FACT SHEET

(Pursuant to Nevada Administrative Code [NAC] 445A.401)

Permittee Name: **Ioneer USA Corporation**

Project Name: **Rhyolite Ridge Project**

Permit Number: **NEV2020107**

Review Type/Year/Revision: **Renewal 2025, Fact Sheet Revision 00**

A. Location and General Description

Location: The Rhyolite Ridge Project (Project) is located in Esmeralda County, within Sections 19 – 23 and 26 – 35, Township 1 South (T1S), Range 37 East (R37E) and Sections 2, 3, and 4, T2S, R37E, Mount Diablo Baseline and Meridian, approximately 15 miles northeast of Dyer and 40 miles southwest of Tonopah. The Project is located on public lands administered by the U.S. Department of Interior, Bureau of land Management (BLM), Battle Mountain District, Tonopah Field Office in Tonopah, Nevada.

The site may be accessed by traveling north or southbound on US-95 to Coaldale Junction. From Coaldale, head west on US-6 for 6 miles. Turn left (south) onto NV-773 for 10.5 miles. Turn left (south) onto NV-264 for 6 miles. Turn left (east) onto Hot Ditch Road (road most likely doesn't have a street sign) to head to the Fish Lake Valley Hot Well (FLVHW). The FLVHW is located approximately 7 miles east of NV264. Make a gradual right turn followed by a sharp right turn. Proceed 0.5 miles, turn left and then proceed 4.3 miles to reach the Project boundary.

General Description: The Rhyolite Ridge Project consists of an open pit lithium and boron mine (referred to as a Quarry in the Water Pollution Control Permit Application), an Overburden Storage Facility (OSF), a processing plant, a Spent Ore Storage Facility (SOSF), and a sulfuric acid plant (SAP). As proposed, the Project has an operating life of 17 years including a four-year construction period. A total mine life of 23 years is proposed, including reclamation and closure of the site.

B. Synopsis

History:

Exploration activities have occurred at or near the Project, with the earliest known boron exploration activities beginning in the 1890s. More recent exploration activities have occurred in the 1960s, 80s, 90s and 2010s and included the work for the permitting of the Project. The Project area has not been previously mined.

Geology:

The Project is located within the northwest part of the Silver Peak Range and lies within the Silver Peak-Lone Mountain extensional complex of west-central Nevada. The Silver Peak Range is bounded by the Fish Lake Valley to the west and south, Clayton Valley to the east, Big Smoky Valley to the north, and falls within a prominent northwest-trending belt of right-lateral, strike-slip faults referred to in geologic literature as the Walker Lane Fault System.

The major regional geological units, from oldest to youngest, include Paleozoic sedimentary rock, intruded by a small Jurassic pluton, that underlie the area, which are stratigraphically overlain by Tertiary and pre-Tertiary volcanic, volcaniclastic and sedimentary rock assemblages, and finally Quaternary alluvium. The Coyote Hole Group dominates the near-surface geology within the Project area and includes the Cave Spring Formation. The Cave Spring Formation is approximately 1,300 feet thick, laterally extensive and approximately 4 to 6 million years old in the Project area. The lower 100-foot section of this formation is relatively heterogeneous. A basal travertine ledge is observed that transitions to thinly interbedded tuffaceous argillite, quartzofeldspathic sandstone, and conglomerate cut by paleochannels. The upper portion is dominated by thinly interbedded tuffaceous argillite and immature quartzofeldspathic wacke containing rare rock fragments and biotite grains.

Mining:

One open pit is planned for the Project. Mining will be conducted by drill/blast and load/haul utilizing truck and shovel/loader. No blasting is expected to be required for the alluvium and/or lithium clay units. The 2024 major modification of the permit expanded the pit to the South and East of the previously permitted footprint, both adding to the permitted pit area and avoiding direct impacts to the protected Teim's Buckwheat populations. There is potential for expansion of the open pit and associated facilities, which will require submittal of the applicable modifications to the Permit.

Ore will be shipped to the Processing Plant and placed on one of the two stockpiles. Waste rock and overburden will be hauled to the OSFs.

Overburden Storage Facilities (OSFs):

The current mine plan calls for three overburden storage facilities (OSFs) over the life of the mine; one to the southwest of the pit called the South OSF, one to the north of the pit called the North OSF, and one as a partial infill of the open pit called the Quarry Infill OSF. As of the 2024 permit update only the South and Quarry Infill OSFs have been approved by the Division. A request for modification to the permit must be submitted to the Division prior to the construction of the North OSF.

