Medium</td> </tr> <tr> <td colspan="2">Reversibility</td> <td colspan="2">Partially reversible</td> </tr> <tr> <td colspan="2">Loss of resources</td> <td colspan="2">Low</td> </tr> <tr> <td colspan="2">Degree to which the impact can be mitigated</td> <td colspan="2">High</td> </tr> </tbody> </table>	Severity	Spatial Scope	Duration	Consequence (sub-total)	Critical (3) (PM-2)	National (5) (PM- 1)	Operational (2) (PM-2)	10 (PM-5)	Frequency of impact	Probable 3 PM (2)	PROBABILITY 8 (PM-4)		Frequency of activity	Daily 5 PM (2)	SIGNIFICANCE OF IMPACT (pre-mitigation)			SIGNIFICANCE OF IMPACT (post-mitigation)	High 80			(Low (18))	Impact status		Negative		Confidence rating		Medium		Reversibility		Partially reversible		Loss of resources		Low		Degree to which the impact can be mitigated		High	
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1.3 Surface water resources 1.3.1 Contamination of water due to coal spillage from haul trucks spillage from haul trucks	Operational		Impacts emanating from the daily operational activities such as loading of coal, movement of trucks and machinery will result in spillage and seepage into water resources. These impacts are however considered to be low after the implementation of mitigation measures.	<table border="1"> <thead> <tr> <th>Severity</th> <th>Spatial Scope</th> <th>Duration</th> <th>Consequence (sub-total)</th> </tr> </thead> <tbody> <tr> <td>Medium (2) (PM-1)</td> <td>Local (3) (PM- 3)</td> <td>Life of operation (3) (PM-2)</td> <td>8 (PM-6)</td> </tr> </tbody> </table>	Severity	Spatial Scope	Duration	Consequence (sub-total)	Medium (2) (PM-1)	Local (3) (PM- 3)	Life of operation (3) (PM-2)	8 (PM-6)																																		
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	1.3.2 Contamination of water spillage of hydraulic fluid from machine and trucks 1.3.3 Contamination of water due to incorrect disposal of industrial and domestic waste 1.3.4 Contamination of water due to incorrect handling of waste from ablution facilities			<table border="1"> <tr> <td>Frequency of impact</td> <td>Probable 2 PM (1)</td> <td rowspan="2">PROBABILITY Certain 4 (PM-2)</td> </tr> <tr> <td>Frequency of activity</td> <td>Residual 2 PM (1)</td> </tr> <tr> <td colspan="2">SIGNIFICANCE OF IMPACT (pre-mitigation)</td> <td>SIGNIFICANCE OF IMPACT (post-mitigation)</td> </tr> <tr> <td colspan="2">Medium (32)</td> <td>Low (12)</td> </tr> <tr> <td colspan="2">Impact status</td> <td>Negative</td> </tr> <tr> <td colspan="2">Confidence rating</td> <td>High</td> </tr> <tr> <td colspan="2">Reversibility</td> <td>Partially reversible</td> </tr> <tr> <td colspan="2">Loss of resources</td> <td>Medium</td> </tr> <tr> <td colspan="2">Degree to which the impact can be mitigated</td> <td>Medium</td> </tr> </table>	Frequency of impact	Probable 2 PM (1)	PROBABILITY Certain 4 (PM-2)	Frequency of activity	Residual 2 PM (1)	SIGNIFICANCE OF IMPACT (pre-mitigation)		SIGNIFICANCE OF IMPACT (post-mitigation)	Medium (32)		Low (12)	Impact status		Negative	Confidence rating		High	Reversibility		Partially reversible	Loss of resources		Medium	Degree to which the impact can be mitigated		Medium
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	1.4 Ground water resources  1.4.1 Contamination of water due to coal stockpile seepage  1.4.2 Contamination of water from pollution control dam seepage  1.4.3 Contamination of water spillage of hydraulic fluid from machine and trucks 1.4.4 Contamination of water due to incorrect disposal	Operational Decommissioning		Impacts emanating from the daily operational activities such as loading of coal, movement of trucks and machinery will result in seepage into groundwater resources. These impacts are however considered to be low after the implementation of mitigation measures, as the site is underlain by a minor aquifer class which does not have a high primary permeability, furthermore no evidence of either a perched and/or permanent groundwater level was observed on site. <table border="1"> <thead> <tr> <th>Severity</th> <th>Spatial Scope</th> <th>Duration</th> <th>Consequence (sub-total)</th> </tr> </thead> <tbody> <tr> <td>Medium(2) (PM-1)</td> <td>Local (3) (PM- 3)</td> <td>Life of operation (3) (PM-2)</td> <td>8 (PM-6)</td> </tr> <tr> <td>Frequency of impact</td> <td>Probable 2 PM (1)</td> <td colspan="2">PROBABILITY Certain 4 (PM-2)</td> </tr> <tr> <td>Frequency of activity</td> <td>Residual 2 PM (1)</td> <td colspan="2"></td> </tr> </tbody> </table>	Severity	Spatial Scope	Duration	Consequence (sub-total)	Medium(2) (PM-1)	Local (3) (PM- 3)	Life of operation (3) (PM-2)	8 (PM-6)	Frequency of impact	Probable 2 PM (1)	PROBABILITY Certain 4 (PM-2)		Frequency of activity	Residual 2 PM (1)												
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	1.5 Waste Management  1.5.1 Contamination of soil resources due to oil and chemical spillages/leakages  1.5.2 Contamination of water resources due to infiltration of chemical and oil seepages  1.6.3 Land pollution due to littering	Operational		There is potential for land, soil and water pollution during the operational phase of the project due to the various operational activities that will be occurring e.g. movement of vehicles, storage and usage of chemical and hazardous substances. <table border="1"> <thead> <tr> <th>Severity</th> <th>Spatial Scope</th> <th>Duration</th> <th>Consequence (sub-total)</th> </tr> </thead> <tbody> <tr> <td>Medium(2) (PM-1)</td> <td>On-site (2) (PM- 1)</td> <td>Operational(2) (PM-2)</td> <td>6 (PM-4)</td> </tr> <tr> <td>Frequency of impact</td> <td>Probable 3 PM (2)</td> <td colspan="2">PROBABILITY Certain 5 (PM-4)</td> </tr> <tr> <td>Frequency of activity</td> <td>Residual 2 PM (2 )</td> <td colspan="2"></td> </tr> <tr> <td colspan="2">SIGNIFICANCE OF IMPACT (pre-mitigation)</td> <td colspan="2">SIGNIFICANCE OF IMPACT (post-mitigation)</td> </tr> <tr> <td colspan="2">Medium (35)</td> <td colspan="2">Low (16)</td> </tr> <tr> <td colspan="2">Impact status</td> <td colspan="2">Negative</td> </tr> <tr> <td colspan="2">Confidence rating</td> <td colspan="2">Medium</td> </tr> <tr> <td colspan="2">Reversibility</td> <td colspan="2">Partially reversible</td> </tr> <tr> <td colspan="2">Loss of resources</td> <td colspan="2">Medium</td> </tr> <tr> <td colspan="2">Degree to which the impact can be mitigated</td> <td colspan="2">High</td> </tr> </tbody> </table>	Severity	Spatial Scope	Duration	Consequence (sub-total)	Medium(2) (PM-1)	On-site (2) (PM- 1)	Operational(2) (PM-2)	6 (PM-4)	Frequency of impact	Probable 3 PM (2)	PROBABILITY Certain 5 (PM-4)		Frequency of activity	Residual 2 PM (2 )			SIGNIFICANCE OF IMPACT (pre-mitigation)		SIGNIFICANCE OF IMPACT (post-mitigation)		Medium (35)		Low (16)		Impact status		Negative		Confidence rating		Medium		Reversibility		Partially reversible		Loss of resources		Medium		Degree to which the impact can be mitigated		High	
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1.6 Impacts on health and safety of personnel	<ul style="list-style-type: none"> <li>Pre-construction</li> <li>Construction</li> <li>Operational Decommissioning</li> </ul>		Direct	Due to the nature of the proposed project it is likely that heavy equipment and machinery will be utilised. The potential for accidents and injuries is therefore likely however the severity of the impact is considered to be low, after implementation of mitigation measures.																																												

