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

Permittee Name: **Coeur Rochester, Inc.**

Project Name: **Rochester Mining Project**

Permit Number: **NEV0050037**
Review Type/Year/Revision: **Renewal 2015, Fact Sheet Revision 00**

A. Location and General Description

Location: The Rochester Mining Project is located in Pershing County, in the south-central portion of the Humboldt Range, approximately 24 miles northeast of the town of Lovelock. The facilities are within portions of Sections 9, 10, 15, 16, 21, 22, 27, 28, 32, and 33 of Township 28 North, Range 34 East, Mount Diablo Baseline and Meridian.

General Description: The Rochester Mining Project includes two open pit mines, the Rochester Mine and the Nevada Packard Mine, eight Waste Rock Disposal Sites (WRDS), ore crushing facilities, five valley-fill heap leach pads (HLP), seven process ponds (including a test evaporation cell), two stormwater basins, Stage V Groundwater Underdrain pond, a silver and gold recovery process plant using Merrill-Crowe zinc precipitation, and ancillary facilities. Facilities are required to be designed, constructed, operated and closed without any discharge or release in excess of those standards established in regulation except for meteorological events that exceed the design storm event. Mining from the two pits was suspended in August 2007, but leaching of ore placed on pads and metals recovery continued. In February 2011, the Permittee resumed mining in the Rochester Pit, and began construction of the Stage III HLP according to the design included in the major modification submittal of June 2010. With the approval of the 2015 major modification and renewal, the Project is authorized to process up to 20,000,000 tons of ore per day and construct the Stage V heap leach pad.

B. Synopsis

Open Pits – Rochester Mine and Nevada Packard Mine

The Rochester Mine is an open pit with final elevation at the lowest point of 5,975 feet above mean sea level (ft amsl). Mining operations in the Rochester Pit were suspended in August 2007. Waste rock has been deposited in the pit in designated areas as permitted by mining, including some potentially acid generating (PAG) material in areas above the historic water table. The appearance of a pit lake in late 2007, was earlier than previously predicted and

results of water quality analyses of samples from the pit lake have been mixed (see summary of water quality analyses below under the heading *Rochester Pit Lake*).
The Nevada Packard Mine, an open pit, is 25 to 200 feet deep (averaging approximately 100 feet) and terminates approximately 140 feet above ground water. Oxide waste rock was placed into one of eight WRDS near the pit or into in-pit backfill facilities as mining permitted. The ore was hauled to the crushing facilities at the Rochester mine site. Mining activity in the Nevada Packard Pit was suspended in August 2007.

The Permittee resumed surface mining in the Rochester Pit, construction of the buttress, and partial backfill of portions of the pit to stabilize the east rim where a conveyor corridor and solution pipe right-of-way will be located. Material from resumed mining will be placed on the Stage III HLP described below.

Low-Grade Ore Stockpile Processing

Approximately 4.5 million tons (MT) of low-grade ore stockpile material has been processed through 2010. This material has been leached on the Stage II and Stage IV HLPs as either run-of-mine (ROM) or crushed ore.

Waste Rock Disposal Sites

There are eight designated WRDSs. Approximately 240 MT of waste rock have been mined and placed in the WRDSs during the life of the Project. The eight WRDSs include the North WRDS, South WRDS, East WRDS, West WRDS, Rochester In-Pit WRDS, Packard Tailings WRDS, Packard West WRDS, and Packard In-Pit WRDS. PAG material has been evaluated using specific protocols provided in the application, and material flagged as PAG has been encapsulated within the Rochester In-Pit WRDS above the historic groundwater elevation (approximately 6,200 ft amsl). As of September 2011, approximately 34.6 MT of waste rock have been deposited in the Rochester Pit, and approximately 9.4 MT have been deposited in the Nevada Packard Pit. WRDS design and closure alternatives are presented in the Non-Ore Management Plan dated 1 August 2000.

Additional waste rock generated by resumption of mining in the Rochester Pit will be disposed of within the pit itself. Non acid generating rock, amended as required with lime to achieve 3 to 1 (3:1) ratio of acid neutralizing potential to acid generating potential (ANP/AGP), will be placed in the eastern portion of the pit to preclude a long term pit lake. Ongoing waste rock characterization will identify PAG material which will be placed in designated WRDSs in areas outside of this backfill zone and above the predicted water table recovery elevation (approximately 6,200 ft amsl).

Ore Crushers and Conveyors

Ore crushing facilities include primary, secondary, and tertiary systems. The primary crusher reduces ore to 9-inch minus, the secondary reduces it further to 3-inch minus, and the tertiary crusher reduces the ore to 3/8-inch minus. Calcium hydroxide is added at this stage to ensure proper alkalinity (pH 11 standard units [SU]) is achieved for cyanide processing. Placement of ROM ore on the Stage III HLP is not planned.

The scalping and tertiary crusher systems were relocated approximately 1,600 feet north of their original location, on the slope to the east of the secondary crushing system. The primary and secondary systems were connected to the overland conveyor system at the head of the third stage of the conveyor. Mining and crushing operations were suspended in August 2007, but will be restarted for loading of the Stage III HLP.

A 7,500-foot, four-stage overland conveyor system was designed to take tertiary crushed ore to the Stage IV heap leach facility. This conveyor system consists of two 48-inch wide overland conveyors, transfer chutes, stacking conveyor, and a truck load-out belt. Mining and crushing operations were suspended in August 2007. With resumed mining, the overland conveyor will be relocated to deliver crushed ore to the Stage III HLP and will include three 48-inch overland conveyors, transfer chutes, stacking conveyor, and a truck load-out belt. Relocation and start-up of the crusher and conveyor systems will be carried out as required to support the Rochester Pit expansion and Stage III HLP construction.

Heap Leach Facilities

There are five valley-fill HLPs Permitted at the Rochester Mine. Each pad is subdivided into phases. The Stage I HLP, built in 1986, covers approximately 85 acres. The Stage II HLP, built in 1988, is located adjacent to and upgradient (south) of the Stage I HLP, covering approximately 129 acres. The Stage IV HLP initially covered approximately 215 acres. The 2015 major modification and renewal increased the footprint by 78 acres to 293 acres. The Stage III HLP design proposal was included with the application for major modification of 2010 and was approved by the Division for construction by the Division in February 2011. The Stage III HLP, as approved by the Division, will be located adjacent and upgradient (south) of the Stage II HLP, and will cover approximately 143 acres. The Stage V HLP was included in the 2015 major modification and renewal and covers 123 acres.

The HLPs and associated ponds were designed and constructed to contain the 25-year, 24-hour storm event volume and solutions resulting from a 24-hour drain-

down. The HLPs were designed to withstand the run-off resulting from a 100-year, 24-hour storm event.

Stage I Heap Leach Pad

The Stage I HLP was constructed in two phases (Phases IA and IB) and loaded with ore through 1990 to a height of 200 feet. It covers approximately 3.4 million square feet and is lined with 80-mil high density polyethylene (HDPE). Beneath the synthetic liner is a 2-inch thick layer of sand (3/8-inch minus) which was placed directly on cleared, grubbed, and compacted native material. In selected areas of coarse-grained native material, 6 inches of compacted fine-grained material was placed prior to placement of the sand layer. High clay zones were removed and backfilled with granular material.

