Tronox KZN Sands (Pty) Ltd

INTEGRATED ENVIRONMENTAL AUTHORISATION FOR THE PORT DURNFORD MINE, KWAZULU-NATAL

Social Impact Assessment

OUR REF. NO. 41106008-REP-00010
MARCH 2025

PUBLIC

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DETAILS AND DECLARATION OF THE SPECIALIST

DETAILS OF THE SPECIALISTS

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DECLARATION OF INDEPENDENCE BY SPECIALIST

I, Steve Horak, a duly authorised representative of WSP Group Africa (Pty) Ltd, declare that I –

- Act as the independent specialist in this application.
- Do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed.
- Do not have nor will have a vested interest in the proposed activity proceeding.
- Have no, and will not engage in, conflicting interests in the undertaking of the activity; and
- Undertake to disclose, to the competent authority, any information that have or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document.

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ABBREVIATIONS

Abbreviation	Full term
AMD	Acid Mine Drainage
BEE	Black Economic Empowerment
CPC	Central Processing Complex
CRR	Comment and Response Report
DMRE	Department of Mineral Resources and Energy
DTMUs	Dozer trap mining units
EA	Environmental authorisation
EAP	Environmental Assessment Practitioner
EDTEA	Economic Development, Tourism and Environmental Affairs
EMEs	Exempted Micro Enterprises
EIA	Environmental Impact Assessment
EIR	Environmental Impact Reporting
FEL	Front-end loaders
GDP	Gross Domestic Product
HDSA	Historically disadvantaged South Africans
I&AP	Interested and affected parties
IDP	Integrated Development Plans
KCD	King Cetshwayo District
KZN	Kwa-Zulu Natal
LDV	Light duty vehicle
LRP	Livelihood Restoration Plan
LOM	Life of Mine
MSP	Mineral Separation Plant
PD	Port Durnford
PFC	Power Factor Correction

Abbreviation	Full term
PIT	Professionals-in-Training Internship Programme
PPP	Public Participation Process
PWP	Primary Wet Plant
QSEs	Qualifying Small Enterprises
ROM	Run of Mine
RSA	Republic of South Africa
SDF	Spatial Development Frameworks
RSFs	Residue storage facilities
S&EIR	Scoping and Environmental Impact Report
SIA	Social Impact Assessment
SLP	Social Labour Plan
SMME	Small Medium Enterprise
WML	Waste Management License

Executive summary

Tronox Kwa-Zulu Natal (KZN) Sands (Pty) Ltd (herein referred to as Tronox) currently operates the Fairbreeze mine where heavy mineral sands are mined south-west of Mtunzini in the Greater Richards Bay area. This is supported by a Mineral Separation Plant (MSP) and Smelter (collectively known as the Central Processing Complex (CPC)) in the Empangeni area (see Figure 1-1). Tronox's previous mining operation, Hillendale, is in the mine closure phase.

The objectives of this report are to:

- Describe the socio-economic conditions of the receiving environment.
- Identify and describe the socio-economic implications associated with the proposed project.
- Identify, describe, and rate the significance of the socio-economic impacts that may result from the proposed project.
- Recommend feasible (practical and cost-effective) mitigation measures to enhance positive effects and reduce negative impacts.

The regional context is within the King Cetshwayo District Municipality. The project area is largely within the uMhlathuze Local Municipality, with a small part of the proposed mining right boundary within the uMlalazi Local Municipality. The uMhlathuze Local Municipality is the largest contributing to the GDP of the District at 44.0%. Agriculture is the most significant contributor to the economy. HIV/AIDS and unemployment are the main challenges in the local municipality.

Positive impacts from the Port Durnford mine allow the project to have high significant positive impacts. These include contributions to the gross national product, community investment projects according to the SLP and employment opportunities for locals, especially youth. Other positive impacts include increased economic development, skill development, and training for the local community.

Negative impacts include loss of agricultural land, change in land use, ambient noise, and light and visual disturbances. These can be reduced to have lower significance ratings with mitigations. However, negative impacts such as community-related health and safety, , increased traffic, and a decline in property value will have significant consequences on the socio-economic status of the surrounding areas.

1 INTRODUCTION

Tronox KZN Sands (Pty) Ltd (herein referred to as Tronox) currently operates the Fairbreeze mine, where heavy mineral sands are mined south-west of Mtunzini in the Greater Richards Bay area. To support this, Tronox plans to convert its prospecting rights into consolidated Mining Rights and environmental authorisation (EA). A full Scoping and Environmental Impact Reporting (EIR) Process is required to support the project's environmental approval. WSP Group Africa (Pty) Ltd (WSP) has been appointed as the Environmental Assessment Practitioner to undertake the Scoping and EIR (S&EIR) Process.

1.1 TERMS OF REFERENCE

The S&EIR process is required in terms of the following legislation:

- Mineral and Petroleum Resources Development Act (Act No. 28 of 2002) (MPRDA)
- National Environmental Management Act (No. 107 of 1998) (NEMA) for submission of application for EA in respect of activities identified in terms of GNR 983, 984 and 985 (7 April 2017, as amended)
- National Environmental Management: Waste Act (Act No. 59 of 2008) (NEM: WA) and the list of waste management activities (GN 921:2013, as amended) require submission of a waste management licence (WML) application.

1.2 OBJECTIVES OF THE SOCIAL IMPACT ASSESSMENT

The objectives of the Social Impact Assessment are as follows:

- Describe the socio-economic conditions of the receiving environment.
- Identify and describe the socio-economic implications associated with the proposed project.
- Identify, describe, and rate the significance of the socio-economic impacts that may result from the proposed project.
- Recommend feasible (practical and cost-effective) mitigation measures to enhance positive effects and reduce negative impacts.

This report is divided into five sections. The first section covers the introduction, objectives, project area, and description. The following section expands on the social impact methodology followed by the legislative context. The next section expands on the social baseline for the province and district municipality. The report then expands on the anticipated impacts and their mitigations.

GAPS IN KNOWLEDGE

- The understanding of the comparison between short term and long-term loss of GDP contribution of the productive Mondi Forestry operation vs the proposed Heavy Metal Sand Mining development.
- The economic impact of the proposed mining development on Mtunzini and the surrounding community areas like Port Durnford Esikhawini.

1.3 PROJECT AREA

Tronox KZN Sands (Pty) Ltd ("Tronox") holds a prospecting right under Department of Mineral Resources and Energy ("DMRE") Reference: KZN 30/5/1/1/2/296 PR in respect of ilmenite, rutile and zircon on the farms measuring 843.72 hectares in extent in the uMlalazi and uMhlathuze Local

Municipalities, KZN province (the "Waterloo PR"), which prospecting right was renewed by the DMRE according to section 18 of the Mineral and Petroleum Resources Development Act, 2002 ("MPRDA").

Historically, Tronox held the following two prospecting rights in terms of section 17 of the MPRDA:

- DMRE Ref: KZN 30/5/1/1/2/10708 PR (formerly 771 PR) in respect of ilmenite, rutile, zircon and heavy minerals on the farms measuring 3 945.95 hectares in extent in the uMhlathuze Municipality, KwaZulu-Natal province (the "Port Durnford PR"); and
- DMRE Ref: KZN 30/5/1/1/2/279 PR in respect of ilmenite, rutile, zircon and heavy minerals on the farms measuring 258.27 hectares in extent in the uMhlathuze Municipality, KZN province (the "Penarrow PR").

On 18 November 2022, Tronox exercised its exclusive right to apply for and be granted a mining right in terms of section 19(1)(b) of the MPRDA by applying for a mining right under DMRE Ref: KZN 30/5/1/2/2/10117 MR (the "Initial Mining Right Application") in respect of the Port Dunford PR (which remained in force at the time); and the Waterloo PR (which is in force to date). The Initial Mining Right Application included the minerals and areas subject to the Penarrow PR. The Initial Mining Right Application consolidated the Waterloo PR, Penarrow PR and Port Dunford PR into one title and was accepted by the DMRE on 25 January 2023.

Tronox is applying for a consolidated MR for all of these areas and seeking EA to mine for heavy minerals, garnet (Abrasive), kyanite, leucoxene (heavy mineral), monazite (heavy mineral), rutile (heavy mineral), silica sand and zirconium ore.

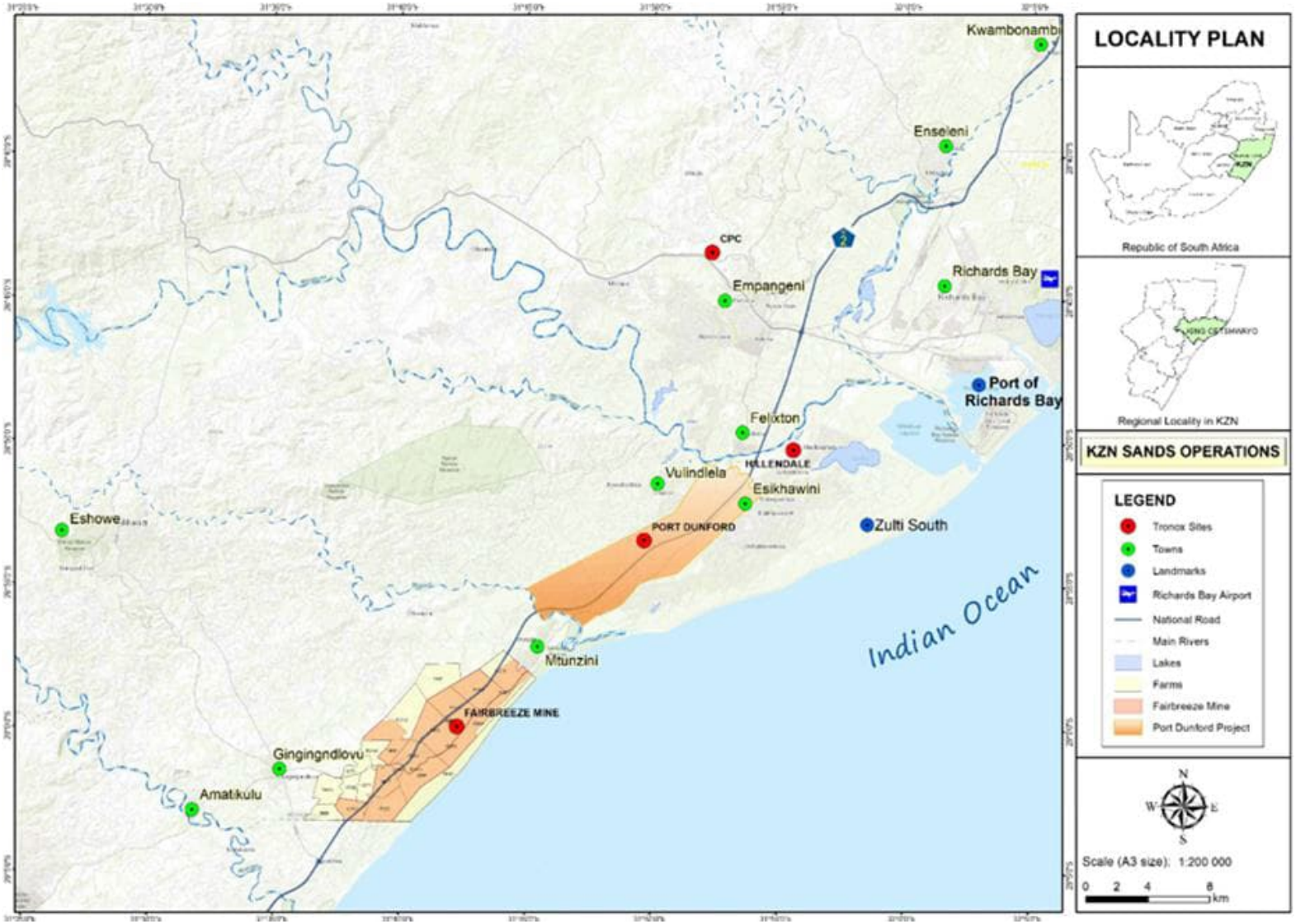

Figure 1-1 - Location of Tronox operations and proposed project area at Port Durnford (Tronox, MWP, current)

1.4 PROJECT DESCRIPTION

The proposed project is for the mining of heavy minerals, including ilmenite, rutile, zircon and leucoxene, which are used to produce:

- Titanium dioxide (TiO2) pigment is used in paints, plastics, paper laminates, ink and the food market.
- Titanium metal
- Welding consumables
- Titanium feedstocks are used to manufacture brake pads and roof tiles and in the glass manufacturing industry.
- Zircon manufactures ceramics, foundry, refractory, zirconia and other zircon chemicals.

It is proposed that the mining activities will be undertaken in two phases:

- Phase 1 is a low-rate mining operation at approximately 70400 tpa (tonnes per annum) for about ten years from 2025 to 2035. It is anticipated that the mining operations will increase in throughput after 2035, and
- Phase 2 (Full Scale), an operation with a mining rate of 3000 tph, will operate until the closing of the mine in 2074.

1.4.1 PHASE 1 MINING

Figure 1-2 presents the main features of the Phase 1 mining operation proposed for the Port Durnford Project.

The low-rate (Phase 1) operation will involve Port Durnford ROM material being mined mechanically with front-end loaders (FELs) and hauled via trucks to the Fairbreeze mine for stockpile and processing. No processing facilities, tailings, or fines disposal facilities will be developed in the Port Durnford lease area. At Fairbreeze mine, the ROM will be stockpiled within a mined-out portion of the orebody. The hydraulic mining process will then continue as per the current practice at Fairbreeze, and the material will be pumped to the Fairbreeze Primary Wet Plant (PWP) for processing. The processed material will then be trucked to the existing MSP located at the CPC in Empangeni. The site layout is depicted in Figure 1-2.

The proposed mine infrastructure for Phase 1 will include the mining areas as well as a temporary site with the following infrastructure to support this operation:

- Conservancy Septic tank system – 2 x 6,000 litre tanks placed under ground.
- Mining equipment parking area.
- Workshop laydown area.
- Water storage tanks (2 x 10 kilolitre tanks).
- Internal water reticulation (to offices & ablutions).
- Offices and ablution units.
- Internal electrical reticulation.
- External lighting.
- Light duty vehicle (LDV) parking area.

