FACT SHEET

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

Permittee Name: **WK Mining (USA) Ltd.**

Project Name: **Three Hills Mine Project**

Permit Number: **NEV2015107**
New Permit 2015, Fact Sheet Revision 00

A. Location and General Description

Location: The Three Hills Mine Project (THMP) is a surface mine and chemical process facility located in the historic Tonopah-Divide Mining District within portions of Sections 33 and 34, Township 03 North (T03N), Range 42 East (R42E); and Sections 3, 4, and 5, T2N, R42E, Mount Diablo Baseline and Meridian, approximately two (2) miles west of the town of Tonopah in Esmeralda County, Nevada. WK Mining (USA) Ltd. is the Permittee for the THMP.

The THMP is located on 343 acres of private land owned or controlled by the Permittee and on 379 acres of public land administered by the U.S. Bureau of Land Management (BLM), Battle Mountain District-Tonopah Field Office.

Site Access: Access to the THMP site is via highway U.S.-95/U.S.-6 (North Main Street) through central Tonopah, to its intersection with Knapp Street. Proceed west on Knapp Street to the end of pavement and continuing onto Paymaster Canyon Road for approximately one mile to the mine entrance.

General Description and Characteristics: Once constructed and operational, the THMP will be a 15,000 ton per day (tpd) run-of-mine (ROM) heap leach facility with an annual ore processing rate of 5,475,000 tons per year. Processing will be by conventional heap leaching of ROM ore stacked on a lined heap leach pad (HLP). Gold will be leached from the ore with dilute sodium cyanide solution and will be recovered in a carbon adsorption, desorption, and recycling (ADR) facility followed by refining.

The Nevada Division of Environmental Protection-Bureau of Mining Regulation and Reclamation (the Division) requires that the THMP is designed, constructed, operated, and closed without any discharge or release in excess of those standards established in regulation except for meteorological events which exceed the design storm event.

B. Synopsis

Background/History

Silver and gold mineralization was first discovered in the Tonopah-Divide Mining District in 1900. Although several mines were eventually developed, by 1929 all mining and production had ceased within the District due to low metal prices and an economic downturn. In 1969, Hughes Tool Company (Hughes) acquired most of the historic claims within the District with the intention of undertaking a precious and base metal exploration program. Hughes sold the claims to Houston Oil and Minerals Corporation. When Hughes divested itself of its mining interests in the mid-1970s, the property was sold to Tenneco.

Echo Bay Mines Ltd. acquired the Tenneco claims and later sold them to Vista Gold Inc. (Vista) in the early 1990s. Vista's 2006 merger with Allied Nevada Gold Corporation (ANGC) resulted in the swapping of Vista's Nevada-mineral claims (including the Three Hills claims) for ANGC stock.

The Permittee purchased 75 percent interest in the Three Hills, and the nearby Hasbrouck claims located south of the THMP site, from ANGC in December 2014, with ANGC retaining a 25 percent interest in the Project

Geology and Mineralogy

The THMP is located within the Walker Lane structural domain of the Basin and Range physiographic province. The Walker Lane right-lateral strike-slip faulting dominates the structural features and trends northwest, with offsets ranging from tens to several hundred feet (ft). This structural domain includes numerous epithermal precious metal deposits in western Nevada and eastern California. The strike-slip faulting resulted in development of northeast and north-south trending extensional structures. These high-angle features form a series of horst and graben landforms throughout the THMP area.

The THMP is located in the western portion of the Tonopah-Divide mining district, which is characterized by exposures of Tertiary volcanic and volcanic-sedimentary rocks that are interpreted to be related to a caldera collapse/dome field setting.

The Tertiary volcanic rocks of the area have been divided into the Mizpah Formation, West End Rhyolite, Fraction Tuff, Siebert Formation, Divide Andesite, Brougher Rhyolite, and Oddie Rhyolite, all of Miocene age. The older West End and Mizpah formations are drilled along the northeast of the Three Hills area, and are host to mineralization at Tonopah. These units have not been encountered at depth under the Three Hills site. Overlying these is the Fraction Tuff, which is believed to have been derived from eruptions related to the collapse of an Early Miocene caldera centered on the area.

Subsequent Basin-and-Range extensional faulting led to the deposition of fluvial and lacustrine sediments of the Siebert Formation, which are inlercalated with air-fall and ash-flow tuffs. Brougher Rhyolite, locally interpreted as a flow, overlies the Siebert, and is eroded except on high hills and peaks. This unit is only known from outcrop exposures near Three Hills, and has not been encountered in drilling. Dikes and domes of the Oddie Rhyolite, which are interpreted to be genetically related to the mineralization of the area, intrude the earlier units. The Divide Andesite, variously described as high level intrusions or flows, is thought by some to be post-mineralization.