There is a shallow, main collection channel which branches to the southeast and to the southwest. Unique to this main collection channel, underneath the channel's synthetic liner, and on both sides of the lowest point of the channel, are underdrain recovery systems which are filled with one-inch rock and 12-inch diameter perforated HDPE pipe encapsulated with geotextile. The perforated pipes in the rock-filled recovery systems for Phase IA report to Catch Basin East (CBE) and Catch Basin West (CBW), located north of the facility. The recovery system for Phase IB is identical but reports to the South American Canyon Sump (SAC), located east of the facility. The catch basins and sumps collect solution, along with greater quantities of spring and meteoric water, for reintroduction into the process circuit. Note that, although the Phase IA and IB underdrain systems drain to opposite sides of the leach pad, the subbase was graded such that all pregnant solution draining down from both phases of the leach pad is directed to the North Dike on the Phase IA side.

Dikes were constructed at both the northern and southern ends of the pad to contain pregnant solutions. The dikes are compacted, rock-filled structures with filter rock covering the rock fill and clays covering the filter rock. An 80-mil HDPE liner was placed on the upstream side of each dike. The Stage I South Dike was constructed to a height of 34 feet and has a crest width of 25 feet with an upstream slope of 3 horizontal to 1 vertical (3H:1V) and a downstream slope of 2H:1V. The North Dike (Phases IA and IB) was constructed to a height of 40 feet with an upstream slope of 3H:1V and a downstream slope of 2H:1V.

Hydraulic relief pipes are located in the main collection channel above the synthetic liner which initially entered the double-walled pipe passing through the North Dike of Stage I to the pregnant ponds. In 1991, the downgradient pregnant ponds were taken out of service when the counter-current fluid management system was installed and the primary pipe to the diverter/pregnant ponds was plugged. Due to leakage emanating from the area of the booted location

(upgradient side of the North Dike embankment), the secondary pipe was later modified to report to a container in a concrete vault, known as the diverter box, located south of the pregnant ponds. From the diverter box, a dedicated sump pump conveys the leakage to the pregnant sump on the north end of the ponds. In November 2007, the Permittee submitted an application to modify the draindown system from the Stage I North Dike Sump to the Pregnant Sump with the intention of limiting the head on the liner by providing a completely passive draindown path to the Pregnant Sump. This design was approved by the Division and construction of the modification was completed in January 2009. Decommissioning of the diverter box was completed in October 2009. The Permit was modified to increase the maximum allowable head on the liner from 1 foot to 2.5 feet because the design does not allow draindown below 1.1 feet.

Leakage from the Stage I HLP was detected in 1991. The Permittee took immediate action to determine the location of the leak and the extent of the groundwater contaminant plume. From the time the leakage was first detected, numerous studies have been completed, characterizing the hydrogeology of the Stage I area and the magnitude and extent of the contaminant plume in attempts to further understand and mitigate actual groundwater impacts. The results of these studies indicate that a source of the leakage is beneath the northern part of the Stage I HLP, and the seepage emanates from near the Stage I boot sleeve and is partially or wholly hydrologically connected to the sub-drainage perforated pipes connecting the Stage I HLP to CBE and CBW.

Attempts to remediate the contaminant plume using sodium hypochlorite are believed to be the cause of high chloride concentrations observed in monitoring well WI-17R. In 2009, the Permittee agreed to convert WI-17R to a pump-back well to provide additional remediation of the chloride plume. The conversion was completed in June 2010.

To address the pad source, the Permittee was required to either close the Stage I heap or to provide an acceptable alternative. The Permittee chose to chemically stabilize the Stage I heap. Multiple treatments with a carbon-rich solution (Green World Science) were applied in 1999 and 2000, in an attempt to precipitate toxic constituents out of the leach solution and sequester them in the HLP. This treatment did not result in complete chemical stabilization of the HLP. In 2000, the HLP was regraded and 6 to 10 inches of topsoil cover was placed on the entire pad and the pad was then reseeded. Application of fluid, including freshwater, to the leach pad, other than direct meteoric precipitation, is currently prohibited by the Permit.

A Corrective Action Plan was approved by the Division on 29 May 2003 for containing and mitigating the leakage from both the pad and the high chloride source. Monitoring well WI-16 was converted to a remedial collection well and

continues to pump contaminated groundwater to the preg sump. Shallower contamination is captured by remedial collection well WI-17R and by the existing Catch Basin Central (CBC) sump which is connected to a french drain system underneath the East and West Pregnant Ponds. Four new monitoring wells (MW-30 thru MW-33) were also installed, including some in the productive aquifer in the Black Ridge Fault (BRF) located just west of the Stage I pad. As of September 2011, the BRF aquifer is not degraded and the contaminant plume is being monitored. If warranted based on future monitoring reports, additional mitigation may be required.

In November 2009, due to compromised well casing in WI-29, a replacement well was installed (WI-29R) in an effort to further investigate exceedances evident in WI-29, which may be caused by migration of the Stage I plume. Similarly, due to MW-30 having been screened too high compared to the water table (the well is dry approximately half of each year), a replacement well (MW-30R) was installed.

Based on analytical results from samples taken at WI-29R, it was determined that the well should be converted to a remedial collection well. A work plan was submitted by the Permittee as part of an engineering design change (EDC) in June 2011 and approved by the Division in January 2012. The conversion was completed in April 2012.

In September 2010, the Permittee installed a weather station to gather detailed meteorological data to be used for final planning for permanent closure. The station is approximately 33 feet high and can measure solar radiation, relative humidity, temperature, precipitation, and wind speed/direction.

Stage II Heap Leach Pad

The Stage II HLP was constructed in four phases starting in 1988 (Phases II, III, X, XI). Based on engineering evaluations of the stability and settlement, as well as maintaining the integrity of the liner system, the Stage II HLP has a maximum Permitted height of 330 feet with crushed ore and run-of-mine ore. This HLP covers approximately 6.0 million square feet and was designed and built similar to Stage I with the exception of greater widths of HDPE liner material, which reduced the number of seams over the surface area. The HLP was designed and approved by the Division, and the initial construction phases of the pad built, prior to the 1989 regulations (NAC 445A.350-447). However, quality assurance and control information is available. The underdrain recovery system under the synthetic liner reports to the Stage II sump (ST-II), located to the east of the HLP. Phase X was constructed on the southeast side of the Stage II facility, post-regulation, and Phase XI was built in 2004.

The process piping at the Stage II North Dike was replaced to provide more efficient flow back to the top of the Stage II heap when operating with both pumps simultaneously. The Division modified the permit in 2007 to allow for up to 65 percent of pump capacity when both pumps are operating simultaneously within the system. The rate of application of process solution to the Stage II HLP is limited by the Permit to a maximum of 3,000 gallons per minute (gpm).

In fall of 2006, the liner at the northwest edge of the Stage II heap was extended to prevent leach material from sliding off the HLP. This liner extension was installed on unprepared base and perforations and tears were evident during the Division inspection of April 2007. In response to Division directives, the Permittee submitted a design package in September 2007 for the replacement of this liner, regrading of the subbase, and the addition of a geosynthetic clay layer (GCL) under the new HDPE liner to address these issues. This design package was reviewed and approved by the Division in January 2008. Construction was completed in July 2008.

Stage III Heap Leach Pad

In June 2010, the Permittee submitted an application for a major modification proposing to construct the Stage III HLP in two phases. The design is for a valley-fill configuration but with a flow-through design which does not impound solution within the heap. A total of 45 to 50 MT of ore will be placed on the Stage III heap, over an area of approximately 143 acres, with a maximum height above the synthetic liner of 400 feet. The leach pad will be constructed directly south and southwest of the Stage II HLP but the fluid management systems for each will be segregated.

The leach pad design calls for grading and filling of the valley to produce a flat area of approximately 5 acres within the valley bottom. A system of shear keys and trenches will be constructed in this area to stabilize the heap and to provide a meandering flow path for draindown prior to exiting the heap fluid collection system.

