TEMBO NICKEL CORPORATION LIMITED
KABANGA NICKEL MINE
ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT AND ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN UPDATE
NON-TECHNICAL SUMMARY REPORT
18 April 2025

1. INTRODUCTION AND BACKGROUND

1.1 INTRODUCTION

Tembo Nickel Corporation Limited (TNCL) is a local private mining company which was formed on January 19, 2021, after the signing of the joint-venture Framework Agreement between the Government of the United Republic of Tanzania and the Kabanga Nickel Company Limited for the development of the proposed Kabanga Mine (hereafter **referred to as the proposed Project**). The proposed Project is located in the northwest of the United Republic of Tanzania in the Ngara District, 42 km south of the town of Rulenge, 5 km southeast of the nearest village of Bugarama, and close to the border with Burundi. The proposed Project area is a greenfield site that will produce nickel sulphide concentrate.

In broad terms, the mining operations at the Kabanga Mine (all located within the Special Mining Licence (SML area) will involve underground works accessed via two separate decline systems, named the North and Tembo mining areas. Run-of-mine (RoM) will be processed in a dual-stream 3.4 Mtpa concentrator plant to produce nickel sulphide concentrate. This concentrate will be trucked 340 km via the B3 road to the Kahama Refinery for refining. From there, the final products (nickel, copper, and cobalt) will be containerised and trucked to the Isaka dry port, approximately 40 km from the Kahama Refinery, and transported by an existing rail system to Dar es Salaam, Tanzania's principal city and largest seaport. Dar es Salaam has the necessary port facilities to import equipment and materials for the proposed Project and to ship the final products for export.

1.2 BACKGROUND

The Environmental Impact Statement (EIS) and Environmental Management Plan (EMP) for the proposed Project were initially conducted between 2007 and 2013 by Golder Associates (now WSP) and MTL Consulting. The study adhered to both local and international standards and was approved by the National Environmental Management Council (NEMC) in September 2013. However, due to economic challenges and a decline in nickel prices, the project did not progress. Following TNCL taking ownership of the Project, the EIA certificate was transferred in June 2021 from Kabanga Nickel Limited *(Under the Framework Agreement terms, a joint stock company, namely TNCL, was formally established. TNCL is owned 84% by Kabanga Nickel Limited and 16% by the Government of Tanzania. The company is dedicated to the mining, processing, and refining of high-grade nickel, with cobalt and copper as co-products,* to TNCL. Given changes in mining designs, environmental conditions, and regulations, the proposed Project required re-registration per the Environmental Impact Assessment and Audit Regulations, 2005, prompting NEMC to request an update to the EIS and EMP. MTL was commissioned to update these documents, which NEMC approved in June 2023.

TNCL is committed to implementing the proposed Project in line with International Standards. To ensure compliance, TNCL has appointed SLR Consulting (Africa) Proprietary Limited (SLR) in partnership with City Engineering Company Limited (CECL) to update the current ESIA and Environmental and Social Management Plan (ESMP) for the proposed Project to meet lender standards.

1.3 PROJECT DEVELOPER

Kabanga Nickel Limited is owned by Lifezone Metals Limited and BHP Billiton (UK) DDS Limited. The proposed Project was acquired by Lifezone Metals Limited in 2021. On 25 October 2021, when the Government of Tanzania granted a Special Mining Licence (SML) to TNCL. Kabanga Nickel Limited owns 84% of TNCL, and as required by law, the Government of Tanzania holds a 16% share. BHP invested in the project in January 2022 by acquiring an 8.9% stake in KNL, which was extended to a 17% stake in February 2023.

TNCL and its subsidiary company, the Tembo Nickel Refining Company Ltd (part of a separate process for the Kahama Refinery), are owned by Kabanga Nickel Limited, which is the majority shareholder. The Government of Tanzania holds a minority share.

2. APPROACH TO THE ESIA

The ESIA objectives focus on ensuring sustainable and responsible mining practices. The IFC, part of the World Bank Group, provides a Sustainability Framework that promotes environmental and social responsibility, transparency, and accountability. Its Performance Standards (established in 2012) outline requirements for project financing.

The mine site faces various biophysical, cultural, and socio-economic challenges. The ESIA process, led by SLR, aims to identify and mitigate these environmental and social risks to ensure sustainable development.

- Gathering and evaluating baseline information to characterise the affected biophysical, cultural and socio-economic environment.
- Identifying national, international, and corporate management requirements that the Project must satisfy.
- Assessing the overall effectiveness of environmental laws and regulations in managing the environmnetal impacts.
- Undertaking consultation with stakeholders and promoting full disclosure of information and transparency regarding the ESIA process.
- Identifying, defining and evaluating the current environmental and social impacts that need to be addressed.
- Developing an environmental and social management framework that sets out key mitigation measures and monitoring objectives and where required, propose remedial measures.

3. PROJECT LOCATION

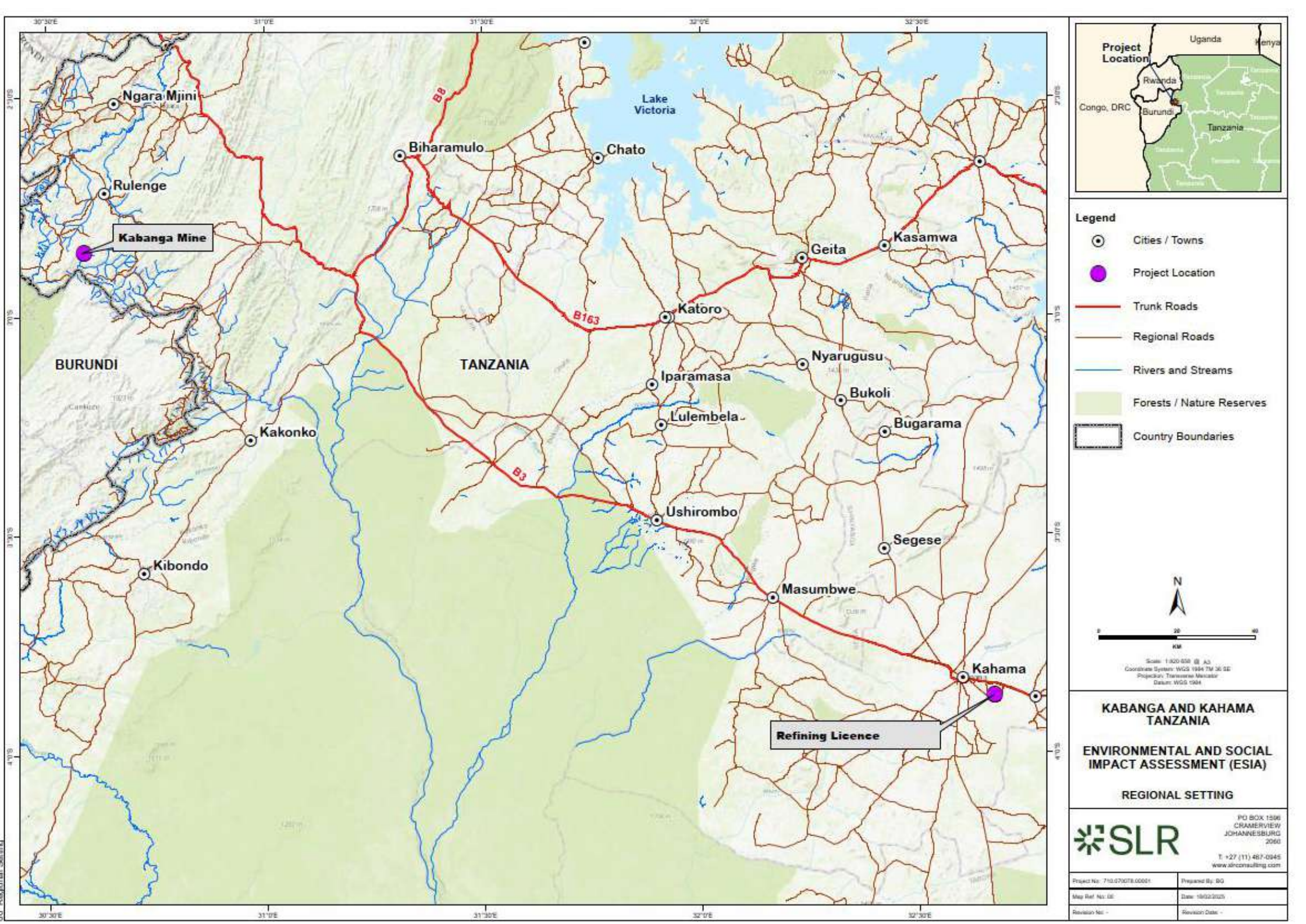
The proposed Project is a greenfield site located in the northwest of Tanzania. The proposed Project site is approximately 1320 km west of the main port of Dar-es-Salaam and about 130 km southwest of Lake Victoria. The site is located in the Ngara District, 42 km south of the town of Rulenge, 5 km southeast of the nearest village of Bugarama, and close to the border with Burundi and borders the Ruvubu National Park. The Ruvubu River originates in Burundi and defines the international boundary between Tanzania and Burundi to the southwest of the Project Area.

The Project area covers an area of approximately 202 square kilometres (km^2) of land. The villages, Rwinyana, Bugarama, Mukubu, Muganza, and Nyabiganga, are located within the Project area and will need to be relocated as part of the proposed Project (Part of a separate process**).**

The proposed Project site can be accessed through either the North or South Access Road. The North Access Road is 30 km from Ngara via Rulenge, and the South Access Road is 70 km from Nyakahura centre to the Kabanga site. Both accesses are unpaved and fall under the Tanzanian National Roads Agency (TANROADS) and the Ngara District as part of the public road network within the Kagera Region. These public roads will require regular improvements before being used to service the mine activities.

The proposed Project infrastructure will predominantly be developed within the Nyamwongo River catchment area. The Nyamwongo River, a tributary of the Muruhamba River, flows through the centre of the proposed Project site. Meanwhile, the Muruhamba River, which runs along the southern boundary of the Project area, merges with the Ruvubu River. The Ruvubu River, forming the natural border between Tanzania and Burundi, continues its journey north-eastward towards Lake Victoria.

Photo 1: Greenfield site showing undulating landscape



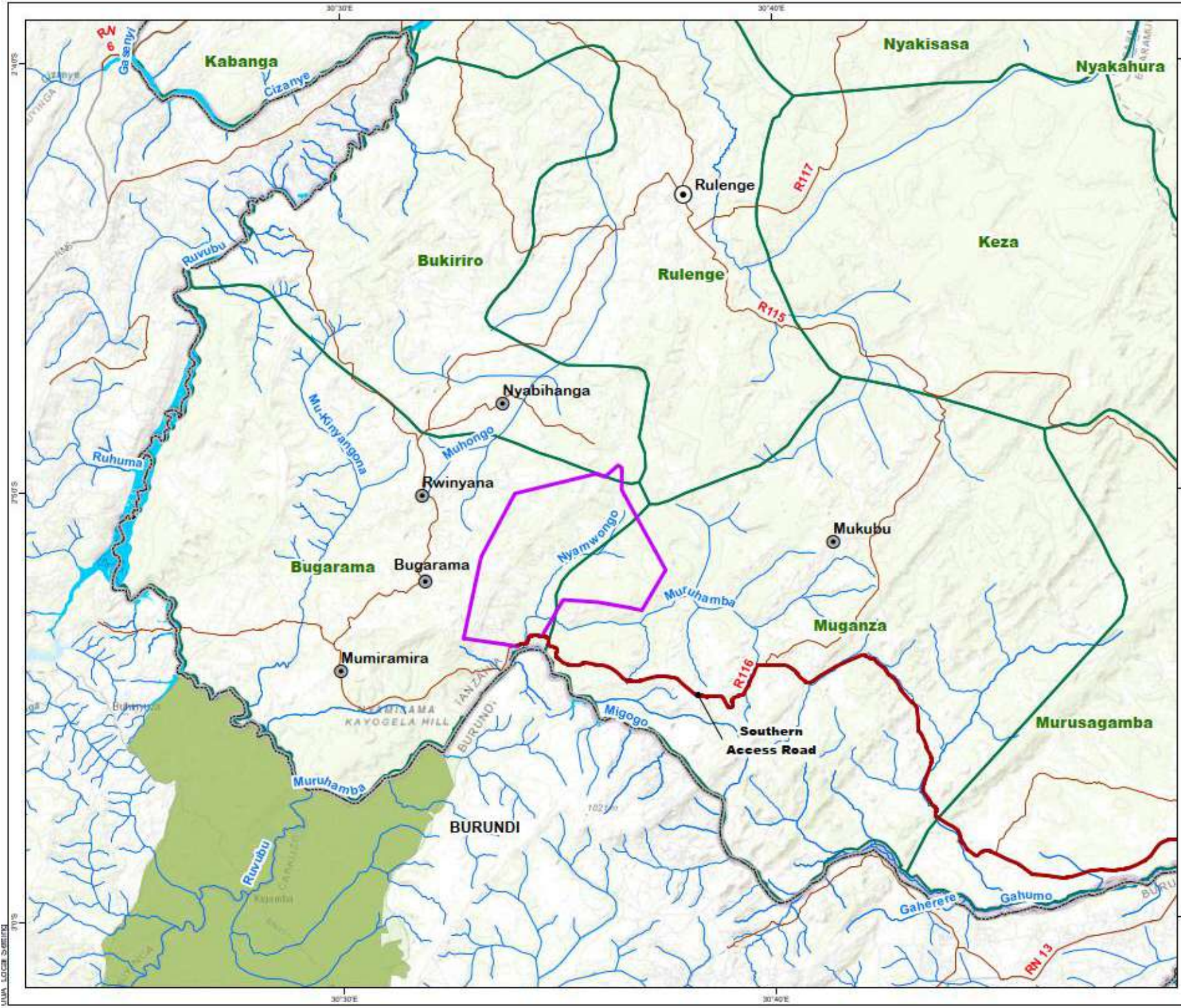
KABANGA AND KAHAMA TANZANIA

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)

REGIONAL SETTING

SLR
PO BOX 1596
CRAMERVIEW
JOHANNESBURG
2060
T: +27 (11) 467-0945
www.slrconsulting.com

Project No: 710.07007B.00001	Prepared By: BG
Map Ref. No: 05	Date: 18/02/2025
Revision No: -	Revision Date: -



KABANGA NICKEL PROJECT TANZANIA

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)

LOCAL SETTING

SLR
PO BOX 1596
CRAMERVIEW
JOHANNESBURG
2060
T: +27 (11) 467-0945
www.slrconsulting.com

Project No: 710.07007B.00001	Prepared By: BG
Map Ref. No: 00A	Date: 09/01/2020
Revision No: -	Revision Date: -

4. OVERVIEW OF THE PROJECT DESCRIPTION

4.1 OVERVIEW

The proposed Project will involve underground mining methods. RoM removed from underground will be transported to the concentrator plant for processing, which will produce the nickel sulphide concentrate, which will be transported via truck from the Kabanga Mine to Kahama Refinery for further processing. The Mining operations will target three key deposits: North, Tembo, and Main, which will be accessed via the establishment of two declines from the surface. The Main deposit will be accessed via a ramp from the North Mine. To establish the two surface declines, vegetation will be cleared, and topsoil will be stripped and stockpiled at designated topsoil stockpiles on the surface. Waste rock generated during the course of underground mining will be brought to the surface and stockpiled on waste rock dumps. Tailings generated from the processing plant will be deposited in a Tailings Storage Facility.