- Guard house.
- Security fence.
- A gravel access road (200 m) will connect the laydown yard to the District Road, connecting to R102.
- A general and hazardous waste storage area.
- Fuel and Lubricant Storage: it is anticipated that a 23 m^3 storage tank will be provided, and it is estimated that 153,422 litres will be utilised per annum.

The ore mined at Port Durnford is proposed to be transported using highway road trucks to the Fairbreeze PWP. The preferred route is transported along a short gravel road from the site onto the R102 (proposed to be expanded and upgraded), then left onto Hely Hutchinson Road and the N2 highway via the onramp closest to Mtunzini. Direct access to Fairbreeze is then possible from an offramp of the N2.

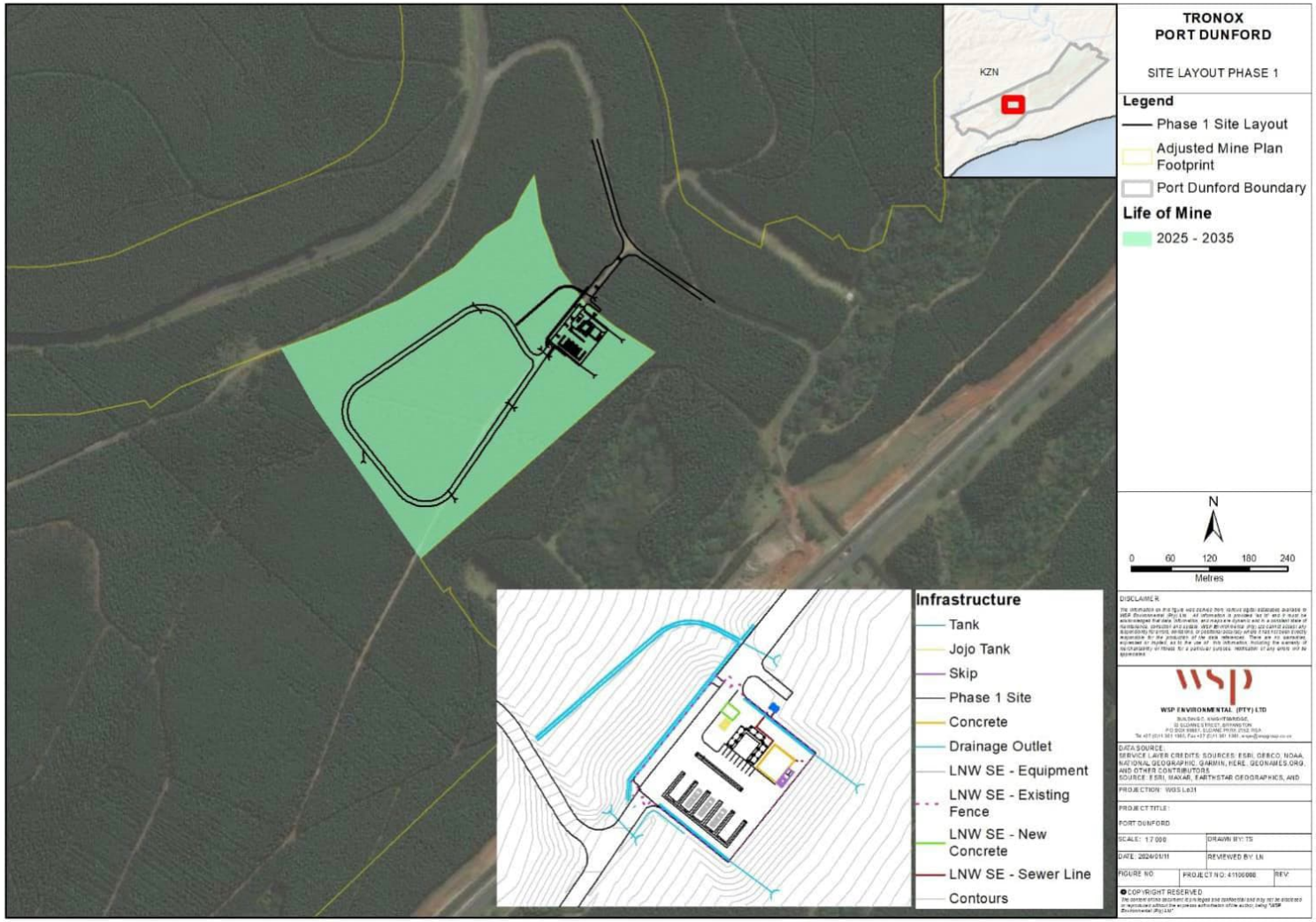

Figure 1-2 - Phase 1 (100 tph) layout

1.4.2 PHASE 2 MINING

From 2036 to the end of the Life Of Mine (LOM), the low-rate truck and shovel mining method will be replaced by a high-rate 3,000 tph mining operation utilising two dozer trap mining units (DTMUs). The DTMUs will be fed via bulldozers and will operate in parallel to collect and prepare the ROM for further hydraulic transfer to Port Durnford's own PWP. The units will be skid-mounted and mobile to screen vegetation, rocks and oversized materials. The remaining ROM will then be slurried and pumped to the PWP, passing through a trommel screen to remove further oversized material.

The 3,000 tph operation will involve a full production facility, consisting of a new PWP, constructed to process the Port Durnford ROM material and residue storage facilities (RSFs) will need to be constructed to contain the fines tailings produced from the PWP. All bulk services (such as power and raw water) and the associated infrastructure to support this operation will also be required.

All HMC produced at the PWP will then be transferred as feedstock via truck to the existing MSP in

Empangeni. At the PWP, the following processes will occur:

- Mined material (ROM) will be deslimed and placed through a spiral circuit to separate the coarse tailings, which will then be used for backfilling and establishing the walls of the RSFs.
- The spiral concentrate will be put through a magnetic separation circuit to remove the reject magnetite, which will be fed back into the coarse tailings circuit.
- The non-magnetic material forms the HMC, which feeds into the PWP, MSP and ultimately the CPC.
- Fine tailings are collected from the desliming process, thickener is added, and process water is retrieved before RSFs are disposed of.

The site infrastructure layout and LOM plan are depicted in s 1-4 and 1-5, respectively.

Figure 1-3 - Proposed Phase 2 infrastructure and layout (3 000 tph)

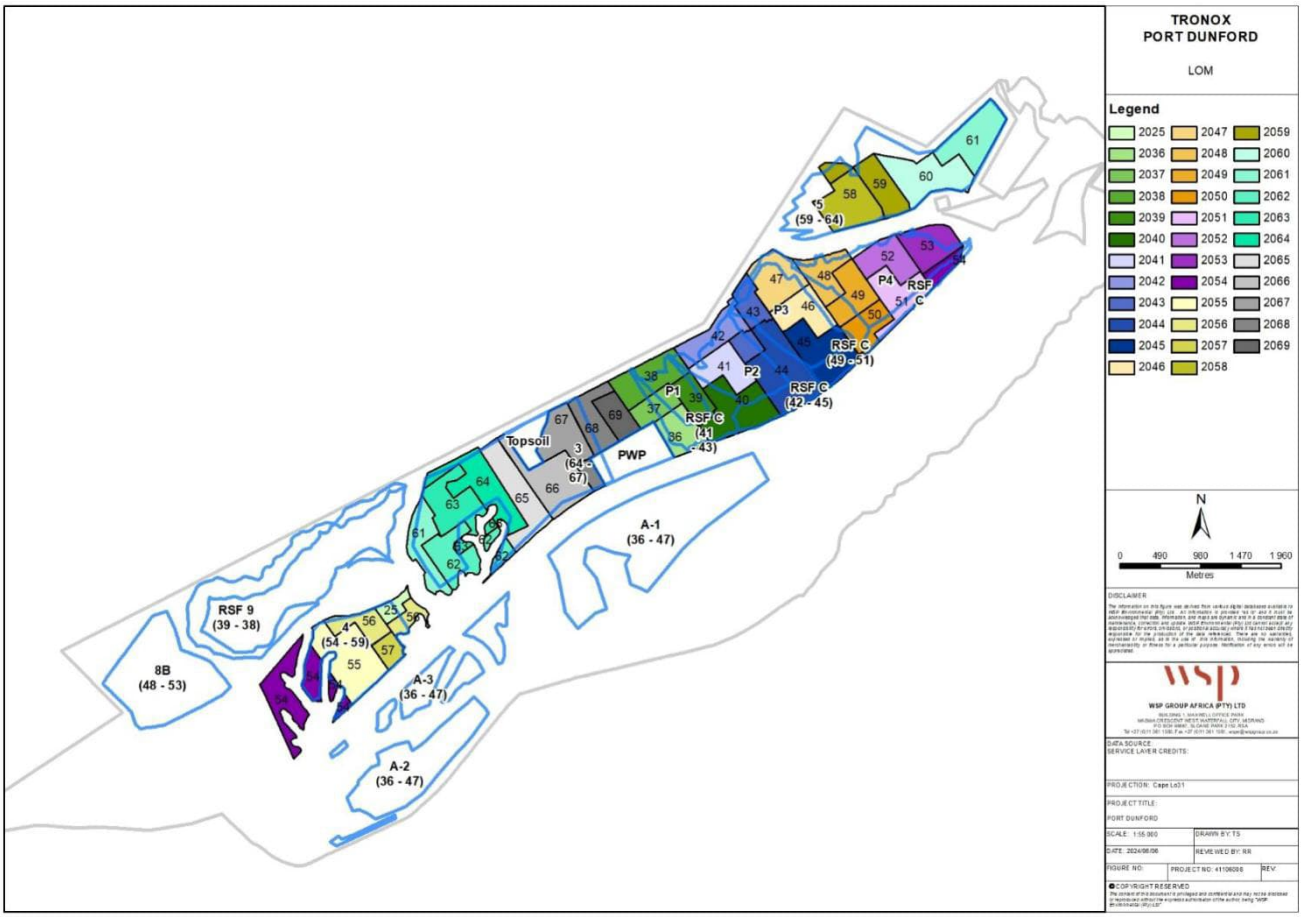

Figure 1-4 - Life of Mine Plan

2 SOCIAL IMPACT METHODOLOGY

To understand the socio-economic baseline conditions of the project-affected areas and the socio-economic implications of the proposed project to the receiving environment, WSP conducted secondary desktop data collection (desktop review). Primary data collection was undertaken as part of a stakeholder consultation process. These two methods are elaborated further in the following sections.

2.1 SECONDARY RESEARCH

WSP reviewed available documents to obtain information regarding the socio-economic conditions in the study area. The documents reviewed include the following:

- Integrated Development Plans (IDPs) and Spatial Development Frameworks of the affected local and District municipalities;
- Socio-economic and demographic statistics (sourced from Statistics South Africa's 2011 census data, municipal report, provincial data and Statistics South Africa's 2016 community survey and Census 2022);
- Documents concerning the proposed project, which include a project description document, scoping report and the 2023 social and labour plan (SLP); and

- Available maps and satellite imagery.

2.2 PRIMARY RESEARCH

WSP consulted with interested and affected parties (I&AP) during the scoping phase of the project by distributing background information documents with comment sheets, conducting one-on-one interviews, focus group meetings and public meetings. The information derived from these meeting minutes was used to understand better the stakeholders' concerns, issues, and expectations. This process formed part of the primary research process.

The first set of public meetings was scheduled in December of 2022 in Richards Bay and Esikhaweni. The attendance at these meetings needed to be increased; therefore, a second set of meetings was arranged for February 2023. Public meetings were held at Kwa Dlangezwa Sports Fields, thus Hlanganani Community Hall and Mtunzini.

The draft scoping report was published and put out for public review and comment on the 21st of November, 2022. On 9 February 2023, the comment period was extended until 22 February 2023. After changes to the mine plan, the ESIR and Scoping process was restarted, and the draft scoping report was placed for public review from the 1st of August 2024 to the 1st of September. This comment period was extended to the 1st of October 2024. To date, all issues, questions, concerns and suggestions for enhanced benefits raised by I&APs in both scoping comment periods have been captured in the Comment and Response Report (CRR), which forms part of the Public Participation Report.

3 LEGISLATIVE CONTEXT

The Social Impact Assessment process The social baseline study for this project considers the relevant South African legislative requirements. Table 3-1 summarises the appropriate guiding regulations, legislation, and best practices for the SIA.

Table 3-1 - Policy, Legislation, Guidelines or Standard

Policy, Legislation, Procedures, or Standard	Description	Relevance to Project
National Legislation		
Constitution of the Republic of South Africa, Act 108 of 1996, Chapter 2: Bill of Rights.	Section 24 of the Constitution states that everyone has the right to an environment that is not harmful to their health or well-being.	The project needs to consider human rights in every phase of the project life cycle and not infringe on any human rights.
National Environmental Management: Protected Areas Act, 57 of 2003	The Act protects and conserves ecologically viable areas representing South Africa's biological diversity, natural landscapes, and seascapes.	The project has undertaken an ecological impact assessment to mitigate negative impacts and conserve the ecology within their operating area.
National Environmental Management Act, 107 of 1998 (NEMA).	The Act provides the legislative framework for integrating good environmental	The project is applying for EA in accordance with this Act to

Policy, Legislation, Procedures, or Standard	Description	Relevance to Project
	management practices into all development activities in South Africa. The National Environmental Management Act broadly states that the participation of all I&AP in environmental governance must be promoted, achieving equitable and effective participation and ensuring the involvement of vulnerable and disadvantaged persons.	practice good environmental management. A public participation process has formed part of the EA process.
National Water Act (Act 36 of 1998).	The National Water Act ensures that projects and future interventions maintain water resources' capability to meet basic human needs. It seeks to support equitable water access and efficient, sustainable, and beneficial use. Future developments must reduce and prevent the pollution and degradation of water resources.	There are several water sources in and surrounding the proposed project. These have been assessed as part of the water specialist studies, and these water sources will be protected. A water use licence will be applied for.
Promotion of Administrative Justice Act, Act 3 of 2000 (PAJA).	Under the provisions of the Public Administrative Justice Act, 3 of 2000 PAJA, an administrative action also includes a decision made by an organ of the state or by a person or body exercising a public power or performing a public function that adversely affects the rights of any person. Therefore, the public has a right to a lawful, reasonable, and procedurally fair administrative process and to be given the reasons for administrative actions.	The project will undertake a public participation process to ensure the affected public can access information regarding the proposed project.
Protection of Personal Information Act, 4 of 2013 (POPI).	The Act promotes the protection of personal information and balances the right of privacy recognised by the Constitution with various needs and interests, like economic and social progress. POPI regulates how personal information may be processed and establishes voluntary and compulsory measures,. POPI is concerned with collecting, storing, using, and destroying personal information. Unless part of a regulatory process that requires the rightful notification of I&AP or to protect the rights of third parties, personal information may be used only with stakeholders' expressed permission.	During the Public Participation Process, the participant's information will not be published unless permitted by the participant.
National Spatial Development Perspective.	According to the National Spatial Development Perspective, spatial development should, where appropriate, accommodate and promote private economic ventures, which can aid	Consequently, municipal-level spatial planning has been considered where relevant.