The liner system for the leach pad consists of (bottom to top) a prepared subgrade, a GCL, and an 80-mil HDPE liner. The GCL has a permeability rating of $1x10^{-6}$ centimeters per second (cm/s) or less and will be placed using conventional overlapping and sealing techniques. Crushed ore will be placed on top of the HDPE liner to act as an overliner, within which a system of leachate collection pipes will be placed. The collection system will consist of 4-inch diameter slotted HDPE lateral pipes which drain to 12-inch diameter HDPE slotted trunk lines or secondary headers. These in turn drain to 20-inch diameter HDPE slotted primary headers which convey solution through the shear key area and terminate at the cutoff wall.

The cutoff wall will be located at the north end of the leach pad and is designed to direct leachate flow into the 22-inch diameter pregnant solution pipe. The wall consists of a 5-foot tall concrete stem wall, penetrated by the 22-inch diameter pipe. A second 22-inch diameter pipe penetration is included as a contingency but will be capped initially and only used if required at some future date. The 22-inch diameter HDPE or steel pregnant solution pipe exits the cutoff wall and conveys leachate to the pregnant solution tank approximately 1,000 feet downgradient. Over the length of this span, the pipe is enclosed within a 30-inch diameter secondary containment pipe.

The pregnant solution tank is a cylindrical steel tank with a working capacity of approximately 47,500 gallons (gal), located on a concrete pad adjacent to the Contingency Pond. The design is such that any upset condition or overflow of the tank will drain across the pad and into the pond. Under normal operating conditions, the draindown from the heap will run through the tank and out through the exit pipe, an 18-inch diameter HDPE or steel pipe, expanding to 22-inch diameter after approximately 25 feet, and running downgradient to the process building. This section of the pipeline also runs within a 30-inch diameter HDPE secondary containment pipe.

The Contingency Pond measures approximately 323 feet by 505 feet at the crest, with a total depth of approximately 22 feet. The pond liner system consists of (bottom to top) a prepared subbase, a 60-mil HDPE secondary liner, a geonet, and a 60-mil HDPE primary liner. The leak detection and recovery system consists of the geonet and a gravel-filled sump (2,603 gal effective capacity) from which an 8-inch diameter HDPE pipe extends up to the crest to allow inspection and evacuation of fugitive solution. The pond is designed to contain the direct precipitation on the leach pad resulting from the 25-year, 24-hour storm event, along with 24 hours of draindown, without passing the minimum required freeboard of 2 feet. In addition, the pond will be capable of containing the direct precipitation on the leach pad resulting from the 100-year, 24-hour storm event, along with 24 hours of draindown, without overtopping the embankment.

The pond will be maintained empty during normal operation. Diversion of solution into the pond will only be the result of shut-down during routine maintenance, upset conditions, or storm events. Industry best practices will be used to minimize wildlife exposure to pond fluids.

In November 2012, the Permittee submitted a minor modification proposing to add a buttress at the downstream foot of the Stage III HLP. The need for the buttress was identified by the design engineer (Knight Piésold) after re-evaluating the properties of the GCL under saturated conditions, which could result in reduced stability as constructed. The buttress was designed to reinforce the Stage

III heap and eliminate the stability issues, as confirmed by analysis results submitted with the design. The upstream face of the buttress includes a GCL overlain by 80-mil HDPE geomembrane.

The buttress as designed will cover the original cutoff wall solution collection area. Two additional conveyance pipe outlets through the wall were added as part of the buttress design to provide additional contingency in case of pregnant pipe blockage. The design also provides a single 18-inch diameter HDPE pipe located on the upstream embankment of the buttress and terminating below the cutoff wall just upstream of the pregnant pipe inlets. This pipe allows for inspection and, if necessary, evacuation of fluid behind the wall in the event all four pregnant pipes become blocked or are otherwise unusable. If this should occur, the Permittee is required by the Permit to cease application of solution and initiate closure of the pad immediately. The minor modification was approved by the Division in March 2013.

The Stage III HLP was originally permitted with a limit on the rate of solution application of 5,000 gpm. In October 2013, the Permittee submitted an EDC proposing the increase of the Permit limit to 6,500 gpm. Supporting documentation submitted with the EDC showed that the solution conveyance system was capable of handling the increased flow without modification, including under storm conditions. The EDC was approved by the Division in October 2013. In June 2014 the Permittee submitted an EDC proposing to increase the solution conveyance again this time to a flow rate of 7,500 gpm. The increase required system modifications including a pressurized bypass of the pregnant tank. The EDC was approved by the Division in July 2014.

Stage IV Heap Leach Pad

The Stage IV HLP was designed and approved prior to the promulgation of the 1989 regulations (NAC 445A.350-447) and constructed in several phases starting in 1994 (Phases VI, VII, VIII, IX, XII, XIIIa,b,c). The heap height is currently permitted to a maximum of 330 feet. The Stage IV HLP was built using an 80-mil HDPE liner (which extends up the embankment). The leak collection and recovery systems consist of 4-inch diameter poly vinyl chloride (PVC) perforated pipes identified as Leak Detection Lines (LDLs) located beneath the liner but above the 12-inch thick, compacted, low-permeability subbase (maximum permeability 4.0×10^{-8} cm/sec). However, the leak detection system only extends to Phase VI, which is the limit of the area where process fluid is impounded. At the southeast corner of Stage IV the leak detection sump includes a single HDPE-lined overflow pond to store excess fluids in the leak detection system. Process fluid accumulated in this pond is limited to 20-day residence.

Stage IV also has a system of Underdrain Lines (UDLs) located beneath the 12-inch thick subbase designed to recover groundwater (e.g., springs/seeps). Both the LDLs and the UDLs consist of perforated pipelines located in gravel-filled trenches surrounded by geotextile. The LDLs and the UDLs report to separate sumps where the fluids are pumped back to the fluid management system.

A network of hydraulic relief perforated pipelines is located above the HDPE liner. The 4-inch diameter PVC perforated pipes are spaced 40 feet apart to recover pregnant solution and minimize hydraulic head on the liner system. The hydraulic relief pipes direct the pregnant solution to the solution collection sump where it is pumped into 18-inch diameter return lines to the process plant. If a breach of one of these pipelines were to occur, the process solution would gravity flow back to the Stage IV HLP via a synthetically-lined ditch.

Process solution was detected in underdrain UDL-3 in August of 2004, indicating the presence of a leak in the liner system on the middle to north side of the leach pad. Cell 2 of the leach pad is believed to be the source of the leakage. Therefore, no solution application has been allowed on Cell 2 since 10 August 2004. A new monitoring well (MW-44), installed in 2007 to test for groundwater degradation near the UDL-3 sump, shows no degradation.

In July 2011, the Permittee submitted an EDC proposing to install injection wells on the Stage IV HLP, and the proposal was approved by the Division in August 2011. Injection wells will be installed a minimum of 100 feet apart and no closer than 40 feet away from the HLP crest. The bottom of each well will be at least 100 feet above the top of the HLP liner. Initially, 20 wells will be constructed and operated, followed by an expansion to a maximum of 280 wells.

Up to 20 wells will be active at any time with a maximum per well input flow rate of 120 gpm. The flowrate will be controlled to prevent upwelling at the well head and to prevent expression of solution on the HLP side slopes. The total flowrate of all injection holes combined may not exceed 2,400 gpm and the total application to the heap, on the surface and through injection wells, may not exceed the Permit limit of 9,000 gpm.

