FIELD SURVEY REPORT

TRINITY METALS

FINAL

GroundTruth

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1. INTRODUCTION

GroundTruth were appointed by Trinity Metals to undertake a broad range of ecological, social and engineering studies across their mining concession areas in Rwanda, to contribute towards Phase 1 of Trinity Metals' Legacy Tailings Management and River Rehabilitation Programme.

This report provides an overview of the first field survey undertaken from 29 July – 5 August 2025. It provides information about three components of the Phase 1 studies namely, hydrocensus, floodline determination and sediment and hydrological modelling, that are being undertaken for the four Trinity mines namely, Rutongo, Nyakabingo, Musha and Ntunga. The hydrocensus study will systematically gather data on community water use, water source types, and water-related issues to inform water resource management and identify areas needing supply interventions. The flood line determination study will model flood events and map flood inundation extents for major rivers affected by mining using hydrological data and terrain models, including projections under climate change scenarios, to guide ecological and engineering planning. Finally, the sediment modelling will assess current and future water flows and sediment dynamics in the catchments associated with the Trinity Metals concession areas under changing land use and climate conditions, supporting impact mitigation and sustainable rehabilitation planning.

2. METHODOLOGY

The following section provides an overview of the field-based methodology adopted for each of the three components.

2.1 Hydrocensus

The hydrocensus was conducted through field visits to key water sources in villages within the four mine concession areas. These included springs, dams, village water collection points, and mine-associated infrastructure. At each site, information was gathered through direct observation, informal interviews with community members and site personnel, and review of available records where applicable. Data recorded included water source type, location, infrastructure present, functionality, flow rate (where measurable), primary uses, health concerns, reported reliability/seasonality, and alternative water sources (if available). Observations were also made on water quality indicators such as clarity, odour, and any potential contamination risks as a result of surrounding land use.

Community feedback was used to verify water use practices, identify periods of scarcity, and document alternative sources utilised during outages. Notes were also taken on challenges reported by users, such as distance and access to alternative supplies. Each source was then summarised in a standardised format, highlighting general characteristics, infrastructure condition, water use, observed issues, and recommendations for improved reliability and protection in the deliverable (Hydrocensus Study Reports), due end of August 2025.

2.2 Flood line determination

The flood line extent of the rivers located within the four mining concessions is to be determined using 2D hydrological modelling on the Hydrologic Engineering Centre of the US Army Corps of Engineers - River Analysis Software (HEC-RAS). The modelling requires high-resolution imagery and LiDAR data of each site as well as a field survey of cross-sectional profiles of the watercourses, updated information on the site conditions, and measurements of hydraulic structures, such as bridges and culverts. Cross-section profiles of the rivers within each mining concession were surveyed, as well as the water depth and slope. The flows in the watercourses were also measured. The flow information collected is to be used as measured data to be compared with the modelled results and used to calibrate the hydrological models. All hydraulic infrastructure located within the relevant river systems was also surveyed.

2.3 Sediment modelling

The sediment study focused on the freshwater ecosystem reaches directly adjacent to, and downstream of, the active and proposed mining areas within the four mining concession areas. The aim of the study was to understand the sediment transport capacity of the freshwater ecosystems that are proximal to the active mines and proposed mines under exploration. In understanding the sediment transport capacity, it is possible to determine the likely rate of transport of tailings from the mining areas down the length of these systems. The data collection

process included surveying detailed cross sections of the freshwater ecosystems, collecting suspended and bedload water samples and conducting grain size analyses of deposited material using a variety of methods from random bulk sediment sampling to photographic grain size analysis. This data will be collated and input into a 1D sediment transport HEC-RAS model. A total of nine sites were surveyed in detail across the four concession areas, six of these in Rutongo, one in Musha, one in Ntunga and one in Nyakabingo.

2.4 Site Visit

The field survey for the flood line determination and sediment and hydrological modelling studies was conducted in the active mining areas at the four Trinity Metals mines from 29 July – 5 August 2025. **Table 2-1** below indicates the field survey programme, which was followed for the flood line determination and sediment and hydrological modelling component of the study.

Table 2-1 Field survey programme for the hydrological and sediment modelling

Day	Date	Site
Tuesday	29/07/25	Rutongo Mine
Wednesday	30/07/25	Rutongo Mine
Thursday	31/07/25	Rutongo Mine
Friday	01/08/25	Rutongo Mine
Saturday	02/08/25	Musha and Ntunga Mine
Sunday	03/08/25	Off Day
Monday	04/08/25	Nyakabingo Mine
Tuesday	05/08/25	Rutongo Mine

The Hydrocensus field survey was conducted from 29 July – 2 August 2025. **Table 2-2** below shows the field survey programme which was followed for the Hydrocensus component of the study.

Table 2-2 Field Survey Programme for Hydrocensus

Day	Date	Site
Tuesday	29/07/25	Rutongo Mine
Wednesday	30/07/25	Rutongo Mine
Thursday	31/07/25	Nyakabingo Mine
Friday	01/08/25	Rutongo Mine
Saturday	02/08/25	Musha and Ntunga Mine

3. SITE OVERVEW – MINING CONCESSION AREAS

The following section provides an overview of the sites surveyed within the four Trinity Metals Mining Concession Areas.