Policy, Legislation, Procedures, or Standard	Description	Relevance to Project
	sustainable economic growth, relieve poverty, increase social investment, and improve service delivery.	

4 SOCIAL BASELINE

This section describes the broader socio-economic background of the study area. It considers the municipality's population, health, and economic aspects where the prospective mine will be situated.

4.1 KWAZULU-NATAL PROVINCIAL BASELINE

KwaZulu-Natal is one of the nine (9) provinces in the Republic of South Africa. It is the third smallest province (in geographic size) and covers approximately 94361 km^2 or 7.7% of South Africa's land mass. The province has the second largest population in the country, with about 12.4 Million (Stats SA, 2022) (Statista, 2021) (KZN Department of Co-Operative Governance, 2021)

The population is spread unevenly among 10 District Municipalities (43 Local Municipalities KZN) and one metropolitan municipality (eThekwini Metropolitan Municipality). eThekwini ranks number 1 in the provincial population. 52.5% of the population resides in rural areas, mainly in settlements under traditional leadership. The province has the largest Indian population outside India. The most spoken language in the province is isiZulu, 80 % followed by English, which accounts for 14.4 % of the population. Widespread poverty, poor access to basic services and public facilities, lack of economic opportunities and general underdevelopment characterise these areas (KZN Department of Co-Operative Governance, 2021).

4.2 KING CETSHWAYO DISTRICT MUNICIPALITY

The King Cetshwayo District (KCD) is located in the KZN province's north-eastern region on the eastern South Africa seaboard. It covers an area of 8 213 square kilometres, from the agricultural town of Gingindlovu in the south to the uMfolozi River in the north and inland to the Nkandla Mountains.

UMkhanyakude District surrounds the KCD to the north, Zululand District to the north-west, uMzinyathi District to the north-east and iLembe District to the south and is approximately 150 km north of the eThekwini metro. The headquarters of the KCD is in Richards Bay, and the district comprises five local municipalities: Mthonjaneni, uMlalazi, Mfolozi, uMhlathuze and Nkandla. The N2 from Durban to Mpumalanga passes through the district (King Cetshwayo District, 2020).

In 2022, the District accounted for a total population of 1 021 344 and ranked the third highest of the total population in KZN, slightly up from 971 135 in 2016. Females constituted 52.7% of the population. The number of households decreased from 225,798 in 2016 to 205,739 in 2022. In 2016, 49.8% of households were headed by women, while 1 552 households were headed by children younger than 18, 80%. Most of the KCD population and households are regarded as rural (King Cetshwayo District, 2020).

The District is among the critical economic players in KZN regarding GDP contribution. It contributed 6.5% of the total estimated provincial GDP generated in 2016. KCD is among the largest districts contributing significantly towards the provincial GDP, with eThekwini and uMgungundlovu at 59.5%

and 11.3%, respectively. The most significant contributing local municipalities to the GDP of the district is the city of uMhlathuze at 44.0%, followed by uMfolozi at 25.7% and uMlalazi at 21.3%. Although the economy of KCD is predominantly dependent on the tertiary sector at 47.9%, the secondary sector at 29% also plays a significant role in its economy, especially the manufacturing sub-sector (King Cetshwayo District, 2020).

4.2.1 UMHLATHUZE LOCAL MUNICIPALITY

The city of uMhlathuze is situated on the northeast coast of the province of KZN, about 180 kilometres northeast of Durban. The uMhlathuze land area currently covers 123 359 ha. It incorporates Richards Bay, Empangeni, eSikhaleni, Ngwelezane, eNseleni, Felixton, Vulindlela, Bhucanana, Hendersonville, as well as the rural areas under Traditional Councils, namely, Dube, Mkhwanazi, Khoza, Zungu (Madlebe), Somopho, Obizo and a small portion of Obuka.

The municipality borders a coastline that spans approximately 45 kilometres. The N2 highway traverses the uMhlathuze Municipality north-east towards the Swaziland border and south-west towards Durban. The R34 Provincial Main Road passes through Empangeni towards Melmoth (uMhlathuze Local Municipality, 2022/2023 - 2026/2027).

4.2.2 UMLALAZI LOCAL MUNICIPALITY

The mining right boundary also falls partly within the uMlalazi Local Municipality, south west of the uMhlathuze Municipality. uMlalazi Local Municipality is found along the north-eastern coast of KZN, 125km north-east of Durban. The eastern portion of the uMlalazi Local Municipality lies on the N2 National and Provincial Development Corridor, which links two major economic hubs, Richards Bay and Durban. UMlalazi municipality is within KCD (uMlazi Local Municipality, 2024-2025). Only 691ha of the mining right falls within the uMlalazi Local Municipality and therefore this municipality is not discussed in any detail.

5 SOCIO-ECONOMIC BASELINE FOR UMHLATHUZE MUNICIPALITY

5.1.1.1 Population Dynamics

The population increase in KCD, broken down per municipality, is indicated in Table 5-1 for 2011, 2016 and 2022. The population rank shows where a significant increment in population lies within KCD. Umhlathuze is ranked 1st in terms of population size.

Table 5-1 – Population increases of municipalities within KCD Municipality

Year	KCDM	UMFOLOZI	UMHLATHUZE	UMLALAZI	MTHONJANENI	NKANDLA
2011	907 519	122 889	334 459	213 601	47818	114 416
2016	971 135	144 363	410 465	233 140	78 883	114 284
2022	10 21 344	159 668	412 075	241 416	99 289	108 896
Population rank		3	1	2	5	4

5.1.1.2 Households

The average household size in uMhlathuze was 3.95 in 2011, with about 94,010 households. The average household size increased to 4.1, and there were about 100,441 households in 2022. If an increase of 1.5% is applied (using data from previous years), the IDP estimated households to be 115,330. If the population grows by 5%, 146 219 households will be reached in 2023 and 205 745 in 2030.

5.1.1.3 Population Gender and Age

In 2016, females numbered 187, 287, and males numbered 177, 175 within the uMhlathuze Local Municipality. Female-headed households increased in 2001 from 36.29 % to 40.70% in 2011. Table 5-2 shows that the population age cohort <15 has been declining at the district and uMhlathuze Local Municipality level, while the population cohort for the 15-64 age group has shown an increase at both the district and local municipality level between 2001 and 2011 (uMhlathuze Local Municipality, 2022/2023 - 2026/2027).

Table 5-2 - Population Age Structure

Municipality	Population		Age Structure (Percentage % of the population)					
			≤15		15-64		65+	
	2001	2011	2022	2011	2022	2011	2022	2011
KCD	885965	907519	29.9	34.8	57.3	60.7	4.4	4.5
uMhlathuze	289190	334459	25.9	29.9	69.4	66.8	4.7	3.3

Source: (Statistics SA, Census 2022)

5.1.1.4 Language

IsiZulu is the majority language spoken by 78.73% of its population in the uMhlathuze Municipality. In second place is English, spoken by 13.3% of the total population. In third place is Afrikaans, spoken by 9.3 % of the total population. (uMhlathuze Local Municipality, 2022/2023 - 2026/2027).

5.1.2 EDUCATION AND EMPLOYMENT

5.1.2.1 Education

In 2022, matric was the highest qualification for 46.5% of the population in uMhlathuze, whereas only 36.9 % had matric in 2011. KCD had 8.4% of its population having matric and a postgraduate qualification in 2011, 39.5 % of the population passed matric, and only 9.5 % obtained higher qualifications in 2022 (Stats SA, 2022).

5.1.2.2 Employment

In 2017, 24.6% of the uMhlathuze population was employed. This is slightly lower than the KCD percentage of 26.5%. Figure 5-1 shows the percentage of employment per ward in uMhlathuze in 2011. Ward 23 had the highest employment at 50% and Ward 30 the lowest, below 10%.

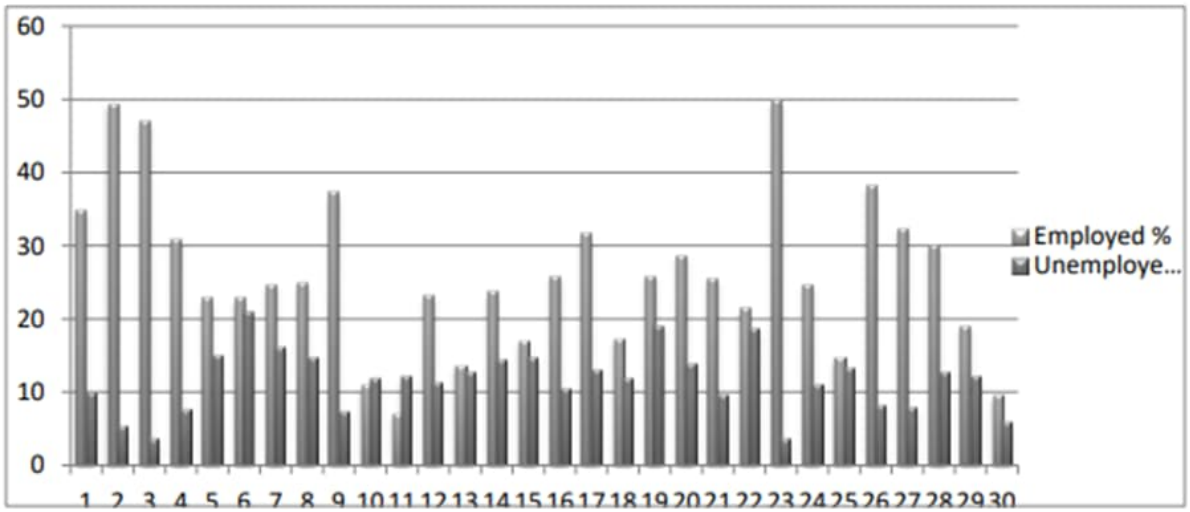

Figure 5-1 - Percentage of Employment per ward in Umhlathuze

6 ECONOMY

King Cetshwayo District consists of excellent agricultural conditions. The agricultural sector is a dual economy with commercial agriculture and traditional agriculture. The most significant contributing local municipality is the uMhlathuze Local Municipality. (44% of the GDP of the uMfolozi follows this, Umfolozi at 25.7% and uMlalazi at 21.3%.

According to (KZN Department of Co-Operative Governance, 2021), 80.6% of the KCD municipality's population have an income of less than R76 400p.a. or R6366.66 monthly. Moreover, 41.3% of the population falls in the income bracket of R9 601 – R38 200 p.a. or R800 – R3 183.33 monthly. In uMhlathuze, many persons in Wards 5, 6, 13, 15, 18, 25 and 29 earn less than R1600 monthly.

Functional age groups indicate the level of the potential workforce in a region. Therefore, the critical age group relates to individuals aged 15 years. Table 6-1 compares 2007, 2012 and 2017 regarding the economically active population in uMhlathuze, KCD, KZN and South Africa. (City of uMhlathuze, 2023)

Table 6-1 – Economic Population (City of uMhlathuze, 2023)

	Total Economically Active Population			Economically Active Population growth rate			Average annual growth (2007-2017)
	2007	2012	2017	2007	2012	2017	
South Africa	18 007 069	18 739 171	1 21 839 604	2,8	2,2	2,5	1.95
KZN	3 296 129	3 027 883	3 473 626	1,1	1,8	2,8	0,53
KCD	258 037	226 303	273 446	0,40	1,9	2,9	0,58
uMhlathuze	142 413	131 468	156 315	0,9	1,8	3,6	0,94

6.1 ECONOMIC TRANSFORMATIONS

The uMlhathuze local municipality is focusing on the following areas for radical economic transformation:

- Attracting investments (Investment commitments to the province worth over R15 billion since May 2019 are materialising);
- Environmental Sustainability (Clearance of 120 000 hectares of land affected by invasive alien species and created 7 500 Job opportunities); and
- Enterprise development (R226 million to small enterprises by the Department of Economic Development, Tourism and Environmental Affairs, facilitating the creation of 3 284 jobs) (City of uMhlathuze, 2023)

Nodal areas for the uMhlathuze Areas

The proposed project will be implemented within recognised nodal areas:

- Empangeni, due to the N2 and other road networks for transport and delivery;
- The Richards Bay node is positioned to take full advantage of exporting manufactured goods, raw materials and minerals to Africa and the rest of the world and
- Esikhaleni node due to the allowance to formalise better employment opportunities surrounded by dense peri-urban development (City of uMhlathuze, 2023).

7 STAKEHOLDER ENGAGEMENTS

The following section discusses the stakeholder engagements which informed the SIA. Key stakeholders were interviewed as part of the SIA. The following categories of stakeholders were interviewed:

1. Neighbouring Landowners;
2. Members of the Zini River Estate;
3. Councillors of nearby communities;
4. Mtunzini Ratepayers Association;
5. Women's Group;
6. Members of the uMhlathuze Municipality;
7. Mkhwanazi Tribal Authority and
8. iNkosi Phalane Trust.

