Data Summary Report

For

Leviathan Mine
2006 Pond Water Treatment

(Appendix A to the Year-End Report for the 2006 Field Season)

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I. Acronyms and Abbreviations

AMD	Acid Mine Drainage
ARC	Atlantic Richfield Company
DQO	Data Quality Objective
DSR	Data Summary Report
GPM	Gallons per Minute
PQL	Practical Quantitation Limit
PWT	Pond Water Treatment
RPD	Relative Percent Difference
SAP	Sampling and Analysis Plan for Pond Water Treatment
Site-Wide SAP	Leviathan Mine Site Site-Wide Sampling and Analysis Plan
USEPA	United States Environmental Protection Agency
Water Board	California Regional Water Quality Control Board, Lahontan Region
Year-End Report	Year-End Report for the 2006 Field Season at Leviathan Mine

II. Introduction

This Data Summary Report (DSR) presents the results of sampling and analysis conducted by the California Regional Water Quality Control Board, Lahontan Region (Water Board) during the summer 2006 Pond Water Treatment (PWT) at Leviathan Mine, as described in the Work Plan for 2006 Site Work by the California Regional Water Quality Control Board, Lahontan Region (*Water Board, June 2006a*). The data presented in this report was gathered following the objectives, procedures, and quality assurance and quality control standards documented in the Sampling and Analysis Plan for Leviathan Mine Site Pond Water Treatment (SAP) (*Water Board, June 2006b*). Overall site objectives and requirements are outlined in the Leviathan Mine Site Site-Wide Sampling and Analysis Plan (Site-Wide SAP) (*MWH, 2002*). The following information is included in the DSR:

- Results of laboratory analyses.
- Results of field measurements.
- Location of sampling stations.

The SAP, field notebook, and monitoring program records for this project are located at the Water Board offices in South Lake Tahoe, California.

a. Investigation Site Description

Leviathan Mine is located in Alpine County, California, approximately six miles east of Markleeville, California and five miles west of Topaz Lake, Nevada, as shown in Figure 1. The site is an inactive sulfur mine that the State of California acquired in the early 1980s in order to clean up water quality problems caused by historic mining. In May 2000, the United States Environmental Protection Agency (USEPA) placed Leviathan Mine on the Comprehensive Environmental Response, Compensation, and Liability Act National Priorities List, thus making Leviathan a federal Superfund site. USEPA identified the State of California and Atlantic Richfield Company (ARC) as Potentially Responsible Parties at the site. Additional information on the history and watershed of Leviathan Mine is contained in the Year-End Report for the 2006 Field Season at Leviathan Mine (Year-End Report).

Acting on the State's behalf, the Water Board has implemented several projects to abate and quantify the discharge of pollutants from Leviathan Mine. In 1985, the Water Board completed construction of a pollution abatement system at Leviathan Mine to address specific problem areas. One component of the 1985 pollution abatement project included construction of five lined evaporation ponds (see Figure 2) to capture and evaporate acid mine drainage (AMD) from remnant underground mine workings. Flows of AMD from the Adit and Pit Under-Drain, along with direct precipitation fill the ponds throughout the year.

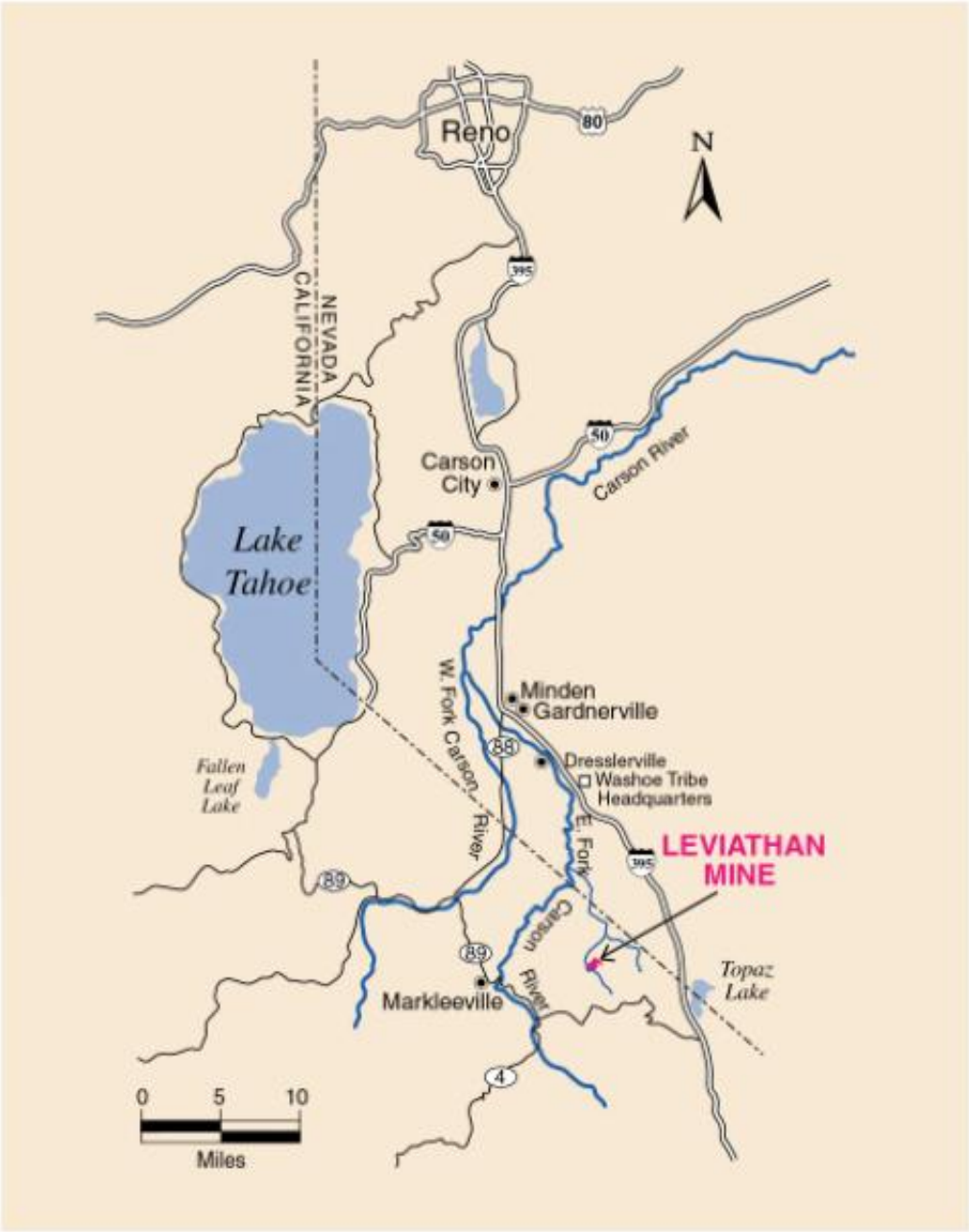

FIGURE 1
SITE LOCATION

Following completion of the 1985 project and up until the Fall of 1999, discharge of AMD from the pond system to Leviathan Creek routinely occurred during the winter and spring months when pond inflow exceeded the storage and evaporative capacities of the pond system. To prevent overflow of AMD from the ponds, the Water Board assessed and field-tested a treatment process that enabled the treatment and discharge of pond water during the summer months to increase pond storage capacity for the subsequent winter and spring months.

The process employed by the Water Board for the treatment of AMD contained in the pond system was described as biphasic neutralization. The biphasic process consisted of neutralizing AMD by the addition of lime (calcium hydroxide [$Ca(OH)_2$]) at two points in the treatment process. Sludge was produced in both phases of the biphasic process. The Lahontan Water Board assembled a treatment system during the 1999 field season on the north east corner of Pond 1 and tested the process at full-scale during the 1999 and 2000 field seasons. The Lahontan Water Board has continued to operate the lime treatment system as a biphasic treatment process during the summer months from 2001 through 2005.

