Fact Sheet for Cyanidation Permit CN-000035

December 31, 2024

The Idaho Department of Environmental Quality (DEQ) proposes to issue a permit to process ore using cyanide pursuant to the provisions of IDAPA 58.01.13 for:

Stibnite Gold Project

Stibnite Road, Stibnite, Idaho 83677

Public Comment Start Date:	12/31/2024
Public Comment Expiration Date:	03/01/2025
Technical Contact:	Adam McMahon (208) 373-0450 adam.mcmahon@deq.idaho.gov

Purpose of this Fact Sheet

This fact sheet explains and documents the decisions the Idaho Department of Environmental Quality (DEQ) has made in writing the draft cyanidation permit for the Stibnite Gold Project.

This fact sheet complies with the "Rules for Ore Processing by Cyanidation" (IDAPA 58.01.13.300.04) that requires DEQ to prepare a draft permit and accompanying fact sheet for public comment before issuing a cyanidation permit.

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Acronyms, Abbreviations, and Symbols

bgs	below ground surface
DEQ	Idaho Department of Environmental Quality
GCL	geosynthetic clay liner
HDPE	high-density polyethylene
IDAPA	Idaho Administrative Code
LCRS	Leakage collection and recovery system
mm	millimeter
MST	Mountain Standard Time
Mt	Million short tons
SGP	Stibnite Gold Project
TSF	Tailings Storage Facility

1 Introduction

This fact sheet provides information on the Idaho Department of Environmental Quality (DEQ) draft cyanidation permit for the Stibnite Gold Project. This fact sheet complies with the "Rules for Ore Processing by Cyanidation" (IDAPA 58.01.13) that requires DEQ to prepare a draft permit and accompanying fact sheet for public comment before issuing a cyanidation permit.

DEQ proposes to issue the cyanidation permit for the Stibnite Gold Project. The cyanidation permit approves the tailings storage facility (TSF) component and associated operating plans, including the water quality monitoring plan (WQMP), as summarized herein. Additional cyanidation facility components and operating plans may be incorporated into the permit in the future. The permit establishes the procedures and requirements to construct, operate, and close the portion of a cyanidation facility that is intended to contain, treat, or dispose of process water or process-contaminated water containing cyanide. This permit ensures that process water and process-contaminated water generated in ore processing operations that use cyanide as a primary leaching agent and pollutants associated with the cyanidation process are safely contained, controlled, and treated so that they do not interfere with the beneficial uses of waters and do not endanger public safety or the environment.

As required by IDAPA 58.01.13.300.04b, this fact sheet includes the following:

- A brief description of the proposed cyanidation facility and operating plan.
- A brief summary of the basis for the conditions on the draft permit.
- The name and phone number of the agency representative to contact for additional information.
- Information on public comment, public meeting, and appeal procedures.

Terms used in this fact sheet are defined in the Definitions section of the permit.

1.1 Public Comment Period

The permit application, draft permit, and fact sheet describing the terms and conditions applicable to the permit are available for public review and comment during a public comment period. The public is provided 60 days to provide comments to DEQ (IDAPA 58.01.13.400.06). In addition to the public comment period, DEQ will hold a public meeting within 30 days after the date of the public notice for a draft permit (IDAPA 58.01.13.400.07). The public meeting is scheduled for January 22, 2025, from 11 a.m. to 1 p.m. Mountain Standard Time (MST). The meeting will be held virtually via *Microsoft Teams.*

Oral or written comments may be submitted by any person at the public meeting. However, for DEQ to address public comments, comments must be submitted in writing during the public comment period. Written comments will be accepted through March 1, 2025, until 5 p.m. MST. Submit comments electronically on DEQ's *Public Comment Opportunities* web page, by mail, or by email to:

Adam McMahon
Cyanidation Program Manager
Idaho Department of Environmental Quality
1410 N. Hilton St.
Boise, ID 83706
adam.mcmahon@deq.idaho.gov

1.2 Permit Issuance

Following the public comment period on a draft permit, DEQ provides notice of a final permit decision within 180 days of receiving a complete application. A final permit decision means a final decision to issue, deny or modify a permit (IDAPA 58.01.13.450.01). DEQ will deny a permit if the application is incomplete or inaccurate; the cyanidation facility as proposed cannot be conditioned for construction, operation and closure; or the Idaho Department of Lands has determined that the permanent closure plan does not meet the requirements of Idaho Code § 47-15, or the rules promulgated thereunder (IDAPA 58.01.13.450.03).

