

Ok Birim Tailings Storage Facility Project

Environmental and Social Impact Assessment

Volume A — Executive Summary





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Environmental and Social Impact Assessment Volume A – Executive Summary

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For more than 40 years, the Ok Tedi Mine has practiced riverine disposal of tailings and waste rock to the Ok Tedi. OTML has committed to largely eliminate the currently approved practice of riverine tailings disposal.





1. Introduction

The Ok Tedi Mine at Mt Fubilan in Western Province, Papua New Guinea (PNG), is an open-cut copper, gold and silver mine owned and operated by Ok Tedi Mining Limited (OTML) since 1984.

Ore is mined and processed at an on-site processing plant capable of treating up to 24 million tonnes per annum of ore. Copper concentrate is transported via a 156-km-long pipeline to port facilities at Kiunga, where it is dried then shipped along the Fly River to Port Moresby for export. Pyrite concentrate produced at the tailings processing plant (TPP) near the mine is transported via a 125-km-long pipeline to subaqueous storage pits on the west bank at Bige, where it is kept permanently submerged to prevent oxidation and acid generation. Residue sand tailings from the TPP are discharged via a 1.5-km-long tailings river disposal pipeline to Ok Kumiup, which flows into the Ok Tedi via Harvey Creek. Waste rock is also disposed to the creek system at the mine. This material is then transported downstream and the coarser sand-sized material settles in a dredged slot near Bige, where dredged material is hydraulically placed into engineered stockpiles on the east and west banks of the Ok Tedi, which joins the Fly River approximately 25 km downstream.

For more than 40 years, the Ok Tedi Mine has practiced riverine disposal of tailings and waste rock to the Ok Tedi. Up until 2025, over 2 billion tonnes of mine-derived sediment had been added to the Ok Tedi and Fly River system.

OTML is currently progressing several planned developments aimed at improving long-term environmental performance and supporting potential mine life extension as part of its Growth 2050 strategy. Projected mine production to 2050 will generate additional tailings and waste rock, placing additional

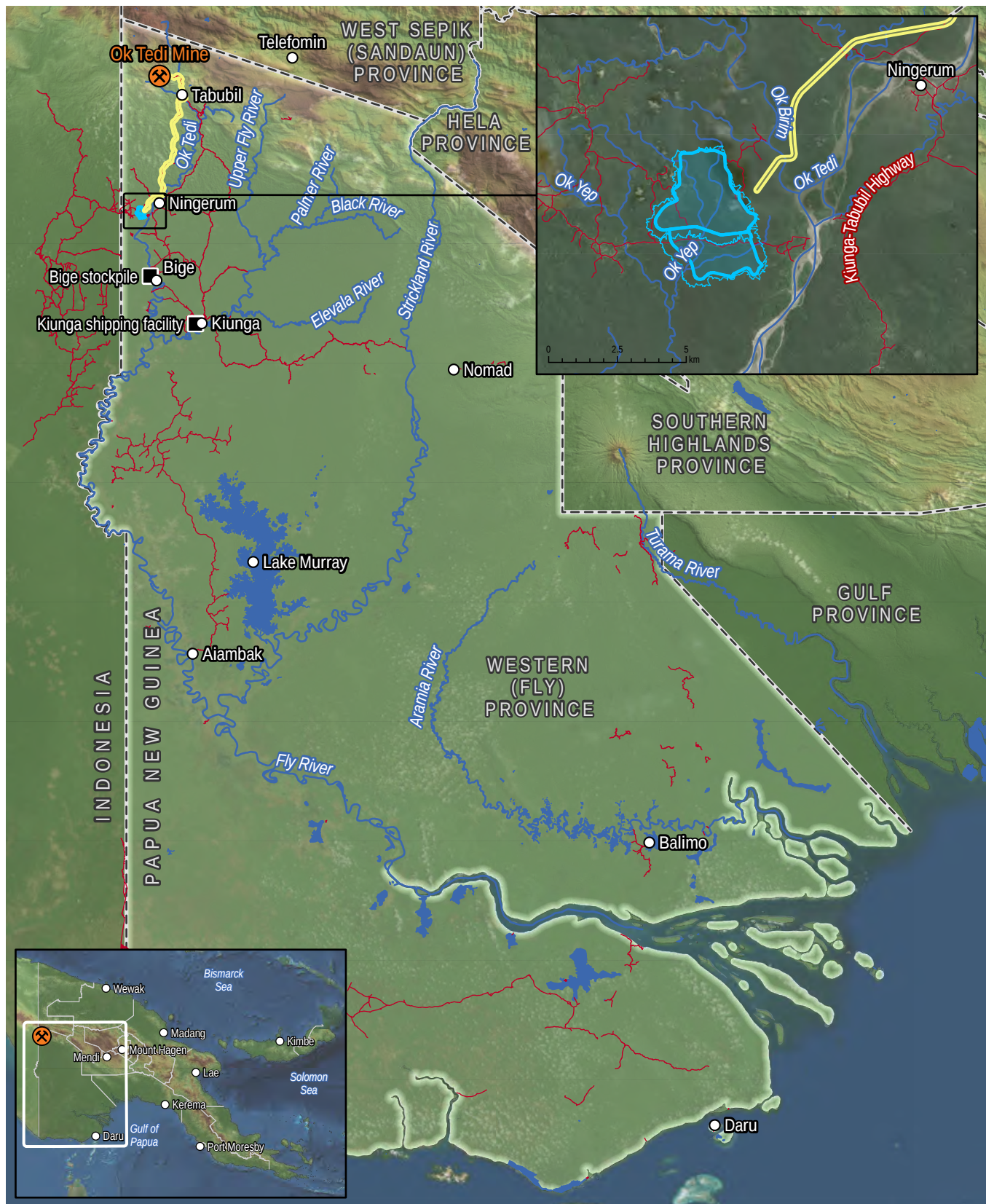
pressure on the downstream river system. OTML has therefore committed to largely eliminate the currently approved practice of riverine tailings disposal. The project involves storing tailings on land in an engineered tailings storage facility (TSF) from 2030 to limit further additions of mine-derived sediment to the Ok Tedi and Fly River system, reduce downstream environmental and social impacts and support continued mine operations to 2050. It is a significant mitigation measure intended to provide a technically proven, environmentally sound and economically viable alternative to the current riverine tailings disposal practice, aligned with contemporary standards and PNG's sustainability development goals.

1.1 Project description

The proposed TSF is approximately 1 km west of the confluence of the Ok Birim and Ok Tedi, and about 55 km due south of the existing Ok Tedi Mine in Western Province; and approximately 800 km west of Port Moresby, the capital of PNG (Figure ES.1). 'Ok' means 'river' in the local dialect.

The project will include (Figure ES.2):

- A ring-dyke TSF to contain up to 368 Mt tailings, accommodating the projected tailings for the current life-of-mine with provision to consider a potential and proposed mine life extension to 2050.
- An on-site hydro-cyclone house to separate coarse material for the TSF embankment construction from fine material to be stored within the TSF.
- An approximately 87-km-long pipeline, pump and choke stations for tailings transport.
- Access road and river crossings including proposed bridges.



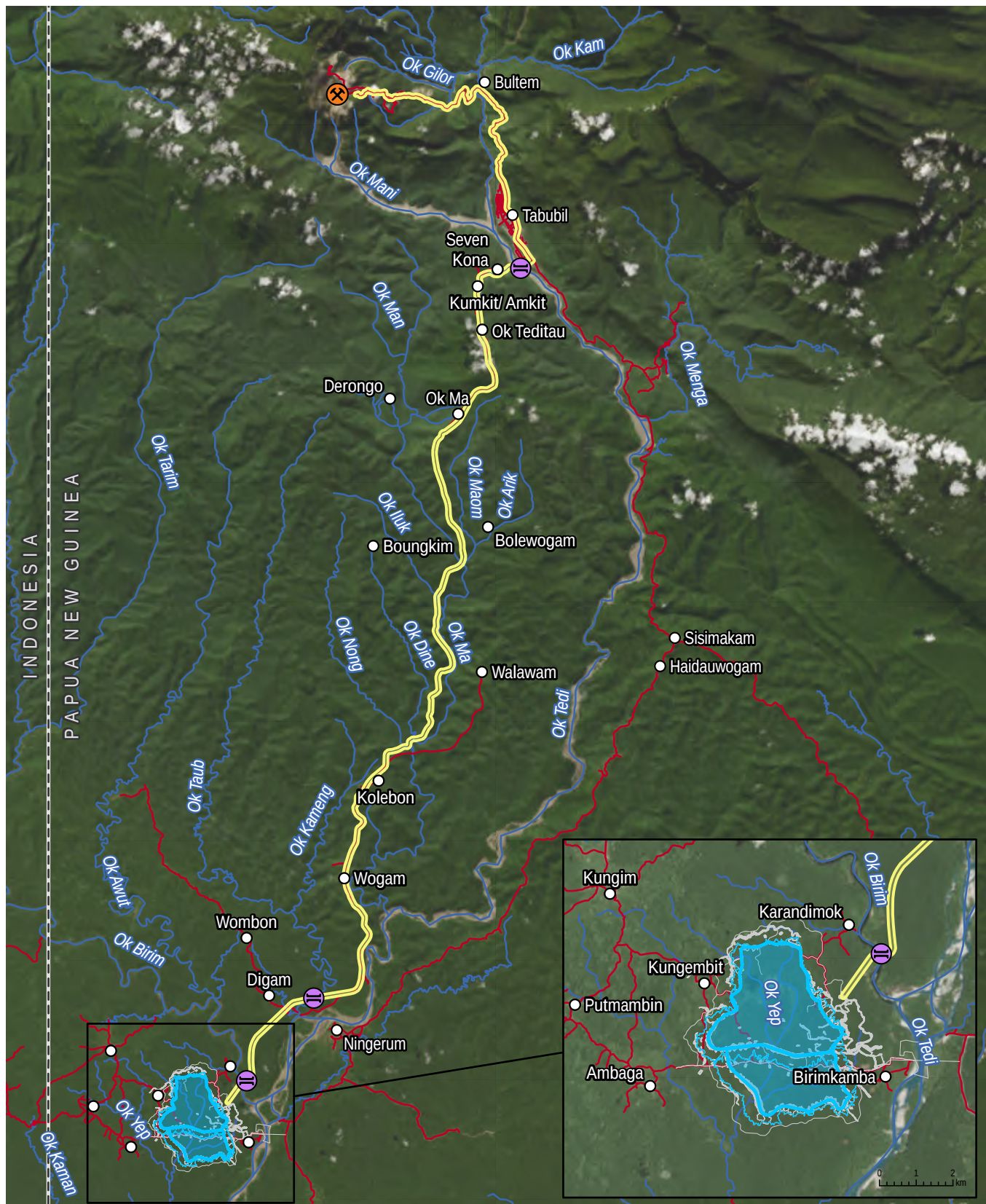
LEGEND

- | | | | |
|---|--------------------|---|----------------------------------|
|  | Ok Tedi Mine |  | Waterbody |
|  | Key infrastructure |  | Province boundary |
|  | Town |  | Proposed TSF footprint |
|  | Road/track |  | Proposed infrastructure corridor |
|  | Watercourse | | |



0 25 50 km
PROJECTION: PNG94 PNGMG94 Zone 54

Figure ES.1 Project location



LEGEND

- | | |
|----------------------|--------------------------|
| Ok Tedi Mine | Proposed layout |
| Community | Bridge (to be finalised) |
| Road/track | TSF detailed design |
| Watercourse | TSF footprint |
| International border | Infrastructure corridor |



0 2.5 5 km

PROJECTION: PNG94 PNGMG94 Zone 54

Figure ES.2 Project components



1.2 Context

The Ok Tedi Mine is located in mountainous terrain with steep slopes covered in rainforest and where the average annual rainfall exceeds 10,000 mm per year (i.e., 10 m per year) (Plate ES.1). The mine is drained by the tributaries of the Ok Tedi that flows into the Fly River before being joined by the Strickland River and then flowing through the delta area to the Gulf of Papua, almost 900 km from the mine (see Figure ES.1). Some 103,000 people live in 158 villages in the mine area and downstream of the mine.



Plate ES.1 Ok Tedi Mine

Mine-derived sediment has vastly exceeded the sediment transport capacity of creeks near the mine where deposition (Plate ES.2) has caused riverbed levels to rise (aggradation). In the Lower Ok Tedi and Middle Fly River, deposition of

mine-derived sediment in the channel has also caused aggradation and increased the frequency and duration of flooding. This altered hydrologic regime has caused extensive vegetation dieback that now covers approximately 2,000 km² of the Ok Tedi and Fly River floodplains.



Plate ES.2 View of Ok Kumiup, which flows into the Upper Ok Tedi via Harvey Creek

Since 1998, regular dredging has been conducted at Bige, approximately 80 km downstream from the mine (Plate ES.3). Dredging recovers a portion of the sand component of the tailings and waste rock for land deposition. Captured sand-sized sediment is removed and stored on both sides of the river, then reworked into engineered stockpiles for revegetation. There are significant volumes of fine sediments discharged into the river that cannot be retrieved by dredging. The TSF is a significant mitigation measure designed to retain both the coarse and fine fractions of the tailings on land, with consequent downriver benefits. PCon will continue to be removed from tailings and disposed at Bige. The dredging program in the Ok Tedi at Bige will also continue



Plate ES.3 View of the existing Bige dredge and stockpile operations

Water quality effects, aggradation by mine-derived sediment that has smothered river channel habitat plus consistently high suspended sediment concentrations have led to large reduction in the biomass and diversity of aquatic fauna in the Middle Fly, and to a lesser extent, its off-river water bodies (ORWB).

Over the mine life, various studies have been completed to evaluate the feasibility of a TSF. In 2024, OTML engaged KCB Australia Pty Ltd to prepare a pre-feasibility study against relevant guidelines, industry benchmarks, and good engineering practices. Of several potential sites, Ok Birim was identified as the preferred location for the proposed TSF. Feasibility study work by KCB Australia Pty Ltd is ongoing and will be completed in mid-2026.

The development of the proposed TSF will lead to a direct reduction in riverine tailings disposal at the mine's current and proposed material movement rates.

1.3 Project proponent

The Ok Tedi Mine is wholly owned and operated by OTML, an unlisted PNG majority State Owned Enterprise, with 67% of shares directly owned by the Independent State of PNG and 33% owned by the Provincial Government and people of Western Province. OTML's registered office is located in Tabubil, Western Province, PNG, with an additional registered office in Port Moresby, PNG and a logistics facility and offices in Brisbane, Australia.



An aerial photograph showing a large-scale mining or construction site. In the foreground, there's a large body of water, possibly a tailings pond, with a reddish-brown sedimented area extending into it. The background shows a vast landscape with more water bodies, dirt roads, and distant greenery under a cloudy sky. A semi-transparent white box with a curved edge is overlaid on the left side of the image, containing text.

A hydro-cyclone house next to the TSF will separate coarse and fine tailings, with coarse underflow used for embankment construction and fine overflow directed to the TSF impoundment. The TSF will look similar to OTML's existing dredge stockpiles at Bige.



2. Description of the proposed development and its objectives

2.1 General overview

The project's total disturbance footprint is approximately 1,980 ha. Project activities will primarily occur in two areas:

- TSF development area (approximately 1,500 ha) – This includes the TSF footprint, hydro-cyclone house and ancillary infrastructure, surface water management facilities and internal roads and tracks. The area is within a lowland setting with regional topography gently sloping to the south. The TSF site is in a sub-catchment of the Ok Yep, to the west and south of Ok Birim and Ok Tedi confluence. The northern part of the TSF site is approximately 1 km west of this confluence. The TSF site is generally flat with undulated shallow valleys ranging in elevation from approximately 40 m to 80 m above mean sea level (AMSL).
- Infrastructure corridor development area (approximately 480 ha) – This includes the proposed pipeline access road, bridges and water/ravine crossings, tailings pipeline and supporting facilities outside the TSF development area. The corridor area varies from the rugged, steep-sided valleys near the mine to the more gently undulating terrain and floodplains towards the TSF site.

Figures ES.3 and ES.4 present the proposed location and layout of the TSF and infrastructure corridor route.

Key components of the project are:

- A hydro-cyclone house for separating coarse and fine tailings, with coarse underflow sand used for embankment construction and fine overflow directed to the TSF impoundment.
- A ring-dyke TSF comprising internal storage cells developed progressively, with embankments primarily constructed using cyclone underflow sand.
- An 87-km-long tailings delivery pipeline from the existing TPP at Ok Tedi Mine to the TSF site, including one pump station at the mine site, two intermediate choke stations, and a terminal choke station.
- A pipeline access road corridor including three bridges and several minor water/ravine crossings.
- Ancillary infrastructure including site offices, laydown areas, workshops, maintenance stations, waste and sewage management facilities, fuel storage, borrow and gravel pits and accommodation camps (as required).
- Power supply primarily from on-site diesel generators, with an installed capacity of up to 11 MW during operations.
- Water supply sourced primarily from existing mine site supply, TSF decant water during operations, supplemented by rainfall and potential abstraction from nearby watercourses or groundwater for construction and potable water (if required).
- Extraction of gravel and borrow fill from the west bank of the Ok Tedi near the TSF for use in construction of the embankment.

Refinement of the final project layout and footprint is ongoing and will continue as further data becomes available from detailed site investigations, technical studies and engineering. This iterative process will enable OTML to effectively avoid or minimise social and environmental impacts.

