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

Permittee Name: **Rawhide Mining LLC**

Project Name: **Denton-Rawhide Mine Project**

Permit Number: **NEV0088018 (Renewal 2015, Fact Sheet Revision 00)**

A. Location and General Description

Location: The Denton-Rawhide Mine Project is located in Mineral County, approximately 36 air miles southeast of the town of Fallon and 32 air miles north of the town of Hawthorne. The mine and processing facilities are located on private land and public land administered by the U.S. Bureau of Land Management (BLM), Carson City District, Stillwater Field Office, within Sections 4, 5, 6, 7, 8, 9, 10, 16, and 17, Township 13 North, Range 32 East, Mount Diablo Baseline & Meridian. Access to the Project area is possible by traveling 32 miles east from Fallon on US Highway 50 to the junction with State Route (SR) 839 near the site of Frenchman. Turn south onto SR 839 and travel 18 miles to the end of the pavement. Proceed on the gravel portion of the road approximately two (2) miles to the main turn-off to the Project site located to the west. The Denton-Rawhide Mine visitor parking area is approximately two (2) miles from the turn-off.

General Description: The Project consists of an open pit gold and silver mine, waste rock dumps, a crushing plant, a conventional cyanide heap leach pad Phases I through VI, the Western Extension, the Far Western Extension, the Northwest Extension, ten (10) double-lined process solution ponds, one (1) single-lined settling pond, one (1) single-lined storm pond, four (4) stormwater control ponds, a processing plant, and ancillary support facilities. The processing plant, as originally constructed, utilized the Merrill-Crowe process for precious metal recovery due to high silver content in the ore. In 2004, a Carbon Adsorption-Desorption Regeneration (ADR) plant was added to the metals recovery system to treat intermediate solution as low concentration pregnant solution directly from the Phase I, II, and III heap leach pad and to reduce the need for sodium cyanide addition to process solution. The Merrill-Crowe process was phased out after commissioning of the Carbon ADR plant. In March 2010, the Merrill-Crowe process plant was restarted for use in the recovery of precious metals along side the Carbon ADR plant. Rawhide Mining, LLC (Permittee) is authorized to process up to 7.0 million tons of ore per year.

Active mining and placement of ore on the heap leach pad ceased in late 2002, with the exhaustion of economic ore reserves. Operations are currently directed to processing recirculated solution to recover metal values remaining in the existing heap leach material. However, mining was resumed in December 2012.

A system of gravity application solution wells was approved by the Division in 2006 and 2007 for installation on the top lift of the heap leach pad to improve residual metal recovery, and was expanded to include bench areas in 2010. The Project is anticipated to create up to 1,369 acres of surface disturbance, approximately two-thirds on private lands and one-third on public lands administered by the BLM.

B. Synopsis

Background: Water Pollution Control Permit NEV88018 was originally issued on October 24, 1988 to BP Minerals America. The Permit was transferred to Kennecott Rawhide Mining Company in 1989. The Permit was subsequently renewed in 1994, 2000, 2004. During the 2010 renewal, ownership of the mine was transferred to Rawhide Mining LLC, the current Permittee.

Ore for the Permitted Denton-Rawhide Mine Project facility was mined from the Murray Hill, Hooligan, Crazy Hill, Grutt Hill, Balloon, ZZ Tops, and North Forty open pits. Part of the Murray Hill waste rock was used to backfill the completed Crazy Hill Pit, mined from 1989 through 1993. The Murray Hill, Grutt Hill, and Hooligan Pits were partially backfilled.

Mining activity ceased in late 2002 but was restarted in December 2012. Ore and waste are blasted on predetermined pit benches and hauled with 85-ton trucks. Run-of-mine (ROM) ore is placed on the heap leach pad Phase I, Phase II, and Phase III. Ore is crushed before placement on heap leach pad Phases IV and V. Waste rock is placed either in the waste rock dump or in the inactive portions of pits as partial backfill.

The fluid management system incorporates a recirculation process to optimize precious metals recovery. Leach solutions from the various heap leach phases are classified as pregnant (high grade) or intermediate (low grade). Pregnant solution is pumped to both the Carbon ADR plant and the Merrill-Crowe plant for processing. As originally designed, intermediate solution was recirculated and reapplied to one of the heap leach pad phases for additional enrichment before processing. In January 2004, the Division approved construction of a carbon-in-column (CIC) carbon adsorption plant to directly process the intermediate solution as a low concentration pregnant solution and eliminate the need to recirculate and "upgrade" low concentrate intermediate solution. This process reduces the precious metal loading in the leach pad and eliminates the need for sodium cyanide addition to solutions to complete precious metal recovery during the leach pad draindown period following Project closure.

In March 1995, the Division approved the Denton-Rawhide Mine Waste Rock Characterization and Handling Plan. Testing indicated approximately 8 percent

(%) of the waste rock is potentially acid generating (PAG). PAG waste rock has, therefore, been encapsulated in designated cells within the waste rock dump.

Heap Leach Pad: The heap leach pad facility was constructed in phased expansions, beginning with Phase I and ending with Phase V. The Phase VI-A/VI-B heap leach pad construction was approved by the Division as a minor modification to the Permit in September 2000, but was not constructed. Construction of the Phase VI heap leach pad, as originally designed and approved, remains an option in accordance with a Permit Schedule of Compliance item. The West Hooligan Heap Leach Pad was discussed with the Division but no proposal was submitted to the Division and the leach pad was not permitted or constructed.