The Pond 1 lime treatment plant operation was modified slightly during the 2005 treatment season to increase the treatment rate of AMD contained in the pond system following an unusually wet winter. The modifications implemented during the 2005 season allowed for an increase in the treatment rate that could be sustained reliably over extended periods. Two points of lime addition remained as they had been in past treatment seasons in an effort to preserve known treatment plant responses, however only one sludge was produced. Modifications performed in 2005 also included eliminating required collection, sample preparation, and field analysis of mid-process samples. With the modified operation, strict control of the first phase operating parameters was no longer needed.

During the 2006 season, the Pond 1 lime treatment plant was operated maintaining two points of lime addition with no sludge segregation. When the treatment plant was treating AMD, the sludge slurry was pumped to the Pit Clarifier where the solids settled out in near-quiescent conditions. Clean water was decanted from the Pit Clarifier via an adjustable outlet and conveyed by gravity to a weir box used for final effluent monitoring and discharge. In addition to the decant outlet, the Pit Clarifier under-drain was used continuously during the 2006 treatment season to more accurately regulate the flow being discharged to the weir box. Using the under-drain continuously during 2006 treatment operations had the added benefit of utilizing the gravel/sand lining the bottom of the Pit Clarifier for additional filtration and clarification for the treated water. Once treatment ended, and discharge through the adjustable outlet (decant outlet) ended, treated water was then discharged only via the Pit Clarifier under-drain and the weir box. The Year-End Report contains additional detailed information on the treatment process, treatment system design, and operations implemented during the 2006 season.

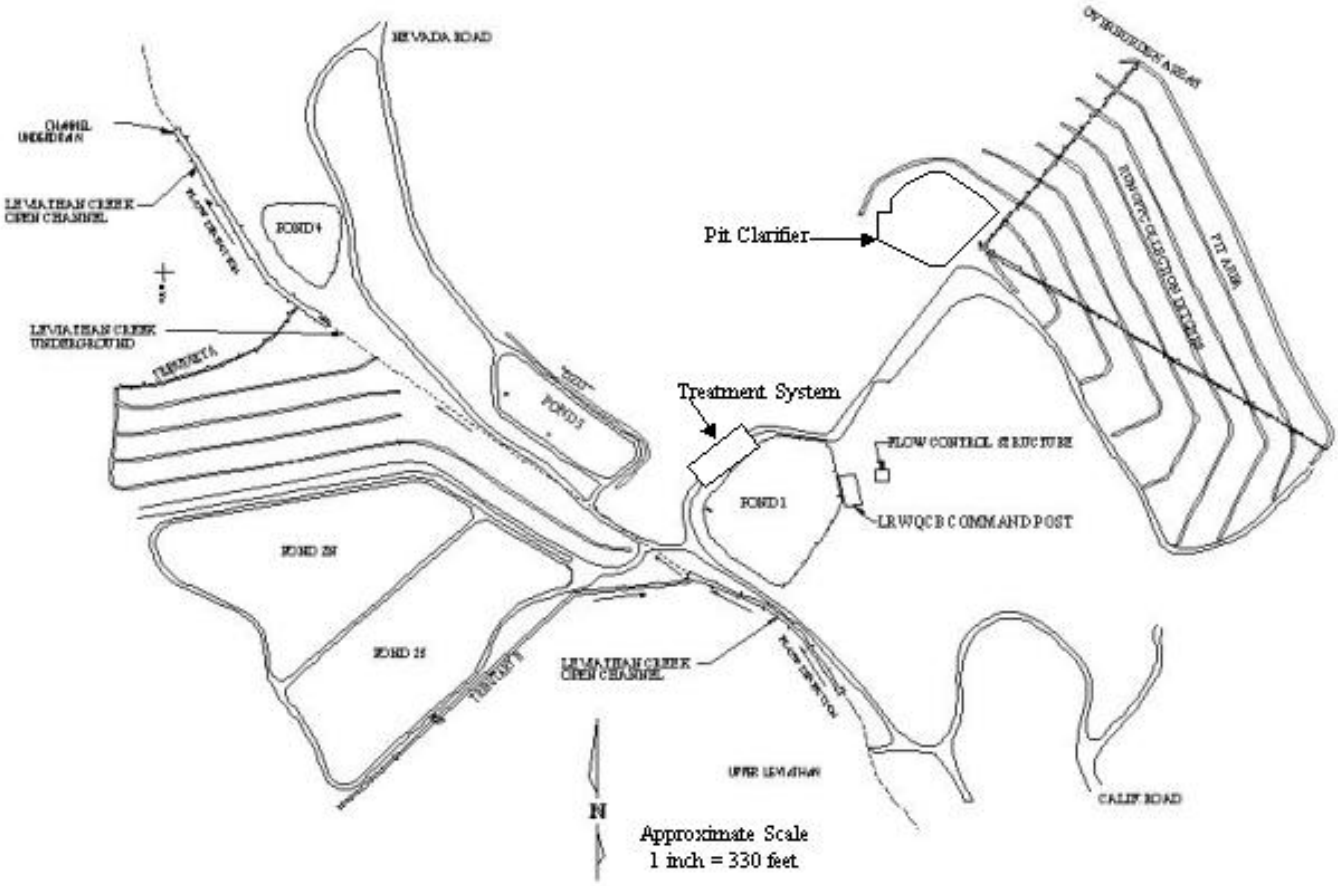

Figure 2 Leviathan Mine Site Map

b. Investigation Objectives

The overall objective of the PWT project was to treat the AMD contained in the ponds and produce an effluent that met the Discharge Criteria designated by USEPA for the project. The Discharge Criteria for the project are listed below in Table 1. If discharge from the Pit Clarifier was found to be out of compliance (by field analysis or direct knowledge of system upset), discharge was stopped. The effluent would be retained in the Pit Clarifier until it met field parameters or returned to Pond 1 for re-treatment.

Table 1. 2006 Discharge Criteria for Pond Water Treatment

WATER QUALITY PARAMETER	MAXIMUM	FOUR-DAY AVERAGE
pH	--	Between 6.0 – 9.0 SU$_{f2}$
Arsenic	0.34 mg/l$_{f1}$	0.15 mg/l$_{f4}$
Aluminum	4.0 mg/l$_{f1}$	2.0 mg/l $_{f4}$
Cadmium	0.009 mg/l$_{f1}$	0.004mg/l $_{f4}$
Chromium	0.97 mg/l$_{f1}$	0.31 mg/l $_{f4}$
Copper	0.026 mg/l$_{f1}$	0.016 mg/l $_{f4}$
Iron	2.0 mg/l$_{f1}$	1.0 mg/l $_{f4}$
Lead	0.136 mg/l$_{f1}$	0.005 mg/l$_{f4}$
Nickel	0.84 mg/l$_{f1}$	0.094 mg/l $_{f4}$
Selenium (Total Recoverable)	Not Promulgated$_{f3}$	0.005 mg/l $_{f4}$
Zinc	0.21 mg/l$_{f1}$	0.21 mg/l $_{f4}$

Mg/L..... Milligrams per Liter
f1 ..... Dissolved concentration in a daily grab sample that has been field-filtered (0.45 micron) and acid preserved.
f2 ..... pH measurement based on 24-hour average discharge.
f3 ..... Total recoverable concentration in a daily grab sample that is acid preserved, but not filtered.
f4 ..... The sum of the detected concentration in four daily grab samples, from four consecutive discharge days, divided by four.

c. Data Quality Objectives

The overall objective of the monitoring program for PWT was to collect data in order to evaluate the effectiveness of the treatment process in terms of effluent and sludge quality. The Data Quality Objectives (DQOs) for this project were developed using the *USEPA Guidance for Data Quality Objectivs, EPA QA/G-4* (EPA 2000), and are described in Appendix A of the SAP. The specific DQOs for this project, as outlined in the SAP are as follows:

- Identify the chemical characteristics of the untreated pond water.
- Identify the chemical characteristics of the treated pond water.
- Identify the chemical characteristics of solids generated in the treatment process.
- Monitor the effectiveness in meeting USEPA discharge criteria.
- Provide real-time data on the quality of the effluent and efficiency of the treatment system at critical points.

