

PANGUNA MINE LEGACY IMPACT ASSESSMENT **PHASE 1 ASSESSMENT REPORT**

Summary Brochure

PANGUNA LEGACY ASSESSMENT COMPANY LIMITED

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INTRODUCTION

In September 2020, a complaint was made through the Australian Government against Rio Tinto Limited about the impact of the Panguna Mine on the local environment and people. The Complaint was filed by the Human Rights Law Centre on behalf of 156 residents of villages in Bougainville in 2020, which subsequently increased to 170.

Rio Tinto Limited engaged with the complainants and with Bougainville Copper Limited agreed to support an independent impact assessment of the impacts caused by the Panguna Mine since it stopped operating in 1989. This is called the Panguna Mine Legacy Impact Assessment.

A round table of parties called the Oversight Committee was formed to govern the independent impact assessment process. The parties at the table were people from the Autonomous Bougainville Government, the Government of Papua New Guinea, key landowner and community representatives, Bougainville Copper Limited (as former operator) and the parties to the Complaint (Rio Tinto Limited, Human Rights Law Centre and the Complainant Representatives). The Oversight Committee is chaired by an Independent Facilitator. There are planned to be three phases of the Legacy Impact Assessment: Preparatory Phase, Phase 1 and Phase 2. The Preparatory Phase was completed in March 2022. A scope of work was developed for Phase 1 later in 2022 and the Oversight Committee appointed an independent contractor called Tetra Tech Coffey to complete the work. This is the first comprehensive environmental, social and human rights assessment of the impacts of the Panguna Mine over the last 35 years. Because of this, Phase 1 was planned to focus on the areas of greatest concern and risk to local people now. This included chemicals in rivers, dangerous river crossings, lack of access to clean water, flooding and destruction of land and sacred sites, landslides and unstable levees, food shortages and human health.

President the Honourable Ishmael Toroama launched the Panguna Mine Legacy Impact Assessment on 6 December 2022 (Plate 1).

This Summary Brochure provides a summary of the results of the Panguna Mine Legacy Impact Assessment Phase 1 Assessment Report. If readers want more detailed information on the outcomes of Phase 1 then they are encouraged to read the full Phase 1 Assessment Report.



Plate 1 President Honourable Ishmael Toroama and members of the Legacy Impact Assessment process at the Launch of the Legacy Impact Assessment in Arawa on 6 December 2022



DATA COLLECTION

Before starting to collect environmental and social data, Tetra Tech Coffey carefully planned investigations and had its own Independent Peer Review team check the plans. The Oversight Committee's independent team of experts, called the Technical Sub-Committee, also checked the plans, which were then reviewed and endorsed by the Oversight Committee. These plans described what sort of environmental and social information would be collected, how it would be collected, where it would be collected and what the results would be compared against to check the level of impact of the mine since 1989.

Phase 1 involved the collection of field data from a large area stretching from Arawa in the east to Empress Augusta Bay in the west. This was called the study area, and was split into four areas called domains, which are groups of places that were expected to have similar environmental and social characteristics and to have experienced similar environmental and social impacts from the mine. Representative samples were collected across the study area to get examples of different types of impact in different parts of the study area. Figure 1 shows the study area and the four domains for the Phase 1 Legacy Impact Assessment.

After first visiting Panguna in late-2022 and early-2023, Tetra Tech Coffey's team of experts from Bougainville, Papua New Guinea, Australia and other countries started to collect field data in the study area in April 2023. Their field work was supported by the local leaders, local communities and local businesses, who were prioritised for providing services during Phase 1. Different studies collected different information and this included sampling for chemicals in rivers, soil and drinking water, river surveys, inspecting land and building stability, food and garden sampling, social surveys and an aeroplane survey of the land.

Over three field campaigns a large amount of data was collected and analysed, including 1,600 environmental samples and 445 social surveys. Figure 1 shows the locations of the samples that were collected and the surveys that were undertaken.

The evaluation and reporting of results took almost a year to complete and involved the following steps:

- The experts checked the data and looked at how the mine's environmental impacts after 1989 affect people.
- Technical study reports were prepared by the team of experts and both Tetra Tech Coffey's Independent Peer Review team and the Technical Sub-Committee checked the reports.
- A large draft impact assessment report was then prepared and the Independent Peer Review team and the Technical Sub-Committee checked the report.
- A draft summary report was prepared and the Technical Sub-Committee and the Oversight Committee checked the report.
- The draft results were presented to the Oversight Committee in August 2024.
- The Oversight Committee approved Tetra Tech Coffey to present the draft results to the community, which was done in October 2024.



