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

Permittee Name: **Newmont USA Limited dba Newmont Mining Corporation**

Project Name: **North Area Leach Project**

Permit Number: **NEV0087065 (Renewal 2015, Fact Sheet Revision 00)**

A. <u>Location and General Description</u>

Location: The North Area Leach Project is located on the west side of the Tuscarora Mountains in the Little Boulder Basin tributary of Boulder Creek Basin, in north-central Eureka County, approximately 20 miles northwest of the town of Carlin. The facility is situated within Sections 3, 4, 5, 9, 10, 11, 13, 14, 15, 16, and 23, Township 35 North (T35N), Range 50 East (R50E); Sections 28, 29, 30, 31, 32, and 33, T36N, R50E; and Sections 2, 3, 10, 11, 14, 15, and 36, T36N, R49E, Mount Diablo Baseline & Meridian. To access the Project site, travel 23 miles west from Elko (the nearest controlled airport facility) on Interstate Highway 80, take the Central Carlin exit #280, then continue north approximately 25 miles on State Route 766.

General Description: The North Area Leach Project is comprised of a heap leach facility constructed in nine phases, which includes two synthetic-lined and leak-detected pregnant ponds, one synthetic-lined and leak-detected Stormwater Pond, a system of synthetic-lined and leak-detected solution collection ditches, a carbon adsorption facility constructed within secondary containment for the recovery of gold, twenty-five approved waste rock disposal facilities (WRDFs), including four in-pit backfill facilities approved with the 2009 renewal, the Exodus and Deep Star underground mines, groundwater monitor wells and associated pipelines, sumps, pumps, and engineered containment for conveyance and control of process solution within the facility. The historic Post Pad 1 heap leach pad and draindown collection system was incorporated into the Permit in 2005, for management and monitoring purposes. Loaded carbon is transported by truck to the separate Mill 5/6-Gold Quarry-James Creek Project (Water Pollution Control Permit (WPCP) NEV0090056) refinery, where gold is desorbed and recovered. The doré is sent off-site for further processing. Tailings in the Mill 4 Tailings Storage Facility No. 2 (TSF 4-2) will be mined and transported to the Leeville Paste Fill Plant (WPCP NEV0090056) for use in the underground paste fill operation as the initial stage of permanent closure of TSF 4-2. 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 which exceed the design storm event.

B. Synopsis

General: The first components constructed as part of what is now the North Area Leach Project were pre-regulation (NAC 445A.350 through 445A.447) designs. The earliest permit associated with the Project is Permit NEV00003, an "Authorization to Discharge" with zero allowed discharge, effective 28 May 1980, for the Boot Strap Mine. WPCP NEV0087065 (Permit) was first issued for the North Area Leach Project effective 27 April 1988.

The North Area Leach Project heap leach pad was constructed as a fully lined facility in a series of phased expansions. Phase I construction was completed in late 1987, and several expansions have been completed since. Phase VII was commissioned in 2008 and Phase VIII was commissioned in 2013. The North Area Leach Project has, over time, received ore from several open pit mines including, but not limited to, Tara, Bootstrap, Capstone, Lantern, Northstar, Bobcat, Payraise, Sold, Beast, and the original Carlin. The majority of the ore previously placed on the North Area Leach pad came from the Genesis Pit. The primary sources of ore for recent heap leach operations are the Tara, Carlin, Saddle, and Pete (oxide portion) pits and future sources will include the expanded and deepened Genesis Pit and the new West Genesis Pit. Management of potentially acid generating waste is in accordance with the Newmont management plans dated 1995 and 2003, as applicable (see below). The Capstone pit has been backfilled with waste rock and portions of the Bootstrap and Carlin pits are currently being backfilled with waste rock. Waste rock backfill is also the option preferred by the Permittee for the Genesis and West Genesis pits, which are predicted to form pit lakes if not backfilled.

Ore loaded on the heap leach pad may be run-of-mine or it may be crushed and agglomerated with cement and lime for pH control. Gold is extracted from the ore with a dilute sodium cyanide solution, which is applied to the heap via drip emitters or sprinklers. Gold is recovered from the pregnant solution within a carbon-in-column (CIC) plant. After transport of the loaded carbon removed from the CIC columns, gold is stripped from the carbon and refined in the refinery located at the Mill 5/6-Gold Quarry-James Creek Project (WPCP NEV0090056). The barren carbon is re-activated in a kiln on-site and the recovered gold doré is sent off site for further processing.

The State of Nevada Division of Environmental Protection (Division) has required permanent closure of the TSF 4-2 as a result of groundwater nitrate contamination caused by leakage from TSF 4-2 (described below). After tailings deposition ceased in 1999, TSF 4-2 was used for many years as a water balance facility for the North Area Leach Project. The component was formally transferred from the Mill 4, TSF 1&2 Project (WPCP NEV0092100) as a minor modification to that Permit and incorporated into the North Area Leach Project with the 2004 renewal.

Diversion ditches for the North Area Leach Project have been designed and constructed to control and withstand runoff from the modeled 100-year, 24-hour storm event. The ponds and solution collection channels have been sized to contain the 25-year, 24-hour storm event. The components are constructed to withstand the 100-year, 24-hour storm event.

The Project will generate up to 1,000 acres of surface disturbance on a combination of public and private lands. The public land is administered by the Tuscarora Field Office of the U.S. Bureau of Land Management in Elko, Nevada.

Underground Mines: The Exodus Mine is an underground mining operation accessed from a portal within the northwest side of the Lantern Pit. Surface facilities associated with the Exodus Mine located outside the southwest rim of the Lantern Pit include a truck shop, truck wash, fueling area, and offices. A batch plant located in the Lantern Pit south of the Exodus Mine portal provides cemented rock backfill for the underground workings. Water collected in sumps in underground workings that has been in contact with mechanized equipment and associated facilities, underground travel ways, or drilling operations is considered contact water that must be managed to prevent further contamination of waters of the State. Contact water from the Exodus Mine is pumped to a steel bin and standpipe outside the mine portal for transport via water truck to the Leeville De-Sedimentation Project Truck Station (WPCP NEV2002105).

The Deep Star Mine was an underground mining operation accessed from a portal in the Genesis Pit. The mine was permanently closed and the portal entrance sealed in 2014, pursuant to an approved final plan for permanent closure (FPPC).

Waste Rock Disposal Facilities (WRDFs): Several WRDFs are located within the North Area Leach Project geographic area. The following table lists the WRDFs permitted as of the date indicated, and whether they are permitted for potentially acid generating (PAG) waste rock, non-PAG waste rock, or both.

Approved North Area Leach Project Waste Rock Disposal Facilities (03 April 2015)			
WRDF Name	**Section, Township, Range**	**Sample Identification**	**WRDF Type**
Beast In-Pit Backfill	3, 4, T35N, R50E	BS-PITBF	PAG/non-PAG[c]
Beast/Sold South Dump (SD4)	3, 4, T35N, R50E; 32, T36N, R50E	BS-SDUMP	PAG/ non-PAG[a,b]
Bluestar In-Pit Backfill	3, 4, T35N, R50E; 31, T36, R50E	BLS-PITBF	non-PAG[c]

Approved North Area Leach Project Waste Rock Disposal Facilities (03 April 2015)			
WRDF Name	**Section, Township, Range**	**Sample Identification**	**WRDF Type**
Bootstrap Backfill Dump	10, T36N, R49E	BT-BFDUMP	non-PAG[b]
Bootstrap/Capstone/Tara Waste Dumps	2, 11, 14, T36N, R49E	BC-DUMP	non-PAG[b]
Capstone Backfill Dump	2, 3, T36N, R49E	CP-BFDUMP	non-PAG[a]
Carlin Dump 3 (CD3)	11, 13, 14, T35N, R50E	CA-CD3	non-PAG[b]
Carlin South Dump	14, 23, T35N, R50E	CA-SDUMP	non-PAG[a]
Carlin Tails Dump (Mill 1 Tails)	11, 14, T35N, R50E	CA-TDUMP	non-PAG[b]
Carlin Underground Dump (CD1)	13, T35N, R50E	CA-CD1	non-PAG[b]
Carlin West Backfill Dump	14 T35N, R50E	CA-BFDUMP	non-PAG[b]
Carlin West Pit Dump	14, 15, T35N R50E	CA-WPDUMP	non-PAG[b]
Deep Star Waste Dump	31, T36N, R50E	DS-DUMP	non-PAG[b]
Genesis In-Pit Backfill	31, T36N, R50E	GEN-PITBF	PAG/non-PAG[c]
Genesis/Blue Star Dump	31, T36N, R50E	G/BS-DUMP	non-PAG[a,b]
Genesis/Blue Star West Dump Section 5)	5, T35N, R50E	GB-DUMP	PAG/non-PAG[a,b,c]
Lantern South Dump	9, 16, T35N, R50E	LA-SDUMP	non-PAG[b]
North Lantern Dump	9, 10, T35N, R50E	LA-NDUMP	non-PAG[c]
North Star (Section 36 Dump)	36, T36N, R49E	NS-SEC36	PAG/non-PAG[b,c]
Section 3 WRDF Phase I and Phase II	3, T35N, R50E	S3-DUMP	PAG/non-PAG[c]
Tara Backfill Dump	15, T36N, R49E	TA-BFDUMP	non-PAG[a,b]
Tara North Dump	11, 14, 15, T36N, R49E	TA-NDUMP	non-PAG[a,b]
Tara Saddle Dump (North and South)	11, 14, 15, T36N, R49E	TA-DUMP	non-PAG[a,b]

Approved North Area Leach Project Waste Rock Disposal Facilities (03 April 2015)			
WRDF Name	**Section, Township, Range**	**Sample Identification**	**WRDF Type**
Tara South Dump	14, 15, T36N, R49E	TA-SDUMP	non-PAG[a,b]
West Carlin In-Pit Backfill WRDF	14, 15, T35N, R50E	EC-IP-WRDF	PAG/non-PAG[c]
West Genesis In-Pit Backfill	31, T36N, R50E	WG-PH1PBF	PAG/non-PAG[c]

a) Pre-1995 construction and design requirements
b) 1995 through 2002 construction and design requirements
c) Post-2002 construction and design requirements

Material placed in any of these WRDFs is characterized and reported on a bi-annual (first and third quarter) schedule, except for new facilities, which are sampled quarterly for a minimum of two years initially. To address the issues associated with PAG waste rock, the existing facilities are managed in accordance with the plan titled *Newmont Gold Company, Refractory Ore Stockpile and Waste Rock Dump Design, Construction and Monitoring, 27 October 1995*. Any facility expanded beyond fluid containment structures existing in 2002, or any new, post-2002, facility construction, must be constructed and managed in accordance with the document *Newmont Mining Corporation, Refractory Ore Stockpile and Waste Rock Dump Design, Construction and Monitoring Plan*, dated January 2003. The 2003 plan incorporates more stringent facility management requirements and requires new facilities be designed to engineered specifications verified by field testing and quality assurance/quality control (QA/QC) documentation. Waste rock placed as in-pit backfill material is tested and classified in accordance with the Operating Plan appendix "Waste Rock Management Plan, Eastern Nevada Operations", procedures and protocols specific to the Genesis Project in-pit backfill WRDFs.

