



# STATE OF NEVADA

Department of Conservation & Natural Resources

DIVISION OF ENVIRONMENTAL PROTECTION

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Web posting 5/4/2010

Notice of Decision

Permit #NEV0000020

Queenstake Resources USA, Inc.

Jerritt Canyon Mine

The Nevada Division of Environmental Protection has decided to renew Water Pollution Control Permit NEV0000020 to Queenstake Resources USA, Inc. This permit authorizes the construction, operation, and closure of approved mining facilities in Elko County. The Division has been provided with sufficient information, in accordance with Nevada Administrative Code (NAC) 445A.350 through NAC 445A.447, to assure the Division that the waters of the State will not be degraded by this operation, and that public safety and health will be protected.

The permit will become effective May 18, 2010. The final determination of the Administrator may be appealed to the State Environmental Commission pursuant to Nevada Revised Statute (NRS) 445A.605 and NAC 445A.407. All requests for appeals must be filed by 5:00 PM, May 13, 2010, on Form 3, with the State Environmental Commission, 901 South Stewart Street, Suite 4001, Carson City, Nevada 89701-5249. For more information, contact Rob Kuczynski, P.E. at (775) 687-9441 or visit the Division's Bureau of Mining Regulation website at [www.ndep.nv.gov/bmrr/bmrr01.htm](http://www.ndep.nv.gov/bmrr/bmrr01.htm).

One comment letter was received during the public comment period. The letter, dated April 2, 2010 was received electronically from Mr. John Hadder, Staff Scientist, Great Basin Resource Watch (GBRW) and included a hydrological review by Tom Myers, PhD. Division responses to the GBRW comments are attached to this Notice of Decision.

GBRW Comment #1: "Great Basin Resource Watch (GBRW) has serious concerns regarding both ground and surface water contamination at the Jerritt Canyon site." ... "[W]e would not support further mining activities until clear and substantial actions are underway to arrest the problems at the site. We do recognize that there has been progress recently, especially after the October 29 [October 13, 2009] Consent Decree, and encourage NDEP to continue in this path towards mitigation and permanent closure of the contaminating elements of the site."

NDEP Response: Comment noted.

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GBRW Comment #2: "There are two fundamental problems at the Jerritt Canyon site...that GBRW...sees the need for action and resolution..."..."First, is the seepage from various waste rock facilities that are contaminating surface water and groundwater and thus "degrading the waters of the [S]tate."..."Second, is the leaking tailings facility...the extent of the contamination plume needs to be determined and the facility closed promptly."..."[T]here exists [within the schedule of compliance] requirements...to address these problems."..."[T]he tailings facility has been a known problem for many years, we urge that NDEP require the Final Permanent Closure Plan well before December, 2010."

NDEP Response: The Division will not allow any further expansion or construction of additional lifts for the existing Tailings Storage Facility (TSF). As a result, the available storage capacity for the TSF is limited. Schedule of Compliance items I.B.9 and I.B.10 in the 2010 Permit Renewal require the Permittee to submit by December 31, 2010, a Major Modification for the design, construction, operation and closure of a new TSF and a Final Permanent Closure Plan (FPCP) for the existing TSF.

GBRW Comment #3: "An additional study of the seepage from the impoundment and evaporation pond is required to optimize pumpage. This study should include a detailed fate and transport model for the area. This would allow prediction of future pathways away from the site."

NDEP Response: The Permittee submitted the revised "Jerritt Canyon Seepage Remediation System (SRS) Performance Assessment and Optimization Plan—April 1, 2010" to the Division for review on April 2, 2010. This document was available for Public Review.

GBRW Comment #4: "[The Permittee] should install several multiport wells downgradient from the existing wells. The monitoring well would be at least 300 feet deep to fully span all potential layers, recognizing that an intermittent clay layer may have segregated the contaminants into layers. In others, the natural heterogeneity of the alluvium beneath and downgradient from the facilities would cause concentrations to vary significantly with depth. At least three wells, 300 feet deep, with multiple screens starting at first water and space every 20 feet with 10-foot screen lengths should perimeter the site to the east and southeast. Each port would be sampled quarterly."

