Tailings Dust Management Plan (Version 1)

As Required By: Class II Air Quality Control Permit for the Copper World Project

May 2023

Prepared by:

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HUDBAY

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Revision Log

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Illustration

1.0 PLAN OBJECTIVE AND DESCRIPTION

This *Tailings Dust Management Plan* (Plan) was developed as part of anticipated requirements associated with obtaining a Class II Air Quality Control Permit (Permit, Air Quality Control Permit) for the Copper World Project (Project). An application for a Class II permit for the Project was submitted to the Arizona Department of Environmental Quality (ADEQ) on October 21, 2022, by Copper World, Inc. (Copper World).

The Copper World Project is located approximately 28 miles southeast of Tucson, in Pima County. The Project involves the construction and operation of an open-pit mining, milling, leaching, and solvent extraction/electrowinning facility. The Project also includes the construction and operation of two Tailings Storage Facilities (TSFs), TSF-1 and TSF-2.

Monitoring and management functions under this Plan will begin once the deposition of tailings begins in each respective TSF (i.e., active operations phase). Monitoring and management under this Plan will be discontinued following the final soil cover placement on each of the respective TSFs.

1.1 PLAN OBJECTIVE

The objective of this Plan is to:

- Minimize the generation of fugitive dust from the exposed tailings surfaces.

1.2 PLAN DESCRIPTION

The remainder of this Plan is divided into the following sections:

- Section 2.0: Description of Tailings Facility Operations
- Section 3.0: Operational Dust Control Measures
- Section 4.0: Opacity Monitoring
- Section 5.0: Monitoring and Reporting
- Section 6.0: Adaptive Management
- Section 7.0: Data Management

In addition to this Tailings Dust Management Plan, two other plans have been developed for the Copper Work Project that involve preventing or monitoring dust emissions. These plans include:

- Visual Observation Plan
- Dust Control Plan

The Visual Observation Plan (VOP) specifies observation points, or Fugitive Lookout Points, where visible emission surveys are to be taken that are associated with the TSFs and other facilities. The VOP also includes applicable reporting forms.

The Dust Control Plan provides general dust control methods as well as specific dust control methodologies, such as for haul roads.

2.0 DESCRIPTION OF TAILINGS FACILITY OPERATION

The Copper World Project includes placement of tailings from the sulfide ore processing (grinding and flotation) circuit in two (2) conventional Tailings Storage Facilities (TSFs), TSF-1 and TSF-2. Tailings slurry from the processing circuit will be dewatered using thickeners and pumped to the TSFs.

The tailings deposition plan consists of the construction of multiple cells. For each cell, a TSF starter dam (start phase) will first be constructed (see **Illustration 1** below). This starter dam is constructed out of local borrow materials or select waste rock. The main starter dam of each individual cell is sequentially raised using the coarse fraction (tailings sands) of the whole tailings in a centerline manner (centerline phase). The tailings are separated using hydro-cyclones into the coarse sand fraction (cyclone underflow) and fine or “slimes” fraction. The coarse sand fraction will be placed downstream of the starter dam and the fine fraction will be deposited upstream. The coarse sand provides a more permeable zone for control of the phreatic level in the TSF embankment.

Along a portion of the downgradient edge of an individual tailings cell, the facility will be raised using upstream techniques (upstream phase). The upstream raise method involves constructing the embankment in discrete lifts using compacted tailings or engineered fill, and spigotting whole tailings from the crest of the embankment. Each upstream embankment raise would be approximately ten (10) feet in height using the compacted fill material. Compacted engineered fill for the upstream raise can either be locally borrowed soil, select waste rock, or tailings from the impoundment if the material meets the required gradation and compaction specifications. Upon completion of each list, the next lift will be stepped inboard to create an overall slope ratio of three horizontal to one vertical (3H:1V).

As part of the starter dam construction, a chimney drain consisting of coarse rock will be constructed on the upstream face of the starter dam, overlain by a layer of cyclone sand to further promote vertical drainage toward a seepage collection system. The proposed chimney drain, seepage collection system, and cyclone sands in the embankments are anticipated to improve recovery of tailings seepage water and keep the majority of structural zones within the embankment from saturation (i.e., downstream shell zone of cyclone sand and starter dam material).