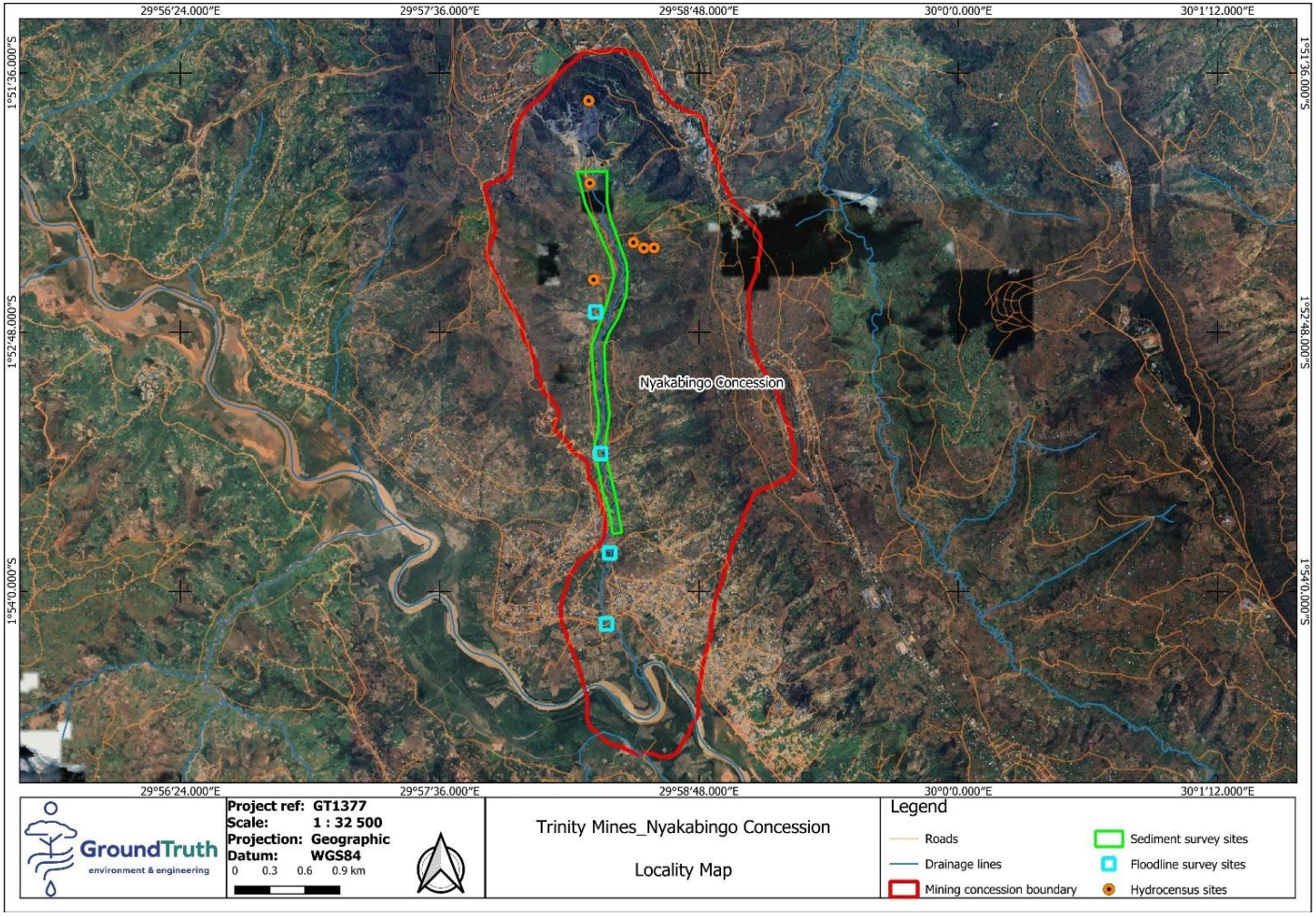

Figure 3-1 Map illustrating the various sites for the field survey within the Nyakabingo Mining Concession

