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

Permittee Name: **Round Mountain Gold Corporation**

Project Name: **Gold Hill Project**

Permit Number: **NEV2010110**
Review Type/Year/Revision: Renewal 2016, Fact Sheet Revision 00

A. Location and General Description

Location: The Gold Hill Project (GHP) is located in Big Smoky Valley in northwest Nye County, Nevada, approximately 45 miles northeast (by air) of the town of Tonopah and 54 miles south (by air) of the town of Austin, in the historic Round Mountain Mining District (also referred to as the Mt. Jefferson and Jefferson Canyon mining districts). The mine and process facility are located approximately five miles north of the Smoky Valley Common Operation (SVCO), Water Pollution Control Permit (WPCP) NEV0087052.

The GHP site is located on unpatented lode claims owned or controlled by the Permittee and public lands administered by the Bureau of Land Management, Battle Mountain District-Tonopah Field Office, all within portions of Sections 19, 28, 29, 30, 31, 32, and 33 of Township 11 North (T11N), Range 44 East (R44E); Sections 4, 5, 6, and 8 of T10N, R44E; and Sections 24, 25, and 36 of T11N, R43E, Mount Diablo Baseline and Meridian.

Site Access: The GHP site can only be accessed through a private connector road (referred to by the Permittee as the Transportation/Utility Corridor) that exits the north end of the SVCO site. From Tonopah, proceed east on U.S. Route-6, six miles to the junction of State Route (S.R.)-376. Proceed north on S.R.-376 approximately 49 miles to the SVCO mine site entrance. From Austin, proceed east on U.S.-50, 12 miles to the junction of S.R.-376. Proceed south on S.R.-376 approximately 58 miles to the SVCO mine site entrance.

Characteristics: The GHP is part of the Round Mountain Expansion Project (RMX) at the SVCO and includes the following:

- A 1.1-mile long, 500-foot wide Transportation/Utility Corridor between the SVCO and GHP;
- A 222-acre open pit;
- A Waste Rock Dump;
- A 300-acre Heap Leach Facility, including a portable crushing circuit to be located on containment within the Heap Leach Pad (HLP), one double-lined process pond, one double-lined event pond, collection and conveyance pipelines, lined ditches, pumps, reagent storage, and associated controls;

- An Adsorption, Desorption, and Recovery (ADR) Plant, including a Carbon-in-Column (CIC) Circuit, Retort and Refinery;
- Internal haul roads and secondary roads;
- Production and dewatering wells, their associated piping systems and a single-lined Fresh Water Pond; and
- Ancillary facilities including, but not limited to: stormwater controls and diversion structures; lime silos and a lime slaker; and fuel storage/dispensing facility and other support facilities.

Groundwater at the GHP site averages 150 feet below ground surface (bgs). Based on the current mine plan, the anticipated volume of dewatering water to be managed, and projected consumptive uses, the Permittee does not envision at this time, the need to construct and operate any Rapid Infiltration Basins (RIBs) at the GHP site.

The GHP is authorized to process up to 6.0 million tons of gold and silver-bearing ore annually. The facilities at GHP are required to be designed, constructed, operated, and closed without any release or discharge from the fluid management system except for meteorological events which exceed the design storm event.

B. <u>Synopsis</u>

History: The Gold Hill deposit was discovered about 1910, during the same time period as the Round Mountain deposit discovery. Historical records indicate that most of the underground development and production at the Gold Hill site occurred between 1930 and 1933, when a 500-foot deep shaft and several drifts were developed along the gold-bearing veins. The mine was closed during the Second World War under the "Essential Materials Act of 1942" by the War Materials Board and did not re-open following the war.

Beginning in the mid-1970's, Bar Gold Corporation, Nevada Star Resources, Noranda, Cordex Exploration Company, Homestake Mining Company, and most recently Round Mountain Gold Corporation (RMGC) conducted exploration, sampling, and mapping programs in the Gold Hill area. Encouraged by the results of their efforts, RMGC submitted a WPCP application for the GHP on 23 December 2010.

Gold Hill was a 50 percent partnership between RMGC, a wholly-owned subsidiary of Kinross Gold Corporation and Barrick Gold Corporation with RMGC as the operator and Permittee of record until January 2016 when Kinross acquired the other 50 percent of Round Mountain from Barrick Gold Corporation.

Geology: The GHP is located on the western margin of the Toquima Caldera Complex and straddles the fault boundary between the outcrop-dominated range to the east and the alluvium-covered pediment to the west. Approximately 70 percent of the GHP area is covered by alluvium and pediment gravel which blankets the bedrock surface in the GHP area. Paleo-channels and topographic breaks are evident in outcrop, trenches, drilling sumps, and in drill sections. The alluvium thickness ranges between 50 and 250 ft east of the GHP site and reaches a thickness of 650-ft at the western-most extent of the project area. The alluvial sequence is characterized as poorly stratified with channel deposits, well-rounded cobble and boulder layers, sand and clay beds.

Bedrock outcrop in the GHP area consists of poorly-to-moderately welded tuff referred to as the Gold Hill member. At depth, the welded tuff grades into a densely welded tuff referred to as the Surprise member, which crops out east of the Toquima Shaft. Mineralization in the Gold Hill area follows a generally east-west striking, steeply dipping fault-fracture set. This trend is cross-cut by the north-south trending range bounding structures.

Major rock types encountered within the Gold Hill Area include Tertiary igneous rocks of the southern Toquima Range. A rhyolite intrusion occurs at depth and below the Gold Hill main zone and crops out north and south of the Gold Hill Area along the margin of the Toquima Caldera Complex. This unit consists of devitrified, flow-banded rhyolite porphyry with feldspar and quartz phenocrysts and disseminated fine-grained pyrite.

Hydrology: The Big Smoky Valley is best characterized as an arid drainage basin where precipitation is generally insufficient to support any perennial stream flow. The few streams that drain the mountain ranges are generally intermittent. When these ephemeral drainages do flow, they carry precipitation runoff which normally infiltrates into the alluvial fans before it reaches the valley floor. There is no continuous surface drainage along the axis of the valley, although there are several distinct playa areas. Several intermittent streams flow into these sinks.

Regional Groundwater Hydrogeology: The project area is located within the Northern Big Smoky Valley Hydrographic Basin (designated l37B) with only a small portion of the project area extending south into the Southern Big Smoky Valley Hydrographic Basin (designated l37A). The project area overlaps the basin-and-range fault boundary between the outcrop-dominated Toquima Range to the east and the alluvium-covered pediment to the west. The majority of the project area is covered by alluvium and pediment gravels derived from volcanic and granitic bedrock. The basin-fill alluvial deposits thicken towards the center of the basin, where they are as much as 5,000 feet thick. These deposits consist mostly of unconsolidated gravel, sand, silt, and clay lenses.

Monitoring wells in the area indicate that saturated alluvium exists along the western side of the current SVCO Pit and along the western side of the proposed GHP pit under unconfined or semi-confined conditions. The natural hydraulic gradient in this alluvial material is east to west, from the range front towards the center of the valley. Pumping for dewatering of the SVCO Pit has locally reversed this gradient to the west of the SVCO Pit. As the alluvium thickens to the west and becomes generally more permeable, the gradient flattens, and a slight northward component of flow is apparent in the middle of the valley, where the alluvium is estimated to be as thick as 5,000 feet.

Volcanic, metasedimentary and granitic bedrock units are exposed in the mountain ranges on the eastern and western sides of the Big Smoky Valley basin. Groundwater flow in these bedrock units primarily occurs in fracture zones and is locally compartmentalized and discontinuous as a result of various geologic structures and features. As a result of the compartmentalization, the water table in the bedrock varies significantly across structures and features and groundwater flow over wide areas is restricted.

Gold Hill Area Hydrogeology: Four main hydrogeologic units occur in the Gold Hill Area including: 1) alluvium unit; 2) ash fall tuff unit; 3) sinter unit; and 4) Mt. Jefferson Tuff unit.

The alluvium unit consists of unconsolidated and semi-consolidated gravel, sand, and silt. It is relatively thin and unsaturated over most of the pit area and east of the pit. The unit thickens to the west, and along the west pit wall the alluvium unit has relatively low hydraulic conductivity and a saturated thickness of about 100 to 150 feet.

The ash fall tuff unit dips to the west and underlies the alluvium along the west pit wall and west of the pit. The unit is displaced by the range-front fault and does not exist east of the fault or east of the pit. This unit consists of 100 to 300 feet of volcanically derived clays and non-welded rhyolite ash that forms an effective low-permeability confining layer below the alluvium and above the underlying sinter unit.