Soil data were gathered from 12 holes drilled on the HLP and was used to model the characteristics of injection well flow. For the minimum permeability measured in the soil samples, the slope of the infiltration cone will not be flatter than 1H:1V and would in most cases be much steeper. Since the HLP has side slopes that are sloped to 3H:1V and the wells will be a minimum of 40 feet from the crest, surface expression of solution on the side slopes is not anticipated. Slope stability analyses run for the worst case conditions of heap material saturation resulted in factors of safety of 1.7 for static conditions, and 1.1 for

pseudostatic. These values exceed the minimum Division requirements for heap stability.

In February 2015 the Permittee submitted an application for a renewal and a major modification to expand Stage IV HLP and construct Stage V HLP. There were several modifications to Project operations associated with the major modification proposed in the application. Each process component modification is briefly described in the following bullets.

- An expansion of approximately 78-acres to the existing Stage IV HLP including increase of the allowable maximum Stage IV HLP stacking height from 330 feet to 400 feet, installation of the Stage IV and V HLP conveyor system, associated load-out points, ore stockpiles, maintenance road, realignment of the Stage IV haul road, construction of secondary access roads, and a utility corridor to accommodate process solutions and fresh water supply pipelines;
- Construction of the approximately 123-acre Stage V HLP (actual 3D surface area of liner limits) located to the south of the existing Stage IV HLP with an associated conveyor, contingency pond, process solution tanks, and underdrain management pond;
- Relocation of a portion of utilities within the footprint of the proposed Stage V HLP including the existing power line and poles to a new alignment corridor and relocation the 100-year, 24-hour event stormwater diversion ditch;
- Relocation of the electrical building, core shed, abandonment of monitoring well WI-24, and relocation of production well PW-2A to accommodate the Stage V HLP, and installation of production well PW-2B;
- Temporary storage of PAG material within the footprint of the North and West WRDSs

<u>Stage IV 2015 Heap Leach Pad Expansion</u>

In 2015, the Permittee proposed to expand the leach pad liner surface of the existing Stage IV HLP. Construction activities will generally include: clearing and grubbing; growth medium stripping and stockpiling; subsurface preparation; heap leach pad liner and solution collection system placement; and completion of other ancillary work within the proposed disturbance area for access, control, and stormwater management. Subsurface preparation will include scarifying, moistening, and re-compacting the top 8 inches of the stripped area to a minimum of 90 percent of the maximum Modified Proctor dry density pursuant to ASTM Method D 1557 as well as grading and performing cut and fill as necessary for the

facility design. Cut and fill areas will be compacted to 90 percent of the maximum dry density pursuant to ASTM Method D 1557 within 2 percent of the optimum moisture content. The underliner will consist of GCL with a maximum permeability of 1 x 10^{-6} cm/sec. This will be overlain by an 80-mil textured HDPE liner. A well-graded granular overliner material will be placed over the HDPE liner to a thickness of between 36 inches and 5 feet. The solution drain pipe system will consist of perforated lateral pipes and perforated collector pipes and will be installed above the pad liner within the overliner. All lateral and collector pipes are ADS N-12 dual-wall smooth interior pipes or approved equal. A series of 4-inch diameter perforated lateral pipes on 20-foot centers will feed into 8-inch, 12-inch or 18-inch collector pipes placed at strategic locations.

Standard construction equipment will be utilized where practical (excavators, compactors, articulating dump trucks, dozers) with smaller equipment utilized as necessary depending upon field conditions. Long-term operating and maintenance access to the facility will be provided by an access road inside the facility perimeter fence adjacent to the expanded leach pad area. Stormwater management structures will also be constructed outside the toe of the expanded heap leach pad. The Stage IV HLP expansion is expected to add approximately 70 MT of ore storage capacity to the facility. Leach solution from the expanded area will be directed to the existing solution management system via an expanded solution collection pipe network. Knight Piésold completed a water balance evaluation of the existing Stage IV HLP solution management system's capability to handle the additional liner area and increased ore volume. Results indicate the existing fluid management system is capable of containing both leach application draindown and stormwater flow from the 25-year, 24-hour design storm event, and withstanding the 100-year, 24-hour storm event, as required by Permit guidelines. By operating the facility with the storage level at least 27 feet below the dike crest, the system will have adequate contingency storage for the design event. The additional liner acreage will not change the permitted Stage IV HLP solution application rate (0.005 gpm per square foot) or overall solution flow to the HLP (9,000 gpm).

In order to minimize the permitted and disturbed areas for ore processing, an evaluation of increasing the ultimate leach pad height from 330 feet to 400 feet was completed. This analysis shows that at 400 feet the stability of the Stage IV HLP meets all NDEP-BMRR requirements associated with liner integrity, solution flow, solution collection pipe integrity, and overall leach pad stability with a static factor of safety of 1.3 and a pseudo-static factor of safety of 1.1. The additional ore material will come from previously permitted mining activities. The allowable maximum leach pad height will not affect overall solution management as both the unit solution application rate per square foot and total allowable solution throughput in gpm will not change.

Stage V Heap Leach Pad

The Stage V HLP is designed to contain approximately 50 MT of ore, will be constructed prior to the Stage IV expansion, and will be located to the south of the expanded Stage IV HLP.

Stage V HLP construction activities will generally include: clearing and grubbing; growth medium stripping and stockpiling; subsurface preparation; HLP liner and solution collection system placement; and completion of other ancillary work within the proposed disturbance area for access control and stormwater management. Subsurface preparation will include scarifying, moistening, and re-compacting the top 8 inches of the stripped area to a minimum of 90 percent of the maximum Modified Proctor dry density pursuant to ASTM Method D 1557 as well as grading and performing cut and fill as necessary for the facility design. The Stage V HLP will be constructed with an 80-mil HDPE liner overlying a GCL with a maximum permeability of 1×10^{-6} cm/sec or bentonite amended native soil compacted to a maximum permeability of 1×10^{-5} cm/sec in the valley bottom where it will be underlain by a process component monitoring system or a maximum permeability of 1×10^{-6} cm/sec on sloped areas. The pad will drain via a drain-pipe network system within the overliner to dedicated solid solution pipes routing the pregnant solution to the pregnant tank. The Stage V HLP will be engineered to an approximate height of 400 feet, with overall slopes ranging from 2.7H:1V to 2.5H:1V.

Stability analysis performed on the Stage V HLP indicated that heap did not meet the minimum factor of safety against failure without additional support. Therefore, a buttress fill is provided at the northern toe of the Stage V HLP facility to improve its stability. The crest of the buttress will be constructed to an elevation of 6,050 feet. The upstream slope will be at 2.5H:1V and the downstream slope will be 2H:1V. A crest width of 30 feet is provided. Suitable fill from the excavation of the perimeter storm water channels or rock fill from the open pit shall be used for the construction of the buttress. The material will be placed in lifts. Compaction will be performed with vehicular trafficking of haul trucks. The optimum lift thickness and number of passes for compaction will be determined in the field by a test fill constructed by the contractor. Approximately 360,000 cubic yards of fill will be required for the construction of the buttress. A flow-through section will be incorporated into the buttress to prevent head build-up in the unlikely event of a failure in the solution conveyance piping. The flow-through section is in a separate alignment from the solution pipes and will consist of a rock-filled channel that would conduct solution directly to the Contingency Pond. The channel will be lined all around and its invert will be just above the top of the soffit of the three solution collection pipes. The rock fill will be surrounded with geotextile to protect the channel liner and prevent migration of fines from the ore heap into the rock fill. Flow through the three solution collection pipes will

accommodate the maximum leaching throughput without exceeding the top of the cutoff wall, thus preventing flow in the rock-filled channel. In the highly unlikely event of complete collapse of all three solution pipes, the rock-filled channel is designed to conduct the maximum leaching throughput to the Contingency Pond. This will prevent the buttress from becoming a solution retaining structure.