The results of the interviews are discussed below.

7.1.1 LANDOWNERS AND BUSINESS

Farmers in the area have invested in commercial trees, sugarcane and Macadamia nuts. One landowner specified that he has student accommodation. The residence accommodates 155 students, each paying a significant amount per month. The owner employs nine people, including domestic security workers. The business owner is concerned that the project will impact his business as students might be unable to continue living on the property. Dust, traffic and increased crime are of

concern to this business owner. The area uses groundwater for drinking water, and there is a concern that groundwater will be impacted by the mine in the future.

7.1.2 PROPERTY VALUES

The Zini River Estate in Mtunzini is a area with fauna and flora as the main attractions. Concerns are mainly regarding the visual change the mine will cause and the loss of the tranquil/serene nature of the area. The property value is said to have tripled since 2005, and significant investments have been made. Zini River estate is planning to develop 14 new stands, and the value of the development is estimated to be 3.5 billion rands. The proximity of the mine to the estate is likely to reduce the property prices, which is a significant concern for all investors.

7.1.3 CURRENT LAND USE

The stakeholder engagement participants identified the following land uses:

- Mondi uses the project site for plantations (Figure 7-1). Mondi employs locals, and some communities have access to the forest areas for cattle grazing.
- Some locals collect wood from the forest. Wood is used for firewood, and others use it for crafts.
- There are also beehives in the forest, and locals collect honey.
- The surrounding rural areas have cattle grazing in the surrounding communal grass lands.
- In an interview with a traditional healer, he said that some traditional healers collect medicinal plants from nearby natural areas around streams, and some use the forest areas for collecting traditional medicines.

Figure 7-1 - Mondi Forest area

7.1.4 VULNERABLE GROUPS

The Esikhawini, Kwa Dlangezwa and Port Durnford rural areas expressed concerns about the need for more job opportunities, skills development projects and basic services from the previous mining operation (Fairbreeze). Women head many households in Mahunu, Dengeni and Nyembe. The

women's group in Port Durnford previously had programmes that taught skills to women who head households. These skills included knitting, beadwork, and bread making, and they allowed income for these households. The Tronox Fairbreeze mine sponsored these programmes; however, funds have recently yet to be received for 2023. The women in the area hoped the upcoming mine would create such opportunities again. Figure 7-2 shows some of the activities women participate in.

Other vulnerable groups in the area include orphans and people with disabilities. Specifically, one of the NGOs noted that children with albinism need support. Participants in the stakeholder engagements indicated a high parentage of people who are still living with HIV/AIDS, are unemployed, are youthful, and there has been an exponential growth in teenage pregnancy.

Figure 7-2 - Women group in Port Durnford

7.1.5 CHALLENGES

The following section discusses unemployment education and basic services, which interviewees raised as issues of concern.

Unemployment

Several interviewees raised concerns about the need for more employment for all residents. The businesses in the areas need opportunities to participate in the mine's development. There is a lack of skills, hence the high unemployment rate.

Education

Stakeholders indicated that the greatest problem was at primary and secondary school level. Most learners need to be aware of educational programmes that could allow them to be employed at the mine. There are plans to introduce development programmes for learners in engineering and technical

schools. The University of Zululand is developing a programme to allow more engineers to work at the mine in the future.

Basic Services

People in the Port Durnford villages, especially in Dengeni and Nyembe, need delivery of basic services, including water, electricity and transport. Public transport does not reach Nyembe village, primarily due to the condition of the road. It takes an hour's walk to the nearest taxi. Unemployment was also flagged as a considerable concern as very few people are employed. There is a need for a library, pre-school, recreational centres, community hall and better roads. Water is a significant concern as there are no reliable sources of water. The communal water tank is filled only once a week.

In Migration

Local businesses expressed concern about how outsiders have benefited more from the previous Fairbreeze mine operation. Some companies that benefited and interacted with the Fairbreeze mine were reported to have fraudulent local addresses. The Port Dunford business forum has a database of local businesses that would like to supply their goods and services to the mine in the future.

7.1.6 FUTURE PLANS

The following points were gathered during engagements on what the stakeholders intend to do in the future:

- Zini River Estate is planning to develop 14 new housing units.
- The student accommodation at Forest Inn and the surrounding areas will be extended to accommodate more students.
- The traditional Council intends to work with the University of Zululand to introduce engineering studies, technical skills, and programmes that can allow employment in the mine.
- Nearby farmers have plans to plant Macadamia nuts in future. It is critical to set plans for farming activities as the Macadamia nuts will only give results in 3-4 years.
- There is an intention to develop a mall in the Esikhawini area called Phalane City Mall. This will aim at lessening unemployment, especially for low-skilled individuals, and
- There are also intentions to invest more in mining, which will have a positive economic impact.

The interviews covered the geographical extent of the affected area of the project. Stakeholders interviewed included:

- Woman's groups
- Traditional cattle owners
- Traditional healers association chair person
- Councillor for Esikhaleni, Mkhomazi
- Mtunzini Ratepayers Association
- Zini River Estate Home Owner's Association
- Neighbouring Landowners

Interviewing these stakeholders provided representation of the communities affected by the project.

8 IMPACT METHODOLOGY

This chapter presents the impact assessment methodology used to assess impacts pre- and post-mitigation.

8.1 ASSESSMENT OF IMPACTS AND MITIGATION

The assessment of impacts and mitigation evaluates the likely extent and significance of the potential impacts on identified receptors and resources against defined assessment criteria to develop and describe measures that will be taken to avoid, minimise or compensate for any adverse environmental impacts, to enhance positive impacts, and to report the significance of residual impacts that occur following mitigation.

The key objectives of the risk assessment methodology are to identify any potential environmental issues and associated impacts likely to arise from the proposed project and propose a significance ranking. Issues/aspects will be reviewed and ranked against a series of significance criteria to identify and record interactions between activities and aspects, as well as resources and receptors, to provide a detailed discussion of impacts. The assessment considers direct[1], indirect[2], secondary[3], and cumulative[4] impacts.

A standard risk assessment methodology ranks the identified environmental impacts pre- and post-mitigation (i.e. residual impact). The significance of environmental aspects is determined and ranked by considering the criteria[5] presented in Table 8-1 - Impact Assessment Criteria and Scoring System.

Table 8-1 - Impact Assessment Criteria and Scoring System

CRITERIA	SCORE 1	SCORE 2	SCORE 3	SCORE 4	SCORE 5
Impact Magnitude (M) The degree of alteration of the affected environmental receptor	Very low: No impact on processes	Low: Slight impact on processes	Medium: Processes continue but in a modified way	High: Processes temporarily cease	Very High: Permanent cessation of processes
Impact Extent (E) The geographical extent of the impact on a given environmental receptor	Site: Site only	Local: Inside activity area	Regional: Outside activity area	National: National scope or level	International: Across borders or boundaries
Impact Reversibility (R) The ability of the environmental	Reversible: Recovery		Recoverable: Recovery		Irreversible: Not possible

[1] Impacts that arise directly from activities that form an integral part of the Project.

[2] Impacts that arise indirectly from activities not explicitly forming part of the Project.

[3] Secondary or induced impacts caused by a change in the Project environment.

[4] Impacts are those impacts arising from the combination of multiple impacts from existing projects, the Project and/or future projects.

[5] The definitions given are for guidance only, and not all the definitions will apply to all the environmental receptors and resources being assessed. Impact significance was assessed with and without mitigation measures in place.

CRITERIA	SCORE 1	SCORE 2	SCORE 3	SCORE 4	SCORE 5
receptor to rehabilitate or restore after the activity has caused environmental change	without rehabilitation		with rehabilitation		despite action
Impact Duration (D) The length of permanence of the impact on the environmental receptor	Immediate: On impact	Short term: 0-5 years	Medium-term: 5-15 years	Long-term: Project life	Permanent: Indefinite
Probability of Occurrence (P) The likelihood of an impact occurring in the absence of pertinent environmental management measures or mitigation	Improbable	Low Probability	Probable	Highly Probability	Definite
Significance (S) is determined by combining the above criteria in the following formula:	$[S = (E + D + R + M) \times P]$ $Significance = (Extent + Duration + Reversibility + Magnitude) \times Probability$				
IMPACT SIGNIFICANCE RATING					
Total Score	4 to 15	16 to 30	31 to 60	61 to 80	81 to 100
Environmental Significance Rating (Negative (-))	**Very low**	**Low**	**Moderate**	**High**	**Very High**
Environmental Significance Rating (Positive (+))	**Very low**	**Low**	**Moderate**	**High**	**Very High**

8.2 IMPACT MITIGATION

The impact significance without mitigation measures will be assessed with the design controls. Impacts without mitigation measures are not representative of the proposed development's actual extent of impact. They are included to facilitate understanding of how and why mitigation measures were identified. The residual impact remains following the application of mitigation and management measures and is thus the final level of impact associated with the development. Residual impacts also serve as the focus of management and monitoring activities during project implementation to verify that actual impacts are the same as predicted in this report.

The mitigation measures chosen are based on the mitigation sequence/hierarchy, which considers five (5) levels, including avoid/prevent, minimise, rehabilitate/restore, offset, and no-go, in that order. The idea is that when project impacts are considered, the first option should be to avoid or prevent the impacts from occurring in the first place if possible. However, this is not always feasible. If this is not attainable, the impacts can be allowed. However, they must be minimised as much as possible by reducing the development footprint so that little damage is encountered. If impacts are unavoidable, the next goal is to rehabilitate or restore the impacted areas to their original form after project completion. Offsets are considered if all the other measures described above fail to remedy high/significant residual negative impacts.

9 SOCIAL IMPACT ASSESSMENT AND RECOMMENDATION MEASURES

An impact assessment and the associated mitigation measures consider social and related impacts and aspects stakeholders raise during the environmental assessment process. Socio-economic implications associated with the proposed project are grouped according to the project phase, e.g. construction, operation and decommissioning. Appropriate mitigation measures are recommended to reduce negative impacts and enhance positive ones. Where relevant, reference is made to applicable specialist studies, in which more comprehensive information regarding the impacts is provided.

9.1 CONSTRUCTION PHASE

9.1.1 ECONOMIC CONTRIBUTION

Background

The Port Durnford mine will positively impact the GDP. The production of goods and services from the mine will contribute to the country's economic development. The annual salary bill for Tronox KZN Sands, with the pension fund contribution, is R 396,695,608.64. The total spend on procurement per annum is R 1,307,709,925. Rates and taxes amount to R 3 546 377.00. (Tronox KZN Sands, 2018-2022)These are significant economic contributions.

Mitigation

- Communities near the project should be given special consideration regarding the benefits arising from the project because they will be the most affected. They should be considered for employment, and
- As stated in the SLP, it is recommended that Tronox give preference to appropriate subcontractors located in the surrounding communities, followed by those found in the municipal area and those located elsewhere or outside the province.

Significance

The project has a positive impact on the national and local economy. The impact rating for contribution to the gross national product increases from Moderate to High post-mitigation.

9.1.2 Increase In Local Economic Development

Background

The stakeholder engagement interviews indicated the anticipated development in the local economy, especially in local business, employment, and skill development. Some projects that previously benefited the community have ceased. The Port Durnford mine will further implement such projects, addressing many issues raised during community engagements.

According to the SLP, Port Durnford Mining could source the services of a local contractor to run the mine on its behalf in the initial stages (first five years). Local economic development projects will be implemented and reviewed every five years to ensure the sustainability of the projects. New projects per this SLP have been identified after conducting a community needs analysis through Traditional Councils and municipal IDP alignment from 2025 to 2029.

Mitigation

According to the SLP, the Port Durnford mine intends to implement LED projects from 2025 to 2029 for local economic development. Table 9-1 shows that the total budget for these projects is R9,700,000. The projects include support to the Port Durnford bakery project, Port Durnford Aluminium Windows, doors, gates and glazing, Ongye Mountains Purified Water Youth Project, Poultry business for the Ntuze Area Youth and Kwa Dlangezwa Bricks and Blocks project.

Significance

As positive impacts, the significance rating for an increase in economic development increases from Low to Moderate post-mitigation.

Table 9-1 - Summary of LED projects 2025 to 2029

Community	Project	Budget	Year
Mkhwanazi	Support the Port Durnford bakery project	R1,000,000	2025
	Port Durnford Aluminium windows, doors, gates, and glazing	R1,500,000	2026
	Ongoye Mountains Purified Water Youth Project	R3,400,000	2027
	Poultry business for Ntuze Area	R2,000,000	2028
	Kwa Dlangezwa Bricks and Blocks project	R1,800,000	2029
	Total	R9,700,000	

9.1.3 EMPLOYMENT OPPORTUNITIES

Background

According to the SLP, Port Durnford Mining envisages employing around 21 new people in the initial stages of the mining (Phase 1 - Low-Rate Mining) operation. Ten of these people will be part of management, while the rest will be operators. The project intends to employ most of its workforce from the Fairbreeze mine, and 322 employees will come over to the new mine from the then-expired Fair Breez mining operation. If the Port Dunford mine does not go ahead these employees' jobs will be at risk.

Port Durnford Mining is not a labour-intensive mine and has few direct jobs to offer. However, by creating indirect jobs in the mine communities through sustainable Small Medium Enterprise (SMME) development and skills development, the company addresses the government's goals to eradicate

poverty. The intent is to have a broader effect in the local region and influence Historically Disadvantaged South Africans (HDSAs) companies and projects on a provincial level.

The issue of employment was raised in several interviews conducted for the SIA and was raised as an issue in the PPP. Most community leaders reported that youth unemployment needs to be addressed. More significant concerns about unemployed locals and outsiders receiving more employment opportunities were raised.

Mitigation

The SLP focuses on employment equity, gender equity and skills development. Equal opportunities are afforded in the procurement of goods and services. These strategies are key when coupled with sourcing labour from the local community and skill development and training opportunities for local community members.