Phase I through V of the heap leach pad construction incorporated a composite liner system and an underdrain solution collection system. The composite liner system is comprised of an 80-mil high-density polyethylene (HDPE) primary liner placed over a prepared, 12-inch thick, low permeability soil layer compacted to 90% Modified Proctor Method, American Society for Testing and Materials (ASTM 1557) with a maximum hydraulic conductivity of 1×10^{-6} centimeters per second (cm/sec). To facilitate solution collection and management, each heap leach pad phase is divided into cells separated by raised earthen berms under the HDPE liner. Approximately 60 inches of underdrain material, consisting of secondary crushed ore, was placed over the HDPE liner to reduce hydraulic head on the liner system. The underdrain solution collection system consists of 4-inch diameter, perforated, corrugated, HDPE pipes, placed on the primary liner at approximately 30-foot centers, and covered with underdrain material.

The Phase I heap leach pad, approximately 1.3 million square feet (ft^2) in area, was constructed in late 1989 and placed into operation in early 1990. The Phase II heap leach pad expansion, approximately 1.3 million ft^2 in area, was constructed in 1990. The Phase III heap leach pad expansion is approximately 1.1 million ft^2 in area and was constructed in 1991. Pregnant solution from the Phase I through Phase III heap leach pad is collected in a leak-detected solution collection channel where it flows to a drop inlet at the northeast corner of the Phase I heap leach pad. Pregnant solution flows from the drop inlet through a buried, leak detected HDPE pipeline located along the east side of the leach pad and can be directed to any of the following ponds: North Pregnant, South Pregnant, Phase IV Recirculation Pond, or the Barren Pond.

The Phase I through Phase III solution collection channel leak detection and recovery systems consist of perforated, corrugated polyethylene pipe enveloped in free-draining soil and placed immediately below the HDPE channel liner. A minimum of 12 inches of low permeability soil was placed in the base of the leak detection trenches. The Phase I through Phase III perforated channel leak detection pipes transition to 2-inch diameter non-perforated HDPE pipes that drain to the North Pregnant Pond for Phase I or to a 36-inch diameter HDPE manhole/sump, identified as LP2-3LD, for Phase II and Phase III. Although file correspondence indicates they were submitted, copies of the as-built drawings of the Phase II/III sump and the buried pregnant solution pipeline leak detection system cannot be located in Division archives.

The leak detection system for all buried pipelines is not a pipe-in-pipe design. Instead, trapezoidal-shaped channels were excavated and the soil in the bottom of the trench was compacted to a maximum hydraulic conductivity of 1×10^{-6} cm/sec. Perforated drain pipe was to be placed on the bottom of each trench and covered with granular fill material. The buried process solution conveyance pipelines were to be placed on top of the fill material and covered. Any leakage from the process solution pipelines should be collected in the underlying perforated drain pipes and flow by gravity to collection sumps.

The leach pad was expanded an additional 3.2 million ft^2 as Phase IV in 1993, and an additional 3.2 million ft^2 as Phase V in 1996. The Phase IV and Phase V heap leach pads are divided into twelve and eleven cells, respectively, with individual underdrain solution collection systems. Two (2) parallel transfer channels convey solution to either the Recirculation Pond or to the Phase IV Pregnant Pond, for the Phase IV expansion, and to either the Intermediate Pond or the Phase V Pregnant Pond for the Phase V expansion. A flume with two (2) drop inlets, one designated for pregnant solution and the other designated for recirculation solution, are provided as an outlet for each cell.

Drop inlets discharge process solution to either the pregnant solution channel or the recirculation/intermediate solution channel. The channels are lined with 80-mil HDPE and underlain with a leak detection and recovery system. Phase IV uses a system of 80-mil HDPE-lined, leak detected solution conveyance channels to deliver process solution from the solution collection channels to the Phase IV ponds. Phase V uses a system of buried, 24-inch diameter, leak detected HDPE pipes to convey process solution to the Phase V ponds.

The Phase IV recirculation and pregnant solution collection channel leak detection and recovery systems were designed to consist of 2-inch diameter corrugated, perforated, HDPE drainage pipe enveloped in granular backfill with geotextile filter fabric immediately below the HDPE liner. A minimum of 12 inches of low permeability soil was placed beneath the leak detection trenches. These two (2) systems flow to solid, 2-inch diameter HDPE pipes that discharge to a common 235-gallon (gal) collection sump. Collected fluids are pumped to the Phase IV Pregnant Pond. Identical systems were designed for the two (2) solution conveyance channels with discharge to either the Phase IV Pregnant Pond or the Recirculation Pond.

The Phase V intermediate and pregnant solution collection channel leak detection and recovery systems were constructed similar to the Phase IV systems except that 3-inch diameter solid HDPE pipe was used instead of 2-inch diameter HDPE pipe and the solid pipes discharge to a 222-gal collection sump. The solution conveyance pipes were placed in compacted, low permeability soil, v-ditches with granular fill and perforated pipes that discharge to the same sump as the solution collection channel leak detection systems. The Phase V pregnant and intermediate solution conveyance pipes flow through partially buried drop structures for energy dissipation. These structures are leak detected with discharge to the Intermediate Pond. A buried process solution pipeline leak detection and recovery system also discharges to the Intermediate Pond. During construction of the liner expansion Engineering Design Change (EDC) approved by the Division in September 2006, the intermediate solution channel was eliminated and replaced with a single perforated 12- to 15-inch diameter HDPE pipeline placed in the pregnant solution collection channel.

