Great Basin Mine Watch

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Leo Drozdoff
Nevada Division of Environmental Protection
901 So. Stewart Street, Ste 4001
Carson City, NV 89701-5249

June 4, 2007

Dear Mr. Drozdoff,

This letter from Great Basin Mine Watch and EARTHWORKS is in regard to the Queenstake Resources Jerritt Canyon Mine (Jerritt Canyon), in Elko County.

We are requesting that the Nevada Division of Environmental Protection (NDEP) take immediate action to control mercury emissions to the atmosphere from the Jerritt Canyon Mine Complex. We believe NDEP must act to protect the health, safety and welfare of Nevada's people, land, air and water from the excessive amounts of mercury currently being emitted by Jerritt Canyon, and comply with the core mandate of the NDEP's Bureau of Air Pollution Control:

*"The mission of the Bureau of Air Pollution Control (BAPC) is to achieve and maintain levels of air quality which **will protect human health and safety, prevent injury to plant and animal life, prevent damage to property**, and preserve visibility and the scenic, esthetic and historic values of the State." (emphasis added)*

We are requesting that NDEP take immediate action to require Queenstake to control these emissions, by any appropriate measures, even to the point of temporarily shutting down the East and West Roasters until controls are in place, if that is deemed necessary.

Basis for Request

The immediate cause for concern is the NDEP 2006 Tier-1 Mercury Speciation Source Test Data (speciation data), which we received from you at a meeting at your offices on May 10, 2007.

The speciation data provides emission rates (pounds per hour) for all three species of mercury (elemental, oxidized and particulate) released from Jerritt Canyon's East and West ore roasters. By comparing ore production rates and hours of operation with previous years, total mercury air emissions can be estimated for

2005 (see table). The resulting estimates are startling. These figures suggest total mercury air emissions over ***8,000 pounds in 2005.***

Estimated 2005 Total Mercury Emissions

Mine Facility	Mine Unit	Hours of Operation[1]	Average Value for Test Runs (lbs/hour)[2]			Total Mercury Emissions[3]
			Elemental	Oxidized	Particulate	
Jerritt Canyon	East Roaster	7,675	0.031760	0.124895	0.000910	1,121
	West Roaster	7,117	0.690148	0.349551	0.008235	7,089
	Refinery & Carbon Kiln	8,604	0.0045455	0.007628	0.000023	104
					ESTIMATED TOTAL	**8,314**

The 2006 emissions can be estimated using the ratio of the amount of ore processed, and assuming similar concentrations of mercury in the ore being roasted. The estimates are between 6000-7000 lbs of total mercury released.

Another approach to total emissions is to take the mercury emissions per ton of ore processed. Using the amount of ore processed during the emissions testing, we have estimated the following total mercury emissions for 2004:

Estimated 2004 Total Mercury Emissions

Source	Average test tons/hr[4]	Hg^{total}/hour (lbs)[5]	Hg^{total}/ton	year	Tons processed/yr[6]	Hg^{total}/yr (lbs)
W. & E. Roasters	119.23	0.60275	0.005055	2004	1,305,833	6601.444

Again, we recognize that these methods of estimating total annual emissions from the units contain uncertainties, but the recent speciation data set has the greatest validity, compared to earlier measurements, primarily due to the presence of NDEP staff on site when the measurements were made. While NDEP states that the speciation data is not intended to be used

[1] Hours of ore roaster operation in 2005 from "Voluntary Mercury Air Emissions Reduction Program: 2005 Program Report," submitted to NDEP by Queenstake, June, 2006.
[2] All speciation data obtained from NDEP Tier 1 Mercury Speciation Source Test Data.
[3] Total mercury emissions estimated by multiplying the 2005 hours of operation with the sum of elemental, oxidized and particulate mercury emission rates from 2006 tests.
[4] Average of three runs, from http://ndep.nv.gov/bapc/mercury/download/2006_Queenstake_OHM.pdf, Appendix I, page I – 0001.
[5] 2006 Tier – 1 Mercury Speciation Source Test Data
[6] Queenstake 2004 Precious Metals Mining – Mercury Air Emissions Questionnaire

to calculate total mercury emissions, the new stack test data is the best information currently available, and these estimates clearly indicate that the Jerritt Canyon Mine is releasing ***substantially*** more mercury air emissions then what was previously reported and much greater than can be allowed to continue.

These data indicate that Jerritt Canyon emits four to five times as much mercury to the atmosphere as the largest other point source in the country. According to the US Environmental Protection Agency (US EPA) 2006 Toxic Release Inventory, the Martin Lake Steam Electric Station & Lignite Mine, in Rusk, Texas released 1,705 lbs of mercury to the atmosphere, making it the previous largest source.