The sinter unit underlies the ash fall tuff unit west of the Pit. Dipping to the west, it consists of approximately 100 feet of hot springs sinter that is highly fractured and contains numerous vugs. The sinter unit is not present east of the range-front fault and east of the pit area. The unit is very permeable and can provide well yields in the hundreds of gallons per minute. A pumping test conducted in the sinter indicated that the unit is laterally discontinuous, highly confined, and receives limited recharge. Its confinement is due to the overlying low permeability ash fall tuff unit and the underlying Mt. Jefferson tuff unit that has low to moderate permeability. The saturated sinter unit will be dewatered in advance of pit excavation.

The Mt. Jefferson tuff unit is an extensive deep geologic unit composed of welded tuff. The unit has low to moderate permeability. The Mt. Jefferson tuff unit underlies saturated sinter west of the range-front fault and unsaturated alluvium east of the fault.

The local groundwater table is present in the alluvium unit west of the pit and in the Mt. Jefferson tuff unit east of the pit. In the alluvium unit, the water table elevation is about 6,150 feet above mean sea level (amsl) along pit west wall, dropping to about 5,700 feet amsl 2,500 feet west of the pit. Further west, the alluvium water table is very flat, with an elevation of about 5,685 feet amsl. The interpreted groundwater flow direction is generally west from the pit area toward the central portion of basin.

East of the pit, the water table in the Mt. Jefferson tuff unit slopes to the west ranging in elevation from 6,275 feet amsl east of the pit to about 6,180 feet amsl in the central pit area. Further west, the sinter unit is confined with a potentiometric surface of about 6,175 feet amsl. Flow between the sinter and the alluvium is anticipated to be very low due to confinement provided by the low permeability ash flow tuff unit. The upper-most groundwater beneath the Phase 1 Waste Rock Dump will be in the alluvium unit at depths ranging from 360 to 450 feet below the base of waste rock (from west to east). Below the west end of the Phase 1 Heap, the depth to alluvial groundwater will be about 470 feet. Below the east end of the heap, the groundwater table may be present in alluvium or bedrock at a depth on the order of 150 feet.

No significant surface water resources are found upgradient or downgradient of the Gold Hill waste rock dumps. Minor drainages on the eastern side of the Gold Hill area will be intersected by stormwater diversion channels to divert stormwater around the facilities.

Mining Operations: The GHP is an open pit mining operation, designed to produce up to 16,700 tons per day (tpd) and 6 million tons per year (tpy) of gold and silver bearing ore. The current plan is for the GHP pit to be developed in two phases over a period of four to six years.

The ore is hauled from the GHP pit to the heap leach pad where it is either placed directly on the HLP or to a lined staging area where it is stockpiled and then crushed to minus 6 inches and then placed on the HLP. The total amount of ore mined during Phase-1 pit development and placed on the Phase-1 HLP is estimated between 13.3 and 27.8 million tons, of which approximately 96 percent of the HLP ore will be oxide.

The Gold Hill Mine is located in a “range-front” setting, similar to that of the nearby SVCO pit and utilizes similar surface mining techniques. Bench heights are up to 35 feet and haul road widths range between 90 and 140 feet. The final Phase-1 pit floor elevation is projected to be 5,930 feet amsl and 255 feet bgs within the deepest section of the pit. The second and final phase of the GHP pit will have a pit floor elevation of 5,675 feet amsl and 650 feet bgs within the deepest section of the pit.

Alluvial water levels range between 6,180 feet amsl along the range-front wall to 5,685 feet amsl in the valley fill west of the pit. Water elevation in the volcanic bedrock and sinter units range from 6,380 to 6,180 feet amsl near the Gold Hill Pit. Active dewatering is expected to occur primarily in the saturated sinter unit (refer to the section ***Dewatering Water Management*** for additional details).

Ore and Waste Rock Characterization: Four ore and waste rock types have been identified within the Gold Hill area. These include undifferentiated alluvium, Tertiary rhyolite tuff, sinter, and undifferentiated Mt. Jefferson tuff. Based on the current mine plan, waste rock material from the Gold Hill pit is predominantly Mt. Jefferson tuff and alluvium (over 90 percent combined) with a much smaller percentage comprised of sinter and rhyolite tuff. The Gold Hill ore is hosted primarily in the Mt. Jefferson tuff unit. In general, the rock types at Gold Hill typically contain higher sulfide and fewer carbonate phases than observed at the SVCO, resulting in an overall higher potential for acid generation and metals mobility.

A geochemical characterization program was performed on representative samples of the Gold Hill ore and waste rock. The program included Meteoric Water Mobility Procedure (MWMP) testing, Acid-Base Accounting (ABA), and Humidity Cell Testing (HCT).

Based on 10 HCT sample results, three samples (sinter ore, Mt. Jefferson tuff ore, and Mt. Jefferson tuff waste) displayed potential to produce acidic conditions in a natural weathering and oxidizing environment. However, further testing showed that base amendment addition required during the cyanidation processing was shown to mitigate acid production for the two ore samples identified as strong acid producers. One sample (Mt. Jefferson tuff waste) displayed potential to produce moderately acidic conditions, and two other samples (rhyolite tuff waste and Mt. Jefferson tuff waste) displayed potential to produce weakly acidic conditions.

Four samples (Mt. Jefferson tuff waste, Mt. Jefferson tuff ore, alluvium, and rhyolite tuff waste) displayed a greater potential to neutralize acid in a natural environment. In general, predictions of acid-generating potential based on ABA data were corroborated by the material behavior in the HCTs. Samples which were classified as uncertain or potentially acid generating (PAG) based on ABA data were generally net neutralizing or weakly acid-generating following HCTs. Samples showing net neutralizing potential following HCTs were classified as inert material.

Based on the whole rock chemistry analyses, the Gold Hill ore and waste rock contain elevated concentrations of antimony, arsenic, manganese, mercury, molybdenum and silver; elevated levels of barium, beryllium, cadmium, lead and/or lithium were also observed in some samples of rhyolite tuff, sinter or Mt. Jefferson tuff. The Mt. Jefferson tuff samples typically contain a wider range of variability compared to the alluvium, rhyolite tuff and sinter.

MWMP test results from samples of Mt. Jefferson tuff show elevated aluminum, antimony, arsenic and fluoride concentrations above the Profile I reference values. Potential for constituent release increased with increasing acid production once acid conditions were established during kinetic testing. Constituent concentrations were above the Profile I reference values, for aluminum, antimony, arsenic, beryllium, cadmium, iron, lead, manganese, nickel, sulfate, total dissolved solids (TDS) and thallium. Potential for constituent release was minimal from net neutralizing samples, and elevated constituent concentrations were limited to aluminum, antimony, arsenic and manganese. This is consistent with whole rock analyses and MWMP test results.

The following conclusions can be made regarding the Gold Hill ore and waste rock:

- The alluvial material is non-acid generating with acid neutralizing potential (ANP) to acid generating potential (AGP) ratios consistently greater than three. This material may be utilized as construction aggregate. The small number of the rhyolite tuff samples tested that had ANP:AGP ratios of less than three are managed as designated waste pursuant to the Waste Rock Management Plan (WRMP). Refer to the section ***Waste Rock Management*** for additional details).

- The Mt. Jefferson Tuff material exhibits a wide range of constituent variability with a majority of the samples exhibiting PAG behavior with ANP:AGP ratio less than three. Mt. Jefferson tuff waste material is segregated and managed as designated waste pursuant to the WRMP. Refer to the section ***Waste Rock Management*** for additional details).
- The sinter unit demonstrates a variable potential for acid generation. Waste material is managed in accordance with the WRMP. Refer to the section ***Waste Rock Management*** for additional details).
- Less altered samples generally contained less pyrite either through weathering to oxides or a lack of primary pyrite.
- Carbonates were not present in all samples, even in the non-PAG samples which showed strongly neutralizing conditions in HCTs, although some calcite was observed in secondary veinlets and could be considered as available for reaction.
- HCT data indicate leachate chemistry ranging from alkaline to acidic and are a reliable indicator of actual weathering behavior. HCT results are generally consistent with the ABA interpretation of the same sample; PAG samples resulted in acidic leachates, uncertain ABA resulted in a mix of alkaline and acidic leachates, and non-PAG and inert samples resulted in alkaline leachates.
- Fifty-eight percent of the waste rock and ore samples from Gold Hill had an ANP:AGP ratio of greater than 3:1 and are considered non-PAG.
- The remaining 42 percent of ore and waste samples were interpreted as PAG material (33 percent PAG, 9 percent uncertain).
- Six percent of the waste rock and ore samples from Gold Hill are considered non-PAG (3 percent inert, 3 percent non-PAG).
- Ninety-four percent of the ore and waste rock samples were classified as PAG (2 percent PAG, 92 percent uncertain).
- Gold Hill HCT results indicate that materials are highly variable with respect to acid generation potential, with the Mount Jefferson tuff accounting for 54 percent of the total rock types. In general, the alluvium contributes the majority of the non-PAG material (39 percent) with the Tertiary volcanics (rhyolite tuff, sinter, Mt. Jefferson tuff) accounting for the remaining 61 percent of variable material, ranging from strongly non-PAG, to strongly PAG.
- Thirty-nine percent of the waste rock mass from the Gold Hill pit will be alluvium.
- The alluvium presents low potential for acid generation or impacts to the environment and will not require special consideration for mining or closure. The alluvium would be suitable for use as construction material and cover.
- The rhyolite tuff represents about two percent of the waste rock and also shows low to moderate potential for acid generation and environmental impacts. No special consideration for mining or closure is anticipated, based on the environmental geochemistry of this material. The rhyolite tuff may not be suitable for construction, however, due to the minor potential for metals leaching.
- The Mt. Jefferson tuff unit comprises 55 percent of the Gold Hill waste rock. The Tertiary sinter formation comprises a small portion of the waste rock (4 percent).