A non-fee proposal, approved by the Division in May 2014, authorizes the Permittee to place approximately 2 million tons of PAG waste rock from the Leeville underground mine operations (WPCP NEV0090056) in previously approved PAG cells within the Beast and Genesis In-Pit Backfill WRDFs. An extra 3.3 million tons of PAG capacity was originally permitted in the Beast and Genesis In-Pit Backfill WRDFs, so the addition of the limited amount of Leeville PAG waste rock is not expected to change the overall volume of those WRDFs.

Petroleum-Contaminated Soil (PCS) Management Plan: An engineering design change (EDC) was approved by the Division in June 2014 to incorporate a PCS management plan into the Permit. The PCS management plan allows on-site disposal of non-hazardous PCS that meets risk-based screening levels for volatile and semi-volatile organic compounds (VOCs and SVOCs, respectively). Approved on-site PCS disposal areas include the Section 5 WRDF, located in Section 5, T35N, R50E, for provisional and final PCS disposal, and the adjacent Section 5 former bioremediation pad (previously managed under Individual Hydrocarbon Permit IHP-04, North Area Hydrocarbon Project 2) for final PCS disposal only. Approved PCS temporary holding pads, which are used to hold PCS while it dries or until screening analyses are performed, include the Truck Shop 4 Washbay Sump Solids Drainage Pad, and the main Interim Holding Pad, located within Sections 3 and 4, T35N, R50E, west of the Section 3 Ore Stockpile area. The Interim Holding Pad was previously managed as a bioremediation pad under IHP-03-2, North Area Hydrocarbon Project 1. The Interim Holding Pad features a buried earthen liner and sump, constructed in 2004, with permeability reconfirmed in 2009 to be less than 1×10^{-7} centimeters per second (cm/sec). The PCS Management Plan also allows combustion of PCS in the Mill 6 roasters, but this treatment method must await Division approval of a modification to the applicable air quality permit. When the PCS management plan was approved in 2014, both the Section 5 former bioremediation pad and the Interim Holding Pad still contained PCS from the previous bioremediation program. A Permit Schedule of Compliance item requires characterization and disposal of this older PCS in accordance with the PCS management plan by specified dates.

Heap Leach Pad: The North Area Leach Project heap leach pad authorized construction consists of a series of nine phases. The phase identification and construction completion dates are: Phase I, 1987; Phase II, 1988; Phase III, 1990; Phase IV, 1991; Phase V-a, 1993; Phase V-b, 1994; Phase VI, January through November 1998; Phase VII, 2007 for commissioning in September 2008; and Phase VIII, October 2013 for commissioning in late 2013. All phases are designed and approved by the Division as engineered components with geosynthetic liner systems; however, details of the liner system design and construction varies from phase to phase.

<u>Phase I and Phase II Construction (1987 & 1988):</u> The Phase I leach pad construction covered approximately 96.1 acres and the Phase II construction covered about 32.8 acres. The phases were built consecutively but are not hydraulically linked. As-built reports have not been located for the pre-regulation Phase I and Phase II construction, but a brief design report with drawings and associated correspondence are on file with the Division.

Based on the design report and related correspondence, the heap leach pad Phase I and Phase II liner system construction was identical except for the use of 80-mil high density polyethylene (HDPE) for the synthetic liner of Phase II instead of the 60-mil HDPE used for Phase I. The synthetic liner was placed directly on a native soil base that was scarified to a minimum 12-inch depth, moisture conditioned, and compacted to a minimum of 95% maximum dry density, Standard Proctor (ASTM Method D698). A maximum hydraulic conductivity of 1×10^{-6} cm/sec was specified for the compacted native soil base. The gradient toward the downgradient toe of the pad is a maximum 8% in the interior area of the pad and a maximum 2% at the edges of the pad.

The underdrain solution collection system consists of 4-inch diameter perforated polyvinyl chloride (PVC) pipe placed on 50-foot centers on top of the liner. The underdrain collection pipes are covered with a minimum 18-inch thick drainage blanket comprised of minus ½-inch gravel or crushed mine waste rock. The underdrain solution collection pipes daylight into a perimeter solution collection ditch lined with 60-mil HDPE placed on a 12-inch thick silt/clay base compacted in 6-inch lifts to a specified maximum 1 x 10^{-6} cm/sec permeability. The collection ditch connects to a single transfer ditch constructed to the same standard with the same materials. Historic correspondence suggests that geotextile may have been placed between the HDPE and underlying compacted base as a leakage collection and recovery system (LCRS). This cannot be confirmed by the design drawings and such a system, based on experience, may not be functional.

The Lower Pregnant Pond (LPP), the Stormwater Pond, the Dissipation Pond, and the connecting overflow channels were constructed during Phase I, and the Upper Pregnant Pond (UPP) was constructed during Phase II. The construction of these components is described in other sections of this Fact Sheet.

<u>Phase III Construction (1990):</u> The Phase III expansion to the heap leach pad, approved as a minor modification, covered approximately 43.6 additional acres. This pad expansion was designed to accommodate approximately 15.5 million tons of leachable ore when loaded to 200 feet high in maximum 30-foot lifts. The pad design allowed solution application rates up to 6,000 gallons per minute (gpm). The maximum solution application rate was later raised to 9,000 gpm; see the Phase VI description below. Design changes were incorporated into the Phase III pad design and existing associated components as construction on subsequent phases proceeded.

The pad subbase was constructed by scarification of native soil to a depth of 12 inches followed by compaction to 95% maximum dry density, Modified Proctor (ASTM Method D1557). A 12-inch thick clay layer was placed in 6-inch lifts over the subbase and covered with an 80-mil HDPE liner. The clay layer has a maximum hydraulic conductivity of 1 x 10^{-7} cm/sec. The base of the pad has a maximum 0.5% slope to the northwest.

The underdrain system consists of 4-inch diameter HDPE solution collection pipes placed on 30-foot centers within an 18-inch thick drainage blanket comprised of minus 1-1/2 inch diameter crushed and agglomerated ore. The design anticipates a maximum 1- to 2-foot hydrostatic head on the synthetic liner surface.

The underdrain solution collection pipes daylight to a solution collection channel located on the west (low) side of the pad. The trapezoidal-shaped channel is constructed on a 12-inch thick scarified and compacted subbase and has both a primary and secondary liner of 80-mil HDPE with a geonet drainage layer between the liners. The geonet acts as an LCRS conveying fluid to three gravel-filled sumps located at low points along the channel. Each sump is fitted with a 4-inch diameter HDPE discharge pipe connected to a 10-inch diameter HDPE vertical riser pipe equipped with a dedicated submersible evacuation pump and totalizer flow meter. Evacuated fluid is returned to the solution channel.

The existing UPP lining system was upgraded to a double-layer synthetic liner system, and the clay Stormwater Pond was also recompacted as part of the Phase III construction. Those upgrades are described in different sections of this Fact Sheet.

Phase IV Construction (1991): The Phase IV expansion to the heap leach pad, approved by the Division as a minor modification, covered approximately 48.2 adjoining acres. This pad expansion was designed to accommodate approximately 19 million tons of leach ore when loaded to 200 feet elevation in maximum 30-foot lifts. The pad design allowed solution application rates up to 6,000 gpm. The maximum solution application rate was later raised to 9,000 gpm; see the Phase VI description below. As with the Phase III construction, some design changes were incorporated into the Phase IV pad and the associated existing components.

The Phase IV pad design incorporates an innovative but complex liner system. The pad subgrade material was placed on stripped, moisture conditioned native soils, compacted to 95% maximum dry density, Modified Proctor (ASTM Method D1557). A 1-foot lift of subgrade material, with a minimum 50% passing the number 200 sieve, was placed on the native soils and compacted to 95% Modified Proctor (ASTM Method D1557) and a maximum permeability of 1 x 10^{-6} cm/sec. A single layer of 40-mil very low density polyethylene (VLDPE) was placed directly on the compacted clay layer as the liner. The tie between the Phase III 80-mil HDPE liner and the Phase IV 40-mil VLDPE liner was accomplished by welding the three 40-mil VLDPE layers and the two layers of geonet in a stack of overlapping layers onto the existing west solution collection channel 80-mil HDPE and geonet LCRS liner system.

The VLDPE liner was covered with a 12-inch thick protective layer of soil having a minimum 50% passing the minus 200-mesh screen and compacted to 95% Modified Proctor (ASTM Method D1557). A 12-inch thick drainage blanket, comprised of maximum 6-inch diameter run-of-mine ore with less than 5% minus 200-mesh fines, was placed on the protective layer.

The drainage blanket solution collection system consists of 4-inch and 8-inch diameter perforated HDPE pipes placed on 40-foot centers that connect to downgradient 8-, 10-, and 12-inch diameter solid HDPE header pipes to convey collected leach solution to the existing solution collection ditch located at the southwest corner of the heap leach pad.

As part of the Phase IV heap leach pad expansion, the existing LPP liner system was upgraded to a double synthetic lined system, which is described in more detail in a separate section of this Fact Sheet. The solution conveyance channel, adjacent to its inlet to the LPP, was also excavated and a gravel-filled LCRS sump (TC-2) was constructed beneath the liner. The sump is fitted with a solution evacuation pump and flowmeter.