Number of samples and surveys		*	2 Weather stations		Road	0 5 10 L	
	445 Social household surveys	0	15 Hydrogeology samples		Watercourse		
		231 Eood samples	•	25 River sediment samples	1223	Phase 1 study area	
		231 Votor quality samples	•	 39 Contaminated site soil 	Domain	Domain area	
		Zo4 water quality samples		samples 80 Contaminated site		Domain A - Mine	
				inspections		Domain B - River System	
				181 Geotechnical assessment		Domain C - Delta	
	0	97 Garden soil samples		Inspections 129 Structural assessment		Domain D - Port and Town	
	•	69 Soil geochemistry samples		inspections			

Figure 1 Sampling locations and surveys undertaken for the Phase 1 Legacy Impact Assessment

RESULTS

Draft results were presented to the community in October 2024. This explained the different impacts found in the different areas, focussing on the most serious impacts and biggest issues of concern to local communities. A summary of the main results follows for each domain.

MINE DOMAIN

The Mine Domain includes the area within the special mining lease boundary. It includes the open pit, dewatering tunnel, waste rock dump and old processing and milling infrastructure.

Community concerns

In the Mine Domain, people are concerned about unstable mine structures and landslides, as well as artisanal and small-scale mining (ASM) activities causing structures to become unstable. People are also worried about health impacts from chemicals, a lack of available land and poor quality land for gardening, and a lack of access to water and land resources. Each of these concerns have been carefully considered in Phase 1.

Other concerns raised by the community included land boundaries and land ownership, and resettlement and village relocation during the original establishment of the mine. However, assessment of these aspects is outside the scope of Phase 1 and so they were not assessed.

Results

The Phase 1 field program in the Mine Domain involved collecting approximately:

- 60 soil and waste rock samples, including from gardens
- 80 water samples, including river and drinking water sources
- 61 food samples.

Samples from all domains were sent to internationallyaccredited laboratories for testing. The results were compared to background levels in areas not impacted by the Panguna Mine and other international criteria to identify whether there was an environmental impact caused by the mine since 1989. Stability assessments of old mine structures including the open pit and roads were also completed. There were 185 household surveys as part of the social and human rights assessments.

Parts of the open pit walls and access roads have a high or extreme risk of collapsing. The areas of highest risk are three areas in the open pit, an area on the access road above Pirurari, and three areas along the Port to Mine Access Road near Panguna Town (Plate 2). It is not possible to predict when these areas will collapse but if collapses occur, people may be hurt or die, or people's access to essential health services may be blocked.



Plate 2 Landslide risk area above the Port to Mine Access Road with active ASM (photo taken from road)

Some of the old mine buildings also have a high or extreme risk of collapsing. The structures with the highest risk are buildings in Panguna Town (Plate 3), and some buildings in the processing and milling area (Plate 4 and Plate 5). If these structures were to collapse, people in or close to these structures at the time may be hurt or die.

Figure 2 shows these areas where there is a high or extreme risk of the ground or buildings collapsing.





- ----- Road
- ----- Watercourse

Geohazard risk rating High Extreme Structural hazard risk level High Extreme

Human rights impact
Potential impact to right to life
Domain-wide human rights impact
Potential impact to right to health (access)

Impact extents are approximate and circles shown are symbolic only. These areas should be used be used as a guide only.



Figure 2 Geotechnical and structural hazards and related social and human rights impacts – Mine Domain

Chemicals from industrial sources such as old power station equipment and fuel storage areas have affected small areas of soil but this is not widespread across the domain. Near some of the old mine structures, including the pit and central workshops, and the switchyard, people are at risk from industrial chemicals found in soil. This may affect the health of people who regularly touch the soil, or unintentionally swallow or breathe in this soil.

Testing of rock from the waste rock dump and at Dapera showed that levels of metals in the rock may affect plant growth. The levels of metals in food and soil from gardens on waste rock did not show a clear relationship; however, overall, there is a low health risk to adults from eating foods grown in this area. There may be a health risk for children younger than six years old if they eat foods grown in the garden areas on the waste rock dump but this requires further investigation. Waste rock does not pose a health risk through direct contact, such as people touching the soil.