Physiographically, the Three Hills area is dominated by Siebert Mountain and Brougher Mountain along the east margin and three smaller hills (north, south, and east) in the center of the Property. Brougher Mountain and the east hill are capped by Brougher Rhyolite. This appears to lie directly over the Siebert Formation as a flow; however this unit has not been encountered in drilling. The Oddie Rhyolite intrudes along north-south structures in the area and occurs as dikes, flows, and flow domes. The west side of the south hill contains a large outflow that intruded along the main fault bounding the mineralization. Several smaller plugs are noted in outcrop and drilling to the east.

Minor amounts of mineralization have been drilled in the Oddie Rhyolite flows along the western edge of the hills. The north and south hills are underlain by ash-flow, air-fall, and water-lain tuffs and epiclastic sediments of the Siebert Formation. These volcanic and epiclastic units generally dip 30 degrees (°) to 40° to the east, immediately under the two hills, then become west dipping to flat lying under the east hill and Siebert Mountain.

The Siebert Formation contains an upper portion dominated by epiclastic sediments and a lower portion containing various lithic, crystal, and lapilli ash-flow units with interbedded epiclastic sediments. This is the dominant host to mineralization in the area. The Siebert Formation is unconformably underlain by the Fraction Tuff, which is exposed along the western edge of the three hills and to the north towards Tonopah.

The Fraction Tuff is a secondary host to mineralization in the area. The mineralization at Three Hills is noted by an early potassic alteration phase that produced brittle rock that was later fractured by Walker Lane movement. Argillic alteration, characterized by the presence of illite and montmorillonite, forms an envelope around the silicified and mineralized zones and along the Siebert-Fraction contact.

Ore and Waste Rock Characterization

Baseline geochemical testing was conducted on six (6) samples of ore material and 27 waste rock samples. Samples were selected from the Siebert, Fraction Tuff, and Oddie Rhyolite Formations, and distributed among unaltered, silicicaltered, and argillic-altered samples. Samples were selected to be representative, by relative percentage, of the excavated material in terms of formation, alteration, geochemistry, and spatially (laterally and with depth). Analytical testing included:

- Acid Neutralizing Potential/Acid Generating Potential (ANP/AGP, also known as Static Testing or Acid-Base Accounting [ABA]), including paste pH and sulfur speciation;
- Total Inorganic Carbon (TIC);
- Net-Acid Generating (NAG) pH;
- Optical mineralogy and X-Ray Diffraction (XRD);
- Meteoric Water Mobility Procedure (MWMP); and
- Kinetic Testing (also known as Humidity Cell Testing [HCT])

Ore: Total sulfur content in the ore samples was very low, averaging 0.044 percent. Sulfide-sulfur content was below analytical detection of 0.01 percent in all samples, reflecting very low potential for acid generation in the ore. The ANP values were also low, with an average ANP content of 4.9 tons calcium carbonate ($CaCO_3$)/1000 tons. The low AGP and ANP content of the ore suggest neither strongly acid-generating nor acid-neutralizing material.

The NAG pH results for the ore samples were all in the circum-neutral to alkaline range. Because of the similar nature (in terms of ABA characteristics) of the ore and waste rock material, the HCT testing on the waste rock may act as proxy for the ore material and vice-versa. MWMP rinse testing was completed on two (2) split samples. Both samples produced rinsate with circum-neutral pH values, low to moderate alkalinity, and most metals concentrations near or below the analytical detection limits. MWMP rinsate concentrations from the ore were slightly above Division Profile I reference values for arsenic, aluminum, and pH upper limit.

Waste Rock: Total sulfur and sulfide-sulfur concentrations were very low in all of the waste rock samples, averaging 0.05 percent total sulfur and 0.01 percent sulfide-sulfur content. No notable relationship between lithological formation or alteration type and sulfur content was observed. AGP values, calculated based on sulfide-sulfur concentrations, were similarly low. ANP values for waste rock varied more widely, ranging from below analytical detection to 75 tons $CaCO_3$/1000 tons. The samples with higher ANP values were generally from the argillic-altered Siebert Formation rocks. These rocks were directly correlated with higher TIC content, suggesting that the higher ANP values are associated with carbonate minerals, which typically provide a readily available source of neutralization.