<u>Phase V-a Construction (1993):</u> The Phase V-a expansion to the heap leach pad, approved as a minor modification, covered approximately 55.1 acres and connects to the north side of the Phase IV heap leach pad expansion. This pad expansion was designed to accommodate approximately 20 million tons of leach ore when loaded to a 300-foot elevation with an initial 30-foot lift, subsequent 50-foot lifts, and a final 20-foot lift. As with previous construction, the pad design allows solution application rates up to 6,000 gpm. The maximum solution application rate was later raised to 9,000 gpm; see the Phase VI description below. As with prior phases of construction, some design changes were incorporated into the Phase V-a pad and the associated existing components.

The heap leach pad liner system design was again changed for Phase V-a construction. The subgrade within the pad perimeter was scarified to a depth of 12 inches, moisture conditioned, and compacted to 95% Modified Proctor (ASTM Method D1557). Field tests using air-entry permeability equipment indicate the final lift of the compacted subgrade meets the 1 x 10^{-6} cm/sec specification and averages 2 x 10^{-8} cm/sec. A layer of 80-mil HDPE was placed as a liner in direct contact with the prepared subgrade. The Phase V-a 80-mil HDPE liner was welded directly to the Phase IV VLDPE liner and the seam was capped with a welded cover of 60-mil HDPE.

A protective layer, 12 inches thick, comprised of TSF 4-1 tailings material was placed on the 80-mil HDPE liner and covered with a minimum 12 inches of crushed minus 6-inch screened leach ore that serves as the drainage blanket.

The leach solution collection piping system is constructed of 4-inch diameter perforated, corrugated polyethylene tubing (CPT) placed within the underdrain blanket on 30-foot centers in a herringbone pattern. The collection piping conveys solution via 8-, 12-, and 18-inch diameter solid CPT headers pipes located in the north, central, and south portions of the heap leach pad to the solution collection channel. Two 8-inch diameter perforated CPT pipes extend the length of the Phase IV to Phase V-a liner connection to collect any solution migrating between the two pad phases.

A 20-inch diameter carbon steel pipeline was installed to deliver barren solution to the heap leach pad. The barren pipeline was placed on existing containment within the solution collection channel.

During Phase V-a construction, the Dissipation Pond was removed and the clay-lined Stormwater Pond was upgraded with a double synthetic liner system. The LPP-to-Stormwater Pond inflow channel was upgraded with triple HDPE liners. The LPP was also upgraded with a new HDPE primary liner and LCRS. These upgrades to the Stormwater Pond, Stormwater inflow channel, and LPP are described in other sections of this Fact Sheet.

Phase V-b Construction (1994): The Phase V-b expansion to the heap leach pad, approved as a minor modification, covered approximately 58.8 acres and connects to the north side of the Phase IV and the east side of the Phase V-a heap leach pad expansions. This pad expansion was designed to accommodate approximately 30 million tons of leach ore when loaded to 300 feet elevation with an initial 30-foot lift, subsequent 50-foot lifts, and a final 20-foot lift. All other design elements and construction methods used for the Phase V-b heap leach pad were identical to those used for the previous Phase V-a heap leach pad expansion.

Phase VI Construction (January & November 1998): The Phase VI expansion to the heap leach pad, approved as a minor modification, covered approximately 91.8 acres and connects to the eastern edge of Phases II, III, and IV. This pad expansion could accommodate approximately 50 million tons of leach ore when loaded to a 300-foot elevation with an initial 20-foot lift and subsequent 50-foot lifts. The pad design allows for an increased solution application rate up to 9,000 gpm cumulative for the entire leach pad, with a maximum application rate per area of 0.006 gpm per square foot. As with prior phases of construction, some design changes were incorporated into the Phase VI design and construction (significant changes from the preceding phase V of construction are noted in italics). Although not considered a truly phased construction, one portion of the pad, completed in January 1998, was loaded while the remaining portion of pad construction was not complete until November 1998.

The leach pad liner system is constructed with an 80-mil HDPE smooth liner placed on a 12-inch thick prepared subgrade, compacted to a minimum 1 x 10^{-6} cm/sec hydraulic conductivity, and covered with 12 inches of compacted protective TSF 4-1 tailings as was done for the Phase V-a/b construction. However, for Phase VI, the underdrain blanket thickness was increased to 18 inches. In addition, double-textured 80-mil HDPE liner was placed in a 400-foot-wide strip along the expanded east and south perimeter of the heap leach pad and along the full length of the liner tie-in with Phases II, III, and IV. At the tie-in seam with Phases II and III, the new 80-mil HDPE liner was extrusion welded to the existing 80-mil HDPE liner. At the tie-in seam with Phase IV, the new 80-mil HDPE liner was extrusion welded to the 40-mil VLDPE and the entire seam was capped with a welded 60-mil HDPE strip of liner.

Underdrain collection piping is again 4-inch diameter perforated CPT placed on 30-foot centers in a herringbone pattern. The collectors connect to 6-, 8-, 12-, 15- or 18-inch diameter perforated main collector pipes via fabricated wyes. An additional 18-inches of underdrain blanket material was placed over the main collector pipes.

The Phase VI design calls for the underdrain collection pipe system to connect into the underdrain collection pipe system of the existing phases. However, during construction, it was discovered that that the eastern edge of the Phase IV heap leach pad had been pushed beyond the ends of the existing 4-inch diameter perforated CPT collector pipes. In order to provide drainage in this area, 6-inch diameter perforated CPT pipe was installed along the toe of the Phase VI heap leach pad and extended to the limit of the Phase VI solution collection channel. The Phase VI 4-inch diameter perforated CPT collector pipes were connected to the 6-inch diameter CPT collector pipe with fabricated wyes to the limit of the Phase VI solution collection channel. Additionally, an existing 8-inch diameter solution collection header pipe was located at the edge of the Phase IV heap leach pad. To add drainage capacity to the Phase VI heap leach pad, the Phase VI collector pipe system was tied into the Phase VI solution collection header.

<u>Phase VII Construction (2007):</u> The Phase VII expansion to the heap leach pad was approved by the Division as a minor modification on 31 May 2006, and was constructed and commissioned by September 2008. The leach pad expansion has a footprint of approximately 51 acres. The Phase VII expansion will accommodate approximately 27.9 million tons of leach ore when completed to the maximum permitted height of 300 feet. The pad will be constructed in nominal 35-foot lifts with 38.5-foot benches. The Phase VII expansion abuts Phase V-b and Phase VI on the west and underdrain solution drains to the northwest and connects with the existing North Area Leach Project solution collection system and processing facilities.

The Phase VII leach pad composite liner system construction is very similar to previous designs with the addition of textured 80-mil HDPE in place of the smooth liner used in the earlier designs. The textured 80-mil HDPE liner is constructed on a 12-inch thick prepared subgrade, compacted to 95% maximum dry density (ASTM Method D1557) to yield a maximum 1×10^{-6} cm/sec hydraulic conductivity and is covered with a ⅛- to 2-inch thick friction layer comprised of imported sand. For pad stability considerations, fat clays identified within the pad footprint were removed from within 200 feet of the east pad perimeter and within 500 feet of the north pad perimeter and replaced with suitable fill. The HDPE liner is covered with a 12-inch thick protective layer of silty sand and/or lean clays. Tailings material from the TSF 4-1 (WPCP NEV0092100) impoundment met the required specification for protective layer material.

The underdrain solution collection system is constructed on the protective layer and covered with a 12-inch thick drainage layer comprised of coarse aggregate material. The selected coarse aggregate is underground backfill material, which contains a maximum 5% of material passing the 200-mesh sieve. The Phase VII expansion area is divided into eleven solution collection basins, each with a solution collection piping system constructed in a herringbone pattern, comprised of 4-inch diameter perforated CPT pipelines placed on 30-foot centers, which report to 8-, 12-, and 15-inch diameter perforated CPT intermediate solution collection header pipes. The intermediate header pipelines connect to two 24-inch diameter perforated CPT main collection headers that interface with the 24-inch diameter main solution collection headers from the Phase V-b and Phase VI portion of the pad. The main perforated collection header pipelines tie to solid 24-inch diameter HDPE conveyance pipelines that discharge to the lined solution conveyance channel located on the northwest side of Phase V-a.

Pad leak detection and collection consists of a Process Component Monitoring System (PCMS) constructed beneath the two main solution collection header pipelines. The Phase VII PCMS, identified as PCMS-3, consists of a 4-inch diameter perforated CPT pipeline placed in the bottom of an 80-mil HDPE-lined trapezoidal trench cut beneath the solution collection header pipeline. The trench is backfilled with clean drainage gravel and encased in 10-ounce non-woven geotextile. The geotextile limits fines migration into the system and protects the HDPE trench liner. This entire PCMS system is overlain by the 12-inch thick pad subgrade and 80-mil double-textured HDPE liner. The 4-inch diameter perforated CPT transitions to a 6-inch diameter solid HDPE conveyance pipeline that terminates at a 6-inch diameter HDPE vertical PCMS outlet sump riser located at the northwest corner of the Phase VII pad expansion.

To accommodate construction of the Phase VII pad, and subsequent Phase VIII leach pad expansion, water quality monitor wells NL-8B and NA-3A were plugged and abandoned. NL-8B was replaced with new monitor well NL-8C, located approximately 750-feet east. Monitor well NA-3A was owned by Barrick Goldstrike Mines but was not included in a water pollution control permit. In addition to abandonment and replacement of monitor wells, the Barrick Access Road and associated stormwater diversion channels were abandoned and reconstructed to the east of the pre-expansion location. The new diversion channels are rip rapped where necessary and are designed to manage peak flows resulting from the 100-year, 24-hour storm event. The approved design allows for use of select mine waste for road wearing coarse (aggregate base) only if characterized and shown to be benign.

<u>Phase VIII Construction (2013):</u> The Phase VIII expansion to the heap leach pad was approved by the Division as a minor modification on 31 May 2006, as part of the same application for the Phase VII pad expansion. All aspects of the composite liner system, solution collection system, and leak collection and

recovery system construction design are identical to the design approved for Phase VII.