Significance

As a positive impact, the significance rating for employment increases from very Low to Moderate post-mitigation

9.1.4 COMMUNITY INVESTMENT

Background

According to the SLP, Port Durnford Mining has previously assisted with providing water to eight (8) sub-wards of the traditional area Somopho in partnership with the district municipality. This was to combat the backlogs regarding delivering basic services in the KCD municipality. The SLP states that the housing backlog in uMhlathuze and uMlalazi Municipalities is a priority. Community housing plans have been developed for the traditional areas, and the municipalities have already submitted them to the provincial government, where they have been approved. Table 9-4 shows the projects Tronox plans to implement.

Mitigation

- Communities near the project should be given special consideration regarding the benefits arising from the project because they will be the most affected;
- It is recommended in the SLP that Tronox give preference to appropriate subcontractors located in the surrounding communities, followed by those found in the municipal area and those located elsewhere or outside the province and
- According to the SLP, a Computer Centre and science laboratory will be built in the high school as a career guidance programme. This project will be discussed and measured annually with the DMRE. The project will also be evaluated annually by the partners involved to identify possible areas for improvement that add value. The annual evaluation of the projects will be recorded and implemented if the necessary funds are available.

Significance

As a positive impact, the significance rating for community investment increases from Moderate to High post-mitigation.

9.1.5 LOSS OF AGRICULTURAL POTENTIAL

Background

During the stakeholder engagements, it was mentioned that the mine would primarily impact farmers near Waterloo and the Penarrow area. This is due to the proximity of the mine to the farms, as shown in Figure 1-1. Dust is the primary concern, especially their investments in Macadamia nut trees.

The Mondi forest area is expected to decrease due to the mining that will occur. There will be a socio-economic impact from the loss of the Mondi forests as a contributor to the local economy. There will be a loss in agricultural resources in the area. Cascading impacts include the loss of natural resources such as grazing, water and firewood that serve the local community. It is understood from the interviews that honey, wood, grazing and employment are the benefits of the forested areas for local communities. The magnitude of the loss in agricultural potential needs to be understood, as these losses will include the Mondi forest areas and land used by communities.

Mitigation

- The original mine plan has been changed several times to avoid impacting the large wetlands and grassland areas used for grazing south of the N2.
- The land will be rehabilitated for post-mining forestry land use.
- There will be a hand-back plan for Mondi to continue with its operations.
- Certain areas will be rehabilitated back to sugarcane after the mine closure.
- A livelihoods restoration plan should be considered for those people who depend on the land for their livelihoods.

Significance

As a negative impact, the significance rating for loss in agricultural potential decreases from Moderate to Low post-mitigation.

9.1.6 COMMUNITY-RELATED HEALTH AND SAFETY RISKS

Background

HIV/AIDS has been noted as a significant challenge for the Port Durnford community. The expected migration of outsiders will likely increase sexual diseases such as HIV/AIDS. Low employment intake from the Port Durnford mine may further exacerbate social ills. The stakeholder engagements indicated that rape and high jackings are common crimes near the University of Zululand. These are likely to increase due to migration and unemployment when these job seekers do not find employment.

Mitigation

The mine has an HIV AIDS programme which aims to deal with the effects HIV/AIDS has on its employees, the affected primary and extended family members, and the local community are included in the programme. Prevalence testing is done annually, voluntarily, and affected employees receive Anti-retroviral treatment. This makes up 14.6% of the Port Durnford Mining workforce. The Wellness Programme targets are presented in Table 9-2: All Port Durnford mine employees will have access to Medical Aids with special provisions for HIV/AIDS-related illness. Furthermore, Port Durnford will put in place an HIV/AIDS awareness programme to educate the local community about the disease.

Table 9-2 – Wellness Programme targets

Programme	Total In five years	2025	2026	2027	2028	2029
Voluntary Counselling	133	15	19	23	35	41
HIV AND AIDS Voluntary Testing	102	10	14	19	27	32

Significance

As a negative impact, the significance rating for community-related health and safety will decrease from High to Moderate post-mitigation.

9.1.7 INCREASED PRESSURE ON MUNICIPAL SERVICES

Background

In migration likely might occur with people looking for jobs on the new mine, placing pressure on the already limited municipal resources. These include water, electricity, and housing. The Port Durnford mine will not be labour-intensive and only offers a few direct jobs, especially for low-skilled labour. The mine will also absorb workers from the Fairbreeze mine and will not necessarily create new jobs. This will result in job seekers who come to the area looking for jobs remaining unemployed, placing more pressure on the municipality to provide services.

Mitigation

- As per Tronox's SLP, it is recommended that its efforts be focused on the need for a local recruitment policy for workforce management. This will mitigate the impact of worker influx.
- Regional diversified growth strategies, spatial planning, and careful resource allocation should be promoted in the municipality to cater for the potential influx.
- Regarding any emerging recruitment opportunities, priority should be given to locals, thus reducing the need for outsiders.
- The number of jobs to be created needs to be communicated clearly, and there will not necessarily be new jobs, but the workers at Fairbreeze will continue to work at the new mine.
- It is recommended that Tronox engage with the municipality regarding its plans and include them in municipal planning, such as the IDP and SLP.

Significance

As a negative impact, the significance rating for increased pressure on municipal services will decrease from High to Moderate post-mitigation.

9.1.8 INTRUSIVE IMPACTS

Increase in Ambient Noise Levels

Background

Noise associated with construction activities is expected. These will include clearing vegetation and constructing offices and ablution areas. Earth moving equipment (trucks, cranes, scrapers and loaders), compressors and generators, pumps, rotary drills, concrete mixers and materials handling activities. These may impact neighbouring sensitive receptors.

Mitigation

As per the WSP noise impact assessment (WSP , 2024),some of the noise mitigation measures include:

- Selecting equipment with lower sound and power levels.
- Ensuring equipment is well-maintained to avoid additional noise generation.
- Ensure that heavy mobile equipment operations, primarily those near sensitive receptors, are scheduled for daytime hours.
- Installing suitable mufflers on engine exhausts.
- Installing acoustic enclosures for equipment that causes radiating noise.
- Limiting the hours of operation for specific equipment or operations, especially mobile sources operating through or close to noise receptors.
- Re-locating noise sources to less sensitive areas to take advantage of distance and shielding.

Significance

As a negative impact, the significance rating for ambient noise levels will decrease from Moderate to Low post-mitigation.

Increase in Dust

Background

The construction activities for the development of the mine will produce dust at sensitive receptors in close proximity (within 1 km) of the site boundary.

Mitigation

The following mitigation measures are proposed in the Air Quality Impact Assessment (WSP, 2024):

Planning construction activities in consultation with local communities.

- When working near potentially sensitive receptors, limit the number of simultaneous activities as far as possible.
- Identify exposed areas not used for operations and revegetate them to reduce the dust to be carried by the wind.
- Ensure access control to exposed areas reduces activity and the wind's potential to carry dust.
- Reduced speeds of vehicles over exposed surfaces to minimise vehicles causing dust.
- Where possible, do not undertake material handling activities in windy conditions.
- Development of a dust fallout monitoring network to identify areas of concern.
- Developing a mechanism to record and respond to complaints.

Significance

Based on this Air Quality Impact Assessment results, the significance of air pollution-related impacts is rated low before mitigation and remains low, provided mitigation measures are implemented per the air quality specialist study.

9.1.9 CONSTRUCTION IMPACTS TABLE

Table 9-3 summarises the respective significance ratings of the construction-related impacts.

Table 9-3 - Impact Rating Pre and Post-Mitigation, Construction Phase

Impact number	Stage	Character	Pre-Mitigation							Post-Mitigation						
			(M+	E+	R+	D)x	P=	S	Rating	(M+	E+	R+	D)x	P=	S	Rating
Contribution to the gross national product	Construction	POSITIVE	3	5	3	3	4	**56**	**P3**	5	5	5	5	4	**80**	**P4**
		Significance	**P3 - Moderate**							**P4 - High**						
Increase in economic development	Construction	POSITIVE	2	3	1	3	2	**18**	**P2**	3	5	3	3	4	**56**	**P3**
		Significance	**P2 - Low**							**P3 - Moderate**						
Employment opportunities	Construction	POSITIVE	2	1	1	1	2	**10**	**P1**	3	5	3	3	4	**56**	**P3**
		Significance	**P1 - Very Low**							**P3 - Moderate**						
Community investment (SLP)	Construction	POSITIVE	3	5	3	3	4	**56**	**P3**	5	5	5	5	4	**80**	**P4**
		Significance	**P3 - Moderate**							**P4 - High**						
Loss in agricultural potential	Construction	NEGATIVE	3	5	3	3	4	**56**	**N3**	2	3	1	3	2	**18**	**N2**
		Significance	**N3 - Moderate**							**N2 - Low**						
Increased pressure on municipal services	Construction	NEGATIVE	5	5	5	5	4	**80**	**N4**	3	5	3	3	4	**56**	**N3**
		Significance	**N4 - High**							**N3 - Moderate**						

Impact number	Stage	Character	Pre-Mitigation							Post-Mitigation						
			(M+	E+	R+	D)x	P=	S	Rating	(M+	E+	R+	D)x	P=	S	Rating
Community-related health and safety	Construction	NEGATIVE	5	5	5	5	4	**80**	**N4**	3	5	3	3	4	**56**	**N3**
		Significance	**N4 - High**							**N3 - Moderate**						
Intrusive Impacts	Construction	NEGATIVE	3	5	3	3	4	**56**	**N3**	2	3	1	3	2	**18**	**N2**
		Significance	**N3 - Moderate**							**N2 - Low**						

9.2 OPERATION PHASE

9.2.1 PREFERENTIAL EMPLOYMENT

Background

The stakeholder interviews strongly emphasised the need for employment in and around Port Durnford. The business forum, councillors, youth forum and the Mkhwanazi traditional council further echoed this. Youth unemployment in the surrounding communities of the project site is the main overarching social issue.

Mitigation

A Port Durnford Mining Transitional Plan is in place to ensure the identification, procurement, subsequent management, and development of HDSA suppliers. The business forum also suggested a strategy during stakeholder engagement interviews: All local businesses that benefit from the mine should be identified by address and confirmed by the Traditional Council.

The SLP states that once the Port Durnford mine is established, Tronox will establish a Future Forum, and there will be a detailed analysis of the procurement spend in the local economy.

According to the SLP, a database of Exempted Micro Enterprises ("EMEs") / Qualifying Small Enterprises ("QSEs") will be maintained to evaluate new possible suppliers that can provide goods and services to Port Durnford Mining. In addition to maintaining an internal database, Port Durnford Mining will sign up for access to a national supplier database to expand the search for black women and youth-owned entities.

The table below shows the target for 2025 to 2029 for historically disadvantaged South Africans and Black Economic Empowerment. The table shows business sectors and the percentage Tronox will source from the Port Durnford community.

Significance

Employment has a positive impact. The significance rating for preferential employment increases from Moderate to High post-mitigation.

Table 9-4 - HDSA and BEE targets from 2025 to 2029

Element	Target 2025	Tronox Target 2026	Tronox Target 2027	Tronox Target 2028	Tronox Target 2029
Mining Goods	50%	55%	60%	65%	70%
Services	60%	65%	70%	75%	80%
Research and Development	55%	60%	65%	70%	70%

9.2.2 Skills Development and Training

Background

The stakeholder engagement interviews indicated that the Port Durnford mine needs a strategy to address local unemployment. It was gathered during interviews that an intervention needs to start from the high school level, where learners are encouraged to select subjects that will allow them to study courses that align with what the mine requires. This strategy will significantly and positively contribute to the community in the long-term.

Mitigations

According to the SLP, the professionals-in-training Internship Programme (PIT) will cater to young professionals who have completed a degree and need on-the-job experience. The preferred skills will align with Tronox's skills requirements. Tronox has a minimum of 30% sourcing of local skills/ un-skilled labour for all contractors.

Significance

The significance rating for skill development and training increases from Low to Moderate post-mitigation as a positive impact.

9.2.3 INTRUSIVE IMPACTS

9.2.3.1 Increase in Ambient Noise Levels

Background

Noise associated with operational activities is expected. These include loading ore into trucks, offloading Run of Mine (ROM) stockpiles and dozing ore material to the DTMU. Due to the Port Durnford operations, night-time noise levels are predicted to increase slightly from the current baseline noise levels.

Mitigation

The following mitigations are recommended in the Air Quality Impact Assessment (WSP, 2024):

- Ensuring equipment with the lowest sound power level specifications is selected for the project.
- - Installing suitable mufflers on engine exhausts and compressor components.
- - Installing acoustic enclosures for equipment causing radiating noise.
- - Locating noise sources in less sensitive areas to take advantage of distance and shielding.
- - Installing acoustic barriers without gaps and a continuous minimum surface density of 10 kg/m^2 to minimise sound transmission through the barrier.
- Barriers should be located close to the source or the receptor location to be effective.
- - Developing a mechanism to record and respond to complaints.

Significance

As a negative impact, the significance rating for ambient noise levels will decrease from Moderate to Low post-mitigation.

9.2.3.2 Light Disturbances

Background

The Mtunzini area is reported to be a serine place and hotspot for birdwatchers. This area is a tourist attraction due to its flora, fauna, and picturesque landscapes. Light from construction vehicles, offloading the ROM stockpile and dozing ore material to the DTMU might disturb residents.

Significance

As a negative impact, the significance rating for light disturbances will decrease from Moderate to Low post-mitigation.

Mitigation

- Shield the light sources with physical barriers (walls, vegetation, or structure).
- Limit mounting heights of lighting fixtures or use foot or bollard level lights where possible.
- Make use of minimum lumen or wattage in fixtures.
- Make use of down-lighters or shielded fixtures.
- Make use of Low-Pressure Sodium lighting or other types of low-impact lighting.
- Make use of motion detectors on security lighting. This will allow the site to remain in relative darkness until lighting is required for security or maintenance.

9.2.3.3 Increase in Dust

Background

The mining activities will produce dust.

Mitigation

The following mitigation measures are proposed:

The timing of construction activities must be communicated to local communities.