A majority of samples had ANP/AGP values above the Division criteria (1.2:1) and BLM criteria (3:1) predicting non-acid generation. NAG testing indicated overall acid neutralizing behavior with pH values generally circum-neutral to strongly alkaline. Overall, the static ABA data indicate that the waste material from the Project will be non-potentially acid generating (non-PAG).

Four (4) samples of waste rock materials were selected for kinetic testing to obtain temporal mass release rates and more accurate assessment and/or confirmation of the ABA and metal leaching behavior. The sample selection focused on materials with lower ANP/AGP ratios and lower NAG pH data. These tests were initiated in October 2014 and terminated in May 2015. Both the MWMP rinse test data and the HCT results indicate non-PAG behavior with circum-neutral pH values, low to moderate alkalinity, low sulfate production, and most metals concentrations near or below the analytical detection limits, with the exception for slight exceedances of Division Profile I reference values for pH, aluminum, arsenic, antimony and iron.

Waste Rock Management

Two (2) waste rock storages areas (WRSAs) will be constructed over the life of the THMP to store approximately 19.9 million tons of waste rock. In-pit roads and haul roads will connect the open pits with the East and West WRSAs by a series of road segments. The area underlying the WRSAs will be cleared and grubbed prior to construction.

Due to the benign nature of the waste rock at the THMP, no selective or special handling is required. All waste will be placed as run of mine, blasted material as it is removed from the mine. Closure of the WRSAs will be conducted with industry standard methods including a vegetative cover to limit erosion and promote revegetation.

The unlined WRSAs will be constructed on competent bedrock as a benched configuration with maximum lift heights of 100 ft and inter-lift benches of approximately 20 ft wide. This configuration results in a compound slope of three (3) horizontal to one (1) vertical (3H:1V), which has been demonstrated to be stable during operations and over the long term. Waste Rock Stability is discussed in greater detail under the section ***HLP and WRSA Stability Analyses***.

The WRSA surfaces will be graded to control runoff and engineered diversions will be installed as necessary for erosion control and rerouting of the surface water features. In addition, the WRSAs will be visually monitored to ensure that drainage and sediment control measures are effective.

No springs or seeps have been identified beneath the proposed WRSAs. The dumps are expected to be free-draining as a result of natural material segregation during dumping. Based on the average annual precipitation rate of 4.92 inches (in), the type of material placed on the dumps, and method of construction, erosion and sediment loss from the dumps is anticipated to be minimal.

Surface Mining

Conventional open pit mining techniques will be used to extract ore and waste rock from the proposed open pit. Drilling and blasting will be used to break the rock prior to excavation. Ore will be loaded into haul trucks for transport to the heap leach pad. Waste rock will be hauled to the WRSAs for permanent placement.

The Permittee intends to develop the open pit in phases or push-backs, which are practical expansions of an open pit that incorporates proper equipment operating room, working geometries of the pit walls and pit wall rock formations, and access roads. The open pit will be excavated from the top of a hill, the current elevation of which is 6,117 ft above mean sea level (amsl).

When mining is complete, the highest elevation of the pit rim will be the crest of the east wall at 5,964 ft amsl, approximately 153 ft below the initial ground surface (bgs). The pit floor elevation will be approximately 5,440 ft amsl, which will result in an eastern highwall of approximately 524 ft. The north end of the open pit will have the low wall, with a height of 52 ft between the crest of the pit in that area (5,732 ft elevation) and the 5,680 ft bench.

Hydrogeologic characterization investigations performed by the Permittee have established the ground water table at an elevation of approximately 4,956 ft amsl; therefore, a pit lake is not expected to develop within the pit. This is discussed in greater detail under the section ***Receiving Water Characteristics***. Pit backfill is not anticipated at this time due to economics and scheduling. The deposit contains approximately 30 million tons of ore and waste rock that will be extracted over an approximate two-year period.

Slope angles within an open pit mine are influenced by rock strength, geologic structure, hydrology, pit wall orientation, and operational considerations. A stability analysis was conducted on single bench height vertical face geometries to determine the combined impact of structurally controlled plane shear and wedge failures on the bench face. Based on this analysis, the pit wall slopes will range from 35° to 45° during active mining.

HLP Design, Construction and Operation

The THMP HLP will be located to the south of the proposed mine open pit. It will be rectangular in shape and orientated in a northwest-southeast direction, approximately 1,770 ft by 1,470 ft with a maximum height of 150 ft above the lowest point on the liner surface. The HLP will be constructed in one (1) phase, with an approximate footprint of 2.6 million square ft (ft^2) and a designed storage capacity of 10 million tons of ore. The maximum total solution application rate for the THMP HLP is 3,000 gallons per minute (gpm) and 0.0031 gpm/ft^2. Along the northwest side of the HLP perimeter, a platform will be constructed which will contain the process solution outlet piping/flumes/valves, pregnant and barren solution tanks, Event Pond, and Process Facilities. In addition, two (2) shallow vadose zone monitoring wells will be constructed downgradient on the southwest side of the HLP.