The Phase VIII pad expansion is designed with a footprint of approximately 28.7 acres and to accommodate approximately 21.5 million tons of leach ore when constructed to a maximum permitted height of 300 feet. Construction occurred from May to October 2013. The pad expansion is expected to be fully loaded in September 2018. The Phase VIII expansion pad PCMS leak collection and recovery outlet port is identified as PCMS-4 and is located adjacent to PCMS-3 at the northwest corner of the Phase VII pad expansion. The PCMS-4, 4-inch diameter perforated CPT is placed in a drain-rock-encased, 80-mil HDPE-lined trench under the main solution collection channel on the west edge of the Phase VIII pad. The PCMS trench is overlain by the 12-inch thick pad subgrade and 80-mil double-textured HDPE liner. At the northwest limit of the Phase VIII pad, PCMS-4 transitions to a 6-inch diameter solid HDPE pipe shortly after crossing the Phase VIII/Phase VII boundary, and traverses under the Phase VII pad adjacent to the perforated PCMS-3 pipe to the PCMS ports at the northwest corner of Phase VII.

Phase VIII abuts Phase VI on the west and Phase VII on the north, and the majority of collected solution drains to the northwest with a small proportion draining to the south. The Phase VIII pad expansion is divided into seventeen solution collection basins with interconnected solution collection piping networks. All collected solution ultimately reports to the existing solution conveyance channel located on the west side of Phase V-a.

Phase V-b/Phase VII Solution Transfer Sump: The design and construction of the Phase V-b/Phase VII Solution Transfer Sump were approved on 31 May 2006, as part of the minor modification authorizing construction of the Phase VII and Phase VIII heap leach pad expansions. The purpose of the sump is to provide containment in the area where the perforated 24-inch diameter CPT solution collection pipelines, located in the single-lined solution conveyance channel, transition to solid 24-inch diameter HDPE conveyance pipelines that transfer solution to the process facilities.

The Phase V-b/Phase VII Solution Transfer Sump is a double synthetic-lined, individually leak detected component. The liner system is designed with a secondary textured 80-mil HDPE liner placed on a 12-inch thick prepared subgrade, compacted to 95% maximum dry density (ASTM Method D1557) to yield a maximum 1 x 10^{-6} cm/sec hydraulic conductivity. A layer of geonet, placed on the secondary liner, serves as an LCRS and is covered with the textured 80-mil HDPE primary liner. Fugitive solution collected within the LCRS reports to a sub-grade leak detection sump filled with select gravel encased in 10-ounce geotextile. The leak detection sump (LCRS-TC) may be evacuated with a dedicated submersible pump via a 12-inch diameter HDPE inclined riser pipe.

Within the Solution Transfer Sump, the solid 24-inch diameter HDPE conveyance pipelines are supported on a 12-inch thick protective layer and are stabilized in place with drainage layer material fill and two gabion mattress structures measuring approximately 9 feet long, 6 feet wide, and 12 inches thick. The lined berm of the Solution Transfer Sump is constructed to allow overflow into the lined solution conveyance channel or onto the lined heap leach pad containment in the event of a major upset.

Hydro-Jex Application: Use of the Hydro-Jex application technology was approved by the Division as an EDC modification in August 2008. The new technology, for applying solution to heap leach pads, was developed and patented by Newmont (Thom Seal, P.E., Ph.D.) and called Hydro-Jex for water chemistry **(Hydro)**-lixiviant solution i**n**jection and metal **ex**traction. The technology is principally directed at heap leach pads that have been leached previously using conventional methods and are progressing toward reclamation and closure. Hydro-Jex is used to recover gold and other metals not recovered during conventional heap leaching. The technology may also provide heap leach pad chemical stabilization benefits for closure. All but the Phase I and Phase II portions of the heap leach facility are approved for the Hydro-Jex application at some point in the operation.

Hydro-Jex holes are drilled using standard dual-rotary methods and 6-inch diameter steel casing, which is advanced as the drill hole progresses. The holes are located a minimum 100 feet from the edge of the pad and are spaced approximately 100 feet apart. Hydro-Jex hole depths vary based on the height of the heap leach pad but all holes are bottomed a minimum 50 feet above the pad liner system. Once in place, the casing is perforated at 2-foot intervals to create screened zones spaced approximately 30 feet apart. A cement plug or inflatable packer is placed in the bottom of the casing to prevent fluid flow from the bottom of the well. The top of the casing extends approximately 4 feet above the surface of the pad and is equipped with a bolted flange for attachment of the stimulation or rinsing solution piping.

Hydro-Jex wells are initially stimulated by pumping barren solution or barren solution mixed with reagents to benefit the leaching process, such as ammonium hydroxide or a mixture of milk of lime and sand as examples, into selected screened zones. The selected zones are isolated with inflatable casing packers and stimulated at pressures up to 500 pounds per square inch for approximately three hours per zone. The stimulation creates micro-fractures that radiate up to 50 feet horizontally from the well. Once the well has been stimulated, a removable plug is raised and lowered within the casing to direct leach solution by gravity flow to specific screened fracture zones. Solution may be applied to a specific zone for a period ranging from days to months, depending on the material type, depth to liner, etc. The application rate to any Hydro-Jex well will not exceed the permitted heap leach pad application rate per area.

Stability analysis indicates that the permitted Hydro-Jex application does not reduce the heap leach pad static or pseudo-static factor of safety below that calculated for non-Hydro-Jex application models. Based on the design parameters, potential for slope failure is further reduced by requiring that no two adjacent wells be operated simultaneously, that solution not be applied if standing solution is observed in a well at an elevation above the lowest screen zone, and that the wells be operated in a random pattern rather than, for example, a sequential north-to-south or east-to-west pattern.

Pregnant Solution Ponds: Two lined pregnant solution ponds, designated the Upper Pregnant Pond (UPP) and the Lower Pregnant Pond (LPP), connected by a lined spillway are used to collect pregnant leach solution from the heap leach pad and provide temporary storage of pregnant solution to balance feed to the gold recovery plant. The UPP is located on the northwest side of the Phase III heap leach pad, and the LPP is located on the northwest side of UPP. Both ponds have been upgraded and modified during the numerous phases of heap leach pad expansion, as noted above and summarized below. The current construction of the ponds is also described below, at the end of the historical summary.

The LPP was constructed during Phase I (1987), and has a nominal fluid capacity, with 2 feet of freeboard, of approximately 11 million gallons. The UPP was constructed during Phase II (1988), and has a nominal fluid capacity, with a 2-foot freeboard, of approximately 7.8 million gallons. As-built reports have not been located for the pre-regulation Phase I and Phase II construction, but a brief design report with drawings and associated correspondence are on file with the Division. Both ponds were originally constructed with a 60-mil HDPE primary liner. An HDPE geonet was placed between the primary synthetic liner and an 8-ounce geotextile layer, which was placed on the underlying 12-inch thick clay layer as part of an LCRS which reports to a separate gravel-filled sump for each pond (PP-1 in LPP, and PP-2 in UPP) equipped with an automated evacuation pump. The clay layer overlies a 12-inch thick scarified and recompacted native soil layer. Both the clay layer and underlying soil layer were compacted to 95% maximum dry density, Standard Proctor (ASTM Method D698). The clay layer design permeability was a maximum 1×10^{-6} cm/sec.

During the Phase III (1990) heap leach pad construction, the UPP lining system was upgraded to a double-layer synthetic liner system with a functional LCRS through the addition of a geonet layer over the original 60-mil HDPE primary liner, now the secondary liner, and a new 80-mil HDPE primary liner. The LCRS conveys fluid to a gravel-filled, depressed collection sump (LCRS-2) fitted with a 4-inch diameter HDPE discharge pipe that passes through the pond liner system to a 10-inch diameter HDPE vertical riser pipe equipped with a dedicated submersible evacuation pump and totalizer flow meter.

As part of the Phase IV (1991) heap leach pad expansion, the existing LPP liner system was upgraded to a double synthetic liner system with a functional LCRS.

Pond sediment, the existing 60-mil HDPE liner, and soft areas of the compacted subgrade were removed and disposed in the Mill 1 TSF. The subgrade was repaired and an additional 4- to 6-inch thick layer of soil placed, moisture conditioned, and compacted to 95% maximum dry density, Modified Proctor (ASTM Method D1557). The upgraded pond liner system consisted, from bottom up, of prepared subgrade, geotextile, geonet, 80-mil HDPE secondary liner, geonet, and 80-mil HDPE primary liner. Hydrostatic testing for leaks was successfully performed on both completed synthetic liners. Also during the Phase IV heap leach pad expansion, the LPP was outfitted with a larger gravel-filled sump for the new LCRS between the secondary and primary liners. Evacuation of the sump was facilitated through a 6-inch diameter HDPE riser pipe fitted with a dedicated submersible pump.

The LPP received further upgrades during the Phase V-a (1993) heap leach pad construction. The two existing 80-mil HDPE liners were peeled back, the existing LCRS sump and riser pipe were sealed with concrete grout and abandoned. The existing liners were repaired and covered with a second layer of geonet and a new (third) layer of 80-mil HDPE to complete the liner system. A new, gravel-filled, LCRS sump (LCRS-1) was constructed between the existing primary liner and the new primary liner.

The current UPP and LPP still have the same capacities as the original ponds (approximately 7.8 million gallons and 11 million gallons, respectively, with a 2-foot freeboard). The current UPP pond liner system, from bottom to top, consists of a 12-inch thick scarified and compacted native soil base, a 12-inch thick compacted clay layer (1×10^{-6} cm/sec permeability), an 8-ounce per yard geotextile layer, a 0.16-inch thick geonet with LCRS (PP-2), a 60-mil thick secondary HDPE liner, an HDPE geonet layer with LCRS (LCRS-2), and an 80-mil thick HDPE primary liner. Some Permittee correspondence suggests the UPP has three synthetic liners, however, record of construction reports on file do not support this claim. Because of the difference in construction between the two LCRS sumps, PP-2 has lower flow limits in the Permit than LCRS-2 (45 and 15 gallons per day (gpd) averaged quarterly and annually, respectively, for PP-2 versus 150 and 50 gpd for LCRS-2), but the Permit requires monitoring of both sumps. However, LCRS-2 is considered the primary LCRS, because it is the uppermost.