These units showed the most variability and highest potential for environmental impacts.

- A majority of the Mt. Jefferson tuff material will require diligent management to include minimizing contact with water and not using this material for construction, operational, or closure purposes.
- Ore material consists predominantly of the Mt. Jefferson tuff (93 percent) mineralized unit. Much of this material will be acid-generating and is expected to have potential for metal release in concentrations that may affect receiving water quality. Ore placed on a heap leach facility will require closure planning to limit contact with oxygen and water, and to manage long-term, low flows, of potentially poor quality water during late-time draindown.

Waste Rock Management: Waste rock at GHP is managed in accordance with the currently authorized ““*Waste Rock Management Plan for the Round Mountain Mine and Gold Hill Area (June 1, 2009)* and subsequent revisions. The Permittee continues to conduct geochemical evaluations of the waste rock in accordance with this plan and applicable WPCP requirements.

A waste rock sampling and monitoring program has been implemented for waste rock generated from Gold Hill mining operations. The geochemical characterization program provides representative information from MWMP testing, ABA, and HCT to evaluate the potential for mobilization of dissolved constituents and acid generation. The Permittee uses these data to update the WRMP, as necessary.

Pursuant to the WRMP, rock types with ANP:AGP ratios greater than three are considered non-PAG and are classified by the Permittee as “non-designated waste rock” for their management purposes. Rock types with an ANP:AGP ratios of three or less are considered PAG and are classified by the Permittee as “designated waste rock” for their management purposes.

The PAG waste is encapsulated within the interior of the waste rock dump (WRD) and non-PAG waste from the pit is placed on the final WRD surfaces. Predictive infiltration cover modeling indicates that a 2-foot cover is considered adequate for the GHP WRD to prevent meteoric water from contacting potentially reactive waste. During active waste rock placement, rock types identified as PAG waste are placed on a nominal 20-foot thick base comprised of non-PAG waste material at an average of 24 feet from any final (regraded) dump face with a nominal 65-foot set-back on each lift. In addition, the designated waste rock is placed in a manner to accommodate a future cover of non-PAG waste material with a nominal thickness of 20 feet.

A detailed review of the material balance for the GHP WRD was performed using MineSight 3D®, a three-dimensional software program used for geologic modeling, mine planning and development. The model utilized the proposed WRD design and the planned encapsulation of designated waste with a 20-foot thick non-designated waste layer above and below the designated waste and a 65-foot setback of non-designated waste on the slopes. During waste dumping, the last 65 feet of the dump crest advancement of any lift is limited to non-designated waste. This ensures that the final regraded slopes of the dump consist of non-designated waste with thickness that ranges from 13 to 35 feet and averages 24 feet.

The results of the MineSight 3D® calculations indicate the GHP WRD requires approximately 42 million tons of non-PAG waste to achieve the proposed encapsulation of designated waste with a 20-foot thick non-PAG waste layer above and below the designated waste and an average thickness of 24 feet on the slopes. Based on the current mine plan, the estimated tonnage of non-PAG waste that available from the Gold Hill pit is 49 million tons; therefore there is a 7 million ton surplus of non-PAG waste.

As stated previously, the GHP WRD is designed for construction in two phases to coincide with the phased pit development. The Phase-1 WRD (i.e. “West” WRD) has a design capacity of 135 million tons of waste rock, a final height of 200 feet above the ground surface (6,249 feet amsl), and a footprint of 501 acres. The Phase-2 WRD (i.e. “North” WRD) has a design capacity of 9 million tons of waste rock, a final height of 175 feet above the ground surface (6,574 feet amsl), and a footprint of 51.6 acres.

The GHP WRDs are constructed by end-dumping material in lifts up to 75-feet in height to an overall average slope configuration not steeper than 2.5H:1.0V (horizontal to vertical). The un-reclaimed dump faces are at the angle of repose. The WRDs are built in lifts to facilitate recontouring and reclamation and some areas of the dumps will be regraded and reclaimed concurrently with ongoing operations. The final configuration of the waste rock dumps are subject to change based on operational considerations during the life of the project.

Construction of the WRDs began in December 2010 with clearing and grubbing the area. The clearing and grubbing and commencement of the waste rock diversion channel began in September 2011. The channel width was increased from 6 feet to 10 feet for ease of construction, allowing the excavation to be completed by scrapers. The placed riprap was approximately sized to meet or exceed the D_{50} specified. The channel was excavated, filter fabric and rip-rap was placed and all work related to this area was completed in December 2011.

Dewatering Water Management: Alluvial water elevations range from 6,180 feet amsl (along the range-front fault) to 5,685 feet amsl (in the valley fill west of the pit), with water elevations in the bedrock and sinter units ranging from 6,380 to 6,180 feet amsl near the pit. Because of the relatively shallow groundwater depth (nominally 150 feet bgs) dewatering will be necessary. Prior to the implementation of any program or operation designed to manage excess dewatering water that is not currently consumed at the GHP site specifically with the intention of reintroducing the dewatering water into the local groundwater basin, the Permittee must first obtain a valid Permit from the Division for the design, construction, operation, and closure of an approved dewatering water management system (e.g. Rapid Infiltration Basin(s) or injection) for the GHP.

The Permittee predicts the GHP pit to be dewatered at a rate between 500 and 1,000 gallons per minute (gpm). Based on estimated dewatering and consumption rates, excess dewatering discharge from the GHP is expected to be minimal. The site water balance indicated that up to about 250 gpm of excess water may be produced by the mine dewatering system on an annual basis, with short-term discharges up to 500 gpm. The need for discharge is expected to decrease during the later stages of the proposed GHP.

Alluvial Dewatering: Hydraulic conductivity is low for the alluvium near the west pit wall. The low hydraulic conductivity of the alluvium close to the pit causes the steep hydraulic gradient in the alluvium between the western edge of the proposed pit and the valley lowlands. Alluvial borehole data indicate that it will not be feasible to dewater the alluvium with vertical wells. Alluvial dewatering will most likely require in-pit methods. Based on the borehole data, the maximum dewatering rate will be in the range of 50 to 150 gpm.

The alluvium is underlain by the sinter bedrock unit. Once the sinter is dewatered, some long-term downward seepage from the alluvium is possible under operational conditions. This is expected to be minor (less than 50 gpm). Therefore, leakage from the alluvium is unlikely to have a substantial influence on the sinter pumping rate.

Sinter Dewatering: The sinter unit exhibits intense fracturing and has locally high hydraulic conductivity values. Observed pre-pumping groundwater levels for the sinter are similar to that of the alluvium, with good hydraulic connectivity within the unit. Projected dewatering rates were estimated by extrapolating the results of the long-term sinter pumping tests and are expected to range between 450 and 850 gpm. Compared to the SVCO, the estimated dewatering rates for the GHP are lower than SVCO.

The Fresh Water Pond is located east of the HLP and stores water from the sinter dewatering operations for use as process make-up water and fire protection. The pond is 172 feet by 172 feet by 16 feet deep and single-lined with 60-mil high-density polyethylene (HDPE) over a minimum 12-inch soil layer, placed in two 6-inch lifts above the prepared subgrade and compacted to $1x10^{-6}$ cm/sec (American Society for Testing and Materials (ASTM) D1557). The floor of the pond is graded to drain to a sediment sump constructed in the northwest corner of the pond.