The 3.14 million square foot Phase VI heap leach pad expansion was approved by the Division as a minor modification to the Permit in September 2000, but was not constructed. The approved expansion could be constructed as phases VI-A and VI-B with footprints of 2.08 million ft^2, and eight (8) cells, and 1.06 million ft^2, and four (4) cells, respectively. A Permit Schedule of Compliance item will allow construction to the approved designs with advanced written notice, but with the requirement that the Permittee meet with the Division for review of the design before proceeding with construction.

This Phase VI expansion was approved by the Division for construction using the same design criteria as that used for the existing heap leach pads. The pregnant and intermediate process solution collection channels use the same design criteria as the existing Phase V collection channels, except that the Phase VI perforated leak detection and recovery pipes are 2-inch diameter HDPE instead of 3-inch diameter HDPE. All buried Phase VI process solution pipelines are leak detected. The Phase V channel will be covered during construction if the Phase VI expansion is constructed. To accommodate drainage, perforated, 12-inch diameter HDPE pipe are placed in the Phase VI channels and covered with crushed rock.

The Phase VI expansion is designed to accommodate approximately 21,500,000 tons of ore at an operational heap height of 180 feet. At the time of approval, the approved maximum design heap height for Phase VI was 300 feet.

In April of 2015 the Permittee submitted an EDC proposing to construct only a portion of Phase VI-A designated as Phase VI-A1. This portion of the heap leach pad has a footprint area of approximately 752,000 ft^2 and encompasses a total of 17.3 acres. The composite liner system is similar to previous phases in that it is comprised of an 80-mil smooth HDPE primary liner placed over a prepared, 12-inch thick. A variation to previous designs is in the low permeability soil layer. In Phase VI-A1 it will be compacted to 90% Modified Proctor Method (ASTM 1557) with a maximum hydraulic conductivity of 1 x 10^{-5} cm/sec. To facilitate solution collection and management, the heap leach pad phase is divided into cells separated by raised earthen berms under the HDPE liner. A minimum of three (3) feet of underdrain material, consisting of crushed and screened ore, is placed over the HDPE liner to protect the geomembrane and reduce hydraulic head on the liner system. The underdrain solution collection system consists of 4-inch diameter, perforated, corrugated HDPE pipes placed in a herringbone pattern on the primary liner at approximately 30-foot centers on slopes under 4.3% and 50-foot centers on slope over 4.3%, and covered with underdrain material. The 4-inch collection pipes convey solution to 18-inch diameter perforated HDPE header pipes. Under the 18-inch header pipes will be a 4-inch vertical wick drain which acts as leak detection.

A slope stability analysis was performed on a cross-section perpendicular to and through the east-facing Phase VI-AI heap leach pad, at its maximum height. The Phase VI-AI will have an overall 3 horizontal to l vertical (3H:1V) slope angle with an expected maximum height of 200 feet above the liner. The maximum grade of the liner is approximately 25.3 percent, while the overall base grade slope is 8.8%. Two-dimensional limit equilibrium modeling techniques were utilized using Rocscience's Slide, Version 5.0, for static and pseudo-static stability analyses. For pseudo-static stability analysis, a seismic coefficient of 0.07 was used for the site, which is consistent with previous stability reports. Stability analyses were completed for both circular and block failures using the Spencer method, which satisfies all components of moment and force equilibrium. The results indicate that the Phase VI-A1 heap leach pad will have factors of safety against slope failure of 1.11 for static conditions and 2.26 for pseudostatic conditions.

The maximum solution application rate *per unit area* for Phase VI-A1 is 0.002 gallons per minute per square foot (gpm/ft2). Solution from Phase VI-A1 reports to three (3) existing double-lined leak detected Phase V ponds located to the east of the proposed pad. The total storage capacity of the Phase V ponds is approximately 9.9 million gallons. The Phase V pond system has adequate capacity to manage the drainage from the Phase V pad and the Phase VI-A1 pad in a 100-year 24-hour rainfall event coincident with a power loss for a period of 36.5 hours. The EDC was approved by the Division in July 2015 and was included in the 2015 renewal.

In 1993, the maximum approved height for the Phase I through Phase III heap leach pad was increased from 120 to 150 feet as part of the Phase IV minor modification. In February 1996, the maximum approved height for heap leach pad Phase I through Phase V was again increased from 150 to 300 feet. This authorization was based on the first 150 feet of crushed ore stacked in 30-foot lifts with 30-foot setbacks, a single 30-foot lift of crushed ore placed with a 50-foot setback, and the upper 120 feet of run-of-mine (ROM) ore end dumped in 30-foot lifts with 50-foot setbacks. In September 2000, a further height increase to 400 feet was approved by the Division as an EDC for all existing phases of heap leach pad construction. Authorization was based on extensive puncture testing and slope stability analysis using existing HDPE liner and compacted base and underdrain samples. Ore is to be stacked in accordance with existing requirements. The maximum height is to be measured vertically from the upper surface of the primary synthetic liner.

During mining operations, ore is fed into the three-stage crushing plant at a standard operating rate of 20,000 tons per day. Lime is added to the crushed ore and the material is transported to the heap leach pads via a series of portable conveyors. The ore is placed on the pads in the approximate lifts by radial stacker at a rate of approximately 640,000 tons per month. Lifts average 30 feet in height, with operational heap heights ranging between 150 and 180 feet (lift No. 5 and lift No. 6), depending upon the heap leach pad phase. Depending on reserves and mine scheduling, ore may be placed on the heap leach pad to the maximum Permitted height of 400 feet (Phase I through Phase V). For heap leach pad Phases I through III, any ore stacked above the 180-foot height (lifts No. 5 or No. 6) would be ROM ore. The ROM ore is end-dumped in 30-foot lifts to the 400-foot maximum Permitted heap leach pad height. For stability purposes, each successive lift is set back approximately 30 feet from the underlying lift edge to create a pyramid-shaped construction. The existing (2010) heap leach pad (Phase I through Phase V) covers a footprint of approximately 10.5 million ft^2 (240 acres).