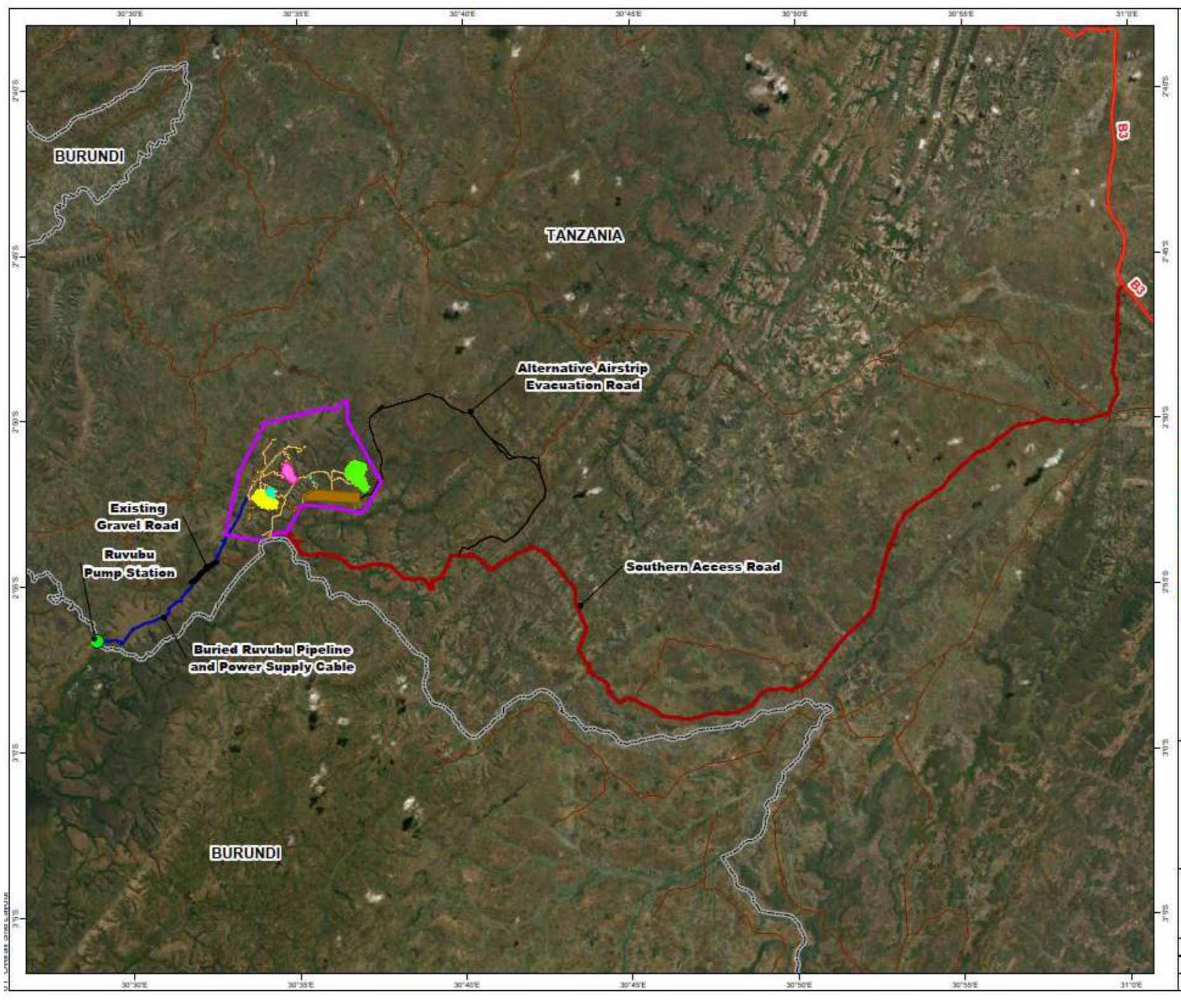
Key components to the proposed Project area tabulated below.

Duration of Construction Phase	4 years (Daytime hours days a week).
Construction phase labour force	Maximum labour force of approximately 1200 people (combination of skilled and unskilled).
Operational phase labour force	Maximum labour force of approximately 780 people (combination of skilled and unskilled).
Source of labour	Unskilled and semi-skilled labour will be sourced from surrounding communities. Skilled labour will be sourced in the country with training opportunities.
Life of Mine	30 years (24 hours for 7 days a week).
Housing	Housing will be at the exploration camp (already existing), permanent camp and nearby communities.

4.1 SUPPORT INFRASTRUCTURE/ACTIVITIES

The following sections provide an overview of the main project infrastructure and activities:

Access and access control 	**Access control**	• The project area will be fenced off to prevent access to the public.
	Northern Access Road	• The northern access road, located about 55 km north of the Kabanga Mine, currently serves as the main route for transporting heavy equipment, materials, and personnel. It will act as the primary construction access route until the southern access road is upgraded to a suitable standard.
	Southern Access Road	• The southern access road is a 72 km gravel road linking the Kabanga Site to the B3 highway at Nyakahura. It is the preferred long-term route for heavy vehicle deliveries, concentrate exports, and light vehicles. The road is classified as a Tanzanian National Road and maintained by the Kagera regional manager.
	Construction phase water requirements and source	• Raw water will be sourced from groundwater ingress.
Water Supply and Management 	**Operational phase water requirements and source**	• Potable water will be sourced from boreholes on site and the Ruvubu River. Water will be treated before use. • Raw water will be sourced from groundwater ingress and supplementary water from the Ruvubu River (via a new pipeline).
	Stormwater Management	• Clean water is collected using drains, diverted away from the mine site, and allowed to flow into the natural drainage system. • The Contaminated water is collected in drains and captured in pollution control dams before being reused.
Power Supply and Use 	• The bulk power supply for the project will be provided by Tanzania Electric Supply Company Limited (TANESCO), Tanzania's national power utility. A new overhead transmission line will be constructed by TANESCO from the Nyakanazi substation to a metering point at the Kabanga boundary, within a 35 m wide corridor. TNCL will then complete the final section of the 220 kV line to the consumer substation at the project site.	
Mineralised rock	**Tailings Storage Facility (TSF)**	• The tailings slurry will be pumped from the concentrator plant to the TSF via delivery pipelines. Excess water from the surface of the TSF will be removed and returned directly to the concentrator plant. • The Dam Break Analysis indicated the highest potential loss of life of 138 in the event of a dam break.
	Waste rock	• Waste rock from the underground mining operations is proposed to be stored on site at two WRDs.
Non-mineralised waste	• Waste generated on site will be managed in line with a formalised waste management plan, that focuses on collection, storage, recycling, reuse and disposal of waste.	
Other Support Services 	• **Buildings:** Building infrastructure (blockwork, prefabricated, workshops and stores and substation buildings) layouts were developed to support the mine and concentrator operations. • **Aerodrome:** Making access to the site easier. • **Paste Backfill Plants:** To backfill paste for underground support. • **Ventilation and Cooling:** Ventilation infrastructure provides fresh air, removes harmful gases, and controls the levels of dust and pollutants, creating a breathable environment for underground workers. Cooling infrastructure manages the heat generated from natural sources like geothermal heat and from mining equipment	



Legend

- Trunk Roads
- Regional Roads
- Country Boundaries

Project Components

- Ruvubu Pump Station
- Existing Road
- Existing Gravel Road
- Road (Including Access and Haul Roads)
- Southern Access
- Ruvubu Pipeline - Bulk Water Pipeline
- Overland Pipeline
- Tembo Mining Infrastructure Area
- North Mining Infrastructure Area
- Concentrator Plant
- Tailings Storage Facility
- Type C Runway
- Project Area

N

0 2 4
KM

Scale: 1:197 000 @ A3
Coordinate System: WGS 1984 TM 36 SE
Projection: Transverse Mercator
Datum: WGS 1984

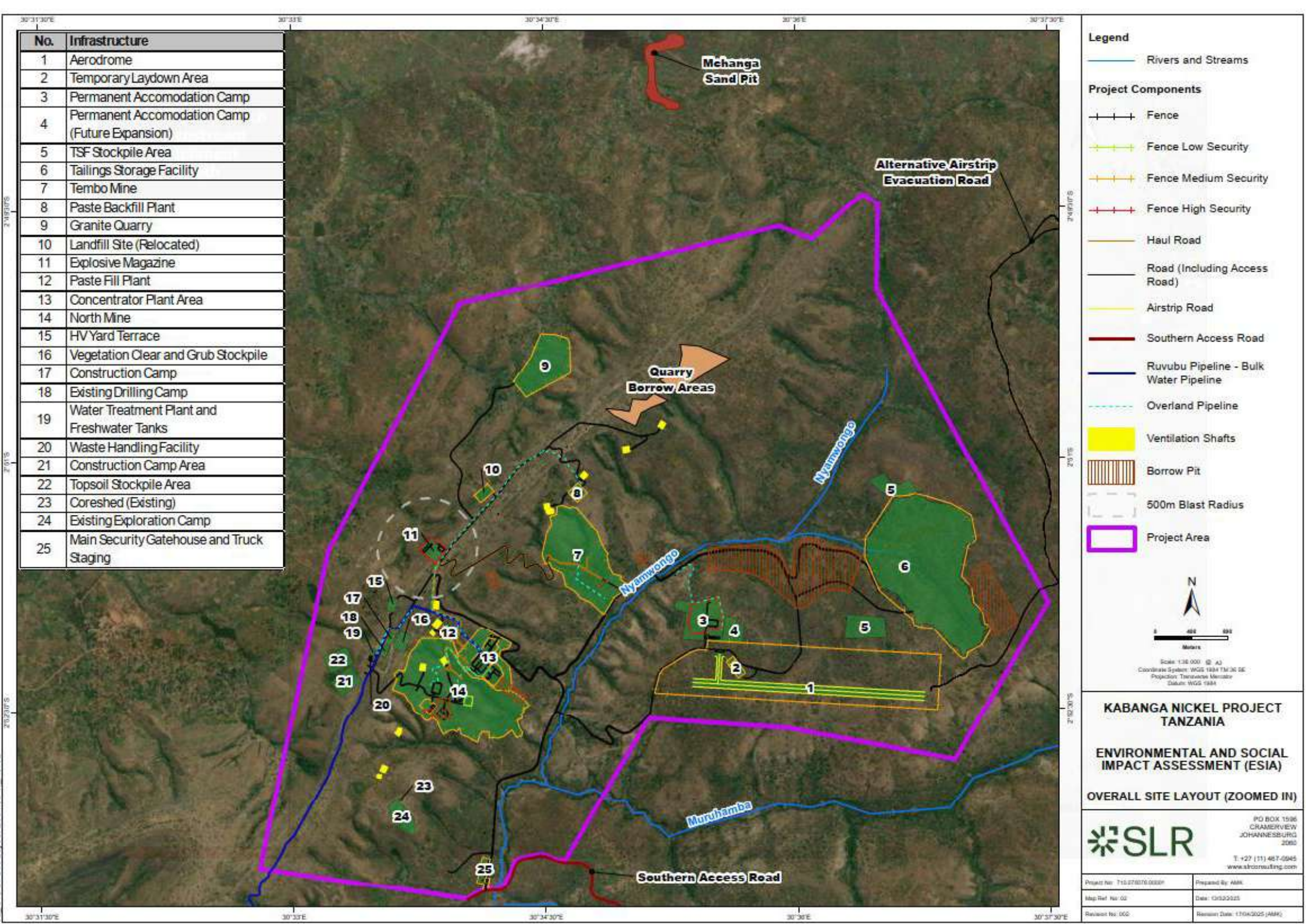
KABANGA NICKEL PROJECT TANZANIA

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)

OVERALL SITE LAYOUT

SLR
PO BOX 1596
CRAMERVIEW
JOHANNESBURG
2060
T: +27 (11) 467-0945
www.slrconsulting.com

Project No: 710.07007B.00001	Prepared By: BG
Map Ref No: 01	Date: 03/12/2024
Revision No: 000 (001)	Revision Date: 11/12/2024 (13/02/2025)



No.	Infrastructure
1	Aerodrome
2	Temporary Laydown Area
3	Permanent Accomodation Camp
4	Permanent Accomodation Camp (Future Expansion)
5	TSF Stockpile Area
6	Tailings Storage Facility
7	Tembo Mine
8	Paste Backfill Plant
9	Granite Quarry
10	Landfill Site (Relocated)
11	Explosive Magazine
12	Paste Fill Plant
13	Concentrator Plant Area
14	North Mine
15	HV Yard Terrace
16	Vegetation Clear and Grub Stockpile
17	Construction Camp
18	Existing Drilling Camp
19	Water Treatment Plant and Freshwater Tanks
20	Waste Handling Facility
21	Construction Camp Area
22	Topsoil Stockpile Area
23	Coreshed (Existing)
24	Existing Exploration Camp
25	Main Security Gatehouse and Truck Staging

Legend

- Rivers and Streams

Project Components

- Fence
- Fence Low Security
- Fence Medium Security
- Fence High Security
- Haul Road
- Road (Including Access Road)
- Airstrip Road
- Southern Access Road
- Ruvubu Pipeline - Bulk Water Pipeline
- Overland Pipeline
- Ventilation Shafts
- Borrow Pit
- 500m Blast Radius
- Project Area