NDEP Response: The installation of additional wells was one of the many recommendations highlighted in the "Jerritt Canyon Seepage Remediation System (SRS) Performance Assessment and Optimization Plan—April 1, 2010".

The Division is requiring optimization of the SRS and in response, the Permittee has begun implementation of the submitted SRS Optimization Plan.

Facilities that have installed multi-screened wells have experienced installation, operational and maintenance difficulties along with mixed performance results. Because of this, the Division does not recommend the installation of multi-screened wells and encourages facilities to install multiple individual wells screened at specific depths.

GBRW Comment #5: "Based on the fate and transport model and new well monitoring data, [the Permittee] should propose and design and plan to permanently stop the degradation; this plan should consider seriously the closure of the [Tailings Storage] facility."

NDEP Response: Refer to the Division response to GBRW Comment #2.

GBRW Comment #6: “[GBRW recommends that the Permittee] increase the surface monitoring locations along the surface waters to accurately determine the location and extent of seepage from the mine facilities to assess water quality upgradient and downgradient of the facilities.” ... “[R]elocate monitoring locations that are too far (up to two miles) below the mine facilities to avoid a zone for dilution and attenuation that does not provide for the monitoring of potential dead zones.”

NDEP Response: Depending on the particular surface water monitoring site and seasonal accessibility, surface waters are monitored for specific constituents either monthly or quarterly and annually. The Division has determined that an expansion in the number of surface water monitoring sites or increase in monitoring frequency is not warranted at this time. In the event monitoring results from the existing surface water monitoring sites dictate the need to increase monitoring frequency or expand the number of monitoring locations, the Permittee will be required to do so.

GBRW Comment #7: “[GBRW recommends that the Permittee] add water balance covers with GCLL [GCL] covers to minimize seepage through the waste rock dumps that are degrading surface waters. This would help avoid the need for treatment in perpetuity.”

NDEP Response: Covering the waste rock dumps is just one of the many options the Permittee is actively investigating to address the poor quality seepage from the waste rock dumps.

GBRW Comment #8: “[GBRW recommends that] if there is insufficient monitoring, the draft permit should add monitoring wells near the ore stockpile.” ... “[I]f there is seepage from the ore stockpile, [the Permittee] should upgrade the base liner to minimize said seepage.”

NDEP Response: The Division has determined that additional monitoring wells are not necessary downstream of the Ore Stockpile Pad at this time. In the event monitoring results from the existing wells dictate the need for more frequent monitoring or the installation of additional monitoring wells, the Permittee will be required to do so.

The Ore Stockpile Pad was upgraded in 2006 to meet the current design criteria pursuant to Nevada Administrative Code (NAC) 445A.434. The existing cover gravels were removed to the base of the pad and the exposed base was regraded to direct meteoric run-off to a designated stormwater collection sump located at the eastern corner of the upgraded pad area. The base grade of the pad was graded to maintain stability for the stockpiled ores and a perimeter berm was constructed to surround the stockpile pad. The Permittee is required to monitor and inspect weekly, the performance of any pipelines, collection sumps and other ancillary structures as required under Part I.I of WPC Permit NEV0000020.

GBRW Comment #9: “The fact sheet mentions the Consent Decree [Decree], but does not describe the history of reaching that decree beyond mention of the 2008 finding of alleged violation.” ... “The Decree was apparently a settlement of litigation initiated in 2009, and NDEP should not be shy about describing the history of this litigation.” ... “[The Division] should also describe Queenstake’s failure to comply with the Consent Decree, which resulted in a “Total Stipulated Penalty” of \$2,692,500.”

NDEP Response: The October 13, 2009 Consent Decree (and settlement) is a stand alone document that was developed after several months of intense negotiation among all involved parties and covers issues specific to the WPC Permit. The Decree and associated correspondence were made available for review during the public comment period.

The purpose of the Fact Sheet is to provide background information relating to and in support of the WPCP. It is not intended to serve as a comprehensive history for the Jerritt Canyon facility.

GBRW Comment #10: "The Fact Sheet notes that dewatering has occurred at the existing site, and that it is not reinjected, because of high suspended sediment, but is used on site...NDEP should require that dewatering water be sampled at least quarterly to demonstrate whether the underground mining affects this water quality; NDEP requires most mines which have dewatering to sample the water being dewatered".