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				Frequency of impact	Probable 3 PM (2 )	PROBABILITY Certain 5 (PM-4)	
				Frequency of activity	Residual 2 PM (2 )		
				SIGNIFICANCE OF IMPACT (pre-mitigation)		SIGNIFICANCE OF IMPACT (post-mitigation)	
				Medium (30)		Low (16)	
				Impact status		Negative	
				Confidence rating		Medium	
				Reversibility		Partially reversible	
				Loss of resources		Medium	
				Degree to which the impact can be mitigated		High	
	1.7 Increase in ambient noise levels due to vehicular movement, usage of machinery, equipment and construction activities.	<ul style="list-style-type: none"> <li>Pre-construction</li> <li>Construction</li> <li>Operational</li> </ul> Decommissioning	Direct	Noise is expected to be produced during the operational phase of the project. The noise will mostly be experienced during the day and will emanate from vehicles, operation of machinery and equipment, loading of coal into train wagons as well as human interactions. The significance of the impact is anticipated to be low, after implementation of mitigation measures and residents in close proximity of the site will be informed of any activities that will cause excessive levels of noise before commencement(i.e. blasting).			
				Severity	Spatial Scope	Duration	Consequence (sub-total)
				Medium(2) (PM-1)	On-site (2) (PM- 1)	Life of operation (3) (PM-3)	7 (PM-5)
				Frequency of impact	Probable 3 PM (2 )	PROBABILITY Certain 5 (PM-4)	
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Degree to which the impact can be mitigated	High																																												
1.8 Creation of employment opportunities, SMME development opportunities and capacity building	<ul style="list-style-type: none"> <li>Pre-construction</li> <li>Construction</li> <li>Operational</li> <li>Decommissioning</li> </ul>	Direct (Positive)	<p>There will be creation of job opportunities (25 new jobs) during the operational phase of the project. However, due to the technical nature of the project and the existence of infrastructure on site, the job opportunities will be limited.</p> <table border="1"> <thead> <tr> <th>Severity</th> <th>Spatial Scope</th> <th>Duration</th> <th>CONSEQUENCE (sub-total)</th> </tr> </thead> <tbody> <tr> <td>Medium (2) (PM-2)</td> <td>On-site (2) (PM- 2)</td> <td>Operational (2) (PM-1)</td> <td>6 (PM-5)</td> </tr> <tr> <td>Frequency of impact</td> <td>Low 2 PM (4)</td> <td colspan="2" rowspan="2">PROBABILITY Probable 4 (PM-7)</td> </tr> <tr> <td>Frequency of activity</td> <td>Temporarily 2 PM (3 )</td> </tr> <tr> <td>SIGNIFICANCE OF IMPACT (pre-mitigation)</td> <td colspan="3">SIGNIFICANCE OF IMPACT (post-mitigation)</td> </tr> <tr> <td>Medium (24)</td> <td colspan="3">Medium (35)</td> </tr> <tr> <td>Impact status</td> <td colspan="3">Positive</td> </tr> <tr> <td>Confidence rating</td> <td colspan="3">Medium</td> </tr> <tr> <td>Reversibility</td> <td colspan="3">Fully reversible</td> </tr> <tr> <td>Loss of resources</td> <td colspan="3">Low</td> </tr> <tr> <td>Degree to which the impact can be mitigated</td> <td colspan="3">High</td> </tr> </tbody> </table>	Severity	Spatial Scope	Duration	CONSEQUENCE (sub-total)	Medium (2) (PM-2)	On-site (2) (PM- 2)	Operational (2) (PM-1)	6 (PM-5)	Frequency of impact	Low 2 PM (4)	PROBABILITY Probable 4 (PM-7)		Frequency of activity	Temporarily 2 PM (3 )	SIGNIFICANCE OF IMPACT (pre-mitigation)	SIGNIFICANCE OF IMPACT (post-mitigation)			Medium (24)	Medium (35)			Impact status	Positive			Confidence rating	Medium			Reversibility	Fully reversible			Loss of resources	Low			Degree to which the impact can be mitigated	High		
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	1.9 Potential energy wastage	<ul style="list-style-type: none"> <li>Pre-construction</li> <li>Construction</li> <li>Operational</li> <li>Decommissioning</li> </ul>	Direct / Indirect	<p>There might be a potential for energy wastage during the operational phase. The impact is anticipated to be low after implementation of mitigation measures.</p> <table border="1"> <thead> <tr> <th>Severity</th> <th>Spatial Scope</th> <th>Duration</th> <th>CONSEQUENCE (sub-total)</th> </tr> </thead> <tbody> <tr> <td>Medium (3) (PM-1)</td> <td>On-site (2) (PM- 1)</td> <td>Life of operation (3) (PM-3)</td> <td>8 (PM-5)</td> </tr> <tr> <td>Frequency of impact</td> <td>Probable 3 PM (2 )</td> <td colspan="2" rowspan="2">PROBABILITY Probable 5 (PM-4)</td> </tr> <tr> <td>Frequency of activity</td> <td>Temporarily 2 PM (2)</td> </tr> <tr> <td colspan="2">SIGNIFICANCE OF IMPACT (pre-mitigation)</td> <td colspan="2">SIGNIFICANCE OF IMPACT (post-mitigation)</td> </tr> <tr> <td colspan="2">Medium (40)</td> <td colspan="2">Low (20)</td> </tr> <tr> <td colspan="2">Impact status</td> <td colspan="2">Negative</td> </tr> <tr> <td colspan="2">Confidence rating</td> <td colspan="2">Medium</td> </tr> <tr> <td colspan="2">Reversibility</td> <td colspan="2">Partially reversible</td> </tr> <tr> <td colspan="2">Loss of resources</td> <td colspan="2">Medium</td> </tr> <tr> <td colspan="2">Degree to which the impact can be mitigated</td> <td colspan="2">High</td> </tr> </tbody> </table>	Severity	Spatial Scope	Duration	CONSEQUENCE (sub-total)	Medium (3) (PM-1)	On-site (2) (PM- 1)	Life of operation (3) (PM-3)	8 (PM-5)	Frequency of impact	Probable 3 PM (2 )	PROBABILITY Probable 5 (PM-4)		Frequency of activity	Temporarily 2 PM (2)	SIGNIFICANCE OF IMPACT (pre-mitigation)		SIGNIFICANCE OF IMPACT (post-mitigation)		Medium (40)		Low (20)		Impact status		Negative		Confidence rating		Medium		Reversibility		Partially reversible		Loss of resources		Medium		Degree to which the impact can be mitigated		High	
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2. Movement of trucks, machinery and equipment	2.1 Increase in traffic flow	Operational	Direct /Indirect	<p>During the operational phase of the project it is anticipated that the traffic volume generated by the movement of vehicles will have a medium impact on traffic flow in the area.</p> <table border="1"> <thead> <tr> <th>Severity</th> <th>Spatial Scope</th> <th>Duration</th> <th>Consequence (sub-total)</th> </tr> </thead> <tbody> <tr> <td>Medium(2) (PM-1)</td> <td>Local (3) (PM- 3)</td> <td>Operational (2) (PM-2)</td> <td>7 (PM-6)</td> </tr> <tr> <td>Frequency of impact</td> <td>Probable 3 )</td> <td colspan="2">PROBABILITY Certain 5 (PM-4)</td> </tr> <tr> <td>Frequency of activity</td> <td>Residual 2 PM (2 )</td> <td colspan="2"></td> </tr> </tbody> </table>	Severity	Spatial Scope	Duration	Consequence (sub-total)	Medium(2) (PM-1)	Local (3) (PM- 3)	Operational (2) (PM-2)	7 (PM-6)	Frequency of impact	Probable 3 )	PROBABILITY Certain 5 (PM-4)		Frequency of activity	Residual 2 PM (2 )																												
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	2.2 Generation of dust from vehicular movement 2.3 Air pollution from vehicular emissions		Direct/ Cumulative	<p>Dust emissions are likely to occur due to vehicular movement as the access roads are gravel. The severity of this impact is anticipated to be low, if mitigation measures such as dampening of the gravel road and adherence to speed limits are observed.</p> <table border="1"> <thead> <tr> <th>Severity</th> <th>Spatial Scope</th> <th>Duration</th> <th>Consequence (sub-total)</th> </tr> </thead> <tbody> <tr> <td>Medium (3) (PM-2)</td> <td>Regional (3) (PM- 1)</td> <td>Life of operation (3) (PM-2)</td> <td>9 (PM-5)</td> </tr> <tr> <td>Frequency of impact</td> <td>Probable 3 PM (2)</td> <td colspan="2" rowspan="2">PROBABILITY 8 (PM-4)</td> </tr> <tr> <td>Frequency of activity</td> <td>Daily 5 PM (2 )</td> </tr> <tr> <td>SIGNIFICANCE OF IMPACT (pre-mitigation)</td> <td colspan="3">SIGNIFICANCE OF IMPACT (post-mitigation)</td> </tr> <tr> <td>High (72)</td> <td colspan="3">Low (20)</td> </tr> <tr> <td>Impact status</td> <td colspan="3">Negative</td> </tr> <tr> <td>Confidence rating</td> <td colspan="3">High</td> </tr> <tr> <td>Reversibility</td> <td colspan="3">Partially reversible</td> </tr> <tr> <td>Loss of resources</td> <td colspan="3">Low</td> </tr> <tr> <td>Degree to which the impact can be mitigated</td> <td colspan="3">High</td> </tr> </tbody> </table>	Severity	Spatial Scope	Duration	Consequence (sub-total)	Medium (3) (PM-2)	Regional (3) (PM- 1)	Life of operation (3) (PM-2)	9 (PM-5)	Frequency of impact	Probable 3 PM (2)	PROBABILITY 8 (PM-4)		Frequency of activity	Daily 5 PM (2 )	SIGNIFICANCE OF IMPACT (pre-mitigation)	SIGNIFICANCE OF IMPACT (post-mitigation)			High (72)	Low (20)			Impact status	Negative			Confidence rating	High			Reversibility	Partially reversible			Loss of resources	Low			Degree to which the impact can be mitigated	High		
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2. Rehabilitation	Re-vegetation of the site	Decommissioning Rehabilitation	Direct/ Cumulative	Subsequent to the dismantling of infrastructure, re-vegetation of the site will be undertaken. This impact is considered positive and its significance is medium, as it will result in the restoration of the site.																																										

Activity / Aspect	Potential Impact	Project Phase	Type of Impact	Impact Rating			
				Severity	Spatial Scope	Duration	Consequence (sub-total)
				Medium (2) (PM-3)	On-site (2) (PM- 2)	Decommissioning (2) (PM-1)	6 (PM-6)
				Frequency of impact	Low 1 PM (1 )	PROBABILITY 3  (PM-3)	
				Frequency of activity	Temporal 2 PM (2 )		
				SIGNIFICANCE OF IMPACT (pre-mitigation)		SIGNIFICANCE OF IMPACT (post-mitigation)	
				Medium (18)		Low (18)	
				Impact status		Positive	
				Confidence rating		Medium	
				Reversibility		Partially reversible	
				Loss of resources		Low	
				Degree to which the impact can be mitigated		High	



**12. Mitigation Measures**

The mitigation measures for all the impacts identified above are provided in the section below. The impacts that were identified in Table 11.1-2. are then categorised according to the environmental components that will be affected on site and as such mitigation measures are developed for the environmental components that are likely to be vulnerable from the activities on site.

**Planning And Design Phase**

Legal Compliance			
Responsibility	Safety Health and environmental Manager	Frequency/time frames	Planning and design until closure
	Environmental control officer		
	Directors and all management		

**Objectives**

1. To ensure development and revision of environmental policy and endorsement by the Managing Director.
2. To provide direction with respect to environmental management during operation phases

**Mitigation Measures**

1. Develop an environmental policy.
2. Policy to provide a framework for setting and reviewing environmental objectives and targets.
3. Policy to be endorsed by Managing Director/Chief Executive Officer.

**12.1 Legal and EMP Compliance**

Legal Compliance			
Responsibility	Safety Health and environmental Manager	Frequency/time frames	Planning and design until closure
	Environmental control officer		
	Site Manager		

**Objectives**

- a) To facilitate compliance with conditions of approval and overall environmental management legal requirements and best practice guidelines

**Mitigation Measures**

4. A copy of the EMP will be kept on site at all times during the site preparation and operation phase. The EMP will be binding on all contractors operating on the site and will be included within the Contractual Clauses.
5. Develop a legal register using all the statutes that are outlined under the policy.
6. Legal register to include an assessment of the legal implications of various Acts and relevant sections of those Acts for operation.
7. Source environmental authorization for the site.
8. Apply for water use license for all the stockpiles that will be on site for a long time period.
9. Distribute and utilize legal register optimally at all operations.
10. Register with legal update firms to ensure that regular legal updates are received by Gijima Pty Ltd and incorporated into the legal register and implications of such new statutes understood and complied with.

**12.2 Environmental Awareness Plan**

<b>Environmental Awareness Plan</b>			
Responsibility	Safety Health and Environmental Manager	Frequency/Time Frame	Planning and design and throughout the operation on a quarterly basis.
	Environmental Control Officer		
	Human Resources Manager		

**Objectives:**

To ensure that:

- All employees who will perform work that will potentially impact on the environment are identified and trained such that they are competent or aware of the potential impact of their activities.
- The level of expertise and training needs of the identified personnel is determined.
- All employees are aware of the impact of their activities.
- Procedures are established and maintained to make appropriate employees aware of their environmental responsibilities.

**Mitigation measures**

11. Ensure that all site personnel have a basic level of environmental awareness training.
12. It is the applicant’s responsibility to provide the site operators with environmental training and to ensure that all have sufficient understanding to pass this information onto the construction staff.
13. Staff operating equipment (such as excavators, loaders, etc.) shall be adequately trained and sensitized to any potential hazards associated with their tasks.

**12.3 Construction And Operational Phase**

The mitigation measures for construction and operational phases are presented under Table 12.3-1.