The Kawerong-Jaba River water quality is still affected by mine chemicals from the Mine Domain but the amount of copper coming from the waste rock dump has greatly reduced by 90% since 1989, which has improved water quality in the river.

However, there are two main areas in the Mine Domain where the levels of metals in river water pose a possible health risk for people undertaking ASM or washing. One area is the drainage downstream of the waste rock dump and the second one is the Kawerong River near Pirurari and Onove. The Phase 1 results for the Mine Domain showed that drinking water sources do not pose a risk to human health from mine-related chemicals, except for in-pit communities because they access water from high up in the open pit which contains high levels of some metals found in the open pit walls.

During construction of the mine in the early 1970s there was large scale vegetation clearing and habitat loss, including mainly Montane Rainforest. This would have reduced bush resources and land available for local people at this time. There is no credible mine-related source for ongoing loss of Montane Rainforest since 1989 and impacts are caused by population increase and reduction in availability of bush and land resources.

Figure 3 shows a summary of the impacted human rights for the Mine Domain.



Plate 4

The fine ore crushing plant located in the processing and milling area



Plate 3 Panguna Town concrete walls



Plate 5 Milling area workshop and storage southeast of Moroni





- Main dwelling structure
- ----- Road

----- Watercourse

luman	rights	impact	
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- Actual impact to right to water
- Potential impact to right to life
- Possible impact to right to adequate food, housing and standard of living

Possible risk to right to health

Conservatively included community

Domain-wide human rights impact

Actual impact to right to a clean, healthy and sustainable environment* Potential impact to right to health (access) Possible impact to right to health (contamination) *This human right is impacted at each location where other human right impacts exist Impact extents are approximate and circles shown are symbolic only. These areas should be used be used as a guide only.



Figure 3 Summary of impacted human rights – Mine Domain

RIVER SYSTEM DOMAIN

This domain includes the Kawerong-Jaba River system from near the Special Mining Lease boundary down to the Lower Jaba River.

Community concerns

In the River System Domain, people are concerned about hazardous river crossings, stability of the levees, and damage to land and gardens from flooding. People are also worried about health impacts from mine chemicals from tailings and waste rock, a lack of clean drinking water and impacts to the Konaviru Wetlands. Each of these concerns have been carefully considered in Phase 1.

Results

The Phase 1 field program in the River System Domain involved collecting approximately:

- 60 soil and tailings samples, including from gardens
- 150 water samples, including river and drinking water sources
- 56 food samples.

Other investigations included stability assessments, river flow and flooding studies and 105 household surveys.

Studies included analysis of how safe it is for people to cross the Kawerong-Jaba River. The results showed that the most dangerous places to cross the river because of the impacts of the mine are in the Upper Kawerong River and Tailings Basin 1, which has quicksand and a riverbed that regularly changes shape.

Near the Jaba Pump Station people are at greatest risk from two things. Firstly, chemicals found in soil near old pump station structures may affect people's health if they unintentionally swallow or breathe in the soil. Secondly, an old mine building now used as a church is at risk of collapsing, which could hurt or kill people if they are inside the church at the time. These risks are only very close to the Jaba Pump Station and are not expected to affect people further away.

During operations, levees were constructed to control the flow of tailings. The largest of these, where the Jaba and Kawerong rivers meet, is called the Main/Pump Station Levee. It is about 30 metres high at the highest point, and 3.2 km long. The Kawerong River flows along the north side of the levee and the Jaba River flows along the south side of the levee. Parts of the Main/Pump Station Levee are at risk of collapsing (Plate 6). This is due to ongoing erosion caused by rainfall, surface water runoff and ASM activity. A large earthquake may also cause this to happen. It is not yet possible to predict when these areas will collapse due to the range of things which may influence this. However, it can be predicted that the levee will most likely collapse first at its narrowest location in Section 4 of the levee and when this happens the Kawerong River will quickly change course and flow into the Jaba River through the gap in the levee. The collapse of the levee may hurt or kill people in the area at the time of collapse, such as ASM workers. The flooding when this happens will not be more serious than the biggest floods already happening in this area.

Another structure at risk of collapsing in the River System Domain is the Momau River Bridge. This bridge has an extreme risk of collapsing when a heavily loaded vehicle uses it, which could hurt or kill people if they are in the vehicle or near the bridge at the time.