Ore will be transported to the Stage V HLP stockpile located to the west of the Stage V contingency pond by the proposed conveyor system. Well-graded granular overliner material will be placed on the liner to a minimum depth of 3 feet. Ore will be placed on the heap leach pad in lifts approximately 50 feet thick. The surface of each lift will be ripped to facilitate process solution percolation. The ore material will come from previously permitted mining activities.

Ore will be leached with a weak cyanide solution applied to the surface using a drip irrigation system. The Stage V HLP application rate will be approximately 0.005 gpm per square foot and overall solution flow to the HLP will be up to approximately 7,000 gpm. Pregnant solution will be collected in the underlying solution collection pipe network, routed through the buttress, and into the Stage V double contained pregnant solution tank. From here, solution will be routed to the Merrill-Crowe plant for final processing. Operating flexibility is provided in the pumping and pipeline systems to allow various flow routes to be utilized under a variety of circumstances, such as allowing recirculation of pregnant solutions from either pad to the other.

The Stage V Contingency Pond will be constructed to the north of the Stage V HLP. It will consist of 80-mil HDPE primary and secondary liners with a separate geonet leak detection system placed between the primary and secondary HDPE liners. This leak detection system incorporates a 3,112 gal sump that allows for the observation and evacuation of fugitive solutions if needed. The design volume of the Stage V Contingency Pond is 18 million gal with 2 feet of freeboard. This is sufficient capacity to contain the volume of solution draindown for 24 hours in addition to the added contribution from the 25-year, 24-hour storm.

The Stage V HLP is designed to accommodate and mitigate potential impacts to springs and seeps in the area. The proposed underdrain system will be oversized to accommodate a flow of approximately 100 gpm. The underdrain system will be sloped to drain to the north toward American Canyon. Flows from the underdrain system will be collected in a lined pond, the Stage V Underdrain Pond, which will be located adjacent to the Stage V Contingency Pond. This pond will be configured to allow flows from the pond to be directed to either the stormwater diversion or to the Stage V HLP process solution system.

The Stage V HLP will also be constructed over the stormwater sediment ponds located within the proposed Stage V HLP footprint. The pond berms will be

graded prior to HLP construction and existing materials or equipment removed or buried in place. Stormwater will be managed using the relocated 100-year, 24-hour diversion. The Stage V HLP and its associated tanks and Contingency Pond are sized to be operated to withstand and fully contain process fluids and projected stormwater accumulations resulting from the 25-year, 24-hour storm event.

The footprint of Stage V HLP covers the following three previous monitoring locations; Production Well (PW-2A), Monitoring Well (WI-24), and American Canyon Spring (ACS). These locations were removed from the Permit Monitoring Requirements with the approval of the February 2015 major modification. Flows from American Canyon Spring will continue to be monitored as the groundwater underdrain system as Permit Part I.D. Monitoring of WI-24 will continue until its replacement is established and two quarters of concurrent data are collected. See Permit item I.B.2. The other location, PW-2A, is not replaced.

Vehicle Wash Bay Solids Leaching

In January 2014, the Permittee submitted an EDC proposing to leach solids of mine ore grade from the vehicle wash bay on the Stage II, Stage III, and Stage IV HLPs. The EDC was approved by the Division in May 2014 with the following requirements:

1. The semi-annual analysis of draindown samples from any HLP with wash bay solids include Total Petroleum Hydrocarbons Extractable (TPH-E);
2. The material shall be free of Total Petroleum Hydrocarbons (TPH) gasoline (non-detect);
3. The material shall be confirmed to not be hazardous waste as determined pursuant to 40 Code of Federal Regulations (CFR) 262.11 using operator knowledge and/or applicable analytical testing methods described in EPA publication SW-846; and
4. The quantity and location where wash bay solids are deposited shall be reported annually.

Pregnant, Barren, and Storage Ponds

The East and West pregnant ponds, built in 1986, have not been used for containment of pregnant solution since the conversion of the Stage I HLP to a counter-current system in 1991. The Permittee intends to leave them in place and use them for closure as outlined in the tentative closure plan. Each pond has 2.6 million gal of storage volume at 2 feet of freeboard. The ponds were re-lined once with 80-mil HDPE, without prior Division approval or as-built documentation, and the East Pond was partially relined again in 2006, with a new "upper" leak detection system and port (EP-U) which were approved by the

Division and documented. EP-U was disconnected in 2009 following the discovery that the sump had been rendered non-functional during construction (perforation in liner at bottom of sump).

The original synthetic liner was placed on geonet over geotextile. The geotextile was placed on two compacted lifts of soil. In the mid-section of each pond is a perforated pipe placed between the original synthetic liner and the clay Low Hydraulic Conductivity Soil Layer (LHCSL) as part of the leak detection system. These pipes are connected to, and have gradients toward, the external monitoring sumps (East [EP] and West [WP] Pregnant Sumps). The perforated pipes transition to solid as they enter the LHCSL. Underneath the clay LHCSL is a gravel layer that extends up the sideslopes of the ponds. Perforated French drain pipes are located within the gravel layers, tracing both pond bottoms before reporting to CBC. Both the leak detection systems and the French drains are vented to the surface. The clay LHCSL was designed to meet $1x10^{-5}$ cm/s permeability or less. Due to the lack of as-built documentation of the pond reconstruction, fluid residence time in both ponds was limited to 20 days for each emergency situation that results in impoundment of process fluid. After receiving Division approval in 2010, the Permittee partially filled the West pregnant pond with fresh water for a passive evaporation test.

In May 2011, the Permittee submitted an EDC proposing to rebuild the East and West ponds with new HDPE liner and new leak detection sumps. The design of each pond called for a liner system of (from bottom to top) a prepared subgrade, a 60-mil HDPE drain-liner (studded) geomembrane secondary liner, and 60-mil HDPE smooth geomembrane primary liner. The space created by the studs on the secondary liner provides a leak path for conveyance of fugitive solution to the collection and recovery sump. The sump is filled with free-draining gravel with a perforated 8-inch diameter PVC pipe for inspection and evacuation of fluid. The net fluid capacity of the sump is approximately 75 gal. The EDC was approved by the Division in May 2011 and construction completed in October 2011.

The Barren and Storage ponds were also built in 1986, to essentially the same design as the two pregnant ponds. The Barren Pond, also known as the South Barren Pond is connected, via a transfer channel, to the Storage Pond but, like the two pregnant ponds, has not been used to contain process solution since 1991 with the exception of short-term (less than 20-day) upset conditions. The Barren Pond was re-lined in 2002, placing a new 80-mil HDPE liner over the original synthetic liner, with new geotextile in between, and installing a new upper leak detection port (SB-U). However, this construction was completed prior to obtaining approval from the Division and as-built information was not sufficient to document the quality of the construction. As a result, the residence time of process fluid in this pond is limited to 20 days.

The Storage Pond, also known as the North Barren Pond, has a capacity of 748,000 gal at 3 feet of freeboard and receives process solution from the process plant, following the zinc precipitation process. This pond was rebuilt in 2004 with Division approval to include an 80-mil HDPE primary liner and geonet over the original synthetic liner, a new perforated leak detection pipe at the downgradient part of the pond bottom, and a leak recovery pipe located between the two synthetic liners that daylight at the pond crest (NB-U). The solution from this pond is pumped to the Stage II HLP.