**Table 12.3-1: Mitigation Measures for the Southern Side Activities [as compiled by Myezo Environmental Management Services (Pty) Ltd] with more focus on the Southern Side.**

Activities	Environmental Impact/Aspect	Mitigation	Phase	Responsibility
<b>PHASE: PRE-CONSTRUCTION</b>				
Proper demarcation of site boundary for the proposed increase in scope on site and the proposed Arbor village establishment.	Encroachment and overlap of boundaries for proposed activities and Arbor village	<ol style="list-style-type: none"> <li>1. The Transnet Land Surveyor Department, the landowners from Truter Boerdery must consult together with Arbor Siding management and Emalahleni Local Municipality to determine the exact boundaries for the Arbor Siding and the proposed Arbor village.</li> <li>2. Land Surveyor documents from Transnet must be kept on site at all times by Arbor Siding.</li> </ol>	Pre-Construction	Managing Director/ Chief Operations Officer Contractor Engineer Transnet Truter Boerdery Emalahleni Local Municipality
<p><u>Construction Camp Set up</u>                      Provide with a layout of the site indicating the position of all of the following, as applicable: ablution facilities, storage areas, ready-mix areas, stockpile areas, waste disposal facilities, hazardous substances storage area, etc. prior to the site establishment, for acceptance.</p>	<ul style="list-style-type: none"> <li>• Soil erosion,</li> <li>• Soil pollution</li> <li>• Biodiversity loss</li> <li>• Water Quality</li> <li>• Groundwater quality</li> <li>• Air Quality</li> <li>• Noise pollution</li> </ul>	<ol style="list-style-type: none"> <li>3. All possible design scenarios with the least environmental impact to be considered.</li> <li>4. Ensure that alignment is compatible with the natural contours.</li> <li>5. Continue ensuring that built structures do not break the horizon.</li> <li>6. Ensure finishes are carefully selected to match the surroundings, and free forms are where practicable.</li> <li>7. Construction camp &amp; ablution facilities will be out of the sensitive zone areas and proper CEMP (Construction Site Environmental Management Plans) will be implemented together with the EMPr.</li> <li>8. Disaster Management Plan and all Site Health and Safety Procedures to be implemented.</li> <li>9. Dust suppression will be implemented within the site to minimise air quality and visibility impacts.</li> </ol>	Pre-Construction	Managing Director/ Chief Operations Officer Contractor Engineer Siding Supervisor

Activities	Environmental Impact/Aspect	Mitigation	Phase	Responsibility
	Social disturbances	10. Prior to establishing the construction camp, the contractor will produce a plan showing the positions of all structures, laydown yards and other infrastructure for approval by the 11. Managing Director and Engineer. 12. The area chosen for these purposes is the minimum reasonably required and which will involve the least disturbance of vegetation. 13. Fires will only be allowed in facilities or equipment specially constructed for this purpose. If required by applicable legislation, a firebreak is cleared around the perimeter of the camp and office sites. 14. Construction and maintenance activities closely of such a nature will be planned properly and monitored as not to disturb the livelihood of adjacent property owners. 15. A designated place for food preparation and eating will be established at the construction site. 16. Dry chemical toilets will be made available at a ratio of 1 toilet per 10 staff, within the campsite perimeter and will be cleaned and serviced as requested by the service provider. 17. Workers movements will be limited to the construction area only and will be enforced in terms of the contracts of appointments 18. Any complaints are addressed accordingly and record will be kept thereof. 19. The applicant will ensure that measures are in place to prevent /mitigate disruption of services as result of construction. 20. Residents will be notified 7 days in advance of disruptions to services.	Pre-Construction	Managing Director/CO O Contractor Engineer
<b>PHASE: CONSTRUCTION</b>				
Construction aspects	<u>Construction Activities</u>	21. Construction methods are respectful of the environment - no unnecessary vegetation clearing, excavations or untidiness. 22. Littering on site and the surrounding areas is prohibited. Clearly marked litterbins are provided on site. The contractor's representative monitors the presence of litter on the work sites as well as the construction campsite. All bins are cleaned.	Construction	Contractor Siding Supervisor

Activities	Environmental Impact/Aspect	Mitigation	Phase	Responsibility
		<ol style="list-style-type: none"> <li>23. Waste is disposed, as soon as possible and not allowed to stand on to decay, resulting in bad odours and attracting vermin.</li> <li>24. Adequate sanitation and water supply are installed for the construction personnel (authorisation from DWAF may be required).</li> <li>25. All waste removed from site is disposed at municipal /permitted waste disposal site.</li> <li>26. The contractor ensures that all temporary structures, materials, waste and facilities used for construction activities are removed upon completion of the project.</li> <li>27. The contractor cleans up and restores all disturbed areas and implement rehabilitation measures where appropriate as elaborated below.</li> <li>28. The contractor ensures that the site is kept tidy at all times, that sufficient refuse bins are provided and that they are emptied regularly.</li> <li>29. Refuse or building rubble generated on the premises is deposited on adjacent properties, roads verges or open spaces. It is contained on site, then removed and disposed of at an approved dumping site at least every two weeks.</li> <li>30. Disturbed and open areas are rehabilitated and re-vegetated as soon as possible after construction.</li> <li>31. No unnecessary removal of indigenous vegetation are allowed, but should rather be incorporated into the landscaping design.</li> <li>32. The construction site is contained to prevent any visual intrusion and be kept in a clean and orderly state at all times.</li> <li>33. Retainment of as much of the existing vegetation as possible in an undisturbed state i.e. not part of the estate footprint.</li> <li>34. Identification of those operations and activities that are associated with the identified significant environmental impacts as outlined in the EMPr and development of aspect registers</li> <li>35. Planning of these activities, including maintenance, in order to ensure that they are carried out under specified conditions as stipulated in the procedure and existing EMP.</li> </ol>		

Activities	Environmental Impact/Aspect	Mitigation	Phase	Responsibility
Construction aspects	<u>Storage of material including Hazardous material</u>	36. Storage of materials (including hazardous materials) 37. Choose storage area location by considering prevailing winds, distances to water bodies, general onsite topography and water erosion potential of the soil. Impervious surfaces will be provided where necessary; 38. Designate, demarcate, fence off and secure all storage areas to minimize the risk of crime; storage areas should be safe from access by unauthorized persons; 39. Provide fire prevention facilities at all storage facilities. 40. Store all hazardous materials such as oils, paints, thinners, fuels, chemicals, etc. in properly constructed and impermeable bunded areas. Hazardous materials will not be allowed to contaminate the subsurface or enter into drainage systems. Siting of hazardous material storage areas will be approved by the Project Manager. 41. Implement and monitor adherence to <u>SHEQ Policy and Procedures</u>	Construction	Contractor Siding Supervisor
Safety of workers	<u>Health and Safety</u>	42. Procedures on site: 43. Management of Fire Extinguishing equipment 44. Contractor site audit Inspection Sheet 45. Emergency management plan 46. OHS Act 85 of 1993 (Section 37(2)) 47. Health and Safety Plan 48. Incident Reporting 49. Non-conformance procedures 50. Personal Protective clothing 51. SHEQ Agenda 52. SHEQ Induction Training 53. Management procedures and Inspection checklists 54. Legislative appointments 55. Safe working procedures for Weighbridge, offloading and loading of Coal at Arbor 56. Safety Talks 57. Vehicle Management System	Contractor Siding Supervisor	Construction

Activities	Environmental Impact/Aspect	Mitigation	Phase	Responsibility
		58. SHE Policy		
<b>Effect on Water Quality</b>				
<ul style="list-style-type: none"> <li>• Construction of roads,</li> <li>• Services infrastructure, dwellings;</li> <li>• Construction camp</li> <li>• Materials Stockpiles</li> <li>• Maintenance of haul roads</li> <li>• Personnel discipline</li> <li>• Temporal Ablution facilities installation (Toilet facilities shall occur at a minimum ratio of 1 toilet per 20 workers (preferred 1:15).</li> </ul>	<p><u>Water Quality:</u> Sedimentation Pollution</p> <p><u>Groundwater Quality:</u> Pollution</p>	<p>59. Proper management of construction activities to reduce erosion and increased silt load on water flowing over uncovered soil.</p> <p>60. Topsoil will be susceptible to erosion; run-off of soil during rain events that may cause sedimentation, poor water quality, riparian vegetation disturbed</p> <p>61. All water flow will be directed through controlled management into the existing drainage system. The contractor will ensure that no erosion and siltation of existing drainage system occurs, as a result of construction/development activities.</p> <p>62. Toilets, permanent or portable/ temporary, shall be maintained in a hygienic state and serviced regularly.</p> <p>63. Portable toilets should be serviced by a reputable contractor and the contents shall be removed to a licensed disposal facility. No spillage is to occur when portable toilets are cleaned or emptied.</p>	Construction	Contract Siding Supervisor
<ul style="list-style-type: none"> <li>• Potential for wetland disturbances.</li> </ul>	<p><u>Wetland Quality</u> Sedimentation/Siltation Pollution</p>	<p>64. A phased planned approach must be taken when construction is initiated. Areas must only be stripped directly prior to construction and only expose soils to erosion for the minimum period necessary. Where possible, re-vegetate of areas.</p> <p>65. An effective stormwater and clean and dirty water separation must be designed and approved by the Wetland Specialist as part of WULA. Erosion control and stormwater infrastructure must form the basis of the initial construction activities, prior to production related construction activities.</p> <p>66. Wetland habitat must be clearly demarcated, and access strictly prohibited (fenced off).</p> <p>67. Topsoil and subsoil must be stockpiled separately in low heaps.</p> <p>68. Stockpile any topsoil or any overburden material outside the outer boundary of wetlands.</p>		



Activities	Environmental Impact/Aspect	Mitigation	Phase	Responsibility
		69. Erosion must not be allowed to develop on a large scale before effecting repairs. 70. Make use of existing roads and tracks where feasible rather than creating new routes through vegetated areas. 71. Vegetation and soil must be retained in position for as long as possible, and removed immediately ahead of construction/earthworks in that area (DWAF, 2005). 72. Runoff from roads must be managed to avoid erosion and pollution problems. 73. All areas susceptible to erosion must be protected and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas. 74. Natural trees, shrubbery and grass species must be retained wherever possible. 75. Areas exposed to erosion due to construction should be vegetated with species naturally occurring in the area. 76. Surface water or storm water must not be allowed to concentrate, or flow down cut or fill slopes without erosion protection measures being put in place.		
<b>Impact on Soil</b>				
<ul style="list-style-type: none"> <li>• Clearing of vegetation for construction</li> <li>• Stripping of topsoil</li> <li>• Levelling, grading and compaction</li> <li>• Material Stockpiling</li> <li>• Construction of roads services, infrastructure, dwellings</li> <li>• Construction of additional infrastructure</li> <li>• Construction of slurry dams</li> </ul>	<p><u>Soil:</u>                      Soil Erosion                      Loss of topsoil                      Disturbance to soil structure                      Soil Pollution from spills and leakages from the diesel storage tank during refuelling or machinery maintenance servicing                      Soil loss                      Exposure of soil, increased erosion</p>	77. Appropriate soil erosion and control procedures are applied to all embankments that are disturbed and established. 78. Occurrence of erosion is monitored during operational phase and corrective measures taken if necessary. 79. Clearance activities will be phased to ensure that only a limited area is cleared. 80. Vegetation clearance will be kept to a minimum to ensure as much of the natural area as possible is maintained. 81. Topsoil is stockpiled in heaps not exceeding 2,0 m in height and be protected from erosion. 82. Re-usable subsoil stripped from construction sites is stockpiled separately and clearly identified as such. 83. Soil is not stockpiled on drainage lines or near watercourses. 84. The diesel storage facility will have impermeable and chemical resistant floors and maintained regularly. Ensure that the drainage and containment system capable of collecting and storing all runoff water arising from the	Construction	Contractor Siding Supervisor

Activities	Environmental Impact/Aspect	Mitigation	Phase	Responsibility
<ul style="list-style-type: none"> <li>• Fuelling of trucks - use of diesel storage tank in the Northern Side of site</li> <li>• Servicing and Maintenance of trucks (oil change, service checks etc.).</li> <li>• Remove the entire existing concrete drainage infrastructure.</li> <li>• Clearing of the concrete rubble and dispose appropriately</li> <li>• Removal of trees (Eucalyptus mature trees)</li> </ul>	levels due to run-off of water. Little precipitation and evaporation, loss of habitat life, reduced water table levels	storage facility in the event of a flood is constructed. The system will also under the heavy rainfall event, maintain a freeboard of half a meter. 85. Operation equipment will be inspected regularly and kept in good running order, and leaks repaired immediately. 86. Spillages of oil, grease and hydraulic fluids will be reported to the site manager, cleaned up using an oil spill kit by removing the soil and disposing such soil in a separate waste bin which will be labelled contaminated soil'. The drum will be taken to a soil farm for decontamination. 87. Contractors, staff and drivers will be trained on how to deal with spillages. 88. There will always be a soil decontaminant on site. 89. There will be incident registers stored on site during operation in phase. 90. Suitable personal protective equipment (PPE) and protective clothing will be provided as prescribed by the company's standard operating procedures. 91. Disturbance of large footprint areas will be avoided. 92. All cleared area will be rehabilitated and landscaped. 93. Any tree cutting will be done in line with municipal by-laws and a licence will be sought before cutting of any listed or indigenous trees on site. 94. Restrict operation activities to demarcated areas and consider all other areas as no-go areas to minimise disturbance or loss of undisturbed land.		
<b>Impact on Storm Water Management</b>				
<ul style="list-style-type: none"> <li>• Divert and extend the storm water drainage channel.</li> <li>• Construct a berm wall on the station side of the channel with the excavated material.</li> <li>• Backfill and compact the old channel where required.</li> </ul>	<u>StormWater Management:</u> Storm water control Soil Erosion Contamination of soil and surrounding area	95. Berms and storm water channels will be considered during the construction phase in order to divert clean runoff from the external catchment away from the disturbed areas.	Construction	Contractor Siding Supervisor