During active operations and deposition of tailings, solution that seeps through the tailings material (drain down) will be collected in a seepage collection system consisting of a network of seepage collection pipes at the base of the facility and seepage collection trenches located at topographic low points on the downstream edge of the TSFs. Solution collected in the seepage collection pipes convey seepage to the seepage collection trenches. Seepage collected by the seepage collection system is pumped to the Primary Settling Pond for reuse in the sulfide processing circuit.

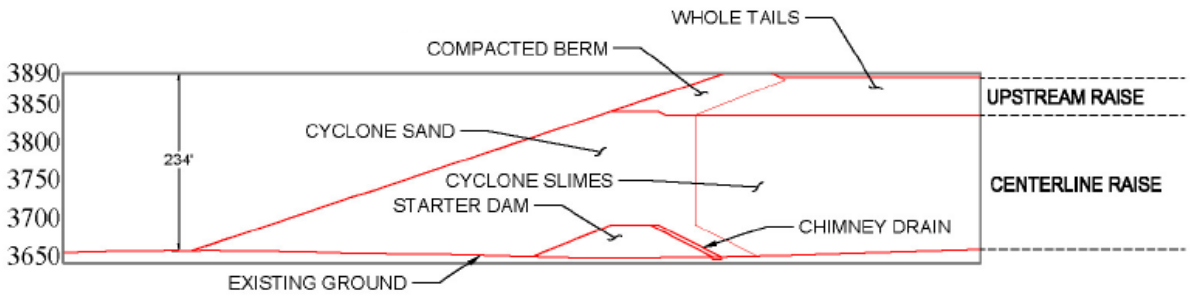

Illustration 1: Typical Embankment Configuration for TSFs

3.0 OPERATIONAL DUST CONTROL MEASURES

Dust control during the following activities or phases of the TSF construction and operation are covered in this section:

Section 3.1 – Access Roads

Section 3.2 – Embankment Slopes

Section 3.3 – Top Header Road and Active Operational Areas

Section 3.4 – Tailings Beach Area

Section 3.5 – Dust Control during Periods of High Winds

With the exception of potential dust generation due to wind erosion on the tailings storage areas, the tailings process is an entirely wet process. Therefore, there are no dust emissions associated with the tailings process in the Plant Site area.

The dust control methodologies outlined herein are designed to ensure that at least a 90% control of PM_{10} emissions is achieved.

Dust management during construction of the starter dam or other site preparation activities, such as the construction of roads or stormwater diversion channels, will employ the general dust control methods as presented in a separate Dust Control Plan that has been developed for the Project.

These general methods include:

- Pre-wetting areas prior to ground disturbance or other earthwork activities;
- Wetting down storage piles;
- Speed control on access roads and within work areas;
- Limiting traffic within work areas; and
- Active watering of activity areas.

3.1 ACCESS ROADS

Dust management on permanent or semi-permanent access roads on the embankment slope of the TSFs will be as follows:

- Cap with native soil (waste rock) materials (if needed);
- Watering or application of a dust suppressant as appropriate (Magnesium Chloride [MgCL2] or equivalent); and
- Limiting vehicular speeds.

3.2 EMBANKMENT SLOPES

The outer embankment slopes will be constructed with either the coarse tailings fraction (in the case of the centerline method) or with compacted materials (tailings, native soils, or waste rock) in the case of the upstream method. These areas, in and of themselves, are not anticipated to generate airborne particulates.

Active disturbance of the embankment materials will be limited once placed. Light grading and surface compaction may be conducted after tailings are placed. Water may be added to the disturbed surfaces to create a surface crust.

3.3 TOP HEADER ROAD AND ACTIVE OPERATIONAL AREAS

During active management of the tailings distribution pipeline on the top header road, i.e., during cycloning or spigotting or during header pipeline relocations, active dust control will include the following:

- General watering (as needed);
- Cap header road with native soil or waste rock (if needed);
- Light surface preparation/compaction and watering (as needed);
- Daily inspections of active operational areas to identify easily erodible areas and prioritize management of those areas; and
- Limiting vehicular speeds.

Operational planning will be employed in order to limit active disturbance areas. Berms or other barriers will be used to prevent access to select areas so that surface crusts can be maintained, etc.