DEQ will also prepare a response to relevant written comments received during the public comment period. This response will briefly describe and respond to all relevant written comments on the draft permit and specify which provisions, if any, of the draft permit that have been changed in the final permit decision, and the reasons for the change (IDAPA 58.01.13.450.02). Relevant comments and responses will be included in Appendix C, and any resulting changes to the permit or fact sheet will be documented in the final fact sheet. The final permit and final fact sheet will be posted on DEQ's web page *Issued Permits and Water Quality Certifications*.

1.3 Documents Available for Review

The draft cyanidation permit and fact sheet can be reviewed or obtained by contacting or visiting the DEQ State Office or Boise Regional Office between 8:00 a.m. and 5:00 p.m., Monday through Friday at the addresses below. The draft permit and fact sheet is also available on DEQ's *Public Comment Opportunities* page.

DEQ State Office
1410 N. Hilton St.
Boise, ID 83706
(208) 373-0502

DEQ Boise Regional Office
1445 N. Orchard St.
Boise, ID 83706
(208) 373-0550

1.4 Accessibility Services

DEQ will provide reasonable language access services and/or disability services for documents at no charge. To request an accommodation under Title VI of the Civil Rights Act of 1964 or Americans with Disabilities Act, contact DEQ's nondiscrimination coordinator at (208) 373-0271 or *accessibility@deq.idaho.gov*. Para obtener información en español, visite *https://www.deq.idaho.gov/about-us/accessibility/.*

2 Background Information

2.1 Facility Information

This fact sheet provides information on the cyanidation permit for the following entity (Table 1):

Table 1. Facility information.

Permittee	Perpetua Resources Idaho, Inc.
Facility Physical Address	Stibnite Road, Stibnite, Idaho 83677
Facility Mailing Address	Perpetua Resources Idaho, Inc. 405 S. 8th Street, Suite 201 Boise, ID 83702
Facility Contact	Michael Wright, Vice President—Projects (208) 901-3063
Responsible Official	Alan Haslam, Vice President—Permitting (208) 901-3053
Facility Location	Latitude: 44.907944 Longitude: -115.328556
Application Submittal Date	October 2, 2024
Date Application Deemed Complete	November 1, 2024

2.2 Facility Description and Operating Plan

The Stibnite Gold Project (SGP) is located within the historic Stibnite Mining District, an area characterized by a century of mining activity. Mining has occurred on unpatented (federal land) and patented (private land) mining claims to recover gold, silver, tungsten, and antimony. Perpetua Resources (permittee) proposes to redevelop portions of this historic mining district, with a mine plan that includes three open pits (Hangar Flats, West End, and Yellow Pine), an ore processing facility, a lined TSF, a tailings/reclaim water pipeline, and a TSF buttress composed of development rock. The currently projected SGP timeline is approximately 23 years, including 3 years of construction, then 15 years of operations, followed by 5 years of final closure and reclamation work. The postclosure period is approximately 25 years, including final TSF closure and long-term process water treatment. At full operation, the SGP will process ore at a rate of

20,000 to 25,000 tons per day; approximately 115 million tons of ore will be processed over the life of the mine.

2.2.1 Ore Processing Facility

The SGP ore processing facility is designed to separate gold, silver, and antimony from a complex sulfide and oxidized ore to produce gold and silver doré, and an antimony concentrate. The ore is crushed and ground to liberate valuable minerals for further treatment. The ore is then processed using cyanide leaching for gold, silver, and antimony recovery. The method of metal recovery is determined by ore type, as SGP mineral resources includes both sulfidic and oxidized or partially oxidized ores.

Initially, high antimony and sulfide bearing ores from the Yellow Pine and Hangar Flats pits, will be processed. In addition, the Bradley Tailings (legacy material) will be reprocessed. Sulfide ores are subjected to froth flotation process to separate sulfide minerals from the nonsulfide minerals. When economical concentrations of stibnite (antimony sulfide) are present, a flotation concentrate will be produced. A gold-silver-bearing sulfide concentrate produced from sulfide ores is pressure oxidized in an autoclave so the precious metals become more amenable to cyanide leaching. Dissolved gold and silver present in the cyanide leach solution are adsorbed on activated carbon, stripped from the carbon, precipitated by electrowinning, melted, and cast into doré bullion as a salable product.

