PHU BIA MINING

GISTM Disclosure Report

Ban Houayxai Tailings Storage Facility

1. Introduction

The purpose of this GISTM Disclosure Report is to provide a summary of information for the Ban Houayxai (BHX) Tailings Storage Facility (TSF), support public accountability and provide information required under Requirement 15.1 B of the Global Industry Standard on Tailings Management (GISTM).

This document will be updated on an annual basis. This latest revision is dated April 2025.

2. TSF Description

The Ban Houayxai (BHX) Tailings Storage Facility (TSF) is located in the province of Xaysomboun, approximately 110 km north of the capital of Vientiane in Laos PDR. The TSF is owned and operated by Phu Bia Mining, a subsidiary of PanAust Limited. It consists of an earth/rockfill cross-valley main embankment and a saddle dam, all constructed using the downstream method.

The TSF embankment (and saddle dam embankments) have been designed as multi-zoned earth/rock fill dam structures, which include an upstream low-permeability core (Zone A) to reduce seepage through the embankment, inclined filters (Zone F1) and chimney drains (Zone F2) constructed downstream of the low permeability zone. Zone F1 and F2 capture any seepage through the low permeability zone and promote drainage of the embankment. The embankment then has downstream structural fill (Zone C) to provide structural support to the filter and the low-permeability zone. The initial construction began in 2010 and the facility has been raised almost annually in line with mine production. Construction generally occurs between October and May each during the dry season in Laos.

A summary of key characteristics for the BHX TSF is presented in the table below:

Characteristic	BHX TSF
Status	Active
Years in Operation	13 (2012)
Height: Current* / Final	Main Embankment: 91 m / 99 m Saddle Dam: 39 m / 47 m
Design Storage	84 Mt
Tailings Production Rate	5 Mtpa

*Current completed design height. The facility is being raised and is higher than this but not at a completed design elevation.

The BHX TSF Expansion Stage 2 construction has been completed to an elevation of 608.8 mRL. It is currently being constructed to the Expansion Stage 3 design, the current Life of Mine (LoM), to an elevation of 616.6 mRL. The existing embankments have been designed to meet closure criteria. There are also conceptual designs to raise the embankment further if the LoM is increased.

The TSF water management consists of a excavated rock channel with a small concrete weir, to the west of the embankment and saddle dam. It is designed to pass the probable maximum precipitation (PMP) event into channel downstream of the saddle dam, which flows to the sediment pond. Pumps and siphons are used to discharge water through the spillway during the dry season to lower the TSF pond level. There is no return water system at the BHX TSF.

3. Consequence Classification

A dam breach inundation study has been completed for the Expansion Stage 3 facility and it determined that the BHX TSF has a consequence classification of “High A” under the ANCOLD (2019) classification. It is important to note the classification is only related to consequence and does not consider likelihood or denote risk. The TSF has been designed to more stringent design criteria due to the classification and meets or exceeds guideline factors of safety.

4. Risk Management

PBM regularly undertake and review detailed risk assessments using the PanAust cooperate risk assessment criteria. Potential risks are identified and controls are adopted to mitigate / minimise these risks. Risk levels are then determined using a matrix based on consequence and likelihood scales. The risk-level matrix from the PanAust Risk Standard is presented below.

Likelihood Scale	Consequence Scale								
	Slight (1)	Low (2)	Medium (3)	High (4)	Extreme (5)	Extreme (6)	Extreme (7)	Extreme (8)	Extreme (9)
Almost Certain (5)	5 (M)	10 (M)	15 (H)	20 (H)	25 (H)	30 (VH)	35 (VH)	40 (VH)	45 (VH)
Likely (4)	4 (L)	8 (M)	12 (M)	16 (H)	20 (H)	24 (H)	28 (VH)	32 (VH)	36 (VH)
Possible (3)	3 (L)	6 (M)	9 (M)	12 (M)	15 (H)	18 (H)	21 (H)	24 (H)	27 (VH)
Unlikely (2)	2 (L)	4 (L)	6 (M)	8 (M)	10 (M)	12 (M)	14 (M)	16 (H)	18 (H)
Rare (1)	1 (L)	2 (L)	3 (L)	4 (L)	5 (M)	6 (M)	7 (M)	8 (M)	9 (M)

Material risks for the PKM TSF relate to main embankment failure modes. A number of controls are in place that have reduced the likelihood of these risks to the lowest level (rare). These controls include the following:

- Appointment of a reputable design engineer (Knight Piésold).

- Internal engineering reviews by the PBM technical team (TSF and Geotech Manager, TSF Superintendent, TSF Construction Superintendent, QAQC and Monitoring Superintendent and Senior Engineers).
- External Reviews by the Engineer of Record (EoR), Tailings Independent Review Panel (TIRP) and a Comprehensive Dam Safety Assessment.
- Extensive array of instrumentation with alert systems, which include deformation, pore water pressure, and flow monitoring.
- Daily inspections of the TSF and regular performance monitoring by the EoR and PBM technical team.
- Skilled experienced workforce and construction contractor.
- High level of quality control and quality assurance of materials before and after placement.
- Good quality monthly reporting and annual construction reports with as-built drawings.

Risk assessments are reviewed by the EoR and TIRP on an annual basis or when there are design changes to the TSF.

