



BASIC ASSESSMENT REPORT IN TERMS OF NEMA

**PROPOSED EXPANSION OF THE TRANSALLOYS (PTY) LTD
OPERATIONS BY INCLUDING A SINTER PLANT WHICH
REQUIRES AMENDMENTS TO THE EXISTING ATMOSPHERIC
EMISSIONS LICENSE (AEL) IN EMALAHLENI LOCAL
MUNICIPALITY, NKANGALA DISTRICT MUNICIPALITY,
MPUMALANGA PROVINCE**

**MARCH 2021
(DRAFT)**



Address: P.O. Box 1322, Ruimsig, 1732

Tel: 082 850 5482

Fax: 086 692 8820

paulette@hydroscience.co.za

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- Curriculum vitae (Environmental Assessment Practitioner): Ms Paulette Jacobs
- Qualification: Ms Paulette Jacobs
- Professional affiliations: Ms Paulette Jacobs (SACNASP, EAPASA WISA, IAIAsa)
- NEMA project list

Appendix B: Photographs & Schematics

- Photographs from site visit (24 February 2021)
- Process Flow Diagram (PFD)
- Site Layout / Site Development Plan (SDP)

Appendix C: Legal

- WUL 16/2/7/B100/B175 for Section 21 (a), (g) & (j) and amendment
- WML 12/9/11/L261/6 for Mn slimes and slag dump and variation
- AEL 17/04/AEL/MP312/11/05 for Category 4

Appendix D: Specialist studies

- Atmospheric Impact Report: Mamadi & Company (Dr Ola Akinshipe), Report MC20TRA01
- Dust Monitoring Report: Skyside, 2021, Annual Dust Deposition Monitoring, January – December 2020, Sampling period: 06 January 2020 – 04 / 05 January 2021, Report AS1217 40.950 A_TA, 4 March 2021.
- Archaeos, Culture and Cultural Resource Consultants, 2021. Letter for HIA exemption request: Development of Sinter Plant at Transalloys (Pty) Ltd, close to eMalahleni, Mpumalanga Province. 10 March 2021.
- Durand, JF, 2021. Proposed development of Sinter Plant at TRansalloys, Mpumalanga. Palaeontological Impact Assessment. 13 March 2021.

Appendix E: Public participation

- Newspaper notice (Witbank News & Middelburg Observer)
- Notification (emails & hand-delivery)
- Contact details of Interested and Affected Parties (confidential)
- Comments received from Interested and Affected Parties
- Comments received from Interested and Affected Parties on draft BAR

Appendix F: Management

- Emergency Preparedness Plan
- Storm Water Management Plan

LIST OF ACRONYMS AND ABBREVIATIONS AND DEFINITIONS

AIS	Alien and Invasive Species Regulations (2014)
AQSR	Air Quality Sensitive Receptors
Biodiversity	Diversity of genes, species and ecosystems on earth, and the ecological and evolutionary processes that maintain this diversity.
BPG	Best Practice Guidelines
CAPEX	Capital Expenditure
CARA	Conservation of Agriculture Resources Act, 1983 (Act 43 of 1983)
CBA	Critical Biodiversity Area (terrestrial and aquatic areas required to meet biodiversity targets for ecosystems, species or ecological processes, as identified in a systematic biodiversity plan)
CBD	Central Business District (centre of a town/city)
CRSA	Constitution of the Republic of South Africa, 1996 (Act 108 of 1996) – Section 24 relates to environment
CSIR	Council for Scientific and Industrial Research
DEFF	Department of Environment, Forestry & Fisheries (national authority responsible for environmental protection and implementation of NEMA)
DOL	Department of Labour
DTI	Department of Trade and Industry
DWS	Department of Water and Sanitation (national authority responsible for water protection and implementation of NWA, custodian of South Africa's water resources)
EAP	Environmental Assessment Practitioner (independent consultant administering NEMA processes on behalf of applicant)
EAPASA	Environmental Assessment Practitioner Association of South Africa
ECA	Environment Conservation Act, 1989 (Act 73 of 1989) – preceded NEMA
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment (process required in terms of NEMA to obtain authorisation for listed activities)
EMF	Environmental Management Framework
EMP	Environmental Management Programme/Plan
EO	Environmental Officer
EPRP	Emergency preparedness and response procedures

ERAP	Emergency Response Action Plan
ESA	Ecological Support Area (terrestrial and aquatic areas that are not essential for meeting biodiversity targets but play an important role in supporting the ecological functioning of one or more Critical Biodiversity Areas; or in delivering ecosystem services.
GIS	Geographic Information System
GNR	Government Notice Regulation (notices published in Government Gazette in terms of already promulgated laws, legislated by government)
GNR 324	Amendment of GNR 985 - Listing 3 deals with activities requiring environmental authorisation due to sensitive locations
GNR 325	Amendment of GNR 984 - Listing 2 deals with activities requiring environmental authorisation due to expected higher environmental impact – requires full EIA (scoping and EIA)
GNR 326	Amendment of GNR 982 - EIA regulations – procedures / requirements
GNR 327	Amendment of GNR 983 - Listing 1 deals with activities requiring environmental authorisation due to expected lower environmental impact – requires Basic Assessment only
GPS	Global Positioning System
HCS	Hazardous Chemical Substance
HIA	Heritage Impact Assessment
IAIA	International Association of Impact Assessment
IBA	Important Bird (and Biodiversity) Area – of international significance for conservation of birds as identified by BirdLife International.
I&APs	Interested and Affected Parties (as identified during the Public Participation Process)
IDP	Integrated Development Plan
IRP	Integrated Resource Plan
mamsl	Metres Above Mean Sea Level
Listed Activities	Activities identified in terms of NEMA Sections 24 and 24D, which require environmental authorisation prior to commencement due to their potential environmental impacts. See GNR 324, 325, 326, 327
MAE	Mean Annual Evaporation
MAP	Mean Annual Precipitation
Mn	Manganese
MSDS	Material Safety Data Sheets

NAAQS	National Ambient Air Quality Standards (13 March 2009 and 24 December 2009)
NDCR	National Dust Control Regulations (1 November 2013)
NEMA	National Environmental Management Act, 1998 (Act 107 of 1998) – overarching environmental legislation in South Africa
NEM:AQA	National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004)
NEM:BA	National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004)
NEM:PAA	National Environmental Management: Protected Areas Act, 2003 (Act 57 of 2003)
NEM:WA	National Environmental Management: Waste Act, 2008 (Act 59 of 2008)
NFEPA	National Freshwater Ecosystems Priority Area
NHRA	National Heritage Resources Act, 1999 (Act 25 of 1999)
NO₂	Nitrogen dioxide
NPI	National Pollution Inventory - Australia
NWA	National Water Act, 1998 (Act 36 of 1998)
OHSA	Occupational Health and Safety Act, 1993 (Act 85 of 1993)
OPEX	Operational Expenditure
PCD	Pollution Control Dam
PFD	Process Flow Diagram
PM	Particulate Matter
PM₁₀	Particulate Matter with an aerodynamic diameter of < 10um also referred to as thoracic particulates
PM_{2.5}	Particulate Matter with an aerodynamic diameter of < 2.5um
PM₁₀ & PM_{2.5}	Determine the potential for human health risks
PPE	Personal Protective Equipment
PPP	Public Participation Process
PRECIS	National Herbarium Pretoria (PRE) Computerised Information System
QDGC	Quarter Degree Grid Cell
RWD	Return Water Dam
SACNASP	South African Council for Natural Scientific Professions (body for the registration of professional natural scientists)

SAHRA	South African Heritage Resources Agency (authority responsible for implementation of NHRA)
SAHRIS	South African Heritage Resources Information System (electronic system onto which reports are loaded for comments from SAHRA)
SANBI	South African National Biodiversity Institute
SABS	South African Bureau of Standards
SANS	South African National Standards
SCC	Species of Conservation Concern
SDF	Spatial Development Framework
SDP	Site Development Plan
SHEQ	Safety, Health, Environment & Quality
SoE	State of the Environment Report
SO₂	Sulphur dioxide
SWMP	Storm Water Management Plan
TMR	Transalloys Metal Recovery
TSP	Total Suspended Particulate – assess nuisance dust effects
US EPA	United States Environmental Protection Agency
WCMR	Waste classification and Management Regulations
WDF	Waste Disposal Facility
WHO	World Health Organisation
WISA	Water Institute of Southern Africa
WUL	Water Use License

1 ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

1.1 Details

Company:	HydroScience CC
Registration Number:	2008/056910/23 14 March 2008
Postal address:	P.O. Box 1322 Ruimsig 1732
Email address:	paulette@hydroscience.co.za
Telephone number:	+ 27 (0) 82 850 5482
Fax number:	+ 27 (0) 86 692 8820
Contact person:	Ms Paulette Jacobs I.D. 680526 0104 08 4
Professional registration (Paulette Jacobs):	South African Council for Natural Scientific Professions (SACNASP): 400005/07 Environmental Assessment Practitioner Association of South Africa (EAPASA): 2020/357
Membership (Paulette Jacobs):	Water Institute of Southern Africa (WISA): 24906 International Association of Impact Assessment South Africa (IAIAsa): 5266

1.2 Experience and expertise

HydroScience CC was established in 2008 after Ms Paulette Jacobs acted as an independent consultant (sole proprietor) since 2000. HydroScience is an environmental, water and waste management solutions provider. Refer to Appendix A for a company profile.

Ms Paulette Jacobs obtained her qualifications from the Rand Afrikaans University in Johannesburg in 1990 and has been in the water, waste and environmental field for the last 30 years, first in research for seven (7) years at the Council for Scientific and Industrial Research (CSIR) and since then in consulting (Pulles, Howard and De Lange Water Quality Management Consultants, SRK Consulting, sole proprietor, HydroScience). Refer to Appendix A for Curriculum Vitae of Ms Paulette Jacobs. Ms Paulette Jacobs assisted Department of Water Affairs and Forestry (now Department of Water and Sanitation, DWS) to compile the Best Practice Guidelines (BPG) for water resource protection in the mining industry and has successfully completed many Water Use Licence (WUL) Applications in terms of the National Water Act (NWA), 1998 (Act 36 of 1998) as well as Environmental Impact Assessments (EIA) in terms of the National Environmental Management Act (NEMA), 1998 (Act 107 of 1998) as

amended for the industrial, retail, commercial/business and residential sectors to obtain environmental authorisations, Atmospheric Emissions Licenses (AEL) and Waste Management Licenses (WML) over the last 20 years. Refer to Appendix A for a project list of applications for environmental authorisation.

1.3 Supporting information

Appendix A contains:

- Company profile: HydroScience
- Curriculum vitae (Environmental Assessment Practitioner): Ms Paulette Jacobs
- Qualification: Ms Paulette Jacobs
- Professional affiliations: Ms Paulette Jacobs (SACNASP, EAPASA, WISA, IAIAsa)
- NEMA project list

1.4 Assumptions, limitations, disclaimer and copyright

The findings, results, observations, conclusions and recommendations given in this report are based on the author's best scientific and professional knowledge as well as available information at the time of compilation (November 2020 – March 2021). The report is based on survey and assessment techniques which are limited by time (one day on site) and budgetary constraints relevant to the type and level of investigation undertaken (Basic Assessment Process) and HydroScience and its staff / representatives reserve the right to modify aspects of the report if and when new information may become available from changes in legislation, on-going research or further work in this field, or pertaining to this investigation.

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Project description information contained in this report is based on information supplied by the client or client appointed sources. It has been assumed that the information provided to HydroScience is correct. Environmental data contained in this report is based on information supplied by specialists in their respective fields, as well as existing available information from official sources pertaining to the area in question (maps and reports published by the relevant government department and agencies). It has been assumed that the information from these specialists or official sources is correct. HydroScience has therefore not checked or verified historical/existing information provided for correctness. HydroScience accepts no responsibility for incomplete or inaccurate data supplied by others (the client and external sources). Where gaps or obvious errors have been identified, these are noted for consideration by the applicant and/or authority.

Transalloys (Pty) Ltd is responsible for the implementation of recommendations and HydroScience cannot and will not take responsibility for its actions or lack thereof.

1.5 Declaration of independence

I, **Paulette Jacobs**, declare that –

- I act as an independent environmental, water and waste consultant in this investigation;
- I have expertise in water, waste and environmental management, including knowledge of the relevant Acts, Regulations and any guidelines that have relevance to the investigation;
- I have performed the work relating to this investigation in an objective manner, even if this results in views and findings that are not favourable to any party involved;
- I have included the specialist studies provided to me in Appendices as well as summarised findings and recommendations in this report;
- I undertake to disclose all material information in my possession that reasonably has or may have the potential to influence this investigation, unless access to that information is protected by law, in which case it will be indicated that such information exists;
- I do not have any vested interest (either business, financial, personal or other) in the investigation other than fair remuneration for work performed; and
- I will provide the parties with access to all information at my disposal regarding the investigation, whether such information is favourable or not.



Signature: Paulette Jacobs

2 APPLICANT / PROPONENT

2.1 Details

Company:	Transalloys (Pty) Ltd
Registration Number:	2007/004433/07
Postal address:	P.O. Box 856 eMalahleni 1035
Physical address:	Old Clewer Road Farm Elandsfontein 309JQ eMalahleni
Telephone number:	+ 27 (0) 13 693 8000 / 8078
Fax number:	+ 27 (0) 13 659 7473 / 7173
Contact person:	Mr Ephraim Monyemoratho Cellular number: 072 697 5957 Email address: ephraimm@transalloys.co.za

3 PROPERTY

3.1 Details

Province:	Mpumalanga
District Municipality:	Nkangala Contact: Stanford Mofore Telephone number: 083 946 3677 / 013 249 2173 Email address: mofores@nkangaladm.gov.za
Local Municipality:	eMalahleni Contact: Ms Sandile Felicity Maseko Telephone number: 071 755 2638 / 013 690 6911 Email address: environmental@emalahleni.gov.za
Ownership:	Transalloys (Pty) Ltd 2007/004433/07
Land use:	Industrial – Ferro-Alloy (Manganese)
Surrounding land uses:	Agriculture, residential, industrial and mining
Farm & portions:	Farm: Elandsfontein 309 JS Portions: Remaining extent of portion 34 and portion 35 (a portion of portion 34)
SG numbers:	TOJS00000000030900034 TOJS00000000030900035
Size:	Total: 96.0185ha Portion 34: 73.9075ha Portion 35: 22.1110ha Sinter plant: 0.57ha
GPS locations:	Existing Plant: 25° 53' 30" South & 29° 06' 16" East Existing Waste Management Facilities: 25° 53' 30" South & 29° 07' 30" East New Sinter Plant: 25° 53' 57.25" South & 29° 07' 6.27" East
Surrounding towns:	Clewer: 1.5km south Kwa-Guqa: 4km north east eMalahleni: 20km east
Roads & access:	N4 between Pretoria and Nelspruit (Mbombela): 1.5 km north N4 via the Mathews Phosa Street (Clewer) off-ramp.

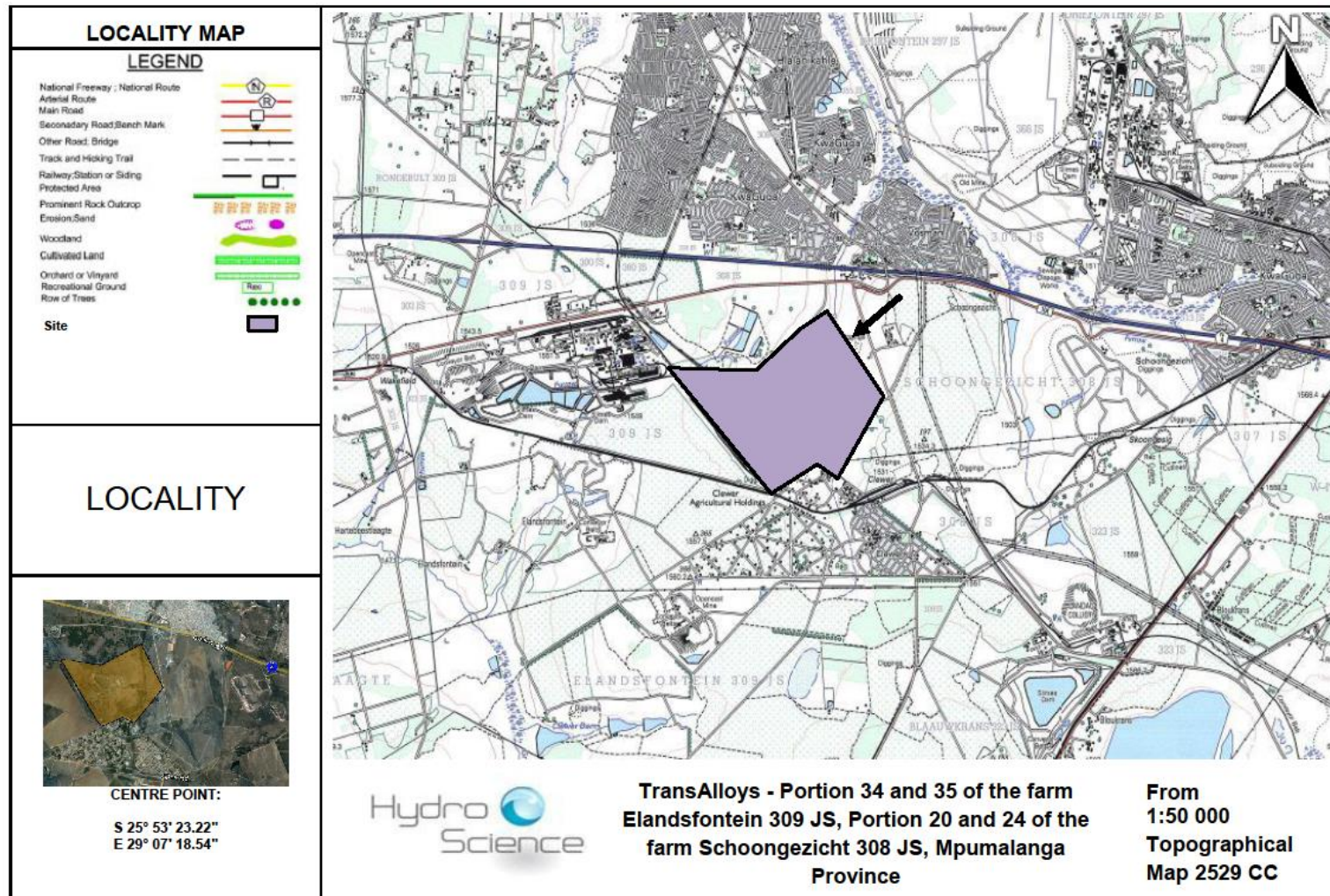


Figure 3-1: Transalloys locality

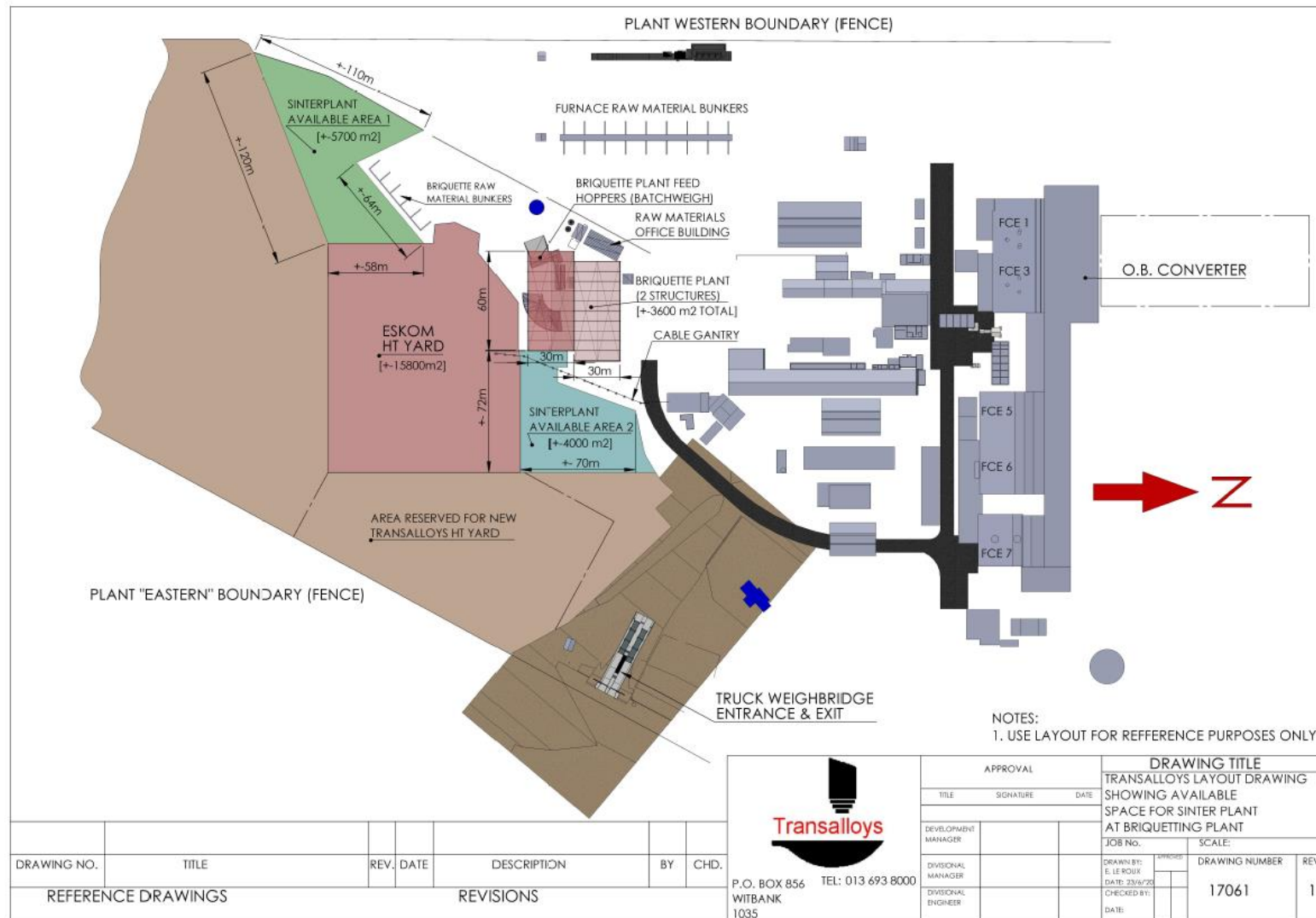


Figure 3-2: Sinter plant locality on Transalloys property (preferred locality in green)