Activities	Environmental Impact/Aspect	Mitigation	Phase	Responsibility
<b>Impact on Storm Water Infrastructure</b>				
Extend the existing storm water culvert for the full width of the loading area and connect it to the new storm water cut-off drain.	<u>Stormwater infrastructure:</u> Storm water control Soil Erosion Contamination of soil and surrounding area	96. Ensure the design and layout of the storm water infrastructure causes minimal environmental impact. 97. Ensure it is easy to maintain, repair and replace without negatively affecting the environment.	Construction	Contractor Siding Supervisor
<b>Impact on Air Quality</b>				
<ul style="list-style-type: none"> <li>• Dust from the clearing of vegetation for the construction camp establishment</li> <li>• Dust generated from the removal of the building rubble</li> <li>• Dust generated from the removal of mature trees.</li> <li>• Dust generated from the Stockpiled coal without dust suppression treatment.</li> </ul>	<u>Air Quality:</u> Dust: Wind direction is from the west-northwest which is directly towards the position of the residential house in the vicinity of the site. The residential house next to the site on the Southern Side will be affected by the wind blowing over the coal stockpile and the dust generated from the trucks transporting coal to and from the stockpile area to the loading areas.  Visibility will be affected  <u>Waste Management:</u>	98. The neighbours will be informed about the planned construction and operational times. Communication protocols including the registration of complaints relating to site activities will be also outlined. 99. The contractor's representative or environmental officer notifies all people living within 100m of the construction site of proposed activities. 100. In the event of serious levels of dust pollution, the implementation of constant dust monitoring by qualified consultants is undertaken. 101. Vehicles used on or entering the site are be serviced regularly to ensure that they do not emit smoke or fumes. 102. Sprinkle water on all exposed surfaces especially during dry and windy conditions. 103. Ensure that the Site Health & Safety protocols and systems are in place and implemented. All workers will wear PPE safety wear at all times. 104. Minimise removal of vegetation cover. 105. Speed limit is enforced in all areas to limit the levels of dust pollution 106. Rehabilitate all bare areas as soon as possible with local indigenous water-wise vegetation. 107. Monitor the cumulative PM10, SO2, CO and VOC air quality impact due to vehicle entrainment on unpaved road surfaces and during loading and off-loading of coal at the site. 108. The predominant wind direction within the site is from the west- northwest on which during daytime there is an	Construction	Contractor Siding Supervisor

Activities	Environmental Impact/Aspect	Mitigation	Phase	Responsibility
	Concrete rubble  <u>Waste Management:</u>	<p>increase in these winds velocity. Less frequent winds are from the southern directions</p> <p>109. With exception of Sulphur dioxide, the pollutants recorded within the site falls within the NAAQ air quality threshold targets.</p> <p>110. Monitor ambient air quality variables especially Sulphur dioxide levels against the target threshold as determined by AQA and SANA 1929:2005 standards in all four sites.</p> <p>111. Monitor the Modelled ambient PM10 concentrations to ensure compliance to the daily NAAQ PM10 limit applicable from 1 January 2015.</p> <p>112. Monitor cumulative impacts associated with the contribution of Arbor Siding operations.</p> <p>113. Ensure that four dust buckets stands be strategically erected to the main areas or sensitive receptor area to verify predicted cumulative impacts and refine controls accordingly. Dust samples from the dust buckets will be taken to analyse the Gravimetric Dust Fallout content,</p> <p>114. The PM10, SO2, CO and VOC concentrations determined through active sampling in order to measure these variables against national ambient air quality guidelines should be conducted in a monthly basis in order verify predicted cumulative impacts and refine the operational site impacts with the aim of lowering the exceeding SO2 concentrations.</p> <p>115. Dust suppression in the form of water spraying the areas of frequent vehicular movement should be done in a 3 hours interval to minimize the generated dust whilst avoiding water accumulation to the surface.</p> <p>116. Monitor changes within the dust fall out gravimetric weight and compliance against the set SANS 1929 standards and within or outside the DEA AQ target</p>		
Waste generated from the breaking and removal of concrete rubble.	<u>Waste Management:</u> Concrete rubble	<p>117. Clear the concrete rubble and ensure dust suppression is implemented on the area as soon as possible.</p> <p>118. All rubble from demolition activities will either be used on site as part of the existing development, or will be taken away from the project site and disposed off appropriately.</p>	Construction	Contractor Siding Supervisor

Activities	Environmental Impact/Aspect	Mitigation	Phase	Responsibility
		119.Rubble will not be dumped on site but will be placed within a receptacle for regular removal; 120.Construction rubble shall be disposed of in registered and legal construction waste disposal site. 121.Transport and dispose to relevant registered legal Council disposal site. 122.Collect Dust fall out samples for comprehensive analysis do		
<ul style="list-style-type: none"> <li>• Remove the building rubble from the site.</li> <li>• Remove the OHTE from the platform line.</li> </ul>	<u>Waste Management:</u>	123.Implement Waste collection and sorting from the source. 124.Ensure Proper Waste Management Measures. 125.Public Awareness regarding importance and function of water resource	Construction	Contractor Siding Supervisor
Construct new evaporation dam.	<u>Pollution Management:</u>	126.Water use licence required. 127.No construction of evaporation dam before the issuing of a Water Use Licence. 128.Ensure the designs and mitigation measures for leakage or spillages are in place. 129.Implement and adhere to conditions of the WUL to be applied for. 130.Should the use of the Pollution Control Dam on the Northern side be used, management measures as listed within the WUL will be adhered to: 131.The Pollution Control Dam shall be operated and maintained to have a minimum freeboard of 0.8 metres above full supply level and all other water systems related to thereto shall be operated in such a manner that it is at all times capable of handling the 1:50 year flood event on top of its mean operating level. 132.The Licensee shall use acknowledged methods for sampling and the date, time and sampler will be indicated for each sample. 133.Flow metering devices shall be maintained in a sound state of repair and calibrated by a competent person at intervals of not more than once in two years. Calibration certificates shall be available for inspection by the Provincial Head or his representative upon request.	Construction	Contractor Siding Supervisor

Activities	Environmental Impact/Aspect	Mitigation	Phase	Responsibility
<ul style="list-style-type: none"> <li>Noise from use of heavy machinery</li> <li>Noise from vehicular movement - clearing, grading, levelling etc.</li> <li>Noise from Siding workers</li> </ul>	<u>Noise Pollution:</u>	<p>134. Dust and noise generation are monitored during operational phase.</p> <p>135. Machinery with low noise levels to be used.</p> <p>136. Construction activities to take place during daytime periods only.</p> <p>137. Vehicles to comply with the standards as provided in the IFC's Environmental Health &amp; Safety Regulations.</p> <p>138. Generators will be placed in such a manner that it is away from noise sensitive areas or acoustically screened off.</p> <p><i>In terms of the conducted assessment parameters described in SANS 10103<sup>3</sup> i.e. the resulting total and increase in ambient noise levels, respectively, indicate that the severity of the noise impacts are generally low. As a result, the introduction of specific noise mitigation measures is not necessary.</i></p>	Construction	Contractor Siding Supervisor
<ul style="list-style-type: none"> <li>Noise from use of heavy machinery</li> <li>Noise from vehicular movement - clearing, grading, levelling etc.</li> <li>Noise from Siding workers</li> </ul>	<u>Heritage Resources:</u> <ul style="list-style-type: none"> <li>Destruction of undiscovered subsurface heritage resources during construction activities.</li> <li>Sites of heritage significance</li> <li>Graves</li> </ul>	<p>139. Archaeologist to check any further clearance with construction crew for possible heritage resources.</p> <p>140. Where any significant resources are found the archaeologist will assess and make the appropriate mitigation requirements.</p> <p>141. Stop construction if any heritage resources – such as graves, human remains or fossils are identified.</p> <p>142. Should graves, fossils or any historical artefacts be identified during construction, activities will cease and the South African Heritage Resources Agency (SAHRA) or provincial Heritage Resources Agency will be informed of the find. Work may only continue once the relevant heritage resources agency has provided approval for the continuation.</p> <p>143. Old station building. According to its style and the material used in its construction, this building probably dates to the 1940s. It is similar in style, layout and material as other stations on the same line, e.g. Dryden and Argent. The structure is fenced off and well protected by an alarm system.</p> <p>144. The Transnet house is outside the demarcated site boundary.</p> <p><i>In terms of the conducted assessment parameters described in SANS 10103<sup>3</sup> i.e. the resulting total and increase in ambient noise levels, respectively, indicate that the severity of the noise impacts are</i></p>	Construction	Contractor Siding Supervisor

Activities	Environmental Impact/Aspect	Mitigation	Phase	Responsibility
		<i>generally low. As a result, the introduction of specific noise mitigation measures is not necessary.</i>		
Arbor Station built structure	Heritage significant resource	145.Avoidance/Preserve: This is viewed to be the primary form of mitigation and applies where any type of development occurs within a formally protected or significant or sensitive heritage context and is likely to have a high negative impact; or, alternatively 146.Archaeological investigation: This is appropriate where development occurs in a context of heritage significance and where the impact is such that it can be mitigated. Mitigation is to excavate the site by archaeological techniques, document the site (map and photograph) and analyse the recovered material to acceptable standards.	Construction Operational Decommission Rehabilitation	Contractor Siding Supervisor
Sourcing of labour and suppliers. Direct economic benefit to the community	147. <u>Socio-economic Impacts</u> To increase positive benefits of the project	148.Job opportunities in terms of positions to be filled within the expansion of the Siding will be given first preference to the qualifying local community members within the vicinity of the site before extending to other areas outside the site proximity. 149.Sourcing of materials from local suppliers will be encouraged to boost the local economic status of the community. 150.The Siding Supervisor will also source previously disadvantaged contractors or BBBEE compliant companies for services such as sanitation, environmental control on site, storm water structures and rehabilitation. 151.Preference will be given to locals for supply of goods and services during construction. 152.A database will be formulated for the locals to submit their credentials for consideration during construction.	Construction	Contractor Siding Supervisor
Proximity of the proposed activities to the proposed Arbor village development	Dust	153.Continue to implement dust suppression in the form of water spraying the areas of frequent vehicular movement should be done in a 3 hours interval to minimize the generated dust whilst avoiding water accumulation to the surface. 154.Monitor changes within the dust fall out gravimetric weight and compliance against the set SANS 1929 standards and within or outside the DEA AQ target.	Construction Operational Decommission Rehabilitation	Contractor Siding Supervisor