Gold Hill Pit Lake: Following the cessation of mining and dewatering, a pit lake will develop in the GHP pit, similar to that at the SVCO pit. The main difference is that the GHP pit lake final water elevation of 6,000 feet amsl (200 years post mining and dewatering) is predicted to be below the bedrock alluvial contact and almost all inflow to the pit will come from the bedrock groundwater. At the SVCO pit, the water level is above the bedrock/alluvial contact and the largest portion of the inflow comes from alluvial groundwater. Like the SVCO pit lake, the GHP pit lake will stratify and mix seasonally due to the wind-driven turbulence and seasonal changes in temperature.

The GHP pit lake is expected to behave in a similar manner to that of the SVCO pit lake, with the chemistry dominated by the natural, background chemistry of the groundwater source. Mass loading from the pit walls expected to be small due to the overwhelming contribution and chemical control by groundwater inflow during filling. The pit lake is predicted to have a pH between 8.0 and 8.3, alkalinity between 150 and 240 mg/L, and elevated concentrations of three major ions (sulfate, chloride, and fluoride) and three metals/metalloids (arsenic, antimony, and manganese). Predictive modeling results of the pit lake chemistry over the long term indicate the lake will continue to evapoconcentrate, resulting in gradually increasing concentrations of solutes.

Heap Leach Pad: The Gold Hill HLP is located on alluvium in an area where the depth to bedrock is between 150 and 800 feet. The HLP was initially permitted to occupy a footprint of 5.34 million square feet with an additional 491,036 square feet for the external solution collection channels and an additional 313,100 square feet for the process area, process pond, and event pond.

The HLP is designed for construction in three phases (Phase-1A, Phase-1B, and Phase-2), each comprised of two cells, with a final height (at closure) of approximately 250 feet above the liner surface (6,512 feet amsl), and a total combined capacity of approximately 65.16 million tons of ore. The HLP is designed to accommodate a nominal cyanide solution application rate of 0.003 gallons per minute per square foot (gpm/ft^2) which equates to 4,000 gallons per minute (gpm).

Run-of Mine (ROM) ore from the open pit is hauled by truck to the four-cell HLP. Approximately 16,700 tpd (6 million tpy) of gold and silver-bearing ore will be mined throughout the four to six-year life of the GHP. With the 2016 Renewal application the mine life is to last untill mid-2018, and with current prices there may be another layback in the future. The total amount of ore mined during Phase-1 pit development and placed on the Phase-1 HLP is estimated between 13.3 and 27.8 million tons, of which approximately 96 percent of the ore is oxide. Typically, ore greater than 6 inches is crushed with a portable jaw crusher before being placed on the HLP with a telescoping discharge conveyor.

Phase-2 HLP ore placement will be determined at a later date, however the Permittee estimates that Phase-2 could potentially generate between 20 and 24 million tons of ROM over the life of the project and crushed ore similar in composition to that of Phase-1.

The entire HLP area (including the process ponds and solution collection channel) are lined with a 60-mil HDPE liner. For the heap leach pad and collection channel, a combination of smooth and textured 60-mil liner has also been installed over a minimum 12-inch soil layer, compacted to 95 percent maximum dry density (ASTM D1557) above the prepared subgrade. The compacted soil layer is placed in two 6-inch lifts, with permeability less than $1x10^{-6}$ cm/sec, and overlain by HDPE liner. For added stability, textured liner has been placed on the western end of the leach pad and from the top of the containment to approximately 360 feet east of the containment berm.

The HDPE liner and the solution collection system (discussed below) are overlain by a nominal 36-inch thick overliner, consisting of minus 2-inch diameter clean gravel. This overliner material will be obtained from existing sources from the Permitte's current operations, and has an average permeability of no less than 0.1 cm/sec.

A 10-foot high containment berm, having a crest width of 10 feet and 3H:1V side slopes, has been installed at the west end of the heap leach pad to provide containment and additional stability, directing solutions to the solution collection channel located on the south side of the pad. Smaller containment berms, 5-feet high with 6-foot crests and 3H:1V side slopes, have been installed for the remaining perimeter of the pad.

An Engineering Design Change (EDC) (approved by the Division 7 November 2011) authorized the sub-dividing of the Phase 1 HLP into two additional phases, Phase 1A and Phase 1B in order to expedite construction activities. At the approximate mid-point east to west, the leach pad was subdivided into eastern portion, Phase 1A, and the western portion, Phase 1B. This division required the berm separating the two phases to become a containment berm, and therefore was increased in its height and width. This phasing would allow leaching to occur on Phase 1A, while completion of construction of Phase 1B is being completed. Once Phase 1B is complete, the leach pad system will operate as one leach pad per the permitted drawings.

During the construction of the HLP, several unauthorized changes and deviations were made from the designs first approved by the Division in the September 2011 Permit. These changes included an increase in the HLP height, and the footprint of the HLP and adjoining Crusher Pad. These changes were acknowledged in the "As-Built" documentation submitted on 12 June 2012 and although the Division had no concerns regarding the construction or the level of Quality Assurance/Quality Control (QA/QC) performed, the changes and deviations were still considered unauthorized.

A Minor Modification (approved by the Division 3 July 2012) rectified these unauthorized changes by authorizing an increase in the size and capacity of the HLP and Crusher Pad. The reconfiguring of the Crushing System resulted in the reconfiguring and expansion of the crusher pad. The original Crushing System design utilized a single crusher to be placed on liner adjacent to the pad with the Crushed Ore Stockpile stacked to the west of the crusher. RMGC added a second crusher and changed the orientation of both crushers so that the Crushed Ore Stockpile is now located south of the crushers. The Crusher Pad placement shifted from the north edge of the HLP to the northeast comer to accommodate the revisions and to remain on the lined containment. This also aligned with the phased construction of the HLP, approved by the Division as an EDC on 7 November 2011.

The reconfiguration of the Crusher Pad resulted in the reconfiguration in the HLP. In order to accommodate the revised location and regain the area lost to the crusher pad, the HLP lined area was extended both north and west. In total, the Heap Leach facility footprint was increased from approximately 5.34 million square feet to 6.37 million square feet. The solution collection piping was expanded to the entire lined pad area including the exterior area and Crusher Pad on the HLP. The solution collection piping that runs through the south berm of the Heap Leach Pad contains secondary pipe sleeve containment as per design however this area was modified to remove the additional liner beneath for constructability purposes to allow compaction of the clay layer above the pipe. For additional containment within this area, a double pipe boot was installed.

An EDC (approved by the Division 28 June 2012), rectified the height increase by authorizing the increase in HLP height from 200 feet to 250 feet in order to achieve an increased HLP volume without additional land disturbance. Geotechnical stability analyses were performed with this increased height, using the same soil properties and seismic conditions as presented in the initial application to evaluate the impacts of the increased height change on HLP stability. Total HLP capacity increased to 65.16 million tons of ore.

Solution Collection System: A network of solution collection pipes are placed above the HDPE liner and prior to the placement of overliner material to facilitate collection of pregnant leach solution and convey the solution to the Process Plant and return barren solution to the HLP. The solution collection network is constructed along the toe of the containment berm.

The HLP is divided into four individual cells, with a series of 4-inch diameter corrugated polyethylene tubing-smooth interior, perforated (CPT-SP) spaced 30 feet on center. The secondary header pipes are 8-inch diameter CPT-SP and the primary header pipes are 15-inch diameter CPT-SP. The leach solution recovery pipes are 18-inch diameter corrugated polyethylene tubing-smooth interior (CPT-S), for the first 1,700 feet of pipe run which then transitions to 24-inch diameter, SDR-32.5 HDPE, until reaching the CIC circuit. All recovery pipes have been sized to convey no more than 70-percent of the maximum flow capacity, up until the last 1,700 feet where the solution recovery lines will become full-pipe flow. In the event pipe capacity is reached, an overflow pipe allows pregnant leach solution to be conveyed to the Process Pond.

The leach solution delivery system is comprised of 16-inch diameter steel pipe which runs from the barren vault/tank, for a pipe-run of approximately 3,950 feet, where it transitions to 14-inch diameter, steel pipe. From this pipe, 12-inch diameter steel risers continue to the top of the HLP, transitioning to 8-inch diameter, SDR-11 HDPE solution headers, 4-inch diameter HDPE pipe and finally to drip lines.

As each HLP cell is loaded, leach solution pipelines are placed across the top and down the sides of the heap. A dilute solution of sodium cyanide will be applied to the ore using drip emitters at a nominal rate up to 0.003 gpm/ft^2. Leach solution is expected to contain between 0.4 to 1.0 pounds of dissolved sodium cyanide per ton of solution at an appropriate pH. To maintain the proper pH, lime is added to the ore prior to placement on the leach pads. Supplemental lime to augment pH is also added via a milk-of-lime slaking and distribution system.