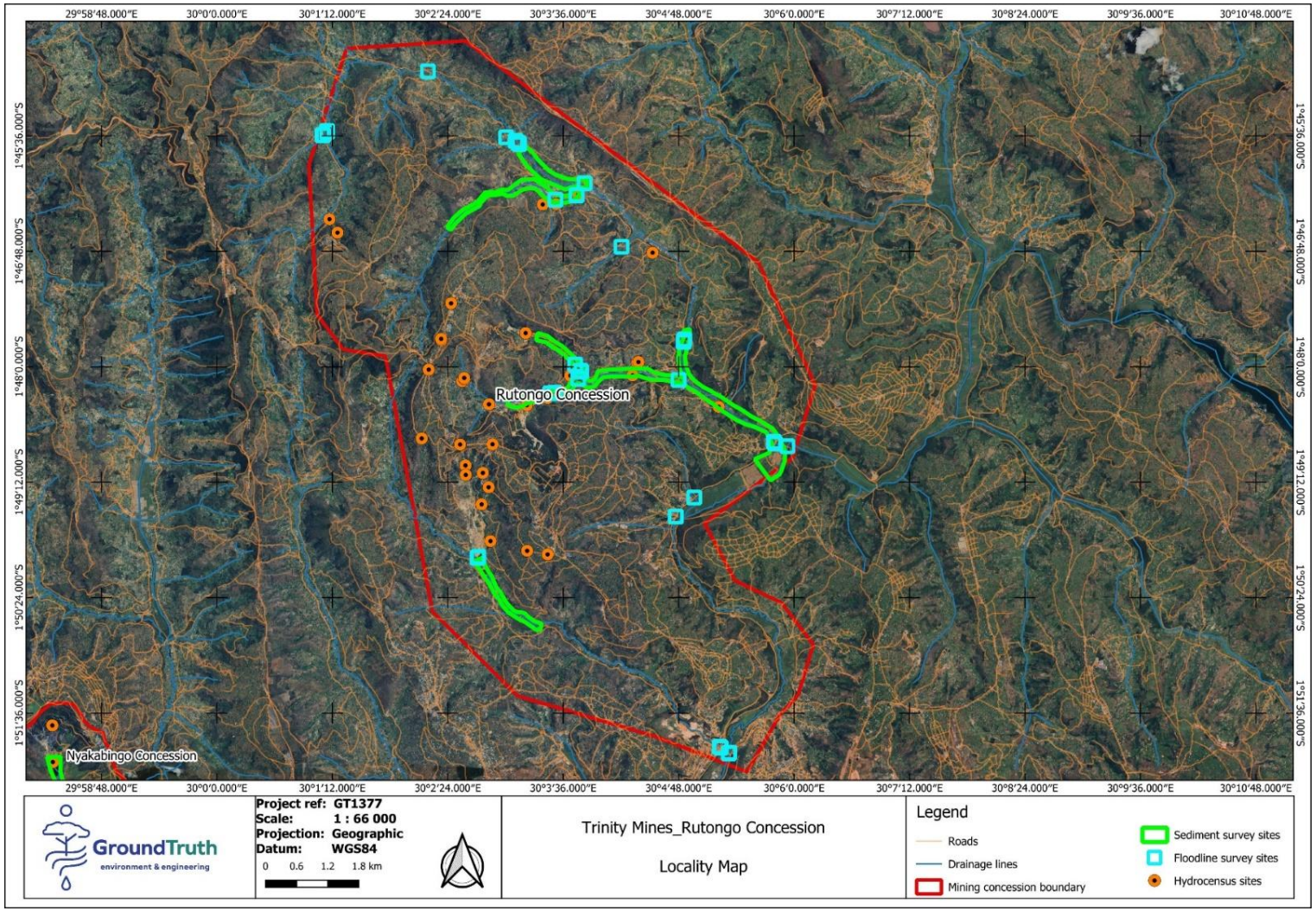

Figure 3-2 Map illustrating the various sites for the field survey within the Rutongo Mining Concession

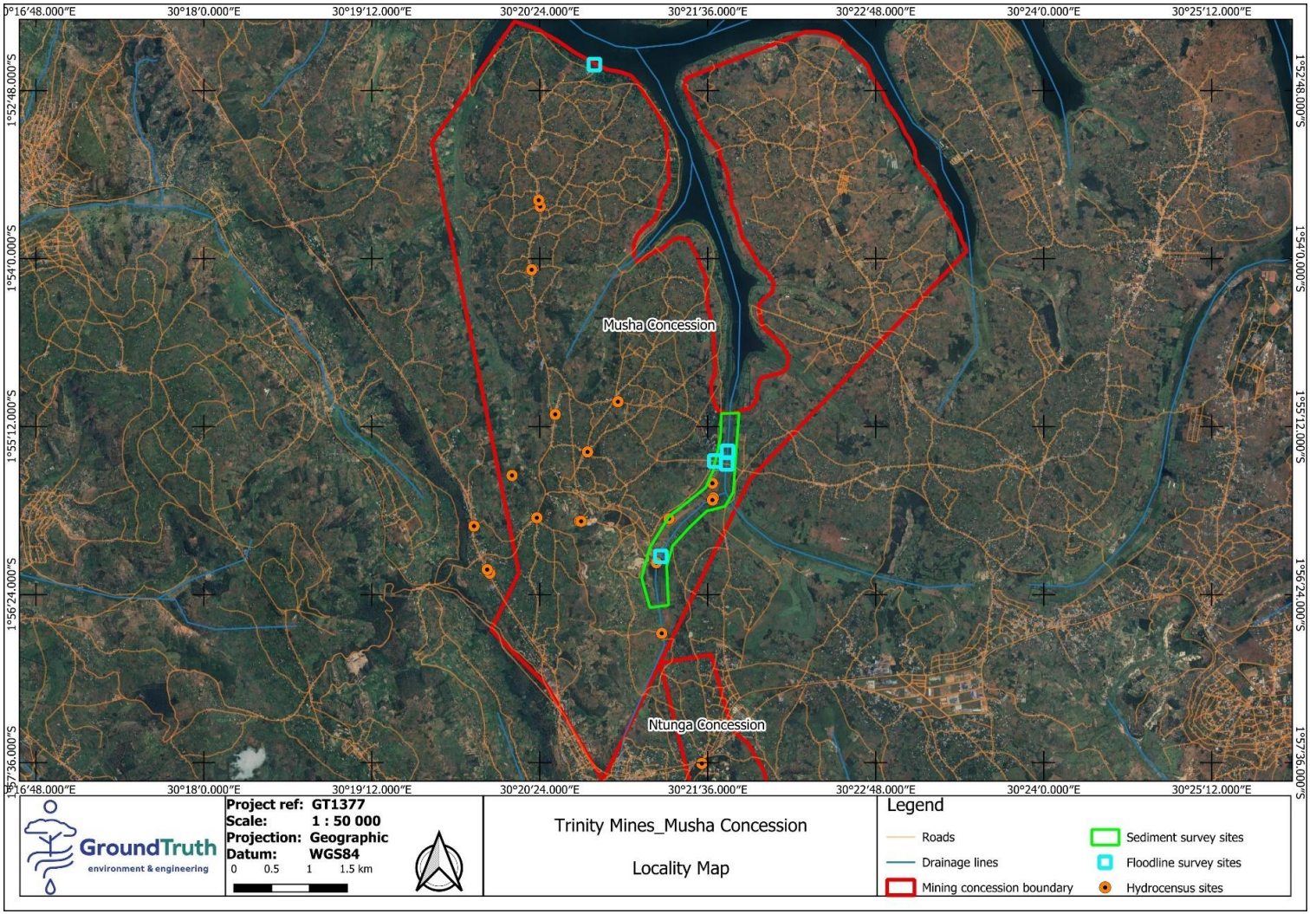

Figure 3-3 Map illustrating the various sites for the field survey within the Musha Mining Concession