The South OSF is located to the southwest of the open pit and is designed to contain 107,722 kilotons of waste rock and overburden. The Quarry Infill OSF will fill in portions of the southwest walls of the open pit, and is designed to contain 190,978 kilotons of waste rock and overburden. The South OSF will stack toward the Quarry Infill OSF, so that in year nine of the current mine plan they will meet. Eventually, the South OSF and Quarry Infill OSF will be one facility, with an average height of approximately 400 feet above ground surface and a maximum height of 640 feet above existing ground surface. The toe of the Quarry Infill OSF is designed to a minimum height of 5700 feet amsl, which is approximately 50 feet above the expected ultimate pit lake elevation, meaning no portion of the Quarry Infill OSF will be submerged by the eventual pit lake.

The OSFs will be stacked via truck end dumping and bulldozer in 20-foot lifts. The OSFs will be actively reclaimed during operations and the side slopes will be recontoured to 3 Horizontal:1 Vertical (3H:1V) overall or flatter and have a minimum of 2.5-feet of an evapotranspiration cover pursuant to the proposed Tentative Plan for Permanent Closure and the Reclamation Plan.

The OSF is designed with permanent stormwater diversion channels, engineered to divert surface water run-on from the surrounding natural topography to natural drainages and/or around the OSF. One of the drainages will be conveyed through the OSF Underdrain System; see the heading titled *OSF Underdrain System* for additional information.

Pursuant to the proposed 2024 Waste Rock Management Plan (WRMP), OSF's will have standard setbacks of 25-feet of non-reactive material between the ground, sides, and top to prevent acid rock drainage (ARD) or metal leaching (ML). The non-reactivity of setbacks will be verified using LECO testing or similar methods. Other than these non-reactive setbacks, all waste materials will be blended to minimize the effects of any potentially acid generating (PAG) waste and maintain a minimum overall neutralization potential ratio (NPR) of at least 1.2 or greater. Additionally, as the OSFs are constructed alluvial material will be placed along the outer slopes with a minimum thickness of 2.5 feet at final reclamation. The native alluvium is expected to perform suitably for vegetative uptake and act as an evapotranspiration (ET) cover. The M5 clay geological unit will be placed in the OSFs with a minimum horizontal setback of 350 feet from the final OSF slope face, between the elevations of 6,100 feet above mean sea level (amsl) and 6,600 feet amsl. The M5 unit will be segregated to provide adequate structural stabilization and meet stability criteria for the OSF.

OSF Underdrain System: The OSF will be constructed with an underdrain system to convey storm/contact water from the OSF into the Contact Water Channels, and from there into either the OSF Contact Water Pond (OSF-CWP) or into the Quarry during operations. Based on the prevailing climatic conditions and short duration of the construction of the OSF, no seepage is expected to occur.

Contact water from upstream of the OSF-CWP will be directed into two Undertrain Inlet Basins through two vertical 24-inch perforated risers encapsulated with drain rock and geotextile to minimize sediment mobilization. The risers will move water into the underdrain piping system. The OSF perforated underdrain pipes will be two 24-inch CPE pipes. The underdrain pipes will be installed in a 4-foot deep trench that follows the natural drainages below the OSF. The trench will be constructed with non-woven 12 ounce per square yard geotextile and drain rock fill. The underdrain pipes will convey the stormwater and contact water to the OSF-CWP. The OSF Underdrain System was sized to convey runoff from the 100-year, 24-hour storm event. The OSF Underdrain Inlet Basin will be backfilled, plugged, and regraded at closure to promote surface water runoff.

Contact water from downstream of the OSF-CWP will be not be directed into the Underdrain System, but will be conveyed by topographic lows beneath the facility and ultimately drain to the Quarry. No underdrain system has been designed for this area.

OSF Contact Water Pond (OSF-CWP): The OSF-CWP will collect the stormwater infiltration, contact water, and the design storm event runoff from the OSF. The OSF-CWP will be constructed with a single 80-mil geomembrane placed above liner bedding material with a compacted subgrade. Internal side slopes of the OSF-CWP will be constructed at a maximum grade of 3H:1V. The OSF-CWP is approximately 450 feet by 350 feet and 20 feet deep, and has a capacity of 34.2 acre-feet at the freeboard of 1 foot above the normal operating volume, and a total volume of 37 acre-feet at the crest. The OSF-CWP is designed to contain the 100-year, 24-hour storm event to within 1-foot of the pond crest in addition to a life of mine monthly average seepage inflow rate of 20 gallons per minute. The stormwater and contact water from the OSF-CWP will be evacuated via pump truck and transferred to the Process Plant for use as make-up water during active operations.