NDEP Response: Pursuant to the Permittee's current underground mining plan, all underground exploration and development will be performed above the water table. Schedule of Compliance item I.B.7 states the following: At least ninety (90) days prior to any underground exploration, development or mining below the elevation of the natural water table, the Permittee shall submit to the Division for prior approval, a mine-specific Dewatering Water Management Plan (DWMP) for the management of groundwater encountered. The DWMP must include the following information: representative Profile I analytical results for the dewatering water, the anticipated volume of dewatering water to be managed, a detailed description of where and how the water will be managed; a technical demonstration that waters of the State will not be degraded by dewatering; and a detailed description of a monitoring program to demonstrate compliance.

GBRW Comment #11: "The Fact Sheet discusses the surface water around the site including a description of the current water quality conditions. The only problem is that it describes current conditions."..."Because the conditions have mostly been affected by mining, it would be more useful to discuss the changes that have occurred over a given time period."

NDEP Response: Since the Jerritt Canyon facility predates Nevada Administrative Code (NAC) 445A.350 through 445A.447, a minimal amount of pre-mining surface water quality data was collected. Furthermore, since facility ownership has changed several times, the amount of historical surface water quality data retained on site is also limited.

GBRW Comment #12: "[I]nconsistencies in the data presentation [in the 2010 Renewal Application] make the reviewer question the overall accuracy of the data presented in support of the renewal of this permit. The assessment also discusses surface water in a cursory fashion using data from the early 90s and also from 2008. The assessment mentions many sites where the water quality exceeds relevant standards; it also notes drainages with mining disturbance. However, there is no trend analysis or significant assessment of the seepage from the water [waste?] rock."

NDEP Response: Refer to the Division response to GBRW Comment #11.

GBRW Comment #13: "The Jerritt Canyon tailings impoundment has leaked and been degrading nearby groundwater since the mid-1980s. The Fact Sheet ...should state in the that the leak[age] is an illegal degradation of waters of the state."..."A seepage remediation system (SRS) has operated for some time Queenstake"..."NDEP has properly issued a notice of alleged violation,

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litigated and signed a consent decree related to the remediation of the degraded groundwater near the tailings impoundment."... "[T]he SRS is not successful and the regulatory stances taken by NDEP have not sufficiently prodded Queenstake to fix the problem."... "Downgradient concentrations have not gone down. Seepage at the base of the facility has increased with new seepage being discovered as recently as 2008"... "At best, the SRS contains the degradation from leaving the site."... "As long as the contaminants are just recycled, the site will not be remediated. NDEP should seriously consider whether this facility should continue operation and whether the pumpback water should be treated to remove the contaminants from the site."

NDEP Response: Understanding and addressing seepage from the Tailings Storage Facility (TSF) is an extremely complex issue due in part to its design (which predates NAC 445A.350 through 445A.447) and the numerous continuous and discontinuous clay and groundwater lenses beneath the TSF and surrounding area. Several studies have been performed over the years in attempt to explain and predict seepage behavior, with each subsequent study an improvement over the previous one. The most recent (2010) study is the most comprehensive study to date. The study attempts to better explain TSF seepage, site lithology and hydrology and provides comment on the effectiveness of the SRS. Refer to the document "Jerritt Canyon Seepage Remediation System Performance Assessment and Performance Optimization Plan—April 1, 2010" for additional details.

Complete remediation of seepage from the existing TSF will only be possible once the TSF is taken off-line and closed. Refer to the Division's response to GBRW Comment #2.

GBRW Comment # 14: "The Fact Sheet notes (at 29) that construction of the [Evaporation] pond eliminated monitoring wells; presumably, these are wells near the tailing impoundment. The pond also had difficulties with leakage during construction (Fact Sheet at 29-30)."... "The draft permit does not associate any of the monitoring wells directly with the evaporation ponds, although it does require sampling of evaporation pond water."... "Considering the water quality observed in water in the pond, including arsenic at 4.15 mg/l (4th quarter report, 2009), NDEP should be certain there are monitoring wells along any pathway for flow from the evaporation pond; whether these wells would differ from those which monitor the tailings impoundment is unclear. Monitoring wells would be most important along any pathway that could differ from pathways from the tailings impoundment due to the similar water quality between each facility."