N

0 400 800 Meters

Scale: 1:30 000 @ A3
Coordinate System: WGS 1984 TM 36 SE
Projection: Transverse Mercator
Datum: WGS 1984

KABANGA NICKEL PROJECT TANZANIA

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)

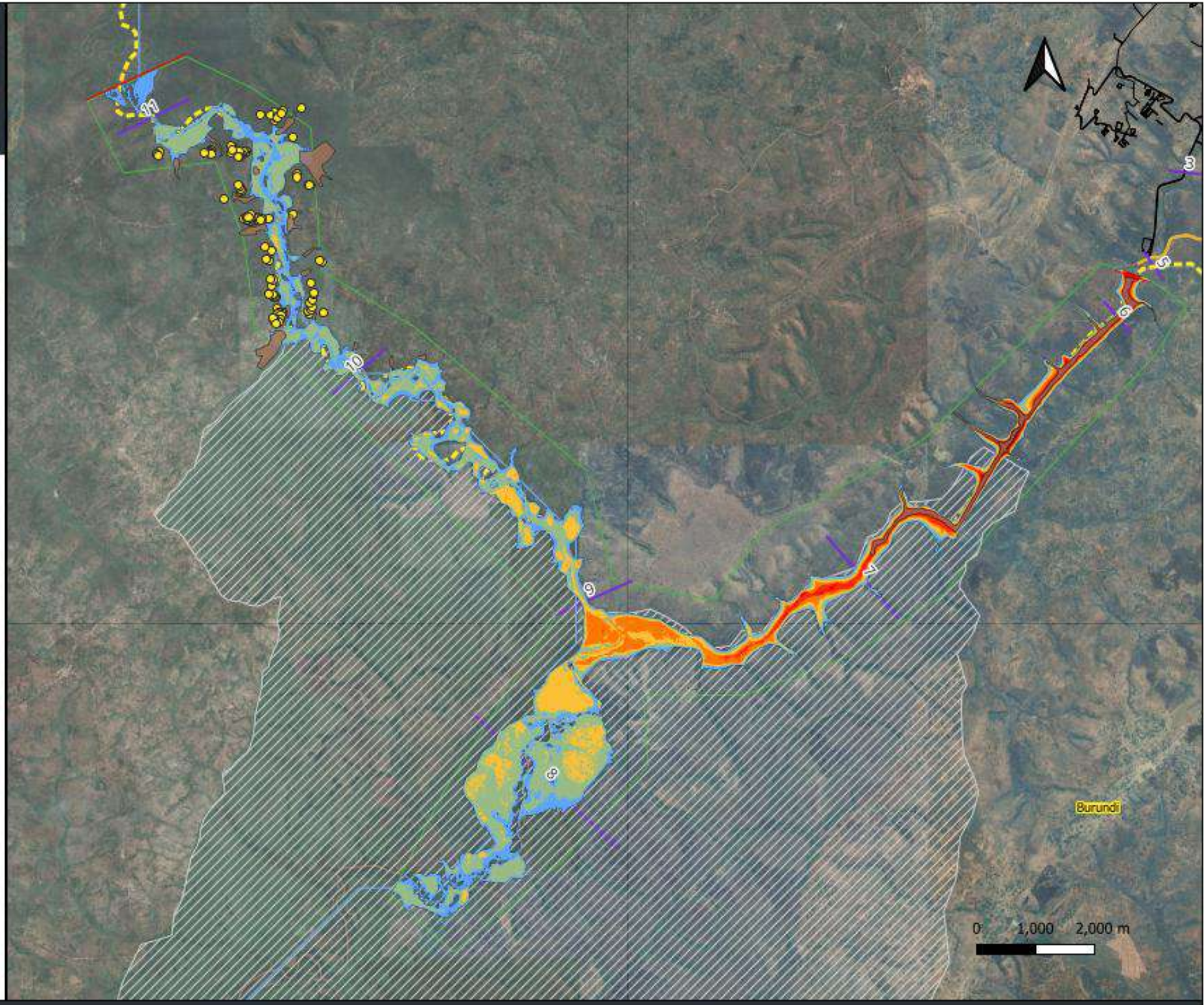
OVERALL SITE LAYOUT (ZOOMED IN)

SLR
PO BOX 1596
CRAMERVIEW
JOHANNESBURG
2060
T: +27 (11) 467-0945
www.slrconsulting.com

Project No: 710.07670.00001	Prepared By: AMK
Map Ref. No: 02	Date: 03/02/2025
Revision No: 002	Revision Date: 17/04/2025 (AMK)

C4

Sunny Day Breach Downstream Catchment Depth



LEGEND

- Watercourses
- Downstream Model Boundary
- Dwellings
- Agricultural Area
- Wetlands
- Site Roads
- International Border
- Southern Access Road
- Inflow/Outflow Boundaries
- Profile Lines

Maximum Flood Depths (m)

- <= 0.00
- 0.00 - 2.50
- 2.5-5
- 5-7.5
- 7.5-10
- 10-12.5
- 12.5-15
- 15-17.5
- > 17.5

wsp

EPSG:21036 : Arc 1960 / UTM zone 36S
Universal Transverse Mercator (UTM)

Client: Kabanga Nickel Limited
Project No: PS208273
Project name: Dam Break Assessment and Classification
Rev:2

Date: 2024-03-26
Designed: MC
Prepared: MC
Reviewed: RS
Approved: NM

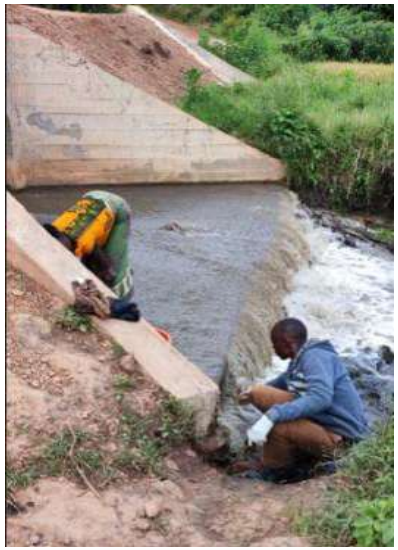
5. BASELINE ENVIRONMENT – BIOPHYSICAL ENVIRONMENT

The proposed Project area lies at an altitude of approximately 1,540 m above mean sea level. The area has a series of hilly terrain, with abruptly elevated hills to the central parts of the proposed Project area. The local terrain is dominated by a rocky ridge that trends in a north-northeast direction through the proposed Project Area. Steep-sided, narrow valleys are present on both flanks of the Project ridge.

The annual temperature and rainfall average at 20.1°C and 1023 mm, respectively at the proposed Project site. The northern and northwestern regions, including the Ngara district, experience a bimodal rainfall pattern: the long rains (Masika) occur from March to May, while the short rains (Vuli) occur from October to December.

The broader landscape consists of gently undulating highlands with occasional abrupt hills and deep river valleys. The proposed development lies within the Ruvubu River sub-catchment, which drains into the Kagera River system and ultimately into Lake Victoria. The Ruvubu River originates in Burundi and flows northeastward, forming a section of the international boundary between Tanzania and Burundi. Numerous smaller seasonal and perennial streams within the project area drain toward the Ruvubu River. Hydrological features in the project area are dominated by small tributaries and valley-bottom wetland systems that generally follow the terrain's natural contours. These wetlands serve as important ecological and hydrological elements, supporting seasonal surface flows and contributing to groundwater recharge. Streamflow is highest during the rainy season and diminishes significantly during the dry season, resulting in intermittent or ephemeral flow regimes in many of the smaller channels.

Local communities primarily use surface water for domestic consumption, irrigation, and livestock watering (**the Photo on the left shows community member using Muruhamba River water in Bugarama Village**).



Streams and wetlands serve as direct water sources for household activities such as washing, cooking, and bathing, especially in areas where access to groundwater is limited. Surface water is also essential for irrigating crops, particularly in rice paddies established in low-lying valley areas. In some locations, small-scale diversions and bunds are constructed to retain water in wetland plots during the growing season. During the dry season, when many smaller streams dry up, residents often rely on permanent pools or spring-fed tributaries for water collection. The surface water quality shows a consistent pattern of slightly acidic conditions (pH < 6.5), particularly during the rainy season when runoff increases. When measured against the WHO Drinking Water Guidelines, most surface water sources fall within acceptable thresholds for key health parameters. Arsenic, lead, selenium, and nitrate were below guideline values across all monitoring sites. Fluoride exceeded the WHO limit of 1.5 mg/L at several locations, particularly during periods of high flow, while uranium was found at elevated levels at a small number of sampling points. These exceedances are likely geogenic in origin, related to natural mineral weathering and enhanced leaching during wet conditions. Other parameters of concern include iron, aluminium, manganese, and nickel.

In addition to surface water, groundwater is a valuable water source for communities in the region. Residents rely on hand-dug wells and boreholes for potable water, livestock watering, and small-scale irrigation (**the Photo on the left shows a community borehole in Rwinyana Village**).

Boreholes generally provide high-quality water with neutral pH and low concentrations of contaminants. Water from springs and shallow wells is more variable, with occasional exceedances of fluoride and uranium compared to WHO guidelines. Nitrate levels are low across all groundwater sources. Arsenic, lead, and selenium were not detected at levels of concern.

The air quality in the proposed Project area is shaped by both natural and anthropogenic sources. Common contributors include the use of wood and charcoal for cooking, vehicle emissions, waste burning, wind-blown dust from exposed surfaces, and localised agricultural burning.

Noise levels in the region are generally low and are influenced by a combination of natural sounds, community activities, and intermittent mining or construction-related operations. Daytime conditions feature a blend of village activity, wildlife sounds, and human movement. The area becomes quieter at night, with natural sounds such as insects and distant wildlife becoming more prominent.

The proposed Project area includes a diversity of soil types. Shallow and nutrient-poor soils dominate the uplands and are prone to erosion, particularly on steeper slopes. In contrast, the valleys support deeper and more organic-rich soils, which retain more moisture and are better suited for cultivation, albeit with limitations due to seasonal waterlogging. Cultivation is concentrated in lowland areas where water and soil depth are more favourable, especially for rice and cassava farming.

The vegetation in the proposed The vegetation in the proposed Project area forms part of the Central Zambezian Wet Miombo Woodlands Ecoregion (**A representative Photo of the Miombo Woodland habitat in the proposed Project Area is provided on the right**), which is one of the most widespread woodland ecosystems in Africa. These woodlands are adapted to nutrient-poor soils and a pronounced dry season. **The Figure on Page 11 provides a map of the habitats associated with the proposed Project area**. Habitat associated with the proposed footprint and infrastructure areas include Miombo Woodland habitat (subdivided into open woodland and thicket mosaic), Grassland habitat (subdivided into open grassland and wooded grassland), Surface Water Ecosystems (modified and natural systems) and Transformed Habitat.

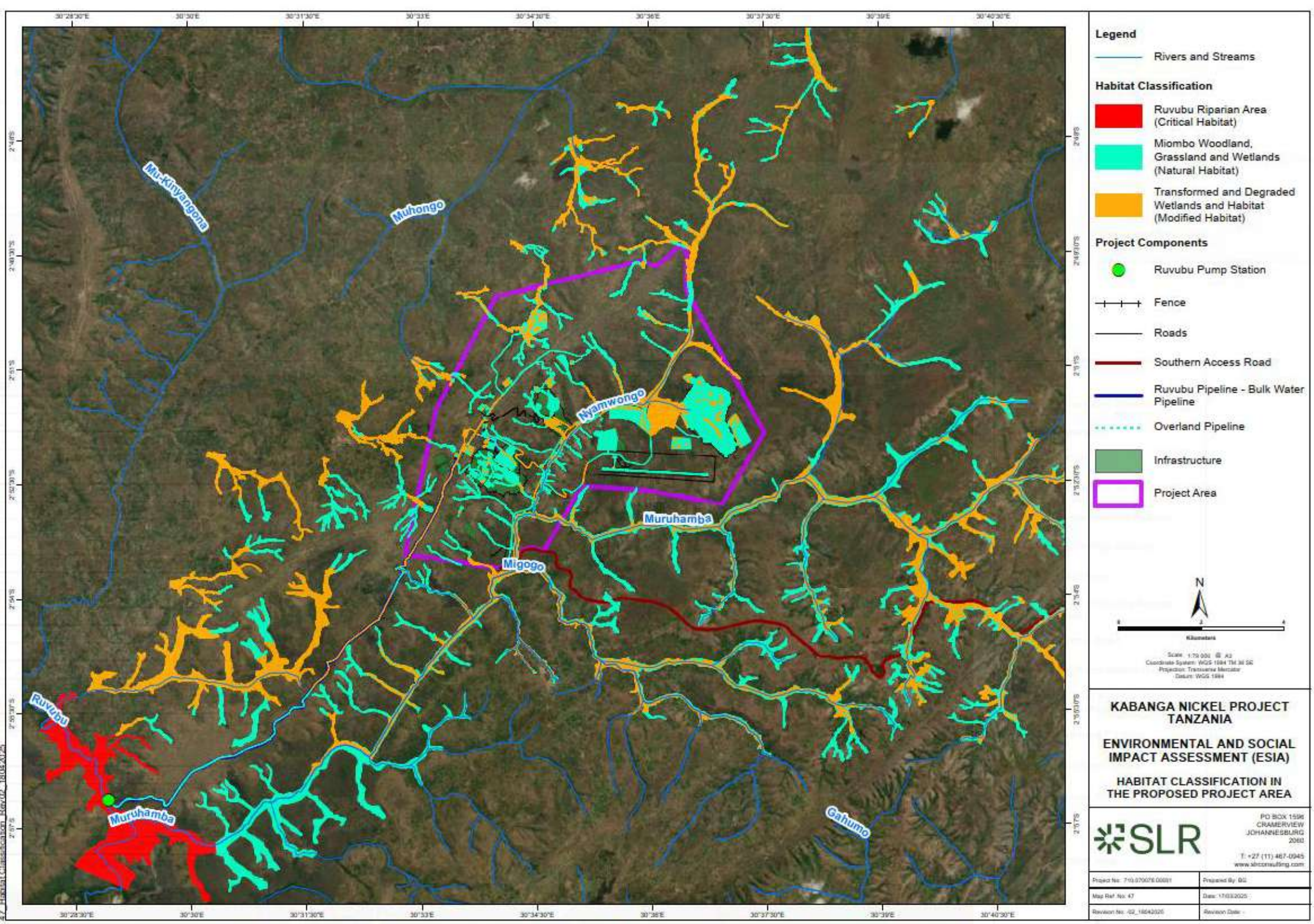
Wetland habitats are present throughout the Proposed project area, mostly in the form of linear valley-bottom systems. Vegetation is forms a mosaic of more disturbed and more natural habitats due to historical clearing, shifting cultivation, and subsistence use of fuelwood and construction materials. **A representative photo of freshwater ecosystems is provided on the left.**

The fauna of the area includes a variety of mammals, birds, reptiles, and amphibians. Common mammals observed during field studies include the Vervet Monkey, African Savanna Hare, and Common Duiker. Notably, a small group of Ashy Red Colobus, an endangered primate species, was recorded along the riparian areas of the Ruvubu River (**An Ashy Red Colobus observed on site is shown in the photo on the right).**

Avifaunal surveys identified 204 bird species, with three species of concern recorded in recent years. These include the Grey Crowned Crane, (endangered), which was observed in the wetland areas within the valley of the TSF, the Red-faced Barbet, (near threatened) which was observed in different areas within the proposed Project area. In previous assessments, the Bateleur (Endangered) was observed in the region. Amphibians and reptiles are also well-represented, with species such as the Senegal Running Frog (**Photo on the right**) and Cape Wolf Snake observed. A total of 15 amphibian species and 11 reptile species were recorded during fieldwork. None of the amphibian and reptilian species known to occur in the proposed Project area are regarded as threatened, endangered, endemic or of conservation concern.