Grading: The HLP will be graded to follow the existing ground that slopes downhill from the southeast to the northwest along the majority of the pad footprint. The grading will follow the existing terrain except for areas with slopes steeper than 10H:1V, which will be regraded to maintain a maximum slope of 10H:1V. Several rock outcrops exist throughout the HLP footprint and will require removal.

The base of the pad will be graded to match natural topography to the greatest extent possible, resulting in an average pad slope of between approximately 2.5 and 3.5 percent. This slope is adequate to provide a stable cross section upon loading to the anticipated maximum height of 150 ft and would allow for positive drainage of solution flows.

Part of the grading work within the leach pad is associated with constructing solution header trenches within each of the five (5) cells to provide a recessed area to install the 8- to 15-in diameter headers and reduce the potential for pipe failure due to crushing. The solution collection trench within HLP Cell 2 will also carry the solid solution headers conveying solution from cells 1, 3, 4, and 5. The solution header trenches will follow the same slope as the base of the pad. Each cell varies in size and is divided by existing ridgelines in the natural terrain. Internal berms dividing the cells will be included in the pad grading and will function to direct flow in each cell to the cell outlets where perforated solution collection pipes will transition to solid solution conveyance pipes.

A berm will be constructed around the perimeter of the pad. Adjacent to this berm will be an access road that extends around most of the pad (excluding the outlet/flumes area). The perimeter berm will have an overall height of five (5) ft on the pad side of the berm, measured from geomembrane surface at the toe to the crest of the perimeter berm.

A secondary channel was designed to contain the solution manifold pipes, flumes, and valves from the pad outlet to the pregnant and barren solution tanks. The secondary channel will be approximately 165 ft long and sloped at a grade of one (1) percent. Fill needed for construction of the leach pad will be generated from cut areas within the pad footprint or imported from an outside borrow source or the mine open pit.

Liner System: The HLP liner system will consist of either a geosynthetic clay layer (GCL) or low-permeability soil layer overlain with an 80-mil double-textured high-density polyethylene (HDPE).

The subgrade preparation beneath the underliner will consist of regrading and compacting the existing ground or placement of random fill material in accordance with the earthwork technical specifications.

If GCL is used as the underlayer, it will be placed in accordance with the manufacturer's recommendations. Powdered bentonite will be utilized between GCL seams to create a continuous underliner layer. If low permeability soil will be used as the underliner, it will be placed and compacted to form a 12-inch thick layer compacted to maximum permeability of 1×10^{-6} centimeters per second (cm/sec) at 95 percent compaction (American Society for Testing and Materials [ASTM] Method D1557). Moisture conditioning will be undertaken as necessary to meet compaction and permeability requirements and to prevent drying of completed areas. Laboratory testing will be performed on underliner samples prior to (Control tests) and during construction (Record tests). In-situ moisture/density and laboratory permeability tests will be carried out to assure conformance to the technical specifications.

The 80-mil HDPE geomembrane will be textured on both sides to increase the frictional resistance between the underliner and overliner materials that will be in contact with the geomembrane. Geomembrane materials will be subjected to testing at the factory site by the manufacturer as well as conformance testing performed by a third party laboratory to ensure quality. During installation the liner will be subjected to a strict quality assurance/quality control (QA/QC) testing and inspection program to achieve the following criteria to: 1) ensure that the geomembrane is installed according to the manufacturer's recommendations; 2) to monitor the integrity of the seams; and 3) to ensure that the minimum thickness of the overlying soil is maintained to minimize damage from equipment traffic.

Process solution percolating through the heap will be collected in a drainage system at the base of the pad and will gravity drain into the pregnant and barren tanks near the outlet of the pad. The solution collection system will include an overliner with a network of perforated pipes.

Overliner: The overliner is comprised of a single 24-in thick layer of drainage medium consisting of gravel and/or sand placed as a blanket on top of the 80-mil HDPE. Minimum overliner cover over the top of solution conveyance and collection pipes shall be 24-inches. This single layer will provide protection to the HDPE liner and pipes during ore placement and will have a high transmissivity to promote lateral drainage of process solutions along the base of the pad. The maximum particle size of the overliner will be limited to minus 1.5 in to avoid placing larger sized rock pieces against the geomembrane that may potentially cause damage. The maximum fines content (minus 200-mesh particle size) will be limited to 10 percent and a gravel content of at least 50 percent will be required by the specification to assure the material will meet a minimum permeability of 5×10^{-2} cm/sec.