NDEP Response: The monitoring wells in question that were removed (abandoned) included GW-6, GW-11, GW-21, GW-26, GW-46, JCM-12A, JCM-12B, JCM-12C, JCM-18A, JCM-18B, TW-7A and TW-7B. These were replaced with shallow wells GW-20, GW-49, GW-50, and GW-52 and deep wells GW-54, GW-55, GW-56, and GW-57 all located on the south side of the TSF. The shallow monitoring wells have a screen interval bottom at or near the top of the "100 foot" clay layer; the deep monitoring wells penetrate the "100 foot" clay layer and are screened entirely beneath the clay layer in the uppermost water bearing unit(s) below the clay. The deep monitoring wells were located laterally within 50 feet of their associated shallow monitoring wells.

GBRW Comment # 15: "[T]he Consent Decree requires that Queenstake reduce the inventory of tailings fluid within the impoundment, and also requires several reports evaluating the situation which were not reviewed for this memorandum."... "Reducing supernatant volume and pumping collection wells has been the remedy since the early 1990s. The current plan, agreed to in a Consent Decree, is essentially more of the same. There does not appear to be any serious consideration to closing and reclaiming the facility."

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NDEP Response: Refer to the Division response to GBRW Comments #2 and #13.

GBRW Comment # 16: “[GBRW recommends] an additional study of the seepage from the impoundment and evaporation pond...to optimize pumpage. This study should include a detailed fate and transport model for the area. This would allow prediction of future pathways away from the site.”

NDEP Response: Refer to the Division response to GBRW Comment #13.

GBRW Comment # 17: “[GBRW recommends that] based on the fate and transport model and new well monitoring data, Queenstake should propose and design and plan to permanently stop the degradation; this plan should consider seriously the closure of the facility.”

NDEP Response: Refer to the Division response to GBRW Comments #2 and #13.

GBRW Comment #18: “Since the late 1990s, seepage from various mine facilities, mostly the waste rock dumps, have contaminated surface waters on both sides of the Independence Range.” ...“Myers (2010)...found that most of the streams monitored at the Jerritt Canyon mine have been affected by seepage from waste rock dumps. The impact on several streams increased in 2001 to concentrations five or more times that observed previously.”

“The Consent Decree has requirements dealing with at least four waste rock dumps [DASH, Marlboro, Snow and Gracie].” ...“There are two troubling aspects to the plans to treat seepage. First, the plan will have to be long term, meaning Queenstake could have a presence at the site essentially in perpetuity...NDEP should bond for this performance. However, the Fact Sheet and Queenstake (2009c) treat the waste rock dumps as “reclaimed”. It is seepage through the facilities that leaches sulfate and TDS to downstream locations. The best way to treat waste rock seepage is to put a sufficient cover over the waste rock to minimize seepage.”

“[GBRW Recommends the addition of] water balance covers with GCLL [GCL] covers to minimize seepage through the waste rock dumps that are degrading surface waters. This would help avoid the need for treatment in perpetuity.”

NDEP Response: As stated in the Fact Sheet, the Marlboro, Snow and Gracie Rock Disposal Areas (RDAs) are not reclaimed. Note that the DASH RDA is only partially reclaimed.

There is no doubt that any cover material, GCL or others, are effective in minimizing meteoric infiltration. However, it should be noted that the meteoric water infiltration contribution constitutes only a portion of the RDA seepage. A significant contributor to seepage emanating from the RDAs appears to be the result of water infiltration from springs beneath the RDAs.

The poor performance of the bioreactor has shown that the installation and operation of such passive seepage treatment systems are not suitable for the Jerritt Canyon RDAs. The Permittee has investigated several potential technologies to reduce TDS concentrations to meet site specific discharge standards. It is obvious that any technology employed will need to be long-term and reclamation bonding aspects for the RDAs and seepage treatment are not the purview of the WPCP Permit Renewal.