The habitat analysis, aligned with the IFC PS 6 habitat and species targets and criteria, identified three habitat categories: critical habitat, natural habitat and modified habitat. **The Figure on the next pages provides a map of the Habitat Classification.** Based on the results of the assessment, the wetland units throughout the study area, although regarded as ecologically sensitive habitat features, are regarded as **modified habitat**, with only a minor inclusion of natural habitat still having been retained in isolated areas of some drainage lines and steeper areas and areas with shallow rocky soil that do not support agriculture or grazing and where wood harvesting has not taken place. Fish species of conservational significance, species that have restricted geographical distribution ranges and species that require migratory freedom to fulfil a stage of their life cycle were identified as being relevant to the surface water ecosystems within the region. An analysis of the ecological and biological requirements of the various species indicated that the more developed habitat presented by the Ruvubu River, located downgradient of the study area, presents more suitable habitat quality than the wetlands and watercourses that fall within the study area. This habitat is still considered to be intact and provides important habitat and habitat connectivity for species. The abstraction from the Ruvubu River is not deemed a threat to the aquatic species of the system. Discharge form the mine if done responsibly is also not deemed an unacceptable threat to the Ruvubu River The riparian habitat associated with the Ruvubu River is therefore **considered to qualify for critical habitat** based on the presence of endangered mammal species. The Miombo Woodland, Grassland and portions of the surface water ecosystems are areas of **natural habitat** that are composed of viable assemblages of plant and/or animal species of largely native origin and where the surrounding anthropogenic activities have not yet modified the area's primary ecological functions, although faunal species composition has been impacted upon. Plant species such as African Blackwood (near threatened) and Long-tubed aloe (vulnerable) have been recorded within these woodlands. The majority of the surface water ecosystems have however been modified and are currently used for agricultural practices such as rice paddies within the permanently wet zones and other seasonal crops such as maize, sweet potatoes and bananas within the seasonally-inundated wetlands and peripheral zones. Although the surface water ecosystems are still considered as ecologically important habitat, notably for water dependant faunal species, and provide very significant ecological function and services, the areas cultivated within the freshwater ecosystems can be considered as **modified habitat. The wetlands and especially the larger valley bottom wetland systems are regarded as very important in terms of streamflow regulation flood control and social goods and service provision.**

The Transformed Habitat (**modified habitat**) is an area that contains a moderate to high proportion of plant and/or animal species of non-native origin and includes areas that have substantially been modified by human activity (i.e., agricultural activities, towns, villages, etc). Areas where the primary ecological functions and species composition have been modified.



Legend

Rivers and Streams

Habitat Classification

- Ruvubu Riparian Area (Critical Habitat)
- Miombo Woodland, Grassland and Wetlands (Natural Habitat)
- Transformed and Degraded Wetlands and Habitat (Modified Habitat)

Project Components

- Ruvubu Pump Station
- Fence
- Roads
- Southern Access Road
- Ruvubu Pipeline - Bulk Water Pipeline
- Overland Pipeline
- Infrastructure
- Project Area

N

0 2 4
Kilometers

Scale: 1:70 000 @ A3
Coordinate System: WGS 1984 TM 30 SE
Projection: Transverse Mercator
Datum: WGS 1984

KABANGA NICKEL PROJECT TANZANIA

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)

HABITAT CLASSIFICATION IN THE PROPOSED PROJECT AREA

SLR
PO BOX 1596
CRAMERVIEW
JOHANNESBURG
2060
T: +27 (11) 467-0945
www.slrconsulting.com

Project No: 710.07007E.00001	Prepared By: GG
Map Ref. No: 47	Date: 17/03/2025
Revision No: -02_18042025	Revision Date: -

6. BASELINE ENVIRONMENT - CULTURAL HERITAGE

The Ngara District's cultural and archaeological heritage is rooted in the legacies of the Bugufi and Bushubi chiefdoms, with sacred sites, mausoleums (**a Photo on the right shows a mausoleum at Bugufi chiefdom**), and ritual artefacts still preserved. Key archaeological sites in the District include Kirinzi and Goyagoya Hills, and Nyakafandi 2 reveal human settlement dating back to the Later Stone Age (LSA), while sacred landscapes like Shunga Mountain and Mafiga Matatu serve both spiritual and symbolic functions. Intangible heritage resources in the district include traditional healing, rituals, and crafts like basketry, beekeeping, and pottery as well as cross-border cultural exchanges with Rwanda and Burundi, especially among the Batwa people.

6.1 TANGIBLE HERITAGE RESOURCES

Archaeological surveys identified 10 key heritage sites across the proposed project area, notably near the Ruvubu River catchment and along the proposed water pipeline route. Most are associated with the Middle and Late Stone Age (MSA/LSA) and the Iron Age, indicated by stone tools, pottery shards, smelting slag, clay quarrying for pottery, showing historic connections to the Batwa (Pygmy) people, who historically engaged in pottery trade across Tanzania and Burundi. Although no Batwa communities currently live within the project area, their cultural legacy remains through such quarry sites. A total of 364 graves are located within the proposed Project area.

6.2 INTANGIBLE HERITAGE RESOURCES

Extensive consultations with communities in Bugarama, Rwinyana, and Nyabihanga wards revealed that while traditional practices like ritual ceremonies for rain and ancestral protection have declined, a deep sense of place and identity remains. These practices, though less frequent today due to globalization and the spread of other religions, particularly Christianity and Islam, are still remembered and valued for their historical and spiritual significance. **The Photo to the left shows a shrine for rituals practices in Bugarama village**.

During the archaeological study undertaken, local communities shared oral histories tied to land use, former settlement patterns, and trade networks, particularly with the Batwa across the Burundi border. Stories about transboundary intermarriages, labour exchange, and clay pottery trade offer a valuable glimpse into the region's social and economic heritage.

The region is scattered with small, often undocumented family burial grounds. A remarkable cultural tradition is the use of trees to serve as living monuments to mark these sacred spaces:

- **Murumba** trees (*Prunus africana*) – planted at corners of adult grave sites.
- **Nganigan**i – marking children's graves and boundaries.
- **Minyaa** and **Jatropha** – used similarly, serving both spiritual and territorial functions.

The **Murumba tree** is also central to spiritual life. Ceremonies like **Kubandwa,** once public and now practiced privately, were historically held beneath these sacred trees. Though banned in the 1980s, the rituals are still being practiced in some homes and groves in the area. Another spiritual practice in the proposed Project area involves the brewing and sharing of traditional beer, especially during rituals and festivals. These include:

- **Ndimas**i – a ritual beer used for blessings and cleansing.
- Other brews like **Gwagwa, Limasi,** Mgorigori, and **Kwete** made from millet, sorghum, maize, or banana, and consumed during harvest dances and community gatherings.

The region's festive heritage also includes dances like the **Ngoma wa Saba** to celebrate harvests and foster community unity. Spiritual healing is a key component of community life, with healers in the area not only acting as herbalists but also custodians of ancestral knowledge. Sacred trees and plants identified in the proposed Project area include:

- **Umaguruka, Rumanuko, Tunumura, Ruvilinganga** – for spiritual cleansing and protection.
- **Umulavumba, Muhongoro, Msasa, Mweza, Umugombe, Muhasama** – for treating ailments from fever to stomach issues.
- **Minaz**i (coconut palm) – valued both nutritionally and spiritually.
- *Vernonia amygdalina* (**Umubirizi**) – used for digestive issues and malaria
- *Rhus vulgaris* (**Umuragar***a*) – known for pain relief and inflammation
- *Lagenaria sphaerica* (**Umutang***a*) – utilized in skin treatments
- *Tetradenia riparia* (**Umulavumba**) – a common remedy for respiratory problems
- *Markhamia lutea* (**Umusange**) – traditionally used for fever and infections
- *Albizia adianthifolia* (**Omusanz***a*) – associated with wound healing
- Aeva leucura (*Mweza*) and Acacia abyssinica (*Umunyinya*) – multipurpose medicinal plants

These trees, while present across Ngara, are reported to be in decline due to increased land pressure from agriculture, infrastructure, and mining-related development.

7. BASELINE ENVIRONMENT - CURRENT LAND USES

Land uses within the Project area is primarily used for subsistence agriculture and livestock farming, with crop cultivation and grazing being the dominant land uses. Farmers grow staple crops such as maize, beans, cassava, sugarcane, potatoes, groundnuts, and sunflower, along with permanent crops like bananas, coffee, and fruit trees (avocado and mango).

Coffee is the only cash crop in the region, while wetlands and lower valley slopes are used for dry-season farming due to their higher water tables. Subsistence livestock farming is widespread, including goats, pigs, sheep, chickens, cattle, and ducks, with grazing concentrated on hilltops and ridges. Beekeepinis also practiced, providing an important ecosystem service.

The villages within the Project area are rural and scattered, with houses typically built using burnt bricks, cement blocks, iron sheets, or thatched roofs. The closest village to the proposed mine site is Bugarama, while the village of Rulenge, approximately 42 km north, serves as the nearest urban centre. The district capital, Ngara, is another 50 km away. Infrastructure in the region is limited, with no major industrial development.

Healthcare services vary across villages, with most having basic dispensaries and three villages having health centres. The main hospital in the area is Rulenge Mission Hospital in Rulenge Village, while pharmacies serve as emergency medical points. Some residents rely on traditional healers for healthcare, especially due to financial constraints.

Educational infrastructure is relatively well developed, with each village having at least one primary school and each ward having a secondary school. High schools and vocational training centres for post-primary education and adult literacy are located in Kabanga, Rulenge, and Bukiriro. A daycare centre is available in Kabanga for younger children.

Waste management in rural areas is poorly structured, with 31% of households lacking a waste disposal pit, leading to random waste dumping. Some burn waste, compost organic material, or use livestock feed, while formal waste collection points are rare. Burial sites are scattered across villages, health centres, and Rulenge Mission Hospital.

A formalized market centre exists only in Murusagamba Village, while trading centres and informal markets operate within local villages. The dominant religion is Christianity, with four or more churches per village, while Islamic worship sites are fewer, with approximately one mosque per village.

The natural environment consists mainly of savanna and grassland vegetation, with some woodland and forested areas. Although agriculture has altered parts of the landscape, the overall visual character remains natural, with croplands and scattered villages blending into the environment. A total of 65 plant species are actively used by the local population for medicinal purposes, firewood, building materials, and livestock fodder.

8. IMPACT ASSESSMENT, MITIGATION AND MONITORING

Key environmental and social impacts were identified based on the nature of the development and the receiving environment, which were then assessed by the ESIA team or specialists. Impacts were assessed, using the impact assessment methodology below. **Impact ratings may change depending on feedback from stakeholders.**

INTERPRETATION OF SIGNIFICANCE		
Significance		**Decision guideline**
Very High (VH)	**Very High + (VH)**	Represents a key factor in decision-making. Adverse impact would be considered a potential fatal flaw unless mitigated to lower significance.
High (H)	**High + (H)**	These beneficial or adverse impacts are considered to be very important considerations and must have an influence on the decision. In the case of adverse impacts, substantial mitigation will be required.
Medium (M)	**Medium + (M)**	These beneficial or adverse impacts may be important but are not likely to be key decision-making factors. In the case of adverse impacts, mitigation will be required.
Low (L)	**Low + (L)**	These beneficial or adverse impacts are unlikely to have a real influence on the decision. In the case of adverse impacts, limited mitigation is likely to be required.
Very Low (VL)	**Very Low + (VL)**	These beneficial or adverse impacts will not have an influence on the decision. In the case of adverse impacts, mitigation is not required.
Insignificant		Inconsequential, not requiring any consideration.