- When working near a potentially sensitive receptor, limit the number of simultaneous activities as far as possible.
- Identify exposed areas not used for operations and revegetate them to reduce the dust to be carried by the wind.
- Ensure access control to exposed areas reduces activity and the wind's potential to carry dust.
- Reduced speeds of vehicles over exposed surfaces to minimise vehicles causing dust.
- Where possible, do not undertake material handling activities in windy conditions.
- Development of a dust fallout monitoring network to identify areas of concern.
- Developing a mechanism to record and respond to complaints.

Significance

Based on the results of this Air Quality Impact Assessment, the significance of air pollution-related impacts is rated as moderate before and low after mitigation, provided mitigation measures are put in place per the air quality specialist study.

9.2.3.4 Increased Traffic Levels

Background

Over time, the planned new mining and downstream mineral processing operations at Port Dunford will replace the existing mining and mineral processing operations at Fairbreeze. The N2 will be used to transport materials, staff, and equipment. Other roads within the Port Durnford area are expected to experience an increase in traffic during the construction and operation phases. The large and heavy materials delivered frequently will result in the deterioration of roads in the area. The deterioration of roads might also impact the area's taxi business and result in protests.

Mitigation

- Engagements with the Taxi Association should be undertaken to confirm which routes will be used.
- Maintenance plans should be put in place.
- All vehicles must not be overloaded, and abnormal vehicles must comply with relevant legislation for overweight loads to ensure the lowest possible road surface damage.
- All vehicles on site must be roadworthy to ensure compliance with national vehicle standards.
- All site vehicles should be marked and regularly maintained to avoid accidents and poor road functioning.
- The construction of partial interchanges at the accesses to the mining areas is recommended as per the Traffic Impact Assessment (WSP, 2024)
- Refer to the Traffic Impact Assessment for further mitigations.

Significance

The significance rating for traffic disturbances will decrease from High to Moderate post-mitigation as a negative impact.

9.2.4 PROPERTY VALUE

Background

As per the Property Values Impact Assessment Report in the Mtunzini Area, residents of the town are concerned that the proposed mine will negatively impact their property values (de Beer, 2024). The main concerns raised by residents includ

- The visual impacts are the greatest concern.
- Dust and visible dust plumes. Wind resulting in dust from the mine is also a concern due to its visual impact on residential houses and estates.
- Noise emanating from the mine operations.
- The impact of trucks' movement towards the north of Empangeni is a concern as it may impact the residents.
- Composite / sense of place impacts. A general undefined concern about the project's closeness to the residential areas of Mtunzini and Zini River Estate.

The Zini River Estate in Mtunzini has doubled in value over the past five years. The view from the estate is a primary source of attraction, which is why the property holds such high value. The views from the Zini River are expected to change with the introduction of mining activity in the proposed Port Durnford Mining development. Immediate screening and rehabilitation strategies will be implemented. Figure 9-1 shows the view from the Zini River estate facing north towards where the Port Durnford Mining operations are planned.

Figure 9-1 - View from Zini Estate

Mitigation

Rehabilitation Strategies will be implemented; however, there is no mitigation for the decline in property value. However, the mine will implement measures to screen the estate from the mining activity by leaving 100m wide tree lines along the road routes where they can and planting new trees to screen the mine visually. The mitigation measures as per the following specialist studies should be implemented:

- Visual Impact Assessment
- Air Quality Impact Assessment
- Noise Impact Assessment
- Traffic Impact Assessment

Significance

As a cumulative negative impact, the significance rating for the decline in property value will decrease from High to Moderate post-mitigation.

9.2.5 CHANGE IN LAND USES

Background

Section 7.1.3 of this report highlights the land use currently in and around the site. The land used by Mondli Forests, Estates in Mtunzini, farms, and community residential areas were identified during engagements. The Fairbreeze mine has been operating for over ten years, and due to the method used and the environmental mitigations applied, it is compatible with other land uses. Therefore, the Port Durnford mine will be compatible with the present land uses, especially with the mitigations applied.

Mitigation

- Screening trees will reduce visual impacts and lower the impact on the sense of place.

- It is recommended that Tronox rehabilitate the mined land.
- Most of the land will be rehabilitated concurrently using the rollover mining method.
- The agricultural assessment indicated that the post-mine rehab strategy should allow for agricultural opportunities post-mining.

Significance

As a negative impact, the significance rating for incompatibility with adjacent land use will decrease from Moderate to Low post-mitigation.

9.2.6 IMPACTS ON LIVELIHOOD

Background

Stakeholder engagements have indicated the need for water supply in the area. Some communities are dependent on the Amanzamnyama River for fishing. Communities reportedly used the forest in Port Durnford for honey and firewood collection. Grazing has also been observed in the Esikhawini area. Local communities are dependent on the forest for livelihoods. Figure 9-2 shows headers and cattle walking towards the forest near Esikhawini. Therefore, Tronox must allow the community access to these resources during operation for as long as possible. If the impacts on livelihood are unavoidable, the project may have to consider implementing a Livelihood Restoration Plan (LRP).

Mitigation

Mitigations of surface and groundwater should be followed as per the specialist studies.

Engagements with communities post-mining on observed change and mitigation strategies for these resources. Tronox must allow the community as much access to these resources during the operation phase as possible. If the impacts on livelihood are unavoidable, the project may have to consider implementing an LRP.

Significance

As a negative impact, the significance rating for livelihood losses due to potential change in land use, ground and surface water on neighbouring water users and ecological benefits will decrease from Moderate to Low post-mitigation.

9.2.7 UNMET EXPECTATIONS/ POOR SOCIAL LICENCE TO OPERATE

Background

The communities surrounding the Port Durnford mine have experienced many challenges previously due to the mine. These include visual and dust impacts in Mtunzini, less employment in the villages and fewer business opportunities for the locals than expected. Although some previous issues were addressed, communities might respond poorly to changes that may occur around them.

Mitigations

The project must establish an ongoing stakeholder engagement to be as transparent as possible with the stakeholders regarding any developmental plans and implementation.

Significance

This is a negative impact. The significance rating will decrease from low to very low after mitigation.

9.2.8 ACCESS ROUTES

Background

Communities now have access trough the forests to the communities on the other side of the proposed mining area. Once the new mine is in full operation this access will be restricted as people will be prevented from entering the mining area.

Mitigations

The mining will be a phased and access restrictions to the mining areas will also be phased. This will allow people to access communities on the other side of the mining area for longer. However, access will eventually be totally prevented and this impact cannot be mitigated. Communities will find other access routes around the mining area however this will pose an inconvenience to communities.

Significance

The significance of the impact will decrease from high to moderate post mitigation measures

9.2.9 OPERATIONAL PHASE: IMPACT SUMMARY

Table 9-5 summarises the respective significance ratings of the construction-related impacts.

Table 9-5 - Impact Rating Pre- and Post-mitigation, Operation Phase

Description	Stage	Character	Pre-Mitigation							Post-Mitigation						
			(M+	E+	R+	D) x	P=	S		(M+	E+	R+	D) x	P=	S	
Preferential employment	Operational	POSITIVE	3	5	3	3	4	**56**	**P3**	5	5	5	5	4	**80**	**P4**
		Significance	**P3 - Moderate**							**P4 - High**						
Skill development and training	Operational	POSITIVE	2	3	1	3	2	**18**	**P2**	3	5	3	3	4	**56**	**P3**
		Significance	**P2 - Low**							**P3 - Moderate**						
Ambient noise levels	Operational	NEGATIVE	3	5	3	3	4	**56**	**N3**	2	3	1	3	2	**18**	**N2**
		Significance	**N3 - Moderate**							**N2 - Low**						
Light disturbances	Operational	NEGATIVE	3	5	3	3	4	**56**	**N3**	2	3	1	3	2	**18**	**N2**
		Significance	**N3 - Moderate**							**N2 - Low**						
Dust disturbances	Operational		3	5	3	3	4	**56**	**N3**	2	3	1	3	2	**18**	**N2**
		Significance	**N3 - Moderate**							**N2 - Low**						
Increased traffic levels	Operational	NEGATIVE	5	5	5	5	4	**80**	**N4**	3	5	3	3	4	**56**	**N3**
		Significance	**N4 - High**							**N3 - Moderate**						
The decline in property value	Operational	NEGATIVE	5	5	5	5	4	**80**	**N4**	3	5	3	3	4	**56**	**N3**
		Significance	**N4 - High**							**N3 - Moderate**						

Description	Stage	Character	Pre-Mitigation							Post-Mitigation						
			(M+	E+	R+	D) x	P=	S		(M+	E+	R+	D) x	P=	S	
Change in land Uses	Operational	NEGATIVE	3	5	3	3	4	56	N3	2	3	1	3	2	**18**	**N2**
		Significance	**N3 - Moderate**							**N2 - Low**						
Impacts on Livelihood.	Operation	NEGATIVE	3	5	3	3	4	**56**	**N3**	2	3	1	3	2	**18**	**N2**
		Significance	**N3 - Moderate**							**N2 - Low**						
Unmet Expectations/ Poor Social Licence to operate	Operation	NEGATIVE	2	3	1	3	2	**18**	**N2**	2	1	1	1	2	**10**	**N1**
		Significance	**N2 - Low**							**N1 - Very Low**						
Access routes	Operation	NEGATIVE	5	5	5	5	4	**80**	**N4**	3	5	3	3	4	**56**	**N3**
		Significance	**N4 - High**							**N3 - Moderate**						

9.3 DECOMMISSIONING PHASE

9.3.1 MANAGING DOWNSCALING AND RETRENCHMENT

Background

During the closure phase, the operational phase workforce will lose their jobs. Unfortunately, this may contribute to various adverse social consequences in the municipality and labour-sending areas, such as:

- Increase or return the unemployment rate to previous levels.
- Financial hardship and poverty.
- Family tensions and breakdown.
- Alienation, shame, stigma, and
- An increase in crime.

Mitigations

The SLP states that during downscaling and retrenchment, consultation with employees through their representative union will be affected by section 189A of the Labour Relations Act.

Future Forum

According to the SLP, The Mine's Future Forum will be established and actively involved in the closure of the project. It will comprise appointed representatives of Port Durnford mine's permanent employees, union representatives and management. The purpose of the Future Forum will be to promote ongoing discussions between employees and management about plans for the mine. It will also identify problems, challenges and possible solutions for productivity and employment. The Future Forum will develop turnaround redeployment strategies to help reduce job losses and improve business sustainability once the mine starts to close.

Consultations

According to the SLP, Tronox will carry out consultations when it anticipates that retrenchment will occur. The consultations will occur through the Future Forum and attempt to reach a consensus on possible solutions to reduce the impact of retrenchment on employees and the local community.

Significance

As a negative impact, the significance rating downscaling and retrenchment will decrease from Moderate to Low post-mitigation.

9.3.2 REMAINING VISUAL DISTURBANCES AND MODIFIED TOPOGRAPHY

Background

There will be a new extensive sand dump, and RSF features 45-90m high, resulting in visual impact disturbances. Tronox intends to rehabilitate all mined land in forest and agricultural areas. No blasting or decommissioning of the buildings will occur, and no resettlement is planned. The visual disturbances post-mining will be minimal.

Mitigation

- Tronox intends to rehabilitate the land with forest conditions similar to those before mining.
- The forestry specialist assessment suggests that for the areas that do not have steep side slopes (RSF and Sandtails Dumps), forestry as an end land use should be possible.
- Engagements and consultation with the surrounding community on post-closure plans will be needed.
- Utilise security lighting that is movement-activated rather than permanently switched on to prevent unnecessary constant illumination.

Significance

As a negative impact, the significance rating for remaining visual disturbances and modified topography will decrease from low to very low post-mitigation.

9.3.3 IMPACTS ON LIVELIHOOD

Background

Stakeholder engagements have indicated the need for water supply in the area. Some communities are dependent on the uMlalazi Lagoon for fishing. Communities reportedly used the forest in Port Durnford for honey and firewood. Grazing has also been observed in the Esikhawini area. Local communities are dependent on the forest for livelihoods. Figure 9-2 shows headers and cattle walking towards the forest near Esikhawini. Therefore, Tronox must allow and return these resources to the community post-mining.

Figure 9-2 - Herders and cattle walking towards forest area (North Coast Road, Esikhawini,17 April 2023, 12:57)

Mitigation

Mitigations of surface and groundwater should be followed as per the specialist study.

Engagements with communities post-mining on observed change and mitigation strategies for these resources.

Significance

As a negative impact, the significance rating for ground and surface water changes on neighbouring water users, land users, and ecological benefits will decrease from Moderate to Low post-mitigation.

9.3.4 DECOMMISSIONING PHASE IMPACT SUMMARY

Table 9-6 - Impact Rating Pre- and Post-mitigation, Closure Phase

Description	Stage	Character	Pre-Mitigation							Post-Mitigation						
			(M +)	E +	R +	D) x	P =	S		(M +)	E +	R +	D) x	P =	S	
Downscaling and retrenchment	Decommissioning	NEGATIVE	2	3	1	3	2	**18**	**N2**	3	5	3	3	4	**56**	**N3**
		Significance	**N2 - Low**							**N3 - Moderate**						
Remaining visual disturbances	Decommissioning	NEGATIVE	2	3	1	3	2	**18**	**N2**	2	1	1	1	2	**10**	**N1**
		Significance	**N2 - Low**							**N1 - Very Low**						
Impacts on Livelihood.	Decommissioning	NEGATIVE	3	5	3	3	4	**56**	**N3**	2	3	1	3	2	**18**	**N2**
		Significance	**N3 - Moderate**							**N2 - Low**						

9.4 CUMULATIVE IMPACTS

9.4.1 LOCAL SERVICES AND ACCOMMODATION

Background

The development of additional mines in the area has the potential to put a strain on local services and accommodation, particularly during the construction phase. The goal will be to source as many un-skilled and semi-skilled employees from the local municipality as possible during the construction and operational phases of the project. Sourcing skills locally will relieve the strain on local services and accommodation in the nearby town of Mtunzini.