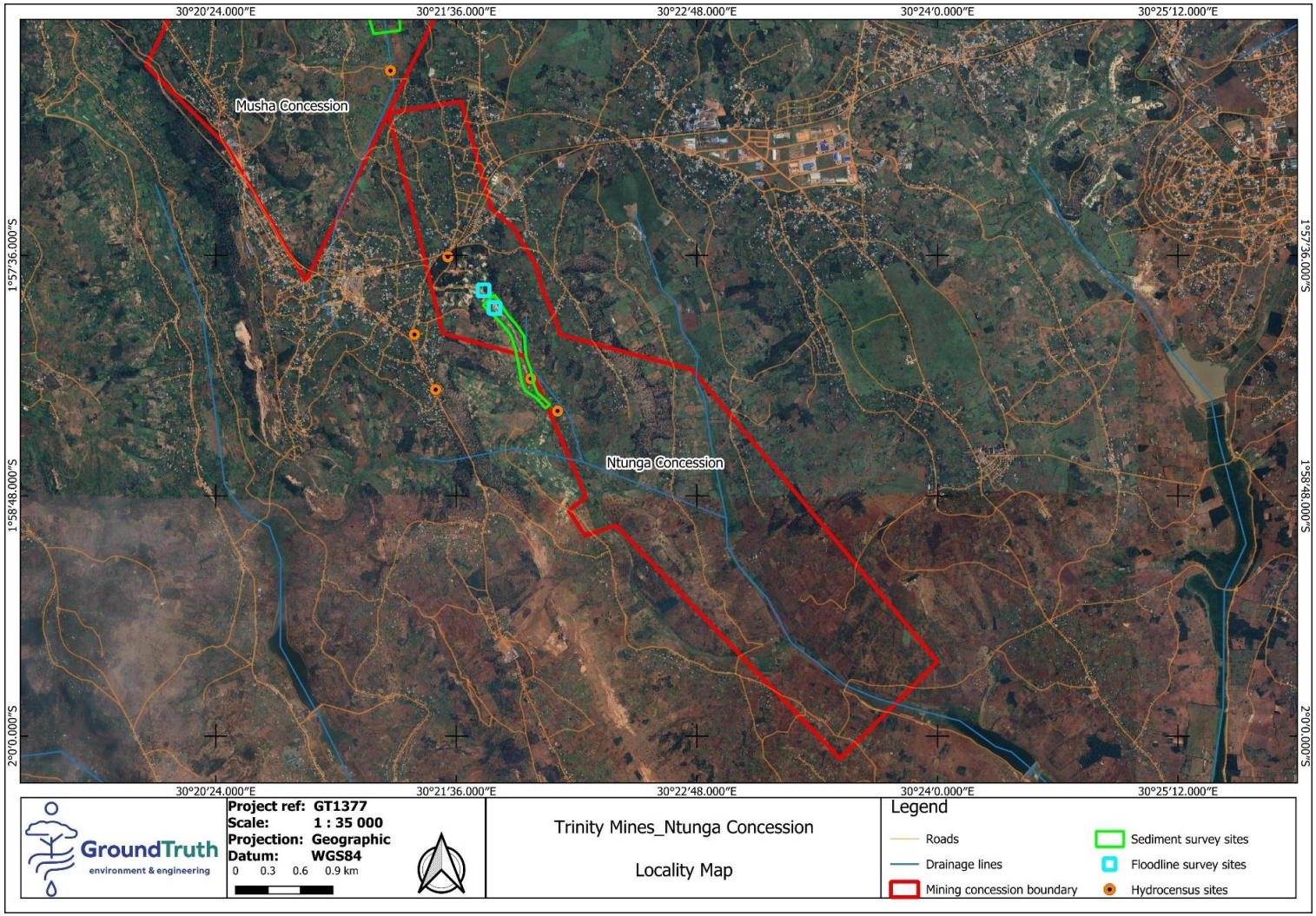

Figure 3-4 Map illustrating the various sites for the field survey within the Ntunga Mining Concession

4. FIELD SURVEY TEAM

Table 4-1 below includes the list of specialists who conducted the field survey.

Table 4-1 Field Survey Team

Member	Component	Role
Steven Ellery	Sediment	Specialist geomorphologist
Kyle Johnstone	Floodline	GIS technician/data management
Khwezi Mncwabe	Floodline	Environmental engineering technician
Keanu Singh	Hydrology	Hydrologist
Tyler Warwick-Oliver	Floodline	Environmental engineer
Busisa Ntshangase	Hydrocensus	Ecologist
Francois Tetero	Support	Water resources specialist

5. FIELD SURVEY DETAILS – RUTONGO CONCESSION AREA

5.1 Hydrocensus

Survey Dates: 29-30 July and 1 August 2025

Number of Sites Visited: 33

Components surveyed: The hydrocensus survey covered components of the local water supply system, including springs, dams, pumping infrastructure, distribution tanks, and community water collection points. At each site, information was gathered on infrastructure condition, functionality, water use practices, challenges and alternatives.

