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GROUND WATER QUALITY DISCHARGE PERMIT UGW450002

STATEMENT OF BASIS

Barrick Mercur Reclamation Project
Tooele County, UT

December 2018

Introduction

The Division of Water Quality (DWQ) under the authority of the Utah Ground Water Quality Protection Rules¹ (Ground Water Rules) issues ground water discharge permits to facilities which have a potential to discharge contaminants to ground water². As defined by the Ground Water Rules, such facilities include mining operations.³ The Ground Water Rules are based on an anti-degradation strategy for ground water protection as opposed to non-degradation; therefore, discharge of contaminants to ground water may be allowed provided that current and future beneficial uses of the ground water are not impaired and the other requirements of Rule 317-6-6.4.A are met.⁴ Following this strategy, ground water is divided into classes based on its quality⁵; and higher-quality ground water is given greater protection⁶ due to the greater potential for beneficial uses.

DWQ has developed permit conditions consistent with R317-6 and appropriate to the nature of the stored material, facility operations, maintenance, best available technology⁷ (BAT) and the hydrogeologic and climatic conditions of the site, to ensure that the operation would not contaminate ground water.

Basis for Permit Renewal

This Permit is being renewed in accordance with R317-6-6.8 which states that a permit may be terminated or a renewal denied if any one of the four items below applies:

- A. Noncompliance by the permittee with any condition of the Permit where the permittee has failed to take appropriate action in a timely manner to remedy the Permit violation;
- B. The permittee's failure in the application or during the Permit approval process to disclose fully all significant relevant facts at any time;

¹ Utah Admin. Code Rule 317-6

² https://deq.utah.gov/ProgramsServices/programs/water/groundwater/docs/2008/08Aug/GWQP_PermitInfo.pdf

³ Utah Admin Code Rule 317-6-6.1A

⁴ Preamble to the Ground Water Quality Protection Regulations of the State of Utah, sec. 2.1, August, 1989

⁵ Utah Admin. Code Rule 317-6-3

⁶ Utah Admin. Code Rule 317-6-4

⁷ Utah Admin. Code Rule 317-6-1(1.3)

- C. A determination that the permitted facility endangers human health or the environment and can only be regulated to acceptable levels by plan modification or termination; or
- D. The permittee requests termination of the Permit.

Background

PERMIT HISTORY

Barrick Mercur Mine (**Figure 1**) operated gold mining and processing facilities at Mercur from 1982 through 1998. During this period ground water quality discharge permit UGW450001 was issued for Valley Fill Leach Area 3 (VFL3) and UGW450002 was issued for the Reservation Canyon Tailings Impoundment. Also during that period, the Division issued Stipulation and Consent Order Docket No. GW90-03-A to resolve operational issues associated with Valley Fill Leach Area 2 (VFL2). The mine entered full closure status in April 1998.

Permit UGW450001 expired in December 1999. The Consent Order for VFL2 remained in effect during the model demonstration period through 2001. In light of the closure status of the mine and the inter-relationships of the facilities discussed above, consolidating the Consent Order stipulations and both groundwater permits into a single enforceable regulatory tool in 2000 was deemed appropriate. This approach incorporated the applicable terms and conditions of Permit UGW450001 into Permit UGW450002. The permit also referenced the terms and conditions of the Consent Order for VFL2. Permit UGW450001 was terminated in 2000 with the effective permit modification date of Permit UGW450002.

The Permittee maintained a record of compliance with the conditions of permit UGW450001, including the VFL2 Consent Order, through the previous permit term prior to incorporation into UGW450002 in August 2000. The Permittee has also maintained a record of compliance with the conditions of UGW450002 both prior and subsequent to the incorporation of UGW450001 and the VFL2 Consent Order into UGW450002 in August 2000. No adverse effects to ground water, the environment or public health are known to have occurred due to the operation of VFL3, VFL2, or the tailings impoundment during this period.