SUMMARY OF POTENTIAL IMPACTS OF THE PROPOSED PROJECT

Aspect	Potential Impact	Discussion	Impact Significance	
			Unmitigated	Mitigated
Biophysical Impacts/Benefits/Risks				
Soil and Land Capability	**Physical loss and contamination of soil resources**	Soil is a valuable resource that supports a variety of ecological functions. Soil is the key to re-establishing post-closure land capability. Soil can be physically disturbed through erosion and compaction. In the case of erosion, the soils will be lost to the area of disturbance. In the case of compaction, the soil's functionality will be compromised. Soil resources can also be polluted which can cause a loss in soil functionality. With the implementation of mitigation measures focussed on soil management, conservation and waste management, the potential impacts can be managed.	**H-**	**L -**
Terrestrial Biodiversity	**Physical and general disturbance of terrestrial biodiversity-Miombo Woodland and Grassland Habitats**	Mining activities and infrastructure have the potential to result in the loss of vegetation, habitat and related ecosystem functionality through physical disturbance. There are also a number of activities/infrastructures that have the potential to disturb fauna and flora directly in all project phases, such as lighting, powerlines, dust, vehicle movement, noise, and vibrations. Floral and Faunal Species of Conservation Concern (SCC) were found within the Miombo Woodland and Grassland habitat units. The loss of habitat which supports these species may be significant on a regional scale, notably far ranging faunal species. However, it must be noted that although the proposed Project area will lead to the loss of **grassland habitat**, including wooded, open, and degraded grasslands, within the proposed Project area, as well as the displacement of faunal species, this habitat type is not restricted to the project site and remains widespread across the region. Mitigation measures for floral species propagation from seeds and, where possible, relocation must be implemented, whilst habitat rehabilitation activities must be implemented to minimise impacts to faunal species within the footprint areas as far as possible. During the operational phase, any remaining Floral SCC within the operational footprint may be threatened by ongoing disturbances. The loss of grassland and miombo woodland habitat may lead to the continued displacement of faunal species that rely on on these areas for shelter and breeding. The significance of the impacts on the Miombo Woodland and Grassland Habitats is highest during	**H -**	**M -**

Aspect	Potential Impact	Discussion	Impact Significance	
			Unmitigated	Mitigated
		the construction phase, high (-) in the unmitigated and mitigated scenario, however with mitigation the overall impact extent can be reduced. During the operational phase, in the unmitigated scenario, the impact on the Miombo Woodland and Grassland Habitats are high (-) and can be reduced to medium (-) during the mitigated phase. With mitigation measures focused on limiting the project's disturbance footprint extent and the implementation of the Biodiversity Management Plan , the potential impacts can be managed. Areas of critical habitat, as identified, must be managed and monitored, and footprint areas must be limited.		
	Physical and general disturbance of terrestrial biodiversity – Surface Water Ecosystems	Mining operations at Kabanga can have significant effects on freshwater ecosystems, including rivers, streams, wetlands, and groundwater resources. These ecosystems are crucial for biodiversity, local communities, and overall environmental health. Large portions of the freshwater habitat will be lost during the construction phase, however it is acknowledged that much of the freshwater ecosystem habitat has already been modified by local community members for agricultural use. The freshwater ecosystem habitat and adjacent dense vegetation provides an ideal habitat for amphibians and small reptiles, whilst the riverine areas associated with the Ruvubu river are utilised by faunal SCC. The freshwater ecosystems provide habitat for numerous indigenous floral species and medicinal species used and grown by the local communities. Overall, loss of the habitat will impact the habitat from a biodiversity perspective during the construction and operational phases. During the operational phase, impacts will significantly impact freshwater systems and habitats, such as chemical and heavy contaminants, siltation and erosion, changes in water flow, habitat use and habitat destruction. In the unmitigated scenario, the impact during the operational phase will be high. The implementation of mitigation measures such as water quality protection, sustainable water use, habitat protection and biodiversity conservation and monitoring will reduce the significance of the impact to medium.	**H -**	**M -**
	Physical and general disturbance of terrestrial biodiversity – Transformed Habitat	Transformed areas include existing and historic mining infrastructure and areas where vegetation has been cleared. The Transformed Habitat is classified as “modified habitat” according to the IFC categories. Impacts associated with the Transformed Habitat are considered low without mitigation measures and very low with mitigation measures, where existing transformed areas such as roads and agricultural fields can be used for infrastructure. Edge effects from operational infrastructure and containment of the footprint area must be managed and monitored during the operational activities. During the operational phase, the significance of the impact on the transformed habitat will be very low in both the mitigated and unmitigated scenarios.	**L-**	**VL-**
Aquatic Biodiversity	**Direct and indirect loss of aquatic biodiversity and freshwater Ecoservices**	There are a number of activities and facilities that have the potential to directly impact aquatic habitats and associated ecosystem services provided by the wetlands in the proposed Project area. The development of the proposed Project will result in the loss of valley-bottom wetland units that have been highly modified for rice cultivation but still provide important hydrological and socio-ecological functions. Although these wetlands no longer support natural vegetation nor sensitive species due to widespread agricultural transformation, they retain ecosystem services such as water resource provision, flow regulation, sediment retention, and nutrient cycling. The most significant freshwater-related impact is the physical loss of these cultivated wetlands, particularly in areas designated for waste rock dumps, pollution control dams and tailings storage facility, which will result in the direct loss of wetlands and their associated functions. In addition, increased stormwater runoff from disturbed soils can lead to increased sediment transport to the wetland units located down gradient to the impact area. The wetland units that would be directly impacted are isolated headwater tributary and source zones and therefore, impacting features can be readily isolated and managed. The direct loss of wetland habitat and the resulting loss of ecoservices provision pertaining to the TSF and the WRDs that are proposed for within the valleys that include wetland areas tends to be at the local level, which reduces the overall significance. The displacement of the livelihoods of the people that currently rely on the ecoservices that are provisioned by these wetland areas will need to be considered. The establishment of roads and other infrastructure will result in edge effects along the periphery of wetland habitat, which will result in perpetual disturbance impacts and the potential displacement of sensitive fauna.	**H -**	**M -**

Aspect	Potential Impact	Discussion	Impact Significance	
			Unmitigated	Mitigated
	Loss of aquatic and wetland biodiversity due to abstraction of water and contamination	There are a number of activities and facilities that have the potential to directly impact aquatic habitats and aquatic biota through sedimentation and abstraction of surface water resources, particularly in an unmitigated scenario. The abstraction of make-up water from the Ruvubu River will result in loss of habitat and will displace aquatic biota and potentially limit interactions with seasonal floodplains. The loss of habitat could result in the loss of fish abundance from the river reach as many of the fish species breed within floodplain habitat. The loss of abundance of fish will result in the lowering of the ecoservice provision of the river. The abundance of water resource within the catchment area and the associated floodplain habitat features that are associated with the watercourse makes for a relatively minor impact rating.	**M -**	**M -**
	Loss of aquatic and wetland biodiversity due to water contamination	Potential impacts to water quality that results from unmitigated runoff from contaminated surfaces, discharges from the PCDs (pollution control dams) and discharges from the TSF (Tailings Storage Facility) would displace sensitive aquatic species. The runoff from WRDs will be captured by PCDs and will be returned to the mining operations to be used as processing water rather than being discharged to the environment. The general stormwater runoff will be managed through an engineered stormwater management plan to ensure that only uncontaminated water is discharged to the environment. Water quality management throughout the mining area can be effectively managed to reduce the potential for the risk to occur as well as to reduce the significance of the risk should it occur. The overall unmitigated impacts to water quality are perceived to be moderate, but the implementation of the abovementioned mitigation strategies significantly reduces both the risk and the likelihood of this from occurring, resulting in a moderate impact significance.	**H -**	**M -**
Surface Water Resource	**Contamination of surface water resources affecting human health, crop yields and livestock**	Mining infrastructure presents numerous sources of pollution that can contaminate surface water resources, particularly in the unmitigated scenario. At elevated concentrations, contaminants can exceed the relevant surface water quality limits and harm humans and livestock. To assess potential water quality impacts associated with the proposed Project, surface water quality impact predictions were undertaken. Key watercourses of interest include the Ruvubu River, Muruhamba River, Nyamwongo River, and Mugasenyi River. The proposed Project design incorporates significant pollution control infrastructure, including lined TSF, a seepage collection system, High-Density Sludge (HDS) and Reverse Osmosis (RO) treatment plants. Under these design scenarios, predicted downstream water quality is similar to upstream baseline conditions, with only minor variation in sulphate concentrations during low flow periods (1 mg/l vs. background of 0.9 mg/l). All measured parameters remain well within WHO (2022) Drinking Water Guidelines. The only observed increase was downstream in the Ruvubu River, where manganese levels reached 0.1 mg/l, exceeding the WHO guideline limit of 0.08 mg/l. With additional mitigation measures focused on the relocation of villages within the proposed Project area and the establishment of stormwater management infrastructure, and treatment facilities that prevents dirty water from leaving the mine site, the potential impact can be managed.	**M -**	**VL -**
	Alteration of natural drainage patterns resulting in loss of water to the downstream catchment	Mining activities and facilities significantly influence drainage patterns, affecting the volume of runoff into downstream catchments and leading to potential water supply impacts for both human and biodiversity users. The proposed project is expected to alter natural drainage patterns, mainly due to drainage line interception, groundwater pumping and discharges from mine infrastructure. While stormwater management systems will separate clean and contact water, returning clean water to the environment and treating contact water in PCDs, the interception of the drainage area resulting from development of the mine, the process plant site and the TSF location on a tributary of the Nyamwongo River may disrupt surface water flows and reduce downstream flow. During construction, streamflow reduction due to intercepted watershed areas is predicted to be approximately 7% in the Nyamwongo River immediately upstream of the confluence with the Muruhamba River. Changes in streamflow in the reaches downstream of the confluence of the Nyamwongo and Muruhamba Rivers are predicted to be less than 3%, reducing to less than 2% in the Muruhamba River at the confluence with the Ruvubu River and much less than 1% in the Ruvubu River downstream of the Muruhamba River. The Muruhamba River, downstream of the confluence with the Mgasenyi River and continuing along the Ruvubu River, comprises the international boundary with Burundi near the project Area.	**M -**	**L -**

Aspect	Potential Impact	Discussion	Impact Significance	
			Unmitigated	Mitigated
		During the operational phase, the streamflow reductions due to the combined effects of drainage area interception and groundwater pumping are predicted to be approximately 10% in the Nyamwongo River and between 2.5% and 3.5% in the Muruhamba River. During the post-closure phase, drainage area interception and groundwater pumping, the predicted streamflow reductions in the Nyamwongo River downstream of the TSF and the Muruhamba River downstream of the confluence with the Nyamwongo River are approximately 10.4% and 6 %, respectively. Streamflow reductions on the Muruhamba River downstream of the confluence with the Muruhamba River are predicted to be less than 4.5% and less than 0.1%, respectively. Discharges from infrastructure will reintroduce some water to the river system, but not enough to offset natural flow losses. Additionally, mine dewatering is likely to cause localised groundwater drawdown, potentially reducing surface water flow in smaller tributaries reliant on baseflow.		
	Abstraction of water from the Ruvubu river influencing river flow	The abstraction of water from a river for mining activities can alter the natural flow regime of the river. When large volumes of water are withdrawn, the river's water levels can decrease, affecting downstream availability for both aquatic ecosystems and local communities that rely on the river for drinking water, agriculture, and fishing. The groundwater ingress into the underground workings together with the runoff volumes is sufficient to supply the Kabanga Project water requirements. The supply from the Ruvubu River is required only intermittently to make up the shortfalls in the supply. An abstraction from the Ruvubu River of 7 000 m^3/d is a small fraction (0.2%) of the average dry weather flow of 5.25 million m^3/d (60.8 m^3/s).	**L -**	**Insignificant -**
Hydrogeology	**Lowering of Groundwater Levels that can Influence Availability for Third-Party Supply**	Groundwater drawdown simulations indicate that water levels in the upper aquifer will decline during the life of the mine as a result of continuous dewatering. This drop, forming what is known as a "cone of depression," will mostly spread in a northeast to southwest direction, following the natural structure of the rock. Several springs and seeps along the slopes of the ridge, currently used by local communities, are expected to dry up, particularly those on the northwestern slope. After mining ends, groundwater levels are predicted to recover gradually. Although these changes would typically affect local water supplies, the impacted communities within the Project Area are expected to be relocated. As such, no direct impact on human water use is anticipated.	**L-**	**VL -**
	Contamination of Groundwater that Could Influence Availability for Third-Party Supply	There are a number of sources in all mine phases that have the potential to pollute groundwater and impact surrounding groundwater users. The main sources of groundwater contamination associated with the proposed project are the Tailings Storage Facility and the Waste Rock Dumps, particularly given that they are acid generating. With the implementation of mitigation measures focussed on lining the tailings storage facility and waste rock dump and controlled water treatment the potential impact can be mitigated and controlled to be localised within the proposed Project area.	**H –**	**L -**
Air Quality	**Increase in Ambient Particulates Affecting Human Health**	The project activities present emission sources that can have a negative impact on ambient air quality and surrounding land uses. One of these emission sources is dust fallout, which has the potential to be a nuisance factor to sensitive air quality receptors. Dust fallout represents the coarse fraction >10 mm of total suspended particles that third parties can visually see. PM has the potential to contribute to health concerns as particulate matter with an aerodynamic diameter of less than 10 mm (PM10) and an aerodynamic diameter of less than 2.5 mm (PM2.5) is the finer inhalable fraction. Modelling results show exceedances of dust fallout, PM10 and PM2.5 within the proposed Project area and areas outside of the proposed Project area. In the mitigated scenario, all villages within the project area will be relocated. In terms of sensitive receptors outside of the proposed Project area, the impacts can be reduced to medium with the implementation of mitigation measures focussed on the preparation and implementation of an air quality management plan.	**H -**	**M -**
Climate Change	**Changing Climate on the Project - Risks**	Climate change presents both risks and opportunities for the proposed project, affecting its operations, infrastructure, workforce, and market dynamics. The physical risks of climate change include wildfires, flooding, landslides, extreme heat, and water scarcity, all of which can disrupt operations, damage infrastructure, and pose health and safety risks to workers. Wildfires are becoming more frequent and severe due to rising temperatures, potentially threatening mine infrastructure and personnel. Flooding, driven by	**H/M -**	**L/VL -**