III. Sampling and Analysis Summary

Table 2, Monitoring Locations and Sampling Schedule, summarizes the sampling program for PWT as proposed in the SAP, however no Phase I solids were produced in 2006. PWT monitoring included the collection of samples for field analysis and for confirmation analysis by the Water Board's contract laboratory, Weck Labs of Industry, California. There were deviations from the SAP for sludge sampling and field parameter analyses. These deviations are documented in Section IV of this report.

Table 2. Monitoring Locations and Sampling Schedule

MONITORING OBJECTIVE	SAMPLING LOCATION	SAMPLE TYPE	FREQUENCY
Influent	Intake line to treatment system	Field Parameters	As Needed
		Lab Analysis	Once per week
Effluent	Discharge line from Pit Clarifier	Field Parameters	Daily
		Lab Analysis	Daily (when discharging)
Phase I Solids	Bin located below Phase I filter press	Lab Analysis	Weekly (composite of daily grabs)
Phase II Solids	Pit Clarifier	Lab Analysis	3 Samples (after completion of treatment)

a. Confirmation Monitoring

The Water Board's contractor operated the Pond 1 lime treatment plant from late-June through August 12, 2006. Preliminary effluent samples were collected from the Pit Clarifier beginning June 28, 2006, with the first effluent discharged to Leviathan Creek on June 30, 2006. After all the pond water was treated and the system was shut down,

the Water Board continued to collect effluent samples discharging from the Pit Clarifier until August 25, 2006, when the flow rate out of the under-drain dropped below approximately four gallons-per-minute (gpm). Six samples of the influent were collected during the treatment period. Three samples of sludge were collected in October 2006 following partial de-watering of the Pit Clarifier.

Water Board staff collected a daily grab sample of the treated effluent each day that the system discharged to the creek. A portion of the grab sample was field filtered, preserved with nitric acid, and submitted to the Water Board's contract laboratory to be analyzed for dissolved aluminum (Al), arsenic (As), copper (Cu), chromium (Cr), cadmium (Cd), nickel (Ni), iron (Fe), lead (Pb), and zinc (Zn). An unfiltered portion of the daily grab sample was preserved with nitric acid and submitted for Total Recoverable Selenium (Se). Once per week, Water Board staff submitted samples of treated effluent and samples of untreated influent for the following analysis: sulfate (SO_4), total dissolved solids, dissolved Al, As, Cu, Cr, Cd, Ni, Fe, Pb, Zn, calcium (Ca), cobalt (Co), manganese (Mn), magnesium (Mg), and Total Recoverable Se. Specific details of sample collection and handling are described in the SAP.

Laboratory monitoring results and qualifiers, for the influent, effluent, and sludge are presented in Attachment A. Also included in Attachment A is a table showing the calculated 4-day average for the effluent concentrations.

The 4-day arithmetic average concentration for aluminum discharged to Leviathan Creek was exceeded during initial plant startup from July 3 through July 5, 2006 and again from July 8 through July 11, 2006. The cause for elevated aluminum concentration is believed to be the result of the lime-dosing set point in Reactor 2 being set slightly higher than was required. Following laboratory confirmation of initial aluminum discharge exceedences, the lime-dosing set point was adjusted to minimize aluminum discharge concentrations while still not exceeding nickel discharge concentrations. Once optimum treatment system set points were established during the initial two-week startup period, no exceedences of the daily maximum or 4-day arithmetic average concentrations occurred.

Data were assessed to confirm that holding times were met and that field quality control samples were collected. Any exceedences of method hold times would be denoted with an "H" qualifier on the data tables but no hold time were exceeded.

Water Board staff collected one field duplicate per week of treatment. The Relative Percent Difference (RPD) was calculated for the duplicate and corresponding sample. If both the sample and duplicate values were greater than or equal to five times the Practical Quantitation Limit (PQL), then the RPD must be less than or equal to 25% to be in control limits. If either the sample or duplicate value was less than five times the PQL, then the absolute difference between the sample and duplicate values had to be less than the PQL to be in control limits. Results that were out of control limits were flagged with "*" qualifier on the Table 1 of Attachment A. Only one set of sample and duplicate

results, collected on 7/20/06, were flagged for exceeding the control limits for RPD (Table A-1). Equipment Rinsate Blanks (ERBs) and Field Method Blanks (FMBs) were also collected once per week and submitted for the same analyses as effluent samples. Water Board staff collected ERBs by pouring distilled water over laboratory equipment used in sample collection and processing after the equipment had been cleaned. FMBs were collecting and processing distilled water in the same method as effluent samples. No data were qualified based on ERB or FMB results.

The system was operated such that one sludge was produced from treatment of the AMD. Water Board staff collected three sludge samples from three different locations in the Pit Clarifier. Sludge samples collected represented the complete interval of sludge from the upper surface of sludge down to the base of the sludge. The sludge samples were analyzed by the Water Board's contract laboratory, according to appropriate analytical procedures, to provide comparisons with the Total Threshold Limit Concentration (TTLC) and the Soluble Threshold Limit Concentration (STLC) for various constituents.

The three sludge samples collected from the Pit Clarifier averaged approximately 21.4 percent solids. The low solids content is most likely due to insufficient drying time because of the short time period between treatment operations and sample collection. The three samples contained constituents in excess of the TTLC and STLC analytical thresholds. The TTLC concentration for arsenic was exceeded in all three samples collected from the Pit Clarifier. The hazardous waste threshold for TTLC arsenic is 500 mg/kg. The STLC concentration for nickel was exceeded in one of the three samples collected. The arithmetic average STLC nickel concentration for the three samples is 16.7 mg/L. The hazardous waste threshold for STLC nickel is 20 mg/L.

With the exception of the TTLC analysis for arsenic and the STLC analysis for nickel, the sludge did not exceed any other STLC or TTLC limits.

b. Real-time Monitoring

To provide "real-time" information regarding metals concentrations and other parameters in the treated effluent, each day that the system was discharging to Leviathan Creek, Water Board staff collected and measured samples of the effluent for pH. These data were used to provide feedback to immediate system operations and as an indicator of effluent quality. As discussed in Section IV below, dissolved Al and Fe were not analyzed during the month of July due to equipment failure. In addition to pH measurements by Water Board staff, treatment system operators measured effluent pH at least once every two hours throughout treatment. pH measurements confirm that the discharge of treated effluent to Leviathan Creek was within USEPA's discharge criteria for pH.

Copies of the Water Boards field log sheets are presented in Attachment B. Specific details of sample collection, handling, and field analytical procedures are described in the SAP.

Treated water flows from the Pit Clarifier through a weir box where the flow data are recorded. The flow measuring system is similar to those used by the United States Geological Survey for measuring AMD flows from the Pit Under-drain and Adit. The weir box has a 90-degree V-notch weir and stage data is recorded at 15-minute intervals by a combination data logger/pressure transducer system. By August 28, 2006 approximately 13.2 million gallons of treated pond water had been discharged out of the Pit Clarifier to Leviathan Creek. A summary of daily discharge data in included as Attachment C. The raw data has not been included due to the large volume of data recorded by the data logger but it is available upon request to the Water Board.