Plate 6 Section 4 of the Main/Pump Station Levee, where failure could affect ASM workers



The mine disposed approximately 600 million tonnes of tailings to the Kawerong River during its operation. Since 1989, the river has gradually moved tailings material towards the ocean. Some of the tailings has revegetated, especially on the south side of the two tailings basins where areas of bare tailings are now covered in vegetation.

Two big changes since 1989 put tailings in new areas. The first change was when the Jaba River overtopped the north side of the river downstream of Bato Bridge sometime between 1998 and 2011, which put tailings in a low area on the north side of the river, referred to as the Northern Tailings Breakout area. The second change was when the Jaba River changed direction before Bato Bridge and flowed south into the Konaviru Wetland in 2017. Now the majority of river flow is into the Konaviru Wetland, which also carries the tailings there. This wetland is important for animals and plants, including waterbirds and vegetation that does not grow in many other places in Bougainville, and the people who use them. The tailings in the wetland has caused increased flooding along Kuneka Creek and surrounding areas.

Figure 4 shows the areas where there is a high or extreme risk of the ground or structures collapsing, and areas of flooding.

The movement of tailings down the river affects some communities by changing flows and flooding, and by metals in the tailings affecting water quality and possibly plant growth. Despite this, there is a low risk to people from eating food grown in tailings areas. Activities that involve touching the tailings like ASM activities at the top of the River System Domain are not expected to be a health risk to people.

Drinking water sources sampled during Phase 1 in the River System Domain do not pose a risk to human health from mine-related chemicals or metals except the use of the Kawerong-Jaba River as a drinking water source during the dry season or extended periods of drought.

There is a lot of flooding in the lower part of the River System Domain. Flooding caused by the mine occurs along either side of Kuneka Creek and little creeks that flow into it, affecting land available for people to use. It also impacts on what the land can be used for, such as gardening. Access to water for drinking and other purposes and bush resources are also affected by this flooding. Flooding also occurs south of Tailings Basin 2 between the Jaba River and the road.

Flooding may also affect people's ability to access essential health services or schools. Tailings and flooding in Kuneka Creek causes overtopping of the diversion plug (also called the Kuneka Creek Bridge) and affects the safety of the road crossing at that location.

There is also extensive flooding surrounding Mokerokeroai village from the lower Pagana River, some of which may be caused by the mine, which may impact how people can use the land and access resources.

Figure 5 shows a summary of the impacted human rights for the River System Domain.







Human rights impact



Impact extents are approximate and circles shown are symbolic only. These areas should be used be used as a guide only.



Figure 4

Geotechnical, structural, and riverine hazards and related social and human rights impacts -River System Domain



0	Village
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- Main dwelling structure
- Point of interest
- ----- Road
- ------ Watercourse

Phase 1 study area

- Actual impact to right to water
 - Actual impact to right to education
 - Actual, potential and possible impact to cultural rights

Actual and possible impact to right to adequate food, housing and standard of living

- Potential impact to right to life
- Possible risk to right to health

Conservatively included community

- ----- Actual impact to right to water Possible impact to right to
- Possible impact to right to adequate food, housing and standard of living
- Possible risk to right to health

Domain-wide human rights impact

Actual impact to right to a clean, healthy and sustainable environment*

Actual impact to right to health (access)

*This human right is impacted at each location where other human right impacts exist Impact extents are approximate and circles shown are symbolic only. These areas should be used be used as a guide only.



Figure 5 Summary of impacted human rights – River System Domain

DELTA DOMAIN

The Delta Domain includes the Jaba River Delta in Empress Augusta Bay within one kilometre of the coastline. The delta has been formed from tailings washed down the Jaba River and into Empress Augusta Bay.

Community concerns

In the Delta Domain, people are concerned about flooding and impacts to land, health impacts from chemicals in dust, water sources, food and soil and marine resources in Empress Augusta Bay. Each of these concerns have been carefully considered in Phase 1.

Results

The Phase 1 field program in the Delta Domain involved collecting approximately:

- 15 soil and tailings samples, including from gardens
- 10 water samples, including river and drinking water sources
- 36 food samples.

Other investigations included river flow and flooding studies and nine household surveys.

Since 1989 tailings has continued to build up at the mouth of the Jaba River. This has resulted in the delta getting bigger but it has been covered by vegetation since at least 2011. In 2023, the area of the delta was about 1,056 ha, compared to 975 ha when the mine stopped operating in 1989. It is unlikely to get much bigger in the future because most of tailings coming down the river now settles in the Konaviru Wetland.