An EDC was approved by the Division on 05 September 2006, which authorized construction of the “North and South” heap leach pad liner extensions. The extensions were necessary to allow the heap leach pad slopes to be “pushed down” to the angles required for closure. Metals recovery may have also been slightly enhanced. The triangle-shaped extensions, measuring approximately 106,900 ft^2 for the North and approximately 112,200 ft^2 for the South, are located respectively along the north side and south side of the Phase 4 heap leach pad, adjacent to the northeast and southeast corners of the Phase 1-3 heap leach pad. An additional 25,000 ft^2 of HDPE liner was also installed to increase freeboard of the solution collection berm along the south side of the pad.

The “North and South” liner system extension was welded to the existing liner and constructed to the same specification as the original liner system, which utilized an 80-mil HDPE primary liner placed on a 12-inch thick compacted layer of low hydraulic conductivity soil with permeability no greater than 1×10^{-6}

cm/sec. The underdrain collection system consists of 4-inch diameter perforated corrugated polyethylene (CPE) pipe placed in a herringbone pattern on 30-foot centers. The collection system is covered with a 3-foot thick protective layer of crushed ore and reports to 12-inch diameter perforated CPE collector pipes. Since the expansion resulted in covering the decant solution collection ditch, a 24-inch diameter perforated CPE pipeline was placed in the ditch and connected to a 48-inch diameter manhole placed at the decant prior to burial.

Leak detection was not constructed for the "North and South" expansion due to the depth to groundwater, which is greater than 1,000 feet in the area of the pad. The existing Phase 1-3 heap leach pad leak detection system conveyance pipeline was extended and the access manhole relocated. Approximately 300 feet of the "South" extension stormwater diversion channel was also relocated outside the toe of the facility.

Following construction of the "South" expansion of the heap leach pad liner in late 2006, an EDC was approved by the Division in January 2007, authorizing construction of the "South Area Berm Extension". The purpose of the approved construction is to increase the operational freeboard of the perimeter solution collection channel located on the south side of the Phase IV heap leach pad. No increase in solution application rate or material volumes were requested or approved.

The approved design consisted of raising the height of the existing berm by four (4) feet over a length of approximately 850 feet, parallel to the widened haul road. The height increase was accomplished by removing the 80-mil HDPE liner from the existing berm, building up the berm height with structural fill covered with a minimum 12-inch thickness of compacted low hydraulic conductivity soil, placing new 60-mil HDPE liner over the berm, double-wedge welding the new 60-mil HDPE liner to the existing 80-mil HDPE liner, and re-keying the new liner into a new key trench along the downgradient side of the berm and adjacent to the widened haul road. It should be noted that 60-mil HDPE was used for the berm extension because the berm is not a weight-bearing portion of the heap leach pad structure.

In August 2010, the Permittee submitted to the Division a minor modification proposing the expansion of the western edge of the heap leach pad. The Western Extension adds approximately 840,000 ft^2 to the total leach pad area. Solution recovery is separate from that of the adjacent Phase I/II/III area and is routed along the north side of the heap through a pipe-in-pipe conveyance pipeline until it is discharged into the existing solution collection ditch just south of the process ponds. A wick drain under the Western Extension solution collection channel is designed to collect and convey any leakage to a sump under the inlet to the conveyance pipe. An 8-inch diameter polyvinyl chloride (PVC) riser pipe provides access for inspection and evacuation of the sump.

The extension is divided by interior berms into seven (7) cells. Each cell includes 4-inch perforated pipes on 30-foot centers, connected to 12-inch perforated header pipes, to drain solution east to the solution collection channel which conveys the flow north to the pipe inlet. The conveyance pipeline consists of 24-inch diameter HDPE primary pipe within a 30-inch diameter HDPE secondary pipe. The pipe-in-pipe section is buried with a minimum three (3) feet of soil cover.

The liner system of the Western Extension consists of, from bottom to top, a 12-inch low hydraulic conductivity soil layer, compacted in two (2) 6-inch lifts to achieve a maximum permeability of 1×10^{-6} cm/sec; an 80-mil HDPE liner; and a 3-foot layer of drainage rock as a protective cover for the liner. The 80-mil HDPE liner extends up each of the perimeter berms to contain process fluid and is secured in an anchor trench on the far side.

In June 2012, the Permittee submitted to the Division a minor modification proposing a further expansion of the western edge of the heap leach pad. The Far Western Extension adds approximately 11.9 million ft^2 to the total leach pad area. Solution drains by gravity to the Western Extension collection system. The liner system is identical in design to that of the Western Extension.

In May 2013, the Permittee submitted to the Division a minor modification proposing an extension of the heap leach pad to the north of the Phase I through Phase III. The Northwest Extension adds approximately 1.1 million ft^2 to the total leach pad area and will be built out to a maximum height of 200 feet measured vertically from the top of the synthetic liner. The majority of solution drains to a new pond, the Northwest Pregnant Pond from which it is pumped to the process circuit, while a smaller portion drains to the existing heap leach pad collection system. The minor modification was approved by the Division in October 2013.