The OSF-CWP will be monitored for a period of time during and after reclamation to provide effective data to fully understand long-term water chemistry and drain-down flow rates of the OSF. Once the chemical constituents of the OSF contact water fall below regulatory limits as agreed upon with the Division, the tentative plan for permanent closure of the OSF-CWP, is for the OSF-CWP liner system to be demolished. The pond will be backfilled and/or graded to drain, and the underdrain system will be capped and covered (to prevent wildlife ingress). The long-term drain down of the OSF will then report directly to the natural drainage. This is a tentative plan, and closure plans are subject to updates at mining progresses.

Processing:

Ore from the open pit will be hauled to stockpiles at the Process Plant. Once the ore is placed on one of the two stockpiles (High-Boron Stockpile or Low-Boron Stockpile), a front-end loader will be used to blend and feed ore into the ROM ore feed bin. After crushing, the crushed ore will be conveyed directly to the leaching vats where the ore is leached with sulfuric acid utilizing counter-current process flow.

Seven steel leaching vats with acid-resistant lining will contain the crushed ore at various stages of the leaching process. Crushed ore will be conveyed by a vat tripper to a vat loading shuttle conveyor into the appropriate vat, each containing sulfuric acid leach solution in varying concentrations. Crushed ore will be leached for a specified time with sulfuric acid, washed, and then removed with a clam shell reclaimer for discharge to a dump hopper and conveyor that feeds a spent ore stockpile. From there the spent ore is loaded into haul trucks for transport to the SOSF.

The leach solution will continue to advance counter-current to vats with progressively less-leached ore until the solution finally contacts fresh ore, which allows the free acid required for final leaching to be utilized efficiently on fresh ore that contains minerals that dissolve in less-aggressive free-acid conditions. The resultant pregnant leach solution (PLS) maximizes the concentration of dissolved salts while minimizing the acid lost to downstream processing stages. The PLS from the final vat is pumped from the vats to the evaporation and crystallization circuit for further processing.

The evaporation and crystallization circuit removes impurities from the PLS and generates boric acid and lithium brine. The boric acid is first to crystallize and be extracted. The boric acid is separated and purified from the sulfate salts to produce the boric acid product. Lithium remains soluble throughout the evaporation/crystallization process. During the process, any excess brine is pumped out and recycled for reuse throughout various stages of the process.

The lithium brine is conveyed through a series of centrifuge, flotation, dissolution, and recrystallization steps to produce a technical-grade lithium carbonate. Process material resulting from the recovery process include spent ore, sulfate salt residues, and neutralization filter cake, which will be dewatered at the Processing Plant and then trucked to the SOSF.

Process Plant Containment: Primary containment in the vat leaching area of the Process Plant will consist of rubber lined, steel leach tanks. The tanks will be supported on ringwall foundations with an HDPE liner placed beneath the tanks and around the inside and outside face of the ringwall. Evenly spaced channels through the ringwall foundation will allow for leak detection below the tanks, which would convey solution to the secondary containment of the vat leaching area in the event of leakage from primary containment. The remaining secondary containment will be constructed with a reinforced concrete containment slab, with stemwalls, installed around the perimeter of the vats/tanks, the pipe racks, and the loading conveyors.

The spent ore conveyor will be over the concrete containment slab for the horizontal section of the conveyor and the inclined section will be equipped with covers and drip pans that drain back to the concrete containment. The secondary containment slab is sized to contain 110-percent of the volume of the largest tank plus the 24-hour, 25-year storm event. The containment slab, walls, and exposed ringwall foundations will be coated with a chemical resistant coating and chemical resistant waterstops will be placed in applicable joints. Solution in the secondary containment will be conveyed to a sump where it will be pumped back into process with a pump truck.