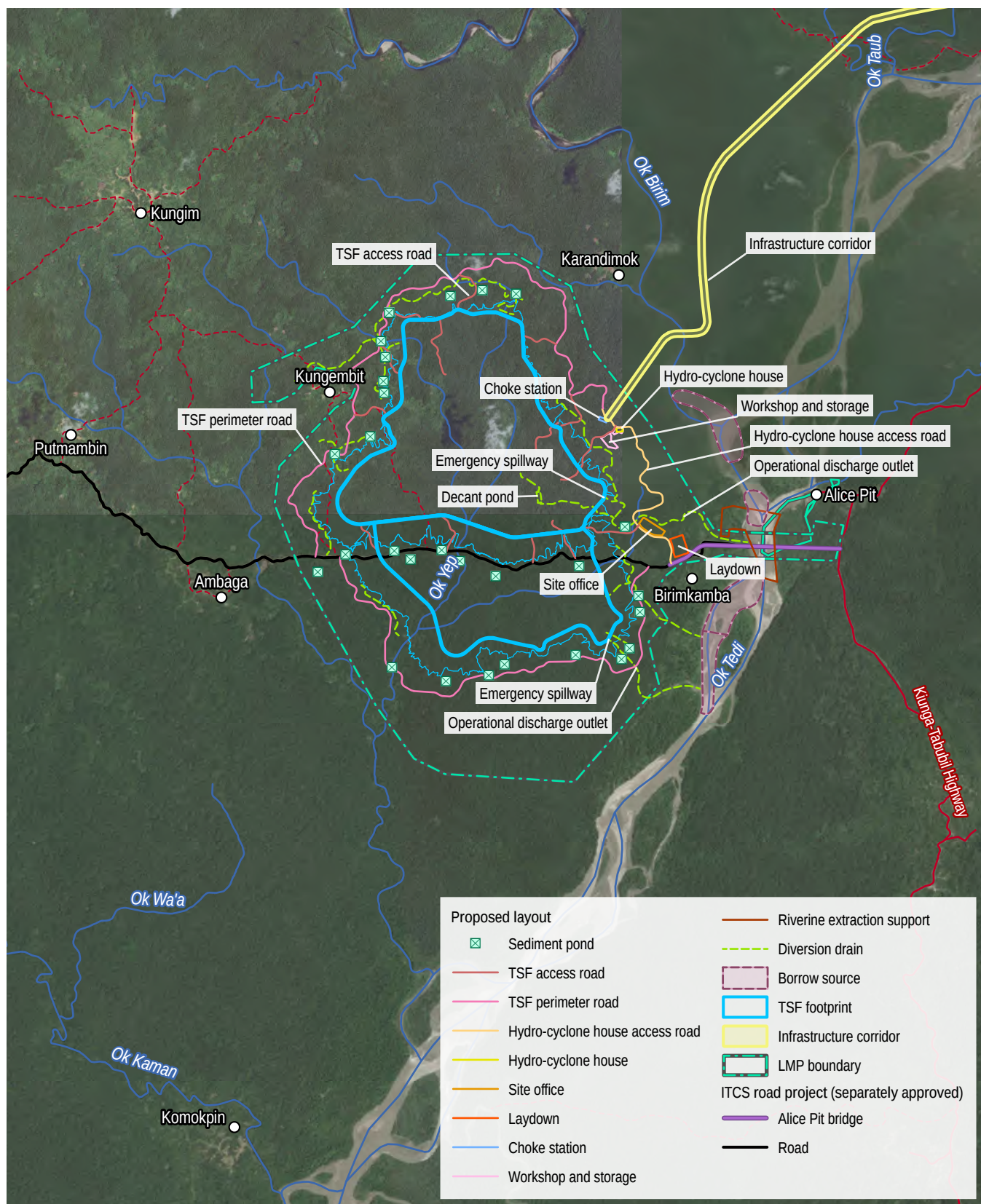


Figure ES.3 Tailings Storage Facility – proposed location and layout

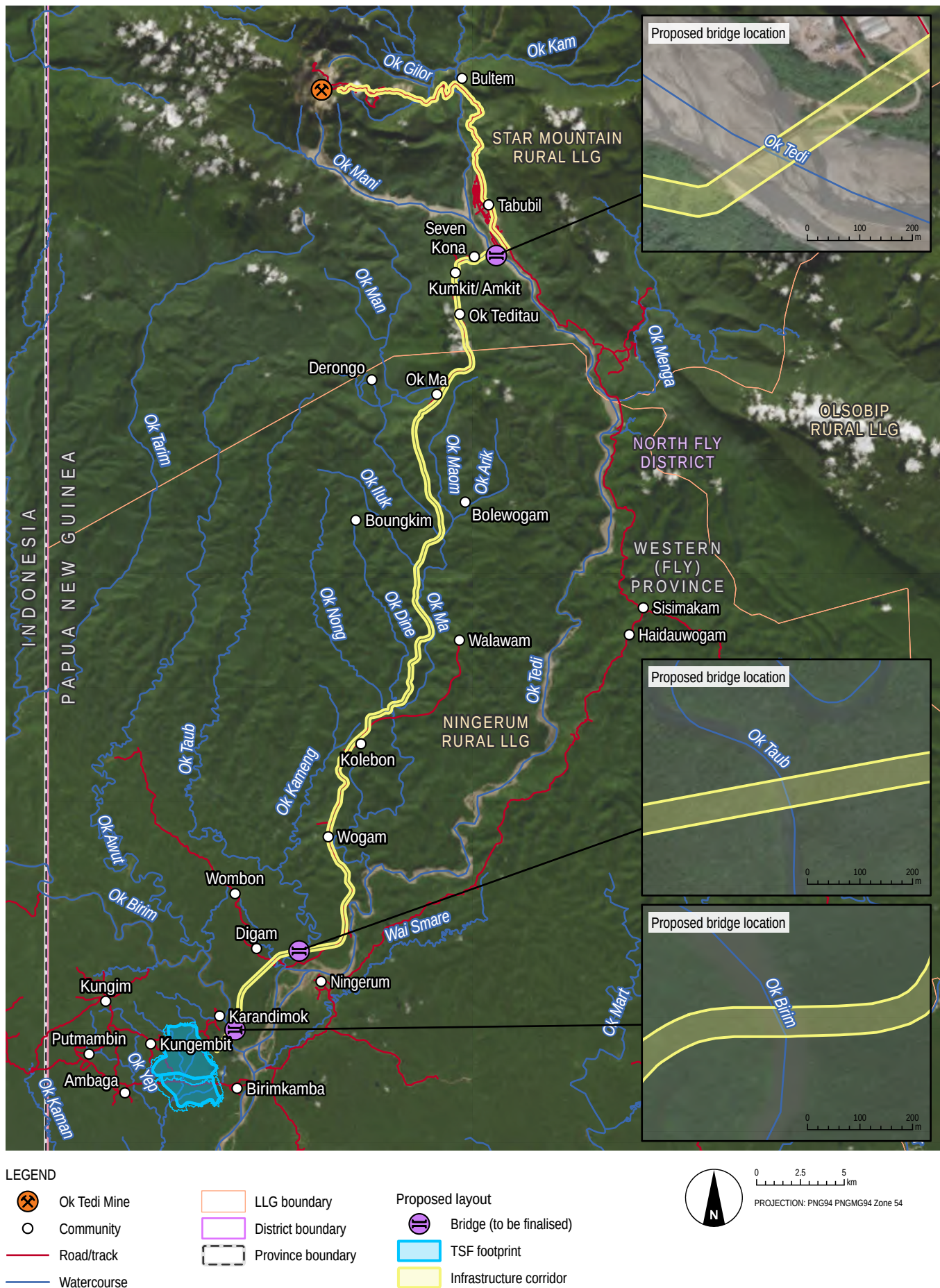


Figure ES.4 Infrastructure Corridor – proposed route and layout overview



2.2 Development schedule

Project activities will occur over four main phases:

- Detailed design phase: approximately 6 months from 2026 to 2027.
- Construction phase: approximately 36 months, from 2027 to 2030.
- Operations phase: 20 years, from 2030 to end of 2049.
- Decommissioning, closure and rehabilitation: approximately 36 months, from 2050 to 2053.

2.3 Assessment of alternative options

OTML has considered a range of alternatives and options to inform the selection of the preferred design and layout for the project. The development of the project from preliminary concept through to pre-feasibility study and feasibility study stage involved the identification and assessment of various alternatives for site selection and project design. These included the alternative scenario of not proceeding with the project, alternatives for tailings storage locations and technologies, and alternatives for associated infrastructure including the access road and tailings pipeline.

Not proceeding with the project

Development of the TSF is a significant mitigation measure that will provide sufficient tailings storage capacity for the currently approved Ok Tedi Mine life and facilitate the phasing out of OTML's current practice of riverine tailings disposal. While riverine disposal has supported the mine's production since 1984, it is associated with ongoing environmental and social impacts, including downstream sediment aggradation, floodplain inundation, and vegetation dieback along the Ok Tedi and Fly River systems. Constructing the TSF will reduce impacts associated with the current tailings disposal method and align tailings management with international good practice.

An alternative scenario where the proposed TSF does not proceed was considered. Under this scenario, OTML would continue to rely on riverine tailings disposal and the associated environmental and social impacts would continue.

Alternatives for tailing storage locations and technologies

In the 1980s, the original Ok Tedi Mine development plan considered a TSF at Ok Ma. However, this site was abandoned due to geotechnical instability following a major landslide during construction. From the 1990s, OTML conducted extensive work over two decades to identify and refine viable TSF site options. Key studies thereafter included the 2013 TSF Options Scoping Study by KCB Australia Pty Ltd, which involved preliminary multi-criteria analysis of 12 potential TSF site options, with preferred sites (including the Ok Birim site) advanced into a site selection study completed in 2014.

Since this time, TSF investigations have considered two main development alternatives and locations between Ok Tedi Mine and Ningerum areas:

- Valley fill TSF in the highlands, which has key advantages such as a relatively smaller construction/embankment footprint using natural topography for impoundment. However, this development alternative also has a greater risk of foundation instability (landslides) and seismicity (earthquakes), particularly in the project region's high rainfall climate, and larger affected catchments given its location in the highlands, as well as greater challenges with achieving safe closure.
- Turkey nest TSF in the lowlands, which has key advantages such as more stable foundations, suitable areas have lower seismic risk and precipitation, smaller catchment area, and passive closure is more likely to be achievable based on works completed at Bige operations. However, this development alternative requires a long pipeline and access road corridor, larger footprint and closer proximity to existing communities and flood risks in floodplain areas.

Site options within the highlands were screened out early due to environmental and social considerations, cost and closure requirements.

A TSF site selection process in 2014 used multi-criteria alternatives assessment, considering factors such as technical feasibility, capital costs, closure requirements, maintenance costs, community impacts, environmental impacts, flood and erosion controls and geotechnical challenges to rank TSF options. In general, TSF costs were influenced by distance from the mine where southernmost sites have increased costs due to added length of pipelines.

Ok Birim was selected as the preferred location for further pre-feasibility and feasibility studies based on its sufficient storage volume, suitable natural topography, proximity to existing infrastructure, availability of relevant data, and relative distance from nearby communities (and fewer community issues) compared to other high-scoring options. Throughout 2025, further refinements were made to avoid resettlement of existing villages due to the footprint of the TSF, move the TSF entirely out of the Ok Birim catchment so that project runoff and TSF discharge would be confined to the already-degraded Ok Tedi catchment, shift the TSF footprint further away from the Indonesian border and minimise impacts to recorded locations of conservation significant fish species.

Sites were also analysed using the multi-criteria alternatives assessment for different technologies, particularly:

- Conventional TSF with cycloned sand embankments, which involves cyclones to use centrifugal forces to separate tailings into coarse and fine fractions and construct embankments with cycloned underflow sand. Finer material (overflow) is deposited in the central impoundment. Key advantages are that it facilitates progressive construction and staged closure, with potential for integration of passive water management, and it is operationally proven in similar settings, such as South America.
- Filtered (dry-stacked) tailings in TSF, which involves mechanical dewatering of tailings to a low-moisture content and stacking in compacted layers. Typically used in arid or temperate climates where water recovery and reduced dam risk are key drivers. A key advantage of this alternative is that it does not involve a pond during operations.

Overall, the cycloned sand TSF technology was preferred over the filtered TSF technology for both technical and economic reasons. While a filtered TSF offers advantages such as the absence of an impounded water pond and a generally drier facility, this technology was eventually discounted due to its significantly higher cost, operational complexity, and lack of precedent at the required throughput in PNG's high-rainfall conditions as transporting or placing the tailings at the TSF via truck or conveyor would be challenging in the typical wet and rainy conditions. Further, the use of filtered tailings at this scale and in this climate remains unproven.

Alternatives for associated infrastructure

Two alternative infrastructure corridor routes were initially considered for the access road and final tailings pipeline from the TPP to the proposed TSF: a north corridor option following the Kiunga–Tabubil Highway from the mine down to north of Ningerum township then crossing and running along the north bank of Ok Tedi for approximately 14 km; and a south corridor option turning west off Kiunga–Tabubil Highway near Alice Pit (south of Ningerum) and crossing the Ok Tedi and running along the west bank of Ok Birim for approximately 11 km. A third alternative route was later identified and selected. This corridor route provides an alternative regional access route with a more direct connection approaching from the north through rural areas. This route was selected for its reduced pipeline length and lower construction costs, improved hydraulic efficiency, while also enhancing long-term regional accessibility benefits for nearby rural communities along the corridor. Importantly, this route will provide a key alternative regional access road for OTML and local communities to transport fuel, goods and supplies, including from nearby Indonesia.

2.4 Conceptual closure planning

Once tailings deposition stops, decommissioning and closure of the project is expected to take three years from 2050 to 2053. All project infrastructure and services under OTML's direct control such as electricity, water supply and sewage will be decommissioned at the cessation of operations. Where possible, assets eligible for salvage will be transferred or sold to third parties for continuing use or demolished/dismantled to be sold as scrap metal or recycled.

During closure the TSF will be configured as a stable, water-shedding and erosion-resistant landform that comprises benched embankment slopes designed to safely convey flows away from rehabilitated surfaces to the receiving environment via appropriately sized closure spillways and channels. Lessons learned from progressive rehabilitation of the Bige stockpiles will be incorporated into closure planning.

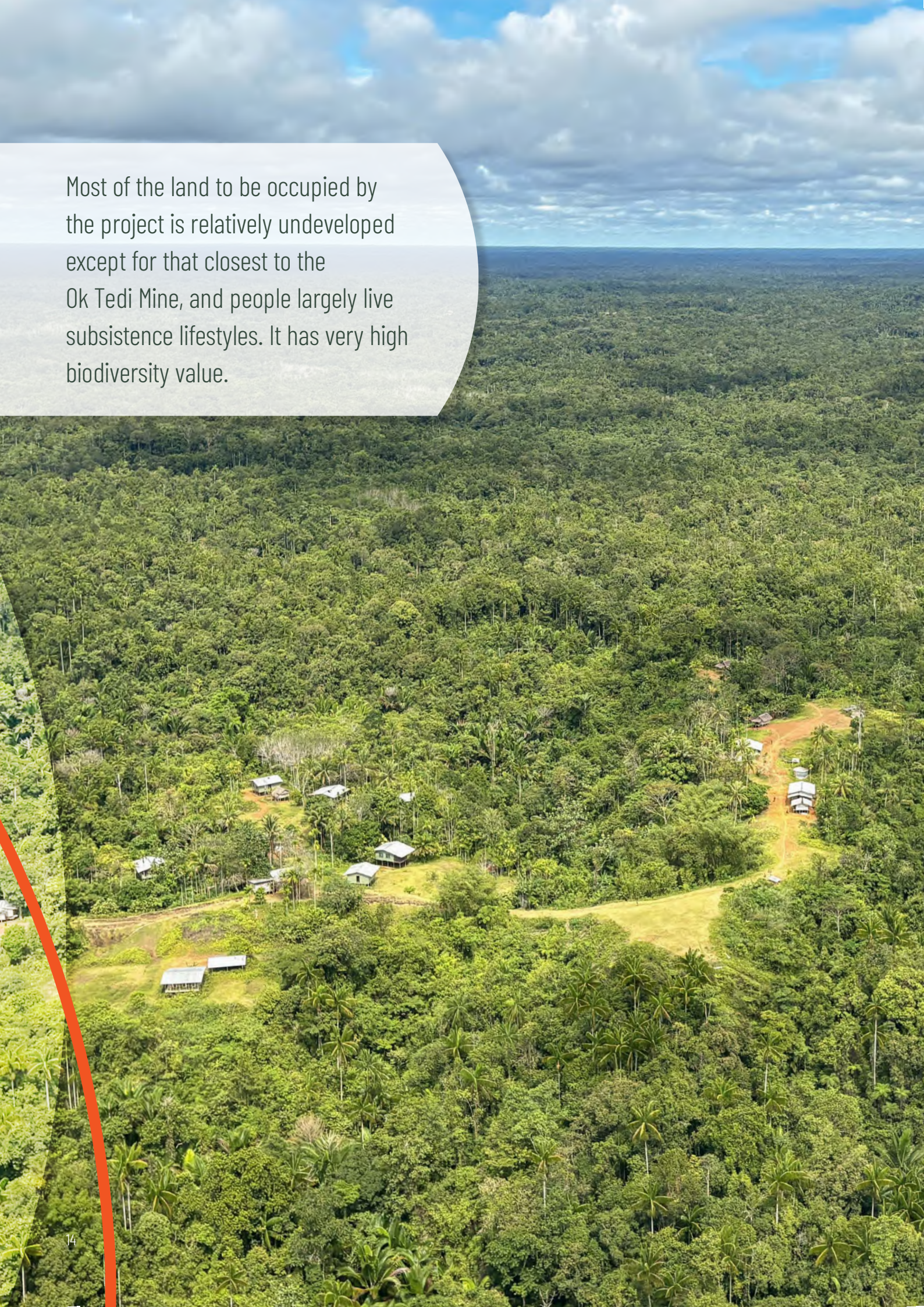
The overarching objective of the conceptual TSF closure plan is to create a landform which is physically and geochemically stable, and compatible with the region's ecology and land uses. The TSF closure design will direct all surface water discharges to the Ok Tedi near Cell 2.