The potential impact should also be considered in light of the possible beneficial cumulative effects on the local economy linked with the proposed mining projects in the local municipality. Such benefits will generate opportunities for investment in the municipality, such as upgrading and expanding existing services and building new accommodations.

Mitigation

Tronox should liaise with the local municipality to address potential impacts on local services.

Significance

The significance of this impact is rated Negative Moderate before mitigation and Low after mitigation.

9.4.2 LOCAL ECONOMY

Background

In addition to the potential negative impacts on local services, establishing new mines in the area and associated infrastructure will create several socio-economic opportunities for the local municipality. The positive cumulative economic opportunities include the creation of employment, skills development and training opportunities, and downstream business opportunities.

The potential cumulative benefits for the local and regional economy are associated with the construction and operational phases of mine development extending over 20-25 years. However, steps must be taken to maximise employment opportunities for local community members and support skills development and training programmes. This impact's significance is positive and rated Medium.

Enhancement Measures

Tronox should liaise with the local municipality and local business forums to identify potential local economy and business opportunities.

Significance

Impact on the local economy is rated as moderately positive before enhancement and highly positive after mitigation.

9.4.3 CUMULATIVE IMPACTS SUMMARY

The cumulative impacts related to local services and accommodation could negatively affect the delivery of local municipality services. Socio-economic opportunities may rise due to increased renewable energy facilities within the municipality. Table 9-7 indicates a summary of the cumulative impacts.

Table 9-7 - Cumulative Impacts Summary

Description	Stage	Character	Pre-Mitigation							Post-Mitigation						
			(M+	E+	R+	D)x	P=	S		(M+	E+	R+	D)x	P=	S	
Local Services and Accommodation	Cumulative	Negative	4	4	3	4	4	**60**	**N3**	3	2	3	2	3	**30**	**N2**
Significance			**N3 - Moderate**							**N2 - Low**						
Local Economy	Cumulative	Positive	3	3	3	4	4	**52**	**P3**	5	4	4	3	4	**64**	**P4**
Significance			**P3 - Moderate**							**P4 - High**						

10 CONCLUSIONS

The proposed Port Durnford mine is expected to have positive and negative socio-economic impacts on nearby communities, estates, universities, and agricultural land. These impacts have been experienced previously with the Tronox Fairbreeze and Hillendale mines. Negative impacts include agricultural loss, incompatibility with surrounding land use, ambient noise, and light and visual disturbances. These can be reduced to have lower significance ratings with mitigations. However, negative impacts such as community-related health and safety, increased pressure on municipal services, increased traffic and a decline in property value will have significantly moderate consequences.

Positive impacts from the Port Durnford mine allow the project to be feasible due to the high significant positive impacts. These include contributions to the gross national product, Community investment projects according to the SLP and employment opportunities for locals, especially youth. Other positive impacts include increased economic development, skill development, and training for the local community. Based on the analysis of the positive socio-economic impacts, which offset the negative impacts, it is recommended that the project be authorised.

11 REFERENCES

City of uMhlathuze. (2023). *SPATIAL DEVELOPMENT FRAMEWORK (2023/2024).* RICHARDS BAY. Retrieved from https://www.umhlathuze.gov.za/images/x87545-1.pdf

de Beer, E. (2024). *An Assessment of the Potential Impact of the Proposed Tronox KZN Sands Port Durnford Mine Project on Property Values in the Mtunzini Area.* SOCIAL RISK RESEARCH (PTY) LTD .

King Cetshwayo District. (2020). *Profile and analysis, district development model.* Cogta. Retrieved from https://www.cogta.gov.za/ddm/wp-content/uploads/2020/08/King-Cetshwayo-DDM-4-July-2020.pdf

KZN Department of Co-Operative Governance. (2021). *KWAZULU-NATAL PROVINCIAL.* Pietermaritzburg: cogta. Retrieved from https://www.kzncogta.gov.za/wp-content/uploads/2021/03/KZN%20PSDF%20Spatial%20Proposals%20February%202021.pdf

Statista. (2021). Total population of South Africa in 2021, by province. Retrieved from https://www.statista.com/statistics/1112169/total-population-of-south-africa-by-province/

Stats SA. (2022). *Census 2022.* Stats SA.

Tronox KZN Sands. (2018-2022). *SOCIAL AND LABOUR PLAN, APPLICATION FOR HILLENDALE AND FAIRBREEZE MINES.* Retrieved from https://www.tronox.com/download.php?path=14507

uMhlathuze Local Municipality. (2022/2023 - 2026/2027). *Fith Generation IDP.* uMhlathuze government. Retrieved from https://www.umhlathuze.gov.za/index.php/integrated-development-plan

uMlazi Local Municipality. (2024-2025, October 29). *Intergrated Development Plan.* Retrieved from umhlathuze.gov.za: https://www.umhlathuze.gov.za/images/IDP.pdf

WSP . (2024). *Environmental Acoustic Impact Assessment .*

WSP . (2024). *Visual Impact Assessment .*

WSP. (2024). *Air Quality Impact Assessment .*

WSP. (2024). *Traffic Impact Assessment .*

Appendix A

SPECIALIST CV

Steve Horak

Earth & Environment - Environmental Planning & Advisory, Director: Social Sciences

CAREER SUMMARY

Steve has worked in the social sciences since 1998 (25 years) in the mining, oil and gas, renewable energy and agricultural sectors. Expertise includes social impact assessments, development of mitigation measures, social management plans, community and stakeholder engagement, resettlement action plans, livelihood restoration plans, social baseline studies, grievance mechanisms, social due diligence, high conservation value assessments and indigenous peoples plans.

Steve has experience locally, in South Africa, and internationally, working in compliance with International Finance Corporation (IFC) social performance standards. He has worked in 17 African countries, including Angola, Botswana, Cameroon, the Democratic Republic of Congo, Djibouti, Ethiopia, Gabon, Ivory Coast, Kenya, Mali, Malawi, Mozambique, Nigeria, São Tome, Sierra Leone, South Africa and Tanzania. Steve's experience is supported by a Masters Degree (Environmental and Social Science) from the University of Pretoria (UP), an Honours Degree in Development Studies from the University of South Africa (UNISA), a BA Degree in Anthropology, UP, Managers Development Programme (MDP) (University of Stellenbosch), Certificate in Public Participation from the International Association of Public Participation Practitioners.

18 months with WSP

25 years of experience

Area of expertise

Social impact assessment, social management plans, community and stakeholder engagement, resettlement action plans, livelihood restoration plans, grievance mechanisms, high conservation value assessments, indigenous peoples plans, and social due diligence.

Languages

English - Fluent

Afrikaans - Fluent

EDUCATION

Managers Development Programme (MDP), University of Stellenbosch, South Africa	2009
Master of Arts, Environment and Society, University of Pretoria, South Africa	2005
Honours Degree in Development Studies, University of South Africa	2000
Bachelor of Arts Degree in Anthropology, University of Pretoria, South Africa	1994

ADDITIONAL TRAINING

Certificate in Public Participation from the International Association of Public Participation Practitioners	2008

PROFESSIONAL MEMBERSHIPS

IAIAsa – International Association for Impact Assessment: South Africa, Membership No.7212	2004
IAP^2 - International Association for Public Participation Practitioners	2008

PROFESSIONAL HISTORY

WSP Group Africa (Pty) Ltd, Director Social Sciences	2022 – Current
Independent Consultant	2015 – 2022
Digby Wells Environmental, Principal Consultant, Departmental Manager	2008 – 2015
Perisseuo Consulting cc (CK98/68973/23), Independent Consultant	1998 – 2008
UNISA, Dept of Development, Administration,	1996 – 1998
South African Defence Force, Operational Medical Orderly, Medical Phase Course Instructor	1990

PROFESSIONAL EXPERIENCE

Social Impact Assessments

Mukondeleli Solar (RF) (Pty) Ltd, Social Impact Assessment, Lead, Wind and Solar PV, South Africa (Mpumalanga) 2023

ArcelorMittal South Africa (Pty) Ltd / Bidvest Port Operations (Pty) Ltd, Social Impact Assessment, Lead, Proposed Logistics Hub At Saldanha Steel Facility - Phase 1, South Africa (Western Cape) 2023

HyShift Consortium, Social Impact Assessment, Lead, Green Hydrogen Electrolyzer, South Africa (Mpumalanga) 2023

Rainbow Rare Earths (Pty) Ltd, Social Impact Assessment, Lead, Rare Earths Phalaborwa Project, South Africa (Limpopo)

Tronox Sands, WSP, Social Impact Assessment, Project Director, Fairbreeze Mine, South Africa (KwaZulu Natal) 2023

Genmin Pty Ltd, WSP, Social Impact Assessment, Lead, Baniaka Iron Ore Mining Project, Gabon 2022-2023

Enertrag South Africa (Pty) Ltd, Social Impact Assessment, Lead for the Dalmanutha Wind Energy Facilities, Belfast, South Africa, (Mpumalanga) 2022

Eskom Holdings SOC Ltd, WSP, Social Impact Assessment Lead, The Proposed Solar Photovoltaic and Battery Energy Storage System at Komati Power Station, South Africa, (Mpumalanga) 2022

Société des Mines de Fer de Guinée (SMFG), WSP, Social Impact Assessments Inputs, Proposed Nimba Iron Ore Project, Guinea, 2022

Enviro Insight, Social Impact Assessment Lead, Proposed Botterblom Wind Energy Facility, South Africa, (Northern Cape) 2021

Minbos, HCV Africa, Social Impact Assessment and Stakeholder Engagement Lead, Cácata Phosphate Mine Project, Angola (Cabinda Province) 2021

Pensana PLC Social Impact Assessment and Stakeholder Engagement Project Lead, Longonjo Ndpr Mining Project Environmental and Social Impact Assessment (ESIA), International Finance Corporation (IFC) Angola 2019-2021

Rand Gold, Digby Wells, Social Impact Assessment Lead, Doko- Aru road development, Democratic Republic of Congo 2010 - 2011

Wesizwe Platinum Mine, TWP, Perisseuo Consulting, Social Impact Assessment Lead, IFC and World Bank standards, South Africa (North West Province) 2007-2008

BKS, Perisseuo Consulting, Preliminary Environmental, Social and Transition Management Assessments Lead, South Africa (Pretoria, Gauteng) 2007 - 2008

Digby Wells, Perisseuo Consulting, Social Impact Assessment Lead, Sand dump reclamation 3/A/1, South Africa (Gauteng) 1998

Tavistock Collieries, Digby Wells, Perisseuo Consulting, Social Impact Assessment Lead, South Africa (Ogies) 1999

Tselentis Colliery, Digby Wells, Perisseuo Consulting, Social Impact Assessment Lead, South Africa (Mpumalanga) 1999

Winning Business Systems, Woman's Development Bank, Perisseuo Consulting Socio-Economic Impact Assessment Lead, (Boipatong, Daveyton, Katlehong) South Africa, 1999

Resettlement Action Planning

Globeleq, WSP, Resettlement and Livelihood Restoration Policy Framework Lead, Namaacha Wind Energy Facility, Mozambique, 2023

Genmin Pty Ltd, WSP, Resettlement and Livelihood Restoration Policy Framework Lead, Baniaka Iron Ore Mining Project, Gabon 2022-2023

Pensana PLC, HCV Africa, Longonjo Ndpr Mining Project, Resettlement Action Plan Development Lead, International Finance Corporation (IFC) standard, Angola, 2021-2022

Glencore, WSP, Tweefontein Relocation Action Plan Lead, IFC standard, South Africa, (Mpumalanga) 2022-2023

Total Energy, Professional Grave Solutions, Mozambique Gas Development Project, Resettlement Action Plan, Implementation of Stakeholder Engagement Process Lead for Grave Relocations - Mozambique Gas Development, Mozambique 2018 – 2021

Tselentis Colliery, Digby Wells, Perisseuo Consulting, Resettlement Action Plan Lead, South Africa, (Mpumalanga) 2004

High Conservation Value (HCV) assessments

Agripalma, Retrocession of concession areas, Stakeholder Engagement and Participatory Process of ceding parts of the palm oil concession back to the government of São Tome, Project Lead, São Tome 2021

Socapalm, HCV Africa, High Conservation Value (HCV) assessments, Social Sciences Lead, Cameroon 2021

Socapalm Palm Oil Plantations, High Conservation Value (HCV) Monitoring: HCVs 4,5 and 6, Monitoring Lead Monitoring and Management Plan Development, Cameroon 2021

Socapalm, HCV Africa, High Conservation Value Assessment, Social Sciences Lead, Cameroon and São Tome 2018 - 2021

SOGB palm oil plantation, HCV Africa, High Conservation Value Assessment, Social Sciences Lead, Ivory Coast 2019

Indigenous Peoples Plan

Eskom Holdings SOC Ltd, WSP, Indigenous Peoples Plan inputs for the proposed Mier Rietfontein Solar PV and Battery Storage Project, Khoi-San Peoples, South Africa, Kalahari, (Northern Cape Province), 2022

Genmin Pty Ltd, WSP, Indigenous Peoples Plan Lead, Baniaka Iron Ore Mining Project, Gabon 2022-2023

Stakeholder Engagement

Sasol Pty (Ltd), WSP, Stakeholder Mapping and Pre-Consultation Approach Development team member for the proposed Boegoebaai Green Hydrogen and Green Derivatives Project, South Africa (Northern Cape) 2022

Genmin Pty Ltd, WSP, Stakeholder Engagement Lead, Baniaka Iron Ore Mining Project, Gabon 2022-2023

Minbos, HCV Africa, Social Impact Assessment and Stakeholder Engagement Cácata Phosphate Mine Project, Angola (Cabinda Province) 2021

Pensana PLC, HCV Africa, Longonjo Ndpr Project Stakeholder Engagement Lead, Angola, 2019 - 2021

Total Energies, Professional Grave Solutions, Grave Relocation Action Plan (GRAP) Development, Stakeholder Engagement Process Lead, (Mozambique), 2016 -2020