The current LPP pond liner system is similar to the UPP liner system with some notable differences. From bottom to top the current LPP liner system consists of a 12-inch thick scarified and compacted native soil base, a 12-inch thick compacted clay layer (1×10^{-6} cm/sec permeability), a 6-ounce per yard geotextile layer, a 0.14-inch thick HDPE geonet with LCRS (PP-1), an 80-mil HDPE liner (the 60-mil HDPE was removed during the Phase IV upgrade), a second HDPE geonet layer with a sealed and abandoned LCRS, an 80-mil HDPE secondary liner, a third HDPE geonet layer with LCRS (LCRS-1), and an 80-mil HDPE primary liner. Despite the presence of three HDPE liners and two current LCRS sumps, the LPP is not considered triple lined, because there is only one LCRS (LCRS-1) that is constructed to current standards between two synthetic liners. Because of the difference in construction between the two current LCRS sumps, PP-1 has lower flow limits in the Permit than LCRS-1 (45 and 15 gpd averaged quarterly and annually, respectively, for PP-1 versus 150 and 50 gpd for LCRS-1), but the Permit requires monitoring of both sumps. However, LCRS-1 is considered the primary LCRS, because it is the uppermost.

Pregnant Solution Pond French Drain: A French drain was constructed beneath both the UPP and LPP during the original Phase I/II construction. The French drain is constructed with a 4-inch diameter perforated Hancor pipe placed in a 4-foot deep trench constructed with a geotextile layer overlain with clean drain gravel. The French drain is designed to drain high groundwater to a synthetically-lined daylight sump, located in the same topographically low spot on the downgradient northwest side of LPP where the pregnant solution pond bottom LCRS ports (PP-1 and PP-2) also daylight. Any water reporting to the French drain sump is pumped and returned to the LPP sump. The French drain sump was relined and equipped with a flow alarm as part of an EDC in February 2001, following a channel liner leak. The French drain outfall pipeline and pond leak detection pipes report to separate sumps and are monitored and managed separately.

Solution Collection and Transfer Channels: All solution collection channels are triple synthetic-lined and leak detected. The liner system for each channel is, from bottom to top, a compacted clay base (maximum 1 x 10^{-6} cm/sec permeability), covered with three layers of synthetic liner material interlayered with two geonet layers to serve as an LCRS, except for the Phase I/II construction, which only has geonet between the upper two layers. The synthetic liner material type and thickness varied from phase to phase (see above for specifics). All LCRS systems report to vertical standpipe sumps that may be visually inspected and evacuated with a portable pump.

Pregnant Solution Pond Pumping Stations: Each pregnant solution pond has a pregnant solution pumping station. Pregnant solution is transferred from the pregnant solution pond to the respective pumping station using a siphon featuring a buried pipe connecting the bottom of the pond to the pumping station vault. Each pumping station is equipped with three vertical turbine pumps. Two pumps operate continuously and the third is a backup.

Both stations are similar in construction except the LPP Pumping Station, the first station constructed during the Phase I construction, has no LCRS or means to evacuate leakage. The pumping stations consist of a below-grade concrete vault with epoxy resin sealant lining the interior. Each vault sits within an envelope of sand and gravel enclosed in an HDPE liner that collects fugitive solutions that may escape the concrete vault. The UPP Pumping Station LCRS sump, identified as PS-1, is equipped with a perforated steel vertical standpipe and automatic pump to evacuate collected solution.

Gold Recovery Plant: Gold is recovered in a CIC carbon adsorption circuit located just south of the LPP within a single area that includes an enclosed building and adjacent outdoor components. Secondary containment for the carbon columns consists of the plant concrete floor and stemwalls. An 80-mil HDPE liner, placed below grade beneath the entire plant and sloped to drain to the HDPE-lined Phase I/II heap leach pad transfer ditch that forms the eastern boundary of the plant area. The buried HDPE liner provides tertiary containment for all plant components except the Barren Solution Pumping Station, for which it provides secondary containment.

The CIC process consists of two trains of six tanks (columns) each with a maximum circuit throughput capacity of 8,000 gpm and a nominal operating rate of approximately 6,500 gpm. Pregnant cyanide solution collected from the heap leach pad may be pumped from either of the two pregnant ponds through the two trains of carbon columns while the activated particles of carbon that adsorb the gold are advanced the opposite direction (counter-current) through the columns. The gold-bearing or "loaded" carbon is removed from the columns and trucked to the refinery located at the Mill 5/6-Gold Quarry-James Creek Project (WPCP NEV0090056) where the gold is "stripped" from the carbon particle substrate. The barren carbon is re-activated and returned to the carbon columns to be loaded again. Gold is refined into doré and sent off site for further purification. Once the gold is removed from the "pregnant" cyanide solution, the "barren" cyanide solution is recycled by pumping to a barren solution tank where additional sodium cyanide is added and the pH adjusted prior to returning it to the leach circuit for another application to the heap.

Barren Solution Pumping Station: A single Barren Solution Pumping Station is located at the Gold Recovery Plant. Constructed during Phase V, the pumping station recirculates barren process solution from the carbon columns back to the top of the heap leach pad. The station contains three vertical turbine pumps, one of which is for backup purposes. The vault is similar in design to that used for the UPP Pumping Station, except it is not recessed below grade like the UPP Pumping Station is, and the buried 80-mil HDPE liner under the Barren Solution Pumping Station vault underlies a much larger area. The Barren Solution Pumping station consists of a poured concrete vault placed within gravel above the Gold Recovery Plant 80-mil HDPE liner. A perforated HDPE pipe placed just above the HDPE liner collects and conveys fugitive solution by gravity into the nearby lined Solution Transfer Channel, which leads to the pregnant solution ponds.

Stormwater Pond: The current Stormwater Pond is a double-synthetically-lined process solution pond that receives overflow from the LPP. Like the LPP and UPP, the Stormwater Pond has a history of upgrades performed concurrently with heap leach pad expansions. The construction history is summarized below, followed by a description of the current Stormwater Pond. An overflow spillway conveyance channel conveys overflow solution from the LPP to the Stormwater Pond. The overflow spillway conveyance channel is described in a separate section below.

The original Stormwater Pond was an earthen pond constructed concurrently with the Phase I (1987) heap leach pad. It was created by excavating a shallow depression behind a 24-foot high earthen dam. The original pond containment consisted of a 12-inch thick scarified and compacted base of native soil, overlain by 12 inches of compacted clay. Both layers were compacted to 95% maximum dry density, Standard Proctor (ASTM Method D698).

As part of the Phase III (1990) heap leach pad construction, the existing clay layer base of the Stormwater Pond was scarified, moisture conditioned, and re-compacted to a specified maximum permeability of 1 x 10^{-6} cm/sec. A 2-foot thick layer of random fill was placed on the prepared clay layer to minimize desiccation.

During the Phase V-a (1993) heap leach pad construction, the previously unlined Stormwater Pond was upgraded by raising the earthen embankment to increase capacity and by installing a double synthetic liner system. Areas with suitable subgrade were scarified to a depth of 12 inches and, as necessary, subgrade material was imported for placement in areas without suitable material. All subgrade was contoured, moisture conditioned, and compacted to 95% maximum dry density (ASTM Method D1557). Field test results confirm that the compacted subgrade had an average permeability of no more than 1 x 10^{-6} cm/sec.

As part of the 1993 upgrade, two layers of 80-mil HDPE liner were installed on a layer of geotextile placed directly on the prepared subgrade. A layer of geonet was placed between the synthetic liners to convey any escaping fluid to a new LCRS collection sump located under the northwest corner of the pond bottom. The LCRS collection sump was constructed by encapsulating granular fill in geotextile between the primary and secondary pond liners. An 8-inch diameter carbon steel riser pipe that runs up the pond wall between the liners, and daylights at the northwest pond crest, may be used, in conjunction with a dedicated pump, to evacuate fluid.

The current Stormwater Pond construction, from bottom to top, consists of a scarified and compacted (field tested at no more than 1 x 10^{-6} cm/sec permeability) native soil subgrade, a layer of 10-ounce geotextile, a layer of 80-mil HDPE, a geonet layer connected to the LCRS sump, and a primary 80-mil HDPE liner. The LCRS sump, riser pipe, and dedicated evacuation pump remain as they were constructed in 1993.

Solution can be removed from the Stormwater Pond via a dedicated 150-gpm, 6-inch diameter pump placed in a 10-inch diameter HDPE inclined slotted riser pipe placed in the pond sump located at the northwest corner of the pond. The riser pipe connects at the pond crest to a 6-inch diameter HDPE transfer pipeline aligned along the west pond crest within the pond containment. The pipeline enters a lined transfer channel at the southwest corner of the pond and conveys solution for discharge into the pregnant solution channel that connects to the LPP and UPP.

Prior to November 2005, the Stormwater Pond was permitted for a maximum 20-day process fluid storage period. Leakage occurred during high pond volumes, leading to establishment of a Permit volume limitation of 21.2 million gallons. Both the 20-day limit and the 21.2 million gallon limit were revised as part of an EDC approved by the Division in November 2005. The EDC authorized continuous use of the Stormwater Pond as a process pond and increased the normal operating capacity limit to 26.4 million gallons. The authorization was based on a review of as-built drawings, an extensive liner repair effort, and a recalculated water balance based on new field surveys, which were submitted as part of the EDC.

Allowing for a minimum freeboard of 3 feet, the 25-year, 24-hour design storm event, and a 6-hour leach pad draindown, the Stormwater Pond currently has a maximum design operating capacity, and Permit limit during normal operating conditions, of 26.4 million gallons, which is equivalent to a minimum normal operating freeboard of 12.9 feet. The maximum pond capacity Permit limit for abnormal conditions is 58.5 million gallons, which equates to a minimum 3-foot freeboard. The 3-foot freeboard limit applies to any single event, except for a storm event in excess of the design 25-year, 24-hour storm event. The maximum pond capacity at the pond crest would be approximately 69.9 million gallons, but filling the pond to that ultimate capacity is not authorized. Because the Stormwater Pond now serves as both a process pond and an emergency overflow pond, the freeboard limits discussed above must be strictly adhered to and have been incorporated into the Permit.

LPP-to-Stormwater Pond Overflow Conveyance Channel. Process solution is conveyed to the Stormwater Pond via an overflow conveyance channel that connects the LPP overflow spillway, at the northwest corner of the LPP, to the southeast end of the Stormwater Pond. The original LPP-to-Stormwater Pond overflow conveyance channel was constructed concurrently with the Phase I (1987) heap leach pad and LPP. The LPP-to-Stormwater Pond overflow conveyance channel was originally constructed with a minimum of 6 inches of shotcrete on hand-set riprap placed over a 12-inch layer of native soil compacted to 95% maximum dry density, Standard Proctor (ASTM Method D698). The Dissipation Pond, a small pond originally constructed along the overflow conveyance channel upgradient from the Stormwater Pond, was designed to reduce the flow velocity of water entering the earthen Stormwater Pond.