4 PROJECT

4.1 Description

Title:	Expansion of the Transalloys (Pty) Ltd operations by including a Sinter Plant which requires amendments to the existing AEL.
Sintering definition:	Sintering or frittage is the process of compacting and forming a solid mass of material by applying heat or pressure without melting it to the point of liquefaction (Wikipedia).
Purpose of Sinter Plant:	Vessel Sintering Technology is a proprietary batch process that was developed to provide a solution to companies that require less than 500 000 tons per year of sinter. Sinter is required for the High Carbon process and products.
Benefits of selected process: Also refer to Figure 4-2	<ul style="list-style-type: none"> • Low capital expenditure (CAPEX) and operation expenditure (OPEX). • Flexible enough to be adjusted to the required operational parameters. • Higher productivity by allowing more fines of ore and reductant in the mix (by the incorporation of the -50mesh fraction). • Operates efficiently with low cost reductants such as charcoal or anthracite. • Low energy demand because it requires < 50% less electricity than conventional sintering processes. • Temperature during sintering reaches 1 200°C but can be increased to improve pre-reduction level of some ores. • Low maintenance cost as most sub-systems are stationary. • Consumes a small amount of air. • No need of oil or LPG for ignition. • Expansion is easy as process is flexible to easily include additional ladles.
Purpose of application / process:	<ul style="list-style-type: none"> • Obtain environmental authorisation for expansion to include Sinter Plant. • Allow amendments to AEL.
Location:	25° 53' 57.25" South 29° 07' 6.27" East
Period of establishment:	Sixteen (16) months

Input / raw materials:	Iron (Fe), Manganese (Mn) and/or Chrome (Cr) Reductants: Charcoal / coke / anthracite
Quantities:	Ore fines: 120 000 tons/annum Dust: 15 000 tons/annum Coke / Calcined anthracite fines: 20 000 tons/annum
Capacity:	100 000 tons/annum
Structures / components:	Buildings: Sintering building (with ladles) Proportioning building Cooling building Main building Workshop MCC & Control Room Wet scrubber (with scrubber waste sump) Baghouse Buffer silo Conveyor belts Mixers Loading platforms Back-up water tank & pump Storage sheds (reductants) Crusher Vibrating screen Existing bunkers for stockpiles (Sinter)

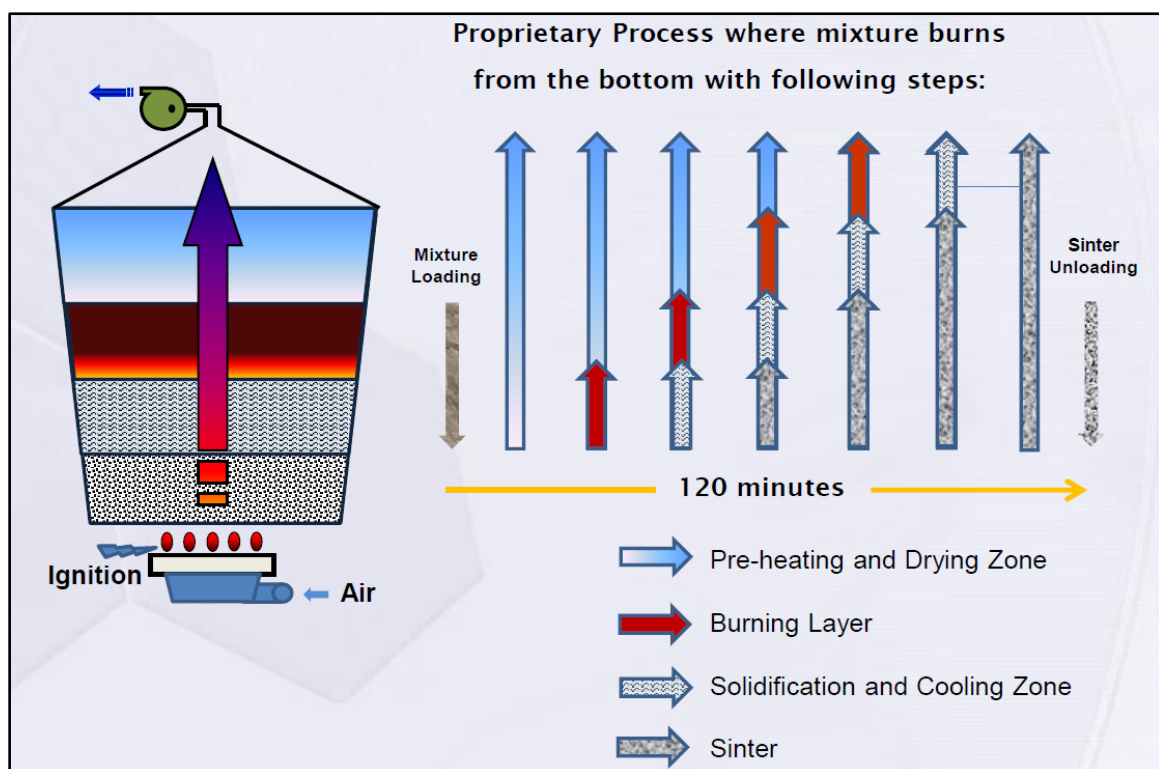


Figure 4-1: Simplified process representation (Traxys, 2020)

COMPARATIVE ITEMS	LADLE SINTERING	Carousel Sintering/Short Traditional Belt Sintering
PROCESS	Stationary ladles without grids or movable parts. No entry of false air flow. Flexible to efficiently run a wide range of raw materials with diverse chemical and physical characteristic. Able to sinter ultra-fine materials. Easily adjustment of production level. No use of gas or oil for ignition.	Strict raw materials' specification to maintain efficiency. Difficult to adjust production level. High cost of ignition.
CAPEX	US\$ 65.00/year-ton capacity Modular- Specific Capex with low variation in regards of plant capacity.	US\$ 100-125/year-ton capacity Specific Capex varies significantly with plant capacity.
OPEX (excluding ore and reductants)	US\$ 25.00/ton of sinter	US\$ 30.00 to 35.00/ton of sinter
Equipment Maintenance	Low cost maintenance with fewer moving parts. Parts exposed to high temperature are those with refractory lining.	High maintenance cost. Complex hydraulic system with moving parts subjected to high temperature.
Environmental	Effective fixed de-dusting system.	De-dusting is inefficient due to continuous movement of the grate.
Electric Power Consumption	50% of traditional sintering process	50 KWh/t

Figure 4-2: Process Comparison (Traxys, 2020)

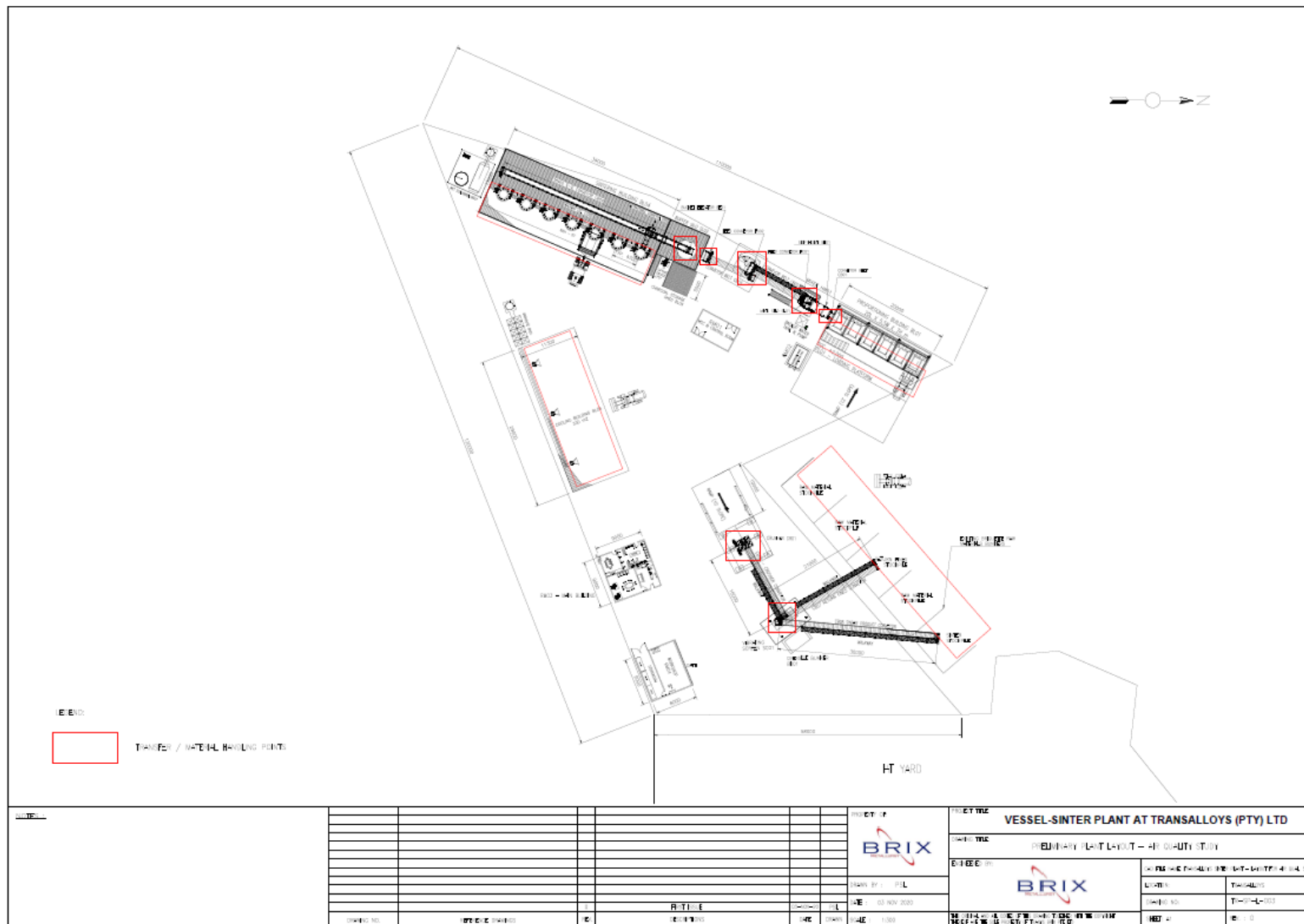


Figure 4-3: Layout 1 - preferred layout based on preferred location (Brix Metallurgy, 2020)

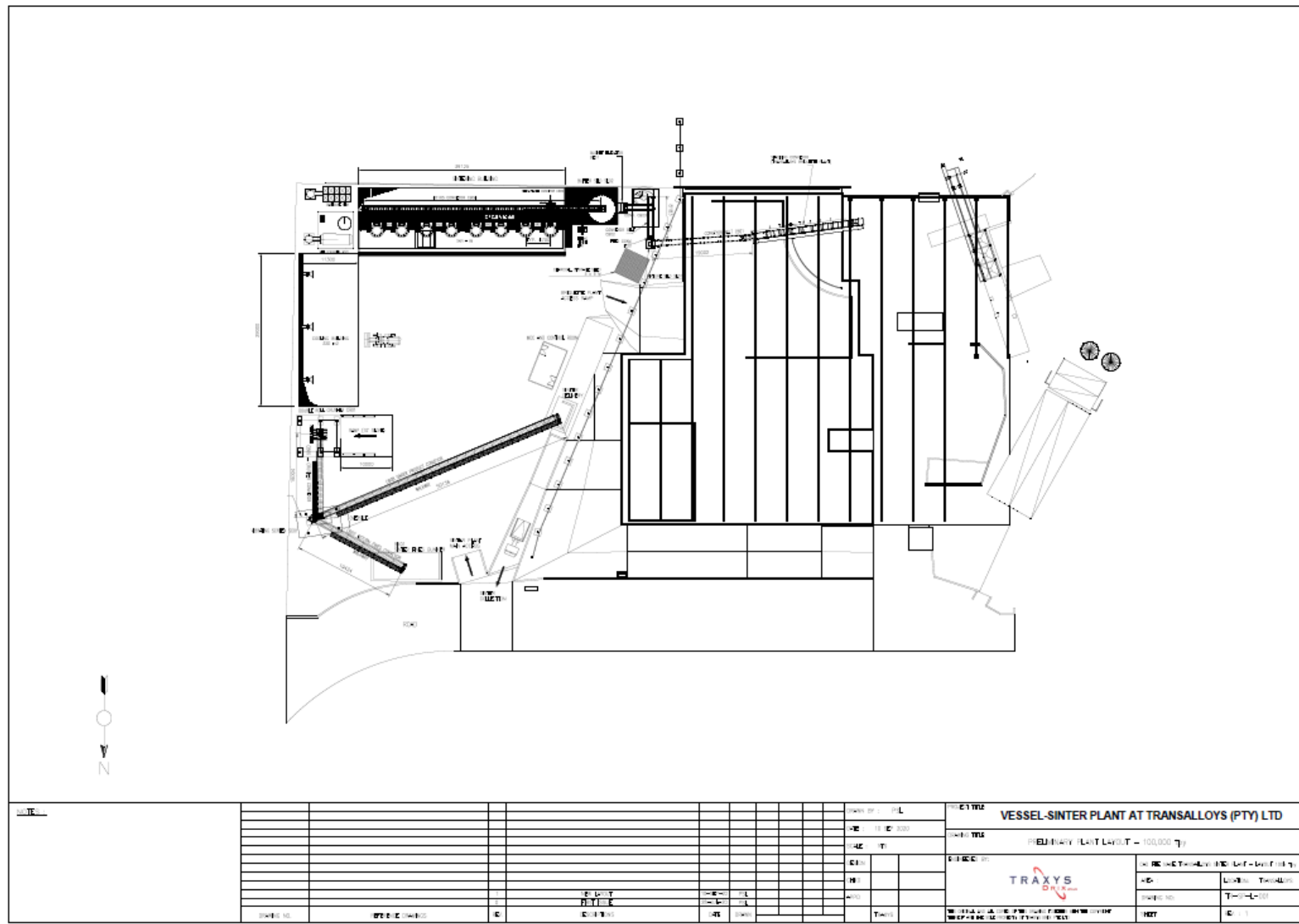


Figure 4-4: Layout 2 – alternative layout on alternative location (Traxys, 2020)

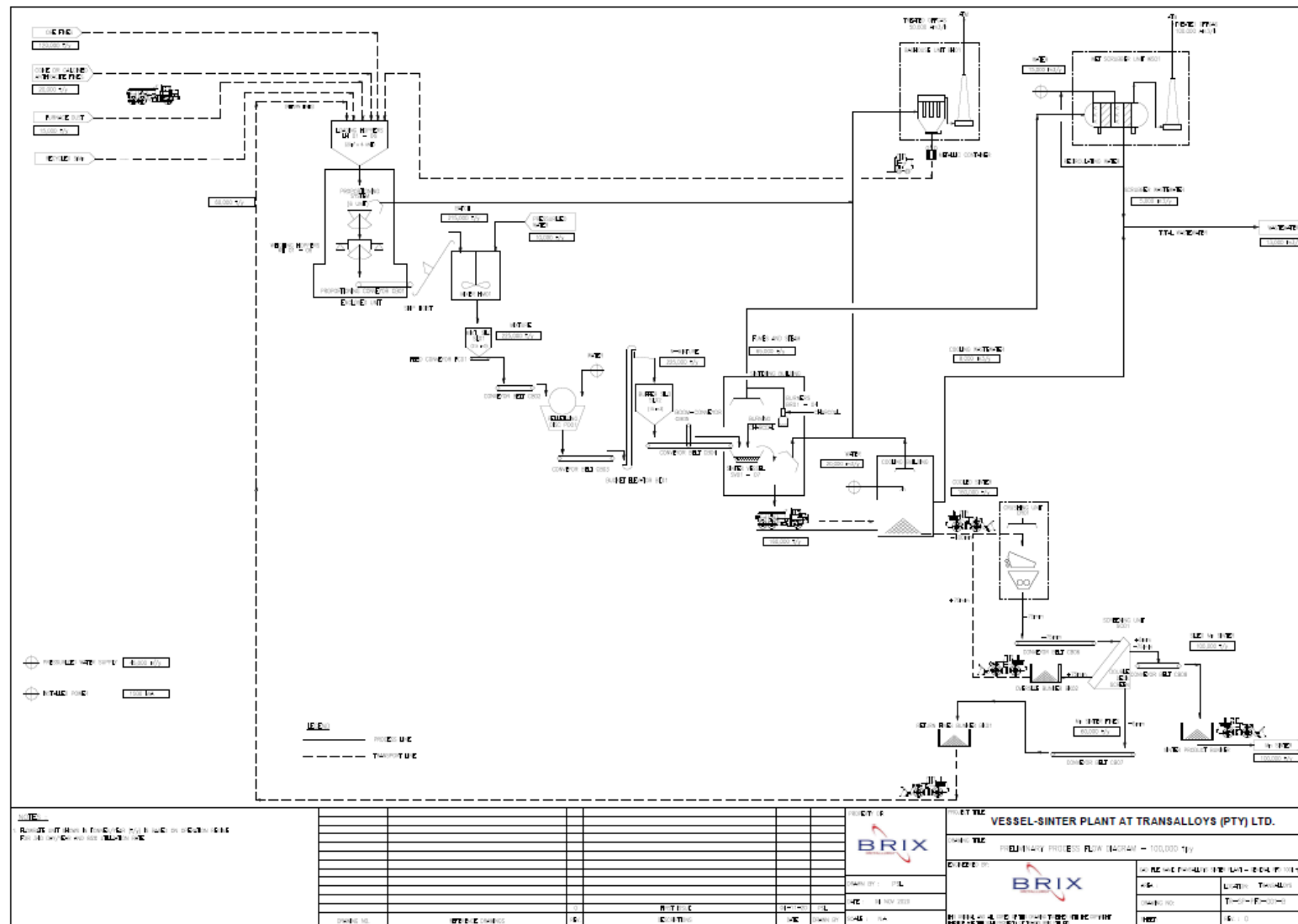


Figure 4-5: Process flow diagram (Traxys, 2020)

4.2 Screening

The Department of Environmental Affairs (DEA) screening tool was used and a screening report generated. The following came from the report:

Aspect:	Sensitivity:	Requirement:
EMF		Olifants Environmental Management Framework (EMF): EMF for Olifants and Letaba Rivers Catchment Areas – Zone A Highveld / Energy Hub Area
		Air Quality Priority Area Highveld Priority Area <u>Specialist study:</u> Mamadi & Company SA (Pty) Ltd, 2021. Atmospheric Impact Report – Proposed Sinter Plant addition at Transalloys (Pty) Ltd, eMalahleni. Specialist report version 1, MC20TRA01 by Dr Ola Akinshipe.
Agricultural	High	The project area has been used for industrial purposes for many years (> 13 years). Sections of the Transalloys property (non-operational areas) are still used for agricultural purposes (livestock).
Animal	Medium	Mammalia: <i>Chrysospalax villosus</i> (Rough-haired Golden Mole) Industrial site with industrial and human activity not allowing animals to naturally occur.
Aquatic biodiversity	Low	Industrial site. Brugspruit & Brugspruit tributary > 500m away with other infrastructure between project site and water course.
Civil aviation	Medium	8 -15 km of civil aviation aerodrome. No impact on project. Project has no impact on aerodrome > 8km away.
Plant	Low	The site is void of vegetation.
Defence	Low	No impact.
Terrestrial biodiversity	Very high	Vulnerable ecosystem. Industrial site which is developed and operational and therefore no ecosystem present / remaining on site.
Archaeological and Cultural Heritage	Very high	Grade II (provincial) Heritage site: The old Clewer Railway Station, dating back to the days of the NZASM Railway in the 1890's. The site is located 1.7 km south-east of the development site. Grave yard: The grave yard was identified in 2015 during the larger site assessment. It is located 1.25 km north-east of the site where the Sinter Plant is planned.