Activities	Environmental Impact/Aspect	Mitigation	Phase	Responsibility
		155. Collect Dust fall out samples for comprehensive analysis done from the 4 buckets strategically placed at the site. 156. Collect samples through the use of dust buckets from the various locations; 157. To submit the samples for comprehensive analysis; 158. To report on the compliance of the analytical results against standards and guidelines in order to identify problem areas and make recommendations for remedial actions; 159. To identify areas and sources of pollution; 160. Mitigation measures such as dust suppression as set within the conditions of the WUL will be implemented and as described in the EMP. 161. Compile and submit copies of the dust fallout monitoring reports to the client for monthly submission and bi-annually to the relevant government authorities.		
	Noise	162. Machinery with low noise levels to be used. 163. Construction activities to take place during daytime periods only. 164. Vehicles to comply with the standards as provided in the IFC's Environmental Health & Safety Regulations. 165. Generators will be placed in such a manner that it is away from noise sensitive areas or acoustically screened off. 166. Train movement schedule to be communicated to the adjacent community and land owners.  <i>In terms of the conducted assessment parameters described in SANS 10103<sup>3</sup> i.e. the resulting total and increase in ambient noise levels, respectively, indicate that the severity of the noise impacts are generally low. As a result, the introduction of specific noise mitigation measures is not necessary.</i>	Construction Operational Decommission Rehabilitation	Contractor Siding Supervisor
	Safety issues at railway crossing	167. Provide employment and proper training opportunity of personnel at railway crossing. 168. A pedestrian crossing to rather be considered on the farm land's side next to the Eskom substation.	Construction Operational Decommission Rehabilitation	Mine Management , Contractors and Employees
Legal Compliance	Legal Compliance	169. Ensure legal compliance throughout the site planned activities in all phases until closure.	Pre - Construction Construction	Contractor Siding Supervisor

Activities	Environmental Impact/Aspect	Mitigation	Phase	Responsibility
		170.Maintenance of compliance with legal and other environmental requirements 171.Determination of applicable legal and other environmental requirements when: 172.A new process or service is planned 173.An existing process is to be modified 174.EMP kept at office and personnel informed through inductions about availability of EMP. 175.Compliance with Section 24 of the Constitution of South Africa (Act No. 108 of 1996). 176.Consultation of Section 21 (a) and (g) of NWA. 177.Compliance with the EIA regulations in terms of Chapter 5 of NEMA as amended. 178.Compliance with all the relevant Provincial regulations and Municipal by laws. 179.Compliance with the EMP and Record of Decisions. 180.Compliance with the provisions for duty of Care and Remediation of Environmental Damage contained in Section 28 of the National Environmental Management Act (Act 107 of 1998).	Decommission Rehabilitation	
Data management system	Information & Data Management	181.Ensure that all acquired monitoring data is captured on a database linked to the operator’s information system. 182.Upon capturing, the data is analysed and plotted visually on a time series graph, for the purposes of establishing improvement of deterioration in water quality. 183.Once analysed, the data is consolidated into a monitoring report, and a copy is sent to the Department of Water and Sanitation at a frequency prescribed in the permit.	Construction Decommissioning	Contractor Siding Supervisor
The amount of dirty water runoff to the natural water bodies through storm water and potential flooding in the area.	<u>Water Quality:</u> Sedimentation	184.Exposed/cleared surfaces will be kept to a minimum to minimise the volume of dirty run-off generated. 185.Adequate sedimentation control measures are instituted at any prominent drainage lines, water crossings and construction trenches. 186.Sedimentation and silt in watercourses will be monitored. 187.Where possible construction activities will be positioned away from drainage lines and areas with a perched water table.	Operational	Siding Supervisor

Activities	Environmental Impact/Aspect	Mitigation	Phase	Responsibility
		188.All fuel, chemical, oil, etc will be confined to areas where the drainage of water can be controlled. Use appropriate structures and methods for storage and handling. 189.No dumping of foreign material in streams, rivers and/or wetland areas is allowed. 190.No washing and or cleaning of clothes, eating utensils, tools or equipment is allowed in water bodies. 191.Adequate sanitation for all personnel is supplied on site. 192.No permanent stock piling of any kind allowed within the 1:100 year flood line or within 10m of any watercourses. 193.The gradient of the site is designed in a way that allows water to gravitate towards a centre then drain in to an evaporation pond. 194.A 100mm sacrificial layer of coal is placed on top of the natural surface. This layer of sacrificial coal will always be kept constant between the surface soil and the coal material stored on site. 195.Pollution control dams with appropriate liners are constructed by an approved engineer. 196.The silt in the dam (fine coal) is reclaimed regularly and disposed in an environmental sound manner. 197.The water is recycled on site		
<b>PHASE: OPERATIONAL</b>				
<ul style="list-style-type: none"> <li>• Use of temporal ablation facilities</li> <li>• Maintenance of ablation facilities on site</li> <li>• Leaks or spillage from Diesel Storage tank</li> <li>•</li> </ul>	<u>Groundwater Quality:</u> Pollution	198.Ensure proper use of ablation facilities. 199.Ensure proper maintenance of ablation facilities. 200.Ensure there are no leakages or spillages from the diesel storage tank. 201.Ensure spills and leakages are attended to as soon as possible and the incident report is kept updated. 202.Make use of portable chemical latrines to handle sewerage, until such time as more permanent facilities have been constructed. 203.Chemical latrines will be serviced by an outside contractor in accordance with local by-laws. 204.Depending on the number of persons utilising change-house facilities during the operational phase, a decision will be		

Activities	Environmental Impact/Aspect	Mitigation	Phase	Responsibility
Spillage of coal during haulage of coal in and out of Loading area.		made on the construction of appropriate sewerage handling facility. 205.Provision of appropriate sewage and works septic tanks, pump stations and soakaways.		
Implementation of WUL conditions	<u>WUL Conditions:</u> <ul style="list-style-type: none"> <li>• Surface water quality monitoring</li> <li>• Groundwater quality monitoring</li> <li>• Dust suppression</li> </ul>	206.Implement WUL Conditions 207.External WUL Audit 208.Awareness and Training 209.Confirmation of commencement of WULA activities 210.Annual soil chemistry study and mapping 211.Design water quality monitoring program (surface and ground) 212.Annual water balance study 213.Water quality monitoring, reporting and feedback to DWS 214.Limited access to pollution control dam 215.The licence is subjected to all applicable provision of the National Water Act, 1998 (Act 36 of 1998). 216.The responsibility for complying with the provision of the licence is vested in the Licence and not any other person or body. 217.The licence is subjected to all applicable provision of the National Water Act, 1998 (Act 36 of 1998). 218.The Licensee will immediately inform the Responsible Authority of any change of name, address, premises and/or legal status. 219.if the properties in the respect of which this licence is issued is subdivided or consolidated, the Licensee will provide full details of all changes in respect of the properties to the responsible Authority within 60 days of the said change taking place. 220.If a Water User Association is established in the area to manage the resource, membership of the Licensee to the Association is compulsory. Rules, regulation and water management stipulation of such association will be adhered to. 221.The Licensee shall be responsible for any water use charges and/or levies imposed by a Responsible Authority.	Operational	Siding Supervisor

Activities	Environmental Impact/Aspect	Mitigation	Phase	Responsibility
		<p>222. While effect will be given to the Reserve as determined in terms of the Act, where a lower confidence determination of the Reserve has been used in issuance of this licence, the licence conditions may be amended should a higher confidence reserve be conducted.</p> <p>223. When compulsory licensing is implemented for the water resource in of which this licence was issued, the water use authorized in this licence may be subject to appropriate conditions on quantity and quality.</p> <p>224. The licence shall not be construed as exempting the Licensee from compliance with the provision of any other applicable Act, Ordinance, Regulation or By-law.</p> <p>225. The licence and amendment of this licence are also subjected</p>		
		<p>226. Protected plants occurring within the footprint are translocated in consultation with an approved specialist after obtaining the necessary permits from authorities.</p> <p>227. All protected species occurring within the footprint are clearly marked for the duration of the construction phase and should remain intact and undisturbed. If this is unavoidable, the contractor follows procedures as advised by the .</p> <p>228. Where alien invasive plants occur they are uprooted, cut and / or chemically treated. (use only approved chemicals)</p> <p>229. The use of alien invasive plants for landscaping is prohibited and a long term management plan for the eradication and control of existing alien invasive plants is implemented.</p> <p>230. No wild animal are under any circumstance handled, removed or be interfered with.</p> <p>231. No wild animal is fed on site</p> <p>232. No domesticated animals (i.e. chickens and pigs) are permitted at the staff village and/or campsite.</p> <p>233. If applicable, regularly undertake checks of the surrounding natural vegetation, in the fences and along game paths to ensure no traps have been set. Remove and dispose of any snares or traps found on or adjacent to the site.</p> <p>234. Problem animals and vermin are removed by an appropriate organisation or authority (i.e. such as the Parks Board, the SPCA or a registered exterminator)</p>		

Activities	Environmental Impact/Aspect	Mitigation	Phase	Responsibility
		235.No use is made of any pesticides, unless approved by the Project Management Team.		
Excess surface water runoff and control of storm water	<u>Storm Water Management:</u> Storm water control Soil Erosion Contamination of soil and surrounding area	236.Clearing will be limited to only areas that will be worked-on. 237.There will be storm water control to ensure separation of clean and dirty water. 238.Clean water will also be diverted way from the dirty work areas via culverts, bunds and diversion trenches. 239.The storm water is controlled and disposed of into the natural area at points where the volume of water becomes too much to be accommodated by the V-drain shaped roads. Energy breakers in the form of natural rock is created at these disposal points and erosion control measures are implemented. 240.Storm water is diverted away from working area to prevent clean water contamination.	Operational	Siding Supervisor
Maintenance of the storm water infrastructure	<u>Stormwater Management:</u> Storm water control Soil Erosion Contamination of soil and surrounding area	241.A maintenance schedule for clearing silt at the culvert crossing will be designed and implemented. 242.Flood protection structures like attenuation walls will be designed and constructed for flood risk areas.	Operational	Siding Supervisor
<ul style="list-style-type: none"> <li>• Operation of trucks for the loading, offloading of coal at stockpile areas</li> <li>• Loading of coal into train wagons</li> </ul>	<u>Air Quality:</u> Dust Visibility	243.Ensure all the Ambient Emission Licence (AEL) conditions are met. 244.Utilise measures such as dust suppression systems and vehicular and haul trucks speed control. 245.Monitor air quality levels and where levels exceed the maximum allowance, investigate source points and implement mitigation measures. 246.Areas of disturbance will be limited to footprints given in the final layout drawings and vehicular movement outside these demarcated areas will be restricted. 247.Conduct dust suppression through dampening and watering of road, which could potentially generate dust. 248.Suppress dust using dust suppression mechanism such as water	Operational	Siding Supervisor SHE Officer

Activities	Environmental Impact/Aspect	Mitigation	Phase	Responsibility
Hazardous waste generated from the oil changes, maintenance of truck and machinery	<u>Waste Management:</u> Hazardous waste	249. Hazardous wastes will be separated from general wastes, stored within secondary containment in appropriate containers. 250. Certificates of hazardous waste disposal (waybills) are to be retained for auditing purposes. 251. Hazardous storage and refuelling areas are to be bunded with an impermeable liner to protect groundwater quality and will comply with relevant SANS codes.	Operational	Siding Supervisor
All pollution generating activities related to the operation of the Siding	<u>Pollution Management:</u> All activities with the potential to cause pollution to the environment in general (soil, surface water, groundwater, air quality, health etc).	252. Monitor the efficiency of any installed sewage system. 253. To enhance the impermeability of the study area, the following additional steps are recommended: 254. Remove the sparse vegetation over the entire area to be developed. Any roots will be removed entirely and the resultant 'crater' will be backfilled with soils compacted in 150 mm thick layers. 255. Shape the entire surface to a suitable cross-fall to facilitate effective run-off drainage (possibly a slope of 1:50 or steeper). It may be required to install suitable drainage systems at the lower point to collect run-off. 256. Scarify the surface to a depth of at least 150mm and re-compact to at least 90% Mod AASHTO density at OMC to OMC + 2%. 257. In the event that a specific Tank is used, the tank will be bunded and made permeable to prevent leakage. 258. Ensure there is permission for using anything that falls under the leased area. 259. Waste/ pollution control. 260. Industrial and domestic waste management. 261. Management of refuse and waste disposal to avoid visual intrusion and prevent a health hazard. 262. Implementation of clean-up programmes for spillages. 263. Management of refuse and waste disposal to minimize impact on water quality. 264. Sewage management. 265. Provision of appropriate sewage and works septic tanks, pump stations and soakaways. 266. Fuel and lubricant management.	Operational	Siding Supervisor