Solution Collection Channel: The Solution Collection Channel provides secondary containment for the Solution Collection System discussed previously between the Process Plant and the HLP. Pregnant leach solution flows along the pad liner and then collects in a solution collection channel located along the toe of the leach pad. Pregnant solution from the leach pad will be routed via a piping system directly to the process plant. In the event of a system upset or if the Process Plant has reached its operational capacity, the pregnant leach solution can be directed to the Process Pond for temporary storage through a 12-inch diameter, SDR-32.5 HDPE pipeline placed within the Solution Collection Channel.

The Solution Collection Channel is located on the south end of the pad and contains non-perforated 18-inch CPT main solution collection pipes, overlying a 60-mil HDPE liner for secondary containment. The HDPE overlies a minimum 12-inch soil layer, placed in two 6-inch lifts above the prepared subgrade and compacted to 95 percent maximum dry density (ASTM D1557). The soil layer has permeability of less than $1x10^{-6}$ cm/sec, and is overlain by HDPE liner.

Once the pregnant leach solution reaches the Solution Collection Channel, it is contained within the 18-inch main collection pipes. Leakage from the main solution collection drainage pipes will be detected by visual observation. Any solution leaking from the pipe reports to the Process Pond.

The Solution Collection Channel and the overflow weirs in the containment berm are sized to handle the flows of the 100-yr, 24-hr storm event. Predictive modeling using the U.S. Army Corp of Engineers (USACOE), Hydrologic Engineering Center-Hydrologic Modeling System (HEC-HMS) computer program was used to simulate the effect of precipitation run-off. The flow in the solution collection channel was modeled using the entire footprint of the heap as an input basin. The flow across the weirs was modeled using the smallest weir and the largest independent section of the HLP that was employing a weir.

Process and Event Ponds: One double-lined process pond and one double-lined event pond have been constructed to accommodate operating and heap draindown solution and storm runoff from the entire pad area.

The Process Pond (as originally permitted) requires an operational working volume of 500,000 gallons (gal) with delivery to the pond regulated by the 65,000-gal Process Tank. At a leach solution application rate of 4,000 gpm, the required 24-hour draindown storage volume is 5.76 million gal. Runoff and drainage from the 100-year, 24-hour storm event from the Process Plant area is estimated at 148,000 gal. The total storage requirement for the pond is estimated at 5.44 million gal.

To meet the necessary storage requirement, the Process Pond is designed with dimensions of 300 feet by 300 feet, a working depth of 16 feet and 3H:1V interior side slopes. This equates to a volume of 6.07 million gal. With two feet of freeboard, this equates to a total volume of 7.36 million gal.

The Event Pond is designed to accommodate runoff from the entire heap leach pad, including the Solution Collection Channels and Process Pond, resulting from the 100-

year, 24-hour storm event of 2.8 inches. This total required storage volume is 12.2 million gal. The total capacity at the crest is 14.5 million gal. The event pond dimensions were initially 460 feet x 300 feet, 3H:1V interior side slopes, and a depth of 16 feet (including two feet of freeboard).

During the construction of the Process Pond and Event Pond, several unauthorized changes and deviations were made from the designs first approved in the 19 September 2011 Permit. These changes included an increase in Process Pond and Event Pond sump dimensions and an increase in Event Pond size and capacity. These changes were acknowledged in the “As-Built” documentation submitted on 12 June 2012 and although the Division had no concerns regarding the construction or the level of QA/QC performed, the changes and deviations were still unauthorized.

A Minor Modification (approved by the Division 3 July 2012) rectified these unauthorized changes by authorizing an increase in the size and capacity of the Process Pond and Event Pond sump dimensions and an increase in Event Pond size and capacity.

The leak detection sump dimensions for both ponds were increased to allow for larger equipment to be used to compact the clay beneath the 60-mil HDPE sump liner. The original design included the bottom of the leak detection sumps having a 4 feet x 4 feet dimensions with 3H:lV side slopes and a depth of two feet. The constructed bottom dimension was increased to 8 feet x 8 feet, with 3H:1V side slopes (average) and a depth of two feet. Assuming 100 percent minus 1-inch drain rock at 37 percent sump porosity, the effective Process Pond sump capacity increased from 604 to 1,487 gal and the effective Event Pond sump capacity increased from 604 to 1,299 gal.

The HLP modifications discussed previously increased the total catchment area including the HLP, solution channel and Event Pond to approximately 7.11 million square feet. The increase in catchment area necessitated an increase in Event Pond stormwater containment capacity. To meet the required containment capacity, the leach solution application rate was reduced from 4,000 gpm to 3,300 gpm and the Event Pond size was increased from 460 feet x 300 feet x16 feet deep to 520 feet x 300 feet x 16 feet deep.
The Process and Event Pond liner and leak detection systems consist of a 60-mil HDPE textured liner (textured surface up), underlain by a 60-mil HDPE Drain Liner™, underlain by a minimum 12-inch soil layer, placed in two 6-inch lifts above the prepared subgrade and compacted to 95 percent maximum dry density (ASTM D1557) with a permeability of less than $1x10^{-6}$ cm/sec.

Construction of the Process Pond began on 5 October 2011. Subgrade was tested in the laboratory and in the field via nuclear density gauge and sand cone testing. It was inspected, field verified, and approved before the clay layer was placed. The majority of the compacted fill and subgrade earthwork was completed before December 2011, at which time construction halted until February 2012. Placement of the 60-mil HDPE drain liner commenced in early March 2012. A 60-mil micro-spike liner and geocomposite was installed on the dividing berm between the Process Pond and Event Pond in place of 60-mil drain liner to reduce the potential for damage during foot traffic on the berm. The combination of 60-mil micro-spike liner and geocomposite was also placed in the transition area of the channel and process pond (mouth of the channel); in place of the 60-mil drain liner, for added protection at the discharge point.

Following secondary liner and sump placement, a 60-mil textured liner was placed over the entire pond surface area with the texture side exposed on the surface. All liner materials were continued into an anchor trench located 3 feet away from the edge of the pond slope edge (hinge point), and were extended 2 feet in depth and 2 feet laterally for additional support. The north leading liner edge was modified to have the textured (primary) and the drain liner encapsulated. The encapsulated system was then tied to the smooth 60-mil (primary) liner from the channel to the north by an extrusion weld.

During construction, the channel area receiving both clay and 60-mil smooth HDPE liner was expanded south within the process pond area. The expansion of the lined system in the area was done as an added environmental precaution, as the modified area's elevation is above design water surface elevations, and therefore has a very low potential to see solution. All compacted fill areas met compaction specifications. Areas that did not initially meet the compaction requirements were re-worked, compacted, moisture treated and re-tested until specifications were met. All clay layer areas tested met permeability specifications. All liner seam specifications were met. Where seams failed, these areas were repaired and re-tested to meet specifications.

Construction of the Event Pond began on 5 October 2011 and progressed along the same schedule as the Process Pond construction. Subgrade was tested in the laboratory and in the field via nuclear density gauge and sand cone testing. It was inspected, field verified, and approved before the clay layer was placed. The majority of the compacted fill and subgrade earthworks were completed before December 2011, at which time construction halted until February 2012. Deployment of the clay layer began in February 2012. It was placed and compacted according to the specifications, and was completely installed by early March 2012. The clay layer was inspected, field verified, and approved prior to synthetic liner placement.

HDPE liner placement first began in early March 2012, with the bottom liner consisting of a 60-mil drain liner. Each seam was field verified via air/vacuum testing, with destruct testing according to the technical specifications. The sump area was increased in size slightly from the design to accommodate clay placement with equipment. Original design size was 16 feet x 16 feet x 2 feet deep, the actual constructed size is 20 feet x 20 feetx 2 feet deep. In the sump area, 2 inch minus clean rock was placed to allow for leak detection collection. A 12-inch SDR-32.5 pipeline with ½-inch holes spaced 4 inches on center and offset 4 inches was installed to collect any leakage.

Following the bottom liner and sump materials placement, a 60-mil textured liner was placed over the entire pond surface area with the texture side exposed on the surface. All liner materials were continued into an anchor trench located 3 feet away from the edge of the pond slope edge (hinge point), and were extended 2 feet in depth and 2 feet laterally for additional support. All compacted fill areas met compaction specifications. Areas that did not initially meet the compaction requirements were re-worked, compacted, moisture treated and re-tested until specifications were met.

All clay layer areas tested met permeability specifications. All liner seam specifications were met. Where seams initially failed, these areas were repaired and re-tested to meet specifications.