OTML has conducted extensive work over two decades to identify and refine viable TSF site options.

Most of the land to be occupied by the project is relatively undeveloped except for that closest to the Ok Tedi Mine, and people largely live subsistence lifestyles. It has very high biodiversity value.





3. Project setting

The project area lies on the southern slopes of the Central Cordillera in the North Fly region of Western Province. It is located close to the border with Indonesia, with the infrastructure corridor extending from the Ok Tedi Mine along the existing road east to Bultem then south to Tabubil for 22 km and then across the Ok Tedi to Ok Ma then south-southwest for approximately 65 km to the TSF.

The Ok Tedi Mine is located at about 1,750 m above sea level at Mt Fubilan, with associated infrastructure extending down the slopes and foothills with the proposed TSF at 40 to 80 m above sea level. Annual rainfall is very high, ranging between over 10,000 mm at Mt Fubilan to 4,000 mm in the lowlands, and approximately 7,000 mm at the TSF site.

The population of Western Province was approximately 300,019 people in 2024 and is the most sparsely populated province in PNG (NSO 2024). Most of the population in the Western Province live along or near the Fly River and its tributaries. Though it is sparsely populated, the province has relatively high levels of urbanisation, with population, services and markets concentrated in the provincial capital of Daru and centres such as Kiunga and Tabubil. The North Fly district is the largest district by population, with 102,633 people in 2024, accounting for about one third of the total provincial population. The district includes four larger regional towns – Kiunga, Tabubil, Ningerum, and Olsobip – with other communities mostly comprising small rural villages and settlements situated near rivers, forest margins or bushland to support subsistence livelihoods such as gardening, hunting, fishing, and sago production. These smaller settlements vary in size and are generally isolated and dependent on bush tracks or waterways for access.

Most of the land to be occupied by the project is relatively undeveloped except for that closest to the Ok Tedi Mine, and people largely live subsistence lifestyles. While the Ok Tedi Mine has had significant environmental and social impacts to the land and people downstream of the mine, the level of impact has typically been less in the project area due to its separation from the Ok Tedi.

3.1 TSF development area

The TSF development area is situated primarily within a lowland setting characterised by relatively flat terrain interspersed with shallow undulating valleys. The landform reflects a combination of gently sloping valley floors and low ridges with drainage channels contributing to local geomorphology. The presence of such features influences surface water flow and natural drainage patterns relevant to the design and management of the TSF.

The Ok Tedi is the main watercourse passing the TSF development area; drainage from the TSF will ultimately report to it. The Ok Tedi system (Figure ES.5) has experienced significant hydrological changes due to long-term mining activities such as riverine tailings and waste rock disposal.

Since mining began, the Middle Ok Tedi has experienced widespread aggradation, with a wedge of mine-derived gravel up to 8 m thick accumulating in the 30 km downstream of the Ok Mani confluence (Plate ES.4). The thickness of deposited sediment thins further downstream. Water levels of the Middle Ok Tedi (Plate ES.5 and Plate ES.6) have changed in response to this deposition.

The Lower Ok Tedi extends from Konkonda to D'Albertis Junction, where it joins the Fly River (Plate ES.7). The Lower Ok Tedi has undergone significant morphological and

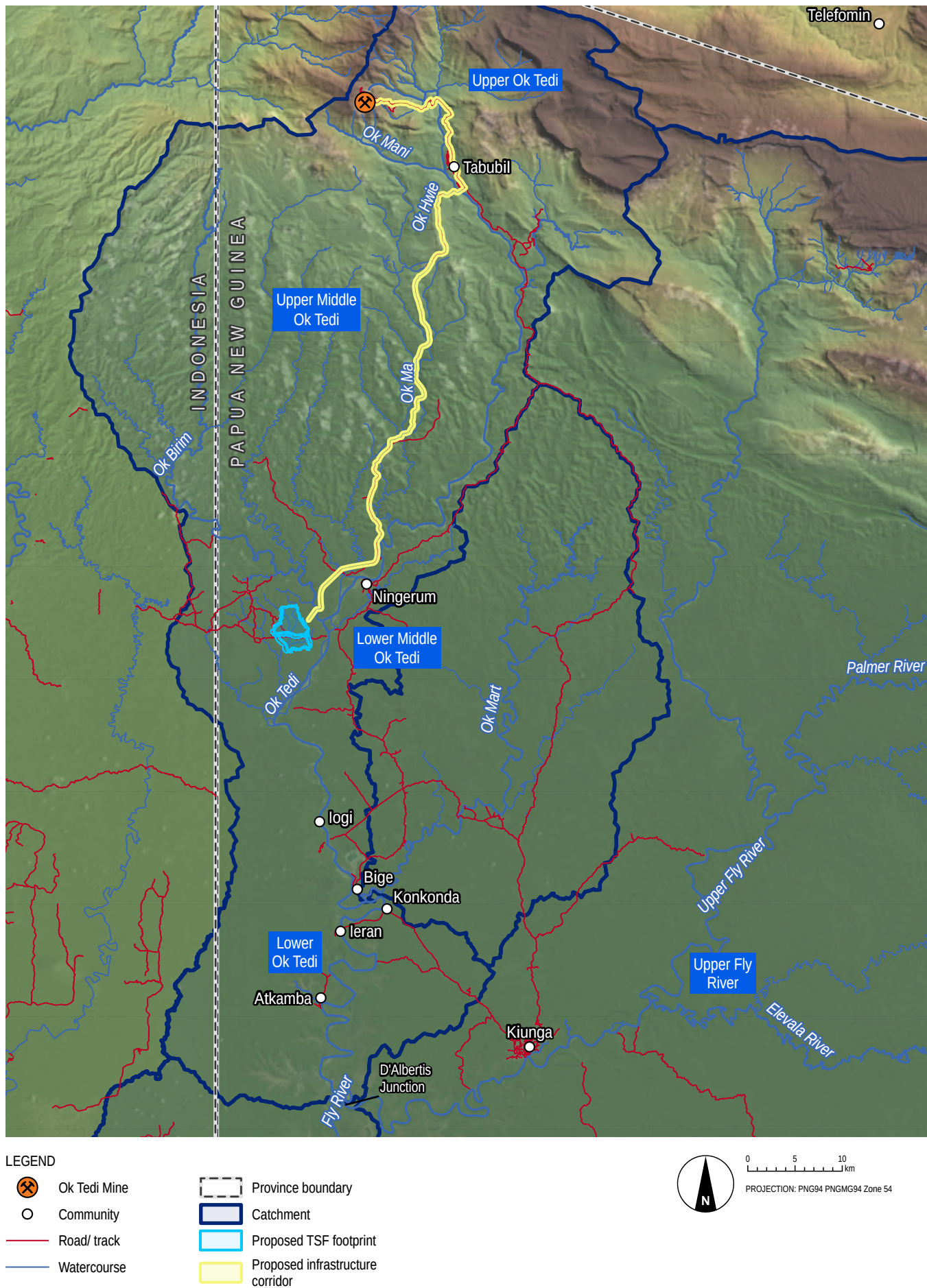


Figure ES.5 Ok Tedi system

hydrological changes in response to mining and subsequent dredging at Bige. Since dredging began, there has been a general trend of bed lowering, with reductions of several metres observed along some of the reach, although some local increases have occurred. Levees that formed during the pre-dredging period due to deposition of mine-derived sediment have largely been maintained or continued to grow, contributing to the isolation of floodplain channels and water bodies.



Plate ES.4 Ok Mani junction with Ok Tedi



Plate ES.5 Ok Tedi bridge



Plate ES.6 Middle Ok Tedi



Plate ES.7 Lower Ok Tedi

While mining at Ok Tedi has had substantial, long-term impacts on downstream floodplain vegetation, resulting in dieback and vegetation community changes, the TSF development area is relatively unaffected by mining activities, with intact and structurally diverse rainforest and swamp habitats and conservation-significant flora and fauna species present.

The terrestrial ecology assessment surveyed flora and fauna at two sites in the TSF development area, and an additional fauna camera trap survey site, supplemented by literature and previous surveys of the Ok Birim and Bige areas. This area exhibits tropical lowland floodplain rainforest dominated by small to medium crowned forest with dense canopy cover, together with patches of swamp woodland characterised by sago palms and other swamp-adapted vegetation species. Sago palm patches within the proposed TSF footprint represent ecologically sensitive habitats with ecological, social and cultural value. The 2025 surveys and local informant interviews identified a range of species (Plate ES.8–ES.10), including 69 species of conservation significance, including flora, bat, mammal, herpetofauna and odonata (dragonfly and damselfly) species listed as Endangered, Vulnerable, Near Threatened or Data Deficient on the IUCN Red List, species listed as protected under the PNG *Fauna (Protection and Control) Act 1966*, and species that are potentially new to science or with uncertain taxonomy (Plate ES.11–ES.14).



Plate ES.8 King bird of paradise (*Cicinnurus regius*)



Plate ES.9 *Nyctimene albiventer*



Plate ES.10 *Hylophorbus* sp.1

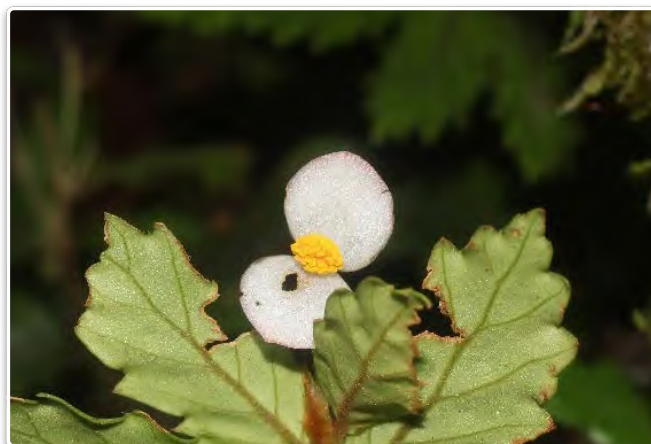


Plate ES.11 *Begonia* sp.1 found in TSF development area, likely new to science



Plate ES.12 *Begonia* sp.2 found in TSF development area, likely new to science



Plate ES.13 Juvenile *Dillenia* sp.1 found in TSF development area, likely new to science



Plate ES.14 *Glochidon* sp.1 found in TSF development area, likely new to science

Mine-derived sediment is not transported or deposited in the TSF development area watercourses but there is mine-derived aggradation at the junction where the Ok Yep meets the Ok Tedi. Across sites in the TSF development area riverine sediment metal concentrations were generally low and water quality was generally good, with most metal concentrations (excluding copper) below guideline values. Water quality monitoring indicated elevated dissolved copper present in several sites. Only one site exhibited elevated metal concentrations and sulfur levels in riverine sediment, located in the Ok Yep, just upstream of the confluence with the Ok Tedi. These elevated levels may be due to backwater effects from the Ok Tedi depositing mineralised sediment into the lower Ok Yep during high flows.

Within the Ok Tedi, existing mining impacts have reduced downstream fish biomass and diversity through riverbed aggradation, sedimentation, elevated suspended sediment

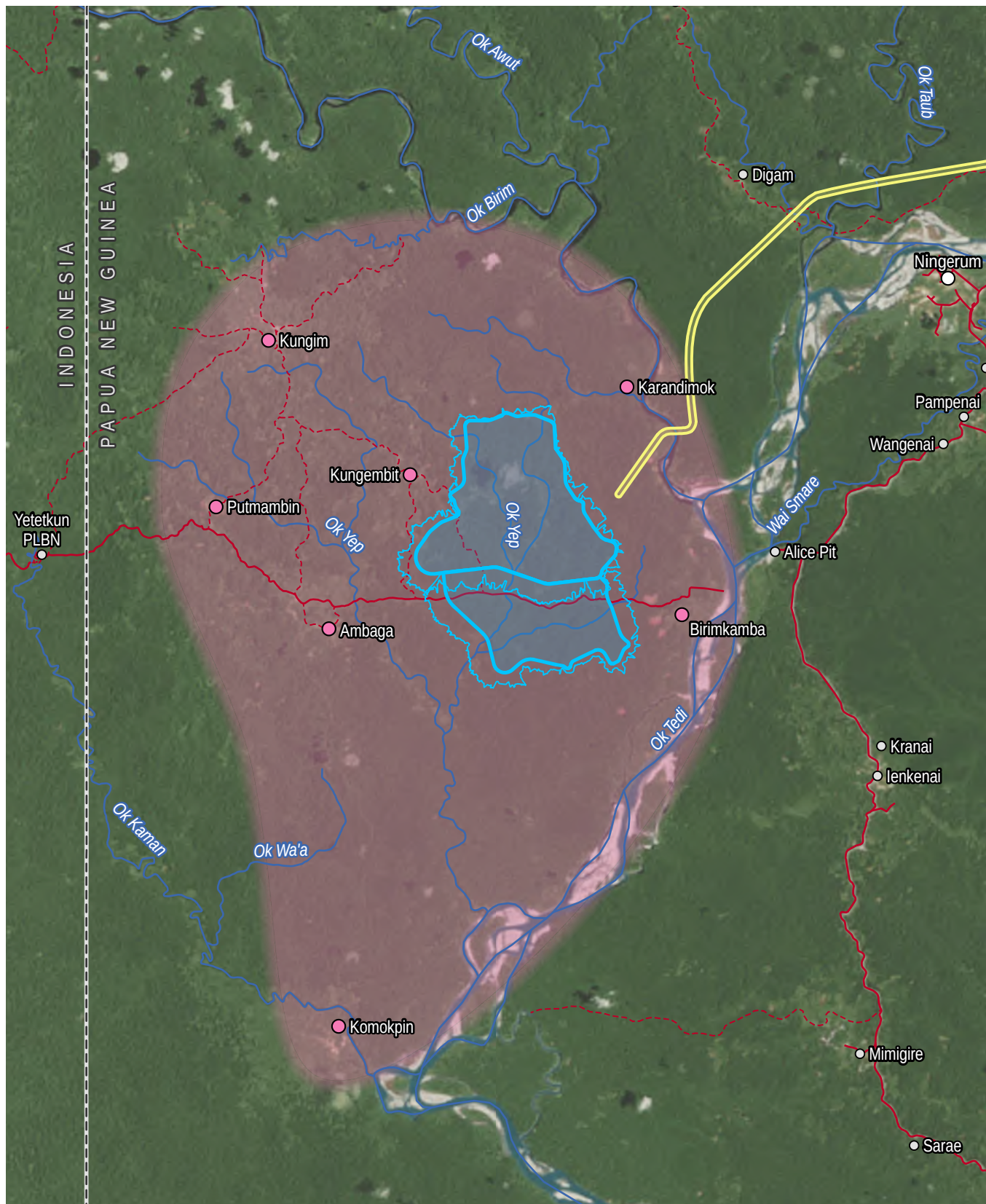
and degraded water quality. Most watercourses in the TSF development area support diverse native fish, macroinvertebrates, aquatic habitats and community resource use, while also providing refuge for species affected by the long-term mining-related impacts in the Ok Tedi. The aquatic ecology assessment surveyed 24 sites in the TSF development area largely across the Ok Yep and its tributaries. These 2025–2026 surveys were supported by historical OTML monitoring and 2014/15 surveys at 11 additional sites. A total of 38 fish species were recorded across the 2014/15 and 2025 surveys, including the endangered Fly River rainbowfish (*Melanotaenia sexlineata*) (Plate ES.15), endangered swamp gudgeon (*Oxyeleotris stagnicola*), and the recently described Kiunga blue-eye (*Kiunga leucozona*) (Plate ES.16) of high conservation importance due to its restricted distribution. Fish tissue analysis found metals generally do not pose human-health risk under realistic fish consumption rates.



Plate ES.15 Fly River Rainbowfish (*Melanotaenia sexlineata*)



Plate ES.16 Kiunga Blue-eye (*Kiunga leucozona*)



LEGEND

- TSF community
- Regional centre
- Study area community
- Road
- - - Track
- Watercourse

- Proposed TSF footprint
- Proposed infrastructure corridor
- Study sub-area
- TSF communities



0 1 2 km
PROJECTION: PNG94 PNGMG94 Zone 54

Figure ES.6 TSF communities

Seven villages are located around the proposed TSF site, the closest of which are Kungembit (Plate ES.17), Birimkamba (Plate ES.18), Karandimok (Plate ES.19) and Ambaga (Figure ES.6). These are generally isolated, with relatively small permanent populations that rely mainly on subsistence livelihood activities (Plate ES.20 and Plate ES.21). TSF communities mainly comprise people from the Yonggom tribe and are connected through family ties. People within the TSF communities also have strong family connections to Indonesian communities, with frequent cross-border movement for marketing, informal trade and visiting family.



Plate ES.17 Aerial view, Kungembit



Plate ES.18 Birimkamba Village



Plate ES.19 Karandimok Village



Plate ES.20 Garden area in Ambaga
(with sago palm in background)



Plate ES.21 Small garden plot in Putmambin

3.2 Pipeline infrastructure corridor

The infrastructure development corridor commences in the mountains and hills then intersects ridges and cuestas south and east from the mine towards Tabubil as well as southwest of Tabubil towards the Ok Ma. Further south near Ningerum, it predominantly intersects relict alluvial plains with low closely spaced ridges and narrow swampy valleys and meander floodplains near major watercourses, such as the Ok Tedi.