Aspect	Potential Impact	Discussion	Impact Significance	
			Unmitigated	Mitigated
		increased precipitation, could damage critical infrastructure such as the North and Tembo Boxcuts and the Concentrator Plant, leading to costly repairs and operational disruptions. Similarly, landslides may occur due to altered rainfall patterns, destabilizing slopes and increasing risks to infrastructure. Extreme heat poses a health risk to workers, affecting productivity and well-being, while water scarcity could impact essential mining processes, requiring efficient water management strategies to maintain operations. Beyond physical impacts, transitional risks arise from the shift towards a low-carbon economy, which places increased pressure on mining companies to demonstrate sustainable practices. Companies failing to meet evolving environmental standards and stakeholder expectations may face reputational damage, affecting investor confidence, customer demand, and regulatory scrutiny. With mitigation measures in place to respond to wildfires, enhanced design and response measures, alternative water sources and energy efficiency measurements, the potential risks can be managed.		
	Changing Climate on the Project - Benefit	The transition to a low-carbon economy also presents opportunities for the proposed Project. With the rising demand for nickel in renewable energy and battery technologies, the project is well-positioned to capitalize on global market trends. Nickel plays a crucial role in the production of lithium-ion batteries for electric vehicles and energy storage, as well as in the manufacture of wind turbines. By adopting sustainable mining practices and efficiency improvements, the project can enhance its market position and attract environmentally conscious investors and buyers.	**M +**	**VH +**
	Changing Climate on Project Affected Communities	Climate change poses significant risks to communities within and surrounding the proposed Project area, particularly in terms of flooding and water scarcity. Increased precipitation and extreme rainfall events could overwhelm stormwater infrastructure, leading to flooding in low-lying downstream areas. This may result in damage to homes, and agricultural land, while also increasing the risk of water contamination from mining infrastructure such as tailings storage facilities and pollution control dams. Many project-affected households rely on floodplains for agriculture and have limited alternative water sources, making them highly vulnerable to flood-related crop losses. While the project's stormwater infrastructure is designed to handle extreme weather, climate change may intensify these events beyond historical patterns. Water scarcity is another major concern, with prolonged droughts and declining streamflow's expected in local rivers such as the Nyamwongo and Muruhamba Rivers. Reduced rainfall and increased evaporation could impact water availability for drinking, irrigation, and household use, affecting the livelihoods of subsistence farmers who depend on these rivers for their crops. Additionally, groundwater pumping and water retention for mining operations could further reduce streamflow and soil moisture, worsening drought conditions for downstream communities. Households that depend on valley-bottom farming may experience lower crop yields or complete crop failure, threatening food security and income stability. Without mitigation, these risks could have long-term consequences for local communities, particularly those relying on agriculture and natural water sources. However, with climate-responsive infrastructure planning, improved water management strategies, and community adaptation measures, these impacts can be reduced. Implementing sustainable water use policies, early warning systems, and flood prevention strategies will be essential to protect both the local population and the natural environment. Further to this with the relocation of villages from within the project area, this risk further reduces.	**H -**	**L -**
	Projects impact on Greenhouse Gases	The proposed Project will contribute to greenhouse gas emissions through activities such as fuel combustion in vehicles, electricity consumption, and land clearing. Over its 30-year lifespan, total emissions are estimated at 1,592,709 tCO_2e, with an average of 66,363 tCO_2e per year. The primary sources of emissions include mobile combustion (80.2%), purchased electricity (19.5%), and stationary combustion (0.2%). Additional emissions result from land-use changes, particularly the clearance of 803 hectares of vegetation in the construction phase. Despite these emissions, the project's overall contribution to Tanzania's national GHG inventory remains relatively low. It is estimated to account for 0.022% of national emissions in a business-as-usual scenario, increasing slightly to 0.072% under a high-ambition	**M/L -**	**L -**

Aspect	Potential Impact	Discussion	Impact Significance	
			Unmitigated	Mitigated
		reduction scenario. According to the European Bank for Reconstruction and Development classification, the project's GHG emissions fall within the medium-low significance range (between 20,000 and 100,000 tCO_2e annually). While the project will add to Tanzania's total emissions, its impact is not considered highly significant in the broader context of national climate commitments. However, there is an opportunity to reduce emissions by integrating energy-efficient technologies, optimizing fuel use, and exploring renewable energy and hydroelectric power sources. Implementing low-carbon strategies will help align the project with global sustainability goals and minimise its long-term climate impact.		
Noise	**Disturbing Noise Levels Affecting Potential Sensitive Noise Receptors**	Mining activities and infrastructure can raise ambient noise levels, affecting nearby areas. The proposed Project will result in an increase in noise levels, particularly within the proposed Project area as well as some areas outside of the proposed Project area. The most affected receptors are located outside of the proposed Project area, near the southern access road as they will experience a moderate noise impact due to the main access road and site traffic. Other noise-sensitive receptors are expected to experience negligible noise increases. Traffic will primarily affect daytime noise levels, with little to no impact during nighttime.	**M-**	**L -**
Cultural Heritage Impacts/Benefits				
Cultural Heritage Impacts	**Direct Loss or Disturbance of Tangible Cultural Heritage and Palaeotropical Resources**	Several activities associated with the construction and operational phases of the Kabanga Nickel Project have the potential to damage or disturb tangible cultural heritage resources. The archaeological survey identified a variety of heritage sites, including those from the Middle and Later Stone Age, Iron Age, and historical periods. Furthermore, a substantial number of graves—364 documented graves —have been identified within the project area. These are highly sensitive cultural resources, with additional undocumented graves potentially present within the broader development zone. Although the remaining monuments and/or memorial grounds are located outside the planned project development area, the heritage significance of the chiefdom of the Wahangaza and Wasubi people cannot be exaggerated. As long as some community members are expected to be relocated, the memorial buildings/grounds offer a window into Ngara's past and underscore the importance of preserving its cultural heritage. Lack of conservation measures, uncontrolled maintenance and changes to the buildings/grounds can change their unique heritage fabric. Mitigation measures will focus on the implementation of cultural heritage management plan and the implementation of the chance find procedure.	**M-**	**L -**
	Indirect Loss of Intangible Cultural Heritage Resources	Intangible cultural heritage encompasses elements such as sacred groves, rocks, lakes, waterfalls, and cultural practices tied to traditional lifestyles. Intangible cultural heritage in the Kabanga area includes ritual sites, oral traditions, spiritual beliefs, and the traditional practices of communities such as the Batwa, Basubi, and Wahangaza. These communities attach cultural meaning to sites such as shrines, sacred trees and plants, and clay quarry areas. The Batwa, in particular, are reliant on access to the clay-rich areas for artisanal pottery, a livelihood activity rooted in long-standing cultural practices and trade networks that extend across the Tanzanian –Burundian border. Mitigation measures will focus on the implementation of a cultural heritage management plan.	**L -**	**VL -**
	Benefit: Indirect Benefits of Socio-economic Upliftment Affecting Cultural Heritage	The Project positively impacts the socio-economic development of local community members by creating jobs and supporting community-focused initiatives. This increase in employment and income levels improves living standards and strengthens community bonds, allowing individuals to invest more in cultural activities and take pride in their heritage. As job prospects improve in the proposed Project area, and responsible community engagement is demonstrated, residents develop greater trust in the Project and a deeper connection to their cultural heritage. The economic stability and resources gained from employment enable the community to actively participate in managing and preserving their cultural heritage, fostering a stronger sense of place and identity. Mitigation measures will focus on the implementation of a cultural heritage management plan.	**M +**	**M +**
Socio-Economic Impacts/Benefits				

Aspect	Potential Impact	Discussion	Impact Significance	
			Unmitigated	Mitigated
Blasting and Vibration	**Blasting Impacts Affecting sensitive receptors and third party infrastructure**	Blasting activities have the potential to impact on people, animals and infrastructure located in the vicinity of the operation. Blast hazards include ground vibration, airblast, fly rock, blast fumes and dust. Ground vibrations travel directly through the ground and have the potential to cause damage to surrounding structures. Airblasts result from the pressure released during the blast resulting in an air pressure pulse (wave), which travels away from the source and has the potential to damage surrounding structures. Fly rock is the release of pieces of rock over a distance and can be harmful to people and animals and damage structures and property. Ground vibrations and airblasts have the potential to cause nuisance to people and animals even if blasts occur within legal limits. With mitigation measures in place, such as an appropriate blast design, the potential impacts can be managed. It should be further noted that surface blasting activities will be limited given the underground nature of the operation. Further to this, villages within the project area will be relocated and will therefore not be within any blast zones.	**M-**	**L-**
Visual	**Generation of Negative Visual Views Affecting Sense of Place**	Mining related activities and infrastructure have the potential to alter the visual environment and aesthetics of an area. Visual impacts on the receiving environment may be caused by activities and infrastructure associated with the mining activities, as well as night-time illumination at these sites. Visual/aesthetic value is the emotional response derived from the experience of the environment with its natural attributes. Given that the proposed Project site is characterised by village related activities, the presence of mining and tall infrastructure will generate negative visual views. While villages within the project area will be relocated, the mining infrastructure will be present for villages members residing in Mumuhamba, Bukiriro, Kihinga, Nyabihanga, Nyarulama, Rwinyana, Mukubu, Yagaba, Bugarama, Muganza, Rujungu and Mashiga. With the implementation of mitigation measures, focused on minimising vegetation clearance, limiting nighttime lighting and painting buildings natural colours, the mitigation measures can be managed but can only be reduced until closure when mining infrastructure is removed.	**H/M -**	**M – (L- at closure)**
Social	**Socio-economic benefits**	The proposed mining project is expected to generate significant economic benefits at national, regional, and local levels through capital investment, employment creation, and increased local spending. **Capital Investment Contribution to the Economy:** During the construction phase, the Ngara District and Kagera Region will still benefit from local procurement of services such as security, transport, cleaning, and hospitality. In the operational phase, the mine's ongoing expenditures for administration, infrastructure maintenance, salaries, and logistics will further contribute to the economy. Additionally, the mine will pay royalties and taxes, including 0.3% of its revenue to the Ngara District Council, as per Tanzania's Local Government Finance Act (2019). Although many specialised services will still be sourced externally, the economic growth generated through wages, infrastructure spending, and social development initiatives will benefit local communities. Given the 30-year operational lifespan, the economic impact will be long-term and highly significant at both the national and regional levels. **Employment Creation:** The construction and operational phases employment opportunities will be created, and additional indirect and induced employment opportunities in support industries such as retail, transport, and food services. Due to limited local educational attainment, most skilled workers will be hired from outside the region. However, the project presents an opportunity for skills transfer and training, allowing local workers to upskill over time. Employment will be long-term, positively impacting local livelihoods. With structured training and recruitment policies, the mine can increase its local hiring capacity, further maximising the economic benefits. **Increased Local Spending:** The presence of the mine and its workforce will drive local economic growth, increasing demand for goods and services. Many businesses and service providers may emerge or expand in response to the rising purchasing power of employees. The local agriculture sector has already seen increased demand for produce, highlighting the positive ripple effects of the project. Over time,	**M +**	**H +**

Aspect	Potential Impact	Discussion	Impact Significance	
			Unmitigated	Mitigated
		the commercial landscape of communities near the site is expected to grow, fostering new business opportunities and local enterprise development. With mitigation measures such as skills development programs and local business support, the economic benefits can be further amplified, ensuring sustainable growth beyond the project's lifespan. Given its long-term impact, local spending is expected to contribute significantly to regional economic development.		
	Social-economic impacts – Temporary economic Displacement Pipeline	The construction of the Ruvubu water pipeline may result in temporary economic displacement for local communities, particularly those engaged in agriculture along its proposed route. During construction, land clearance, topsoil removal, and earthworks will temporarily disrupt farming activities, leading to potential income loss and reduced food security for affected households. While the displacement will be short-term, any damage to crops may foster negative sentiment toward the project. Once construction is completed, farmers will be able to resume their activities, although certain restrictions may be imposed to protect the pipeline's integrity and facilitate maintenance. These could include prohibitions on deep-rooted crops, trees, and permanent structures within the pipeline corridor. With proper mitigation measures, such as compensation for lost crops, alternative land access, and clear communication with affected communities, the severity of displacement can be significantly reduced. Without mitigation, the impact is medium in significance, but with mitigation, it is very low. Ensuring timely restoration of agricultural land and engagement with local farmers will be key to minimizing economic hardship and maintaining positive community relations.	**M-**	**VL-**
	Socio-economic – Loss and Sterilization of Mineral Resources	Mining operations inherently result in the loss and sterilisation of mineral resources, particularly when waste rock and tailings are disposed of in Waste Rock Dumps and Tailings Storage Facilities. These storage areas may contain low-grade or uneconomical mineralised rock, which, under current market conditions or technological limitations, is not feasible to extract. However, as mining technologies improve or market demand changes, these minerals could become valuable, but their storage in engineered waste facilities makes recovery extremely difficult and costly. However, better mine planning, waste sorting strategies, and optimised designs can help minimise resource loss. By incorporating more efficient mineralised rock recovery techniques and strategic disposal planning, the probability of sterilisation can be significantly reduced, lowering the long-term economic impact.	**VH-**	**L-**
	Health and wellbeing impacts	Large-scale mining projects bring economic benefits, such as job creation and infrastructure development, but also pose social and health risks to surrounding communities. The influx of migrant workers increased disposable income, and shifting social dynamics can lead to challenges such as disease transmission, gender-based violence, community conflict, and safety hazards. Without effective management strategies, these impacts could lead to long-term negative consequences for both the project and local communities. However, proactive mitigation measures such as health programs, community health and safety plan, emergency response plan, security measures, and community engagement can help manage these risks and ensure positive long-term outcomes for all communities. **Increased Spread of Disease:** The influx of workers and jobseekers due to the mining project increases the risk of spreading diseases such as HIV/AIDS and sexually transmitted infections (STIs). Migrant workers, including construction workers and truck drivers, often engage in activities that contribute to disease transmission. Although workers from outside the district will be accommodated onsite, interactions with local communities are inevitable. The region already has a higher-than-average HIV prevalence, and stakeholders have expressed concerns about the potential rise in infections. The risk persists into the operational phase, as long-distance truck drivers and transient workers continue to facilitate disease transmission. With mitigation measures focused on awareness programs and a Community Health Management Plan, this impact can be reduced. **Increased Incidence of Anti-Social Behaviour:**	**M-**	**L-**