Activities	Environmental Impact/Aspect	Mitigation	Phase	Responsibility
<ul style="list-style-type: none"> <li>• Noise from use of heavy machinery</li> <li>• Noise from vehicular movement - loading and offloading of coal at stockpile areas and the loading of coal into train wagons etc.</li> <li>• Noise from Siding workers</li> <li>• Vibrations from the movement of the train</li> </ul>	<p><u>Noise pollution</u>            Residential house in the vicinity of the house to be consulted on the route and access roads for the trucks and operating hours of the train.</p>	<p>267.Prevention of soil and water contamination due to fuel spillage.</p> <p>268.Noise complaints will be recorded and followed with formal response.</p> <p>269.A complaints register will be kept on site.</p> <p>270.All equipment and vehicles will be maintained in good operating condition. Any worn or faulty exhaust- and/or intake silencers will be replaced immediately</p> <p>271.Landowner will be informed of the plan to do 24hr operation will be done and recommended measures to alleviate noise will be implemented.</p> <p>272.A buffer zone between the rail (source) and noise sensitive areas (residential receptors) will be maintained. This buffer will be maintained by means of noise screening trees and at least a radius of 100m from any residential structure will be maintained and no noisy activities will be done, except for transportation activities via access roads to and from the site and actual loading. Control measures are implemented. All noise levels are controlled at the source.</p> <p>273.All employees are given the necessary ear protection gear if the noise levels exceed 70db.</p> <p>274.Interested and affected parties are informed about impending excessive noise.</p> <p>275.Generators and pumps are housed in casings to help reduce any noise in operation.</p> <p>276.No loud music or excessive noise generated by employees is allowed on site and in construction camps.</p> <p><i>In terms of the conducted assessment parameters described in SANS 10103<sup>3</sup> i.e. the resulting total and increase in ambient noise levels, respectively, indicate that the severity of the noise impacts are generally low. As a result, the introduction of specific noise mitigation measures is not necessary.</i></p>	Operational	Siding Supervisor
Disturbance of heritage resources	<u>Heritage Resources:</u> Destruction of undiscovered	277.Should there be any identification of archaeological artefacts, South African Heritage Resources Agency will be notified.	Operational	Siding Supervisor



Activities	Environmental Impact/Aspect	Mitigation	Phase	Responsibility
		278.Should graves, fossils or any historical artefacts be identified during construction, activities will cease and the South African		
		279.instructs the responsible person to remove or control these species according to the most effective methods as given in the relevant literature. 280.The arranged an environmental briefing and training session with the contractor and his crew prior to commencement of construction activities.	Operational	Siding Supervisor
<b>PHASE: DECOMMISSIONING &amp; REHABILITATION</b>				
Demolishing of infrastructure - debris may flow into natural water bodies during rainy season e.g. flash floods, unmanaged storm water flow	<u>Water Quality:</u> Sedimentation	281.Ensure water sources within the area are protected from effects of sedimentation resulting from the demolishing activities.	Decommissioning	Contractor  Siding Supervisor
Demolishing of Dirty water channels and Pollution Evaporation Dams (PCDs)	Pollution	282.Ensure that all infrastructure is demolished and the debris disposed in an environmentally friendly manner. 283.Disposal of rubble to be done at a legal and properly registered disposal facility.		Contractor  Siding Supervisor
<ul style="list-style-type: none"> <li>Tear down of the Diesel Storage Tank</li> <li>Phasing off of the Coal Loading zones</li> </ul>	<u>Groundwater Quality:</u> Pollution	284.Ensure that the groundwater is protected from the demolition activities planned during decommissioning of all infrastructure on the site.		Contractor  Siding Supervisor
<ul style="list-style-type: none"> <li>Demolishing of all infrastructure on site</li> <li>Clearing, levelling and rehabilitation activities</li> </ul>	<u>Soil:</u> Soil Erosion  <u>Topography:</u> Scenic view Ground stability	285.Bare surfaces will be managed as small as possible. 286.Any disturbed areas will be rehabilitated and landscaped to create a better scenic view. 287.The current disturbance will be cleaned 288.All temporary infrastructures will be demolished during closure. Waste will be disposed of at a licensed Municipal waste disposal site. 289.The landscape will blend with the surrounding areas to avoid water ponding.	Decommissioning	Contractor  Siding Supervisor
<ul style="list-style-type: none"> <li>Tear down of the Diesel Storage Tank</li> </ul>	Soil Pollution	291.Ensure there are no leaks or spillages from the decommissioning of the Diesel Storage tank and the Chemical storage area.	Decommissioning	Contractor Siding Supervisor

Activities	Environmental Impact/Aspect	Mitigation	Phase	Responsibility
<ul style="list-style-type: none"> <li>Phasing off of the Coal Loading zones</li> <li>Demolishing of Dirty water channels and Pollution Evaporation Dams (PCDs)</li> </ul> 290.		292.Ensure there is no leakages from the Coal Loading zones during decommissioning and all the coal residue is removed from the area.		
Tear down all infrastructure on the site	<u>Biodiversity:</u> Fauna and flora loss	293.Ensure the local and indigenous flora species are protected and used during rehabilitation of the site.	Decommissioning	Contractor Siding Supervisor
	<u>Storm Water Management:</u> Storm water control Soil Erosion Contamination of soil and surrounding area	294.Ensure all the storm water management infrastructure is removed without causing further negative impact to the environment. 295.Ensure proper disposal of the rubble at the legal and registered disposal site or sent to recycling centre. 296.Construction staff only use authorised temporary paths and roads. 297.The Environmental Control Officer ensures that all temporary structures, materials, waste and facilities used for construction activities are removed upon completion of the project.	Decommissioning	Contractor Siding Supervisor
	<u>Storm water infrastructure:</u> Storm water control Soil Erosion Contamination of soil and surrounding area	298.Upon completion of the construction period, the ensures that any/all temporary access roads and returned to a state no worse than prior to construction commencing. 299.Once heavy machinery has cleared the bulk of these material stockpiles, the disturbed areas is levelled and cleared of any foreign material manually. 300.Fully rehabilitate all disturbed areas and protect them from erosion. 301.Slopes will be designated according to predefined specifications, aimed at the prevention of soil erosion, of efficient storm water control of the eventual re-establishment of vegetation and of ultimately achieving aesthetically acceptable landscapes. 302.In general, no slopes steeper than 1(V):3(H) are allowed. 303.Cut slopes are not steeper than 1:2(V:H) and rounded off on the top edge.		

Activities	Environmental Impact/Aspect	Mitigation	Phase	Responsibility
		304. Bulk and fine shaping is executed according to design, aimed at the prevention of soil erosion, of efficient storm water control, of the eventual re-establishment of vegetation and of ultimately achieving aesthetically acceptable landscapes. 305. On the man-made slopes, the following rehabilitation methods are applied: 306. Replacing and redistribution of stripped topsoil to a minimum depth 200mm		

**Rehabilitation (Closure Planning)**

Rehabilitation			
Responsibility	Safety Health and environmental Manager	Frequency/time frame	Planning and Design and throughout the operation on a quarterly basis and during closure
	Environmental control officer		
	Site Manager		

**Objectives**

- a) To ensure that budgeting for achieving of set environmental management measures to be incorporated at planning stage or as part of EMP implementation.
- b) To provide land capability that will be utilized by the community post the coal loading activities and to create a self-sustaining land surface.
- c) To ensure that rehabilitated land is stable in the long term, both from the point of view of soil erosion and stability and is not causing any further pollution.
- d) Plan with closure in mind, by designing and operating to minimise environmental damage and factoring post-operation land use considerations into decision making.
- e) To have the newly created topography to contribute to and blend in with the natural surrounding environment to ensure self-sustaining, stable systems with alternative utilization potential.
- f) To develop rehabilitation designs that the least possible amount of material has to be shift so as not to affect the structure of topsoil and overburden material to be used.
- g) To consider careful selection of indigenous plant species, adapted to the climatic ondition, will be used to ensure a low cost, low maintenance and speedy recovery of disturbed areas. Where possible, self-seeding will be encouraged from the natural seedbed in the topsoil.
- h) To undertake soil amelioration to the extent tht would bring disturbed soils into equilibrium with the naturl environment and not reach agricultural levels.
- i) To ensure that available material will be used as a cover layer, even if amelioration is required, to avoid further destruction of land by creating borrow pits.

**Mitigation Measures**

- 14. The rehabilitation will be conducted in such a manner that it is in line with legislative prescriptions, especially the main provision of NEMA. National Water Act (No.36 of 1998) provision will be taken into account, especially when handling the pollution control dams. Compliance with Occupational Health and Safety Act (OHSA) (Act 85 of 1993) will be observed during rehabilitation activities.

**Flora and Fauna Rehabilitation Plan**

- 15. Should there be a requirement to cut listed trees, a special permit will be sourced from removal of trees for the relevant Department of Forestry.

**General Working Procedures**

- i. Ensure that maps of the area to be work are available at the project office at all times. A record of the area before rehabilitation and a record of the area after rehabilitation will be kept on site.
- ii. Take photographic records of each area to be rehabilitated before working on it
- iii. Complete the project schedule to make reporting easy
- iv. Ensure that adequate PPE is worn at all times
- v. The operations will be planned and operated using TFR guidelines and will adhere to the safe working procedures drafted by TFR.
- vi. All safety and security measures to be applied at all times

- vii. The train will be placed by TFR in the designated siding as per instructions of the safe working procedures drafted by TFR.
- viii. Shunting, loading and removal of wagons, will be done according to instructions set out in the safe working procedure document.

### **13. Description of aspects of the activity covered by this EMP**

As indicated in Section 2, the site will be used to load coal onto rail wagons.

#### **13.1 Planning and Design**

- ⇒ Development of drawings.
- ⇒ Operational plans.
- ⇒ Consolidation of safety files and other regulatory operational manuals.
- ⇒ Get in line with TFR standard of service and operational procedures.
- ⇒ Where necessary, get acquainted with Diesel Traction Fuelling (DTF), Hydrocarbon Pollution Elimination (HPE), and Water Pollution Elimination (WPE) TFR run projects to manage the degree of pollution and rehabilitation.

#### **13.2 Mobilisation and Site Establishment**

- ⇒ Transporting equipment, materials and personnel to site.
- ⇒ Clean -up the site and remove old stockpiled slippers.
- ⇒ Clean existing offices and set additional mobile offices if needed.
- ⇒ Install storage and ablution facilities.
- ⇒ Demarcate waste disposal facilities.
- ⇒ Fence the site and put access gates.

#### **13.3 Pre-Operational Phase**

- ⇒ Transportation.
- ⇒ Installation of electrical equipment and lighting.
- ⇒ Diesel storage and supply.
- ⇒ Install water management structures: Diversion trenches, fix culverts, construct pollution containment dam.
- ⇒ Clean the site and remove redundant materials.
- ⇒ Rehabilitate embankments and provide fire breaks.
- ⇒ Inspect all the lines and ensure safety.
- ⇒ Provide a pad for the stockpile area.
- ⇒ Storm water management .