The key tributaries of the Ok Tedi within the corridor are the Ok Hwie, Ok Ma and Ok Birim (see Figure ES.5; Plate ES.22). These are perennial watercourses that have largely not been influenced by mining activities. Sediment transport and deposition in these watercourses is determined by natural erosion and sedimentation processes, influenced by flow rates and the morphology of the watercourses. Riverine sediment metal concentrations and sulfur concentrations across these sites were generally low; however, water quality monitoring reflected the underlying geology, with elevated pH and dissolved copper concentrations. The elevated levels are likely due to the Ok Ma's proximity to the naturally mineralised area around Mt Fubilan and the Ok Tedi Mine, rather than due to effects of mining activities.

The terrestrial ecology assessment surveyed flora and fauna at two sites in the infrastructure development corridor, in the foothills between 200 and 460 m above sea level along the Ok Ma. This area comprises intact lowland primary rainforest with dense understory vegetation, including vines and ferns, as well as small forest streams and swampy habitats. The landscape contains a mix of ridges, seasonal streams and varied microhabitats with dry to semi-moist conditions. Some areas also include secondary forest associated with shifting cultivation, sago patches, and limestone karst features, including the Lukwi Karst system. The 2025 surveys and local informant interviews identified 34 species of conservation significance within the infrastructure development corridor, including flora, bat, mammal, herpetofauna and odonata species listed as Endangered, Vulnerable, Near Threatened or Data Deficient on the IUCN Red List, species listed as protected under the PNG Fauna Act, and species that are potentially new to science or with uncertain taxonomy.

The aquatic ecology assessment surveyed 13 sites in the infrastructure development corridor, mostly across Ok Ma and its tributaries. The Ok Birim is characterised by its wider channels and permanent flow; it is well connected to

its tributaries, making it an important refugia and foraging habitat for many fish species. Four sites in the main Ok Birim channel were surveyed and shown to support high fish abundance and species diversity, including species that are depleted from the Ok Tedi system despite having less habitat complexity than the smaller tributaries. One eel-tailed catfish species potentially new to science was identified in the Ok Birim. Similarly, the Ok Ma was also identified as being an important refugia for fish species that are lost from the Ok Tedi. Thirty-six species were recorded in the infrastructure corridor watercourses.

Twenty-one villages are located along the infrastructure corridor (Figure ES.7). These communities are dispersed and generally consist of small bush-material settlements set among gardens, with livelihoods strongly dependent on customary land and natural resources. Subsistence gardening, hunting, fishing, sago harvesting, betel nut sales, and artisanal and small-scale mining are the main sources of food and income. Many people from communities in the broader area have relocated to settlements along the corridor, the Kiunga-Tabubil Highway, or regional centres (e.g. Ningerum or Tabubil) for better access services such as schools, health care, and markets. Access to services remains limited and often requires travel by foot or boat.



Plate ES.22 Ok Birim, near Karandimok Village



LEGEND

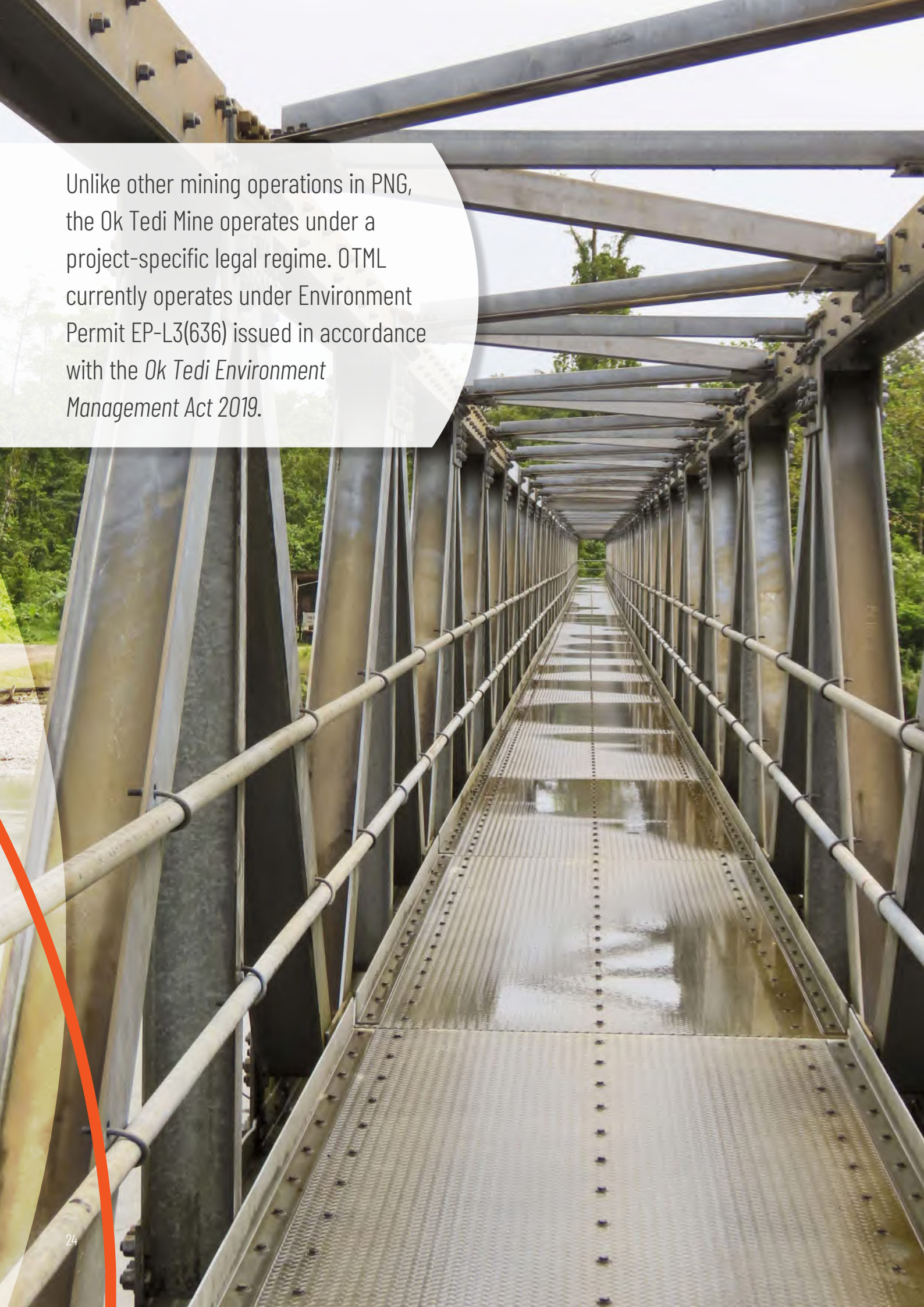
- Ok Tedi Mine
- Infrastructure corridor community
- Regional centre
- Study area community
- Road
- Track
- Watercourse

- Proposed TSF footprint
- Proposed infrastructure corridor
- Study sub-area
- Infrastructure corridor communities



0 5 10 km
PROJECTION: PNG94 PNGMG94 Zone 54

Figure ES.7 Infrastructure corridor communities – Ok Tedi Mine to TSF



Unlike other mining operations in PNG, the Ok Tedi Mine operates under a project-specific legal regime. OTML currently operates under Environment Permit EP-L3(636) issued in accordance with the *Ok Tedi Environment Management Act 2019*.



4. ESIA Process

The scope of this ESIA is restricted to the assessment of potential direct, indirect and cumulative impacts associated with the proposed project (Figure ES.2). The ESIA does not consider existing and ongoing environmental and social impacts of the Ok Tedi Mine, except where these are directly relevant to the project. Similarly, possible future expansions or changes to the mine beyond OTML's currently approved mine life to 2050 (as per the Strategic Business Plan) are outside the scope of this ESIA and will be considered separately under the *Ok Tedi Environment Management Act 2019* (OTEMA) at the appropriate time.

4.1 Regulatory process

Unlike other mining operations in PNG, the Ok Tedi Mine operates under a project-specific legal regime. The *Mining (Ok Tedi Agreement) Act 1976* (Ok Tedi Agreement) and supplemental agreements under this act set the legal foundation for Ok Tedi Mining Limited (OTML) operations, while the OTEMA establishes a standalone environmental management framework tailored to the Ok Tedi Mine. OTML currently operates under Environment Permit EP-L3(636) issued in accordance with OTEMA; this permit requires a major amendment for the project.

The project amendment process under OTEMA involves an environmental impact assessment and submission of an environmental impact statement (i.e., this ESIA). Broadly, the process for this involves:

- Submission of an environmental inception report (EIR) setting out the issues to be covered in the environmental impact statement.
- Submission of an environmental impact statement prepared in accordance with the EIR.
- Assessment of the environmental impact statement by the State of PNG, including public review.
- Decision by the Minister whether to approve the project in principle.
- If approved, granting an amended Environment Permit EP-L3(636) to OTML.

This ESIA fulfils the requirements of an environmental impact statement for assessment purposes. It has been prepared in accordance with OTEMA requirements for assessing environmental and social impacts, as well as to align with the Department of Environment and Conservation (DEC) *Guideline for Conduct of Environmental Impact Assessment and Preparation of Environmental Impact Statement* (DEC 2004).

Separately, a range of approvals and tenements will be issued by the Mineral Resources Authority under the *Mining Act 1992*.

4.2 ESIA structure

This ESIA is presented in four volumes:

- Volume A – Executive Summary (this report). A non-technical summary report, prepared in English and Tok Pisin, that provides a summary of the main findings of the impact assessment.
- Volume B – Main report. A stand-alone document that presents the findings of technical studies, including potential environmental (biophysical), social and cultural heritage impacts of the project, the management measures to be implemented and residual impacts and benefits. The main report is prepared in English only.
- Volume C – Attachments.
- Volume D – Appendices. Technical reports generated to characterise the existing environmental, social and cultural heritage values, and where relevant, assist with identifying the potential impacts of the project. Appendices are in English only. Table ES.1 provides the list of appendices.

Table ES.1 List of technical appendices to the ESIA

Volume D – Appendices		
Appendix	Name	Author
A	Geochemical characterisation results	Environmental Geochemistry International Pty Ltd
B	Hydrology and sediment transport and riverine particulate geochemistry report	Dr G. Pickup
C	Surface water quality report	Environmental Geochemistry International Pty Ltd
D	Groundwater assessment and modelling technical report	KCB Australia Pty Ltd
E	Aquatic ecology technical report	SLR Consulting Australia Pty Ltd
F	Terrestrial biodiversity characterisation report	Ecomate Management Limited and Dr S. Richards
G	Terrestrial biodiversity impact assessment report	F. Crome
H	Air quality assessment and greenhouse gas emissions assessment report	Tetra Tech Inc.
I	Noise assessment technical report	Sonus Pty Ltd
J	Climate change risk assessment report	Tetra Tech Inc.
K	Soils characterisation technical report	KCB Australia Pty Ltd
L	Archaeology and cultural heritage report	Indigenous Heritage Management Consultancy Ltd
M	Social characterisation report	Tetra Tech Coffey Pty Ltd



The ESIA presents the findings of technical studies, including potential environmental and social impacts of the project, the management measures to be implemented and residual impacts and benefits. It is supported by technical studies by international experts, informed by strong PNG participation.

Engagement for the project has been consistent with the principles of a free, prior and informed consent (FPIC) process.





5. Stakeholder engagement

5.1 Overview

Stakeholder engagement is central to OTML's operations. OTML currently conducts formal and informal engagement activities with a wide range of stakeholders, including landowners, affected communities, provincial and national government agencies, employees, contractors, suppliers, and other interest groups. This engagement shares information and updates on OTML's operations, seeks feedback, and responds to stakeholder issues and complaints. Stakeholder engagement activities involve formal communication and consultation meetings, including with men, women and children of villages across the nine Community Mine Continuation Agreement (CMCA) regions and six mine villages, and targeted stakeholder forums.

Stakeholder feedback is captured and managed through OTML's dedicated Complaints and Grievance Management System. The system is managed by OTML's Community Relations team and has been designed to align with the United Nations and International Finance Corporation (IFC) guidelines for resource sector development.

The key objectives guiding stakeholder engagement activities for the project have been to:

- Inform potentially affected communities and other interested stakeholders about the project and its potential impacts.

- Receive input from communities and other stakeholders about the nature and extent to which project-related effects may impact on the physical and social environment.
- Contribute to the continued partnership between OTML and stakeholders, which enables a collaborative approach to maximising the potential social benefits, and minimising potential negative impacts, of the project.
- Meet statutory requirements relevant to the project.

5.2 Principles of engagement

Engagement for the project has been approached in accordance with the following guiding principles, consistent with the principles of a free, prior and informed consent (FPIC) process:

- **Informed consent:** using methods that create effective and meaningful opportunities for engagement; providing consistent and detailed information, accessible to affected peoples and other relevant stakeholders; respects community and individual's privacy and confidentiality, and; applies a time schedule that suits community governance and decision-making processes.
- **Participatory:** engagement will promote informed participation and be supported by timely and accurate information; stakeholders will be provided with sufficient time and resources to provide feedback and input into this process; consultations with community members will be in a way that is appropriate for their customs and practices.
- **Integrity:** engagement will be open, truthful, and transparent to enable all stakeholders to participate in a meaningful way.

- **Inclusiveness:** engagement will be accessible and balanced; reasonable attempts will be made to include stakeholders that may be harder to reach; information will be understandable and readily accessible to stakeholders in culturally appropriate ways so a full range of values and perspectives are included, with specific attention to particular interests and needs of different clans, women and vulnerable groups. Adherence to cultural protocols may necessitate the need for flexibility in engagement schedules and the development of fall-back plans to satisfy the engagement purpose.
- **Respect and collaboration:** stakeholders will be valued and respected; engagement throughout the process will be based on actively listening to, and attempting to understand their human rights and cultural, stakeholder needs, and; being responsive to how stakeholders wish to be engaged considering human rights.
- **Transparency and accountability:** ongoing processes will be established to monitor, evaluate and disclose information, including processes to track and communicate decisions and activities in a reliable, accurate and clear manner. OTML's grievance and complaints mechanism has and will be followed to address stakeholder concerns or issues.
- **Independent:** the engagement related to the ESIA has been conducted in an independent and impartial manner, free of political or stakeholder bias.

5.3 Consultation activities

Stakeholder engagement for the ESIA has been planned around four key phases:

- Project initiation and awareness.
- Information gathering and impact assessment.
- Pre-submission ESIA roadshow.
- Environmental impact statement (EIS) disclosure in accordance with the requirements of the *Ok Tedi Environment Management Act 2019* (OTEMA). This ESIA fulfils the requirements of an EIS under OTEMA.

The first three phases informed this ESIA, with EIS disclosure to be conducted following submission of the ESIA to the Conservation and Environment Protection Authority (CEPA).

The following sections provide an overview of engagement activities for each phase. Figure ES.8 shows the engagement locations.

Project initiation and awareness

A roadshow was conducted in May and June 2025 in the villages near the TSF, Ningerum, and Kiunga. The purpose of the roadshow was to inform communities and other stakeholders about the project, the EIS process and upcoming fieldwork and engagement activities, including:

- Details of the project, particularly the TSF and infrastructure corridor.
- Explain the EIS process under OTEMA, including key milestones and timelines, including CEPA's role in the process.
- Describe the environmental and social studies being conducted for the ESIA.
- Receive feedback from communities and stakeholders to ask questions and raise initial concerns about the project and its potential impacts and provide feedback on issues for consideration in the ESIA.
- Explain how local people can raise concerns and grievances with OTML regarding the project.

Feedback was also sought on stakeholders to be engaged and community preferences for engagement to inform future engagement for the project.

Stakeholder groups targeted for this phase included:

- Affected landowners and communities from villages near the proposed TSF site, including Birimkamba, Putmambin, Karandimok, Kungembit, Ambaga and Kungim.
- Government representatives from the North Fly District, and Ningerum Rural Local Level Government.
- Non-governmental organisations such as the Ok Tedi Development Foundation and Montfort Catholic Diocese.

Engagement was conducted through community focus group discussions, male focus group discussions, female focus group discussions, and key informant interviews.