Solution Collection Piping System: Geomembrane-lined internal cell separation berms divide the leach pad into smaller and more manageable solution collection areas. The cell separation berms prevent the solution collection system from being overloaded from upgradient flows by acting as hydraulic barriers between collection areas. Solution in each cell will be collected by a network of perforated corrugated polyethylene (CPe) pipes, which drain to the low point in each cell. On the upgradient side of the berm, the perforated CPe pipes will transition to HDPE standard dimension ratio (SDR)-11 solid-wall solution conveyance pipes to allow solution flow rate and leachate collection from each cell to be monitored separately.

The conveyance pipes will drain to the low point in the pad near the solution tanks and Event Pond area. After exiting the pad, the conveyance pipes will connect to flumes (Palmer-Bowlus or similar design) where solution from each cell can be monitored and measured. Valves located downstream of each flume will be used to direct the solution to either a pregnant solution manifold pipe or barren solution manifold pipe, which are connected to the pregnant solution tank and barren solution tank, respectively. The solution manifold pipes will consist of 24-inch diameter SDR-17 HDPE pipe. The solution collection and conveyance pipes are conservatively designed to accommodate an application rate of 0.0031 gpm/ft^2 (at 50 percent capacity) to account for storm events, scaling and deformation.

The network of perforated CPe pipes consist of a main solution collection header pipe located in a pipe trench within the major drainage of each cell, which is fed by lateral collection pipes ranging in size from 6-in diameter to 15-in diameter. The lateral collection pipes are fed by 4-in diameter collection pipes which are spaced 60 ft apart in a herringbone pattern.

Each solution tank will be equipped with pumps. The pregnant solution will be conveyed to the ADR Plant for processing, while the barren solution will be recycled onto the HLP for leaching of the ore.

Event Pond and Solution Tank Excavation Containment Design, Construction, and Operation

An area approximately 700 ft by 464 ft will be filled and graded to accommodate the Event Pond, solution tanks, ADR Plant and associated support facilities.

The Event Pond, Solution Tank Containment Excavation and pipeline channel will be double lined with 80-mil HDPE as the primary liner and 60-mil HDPE as the secondary liner and an interlayer of geonet for leak detection. The floors of the Event Pond and Solution Tank Excavation Containment will be sloped in a manner such that any leakage through the primary liner can be conveyed via gravity to either the Event Pond or Solution Tank Excavation Containment Leak Collection Recovery System (LCRS) sumps.

Event Pond: The Event Pond is rectangular in shape with crest dimensions 290 ft by 300 ft and excavated to a nominal depth of 30 ft. It has a storage capacity of 7.58 million gal at the freeboard elevation of 5,671 ft amsl. The storage capacity at the pond crest elevation of 5,677.5 ft amsl (at two [2] ft freeboard) is 11.44 million gal. The Event Pond is designed to accommodate runoff from the 100-year, 24-hour storm event, and up to 12 hours of draindown from the HLP.

Solution Tanks: During normal operations, leach solution flows via gravity from the HLP to either the Pregnant Solution Tank (PST) or the Barren Solution Tank (BST). The PST has a capacity of 90,000 gallons (gal) and the BST has a capacity of 135,000 gal; both are cylindrical in shape with open tops. The tanks will be placed within secondary containment within the southeast portion of the Event Pond that has been backfilled in an area referred to as the Solution Tank Containment Excavation. In the event of a power or equipment failure, or large precipitation event, solution will overflow the tanks to the Solution Tank Excavation Containment and flow into the adjacent Event Pond.

LCRS Sumps: Both the Event Pond and the Solution Tank Excavation Containment have their own dedicated LCRS sumps. The sumps consist of a gravel-filled depression between the primary and secondary HDPE liners within the Event Pond and Solution Tank Sump Excavation low spots. Large diameter HDPE pipes (12-in diameter SDR-21) will be installed on the sloped surfaces of the Event Pond and Solution Tank Sump Excavation. The LCRS pipes will extend from the sumps to the Event Pond crest for easy installation and removal/replacement of the LCRS pumps and discharge piping. The last 10 ft of the LCRS pipe resting within the confines of the gravel-filled sump is slotted and capped.

The Event Pond LCRS sump will be located within the Event Pond Pumpback System. The combined sump will be five (5) ft below the bottom of the pond where the bottom two (2) ft will serve as the LCRS sump and the top three (3) ft as the Pumpback Sump. The sump bottom and top dimensions are 6 ft by 6 ft and 31 ft by 31 ft. respectively. The fluid capacity of the LCRS sump will be 87 cu ft (655 gal) assuming a select gravel porosity of 30 percent.