Aspect	Potential Impact	Discussion	Impact Significance	
			Unmitigated	Mitigated
		With increased employment and higher disposable incomes, the mining project may contribute to a rise in alcohol and drug abuse, prostitution, and public disorder. Gender-based violence and family breakdowns have been linked to increased wealth in male-dominated workforces. While most construction workers will be housed onsite, some level of interaction with local communities will inevitably lead to social challenges. This risk is particularly pronounced after salary payments, when substance abuse tends to increase. With the implementation of mitigation measures focussed on community engagement and strict enforcement of behavioural policies this impact can be reduced. **Increased Community Tension and Conflict:** The arrival of jobseekers and construction workers from outside the area may lead to tensions between locals and newcomers. Perceptions that jobs are being given to outsiders instead of local residents can create resentment and conflict. Additionally, increased demand for housing, water, and electricity may put pressure on existing resources, leading to competition and dissatisfaction among residents. During the operational phase, these tensions may persist due to concerns over Corporate Social Responsibility (CSR) spending, perceptions of unequal benefit distribution, and frustration over changes to local social dynamics. Transparent hiring practices, stakeholder engagement, and community benefit programs can help reduce conflict and maintain positive relationships between the project and the community. **Increased Incidence of Gender-Based Violence and Harassment (GBVH):** Mining projects, particularly those involving a predominantly male workforce, can lead to an increase in gender-based violence and harassment (GBVH) in local communities. Economic shifts linked to the project have already been linked to rising GBVH cases, including domestic violence, sexual exploitation, and transactional sex. The presence of migrant workers and increased disposable income may worsen these trends, especially for women and teenage girls who are more vulnerable to coercion and unintended pregnancies. The patriarchal cultural norms in the area also contribute to women's economic dependency and financial control by male family members. Without intervention, GBVH will likely continue throughout the operational phase, particularly in periods following salary payments. The implementation of a GBVH Management Plan, education programs, and strict enforcement of workplace policies can help reduce this impact.		
	Hazardous Excavations and Infrastructure Risks	The presence of, waste rock dumps, tailings storage facilities, and deep excavations poses a safety risk to both community members and animals. These hazards persist throughout the operational, decommissioning, and closure phases. Without proper security measures and restricted access, there is a risk of injury or fatalities. The indirect consequences extend beyond the mine site, affecting local communities where victims may reside. Fencing, warning signs, access control, and secure rehabilitation of mining areas can significantly reduce this risk. While the unmitigated impact is high, implementing strict safety measures can reduce it to low significance.	**H-**	**L-**
	Quality of the living environment benefit – Improved Access to Services and CSR spend	Corporate Social Responsibility (CSR) initiatives play a crucial role in enhancing access to essential services in communities surrounding mining projects. By investing in infrastructure, healthcare, and education, CSR spending can lead to long-term socio-economic benefits, supporting community development and improving quality of life. However, poor management, unrealistic expectations, and misallocation of funds can limit the effectiveness of these programs. Proper implementation and community engagement are essential to ensure that CSR initiatives provide sustainable and equitable benefits. TNCL is legally obligated to implement CSR programs in the communities surrounding the proposed Project site and has formalized this commitment through a Memorandum of Understanding with the Ngara District Council. If managed effectively, these programs can provide enhanced educational opportunities, skills development, and improved access to clean water and healthcare.	**L+**	**H+**
	Quality of the living environment Impact –	The influx of migrant workers and job seekers particularly during the construction phase of the mining project is likely to contribute to an increase in criminal activity within the surrounding communities. Reports from stakeholders indicate that theft and targeted	**M-**	**L-**

Aspect	Potential Impact	Discussion	Impact Significance	
			Unmitigated	Mitigated
	Increased Criminal Activity	crimes, particularly against individuals receiving compensation payments, have already been observed. Alcohol abuse and cash payments to workers may further contribute to antisocial behaviour and gender-based violence. The construction phase is expected to see the highest level of crime, with the situation likely to improve during operations as the workforce stabilises. However, some level of crime may persist throughout the mine's lifecycle. With the implementation of mitigation measures focussed on proactive crime prevention strategies this impact can be reduced.		
	Health Impacts	The development and operation of the Kabanga Mine will have significant health and safety implications for both workers and local communities. Key risks include road safety hazards from the transport of the nickel sulphide concentrate, workplace accidents, emergency response limitations, and the spread of infectious diseases such as HIV/AIDS, tuberculosis (TB), and malaria. Additionally, overcrowding, in-migration, and inadequate access to healthcare services may place further strain on local medical infrastructure. This is discussed in more detail below. **Concentrate Transport Route Health and Safety:** The daily transport of concentrate will require 48 trucks moving along a 340 km route to the refinery. This increases the risk of road traffic accidents, hazardous spills, and the spread of infectious diseases through rest stops where truck drivers may congregate. Local emergency response services along the route are inadequate, raising concerns about how accidents, injuries, and environmental hazards will be handled. **Emergency Preparedness and Response at Kabanga Mine:** A comprehensive Occupational Health and Safety Risk Assessment must be developed to address emergency incidents, underground mining risks, chemical spills, and fire hazards. Currently, local hospitals lack the capacity to treat severe injuries, making efficient emergency transport and crisis response planning essential. **Medical Emergency Response Plan at Kabanga Mine:** The mine clinic lacks critical emergency medical resources, including an Advanced Trauma Life Support trained doctor, paramedic, and onsite blood storage. This creates delays in treating serious injuries, especially as after-hours air evacuation is unavailable. **HIV/AIDS and Sexually Transmitted Infections:** Tanzania has an HIV prevalence rate of 4.4%, with the Kagera Region at 5.7%. Factors such as sex work, migrant labour, and increased disposable income among workers may contribute to higher infection rates. The mine clinic currently offers HIV/AIDS testing but no treatment, requiring referrals to external health facilities. **Malaria Risk:** The mine site is in a high-risk malaria zone, with seasonal peaks in December and January. Mine infrastructure and water pooling from construction and operations could increase mosquito breeding and worsen the problem. **Tuberculosis (TB) and Respiratory Illness:** Tanzania has one of the highest TB rates globally (183 cases per 100,000 people). Miners are at increased risk due to dust exposure and prolonged time in confined spaces. The mine clinic lacks a digital X-ray unit, which delays TB detection and treatment. **Increased Pressure on Local Health Facilities:** Health services at Nyamiaga District Hospital and nearby clinics will face increased demand due to job seekers, migrant workers, and their families. These facilities already struggle with limited resources, raising concerns about overcrowding and inadequate care. **Occupational Health and Safety Risk Assessment:** A revised risk assessment is needed to address hazards such as underground mining risks, machinery use, and chemical exposure. A worker-specific Occupational Risk Exposure Profile should be created to track health risks and necessary precautions. **Population In-Migration and Overcrowding:** With workers from outside the district, local housing shortages and sanitation issues may worsen. This can increase disease transmission and put pressure on services.	**H -**	**M/L-**

Aspect	Potential Impact	Discussion	Impact Significance	
			Unmitigated	Mitigated
		Potential for Future Epidemics and Pandemics: Given Tanzania's vulnerability to outbreaks (Ebola, Marburg, cholera, Mpox, COVID-19 variants, etc.), the mine lacks a pandemic preparedness plan. Frequent international trucking and labour migration could spread infectious diseases more quickly. **Site Clinic Expansion and Medical Services:** The current mine clinic can only serve 240 workers, which is insufficient for peak operations. A new clinic is needed with better emergency services, digital X-ray capability, and expanded staff. **Canteen Facilities and Food Safety:** The current canteen is insufficient for 1,200 workers, raising hygiene and food safety concerns. Proper food handler training and sanitation measures are essential. The health and safety risks associated with mining operations, in-migration, disease transmission, and workplace hazards require comprehensive mitigation measures. With mitigation measures focussed on upgrading medical response capabilities (onsite clinics, emergency transport, staff training), developing additional camps, implementing disease prevention programs (malaria control, TB screening, HIV/AIDS education), enhancing worker safety through medical surveillance and occupational health protocols, strengthening local healthcare facilities to manage increased demand and providing proper workforce housing and controlling labour migration.		
Traffic	**Increase in traffic volumes affecting the safety of third parties and animals**	The proposed Project will increase vehicle traffic, in both the construction (peak at 40 trucks per day) and operational phase (peak at 48 trucks per day) of the project. The increase in traffic volumes have the potential to result in pedestrian accidents, vehicle accidents which can be fatal or harmful to people and animals. In addition to this, road deterioration, can result in wear and tear on road surfaces leading to potholes and cracks. The Northern Access Road will be used temporarily until upgrades to the Southern Access Road are complete. With the implementation of mitigation measures focused on road upgrades, intersection improvements, and traffic controls, this impact can be reduced.	**H -**	**M -**
Land Use	**Economic and physical displacement resulting in loss of access to natural resources and disruption of social structures**	Large-scale mining projects often require significant land acquisition, leading to both economic and physical displacement of local communities. While these projects contribute to economic growth, they can also disrupt livelihoods, access to natural resources, and social structures. Displacement can result in loss of agricultural land, restricted access to grazing areas, and reduced availability of essential natural resources such as firewood and medicinal plants. Additionally, relocation may strain host communities, disrupt social networks, and challenge cultural identity. To minimize these negative consequences, it is essential to implement resettlement strategies that promote sustainable livelihoods and provide adequate compensation. **Economic Displacement & Loss of Access to Natural Resources:** The proposed mining project will require approximately 4,179 hectares of land, leading to the economic displacement of 1,326 households. Many affected households rely on this land for subsistence farming, grazing, and the collection of natural resources for daily survival. The loss of access to these resources will disrupt traditional livelihoods, making it difficult for households to sustain their food supply and income. During consultations, community members expressed concerns over the quality of land at the proposed resettlement site, fearing it may not be as fertile as their current land (specific to physically displaced PAPs). The increased distance to alternative agricultural land and grazing areas could further burden those displaced, requiring additional travel time and effort. Vulnerable groups, particularly elderly-headed households and persons with disabilities, are at greater risk due to mobility limitations and reduced ability to adapt to new environments. To address these challenges, a Resettlement Action Plan (RAP) has been developed in accordance with international standards to mitigate the negative effects of displacement. The RAP includes a livelihood restoration plan, ensuring that affected households can rebuild their economic activities. **Physical Displacement & Disruption to Social Structures:**	**H -**	**L -**

Aspect	Potential Impact	Discussion	Impact Significance	
			Unmitigated	Mitigated
		The proposed Project will result in the physical relocation of 349 households, meaning families will need to leave their homes and resettle in a new area. Physical displacement does not only affect housing but also social networks, community cohesion, and cultural identity. If not carefully managed, this displacement could lead to long-term social and psychological distress, along with challenges in accessing education, healthcare, and other essential services. During stakeholder consultations, community members raised concerns over the delay in finalising the resettlement process, which has already impacted livelihoods and created uncertainty. Additionally, host communities may struggle to accommodate the influx of resettled families, leading to increased competition for resources and potential social tensions. However, if the resettlement process is well-managed, displaced households may benefit from improved access to housing, services, and infrastructure, ultimately enhancing their standard of living. Ensuring transparent communication, fair compensation, and sustainable integration into host communities is critical to minimising disruptions and potential conflicts.		

Summary of Management Plans and Monitoring

A summary of the **monitoring programme** which will be developed are tabulated below.

Monitoring programme		
Item	**What is monitored**	**Purpose**
Biomonitoring	The health and diversity of aquatic species, such as insects, fish, and plants found in rivers and streams.	To monitor the long-term impacts of the project on the river ecosystem and detect early signs of pollution.
Surface water monitoring	The quality and quantity of water in rivers and streams near the project, including flow rates and water taken from the Ruvubu River.	To ensure that the project does not pollute rivers or take too much water, affecting downstream users or ecosystems.
Groundwater monitoring	The quality and level (quantity) of underground water sources.	To detect any possible contamination and monitor the depletion of groundwater due to project activities.
Air quality monitoring	Levels of dust (fallout), fine airborne particles (PM_{10}/$PM_{2.5}$), and gases released into the air.	To protect the health of workers and nearby communities and ensure compliance with air quality standards.
Noise monitoring	Levels of noise generated by project activities at different times and locations.	To make sure noise levels stay within acceptable limits and do not disturb local communities or wildlife.

A summary of the **management plans** which will be developed are tabulated below.

Management Plans Developed as part of the ESIA	
Name of plan	**Purpose**
Environmental Preparedness and Response Plan	This plan outlines procedures for effectively responding to environmental emergencies or unplanned incidents that may pose serious risks to workers, subcontractors, local communities, or the environment. It aligns with the requirements of IFC Performance Standard 1 on Emergency Preparedness and Response and aims to prevent, control, and mitigate the impacts of both immediate and delayed environmental hazards through timely and coordinated actions.

Grievance Redress Management Plan	This plan establishes a formal Grievance Redress Mechanism in line with IFC Performance Standard 1, which requires projects to provide a transparent, accessible, and culturally appropriate mechanism for receiving and resolving concerns from Affected Communities related to the project's environmental and social performance. The plan ensures that grievances are addressed promptly, fairly, and effectively, thereby promoting accountability and fostering trust between the project and local communities.
Acid Rock Drainage and Acid Mine Drainage Management Plan	This plan outlines the measures to predict, prevent, and manage Acid Rock Drainage and Acid Mine Drainage associated with the project. In alignment with IFC Performance Standards 3 and 6, it aims to minimise the potential for acid-generating materials to impact soil, surface water, and groundwater quality, and to protect biodiversity and ecosystem services. The plan includes site-specific risk assessments, water quality monitoring, containment strategies, and long-term management commitments.
Biodiversity Management Plan and Action Plan	This plan provides a structured approach to avoid, minimise, and mitigate project-related impacts on biodiversity and natural habitats. Developed in accordance with IFC Performance Standard 6, it aims to ensure the conservation of biodiversity, maintain ecosystem services, and promote the sustainable management of living natural resources. The plan includes mitigation measures, and monitoring to manage risks to species and habitats, particularly those that are critical, threatened, or endemic.
Stakeholder Engagement Management Plan	The overall objective of this SEP is to define a program for stakeholder engagement, including public information disclosure and consultation throughout the entire project cycle. The SEP outlines the ways in which the Tembo Nickel will communicate with stakeholders and includes a mechanism by which people can raise concerns, provide feedback, or make complaints about the project and any activities related to it. The SEP makes specific provisions for the meaningful engagement of vulnerable groups and individuals who may be at risk of being disproportionately affected by project impacts or having reduced access to project benefits.
Cultural Heritage Management Plan	This plan outlines the procedures for identifying, protecting, and managing cultural heritage resources that may be affected by the project. In line with IFC Performance Standard 8, it aims to safeguard both tangible and intangible cultural heritage, including sites, structures, traditions, and practices of significance to local communities. The plan includes measures for consultation with affected communities, chance find procedures, and ongoing monitoring to ensure that cultural heritage is respected and preserved throughout the project lifecycle.
Resource Efficiency Management Plan	The purpose of the Resource Efficiency Plan is to identify major energy and water uses, promote sustainable resource use through recommended efficiency measures, benchmark project performance against sector standards, and outline methods for monitoring resource consumption.
Green House Gas Management Plan	The purpose of the GHG Emissions Management Plan is to identify major sources of project-related greenhouse gas emissions, outline feasible and cost-effective reduction measures, benchmark emissions intensity against sector standards, and establish monitoring methods to track emissions over time.
Traffic Management Plan	This plan outlines measures to manage and mitigate the traffic-related impacts of the project. In alignment with IFC Performance Standard 4, it aims to ensure the safe movement of vehicles, protect local communities and road users, reduce congestion, and minimise risks associated with increased project-related traffic during construction and operations. The plan includes routing strategies, speed control measures, driver training, and community awareness initiatives.
Vulnerable Peoples Management Plan	The plan has been developed to ensure that individuals and groups who may be disproportionately affected by the project receive targeted engagement, support, and protection throughout the Project's lifecycle. The plan aligns with Tanzanian regulatory requirements, international best practices, and lender standards, recognising that certain populations face heightened social, economic, and environmental risks due to their circumstances.
Waste Management Plan	The Waste Management Plan aims to ensure legal compliance and promote best practices. Aligned with the waste management hierarchy endorsed by the UNEP Green Economy Report (2011), the plan prioritises waste prevention, reduction, reuse, and recycling over disposal. It encourages viewing waste as a resource, supports circular economy principles, and contributes to the project's environmental vision and commitment to sustainable waste practices.
Community Health and Safety Management Plan	The Community Health and Safety Management Plan aims to protect and promote the health, safety, and well-being of communities affected by the project. It provides a structured approach to identify and manage health and safety risks, enhance public health through preventive measures and education, ensure emergency preparedness, support vulnerable groups, and foster collaboration with stakeholders. The plan is dynamic and will be updated regularly to respond to evolving community needs and emerging risks.

