forestry, fisheries
& the environment

Department:
Forestry, Fisheries and the Environment
REPUBLIC OF SOUTH AFRICA

RISK ASSESSMENT IN TERMS OF REGULATION 8 OF THE WASTE EXCLUSION REGULATIONS

	(For official use only)
File Reference Number:	12/9/11
NEAS Reference Number:	
Date Received:	

Risk Assessment for an application for exclusion of waste stream or portion of waste stream in terms of the National Environmental Management: Waste Act, 2008(Act No.59 of 2008), as amended.

Kindly note that:

1. This form is current as of 01 April 2021. It is the responsibility of the applicant to ascertain whether subsequent versions of the form have been published or produced by the competent authority.

2. The information must be typed within the spaces provided in the form. The sizes of the spaces provided are not necessarily indicative of the amount of information to be provided. Spaces are provided in tabular format and will extend automatically when each space is filled with typing.

3. Incomplete forms (including information as required in the application form may be returned to the applicant for revision and the inclusion of additional information.

4. Unless protected by law, all information filled in on this application will become public information on receipt by the competent authority. Any interested and affected party should be provided with the information contained in this application on request, during any stage of the application process.

BACKGROUND INFORMATION	
APPLICANT	Tronox Mineral Sands (PTY) Ltd., Namakwa Sands Smelter Operation
CONTACT PERSON	JJ Le Roux
NAME	JJ Le Roux
ADDRESS	P.O Box 435, Vredenburg, 7380
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WASTE GENERATING FACILITIY OR FACILITIES						
PHYSICAL ADDRESS OF FACILITY OR FACILITIES	81/1 Trunk Road Saldanha 7395					
GPS CO-ORDINATES AT CORNERS OF WASTE GENERATING FACILITY OR FACILITIES	LATITUDE			LONGITUDE		
	32°	57′	49.6″	18°	02′	45.0″
	32°	57′	49.6″	18°	02′	45.7″
	32°	57′	47.6″	18°	02′	45.6″
	32°	57′	47.8″	18°	02′	46.1″
WASTE STREAM OR PORTION OF A WASTE STREAM TO BE EXCLUDED FROM THE DEFINITION OF WASTE	Desulphurised Slag					
BENEFICIAL USE/S	• Aggregate • Concrete product aggregate • Road base materials • Construction fill • Asphaltic concrete and other bituminous mixtures • Brick making • Cement production alternative raw material					

WASTE GENERATING PROCESS	
DETAILED DESCRIPTION OF WASTE GENERATING PROCESS[1]	<u>Furnaces</u> The smelting process comprises of the carbonaceous reduction of ilmenite to produce titania desulphurised slag with a titanium dioxide content of 87% and iron with a carbon content of 2.5%. The ilmenite is sourced from the Mineral Separation Plant (MSP) and stored in silos. From these silos it is conveyed to the ilmenite furnace day bins.

[1] A process flow chart must be attached with this form for the process description

Anthracite, which is mainly imported from Vietnam and stockpiled, acts as the reductant.

Ilmenite and anthracite are continuously fed in controlled ratios through the hollow electrode and side feed ports into the operating furnace. The furnaces are direct current electric arc furnaces. The reduction of ilmenite is an endothermic reaction.

Slag and iron are tapped from the furnaces into slag pots and iron ladles, respectively. The iron ladles are sent to the iron plant for treatment. The slag pots are taken to the slag cooling area. **[note this slag referred to above is not the desulphurised slag assessed in this application]**

<u>Iron Plant</u>
Iron is tapped from the furnaces at a temperature of approximately 1 450°C into 32-ton refractory lined ladles and transported to the Iron plant for treatment.

The primary product from the iron plant Is high and low silicon pig Iron. At the Iron Plant the ladle with iron is taken to the injection station to be recarburised and desulphurised. Carbon is injected to increase the carbon content from approximately 2.5% to 4.1% max. Calcium carbide is injected to decrease the sulphur content to below 0.012%. Silicon carbide is also added to the molten iron to increase the silicon content. The amount of silicon carbide required depends on whether high or low silicon pig iron is produced.