Site Photos:

Mutagata spring source at Ruli village is a critical water source supplying Murambi, Masoro, and Kanzuzi sectors

Field team member at Nyarurembo distribution tanks


Left: Ruri village water collection, which was non-functional during the study. This was the case at a number of community water collection points as a result of infrastructure failure coupled with declining spring source yields in the dry season..
Right: Nyakibande village spring, showing typical village spring water collection point. The springs run continously and the excess water is often directed through shallow trenches to nearby cultivated fields.


Left: Child (red circle) walking down the hill to a spring source. This is the typical journey taken by community members to alternative water sources which may be physically challenging to reach.
Right: *Eucalyptus* plantations within the catchment are a potential threat to critical spring sources, especially in the dry season.

Site Description and Impacts:

Communities in and around active mining areas in the Rutongo Mine concession area primarily rely on springs, community water collection points, and some very limited rainwater harvesting. Water supply infrastructure is constructed by the government and then handed over to private operators such as COWBE to maintain and operate. These operators collect a fee ranging from 20 to 100 Rwandan Francs to fill 20L containers at the community water collection points. The collection points mostly service communities in the hilltops. It was observed that communities at the valley bottoms mostly rely on springs as primary water sources. However, when water is not available at the water collection points, community members make use of the springs as an alternative, making them critical water resources in the concession area.

Key mining related impacts include water quality degradation from turbidity in rivers due to extensive illegal mining, as well as unregulated legal mining by the Rutongo Business of Sand and Stone (RBSS). Spring contamination risks also exist at springs located within active mine zones such as Gasambya mine, and threats from riverbank loss from unregulated mining activities. However, positive steps include Trinity Metals' use of water recycling systems for mining and processing to reduce natural water reliance and minimise discharge into the environment.

Beyond mining impacts, water supply to the villages is constrained by infrastructure challenges. Many collection points are damaged or non-functional, with some remaining dry for several years due to pump or system failures. Limited pumping and storage capacity, particularly at Mutagata spring source which supplies Murambi, Masoro, and Kanzuzi sectors, causing intermittent supply that cannot meet demand during peak or dry periods. Seasonal variability further reduces spring yields, while *Eucalyptus* plantations threaten spring yield at some sites. Accessibility is also difficult, with communities facing long and steep collection routes, while financial strain arises when residents must purchase water or rely on restricted access during periods of intermittent or no water supply at collection points near their households.

Over-reliance on a few functioning water collection points and springs highlights the need for improved infrastructure, maintenance, and additional reliable water sources within the Rutongo Mine concession area.

5.2 Sediment modelling

Survey Dates: 29 - 31 July 2025, 1, 5 August 2025

Number of Sites Surveyed: 6

Components surveyed: freshwater ecosystem cross-sections, suspended and bed load within the channels, sediment grain size of deposited material, general geomorphic observations

Site Photos:

Valley adjacent to the Nyamnyumba mine in Sediment Site 1. Signs of extensive mobilisation of sediment and coarser material in the valley bottom.

Left: Mining activities at Makogote – a clear source of large sediment to the downstream rivers at Sediment Site 3.
Right: Stream upstream of Makogote mining area – an indication of a stream that is not impacted by mining activities at Sediment Site 3.


Left: The Rusine River upstream of the Karambo mining area, relatviely unaffected by illegal mining and RBSS activities, at Sediment Site 4.
Right: The Rusine River downstream of the Mahazehe mining site and upstream of the Nyabugogo confluence, at Sediment Site 5.


Left: Area of deposition below the Masoro mining area where RBSS mining is occurring in Sediment Site 6.
Right: Directly downstream of left picture, these depositional areas consistently coincided with geological control points pictured here.

Site Description and Impacts:

The Rutongo concession area is an extremely steep and rocky landscape, which makes runoff and sediment management difficult. The catchment areas are extensively cultivated and much of the uncultivated areas are either occupied by homesteads or *Eucalyptus* plantations/woodlots. Much of the fine particulate material that is transported into the freshwater ecosystems is likely mobilised from these sources. Trinity mining activities in the concession area are further adding to the mobilisation of fine particulate matter into the freshwater ecosystems, but are also adding large volumes of moderate to large grain size particulate matter to these systems. The mobilisation of sediment material into the freshater ecosystems has been occurring for an extended period and long pre-dates Trinity's ownership and management of the concession area. The combination of the fine sediment sourced from the catchment and the coarser sediment sourced from the mining activities has provided a rich source of sand and aggregate for building material mining in the freshwater ecosystems in the concession area. A local company abbreviated as RBSS has been issued a permit to mine sand and aggregate from the rivers in the Rutongo concession area. The activities of RBSS are completely altering the bed, channel and bank characteristics of the freshwater ecosystems where they are actively mining, and are further artificially skewing the grain size distribution

within these freshwater ecosystems by systematically removing the sand fraction and a broad range of the cobble fraction for aggregate processing. The activities of RBSS coupled with illegal mining activities in the larger river systems have severely impacted the geomorphic functioning and ecological condition of these systems and will have lasting effects on the sediment transport capacity of these ecosystems.
To effectively manage sediment flux and safeguard freshwater ecosystems, it is essential to establish clear and enforceable standard operating procedures (SOPs) for sand and aggregate mining activities. Particular attention should be given to valley-bottom areas where illegal mining and RBSS operations are prevalent. These activities are currently exerting a disproportionately negative impact on freshwater systems. Implementing regulatory frameworks and accountability mechanisms in these zones could significantly improve ecosystem health and resilience.