IV. Deviations from the SAP

There were several deviations from the sampling and analysis proposed in the SAP. Real-time monitoring was altered due to equipment malfunctions and the sludge sampling was modified to adjust to treatment system operations.

Real-time monitoring detailed in the SAP included field monitoring of pH, dissolved aluminum, and dissolved iron. A Hach DR2010 Spectrophotometer is used to perform field analysis of aluminum and iron. On June 29, 2006, during the first week of treatment, the instrument failed to turn on and could not be repaired in the field. The instrument was sent to Hach Company for repair with an estimated turnaround time of 10 days. Hach Company was unable to supply a loan instrument during the repair time. The turnaround time took longer than originally estimated by Hach and they finally returned the repaired instrument on August 1, 2006. Water Board staff only monitored pH as a field indicator of effluent water quality between June 29 and August 1, 2006. Monitoring of dissolved aluminum and dissolved iron resumed from August 1, 2006 until the treatment system was shut down on August 12, 2006.

The treatment system was operated in the modified, single sludge process, so there was no generation of Phase I sludge. The sludge was not segregated during the treatment process and all the sludge was directed to the Pit Clarifier for de-watering. The sludge generated by treatment was sampled and analyzed according to procedures detailed in the SAP for Phase II Sludge.

Weck Labs completed Laboratory Data Validation Checklists for Metals Analysis by ICP and ICPMS, as described in Appendix E-1 of the Site-Wide SAP, for eight of 20 reports collected for treatment. Due to the large number of analytical reports and corresponding Laboratory Data Validation Checklists produced for treatment, they have not been included in this report but are available at the Water Board office. Level A/B Screening Checklists and Data Validation Checklists for Field Quality Control were not completed for PWT data reporting. However the PWT data were assessed to confirm that holding times were met and that field quality control samples were collected.

V. References

CA Regional Water Quality Control Board, Lahontan Region. June 2006a. Work Plan for 2006 Site Work by the California Regional Water Quality Control Board.

CA Regional Water Quality Control Board, Lahontan Region. June 2006b. Sampling and Analysis Plan for Leviathan Mine Site Pond Water Treatment.

Montgomery Watson Harza. April 2002. Leviathan Mine Site, Site-Wide Sampling and Analysis Plan.

United States Environmental Protection Agency. 2000. USEPA Guidance for Data Quality Objectivs, EPA QA/G-4.

Attachment A

Laboratory Data Summary Results

Table A-1
2006 Effluent Daily Concentrations

	Sample Date	pH	Al	Q	As	Q	Ca	Q	Cd	Q	Co	Q	Cr	Q	Cu	Q	Fe	Q	Pb	Q	Mg	Q	Mn	Q	Ni	Q	Zn	Q	Se	Q	TDS	Q	Sulfate	Q
Daily Max Discharge Criteria:		**6 - 9 SU**	**4.0**		**0.34**		**n/a**		**0.009**		**n/a**		**0.97**		**0.026**		**2.0**		**0.136**		**n/a**		**n/a**		**0.84**		**0.210**		**n/a**		**n/a**		**n/a**	
Pit Clarifier	6/27/2006		1.700		0.0027	J			0.00021	J			0.00061	J	0.00110	J	0.000001	U	0.000042	U					0.0580		0.00073	U	0.00180	J				
Pit Clarifier	6/28/2006	8.00	1.500		0.0029	J			0.00026	J			0.00140	J	0.00130	J	0.00048	U	0.000042	U					0.0600		0.00073	U	0.00210					
Pit Clarifier	6/29/2006	7.40	0.290		0.0027	J			0.00150	J	0.046		0.00014	J	0.00200	J	0.1800		0.000042	U					0.1300		0.00660	J	0.00190	J				
Effluent to Creek	6/30/2006	8.20	2.900		0.0030	J			0.00034	J			0.00083	J	0.00530		0.0048	U	0.000710	J					0.0760		0.00330	J	0.00190	J				
Effluent to Creek	7/1/2006	8.50	2.900		0.0030	J			0.00015	J			0.00032	J	0.00097	J	0.0076	J	0.000042	U					0.0470		0.00140	J	0.00210					
Effluent to Creek	7/2/2006	8.70	3.400		0.0035	J			0.00011	J			0.00046	J	0.00090	J	0.0048	U	0.000042	U					0.0500		0.00073	U	0.00200					
Effluent to Creek	7/3/2006	8.50	2.500		0.0037	J	1000		0.00012	J	0.0041	J	0.00053	J	0.00085	J	0.0083	J	0.000042	U	21		0.18		0.0560		0.00082	J	0.00200		2800		2600	
Effluent to Creek	7/4/2006	8.10	1.500		0.0036	J			0.00011	J			0.00063	J	0.00085	J	0.0290		0.000042	U					0.0650		0.00075	J	0.00190	J				
Effluent to Creek	7/5/2006	8.00	1.900		0.0039	J			0.00012	J			0.00072	J	0.00087	J	0.0130		0.000042	U					0.0640		0.00073	U	0.00210					
Effluent to Creek	7/6/2006	8.20	1.400		0.0032	J			0.00012	J			0.00055	J	0.00064	J	0.0048	U	0.000042	U					0.0450		0.00180	J	0.00170	J				
Effluent to Creek (Duplicate)	7/6/2006	8.20	1.400		0.0034	J			0.00009	J			0.00047	J	0.00064	J	0.0048	U	0.000042	U					0.0450		0.00190	J	0.00180	J				
Effluent to Creek	7/7/2006	8.40	2.500		0.0041	J			0.00009	J			0.00057	J	0.00100	J	0.0048	U	0.000042	U					0.0480		0.00130	J	0.00170	J				
Effluent to Creek	7/8/2006	8.30	3.200		0.0039	J			0.00009	J			0.00064	J	0.00092	J	0.0048	U	0.000042	U					0.0430		0.00091	J	0.00190	J				
Effluent to Creek	7/9/2006	8.10	1.900		0.0034	J			0.00010	J			0.00066	J	0.00170	J	0.0048	U	0.000042	U					0.0390		0.00150	J	0.00190	J				
Effluent to Creek	7/10/2006	8.30	2.000		0.0041	J	940		0.00010	J	0.0045	J	0.00053	J	0.00081	J	0.0048	U	0.000042	U	21		0.14		0.0480		0.00450	J	0.00180	J	3300		2500	
Effluent to Creek	7/11/2006	8.12	1.300		0.0038	J			0.00012	J			0.00055	J	0.00094	J	0.0048	U	0.000042	U					0.0520		0.00110	J	0.00140	J				
Effluent to Creek	7/12/2006	8.00	1.100		0.0035	J			0.00012	J			0.00057	J	0.00077	J	0.0048	U	0.000042	U					0.0510		0.00081	J	0.00190	J				
Effluent to Creek	7/13/2006	8.10	1.100		0.0039	J			0.00012	J			0.00066	J	0.00084	J	0.0048	U	0.000042	U					0.0450		0.00073	U	0.00120	J				
Effluent to Creek (Duplicate)	7/13/2006	8.10	1.100		0.0043	J			0.00011	J			0.00070	J	0.00077	J	0.0048	U	0.000042	U					0.0410		0.00073	U	0.00130	J				
Effluent to Creek	7/14/2006	8.00	1.200		0.0040	J			0.00010	J			0.00120	J	0.00076	J	0.0048	U	0.000042	U					0.0430		0.00073	U	0.00140	J				
Effluent to Creek	7/15/2006	8.22	2.200		0.0039	J			0.00015	J			0.00160	J	0.00080	J	0.0048	U	0.000042	U					0.0500		0.00073	U	0.00140	J				
Effluent to Creek	7/16/2006	8.16	2.400		0.0035	J			0.00011	J			0.00180	J	0.00076	J	0.0048	U	0.000042	U					0.0470		0.00073	U	0.00190	J				
Effluent to Creek	7/17/2006	8.05	0.230		0.0025	J	660		0.00010	J	0.0014	J	0.00150	J	0.00065	J	0.0048	U	0.000042	U	27		0.18		0.0320		0.00220	J	0.00170	J	2500		1800	
Effluent to Creek	7/18/2006	7.80	0.890		0.0028	J			0.00007	J			0.00130	J	0.00080	J	0.0048	U	0.000042	U					0.0330		0.00200	J	0.00220					
Effluent to Creek	7/19/2006	7.60	0.470		0.0029	J			0.00011	J			0.00096	J	0.00082	J	0.0048	U	0.000042	U					0.0430		0.00190	J	0.00190	J				
Effluent to Creek	7/20/2006	7.94	1.500		0.0032	J			0.00015	J			0.00080	J	0.00095	J	0.0048	U	0.000042	U					0.0490		0.00180	J,*	0.00270					
Effluent to Creek (Duplicate)	7/20/2006	7.94	1.400		0.0034	J			0.00014	J			0.00084	J	0.00092	J	0.0048	U	0.000042	U					0.0480		0.03800	*	0.00260					
Effluent to Creek	7/21/2006	7.90	0.045		0.0028	J			0.00094	J			0.00071	J	0.00480	J	0.0058	J	0.000042	U					0.0660		0.00940	J	0.00180	J				