Freshwater Pond: Construction of the Fresh Water Pond began in February 2012 with earthworks consisting of localized cut and fill operations. This work continued until the first week of March when all earthworks related to this pond were completed. A 10-inch waterline was installed at the bottom of the pond. Before the pond liner was installed, a 5 feet x 5 feet x 1 foot clay base surrounding the 10-inch diameter pipeline was installed and compacted to 95 percent Modified Proctor to provide additional leak prevention in this area. This clay base was an addition to the original design.

During pond excavations and as cut and fill activities progressed, the presence of gravels and cobbles within the material was observed. The material was later determined to be suitable for competent fill material, provided moisture treatment and compaction continued. However, as a conservative protection measure, a 300-mil geocomposite, including a 10-oz non-woven geotextile on either side, was placed on the bottom of the pond and the upside slopes to about 6 feet in height for additional protection of the 60-mil synthetic liner.

The 60-mil synthetic liner was then installed as designed, with a double-boot placed over the 10-inch diameter pipeline for additional protection. These modifications are shown on as-built drawings. All compacted fill areas met compaction specifications. Areas that did not initially meet the compaction requirements were re-worked, compacted, moisture treated and re-tested until specifications were met. All liner seam specifications were met. Where seams failed, these areas were repaired and re-tested to meet specifications.

Use of Stebbins Hill Clay for Construction Purposes: The Permittee anticipates that the amount of soil suitable for future construction and closure activities at the GHP and SVCO sites will far exceed availability. A potential, yet previously untapped source of material for construction exists in the Stebbins Hill Clay. An estimated 1.4 million tons of clay is available in the three stockpiles located at the SVCO, an amount which is more than adequate to meet the projected 462,500 tons of soil material required for underliner construction at the GHP site.

Use of the Stebbins Hill clay was first proposed during a 28 March 2011 meeting. The Division indicated that they were receptive to the use of Stebbins Hill Clay for construction purposes, however because the characterization results showed the clay material to have a significant PAG (potentially acid generating) component, the Division would need to perform a thorough and comprehensive evaluation of the Permittee's proposal. In addition, the Division authorization to use PAG clays for construction purposes could have potentially wide-ranging impacts not only at the GHP and SVCO, but at mine sites throughout the state.

In order to formulate a final decision, the Division requested that the Permittee and/or Interralogic provide supplemental technical information and characterization data for review. The requested information was received on 23 June 2011, and during the Division's review, additional concerns were identified and highlighted in a letter to the Permittee dated 5 July 2011. A meeting at the Division offices with the Permittee and Interralogic on 13 July 2011 further clarified the Division's position regarding the use and placement of the clay and the need for additional technical information, which was received via surface mail on 28 July 2011.

Stebbins Hill Clay Background and Characterization Results: The Stebbins Hill clay is comprised of a mixture of clay minerals (montmorillonite and kaolinite), fine-grained mica (illite), feldspar, and quartz. The clays and mica represent the end-stage of weathering of primary silicates and will be stable under normal earth surface conditions and any additional weathering will result in the alteration of any residual feldspar and illite to clay minerals.

The quartz is nearly inert and will not undergo further mineral transformations. Small amounts of calcite and pyrite also exist in the Stebbins Hill clay and are more reactive than the silicate minerals; however, they will not react significantly in the underliner environment primarily due to the physical constraints imposed by the clay and mica minerals. The presence of clay particles limits the water movement and oxygen movement through this material. These minerals are layer silicates that will orient themselves in planar fashion perpendicular to the downward directed pressure load, such during construction by compaction and also under load from 200 feet of crushed ore on top of the liner system, to further decrease permeability.

The potential direction of water and air flow will be downward, but migration through the clay will be severely limited by the barrier created by the planar-orientation of the clay minerals. The clay mineral content of the Stebbins Hill clay is likely a major factor for the very low permeability found in testing. Without a high flux rate of water and dissolved ions through the clay, reactions can only take place by diffusion controlled processes. These processes are very slow and also limited by the physical barriers of the planar clay minerals. In addition, because the clay minerals are not highly reactive, there is little chemical driving force that might accelerate molecular diffusion. Without a high rate of flux of water and dissolved solutes through the clay, including dissolved oxygen, there is very little to no opportunity for the calcite and pyrite to react in a rapid manner and no mechanism to transport solutes into the subsurface below the underliner. Thus, the reactivity of the clay underliner is extremely low.

The Stebbins Hill Clay was mined from exposed faces of the Stebbins Hill Formation in the Round Mountain Pit at the SVCO. The clay was mined at different times and because of this, exhibits a wide range in physical and chemical properties. The clay is currently stored in three stockpiles at the SVCO, which are referred to as the "Old", "North", and "East" stockpiles.

Characterization results indicate that the stockpiled Stebbins Hill Clay meets the permeability specifications pursuant to Nevada Administrative Code (NAC) 445A.434. However, ABA results indicate that the "Old" Clay is acid neutralizing while the "North" and "East" clays are PAG, due to variability in carbonate and sulfide mineral content. Estimated stockpile volumes/tonnages & requirements for the Gold Hill Project are listed below in Table 1:

Table 1.--Stockpile Volumes/Tonnages & Requirements for Gold Hill Project

	"Old" Clay (non-PAG)	***"North" Clay (PAG)***	***"East" Clay (PAG)***
Volume *(cubic yards)*	*203,723*	*408,071*	*239,612*
Dry Density *(pound per cubic foot)*	*119.4*	*124.8*	*126.1*
Total *(tons)*	*328,381*	*687,518*	*407,903*
Total Volume of Stebbins Hill Clay Available: 851,406 cubic yards			
Total Tonnage of Stebbins Hill Clay Available: 1,423,803 tons			

Alluvium Characterization Results: As stated previously, the Gold Hill alluvium is classified as non-acid generating based on extremely low sulfur content and low to moderate neutralization potential. Meteoric water mobility procedure results from alluvium at the GHP site indicate that the alluvium releases a high amount of alkalinity over the short term resulting in neutral to slightly alkaline pH values. Humidity cell testing results indicate that the Gold Hill alluvium continues to produce alkalinity and circumneutral pH water after an extended period of simulated weathering.

Geochemical testing results from the Gold Hill alluvium indicate that it produces alkalinity upon exposure to water over both the short and long term, and will provide a chemically stable platform for the Gold Hill HLP that will provide a high attenuation capacity for solutes potentially released from the HLP. Continuous contact of the clay with the underlying alluvium does not present an interface for reaction since it produces alkalinity upon exposure to water over both the short and long term.

In the absence of any mechanism to transport oxygen and water through the clay, sulfide oxidations will not occur at a rate or extent sufficient to change the low permeability characteristics of the clay. Since the depth to groundwater is on average about 250 feet below ground surface, interaction with groundwater through-flow will not occur.

Clay Placement and "Encapsulation": The Permittee used the Stebbins Hill "North" and "East" clays as an underliner for the HLP. In this configuration, the upper "encapsulation" consists of a synthetic liner, and crushed ore layer of approximately 200 feet. The lower "encapsulation" consists of a 12-inch layer of compacted and prepared underliner, followed by a 250 foot layer of alluvium. Assuming an average density of 125.45 pounds per cubic foot, the HLP underliner required approximately 399,446 tons of "North" and "East" clay material.

The process and event ponds and the solution channel each have secondary containment. The ponds are double-lined and leak detected with 60-mil HDPE textured liner (textured surface up), underlain by a 60-mil HDPE Drain Liner™. The solution channel is comprised of HDPE within a 60-mil HDPE-lined channel.

The ponds and the channel have an underliner with a compacted permeability of $1x10^{-5}$ cm/sec. During construction, the Permittee used compacted Gold Hill alluvium for the solution channel underliner. Where the alluvium did not meet the specified permeability, the Permittee utilized a blend of Stebbins Hill "Old" clay material and native alluvium, compacted to meet a permeability rate of $1x10^{-5}$ cm/sec.

The Division recommended that a new groundwater monitoring well (GHA-11-3) be installed downgradient of the HLP to ensure adequate monitoring coverage. Groundwater monitoring well GHA-11-3 was drilled and constructed in December 2011 to specifically monitor groundwater associated with the Permittee's use of clay from the Stebbins Hill Formation as heap leach pad (HLP) under liner material. During well development, the presence of grout was noted in the purge water. Repeated attempts to purge the well have failed to eliminate the grout. The Permittee concluded that since it was not possible to collect a representative groundwater sample from the well, GHA-11-3 would need to be abandoned and replaced.

In an EDC approved 10 September 2012, the Division authorized the Permittee's request to abandon GHA-11-3 and install a replacement downgradient monitoring well (GHA-l l-3A) southeast and within 50 feet of the current location to provide the necessary groundwater monitoring. The replacement well will be identical in design and depth to the existing well.