3.4 TAILINGS BEACH AREA

Cyclones, or spigots in the case of whole tailings deposition, will be operated such that the decant pool is maintained at a predetermined distance away from the dam crest. The sequencing of the cyclones/spigots can also be altered during operations to re-wet select portions of the beach areas. Under normal operating conditions, the beach area will either be wet, or a crust will form and bind the tailings, thus helping prevent the generation of airborne particulate matter from wind erosion.

During header pipe relocations, select areas will not receive fresh tailings, and thus dust control alternatives will be limited to those areas as can be reached with a water truck from the existing pipeline header road.

3.5 DUST CONTROL DURING PERIODS OF HIGH WINDS

When wind speeds are at or above 15 mph, or gusts at or above 20 mph, as measured at the official Meteorological Station, or other appropriate measuring location, the surface of the entire TSF shall be inspected, at least once per day, to determine locations where easily erodible areas exist. Water and/or a binder will be added to these erodible areas as practicable.

Additional dust control measures during high winds may include the following:

- Increased inspections/monitoring of areas of concern; and
- Restrict traffic and activities on the TSF to only that essential for tailings placement and/or dust control operations.

Copper World staff will also monitor upcoming weather conditions to proactively prepare for high wind events.

4.0 OPACITY MONITORING

This section describes the conditions by which opacity measures are made, including the proposed observation frequency.

4.1 OBSERVATION LIMITS, METHODS, AND QUALIFICATIONS

The following opacity limit applies to the TSFs:

- Airborne particulate matter from the TSFs is limited to no greater than 20% opacity measured in accordance with EPA Reference Method 9.

Additionally:

- The TSFs shall not cause or permit the airborne diffusion of visible dust emissions, including fugitive dust, beyond the property boundary line within which the emissions become airborne. With actual practice, the airborne diffusion of visible emissions across property lines shall be prevented by appropriately controlling the emissions at the point of generation, or ceasing entirely the activity or operation which is causing or contributing to the emissions.

  This condition shall not apply when wind speeds exceed twenty-five (25) miles per hour as recorded at the official Meteorological Station, or other appropriate measuring location.

The following opacity measurement methods and qualifications apply:

- Any instantaneous survey required by the Class II Air Quality Control Permit shall be performed by an EPA Reference Method 9 Certified Observer.

- Any six-minute observation required by the Class II Air Quality Control Permit shall be determined using the EPA Reference 9 Method and performed by an EPA Reference Method 9 Certified Observer.

4.2 GENERAL OPACITY MONITORING FREQUENCY

The following general opacity monitoring frequency for the TSFs is anticipated:

- Daily visible emissions (instantaneous) surveys of the tailings facility starting from the day embankment construction begins, i.e., placement of tailings.

- Daily visible emissions survey at locations where construction activities associated with the tailings facility, such as for perimeter access roads, diversion channels, etc., are adjacent to the property boundary line (i.e., process area boundary).

5.0 MONITORING AND REPORTING

The proposed monitoring and reporting components associated with this Plan are listed below.

5.1 MONITORING

Monitoring components associated with the TSFs will be per the approved Class II Air Control Permit issued for the Project. Monitoring components pertinent to this Plan will be updated based on the approved Permit.

5.2 REPORTING

Reporting components associated with the TSFs will be per the approved Class II Air Control Permit issued for the Project. Reporting components pertinent to this Plan will be updated based on the approved Permit.

6.0 ADAPTIVE MANAGEMENT

The adaptive management process will be incorporated into the implementation of operational dust control measures. This process will ensure that the most practicable dust control measures are utilized, and that the intent of the Plan is being met. Regarding this Plan, this process includes the following:

- Annual review of this Tailings Dust Management Plan for its effectiveness in controlling fugitive emissions.

If the review of the Plan shows ineffectiveness in controlling fugitive emissions, a revised Plan shall be submitted to ADEQ for approval. The revised Plan shall show improved methods/techniques for reducing fugitive emissions to minimize or prevent potential future violations. The annual review shall consider the following:

- Past compliance issues (both resolved and unresolved);
- Validated complaints reported to ADEQ; and
- Proposed methods of avoiding the above issues/validated complaints in the future.

7.0 DATA MANAGEMENT

Records will either be kept in hardcopy format or electronically. These records will be used as a basis of reporting and compliance verification. All records, analyses, and reports required by ADEQ will be retained for a minimum of five years from the date of generation. All records shall be made available for inspection by authorized ADEQ department personnel during normal working hours.