The molten Iron is then transferred into a pig caster machine to form pig iron blocks which get cooled using water and then stockpiled for storage. The ladle is then cleaned using a front-end loader with a ladle scraper attachment and whatever is left behind from the cleaning process is what is referred to as the Desulphurised slag. The Desulphurised slag is then left to air cool on the iron plant isle and then after placed in a designated screening yard where bigger skulls (large pieces of iron which forms from spillages and form on the sides of the pig caster in the iron plant). These are good quality iron peace's which are recycled back into the process are recycled, and the finer material is left behind and stockpiled (for disposal).

Refer to process flow diagram as appendix 1 hereto

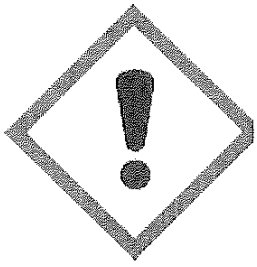
PRODUCTION PROCESS FLOW CHART ATTACHED	YES ✓	NO
WASTE CLASSIFICATION	HAZARDOUS ✓	GENERAL

IF HAZARDOUS LIST THE HAZARDS OF THE WASTE

SANS10234 Classification Summary

Description	Category	Trigger
Health Hazards		
6. Carcinogenicity	1	H350: Crystalline silica (Quartz) is classified as a human carcinogen.

9. Specific target organs toxicity following repeated exposure	1	H372: STOT-R 1 - H372 - Causes damage to Lungs by inhalation through prolonged or repeated exposure
Environmental Hazards		
Acute aquatic toxicity	3	H402: Harmful to aquatic life



Hazard statements

H335: May cause respiratory irritation
H350: May cause cancer if inhaled
H372: Causes damage to organs (lung/respiratory system) prolonged or repeated exposure (inhalation)
H402: Harmful to aquatic life

Precautionary statements

P201: Obtain special instruction before use
P202: Do not handle until all safety precautions have been read and understood
P260: Do not breathe dust
P261: Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray
P285: In case of inadequate ventilation wear respiratory protection
P273: Avoid release to the environment

RISK ASSESSMENT WITHOUT AND WITH MITIGATION

Activity	Risk Description	Environmental Receptors	Assessment of Risk					Significance	
			Impact	Probability	Magnitude	Duration	Scale		
Desulphurised Slag storage	Dust generation and subsequent inhalation exposure **without** mitigation	Receptors in the surrounding environment via inhalation pathway	Impact on air quality and on human health via inhalation	3	6	5	2	39	Moderate
	Dust generation and subsequent inhalation **with** mitigation (e.g water sprays or other dust suppressants where relevant, wearing of PPE(dust mask and safety glasses)			1	2	5	2	9	low
	Potential for stockpiled material to enter the surrounding environment **without** mitigation	Surface water, soil, and groundwater contamination	Impact on aquatic biota and water quality	5	6	2	2	50	moderate
	Potential for stockpiled material to enter the surrounding environment **with** mitigation(eg Slag must only be stored on an impermeable surface).			1	2	2	2	6	low
Desulphurised Slag handling	Potential for desulphurised slag to generate dust during loading, handling, and	Receptors in the surrounding	Impact on air quality and on human health via inhalation	3	6	5	2	39	moderate

Activity	Risk Description	Environmental Receptors	Assessment of Risk					Significance	
			Impact	Probability	Magnitude	Duration	Scale		
	unloading, **without** mitigation	environment via inhalation pathway							
	Potential for desulphurised slag to emit dust during loading, handling, and unloading, **with** mitigation (e.g water sprays or other dust suppressants where relevant, wearing of PPE(dust mask and safety glasses)			2	2	5	2	18	low
	Spillage during handling and transfer resulting in interaction with storm water **without** mitigation	Surface water, soil, and groundwater contamination	Impact on aquatic biota and water quality	3	8	2	2	39	moderate
	Spillage during handling and transfer resulting in interaction with storm water **with** mitigation (eg. Any material spilled must immediately be recovered and placed on the stockpile, back into the process, or disposed of lawfully).			1	2	2	2	6	low