Precious Metal Extraction and Recovery: The solution collection system transports pregnant solution from the heap leach pad to the process plant. Gold and silver recovery is accomplished through the 3-ton, six-tank (500 gallons each) CIC circuit, at a nominal flow rate of 4,000 gpm. This process involves passing pregnant solution through the activated carbon columns.

From the CIC circuit, barren solution is pumped to the Barren Solution Tank which is equipped with an overflow pipe to allow barren solution to overflow to the Process Pond in the event solution tank capacity is reached. From the Barren Solution Tank, barren solution is pumped through HDPE delivery pipelines to the pad for re-application to ore.

Loaded carbon is then stripped with an acid and the resulting gold and silver-bearing solution is conveyed to two 125-cubic foot electrowinning cells. Spent carbon is reactivated through a carbon kiln. The collected sludge from the electrowinning cells containing the metal values is placed into a 12-cubic foot mercury retort to drive off the mercury which is collected by a series of scrubbers and traps. The post-retort sludge is then placed in the refinery furnace for smelting and pouring of doré bars.

In the event solution tanks reach capacity, overflow pipes direct solution to the Process Pond. The entire process area is lined with a 60-mil HDPE liner for secondary containment underlain by a 12-inch layer of soil, placed in two, 6-inch lifts and compacted pursuant to ASTM D1557. Soil permeability for each lift is less than $1x10^{-6}$ cm/sec and runoff and/or drainage from this area is collected in the Process Pond which is sized to accommodate the additional volume of solution. Refer to Table 3 for GHP Process Facility tank volumes.

Construction of the process facility began in October 2011 with the over excavation of the site to the subgrade elevation. The clay layer, 60-mil smooth HDPE liner, geocomposite, gravel drain layer, and random fill were placed to the building subgrade at the end of November 2011. After erection of the building, final grading was completed in May 2012. The subgrade grade, and consequentially the secondary, and primary liner were placed at an approximate 1 percent slope discharging to the process pond. The final grade of the plant site is approximately 2 percent; this provides additional clearance from the primary liner for underground utilities and structures, while still maintaining positive drainage on both planes. As designed, a geocomposite consisting of 300-mil geogrid, including a 10-oz, non-woven geotextile on either side, was placed between the primary liner and the 1-foot thick gravel drain. The plant site area was expanded to the east and south allowing a larger footprint for possible future expansion or additions.

All compacted fill areas met compaction specifications. Areas that did not initially meet compaction requirements were re-worked, compacted, moisture treated and re-tested until specifications were met. All clay layer areas tested met permeability specifications. The gravel drain material was manufactured onsite and met gradation specifications of the overliner material. All liner seam specifications were met. Where seams initially failed, these areas were repaired and re-tested to meet specifications.

In an effort to improve equipment reliability, optimize process plant efficiency, and facilitate process plant maintenance during active operations, an EDC approved by the Division 8 August 2013 authorized the following modifications to the existing Gold Hill Process Facility:

EW Cell Bypass: The existing refinery maintains two electro-winning (EW) cells arranged in series that must cease operation completely to facilitate cleaning and maintenance. The Permittee intends to reconfigure the existing circuit with additional ball valves, pipe, and pipe fittings thereby allowing the EW system to continue to operate in series, as designed, but alternately allow either cell to be removed from service while the other cell continues operation. This minor plumbing change will reduce operational down time due to maintenance and will not alter Permitted solution flow rates.

Refinery Sump Screen: Solution currently collected in the Refinery floor sump is pumped to the Barren Tank. During active operations, debris that has collected in the sump is often pumped with the solution to the Barren Tank and on to the heat exchanger system, resulting in additional maintenance and removal of the debris from the system. To eliminate the potential of debris entering the Barren Tank, the Permitee intends to install an in-line collection screen system within the sump pipeline for debris removal, prior to the discharge of solution to the tank.

Pregnant Solution Tank Bypass: The carbon stripping process requires that the barren strip solution maintain the correct temperature range for efficient stripping. Although it would be desirable to pre-heat the barren solution, there is currently no provision at the Gold Hill Process Facility to recycle strip solution to the Barren Tank. The Permittee intends to add valves and piping to bypass the pregnant solution tank during the pre-heat period prior to stripping. This system modification will not change the permitted flow rate of the strip system.

Carbon Filter Press Bypass to Carbon Fines Tank: Water and carbon fines removed from the operation of the Carbon Filter Press are directed to the nearby sump vault. The collected water/fines mix is pumped to the CIC tanks where there is always the potential for the mix to be pumped to the HLP. The Permittee modified the circuit piping to allow water/fines mix to be removed from the Carbon Filter Press be pumped to the Carbon Fines Tank rather than the sump vault to reduce if not eliminate the potential for carbon being pumped to the HLP. The pipe and fittings will be constructed of the same HDPE used for the existing piping. The existing piping to the sump vault will remain in place for operational flexibility.

Sump Bypass to Carbon Fines Tank: The carbon handling and preparation tanks in the Carbon Filter Press area have overflows that can potentially discharge carbon onto the plant floor where it is collected in the sump vault discussed previously. Solution collected in this sump is pumped to the CIC tanks, resulting in the potential for carbon to be pumped to the HLP. A modification to the piping proposed by the Permittee will allow collected solution containing carbon fines to be pumped to the Carbon Fines Tank rather than on to the CIC system. As of the 2016 Renewal this proposal has not been put into place. The existing sump piping to the CIC system will be retained for operational flexibility.

Sump Outlet Relocation: Currently all solution (process and routine clean-up) pumped from the collection sumps report to CIC Circuit Tank #6, immediately before the tail screen. Sediments from the routine clean-up are introduced too close to the tail screens often resulting in the plugging of the screen. By moving these flows to CIC Circuit Tank#1, this can be alleviated by providing additional residence time for mixing and dilution of these flows, thereby reducing the potential for tail screen plugging. The two sump pump discharge pipelines and the two pipelines from the strip area of the plant will be modified to re-route the flows to CIC Circuit Tank#1. This modification will not change the volume of liquid currently being pumped in the plant.

Sump Pump Replacement: Three sump pumps within the Gold Hill Process Facility cannot adequately manage the amount of sludge collected in the sump vaults. Two of the sump vaults typically collect carbon at high concentrations, often resulting in significant wear on the pump impellers. The third sump vault is located in the Acid Wash Containment Area and was originally installed with a pump equipped with a chemically-resistant plastic impeller. During typical plant operations, the presence of grit and other contaminants in the sump water often resulted in excessive wear and impeller failure. All three of these sump pumps will be replaced with a Galigher Vertical #5000 (or similar)

Pump. These types of pumps have proven to be successful in operation at the Permittee'sSVCO.

Ancillary Facilities: Ancillary facilities include portable lime silos and slaker, bulk chemical storage area, fuel storage and dispensing area, a ready-line with minimal maintenance area, and a prill silo for ammonium nitrate storage. All heavy maintenance of equipment is performed off-site at the SVCO facility. Secondary containment of at least 110-percent of the largest tank or storage vessel has been constructed around all tanks to prevent the release of solution to the environment in the event of primary containment failure.

A portable lime slaker is located on containment near the HLP. The lime is utilized for process solution pH control. Fuel and bulk chemical storage areas and their associated secondary containment have also been constructed at the Gold Hill area. The fuel facility is co-located with the equipment ready-line, along the access/haul road and will consist of diesel storage tanks and a fuel island.

Table 2.—Gold Hill Project, Process Facility Nominal Tank Volumes:

Tank	***Volume (gallons)***	***Volume (cubic feet)***
Barren Solution Tank	65,080	8,700
Sodium Cyanide Tank	22,000	3,000
Pregnant Solution Tank (outside plant)	65,080	8,700
Pregnant Solution Tank (inside plant)	14,138	1,890
Barren Solution	14,138	1,890
Acid Storage	2,400	314
Caustic Storage	16,906	2,260
Acid Wash	2,147	287
Dilute Acid	3,030	405
Electrowinning Sludge	1,182	158
Activated Carbon	3,942	527
Carbon Attrition	1,421	190
Loaded Carbon	3,643	487
Anti-Scalant Tank (in Plant)	1,200	161
Barren Return Tank	160	22
Mercury Inhibitor Tank	8,000	1,070
Anti-Scalant Tank (outside Plant)	8,000	1,070

Three 10,000-gallon fuel tanks and grease tote have been constructed at the fuel pump area. A Conex trailer is used to store lubricants and fluids, and a second trailer is used for storing welding equipment, an air compressor and parts, as well as, a portable emergency eye wash. Sumps have been constructed to collect any spills and allow for the disposal of collected fluids.