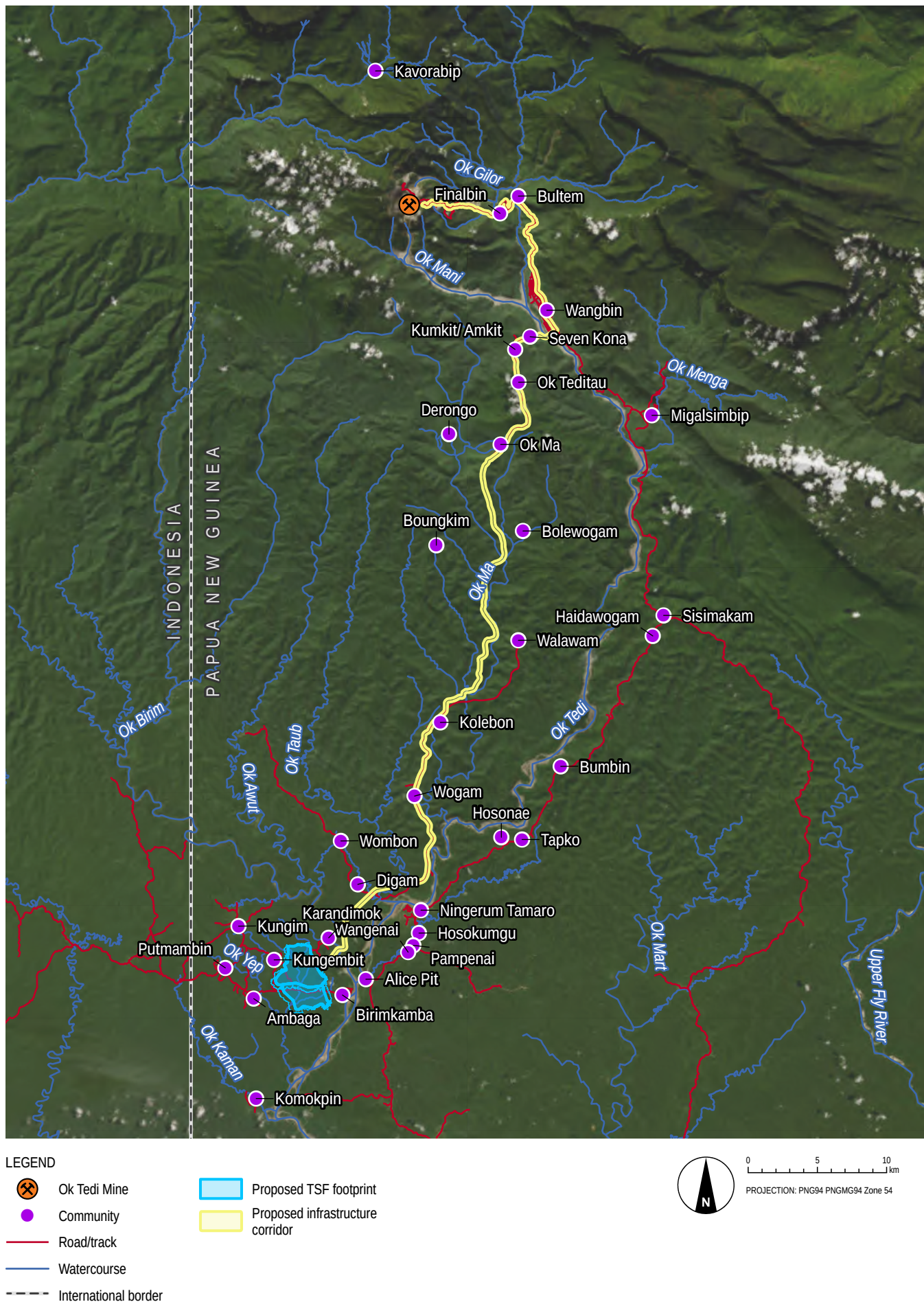


Figure ES.8 Communities engaged with during ESIA process

Information gathering and impact assessment

The purpose of this phase was to share information about the project and ESIA activities, and to gather information from project affected communities and other stakeholders on existing environmental and social conditions, and feedback on perceived impacts and benefits of the project. Engagement for this phase was conducted by OTML, Tetra Tech Coffey, and technical specialists during fieldwork.

As part of this phase, engagement was conducted through fieldwork for several technical investigations:

- Aquatic ecology (2025).
- Terrestrial ecology (2025 and 2026).
- Archaeology and cultural heritage (2025).
- Social studies, including social characterisation, social impact assessment, resource use assessment, and human rights impact assessment (2025 and 2026).

Engagements for social studies were conducted by the OTML Community Relations and Sustainability Department and Tetra Tech Coffey. Stakeholders targeted for this round included:

- Affected landowners and communities from the TSF villages, including Ambaga, Birimkamba, Karandimok, Komokpin, Kungembit, Kungim, Putmambin, and Buseki people.
- Affected landowners and communities along the construction haulage corridor from Tabubil to Alice Pit including Alice Pit, Ningerum which had representatives from Bumbin, Hiorinkia, Hosokumgu, Hosonae, Pampenai, Tapko and Wangenai, Wurimkanatko, Walawam, Haidawogam and Sisimakam
- Affected landowners and communities from villages along the tailings pipeline route, including Kumkit and Ankit. Ok Teditau, Bounkim, Wombon at Ok Ma settlement, Digam, Ningerum Tamaro and Wombon at Ningerum and Bolewogam and Wogam (see Figure ES.8).

Engagement methods used in this phase included:

- Meetings with community leaders from villages near the proposed TSF site, villages along the construction haulage corridor and tailings pipeline route.
- Community focus group discussions, including separate discussions with males and females.

- Key informant interviews with key stakeholders, such as community service providers.
- Written community updates (Toksava and Komuniti Nius).
- Written requests for information.

Pre-submission ESIA roadshow

As part of stakeholder engagement for the EIS process and to support free, prior and informed consent, a pre-submission roadshow was completed in April and May 2026. The roadshow was undertaken to inform communities and stakeholders of the EIS process and project progress, present the draft ESIA results of the completed environmental and social studies, and summarise the engagement activities undertaken, prior to the submission of the final ESIA report to CEPA.

The roadshow presentation was conducted across all village communities near the TSF and tailings pipeline corridor, including key community leaders and LLG representatives. This engagement roadshow was expanded to include the Seven Kona communities of Kumkit, Ankit, and Ok Ma, together with leaders and representatives from the six mine villages, representing two additional stakeholder groups included in this round of engagement.

The engagement was completed in each community through slideshow and poster presentations, and provided stakeholders with opportunities to provide feedback and seek clarification on concerns regarding the project and the ESIA results. The engagement was delivered by members of Tetra Tech Coffey's PNG team and delivered in Tok Pisin and English, with translation to Tok Ples by community leaders where required. OTML also attended.

The roadshow engagement included the following stakeholder groups:

- Communities from the TSF villages, including Ambaga, Birimkamba, Karandimok, Komokpin, Kungembit, Kungim, Putmambin, and Buseki people.
- Affected landowners and communities along the construction haulage corridor from Tabubil to Alice Pit including Alice Pit, Ningerum Tamaro, Bumbin, Wombon, Digam, Bolewogam and Kolebon.

- Affected landowners and communities from villages along the infrastructure corridor, including communities from Ok Ma settlement which included representatives from the communities of Kumkit, Ankit, Ok Teditau, Boungkim, Nioksikwi and Derongo.
- Leaders and representatives of the six mine villages at Tabubil, and the seven Kona communities of Kumkit and Ankit, Ok Ma and nearby communities – representing two additional stakeholder groups identified and included in this round of engagement.

Walawam communities, along with the Kiunga Rural, Kiunga Urban and the Star Mountain LLG Ward representatives were not a part of this round of engagement.

5.4 Results of consultation

The issues raised throughout the ESIA stakeholder engagement activities varied while reflecting a consistent set themes, concerns and expectations that emerged across the different communities, reflecting differences in proximity to proposed project activities or infrastructure, among the TSF and pipeline-affected communities, local institutions and key government stakeholders. The principal issues raised related to land access and livelihood, security, resettlement uncertainty, environmental protection, fairness and compensation, access to social services, safety and security and expectations for economic development.

A major outcome of the engagement process was the clear expectation that the project should deliver tangible benefits, including improved infrastructure, employment, training, housing, roads, and access to health, education, and policing services. These expectations were accompanied by repeated calls for transparent negotiations, fair compensation, and inclusive decision-making, particularly for landowners and communities that may be indirectly affected.

Stakeholders also expressed concern about in-migration, law and order, border security, and the potential for social disruption associated with increased movement into project-affected areas, particularly along the pipeline corridor and near the Indonesian border in connection with the ITCS Road.



Key themes emerging from engagement related to the ESIA include:

- Environmental impacts: participants expressed concern about a range of potential environmental effects associated with the project, including dust emissions, odour, changes to water quality, impacts on river health, soil degradation, biodiversity loss, and flooding. There was also strong interest in the long-term rehabilitation of disturbed areas, with communities wanting assurance that impacted land and water systems would be properly restored and managed over time.
- Social impacts: communities identified possible social and health implications arising from environmental degradation and related project activities. In particular, there were concerns that changes to air quality and water quality could negatively affect community wellbeing and overall quality of life.
- Management of impacts: a recurring theme from the engagement process was the need for strong, ongoing monitoring and clear management measures across all stages of the project, including construction, operation, and closure. Communities emphasised that potential impacts should be carefully managed, transparently reported, and addressed in a timely manner to reduce risk and maintain the community's confidence in the project's operation.

While many issues were raised regarding benefits and compensation arrangements for the impacted landowners and communities, these matters fall outside the scope for the ESIA process and therefore were not addressed through ESIA-related stakeholder engagement activities.

Overall, the feedback received through the engagement process indicated that communities are not opposed to development. Rather, they expect it to be implemented in a fair, transparent, inclusive, and responsible manner that recognises local concerns and adequately manages environmental and social impacts.

5.5 Ongoing consultation

Public disclosure of the ESIA (EIS disclosure) will be conducted in accordance with the requirements of OTEMA. OTML and Tetra Tech Coffey will conduct EIS disclosure in conjunction with CEPA and the Mineral Resources Authority. This process will include:

- Presenting the ESIA to national and provincial governments in Port Moresby and Kiunga.
- Presenting the ESIA to project affected communities within the project area, in Ningerum and Tabubil by an EIS roadshow (in Tok Pisin, English and local language as necessary via a translator).

The purpose of this phase is to present findings from this ESIA and address issues previously raised by project affected communities and other stakeholders. In particular, it will seek to:

- Present the information contained in this ESIA.
- Summarise the issues and concerns raised in previous engagement.
- Inform the community about how these issues have been considered and the management measures developed to address these concerns.

CEPA will determine the timing for the EIS roadshow in conjunction with OTML. It is expected to occur between three and six months following the submission of the ESIA to CEPA.

Additional engagement with project affected communities and other stakeholders is ongoing and will include:

- Project updates and stakeholder briefings to provide information on key project decisions and milestones.
- Engagement with customary landowners of land directly impacted by the project, to provide information on landowner compensation.

Should the project proceed, engagement will be conducted during the construction phase to provide information on construction activities, potential impacts and proposed management measures. This engagement will then continue throughout the life of the project, including leading up to, during and after closure.

5.6 Grievance and complaints management

OTML maintains an established grievance and complaints management system that provides structured procedures for recording, managing, and resolving stakeholder concerns, with the aim of addressing potential social impacts and ensuring transparency and accountability in line with corporate policies.

Grievances relating to the project and EIS process will be managed through OTML's existing grievance management process for the Ok Tedi Mine.





Development of the TSF will lead to a direct reduction in riverine tailings disposal, minimising and mitigating impacts of continued mining operations on the downstream environment. Despite the benefits of the project, material environmental and socio-economic adverse impacts during construction, operation and closure of the project are unavoidable, particularly in the TSF development area.



6. Predicted physical, biological and socio-economic benefits and impacts

The Ok Tedi Mine's projected increased production will result in greater volumes of mine waste, placing additional stress on the river system. Consequently, efforts to reduce the amount of sediment discharged into the river, including via tailings management, are particularly important to mitigate environmental impacts. OTML proposes a significant new mitigation measure, construction of the TSF, to limit the downriver impacts of the Ok Tedi Mine. Development of the TSF will lead to a direct reduction in riverine tailings disposal at the mine's current and proposed material movement rates, minimising and mitigating impacts of continued mining operations on the downstream environment. This action is consistent with the IFC Performance Standard mitigation hierarchy and OTML's obligation under OTEMA to *"progressively reduce or mitigate the impact of harmful effects on the environment as such reductions and mitigation become practicable through technology and economic developments."*

Despite the benefits of the project, material environmental and socio-economic adverse impacts during construction, operation and closure of the project are unavoidable. The application of mitigation measures will limit these impacts.

The EIS was scoped to address the physical, biological and socio-economic issues described in the EIR, the findings of which are described below.

6.1 Benefits

Largely eliminating riverine tailings disposal at the mine will generate a broad range of positive environmental and social effects and opportunities. It represents a significant opportunity to enhance the mine's environmental and social outcomes while contributing positively to the mine's legacy as a responsible and sustainable mining operation.

The project provides a sustainable method of tailings disposal to support mining to continue to 2050, with the associated economic benefits the operation of the mine provides. This includes continued contribution of the mine to provincial and national wealth, particularly from ongoing royalties, dividends and taxes.

Key benefits at various levels are expected to include:

- National level – Aligns with PNG's commitments to sustainable development and responsible mining practices to encourage the continued investment of mining projects within the country.
- Regional level – Reduces downstream environmental impacts on the river system upon which downstream communities rely.
- Local level – Contributes to addressing long-standing environmental concerns.

Environmental benefits

The development of the proposed TSF will lead to a direct reduction in riverine tailings disposal at the mine's current and proposed material movement rates. This is intended to significantly reduce current levels of silt discharged to the river and contribute to indirect environmental benefits, such as an earlier onset in the reduction in current levels of riverbed aggradation, and potential improved aquatic and terrestrial habitat and ecosystem health.

Social benefits

Potential indirect social benefits and positive impacts from the project include:

- Continued financial benefits such as taxes, fees, dividends and compensation payments from the mine (and associated flow-on effects), potentially up to 2050.
- Indirect stimulation of local and regional economies through construction activity.
- Improved access to essential services (e.g., education and health care) from the construction of new road infrastructure for the project, including new river crossings; and opportunities of roads and bridges to be transferred for community use upon closure of the TSF.

These benefits are further outlined in relevant sections below.

6.2 Terrestrial environment

Soils and landforms

Landform changes include alterations to the natural shape and features of the terrain through excavation, filling, and construction activities, which may modify surface water flow, increase erosion potential, and influence future land use. Construction of the TSF will permanently alter the landform, with a 1,500 ha, 30-m-high final landform expected at closure.

Physical disturbance of soils and landforms will be caused by land clearance and bulk earthworks, such as for the construction of the TSF development area (TSF impoundment footprint, hydro-cyclone house, laydown area and associated ancillary infrastructure) and infrastructure corridor development area (proposed access roads, bridge and

water crossings, tailings pipeline and supporting facilities outside the TSF development area). If not appropriately managed, physical disturbance exposes soils increasing their susceptibility to erosion and compaction, which can reduce soil capacity to support vegetation growth. Physical disturbance can destabilise landforms, which can lead to erosion and slope failure. Physical disturbance impacts are expected to be greatest when ground disturbance is at its peak during the construction phase.

Changes to physical properties of soils may occur through soil compaction, and modification of structure through poor management of soil stockpiles. The construction of project infrastructure will lead to soil compaction throughout the project area. The physical properties of the soil will change when compacted, making it difficult for naturally occurring vegetation to successfully re-establish during the rehabilitation phase of the project. Chemical impacts, which may occur due to seepage or soil contamination, can degrade soil quality and compromise soil function, limiting its ability to sustain vegetation. Potential impacts resulting from contamination to soils will be greatest during operations, and without appropriate management, may extend into closure.

Management measures will aim to minimise disturbance areas, manage erosion, minimise soil compaction and soil contamination, and provide for appropriate use of soils for rehabilitation. Residual impacts are predominantly associated with alteration of high-sensitivity ridgeline landforms within the TSF development area. Residual impacts on landform stability and soil capacity are generally expected to be localised with progressive rehabilitation supporting long-term stabilisation of disturbed areas.

Groundwater

Potential groundwater impacts are predominantly associated with operation of the TSF, due to changes in groundwater flow and levels, and contamination. Potential groundwater impacts during construction are related to excavation and earthworks for TSF embankments, works along the infrastructure corridor and starter dam construction, trenching and pipeline installation along the infrastructure corridor, land clearance and loss of vegetation, and contamination due to spills and leaks or mobilisation of existing contaminants.

Potential impacts to groundwater quantity include localised changes to groundwater recharge, flow paths, groundwater levels and discharge to surface water systems. During operations, seepage from the TSF is predicted to create a localised groundwater mound beneath and adjacent to the facility, increasing groundwater levels and groundwater discharge to nearby drainage lines. Figure ES.9 shows the predicted surface expressions of seepage around the TSF. Groundwater modelling indicates that these changes will be largely confined to the area surrounding the TSF and are not expected to affect village groundwater supplies.

Seepage or leakage from stored water, tailings pore water or decant water at the TSF may interact with groundwater. TSF seepage is expected to increase salinity and potentially contain heavy metals. Seepage will commence during operation following placement of tailings in the TSF and is expected to continue post-closure. Groundwater modelling predicts that elevated concentrations of dissolved salts, sulfate and some metals may occur in groundwater immediately surrounding the TSF and along local groundwater flow pathways (Figure ES.10). Predicted impacts are expected to decrease with distance from the TSF due to dilution and dispersion, with modelling indicating negligible impacts at village groundwater receptors and no exceedances of relevant drinking water guidelines for any element including copper or arsenic at village locations.

Management measures include TSF design features to minimise and intercept seepage, groundwater monitoring, diversion of clean water away from disturbed areas, spill prevention and containment systems, emergency response procedures and contamination management. OTML will implement a groundwater monitoring program throughout construction and operations.

Following implementation of these measures, residual impacts related to groundwater level increases, localised seepage expression, increased baseflow to nearby drainage lines, and changes to groundwater quality in the vicinity of the TSF are expected to remain localised and not affect villages. Some seepage-related impacts are predicted to continue beyond closure and will be managed through ongoing monitoring and closure measures.