Treatment of oxide and partially oxidized (transitional) ores from the West End deposit are expected to begin in year 7 of operations, requiring construction of an oxide leach circuit. Oxide ores are crushed and ground and then go directly to cyanide leaching, carbon adsorption, stripping, electrowinning, melting, and casting. After crushing and grinding, transitional ores are subjected to pyrite flotation, concentrating the gold-bearing sulfides. This concentrate is oxidized in the autoclave, similar to the treatment method for sulfide ore. Flotation tailings, containing the oxide component, are leached in the oxide leach circuit. Oxide and transitional ores represent approximately 4.5% and 24.7% of ore over the life of the mine, respectively.

After processing, the tailings are transported via pipeline as a slurry to the TSF for permanent storage. The ore processing facilities will be incorporated in a future permit modification per IDAPA 58.01.13.750 (section 3.2).

2.2.2 Tailings Storage Facility

Approximately 120 million short tons (Mt) of tailings (115 Mt ore plus added lime/limestone) will be produced over 15 years at a tailings production rate between 18,000 and 26,000 short tons per day. The tailings will contain residual concentrations of cyanide and metals, including arsenic and antimony, requiring a fully lined containment facility. Tailings and process water will be held within a fully lined impoundment formed by an embankment or dam constructed across the Meadow Creek valley. The TSF, consisting of the impoundment, embankment, and associated water diversion structures, will occupy approximately 423 acres at final construction buildout.

Tailings will be deposited in the TSF starting in mine year 1 through mine year 15. At the end of operations, the TSF is projected to contain approximately 120 Mt of tailings solids (approximately 115 Mt of ground ore plus approximately 5 Mt of lime, ground limestone and gypsum resulting from the neutralization of oxidized sulfides), operational water pool (often referred to as the "supernatant" solution), and precipitation runoff.

The TSF will be constructed in five phases with a maximum embankment crest height of 480 feet and elevation of 7,080 feet above mean sea level. The embankment will be constructed using downstream construction methods, with a starter embankment constructed for initial operations, followed by four embankment raises to accommodate planned tailings production. The TSF embankment is designed as a standalone structure meeting the Idaho Department of Water Resources and DEQ minimum slope stability design criteria. The TSF buttress located immediately downstream of, and abutting against, the TSF embankment will substantially enhance embankment stability but is not needed to meet embankment slope stability design criteria.

To minimize the release of pollutants, the TSF impoundment, including the upstream embankment face, will have an engineered liner system to contain and prevent transport of tailings or seepage of process water out of the facility. The TSF liner system is a composite liner of geosynthetic materials.

The upper layer of the composite liner will consist of a 60 mil (1.5 millimeter [mm]) high-density polyethylene (HDPE) geomembrane, double-sided textured for stability on slopes and to improve safety during construction. A geosynthetic clay liner (GCL) will be placed underneath the geomembrane layer, providing a self-sealing leakage barrier if the geomembrane liner is torn or punctured. The liner system includes an additional layer in areas where groundwater is less than 100 feet below ground surface (feet bgs), providing additional or enhanced containment (IDAPA 58.01.13.200.a.iii and 58.01.13.204.02). In shallow groundwater areas (less than 100 feet bgs), the liner system will include a leakage collection and recovery system (LCRS).

The LCRS will consist of (from top to bottom) a primary 60 mil (1.5 mm) textured HDPE geomembrane, 60 mil (1.5 mm) HDPE MicroDrain© with stud side up, and a geosynthetic clay liner (GCL). MicroDrain© is a geomembrane with drain studs that provides an interstitial gap between the geomembranes to convey fluids. The system is designed to capture potential leakage through the primary liner. Any captured leakage from the primary liner will travel to a collection sump at the base of the impoundment, be pumped to the embankment crest, and discharged back into the impoundment.

The TSF will also include a network of drains installed above and below the engineered liner systems. The overdrain system consists of a network of geocomposite drains placed above areas of the liner to reduce hydraulic head on the liner and excess pore pressure in the overlying tailings. Water in the overdrains will travel to a collection sump, be pumped to the embankment crest, and discharged back into the impoundment.

Underdrains installed during site preparation will collect spring and seep flows beneath the TSF impoundment liner and embankment, reducing hydrostatic uplift on the liner system. Geocomposite secondary drains cover the valley floor conveying flow to perforated drainpipes placed in gravel-filled trenches. Secondary drains will be oriented facing downslope towards the nearest primary drains. Secondary drains run diagonally to primary in a herringbone pattern along the center of the impoundment and in areas where groundwater seeps were identified. Underdrain flows will be collected in a vault upstream of the discharge point and then discharged to surface water or directed to the ore processing facility for use as makeup water or to water treatment. Any surface water discharges are regulated under Idaho's Pollutant Discharge Elimination System "Rules Regulating the Idaho Pollutant Discharge Elimination System Program" (IDAPA 58.01.25) (IPDES).