The LPP-to-Stormwater Pond overflow conveyance channel was upgraded with a triple-lined containment system as part of the Phase V-a (1993) heap leach pad expansion. The Dissipation Pond was removed at this time, because it was no longer needed due to the installation of HDPE liners in the overflow conveyance channel and Stormwater Pond. Three layers of 80-mil HDPE liner were placed in the channel. Two layers of geonet placed between the triple liners convey any leakage fluid to downstream LCRS sumps constructed of granular fill encapsulated within geotextile near the downstream end of the channel. A 4-inch diameter perforated HDPE collection pipe within each sump collects fluid for conveyance through a 4-inch diameter solid HDPE pipe to a vertical 10-inch diameter HDPE pipe sump for evacuation. Both LCRS sumps, TC-3 (between the primary and secondary liners) and TC-4 (between the secondary and tertiary liners), are included in the Permit for monitoring and reporting, and both have flow rate limits of 150 and 50 gpd (quarterly and annually, respectively), but TC-3 is considered the primary LCRS, because it is the uppermost.

Make-up Water: Make-up water is primarily provided by production wells. However, the well supply may be supplemented with dewatering water from the Leeville Infiltration Project (WPCP NEV2002105) and with reclaim water from the TSF 4-2 facility. Interim storage is provided by the No. 3100 TK 47 tank.

Tailings Storage Facility (TSF) 4-2: The TSF 4-2, originally part of the Mill 4 TSF 1 & 2 Project (WPCP NEV0092100), is in temporary closure awaiting permanent closure. No tailings have been deposited since the Mill 4 Project went into temporary closure in late 1999, but non-tailings process solution inflows continued for many years from various sources, including but not limited to the TSF 4-2 Underdrain Reclaim Solution Pond, the TSF 4-2 groundwater remedial pumpback wells, the North Area Leach barren pump station, the Leeville Mine Desedimentation Facility (WPCP NEV2002105), ponds associated with the Pete Mine WRDF and refractory ore stockpile (WPCP NEV0090056), and dewatering sumps associated with underground workings at the Pete-Bajo and Exodus mines. The TSF 4-2 was transferred out of the Mill 4 Project WPCP NEV0092100, as a minor modification to that Permit, in advance of the pending final closure of that mill facility. The TSF 4-2 was transferred into the North Area Leach Project with the 2004 Permit renewal. A minor modification was approved by the Division concurrently with the 2015 renewal to allow the mining of tailings from the TSF 4-2 for use in cemented paste backfill of the Leeville Underground Mine.

Construction of the TSF 4-2 was initiated in September 1992, and completed in January 1993. Additional lifts to the embankment were constructed during 1993, 1994, and 1996. The facility was originally designed and constructed to receive an average 7,500 tons of tailings per day with a total capacity for approximately 27 million tons of material. When tailings deposition ceased in 1999, at least 6 months of capacity remained. However, permanent closure of the TSF 4-2 is required by an 31 August 2009 Order, which was written in response to groundwater degradation with nitrate that was determined to be caused by leakage from the TSF 4-2 (described below). The Permit also contains a similar requirement for permanent closure of the TSF 4-2.

The TSF 4-2 embankment was constructed using upstream methods and incorporates 2.5H:1V (horizontal to vertical) slopes on both the upstream and downstream faces. The design can contain, without discharge, all in-flows resulting from a 100-year, 24-hour storm event. Four upgradient stormwater diversion channels route precipitation flow away from the TSF 4-2 structure.

The upstream face of the embankment is lined with a QA/QC-documented, low permeability (1 x 10^{-6} cm/sec or less), 15-foot thick, soil seal compacted to 95% maximum dry density, Standard Proctor (ASTM Method D698). A 15-foot thick face drain, constructed of QA/QC documented drainage aggregate (screened mine waste rock) with no more than 7% particles passing the 200-mesh sieve, is located behind the seal zone to intercept seepage and channel it to the double-lined Underdrain Reclaim Pond. The soil seal and face drain were constructed in nominal 1-foot lifts and hydraulically tied to a cutoff trench cut a minimum of 5 feet into native soils. The upstream face of the seal zone was covered with a layer of 6-ounce geotextile and overlain with 30-mil PVC to provide erosion protection. The 250-foot wide embankment, comprised of end-dumped random fill (mine waste rock), was placed in nominal 4-foot lifts. All lifts were compacted to design specifications.

The impoundment basin subgrade was grubbed, scarified, and compacted prior to placement of a QA/QC-documented 12-inch thick soil seal zone, which was compacted to 95% maximum dry density, Standard Proctor (ASTM Method D698), and tested to confirm a maximum permeability of 1 x 10^{-6} cm/sec. A 30-mil thick PVC geomembrane liner, placed on 10-ounce geotextile, overlies the seal zone in the supernatant pond area of the basin and is tied into the lined cutoff trench.

The PVC liner has degraded by exposure to sunlight and weather over time and the resulting rips and tears required frequent repairs. To maintain the integrity of the underlying seal zone, two non-fee modifications were approved to place protective cover material on the embankment. The first modification, approved by the Division in October 2008 and completed in February 2009, consisted of placing characterized tailings material from the historic Universal Gas Tailings Facility (pre-regulation circa 1978) in a bench layer approximately 18 feet thick and approximately 50 to 100 feet wide into the basin along the southern portion of the embankment. The protective tailings cover was capped with a 1-foot thick layer of growth media. The second modification, submitted at the request of the Division and approved by the Division in September 2010, consists of placing a 3-foot-thick (horizontal) layer of screened rock backfill fines material on the exposed embankment liner and covering the fines layer with a 1-foot-thick (horizontal) layer of 6- to 12-inch diameter rip rap. The second modification resulted in covering the balance of the exposed liner on the northern portion of the embankment, except for a corridor approximately 100 feet wide that allows access to and operation of the solution evacuation pumps. In all cases, the liner, underlying geotextile, and seal zone were repaired as necessary prior to placement of cover material and inspections and necessary repairs will continue in the corridor area.

Underdrain collection pipework is comprised of 4-inch diameter CPT pipe set on 50-foot centers and tied to 6-inch diameter HDPE collection header pipes. The collection pipeline network was laid directly on the 10-ounce geotextile within the PVC-lined supernatant pond area or in finger drain trenches cut into 12 inches of drainage aggregate material (spent leach material from the North Area Leach facility) outside the PVC-lined area. The underdrain collection pipe system was covered with 18 inches of underdrain material (drainage aggregate as above) in the supernatant pond area and 12 inches of material elsewhere in the basin. A layer of 16-ounce geotextile was placed over the PVC-lined underdrain blanket material to retard fines migration in order to minimize hydrostatic head on the liner system and protect the integrity of the containment system.

Mill tailings were distributed by a pipeline placed along the embankment and attached to a series of drop bars that utilized subaerial deposition to enhance tailings consolidation and fluid recovery. Underdrain flow is collected by the main collection header, a 6-inch diameter slotted HDPE pipe located in the cutoff trench above the upstream toe of the tailings embankment. Supernatant decant fluid is collected by a decant tower comprised of a 20-inch diameter, slotted, carbon steel pipe fitted with a submersible pump.

An EDC was approved by the Division in August 2006, authorizing an upgrade to the heap leach pad-to-TSF 4-2 barren solution conveyance and make-up solution return pipeline system. The barren solution conveyance pipeline was upgraded to an 18-inch diameter HDPE pipeline within a 24-inch diameter HDPE pipeline for secondary containment. The conveyance pipeline is connected with a valve to the barren solution header on the heap leach pad. The conveyed barren solution contains only residual cyanide and no cyanide may be added when transferring solution to the TSF 4-2. Solution is discharged within the TSF 4-2 via a 100-foot-long section of the 18-inch diameter pipeline with 6-inch diameter holes cut on the upper side at 5-foot intervals. Solution can be fed to snowmakers and other evaporative sprays within the TSF 4-2 footprint. The make-up solution return pipeline consists of a 6-inch diameter HDPE pipeline within a 10-inch diameter HDPE pipeline for secondary containment. Both pipelines are routed in parallel over the TSF 4-2 embankment to avoid structural penetrations. The barren solution conveyance pipeline and make-up solution return pipeline are routed respectively through 26-inch diameter and 12-inch diameter carbon steel pipelines to span the stormwater diversion channel. The pipelines will drain by gravity back to either the heap leach pad or the TSF 4-2 containment.

Underdrain and decant flow are directed to the 800,000 gallon, double-lined and leak detected Underdrain Reclaim Pond. The pond capacity is sufficient to contain eight hours of decant and underdrain flow plus reclaim line draindown, in the event of a power outage, plus flow from a 100-year, 24-hour storm event. Underdrain Reclaim Pond construction included conditioning and compaction of underlying native soils, followed by placement of 10-ounce geotextile on the prepared subgrade to protect the overlying secondary, 60-mil thick HDPE synthetic pond liner. A layer of geonet is sandwiched between this secondary liner and the overlying 60-mil thick HDPE primary liner to create an LCRS, which reports to an 8-inch diameter, 8-foot high steel tank sump. Any fluid reporting to the sump is pumped into the reclaim pipeline.

Fluid head pressures within the tailings storage facility, which are to be maintained below an average of 2 feet of hydraulic head, are measured by a network of vibrating wire piezometers. Four piezometers are located within the underdrain blanket and two piezometers are located within the tailings solids mass.

Groundwater quality in the vicinity of TSF 4-2 is monitored with a network of downgradient monitoring wells and with upgradient monitoring wells M42W-1 and M42W-6B. Surface water quality is monitored, when flow is present, at five locations along the Rodeo Creek Diversion west and north of the TSF 4-2.