Table A-1
2006 Effluent Daily Concentrations

	Sample Date	pH	Al	Q	As	Q	Ca	Q	Cd	Q	Co	Q	Cr	Q	Cu	Q	Fe	Q	Pb	Q	Mg	Q	Mn	Q	Ni	Q	Zn	Q	Se	Q	TDS	Q	Sulfate	Q
Daily Max Discharge Criteria:		**6 - 9 SU**	**4.0**		**0.34**		**n/a**		**0.009**		**n/a**		**0.97**		**0.026**		**2.0**		**0.136**		**n/a**		**n/a**		**0.84**		**0.210**		**n/a**		**n/a**		**n/a**	
Effluent to Creek	7/22/2006	7.60	0.530		0.0031	J			0.00039	J			0.00140	J	0.00076	J	0.0048	U	0.000042	U					0.0290		0.00410	J	0.00200					
Effluent to Creek	7/23/2006	7.40	0.028		0.0025	J			0.00021	J			0.00160	J	0.00120	J	0.0048	U	0.000042	U					0.0054		0.00430	J	0.00160	J				
Effluent to Creek	7/24/2006	7.59	0.350		0.0033	J	690		0.00047	J	0.0100		0.00200	J	0.00140	J	0.0048	U	0.000042	U	25		0.33		0.0270		0.00500	J	0.00190	J	2800		1900	
Effluent to Creek	7/25/2006	7.80	0.750		0.0038	J			0.00028	J			0.00370	J	0.00120	J	0.0048	U	0.000042	U					0.0250		0.00240	J	0.00230					
Effluent to Creek	7/26/2006	7.80	0.760		0.0035	J			0.00021	J			0.00280	J	0.00100	J	0.0048	U	0.000042	U					0.0170		0.00170	J	0.00280					
Effluent to Creek	7/27/2006	7.70	0.760		0.0039	J			0.00019	J			0.00210	J	0.00100	J	0.0048	U	0.000042	U					0.0140		0.00270	J	0.00310					
Effluent to Creek (Duplicate)	7/27/2006	7.70	0.710		0.0035	J			0.00019	J			0.00200	J	0.00093	J	0.0048	U	0.000042	U					0.0150		0.00350	J	0.00280					
Effluent to Creek	7/28/2006	7.60	0.530		0.0026	J			0.00024	J			0.00250	J	0.00120	J	0.0048	U	0.000042	U					0.0096		0.00240	J	0.00240					
Effluent to Creek	7/29/2006	7.80	0.610		0.0028	J			0.00024	J			0.00240	J	0.00130	J	0.0240		0.000042	U					0.0091		0.00990	J	0.00220					
Effluent to Creek	7/30/2006	7.80	0.040		0.0018	J			0.00024	J			0.00200	J	0.00140	J	0.0080	J	0.000042	U					0.0075		0.00370	J	0.00180	J				
Effluent to Creek	7/31/2006	7.96	0.630		0.0032	J	710		0.00029	J	0.0050		0.00240	J	0.00130	J	0.0048	U	0.000042	U	30		0.29		0.0180		0.00400	J	0.00250		2900		2000	
Effluent to Creek	8/1/2006	8.01	0.450		0.0031	J			0.00019	J			0.00160	J	0.00086	J	0.0048	U	0.000042	U					0.0090		0.00073	U	0.00240					
Effluent to Creek	8/2/2006	7.71	0.760		0.0040	J			0.00021	J			0.00120	J	0.00090	J	0.0048	U	0.000042	U					0.0170		0.00073	U	0.00290					
Effluent to Creek	8/3/2006	7.80	0.450		0.0040	J			0.00027	J			0.00099	J	0.00076	J	0.0048	U	0.000042	U					0.0160		0.00073	U	0.00240					
Effluent to Creek (Duplicate)	8/3/2006	7.80	0.410		0.0024	J			0.00030	J			0.00120	J	0.00120	J	0.0048	U	0.000086	J					0.0170		0.00490	J	0.00240					
Effluent to Creek	8/4/2006	7.77	0.600		0.0027	J			0.00024	J			0.00130	J	0.00120	J	0.0048	U	0.000064	J					0.0150		0.00320	J	0.00260					
Effluent to Creek	8/5/2006	7.67	0.480		0.0031	J			0.00027	J			0.00086	J	0.00110	J	0.0048	U	0.000098	J					0.0190		0.00190	J	0.00340					
Effluent to Creek	8/6/2006	7.90	0.410		0.0028	J			0.00028	J			0.00078	J	0.00110	J	0.0048	U	0.000086	J					0.0260		0.00190	J	0.00360					
Effluent to Creek	8/7/2006	8.06	1.400		0.0037	J	890		0.00023	J	0.0064		0.00094	J	0.00110	J	0.0048	U	0.000100	J	31		0.35		0.0180		0.00100	J	0.00270		3300		2400	
Effluent to Creek	8/8/2006	7.78	0.770		0.0050				0.00034	J			0.00058	J	0.00092	J	0.0048	U	0.000042	U					0.0310		0.02500		0.00200					
Effluent to Creek	8/9/2006	7.81	0.860		0.0053				0.00028	J			0.00066	J	0.00078	J	0.0048	U	0.000048	J					0.0200		0.00140	J	0.00340					
Effluent to Creek	8/10/2006	7.27	0.022		0.0026	J			0.00026	J			0.00059	J	0.00130	J	0.0048	U	0.000042	U					0.0080		0.00380	J	0.00220					
Effluent to Creek (Duplicate)	8/10/2006	7.27	0.024		0.0032	J			0.00028	J			0.00063	J	0.00130	J	0.0048	U	0.000042	U					0.0088		0.00550	J	0.00220					
Effluent to Creek	8/11/2006	8.03	0.960		0.0047	J			0.00025	J			0.00045	J	0.00078	J	0.0048	U	0.000042	U					0.0220		0.00120	J	0.00310					
Effluent to Creek	8/12/2006	7.84	0.780		0.0049	J			0.00023	J			0.00048	J	0.00067	J	0.0048	U	0.000042						0.0190		0.00160	J	0.00280					
Effluent to Creek	8/13/2006	7.33	0.036		0.0035	J			0.00030	J			0.00048	J	0.00120	J	0.0048	U	0.000130	J					0.0097		0.00290	J	0.00220					
Effluent to Creek	8/14/2006	7.37	0.035		0.0036	J	540		0.00030	J	0.0034	J	0.00045	J	0.00110	J	0.0048	U	0.000042	U	41		1.40		0.0097		0.00380	J	0.00140	J	2300		1600	
Effluent to Creek	8/15/2006	7.28	0.030		0.0064				0.00031	J			0.00033	J	0.00220	J	0.0048	U	0.000042	U					0.0490		0.00600	J	0.00160	J				