The Northwest Extension liner system consists of, from bottom to top, 12 inches of prepared structural fill, a 12-inch low hydraulic conductivity soil layer, compacted in two (2) 6-inch lifts to achieve a maximum permeability of 1×10^{-6} cm/sec; an 80-mil HDPE liner; and a 3-foot layer of drainage rock as a protective cover for the liner. The majority of solution is collected in a system of perforated 4-inch diameter PVC pipes which convey the solution to 18-inch diameter HDPE header pipes on the northeast and southeast sides of the pad. The 18-inch diameter pipes convey the solution to the Northeast Sump and Southeast Sump, which overflow to the Northwest Pregnant Pond and the Phase IV Ponds, respectively.

The Northeast Sump is constructed within a 40-foot by 40-foot depression designed into the liner system. In the middle of the southeast edge of the depressed area, at the edge of the liner adjacent to the berm, an 8-foot long, 48-inch diameter HDPE standpipe is placed vertically, with the lower 66 inches perforated to allow solution to enter. Approximately six (6) inches from the bottom, a 24-inch diameter HDPE pipe exits the standpipe horizontally, booting through the heap leach pad perimeter berm HDPE liner, and continuing to the Northwest Pregnant Pond. The section of the 24-inch diameter pipe which is buried within the perimeter berm is enclosed within a 30-inch diameter HDPE secondary containment pipe.

The lowest section of the Northwest Sump around the standpipe is designed with a second 80-mil HDPE geomembrane layer to provide a leak detection and collection system in this area where the depth of pooled solution may be as much as two (2) feet. The primary and secondary liners directly below the standpipe are separated by approximately 12 inches of drain rock, into which extends an 8-inch diameter PVC pipe, perforated at the bottom to provide access for inspection and evacuation of the sump (net fluid capacity of the sump is approximately 825 gal).

The approximately one-sixth of the Northeast Extension directly adjacent to the existing heap leach pad drains to a 30-inch diameter HDPE header pipe which empties into the Southeast Sump and, from there, enter the existing solution collection system rather than the Northwest Pregnant Pond. A wick drain placed within drain rock directly below the 80-mil HDPE underlying the 30-inch diameter pipe provides leak detection capability. The Southeast Sump is constructed within a 30-foot by 30-foot depression designed into the liner system. In the middle of the southeast edge of the depressed area, at the edge of the liner adjacent to the berm, an 8-foot long, 48-inch diameter HDPE standpipe is placed vertically, with the lower 66 inches perforated to allow solution to enter. Approximately six (6) inches from the bottom, a 24-inch diameter HDPE pipe exits the standpipe horizontally, booting through the heap leach pad perimeter berm HDPE liner, and continuing to join the existing heap leach pad solution collection system. The section of the 24-inch diameter pipe which is buried within the perimeter berm is enclosed within a 30-inch diameter HDPE secondary containment pipe.

The lowest section of the Southeast Sump around the standpipe is designed with a second 80-mil HDPE geomembrane layer to provide a leak detection and collection system in this area where the depth of pooled solution may be as much as two (2) feet. The primary and secondary liners directly below the standpipe are separated by approximately 12 inches of drain rock, into which extends an 8-inch diameter PVC pipe, perforated at the bottom to provide access for inspection and evacuation of the sump (net fluid capacity of the sump is approximately 272 gal).

In April 2014, the Permittee submitted to the Division an EDC to lower the maximum Permitted solution flow rate to the heap leach pad from 7,000 gallons per minute (gpm) to 6,500 gpm. The cumulative solution application rate to the heap leach pad by all methods shall not exceed the Permitted 6,500 gpm. Additionally, the solution application rate *per unit area* for surface application should not exceed 0.005 gpm/ft^2. The EDC was approved by the Division in April 2014.

Heap Leach Pad Gravity Application Solution Wells: A sonic drill program completed in 2000, as part of the development of a final permanent closure plan for the heap leach pad, determined that solution applied under gravity-head conditions through the boreholes could provide enhanced metal recovery from deeper portions of the heap leach pad material. An EDC was approved by the Division in December 2006 that authorized routine operation of the six (6) original boreholes as heap leach pad gravity application solution wells.

The original boreholes ("Deep" wells) were completed to depths of 130 to 160 feet below the surface of the heap leach pad when that surface had been constructed to a height of 240 feet above the primary liner. Heap leach pad stability analyses were performed using a 340-foot heap leach pad height with boreholes completed to a depth of 240 feet below the pad surface. The modeled boreholes were placed a minimum of 80 feet back from the heap leach pad crest with a 2.3H:1V slope angle. The gravity application solution wells were modeled with a fully saturated heap leach pad overliner and model runs were completed with the well 0%, 50%, and 100% full. Rotational and transitional failure modes for static and pseudo-static loading were modeled for all well scenarios. In all modeled cases, the minimum factor of safety for rotational failure was 1.09 and 1.58 for transitional failure. Several operational and monitoring requirements were added to the Permit based on the Deep well design and the modeled parameters.

An EDC was approved by the Division in February 2007, which authorized the installation and operation of additional gravity application solution wells. Modeling similar to that completed for the previously approved Deep wells was completed and demonstrates similar stability and factor of safety results. Additional operational and monitoring requirements were added to the Permit based on the submitted designs and modeling.