The Solution Tank LCRS sump will be located within the Solution Tank Pumpback System. The combined sump will be three (3) ft below the bottom of the pond where the bottom two (2) ft will serve as the LCRS sump and the top one (1) ft the Pumpback Sump. The sump bottom and top dimensions are 6 ft by 6 ft and 31 ft by 31 ft. respectively. The fluid capacity of the LCRS sump will be 87 cu ft (655 gal) assuming a select gravel porosity of 30 percent.

Event Pond Pumpback System: Removal of fluid from the Event Pond will be via a submersible pump and pump tube inserted into a 12-in diameter carbon steel support pipe resting on two (2) 6-inch carbon steel pipes along the Event Pond slope. The pump tube is an 8-in diameter SDR-21 HDPE pipe which can discharge to either the Pregnant or Barren Solution Tanks. The pond lining system extends 14 ft beyond the pond crest to a containment berm such that the pipe remains within secondary containment.

Carbon ADR Facility Design and Operation

The Carbon ADR Facility is adjacent to the Event Pond. The Facility will include one (1) Carbon-in-Column (CIC) train consisting of five (5) columns, each measuring 12.5 feet in diameter by 13 feet in height. These columns are designed to operate with six (6) tons of carbon per column. Pregnant solution collected in the PST will be pumped to the CIC train through pipes, and over secondary containment or through pipe-in-pipe for secondary containment. Loaded carbon will be advanced to the Carbon Desorption Circuit, including an acid-wash vessel and an elution vessel for stripping. Processed carbon will be returned from the desorption facility to the CIC plant for regeneration and reuse. Effluent from the CIC will be returned to the barren tank for recirculation to the HLP.

Barren solution will also be pumped to the Number Five Column of the CIC train from the BST, which is adjacent to the PST. Barren solution will be sampled and screened for metallurgical accounting and returned to the leach distribution system through a pipeline.

Pregnant solution will flow to two (2) electrowinning cells operated in parallel. Stripped gold will be plated from the pregnant eluent onto stainless steel cathodes which will be periodically washed with a high pressure spray to remove the gold. The resulting sludge will be filtered in a filter press, and heated in a retort to remove mercury.

Retorted sludge will then be treated in an induction smelting furnace. Off-gases from the furnace will be extracted with a blower and filtered in a baghouse dust collector to remove particulates and discharge to the atmosphere. The Carbon ADR Facility will be built on a concrete foundation that will incorporate 110 percent containment. Spilled process solutions will report to a sump for evacuation back into the process circuit.

HLP and WRSA Stability Analyses

Stability analyses for the heap leach facility and waste rock storage area were performed using the computer program SLIDE 6 by RocScience. SLIDE is a two-dimensional slope stability program for evaluating circular or noncircular failure surfaces in soil or rock slopes using limit equilibrium methods. Spencer's procedure, which is widely accepted for use under all slope geometries and soil profiles, was used within the stability model and assumes all interslice forces are parallel and have the same inclination. The factor of safety is defined as the resisting forces along a potential failure plane divided by the gravitational and dynamic driving forces, therefore factors of safety in excess of 1.3 indicate stability and those less than 1.05 indicate instability.

Both static and seismic conditions were analyzed. To assess the stability of slopes during seismic loadings, a pseudostatic approach is typically used in which the potential slide mass is subjected to an additional, destabilizing horizontal force which represents the effect of earthquake motions and is related to the peak horizontal ground acceleration (PHGA). The seismic force is the weight of the slide mass multiplied by a horizontal pseudostatic earthquake coefficient (kH). Seismic coefficients equal to one half the PHGA of 0.07g (during active leaching) and 0.14g (at closure) respectively, were adopted for pseudostatic stability analyses. Minimum acceptable factors of safety for static and pseudostatic conditions were established by the Division as 1.3 and 1.05, respectively.

HLP Stability Analysis: Both static and pseudostatic loadings were evaluated for the critical HLP cross-section, which is located at the northern end of the HLP and adjacent to the Event Pond. This section was deemed to be the most critical since base grades slope toward the facility toe and the embankment is at its maximum height along this section. The stability of the facility was analyzed for ultimate facility geometry. ROM ore will be placed in 30-ft lifts by end dumping from haul trucks at the angle of repose (approximately 1.4H:1V), and subsequent lifts will be setback to maintain an overall slope of 3H:1V. The ultimate geometry was modeled to a maximum design height of 150 feet.