The North Barren (NB) and South Barren (SB) sumps are the original leak detection sumps for the Storage and Barren ponds, respectively. These ponds also have French drain systems located beneath the clay LHCSL. The clay LHCSL was designed to meet $1x10^{-5}$ cm/s permeability or less. The French drains consist of a gravel layer that extends up the sideslopes of the ponds. Perforated pipes are located within the gravel layers, tracing the pond bottoms before reporting to Catch Basin North (CBN). Both the leak detection systems and the French drains are vented to the surface. Solids accumulate in the Storage Pond and require periodic removal, which must be carried out consistent with the requirements for disposal of process material.

In February 2008, the Permittee submitted an EDC, which was subsequently approved by the Division, proposing to replace parts of the Stage II pregnant solution piping system along the north side of the pregnant ponds and resurface the area with shotcrete. The modification provided mitigation of releases around the pregnant sump as well as increasing the gravity draindown from the Stage I pad. Approval was granted by the Division and construction was completed in January 2009.

Stormwater and Emergency Management Ponds

Three stormwater and emergency management ponds were built to provide additional storage capacity during emergency situations such as power outages and extreme storm events. One pond is located in South American Canyon, and was constructed with a compacted clay base with permeability of $1x10^{-5}$ cm/s or less. The second pond was divided into two ponds in Sage Hen Flats, north of the process plant area and south of American Canyon Springs, and equipped with an automated pumpback system. These ponds also have compacted clay bases with permeability of $1x10^{-5}$ cm/s or less. The third pond, located east and downgradient of Stage IV in American Canyon, was constructed with an 80-mil HDPE liner overlaying a compacted clay base and has a capacity of 234,000 gal. This pond also has a pumpback system.

Test Evaporation Cell

In February 2010, the Permittee submitted an EDC for the addition of an evaporation test cell to verify evaporation rates used in closure calculations. The cell measures approximately 115 feet by 160 feet at the crest and approximately 8 feet deep. The EDC was approved by the Division and construction was completed in August 2010.

The cell construction consists of (from bottom to top) compacted bedding material, 60-mil HDPE secondary liner, geonet, and 60-mil HDPE primary liner. A leak detection and recovery sump (140 gal effective capacity) is located at the northwest corner, with inspection and evacuation of solution carried out through a 6-inch diameter PVC pipe. Crushed mine rock was used to fill the cell and two monitoring standpipes, constructed of 6-inch diameter slotted PVC pipe, were installed to allow inspection of solution levels within the fill material. Barren solution from the process plant is diverted into the cell and calculations of evaporation made based on inflow rate, pond dimensions, and changes in observed water level in the standpipes. These data will then be used for calculation of evaporation rates upon which the Final Plan for Permanent Closure will be based.

In August 2010, fluid began reporting to the leak detection sump of the cell and by October 2010 the Permittee was reporting approximately 200 gal per day evacuated from the sump. Use of the pond has been suspended and investigations of the source of leakage undertaken. The Division required that the cell be repaired or replaced and confirmation given that waters of the State will not be degraded.

In May 2011, the Permittee received approval for the rebuilding of the test evaporation pond. All fill material was removed and the HDPE primary and secondary liners replaced according to the specifications in the previously Division approved EDC. Gradation of fill materials was controlled to exclude rocks which had potential to damage the liners. The newly rehabilitated pond was hydraulically tested with fresh water with no evidence of leaks. The Division approved introduction of solution into the pond in September 2011.

In June 2013, in response to ongoing difficulty accurately measuring the net evaporation from the test ET cell, the Permittee submitted an EDC for the redesign thereof including an upgraded dosing system and revised distribution pipe network. The EDC was approved by the Division in August 2013.

Process Plant Area

The Merrill-Crowe facilities were built in 1986. The pregnant solution that is processed for silver and gold recovery originates from the Stage II, Stage III, and Stage IV HLPs. The pregnant solution is clarified with one of three clarifiers and de-aerated using a vacuum tower. Zinc dust is added to the solution to create a precious metal precipitate. The precipitate is filtered out with one of three filter presses. Filter precipitate is cleaned from the presses weekly, dried, mixed with fluxes, and smelted in a reverberatory furnace to recover precious metals. During the drying process, mercury is removed by retorts, trapped in a condenser, transferred to storage containers, and sold. Secondary containment is provided (both internal and external to the building) for solutions that could escape primary containment. In March 2008, an EDC was submitted to the Division proposing to extend the concrete secondary containment on the south side of the process building in the area of the Wet Electrostatic Precipitation (WESP) scrubbers. This EDC was approved by the Division and construction was completed in July 2008.

On the western side of the process plant, between the Pregnant and the Barren ponds, is the cyanide mixing and barren sump area. An EDC was approved by the Division on 15 November 2007, which included the removal of one of the 20,000 gal cyanide tanks, replacing it with a 10,000 gal caustic solution tank and associated piping. The redesigned reagent facilities include provision for caustic addition to the cyanide solution, optimizing the leaching process chemistry for improved metals recovery. Construction of the modified system was completed in June 2008.

Both the cyanide and the caustic reagent storage facilities are located within a concrete secondary containment area. This secondary containment was designed to drain into the Barren Pond in the event of leaks or spills. Sodium cyanide is currently transported to the facility as solid briquettes in a tanker truck. Water is added upon arrival at the site and the solution is transferred to the storage tanks. Sodium cyanide solution can be added after de-aeration at the plant, or to the process solution from the Stage II heap before introduction to Stage IV. As part of the EDC of 15 November 2007, a concrete containment apron was added around the Barren Sump to collect overspray of process solution and provide a drainage path into the Barren Pond.

West of the reagent mixing area is an on-site laboratory. Samples processed in the laboratory include mine drill hole samples, exploration and development drill hole samples, and water quality monitoring samples.

In March 2010, the Permittee submitted an EDC to the Division proposing to modify the laboratory waste neutralization sump to a configuration which provided means for visual detection of leaks from the sump. This was accomplished by installing a new HDPE sump above ground outside the lab

building, raised several inches above ground so that leaks would be immediately apparent. The design also included a drain line to convey excess fluid to the barren sump by gravity. This modification was approved by the Division in July 2010, and construction completed in September 2010.

In April 2012, the Permittee submitted an EDC proposing to make several improvements in the Process Plant. These included:

a. the addition of a portable filter press and a fourth permanent filter press to increase throughput of the Merrill-Crowe system;
b. replacement of the existing de-aerator pump with a 250 horsepower (hp) variable frequency drive (VFD) pump;
c. installation of a new "bathtub" cooled filter feed pump and 400 hp VFD control system;
d. installation of a new concrete spillway and bridge to provide secondary containment for all piping, draining to the North Barren Pond;
e. installation of a new 80-mil HDPE-lined secondary containment for the Stage IV barren pipeline along a new route (old buried barren pipeline abandoned);
f. re-plumbing of the Stage II pregnant pipeline directly to the clarified tank (and abandonment of the old connection to the Stage IV barren Pipeline);
g. adaptation of the clarified and unclarified tank overflow lines to be directed to the new concrete spillway; and
h. provision of a new bypass line from the Stage IV pregnant pipeline into the clarified tank.

The EDC was approved by the Division in April 2012, and work was completed in August 2012.

In October 2012, the Permittee submitted an EDC proposing to construct additional concrete containment for air pollution control equipment added as part of the Tier 2 Phase 2 Mercury Operating Permit. The containment was designed to drain to a sump from which any fluid will be pumped directly to the existing mercury trap on the WESP. The EDC was approved by the Division in October 2012 and construction completed the same month.