Division approval of a second EDC in April 2007 authorizes installation of up to 80, Phase I, 'Shallow' and up to 80, Phase II, 'Intermediate' wells on the top lift of the heap leach pad. In July 2007, 62 of the 80 Phase I wells were completed. As of July 2015 none of the 80 Phase II wells have been installed.

As measured from the upper pad surface, the Shallow wells range from 30 to 35 feet in depth, and the Intermediate wells range from 58 to 65 feet in depth. Shallow and Intermediate wells are placed at 50-foot intervals to form an alternating grid. As modeled, no well can be placed less than 150 feet from the existing edge of the pad. The wells are drilled using a hollow-stem auger drill at a nominal 10-inch diameter. Each well is backfilled with coarse drain rock material and a 10-foot section of solid schedule 40 PVC pipe is installed as a collar casing. As with the Deep wells, solution may only be applied under gravity falling head conditions. As of September 2010, a total of 62 shallow wells have been installed, none of which are in operation or expected to be operated in the future. In addition, 64 intermediate depth wells have been installed and are currently in operation, with more (up to the Permitted maximum of 80) planned to be installed.

In March 2010, the Permittee submitted an EDC proposal to install additional gravity drain wells on the heap leach pad benches identified as “Bench heap leach pad gravity application solution wells”. The engineering design report included stability analyses (static and dynamic) which resulted in minimum factors of safety against failure of 1.47 (static) and 0.96 (pseudostatic). As a follow-up to the pseudostatic case, a deformation analysis was performed resulting in a predicted heap deformation of less than one (1) inch. The EDC was approved by the Division in July 2010. As of July 2015, none of these gravity drain wells have been installed.

In May 2010, the Permittee submitted an EDC proposal to raise and reline the western perimeter berm of the Phase I, II, and III leach pads. The modification would increase the available freeboard in this area to accommodate future regrading of the ore. The EDC was approved by the Division in June 2010.

Ponds: The 1989 construction included four (4) 2.8 million gal, double-lined ponds - the North Pregnant, South Pregnant, Barren, and Safety Supply. The construction design includes a 6-ounce per square yard (oz/yd^2), non-woven, needle-punched geotextile placed on the compacted subgrade below a 40-mil HDPE secondary liner. A 12-oz/yd^2, non-woven, needle-punched geotextile was used as a leak detection and collection layer between the secondary liner and the 60-mil HDPE primary liner.

The North and South pregnant ponds and the Barren and Safety Supply ponds are connected by a spillway placed at the two-foot freeboard elevation, which allows solution flow between the ponds to provide additional solution storage capacity. An overflow pipeline that connects the South Pregnant Pond and the Barren Pond addresses additional emergency solution storage requirements.

The Phase I design and as-built drawings do not provide detailed information regarding the construction of the pond leak detection systems. Solid PVC pipes from the North and South pregnant pond leak detection systems drain along with the leak detection pipe for the buried process solution pipelines to a common 210-gal sump located west of the Barren Pond. This sump is fitted with an automated evacuation pump but does not include a means to measure the amount of fluid evacuated to the Barren Pond.

In December 2011, the Permittee submitted an EDC proposing to replace the South Pregnant Pond 60-mil HDPE primary liner with 80-mil HDPE, and the 12-oz/yd^2 woven geotextile with a geonet for conveyance of leakage to the sump. The 40-mil secondary liner and existing leak detection sump were proposed to be retained. Due to the installation of piping and other equipment at the crest of the pond, access to the existing liner anchor trenches was limited. The Permittee proposed that the new primary liner be welded to the crest of the existing primary liner since constructing a new anchor trench was not possible.

The Permittee submitted results of material tests for the existing liner, as well as peel and shear tests of samples welded to new liner. All of these tests showed equal or better strength compared to current quality standards and the proposal was approved by the Division in January 2012. However, the Permittee is required by the Permit as a Schedule of Compliance item to install a new primary liner with a conventional anchor trench prior to converting the pond to an evapotranspiration cell at closure, if that is proposed as part of the final permanent closure plan.

In June 2014, an EDC was approved by the Division for the relining of the North Pregnant Pond. The replacement of the primary liner As-Built report was approved by the Division in October 2014.

Although design drawings exist, as-built drawings for the buried process solution pipelines leak detection system have not been located. Pipes from the Barren and Safety Supply pond leak detection systems drain to the concrete containment for the barren solution pumphouse. The barren solution pumphouse also contains an automated sump but, again, without a means to quantify leakage flow or volume. Collected leakage solution is pumped to the Barren Pond. The automated sumps without flow measurement are monitored daily and recorded weekly for inclusion in the quarterly report.

The Sludge Pond was constructed with 6-ounce geotextile installed below the single 60-mil HDPE liner. The pond is 60 feet wide by 175 feet long with 3H:1V side slopes and varies in depth from six (6) feet to ten (10) feet deep with the deeper end adjacent to the Barren Pond. The buried sludge line from the process building to the Sludge Pond was designed with leak detection and has a 108-gal sump located to the west of the Sludge Pond.