Activity	Risk Description	Environmental Receptors	Assessment of Risk					Significance	
			Impact	Probability	Magnitude	Duration	Scale		
Transporting of desulphurised slag	Potential for desulphurised slag dust entrainment by wind **without** mitigation	Receptors in the surrounding environment via inhalation pathway	Impact air quality and on human health via inhalation	4	2	5	2	36	moderate
	Potential for desulphurised slag dust entrainment by wind **with** mitigation (covered load bay)			1	2	5	2	9	low
	Spillage during handling and transfer resulting in interaction with storm water **without** mitigation	Surface water, soil, and groundwater contamination	Impact on aquatic biota and water quality	2	8	2	2	24	low
	Spillage during handling and transfer resulting in interaction with storm water **with** mitigation (eg. apply waste management controls as detailed in the risk management plan.			1	2	2	2	6	low
Desulphurised Slag Processing (crushing, screening, etc)	Dust generation and subsequent inhalation exposure **without** mitigation	Receptors in the surrounding environment via inhalation pathway	Impact air quality and on human health via inhalation	4	6	5	1	48	moderate
	Dust generation and subsequent inhalation **with** mitigation (e.g water sprays or other dust suppressants where relevant, wearing of			1	4	5	1	10	low

Activity	Risk Description	Environmental Receptors	Assessment of Risk					Significance	
			Impact	Probability	Magnitude	Duration	Scale		
	PPE (dust mask and safety glasses))								
Desulphurised Slag management / beneficiation	Dust generation and subsequent inhalation exposure **without** mitigation	Receptors in the surrounding environment via inhalation pathway	Impact air quality and on human health via inhalation	3	6	5	2	39	Moderate
	Dust generation and subsequent inhalation **with** mitigation (e.g encapsulation)			1	4	5	2	11	low
	Potential for the beneficiated material, or leached constituents thereof, to enter the surrounding environment **without** mitigation	Surface water, soil, and groundwater contamination	Impact on aquatic biota and water quality	4	6	5	2	52	moderate
	Potential for the beneficiated material, or leached constituents thereof, to enter the surrounding environment **with** mitigation (e.g. encapsulation)			1	2	5	2	9	low

The following factors and criteria must be used to assess the impacts of the activities:

CRITERIA	
Magnitude (Severity)	**Duration**
10 – Very high	5 – Permanent (longer than 10 years)
8 – High	4 – Long term (5 – 10 years)
6 – Moderate	3 – Medium term (12 months to 5 years)
4 - Low	2 – Short term (< 12 months)
2 - Minor	1 – Immediate
Scale	**Probability (Likelihood)**
5 – International	5 – Definite
4 – National	4 – Highly probable
3 – Regional	3 – Medium probability
2 – Local	2 – Low probability
1 – Site only	1 – Improbably
0 – None	0 - None

Magnitude
Measures the size of the impact

Duration
Duration refers to the lifetime of the impact i.e. how long it will last

Scale
The scale refers to the extent of the impact

Probability
The probability refers to the chance of the impact to occur. The potential impact could be most likely to occur, unlikely, etc.

Assessment of Significance of Impact

Significance rating of the potential impact illustrates the importance of the impact itself. The size of the area affected by pollution may be extremely high but the significance of this effect is dependent on the concentration or level of pollution in that area. In order to determine the significance of an impact, the following method should be used:

Significance (S) = (Magnitude + Duration + Scale) x Probability

The values of S must then be categorised as follows:

RATING		DESCRIPTION
SP > 60	High significance	An impact which could influence the decision about whether or to proceed with the activities regardless of any possible mitigation
SP 30 - 60	Moderate significance	An impact or benefit which is sufficiently important to require management and which could have an influence on the decision unless it is mitigated
SP < 30	Low significance	Impacts with little real effect and which will not have an influence on or require modification of the activities
+	Positive impact	An impact that is likely to result in a positive consequence/effect

I, Marius Vlok (the Applicant) hereby declare that I have read the completed Risk Assessment form and hereby confirm that the information is, to the best of my knowledge, true and correct.

Furthermore, I declare that I am fully aware of my responsibilities in terms of the Waste Exclusion Regulations, and that failure to comply with these Regulations may constitute an offence in terms of the National Environmental Management: Waste Act, 2008 (Act 59 of 2008).

Signature of the applicant[2]/ Signature on behalf of the applicant:

Marius Vlok

Name of Applicant:

SHE Manager

Designation

Date: 07/06/2021

[2] If the applicant is a juristic person, a signature on behalf of the applicant is required as well as proof of such authority.

Appendix 1: Process Flow Chart