Aspect:	Sensitivity:	Requirement:
		The chances of finding any heritage related features are indeed extremely slim, if any. See attached exemption letter from Archaetnos (Appendix D).
Palaeontology	Very high	<p>Shale and sandstone of the Vryheid Formation of the Ecca Group of the Karoo Supergroup underlie the study site. The sedimentary rocks of the Vryheid Formation are highly fossiliferous in places. The uppermost part of the underlying rocks is highly weathered, however, which diminishes the possibility of finding fossils of good quality in the study area.</p> <p>No geological outcrops were observed, and therefore no fossils were found during the site assessment in the southern part of the study site where the proposed Sinter Plant is to be built. See attached from Dr Francois Durand (Appendix D).</p>

4.3 Need and desirability

Addressing need and desirability is a way of ensuring sustainable development. Therefore, the project must be ecologically sustainable and socially and economically justifiable.

Economic Investment or Capital Value:	R10 million
Job created:	10 permanent jobs 25 temporary jobs
Need & desirability	<p>The project is required to improve process efficiency and effectiveness as well as reduce waste to be disposed. Sinter is required to produce High Carbon product. The Sinter Plant will be established in an operational industrial plant area and therefore no further disturbance of the biophysical environment is expected.</p> <p><u>Biodiversity:</u> No removal of flora and therefore no disturbance of fauna habitat.</p> <p><u>Air quality:</u> The emissions from the process will be mitigated and managed.</p>
Fatal flaws:	No fatal flaws were identified.

5 LEGAL FRAMEWORK

5.1 Constitution of the Republic of South Africa (CRSA)

The Constitution of the Republic of South Africa (CRSA), 1996 (Act 108 of 1996) places a duty on the State to protect the environment. Section 24 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.”

The right in the CRSA is given effect in several articles of national legislation including the National Environmental Management Act (NEMA), 1998 (Act 107 of 1998) as amended.

5.2 National Environmental Management Act (NEMA)

The National Environmental Management Act (NEMA), 1998 (Act 107 of 1998) as amended is the overarching environmental legislation in South Africa.

5.2.1 Sustainable development

The principle of Sustainable Development has been established in the CRSA and given effect by the NEMA. Section 1(29) of NEMA states that sustainable development means the integration of social, economic and environmental factors into the planning, implementation and decision-making process so as to ensure that development serves present and future generations. Thus, Sustainable Development requires that:

- The disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied.
- That pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied.
- That the disturbance of landscapes and sites that constitute the nation’s cultural heritage is avoided, or where it cannot be altogether avoided, is minimised and remedied.
- That waste is avoided, or where it cannot be altogether avoided, minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner.
- That a risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions.
- Negative impacts on the environment, on people’s environmental rights be anticipated; and, prevented, and where they cannot altogether be prevented, are minimised and remedied.

Duty of care is addressed in Section 28 of the NEMA.

In terms of sustainable development:

- ***The disturbance of ecosystems, loss of biological diversity and the disturbance of landscapes and sites that constitute the nation’s cultural heritage are avoided***

through the placement of the Sinter Plant within the existing operational footprint of the plant area which is already disturbed and not on a green fields area.

- *Pollution and degradation of the air environment in an Air Quality Priority Area (Highveld Priority Area) are minimised through the installation of baghouses and scrubbers.*
- *Waste cannot be avoided in an industrial process but will be handled at the existing licensed Waste Management Facilities (WML 12/9/11/L261/6) on-site or removed off-site for recycling / disposal as per the Environmental Management Programme (EMP).*
- *Other potential negative impacts identified will also be managed through the EMP.*

5.2.2 NEMA regulations

Government Notice Regulation (GNR) 982, 983, 984 and 985 of 4 December 2014 contain the latest regulations pertaining to Environmental Impact Assessment (EIA) under sections 24(5), 24M and 44 of the NEMA. These were amended / updated on 7 April 2017 under GNR 324, 325, 326 & 327.

GNR 982 as amended / updated in GNR 326 stipulate requirements in terms of processes to be followed and information to be included in documentation.

GNR 984 as amended / updated in GNR 325 was considered and no applicable activities were identified.

GNR 985 as amended / updated in GNR 324 was considered and no applicable activities were identified.

All activities identified for this project, which require environmental authorisation, are contained in GNR 983 as amended / updated in GNR 327.

5.2.3 Listed activities applicable

The following listed activities require environmental authorisation:

GNR & Date	Activity Number and Description	Project Description
GNR 983 as amended / updated in GNR 327 of 7 April 2017	Activity 34: The expansion of existing facilities or infrastructure for any process or activity where such expansion will result in the need for a permit or license or an amended permit or license in terms of national or provincial legislation governing the release of emissions, effluent or pollution.	The existing Transalloys operations, facilities and infrastructure in Clewer will be expanded to include a Sinter Plant. The expansion will require amendment to the existing Atmospheric Emissions License (AEL).

5.3 National Environmental Management: Biodiversity Act (NEMBA)

5.3.1 Commitment to biodiversity conservation

Although South Africa became a signatory to the Convention of Biological Diversity in 1998, the more recent enactment of national legislation has affirmed our country's commitment to biodiversity and conservation as required in the CRSA. The National Environmental Management: Biodiversity Act (NEMBA), 2004 (Act 10 of 2004) has been promulgated by the South African President and was published in the Government Gazette in June 2004 (Volume 467; No. 26426). One of the objectives of this Act is to provide for the management and conservation of South Africa's biodiversity within the framework of the NEMA and to ensure the sustainable use of indigenous biological resources.

The Act, in protecting biodiversity, deals with:

- the protection of threatened ecosystems and species;
- the control of alien invasive species;
- the control of genetically modified organisms; and
- regulates bioprospecting.

As with NEMA, NEMBA incorporates and gives effect to international agreements relating to biodiversity.

5.3.2 Protection of threatened ecosystems and species

Ecosystems that are Critically Endangered, Endangered or Vulnerable can be listed in terms of Section 52 of the Act as threatened ecosystems at both national and provincial level. For example, Critically Endangered ecosystems are defined in the Act as being 'ecosystems that have undergone severe degradation of ecological structure, function or composition as a result of human intervention and are subject to an extremely high risk of irreversible transformation'. Importantly, any land-use change application occurring within an ecosystem listed as Critically Endangered or Endangered will automatically require environmental authorisation.

The terrestrial biodiversity theme indicates a vulnerable ecosystem. The area planned for the Sinter Plant establishment is however, void of vegetation.

Threatened or Protected Species Regulations of 2013 (GNR388 of 2013): Part 2 of NEMBA provides for listing of species that are threatened or in need of protection to ensure their survival in the wild, while regulating the activities, including trade, which may involve such listed threatened or protected species and activities which may have a potential impact on their long-term survival. In February 2007, the Minister of Environmental Affairs and Tourism published a list of Critically Rare, Endangered, Vulnerable and Protected Species, according to Section 56(1) of the Act, which was updated again in 2013.

5.3.3 Control of alien invasive species

The list of alien and invasive species is intended to provide a legal framework to manage and control alien species that are considered invasive and that have the potential to threaten biodiversity, water resources and agricultural potential. NEMBA has identified all species that should be considered as alien or invasive species, as well as the restricted activities relating to each species. It is now required by law (from 1 October 2014), for landowners to investigate the type and extent of alien invasive species growing on their property and to implement an effective control and eradication management plan.

116.26km² of tertiary catchment B11 is covered under alien invasive vegetation (EMF, 2009). Alien and invasive species are found on the Transalloys property. Refer to Alien and Invasive Species Regulations, 2014 (GNR598). An alien invasive eradication programme has been established by Transalloys to control alien and invasive vegetation.

5.4 National Environmental Management: Waste Act (NEMWA)

In terms of the National Environmental Management: Waste Act (NEMWA), 2008 (Act 59 of 2008), the following is relevant to this project:

- DEA's Draft guidelines on the Separation of Waste at Source, 2018.
- GNR 926 of 29 November 2013. National Norms and Standards for the Storage of Waste. The storage of waste material on site has to comply with these Norms and Standards.
- GNR1093 of 11 October 2017. National Norms and Standards for the Sorting, Shredding, Grinding, Crushing, Screening or Bailing of General Waste.
- GNR 634 of 23 August 2013. Waste classification and Management Regulations (WCMR).
- GNR 635 of 23 August 2013. National Norms and Standards for the Assessment of Waste for landfill disposal.
- GNR331 of 2 May 2014. National Norms and Standards for the remediation of contaminated land and soil quality.
- Waste Management License (WML) 12/9/11/L261/6 for Mn slimes and slag dump. These existing facilities will be used for disposal of waste not taken off-site

5.5 National Environmental Management: Air Quality Act (NEMAQA)

In terms of the National Environmental Management: Air Quality Act (NEMAQA), 2004 (Act 39 of 2004), the following is relevant to this project:

- Location within Highveld Priority Area in terms of air quality.
- Existing AEL 17/04/AEL/MP312/11/05 as amended in 2019 and valid to 2024
 - Category 4: Metallurgical Industry.
 - Existing sub-categories:
 - Category 4.6: Basic Oxygen Furnaces in steel making industry
 - Category 4.9: Ferro-alloy Production with Mn using heat
 - Category 4.11: Agglomeration Operations – production of pellets or briquettes
 - Category 4.20: Slag Processes
 - New sub-category (amendment required):
 - Category 4.5: Sinter Plants (relates to this application and process) – agglomeration of fine ores using heat

5.6 National Water Act (NWA)

5.6.1 Water uses

The National Water Act (NWA), 1998 (Act 36 of 1998) Section 21 defines water use as:

- (a) taking water from a water resource.
- (b) storing water.
- (c) impeding or diverting the flow of water in a watercourse.
- (d) engaging in a stream flow reduction activity contemplated in section 36.
- (e) engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1).

- (f) discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit.
- (g) disposing of waste in a manner which may detrimentally impact on a water resource.
- (h) disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process.
- (i) altering the bed, banks, course or characteristics of a watercourse.
- (j) removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people.
- (k) using water for recreational purposes.

The project does not trigger any new water uses. Transalloys has an existing Water Use License (WUL) for Section 21 (a), (g) & (j).

5.6.2 Legal requirements

The NWA states in Section 22 (1) that a person may only use water –

- (a) without a licence –
 - (i) if that water use is permissible under Schedule 1;
 - (ii) if that water use is permissible as a continuation of an existing lawful use; or
 - (iii) if that water use is permissible in terms of a general authorisation issued under section 39;
- (b) if the water use is authorised by a licence under this Act; or
- (c) if the responsible authority has dispensed with a licence requirement under subsection (3).

Transalloys has a Water Use License (WUL), Licence 16/2/7/B100/B175 for Section 21 (a), (g) & (j).

5.7 Conservation of Agricultural Resources Act (CARA)

Conservation of agricultural potential:

The aim of the Conservation of Agricultural Resources Act (CARA), 1983 (Act 43 of 1983) is to provide for control over the utilization of the natural agricultural resources of the Republic in order to promote the conservation of the soil, the water sources and the vegetation and the combating of weeds and invader plants; and for matters connected therewith.

To achieve this aim, the following objectives are included:

- To provide for the conservation of the natural agricultural resources of the Republic by the maintenance of the production potential of land;
- The combating and prevention of erosion and weakening or destruction of the water sources, and
- The protection of the vegetation and the combating of weeds and invader plants.

Combating weeds and invader plants:

In 1984, regulations were passed in terms of the CARA, regulations declaring about 50 species “weeds” or “invader plants”. On 30 March 2001, the Minister of Agriculture promulgated an amendment to these regulations. This amendment then contained a more comprehensive list of species that are declared weeds and invader plants dividing them into three (3) categories. These categories are as follows:

- Category 1: Declared weeds that are prohibited on any land or water surface in South Africa. These species must be controlled, or eradicated where possible.

- Category 2: Declared invader species that are only allowed in demarcated areas under controlled conditions and prohibited within 30m of the 1:50 year flood line of any watercourse or wetland.
- Category 3: Declared invader species that may remain, but must be prevented from spreading. No further planting of these species is allowed.

In terms of the amendments to the regulations under the CARA, landowners are legally responsible for the control of alien invasive vegetation species on their properties. An alien invasive eradication programme has been established by Transalloys to control alien and invasive vegetation.

5.8 National Heritage Resources Act (NHRA)

5.8.1 Legislation

The National Heritage Resources Act (NHRA), 1999 (Act 25 of 1999) requires protection of the following cultural heritage resources:

- a. Archaeological artifacts, structures and sites older than 100 years;
- b. Ethnographic art objects (e.g. prehistoric rock art) and ethnography;
- c. Objects of decorative and visual arts;
- d. Military objects, structures and sites older than 75 years;
- e. Historical objects, structures and sites older than 60 years;
- f. Proclaimed heritage sites;
- g. Grave yards and graves older than 60 years;
- h. Meteorites and fossils; and
- i. Objects, structures and sites of scientific or technological value.

The national estate includes the following:

- a. Places, buildings, structures and equipment of cultural significance;
- b. Places to which oral traditions are attached or which are associated with living heritage;
- c. Historical settlements and townscapes;
- d. Landscapes and features of cultural significance;
- e. Geological sites of scientific or cultural importance;
- f. Archaeological and paleontological importance;
- g. Graves and burial grounds;
- h. Sites of significance relating to the history of slavery; and
- i. Movable objects (e.g. archaeological, paleontological, meteorites, geological specimens, military, ethnographic, books etc.).

The area planned for the Sinter Plant establishment is within an existing operational area but is classified as a high sensitivity in terms of Archaeology & Cultural Heritage as well as Palaeontology. Archaeologist and palaeontologist therefore conducted investigations. Grade II heritage site (Clewer Railway Station) and grave yard are located more than 1km from the proposed site and no impacts are anticipated.

5.9 Other documents

The following documents were also considered:

- Department of Environmental Affairs (DEA), 2017. Integrated Environmental Management Guideline. Guideline on need and desirability. ISBN 978-0-9802694-4-4.
- DEA, 2017. Public participation guideline in terms of NEMA, 1998 EIA regulations. ISBN 978-0-9802694-2-0.
- Olifants Environmental Management Framework (EMF).

5.10 Supporting information

Appendix C contains copies of the existing licenses:

- WUL 16/2/7/B100/B175 for Section 21 (a), (g) & (j)
- WML 12/9/11/L261/6 for Mn slimes and slag dump
- AEL 17/04/AEL/MP312/11/05 for Category 4

6 ENVIRONMENTAL SETTING

6.1 Socio-economic Overview

Province:	Mpumalanga
District:	Nkangala District Municipality (NDM)
Local municipality:	eMalahleni
Spatial:	<p>The eMalahleni Local Municipality is strategically located in terms of the provincial context and transport network. It is situated in close proximity to the City of Johannesburg, City of Tshwane and Ekurhuleni Metropolitan Municipalities in Gauteng, and is connected to these areas by the N4 and N12 freeways.</p> <p>The southern areas of the eMalahleni Local Municipality form part of the region referred to as the Energy Mecca of South Africa, due to its rich deposits of coal reserves and power stations. The southward road and rail network connect the eMalahleni area to the Richards Bay and Maputo harbours, offering export opportunities for the coal reserves.</p> <p>In terms of the overall spatial structure, the eMalahleni Local Municipality can be described as a rural area, consisting of large farms, dispersed urban settlements, coal mines and power stations. A dominating feature in terms of the spatial structure is the transport network; specifically the N4 freeway and adjacent railway line which transverse the area from east to west and constitute the Maputo Corridor. The point of convergence of the N4 and N12 freeways and the railway lines that run parallel to these roads is a focal point in the spatial structure. eMalahleni town and its extensions have developed in a linear pattern along these freeways and railway lines, with the Central Business District (CBD) located north of the convergence point. There are various secondary roads in the area which provide strong north-south linkages. The dams and rivers in the area are also significant form-giving elements in the spatial structure. The rich coal deposits and coal mines throughout the area pose physical constraints to settlement development and expansion.</p> <p>The development pattern of the municipal area can be described as fragmented, due to the following attributes:</p> <ul style="list-style-type: none"> • The previous dispensation of separate development based on race; • Large areas within the municipal area are undermined or have mining rights. A good example of this is the area between the eMalahleni CBD and Kwa-Guqa, which resulted in the physical separation of these areas;

	<ul style="list-style-type: none"> • The Eskom power lines on the boundaries and within Kwa-Guqa hampers urban development within Kwa-Guqa; • Wetlands in the area between the eMalahleni CBD and Kwa-Guqa which pose a constraint to development in this area; • The Witbank Dam and Olifants River east of eMalahleni pose natural barriers for development in an easterly direction; and • The two freeways (N4 and N12) divide the eMalahleni urban areas in three (3) separate parts and hamper traffic flow between these areas.
<p>Demographics:</p>	<p><u>Area:</u> 2 677.67 km²</p> <p>Statistics South Africa: Population was 395 466 in 2011. Population was 455 228 in 2016. This represents a 3.2% growth rate per annum giving an estimate of 500 343 people in 2019. Population of 707 530 estimated for 2030. Households increased from 119 874 in 2011 to 150 420 in 2016 with household size declining from 3.3 to 3 over the same period. This is the third largest population in the province.</p> <p>Youth (15 – 34 years) make up 43.1% of population. Males are 52.9% of the population. Females are 47.1% of the population.</p> <p>(eMalahleni.gov.za)</p>
<p>Education:</p>	<p>25.5% increase in 20+ population from 2011 to 2016. No schooling declined from 14% (1996) to 5% (2016). Primary schooling declined from 20% (1996) to 10% (2016). Secondary schooling declined from 35% (1996) to 34% (2016). Matric increased from 18% (1996) to 37% (2016). Post matric declined from 10% (1996) to 8% (2016). Only one (1) satellite university in eMalahleni.</p> <p>(eMalahleni.gov.za)</p>
<p>Employment:</p>	<p>Unemployment decreased from 27.3% (2011) to 25.4% (2015) and then increased to 26.6% (2016). Poverty headcount deteriorated from 8% (2011) to 10.9% (2016).</p> <p>(eMalahleni.gov.za)</p>

<p>Health:</p>	<p>Top three (3) causes of death:</p> <ol style="list-style-type: none"> 1. Influenza & pneumonia 2. Tuberculosis 3. Other external causes of accidental injury <p>HIV prevalence rate was measured at 40.7% in 2013, the 9th highest of municipal areas in the province.</p> <p>(eMalahleni.gov.za)</p>
<p>Economy:</p>	<p>Population growth rate is higher than economic growth rate. This has a negative implication on GDP per capita, infrastructure, service delivery and job creation.</p> <p>eMalahleni contributes 45.9% of the economy of NDM (2019 Provincial Municipal Profile Report by Department of Economic Development & Tourism).</p> <p>eMalahleni is the biggest economic contributor to NDM and the second largest in the Province (after Mbombela) with 18% contribution to Provincial GDP in 2018.</p> <p>Economy was R66 billion in 2018.</p> <p>Sectors contributing (2017):</p> <ul style="list-style-type: none"> • Mining: 55% • Trade 9.1% • Community services: 8.9% • Finance: 7.9% <p>Projected GDP is 0.9% between 2018 and 2023.</p> <p>(eMalahleni.gov.za)</p>
<p>Land uses:</p>	<ul style="list-style-type: none"> • <u>Mining</u>: Coal mining is mainly conducted by opencast techniques, high extraction underground operations and conventional board-and-pillar underground operations. The coal mines provide essential fuel to the local power stations as well as to the domestic and international markets. Numerous abandoned mining operations are located towards the west and north-west of Witbank. • <u>Power stations</u>: Several large coal-fired power stations including Arnot, Hendrina, Komati, Duhva, Matla, Kriel and Kendal. These stations are all supplied from local feeder mines. Large ash disposal operations are associated with each power station. • <u>Industrial</u>: Although eMalahleni was traditionally known for coal mining and electricity production, other industries have also developed in the town, making eMalahleni a prominent industrial node. This includes metallurgical enterprises such as the production of steel, chrome and vanadium. Industries include Silicon Smelters, Glencore, Char Technologies, Bushveld Vanchem, Ferrobank Industrial area, Evraz Highveld, Ferrometals.