High-Boron Stockpile and Low-Boron Stockpile: The High- and Low-Boron Stockpiles are designed to capture any leachate from the ore material. The solution will be evacuated from the stockpile sumps. The High and Low-Boron Stockpiles will be constructed from top to bottom of the following: 1-foot layer of crushed rock, 5 feet fill, a layer of nonwoven geotextile, 3 feet of a native gravel-sand mix with embedded perforated pipes to collect and convey stormwater to a sump for evacuation, 80-mil HDPE liner, and a prepared subbase. The perforated pipes are 8-inch diameter pipes and convey the collected stormwater to a 24-inch diameter HDPE pipe that empties to the sump, for eventual evacuation via pump truck. The High- and Low-Boron Stockpiles were designed to contain run-of-mine ore to an approximate height of 20 feet above the liner surface.

Partially enclosed conveyors will convey the stockpiled material to the vat area while also preventing run-of-mine ore from spilling on the ground. Solid removal, site remediation and impacted material disposal procedures will be implemented in the unlikely event of spillage of ore onto the ground.

Spent Ore Pile: The Spent Ore Pile will temporarily stockpile the spent ore generated from the process facility prior to its shipment via truck to the SOSF. The Spent Ore Pile will be constructed from top to bottom of the following: 1-foot layer of crushed rock, 5 feet of fill, non-woven geotextile, 3 feet of a native gravel-sand mix with embedded perforated pipes to collect stormwater and convey it to a sump for evacuation, 80-mil HDPE liner, and a prepared subbase. The perforated pipes are 8 inches in diameter and convey the collected stormwater to a 24-inch HDPE pipe that empties to the sump for eventual evacuation via pump truck. The Spent Ore Pile was designed to contain spent ore to an approximate height of 16 feet above the liner surface.

The Spent Ore Pile will have a truck wheel wash/bath incorporated into the facility to allow for a minimum of one-wheel revolution and remove any fugitive soil remnants that are on the truck wheels prior to leaving containment and transporting the material to the SOSF.

Process Facilities Pad-Contact Water Pond: The Process Facilities Pad-Contact Water Pond (Process-CWP) is designed to detain stormwater runoff from the process facilities pad. The stormwater runoff from the process plant and SAP area will be conveyed by overland sheet flow to a system of swales and perimeter ditches, which will convey the water to the Process-CWP.

The Process-CWP is single lined with a sloping bottom to a sump and evacuation system. The lining system will consist of, from the bottom: a prepared subgrade, 1-foot of liner bedding material, and an 80-mil HDPE single-sided textured geomembrane. This pond may be required to be double-lined in the future if the typical water quality is demonstrated to have the potential to degrade the waters of the state. The Process-CWP is approximately 380 feet by 250 feet wide and will be 13 feet deep, including 4 feet of freeboard and interior slopes of 3H:1V. The pond is designed to contain the 25-year, 24-hour storm event 24-hour storm event below the 4-foot freeboard and must be evacuated to a depth of 9 feet to provide adequate storage capacity for the 25-year, 24-hour storm event. The Process-CWP is capable of containing at the spillway elevation of 5,553 feet, the 100-year, 24-hour storm event on top of the maximum operating depth of 9 feet. Water evacuated from the Process-CWP will be used as make up water for the Processing Plant. The emergency spillway prevents the pond from overtopping during extreme upset conditions.

Sulfuric Acid Plant (SAP):

Molten/Liquid Sulfur and solid/Prilled sulfur will be used as the feedstock in a chemical reaction process of MECS® technology for acid plants, developed by Elessent Clean Technologies. The process will produce sulfuric acid and generate steam. These two products are required to leach ore in the leach vats, provide heat to the balance of the process facility, and generate electrical power. Upon arrival of the sulfur feedstock to the site, the solid/Prilled sulfur will be stored outside on an earthen pad contained by bund walls, to be fed into a sulfur hopper and conveyed to the melter, which is a stirred tank where heat produces liquid sulfur. The molten/liquid sulfur, both that delivered to site and that produced via melting, will be fully contained in the carbon steel Clean Sulfur Tank or the acid-resistant brick-lined Clean Sulfur Pit. Both the tank and pit will be thermally maintained by steam coils to ensure the viscosity of the molten/liquid sulfur. Sulfuric acid will be stored in dedicated carbon steel tanks where it will be piped to the leaching vats containing crushed ore from mine and proceed through the leaching process. Steam will be used to generate heat needed for the evaporation and crystallization circuit, as well as, to power a steam turbine generator capable of producing approximately 40 megawatts required to run the various facilities and provide the project a power independence.