In January 2013, the Permittee submitted an EDC proposing to add another deaeration tower on new concrete secondary containment. The additional containment was designed to be located directly south of and adjacent to the existing deaeration tower, with an opening in the stemwall between the two to allow any leakage to flow into the clarified solution area containment which overflows to the North Barren Pond. The EDC was approved by the Division in January 2013.

In April 2013, in response to exceedances of the Profile I reference value for weak acid dissociable (WAD) cyanide in well TB1, the Permittee submitted an EDC proposing the replacement of the barren sump. The new design proposes a concrete vault design lined with HDPE double-wall panels. The new design will allow monitoring of the space between the two HDPE panels for leakage, and evacuation thereof if necessary. Provision will also be made for elimination of overspray of solution from the pumps and for tying into the adjacent cyanide off-load areas and process ponds. As part of this effort, TB1 was replaced by TB1R due to difficulty obtaining samples from TB1 (damaged casing). The EDC was approved by the Division in June 2013.

In August 2013, the Permittee submitted an EDC proposing the addition of another filter press on new containment adjacent to the process building. The new concrete slab and stemwall system would contain minor spills and overflow larger upsets back into the main process building area. The EDC was approved by the Division in September 2013. The additional equipment resulted in a total design flow capacity of 13,750 gpm through the process plant. The Permit requires that solution application to the HLPs be managed such that the flow to the plant does not exceed the plant capacity.

In January 2014, the Permittee submitted an EDC proposing to reconfigure the barren pipelines exiting the barren sump to allow more flexibility for directing flow from the pumps to the different HLPs. The EDC was approved by the Division in May 2014.

Rochester Pit Lake

A pit lake began forming in the Rochester Pit in early April 2007, immediately after mining began on the 5,975-foot bench. This was 85 to 100 years earlier than predicted in the March 2004 draft report ”Coeur Rochester Hydrology and Hydrochemistry of the Post-Mining Pit.” The initial pit lake was relatively shallow (approximately 18 feet deep), and was found to be contaminated with cyanide, which caused the Division to take enforcement action. The Permittee, with Division approval, installed a pumping system by which pit lake water was conveyed to the Barren Pond, after which the cyanide concentrations in the pit lake abated to below laboratory detection levels by the end of May 2007. The ensuing investigation, including analysis of groundwater samples from four new monitoring wells in the BRF aquifer, determined that the BRF aquifer was not degraded, suggesting limited connectivity between the pit lake and the BRF aquifer. The cyanide could not flow directly from process components to the pit lake, leaving sabotage as a possible explanation.

After the cyanide removal, the pit lake chemistry was initially similar to the 2004 model predictions, with only pH, cadmium, nitrate, and thallium exceeding the

Profile I reference values. However, in the fourth quarter of 2008, pH began to decrease and nitrate and dissolved metals concentrations (aluminum, cadmium, copper, iron, lead, manganese, thallium, and zinc) began to rise. The Permittee has undertaken further study of the pit lake hydrogeology including predictions of the influence of sulfidic rock in the pit. A short-term amendment test program in June of 2009 was successful in raising the pit lake pH to 9.0 SU by adding hydrated lime. The lime amendment program continues as required by the Permit to maintain the pit lake pH between 6.5 and 8.5 SU.

Since the pit lake formed, the Division has modified the permit to include monitoring requirements for the waters therein. The pumping facilities installed by the Permittee, which were used to convey pit lake solution to the Barren Pond until the cyanide concentration was reduced below laboratory minimum detection levels, have been removed, and are no longer active. A revised pit lake model and pit closure plan must be submitted with each Permit renewal application, or upon any change which could potentially impact pit lake water quality. Additionally, the Permittee added three monitoring wells (TH-1, TH-2, and TH-3) to characterize the extent of the water source contributing to the pit lake. TH-3 was subsequently plugged and abandoned in March 2010 as the rising pit lake inundated the 6,000 ft amsl bench on which it was collared.

The Permittee conducted a revised pit lake study in February of 2009 to provide the basis for long-term resolution of the pit lake water quality issue. The three main approaches evaluated were: 1) allow the pit lake to remain but amend the lake, as required, in a way that will prevent acid generation; 2) complete backfill of the pit lake with waste rock of a type that will be acid neutralizing; and 3) partial backfill of the pit lake with waste rock of a type that will be acid neutralizing.

A revised study was submitted in June 2010, along with the proposal for major modification (Stage III HLP), which further refined the backfill alternatives and provided more detailed modeling of the three configurations. This report predicted that the no-action scenario (allow pit lake to remain) would initially continue the current flow-through hydrology with potential degradation of groundwater, followed by a long-term (200 years or more) hydrologic sink pit lake with no potential for groundwater degradation, but with potential adverse health impacts to human, terrestrial, and avian life. The predicted pit lake chemistry shows long-term (200 years or more) elevated concentrations of antimony (0.023 milligrams per liter [mg/L]), cadmium (0.033 mg/L), and manganese (0.64 mg/L).

The partial backfill (to approximately 6,150 feet amsl) scenario also predicted a hydrologic sink but with only seasonal expression of groundwater above the backfill surface. Pore water chemistry for this case was predicted to include long-

term (200 years or more) elevated concentrations for pH (8.7 SU), antimony (0.015 *mg/L),* arsenic (0.019 mg/L), cadmium (0.008 mg/L), and selenium (0.083 mg/L). The seasonal wetland for this scenario was predicted to show long-term (200 years or more) elevated concentrations for antimony (0.053 mg/L), arsenic (0.047 mg/L), cadmium (0.018 mg/L), manganese (0.18 mg/L), selenium (0.27 mg/L), and thallium (0.007 mg/L). The seasonal wetland also resulted in Hazard Quotient (HQ) of greater than 1 for boron uptake to Mule Deer in the Screening Level Ecological Risk Assessment (SLERA) report.

The 2010 study included an increased backfill scenario (to approximately 6,175 feet amsl) which also included a seasonal expression of groundwater above the backfill surface, but which reduced evaporation enough to produce a weak flow-through system (approximately 2 gpm) instead of a sink. Pore water chemistry for this case was predicted to include long-term (200 years or more) potential for degradation of groundwater, with exceedances for pH (8.6 SU), cadmium (0.006 mg/L), and lead (0.027 mg/L). The seasonal wetland for this scenario was predicted to show long-term (200 years or more) elevated concentrations for cadmium (0.008 mg/L), lead (0.044 mg/L), and manganese (0.16 mg/L). The potential risks to human, terrestrial, or avian life created by the seasonal wetland were not addressed in the SLERA and the Division has requested an update to address this issue.

In response to these results, the Division requested a fourth case be run with an additional increase in the backfill sufficient to prevent both surface expression of the groundwater and eliminate the evapo-concentration effect. This case was run with a selected backfill elevation of 6,250 feet amsl and results were submitted in August 2010, showing long-term (200 years or more) exceedance only for pH (9.6 SU) and a flow-through rate of approximately 22 gpm. The report also stated that the chemistry of the pit hydrogeologic system was such that the high pH did not create a potential for exceedances of Profile I constituents.

Evaluation of the different scenarios is ongoing and will continue as future studies are conducted and the models refined. The Division has established the requirement in the Permit that the final configuration must minimize the impoundment of surface drainage, and must not degrade waters of the State, or adversely affect the health of human, terrestrial, or avian life, pursuant to NAC 445A.429.