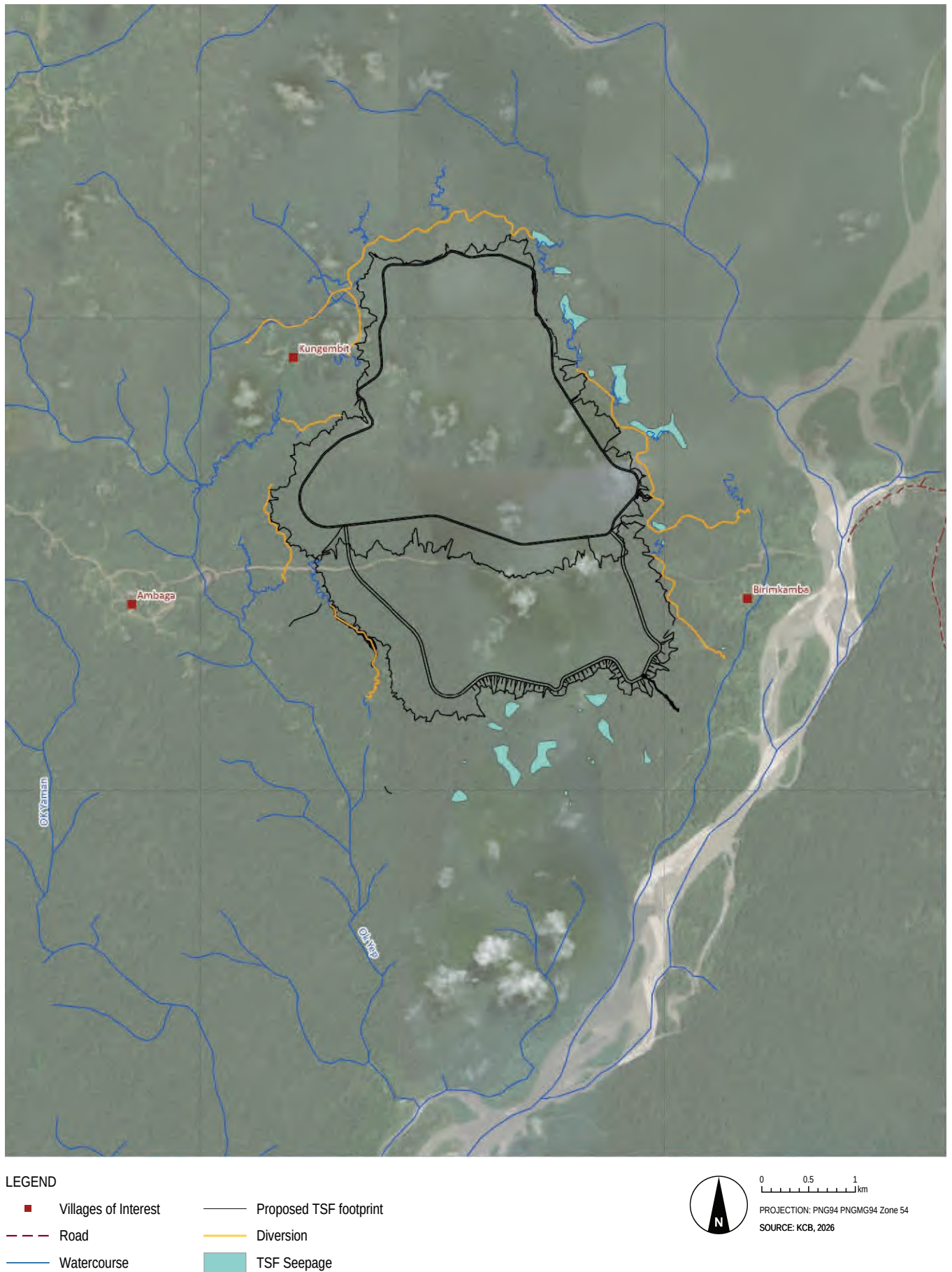
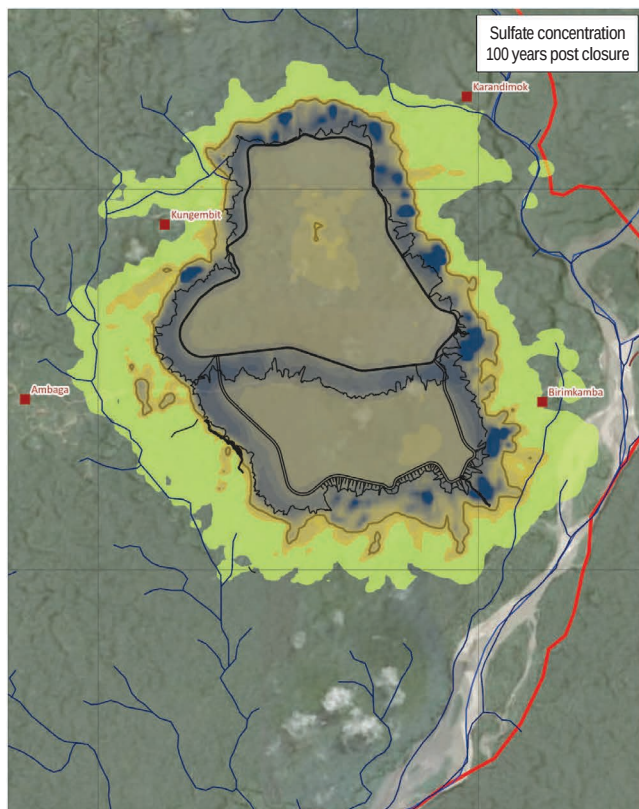
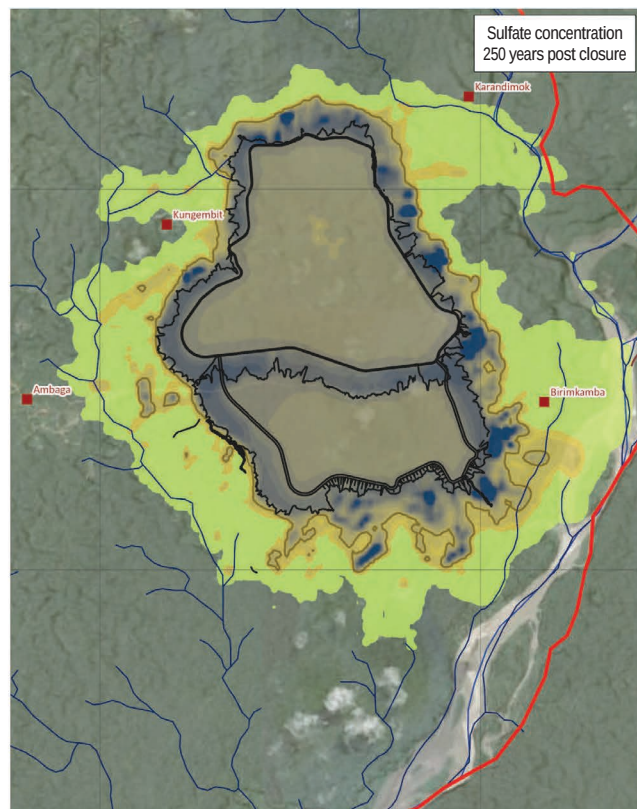
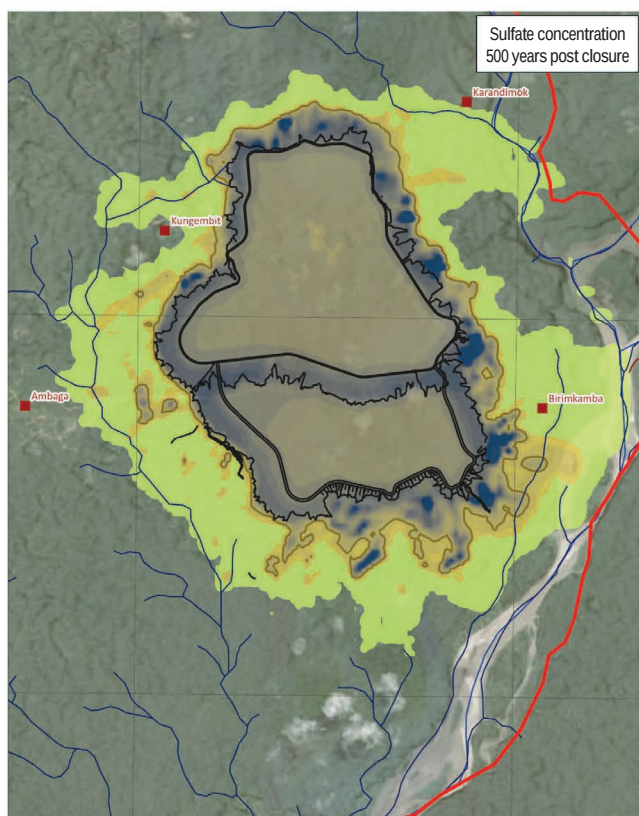
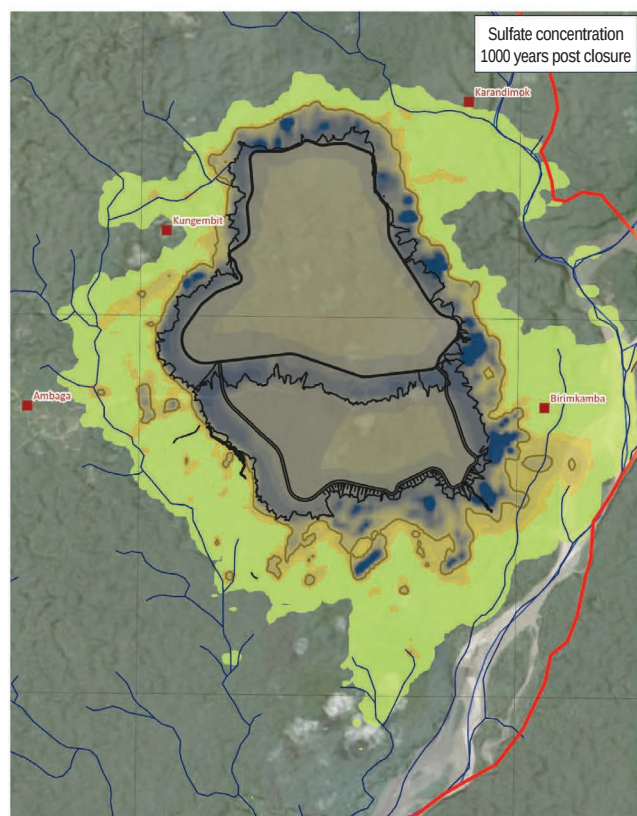


Figure ES.9 Predicted surface expressions of seepage



LEGEND

■ Villages of Interest	— Contour (250 mg/L)	 250 - 500	 1,500 - 1,750
— Stream	Sulfate Concentration	 500 - 750	 1,750 - 2,000
— Watercourse	 0.5 - 50	 750 - 1,000	 2,000 - 2,250
— Proposed TSF footprint	 50 - 100	 1,000 - 1,250	 2,250 - 2,500
 Model Domain	 100 - 250	 1,250 - 1,500	 > 2,500



0 1 2 km
PROJECTION: PNG94 PNGMG94 Zone 54
SOURCE: KCB, 2026

Figure ES.10 Sulfate concentrations post-closure

Terrestrial ecology

The project will result in the clearing and disturbance of approximately 1,980 ha of land for the TSF, infrastructure corridor, access roads and associated facilities. Potential impacts to terrestrial biodiversity include habitat loss and fragmentation, edge effects, disturbance to streams and riparian habitats, erosion and sedimentation, contamination, fauna disturbance and mortality, impacts on caves and cave fauna, and indirect impacts associated with increased access, hunting pressure, invasive species and human activity.

The assessment identified a range of biodiversity values within the project area, including lowland forest habitats, streams and riparian vegetation, caves, threatened species, species potentially new to science, and species of cultural and conservation significance. While direct habitat loss will occur within the project footprint, most affected habitats are widespread within the region and management measures have been developed to minimise disturbance, protect sensitive habitats, manage erosion and sedimentation, control invasive species, restrict hunting by project personnel, and support rehabilitation and revegetation.

Combined with continued dredging at Bige, reducing riverine tailings disposal is expected to substantially reduce ongoing sediment-related impacts to the Ok Tedi and Fly River floodplains. Modelling indicates that long-term recovery of floodplain vegetation and habitats could exceed the habitat losses associated with project construction, resulting in a net positive biodiversity outcome. Predicted habitat recovery ranges from approximately 3,700 ha to 9,000 ha, compared with an estimated disturbance footprint equivalent to 1,722 habitat hectares. Most of this comprises low altitude forest on uplands, with 1,563 ha to be removed.

Residual impacts on streams and riparian habitats are assessed as moderate, while impacts on caves are generally low to moderate due to avoidance of known cave systems and implementation of protection measures. Residual impacts on some fauna species remain moderate to high, primarily due to indirect risks associated with increased access and hunting pressure. Conversely, many threatened plant species, several species potentially new to science, and lowland forest habitats are predicted to experience positive residual outcomes as a result of floodplain recovery, habitat rehabilitation and revegetation initiatives.

Overall, the project is predicted to deliver a net positive biodiversity outcome, with long-term ecological benefits associated with reduced floodplain dieback and habitat recovery outweighing the direct habitat losses within the project footprint. Ongoing monitoring and implementation of a Biodiversity Action Plan will be undertaken to verify recovery outcomes and support adaptive management throughout the life of the project.

Air quality

Emissions from linear construction activities such as works along the infrastructure corridor and access roads will be transient in nature and localised impacts are expected to be short-term. Construction is expected to result in localised emissions of particulate matter and combustion products. Emission intensity will peak during the construction phase when earthworks, trenching, clearing and blasting (if required) generate the most fugitive dust and use of heavy equipment and transport of personnel and material is at its peak. Construction-phase air quality impacts are primarily associated with fugitive dust emissions.

Management measures will include dust suppression during extended dry periods, vehicle speed controls, progressive rehabilitation, minimisation of exposed disturbed areas, stockpile management, maintenance of vehicles and equipment, and controls on high dust-generating activities closest to villages during dry weather conditions. Following implementation of these measures, residual air quality impacts are expected to be temporary and localised at the nearest sensitive receptors (Figure ES.11). Predicted particulate matter concentrations are expected to remain below adopted project air quality goals. During operations, particulate matter impacts are expected to be low, while NO_x emissions from diesel-powered electricity generation will remain the primary long-term air quality impact, although predicted concentrations are expected to remain below relevant international reference values.

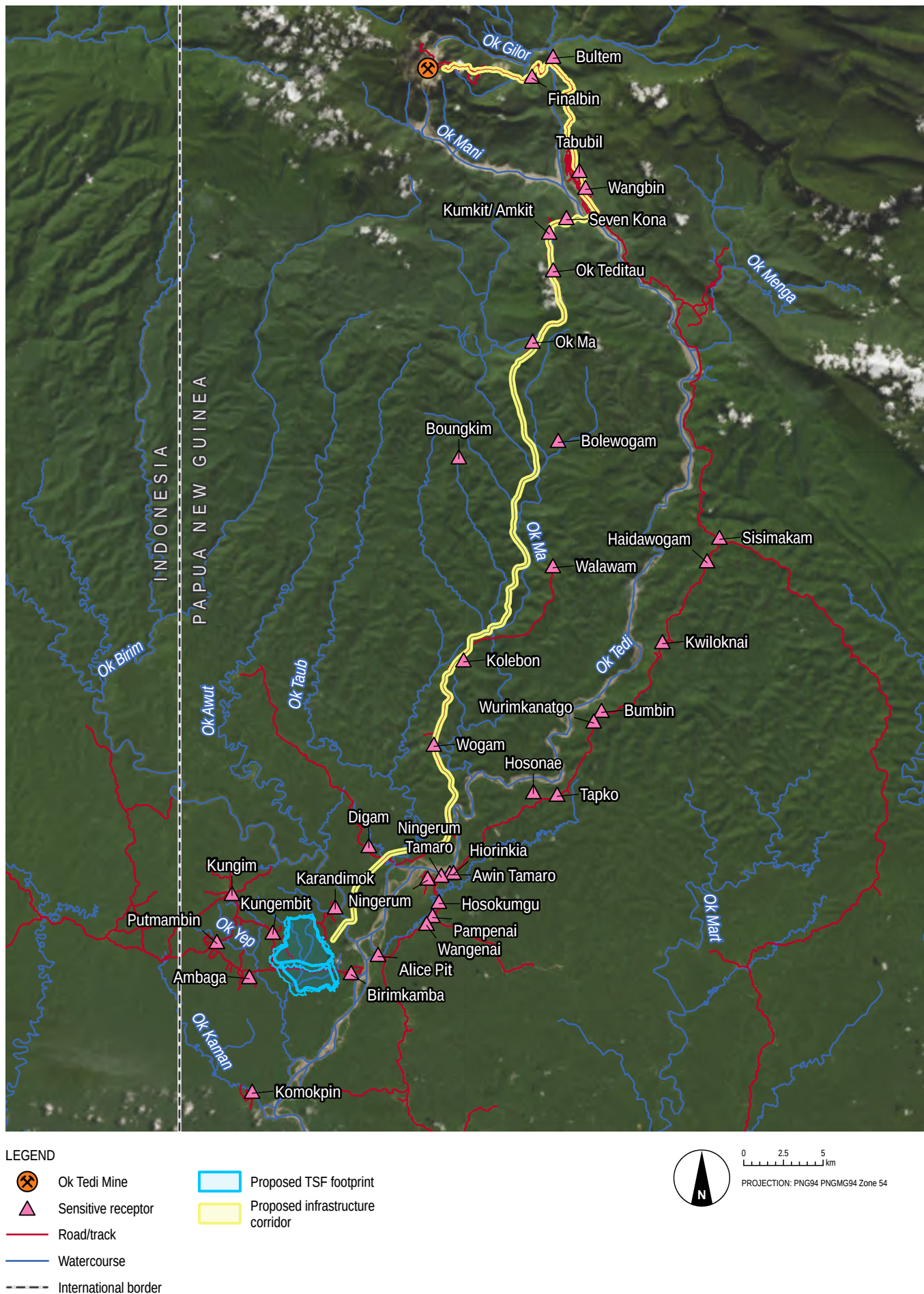


Figure ES.11 Air quality, noise and vibration sensitive receptors



Greenhouse Gases (GHG)

Scope 1 emissions during the construction phase include carbon stock loss due to vegetation clearance, diesel and fuel combustion associated with generator usage, transport activities associated with heavy machinery and mobile equipment, trucks movements, and civil works, emissions from blasting explosives, and on-site concrete batching emissions. Scope 1 emissions during the 20-year operations phase are expected to be primarily sourced from the diesel combustion in on-site generators, and fuel combustion in operational mobile fleet and maintenance heavy equipment. Scope 2 emissions are expected to be limited to mine power supply to operate the tailings pipeline.