Chemical reagent storage area is located within the process area. Reagents at the GHP include: quick lime, sodium cyanide, sodium hydroxide, zinc metal, lead nitrate, calcium hypochlorite (for cyanide neutralization), a mercury inhibitor, activated carbon, refining flux (including sodium borate, silica, sodium nitrate, and sodium carbonate), and anti-scalant. Sumps have been installed to collect any spills and allow for the disposal of collected fluids.

Currently, all sodium cyanide delivered to the GHP site by the Cyanco Company (Cyanco) is stored in a single, 24-foot long by 9-foot diameter, steel tank owned and maintained by Cyanco. Nominal tank volume is about 11,200 gallons (1,500 cubic feet). The tank has a dedicated pump system for delivering cyanide solution to the process plant. The tank is located on a 41-foot by 30-foot reinforced concrete containment pad with a 14-foot by 20-foot access ramp to accommodate the bulk cyanide solution tanker trailer from Cyanco. A one-foot high concrete berm surrounds the containment pad which is coated with a chemical-resistant epoxy coating and water-stop material installed between the concrete joints to prohibit the release of any sodium cyanide solution off containment. The containment pad is also graded to direct any spills or releases to a collection sump which conveys any solution collected into the adjacent Process Pond. The existing concrete pad offers an interim storage capacity of 4,885 gallons, since any spill or release will flow directly to the sump and ultimately discharge to the Process Pond.

In an effort to meet the current permitted process and cyanide application rates, an EDC approved 22 March 2013, authorized the installation of a second cyanide storage tank to be located next to the existing cyanide tank within the GHP process plant area. The second tank, also manufactured by Cyanco, will be is identical to the first tank. The new tank will be cross plumbed into the existing tank to provide the necessary onsite storage. Cyanide solution delivery systems will remain unchanged.

As the two cyanide solution tanks will be interconnected, the total solution volume (container volume) will double. To accommodate the new 11,200-gallon cyanide storage tank, a new reinforced concrete pad addition, approximately 39 feet by 15 feet will be constructed adjacent to and adjoining the existing cyanide containment pad. A one-foot high concrete berm surrounds three sides of the new containment pad which will also be coated with a chemical-resistant epoxy coating and include water-stop material installed between the concrete joints to prohibit the release of any sodium cyanide solution off containment. The new containment pad will be graded to direct any spills or releases onto the existing containment pad and collection sump which will ultimately convey any solution collected into the adjacent Process Pond.

Both the existing and new cyanide solution storage tanks will be equipped with heat tracing, temperature controls and insulation. Equipment includes an ultrasonic level transmitter and display that requires 110-volt service. The 3-inch diameter dripless fill fitting and 3-inch diameter overflow piping can be added at either end after setup. These tanks can be set on a pad or liner and need no additional foundation. A telemetry unit via a cellular or land-line phone that reads the level transmitter for Cyanco control room personnel for automated inventory control and to avoid running empty or overfilling.

Cyanco has equipped these tanks with 110-vac metering pumps capable of 2-gpm at 300 pounds per square inch (gauge) pressure (psig). A 480-volt, 3-phase magnetic-drive centrifugal pump capable of feeding 100 gpm at 30 psig can also be installed. The tanks can be setup for gravity drainage (no pump); however actual operating practice shows that this tends to be inaccurate for most applications because of head pressure changes.

Petroleum Contaminated Soil Management: Petroleum contaminated soil (PCS) generated at the GHP site is managed at the SVCO site. The sites approved PCS plan is with SVCO PCS Management Plan.

Water Supply: Production wells have been installed to ensure adequate water supply for consumption, ore processing, and dust control needs. RMGC has constructed eight water wells, which may be used as production wells and/or dewatering wells to supply water to the Gold Hill facilities depending upon operational requirements and individual well yield. In addition, pit dewatering is expected to contribute a significant amount to the water supply at the GHP.

A lined storage pond is located north of the HLP and adjacent to the access/haul road. The pond is used to store make-up water only and is lined with a single 60-mil HDPE liner.

Stormwater Controls: Ephemeral drainages exist throughout the Gold Hill area including a few unnamed drainages above the heap leach facility. Stormwater run-on is diverted around the process facilities and returned to natural drainages, where practical. In those limited cases where topography (i.e., ridges) prevent the construction of ditches to return flow to natural drainages, stormwater run-on may is impounded and used for processing where practical.

The run-on diversions are designed to accommodate the 100-year, 24-hour storm event for process facilities and the 25-year, 24-hour storm event for all other facilities when needed.
Predictive modeling using the USACOE, HEC-HMS computer program was used to simulate the effect of precipitation run-off.

Construction of the Gold Hill Diversion included excavation/fill of the channel, filter fabric installation and riprap placement occurring concurrently as work moved up the channel. Excavations were made using scrapers and bulldozers, with cut material being used in all fill areas. A 10-ounce, non-woven geotextile filter fabric was installed with overlaps facing downstream. All riprap was screened to 42 inch minus using a grizzly rock separator and was placed with an excavator and rock trucks. The diversion channel discharges into a natural drainage way that intersects the Gold Hill access road. At this intersection (three) 96-inch diameter corrugated metal pipe (CMP) culverts were placed, along with both inlet and outlet rip-rap protection.

The channel width was increased from six feet to ten feet for ease of construction, allowing the excavation to be completed by scrapers. Filter fabric was used in place of the design specified filter criteria. The specified filter material was not readily available on the mine and it was deemed more cost effective to use a 10-ounce non-woven geotextile. Riprap was brought to the top of the channel, rather than the designed 100-yr flow height plus freeboard level. Bringing the riprap level higher does not affect the current design function. It will increase safety in the case of a storm of greater than 100-yr reoccurrence interval taking place. The placed riprap was sized to approximately meet or exceed the largest d_{50} specified for the channel sections.

C. Receiving Water Characteristics

Gold Hill Area Groundwater Quality: Baseline water chemistry for the Gold Hill area is provided by bedrock wells GHB-03-1, GHB-03-2, GHB-03-3, GHB-03-4, GHB-PBW and alluvial wells, GHA-03-1, GHA-03-22, GHA-03-3, GHA-03-4, GHA-03-5, GHA-03-6.

Alluvial groundwater is characterized as sodium-calcium-bicarbonate water with neutral to slightly alkaline pH with TDS concentrations typically less than 500 mg/L. Groundwater chemistry in the alluvium is highly dependent on recharge from infiltration of precipitation. As a result, most constituent concentrations are generally below the Profile I reference values with the exception of arsenic and fluoride at alluvial well GHA-03-1 (located west and downgradient of the GHP pit and on the east toe of the Phase 1 WRD) and alluvial well GH-03-02 (located southwest and downgradient of the GHP pit and south of the Phase 1 WRD); arsenic and manganese at alluvial well GHA-03-3, (located south and downgradient of the GHP pit), arsenic at alluvial well GHA-03-5 (located west and downgradient of the GHP pit); and iron and manganese at alluvial well GHA-03-6 (located west and downgradient of the GHP pit). Construction of the Phase 1 WRD will require abandonment of alluvial well GHA-03-1.

The bedrock groundwater can be generally characterized as sodium-calcium-bicarbonate water with neutral to slightly alkaline pH and TDS typically less than 500 mg/l. Background groundwater constituent concentrations do not exceed Profile I reference values with the exception of antimony, arsenic, and fluoride at bedrock well GHB-03-1 (located west and downgradient of the proposed GHP pit at the proposed Phase 1 ERD); arsenic, iron, and manganese at bedrock well GHB-03-2 (located within the proposed GHP pit); arsenic at bedrock well GHB-03-3 (located within the proposed GHP pit); and antimony, arsenic, and manganese at bedrock well GHB-03-4 (located outside and on the east rim of the proposed GHP pit). These constituents are consistently reported at concentrations above the Profile I reference values in the bedrock wells and the elevated concentrations may be the result of historic mining activity or the result of natural localized mineralized zones. GHB-03-02 through GHB-03-04 will be abandoned with the development of the pit.

D. Procedures for Public Comment

The Notice of the Division's intent to issue a Permit authorizing the facility to construct, operate, and close, subject to the conditions within the Permit, is being sent to the **Tonopah Times-Bonanza and Goldfield News** in Tonopah 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 renewed Permit.

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

See Section I of the Permit.

G. Rationale for Permit Requirements

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

The primary method for identification of escaping process fluids is placed on required routine monitoring of leak detection systems, groundwater monitoring wells, and routine visual inspections of components for possible surface releases. Specific monitoring requirments can be found in the Water Pollution Control Permit.

H. Federal Migratory Bird Treaty Act

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

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

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Revision 00: 2016 Renewal, Boiler plate updates.