Tailings is spread across large areas of the Delta Domain and this may reduce the quality and amount of food able to be grown. There are also tailings in Empress August Bay from tailings being washed down the river. Garden soil samples collected did not show any minerelated chemicals or metals, but metals are present in the tailings. Despite this, there is a low risk to people from eating food grown in tailings areas. Activities that involve touching the tailings like gardening are not expected to be a health risk to people.

Based on Phase 1 sampling, drinking water in the Delta Domain does not pose a risk to human health from minerelated chemicals or metals except for the use of the Kawerong-Jaba River as a drinking water source.

The main impacts to people are linked to widespread flooding, some of which is caused by the mine, and metals in tailings which may affect the use of the land and water sources. Studies during Phase 1 show that flooding at Matoga does not come from the Jaba River and therefore flooding here is not caused by the mine. Flooding at Marau is expected to be similar to flooding in 1989 because the flows of the Jaba and Pagana rivers near Marau in 1989 were mainly influenced by the tailings pipeline embankment, and the relocation of the Tuju (Marau) River mouth to protect the tailings pipeline, which are still there today.

Metals from tailings from the mine could be affecting marine resources in Empress Augusta Bay but marine surveys were not completed during Phase 1 so there is not enough data yet to confirm this.

Figure 6 shows a summary of the impacted human rights for the Delta Domain.





- Village
- Main dwelling structure
- Point of interest
- Road
- Watercourse
- Phase 1 study area

Human	rights	impact
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- Actual impact to right to water Possible impact to cultural
 - rights

Domain-wide human rights impact

- Actual impact to right to a clean, healthy and sustainable environment*
- Actual impact to right to health (access)
- Possible impact to right to adequate food, housing and standard of living





Figure 6 Summary of impacted human rights – Delta Domain

PORT AND TOWN DOMAIN

The Port and Town Domain includes Arawa Bay, Anewa Bay and the Rorovana villages. It also includes mine related infrastructure in the Loloho Port area such as the concentrate storage, hydrocarbon fuel storage and power stations, as well as the Port to Mine Access Road and Pinei River.

Community concerns

In the Port and Town Domain, people are concerned about flooding and sedimentation in gardens, particularly near the Pinei River. They are also worried about reduced fish stocks at the mouth of the Pinei River in Rorovana Bay and chemicals associated with old mine infrastructure near the port affecting community health. People are also worried about the chemicals in Anewa Bay affecting women's reproductive health. Each of these concerns have been carefully considered in Phase 1.

Results

The Phase 1 field program in the Port and Town Domain involved collecting approximately:

- 36 soil samples, including from gardens
- 24 water samples, including river and drinking water sources
- 38 food samples.

Other investigations included stability assessments of old mine buildings and tanks and 65 household surveys. Field inspection and desktop assessment of river flow and flooding studies were also completed around Rorovana and the Pinei River.

There are mine related buildings and tanks, such as the power station (Plate 7), weighing tower (Plate 8) and reagent storage tanks (Plate 9) that are at risk of collapsing. If these buildings collapse, they may hurt or kill people in the immediate area. Figure 7 shows the areas where there is a high or extreme risk of structures collapsing.

Several places in the Port and Town Domain were identified that may have chemicals that are dangerous if inhaled or can damage people's skin. At Anewa Bay, these are at the bulk fuel store area, reagent storage tanks, storage and warehouse site and shipping containers. At Rorovana 3, these include shipping containers, discarded drums and at the sewage treatment plant.

Levels of chemicals in some areas of soils at Anewa Bay may affect people's health if they regularly touch this soil, or if they unintentionally eat or breathe in the soil. Figure 8 shows these places, which include the reagent storage tanks, Loloho fire station, bulk fuel store area, and the Shell oil fuel storage terminal.



Plate 7 The power station in Anewa Bay



Plate 8 Weighing tower in the private Loloho Port



Plate 9 Reagent storage tanks in Anewa Bay

The Phase 1 results showed that areas affected by industrial chemicals are localised and not widespread across the domain. There were levels of chemicals in soil collected from gardens near infrastructure that may limit the type and amount of crops that can be grown in these gardens. However, there is a low risk to human health from eating food grown from these areas. This includes areas near the former Itakaya waste disposal site along the Port to Mine Access Road.

In addition, there were no risks to human health from chemicals detected within the marine environment based on the limited sampling that was undertaken.