Nitrate Investigation Monitoring and Pumpback System: Nitrate ($NO_3 + NO_2$ as N) values in monitor well M42W-4 exceeded the 10 milligrams per liter (mg/L) reference value in October 2006 and concentrations in the well continued to increase since that time. Additional wells were installed to monitor and evaluate potential sources during late 2007 through 2008, ultimately resulting in the determination that the TSF 4-2 was the source of the contamination. A Finding of Alleged Violation and Order were written on 31 August 2009, followed by the submittal and approval of a Corrective Action Plan (CAP) to address the issue. Several phases of new monitoring well installation (29 total new monitoring wells), and conversion of monitoring wells to pumpback wells (11 total pumpback wells), described in part below, were required to delineate the magnitude and extent of elevated nitrate and to develop an effective groundwater remediation system. The delineated contamination is confined to a zone extending approximately 3,300 feet from the west and northwest sides of the TSF 4-2 in a northwesterly (downgradient) direction to just south of the crusher facility.

As a result of the investigation results, an EDC modification to the Permit was submitted in late February 2009, and approved by the Division in mid-April 2009, to formally place certain additional wells, two additional Rodeo Creek Diversion surface water monitoring locations, and the TSF 4-2 Underdrain Reclaim Pond French Drain (RSPS-B) into the Permit monitoring requirements. In addition, active pumping of M42W-13d was approved to reduce the downgradient migration of nitrate. Details of the EDC are contained in an NMC letter report dated 23 February 2009, and titled *"Engineering Design Change Request – Proposed Corrective Action Plan (CAP) for Nitrates in Shallow Groundwater Near W-4 [aka M42W-4] Monitoring Well, North Area Leach Project, WPCP NEV0087065"*.

An additional EDC modification was approved by the Division in early November 2010, to add Permit monitoring requirements for existing constructed monitoring wells and newly constructed wells M42W-S6 and M42W-S7; to authorize conversion of monitoring wells M42W-S3d, M42W-S5, and M42W-Bs to pumpback wells; and to construct a leak detected pumpback solution conveyance pipeline for the converted wells. The conveyance pipeline secondary containment conveys leakage by gravity to a pair of linked, 1,500 gallon capacity, containment tanks equipped with a level indicator probe for pump shutdown and alarm activation. Existing monitoring wells M42W-S2s, M42W-S3s, M42W-Ds, M42W-Dd, and M42W-5C were also converted to pumpback wells and tied into the existing conveyance pipeline system as part of an EDC approved by the Division in February 2012.

Each pumpback well is equipped with a flow meter and a submersible pump placed approximately 10 feet from the bottom of the well that will evacuate the estimated 5- to 10-gpm flow. The pumpback solution conveyance pipeline is constructed of a 2-inch diameter flexible line placed within a 4-inch diameter secondary containment pipeline. Where the pipeline crosses a haul road it is buried a minimum 6 feet deep in a backfilled pipe trench. The conveyance pipelines from each well are connected with tee-fittings to convey pumpback solution to the TSF 4-2 Underdrain Reclaim Pond. The 2-inch diameter primary pipelines are equipped with check-valves to prevent solution flow back to a wellhead at lower elevation. The secondary containment will gravity drain any leakage to two 1,500-gallon prefabricated secondary containment tanks located adjacent to pumpback wells M42W-S3s and M42W-S3d, which is located at the lowest elevation in the system (furthest northwest extent of the plume) near the southeast corner of the laydown yard on the south side of the North Area Leach crusher facility. Any collected solution would be evacuated to approved containment. Additional wells, investigation, or mitigation measures may be implemented as necessary.

Mining of TSF 4-2 Tailings for Leeville Mine Paste Fill: A minor modification (WPCP NEV0087065) was approved by the Division concurrently with the 2015 renewal to mine an approximately 25% to 75% (4.37 to 13.1 million tons) of the estimated 17.5 million tons of tailings previously deposited in TSF 4-2. The mined tailings will be used with aggregate, fly ash, and cement in approved ratios and compositions as tailings paste backfill of underground workings in the Leeville Underground Mine (WPCP NEV0090056). A major modification of WPCP NEV0090056 was previously approved by the Division in August 2014 for the tailings paste fill process and part of the containment for the plant.

The tailings mining operation will include a three-stage process, consisting of: 1) mining and internal transport to a tailings stockpile constructed within the TSF 4-2 soil liner footprint; 2) screening the tailings to remove any debris and oversize material; and 3) external transport from the TSF 4-2 tailings stockpile to the synthetically-lined tailings stockpile at the Paste Fill Plant facility. The mining stage will utilize pneumatic-tired loaders or tracked excavators, tracked dozers, and articulated 40-ton haul trucks, and will occur only during the warmer months of each year. The screening stage will utilize a mobile screening plant located on the TSF 4-2 tailings stockpile, which will be operated year-round as needed. The external transport stage will utilize articulated 40-ton, and non-articulated 200-ton or 240-ton, haul trucks, and may occur year-round, as needed, to supply the Paste Fill Plant. The distance from the TSF 4-2 tailings stockpile to the Paste Fill Plant tailings stockpile is approximately 4,800 feet (0.9 mile).

The tailings mining operation will begin near the southeast corner of TSF 4-2, beneath the approved tailings stockpile footprint. A smaller Phase I tailings stockpile, measuring approximately 380 feet by 1,000 feet and oriented with long axis to the northeast, will be constructed using a minimum 3-foot thick layer of oxide waste rock placed on top of the tailings surface (within the footprint of the TSF 4-2 soil liner), and will temporarily store tailings mined from an excavation adjacent to the stockpile on its northwest side. The initial tailings excavation will then be backfilled with more oxide waste rock and brought up to grade to expand the tailings stockpile to its Phase II final size, approximately 600 feet by 1,000 feet. The run-of-mine oxide waste rock is capped with a 2-foot thick layer of minus 2-inch diameter road plating material to form the stockpile surface, which is sloped 2% northwestward, toward the center of the TSF, to shed meteoric water and allow the stockpiled tailings to drain. After completion of the tailings mining in the stockpile footprint, the tailings mining will move to a new location near the northeast corner of TSF 4-2, and will expand westward and southward from there to its final extent.

Tailings will be mined down to a minimum of 2-feet above the top surface of the underdrainage blanket or PVC liner (in the TSF basin or supernatant pond area, respectively). A minimum of 2-feet of oxide waste rock will be placed on top of the remaining tailings, to provide additional protection for the underdrainage blanket and PVC liner, and to prevent the mining equipment from sinking into the tailings. The underdrainage blanket and TSF liners slope downward to the west, and the tailings were originally deposited on the east side of TSF 4-2, so the tailings mining operation will start in the thinnest and coarsest tailings on the east side and follow the base of the tailings downward to the west into thicker and finer tailings. If 25% of the tailings are removed, the resultant tailings excavation will be approximately 50 feet deep (below the pre-mining tailings surface) at its deepest and furthest west point. If 75% of the tailings are removed, the resultant excavation will be up to 100 feet deep.

In March 2014, the Division approved a non-fee, limited version of the tailings mining operation prior to approval of the full minor modification. The non-fee approval authorized construction of the haul road between the Paste Fill Plant and the TSF 4-2, construction of the tailings stockpile on the TSF 4-2 footprint, and limited tailings mining, screening, and stockpiling, without removal of tailings from the TSF 4-2 footprint, provided that the tailings mining not does not extend into saturated tailings or into tailings less than 15 feet above the top of the TSF underdrain blanket. The full minor modification was approved by the Division later in 2015.

A geotechnical investigation of the tailings in TSF 4-2, performed in 2011 to 2013, utilized borings and shallow test pits to determine static water depth, particle size distribution, Atterberg limits, and shear strength. These data, and a stability assessment performed as part of the minor modification using the geotechnical data, suggest that the mined cut face in the tailings excavations will be stable under static conditions at a 3H:1V final slope angle. During mining, an approximately 12-foot high working face will be excavated at a steeper angle as conditions allow, but will be continuously regraded to 3H:1V, or to a shallower angle if warranted, by a dozer working on the tailings slope above, pushing material downward to the excavator. The working face and regraded tailings slope will be monitored throughout the excavation process for slope movements, and if observed, additional precautions may be taken to safeguard personnel and containment integrity, as warranted.

One or more sumps, each equipped with a floating pump barge, will be located in topographic lows in the tailings mining excavation to convey accumulated water away from the tailings mining operation. Water accumulating in the sumps may originate from several possible sources, including, but not necessarily limited to, seepage from the tailings material, meteoric water, return water from the TSF evaporation system, and drainage from the TSF supernatant pond. Approval of an additional application is required prior to modifying, or connecting to, the existing TSF 4-2 piping system that would allow the evacuated water to be pumped to the heap leach pad, the TSF 4-2 evaporation system, or the TSF 4-2 supernatant pond. Until such an application is approved, any water evacuated from tailings excavations must not be pumped outside of the TSF 4-2 liner system.

The skid-mounted tailings screen plant is located on the tailings stockpile, which is wholly contained within the TSF 4-2 soil liner footprint. The screen plant removes any debris and any other material greater than ½-inch in diameter from the tailings before it is transported to the Paste Fill Plant. The Permittee estimates that a maximum of 10% of the mined tailings material (probably much less) will be screened out and will remain within the TSF 4-2 footprint. The minus ½-inch screened tailings fraction will then be transported from the TSF 4-2 tailings stockpile to the Leeville Paste Fill Plant tailings stockpile for use in the paste fill. Particle size distribution tests performed on the tailings material confirm that the TSF 4-2 tailings consist predominantly of silt- and sand-sized particles that will easily pass through the screens at the screen plant. Any water used by the screen plant will be obtained from within the limits of the TSF 4-2 soil liner, so as not to add to the TSF 4-2 fluid inventory.

The 2015 renewal Permit requires submittal of a final plan for permanent closure (FPPC) for TSF 4-2, and implementation of the FPPC once approved. A previous FPPC for TSF 4-2 was rendered obsolete when the Permittee decided to mine the TSF 4-2 tailings. According to the tentative plan for permanent closure (TPPC) included with the minor modification to mine the tailings, at closure the remaining tailings will be covered with 3 feet of growth media and revegetated. The north TSF 4-2 embankment will be breached to create a drainage channel capable of conveying meteoric water from the probable maximum precipitation (PMP) 24-hour storm event out of the TSF 4-2 footprint and into an existing diversion channel north of TSF 4-2. The maximum slope angle of growth media over tailings will be 3H:1V, and the maximum slope angle of the embankment drainage channel walls will be 2.5H:1V.