The SAP will have secondary containment consisting of concrete that will be lined with an acid-resistant epoxy. The strong acid area, inclusive of all equipment and piping, will be located within acid-resistant concrete and epoxy coated containment that is sloped to collection trenches and sumps, which will be lined with acid- resistant brick.

The SAP will include a blower, melter, sulfur furnace, and a four-pass catalytic converter with tail gas scrubber. The produced acid will be stored in storage tanks within secondary containment until it is needed for processing.

Spent Ore Storage Facility (SOSF):

The spent ore and by-products from the process facility (i.e., sulfate salts and precipitation filter cake) will be transported and stored at the SOSF. The SOSF is a non-impounding tailings facility and is designed to meet the design requirements pursuant to NAC 445A.437. The SOSF is located within the southwest portion of the Project boundary. The SOSF design includes a perimeter road for light vehicle access that will encompass the entire synthetically lined basin area. The SOSF is designed to be constructed in two phases, Phase 1 and Phase 2, approximately 4.4 million and 2.0 million square feet area, respectively. The storage capacities are 12.2 million tons and 12 million tons for Phase 1 and 2, respectively, with a total working capacity of 24.2 million tons.

The SOSF will be constructed from bottom to top in the following manner: a prepared subbase compacted to 95-percent maximum dry density, overlain by a 6-inch layer of liner bedding material, compacted to a minimum of 95-percent of maximum unit weight. An 80-mil HDPE double-sided textured geomembrane overlies the bedding material. Collection piping is placed on the HDPE geomembrane surface and is covered by a 2-foot overliner layer. The collection piping system will consist of a herringbone pattern of 4-inch diameter perforated corrugated polyethylene pipe (CPeP) with an on-center spacing of 45 feet., These pipes will convey solution to 8-inch diameter perforated CPeP, which then conveys solution to a 12-inch diameter perforated CPeP at the lowest point of the SOSF. The CPeP feed into two 12-inch diameter solid walled HDPE (dimension ratio 21) collection headers through the SOSF outlet berm and into the SOSF Underdrain Pond. The 8-inch and 12-inch diameter CPeP will be covered with a 2-foot layer of drainage aggregate as opposed to overliner material.

The SOSF will be constructed with a structural zone for stability purposes and the remainder of the facility is separated into two material types: spent ore berm and non-structural zone to minimize erosion of the facility. The structural zone will be constructed with spent ore compacted to 95-percent of maximum dry density and ± 5 percent optimum moisture content. The spent ore berm will be placed on the outside of the SOSF as a 20-foot lift of spent ore with no free water with the crest width of 54 feet. The remainder material of the SOSF will be constructed with non-structural zone which will be made of spent ore, sulfate salts, and neutralization filter cake.

The stability analysis completed on the SOSF results indicated the design exceeded the static minimum factor-of-safety, but the pseudo-static minimum factor-of-safety was not met. A deformation analysis was completed to evaluate the potential for failure in the event of an earthquake. Generally, the northwest and northeast slope have potential deformation of less than 10-inches. The southeast slope deformation ranged from about 15-inches to 42-inches, based on the design engineer's evaluation of the deformation study. In the opinion of the design engineer, this wide variance was due to the smaller structural zone on the upstream slope (southeast side). Displacements forced along the liner interface are reduced to 6 inches. A 15-foot setback around the facility perimeter at the start of spent ore placement is incorporated into the design to capture any material that shifts, therefore keeping the process material on containment.

A network of vibrating wire piezometers (VWPs) will be installed beneath the primary structural zone and immediately upgradient in the non-structural zone within the SOSF interior. The VWPs will be installed within the overliner material and spaced equally between the adjacent pipes of the solution collection system and the armor cables, and will be routed to a data collection system mounted above the surface between the SOSF and the SOSF Underdrain Pond.

Stormwater diversion channels are designed to be installed to divert non-contact water around the SOSF. The channels were designed to withstand and convey water from a 100-year, 24-hour storm event. The channels are designed to be trapezoidal channels with a maximum 2.5H:1V side slope.

At the time of closure, the SOSF will be recontoured to remove the benching configuration and a 4-foot evapotranspiration cover will be placed to limit infiltration.