Table A-1
2006 Effluent Daily Concentrations

	Sample Date	pH	Al	Q	As	Q	Ca	Q	Cd	Q	Co	Q	Cr	Q	Cu	Q	Fe	Q	Pb	Q	Mg	Q	Mn	Q	Ni	Q	Zn	Q	Se	Q	TDS	Q	Sulfate	Q
Daily Max Discharge Criteria:		**6 - 9 SU**	**4.0**		**0.34**		**n/a**		**0.009**		**n/a**		**0.97**		**0.026**		**2.0**		**0.136**		**n/a**		**n/a**		**0.84**		**0.210**		**n/a**		**n/a**		**n/a**	
Effluent to Creek	8/16/2006	7.32	0.028		0.0067				0.00032	J			0.00033	J	0.00200	J	0.0048	U	0.000042	U					0.0470		0.00180	J	0.00190	J				
Effluent to Creek	8/17/2006	7.24	0.030		0.0064				0.00029	J			0.00034	J	0.00180	J	0.0048	U	0.000042	U					0.0460		0.00190	J	0.00170	J				
Effluent to Creek (Duplicate)	8/17/2006	7.24	0.031		0.0068				0.00030	J			0.00033	J	0.00190	J	0.0048	U	0.000042	U					0.0480		0.00310	J	0.00180	J				
Effluent to Creek	8/18/2006	7.21	0.028		0.0073				0.00029	J			0.00029	J	0.00190	J	0.0048	U	0.000042	U					0.0500		0.00150	J	0.00170	J				
Effluent to Creek	8/19/2006	7.44	0.024		0.0074				0.00032	J			0.00028	J	0.00200	J	0.0048	U	0.000078	J					0.0510		0.00180	J	0.00170	J				
Effluent to Creek	8/20/2006	7.30	0.022		0.0073				0.00032	J			0.00026	J	0.00170	J	0.0048	U	0.000045	J					0.0520		0.00190	J	0.00160	J				
Effluent to Creek	8/21/2006	7.37	0.021		0.0070		500		0.00026	J	0.0051		0.00026	J	0.00160	J	0.0048	U	0.000042	U	45		1.50		0.0530		0.00130	J	0.00170	J	2300		1500	
Effluent to Creek	8/22/2006	7.59	0.018		0.0049	J			0.00030	J			0.00030	J	0.00130	J	0.0048	U	0.000042	U					0.0190		0.00270	J	0.00130	J				
Effluent to Creek	8/23/2006	7.20	0.017		0.0043	J			0.00027	J			0.00023	J	0.00140	J	0.0048	U	0.000042	U					0.0180		0.00230	J	0.00100	J				
Effluent to Creek	8/24/2006	7.36	0.015		0.0045	J			0.00023	J			0.00024	J	0.00130	J	0.0048	U	0.000042	U					0.0190		0.00250	J	0.00098	J				
Effluent to Creek (Duplicate)	8/24/2006	7.36	0.014		0.0045	J			0.00023	J			0.00033	J	0.00160	J	0.0048	U	0.000042	U					0.0210		0.00350	J	0.00099	J				
Effluent to Creek	8/25/2006	7.25	0.018		0.0044	J			0.00021	J			0.00027	J	0.00160	J	0.0048	U	0.000042	U					0.0220		0.00240	J	0.00140	J				

All values reported in milligrams/liter, except pH.
All parameters reported as dissolved, except Selenium reported as total recoverable.
n/a - not applicable, no discharge criteria exists for this parameter.

Qualifiers:
U - Analyte not detected at the given Method Detection Limit.
J - Analyte detected between the Method Detection Limit and the Reporting Limit
* - Relative Percent Difference outside of control limits

Table A-2
2006 Effluent 4-Day Average Concentrations

	Sample Date	Al 4-day Average	As 4-day Average	Cd 4-day Average	Cr 4-day Average	Cu 4-day Average	Fe 4-day Average	Pb 4-day Average	Ni 4-day Average	Zn 4-day Average	Se 4-day Average
4- Day Average Discharge Criteria:		**2.0**	**0.15**	**0.004**	**0.31**	**0.016**	**1.00**	**0.005**	**0.094**	**0.21**	**0.005**
Effluent to Creek	7/3/2006	2.9250	0.0033	0.0002	0.0005	0.0020	0.003975	0.00019	0.0573	0.0023	0.0020
Effluent to Creek	7/4/2006	2.5750	0.0035	0.0001	0.0005	0.0009	0.011225	0.00002	0.0545	0.0008	0.0020
Effluent to Creek	7/5/2006	2.3250	0.0037	0.0001	0.0006	0.0009	0.012575	0.00002	0.0588	0.0006	0.0020
Effluent to Creek	7/6/2006	1.8250	0.0036	0.0001	0.0006	0.0008	0.012575	0.00002	0.0575	0.0009	0.0019
Effluent to Creek	7/7/2006	1.8250	0.0037	0.0001	0.0006	0.0008	0.010500	0.00002	0.0555	0.0011	0.0019
Effluent to Creek	7/8/2006	2.2500	0.0038	0.0001	0.0006	0.0009	0.003250	0.00002	0.0500	0.0011	0.0019
Effluent to Creek	7/9/2006	2.2500	0.0037	0.0001	0.0006	0.0011	0.000001	0.00002	0.0438	0.0014	0.0018
Effluent to Creek	7/10/2006	2.4000	0.0039	0.0001	0.0006	0.0011	0.000001	0.00002	0.0445	0.0021	0.0018
Effluent to Creek	7/11/2006	2.1000	0.0038	0.0001	0.0006	0.0011	0.000001	0.00002	0.0455	0.0020	0.0018
Effluent to Creek	7/12/2006	1.5750	0.0037	0.0001	0.0006	0.0008	0.000001	0.00002	0.0475	0.0020	0.0018
Effluent to Creek	7/13/2006	1.3750	0.0038	0.0001	0.0006	0.0008	0.000001	0.00002	0.0490	0.0017	0.0016
Effluent to Creek	7/14/2006	1.1750	0.0038	0.0001	0.0007	0.0008	0.000001	0.00002	0.0478	0.0007	0.0015
Effluent to Creek	7/15/2006	1.4000	0.0038	0.0001	0.0010	0.0008	0.000001	0.00002	0.0473	0.0005	0.0015
Effluent to Creek	7/16/2006	1.7250	0.0038	0.0001	0.0013	0.0008	0.000001	0.00002	0.0463	0.0004	0.0015
Effluent to Creek	7/17/2006	1.5075	0.0035	0.0001	0.0015	0.0007	0.000001	0.00002	0.0430	0.0008	0.0016
Effluent to Creek	7/18/2006	1.4300	0.0032	0.0001	0.0016	0.0008	0.000001	0.00002	0.0405	0.0009	0.0018
Effluent to Creek	7/19/2006	0.9975	0.0029	0.0001	0.0014	0.0008	0.000001	0.00002	0.0388	0.0016	0.0019
Effluent to Creek	7/20/2006	0.7725	0.0029	0.0001	0.0011	0.0008	0.000001	0.00002	0.0393	0.0020	0.0021
Effluent to Creek	7/21/2006	0.7263	0.0029	0.0003	0.0009	0.0018	0.001450	0.00002	0.0478	0.0038	0.0022
Effluent to Creek	7/22/2006	0.6363	0.0030	0.0004	0.0010	0.0018	0.001450	0.00002	0.0468	0.0043	0.0021