The modeled liner system considered a GCL against a double-textured HDPE liner, since a viable low-permeability soil borrow source has not been identified at the time of the THMP Permit application submittal. Typically the interface between the GCL and HDPE geomembrane has a lower shear strength compared to the interface between a compacted low permeability material and an HDPE geomembrane. So if a borrow source is identified in the future, the strength of the natural soil liner system would be greater than the strength modeled in the stability analyses. Overliner gravels and a phreatic surface were not modeled in the stability analysis since they do not adversely affect heap stability if the leach solution drainage operates as designed.

The block failure form was identified as the most critical since the majority of the failure plane is located along the HDPE/GCL interface. Results indicate that the HLP slopes will remain statically stable (factor of safety [FOS] greater than 1.05) throughout the lifetime of the facility for the operating basis earthquake (475 year return event), but in the case of an extreme seismic event (2,475 year return event) slope movement would likely occur (FOS less than 1.05). Based on these results, a slope displacement analysis was performed to estimate potential movements.

To assess the potential amount of slope movement, a displacement analysis was conducted to estimate the magnitude and probability of permanent slope displacement utilizing a non-linear, fully coupled stick-slip sliding block model to estimate dynamic performance of soil slopes.

The model predicted a nine (9)-in median value of displacement. Probabilistic calculations that correspond to 5 percent and 25 percent probability of exceedance are estimated at 25 in and 14 in or less of displacement, respectively, for the 2,475 year return seismic event. This amount of movement would not compromise the integrity of the slope; however, it would likely cause sloughing along the slope and could cause damage to the liner system.

Since this condition is applicable to long-term or closure conditions and there will be minimal leach solution accumulated along the HDPE/GCL interface, the potential breach in the geomembrane would appear to have negligible environmental impacts and would be controlled by the GCL underlayer material.

WRSA Stability Analyses: Both static and pseudostatic loadings were evaluated for the critical WRSA cross-section, which is located on the west side of the WRSA. This section was deemed to be the most critical since base grades slope toward the facility toe and the embankment is at its maximum height along this section. The stability of the facility was analyzed for ultimate facility geometry and only circular failure surfaces were evaluated since the WRSA will be unlined and overly competent bedrock.

The waste rock stability analysis shows that under circular failure with a conservative friction angle of 35°, a PHGA of 0.07g (during active operations, 475-year earthquake return) and 0.14g (during closure, 2,475-year earthquake return), the static and pseudostatic FOS are greater than 1.0.

Ancillary Facilities

Petroleum, Oil, and Lubricants (POL) Storage and Dispensing: A POL storage and dispensing facility will be located within the contractor yard area. It will include separate diesel aboveground tanks for fueling of light/intermediate and heavy vehicles. Fuel will be obtained either from filling stations in Tonopah, or from a tank in the fuel storage depot at the contractor yard.

Spill containment will be designed for 110 percent of the largest tank or tanker within the containment. Fuel will be delivered via highway-legal trucks directly to the depot. Drivers offloading fuel will be certified and trained. A sump will be located at one end of the containment so that spilled fuels can be collected and removed for appropriate disposal from the containment using a portable pump.

Oil-Water Separator: A centralized oil-water separator will be installed adjacent to the truck shop to treat water from drains located at each maintenance bay and from the wash rack. The floor drains in the maintenance area will be intended for collection of rainwater and snow melt from vehicles and equipment. Gray water from the oil/water separator will be collected in a tank within containment or a lined impoundment. The gray water will be recycled back to the wash system; excess water will be used for dust control. The separated oil will be stored either in a double-lined tank or a single-lined tank within concrete containment with a capacity of at least 110 percent of the volume of the largest tank.

Petroleum Contaminated Soils (PCS) Management: Any PCS generated at the THMP site will be collected and disposed of pursuant to applicable regulations at a Division-approved facility.

Stormwater Diversion Structures: Stormwater diversion structures at the THMP are designed to:

- Divert non-contact water (i.e., water that has not come in contact with process material or solutions) around the mine facilities and discharge to downstream water courses;
- Convey sediment-laden runoff (i.e. stripped surfaces and roadways) to detention basins where the sediment will be temporarily stored and the clarified storm water discharged to downstream water courses; and
- Contain precipitation that has come in contact with process solution.

Surface water runoff from catchment areas upstream of the HLP will be intercepted and routed around the proposed facility via a diversion channel and culverts to a natural drainage way. Runoff from the impacted areas (contact with process solution) will be stored internally within the HLP.