Mkango Resources, Digby Wells, Stakeholder Engagement Lead, Environmental and Social Impact Assessment (EISA) to IFC standard, Rare Earth project, (Malawi), 2014 - 2015

Aurecon, Bridge over the Niger River, Stakeholder Engagement Lead, ESIA, IFC, (Nigeria), 2013 -2014

Platreef Resources, Digby Wells, Proposed Platinum Mine, Stakeholder Engagement Lead, South Africa (Limpopo) 2013 -2014

Randgold, Hydro Power Stations on the Kibali River, Stakeholder Engagement Lead, ESIA, RAP, IFC requirements, (Democratic Republic of Congo) 2013

Randgold, Life of Mine Kibali Gold Project, Stakeholder Engagement Plan Lead, (Democratic Republic of Congo) (DRC) 2012

Randgold, Stakeholder Engagement Lead, Hydro Power Developments ESIA, Kibali Gold Project, (DRC) 2012

Taurus Gold, Stakeholder Engagement Process Independent Review Afema Gold project Ivory Coast 2012

Randgold, Stakeholder Engagement Lead, Updating of ESIA to IFC, Lolo Mine, (Mali) 2011

Randgold, Public Consultation and Disclosure Lead, ESIA, Resettlement Action Plan (RAP) engagements to IFC standard, (DRC) 2010 - 2012

Koidu Holdings, Digby Wells, Public Consultation and Disclosure, ESIA, IFC, Sierra Leone 2010 - 2011

Randgold, Digby Wells, Public Consultation and Disclosure: Nzoro Road Upgrade ESIA, IFC, DRC 2010 – 2011

CIC Energy, Digby Wells Public Consultation and Disclosure Lead, Serorome Parshalt, Mamabula Project ESIA IFC, Botswana, 2008

Due Diligence

ASGC, WSP, Lenders Due Diligence, Project Strada-Senegal roads project, RAP methodology Lead, Senegal, 2023

ASGC, Kidepo, WSP, IFC Due Diligence Tourism Road Project, RAP methodology Lead, Uganda, 2023

Confidential client, WSP, IFC Due Diligence, Wind Energy Facility, Social Sciences Lead, Kenya, 2022

Confidential client, WSP, IFC Due Diligence, Railway Project, Social Sciences Lead, Ethiopia 2022

Confidential client, WSP, IFC Due Diligence, Gold Tailings Reclamation Project, Social Sciences Lead, South Africa 2022-2023

Confidential Client, WSP, Environmental and Social Impact Assessment (ESIA) Review and Gap Analysis of a 100MW Gas to Power Plant, Mozambique 2022

Uranex Nachu Graphite Mine, Stakeholder Engagement Process Review, Environmental and Social Impact Assessment (ESIA), International Finance Corporation (IFC), Tanzania 2013

Banro Corporation, Digby Wells, IMC independent IFC Review, Bankable Feasibility Study, DRC, 2009

Price Waterhouse Coopers, Perisseuo Consulting, Feasibility Study, Mankwe Campus University of the North West, South Africa (North West) 2004

Public Participation (South Africa)

Glencore, Kongiwe Environmental, Public Participation Process Lead, Leslie 1 Coal Mining Project, Leslie South Africa (Mpumalanga) 2018

Glencore, Kongiwe Environmental Public Participation Process Lead, eMakhazeni Coal Mining Project, Belfast, South Africa (Mpumalanga) 2018

Glencore, Kongiwe Environmental, Lephalale Coal and Power Project, Public Participation process Lead, Lephalale, South Africa (Limpopo) 2017

AECOM, Digby Wells, Public Participation Process Lead, EIA Sludge Storage Facility and Pipeline Associated with the Treatment of Acid Mine Drainage in the Eastern Basin of Witwatersrand Gold Fields, South Africa (Springs) 2014 - 2015

Sasol Mining, Digby Wells Public Participation Process Lead, Environmental Regulatory Processes for Proposed Syferfontein Block 4 Mine Expansion Project, South Africa, (Trichardt) 2014-2015

Northern Coal, Digby Wells Environmental, Belfast, Public Participation Process Lead, Environmental Authorisation for Listed Activities Associated with a Proposed Open Pit Coal Mine on the Farm Weltevreden 381 JT, South Africa, (Mpumalanga Province) 2014 – 2015

Xstrata Coal, Digby Wells Public Participation Process Lead, Zandbaken Mine, EIA Green Fields Project, South Africa, (Mpumalanga) 2012

Mincorp, Digby Wells, Public Participation Lead, Prospecting Right Application, South Africa, (KwaZulu Natal) 2011

Temo Coal, Digby Wells Public Participation Lead, Mining Right Application, South Africa, (Limpopo) 2011

Mashala Resources, Digby Wells Public Consultation Lead, Geluk Closure Plan, South Africa, (KwaZulu Natal) 2010-2011

DRD Gold, Digby Wells, Public Participation Process Lead, Crown Ergo Pipeline Project, South Africa, (Gauteng) 2010-2011

Xstrata Alloys, Digby Wells, Public Meetings Facilitation Lead, Lesedi Power Station, South Africa, (Mpumalanga) 2010

HCI Khusela, Digby Wells, Public Participation Process Lead, Palesa Colliery Expansion, EIA EMP amendment, South Africa, (Mpumalanga), 2010

HCI Khusela, Digby Wells, Public Participation Process Lead, Mbali Mine EMP amendment, South Africa (Mpumalanga) 2009

Marafe Resources, Digby Wells, Public Participation Process Lead, Bankfontein Mining Right Application, South Africa, (Mpumalanga) 2009

Crown Gold Recoveries, Digby Wells, Public Consultation Lead, Topstar Dump Reclamation, South Africa, (Gauteng) 2008-2011

Exxaro, Digby Wells, Public Participation Process Lead, Arnot Coal EIA/EMP amendment, South Africa, (Mpumalanga) 2008-2010

Bakgaga Mining, Digby Wells, Public Consultation Lead, Prospecting Right Application, South Africa, (Limpopo) 2008

Mincorp, Digby Wells, Public Participation Process Lead Schoongezicht, Mining Right Application, South Africa, (Mpumalanga) 2008

Pomodzi Gold, Digby Wells Public Participation Process Lead, Environmental Management Plan Amendment, South Africa, (North West) 2008

Vista Resources, Digby Wells, Consultation Process Lead, Prospecting Right Application, South Africa, (Makhado Local Municipality, Limpopo Province) 2008

TWP Perisseuo Consulting Public Participation Process Lead, IFC and World Bank standards Proposed ConRoast Platinum Smelter, South Africa (North West), 2008

Mintails, Umsizi, Perisseuo Consulting Public Participation Process Lead, Super Dump, EIA, South Africa, (Gauteng) 2008

Black Mountain Mine, Umsizi, Perisseuo Consulting, Public Participation Process Lead, Closure Plan, South Africa, (Northern Cape) 2007-2008

Taba Romana Granite, CT Environmental, Perisseuo Consulting, Public Participation Process Lead, South Africa, (Britz, North West) 2006

CT Environmental, Perisseuo Consulting Public Participation Process Lead for the conversion of the old order mining rights: extension of existing opencast mining operations, construction of a river diversion and application for an integrated water use licence on the farm Halfgewonnen 190 IS, South Africa (Mpumalanga) 2006

Xstrata Coal, Digby Wells, Perisseuo Consulting Public Participation Process Lead, Spitzkop Colliery (EMPR amendment), South Africa (Ermelo, Mpumalanga) 2005

CT Environmental, Perisseuo Consulting, Public Participation Process Lead, Environmental Management Plan (EMP) new coal mine development Boschmanskop, South Africa, (Mpumalanga) 2005

Xstrata Coal, Digby Wells, Perisseuo Consulting Preliminary Public Participation Lead, EMP new coal mine development, Boschmanskop, South Africa, (Mpumalanga) 2004

Xstrata Coal, Digby Wells, Perisseuo Consulting, Public Participation, Spitzkop Colliery, EMPR amendment, South Africa, (Mpumalanga) 2003

Etruscan, Digby Wells, Perisseuo Consulting, Public Participation Process Lead, EMP and Water License Application new diamond mining development, South Africa, (North West) 2003

Digby Wells, Perisseuo Consulting, Public Participation Process Lead, EMP, Diamond Mining Development, South Africa, (Vaal River) 2003

Social and Labour Plans

Northern Coal, Digby Wells, Social and Labour Plan Audit Lead, Jaglust Colliery, South Africa, (Mpumalanga) 2011

Sylvania, Digby Wells, Social and Labour Plan Lead, Vollspruit Mine, South Africa, (Steelpoort Valley Limpopo) 2011

Zyl Limited, Digby Wells, Social and Labour Plan Lead, Kangwane, South Africa, (KwaZulu Natal) 2011

HCI Kusela, Digby Wells, Social and Labour Plan Lead, Palesa Colliery, South Africa, (Gauteng) 2011

Xstrata Coal, Digby Wells, Social and Labour Plan Lead, Easternplats Kenidies Vale & Spitzkop, South Africa, (Limpopo) 2011

Eastplats, Digby Wells, Social and Labour Plan Audit Lead, Crocodile River Operations, South Africa, (North West) 2010

Xstrata Coal, Digby Wells, Social and Labour Plan Lead, Local Economic Feasibility Assessment, South Africa, (Mpumalanga) 2010

Tyax, Digby Wells, Social and Labour Plan Lead, Agnus Mine Tyax Trading Mining Right Conversion, South Africa, (Mpumalanga) 2009

Universal Coal, Digby Wells, Social and Labour Plan Lead, Kangala Mining Right Application, South Africa, (Mpumalanga) 2009

Chemwes Recovery Operation, Digby Wells, Perisseuo Consulting Social and Labour Plan Development Lead, South Africa (North West) 2004

Social Development Planning and Facilitation

Palabora Copper, Social Closure Plan Framework Development Lead, South Africa, (Limpopo), 2022

Talmar, Sustainable Developments, Social Development Facilitation Lead, Namakwa Irrigation Scheme, Onseepkans, South Africa,(Northern Cape).2018 -2021

LMJ Consulting, Magalies Water, Social Development Lead, Maboloka-Letlhabile Ground Water Supply Project, South Africa, (Brits) 2016

BHP Billiton, Digby Wells, Perisseuo Consulting Social Development Plan Development, South Africa, (Revilo North West) 2004-2005

Community Baselines

Xstrata Coal Operations, Digby Wells, Community Baseline Survey Lead, South Africa, (Mpumalanga) 2009-2010

BHP Billiton, Digby Wells Community Baseline Survey Lead, Kutala Southern Access Project, (Mpumalanga) 2009

Department of Public Works, Bigin Africa, Perisseuo Consulting Special Intervention Programme Team Member, Data Management Specialist, Free Basic Water Implementation, South Africa, (National) 2008

Department of Water Affairs and Forestry WRP, Perisseuo Consulting, Consumer Survey Team Member, Water Services Regulation, South Africa, (National) 2008

Department of Water Affairs and Forestry, Perisseuo Consulting Business Intelligence Team Member, Water Services Planning and Information, National Census, South Africa, (National) 2005 -2008

Environmental Impact Assessments

Universal Coal, Digby Wells, Environmental Impact Assessment Lead, Mining Right Application, South Africa, (Mpumalanga) 2009-2011

CT Environmental, Perisseuo Consulting, Environmental Impact Assessment (EIA) and Environmental Management Programme (EMP) for Boschmanskop Coal Mine, South Africa, (Mpumalanga) 2006

Department of Water Affairs and Forestry, Project Coordinator, Strategic Environmental Assessment: Usutu – Mhaltuze Water Management Area, South Africa, (Kwa-Zulu Natal) 2000-2003

Monitoring and Evaluation

Department of Provincial and Local Government Focus BI, Perisseuo Consulting, Monitoring and Evaluation Framework, Team Member (National) 2006

Department of Water Affairs and Forestry, Coastal & Environmental Services, Perisseuo Consulting, Socio-Economic Profiling Lead, Kromme, Seekoei Catchments, Reserve Determination, South Africa (Eastern Cape) 2006

Training and Facilitation

Department of Agriculture, Social Development Facilitation, Namakwa Irrigation Scheme, Talmar Sustainable Developments, South Africa, Onseepkans, (Northern Cape) 2017-2021

Total Energy, Professional Grave Solutions, Lead trainer, training Community Liaison Officers for the relocation of approximately 1000 graves in northern Mozambique 2017-2020

Kongiwe Environmental, Chairing and Facilitation, Public and Stakeholder Meetings, 2018-2020

Digby Wells Environmental, Chairing and facilitation: Public and Stakeholder Meetings, 2008-2015

Perisseuo Consulting, Workshop facilitation, Chair public and stakeholder meetings, various projects, 1998-2008

Department of Water Affairs and Forestry, Workshop facilitation and chairing meetings: for the Strategic Environmental Assessment (SEA) Usutu to Mhlatuze Water Management Area (WMA), 2000-2003

Winning Business Systems Skills Accel / South Atlantic Plastics, Training and workshop facilitation for small business development, (Gauteng) 1998

Client BKS / Consultbro, Workshop facilitation and training in small business development, 1998

The University of South Africa (UNISA), Coordinator, Centre for Development Administration, Teaching Programme in Community Based Development, UNISA 1998-2000

The University of South Africa, Teaching Participatory Development Management during attendance sessions, 1998-2000

The University of South Africa, Junior lecturer: Development Administration first year, teaching first-year Development Administration 1998-2000

Stellenbosch University, Project trainer, MA Political Science, Managing simulation game Exaction, 1999

Atlas Aviation Company, Project trainer, Air Traffic Controllers, managing simulation game Green Revolution, 1999

BKS Consultburo, Consulting Engineers, Perisseuo Consulting, Kyalami Community Health Education Programme for the Kyalami Metropolitan Council, (Gauteng Province) 1998

South African Defence Force, South African Medical Services, Medical Phase Instructor, Teaching the Operational Medical Orderly Course South Africa (National) 1990

Anthropological Research

Chizumulu Island, Lake Malawi, 1996

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