5.3 Flood line determination

Survey Dates: 29 - 31 July 2025, 1, 5 August 2025

Number of Sites Surveyed: 24

Components surveyed: Hydraulic infrastructure, channel cross-sections, channel depths and velocities, river discharge and installation of survey benchmarks

Site Photos:

Photographs showing tape measure erected across the channel to indicate location of the cross section. The cross-sectional profile of the channel was surveyed using a high accuracy GPS device and a sonar device.

Both photographs show team members measuring water depths and velocities in the watercourse.

Photograph showing team members measuring the dimensions of hydraulic infrastructure. The length, width, height and invert level of the bridge culvert was surveyed.

Photograph showing highly modified channel due to sand/aggregate mining.

Site Description and Impacts:

The Rutongo concession area is a very steep landscape with clearly defined valleys and channels. The Rutongo concession area is the largest of the four concession areas and has man tributaries feeding into the main watercourses. However, the watercourses have been highly disturbed by the aggregate mining activities taking place. As a result, the channel has been re-directed in many places making it difficult to survey cross sections as they are not a true reflection of the river system. With this in mind, the team made the decision to survey cross sections in the most stable sections of the river that would be the least likely to change due to the continuous mining activities or high flows. The most stable sections in the river were located close to bridge culverts. Cross sections were surveyed on the upstream side of culverts and benchmarks were marked on the walls and columns of the existing infrastructure. In the event that there was no existing structure to use as a benchmark, a permanent benchmark was constructed using a plastic pipe secured into a concrete base. The benchmarks will be used to re-survey the sites during the rainy season.

6. FIELD SURVEY DETAILS – MUSHA CONCESSION AREA

6.1 Hydrocensus

Survey Dates: 2 August 2025

Number of Sites Visited: 21

Components surveyed: The hydrocensus survey covered components of the local water supply system, including springs, dams, pumping infrastructure, distribution tanks, and community water collection points. At each site, information was gathered on infrastructure condition, functionality, water use practices, challenges and alternatives.

Site Photos:

Gahoko spring source which supplies the distribution tanks at Gateka and Akabare where water is further supplied to the various village water collection points.

Left: Muhogoto village spring, which was functional during the study. This spring is the main water source for the village. The water is used for domestic purposes.
Right: Bisinia Dam, used as an alternative water source by community members. Some community members were observed to be washing clothes here. Community members reported to be using the water from the dam for domestic purposes. They boil the water before use. Overflow from the dam is directed to cultivated fields via shallow trenches.


Left: Kagarama village water collection point, observed to be non-functional during time of field survey. This point is supllied by the Akabare village distribution tank,which was still being filled during the time of the study.
Right: Rugabano village water collection point was operational during the time of the field survey, with a flow rate of 0.5 litres per second.

Site Description and Impacts:

Communities within the Musha Mine concession area are supported by a network of springs, pumps, distribution tanks, community collection points, Lake Muhazi and dams. Key sources such as the Gahoko and Cyimbaze Springs provide water that is pumped to the mine and to nearby village water collection points via the Gateka village and Akabale village distribution tanks, with further distribution to institutions such as Saint Kizito Technical High School. As with other mine concession areas, the water supply infrastructure to water collection points is constructed by the government and handed over to a private operator for maintenance and operation.

While the water system ensures broad coverage, its functionality is heavily dependent on pumping schedules and the refilling of distribution tanks, which results in intermittent supply across villages. Several collection points were observed to be non-functional at the time of the assessment, highlighting the system's vulnerability to operational delays.

Compared to other mine concession areas, the Musha Mine concession is relatively flat. Water supply is also generally not a major challenge here as with other mine concession areas, aside from waiting periods (not more than two days) associated with alternating pumping to fill the distribution tanks. The availability of alternative water sources such as Lake Muhazi, Bisinia and Nyakiriba Dams also helps ensure that community members can access water during periods when supply is directed to other villages. However, reliance on these alternatives can present physical challenges, particularly due to the distances involved, which in turn limits the quantity of water households are able to collect per trip. It was also noted that, in attempts to strengthen water security within the concession, Trinity Metals Musha is exploring the possibility of developing a groundwater supply for Kagarama village.

6.2 Sediment modelling

Survey Dates: 2 August 2025

Number of Sites Surveyed: 1

Components surveyed: freshwater ecosystem cross-sections, suspended and bed load within the channels, sediment grain size of deposited material, general geomorphic observations

Site Photos:

Left: A tailings dam on the Musha mine where artisinal sluicing is occurring. This tailings dam traps the large majority of the sediment generated from the mining activities.
Right: The Bisinia Dam which likely traps all other sediment originating from the Musha mine

Both photographs indicate the broad nature of the valleys in the Musha concession area with extensive agricultural activities within them. A dense network of drains take water from a central drain and distribute water to the fields, thereby decreasing the sediment transport capability of the systems.

Site Description and Impacts:

The Musha mining concession area is gently sloped and less erosive than the other concession areas. As a result, there is far less sediment being mobilised into the freshwater ecosystems from surrounding landuses such as cultivation and *Eucalyptus* plantations/woodlots given the gentler gradient. Furthermore, the main Musha mining operation has a variety of sediment trapping mechanisms in place (by virtue of the nature of its operations) and is located upstream of the Bisinia Dam. Therefore, the mining operation is having a minor impact on the sediment input and flux through the ecosystem downstream. Another distinguishing factor about the Musha concession area is that the valley bottom areas are much wider and flatter than those in the other concession areas, thereby rendering it less efficient at transporting sediment. These

valley bottom areas are characterised by extensive unchannelled wetland habitat (most of which are currently cultivated), which is significantly different to the other areas which are predominantly riverine or channelled wetland.
The Musha concession area presents significant opportunities to advance ecosystem restoration objectives. However, realising these opportunities will require comprehensive and inclusive engagement with local communities who currently utilize the wetlands for agricultural activities. There is considerable potential to introduce and promote more sustainable farming practices within these areas. To ensure successful implementation, it is essential to undertake careful and collaborative stakeholder engagement that respects existing land use and fosters community support.