The Phase IV Recirculation Pond, 2.6 million gal capacity, Phase IV Pregnant Pond, 2.1 million gal capacity, Phase V Intermediate Pond, 4.5 million gal capacity, Phase V Pregnant Pond, 3.2 million gal capacity, and Phase V Storm Pond, 2.2 million gal capacity, were designed with a double liner and a leak collection and recovery system (LCRS). The ponds are constructed, from top to bottom, with a 60-mil HDPE primary liner, a geonet layer for leak collection and conveyance, and a 40-mil HDPE secondary liner overlying a prepared subbase. The geonet drains to a depressed, gravel-filled sump located at the pond low point to provide collection of solution leakage. An HDPE evacuation pipe extends from the depressed sump to the Phase IV or Phase V pumphouse. Any evacuated fluid will flow across the concrete pumphouse floor to a concrete solution collection sump. An automated sump pump returns any solution collected at the pump house to the Phase IV Pregnant Pond or the Phase V Intermediate Pond without quantification. The buried pipelines to convey solution from the Phase V Pregnant Pond, Phase V Intermediate Pond, and Phase V Storm Pond to the Phase V pumphouse are leak detected and daylight in the pump house.

The 4.7 million gal Phase IV Stormwater Pond is constructed with a 40-mil HDPE primary liner overlying 12 inches of prepared subbase that was compacted to 95% maximum dry density as determined by the Modified Proctor Method (ASTM D1557). The Phase IV Storm Pond may be used to store process fluids for up to twenty (20) days provided that adequate volume is maintained to contain the additional solution volumes from an 8-hour draindown and the design storm event.

The minor modification of May 2013 included a new pond, the Northwest Pregnant Pond, for the purpose of collecting solution from the Northwest Extension of the heap leach pad. The Northwest Pregnant Pond is designed to measure approximately 380 feet by 190 feet with a depth of approximately 20 feet, providing a capacity of approximately 5.4 million gal at two (2) feet of freeboard. The liner system consists of, from bottom to top, of a prepared subgrade, a 60-mil HDPE secondary drainliner, and an 80-mil HDPE primary liner. The drainliner provides a path for conveyance of fugitive solution to the leak detection sump, located at the northeast corner of the pond. The sump is filled with drain rock and is penetrated by an 8-inch PVC pipe, perforated at the lowest section, to allow inspection and evacuation of the sump (net fluid capacity approximately 2,154 gal).

Lime Saturator Plant: An EDC was approved by the Division in May 2005 for the installation of the trailer-mounted Lime Saturator Plant. The plant was installed to replace transport of liquid caustic (sodium hydroxide) by truck to the mine site for use in the process solution to maintain high pH.

The plant is comprised of a stand-alone lime silo for storage of dry quick lime and a lime slaker, a vibrating screen to remove coarse grit, a stirred 750-gal tank to store 25% lime slurry, a 3,000-gal thickener tank to mix slurry with barren leach solution, and a small hydrocyclone and a grit screw to remove calcium carbonate and grit from the barren solution. The latter components are mounted on a 45-foot-long trailer located within a 15-foot by 50-foot concrete pad lined with 60-mil HDPE. A 1-foot high lined berm provides approximately 160% containment for the volume of the largest vessel. Barren solution is diverted from the 12-inch diameter barren solution supply line through a pressure reducer and a 2-inch diameter HDPE surface pipeline to the saturator. Any escaping solution or meteoric water reports to a collection sump and is conveyed by gravity through a 2-inch diameter surface pipeline to the Phase IV Stormwater Pond for evacuation to a process pond.

On May 5, 2008 an EDC was submitted by the Permittee requesting the relocation of the Lime Saturator Plant to an engineered concrete containment pad. The new containment measures 16-feet by 38-feet and consists of an 18-inch high containment wall around the perimeter, open only at the overflow channel which is designed to free drain to the barren pond in the event of an upset condition. The EDC was approved by the Division on May 14, 2008 and the relocation was completed in April 2009.

Process Plant: Due to high silver content in the ore, the original facility construction design included a Merrill-Crowe Process to treat process solution while optimizing the recovery of silver along with gold recovery. Pregnant solution is pumped to the Merrill-Crowe plant at a maximum rate of 3,300 gpm. The process utilizes a series of clarifying filters, a deaeration tower, controlled quantities of zinc dust, and filter presses to recover gold-silver-zinc precipitate. Barren solution is pumped to the Barren Pond for cyanide reconditioning and reapplication to the heap leach pad. The precipitate is refined on-site into doré and shipped off-site for final refining. Mercury is removed from the precipitate and stored in secure containers prior to being shipped off-site.

Residue from the clarifying filters is placed in the single-lined Sludge Pond. The Sludge Pond is connected to the Barren Pond by a spillway to allow decanting of the fluid within the sludge. To maintain adequate storage capacity, sludge is slurry-pumped as needed from the Sludge Pond to the Phase I, II, and III heap leach pad through an HDPE pipeline.

The Merrill-Crowe plant is designed to contain 110% of the volume of the largest process container in the building. The floor of the plant is sloped to drain any spillage or leakage of solution to a concrete-lined trench in the building. The trench drains to a buried HDPE pipeline that directs accumulated fluid into the Sludge Pond.

In January 2004, an EDC was approved by the Division to allow construction of a Carbon ADR Plant using CIC technology. The rationale to add the Carbon ADR plant was two-fold. First, it allows direct processing of intermediate solution from the Phase I, II, and III heap leach pad instead of re-circulating the solution through the heap leach pad to "upgrade" the precious metal content prior to introduction as pregnant solution to the Merrill-Crowe plant. Second, the CIC plant can be used at closure as a final cleaning step for heap leach pad draindown solution to recover precious metals without the addition of sodium cyanide to the leach solution.