Table A-2
2006 Effluent 4-Day Average Concentrations

	Sample Date	Al 4-day Average	As 4-day Average	Cd 4-day Average	Cr 4-day Average	Cu 4-day Average	Fe 4-day Average	Pb 4-day Average	Ni 4-day Average	Zn 4-day Average	Se 4-day Average
4- Day Average Discharge Criteria:		**2.0**	**0.15**	**0.004**	**0.31**	**0.016**	**1.00**	**0.005**	**0.094**	**0.21**	**0.005**
Effluent to Creek	7/23/2006	0.5258	0.0029	0.0004	0.0011	0.0019	0.001450	0.00002	0.0374	0.0049	0.0020
Effluent to Creek	7/24/2006	0.2383	0.0029	0.0005	0.0014	0.0020	0.001450	0.00002	0.0319	0.0057	0.0018
Effluent to Creek	7/25/2006	0.4145	0.0032	0.0003	0.0022	0.0011	0.000001	0.00002	0.0216	0.0040	0.0020
Effluent to Creek	7/26/2006	0.4720	0.0033	0.0003	0.0025	0.0012	0.000001	0.00002	0.0186	0.0034	0.0022
Effluent to Creek	7/27/2006	0.6550	0.0036	0.0003	0.0027	0.0012	0.000001	0.00002	0.0208	0.0030	0.0025
Effluent to Creek	7/28/2006	0.7000	0.0035	0.0002	0.0028	0.0011	0.000001	0.00002	0.0164	0.0023	0.0027
Effluent to Creek	7/29/2006	0.6650	0.0032	0.0002	0.0025	0.0011	0.006000	0.00002	0.0124	0.0042	0.0026
Effluent to Creek	7/30/2006	0.4850	0.0028	0.0002	0.0023	0.0012	0.008000	0.00002	0.0101	0.0047	0.0024
Effluent to Creek	7/31/2006	0.4525	0.0026	0.0003	0.0023	0.0013	0.008000	0.00002	0.0111	0.0050	0.0022
Effluent to Creek	8/1/2006	0.4325	0.0027	0.0002	0.0021	0.0012	0.008000	0.00002	0.0109	0.0045	0.0022
Effluent to Creek	8/2/2006	0.4700	0.0030	0.0002	0.0018	0.0011	0.002000	0.00002	0.0129	0.0021	0.0024
Effluent to Creek	8/3/2006	0.5725	0.0036	0.0002	0.0015	0.0010	0.000001	0.00002	0.0150	0.0013	0.0026
Effluent to Creek	8/4/2006	0.5650	0.0035	0.0002	0.0013	0.0009	0.000001	0.00003	0.0143	0.0011	0.0026
Effluent to Creek	8/5/2006	0.5725	0.0035	0.0002	0.0011	0.0010	0.000001	0.00005	0.0168	0.0007	0.0028
Effluent to Creek	8/6/2006	0.4850	0.0032	0.0003	0.0010	0.0010	0.000001	0.00007	0.0190	0.0019	0.0030
Effluent to Creek	8/7/2006	0.7225	0.0031	0.0003	0.0010	0.0011	0.000001	0.00009	0.0195	0.0020	0.0031
Effluent to Creek	8/8/2006	0.7650	0.0037	0.0003	0.0008	0.0011	0.000001	0.00008	0.0235	0.0075	0.0029
Effluent to Creek	8/9/2006	0.8600	0.0042	0.0003	0.0007	0.0010	0.000001	0.00006	0.0238	0.0073	0.0029
Effluent to Creek	8/10/2006	0.7630	0.0042	0.0003	0.0007	0.0010	0.000001	0.00005	0.0193	0.0078	0.0026
Effluent to Creek	8/11/2006	0.6530	0.0044	0.0003	0.0006	0.0009	0.000001	0.00003	0.0203	0.0079	0.0027

Table A-2
2006 Effluent 4-Day Average Concentrations

	Sample Date	Al 4-day Average	As 4-day Average	Cd 4-day Average	Cr 4-day Average	Cu 4-day Average	Fe 4-day Average	Pb 4-day Average	Ni 4-day Average	Zn 4-day Average	Se 4-day Average
4- Day Average Discharge Criteria:		**2.0**	**0.15**	**0.004**	**0.31**	**0.016**	**1.00**	**0.005**	**0.094**	**0.21**	**0.005**
Effluent to Creek	8/12/2006	0.6555	0.0044	0.0003	0.0005	0.0009	0.000001	0.00003	0.0173	0.0020	0.0029
Effluent to Creek	8/13/2006	0.4495	0.0039	0.0003	0.0005	0.0010	0.000001	0.00006	0.0147	0.0024	0.0026
Effluent to Creek	8/14/2006	0.4528	0.0042	0.0003	0.0005	0.0009	0.000001	0.00005	0.0151	0.0024	0.0024
Effluent to Creek	8/15/2006	0.2203	0.0046	0.0003	0.0004	0.0013	0.000001	0.00005	0.0219	0.0036	0.0020
Effluent to Creek	8/16/2006	0.0323	0.0051	0.0003	0.0004	0.0016	0.000001	0.00005	0.0289	0.0036	0.0018
Effluent to Creek	8/17/2006	0.0308	0.0058	0.0003	0.0004	0.0018	0.000001	0.00002	0.0379	0.0034	0.0017
Effluent to Creek	8/18/2006	0.0290	0.0067	0.0003	0.0003	0.0020	0.000001	0.00002	0.0480	0.0028	0.0017
Effluent to Creek	8/19/2006	0.0275	0.0070	0.0003	0.0003	0.0019	0.000001	0.00004	0.0485	0.0018	0.0018
Effluent to Creek	8/20/2006	0.0260	0.0071	0.0003	0.0003	0.0019	0.000001	0.00004	0.0498	0.0018	0.0017
Effluent to Creek	8/21/2006	0.0238	0.0073	0.0003	0.0003	0.0018	0.000001	0.00004	0.0515	0.0016	0.0017
Effluent to Creek	8/22/2006	0.0213	0.0067	0.0003	0.0003	0.0017	0.000001	0.00004	0.0438	0.0019	0.0016
Effluent to Creek	8/23/2006	0.0195	0.0059	0.0003	0.0003	0.0015	0.000001	0.00003	0.0355	0.0021	0.0014
Effluent to Creek	8/24/2006	0.0178	0.0052	0.0003	0.0003	0.0014	0.000001	0.00002	0.0273	0.0022	0.0012
Effluent to Creek	8/25/2006	0.0170	0.0045	0.0003	0.0003	0.0014	0.000001	0.00002	0.0195	0.0025	0.0012

All values reported in milligrams/liter.
All parameters reported as dissolved, except Selenium reported as total recoverable.
Shaded areas indicate exceedences of the 4-Day Average criteria.