6.3 Flood line determination

Survey Date: 02 August 2025

Number of Sites Surveyed: 5

Components surveyed: Hydraulic infrastructure, channel cross-sections, channel depths and velocities, river discharge and installation of survey benchmarks

Site Photos:

Photograph showing the tailings dam located on the Musha mine.

Photograph showing water being diverted into cultivated land.

Photograph showing team member surveying pedestrian crossing erected over watercourse.

Site Description and Impacts:

The Musha mining concession area is relatively flat and has very wide valley bottom areas, which are heavily cultivated. Local community members have captured water in the system through stream diversions, irrigation canals and earthen berms for agricultural purposes. As a result, there is no defined channel flowing through the system. The cultivated valley peters out into a wetland habitat prior to entering Lake Muhazi downstream.

As it is currently low flow season, there was very little, to no, flow remaining in the channel, and in some sections of the watercourse the water was stagnant. As a result no cross section was surveyed within this concession as there was no continous, defined channel and very little flow. The existing hydraulic infrastructure was surveyed, and the flow depth and velocity was surveyed at one site that had sufficient flow. In order to model this concession area, the use of LiDAR data will be critical as there is insufficient measured data that can be used to calibrate the hydrological model.

7. FIELD SURVEY DETAILS – NTUNGA CONCESSION AREA

7.1 Hydrocensus

Survey Dates: 2 August 2025

Number of Sites Surveyed: 5

Components surveyed: The hydrocensus survey covered components of the local water supply system, including springs, dams, pumping infrastructure, distribution tanks, and community water collection points. At each site, information was gathered on infrastructure condition, functionality, water use practices, challenges and alternatives.

Site Photos:


Left: Ntunga village water collection point. Appears to be the main water collection for the village as there were a lot of containers and community members compared to other points. Villages indicated that the actual water source was located at Bicumbi.
Right: Water collection point at Ntunga village reported to have water only once a month by locals. An alternative for the village is a private tank located in a household where locals pay 50 francs for every 20 litre container. Another alternative is at Kukariba spring which is a two hour walk away. Other water collection points in Ntunga and Ahoryahoze villages are also used as alternatives.


Left: Kabacuzi village spring used for domestic purposes by the community members
Right: Hand dug well in Kabacuzi village used to wash clothes

Site Description and Impacts:
Community members in Ntunga mine concession area rely on a combination of springs and water collection points. Due to time constraints, the main source supplying the water collection points could not be assessed during the study. Water availability at the community points assessed ranged from daily to once a month, with alternative sources located as far as a two-hour walk away. The situation in the Ntunga concession area is similar to other mine concessions, with some villages having reliable water sources close to their homes, while others must rely on alternative sources located at considerable distances.

7.2 Sediment modelling

Survey Dates: 2 August 2025
Number of Sites Surveyed: 1
Components surveyed: freshwater ecosystem cross-sections, suspended and bed load within the channels, sediment grain size of deposited material, general geomorphic observations
Site Photos:

Left: Approximately 100m downstream of the tailings discard facility, which is located at the head of the stream system, a large area of erosion was observed along with a yellow/olive yellow residue in the most recent channel. **Right**: The top portion of the stream is characterised by a series of alluvial fans which are characterised broadly by a gently sloping depositional 'head' and a slightly steeper and erosional 'toe'. These fans will slowly transport material down the valley in a seasonal 'conveyor belt'.


Left: There is still evidence of deposited material originating from the mining operations approximately 650m downstream of the tailings discard facility.
Right: It is only approximately 850-900m downstream of the mining operation where signs of deposition originating from the Ntunga mining operation cease.

Site Description and Impacts:

The Ntunga mining concession is moderately steep and comprises of a single valley with a mine at the head of the valley, similar to Nyakabingo Mine. A large tailings dump exists at the head of the valley that is currently contributing sediment of variable grain sizes to the downstream areas. The valley below Ntunga Mine is moderately steep and is characterised by both erosional and depositional areas and likely follows a cyclical pattern of 'cutting and filling'. Currently, this pattern manifests in the form of sediment deposition as a series of alluvial fans, which are characterised by a very gently sloping depositional area at the head of the fan and a steeper eroding area at the toe of the alluvial fans. Where the slope is slightly steeper, erosion occurs, and where the slope is more gentle, deposition occurs. This erosion and deposition process is the natural sediment conveyor belt that conveys sediment down the length of the valley. However, the rate at which sediment is transported down the valley has likely increased since mining started in the catchment. There may be opportunities to explore introducing wetland habitat into these depositional zones as part of an ecosystem stabilisation and restoration objective, but this can only be determined once the geomorphology of the valley is better understood.

7.3 Flood line determination

Survey Date: 02 August 2025

Number of Sites Surveyed: 2

Components surveyed: Hydraulic infrastructure, channel cross-sections, channel depths and velocities, river discharge and installation of survey benchmarks

Site Photos:

Photograph showing dry channel bed with mineral deposits.

Site Description and Impacts:

The Ntunga concession area is a single system that is moderately steep landscape with a clearly defined valley and channel. There was no flow observed within the system at the time of the survey. The channel bed appears very stable and has not been overly modified by mining activities. A cross section was surveyed and permanent benchmarks were installed. The flows surveyed in future during the rainy season will be used to calibrate the model.