The Carbon ADR plant system is a self-contained system comprised of carbon adsorption, carbon desorption, carbon acid wash, carbon regeneration, and carbon sizing processes. The Carbon ADR plant includes two (2) individual 5-stage, vertical carbon adsorption columns (CIC). Each stage of the CIC is designed to hold two (2) tons of activated carbon. The columns can be operated independently with each having a nominal 1,500 gpm flow capacity. Pregnant solution enters the bottom of each column, passes upward through each stage, and exits the top as barren solution. Activated carbon is transferred from stage to stage in 2-ton batches, downward and counter-current to solution flow. Dissolved metals adsorb onto the carbon and once the carbon is loaded, or becomes "pregnant", the adsorbed metals must be stripped or "desorbed" from the carbon.

The desorption process requires the pregnant carbon to be transferred from the CIC circuit to a 2-ton strip vessel, where the metals are desorbed in a pressurized, high-temperature process. A second carbon strip vessel was added, adjacent to the existing vessel within expanded concrete containment, as an EDC approved by the Division in December 2007. A 1.0% NaOH and 0.0-0.1% NaCN strip solution is heated to 295-305 degrees Fahrenheit (°F) and circulated in a closed-loop system comprised of the solution storage tank, a propane-fired heater skid, strip vessel, and a 75 cubic foot electrowinning cell ('E' Cell). As part of the EDC approved by the Division in December 2007, a second 'E' Cell was also constructed adjacent to the existing cell and a water chiller, located on dedicated concrete secondary containment, was added to the process water circuit. The strip solution is pumped through the pregnant carbon in an upflow direction to desorb the precious metals from the surface of the carbon. The precious metals are precipitated from the strip solution in the 'E' Cell. The precipitate is pumped from the 'E' Cell, filtered to remove excess process solution, then transferred to the refinery where it is retorted to remove all moisture and melted along with Merrill-Crowe filtrate in the refinery furnace to form doré.

Stripped carbon is transferred to a 2-ton acid wash vessel. An approximate 5% muriatic (HCl) acid solution, circulated through the carbon at 35 gpm, dissolves adsorbed carbonate, to maintain optimum adsorption capacity of the carbon. The carbon is then neutralized with caustic and fresh water. Approximately 10% to 25% of the carbon batch is transferred to the 1-ton per day electric carbon regeneration kiln and the remainder is transferred back to the CIC columns.

The carbon regeneration kiln, located within the Carbon ADR Plant containment, heats the carbon to 1,100 °F and holds the temperature for 20 minutes to dewater the carbon and remove any residual organics. The hot carbon is discharged by gravity to a water-filled quench tank to be cooled and may either be reintroduced as pumped slurry into the top of the CIC columns or stored for later use in an adjacent carbon storage vessel constructed as part of an EDC approved by the Division in December 2007.

The Carbon ADR Plant is located on a concrete slab within a containment stemwall. The containment volume meets regulatory requirements and has been constructed over a subbase that was compacted to 90% maximum dry density as determined by the Modified Proctor Method (ASTM D1557). Appropriate caulking materials and waterstops have been placed along all joints. Concrete located in the acid wash area is coated with epoxy sealant. Two (2) floor sumps are fitted with automated pumps and discharge to their respective system process stream. In the event of upset conditions, the pump flows can be routed to either the Barren Pond or to the Sludge Pond via the process plant launder. Since the base of each column cannot be visually inspected, the CIC columns are placed on concrete rings fitted with wick-drain type leak detection. An EDC approved by the Division in December 2006, authorized construction of the double-walled, stainless steel ‘E’ Cell sump with leak detection.

General: Diversion ditches have been designed to accommodate the runoff from a 100-year, 24-hour storm event and route the flow around all process components. The solution ponds are sized to contain additional solution volumes resulting from an 8-hour loss of electrical power combined with the volume of meteoric water from a 25-year, 24-hour storm event collected in the fluid management system.

Cyanide tanks are located at the Barren Pond and at the Phase V Pregnant Pond for process solution reconstitution. Make-up water is supplied by wells and is stored in two (2) tanks with respective capacities of 40,000 gal and 250,000 gal each.

In response to audits performed as part of the International Cyanide Code certification process, several upgrades to the sodium cyanide off-loading and storage containment were completed as part of an EDC approved by the Division in December 2007. Modifications included construction of a new concrete containment area for an additional 15,000 gal sodium cyanide storage tank, extension of the existing concrete sodium cyanide tanker truck off-loading pad by 48 feet to accommodate the entire length of the delivery tanker, and addition of a concrete apron to direct any solution overflow or spill, in excess of the 110% containment volume design, from the contiguous tank and off-loading containment areas to the South Barren Pond.

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

The facility is located on the foothills, pediment slopes, and drainages in the southern portion of the Sand Springs Range. Most drainages remain dry year-round except for ephemeral flows in response to intense storm events or rapid snow melt. No surface water is found within five (5) miles of the Project except for the ephemeral washes that drain into the alkali flat of northwest Gabbs Valley. The site geomorphology varies in elevation between 4,100 and 6,300 feet above mean sea level with moderate to steep slopes.

Groundwater in the vicinity of the facility has not been located. More than 300 exploratory holes have been drilled to depths of at least 500 feet with several drilled to 2,000 feet depth in the area of the mine pits. Nine (9) holes were drilled to a depth of 300 feet and one (1) hole to a depth of 500 feet in the heap leach pad area. None of the holes drilled have encountered groundwater. Non-potable process make-up water is obtained from two (2) wells located four (4) miles downgradient from the facility.

D. <u>Procedures for Public Comment</u>

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 **<u>Lahontan Valley News</u>** 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 then 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 well(s) and surface water. 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 (CFR) 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 (2) 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: Shawn Gooch
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