	<ul style="list-style-type: none"> • <u>Agricultural</u>: Crop cultivation & livestock farming. Both dryland and irrigated farmlands, with many areas in the southern and central portions producing high yields of maize. Irrigation farming of diverse crops, the largest of which is the Loskop Dam Irrigation Scheme. Intensive farming in the form of piggeries and cattle feed lots. 54.99km² of tertiary catchment B11 is under irrigation (EMF, 2009). • <u>Urban</u>: Witbank, Clewer & Kwa-Guqa
<p>Transalloys' operations:</p>	<p><u>Production processes and products</u>: The Transalloys plant manufactures silico-manganese (Si-Mn) and medium carbon ferromanganese (Fe-Mn) through processing in submerged arc furnaces. Medium carbon Fe-Mn is mainly used for alloying, especially in the manufacture of hot dipped strip and is also an important ingredient in welding rod coatings. Si-Mn combines both the deoxidation and alloying functions, which are the purposes of adding manganese to steel.</p> <p><u>Sinter requirement</u>: To produce High Carbon products, Transalloys requires sinter.</p> <p><u>Structures and infrastructure</u>: Transalloys has the following plants or process units:</p> <ul style="list-style-type: none"> • Raw material handling (railway lines and trucks, equipment, storage areas/bunkers, etc.) • Electrical furnaces for smelting and chemical reactions • Cooling systems for furnaces and compressors • Filter plant for handling dust from furnaces (baghouses) • Pelletizing plant (2) for pelletization of furnace dust from filter plant • Briquetting Plant for briquetting of ore fines, alloy fines and baghouse dust • Hot metal ladles • Alloy casting – bed casting (casting machines no longer in use) • Crushers and Screening plants (4) for sizing and separating final products • Transalloys Metal Recovery (TMR) plant and waste management facilities <ul style="list-style-type: none"> ○ Slag dump ○ Mn slimes dam ○ Fe-Cr slimes dam (not currently in use) • Sorting, packaging and despatch.
<p>Transalloys' socio-economic contribution:</p>	<p>Approximately R3 million is dispersed annually by Transalloys on training, social upliftment, donations and bursaries.</p> <p>More than R600 million is distributed to support industries and suppliers for the operation of Transalloys, annually.</p>

Economic Investment for project:	R10 million
Job creation:	<p>Transalloys employs over 300 people of which 75% is black.</p> <p>The new project will create another 10 permanent jobs and 25 temporary jobs.</p>

6.2 Biophysical Environmental Overview

<p>Access:</p>	<p>N4 between Pretoria and Nelspruit (Mbombela) is located 1.5 km north of Transalloys. From the N4 take the Mathews Phosa Street (Clewer) off-ramp. Transalloys entrance is along the Clewer road.</p>
<p>Services:</p>	<p><u>Electricity:</u> Transalloys operations utilises electricity sourced directly from Eskom.</p> <p><u>Water:</u> Transalloys is supplied (via pipeline) with municipal water from Emalahleni local municipality (via Witbank Dam) for its domestic (worker) and industrial uses.</p> <p><u>Sewage:</u> Sewage effluent feeds into a septic tank from which sludge is emptied with a honey sucker (for off-site disposal) and the overflow feeds into five (5) oxidation ponds which is licenced.</p>
<p>Climate:</p>	<p>Highveld climatic region.</p> <p><u>Precipitation:</u> Dry cold winters and warm summers with thunderstorms. Annual rainfall, which falls mainly during summer, varies between 550 and 800 mm. Precipitation occurs as showers and thunderstorms mainly from October to March with maximum events occurring in November, December and January. Rainstorms are often violent (up to 80 mm can occur in one day) with severe lightning and strong winds, sometimes accompanied by hail. Frost can be expected to occur between May and mid-September, with an average of 58 frost days per annum.</p> <p>Mean Annual Precipitation (MAP): 687 mm/annum Mean Annual Evaporation (MAE): 1 597 mm/annum (WR90) Mean Annual Runoff (MAR): 22.9 million m³/annum (WR2005)</p> <p><u>Temperature:</u> The annual mean temperature is 15°C. The highest average maximum daily temperatures occur during November to March ranging from 25.2°C to 27.5°C. June, July and August can be regarded as the coldest months with the average minimum temperatures ranging from 5.0°C to 6.0°C. Monthly minimum: -2.3°C (July) Monthly maximum: 33.4°C (December)</p> <p><u>Wind:</u> The prevailing wind direction throughout the year is from the northwest. Storm winds, however, usually blow from the southeast with the strongest winds occurring in the late winter and early spring. Calm conditions (wind speeds <1 m/s) occur approximately 7.4% of the time.</p>

<p>Topography:</p>	<p>Mpumalanga Highveld region.</p> <p>The average elevation is 1 500 meters above mean sea level (mamsl). The topography is defined as moderately undulating plains, and the landscape consists of gently rolling hills with scattered trees and grassland. Slopes on the site and the surrounding topography determine the natural flow of the surface runoff, specifically storm water.</p> <p>Transalloys is located on natural topographic high ground (spur), which is bounded on the western and eastern sides by two tributaries of the Brugspruit. The two tributaries confluence approximately 1.3 km northeast of the site and then the stream flows northwards towards Driefontein.</p> <p>The Transalloys plant is located between 1 538 to 1 501 mamsl sloping from west to east towards the Brugspruit over a distance of 1.88km. The site is located at 1 546mamsl.</p>
<p>Water environment:</p>	<p><u>Water Management Area (WMA):</u> 4 Olifants (54 550 km²)</p> <p><u>Sub-catchment:</u> Upper Olifants River (12 285 km²). Klipspruit drains into Olifants River above Loskop Dam (before Olifants/Wilge confluence). The Upper Olifants River catchment comprises the drainage areas of the Olifants River, Klein Olifants River and Wilge River with tributaries down to the Loskop Dam. The headwaters of these rivers are located along the Highveld Ridge in the Secunda-Bethal area and the rivers then flow in a northerly direction towards Loskop Dam. The major tributaries are the Steenkoolspruit, Klein Olifants River, Wilge River and Elands River.</p> <p><u>Catchment area:</u> 376 km²</p> <p><u>Quaternary catchment:</u> B11K</p> <p><u>Dams:</u> The natural rivers and streams have been extensively dammed with the result that the stream flow is now highly regulated. The major impoundments upstream of Loskop Dam include Witbank Dam, Middelburg Dam, Bronkhorstspruit Dam and Premiere Mine Dam. Many smaller farm dams and water supply structures associated with the mining operations have also been constructed in the catchment.</p> <p><u>Streams / rivers:</u> The Brugspruit and its tributary runs through the Transalloys property. The Brugspruit is a tributary of the Klipspruit.</p> <p><u>Wetlands:</u> Valley bottom wetland with a channel, valley bottom wetland without a channel, hillslope seepage wetland feeding a water course and 2 hillslope seepage wetlands not</p>

	<p>feeding a water course were found on the Transalloys site (Ikhaphozi Enviro, 2012).</p> <p><u>Legal:</u> Transalloys has a WUL 16/2/7/B100/B175 for Section 21 (a), (g) & (j) water uses in terms of the NWA. No changes required for this license in terms of this project.</p> <p><u>Water requirements:</u> Transalloys utilises approximately 27 000 m³/month of water. Water is used in the operations for:</p> <ul style="list-style-type: none"> • domestic purposes by workers (drinking, food preparation in canteen, ablution), • cooling purposes (furnaces, compressors and slag), • reprocessing of slag (TMR plant), • transport (slimes from TMR plant reprocessing to Mn slimes dam), and • dust suppression (roads, raw material area). <p><u>Water sources:</u> Water for domestic and cooling purposes is sourced from the municipal water supply. Water in the waste management circuit (waste processing, slimes transport & deposition) is recycled in a closed circuit via a penstock in the Mn slimes dam and a Return Water Dam (RWD). Captured storm water is also used, for dust suppression and quenching.</p> <p><u>Storm water:</u> Storm water is controlled by contour drains and cut off trenches that will separate clean and dirty water. Storm water drains around the waste disposal area direct any rain water flow to the RWD. Storm water drains around the plant direct runoff to the Pollution Control Dam (PCD).</p>
<p>Air environment:</p>	<p><u>Highveld Priority Area:</u> National air pollution hotspot in terms of Section 18(1) of the NEMAQA on 23 November 2007.</p> <p><u>Wind directions and speed (Mamadi & Company, 2021):</u> Periodic (24 hours) and day-time wind fields show strong winds from North West, North-north West & North with strong but less frequent winds from East and West. Night-time wind fields show strong winds from North, East and North-north east.</p> <p>Wind speed: 3m/s</p>

	<p>Legal: Transalloys has an AEL 17/04/AEL/MP312/11/05 for Category 4 (Metallurgical Industry) in terms of the NEMAQA.</p> <ul style="list-style-type: none"> • Category 4.6: Basic Oxygen Furnaces in steel making industry • Category 4.9: Ferro-alloy Production with Mn using heat • Category 4.11: Agglomeration Operations – production of pellets or briquettes • Category 4.20: Slag Processes <p>A new sub-category (amendment required) for Category 4.5: Sinter Plants – agglomeration of fine ores using heat.</p> <p><u>Existing impacts on air quality (Mamadi & Company, 2021):</u></p> <ul style="list-style-type: none"> • Mining • Industrial • Agriculture • Domestic fuel combustion • Vehicle tailpipe emissions • Open areas (wind erosion)
<p>Waste management:</p>	<p><u>Location:</u> The waste management area is located north-east of the Transalloys plant on the remainder portions 20 and 24 of the farm Schoongezicht 308 JS.</p> <p><u>Deposition:</u> Deposition is land building.</p> <p><u>Waste types:</u> Four (4) different types of industrial waste were identified namely:</p> <ul style="list-style-type: none"> • slag waste resulting from processing at Transalloys plant (current arising's which gets reprocessed upon cooling)

	<ul style="list-style-type: none"> slag (coarse waste) from reprocessing at the TMR plant deposited on the same footprint as the original slag; Mn slimes (fines from reprocessing of slag deposited on a Mn slimes dam of 6ha; and historic Fe-Cr slimes on a Fe-Cr slimes dam (in the process of decommissioning and closure). <p><u>Reprocessing:</u> All historically stockpiled Fe-Mn and Si-Mn slag have been reprocessed and only new slag arising's from the Transalloys plant is processed at the TMR plant. The overall objective of the TMR plant is to concentrate metal from the relatively low-grade slag from Transalloys' main plant. Reclaimed metals are returned to the Transalloys plant. The operation may be seen as an environmental clean-up since potentially hazardous or harmful metals are removed from the waste produced and deposited by Transalloys. A reduced quantity of waste requires disposal and the waste requiring disposal is of a less hazardous nature. A secondary effect of reprocessing is that fine material, which with time would have been transported elsewhere by wind and/or rain, is concentrated in a slimes dam.</p> <p><u>Sinter plant waste:</u> Any waste from the sinter plant will be recycled, disposed off-site or deposited onto the existing Waste Disposal Facility (WDF).</p>
<p>Archaeology & Cultural Heritage (Archaetnos, 2021)</p>	<p><u>Grade II (provincial) Heritage site.</u> The old Clewer Railway Station, dating back to the days of the NZASM Railway in the 1890's. The site is located 1.7 km south-east of the development site.</p> <p><u>Grave yard:</u> The grave yard was identified in 2015 during the larger site assessment. It is located 1.25 km north-east of the site where the Sinter4 Plant is planned.</p> <p>The chances of finding any heritage related features on the proposed site are indeed extremely slim, if any.</p>
<p>Palaeontology (Durand, 2021)</p>	<p>Shale and sandstone of the Vryheid Formation of the Ecca Group of the Karoo Supergroup underlie the study site. The sedimentary rocks of the Vryheid Formation are highly fossiliferous in places. The uppermost part of the underlying rocks is highly weathered, however.</p> <p>The fossils that occur in the Vryheid Formation are mostly that of leaf and stem imprints of plants such as <i>Glossopteris</i>, lycopods, ferns, horsetails, conifers, cordaitaleans and ginkgoaleans. Rare fossils of silicified and coalified wood, insects, bivalves, conchostrachans and fish scales also occur in this formation.</p>

	No geological outcrops were observed. No fossils were found during the site assessment in the southern part of the study site where the proposed Sinter Plant is to be built.
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6.3 Supporting information

Appendix D contains a copy of the air quality specialist study.

7 ALTERNATIVES CONSIDERED

7.1 Land use alternative

The property is already used for industrial purposes and no alternative land use was therefore considered.

7.2 Alternative location

An alternative location on the Transalloys plant area for the Sinter Plant was considered.

This area is located (Figure 3-2):

- north of the existing Eskom HT yard;
- east of the briquetting plant; and
- west of the area reserved for the new Transalloys HT yard.

This alternative location, however, has the following disadvantages:

- The available area / space is less at 4 000m² compared to the 5 700m² of the preferred location.
- The location is close to the existing and planned new HT yard which poses a problem in terms of metal dust in close proximity to electricity which can interfere with power supply.

7.3 Alternative capacity

It was considered in the early stages to construct a 50 000 tons/annum plant but it was decided to go for a 100 000 tons/annum plant due to the scale of economics.

7.4 Alternative layout

The following alternative layouts were considered (provided by Traxys, 2020-2021):

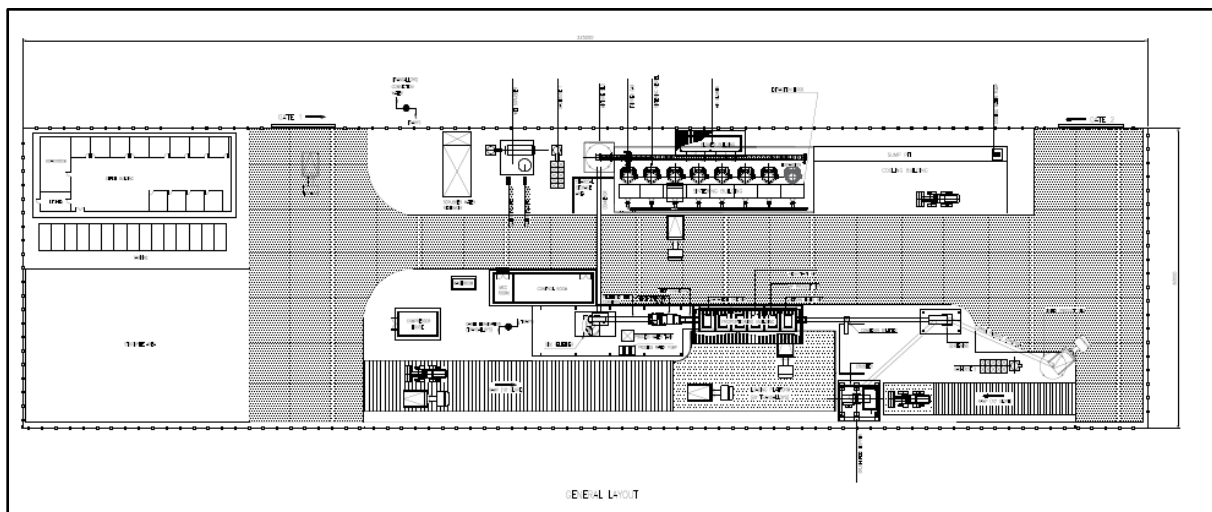


Figure 7-1: Layout 1 (green fields)

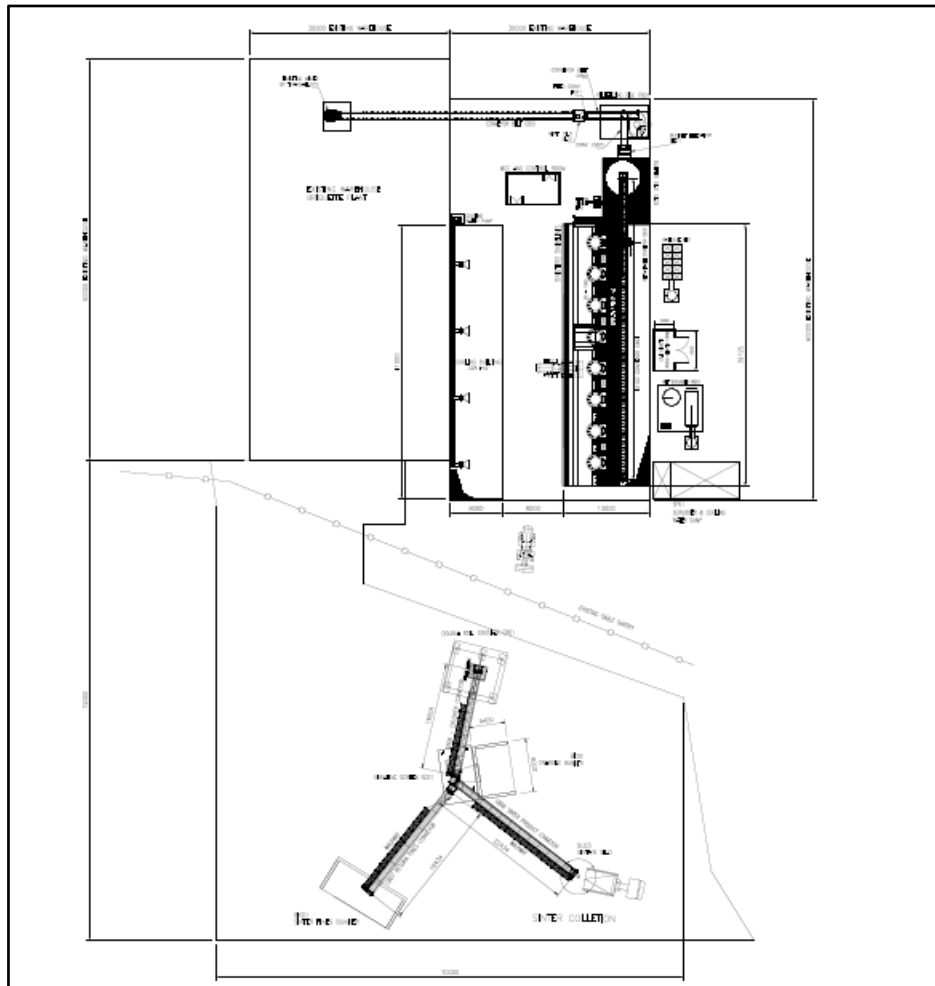


Figure 7-2: Layout 2 (warehouse)

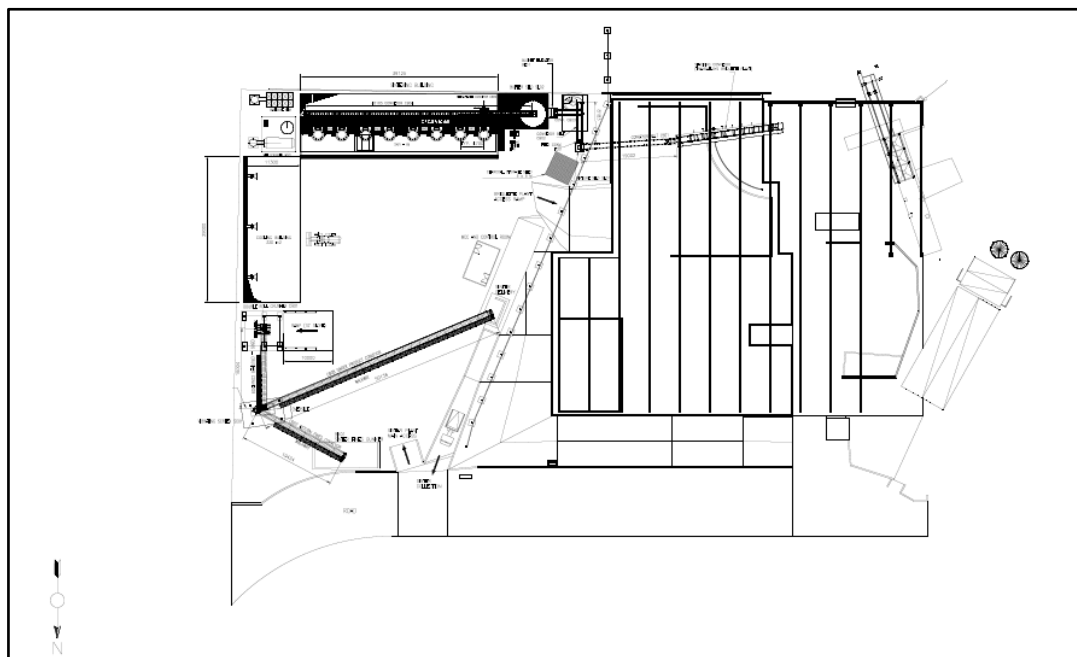


Figure 7-3: Layout 3 (north of HT yard)



Figure 7-4: Layout 4 (preferred based on preferred position – area of briquetting raw material bunkers)

The layout was determined based on the site location.