8. FIELD SURVEY DETAILS – NYAKABINGO CONCESSION AREA

8.1 Hydrocensus

Survey Dates: 31 July 2025

Number of Sites Surveyed: 6

Components surveyed: The hydrocensus survey covered components of the local water supply system, including springs, dams, pumping infrastructure, distribution tanks, and community water collection points. At each site, information was gathered on infrastructure condition, functionality, water use practices, challenges and alternatives.

Site Photos:

Field team at Kilikumuryango water source and distribution tanks which provide water to the water collection points at villages downstream of the mine.

Left: Mwagiro and Bugarura villages handpumped borewell installed by Trinity Metals Nyakabingo. The water from this source was deemed unstuitable for consumption as a result of elevated manganese and iron concentrations.
Right: This water collection point is located in Mwagiro village across the Nyakabingo River and on the opposite hill to the borewell (image left). This water collection point is supplied by the Kilikumuryango water source a few meters uphill from this point.

This spring is located at Mwagiro village, approximately 0.5km downstream of the Nyakabingo mine and approximately 200m from the mine settling dam. The proximity of this source to the mine puts it at risk of contamination, and as a primary water source for the villages nearby, a safe alternative water source is needed.

Site Description and Impacts:

Communities in Nyakabingo mine concession area include Mwagiro, Nyarurama, Bugarura, Nyabisindu, Taba, and Nyamirembe villages. These villages rely primarily on springs, and community water collection points for domestic and agricultural use. Similar to the other mine concession areas, the community water collection points in Nyakabingo are managed by COWBE, which is private operator managing a water distribution network handed over to them by the government.

Water availability varies, with some sources providing sufficient yield while others have low flow rates, making them inadequate to meet household needs. Certain sources were found to have water quality issues, including elevated arsenic, manganese, or iron levels, rendering them unsuitable for consumption. The Kirikumuryango water source and distribution tank, managed by COWBE, provides a more reliable supply to several villages, schools, and the health centre further downstream of the mine, but other sources remain vulnerable to contamination and seasonal scarcity.

The communities face several water-related risks and challenges. Springs and collection points that are heavily relied upon are exposed to contamination risks, particularly those near the mining area such as in Mwagiro village. Accessibility is also a concern, as some alternative sources are distant or difficult to reach. Overall, there is a need for safe and accessible alternative water sources for villages close to the active mining area to reduce reliance on vulnerable springs and ensure reliable supply for these villages.

8.2 Sediment modelling

Survey Dates: 4 August 2025

Number of Sites Surveyed: 1

Components surveyed: freshwater ecosystem cross-sections, suspended and bed load within the channels, sediment grain size of deposited material, general geomorphic observations

Site Photos:

Left: One of the tailings dams downstream of the mining area. Extensive sediment deposition has already occurred in this dam.
Right: Downstream of the dam pictured on the left is an extensive area of deposited stone and large cobble sediment with a deepening erosional channel cutting its way through the deposited material.

Photograph looking upstream towards the Nyakabingo mining area, depicting the deposited material which has originated from that valley-head. Note the distinct lack of fine material – indicating the erosive force and sediment transport potential of flood flows down this valley.

Left: Little evidence of large cobble and rock material deposited from the mining activites upstream. Note the colour of the water indicating a much greater degree of fine sediment transport (both as a result of increased flow and availability of fine sediment).
Right: Mining of the fine material and aggregate starts approximately 2km downstream of the mining area.

Site Description and Impacts:

The Nyakabingo concession area possibly represents the steepest valley-head area. The mining area also has a different geology from the other sites and therefore the sediment that is produced from this mine is unique in it's angularity, weight and size classes. However, broadly speaking, the Nyakabingo concession area is similar to the Rutongo concession area in terms of broad land use and sediment sources, although the Nyakabingo concession area is comprised of a single long valley and therefore may be easier to manage. Recent dam construction at the head of the valley line will likely temporarily aid in the trapping of some sediment that originates from the mine. However, the rate at which these dams will fill up with sediment will need to be reviewed, and the question of where to discard the material from these dams will need to be addressed. There is currently a large volume of cobble and rock sized sediment sitting at the head of the valley, with very little fine sediment which has all been exported and deposited a pproximately 1.5km downstream. This is likely to continue to be the trend and much of the sand and small cobble sediment will be deposited upstream of geological control points in the downstream landscape. These geological control points may become strategic points for targeted tailings mining in the future, and may require interactions to identify potential wetland areas that would need creation and protection.

8.3 Flood line determination

Survey Date: 04 August 2025
Number of Sites Surveyed: 4
Components surveyed: Hydraulic infrastructure, channel cross-sections, channel depths and velocities, river discharge and installation of survey benchmarks
Site Photos: 
Photograph showing tailings dams at the top of the system.

Photograph showing tailings deposits in the watercourse.

Photograph showing team members measuring waters depths and velocities in the watercourse.

Site Description and Impacts:

The Nyakabingo mining concession is topographically similar to, Rutongo viz., has a very steep landscape and is characterised by a single primary river system. Nyakabingo is the most affected of the areas by Trinity's mining activities. There is evidence of tailings in the river system stretching downstream of the mine. The channel, as a result, is very modified due to the

imported aggregate in the channel. A cross-section was surveyed at a site where there was evidence of bedrock. This site was ideal as the cross-sectional profile of the channel is unlikely to change. Flow measurements and existing hydraulic infrastructure were also surveyed in the system.