In September 2011, the Waste Rock Management Plan was updated to include specific monitoring and testing requirements for backfill placed in the pit. Testing and reporting required by the Permit for backfill material are as follows:

(1) Weekly records of backfill tonnage placed:

i. Total in-pit
ii. In-pit PAG site (above 6,250 ft amsl)
iii. In-pit below 6,250 ft amsl

(2) Weekly records of tons of lime and limestone amendment added.

(3) Results of all LECO and Sobek analyses conducted on site.

(4) Monthly certified lab confirmations of one LECO total sulfur and LECO pyritic sulfur on a sample split from material sampled and tested on site for the same parameters (for comparison of site results to lab results).

(5) Monthly certified lab confirmation of ANP/AGP from same split for validation of 0.4 percent total sulfur and 0.05 percent pyritic sulfur criteria.

As of September 2011, backfill activity had resulted in complete elimination of the pit lake and was ongoing. Monitoring well MW-49 will be installed in the pit after completion of the backfill to monitor groundwater in the location of the recently backfilled pit lake.

Production Well Field

Fresh water is currently obtained from three production wells: PW-1A, PW-2A, and PW-4A. Production well PW-3 has been used in the past but is currently inactive (PW-3 is obstructed and will be replaced by PW-3A in 2013). The well field is located along a 2.5 mile section of the north-south trending BRF zone in Sage Hen Flats. Water rights have been obtained from the Nevada State Engineer. Original production wells installed in 1985 and 1986 ranged in depth from 996 to 1,203 feet below ground surface (bgs). From the production wells, water is pumped to the Number One Storage Tank (TW-1), located southeast of the on-site laboratory. The non-potable water from TW-1 (20,000 gal capacity) is pumped up to TW-2 (350,000 gal capacity) located by the pit overlook (ready line area) and then distributed to the crushing facilities (if active), the maintenance shop and warehouse building, the process facilities, and the administration building.

Ancillary Facilities

Ancillary facilities include administrative buildings, parking areas, fresh water supply and storage, fuel storage, explosive storage, power, communications, and landfill. The two-story mine maintenance shop and warehouse building is located west of the laboratory. A variety of petroleum products are used to maintain and operate vehicles and mobile equipment and are stored in the maintenance shop or warehouse, or in the fuel storage facilities, located west of the maintenance shop.

Fuel storage facilities include one vertical, above-ground, 6,000 gal unleaded gasoline storage tank within a bermed concrete containment area near the maintenance shop. A second, larger fuel storage area is located at the ready-line west of the primary crusher. It contains three horizontal, above-ground, diesel fuel storage tanks with 50,000-gal, 10,000-gal, and 8,000-gal capacities. Greases, oils, and antifreeze are also stored within this area. A bermed concrete secondary containment unit is provided at this facility.

In December 2012, the Permittee submitted a non-fee review proposing the construction of a new bulk oil and lubrication connex with appropriate containment. The connex would be located on a concrete slab and stemwall foundation designed to contain any leaks or spills from the oil and lubricant containers. The proposal was approved by the Division in December 2012.

C. Site Hydrology and Background Water Quality

Due to the complex site hydrology/hydrogeology and the scope of this fact sheet, reference is made to the original application and other hydrology documentation submitted to the Division. There are three primary hydrogeologic units: an upper aquifer in the unconsolidated valley fill sediments, a lower aquifer in the bedrock zones, and the most productive aquifer which occurs within the BRF zone. Inter-aquifer connections are present as evidenced by in-pit pump test results which suggest that the pit lake water may be flowing slowly toward the BRF. However, faults compartmentalize the groundwater as evidenced by variability in groundwater elevations which range from approximately 5,750 ft amsl to approximately 6,255 ft amsl in the monitoring wells. Lateral subsurface flow is predominantly in a northerly direction and there is evidence of local upward movement of groundwater resulting in springs along the fault zones.

The quality of the upper aquifer is reported as moderate with neutral pH, moderate concentrations of total dissolved solids (TDS), and low to moderate concentrations of trace constituents. Based on quarterly monitoring of wells in the area, background water quality has been shown to meet all Division Profile I reference values (e.g., wells WI-27, TB-3), or to have exceedances for Fe and/or Mn only (e.g., wells WI-1, WI-15). The principle ionic constituents include calcium, sodium, chloride, and bicarbonate. The hydraulic conductivity in the saturated zone is low.

The lower aquifer is locally separated from the upper aquifer by a higher permeability dry zone at the contact between the sediment and bedrock layers in the area of the Stage I pad and process plant. Water from the lower aquifer has a neutral pH, low concentration of TDS, some sulfates, and low trace constituent concentrations. Based on quarterly monitoring of wells in the area (e.g., wells MW-25, MW-30, MW-33, MW-44), background water quality meets all Division

Profile I reference values. The principal ionic constituents in the deep aquifer include calcium, sodium, bicarbonate and chloride. Hydraulic conductivity in the lower aquifer is lower than in the upper aquifer as evidenced by water level measurements in the monitoring wells.

Water from the BRF aquifer shows similar background chemistry to the deep aquifer, with the exception that some monitored locations (e.g., wells PW-2A, WI-24, MW-35, MW-45, MW-46, MW-47) have shown exceedances of Profile I reference values for Mn, and/or Fe, and/or Tl, and/or slightly low pH in the quarterly reports. The slightly low pH has only been seen in well MW-35 (the location of which within the BRF is uncertain) and in one analysis from MW-46. The production wells, which are screened within the BRF aquifer and show depth to water of approximately 304 ft, are Permitted for domestic use.

In June 2011, the Permittee submitted an EDC proposing to abandon wells MW-30, MW-31, MW-32, MW-36, MW-38, MW-39, MW-40A, MW-41A, MW-42, MW-43, TB-1A, TB-2, TB-4, TB-5, and WI-29 due to consistently dry conditions; to convert WI-29R to a remediation well; and to change the monitoring frequency in wells MW-48, MW-30R, and WI-29R from monthly to quarterly. The EDC was approved by the Division in July 2011 but with the exception that the Division required that wells MW-30 and MW-41A were retained and the monitoring of MW-48 was maintained as monthly due to ongoing concerns with nitrate + nitrite as N levels. The WI-29R conversion was completed in April 2012 and all wells were abandoned by February 2012.

In May 2012, in response to comments on the Final Plan for Permanent Closure, the Permittee submitted a work plan for the installation of pumpback wells MW-50 to MW-54. These wells are alluvial wells designed to remediate groundwater in the area north of the Stage I HLP. The work plan was approved by the Division in January 2013.

All natural drainage channels at the site are ephemeral in nature, flowing seasonally or during times of high precipitation, although some of the springs are perennial. Springs exist in American Canyon, South American Canyon, and Lower American Canyon. American Canyon Spring exhibits a long-term exceedance of nitrate + nitrite (as N), but no other indications of process contamination. The exceedance was previously determined to be due to the upgradient septic leach field. The septic system was upgraded accordingly with a new sewage plant in 2012.

Diversion ditches were built and are required to be maintained to divert stormwater runoff away from process components.

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

The Notice of the Division's intent to issue the Permit, authorizing the facility to construct, operate, and close, subject to the conditions within the Permit, is being sent to the **Lovelock Review-Miner** in Lovelock for publication. The notice is being mailed to 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 the 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, and Special Conditions

See Section I of the Permit.

G. Rational for Permit Requirements

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

The primary method for identification of escaping process solution will be placed on required routine monitoring of leak detection systems as well as routinely sampling downgradient monitoring wells 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 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 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 Blvd., Reno, Nevada 89502, (775) 861-6300, for additional information.

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Date: 4 December 2015

Revision 00: Renewal/Major Modification for expanded HLP Stage IV and new HLP Stage V – SG 12/2015