7.5 No-go alternative

The no-go alternative would be to not proceed with the project. In this case, Transalloys has two (2) options:

- Transalloys will have to source and purchase sinter from another party. This will result in Transalloys being dependent on another party for its High Carbon production process.
- Transalloys will not be able to produce High Carbon products.

8 PUBLIC PARTICIPATION PROCESS

8.1 Summary

Newspaper notice:	<p>Newspaper: Witbank News Date: 2021-02-19 Page: 16 – 17 Date: 2021-03-12 Page: 16</p> <p>Newspaper: Middelburg Observer Date: 2021-02-19 Page: 13 Date: 2021-03-05 Page: 16</p> <p>Refer to Appendix E for tear sheets.</p>
Site notices:	<p>Date placed: 24 February 2021 Size of notices: 800 X 600 mm Number of notices placed: 4 Size & wording: Figure 8-1. Location: Figure 8-2 & 8-3.</p>
Interested and Affected Parties (I&APs):	<p>Number of surrounding properties: 28 Number of property owners: 9 Number of hand-delivered notices: 9 Number of people emailed: 101 (2021-02-22 – 2021-03-09) including:</p> <ul style="list-style-type: none"> • Local municipality (±15) • District municipality (±5) • Province (±12) • National (±5) • DMR • DWS (±7) • DAFF • SAHRA` • Eskom • Other (±28)
Comments received:	<p>Registered: Evraz, Mpumalanga Provincial Government, Jennifer Kock</p>
Comments relate to:	<p>Registration and requesting copies of document for review.</p>

8.2 Introduction

The Public Participation Process (PPP) aims to provide all Interested and Affected Parties (I&APs) with clear, accurate and comprehensible information about the project for the proposed expansion of the Transalloys (Pty) Ltd operations by including a Sinter Plant which requires amendments to the existing AEL. In addition, the process seeks to provide I&APs with the opportunity to indicate their viewpoints on issues and concerns about the proposed project.

This process, therefore, enhances transparency and accountability in decision-making, as it allows all I&APs to suggest ways of avoiding, reducing or mitigating potential negative impacts, as well as enhance positive impacts of the proposed project. All inputs from the I&APs are considered in the planning process. Consequently, clear recording of all issues and concerns raised have been maintained in a comments and response register. This register has been updated when new issues or concerns were raised.

This section provides a methodical description of the PPP followed. It also contains a complete record of public notices, details of all registered I&APs and all communications to and from I&APs pertaining to the application.

8.3 Approach

The aim of the PPP is not only to adhere to the required legislation, but also to give as many stakeholders and I&APs as possible, an opportunity to be actively involved in this process.

The PPP has been carried out in accordance with Chapter 6 of the NEMA and in support of the EIA Regulations of 2014 as amended. Based on these Regulations, published in terms of Sections 39 to 44 of GNR 982 amended in GNR 326 of NEMA, the following steps were undertaken:

- Potential I&APs were identified through obtaining and updating Transalloys' latest stakeholder database, windeed searches, conducting a visit to the area and conducting interviews (24 February 2021), through site notices placed (Figures 8-1 – 8-3) as well as through placing notices in the Witbank News and Middelburg Observer;
- A stakeholder register was compiled in terms of Regulation 42 that includes national, provincial and local authorities, government departments, organisations, as well as landowners that may have an interest;
- I&APs were given more than a month to register and raise concerns (February – April 2021) which included 30 days to review the draft BAR (15 March – 14 April 2021). A hard copy was made available at the eMalahleni (Witbank) and Kwa-Guqa Libraries, Clewer Post Office and Transalloys reception. A soft copy was made available upon request. Any concerns that have been raised by I&APs were acknowledged, noted and addressed (Table 8-3 – 8-4) by the EAP where possible;
- A recorded summary of concerns raised by I&APs, as well as the responses from the EAP, were kept throughout the entire process.

8.4 Public awareness

8.4.1 Site Notices

Site notices, measuring 800 mm x 600 mm, were placed at locations where these would be most visible. The notices were placed as follows:

- Along the Transalloys access road: 25° 53' 25.3" South; 29° 07' 54.8" East
- At the security office (A4 size) along the access road: 25° 53' 27.83" South; 29° 07' 39.08" East
- At the security gate along the access road: 25° 53' 27.36" South; 29° 07' 38.42" East
- At the service entrance gate to the plant area: 25° 53' 45.97" South; 29° 07' 11.71" East
- At the main entrance to the plant: 25° 53' 40.72" South; 29° 07' 05.67" East
- Clewer Post Office (A4 size): 25° 54' 24.4" South; 29° 08' 00.1" East
- On the notice board inside the Transalloys Administrative Building (A4)

Each notice contained details regarding the applicant (Transalloys (Pty) Ltd), the nature of the activity (Sinter Plant with AEL amendment), and the contact details of the EAP (See Figure 8-1). The placement of the site notices was recorded by taking photographs of the placed notices on site, as well as by recording the GPS coordinates of these positions. See Figures 8-2 – 8-3. These notices remained on the site for the duration of the process (February – May 2021).

8.4.2 Newspaper Notice

A detailed newspaper notice was placed in the Witbank News (page 16 – 17) and Middelburg Observer (page 13) of 19 February 2021. The newspapers are distributed as follows:

Witbank News: 25 000 copies per week to:

- Witbank
- Middelburg
- Ogies
- Phola
- Kriel
- Van Dyksdrift
- Kendal Power Station
- Wonderfontein
- Arnot
- Pullenshope
- Groblersdal
- Marble Hall
- Loskop
- Bronkhorstspuit
- Stoffberg

Middelburg Observer:

- Middelburg
- Belfast
- Hendrina
- Komati Power Station
- Wonderfontein
- Arnot
- Pullenshope

- Witbank
- Groblersdal
- Marble Hall
- Loskop
- Stoffberg

The aim of placing a notice in the local newspapers was to create a greater awareness of the project and to invite a broader spectrum of I&APs to register and be part of the process.

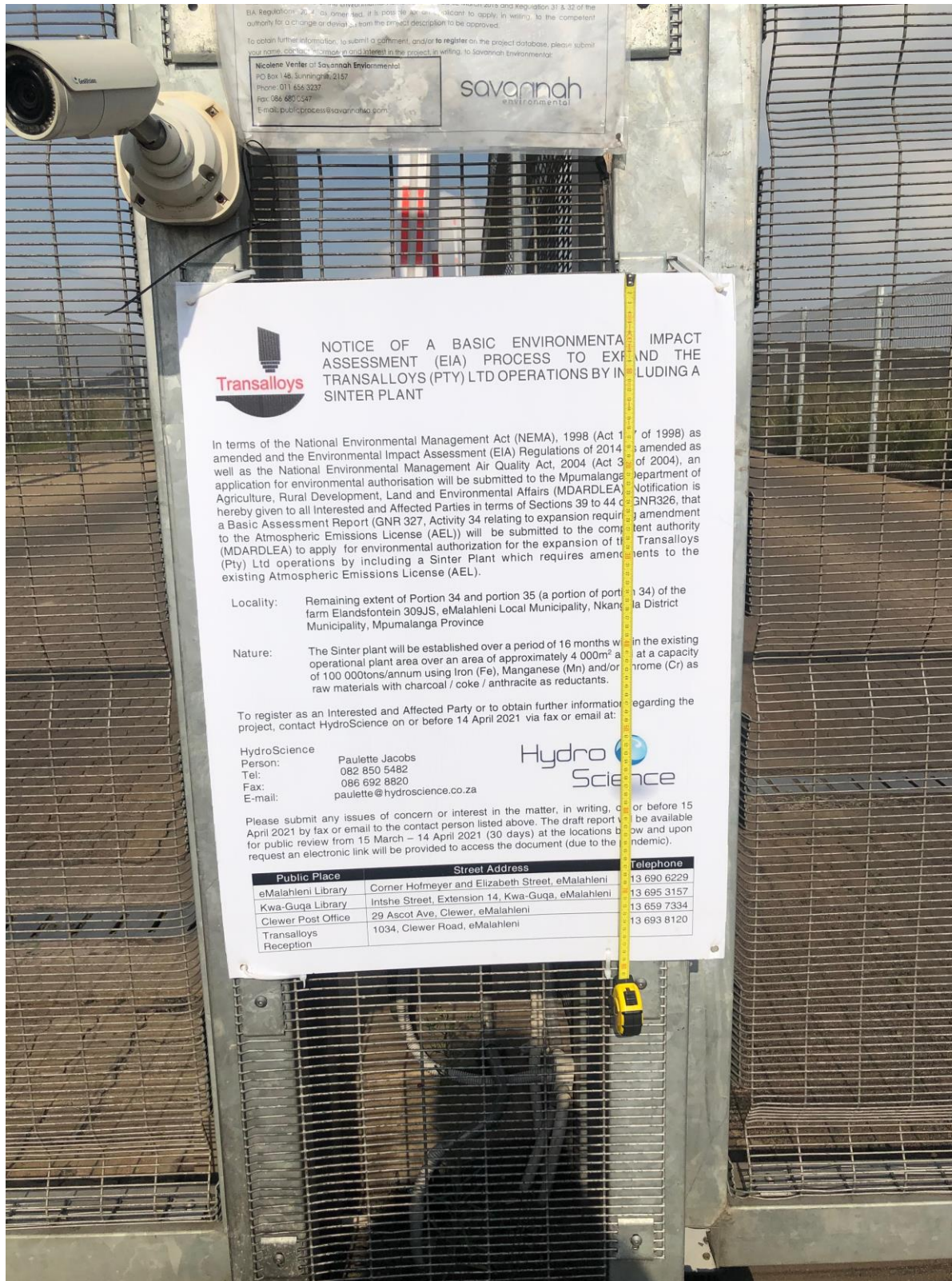
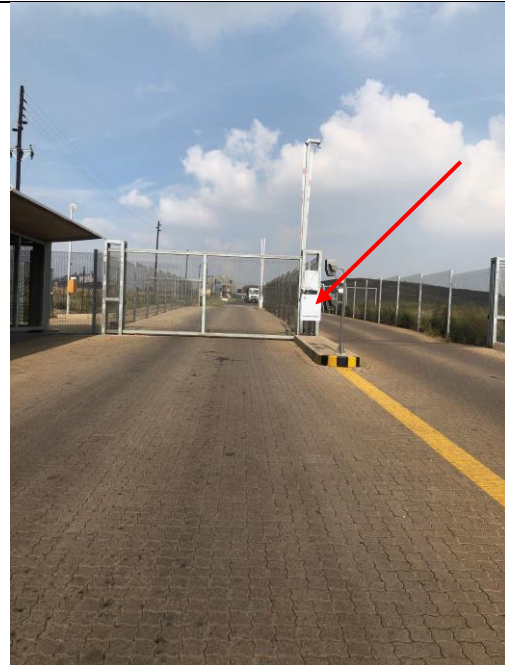
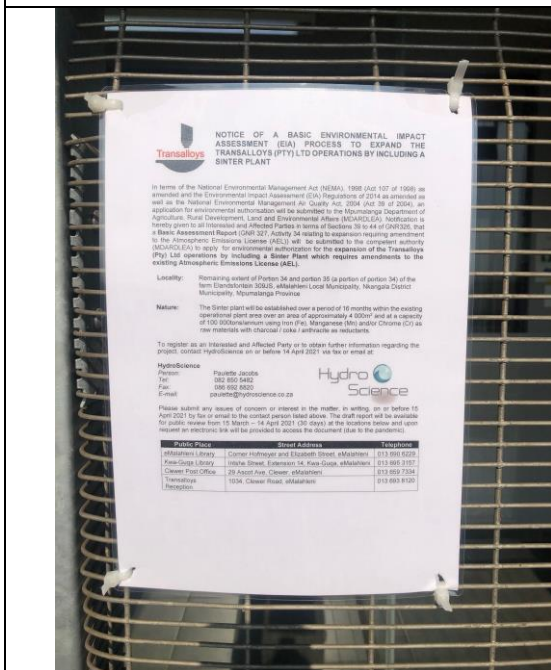


Figure 8-1: Wording and size of notices placed



At the security gate along the access road 25° 53' 27.36" South; 29° 07' 38.42" East



At the security office (A4 size) along the access road
25° 53' 27.83" South; 29° 07' 39.08" East

	
<p>Along the Transalloys access road 25° 53' 25.3" South; 29° 07' 54.8" East</p>	<p>At the service entrance gate to the plant area 25° 53' 45.97" South; 29° 07' 11.71" East</p>
	
<p>At the main entrance to the plant 25° 53' 40.72" South; 29° 07' 05.67" East</p>	<p>On the notice board inside the Transalloys Administrative Building (A4)</p>

Figure 8-2: Notices placed

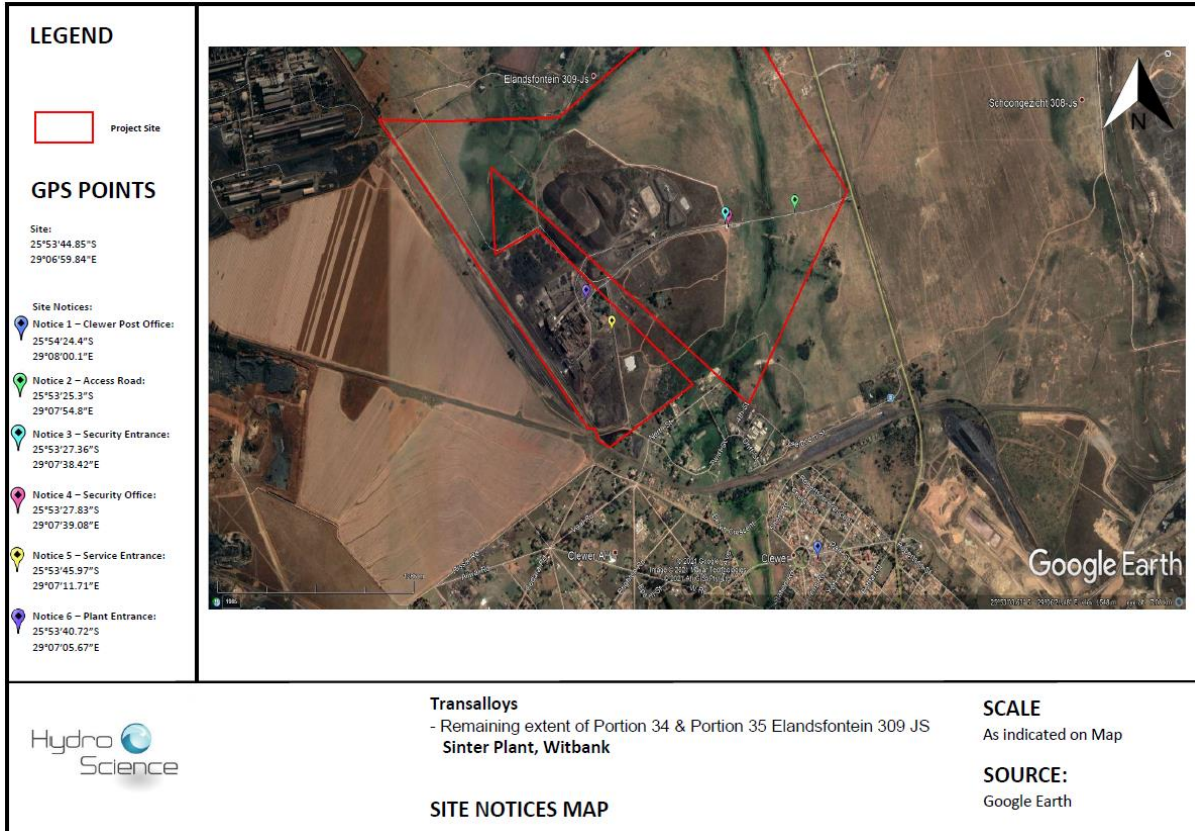


Figure 8-3: Aerial view of location of site notices

8.5 Comments and Response Register

Any concerns that were raised by I&APs during the process were recorded and addressed by the EAP where possible (see Table 8-3). All proof of communication can be seen in Appendix E.

Furthermore, all registered I&APs were given an opportunity to comment in writing (15 March – 14 April 2021), on the draft BAR before its submission to the competent authority, MDARDLEA, in May 2021.

8.6 BAR Submission

The draft BAR was made available for public review at the eMalahleni (Witbank) and Kwa-Guqa Public Libraries, the Clewer Post Office and Transalloys' reception (hard copy) and electronically upon request from 15 March to 14 April 2021. All I&APs have therefore been given an opportunity to comment on this document. Once the period for comments lapsed, all comments made were included in the comments and response register.

After submission of the draft BAR to the authorities, during the public review period, the authorities were also afforded an opportunity to submit their comments to be addressed in the final BAR.

The final BAR (including all supporting documentation) will be submitted to MDARDLEA for consideration. A decision will be provided by MDARDLEA in terms of their considerations and findings and if authorised, conditions of the authorisation will be provided.

Table 8-1: List of I&APs

Direct neighbours:

- Anglo Operations (Pty) Ltd
- Transnet Ltd
- Burger kontrakte
- Cusa (Pty) Ltd
- Evraz Highveld Steel & Vanadium
- Emerald Sky Trading 706 (Pty) Ltd
- SANRAL
- Magnificent Marketing
- Other individuals

Authorities:

- Local authority - eMalahleni
- District authority - Nkangala
- Provincial authority – MDARDLEA
- National authority – DEFF
- DMR
- DWS
- SAHRA
- DAFF

Others:

- Mpumalanga Wetland Forum
- National African Federated Chamber of Commerce (NAFCOC)
- NUMSA
- Solidariteit
- Clewer Primary School
- Clewer Creche
- Clewer residents
- Others

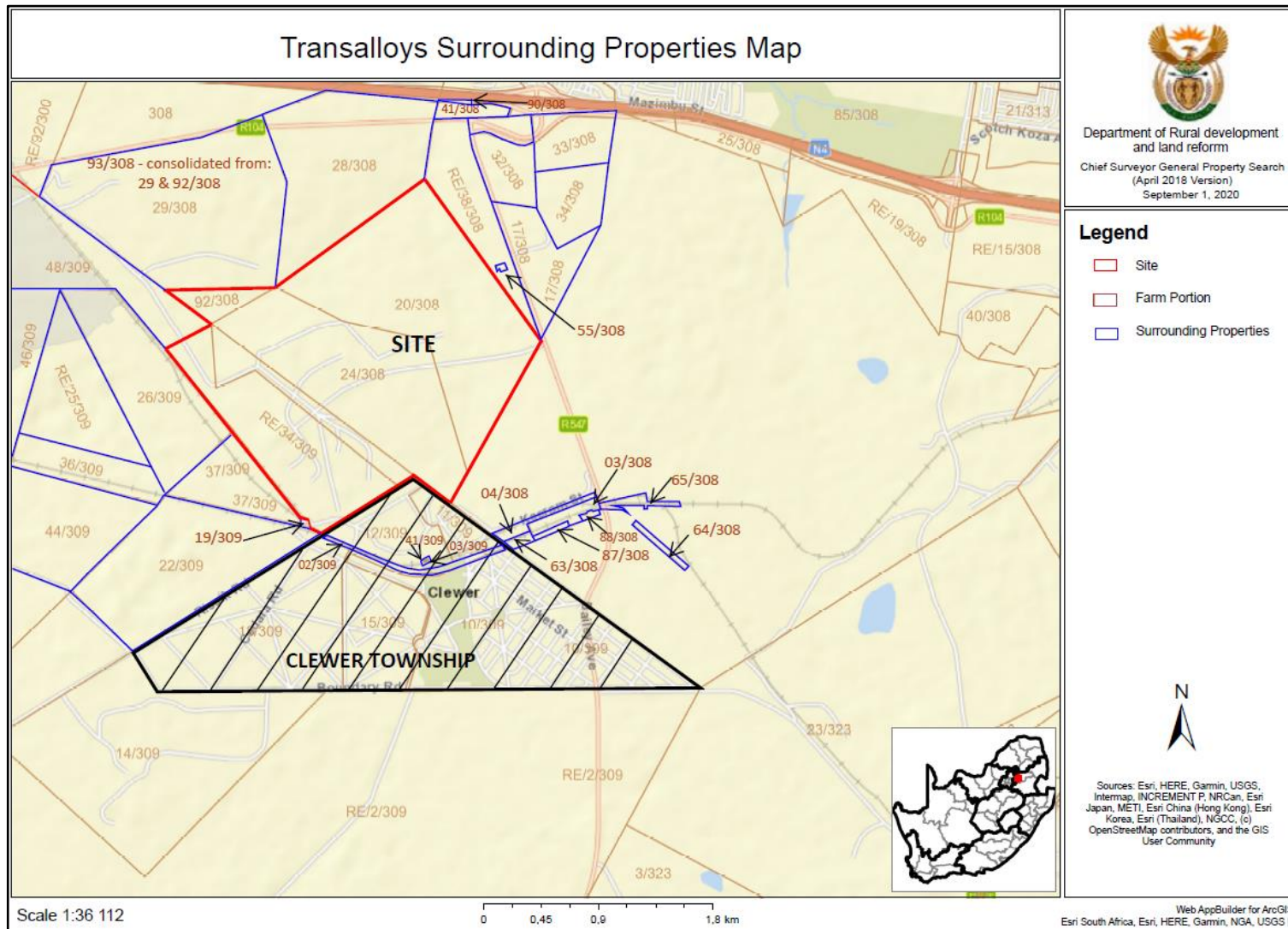


Figure 8-4: Transalloys surrounding properties

Table 8-3: Comments and responses

Entity / Person:	Date:	Comment:	Response:
Evraz Highveld Ms Thia Oberholzer	2021-02-22	Register Copy of document requested	Registered. Electronic copy provided: 202-03-15
Mpumalanga Province Tiaan Kleynhans	2021-02-23	Register Copy of document requested	
Jennifer Kock (Chair) Transalloys Waste Monitoring Committee Transalloys Mn Slag Users Association	2021-02-25	Register Copy of document requested	
Magnificent Makaring	2021-03-09	Question re direct neighbours to his property.	2021-03-09: Provided map and indicated surrounding property owners
Comments on Draft BAR			

9 IMPACT ASSESSMENT

9.1 Methodology

The significance of the adverse environmental impacts identified were assessed in terms of their:

- Duration;
- Extent;
- Probability; and
- Severity.