SOSF Underdrain Pond: The SOSF Underdrain Pond will collect any draindown or stormwater runoff from the SOSF and is rectangular with crest dimensions of 280 feet by 435 feet. The SOSF Underdrain Pond will be approximately 20 feet deep with a capacity of 9.8 million gallons (approximately 1.31 million cubic feet) below the 3-foot freeboard limit and 12.4 million gallons (approximately 1.66 million cubic feet) at the pond crest. The SOSF Underdrain Pond will contain floating bird balls or disks to discourage waterfowl from entering the pond. The SOSF Underdrain Pond is sized to contain 10-hours of drain down from the SOSF, runoff from 100-year, 24-hour storm event, and 3 feet of freeboard.

The SOSF Underdrain Pond will be double-lined with 80-mil HDPE geomembrane with a geonet interlayer for leak detection. The SOSF Underdrain Pond bottom will slope at a minimum of one percent to promote gravity drainage to the leak detection sump. A 12-inch diameter HDPE riser will extend along the slope of the pond from the sump to the pond crest to allow for the installation of a pump and discharge piping installation. The leak detection sump will be alongside the pond pumpback system.

Removal of fluid from the SOSF Underdrain Pond will be via a pump inserted into a sloping riser placed along the pond slope above the primary liner. The pump riser consists of an 8-inch diameter HDPE intake pipe that extends through an 18-inch diameter HDPE pipe sleeve. The pumpback riser will be perforated or slotted from the base of the SOSF Underdrain Pond to the freeboard elevation so the intake pipe can be raised if sediments were to accumulate in the pond bottom.

A skid mounted pump on the crest of the pond will be used to pump solution from the SOSF Underdrain Pond to a water truck fill stand that will be situated on a geomembrane lined platform along the pond crest. The pond lining system will continue along the lined bench and containment berm such that the pipeline remains within containment. From the pond pump back system, water trucks will haul solution from the SOSF Underdrain Pond to the process plant for use in the process.

When the SOSF enters closure, the SOSF Underdrain Pond will be converted to an evaporation cell collecting any solution draindown until there is no more draindown or the solution is below Profile I or background limits. Once that occurs, the pond will be backfilled and reclaimed in accordance with the approved final plan for permanent closure.

Background Water Quality and Site-Specific Monitoring

Groundwater: Permittee conducted four years of water quality monitoring at the site prior to mining activities of any sort taking place. These included quarterly sampling of two groundwater wells upgradient of the process facility (MW-2A and MW-2B) and quarterly sampling of the well located adjacent to the proposed quarry outline (MW-01). All three of these wells were sampled beginning in the fourth quarter of 2018, with analysis conducted in the first quarter of 2024 and no mining activities having yet taken place on site. This monitoring was sufficient to support a determination of background water quality in the area of these wells.

Water in MW-01 was found to be very alkaline, with an average pH of 8.49 in 29 quarters of monitoring, and water had markedly elevated dissolved arsenic concentrations, with an average of 0.191 mg/L in 29 quarters of monitoring. No other repeatable exceedances were noted for this well. Water in MW-2A and MW-2B, which are closely co-located, also contained alkaline water with elevated arsenic, though to a lesser extent than MW-01. Average pH in MW-2A and MW-2B was 8.09 and average dissolved arsenic was 0.0634 mg/L in 29 quarters of monitoring.

Water quality was also analyzed for wells within the boundaries of the quarry, which would be representative of dewatering water encountered during mining. There was a marked difference between water quality as the wells moved south along the quarry outline. TW-01 is the north- and eastern-most well analyzed, which contained very alkaline water, with an average pH of 9.36 in 9 quarters of monitoring. This well also had elevated arsenic, with an average dissolved arsenic concentration of 0.165 mg/L in 9 quarters of monitoring. TW-02 was south of TW-01 and the westernmost of the wells, adjacent to the western edge of the quarry. Water quality in TW-02 is slightly alkaline, with an average pH of 8.6 in five quarters of monitoring, an average dissolved arsenic concentration of 0.078 mg/L. These are both reduced from the water quality in TW-01. TW-02 is the southernmost well within the quarry boundary and is east of TW-02 and west of TW-01. Water quality in TW-01 is less alkaline than the other two, with an average pH of only 8.27 in 6 quarters of monitoring. Dissolved arsenic is also severely reduced in this well, with an average concentration of 0.001 in six quarters of monitoring. However, manganese is considerably elevated in this well, with an average dissolved concentration of 0.14 mg/L in 6 quarters of monitoring. This is the only well on site to demonstrate elevated manganese levels and arsenic levels below 0.01 mg/L consistently. The pre mining water table in the quarry area ranged from 6,150 feet above mean sea level on the southeast side of the pit to 5,850 feet above mean sea level in the northwest side of the pit.