Barrick will continue to transfer neutralized VFL3 draindown water and tailings impoundment incidental seepage to the East Bay (a lined facility integral to the Reservation Canyon Tailings Impoundment) through the end of the closure period as needed until such time that treatment of the East Bay water has met the approved goals and objectives for discharge to an onsite location under Permit UGW450002. Barrick has completed the cessation of operations and reclamation of VFL3 associated with this permit as well as the complete closure of VFL2.

Permit UGW450001 was incorporated into UGW450002 on the basis that: 1) all ground water protection levels have been and will continue to be met; 2) the sampling, monitoring and reporting procedures are deemed adequate to determine compliance with the applicable requirements; 3) there is no expected impairment of present or future

beneficial uses of ground water; and 4) final closure of VFL3 will be completed under the provisions of UGW450002.

DESCRIPTION OF FACILITIES (**Figure 2**)

Valley Fill Leach Area No. 2 - This facility is located in the NE ¼ of Section 8, Township 6 South, Range 3 West, and the SE ¼ of Section 5, Township.6 South, Range 3 West in the saddle between Manning and Mercur Canyons in the southern Oquirrh Mountain range of Tooele County. Barrick Mercur Mine operated VFL2 for the extraction of gold using cyanide solutions. This facility was closed in July 1993, was neutralized in September 1994, and covered by November 1995. The facility remains subject to the conditions of Stipulation and Consent Order GW90-03-A now contained in Permit UGW450002. Those conditions remaining are ground water monitoring and dewatering of the leach pad. The facility is limited to one cell approximately 1,200 feet long and 500 feet wide. During 1998, an infiltration manhole was installed through the cover to accommodate the infiltration of incidental area flows and seepage. Final cover placement on VFL2 was completed in September 1995. Barrick intends to grout the leakage collection pipe closed, and reclaim the leakage collection system area. Barrick completed the 5-year post-closure monitoring of the leakage collection system in April 2001 and demonstrated that post-closure monitoring results met previous modeled predictions for the system and drilled out the VF2 liner. Residual waters have been modeled to be *de minimis* with respect to probable impacts to ground water quality at the property boundary.

Valley Fill Leach Area 3 - This facility is located in the SW ½ of the SW ¼ of Section 32, Township 5 South., Range 3 West, and the NW ¼ of Section 5, Township 6 South, Range 3 West, in Mercur Canyon in the southern Oquirrh Mountain range of Tooele County. Barrick Mercur Mine operated VFL3 for the extraction of gold using cyanide solutions from January 1991 through 1997. The facility is now reclaimed and awaiting final, permanent closure. The facility is limited to one cell approximately 1,700 feet long and 750 feet wide. At the end of the facility's life, it contained approximately 5 million tons of spent heap leach ore with an average depth of 150 feet. The heap was neutralized during 1997 and covered during 1998. In 1997, a vertical solution dewatering well was put in place to pump in concert with the pumping cistern the remaining fluids from this leach area and transport via pumping and piping to the East Bay lined cell within the Reservation Canyon Tailing Impoundment. After the free draining fluids in VFL3 achieve model-predicted flow rates, the wells will be removed and final closure will be complete. Residual waters have been modeled to be *de minimis* with respect to probable impacts to ground water quality at the property boundary.

Reservation Canyon Tailing Impoundment (incl. East Bay) - The tailings impoundment is located in Reservation Canyon in the southern Oquirrh Mountain range on the Tooele/Utah County line in Section 5 of Township 6 South, Range 3 West Salt Lake Base and Meridian. Barrick Mercur Mine operated the tailings impoundment for the disposal of waste material from the beneficiation and processing of gold from its gold milling operation. The tailings facility consists of a saddle dam, main dam, upstream levee, internal East Bay lined cell, approximately 27 million tons of deposited mill tailings, and

all drains and external containment ponds associated with the main dam and saddle dam. The tailings treatment system is no longer in use as the milling operations have been dismantled and removed.

No new facilities are proposed.