#### **13.4 Operation**

- ⇒ Receive coal material via trucks.
- ⇒ Weighbridge.
- ⇒ Stockpiling of material on stockpile area.
- ⇒ Loading into rail wagons.

#### **13.5 Decommissioning and Rehabilitation**

- ⇒ Demolition of site infrastructure.
- ⇒ Backfilling and capping of sumps or pollution containment structures.
- ⇒ Concurrent rehabilitation of disturbed surfaces.
- ⇒ De-establishment and site clean up.
- ⇒ Decommissioning and final rehabilitation (outstanding surface disturbances).

## 14. Roles And Responsibilities

The Site Development Manager is responsible for ensuring that all the EMP requirements are implemented. He/she may appoint a person who will assist in conducting internal monitoring audits. The appointment will be in writing and the environmental responsibilities will be included in the key performance areas of the appointed personnel.

Roles and Responsibilities			
Responsibility	Safety Health and environmental Manager	Frequency/time frame	Until closure
	Environmental control officer		
	Site Manager		

### Objectives

To ensure that:

- j) There is allocation of sufficient personnel and other resources to meet objectives and targets.

### Mitigation Measures

3.15 All EMP commitments will be included in contractors contracts

## 15. Time Frames

The management measures will be implemented during the duration of the operation of the site until closure.

Responsible personnel with respect to the roles highlighted under the management commitments in Section 5, Table 12.3-1 are outlined in Table 15-1 below.

Table 15-1: Table showing responsibilities and timeframes for implementing each of the mitigation measures

Environmental Element Affected	Responsibility	Time Frames and Phases of Implementation
1. Topography	Siding Supervisor	Operation and decommissioning
2. Soils (pollution) and/ or Erosion	Siding Supervisor	Ongoing
3. Land Capability and Land Use	Siding Supervisor	Operation, Decommissioning
4. Ecology	Siding Supervisor and Manager: Engineering Services	Construction, Operation, Decommissioning
5. Surface water	Siding Supervisor Manager: Engineering Services Water Quality Specialist	Ongoing
6. Ground water		Ongoing
7. Air Quality	Siding Supervisor and Air Quality Specialist	Ongoing

<b>Environmental Element Affected</b>	<b>Responsibility</b>	<b>Time Frames and Phases of Implementation</b>
8. Noise	Site Manager, Engineering Services	Ongoing
9. Visual	Siding Supervisor	Operation and Decommissioning
10. Archaeology	Siding Supervisor	Ongoing
11. Socio-economic	Siding Supervisor, Human Resources Manager, Stake Holder Liaison Manager	Ongoing

Table 15-2 defines the responsibilities that will be held by the designated groups with respect to the implementation of the EMP.

Table 15-2: Responsibilities for identified environmental responsible positions

<b>ROLES</b>	<b>RESPONSIBILITIES</b>
<b>Project Manager</b>	<p>The Project Manager is responsible for overall management of project and EMP implementation.</p> <p>The following tasks will fall within his / her responsibilities:</p> <ul style="list-style-type: none"> <li>• Be fluent with regards to the recommendations and mitigation measures of this EMP, and implement these measures.</li> <li>• Monitor site activities on a daily basis for compliance.</li> <li>• Conduct internal audits of the construction site against the EMP.</li> <li>• Confine the construction site to the demarcated area.</li> <li>• Rectify transgressions through the implementation of corrective action.</li> </ul>
<b>Siding Supervisor</b>	<ul style="list-style-type: none"> <li>• Conduct regular site visits to be able to report on and respond to any environmental issues;</li> <li>• Report compliance and non-compliance issues to the municipal representative and authorities as applicable;</li> <li>• Advise and associated contractors on environmental issues within the defined work areas;</li> <li>• Review access and incident records that may pertain to the environment and reconcile the entries with the observations made during site inspection, monitoring and auditing;</li> <li>• Recommend corrective action when required for aspects of non-compliance to the EMP;</li> <li>• Take immediate action on site where clearly defined and agreed “no-go” areas are violated or in danger of being violated and to inform Gijima (Pty) Ltd’s representative of the occurrence immediately and to take action;</li> <li>• Be contactable by the public regarding matters of environmental concern as they relate to the operation of the works; and</li> </ul>

ROLES	RESPONSIBILITIES
	<ul style="list-style-type: none"> <li>• Take immediate action on site when prescriptive conditions are violated, or in danger of being violated and to inform the Gijima (Pty )Ltd representative of the occurrence and action taken.</li> </ul>
<b>Contractor</b>	<p>The Contractor is responsible for the overall execution of the activities envisioned in the construction phase including the implementation and compliance with recommendations and conditions of the EMP.</p> <ul style="list-style-type: none"> <li>• The Contractor will therefore ensure compliance with the EMP at all times during construction activities and maintain an environmental register which keeps a record of all environmental incidents which occur on the site during construction of the proposed siding</li> <li>• These incidents may include:                             <ul style="list-style-type: none"> <li>➢ Public involvement / complaints.</li> <li>➢ Health and safety incidents.</li> <li>➢ Incidents involving Hazardous materials stored on site.</li> <li>➢ Non- compliance incidents.</li> </ul> </li> <li>• The Contractor is also responsible for the implementation of corrective actions issued by the and Project Manager within a reasonable or agreed period of time.</li> </ul>

**15.1 Budget**

Operational budget will be used to implement all EMP commitments. A dedicated amount for the environmental control officer will be in the monthly allocations. The implementation of other aspects such as monitoring will also be included in monthly allocations.

**16. Performance Monitoring And Reporting**

Performance Monitoring and Reporting			
Responsibility	Safety Health and Environmental Manager	Frequency/time frame	Until closure
	Environmental Control Officer		
	Site Manager		

**Objectives**

To ensure that:

- a) There is ongoing monitoring of all the commitment undertaken in the EMP
- b) Assessment of performance is monitored and corrective actions are taken should there be identified deviations
- c) The applicant will conduct internal audits to check compliance of project activities with the approved EMP. The site will be visited and any non-compliances will be addressed through development of corrective actions. The corrective actions will be assigned to responsible personnel who will then implement them. EMP performance will be part of weekly project meetings.



- d) All site personnel will be given a copy of the management measures committed to in this EMP, to keep with them during the duration of the operational activities. Internal audits will be conducted on a weekly and monthly basis to check compliance of activities with the approved EMP. During the internal audits, the site will be visited and any non-compliance identified will be addressed through development of corrective actions. The corrective actions will be assigned to site safety representative on site, who will then implement them. The site supervisor will follow-up on the corrective actions on a weekly basis and sign them off once satisfied that they have been implemented.
- e) Develop environmental monitoring committee which shall consist of Health and Safety Officers, Project Managers, Environmental Liaison Officer. The committee will be part of the internal audit teams and be involved in the implementation of the management measures.

### **16.1 Environmental Monitoring**

Monitoring and measuring, on a regular basis, the key characteristics of the operations and activities that can have a significant impact on the environment. This includes the recording of information to track performance, relevant operational controls and conformance with the environmental objectives and targets.

#### **Objective:**

- To monitor compliance with the EMP
- To monitor the effectiveness of management measures stipulated in the EMP

#### **Sources of Impact:**

- Daily activities at the site that may impact on the environment.
- Loading of coal, offloading of coal at Stockpile area, loading coal into train wagons at loading zone etc.

#### **Actions / Controls**

- Appropriate frequency checks during normal operation of the site, to ensure no environmental risk are present as a result of operations/activities and/or tasks;
- Appropriate frequency records during normal operation of the site of activities/task undertaken; and
- Records of waste removed from the site, or placed in storage for removal, during all phases of the development, and appropriate frequency records during normal operation of the facility.

#### **Monitoring**

Gijima will undertake internal audits to

- monitor compliance with the EMP during operation and closure phases of the proposed development;
- and to identify any potential risk that may be arising and to promote preventive maintenance and risk reduction as may be required.

#### **Corrective Actions/Reporting**

Gijima will ensure that should non – compliance with the EMP be identified, corrective measures will be implemented and reported accordingly. This will assist in preparation for the external audits as well.

### **16.2 Site Documentation and Reporting**

All non-conformances will be recorded and reported to the responsible personnel. These non-conformances will be rated according to a developed weighing methodology to determine the significance of each incident.

The following documentation will be required on site:

- Complaints register;
- Environmental incident register;
- Disposal certificates of waste and waste water generated as a result of the proposed developments;
- Audit reports;
- Non – conformance reports;
- Written corrective action instructions;
- EA; and
- EMPr.

Table 16-1: Monitoring Plan

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Security - unauthorised access to site Monitoring of perimeter soil berm used as fencing for the site. Soil erosion - Heavy rainfall /floods	Security and access control to site. Sedimentation of watercourses resulting from the silt and soil eroded from soil berm especially during heavy rainfall or floods	Safety of communities surrounding the site. No access to safety- hazard areas without permission and proper site safety clothing. Check the soil berm for any disturbance or damage and repair. Ensure the soil berm is stable.	Siding Supervisor Security Officer	Foot or vehicle patrol. Record Frequency of reporting: Monthly and following any heavy rainfall will be included in the monthly report.
Biodiversity monitoring should be undertaken.  Faunal mortality Biodiversity loss	Disturbance to the fauna and flora on site will be minimised. All impacts affecting biodiversity will be mitigated as per the listed mitigation measures in the EMP. Habitat pollution due to uncontrolled stormwater drainage poses a significant risk to the National Freshwater Ecosystem Priority Areas (NFEPAs) ecosystem in the close vicinity to the operational site outside the Arbor Siding boundary.	Visual assessment of site to record species occurrence of terrestrial biodiversity including various plant communities, invasive alien species, fauna and other ecosystems occurring on the site. Annual surveys of TSF with respect to success of vegetation establishment. Monitor species activities and other activities taking place within or adjacent to the project area. Monitor the movement and activities of the Avifauna, animals and small mammals observed on site. Regular site inspection of fauna species within the site. Determine or map the ecological sensitivity of the area. Proper stormwater drainage and maintenance plan will be put in place to prevent the stormwater draining into the nearest freshwater ecosystem. Visual observation of the NFEPAs ecosystem to be done regularly and traces of coal residue monitored, mitigated and reported.	Siding Supervisor	Will include, but is not limited to: <ul style="list-style-type: none"> <li>➤ Monitoring of the condition of habitats, ecosystems, topsoil stockpiles, species inventory and alien vegetation control including the stormwater drainage system leading outside the Arbor Siding boundary.</li> </ul>