Concerns with Use of Data for Total Emission Levels

We recognize that NDEP specifies that the speciation data is not intended to be used to calculate total mercury emissions, that it is not peer reviewed, and that the data represents presumed maximum operations. Despite these limitations, the speciation data represent the best emission data currently available, and the testing was conducted to meet testing requirements set out by state regulations. In fact, NDEP has indicated that this is the first emissions testing at Jerritt Canyon with direct and constant NDEP oversight. We believe that the NDEP should use the new data as evidence to justify regulatory action at the Jerritt Canyon mine.

While NDEP has recently argued that the speciation data were not conducted in a manner that would allow the data to be utilized to determine Potential To Emit (PTE) levels, earlier comments by NDEP show that the Ontario Hydro Method (OHM) is considered by NDEP as a valid method of determining total mercury emission rates.

> "The Protocol states that the Ontario Hydro Method (OHM), in conjunction with EPA Methods 1 through 4, will be used to determine the mass emissions of elemental, oxidized, particle-bound, and total mercury (Hg)."[7]

Indeed, the stated purpose of the test, as written in the report to NDEP from Jerritt Canyon was to "measure the emissions of mercury from three sources."[8] "Sampling followed procedures set for the by the NDEP and the EPA Code of Federal Regulations, Title 40, Part 60, Appendix A, Methods 1,2,3,4, and the Ontario Hydro Method."[9]

Also, we understand that the sampling was done to satisfy state regulations (NAC 445B.3673). Key relevant parts of which are:

> NAC 445B.3673 Existing thermal unit that emits mercury: Contents of phase-1 application; sampling and testing for tier-1 thermal unit

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[7] http://ndep.nv.gov/bapc/mercury/download/2006_Queenstake_OHM.pdf, page A 0011; letter from NDEP to Jerritt Canyon.
[8] http://ndep.nv.gov/bapc/mercury/download/2006_Queenstake_OHM.pdf, page 1.
[9] http://ndep.nv.gov/bapc/mercury/download/2006_Queenstake_OHM.pdf, page 2.

> (a)(3) The owner or operator of the thermal unit that emits mercury must conduct the initial sampling and testing of mercury emissions and tests of performance and submit the results of the initial sampling and testing and tests of performance to the Director not later than December 31, 2006.

Indeed, NDEP has apparently accepted the report by Western Environmental Services & Testing Inc., as satisfactory for meeting this regulatory requirement.

While we understand that the control and measurement of mercury emissions from metal mine thermal units is still a new and evolving science, NDEP, the public, and the industry, must rely upon the best data available to assess the Nevada Mercury Air Emissions Control Program (NMAECP), existing controls, and potential impacts. We believe the emission testing of Tier 1 units was initially conducted to assess emissions under a presumed maximum operating level. Until other data is made public, we will utilize this data in that manner.

Another indicator that this speciation data can be credibly used to estimate total emission levels (again, with the understanding of it being conducted at maximum operating levels) is the rough equivalence of reported emissions from the other Tier – 1 sources with the levels reported by those sources to US EPA Toxic Release Inventory.

Additional Indication of Excessive Emissions

According to the *Precious Metals Mining – Mercury Air Emissions Questionnaire* submitted to NDEP by Jerritt Canyon in March, 2006, the most recent available to the public, Jerritt Canyon roasted 1,305,833 tons of ore, and produced 1570 lbs. elemental mercury in 2004. From our discussions and email communications with NDEP staff, we understand that the ore utilized during Jerritt Canyon's emissions tests contained the following mercury content:

	East Roaster:	West Roaster:
Run 1:	25 mg/kg	26 mg/kg
Run 2:	40 mg/kg	27 mg/kg
Run 3:	39 mg/kg	25 mg/kg

Average: 30.33 mg/kg (again, we recognize the desirability of using better data on average ore content).

Ore roasted x average Hg content = approximate Hg roasted
1,305,833 tons x 30.33 mg/kg => 39 tons

Given these numbers, it would follow that over 39 tons of mercury were sent through the roasters at Jerritt Canyon in 2004, over 78,000 lbs. of mercury. The discrepancy between the 1570 lbs reported as produced and the 78,000 lbs processed is over 75,000 lbs. While this number may not be an accurate figure for total mercury processed, it is indicative of the scale of the issue.

GBMW and EARTHWORKS have argued for mass balance calculations such as this to be conducted at all Nevada's precious metal mines. The scale of discrepancy between reported emissions, by-product produced, and this crude calculation of mercury in the roasted ore,

supports our request for such data. It is in the interest of NDEP and the Nevada mining industry to implement some type of mass balance regime, as this reporting uncertainty is not in anyone's interest.