Ground Water Quality

Ground Water Classification. Based on the total dissolved solids data from eleven monitoring wells at the site the ground water is defined as both Class IA Pristine Ground Water and Class II Drinking Water Quality Ground Water. The average total dissolved solids values from the wells range from 345 mg/l to 2,124 mg/l.

Background Concentrations - When greater than 50% of the background samples for a particular constituent were detectable, background was determined by estimating the mean and standard deviation of all background samples.

Protection Levels - Class IA ground water is protected as pristine ground water and Class II ground water is protected for use as drinking water or other similar beneficial use by the Ground Water Quality Protection Rules, UAC R317-6. Protection Levels are determined based on the criteria of UAC R317-6.4 taking into account naturally occurring degradation in accordance with UAC R317-6-6.10.

No substantial modification to the Compliance Schedule is proposed in this permit renewal.

Groundwater Monitoring - The Permittee has installed eleven monitoring wells at the site. Dry wells are not used as compliance monitoring points under this permit. Wells MW-1, MW-2, MW-9, MW-10, MW-11, MW-13, MW-15, MW-16, MW-17, MW-18, and MW-19 will be used as compliance monitoring wells. These wells will be monitored for metals, inorganic ions, pH, cyanide, nitrate, nitrite, ammonia and total dissolved solids. Routine monitoring and reporting will be on a semiannual basis.

Closure and Reclamation

Permanent closure and final reclamation of the VFL3 and the Reservation Canyon tailings impoundment was initiated in 1998 as part of a mine-wide closure. Under previous versions of these permits, permanent closure and final reclamation requirements that are protective of ground water were incorporated. These include the following activities that have been implemented.

Tailings Impoundment

1. Placement of perforated drainage pipes with a drain gravel cover in the concrete drainage aprons, encapsulating the gravel drains with filter fabric, and covering of drains with subsoil and top soil.
2. Covering and re-vegetative seeding of the downstream embankments of the Main Buttress and Levee Buttress with a minimum one-foot thick layer of subsoil and a minimum one-foot thick layer of topsoil.

3. Covering and re-vegetative seeding of the area between the Levee Buttress and the Saddle Dam.
4. Design and construction of a storm water diversion channel through the Saddle Dam to permit free drainage of storm water that falls between the Levee Buttress and the Saddle Dam.
5. Re-grading crest height of the Buttress Embankment rock fill onto the tailings beach leaving a normal six-foot high interim rock fill berm above the tailings surface for storm water control and freeboard.
6. Placement of cover system over the tailing surface.
7. Installation of an incidental area flows and seepage pipeline connection to an infiltration manhole in the Valley Fill Leach Area No. 2 facility.
8. Upgrading existing, and construction of additional interim storm water diversion channels.

Valley Fill Leach Area 3

1. Dismantling and removal of process facilities.
2. Implementation of permanent closure and final reclamation by re-grading, re-contouring, shaping, placement of a soil cover system (minimum 3 feet of subsoil and minimum 1 foot of top soil) and re-vegetative seeding of the Valley Fill Leach Area No. 3 facility.

Valley Fill Leach Area 2

1. Dismantling and removal of process facilities.
2. Completion of contouring, shaping, placement of a soil cover system (minimum 3 feet of subsoil and minimum 1 foot of top soil) and re-vegetative seeding of the Valley Fill Leach Area No. 2 facility.

COMPLIANCE SCHEDULE

Compliance Monitoring Wells - Barrick has installed six monitoring wells at the tailings impoundment, four wells at Valley Fill Leach Area No. 3, and one well at Valley Fill Leach Area No. 2. All eleven wells will be used as compliance monitoring points through the life of the permit unless modified by the Director. Barrick will maintain its current ground water monitoring well network in compliance with the requirements of this permit.

All sampling and reporting will comply with the Quality Assurance Project Plan (Appendix A of the permit). Compliance monitoring and reporting will be completed on a semi-annual basis.

No substantial modification to the Compliance Schedule is proposed in this permit renewal.

FIGURES

Figure 1 – Site Location Map

Figure 2 – Facility Map