The above was used to determine the significance of an impact without any mitigation, as well as with mitigation.

Nature of an impact: An impact's nature can be positive (+) or negative (-).

Consequence: Considers duration, extent and severity

Consequence = duration + extent + severity

Table 9-1: Environmental risk and impact assessment criteria

DURATION (D)		
Immediate	Less than 1 month	1
Short-term	2 – 16 months (construction / assembly phase)	2
Life of project	Operational phase	3
Post-closure	Time of rehabilitation and for re-establishment of natural systems	4
Residual	A permanent impact (100 years or more)	5
EXTENT I		
Site specific	Site of the proposed work (Sinter plant location)	1
Local	Site and immediate surroundings (Transalloys property)	2
Regional	Municipal area (eMalahleni)	3
Provincial	Provincial area (Mpumalanga)	4
National	Republic of South Africa	5
PROBABILITY (P)		
Rare	<5% probability of occurrence – may occur in exceptional circumstances	1
Unlikely	15% - 6% probability of occurrence – could potentially occur at some time	2
Possible	45% - 16% chance of occurrence – might occur at some time	3
Likely	65% - 46% probability of occurrence – will probably occur in most circumstances	4
Almost Certain	90% - 66% probability of occurrence – is expected to occur	5
Definite	100% - will occur	6
SEVERITY (S)		
Catastrophic (critical)	Total change in area of direct impact, relocation not an option, death, toxic release off-site with detrimental effects, irreversible loss, huge financial loss	6

Significant (High)	> 70% change in area of direct impact due to loss of significant aspect, extensive injuries, long term loss in capabilities, off-site release to high extent, major financial implications	5
Serious	50 – 70% long-term loss, extensive rehabilitation / restoration / treatment required, high financial impact, still restricted in extent	4
Moderate (medium)	20 – 49% change, medium term loss in capabilities, rehabilitation / restoration / treatment required, on-site release with outside assistance, medium financial impact	3
Minor	10 – 19% change, short term impact that can be absorbed, on-site release, immediate containment, low financial implications	2
Insignificant (low)	< 10 % change in the area of impact, no financial implications, localised impact, a small percentage of population	1

[Duration (D) + Extent I + Severity (S)] x Probability (P) = Impact Significance (IS)

IMPACT SIGNIFICANCE (IS)		
Impact Significance	IS score range	Description
Low (L)	<15	The impact is minor or insubstantial; it is of little importance to any stakeholder and can easily be rectified.
Moderate Low (ML)	16 – 45	The impact is limited in extent, even if the intensity is major; the probability will only be likely, the impact will not have a significant impact considered in relation to the bigger picture; no major material effect on decisions and will require only small-scale management intervention bearing moderate costs.
Moderate High (MH)	46 – 70	The impact is significant to one or more stakeholders, and its intensity will be medium or high; therefore, the impact may materially affect the decision, and management intervention will be required.
High (H)	71 <	The impact could render options controversial or the entire project unacceptable if it cannot be reduced to acceptable levels; and/or the cost of management intervention will be a significant factor in project decision-making.

9.2 Impact Assessment Ratings

The impacts and associated significance ratings for the Sinter Plant for assembly / construction phase and operational phase for the various alternatives (different layouts and different positions) were assessed (Tables 9.2 – 9.4). The no-go option (Table 9.5) would not meet the project objective.

The planning phase activities are considered to be of a negligible impact significance as these typically involve desktop assessment and site inspections.

Table 9-2: Construction / assembly – Impacts and Significance for the alternative site

Aspect and Description		Impact Rating (before mitigation)							Impact Rating (after mitigation)						
Aspect	Description	Nature of Impact (Positive/Negative)	Spatial Scope/ Extent (6)	Duration (6)	Severity (6)	Consequence	Probability (6)	Significance (108)	Nature of Impact (Positive/Negative)	Spatial Scope/ Extent (6)	Duration (6)	Severity (6)	Consequence	Probability (6)	Significance (108)
BIODIVERSITY: FLORA AND FAUNA	Site void of vegetation / habitat.	No impact.													
SURFACE WATER – Pollution of surface water	Spillage / leak of hydrocarbons (fuel / oil / grease) from vehicles and equipment / machinery.	N	2	2	3	7	5	35 Moderate Low	N	1	2	3	6	2	12 Low
GROUNDWATER – Pollution of the groundwater system	Spillage / leak of hydrocarbons (fuel / oil / grease) from vehicles and equipment / machinery.	N	2	2	3	7	5	35 Moderate Low	N	1	2	3	6	2	12 Low
SOIL - Pollution and Compaction	Spillage / leak of hydrocarbons (fuel / oil / grease) from vehicles and equipment / machinery.	N	2	2	3	7	5	35 Moderate Low	N	1	2	3	6	2	12 Low
	Erosion of soil (soil wash / blown away).	N	2	2	2	6	6	36 Moderate Low	N	2	2	2	6	2	12 Low
	Compaction of the soil.	N	2	2	3	7	6	42 Moderate Low	N	2	2	3	7	3	21 Moderate Low
AIR QUALITY – Polluting or decreasing the quality of the air	Particulate matter, dust and airborne particles flying through the air.	N	2	2	4	8	5	40 Moderate Low	N	2	2	4	8	1	8 Low

Aspect and Description		Impact Rating (before mitigation)							Impact Rating (after mitigation)						
Aspect	Description	Nature of Impact (Positive/ Negative)	Spatial Scope/ Extent (6)	Duration (6)	Severity (6)	Consequence	Probability (6)	Significance (108)	Nature of Impact (Positive/Negative)	Spatial Scope/ Extent (6)	Duration (6)	Severity (6)	Consequence	Probability (6)	Significance (108)
VISUAL IMPACT – Change in the sense of place or decreasing the aesthetic value	On an industrial site.	No impact.													
HEALTH – degradation in health	Inhalation / ingestion of dust created during site establishment	N	1	2	2	5	6	30 Moderate Low	N	1	2	2	5	3	15 Low
NOISE	On an industrial site.	No impact.													
SAFETY & SECURITY	On an industrial site with access control and security.	No impact.													
SOCIO-ECONOMIC	Disruption during assembly due to unforeseen circumstances (pandemic, strike etc.)	N	2	4	3	9	3	27 Moderate Low	N	2	4	1	7	1	7 Low
ARCHAEOLOGY & CULTURAL HERITAGE AS WELL AS PALAEOLOGY	Sites within 2km: Grave yard on Transalloys property. Grade II Heritage Site (Clewer Railway Station). The sedimentary rocks of the Vryheid Formation are highly fossiliferous in places. No fossils found.	N	Insignificant due to distance >1km away – see Exemption letter from Archætnos, 2021 and Palaeontology report from Durand, 2021 (Appendix D)												

Table 9-3: Construction / assembly – Impacts and Significance for the preferred site

Aspect and Description		Impact Rating (before mitigation)						Impact Rating (after mitigation)							
Aspect	Description	Nature of Impact (Positive/Negative)	Spatial Scope/ Extent (6)	Duration (6)	Severity (6)	Consequence	Probability (6)	Significance (108)	Nature of Impact (Positive/Negative)	Spatial Scope/ Extent (6)	Duration (6)	Severity (6)	Consequence	Probability (6)	Significance (108)
BIODIVERSITY: FLORA AND FAUNA	Site void of vegetation / habitat.	No impact.													
SURFACE WATER – Pollution of surface water	Spillage / leak of hydrocarbons (fuel / oil / grease) from vehicles and equipment / machinery.	N	2	2	3	7	5	35 Moderate Low	N	1	2	3	6	2	12 Low
GROUNDWATER – Pollution of the groundwater system	Spillage / leak of hydrocarbons (fuel / oil / grease) from vehicles and equipment / machinery.	N	2	2	3	7	5	35 Moderate Low	N	1	2	3	6	2	12 Low
SOIL - Pollution and Compaction	Spillage / leak of hydrocarbons (fuel / oil / grease) from vehicles and equipment / machinery.	N	2	2	3	7	5	35 Moderate Low	N	1	2	3	6	2	12 Low
	Erosion of soil (soil wash / blown away).	N	2	2	2	6	6	36 Moderate Low	N	2	2	2	6	2	12 Low
	Compaction of the soil.	N	2	2	3	7	6	42 Moderate Low	N	2	2	3	7	3	21 Moderate Low
AIR QUALITY – Polluting or decreasing the quality of the air	Particulate matter, dust and airborne particles flying through the air.	N	2	2	4	8	5	40 Moderate Low	N	2	2	4	8	1	8 Low

Aspect and Description		Impact Rating (before mitigation)							Impact Rating (after mitigation)						
Aspect	Description	Nature of Impact (Positive/ Negative)	Spatial Scope/ Extent (6)	Duration (6)	Severity (6)	Consequence	Probability (6)	Significance (108)	Nature of Impact (Positive/Negative)	Spatial Scope/ Extent (6)	Duration (6)	Severity (6)	Consequence	Probability (6)	Significance (108)
VISUAL IMPACT – Change in the sense of place or decreasing the aesthetic value	On an industrial site.	No impact.													
HEALTH – degradation in health	Inhalation / ingestion of dust created during site establishment	N	1	2	2	5	6	30 Moderate Low	N	1	2	2	5	3	15 Low
NOISE	On an industrial site.	No impact.													
SAFETY & SECURITY	On an industrial site with access control and security.	No impact.													
SOCIO-ECONOMIC	Disruption during assembly due to unforeseen circumstances (pandemic, strike etc.)	N	2	4	3	9	3	27 Moderate Low	N	2	4	1	7	1	7 Low
ARCHAEOLOGY & CULTURAL HERITAGE AS WELL AS PALAEOLOGY	Sites within 2km: Grave yard on Transalloys property. Grade II Heritage Site (Clewer Railway Station). The sedimentary rocks of the Vryheid Formation are highly fossiliferous in places. No fossils found.	N	Insignificant due to distance >1km away – see Exemption letter from Archætnos, 2021 and Palaeontology report from Durand, 2021 (Appendix D)												

The scope of this study did not include the quantification of emissions during start-up, maintenance or shut down. During start-up, all pollution reduction plant and equipment, will be started up first and checked to see if these are running properly in accordance with good operating practice.

Table 9-4: Operation – Impacts and Significance for the Sinter Plant Operation

Aspect and Description		Impact Rating (before mitigation)							Impact Rating (after mitigation)						
Aspect	Description	Nature of Impact (Positive/Negative)	Spatial Scope/ Extent (6)	Duration (6)	Severity (6)	Consequence	Probability (6)	Significance (108)	Nature of Impact (Positive/Negative)	Spatial Scope/ Extent (6)	Duration (6)	Severity (6)	Consequence	Probability (6)	Significance (108)
SURFACE WATER – Pollution	Spillage / leak of hydrocarbons (fuel / oil / grease) from equipment / machinery.	N	2	3	3	8	5	40 Moderate Low	N	1	3	3	7	2	14 Low
GROUNDWATER – Pollution	Spillage / leak of hydrocarbons (fuel / oil / grease) equipment / machinery.	N	2	3	3	8	5	40 Moderate Low	N	1	3	3	7	2	14 Low
SOIL - Pollution	Spillage / leak of hydrocarbons (fuel / oil / grease) from equipment / machinery.	N	2	3	3	8	5	40 Moderate Low	N	1	3	3	7	2	14 Low
AIR QUALITY – Polluting or decreasing the quality of the air	Particulate matter, dust and airborne particles flying through the air. Emissions from plant.	N	2	3	4	9	5	45 Moderate Low	N	2	3	4	9	1	9 Low
HEALTH – degradation in health	Inhalation / ingestion of emissions / dust	N	2	3	4	9	6	54 Moderate Low	N	1	3	2	6	3	18 Low
SOCIO-ECONOMIC	Disruption during operation due to unforeseen circumstances (pandemic, strike etc.)	N	2	3	3	8	3	24 Moderate Low	N	2	3	2	7	1	7 Low
ARCHAEOLOGY & CULTURAL HERITAGE AS WELL AS PALAEOLOGY	Sites within 2km: Grave yard on Transalloys property. Grade II Heritage Site (Clewer Railway Station).	P	Positive impact due to dust reduction expected (Archaetnos, 2021)												

Quantification of air quality and emissions impact (Mamadi & Company, 2021):

The Sinter Plant contribution ranged between 3 – 7.6% for PM and Mn and therefore the impact is considered minimal.

- PM₁₀ and PM_{2.5}
 - Furnace building fugitives contribute mostly to simulated off-site PM₁₀ and PM_{2.5} concentrations.
 - Annual average concentrations do not exceed National Ambient Air Quality Standards (NAAQS) at plant boundary or off-site (40µg/m³ for PM₁₀ and 20µg/m³ for PM_{2.5}).
 - More than the permissible 4 days exceedances of the 24-hour limit value of 75µg/m³ for PM₁₀ and 40µg/m³ for PM_{2.5} at Transalloys boundary but not at Clewer or other Air Quality Sensitive Receptors (AQSR).
- Annual average and maximum hourly NO₂ concentrations are below NAAQS of 40µg/m³ at Transalloys boundary and at all AQSR.
- Annual average and maximum hourly SO₂ concentrations are below NAAQS of 50µg/m³ at Transalloys boundary and at all AQSR.
- Annual average Mn concentrations for Scenario 1 (proposed operation of Sinter Plant) are low and below World Health Organisation (WHO) Guideline Value of 0.15µg/m³ at AQSR.
- Annual average Mn concentrations for Scenario 2 (existing operations in addition to proposed Sinter Plant) exceed WHO Guideline Value at AQSR such as Clewer & Kwa-Guqa but show a negligible health risk over most of the areas surrounding Transalloys. Furnace building fugitives, vehicle entrained dust on paved and unpaved roads, and crushing and screening contribute mostly to Mn concentrations
- Dust:
 - Residential dustfall limit of 600mg/m²-day was only exceeded at FPP-Stand Block (non-residential location close to crushing & screening as well as material handling at siding and conveyors) in October 2016.
 - All other dustfall measurements are below residential dustfall limit of 600mg/m²-day for 2016 to 2020.
 - Simulated dustfall rates did not exceed dustfall limits at Transalloys boundary or at AQSR.

Cumulative impact (Mamadi & Company, 2021):

Several sources including Ferrobank and Highveld exist in the area and contribute to impacts, not only Transalloys.

Table 9-5: No-go – Impacts and Significance

Aspect and Description		Impact Rating (before mitigation)							Impact Rating (after mitigation)						
Aspect	Description	Nature of Impact (Positive/ Negative)	Spatial Scope/ Extent (6)	Duration (6)	Severity (6)	Consequence	Probability (6)	Significance (108)	Nature of Impact (Positive/Negative)	Spatial Scope/ Extent (6)	Duration (6)	Severity (6)	Consequence	Probability (6)	Significance (108)
SOCIO-ECONOMIC	No High Carbon Products or alternative supplier	N	2	5	4	11	5	55 Moderate High	Proceed with project.						

10 ENVIRONMENTAL MANAGEMENT PROGRAMME (EMP)

10.1 Alterations to the EMP

As EMPs should remain dynamic and flexible, certain conditions may require the EMP to be revised. These conditions may include the following:

- Changes in legislation;
- Published/gazetted norms and standards;
- Occurrence of unanticipated impacts or impacts of greater significance, intensity and extent than anticipated;
- Conditions in environmental authorisation or AEL which do not form part of the EMP;
- Inadequate mitigation measures, i.e. where the level of an environmental parameter is not conforming to the required level despite the implementation of the mitigation measure; and
- Secondary impacts which occur as a result of the mitigation measures.

10.2 Responsibility

Transalloys (Pty) Ltd will be responsible for the implementation of all mitigation and management measures as well as the compliance with this EMP and any license and authorisation conditions.

Transalloys (Pty) Ltd will delegate its responsibilities to an Environmental Control Officer (ECO) during the construction / assembly phase.

Each contractor involved in the project will comply with the EMP and authorisation conditions.

The ECO will be suitably qualified to perform the necessary tasks and will be appointed at a level such that he/she can interact effectively with site contractors, labourers and the public.

The ECO will be required to perform the following tasks:

- Monitoring and execution of the EMP by being on site regularly (weekly);
- Inspect the site as required to ensure adherence to the management actions of the EMP and authorisations/licences (compliance assessments/audits);
- Complete Site Inspection Forms on a weekly basis;
- Provide inputs to or compile the environmental compliance assessment report;
- Liaise with contractors on issues relating to implementation of, and compliance with, the EMP and authorisations/licences;
- Maintain a record of environmental incidents (spills, impacts, legal transgressions etc.) as well as corrective and preventive actions taken; and
- Maintain a public-complaints register in which all complaints are recorded.

The conditions of the authorisation/licences and EMP will be brought to the attention of all persons (employees, workers, consultants, contractors etc.) associated with the undertaking of these activities and Transalloys (Pty) Ltd will take such measures that are necessary to bind such persons to the conditions thereof (contracts with penalties for non-compliances). All consultants and / or contractors will go through induction.

Transalloys (Pty) Ltd can further enforce this by running workshops in order to raise environmental awareness. These workshops should cover aspects such as fire prevention,

strict use of ablution facilities, water conservation, waste management and general duty of care.

Entity:	Responsible Person:	Contact details:
Transalloys (Pty) Ltd	Mr Ephraim Monyemoratho (Environmental Manager)	072 697 5957
Environmental Control Officer for construction / assembly phase	To be appointed	-

10.3 Activities causing potential impacts

The following activities are activities that could cause potential impacts if not managed properly or if no mitigation measure is implemented:

- Site preparation (clearance, levelling, compaction etc.);
- Creating conditions for alien invasive species to breed or grow;
- Hydrocarbon spills / leakages;
- Plant operation with associated emissions;
- Poor waste management;
- Poor management of water;
- Random events such as fire / explosion / strikes / pandemics etc;

10.4 Potential Impacts

10.4.1 Negative Impacts

- Pollution/contamination of soil, surface water and groundwater due to leakages or spillages of hydrocarbons (fuel, oil & grease) and hazardous substances; and
- Pollution of air or deterioration of air quality due to dust and emissions.

10.4.2 Positive impacts

- Reduction of dust;
- The location of the Sinter plant on an already disturbed industrial site with security and access control; and
- The production of High Carbon products due to sinter production and availability.

10.4.3 No-go Option impacts

- No production of High Carbon products due to unavailability of sinter; or
- Dependent on another party for the supply of sinter.

10.5 Management measures

Dedicated measures have been identified to manage the impacts identified above (Tables 9.2 – 9.4). The purpose of the EMP is to ensure that undue or reasonably avoidable adverse impacts of the project are prevented; that impacts which cannot be prevented are managed to reduce their significance; and that the positive benefits of the project are enhanced. Transalloys (Pty) Ltd is responsible for the implementation of recommendations and mitigation/management measures and HydroScience cannot and will not take responsibility for the actions of Transalloys (Pty) Ltd or lack thereof.