2.2.3 Pipeline Corridor (Tailings Pipeline, Reclaim Water Line, and Pipeline Pond)

A pipeline corridor will run from the ore processing facility to the TSF to transport tailings and return reclaim water for use in ore processing. Reclaim water is sourced from the TSF supernatant pool and is comprised of tailings consolidation water and direct precipitation on the TSF. The tailings and reclaim water piping system is designed as two parallel 18-inch diameter pipelines buried in a linear low-density polyethylene liner containment wrap. Tailings slurry will be pumped from the tailings pumphouse to the TSF via an 18-inch HDPE-lined carbon steel pipe. Reclaim water is pumped out of the TSF supernatant pool to the reclaim water tank and will flow by gravity from the reclaim water tank (near the TSF) to the process water tank (at the process plant) via an 18 inch-HDPE pipe.

The pipeline corridor also includes the TSF Pipeline Pond, designed to contain tailings or reclaim water during maintenance or repair of either the tailings or reclaim water pipelines. This pond is double-contained and has a leak detection system that complies with the requirements of a process water pond (IDAPA 58.01.13.202).

The pipeline corridor will be incorporated in a future permit modification per IDAPA 58.01.13.750 (section 3.2).

3 Conditions

3.1 Standard Conditions

IDAPA 58.01.13.500 includes standard permit conditions that are incorporated into section 2.1 of the permit.

3.1.1 Begin Construction

IDAPA 58.01.13.500.10 requires the permittee to begin construction of a permitted cyanidation facility within one year of the effective date of this permit, otherwise the permit is deemed void. For this permit, only the tailings storage facility is approved for construction, subject to the conditions in section 2.2 of the permit. Construction activities of a permitted cyanidation

facility includes placement of earthworks or concrete foundations for containment systems, placement of containment systems, or placement of facility equipment or structures. For this permit, placement of materials for the tailings storge facility embankment qualifies as beginning construction.

Construction of cyanidation facility components not covered by this permit is not approved, specifically the ore processing and pipeline corridor facility components, including the tailings pipeline, reclaim water pipeline, and tailings pipeline pond. However, site preparation activities which occur during preconstruction of these components is allowed. Allowable preconstruction activities include excavation, site leveling and grading, or construction of ancillary features such as roads or other permitted facilities. While not prohibited, preconstruction activities are not covered under this permit and must be conducted in accordance with applicable federal and state regulations, including but not limited to “Rules for the Control of Air Pollution in Idaho” (IDAPA 58.01.01) and “Rules Regulating the Idaho Pollutant Discharge Elimination System Program” (IDAPA 58.01.25).

3.2 Specific Conditions

All permit conditions in accordance with IDAPA 58.01.13.200–204 are included in sections 2.2 and 2.3 of the permit. A brief summary of the basis for the specific conditions on the draft permit, including references to applicable statutes or regulations and appropriate supporting references to the administrative record, are discussed below.

For facility components with final plans and specifications, DEQ conducted an accuracy and protectiveness review based on the cyanidation rules and other applicable rules, including but not limited to, the “Water Quality Standards” (IDAPA 58.01.02), “Ground Water Quality Rule” (IDAPA 58.01.11) and “Rules for Ore Processing by Cyanidation” (IDAPA 58.01.13.300.02). Based on that review, DEQ determined the TSF facility component is accurate and protective, and the permit authorizes construction of that facility component, subject to the conditions in sections 2.2 and 2.3 of the permit. The TSF design meets the requirements of IDAPA 58.01.13.200.06.a:

1. Minimize releases of pollutants into groundwater or subsurface migration pathways so any release will not cause unauthorized degradation of waters.
2. Preclude any differential movement or shifting of the subgrade, soil layer, liner, or contained material that endangers containment integrity as a result of the proposed range of operating conditions for each component and anticipated seismic activity at the site.
3. Include additional containment of process water, as requested by DEQ, in areas where groundwater is considered to be near the surface.