Pursuant to the Decree, the Permittee will be submitting to the Division, a final design for an effective long-term treatment system at the DASH RDA together with applications for any new permits that may be required by the Division for the construction and operation of the approved treatment system. Prior to the resumption of mining, the Permittee shall ensure that the waste rock handling practices are adequately described in an approved waste rock management plan.

Pursuant to the Decree, by November 1, 2010, the Permittee is required to construct, install and operate the approved long-term treatment system at the DASH RDA. If the Division has not approved a treatment method based on the bench-scale results, the Permittee shall install a system utilizing Division approved standard water treatment technology to meet the applicable water quality standards.

Pursuant to the Decree, by November 1, 2012, the Permittee is required to submit final designs for the effective long-term treatment systems to address all parameters that exceed applicable water quality standards at the Marlboro Canyon, Gracie and Snow RDAs. The designs must be submitted with applications for any new permits that may be required by the Division for the construction and operation of the approved treatment systems and a proposed construction schedule. Construction of the approved treatment systems at Marlboro Canyon, Gracie and Snow Canyon RDA's shall be performed in accordance with a Division-approved schedule.

GBRW Comment #19: "The mine has attempted since 2002 to treat waste rock seepage ("water emanating from the RDAs" (Fact Sheet at 7) using a bioreactor. This method has failed to lower concentration sufficiently to "achieve performance goals" (Fact Sheet at 8), which may be an under-statement." ... "Sulfate concentrations at most locations associated with the site have continued to increase (Figure 2). Because the consent decree does not include a bioreactor, [GBRW] assume[s] that Queenstake will need to prepare a new design."

NDEP Response: Refer to the Division response to GBRW Comment #18.

GBRW Comment # 20: "The Fact Sheet (at 9, 10) describes the plans to capture seepage from the foot of the DASH waste rock dump, which is clearly described as infiltrating precipitation (Fact Sheet at 8). The consent decree also refers to this. This seepage, uncollected, clearly enters Sheep Creek. Myers (2010) documented degradation in that stream. The remediation plan was finally implemented by December 7, 2009, just four months and seven days past the deadline established in the original Administrative Order on Consent There is no data yet available to demonstrate whether this treatment will work."

NDEP Response: The system referred to by GRBW is an interim seepage collection and conveyance system installed and operated while the comprehensive DASH seepage management plan and implementation schedule is being developed (Refer to the Division response to GRBW Comment #18, above). In this interim seepage collection scenario, seepage from the toe of the DASH RDA is directed through a pipeline to the Evap Pond for enhanced evaporation. The interim system is designed to handle flows up to 235 gpm, over twice the maximum observed flow.

The Division approved the DASH Interim Seepage Collection and Conveyance System as an EDC on July 14, 2009 with the requirement that all construction be completed by October 31, 2009. The date was later extended to November 30, 2009 pursuant to the October 13, 2009 Consent Decree.

Construction delays due to weather and materials delivery resulted in the EDC was completed on December 7, 2009, seven days after the required date.

GBRW Comment #21: "Queenstake (2009a) presented humidity cell data for its proposed Starvation Canyon add-on. The data could be presented in ways that would be much more useful and it could be interpreted better as well. Tables summarizing the data would be preferable to Laboratory Analytical Reports. The graphs also show mostly non-reactive rock, but there is variability with spikes occurring at different time periods. The data would be much more interpretable if there was also data concerning the amount of water that has drained by each time period. Providing this as pore water volumes would be helpful in transferring the information to field situation; presented as pore volumes, the seepage from the cells could be correlated with seepage from waste rock dumps."

NDEP Response: Comment noted.

GBRW Comment #22: "Most of the streams monitored at the Jerritt Canyon mine have been affected by seepage from waste rock dumps. The impact on several streams increased in 2001 to levels five or more times that observed previously." ... "The monitoring plan does not provide adequately for the determination of seepage from the mine facilities. At most sites, there is not an obvious baseline site or a site just below the facilities that would measure a cumulative effect from those facilities." ... "Monitoring points sited in the middle of a reach through which seepage is expected to only partially monitor the mine-caused seepage. Many downstream monitoring sites are too far, up to two miles, below the mine facilities; this provides a zone for dilution and attenuation and does not provide for the monitoring of potential dead zones."

NDEP Response: Refer to the Division response to GBRW comments #18 and #6.