Testing of drinking water sources from the Port and Town Domain showed that they do not pose a risk to human health from mine-related chemicals and metals.

Based on previous studies, it is acknowledged that flooding and sedimentation in the Pinei River were caused by the mine due to the construction of Port to Mine Access Road and diversion of the river. Current flooding impacts and sedimentation in the Pinei River are not caused by the mine.

Figure 9 shows a summary of the impacted human rights for the Port and Town Domain.



- Village
- Point of interest
- ----- Road
- Watercourse

Hazardous chemical storage
Structural hazard risk level

High

Human rights impact

Potential impact to right to life

Potential impact to right to health

Impact extents are approximate and circles shown are symbolic only. These areas should be used be used as a guide only.



Figure 7 Chemical and structural hazards and related social and human rights impacts – Port and Town Domain



- Village
- Point of interest
- ----- Road
- Watercourse
- Site contamination risk ranking
- 5

- Sample location
- Garden soil sample
 - Food sample
- Soil exceedence criteria
 - Agricultural residential health criteria
- Food exceedence criteria
 - Food standards criteria

Human rights impact

- Possible impact to right to adequate food, housing and standard of living*
 - Possible risk to right to health

Domain-wide human rights impact

Actual impact to right to a clean, healthy and sustainable environment†

*Impacts in Anewa Bay differ depending on rightsholder groups across the domain †This human right is impacted at each location where other human right impacts exist Impact extents are approximate and circles shown are symbolic only. These areas should be used be used as a guide only.



Figure 8 Impacts to land quality or availability and related social and human rights impacts – Port and Town Domain



- Village
- Main dwelling structure
- Point of interest
- ----- Road
- ----- Watercourse

Human rights impact

- Potential impact to right to life Potential impact to right to
- health
- Possible impact to right to adequate food, housing and standard of living*
- Possible risk to right to health

Domain-wide human rights impact

- Actual impact to right to a clean, healthy and sustainable environment†
- *Impacts in Anewa Bay differ depending on rightsholder groups across the domain †This human right is impacted at each location where other human right impacts exist Impact extents are approximate and circles shown are symbolic only. These areas should be used be used as a guide only.



Figure 9 Summary of impacted human rights – Port and Town Domain



AREAS OF UNCERTAINTY

The main areas of uncertainty for the Phase 1 results include:

- A limited number of samples were collected at the surface and close together for soil, rocks and water, which means the underground areas are unknown and makes it difficult to define how wide chemicals spread.
- How much ASM influences chemicals in rivers is not known but there are impacts to water quality in the Kawerong River upstream of the mine due to ASM.
- It is not known how quickly the Main/Pump Station Levee is eroding.
- The duration and frequency of flooding, and water quality during flooding is not well understood.
- How much chemicals in soil, and the tailings and flooding affects the growing of food and crops is not well understood.
- Level of mine chemicals, marine resource availability and use in Empress Augusta Bay and Anewa Bay and health risks of this is not known.
- Health risks of chemicals in soil, water and food, and the level of exposure to people from chemicals.

RECOMMENDATIONS

The impacts summarised above and described in more detail in the Phase 1 Assessment Report have actual or potential human rights impacts, or possible human health risks. Recommendations are made in the Phase 1 Assessment Report on what needs to be remedied to address or mitigate impacts identified by the impact assessment and further investigations that would address uncertainties in the impact assessment. These are summarised below for each domain.

MINE DOMAIN

Recommendations of what needs to be remedied to address or mitigate identified impacts include identifying and assessing options to:

- Mitigate the unstable buildings or landforms that may collapse and result in fatalities. The areas that may be affected include Panguna Town and surrounds, the processing and milling area, the Panguna open pit, and Pirurari and surrounds.
- Mitigate the areas of landslide risk along areas of the Port to Mine Access Road and Pirurari Road, which may prevent or change access to healthcare, or improve the rate of access restoration if events occur.

Recommendations also include further investigations in the Mine Domain to:

- Improve the understanding of how people use water and are exposed to chemicals.
- Identify how far chemicals have spread and assess options to manage the impacts of this.
- Understand how chemicals affect growing food and crops.
- Work out how much people are exposed to chemicals to better understand risks to their health.