Surface Water: In addition to groundwater monitoring, the permittee also conducted surface water monitoring at two springs listed on the permit sufficient to establish pre-mining background water quality.

SP-01, or Cave Springs, was sampled seven times in 2020 and 2021 when it was flowing- the spring has been dry and unable to be sampled since the fourth quarter of 2021. These samples were sufficient to establish a pre-mining water quality standard of elevated pH and arsenic. The average pH in 7 quarters of monitoring was 8.13, and the average dissolved arsenic was 0.0673 mg/L. Both of these are elevated above standard Profile 1 reference values, which in 2025 indicated a reference range of 6.5-8.5 for pH and a reference value of 0.01 mg/L for dissolved arsenic. A site-specific water quality standard was granted for Cave Springs (SP-01) of the arithmetic mean plus two standard deviations of the seven quarters of sampling analyzed for arsenic.

SP-06 was also sampled to establish pre-mining water quality standards. This spring was running more often than Cave Spring, and so twelve sample points were available for analysis. Water quality in SP-06 was alkaline, with an average pH of 8.41 in 12 quarters of sampling. It also contained elevated arsenic and antimony, with an average dissolved arsenic concentration of 0.0563 mg/L and an average dissolved antimony concentration of 0.0129 mg/L in twelve quarters of monitoring. All three of these are elevated above standard Profile 1 reference values, which in 2025 indicated a reference range of 6.5-8.5 for pH, a reference value of 0.01 mg/L for dissolved arsenic, and a reference value of 0.006 mg/L for dissolved antimony. A site-specific water quality standard was granted for Spring 6 (SP-06) of the arithmetic mean plus two standard deviations of the twelve quarters of sampling analyzed for arsenic and antimony.

Groundwater Model and Pit Lake Model:

The climate in this region is dominated by high-desert, semi-arid conditions with an average annual precipitation of 6 to 9 inches per year and an estimated average annual open-water evaporation rate of 63.5 inches per year. The local hydrogeology contains a mixture of porous lithological units including alluvium, carbonates, and gritstones and less permeable lacustrine sediments such as marl, and clay. Groundwater is primarily controlled by compartmentalized, shallow fracture flow. Groundwater quality in the project area is circumneutral to alkaline, with several elemental concentrations above Profile I reference values, including arsenic, aluminum, antimony, and iron.

A post-mining pit lake is expected to develop, reaching a steady-state water level of about 5,644 feet approximately 200 years after closure. The final pit lake level will be approximately 176 feet below the pre-mining groundwater elevation resulting in a hydraulic sink. Using sensitivity analyses, the pit lake model accounted for varying climate conditions and predicted hydraulic sink conditions for all simulations, with final pit lake levels ranging from approximately 168.5 to 189 feet below the surrounding groundwater elevation. The pit lake chemistry is expected to meet Profile III reference values, with the exception of arsenic and fluoride, during the modeled 200-year period. Under varying sensitivity analysis, molybdenum and boron also exceeded Profile III reference values. An Ecological Risk Assessment for predicted pit water quality at the Rhyolite Ridge site demonstrated little to no potential to adversely affect wildlife.

The 2025 major modification changed the shape of the quarry and the future pit lake. An updated pit lake study and ecological risk assessment were completed, which showed that the future pit lake would have generally the same depth and chemistry as in the previous study and would also pose no greater risk to wildlife than previously determined. However, this study did not include the updated geochemical data collected as part of the expanded geochemical characterization study, as it was in the process of being collected and analyzed at the time of the study. Since the mine plan of operations does not include mining below the water table for some time after initial mining operations, schedule of compliance items were added to the 2025 permit to submit an updated pit lake study and ecological risk assessment that include the new geochemical data prior to mining below the level of groundwater.

No intermittent or perennial surface water exists in the Project area and no impacts to springs are predicted during operations or post closure.

Ancillary Facilities:

The Truck Maintenance Shop will be a pre-engineered fabric building secured on a reinforced concrete slab. The Truck Wash Bay will be an open area adjacent to the Truck Maintenance Shop, with a reinforced concrete slab on grade. The wash system is designed to recycle water to the greatest extent possible.