Total Scope 1 GHG construction emissions are estimated at 1,031,020 t CO₂e, comprising 30,670 t CO₂e from mobile and stationary combustion sources and 1,000,350 t CO₂e from total carbon stock loss due to vegetation clearing. During the operational phase, a total of 44,793 t CO₂e per year is estimated to be emitted from mobile and stationary combustion sources. The main sources of GHG emissions are from mobile and stationary diesel fuel combustion and land clearance within the project site. While GHG emissions are substantial in absolute terms, they are consistent with the scale and nature of a long-life mining infrastructure project and have been quantified using internationally recognised methods. Overall, the project's estimated annual average Scope 1 GHG emissions of 44,793 t CO₂e during operations represent approximately 0.42% of PNG's 2024 national emissions (EDGAR 2025). This indicates the project is expected to result in a relatively minor contribution to PNG's national emissions during operations.

Noise and vibration

During construction, noise will be generated by heavy earthmoving plant for TSF embankment works (excavators, dozers, compactors) and pipeline construction (trenching, pipe stringing), the use of haul trucks, deliveries and construction traffic on access roads, and from diesel generators and site power. Construction traffic associated with the transport of borrow fill, materials, equipment and personnel will also contribute to noise levels. Potential impacts will be greatest where construction activities occur in proximity to the nearest villages and settlements (see Figure ES.11), where temporary

increases in ambient noise levels may affect community amenity, disrupt daily activities, and contribute to nuisance, sleep disturbance and stress. Elevated noise levels may also affect fauna behaviour and habitat use in areas close to active works.

Construction activities generally will be limited to between the hours of 7:00am to 10:00pm. Daytime construction noise will not be assessed against a fixed criterion as the works are temporary and the ability to attenuate construction noise is often more limited than during the operations phase. Instead, reasonable and practicable management measures will be applied. Noise modelling indicates that construction activities within both the TSF development area and infrastructure corridor are expected to comply with the adopted project noise goals following implementation of management measures. Construction traffic noise is generally predicted to be negligible in the context of existing traffic levels and background noise conditions.

Drilling and controlled blasting may be required in early works where competent rock is encountered, and such activities would generate ground vibration and air-blast emissions that may impact sensitive receptors. Blasting will be undertaken in accordance with current OTML practices and good international industry practice, with management measures implemented to minimise impacts on sensitive receptors.

During operations, key noise sources will include operation of the hydro-cyclone house, mobile decant pumps, tailings placement and compaction equipment, on-site power generation, and maintenance activities. Noise modelling indicates that operational noise levels are expected to comply with adopted daytime goals at all sensitive receptors. Predicted night-time noise levels may exceed the adopted goals at the nearest receptor in Kungembit when tailings placement and embankment raising activities occur within approximately 1,500 m of the village. These impacts are expected to be localised, temporary and managed through implementation of operational noise controls.

6.3 Aquatic environment

Physical riverine environment

The TSF is predicted to result in substantial long-term improvements to the mine-affected physical riverine environment by significantly reducing mine-derived tailings inputs to the Ok Tedi and Fly River systems. Key physical riverine processes where the TSF is predicted to positively influence river system behaviour include:

- Changes in Ok Tedi water levels: Historical riverine tailings and waste rock disposal has altered downstream flow dynamics and the natural functioning of the river systems. The TSF is predicted to contribute to gradual reductions in water levels in the Lower Ok Tedi, with progressively smaller changes further downstream and minimal change beyond Mabaduam and into the central and lower Middle Fly.
- Sediment loading and transport: Sediment loads strongly influence river morphology, bank stability and downstream aquatic habitat processes. The TSF is expected to substantially reduce downstream delivery of tailings-derived sand and silt, leading to long-term reductions in suspended sediment loads and downstream sediment accumulation.
- Sediment deposition in river channels, floodplains and ORWBs: Reduced sediment loads are predicted to decrease riverbed aggradation, floodplain sediment deposition and the frequency and extent of overbank flooding in some reaches. However, historical sediment already stored within the river system and floodplains will continue to influence sedimentation processes for decades.
- Floodplain and levee processes: Historical aggradation in the Lower Ok Tedi and Middle Fly has increased the frequency and duration of floodplain inundation and contributed to tie-channel blockage and levee growth. While levee growth is expected to continue, the rate of aggradation and floodplain sediment accumulation is predicted to reduce progressively over the long term with the TSF.

- **Riverine particulate geochemistry:** Historical riverine disposal of sulfide-bearing tailings and waste rock has resulted in elevated concentrations of particulate copper and sulfur within sediments of the Ok Tedi and Fly River systems. Although significant improvements have occurred through removal of PCon and the addition of limestone to the mill feed, mine-derived sediments remain an ongoing source of particulate-associated contaminants. The TSF is predicted to provide substantial long-term improvement to downstream riverine particulate geochemistry through a significant reduction in particulate copper and sulfur discharged to the river system, a significant increase in acid neutralising capacity and a corresponding substantially lower long-term acid generation risk.

Construction of the access road, tailings pipeline, bridges and watercourse crossings will disturb soils, alter local drainage patterns and increase erosion and sediment transport, particularly in steep terrain and near relatively undisturbed watercourses such as the Ok Birim and Ok Taub. Localised increases in turbidity, suspended sediment concentrations and sediment deposition are expected downstream of active work areas. During operations, impacts are expected to reduce substantially but ongoing use and maintenance of roads, crossings and associated infrastructure may continue to generate localised erosion, sediment runoff and water quality impacts in adjacent drainage lines and waterways.

Within the TSF development area extensive earthworks, vegetation clearing, drainage diversions and construction of the TSF and associated infrastructure will result in major adverse impacts to local drainage and hydrology, sediment transport and surface water quality. Permanent modification of drainage pathways within the eastern branch of the Ok Yep catchment will occur, together with localised increases in erosion, sedimentation, turbidity and suspended solids. During operations, major adverse impacts to drainage and hydrology will persist due to the permanent presence of the TSF, diversion structures and altered surface water connectivity. Moderate adverse impacts to sediment transport and water quality are also predicted from ongoing discharges of project-affected water and TSF decant water, although these impacts are expected to remain localised and diminish with distance from discharge points.

Residual adverse impacts to the Middle Ok Tedi during construction are expected to be minor and largely limited to localised increases in suspended sediments and turbidity associated with runoff from construction areas and borrow material extraction activities. These impacts are expected to be temporary and rapidly diluted within the river system. During operations, no significant adverse residual impacts are predicted for the Middle Ok Tedi, as the influence of TSF discharges on river hydrology and water quality is expected to be negligible relative to river flows.

Predicted TSF discharge quality modelling for the TSF operations indicates TSF discharges are expected to contain elevated sulfate and copper concentrations compared to selected upstream Ok Tedi water quality sites. Discharge loads are predicted to increase as each TSF cell is completed. However, these discharges will only have a minor and localised effect on surface water quality in the Ok Tedi immediately downstream of the discharge point, irrespective of flow conditions.

Modelling indicates that the TSF will cause minor increases in sulfate concentrations in the Ok Tedi River, with downstream concentrations increasing by approximately 6 to 9 mg/L under typical flow conditions and potentially higher during low-flow and El Niño periods. In contrast, dissolved copper concentrations are predicted to remain largely unchanged, with only negligible increases ($\leq 0.2 \mu\text{g/L}$) due to adsorption onto suspended solids. Figure ES.12 identifies proposed surface water quality monitoring points for TSF-related discharges to confirm that water quality is within levels predicted above; triggers will determine the need for further investigation and/or intervention if levels exceed those predicted.

Figure ES.13 and Figure ES.14 illustrate the overall predicted spatial extent and severity of residual watercourse impacts and beneficial improvements associated with the project during construction and operations.



LEGEND

- Proposed surface water monitoring location
- Community
- Road
- - - Track
- Watercourse
- Proposed TSF footprint
- Proposed infrastructure corridor



0 1 2 km
PROJECTION: PNG94 PNGMG94 Zone 54

Figure ES.12 Location of surface water quality monitoring and sampling points for the project

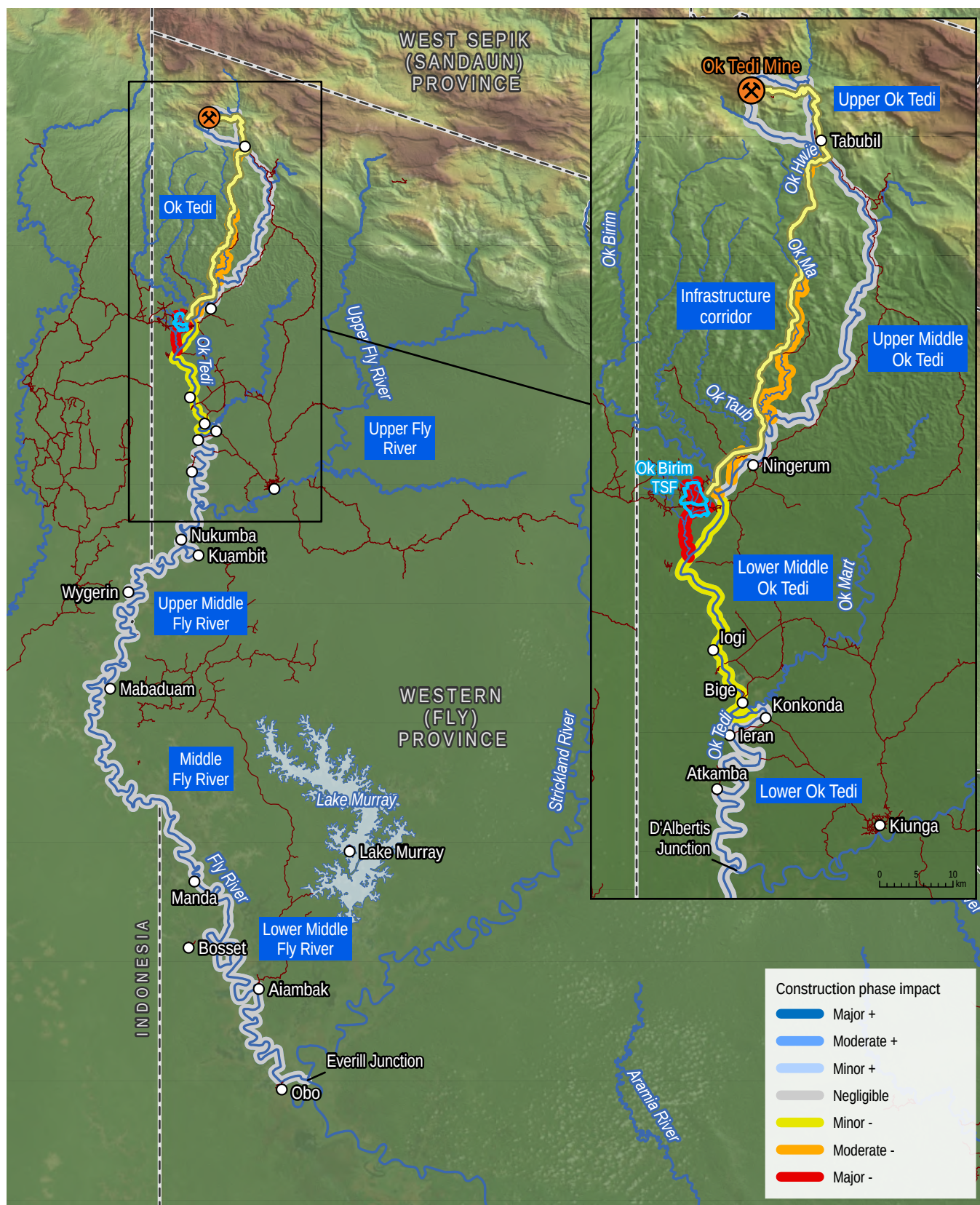


Figure ES.13 Predicted impacts to watercourses as a result of the project during construction

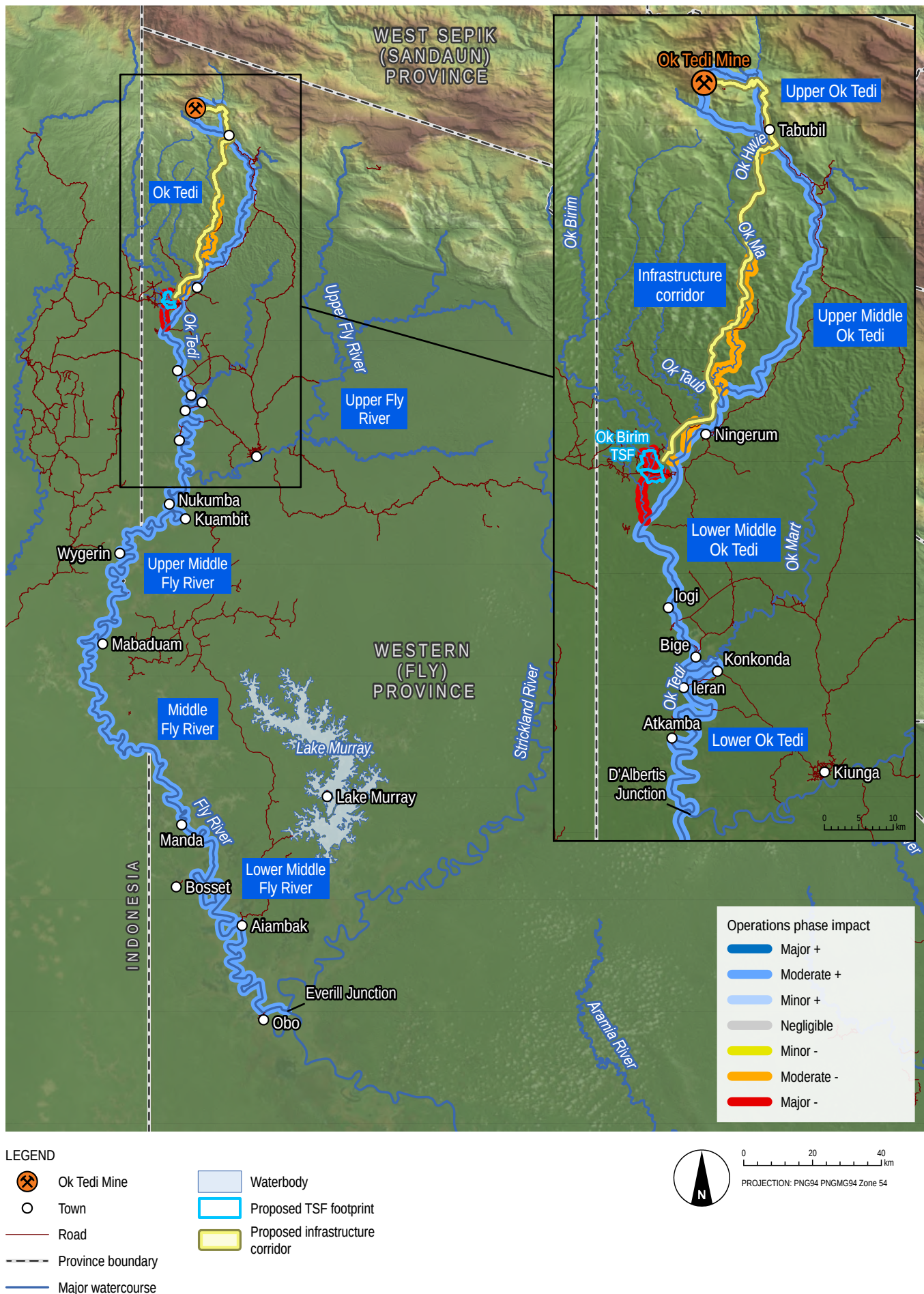


Figure ES.14 Predicted impacts and improvements to watercourses as a result of the project during operations

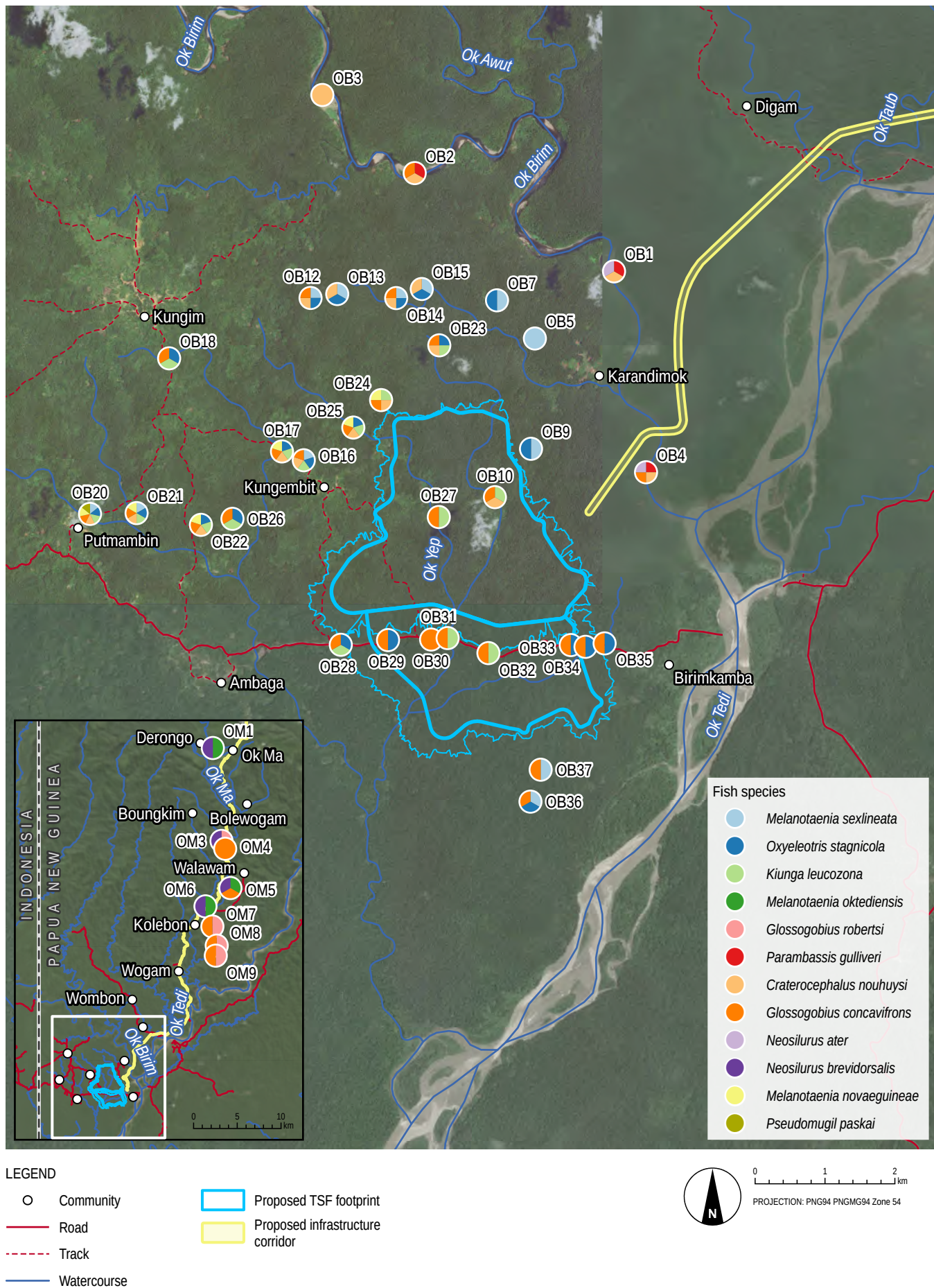


Figure ES.15 Fish species and occurrences recorded in the aquatic ecology assessment

Aquatic ecology

The project will result in significant localised adverse impacts on aquatic ecosystems, particularly during construction of the TSF, while delivering major long term regional benefits to the Ok Tedi and Fly River systems through the diversion of tailings from direct riverine discharge.