There will be one (1) diversion channel that is independent of roadways. The channel will be located adjacent to the southeast and northeast sides of the HLP. Due to its location upstream of critical infrastructure, the channel is designed to convey flow from the 100-year, 24-hour storm event. The channel will divert runoff around and past the HLP, where flow will discharge onto the natural topography and drain north into Slimes Wash.

The diversion channel is designed as a trapezoidal section with a constant eight (8)-ft floor width and a minimum depth of four (4) ft. The calculated storm water flow velocities are estimated at less than five (5) ft per second (ft/sec) and riprap or channel erosion protection will not be required.

Roadside channels will be constructed as necessary along the roadways to control surface water runoff. Culverts were designed at road crossings to divert storm water flows away from roadway surfaces and maintain traffic flow. The culverts consist of corrugated metal pipe and vary in diameter, depending on the design flow rates.

C. Receiving Water Characteristics

The proposed THMP will be a zero-discharge facility with no dewatering or groundwater extraction. The mine water supply is planned to be obtained from the town of Tonopah, about one (1) mile east of the Project. The depth of groundwater is approximately 850 ft bgs and approximately 470 ft beneath the floor of the proposed pit; therefore no pit lake will form after mining.

Climatic conditions are dry with an average precipitation of approximately five (5) in per year and pan evaporation of approximately 105 in per year. The resulting vegetation is sparse and there are no perennial streams. No natural springs exist within or in the vicinity of the THMP.

Hydrogeology: Regional data indicate that groundwater beneath the Project flows generally in a west-southwest direction in the deep, Tertiary volcaniclastic sequences.

An existing up-gradient monitoring well (3H-MW-1) at the THMP indicates depth to groundwater is about 850 ft bgs. This is consistent with information from historical underground mining in the district suggesting groundwater at approximately 750 to 850 ft bgs. Historical records indicate that there are hydrogeologic features (e.g., faults and fracture zones) with significant water storage and permeability, such as near the historic Rex Shaft located north of the proposed mine; however, less fractured volcaniclastic rocks, such as those intercepted in monitoring well 3H-MW-1 appear to be less productive.

Regional data indicate that groundwater quality is generally good with total dissolved solids (TDS) concentrations around 300 mg/L, which is typical of calcium-sodium-bicarbonate type waters. Metals concentrations are low with slight exceedences of Division Profile I reference values for arsenic, manganese, and cadmium. The quality of water from the monitoring well is also generally good, with a TDS concentration of just over 400 mg/L, neutral pH, and very low metals concentrations.

Because the proposed mining Project will not require groundwater extraction, impacts to local groundwater users are not anticipated. Installation of a well field in the vicinity of the historic Rex Shaft, located 2,900 ft northwest of the proposed pit for make-up water supply was evaluated by the Permittee. Between 350 and 500 gpm would be required and two (2) scenarios were simulated to predict the potential impacts of this action.

The first scenario involves construction of wells directly into existing underground workings to take advantage of the storage and permeability offered by them for water production, and the second scenario involves construction of wells adjacent to the mine workings, which could potentially take advantage of the storage and permeability of the underground workings but without a direct connection.

Results of the predictive modeling suggest a negligible drawdown for the first scenario with the predicted 10-ft isopleth extending less than 100 ft from the footprint of the underground workings. In the second scenario, a 10-ft isopleth extending a maximum of 3,500 ft from the well field is predicted. In neither case does the drawdown appear to adversely affect local or regional groundwater users.

Regional Hydrogeology: The Project is located at the southwest margin of the Great Basin Carbonate Rock Aquifer System that spans from western Utah to southern Idaho, and into southern California. This regional aquifer represents a semi-continuous, cross-basin, aquifer comprising older Paleozoic carbonates, and younger basin-fill sediments and volcanic sequences. Flow occurs through unconsolidated and consolidated porous and fractured sediment and rock.

Regional groundwater recharge occurs mostly from rainfall in the upland areas northeast of Tonopah, resulting in surface flows that infiltrate through the coarse-grained, alluvial fan sediments into the underlying aquifer. Regional groundwater flow direction is from the carbonate aquifer system into the adjacent, downgradient, volcanic-dominated regime. Groundwater flows in a west-southwest direction with a shallow groundwater gradient of approximately 0.003 ft/ft. Regional discharge occurs as evaporation from lowlands and playas, and as groundwater flow to adjacent regions over 20 miles south and southwest of the THMP site.

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 sent to the **Tonopah Times-Bonanza and Gold Field News** for publication. 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 of public notice. 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, any affected 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 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 upgradient and 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 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:	Rob Kuczynski, P.E.
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