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
				<p>➤ Photographic records to be kept.</p> <p>Monthly internal site inspection reporting.                      Annual report and submit to Biodiversity section of provincial DEA and DMR                      Annually</p>
Monitoring of erosion Roads	Soil Erosion resulting from heavy traffic flow of trucks offloading coal at stockpile area Soil erosion from heavy rainfall events Roads sides eroded and unstable for trucks to transport coal to stockpile and loading areas.	Sedimentation of water resources. Stability of the operational areas within the site. Flat surfaces to ensure stable transportation of coal to weighbridge; offloading at stockpile area; loading of coal into train wagons. Railway ground infrastructure stability to be monitored and inspected especially after heavy rainfall events. Repairs to be done timeously to prevent further damage and safety hazards to the personnel on site and neighbouring community. Topography to be inspected to ensure efficiency in the offloading at stockpile area and the loading at loading zone without incidents that could impact the environment.	Siding Supervisor	Visual inspection of the site and rail infrastructure. Walk over rehabilitated areas, drive along roads  Monthly report to DMR and DWS Every 6 months and following any heavy rainfall
Inappropriate tree felling or removal of alien invasive plants  Monitoring of alien plants over the whole site	Infestation of alien invasive plants within the site. Uncontrolled growth and spread of invasive alien species (Eucalyptus).	Visual assessment of site to record species occurrence of terrestrial biodiversity including various plant communities, invasive alien species, fauna and other ecosystems occurring on the site. Monitor species activities and other activities taking place within or adjacent to the project area. Determine or map the ecological sensitivity of the area.	Siding Supervisor	Visual inspection on foot patrol Map presence of invasive plants Plan removal, remove and document area covered on monthly basis Verify with Photographs Monthly.
Monitoring of Water Quality – from selected points.	Surface and ground water pollution from surface runoff	The objective is to prevent and minimise water pollution.	Siding Supervisor	Identify sources of potential contamination.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
<p>Stockpiling of coal poses a significant risk to water resources - both surface water and groundwater.</p>	<p>from the stockpile area and the pollution control dam. Changes in surface and groundwater quality will be monitored regularly. The change in hydrological characteristics of the area can affect surface runoff, soil moisture, and evapo-transpiration and groundwater behavior.</p>	<p>As part of the approved and issued Integrated Water Use Licence (04/B20F/G/4009 File No: 27/2/2/B620/12/9), surface water quality monitoring reporting will be done on the following variables:</p> <ul style="list-style-type: none"> <li>pH</li> <li>Electrical conductivity (mS/m)</li> <li>Chloride (mg/L)</li> <li>Sulphate (mg/L)</li> <li>Fluoride (mg/L)</li> <li>Sodium (mg/L)</li> <li>Potassium (mg/L)</li> <li>Calcium (mg/L)</li> <li>Magnesium (mg/L)</li> <li>Aluminium (mg/L)</li> <li>Iron (mg/L)</li> <li>Manganese (mg/L)</li> <li>Nitrate (mg/L)</li> <li>Total Dissolved solids [TDS] (mg/L)</li> <li>Total hardness (mg/L)</li> </ul> <p><b>Ground water monitoring:</b></p> <p>Identification of sources of potential contamination          Determine the extent of any pollution plume that may occur and prevent the contamination from moving off site          Assessment of possible impact on the receiving water environment in order to formulate remedial measures should ground water contamination be evident.</p> <p>Monthly sample collection from the seven (7) monitoring points, bottling, labelling, storage and transportation for laboratory analysis. The analysis according to the DWAF South African Water Quality Target Value (SAWQTV) was also conducted. The analysis was also used to check fitness of water for domestic and irrigation purposes within the site.</p>		<p>Assess possible impact of receiving water environment.</p> <p>Chemical and bacteriological tests at identified boreholes as recommended in the EMP. Build up database and graph the results.          Compare with limits and take action on non-conformances          Water quality samples collected monthly          Report submitted to DWS          Water monitoring report every month          Submit monitoring report every 3 months and annually.</p>

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
<p>Stockpiling of coal - Air Quality</p>	<p>Air quality deterioration due to coal dust in the air and potential low visibility and health impacts to personnel on site. Air Quality - dust fall out monitoring programme. Monitor changes within the dust fall out gravimetric weight and compliance against the set SANS 1929 standards and within or outside the DEA AQ target.</p>	<p>Bi-annual quality surveys conducted to measure the gravimetric dust fall out at the operational and cumulative impacts currently in effect causing poor air quality in the site. Four (4) monitoring buckets installed at Arbor Siding in four directions (i.e. north, east, south and west) provide the data used for the analysis. The points are located as follows:</p> <ul style="list-style-type: none"> <li>• <b>North point</b> monitored dust generated by Arbor activities, Ntshovela mine and an access point for the neighbouring residential area;</li> <li>• <b>East point</b> monitored dust generated during accessing Arbor Siding facilities and the above mentioned neighbouring land-uses; and activities along the R555;</li> <li>• <b>South point</b> monitored the actually operational activities at the siding during the off-loading and loading of coal; and</li> <li>• <b>West point</b> monitored the dust generated during the loading of coal (no longer valid as stand was stolen).</li> </ul> <p>The buckets are left open so that generated dust at the study site can settle in them for periods of 30+/-2 days. After the running period the dust were collected, sealed on site and sent to a laboratory for analysis. The masses of the water-soluble and insoluble components of the material were collected and the results were obtained by gravimetric weight and reported as mg/m<sup>2</sup> /day. Determine if the results obtained are within the set SANS 1929 standards or exceed the set standard and are within or outside the DEA AQ target. Implement corrective action and mitigation measures put in place as described in the EMP, the Site Management Best Practices and the Air Quality Management Plan.</p>	<p>Siding Supervisor  Air Quality Specialist</p>	<p>Air Quality - dust fall out samples taken for comprehensive analysis done from the 4 buckets strategically placed at the site. Collect samples through the use of dust buckets from the various locations; To submit the samples for comprehensive analysis; To report on the compliance of the analytical results against standards and guidelines in order to identify problem areas and make recommendations for remedial actions; To identify areas and sources of pollution; and</p> <p>Mitigation measures such as dust suppression as set within the conditions of the WUL will be implemented and as described in the EMP. Comply and submit copies of the dust fallout monitoring reports to the client for submission to the relevant government authorities.</p> <p>Monthly to client Bi-annual to authorities</p>



SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
	Potential Safety hazard should materials not be handled properly.			
Construction waste (rubble); general waste generation (litter, solid waste)	Potential contamination of water resources from littering and improper waste management practices and disposal.	Monitoring of maintenance of general waste disposal	Siding Supervisor	Running total of loads of waste taken. Record of waste taken to waste disposal site Keeping records of waste taken to disposal site . All loads of waste to be recorded and quantity extrapolated. Covering of waste pit Monthly
Sanitation/ Ablution facility set up, use and decommissioning	Potential soil pollution, surface water and groundwater pollution due to lack of protective barrier, location and distance from sensitive areas. Poor use and maintenance of sanitation facilities.	Monitoring of condition of sewage facilities	Siding Supervisor	Visual inspection. Record condition.
Fuel storage - Diesel storage tank	Potential seepage or leakage from the tank or during the refueling of trucks or during maintenance servicing could lead to pollution of the soil and water sources.	Monitoring of condition of bunded areas around diesel fuel tanks, refuelling area, old oil tank; and petrol tanks. Heavy impermeable lining on the diesel storage area	Siding Supervisor Siding Supervisor	Visual inspection
Observations of all ground breaking activities during the construction phase in accordance with the Heritage Impact Assessment report.	Disturbance of any existing heritage significant resources or sites during construction, operation and decommission phase.	Visual observation of heritage resources or sites Record sites or resources Report the sites or resources observed to SAHRA	Siding Supervisor	Report during survey before construction and at decommissioning As and when discovered Every Six months



SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Survey to identify the status of existing heritage sites during operation	Disturbance to existing heritage sites or resources during operation.	Visual observation of heritage resources or sites Record sites or resources Report the sites or resources observed to SAHRA	Heritage specialist	Report on survey during operational phase. Annual report
Use of wastewater from the Pollution Control Dam for dust suppression.	Water use at the site. Water allocation for dust suppression to comply with licence condition.	Monitoring of water usage and ensuring water flow meters are installed at the pollution control dam. Monitor volume of water from PCD used per month for dust suppression not to exceed the target set in the WUL conditions.	Siding Supervisor	Record total water use and water use at different plants by recording flow meters. Ensure compliance with licence.
Compliance to site EMP	All aspects listed within EMP that require monitoring.	Refine the existing EMP and compile a site specific Operation EMP.	Siding Supervisor	Daily Monthly report
Alien vegetation control		Compile an Alien Invasive Management Plan	Ecological specialist	Bi weekly Monthly report
Soil Management: Soil erosion, pollution, disturbance, topography,	Areas with a high inherent risk of soil erosion, soil wash or flooding; Areas with a high risk of soil damage, i.e. where there are vulnerable soils and/or topography, and where climatic and farm management practices may combine to damage the soils particularly easily. "Soil damage" includes all of the following: <ul style="list-style-type: none"> <li>• wind erosion;</li> <li>• water erosion,</li> <li>• erosion related to tillage and harvesting ;</li> <li>• compaction, including</li> </ul>	Compile a soil management plan (storing, sloping, and vegetation of topsoil)	Ecological specialist	Daily Monthly report Annual report

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
	<p>puddling, crusting (=surface capping), or developing impermeable “pans”.</p> <ul style="list-style-type: none"> <li>• organic matter decline;</li> <li>• salinisation;</li> <li>• acidification;</li> <li>• landslides;</li> <li>• subsidence;</li> <li>• desertification;</li> <li>• adverse effects of climate change on the soil, and</li> <li>• soil biodiversity loss.</li> </ul>			
Biodiversity protection on site	Potential biodiversity loss and faunal mortality from site operations from construction to rehabilitation.	Protection and handling of fauna found within the site at all stages of operation.	Siding Supervisor	Site observation report Monthly Every six months for seasonal change Annually

## 16.2 Monitoring System

### 16.2.1 Water Monitoring

As part of the approved Environmental Management Programme (EMP) and Integrated Water Use License, Arbor will conduct water quality monitoring reporting on the following parameters: pH, Electronic Conductivity, Sulphates, Nitrates, Sodium, Fluorides, Magnesium and Calcium.

A database will be created for storage of water quality data, this database will be designed such that it is flexible enough to allow future additions/refinements to the monitoring programme. A suitably qualified person will manage the data and appropriate control mechanisms defined to ensure that no errors occur.

### 16.2.2 Groundwater Monitoring

The following water monitoring methodology is recommended:

- Record the static pre- pumped water level, prior to sampling.
- The unfiltered sample will be collected (in clearly marked 1L plastic bottles) for major cation and anion as well as trace and heavy metal analysis.
- Samples will be kept in a cooler box and sent to the laboratory within 48 hours.

Quarterly monitoring will be conducted to reflect the following variables:

- pH-Value at 25 ° C
- Conductivity at 25° C in mS/m
- Total Dissolved Solids
- Suspended Solids
- Nitrate & Nitrite as N
- Chlorides as Cl
- Total Alkalinity as CaCO<sub>3</sub>
- Fluoride as F
- Sulphate as SO<sub>4</sub>
- Calcium as Ca
- Magnesium as Mg
- Sodium as Na
- Potassium as K
- Iron as Fe
- Manganese as Mn
- Aluminium as Al

#### 16.2.2.1 Sampling Methods and Guidelines

Samples collected will be preserved so as to ensure that the samples are maintained in a condition representative of their in-situ state. The sampling and sample preservation will be undertaken according the following guidelines:-

- "Groundwater sampling: a comprehensive guide for sampling methods", compiled by John M Weaver for the Water Research Commission (WRC Report TT 56/92).
- SABS ISO 5667-11 : 1993 Guidance on sampling of groundwater
- SABS ISO 5667-1 : 1980 Guidance on the design of sampling programs
- SABS ISO 5667-2 : 1991 Guidance on sampling techniques
- SABS ISO 5667-3: 1994 Guidance on the preservation and handling of samples

The site will be left neat and tidy after the sampling work has been completed.

### **16.2.3. Surface Water Monitoring**

Surface water samples will be collected on a monthly basis. Monthly Monitoring will be conducted to reflect the following:

- pH-Value at 25 ° C
- Conductivity at 25° C in mS/m
- Total Dissolved Solids
- Suspended Solids
- Nitrate & Nitrite as N
- Chlorides as Cl
- Total Alkalinity as CaCO<sub>3</sub>
- Fluoride as F
- Sulphate as SO<sub>4</sub>
- Calcium as Ca
- Magnesium as Mg
- Sodium as Na
- Potassium as K
- Iron as Fe
- Manganese as Mn
- Aluminium as Al

#### **16.2.3.1. Sample bottling and labeling**

All samples will be collected utilizing sterilized bottles provided by the Lab. Before a sample can be collected, a prescribed sampling bottle will be labelled in correspondence with the point identity from which sampling will take place.