The Fuel Station will be located at the southern end of the Process Facility just west of the Truck Maintenance Shop.

C. <u>Receiving Water Characteristics</u>

The Project is located within the Fish Lake Valley Hydrographic Basin. The Project area contains one ephemeral stream, which runs centrally through the Project and is referred to as the Cave Springs drainage. Most drainages in the Project area are ephemeral and typically evaporate or infiltrate in the valley bottom. There is one spring/seep located within the Project area, SP-6, while there are eight other springs located within a mile of the Project boundary.

The depth to groundwater at the Project is approximately 50 to 260 feet below ground surface. Groundwater is present in both the bedrock and alluvium units. Groundwater flow is primarily within fracture and structures with minor porous flow in location carbonates and gritstones with flow locally to the north from the Pit and OSF and then west. The water quality of the groundwater generally is below NDEP Profile I reference values except for arsenic, antimony, and aluminum. See “Background Water Quality and Site Specific Monitoring” section above.

Groundwater is approximately 150 to 260 feet below the pre-mining surface elevation of the Pit. The depth to groundwater below the SOSF, OSF, and Processing Plant ranges from 210 to 285 feet, 100 to 260 feet, and 205 to 260 feet, respectively. The groundwater will be monitored utilizing both vibrating wire piezometers and monitoring wells.

D. Procedures for Public Comment

The Notice of the Division's intent to issue a Permit authorizing the facility to construct, operate and close, subject to the conditions within the Permit, is being published on the Division website: https://ndep.nv.gov/posts/category/land. The Notice is being mailed to interested persons on the Bureau of Mining Regulation and Reclamation mailing list. Anyone wishing to comment on the proposed Permit can do so in writing within a period of 30 days following the date the public notice is posted to the Division website. The comment period can be extended at the discretion of the Administrator. All written comments received during the comment period will be retained and considered in the final determination.

A public hearing on the proposed determination can be requested by the applicant, any affected State or intrastate agency, or any interested agency, person or group of persons. The request must be filed within the comment period and must indicate the interest of the person filing the request and the reasons why a hearing is warranted.

Any public hearing determined by the Administrator to be held must be conducted in the geographical area of the proposed discharge or any other area the Administrator determines to be appropriate. All public hearings must be conducted in accordance with NAC 445A.403 through NAC 445A.406.

E. Proposed Determination

The Division has made the tentative determination to issue the renewed Permit.

F. Proposed Limitations, Schedule of Compliance, Monitoring, Special Conditions

See Section I of the Permit.

G. Rationale for Permit Requirements

The facility is located in an area where annual evaporation is greater than annual precipitation. Therefore, it must operate under a standard of performance which authorizes no discharge(s) except for those accumulations resulting from a storm event beyond that required by design for containment.

The primary method for identification of escaping process solution will be placed on required routine monitoring of leak detection systems as well as routinely sampling downgradient monitoring wells. Specific monitoring requirements can be found in the Water Pollution Control Permit.

H. Federal Migratory Bird Treaty Act

Under the Federal Migratory Bird Treaty Act, 16 U.S. Code 701-718, it is unlawful to kill migratory birds without license or permit, and no permits are issued to take migratory birds using toxic ponds. The Federal list of migratory birds (50 Code of Federal Regulations 10, 15 April 1985) includes nearly every bird species found in the State of Nevada. The U.S. Fish and Wildlife Service (the Service) is authorized to enforce the prevention of migratory bird mortalities at ponds and tailings impoundments. Compliance with State permits may not be adequate to ensure protection of migratory birds for compliance with provisions of Federal statutes to protect wildlife.

Open waters attract migratory waterfowl and other avian species. High mortality rates of birds have resulted from contact with toxic ponds at operations utilizing toxic substances. The Service is aware of two approaches that are available to prevent migratory bird mortality: 1) physical isolation of toxic water bodies through barriers (e.g., by covering with netting), and 2) chemical detoxification. These approaches may be facilitated by minimizing the extent of the toxic water. Methods which attempt to make uncovered ponds unattractive to wildlife are not always effective Contact the U.S. Fish and Wildlife Service at 1340 Financial Boulevard, Suite 234, Reno, Nevada 89502-7147, (775) 861-6300, for additional information.

Prepared by: Allie Thibault
Date: 22 May 2025
Revision 00: 2024 Renewal with Major Modification