Construction of the TSF will permanently remove spring-fed creeks and sensitive aquatic habitats within the TSF footprint (Ok Yep headwaters), while increased sediment runoff and elevated total suspended solids (TSS) are expected to degrade downstream aquatic environments. These habitats support high value and restricted distribution aquatic species, and their removal represents a major, irreversible local impact. Figure ES.15 shows conservation significant fish species, recorded throughout the study area; it shows that, for example, approximately 40% of the known locations of *Kiunga leucozona* are within the TSF footprint. OTML will conduct further monitoring to broaden the understanding of the distribution of this species with the view to expanding its known range.

Species of high conservation significance, including the Kiunga blue-eye and Fly River rainbowfish, will be impacted by habitat loss, sedimentation and reduced water quality. During operations, persistent sedimentation and elevated dissolved metals from TSF seepage are predicted to create long-term degraded conditions in the Ok Yep, with water quality changes likely to exceed aquatic ecosystem protection guidelines, requiring implementation of effective seepage and sediment management controls.

Conversely, diversion of tailings to the TSF will benefit the Ok Tedi and Middle Fly River. The changes to the form and water quality of the Ok Tedi and Fly River systems as a result of the reduction in tailings derived sediment inputs are expected to improve channel stability, water quality (including TSS concentrations), and aquatic habitat over the long-term, supporting the long-term recovery of fish and macroinvertebrate communities in the Lower Ok Tedi and Middle Fly River systems.

The infrastructure corridor, including access roads and tailings pipeline generally follows the alignment of the Ok Ma and crosses the main Ok Birim channel. Construction and operation of the pipeline and access road will increase sediment and potential contaminant runoff to the Ok Ma system. As the Ok Ma and Ok Birim are important aquatic refugia that support fish species now lost or reduced in the Ok Tedi and Middle Fly,

management of potential impacts and maintaining the health of the ecosystem is important to facilitate recolonisation of the Ok Tedi and Fly River systems following mine closure.

6.4 Socio-economic environment

The project will generate substantial economic and social benefits through employment, business opportunities, skills development, compensation payments, improved transport infrastructure and enhanced access to services. During construction, approximately 300 workers will be employed, reducing to around 150 workers during operations. Employment and procurement opportunities are expected to provide long-term income and skills development benefits for communities in the North Fly District and Western Province. Construction of the pipeline access road and bridges over the Ok Tedi and Ok Birim will significantly improve access and connectivity for communities west of the Ok Tedi, improving access to health services, schools, markets and regional centres.

Potential adverse social impacts are primarily associated with land access requirements, loss of livelihood areas, cultural heritage impacts, community safety risks, project-induced in-migration (PIIM), increased pressure on community services, and changes to traditional lifestyles. The TSF development area will permanently affect land used for gardening, hunting, fishing, sago production and collection of bush resources, particularly for communities closest to the TSF including Birimkamba, Kungembit, Ambaga and Karandimok. Livelihood restoration plans, compensation arrangements and ongoing monitoring will be implemented to restore and improve affected livelihoods.

The project has the potential to affect tangible and intangible cultural heritage values, including sacred sites, burial grounds, ancestral settlements, clan boundaries and culturally significant landscapes. The highest potential impacts will occur within the TSF development area where some cultural heritage values cannot be completely avoided. A Cultural Heritage Management Plan, detailed site investigations, avoidance measures, ongoing consultation and chance-find procedures will be implemented to minimise impacts. No sites meeting the criteria for Critical Cultural Heritage under IFC Performance Standards 7 or 8 were identified.

Community safety risks are associated with increased traffic,

construction activities, workforce-community interactions and project-induced population growth. Increased traffic on the ITCS Road, Kiunga-Tabubil Highway and pipeline access road may increase the risk of accidents affecting road users and nearby communities. Population growth associated with PIIM may also contribute to increased pressure on services, community conflict, crime, family and sexual violence, and sorcery accusation-related violence. These risks will be managed through traffic management measures, workforce codes of conduct, community safety programs, grievance mechanisms, and collaboration with government and community stakeholders.

The project will also influence food and water security. Permanent loss of gardening land, bush resources and some aquatic resource areas within the TSF development area is expected to have the greatest impact on food security for communities closest to the TSF. Localised impacts on water sources may occur within the TSF development area and along parts of the infrastructure corridor. Management measures include minimisation of disturbance, water quality protection, alternative water supplies where required, livelihood restoration programs and ongoing monitoring.

The ecosystem services assessment identified impacts on provisioning services, including gardening land, hunting areas, fisheries, water resources and bush resources, as well as cultural ecosystem services linked to cultural heritage, traditional knowledge and customary land use. These impacts are expected to be greatest for communities located closest to the TSF footprint and infrastructure corridor and will be managed through compensation, livelihood restoration, cultural heritage protection measures and environmental management programs.

The human rights impact assessment identified the most salient potential human rights risks as those relating to livelihoods, food and water security, cultural rights, community health and safety, gender-based violence, project-induced in-migration, access to services and workers' rights. The project will implement measures aligned with the UN Guiding Principles on Business and Human Rights, IFC Performance Standards and Equator Principles, including stakeholder engagement, free, prior and informed consent processes where required, grievance mechanisms, workforce management measures, community health programs, and ongoing human rights due diligence.

6.5 Cumulative impacts

A total of nine projects were assessed to determine whether they were eligible and would contribute to the cumulative impacts of the project. Of these, five credible projects had spatial and temporal relationships with the project and were considered to have the potential for a cumulative effect. These projects are:

- The P'nyang Gas Field Development
- The Stanley Gas-Condensate Project
- The Elevala-Ketu-Tingu Condensate Recovery Project
- The West-Agro Fly Vanilla Project.
- Alice Pit to Border Road (ITCS Road).

Cumulative impacts associated with vegetation clearance, sedimentation, road use, vehicle traffic and port use, and the construction workforce are possible. Management strategies for mitigating the potential cumulative effects for each aspect will be implemented as part of the Ok Birim TSF Project's ESMP. Other proponents are expected to also implement management strategies to manage impacts of their projects to limit the potential for cumulative effects. This will provide an overarching framework to respond to changing conditions. The Western Provincial Government will be encouraged to incorporate these strategies into its development planning to help manage in-migration, workforce demand, and economic change associated with development across the province, while also limiting impacts on the environment.

6.6 Natural hazards, climate change and unplanned events

The project has the potential to result in unplanned events outside normal operating conditions. Such events are typically unforeseen and triggered by natural causes such as earthquake or extreme weather) or by incidental factors, for example, human error, equipment failure or accidents. While their likelihood is generally low, the potential consequences can be severe, resulting in significant environmental, social and operational impacts including land or water contamination, habitat loss, harm to human health and safety, livelihood and resource use disruption, culturally heritage damage and major environmental non-compliances.

The ESIA considers potential unplanned events with the greatest potential to cause significant impacts on project infrastructure, local communities and the surrounding environment; and outlines the proposed design controls, mitigation measures and emergency preparedness and response actions to address these. Where relevant, the measures build on OTML's existing operational risk management systems and emergency procedures. Credible major incidents identified for the project during construction and operation based on OTML's operational experience, the environmental context, and hazards that are typically associated with large TSFs and supporting infrastructure include but are not limited to natural disasters, overtopping of the TSF, structural failure or breach (e.g., TSF or major river crossing/bridge) and tailings pipeline failure.

TSF breach

Failure of the TSF has the potential to result in significant environmental, social and economic impacts, depending on the breach location, failure mechanism and prevailing hydrological conditions. The dam breach assessment considered both sunny day failure and rainy day failure scenarios at five potential credible breach locations across Cells 1 and 2 of the TSF.

Potential impacts of a TSF breach include downstream environmental degradation, contamination of waterways, disruption to transport access and livelihoods, operational shutdown of the mine, and impacts to public health and local communities. Potential impacts on downstream communities, infrastructure and the environment were assessed, with

modelling results indicating that the Kungembit and Birimkamba communities are not directly inundated under the assessed scenarios. Two isolated dwellings and the ITCS Road could be affected by tailings inundation, flood depth increases and infrastructure disruption under some scenarios.

The overall severity of damage and loss as a consequence of a TSF failure is considered "Major" under ANCOLD guidance, largely due to the inundation of the Ok Yep and consequential downstream impacts on the Ok Tedi (notwithstanding its already heavily impacted condition), the potential closure of the ITCS Road, and social and business implications of continued mining. A TSF breach may result in reputational damage to OTML and temporary suspension of mining, which may have resulting impacts on employment. Depending on the scenario, the assessment determines that the GISTM consequence category for potential loss of life is High or Very High, and the ANCOLD consequence category for potential loss of life is Low or High A.

Climate change

Climate change may also influence the frequency and severity of certain natural hazards during the life of the project and post-closure, with possible changes in rainfall patterns, flooding regimes and extreme weather events that may affect infrastructure, local communities and the surrounding environment.

The project is located in a tropical rainforest climate where climate change is expected to primarily increase temperatures and extreme rainfall intensity. TSF infrastructure has been assessed as highly resilient due to conservative PMP and PMF design criteria, resulting in a low likelihood of catastrophic failure under future climate conditions. Supporting infrastructure, such as the pipeline and road, may face increased risks of localised flooding, erosion, maintenance demands, and operational disruption due to more intense rainfall and higher temperatures. Increasing temperatures may also influence geochemical processes within the TSF, including potentially affecting water quality, requiring ongoing monitoring and management. These risks are manageable through monitoring, adaptive management, and operational controls.

The project environmental and social management plans (ESMPs) describe the environmental and social objectives and management measures that will be implemented to mitigate impacts that may occur.



7. Environmental and social management, monitoring and reporting framework

7.1 Management

OTML has developed an integrated management system (IMS) to effectively manage the occupational health, safety, environmental and social aspects of activities associated with its operations. The IMS generally aligns with the requirements of the standards ISO14001 and OHSAS18001. These standards specify the minimum requirements for an organisation with respect to policies, the identification and management of environmental, safety and health aspects/risks, compliance with legal and other requirements, and continuous improvement of environmental, safety and health performance. OTML is in the process of updating the IMS to incorporate social performance aspects. This is being done to align the IMS with international standards such as the Equator Principles, International Finance Corporation Performance Standards as well as The Copper Mark and GISTM.

The main types of documents in the IMS are:

- **Policy statements.** High level documents which state the rules and values of the organisation.
- **Standards.** Each component of the IMS is described by a 'Standard' document that describes the standard to which OTML will operate in order to achieve its targets and objectives.

- **Manuals, plans, and guidelines.** Created for significant aspects where required to provide further details as to how that aspect is managed.
- **Procedures, safe work plans, job safety and environmental analyses, and work instructions.** Lower-level documents that describe the specific actions or requirements for subtasks that will need to be undertaken to achieve the outcomes required by a standard or a plan.

Risk and legal compliance priorities were used to determine which standards and plans were developed for OTML. A risk review in March 2026 has also informed OTML's approach to strengthening the IMS and identification and management of environmental and social risks.

OTML has developed an environment management plan (EMP) to document plans for managing its environmental commitments for its operations in PNG. This satisfies the requirement under condition 91 of Environment Permit EP-L3(636) that an EMP is submitted to the Director of the Conservation and Environment Protection Authority (CEPA) within 12 months of the commencement of the *Ok Tedi Environment Management Act 2019* (OTEMA).

The EMP provides an overview of the structure through which OTML establishes and assesses its commitments, objectives, plans and procedures, achieves compliance with its obligations, and demonstrates improved performance. The EMP applies to environmental management of all processes and activities under OTML's control within PNG, including management of contractors, suppliers and service providers.

OTML's social management system consists of Community Relations and Sustainability programs and economic programs through the Ok Tedi Development Foundation and the CMCA implementation; it is not yet a 'system' per se. OTML is in the process of developing a series of social plans and standards as part of its updates to the IMS and development of an integrated Environmental and Social Management System. The plans and standards will follow the same format and structure as OTML's existing operational documents. The social plans will be aimed at limiting adverse social impacts of OTML operations and maximising benefits to stakeholders.

The project has issue-specific environmental and social management plans (ESMPs) that describe the environmental and social objectives and management measures that will be implemented to mitigate impacts that may occur.

A construction ESMP (CESMP) is attached to the ESIA, and includes sub-plans that outline the management approach for the following topics:

- Erosion and sediment control
- Surface water
- Groundwater
- Biodiversity
- Air quality and greenhouse gas emissions
- Noise and vibration
- Cultural heritage
- Traffic and transport
- General waste management
- Major incident management.

A number of social plans will be prepared by OTML prior to the commencement of construction of the project. The social plans will be aimed at limiting adverse social impacts of the project's construction and operation and seek to maximise benefits to stakeholders. Plans will be developed to address the following:

- Community development
- Community health and safety
- Land access and resettlement
- Project induced in-migration into local and regional communities
- Social monitoring.

7.2 Monitoring

The project's monitoring requirements are detailed in the project's ESMP. The purpose of environmental and social monitoring for the project will be to verify the impact predictions contained in this ESIA, confirm effective implementation of environmental and social management measures and to demonstrate compliance with regulatory permits and licences. Where necessary, corrective action will be taken should monitoring indicate that management measures are not effective.

Monitoring programs will be further developed as the project proceeds into detailed design and will take into consideration the conditions of the amended environment permit. The monitoring programs will typically include the environmental aspects relevant to each project-related activity, descriptions of the components to be monitored, and frequency of monitoring and purpose, where the latter will address both routine ongoing monitoring and intensive 'validation' surveys aimed at validating the predicted impacts for operations, with monitoring frequency then being reduced.

The parameters to be measured will be reviewed and expanded with specific key performance indicators, monitoring locations and frequencies in subsequent iterations of the ESMP.

Monitoring will be undertaken by suitably experienced and qualified personnel and monitoring results will be presented in regular internal reports. The results will also be summarised and reported to government regulators as required by applicable legislation and permits described next.

7.3 Reporting

Under Condition 53 of Environment Permit EP-L3(636), OTML must provide an annual summary of environmental incidents recorded in the company's environmental management system in the Annual Environmental Report. Incidents shall be reported based on the severity rating of the incident as defined within the environmental management system.

Under Condition 54 of Environment Permit EP-L3(636), OTML must notify the Director within 24 hours of any significant environmental incident (as defined in the EMP) that occurs in relation to the carrying out of works or discharge of wastes into the environment from the premises.

For the purposes of the EMP and Environment Permit EP-L3(636), an incident is classified as significant if it is assessed actual level 3 consequence for Environmental, Reputational or Compliance impact as described in OTML IMS Consequence Table.

Non-compliances with permit conditions will also be treated as 'environmental incidents' and managed under the OTML IMS Standard OTML-IMS-STD-1.19 Incident Reporting and Investigation.



Members of the public are encouraged to share their views on the project and ESIA with CEPA.



8. Further information and submissions

Hard copies of the ESIA will be on public display at the following locations:

- Conservation and Environment Protection Authority (CEPA), Port Moresby
- Mineral Resources Authority (MRA), Port Moresby
- Western Provincial Government, Kiunga

As part of its assessment of the ESIA, the State of PNG will invite members of the public to make written submissions to CEPA about their views on the ESIA. Guidance on how to do this can be obtained from:

Managing Director

Conservation and Environment Project Authority
Stratos Avenue, Savannah Heights
PO Box 6601
Waigani, National Capital District
Papua New Guinea

Subject to the consent and approval of its release by CEPA, OTML will make the entire ESIA available:

- In hardcopy, for review by members of the public, at the offices of OTML in Tabubil and Port Moresby.
- For download, from the OTML website at www.oktedi.com

If you would like further information from OTML about the project, please contact:

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Engagement for the project will continue with public disclosure of the ESIA by OTML and Tetra Tech Coffey in conjunction with CEPA and the MRA. Additional engagement with project affected communities and other stakeholders is ongoing and will continue to follow the principles of free, prior and informed consent.