Human Rights Management Plan	The Human Rights Management Plan has been developed in line with the UN Guiding Principles on Business and Human Rights and in accordance with Equator Principle 4. Based on the ESIA's human rights impact assessment, the plan is integrated into the Project's Environmental and Social Management System and is updated annually to reflect changes in the project context. It defines roles, actions, and procedures to prevent, monitor, and respond to human rights impacts across the project's operations and supply chain.
Chemicals and Hazardous Materials Management Plan	To ensure the safe management of chemicals and hazardous materials used by TNCL, in compliance with IFC Performance Standard 3, Tanzanian legislation, and TNCL's internal environmental commitments. The plan aims to identify hazardous materials onsite, prevent or minimise their release, assess associated risks throughout their lifecycle, promote the use of safer alternatives, and prohibit the use of substances banned or phased out internationally due to their harmful environmental or health impacts.
Management Plans to be developed following the ESIA	
Name of plan	**Purpose**
Air Quality Management Plan	To outline measures for managing and mitigating air emissions associated with project activities, including dust and gaseous pollutants. The plan aims to ensure compliance with national standards and IFC Performance Standard 3, while safeguarding community and worker health.
Project Induced In-migration Management Plan	To manage and mitigate the social, environmental, and health impacts associated with the movement of people into the project area, in line with IFC Performance Standard 1. The plan promotes coordinated stakeholder engagement, land use planning, and service delivery.
Business Continuity Management Plan	To ensure that the project can continue operating during and after unexpected events or disruptions by identifying key risks, establishing recovery strategies, and maintaining critical functions.
Gender Based Violence Management Plan	To prevent, monitor, and respond to incidents of gender based violence related to project activities, in alignment with IFC Performance Standards 2 and 4. The plan promotes awareness, reporting mechanisms, survivor support, and accountability across the workforce and communities.
Employee Health Awareness Plan	To promote health education, disease prevention, and wellness initiatives among employees. The plan supports early detection, improved health outcomes, and alignment with broader community health strategies.
Stormwater Management Plan	To control and manage surface runoff to prevent erosion, flooding, and contamination of nearby water bodies. The plan includes design standards, operational controls, and compliance with national water regulations and IFC Performance Standard 3.
Water Conservation and Demand Management Plan	To promote the sustainable use of water resources by reducing demand, improving efficiency, and reusing water where feasible. The plan aligns with IFC Performance Standard 3 and supports the project's broader resource efficiency goals.
Soil Management Plan	The Soil Management Plan will define procedures for topsoil stockpiling, including optimal locations, erosion and stormwater control measures, stockpile design, and restricted access. The plan will also detail rehabilitation measures for disturbed land, addressing soil replacement, fertilisation, erosion prevention, and restoration of land functionality.

A range of project alternatives was assessed to ensure the most environmentally, socially, and economically sustainable design for the Kabanga Nickel Project:

1. Access Route

Three alternatives were evaluated for transporting nickel concentrate from the mine to the refinery:

- Northern Access Road (via Rulenge and Keza) would require upgrading a 3 km section and passes through populated areas, raising safety and social concerns.
- Kumubuga Road proposed the construction of a new road to avoid congestion and improve safety but would incur high construction and resettlement costs.
- Southern Access Road, an existing 72 km gravel road maintained by TANROADS, was selected due to its directness, lower resettlement needs, and reduced land disturbance.

2. **Water Supply**

Four alternatives were considered to supplement mine water and recycled process water:

- Construction of reservoirs in the Murahamba or Mu-Kinyangona River valleys,
- A pipeline from the Ruvubu River near Rulenge, or
- A hybrid option combining boreholes and a Ruvubu River pipeline. The hybrid option was preferred due to habitat disturbance.

3. **Nickel Concentrate Processing**

Two alternatives were analysed:

- Exporting concentrate to international refineries, which would involve long-haul trucking.
- In-country beneficiation, aligned with Tanzanian law, was selected to maximise local value addition, reduce transport distance, and support national development goals. Concentrate will be processed at the Kahama Refinery.

4. **Aerodrome Location**

Three potential sites were assessed:

- On the ridge near the plant, which posed construction challenges,
- On a plateau near the TSF, which was unsuitable due to geotechnical and security risks, and
- On a plateau adjacent to the accommodation complex, which was selected for its level terrain, safety, and proximity to site services.

5. **Underground Mine Access**

Initial plans proposed three boxcuts and underground declines from the North and Tembo zones. The final design reduces this to two boxcuts—one each at the North and Tembo Mines—to minimise surface disturbance while maintaining access to all ore zones.

6. **Tailings Storage Facility (TSF)**

Eleven potential TSF sites were initially screened. Sites such as Rubona, Muhongo, and Bugarama were excluded due to proximity to sensitive ecosystems and high resettlement impacts. Nyamwongo River Valley was chosen based on environmental safety, geotechnical suitability, and cost-effectiveness. Thickened tailings, a synthetic liner, and a dry cover closure system were selected to manage acid rock drainage risks.

7. **Waste Rock Dumps (WRDs)**

Originally, three WRDs (North, Tembo, and Conveyor) were proposed. This was optimised to two—North and Tembo WRDs—with updated sizing to balance mine waste output and underground backfill requirements, reducing surface footprint.

8. **Haul Roads**

Two options for haul roads from Tembo Boxcut to the ROM pad were considered:

- Option 1 (east of Tembo) was longer but cheaper to construct,
- Option 2 (west of Tembo) was shorter and offered long-term operational cost savings, despite higher capital costs. Option 2 was selected for ore haulage, while Option 1 will serve as a service road.

9. **No-Go Alternative**

This scenario, which entails not developing the project, would avoid environmental and social impacts but would also forfeit significant national and local economic benefits, including employment, infrastructure, and revenue.

9. STAKEHOLDER ENGAGEMENT PLAN (SEP)

INTRODUCTION

TNCL aims to operate transparently and responsibly, ensuring meaningful engagement with affected stakeholders in Tanzania.

KEY STAKEHOLDERS

The following groups are considered to be the key project stakeholders:

- **Affected Parties:** Includes households and / or persons residing on or using the affected land, resettled communities and adjacent communities (to both the proposed mining area and the access roads).
- **Other interested Parties:** Includes national or local government authorities, politicians, religious leaders, NGOs, civil society organisations and groups with special interests, or other businesses, parties with interest in conservation, mining, etc.
- **Disadvantaged/vulnerable individuals or groups:** Include those with an increased likelihood of being adversely affected by the project, as well as those who, due to their circumstances, may be more limited than others in their ability to take advantage of a project's benefits.

ENGAGEMENT METHODS

A variety of engagement methods have / will be used depending on the stakeholder. Some of the proposed methods of engagement are included below:

- Formal written communication (will be translated into Kiswahili);
- One on one meetings;
- Focus Group Discussions (to include vulnerable people and women); and
- Public / community meetings or workshops.

Additional measures will be taken, where required, to ensure meaningful engagement of Vulnerable People and Women.

ONGOING ENGAGEMENT

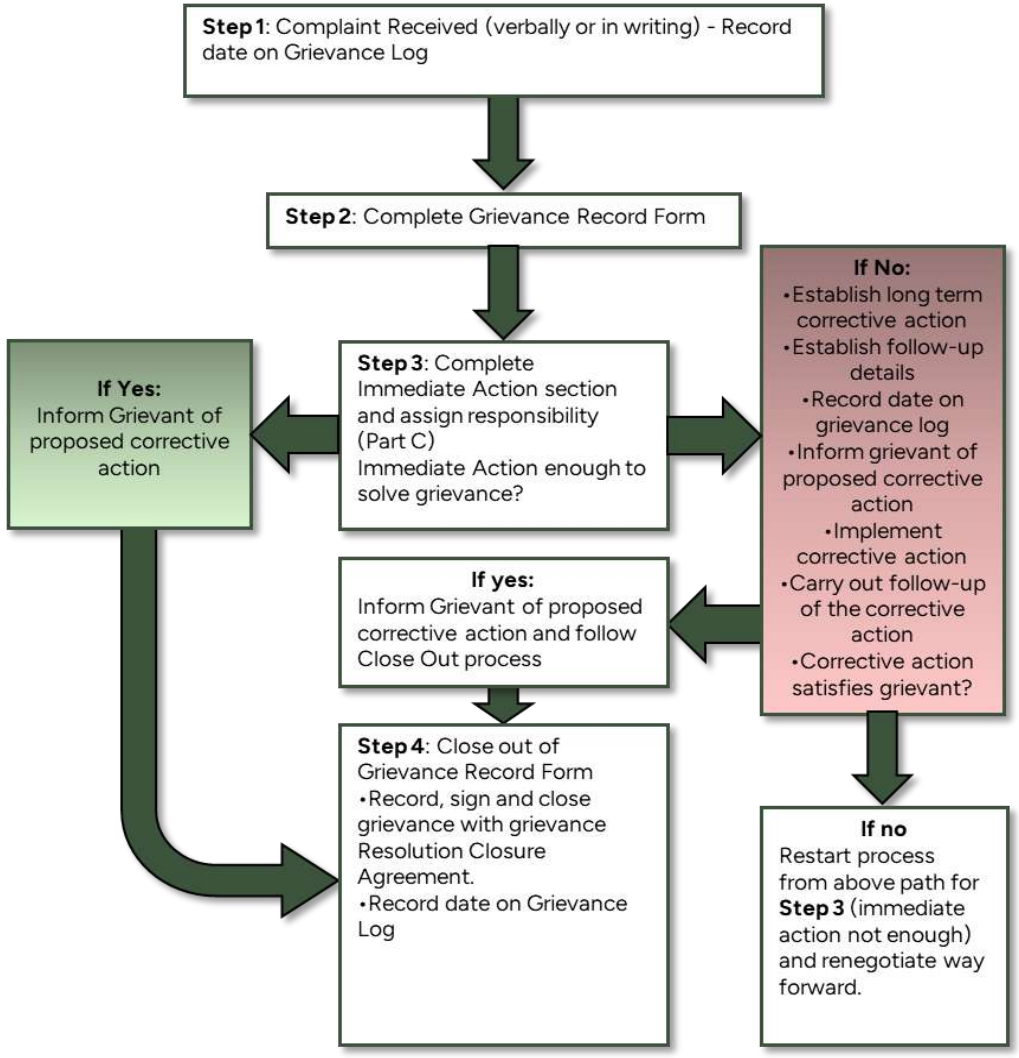
Engagement needs to be ongoing throughout the life of the Project with feedback provided to stakeholders. Feedback mechanisms will include:

- Formal stakeholder engagement reports;
- Community meetings; and / or
- Focus group discussions.

The Grievance Mechanism is described in Section 10, this is the process whereby stakeholders can submit grievances with regard to the Project.

10. GRIEVANCE MECHANISM

The TNCL Grievance Management System aims to prevent dispute escalation, provide early warnings of unresolved complaints, address grievances within the project's influence, involve appropriate authorities, mitigate negative impacts, and promote fair, transparent conflict resolution. Grievances will be monitored through environmental and social audits and TNCL will provide feedback via meetings or newsletters, ensuring all grievances receive a response within 30 days, with regular updates on delayed resolutions.



11. WHAT HAPPENS NEXT

Thank you for your interest in this proposed Project. This Non-Technical Summary (NTS) has been made available to all interested and affected stakeholders to inform you of the findings of the ESIA process for the proposed Kabanga Nickel Mine Project proposed to be developed by TNCL.

You can share your comments and feedback through our designated Comments Page (attached to this NTS) or via electronic platforms via the provided QR code.

Additionally, a voice-over version of the NTS is available in Kiswahili for access via the QR code below.

All comments received will be reviewed and incorporated into the Final ESIA and Environmental and Social Management Plan ESMP. Your feedback will play a crucial role in shaping the ESMP is a vital tool in any mining project for minimizing negative impacts, ensuring compliance with regulations, fostering stakeholder engagement, and promoting sustainability. It protects stakeholders, particularly the environment, local communities, and workers, by setting clear guidelines for managing Project risks and impacts.

Thank you for your Participation!

12. COMMENTS / QUERIES

Please insert your details below and submit to kabanga.se@slrconsulting.com.

Full

Name: _____

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Mobile No.:

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Email Address:

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Street Address/ Town/ Village:

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Comment / Query:

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Comment / Query :

By providing your personal information for this Project you consent to SLR managing your information in accordance with the Protection of Personal Information Act 4 of 2013 and the Personal Data Protection Act 11 of 2022. If you register and supply your contact details as an affected community member for this Project, you will be included in the SLR I&AP database. It is assumed that as an affected community for this Project you authorise SLR to retain and use your Personal Information as part of a contact database for this and/or other ESIA and that you confirm your acceptance for SLR to contact you regarding this and/or other ESIA processes. SLR will not process your Personal Information, other than as permitted or required by s ESIA processes, or as required by law or public policy. SLR will use reasonable, appropriate security safeguards in order to protect Personal Information, and to reasonably prevent any damage to, loss of, or unauthorised access or disclosure of Personal Information, other than as required for ESIA processes or as required by any Law or public policy.