5. Impact Assessment

An assessment of impacts was completed as part of the BHX TSF Dam Breach Study (2024) that produced inundation maps for fair weather and flood induced scenarios. The assessment confirmed the consequence classification and is used to support the BHX TSF Emergency Response Plan (ERP). The assessments identified the population at risk from a theoretical embankment failure and that it has potential to impact local infrastructure, economy and environment. The impact assessments aides in implementing mitigation measures and developing the ERP. Detailed information is presented in the BHX ERP.

6. Design for all Phases of the TSF

The development of the TSF phases at BHX can be summarised as follows:

- The BHX Starter Embankment was design to 600 mRL but was only constructed to 560 mRL during the 2010-2011 build season due to construction timescale constraints and material availability issues.
- In June 2011 following a significant rain event the temporary spillway on the facility failed and the significant damage of the embankment occurred with a large portion of the embankment being eroded forming a scour channel across the full width of the embankment resulting in a loss of containment. Works from November 2011 to July 2012 remediated the failure to a revised design and the TSF was reconstructed to 568 mRL.
- The 2012-2013 build season focussed on raising the embankment to the maximum elevation for the current spillway invert level. Minor works were completed on the spillway, a 2.5 m concrete weir raising the invert from 570.0 mRL to 572.5 mRL. The TSF Embankment was raised to 587.3 mRL.
- An interim raise of the spillway weir was completed in 2015-2016, raising the invert to 575.5 mRL. A further raise of the spillway weir to 580 mRL was completed in 2016-2017.
- The 2017-2018 build season consisted of raising the Main Embankment from 587.3 to 593.0 mRL and the spillway weir from 580 to 587 mRL.
- Construction of the next Main Embankment raise began in October 2018, with the Embankment elevation constructed to 597.0 mRL in December 2019. From 0ctober 2019 to March 2020 the Spillway Weir was raised 591 mRL.

- A 3.1 m raise of the Main Embankment, to 600.1 mRL, was constructed from July 2020 to June 2022. A further Spillway Weir raise to 595 mRL was constructed between October 2021 and April 2022.
- The Staged TSF Expansion Project for a revised LOM began in November 2022, raising the Embankment to 604.1 mRL and Spillway Weir to 597.6 mRL by April 2023 as part of the Expansion Stage 1.
- Expansion Stage 2 was undertaken during the 2023-2024 build season. The Main Embankment was raised to 608.8 mRL and the Spillway Weir was converted to a Saddle Dam to the same elevation. The Expansion Stage 2 Spillway was excavated through a rock channel with a concrete weir invert at 602.1 mRL.
- Expansion Stage 3 commenced during the 2024-2025 build season and will continue for the 2025-2026 build season.

7. External Review and Environmental and Social Monitoring Programmes Findings

An Engineer of Record (EoR) with suitable expertise and experience is engaged and an annual inspection is completed by a Tailings Independent Review Panel (TIRP). The EoR performs three inspections annually, including an Annual Dam Safety Review (ADSR). An independent Comprehensive Dam Safety Review (CDSR) is completed once every 3 to 5 years.

Dates of the most recent and the next reviews are presented in the following table:

Review	Most Recent	Next
EoR Inspection 1	January 2025	January 2026
EoR Inspection 2	May 2024	May 2025
EoR ADSR	October 2024	October 2025
TIRP	May 2024	May 2025
CDSR	May 2024	May 2027-2029

The most recent inspections have resulted in no critical findings.

The most recent inspections have resulted in no material findings. The EoR inspection concludes the TSF is constructed in accordance with the design and the changes to the design implemented during construction are in line with the design intent, and performing and being operated in accordance with the design intent, performance objectives and indicators, applicable guidelines, standards and regulatory requirements. The TIRP concurred with this statement.

The PBM Environmental and Social Management Monitoring Programme (ESMMP) includes weekly monitoring of surface and groundwater quality. The surface water is monitored upstream of the TSF to obtain ambient readings, at the TSF pond, downstream of the sediment pond and the downstream compliance location. Groundwater monitoring is undertaken in the left and right abutments of the TSF embankment. Noise, air quality and biodiversity are also included in the environmental monitoring. No exceedances have been identified in the environmental monitoring for BHX TSF. Social monitoring is performed following Community Management Plans that have been developed for community relations, community development and community health and safety.

8. Emergency Response Plan

The ERP is updated annually at the end of each construction season and drills / training are completed annually so personnel are aware of their roles and responsibilities. The ERP is based on the impacts identified in the Dam Breach Assessment.

PBM have a site based Significant Incident Management Team (SIMT) that manage incidents that affect the regional business or operation, there is also a Field Response Team who manage the emergency response. A Crisis Management Team at PanAust Ltd in Brisbane is initiated if the incident affects PanAust Ltd.

The ERP includes the following information:

- Roles and responsibilities of key personnel and their contact details.
- Regulatory and training requirements.
- Information on warning systems and procedures for the local community population at risk.
- Communication procedures and contact details of relevant external bodies.
- Resources available in the event of an emergency.
- The emergency response plan protocol and hazard levels.
- Early planning considerations for imminent emergency for each department.
- Flow charts to identify the procedure for each incident and details on the main threats and emergency response considerations.
- Site maps with access routes, muster points and inundation zones.
- Information on breach wave arrival times and inundation depths at key locations.

9. Closure Financial Capacity

PanAust confirm it has the financial capacity to cover the costs of closure and post-closure of the PKM TSF.