RIVER SYSTEM DOMAIN

Recommendations of what needs to be remedied to address or mitigate identified impacts include identifying and assessing options to:

- Mitigate the unstable sections of the Main/Pump Station Levee and conduct further investigation of the rate of levee deformation and time to failure.
- Mitigate the unstable mine-related structures that may fail and result in fatalities. This relates to the Momau River Bridge and the Jaba Pump Station.
- Mitigate the hazardous river conditions or to improve access where there is no bridge to provide safe crossing. This affects the villages of Tempiri, Gold Miners, Gold Miners Camp, Toku, Maton, Pem'ana and Katauli.
- Mitigate the riverine hazards (high flow and flood events) that temporarily prevent access to healthcare, or to improve access. This affects the communities that live more than 2 km from a bridge.
- Mitigate the flooding associated with the Kuneka Creek diversion channel that impacts productive land.
- Mitigate the flooding that prevents access to education, or to improve access. This affects Pem'ana, Namunsa, Polamato, Kobalu, Kokore and Kuneka.

Recommendations also include further investigations in the River System Domain to:

- Improve the understanding of how people use water and what food people eat from gardens.
- Identify how far chemicals in soil have spread and assess options to manage the impacts of this.
- Understand how long flood events last, and how this affects access, food, crops and water quality.
- Understand how chemicals and metals affect growing food and crops.
- Understand cultural rights and areas of cultural heritage sensitivity.
- Understand bush resource use in Konaviru Wetlands.
- Understand aquatic resource use in the Kawerong-Jaba River System.
- Further quantify the exposures to chemicals and metals to better understand the risks to human health.

DELTA DOMAIN

Recommendations of what needs to be remedied to address or mitigate identified impacts include identifying and assessing options to:

• Mitigate the impact of flooding preventing access to healthcare for communities living in an area with no safe access during floods, including identifying alternative access routes.

Recommendations also include further investigations in the Delta Domain to:

- Understand how long flood events last, and how this affects access, food, crops and water quality.
- Understand how metals in tailings affect growing food and crops.
- Understand if metals from the mine are impacting marine resource use in Empress Augusta Bay.
- Understand cultural use and cultural heritage sensitivity.
- Further quantify the exposures to chemicals and metals to better understand the risks to human health.

PORT AND TOWN DOMAIN

Recommendations of what needs to be remedied to address or mitigate identified impacts include identifying and assessing options to:

• Mitigate the structural, chemical and explosive hazards, including the make-safe of infrastructure and options for the safe removal of chemical hazards in the Anewa Bay, Loloho Port, Rorovana 3 and Camp 11 areas.

Recommendations also include further investigations in the port and town domain to:

- Identify how far the chemicals and metals in the soil and water may have spread and assess options to manage the impacts of this.
- Understand how chemicals and metals in the soil affects how food and crops grow.
- Understand if chemicals and metals are affecting marine resources in Anewa Bay.
- Determine the amount of chemicals and metals people may be exposed to, to better understand the risks to human health.



FEEDBACK ON THE PRESENTATION OF DRAFT RESULTS

Community presentations of the draft results from Phase 1 were held in October 2024 and people provided feedback on the results. The presentations were held in five locations accessible to people from each of the study area domains and delivered in Tok Pisin. There was a strong level of interest and engagement in the community presentations, with between 100 and 400 people attending at each location (Plate 10). This summary reflects feedback collected through the feedback forms completed after the presentations.

Overall, the presentations were well-received, with respondents expressing strong support for the assessment process and appreciation for the work done. The majority of respondents (about 90%) said they understood the results being presented. For those that said they did not understand properly, they most common questions related to the chemical effects on the environment and human health, water safety for drinking and other use, the impacts on marine resources and particularly whether it was safe to consume fish, and general human health effects.

Respondents said:

"When the chemicals are present in the environment after the mining activities stopped, what are the signs we can see on the impacts it has on the human body? What kind of sickness?"

"I want in the next phase for the people to be tested because we are living in the affected area. The environment is already damaged so I don't want our future generations to get hurt."





Plate 10 Community presentations at loro 2



Following the presentation, the respondents highlighted issues that mattered most to them such as chemical contamination, water pollution, river safety, environmental damage and health risks. Many expressed a desire for solutions, particularly for removing chemicals from the environment, especially from water sources. Regarding further feedback on Phase 1, approximately 30% of the respondents requested further investigation to address their concerns and asked for clarity on what solutions would follow now that the impacts have been identified.



NEXT STEPS

The Oversight Committee and the Parties to the Complaint will think about the results of the Phase 1 Assessment Report along with the community feedback to work out the next steps of the Legacy Impact Assessment process.

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