Need for Information on Mercury Disposal

NDEP must determine and make public where the excess mercury that is generated at Jerritt Canyon is going. Due to the ongoing seepage from the Jerritt Canyon tailings pond[10] and the scale of the issue, if the excess mercury is being disposed of in the tailings pond serious and long term environmental contamination is likely occurring. Under no circumstances is it reasonable to allow the disposal of an amount of mercury even close to those calculated to be disposed of without rigorous assurance of long-term control.

Impact on Public Health and Environmental Protection

Queenstake Resources has had more than sufficient opportunity to take the necessary actions to protect Nevada's people and resources, and those from nearby states, from excessive mercury emissions. In addition, the speciation data indicates there may be a history misinformation by Queenstake Resources to the public, NDEP, and US EPA. We are calling for an inquiry as to whether the incomplete or inaccurate reporting to the public, NDEP and the US EPA, on the part of Queenstake Resources, was willful.

Voluntary Mercury Reduction Program

In June, 2002, NDEP and US EPA initiated the Voluntary Mercury Reduction Program (VMRP), working with four mining operations, including Jerritt Canyon. Under the VMRP, Jerritt Canyon reported major reductions in mercury emissions, from 9,400 lbs in 1998 and 1999, to 4,740 lbs in 2002, to 790 lbs in 2003 and only 381 lbs in 2005 (all from the US EPA Toxic Release Inventory). NDEP and mining companies touted these reductions as evidence of the success of the VMRP. The current speciation data raises serious questions as to the validity of these reductions. In addition, and more importantly, they raise serious questions as to the accuracy and veracity Jerritt Canyon's reports to US EPA, and the effectiveness of their mercury control program in general.

A second and serious issue raised by Jerritt Canyon's problems is the effectiveness of reliance upon VMRP based controls within the Nevada Mercury Air Emissions Control Program (NMAECP). Under the NMAECP, VMRP units were allowed to rely upon their existing controls during the initial period of the program, under the Presumptive Nevada Maximum Achievable Control Technology (MACT). With this new data NDEP should begin to require that all VMRP controls must be proven to be MACT as soon as possible.

US EPA Toxic Release Inventory

Under the federal Emergency Planning and Community Right to Know Act, Jerritt Canyon has been required to report point source mercury emissions to the best of their understanding since 1999 (reporting for 1998 releases). The reported releases are[11]:

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[10] Queenstake Resources Ltd.; NI 43-101 Technical Report Jerritt Canyon Mine; SRK Consulting (US), Inc. April 2007; http://www.queenstake.com/technicalreport.php

[11] Emissions information from EPA's Toxic Release Inventory (TRI) website: http://www.epa.gov/triexplor

Year	lbs Hg
1998	9,400
1999	9,400
2000	6,700
2001	7,990
2002	4,740
2003	790
2004	461
2005	381

Of particular significance is the dramatic decrease in reported emissions in 2003. Coincidentally, Queenstake Resources purchased Jerritt Canyon on June 30, 2003 from Anglo Gold and Meridian. These numbers require NDEP and EPA to investigate, with urgency, what caused the drop in reporting in 2003.

NDEP's Ongoing Compliance Order:
On February 15, 2007 NDEP issued a *Compliance Order* and an enforcement notice related to control of mercury emissions at Jerritt Canyon. We understand that this order allows NDEP to take such actions as are necessary to bring Jerritt Canyon's mercury emissions under adequate control. We are asking NDEP to take immediate and effective action.

Conclusion
Due to the abundance of indicators of excessive mercury emissions from the Jerritt Canyon Mine, NDEP must act immediately to protect Nevada's people and resources.

1. We urge NDEP to take whatever actions necessary to achieve immediate mercury emissions reductions, up to temporarily ceasing operations of the West and East Roasters, until proper and fully functional Maximum Achievable Control Technology is installed and operable.

2. Given the sizeable questions about mercury management at the mine, we urge NDEP to investigate and provide full public disclosure on short and long-term mercury management at Jerritt Canyon.

3. Given the failure of existing equipment to properly control mercury emissions, it's clear that NDEP must complete a reassessment of the Presumptive Maximum Achievable Control Technology (MACT).

Thank you for your attention to this matter. Please feel free to contact us with any questions or concerns.

Respectfully,

Dan Randolph
Executive Director
Great Basin Mine Watch

Bonnie Gestring
EARTHWORKS

cc:
Sheila Leslie, Assemblywoman
David Bobzien, Assemblyman