The TSF impoundment includes a liner system that meets the requirements of IDAPA 58.01.13. In addition, the impoundment liner system includes an LCRS, which provides additional or enhanced containment in areas with shallow groundwater (IDAPA 58.01.13.200.a.iii and 58.01.13.204.02).

Other components of the proposed cyanidation facility require further information and DEQ reserves its authority to require any such additional information necessary for review decisions on compliance with the cyanidation rules (IDAPA 58.01.13.200–205) and protection of human health and the environment (IDAPA 58.01.13.100.03). For DEQ approval, including a full accuracy and protectiveness review (IDAPA 58.01.13.300.02), further information is required for these facility components. Specifically, the ore processing facility and pipeline corridor (tailings and reclaim water pipelines and pond) are not approved with this permit decision and will require incorporation into the permit as a permit modification (IDAPA 58.01.13.750). This modification will be subject to the requirements of IDAPA Section 58.01.13.400, including public comment with respect to any draft permit terms and conditions applicable to those other components (IDAPA 58.01.13.400.06).

4 Operation and Maintenance Plans

IDAPA 58.01.13.100.03.s requires operation and maintenance plans to be included with the permit application. The permit incorporates plans included in the permit application by reference and are permit requirements. These plans describe how the facility will be constructed, operated, and closed so that process or process-contaminated water does not interfere with the beneficial uses of the waters of the state and do not endanger public safety or the environment. IDAPA 58.01.13.100.03.s requires the following:

- Maintenance plans
- Water management plan
- Water quality monitoring plan
- Emergency spill and response plan
- Seasonal/temporary closure plan, if applicable

Additionally, the applicant is required to submit a permanent closure plan to DEQ and the Idaho Department of Lands as required under the Idaho Mind Land Reclamation Act (Idaho Code § 47-15).

Approved operation and maintenance plans are listed in section 1.3 of the permit and incorporated by reference as permit requirements. Plans for cyanidation facility components not approved with the permit are not listed in Section 1.3 of the permit (e.g. Cyanidation Facility Operation and Maintenance Plan for the ore processing facility). Operation and maintenance plans for future facility components will be reviewed and approved as part of the permit modification in accordance with IDAPA 58.01.13.750.

5 Compliance with Other DEQ Rules

In addition to the cyanidation rules and the requirements of the permit, the permittee must construct, operate, maintain, close, and monitor the proposed cyanidation facility in conformance with, but not limited to, the “Water Quality Standards” (IDAPA 58.01.02); “Idaho Rules for Public Drinking Water Systems” (IDAPA 58.01.08); “Rules and Standards for Hazardous

Waste" (IDAPA 58.01.05); Solid Waste Management Rules" (IDAPA 58.01.06,); "Groundwater Quality Rule" (IDAPA 58.01.11); and "Rules Regulating the Idaho Pollutant Discharge Elimination System Program" (IDAPA 58.01.25).

Appendix A. Your Right to Appeal

Persons may be entitled to appeal agency actions authorized under the "Rules of Administrative Procedure Before the Board of Environmental Quality" (IDAPA 58.01.23) and administrative provisions of the "Rules for Ore Processing by Cyanidation" (IDAPA 58.01.13.003).

The petition must be filed 35 days from the date of the action or inaction of DEQ.

All documents concerning actions governed by these rules must be filed with the Hearing Coordinator at the following address:

Diane Cutler, Rules and Planning Analyst
Idaho Department of Environmental Quality
1410 N. Hilton St.
Boise, ID 83706-1255

Documents may be filed by email, US mail, or hand-delivery. The originating party is responsible for retaining proof of filing by fax. The documents are deemed to be filed on the date received by the Hearing Coordinator. Upon receipt of the filed document, the Hearing Coordinator will provide a conformed copy to the originating party.

Appendix B. Public Involvement and Public Notice

DEQ proposes to issue a permit to the Stibnite Gold Project. The permit includes design, operation, maintenance, and monitoring conditions. This fact sheet describes the facility and DEQ's reasons for requiring permit conditions.

DEQ will place a Public Notice of Draft on January 2, 2025, in the Star-News to inform the public and to invite comment on the draft cyanidation permit and fact sheet.

The notice includes the following:

- Provides contact information for DEQ and the applicant.
- Describes the public involvement procedures and how to obtain additional public information.
- Offers to provide the documents in an alternate format to accommodate accessibility.
- Provides a general description of the facility location.
- Specifies the public comment period.
- States the public meeting location and time.

Appendix C. Public Comments and Response to Comments

DEQ will complete this section after the public comment period on the draft permit.