Table 10-1: Identified potential impacts and proposed management measures for the Decommissioning of the pipeline and depots

1. Environmental Awareness Training

Management Outcome: All on-site staff, contractors and visitors are aware of and understands the individual responsibilities in terms of this EMP.				
Responsible person for implementation and monitoring: Environmental Manager and ECO				
Impact Management Actions	Implementation		Monitoring	
	Method of Implementation	Timeframe for Implementation	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> All staff, contractors and visitors must receive environmental awareness training; All new staff coming onto site must receive environmental awareness training; All staff are made aware of the conditions and controls linked to the Environmental Authorisation (EA), Water Use License (WUL), Waste Management License (WML), Atmospheric Emissions License (AEL) and within the EMP; The responsible operator of vehicle / equipment / machinery must have the required training to make use of the spill kit in emergency situations; All staff, contractors and visitors are made aware of their individual roles and responsibilities in achieving compliance with the EA, WUL, WML, AEL and EMP; The Construction / Assembly Contractor must erect and maintain information posters at key locations on site; Environmental awareness training should include the following: <ol style="list-style-type: none"> Description of significant environmental impacts, actual or potential, related to their work activities; 	<p>Presentations should be as visual as possible - it can include posters, power point, videos or any other material that will assist in the training.</p>	<p>Environmental awareness training must be continuous and as soon as new staff members start on site.</p> <p>Environmental posters / signage must be on site at all times and must be visible / readable.</p>	<p>As and when required</p>	<p>Photos</p> <p>Attendance Register</p> <p>Training material</p> <p>Induction video</p>

<ul style="list-style-type: none"> ii. Mitigation measures to be implemented when carrying out specific activities; iii. Emergency preparedness and response procedures (EPRP); iv. Emergency procedures; v. Procedures to be followed when working near or within sensitive areas; vi. Water usage and conservation; vii. Solid waste management procedures; viii. Sanitation procedures. • A record of all environmental awareness training courses undertaken as part of the EMP must be available; • Educate workers on the dangers of open and/or unattended fires; • An attendance register of all staff, contractors or visitors that received environmental awareness training must be kept; • Course material must be available and presented in all appropriate languages; • Environmental training and topics can form part of the induction or Toolbox Talks. 				
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2. Site Preparation (assembly / construction)

Management Outcome: Impacts on the environment are minimised when establishing new infrastructure and the development footprints are kept to a minimum and within demarcated site establishment area.				
Potential Impacts:				
<ul style="list-style-type: none"> • Loss of vegetation and fauna habitat – site has no vegetation • Activities may lead to displeasing aesthetics, such as the storage of materials, excavation activities and the use and storage of machines / vehicles / equipment • Pollution of soil and groundwater due to spills on site 				
Responsible person for implementation: Construction Contractor during Construction / Assembly; Environmental Manager and ECO during operation				
Responsible person for monitoring: Environmental Manager				
Impact Management Actions	Implementation		Monitoring	
	Method of Implementation	Timeframe for Implementation	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> • A Method Statement must be provided by the construction contractor prior to any on-site activity that includes: <ul style="list-style-type: none"> ○ overnight vehicle / machinery parking areas; ○ stockpile and lay down areas; ○ equipment cleaning areas; ○ eating and ablution facilities (use existing); ○ waste management; ○ access route (through service entrance). • Remain with demarcated area (site footprint); • Site is located on previously disturbed areas; • If possible, no temporary facilities or portable toilets to be setup due to existing facilities available in the plant; • Prefabricated structures should be prioritised in order to reduce on site fabrication; • No staff / contractors to be accommodated on the property; • Signs (safety) have been erected throughout the plant; • Housekeeping should be done daily. 	Area identified.	Before site establishment starts	Daily during assembly / construction	Photos

3. Storm and Waste Water Management

Management Outcome: An effective system of storm water run-off control is implemented and impacts to the environment caused by storm water and wastewater discharges during activities are avoided.				
Potential Impacts:				
<ul style="list-style-type: none"> • Pollution of downstream watercourse (Brugspruit and its tributary) • Pollution of soil • Erosion and siltation 				
Responsible person for implementation and monitoring: Environmental Manager				
Impact Management Actions	Implementation		Monitoring	
	Method of Implementation	Timeframe for Implementation	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> • Appropriate pollution control necessary to prevent discharge of water containing polluting matter or visible suspended solids; • Plant to be established on an impermeable area (concrete) to prevent groundwater contamination; • Runoff from the site must be strictly controlled, and contaminated water must be collected (drains) and stored (PCD for reuse); • All spillages of hydrocarbons onto surfaces must be controlled by the use of an approved absorbent material and the used absorbent material disposed of at an appropriately licensed waste disposal facility (keep safe disposal certificate). 	Contaminated storm water from the site will be diverted to the existing PCD. Sewage is captured in septic tanks with overflows to evaporation pond. Refer to Appendix F for Storm Water Management Plan (SWMP).	Measures already in place and to be checked during activities.	Continuous	<p>Photos</p> <p>Monitoring of PCD and Evaporation ponds</p> <p>Monitoring of groundwater (boreholes)</p>

4. Solid Waste Management

Management Outcome: Wastes are appropriately stored, handled and safely disposed of at a licensed waste facility.				
Potential Impacts:				
<ul style="list-style-type: none"> • Loss of habitat through the damage of vegetation • Compaction of soil • Pollution of soil due to spillages associated with dumping of solid waste • Establishment of Alien Invasive Plant Species 				
Responsible person for implementation: Construction Contractor during Construction / Assembly; Environmental Manager and ECO during operation				
Responsible person for monitoring: Environmental Manager				
Impact Management Actions	Implementation		Monitoring	
	Method of Implementation	Timeframe for Implementation	Frequency	Evidence of Compliance
<u>General:</u> <ul style="list-style-type: none"> • All measures regarding waste management must be undertaken using an integrated waste management approach. • A suitable position must be found and clearly demarcated for waste collection and storage. <u>Prevention of waste:</u> <ul style="list-style-type: none"> • Waste material storage areas should be safe, secure and weather-proof to prevent damage to material (resulting in waste generation) and theft. Area with impermeable base or in sealed containers. • Due to the movement of people, there will be litter production and higher probability of littering. Therefore, there should be on-site signs raising the awareness of the impacts of littering on the natural environment and weekly litter patrols to collect litter. • Train staff/contractors to operate in an environmentally responsible manner (closing of taps for water conservation, reporting spills, no littering etc.). • No planned maintenance or servicing of vehicles / machinery / equipment on site (only in workshops). If emergency maintenance is required to on-site vehicles, machinery and/or 	Existing Integrated Waste Management and WML license conditions (Appendix C)	Measures must be implemented before site establishment starts and must be controlled during activities.	Continuously	Photos Documents Waste reporting to Department of Environment, Forestry & Fisheries (DEFF)

<p>equipment, drip trays and / or absorbent mats will be placed underneath the vehicles / machinery / equipment where maintenance work is conducted to prevent grease/oil spillages impacting the environment or generating waste (contaminated soil).</p> <p><u>Reduction / minimisation of waste:</u></p> <ul style="list-style-type: none"> • Reduce waste quantities and disposal costs through a reduction in the materials ordered. • Engage with the supply chain to supply products and materials that use minimal packaging. <p><u>Reuse / recycling of waste:</u></p> <ul style="list-style-type: none"> • Separate / sort / segregate waste for collection and recycling - make arrangements with recycling contractors to provide clearly marked bins for material separation / sorting. Make sure that contractors are aware of the placement of the bins and their responsibility to separate / sort materials. • Though no special disposal methods are required for non-hazardous waste, non-biodegradable refuse such as glass bottles, plastic bags, etc., must be stored in suitable containers to allow for recycling and emptied on an as-required basis for recycling purposes. <p><u>Waste handling on site:</u></p> <ul style="list-style-type: none"> • Separate / segregate / sort waste into different containers. • Collect waste in suitable containers (drums / skips / bins on site). • Waste containers should be marked, or colour coded to indicate which types of waste can be disposed to it. Staff to be trained in this regard to segregate waste. • Ensure sufficient containers are available for storage of waste prior to removal off site to prevent overflow and littering on the site and surroundings. • Ensure no litter, refuse, waste and rubble generated on the premises will be placed, dumped or deposited on this site, adjacent or surrounding sites or properties. • The waste collection and storage site must be maintained in a clean and orderly fashion. • Waste must be disposed, as soon as possible to a municipal transfer station, skip or on a licensed waste disposal facility 				
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<p>(WDF). Waste must not be allowed to stand on site to decay, resulting in malodours and attracting pests. Empty containers regularly and waste should not be stored on site in excess of 30 days.</p> <ul style="list-style-type: none"> • Waste collection bins with secure covers (scavenger and weatherproof) must be provided to prevent fauna entering the container. Waste containers must not be left standing without a cover as this may attract fauna to inspect the skip and possibly cause death or injury to the fauna. • Waste may not be burnt on site. • Hazardous waste must be stored separately from general waste on an impermeable surface within a bund wall and disposed of at a licensed hazardous waste site if not recycled. • Comply with the Norms and Standards for Waste Storage (GNR 926 of 29 November 2013). <p><u>Waste removal & disposal:</u></p> <ul style="list-style-type: none"> • Companies that transport the waste must be registered / licenced to do so. • Site must be easily accessible for trucks picking up or dropping off the skips. • Remove waste from site for recycling or disposal to the WDF on a regular basis (at least weekly or when container is full). • No burning or burying of waste. • Any hazardous waste will be stored and handled according to the relevant legislation and only disposed to the licensed WDF. <p><u>Documentation:</u></p> <ul style="list-style-type: none"> • Report on the quantities of different waste streams managed on each site (disposed, reuse, recycling, energy recovery). • Ensure copies of all waste manifests (safe disposal certificates) are kept, showing responsible handling, transport and disposal. • Include measure in contract that will ensure contractors are required to clean their work area after construction. 				
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5. Emergency Procedures

Management Outcome: Ensure emergency procedures are in place to enable a rapid and effective response to all types of environmental emergencies.				
Responsible person for implementation and monitoring: Environmental Manager				
Impact Management Actions	Implementation		Monitoring	
	Method of Implementation	Timeframe for Implementation	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> The Emergency Preparedness and Response Plan (EPRP) must deal with accidents, potential spillages, emissions and fires / explosions in line with relevant legislation. All staff must be made aware of emergency procedures as part of environmental awareness training; The relevant local authority's fire department must be made aware of a fire as soon as it starts. In the event of emergency mitigation measures being necessary to contain the spill or leak, it must be implemented as per the section below - Hazardous Substances. 	EPRP (Appendix F)	Continuous.	Continuous	Photos Documentation Incident & accident reporting

6. Hazardous Substances

Management Outcome: Safe storage, handling, use and disposal of hazardous substances.				
Potential Impacts:				
<ul style="list-style-type: none"> Contamination of soil or watercourse due to leaks/ spills 				
Responsible person for implementation: Construction Contractor during Construction / Assembly; Environmental Manager during operation				
Responsible person for monitoring: Environmental Manager				
Impact Management Actions	Implementation		Monitoring	
	Method of Implementation	Timeframe for Implementation	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> The use and storage of hazardous substances to be minimised and substituted with non-hazardous and non-toxic alternatives where possible. All hazardous substances will be stored in suitable containers as defined in the Method Statement provided by the supplier. Containers will be clearly marked to indicate contents, quantities and safety requirements. All storage areas will be bunded. The bunded area will be of sufficient capacity to contain a spill / leak from the stored containers (110% of container capacity). An Alphabetical Hazardous Chemical Substance (HCS) control sheet will be drawn up and kept up to date on a continuous basis. All hazardous chemicals that will be used on site will have Material Safety Data Sheets (MSDS); All employees working with HCS will be trained in the safe use of the substance and according to the MSDS; Employees handling HCS must be aware of the potential impacts and follow appropriate safety measures. Appropriate personal protective equipment (PPE) must be made available. Ensure that hydrocarbons are stored in appropriate storage tanks or in bowsers. The tanks / bowsers must be situated on a smooth impermeable surface (concrete) with a permanent bund. The impermeable 		Continuous but especially on this site during construction / assembly.	Continuous	Photos Incident reporting

<p>lining must extend to the crest of the bund and the volume inside the bund must be 130% of the total capacity of all the storage tanks / bowzers (110% statutory requirement plus an allowance for rainfall).</p> <ul style="list-style-type: none"> • The floor of the bund must be sloped, draining to a separator. • Provision must be made for re-fuelling by protecting the soil with an impermeable groundcover. Where dispensing equipment is used, a drip tray must be used to ensure small spills are contained. • All empty dirty drums must be stored on a drip tray or within a bunded area. • No unauthorised access into the hazardous substances' storage areas shall be permitted. • No smoking must be allowed within the vicinity of the hazardous storage areas. • Adequate fire-fighting equipment must be made available at all hazardous storage areas. • An appropriately sized spill kit kept on-site relevant to the scale of the activity involving the use of hazardous substance must be available at all times. • The responsible operator must have the required training to make use of the spill kit in emergency situations. • In the event of a spill, contaminated soil must be collected in containers and stored in a central location and disposed off according to the National Environmental Management: Waste Act (Act 59 of 2008) and the Norms and Standards for waste storage (GNR 926 of 29 November 2013). 				
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7. Emissions and Dust

<p>Status quo: Dust fallout meets standards of National Environmental Management: Air Quality Act, 2004; (Act No. 39 of 2004) National Dust Control Regulations, 2013 (Skyside, 2021) – see Appendix D. PM₁₀ is elevated and exceeded 24-hour NAAQS of 75 µg/m³ but not annual average NAAQS of 40 µg/m³ in 2013 and 2015 but recent results (2018 – 2019) did not exceed NAAQS (Mamadei & Company, 2021).</p> <p>US EPA: Fugitive emissions amount to 3.4% of uncontrolled primary emissions; PM₁₀ = 96% of PM emissions; PM_{2.5} = 65% of PM emissions</p>				
<p>Management Outcome: Dust prevention measures are applied to minimise the generation of dust.</p>				
<p>Potential Impacts:</p> <ul style="list-style-type: none"> Nuisance for residents or people at work from dust Health risk (ingestion, inhalation) - PM, PM₁₀, PM_{2.5}, Mn, NO₂, SO₂ Fugitive emissions (PM, PM₁₀, PM_{2.5}, Mn) from Sinter Plant building, materials (raw material, product and waste / slag) handling / tipping, vehicles (transport of slag, raw materials and product) and windblown dust. 				
<p>Responsible person for implementation and monitoring: Environmental Manager</p>				
Impact Management Actions	Implementation		Monitoring	
	Method of Implementation	Timeframe for Implementation	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> Sinter plant: <ul style="list-style-type: none"> Install Chamine do Lavdor de Gases Wet Scrubber Install Chamine Baghouse – Saida Secondary fume extraction to capture tapping, casting and escaped furnace fumes. Fumes to be send to scrubber plant. Take all reasonable measures to minimise the generation of dust (water and Dustek). Exposed surfaces must be stabilised / covered as soon as it is possible. Appropriate dust suppression measures must be used when dust generation is unavoidable, e.g. dampening / spraying with water and Dustek on unpaved roads, sprinklers on conveyors or in material handling areas. 	Water sprayers across the site.	Continuously	As per AEL requirements. As per monitoring plan.	Photos - visual Dust and PM ₁₀ results Emissions monitoring and results – Mn, PM _{2.5} , NO ₂ , SO ₂ Compliance with AEL and legislated limits – see below.

<ul style="list-style-type: none"> • PPE for workers. • Shut-down when air quality and dust mitigation equipment fail or there is an emergency incident. 				
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From Mamadi & Company Air Impact Study (2021) and legislation, standards to be complied with:

For Manganese (Mn) 0.15µg/m³ use WHO Guideline Value

Table 10-1: SA National Ambient Air Quality Standards (SANAQS) for criteria pollutants (1 March 2009 & 24 December 2009)

Pollutant	Averaging Period	Limit Value (µg/m ³)	Limit Value (ppb)	Frequency of Exceedance	Compliance Date
PM _{2.5}	24 hour	65	-	4	Immediate – 31 Dec 2015
	24 hour	40	-	4	1 January 2016 – 31 Dec 2029
	24 hour	25	-	4	1 January 2030
	1 year	25	-	0	Immediate – 31 Dec 2015
	1 year	20	-	0	1 January 2016 – 31 Dec 2029
	1 year	15	-	0	1 January 2030
PM ₁₀	24 hour	120	-	4	Immediate – 31 Dec 2014
	24 hour	75	-	4	1 January 2015
	1 year	50	-	0	Immediate – 31 Dec 2014
	1 year	40	-	0	1 January 2015
NO ₂	1 hour	200	106	88	Immediate
	1 year	40	21	0	Immediate
SO ₂	10 minutes	500	191	526	Immediate
	1 hour	350	134	88	Immediate
	24 hour	125	48	4	Immediate
	1 year	50	19	0	Immediate

Table 10-2: National Dust Control Regulations (1 November 2013)

Restriction Areas	Dustfall rate (D) in mg/m² - day over a 30-day average	Permitted frequency of exceedance
Residential areas	D < 600	Two within a year, not sequential months
Non-residential areas	600 < D < 1200	Two within a year, not sequential months

8. Communication

Management Outcome: Proper communication with landowners, neighbours and the public				
Responsible person for implementation and monitoring: Environmental Manager				
Impact Management Actions	Implementation		Monitoring	
	Method of Implementation	Timeframe for Implementation	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> Notify landowners, neighbours and councillors at least 7 days before activities start of the intention to commence with the Sinter Plant construction. Keep a complaint register on site. A notice board should be visible at the security entrance with the contact information of the Emergency Contact. 	<p>Telephone calls</p> <p>Emails</p> <p>Notifications/ Posters</p>	Continuously	Continuously	<p>Photos</p> <p>Emails</p> <p>Signed registers</p>

9. Archaeology and cultural heritage as well as Palaeontology

Management Outcome: Rescue of archaeological material				
Potential impacts: Due to the nature of archaeological material, such sites, objects or features, as well as graves and burials may be uncovered during construction activities on site.				
Responsible person for implementation and monitoring: Construction Contractor and ECO				
Impact Management Actions	Implementation		Monitoring	
	Method of Implementation	Timeframe for Implementation	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> • Cease work. • Contact an archaeologist • If a particularly fossiliferous area is uncovered during construction / excavation, follow the Chance Find Procedure guidelines. 	Inspect excavations	Construction	During excavation	Photos

10. Alien invasive vegetation

Management Outcome: Eradication of alien invasive vegetation				
Potential impacts: Encroachment and establishment of alien invasive vegetation due to disturbance.				
Responsible person for implementation and monitoring: Environmental Manager				
Impact Management Actions	Implementation		Monitoring	
	Method of Implementation	Timeframe for Implementation	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> Removal and disposal of alien invasive plant species to be conducted as required by law - Alien Invasive Species Regulations 2014 (NEMBA Act 10 of 2004) Alien invasive control and eradication plan. 	Physical removal Approved treatment	Continuously	On-going	Photos Progress on plan

10.6 Monitoring programme

10.6.1 Surface Water Monitoring

Transalloys has sixteen (16) existing surface water monitoring points as part of its monitoring programme. Their positions are indicated on Figure 10-1 and they include:

- Environmental monitoring points in natural water courses:
 - On Brugspruit (eastern tributary), upstream of Transalloys' operations in Clewer (S1)
 - On Brugspruit (eastern tributary), along Transalloys access road at the bridge (S2)
 - Western tributary at raw material storage area on Transalloys' property (S3)
 - Western tributary before confluence but past Transalloys' operation (S4)
 - Confluence of two streams - Brugspruit confluence at N4 (S5)
- Industrial water monitoring points:
 - S6 – S9 in plant area
 - Pollution Control Dam (S10)
 - Evaporation Pond (S11)
 - S12 – S16 around WDF