Post Pad No. 1 Heap Leach Pad and Draindown Collection System: The Post Pad No. 1 heap leach pad and draindown solution collection system were transferred as an EDC modification from the TSF 1 WPCP NEV0092100 to the North Area Leach Project Permit for management and monitoring purposes following the sale of the Mill 4 facility to Barrick Goldstrike Mines Inc. (BGMI). Newmont originally acquired the Post Pad No. 1 facility through a land exchange with BGMI in 1999.

The facility is comprised of a 14.9-acre heap leach pad and solution ponds. In an 13 August 1990 correspondence, BGMI requested Division approval to permanently close the facility. In correspondence dated 06 September 1990 and 03 October 1990, the Division indicated concurrence with the BGMI proposal for closure of the Post Pad No. 1, solution ponds, leach pad monitoring ports, monitoring locations GWOP-1 through GWOP-4, and placement of waste rock on top of the leached material.

The remaining responsibility is for heap effluent handling and monitoring, and stabilization of the effluent handling system into a permanent closure scenario in accordance with an approved FPPC. Effluent is currently collected in a tank located at the toe of the heap leach pad. The tank is routinely evacuated and the solution is taken to TSF 4-2 or other North Area Leach process facilities for use as reclaim water.

Pit Lake Predictive Studies: Two open pits associated with the approved Genesis Project expansion, to be located within the immediate North Area Leach facility area, have the potential to form pit lakes. The pits are the existing Genesis Pit that will be deepened and widened, and the new West Genesis Pit that will be developed as part of the Genesis Project. Extensive characterization of pit wall rock and waste rock and a pit lake water quality predictive study (pit lake study) were completed as part of the 2009 renewal application. For the 2015 renewal, a few minor changes to the Genesis Project warranted a Permit Schedule of Compliance item requiring updates to the pit lake studies for the Genesis and Tara Pit Lakes, and to the groundwater hydrogeochemical model for the approved Genesis Pit and West Genesis Pit backfills. The Genesis Pit Lake study is for the scenario where the approved expansion of the Genesis Pit does not occur, and the groundwater hydrogeochemical model is for the scenario where the approved Genesis Project is fully implemented. The Tara Pit will not be backfilled.

The Division approved the backfilling of the Genesis and the West Genesis pits with waste rock to an elevation above the pre-mining groundwater elevation to preclude formation of pit lakes after the cessation of mining and associated regional dewatering activities. However, if no further mining occurs and the Genesis Pit remains at its current depth of 4,950 feet above mean sea level (AMSL) without backfill, pit infilling by groundwater and the formation of a pit lake is expected to begin in the year 2131, if mining and dewatering cease at the Leeville Mine in 2018. The pit will fill slowly and once groundwater equilibrium is established, regional groundwater will flow slowly at about 1-2 gpm from the Genesis Pit north toward the Betze/Post Pit where groundwater elevations are approximately 20 feet lower. Due to high predicted evaporation rates, the Genesis Pit Lake would become essentially a terminal lake over time and evapoconcentration would increase solute concentrations. As a result, if the Genesis Project mining and backfill does not occur, the final Genesis Pit Lake is predicted to exhibit an alkaline pH of 8.2-8.6 standard units (SU) and relatively high concentrations of arsenic (2.9 mg/L) with the potential for low-volume flow-through to groundwater. Mitigation would be required if this scenario occurred, to eliminate the predicted potential for groundwater degradation.

Based on documentation submitted with the 2009 Permit renewal application, if the Genesis Project mine expansion occurs, the Genesis Pit will reach an ultimate mining depth elevation of 4,640 feet AMSL and the West Genesis Pit will reach a final mining depth elevation of 4,820 feet AMSL. Leeville Mine dewatering is predicted to lower the local groundwater elevation to approximately 3,600 feet AMSL by the year 2018. Based on the approved mining plan and model, the Genesis Pit would begin to refill in about the year 2054 and be approximately 90% filled by the year 2347. Groundwater would begin filling the West Genesis Pit in about the year 2079.

The pits will be backfilled with both non-PAG and PAG waste rock. The latter will only be placed and fully encapsulated within a minimum 10-foot thick envelope of neutralizing material (acid neutralization potential to acid generation ratio (ANP/AGP) $\geq$ 3:1) at an elevation at least 20 feet above the maximum predicted groundwater rebound elevation. The predicted post-mining groundwater rebound elevation in the Genesis Pit backfill is approximately 5,236 feet AMSL. Therefore, only non-PAG waste rock will be placed below the predicted groundwater rebound elevation and be inundated by recovering groundwater. An approved waste rock management plan provides procedures and protocols for waste rock placement. Based on modeling, completed in-pit backfill will be covered with a minimum 2-foot-thick layer of compacted soil cover.

Groundwater hydrogeochemical modeling and extensive pit wall rock and waste rock static and kinetic test characterization indicate the inundated backfill will actually decrease the potential for degradation of groundwater during future pit infilling by groundwater and recovery of the local water table elevation. Results of solute transport studies and attenuation studies indicate future groundwater chemistry will meet water quality standards and exceed the water quality of reference samples collected since August 1992, from background water quality monitoring well DS-66.

The existing Tara Pit was mined in the early 1990's and material was placed on the North Area Leach heap leach pads. The Tara Pit, located approximately 2 miles northwest of the Genesis/West Genesis pits, will develop a pit lake once dewatering ceases for other mines in the area. The *"Tara Pit Lake Water Quality Prediction Update"*, dated March 2007, predicts the pit lake will begin to form in the year 2136 and will be approximately 90% filled at the end of year 2313. Infilling of the downgradient Betze/Post Pit will create a hydraulic flux from the Tara Pit making it a flow-through pit lake. Groundwater modeling and static and kinetic testing of pit wall rock indicate the predicted pit lake water quality will meet Division Profile III reference values, except for a slight predicted exceedance of the fluoride reference value (2.1 mg/L versus 2.0 mg/L reference value). The predicted antimony concentration in the Tara Pit Lake after 300 years is 0.037 mg/L, which is slightly higher than the average background groundwater concentration in the area (0.024 mg/L), but lower than the maximum background groundwater concentration in the area (0.3 mg/L). All other predicted Profile I constituent concentrations are lower than either the Profile I reference value or the average background groundwater concentration in the area. Therefore, the water quality predictive model concludes that the Tara Pit Lake will not have the potential to degrade waters of the State, despite being a flow-through pit lake.

The Permit requires that an updated pit lake study and ecological risk assessment be submitted with each Permit renewal application or prior to any operational or facility change or modification that could affect the predictive model. The Schedule of Compliance item incorporated into the 2015 renewal Permit addresses this requirement.

C. Receiving Water Characteristics

The North Area Leach Project is located on the west side of the Tuscarora Mountains, in the Little Boulder Basin tributary of Boulder Creek Basin. Rodeo Creek flows into but does not exit Little Boulder Basin.

Rodeo Creek is an ephemeral stream with some perennial reaches. During spring months (April through May), snowmelt and occasional spring precipitation produce flow within the ephemeral drainages. Ephemeral flows during mid- to late-summer are in response to local, often intense, short-term thundershowers.

Local surface water quality varies from good to poor and can be classified as calcium bicarbonate type. The highest quality water is found in Boulder Creek, which flows in large quantities but typically only during a few periods of the spring runoff. The surface water will vary from near neutral to moderately alkaline; pH values of greater than 10.0 SU have been recorded for the waters of Boulder Creek. The surface water has a relatively low content of suspended solids with a maximum of approximately 20 mg/L and total dissolved solids (TDS) content of approximately 200 mg/L. The overall water quality is variable but generally meets drinking water standards.

Two groundwater regimes, an upper unconfined, probably perched system, and a lower, regional confined aquifer system, occur in the Project area. The upper zone, within the Carlin formation, occurs at depths as shallow as 30 feet below ground surface (bgs) and may contribute to locally observed and suspected artesian-type flow. The lower zone, in the underlying Paleozoic bedrock, is representative of the actual regional bedrock aquifer system with static water levels greater than 100 feet bgs.

Groundwater in the vicinity of the Project contains high arsenic levels, and locally high antimony levels, due to natural geologic conditions, similar to those that produced the gold mineralization in the region. The highest groundwater arsenic concentration detected to date is 0.36 mg/L. Background groundwater antimony concentrations vary widely in the Project area from 0.001 mg/L to 0.3 mg/L. The water is typically alkaline, with pH ranging from about 7.1 SU to 8.9 SU. TDS range from 200 to 300 mg/L, while the concentration of barium ranges from 0.06 to 0.11 mg/L, boron from 0.09 to 0.13 mg/L, magnesium from 6.2 to 12.0 mg/L, and manganese from less than the limit of detection to 0.25 mg/L.

D. Procedures for Public Comment

A Notice of Intent to issue this Permit authorizing the operator to construct, operate and close the facility, subject to the conditions within the Permit, was sent to the **Elko Daily Free Press** for publication. The Notice was mailed to interested persons on the Bureau of Mining Regulation and Reclamation mailing list. Anyone wishing to comment on the proposed Permit can do so in writing within a period of 30 days following the date of public notice. The comment period can be extended at the discretion of the Administrator. All written comments received during the comment period will be retained and considered in the final determination.

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

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

E. Proposed Determination

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

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

See Section I of the Permit.

G. Rationale for Permit Requirements

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

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

H. Federal Migratory Bird Treaty Act

Under the Federal Migratory Bird Treaty Act, 16 U.S. Code 701-718, it is unlawful to kill migratory birds without license or permit, and no permits are issued to take migratory birds using toxic ponds. The Federal list of migratory birds (50 Code of Federal Regulations 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 (covering with netting), and 2) chemical detoxification. These approaches may be facilitated by minimizing the extent of the toxic water. Methods which attempt to make uncovered ponds unattractive to wildlife are not always effective. Contact the U.S. Fish and Wildlife Service at 1340 Financial Boulevard, Suite 234, Reno, Nevada 89502-7147, (775) 861-6300, for additional information.

Prepared by: Thomas E. Gray
Date: 07 April 2015

Revision 00: Renewal 2015, effective Day Month 2015, and minor modification TSF 4-2 tailings removal; Includes EDC for PCS Management Plan approved 20 June 2014, non-fee modification for Leeville PAG waste placement in Beast and Genesis In-Pit WRDFs 06 May 2014, and Phase VIII leach pad as-built report October 2013; Also includes boilerplate updates.