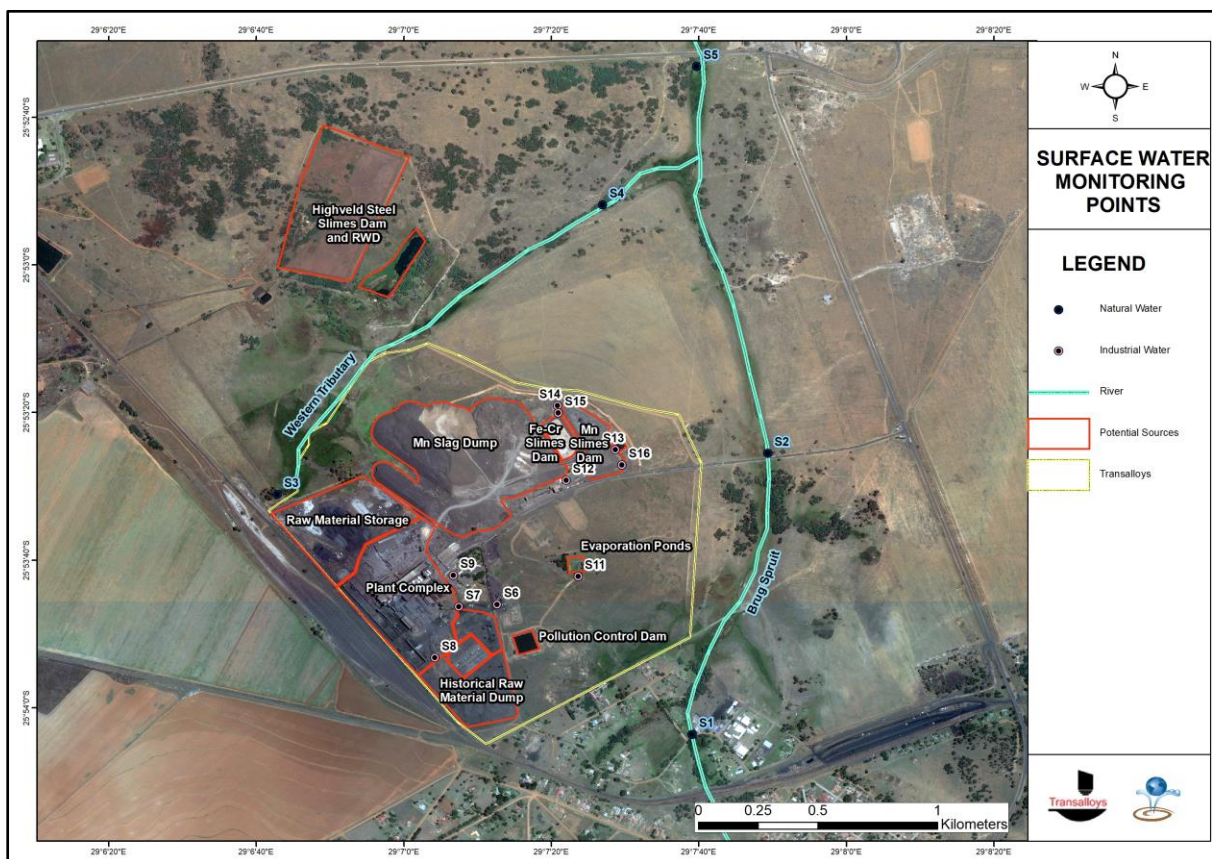


Figure 10-1: Transalloys' surface water monitoring points (MvB Consulting, 2021)

Biomonitoring is conducted at five (5) points (Figure 10-2):

- On Brugspruit (eastern tributary), upstream of Transalloys operations in Clewer (TRANS1 – same as S1)
- On Brugspruit (eastern tributary), along Transalloys access road at the bridge (TRANS2 – same as S2)
- On Brugspruit (eastern tributary), before confluence (TRANS3)

- Western tributary before confluence at Transalloys' plant (TRANS4)
- Confluence of two streams - Brugspruit confluence at N4 (TRANS5 – same as S5)

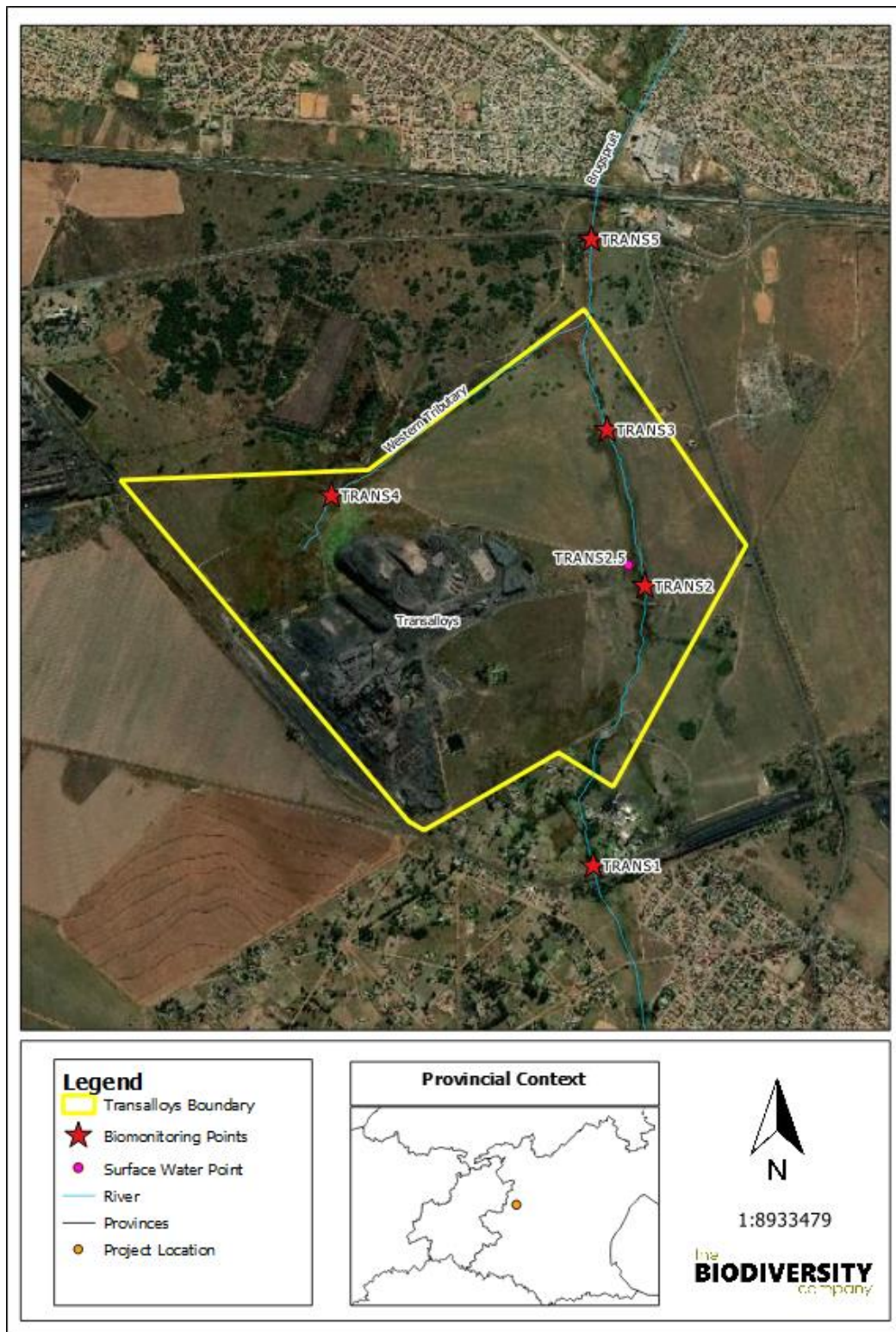


Figure 10-2: Transalloys' biomonitoring points (TBC, 2021)

10.6.2 Groundwater Monitoring

Transalloys has twenty-three (23) existing groundwater monitoring points (some monitored shallow (S) and deep (D)) as part of its monitoring programme. Their positions are indicated on Figure 10-3 and they include:

- Boreholes around the raw material storage area (RBH1C, RBH2 & RBH6)
- Boreholes around the historical raw material dump (RGC1, RBH1A, RBH1B & RBH7)
- Boreholes around the PCD and evaporation pond (RGC2S, RGC2D, RBH4S, RBH4D, RGC3S, RGC3D, TA1S, TA1D, TA2S, TA2D)
- Boreholes around WDF (BH1, BH2, BH3, BH4, RGC7S, RGC7D, RBH3D, RGC8S, RGC8D)
- Boreholes off and downstream of the property and operations (RGC4, RGC5, RBH5S, RBH5D, RGC6, RGC9S, RGC9D)

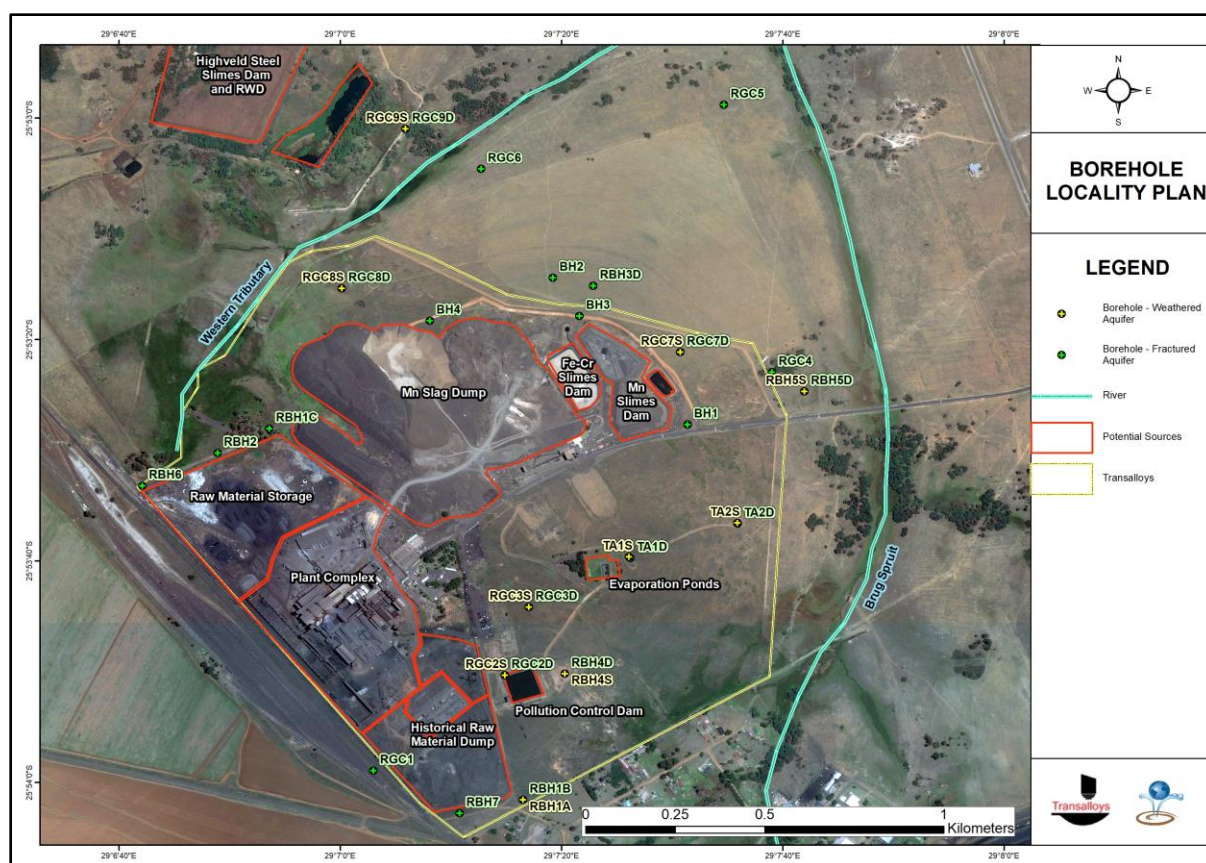


Figure 10-3: Transalloys' groundwater monitoring points (MvB Consulting, 2021)

10.6.3 Air Monitoring

Transalloys has seven (7) existing air monitoring points as part of its monitoring programme for dust and PM₁₀ (dust buckets). Dust fallout monitoring commenced in October 2015 (Skyside, 2021). Their positions are indicated on Figure 10-4 and they include:

- Residential
 - Clewer Creche
 - Clewer Primary School
- Non-residential
 - Historical Dump
 - PCD

- Slimes Dam
- Transalloys Main Entrance
- FPP – Stand Block

Transalloys further has two (2) E-samplers, one at the Truck Stop and one at Clewer Primary School. Their positions are also indicated on Figure 10-4.



Figure 10-4: Transalloys’ dust and PM₁₀ monitoring points (Skyside, 2021)

Additional monitoring association with installation of Sinter Plant:

The following stack (**point source**) monitoring points need to be added to the monitoring programme for emissions with the installation of the Sinter Plant and monitored for PM, NO_x, SO₂ and Mn:

- Sinter Plant Wet Scrubber
- Sinter Plant Baghouse

Sinter Plant **fugitive emissions** as an area source to be monitored for Mn, PM, PM₁₀ and PM_{2.5} 24 hours / day

All monitoring records are kept for at least five (5) years.

10.6.4 Other monitoring

Keep a complaints’ register as is currently the case and record measures taken to address these complaints. Transalloys has an environmental hotline (013 693 8028)

Occupational Health and Safety Act (OHSA) compliance as is currently the case:

- Register to indicate that all the employees and contractors have been informed as to their rights under the Act; and

- Accident records as per the Act - reported to the Department of Trade and Industry (DTI) and the Department of Labour (DOL).

Environmental Incidents reports as is currently the case.

10.6.5 Additional monitoring required for project

Compliance with EMP and environmental authorisation - appoint an Environmental Control Officer (ECO) for the construction / assembly phase.

10.7 Record keeping and reporting

10.7.1 Compliance recording and reporting

Accurate and up-to-date records will be kept by the ECO of all system malfunctions resulting in non-compliance with the EMP, environmental authorisation and license conditions.

10.7.2 Incident recording and reporting

Transalloys (Pty) Ltd will also, within 24 hours, ensure that the relevant authorities (MDARDLEA, NDM, DWS, DOL, DTI etc.) are notified of the occurrence or detection of any incident which has the potential to cause, or has caused pollution of the environment, health or safety risks or which is a contravention of the EMP, or any environmental authorisation or license condition. Transalloys (Pty) Ltd is then to submit an action plan indicating measures, which will be taken to:

- Correct the impacts resulting from the incident;
- Prevent the incident from causing any further impact; and
- Prevent a recurrence of a similar incident.

10.7.3 Complaints recording and reporting

A complaints register will be kept and all complaints from the public / community will be noted therein as well as measures taken to rectify the situation as described above. No ncomplaint from 2014 to 2020.

10.8 Environmental awareness plan

10.8.1 Objectives

The objectives of an environmental awareness plan are to:

- Inform employees, landowners, contractors and visitors of any environmental risk which may result from their presence, work or activities, and
- Inform employees, landowners, contractors and visitors of the manner in which the identified possible risks must be dealt with in order to avoid pollution or degradation of the environment and health and safety hazards.

In general, the purpose of implementing an environmental awareness plan is to optimise the awareness of those on the property and partaking in the activities, which have the potential to impact negatively on the environment, and in doing so, promote the goal of sustainable development.

10.8.2 Communication

Both objectives of the environmental awareness plan indicate that employees, landowners, contractors and visitors must be informed of environmental matters. Information sharing is only possible through effective communication channels.

The goal for proficient communication is to provide structures for effective communication, participation and consultation that relate to the occupational health and safety hazards, environmental hazards and the Safety, Health, Environment and Quality (SHEQ) management system.

The objective of the communication procedure is to ensure effective communication flow, involvement of all levels of employees in the communication chain and to comply with the requirements in terms of ISO 9001:2008 clause 5.5.3 and ISO 14001:2004 clause 4.4.3.

All visitors / contractors to the site undergo an induction at the security office.

10.8.3 Communication responsibility

It will be the responsibility of the SHEQ officer / manager to communicate the environmental awareness plan with employees, landowners, contractors and visitors. Should the SHEQ struggle with information or should there be a query regarding certain environmental issues it can be discussed with the appointed ECO.

The communication can be done in the following way:

- As part of the induction;
- As part of toolbox talks;
- Posters or information sheets on the notice boards;
- Signage in the operational areas;
- Environmental awareness training for the contractors and their staff members as well as the Transalloys (Pty) Ltd employees that will be working on site. This should be done before the construction / assembly commences.

10.8.4 Aspects covered

The following Environmental Risks / Aspects should be covered as part of the Environmental Awareness Plan:

- Water saving;
- Waste Management / Recycling;
- Importance of Personal Protective Equipment (PPE);
- Erosion;
- Alien Invasive Species Eradication;
- Risk of spillages (fuel, oil, grease, cement and hazardous material);
- Dust
- Importance of nature and why we protect it.

11 CONCLUSIONS & RECOMMENDATIONS

The Sinter Plant is required by Transalloys to produce High Carbon Products. The layout of the plant was determined by the selected preferred site. The preferred site was selected based on available space (5 700m²) within the operational footprint area to avoid clearance and disturbance of any other areas on the property.

The establishment of a Sinter Plant will not adversely impact the socio-economic or biophysical environment to such an extent that it cannot be mitigated or managed (Section 10 of this report). The Sinter Plant will have positive socio-economic impacts such as job creation, skills development, financial investment, production of High Carbon Products as well as associated economic contribution (investment and taxes) to the area (eMalahleni Local Municipality and Mpumalanga Province) and country. The Sinter Plant operation may also have a positive impact on the biophysical environment in terms of dust reduction but the monitoring programme will confirm this with time.

The establishment and operation of the Sinter Plant may potentially have negative impacts on the biophysical environment (contamination of soil, air and water) but these can all be mitigated to a low to moderate level.

Transalloys has monitoring programmes in place for environmental aspects such as surface water, groundwater, air and emissions which will alert to any impact to implement additional management measures timeously. Transalloys is an operational site with all the necessary access control, security and management measures in place required by an industrial site for storm water management, emergency management and waste management.

11.1 EAP Opinion

It is the opinion of the EAP that the project may continue based on the following:

- Existing industrial operation with a new Sinter Plant within the existing operational footprint area.
- Findings of Mamadi & Company on Air Quality Impact.
 - The Sinter Plant contribution ranged between 3 – 7.6% for PM and Mn and therefore the impact is considered minimal.
 - PM₁₀ and PM_{2.5}
 - Furnace building fugitives contribute mostly to simulated off-site PM₁₀ and PM_{2.5} concentrations.
 - Annual average concentrations do not exceed NAAQS at plant boundary or off-site (40µg/m³ for PM₁₀ and 20µg/m³ for PM_{2.5}).
 - More than the permissible 4 days exceedances of the 24-hour limit value of 75µg/m³ for PM₁₀ and 40µg/m³ for PM_{2.5} at Transalloys boundary but not at Clewer or other AQSR.
 - Annual average and maximum hourly NO₂ concentrations are below NAAQS of 40µg/m³ at Transalloys boundary and at all AQSR.
 - Annual average and maximum hourly SO₂ concentrations are below NAAQS of 50µg/m³ at Transalloys boundary and at all AQSR.
 - Annual average Mn concentrations for Scenario 1 (proposed operation of Sinter Plant) are low and below WHO Guideline Value of 0.15µg/m³ at AQSR.
 - Annual average Mn concentrations for Scenario 2 (existing operations in addition to proposed Sinter Plant) exceed WHO Guideline Value at AQSR such as Clewer & Kwa-Guqa but show a negligible health risk over most of the areas surrounding Transalloys. Furnace building fugitives, vehicle entrained dust on paved and unpaved roads, and crushing and screening contribute mostly to Mn concentrations

- Dust:
 - Residential dustfall limit of 600mg/m²-day was only exceeded at FPP-Stand Block (non-residential location close to crushing & screening as well as material handling at siding and conveyors) in October 2016.
 - All other dustfall measurements are below residential dustfall limit of 600mg/m²-day for 2016 to 2020.
 - Simulated dustfall rates did not exceed dustfall limits at Transalloys boundary or at AQSR.
- Findings of Archaeos. No negative impacts on Archaeology and Cultural Heritage but positive impact on Grade II Heritage Site (Clewer Railway Station) expected due to reduction in dust.
- Air and emissions monitoring in place already and expanded to include Sinter Plant Wet Scrubber & Baghouse
 - Continuance of dustfall and PM₁₀ monitoring
 - Ambient monitoring of SO₂, NO₂ and PM_{2.5}
 - Measure Mn content in PM₁₀
- Water quality monitoring for surface water and groundwater already in place.

11.2 Conditions

The project can be authorised under the following conditions:

- Compliance with EMP.
- Continue with monitoring as per existing monitoring programmes (surface water, groundwater, air and emissions) in EMP with additional monitoring as required for Sinter Plant.
- Proper implementation of the recommendations of this report as well as that of Mamadi & Company such as:
 - Furnace building fugitives: Address uncertainties through detailed furnace building fugitive emission measurement campaign. Implement individual engineering measures for each source such as process modifications and / or installation of secondary suction hood and cleaning technology to capture fumes not captured by primary extraction circuit.
 - Crushing and screening: Consider enclosure or the use of a telescopic chute with water sprays at secondary screening plant and jiggling plant to reduce emissions.
 - Stack emissions: Continue regular measurements (annually for 1 – 8 hours for PM, NO₂, SO₂ and Mn) as per AEL requirements for future operations.
 - Vehicle entrained dust from roads: Continue with water trucks and chemical suppressants (Dustek) at application of greater than 1l/m²-hour, avoid spillages by covering trucks, sweeping of paved roads, traffic control.

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