Table A-3
2006 Untreated Influent

	Sample Date	pH	Al	Q	As	Q	Ca	Q	Cd	Q	Co	Q	Cr	Q	Cu	Q	Fe	Q	Pb	Q	Mg	Q	Mn	Q	Ni	Q	Zn	Q	Se	Q	TDS	Q	Sulfate	Q
Daily Max Discharge Criteria:		**6 - 9 SU**	**4.0**		**0.34**		**n/a**		**0.009**		**n/a**		**0.97**		**0.026**		**2.0**		**0.136**		**n/a**		**n/a**		**0.84**		**0.210**		**n/a**		**n/a**		**n/a**	
Influent	7/3/2006	2.70	460		12		230		0.085		2.4		1.8		3.8		1000		0.0057		59		13		6.70		1.3		0.0027		9800		6400	
Influent	7/10/2006	2.50	440		11		210		0.074		1.5		1.5		3.2		920		0.0039		56		12		6.40		1.2		0.0033		8500		5800	
Influent	7/17/2006	2.50	430		7		210		0.065		2.3		1.4		2.4		790		0.0032		56		11		5.70		1.0		0.0030		7400		5300	
Influent	7/24/2006	2.60	400		6		200		0.064		2.2		1.2		2.3		720		0.0032		52		10		6.00		1.1		0.0028		6400		4900	
Influent	7/31/2006	2.54	460		6.3		210		0.082		1.7		1.4		2.6		890		0.0024		64		10		6.30		1.2		0.0040		8000		6700	
Influent	8/7/2006	2.48	410		4.6		220		0.065		1.8		1.1		2.4		590		0.0021		53		6.1		0.00014	U	0.76		0.0035		7300		5700	

All values reported in milligrams/liter, except pH.
All parameters reported as dissolved, except Selenium reported as total recoverable.
n/a - not applicable, no discharge criteria exists for this parameter.

Qualifiers:
U - Analyte not detected at the given Method Detection Limit.
J - Analyte detected between the Method Detection Limit and the Practical Quantitation Limit.
* - Relative Percent Difference outside of control limits

Table A-4
2006 Sludge Analysis

Regulatory Criteria	Al		Sb		As		Ba		Be		Cd		Cr		Co		Cu		Fe		Pb		Hg		Mo		Ni		Se		Ag		Tl		V		Zn	
STLC (mg/L)	NP		15		5		100		0.75		1		560		80		25		NP		5		0.2		350		20		1		5		7		24		250	
TTLC (mg/kg)	NP		500		500		10000		75		100		2500		8000		2500		NP		1000		20		3500		2000		100		500		700		2400		5000	
Pit Clarifier Sample Date and Testing Procedure	**Al**	**Q**	**Sb**	**Q**	**As**	**Q**	**Ba**	**Q**	**Be**	**Q**	**Cd**	**Q**	**Cr**	**Q**	**Co**	**Q**	**Cu**	**Q**	**Fe**	**Q**	**Pb**	**Q**	**Hg**	**Q**	**Mo**	**Q**	**Ni**	**Q**	**Se**	**Q**	**Ag**	**Q**	**Tl**	**Q**	**V**	**Q**	**Zn**	**Q**
10/17/2006 (A)																																						
STLC (mg/L)	690		0.41	U	0.61		0.059	U	0.043	J	0.18		2.7		7.6		6.6		1200		0.032	U	0.0007	U	0.022	U	20		0.13	U	0.013	U	0.19	U	0.37		3.6	
TTLC (mg/kg dry)	48000		12		690		5.6	J	1.6	J	17		150		280		300		66000		0.5	U	0.03	J	3.7	U	710		1.3	U	0.23	U	1.7	U	32		140	
23.8*																																						
10/17/2006 (B)																																						
STLC (mg/L)	510		0.41	U	0.76		0.059	U	0.032	J	0.15		2.2		5.7		6.8		1400		0.032	U	0.0007	U	0.022	U	14		0.13	U	0.013	U	0.21	J	0.64		2.9	
TTLC (mg/kg dry)	47000		12		990		5.5	J	1.5	J	18		150		280		340		77000		0.59	U	0.02	J	4.4	U	690		1.5	U	0.27	U	3.5		62		140	
20.0*																																						
10/17/2006 (C)																																						
STLC (mg/L)	530		0.41	U	0.44		0.059	U	0.035	J	0.19		2.1		6.5		6.1		920		0.032	U	0.0007	U	0.022	U	16		0.13	U	0.013	U	0.19	U	0.46		3.1	
TTLC (mg/kg dry)	46000		12		970		5.4	J	1.5	J	18		150		270		340		95000		0.58	U	0.027	J	4.3	U	670		1.5	U	0.26	U	3.4	J	61		130	
20.5*																																						

* percent solids
NP: None promulgated.
Shaded cells indicate concentrations that exceed hazardous waste criteria.

Qualifiers:
U - Analyte not detected at the given Method Detection Limit.
J - Analyte detected between the Method Detection Limit and the Practical Quantitation Limit.

Attachment B

Field Data Sheets

2006 Daily Chemistry for: Effluent

in mg/l except pH

Metals reported as: preliminary result (PR) x dilution factor (DF) = final result (FR); if no dilution factor used record only final result.

Date	Time	pH	Al		Fe		Sample ID # / Comments
6-28-06	1245	8.0	PR x DF =	FR 0.66	PR x DF =	FR 0.00	056BP211 Collected from pit clarifier
6-29-06	1230	7.4					056BP212 collected from P.C. near picolo
6-30-06	1310	8.2					056BP213 collected from weir V-notch
7-1-06	1700	8.5					06/07PWT001 collected from weir
7-2-06	1515	8.7					067PWT002 collected from weir
7-3-06	1030	8.5					067PWT003 Eff collected from weir V-notch
7-4-06	1335	8.1					067PWT005 Eff collected from weir V-notch
7-5-06	11:45	8.0					067PWT006 Eff collected from weir
7-6-06	10:15	8.2					067PWT007, 008 (Dup)
7-7-06	10:45	8.4					067PWT009
7-8-06	14:05	8.3					067PWT012
7-9-06	9:00	8.1					067PWT013
7-10-06	10:40	8.3					067PWT014
7-11-06	10:10	8.12					067PWT016
7-12-06	10:20	8.0					067PWT018 2pt pH calibration (7+10)
7-13-06	1045	8.1					067PWT019+20 (dup)
7-14-06	1430	8.0					067PWT021
7-15-06	1125	8.22					067PWT023
7-16-06	1140	8.16					067PWT024

Filling pit cla

Disch to L. Cre

2006 Daily Chemistry for: Effluent

in mg/l except pH

Metals reported as: preliminary result (PR) x dilution factor (DF) = final result (FR); if no dilution factor used record only final result.

Date	Time	pH	Al		Fe		Sample ID # / Comments
			PR x DF =	FR	PR x DF =	FR	
7.17.06	1120	8.05					067PWT025 discharge mostly from underdrain closed down picolo b/c high pH
7.18.06	1600	7.8					067PWT027 " "
7.19.06	945	7.6					067PWT029 " "
7.20.06	1020	7.94					067PWT030, 031 discharge from underdrain + picolo
7.21.06	1000	7.9					067PWT032, pH from URS meter
7.22.06	1745	7.6					067PWT034, URS meter - 7.9 at weir
7.23.06	1615	7.4					067PWT035 URS meter 7.6 at weir
7.24.06	1000	7.59					067PWT036 Eff collected from weir box
7.25.06	1030	7.8					067PWT038
7.26.06	1115	7.8					067PWT040
7.27.06	1400	7.7					067PWT041
7.28.06	1715	7.6					067PWT043
7.29.06	945	7.8					067PWT045
7.30.06	1045	7.8					067PWT046
7.31.06	1050	7.96					067PWT047
8.1.06	1005	8.01					
8.1.06	1145	7.70		0.07		0.000	067PWT049 flow almost entirely from P.C. underdrains
8.2.06	1000	7.71		0.09		0.000	067PWT051

2006 Daily Chemistry for: Effluent

in mg/l except pH

Metals reported as: preliminary result (PR) x dilution factor (DF) = final result (FR); if no dilution factor used record only final result.

Date	Time	pH	Al		Fe		As		Sample ID # / Comments
			PR x DF =	FR	PR x DF =	FR	PR x DF =	FR	
8.3.06	~~1035~~ 935	7.8		0.09		0.000			067PWT052
8.4.06	1140	7.77		0.13		0.000			067PWT054
8.5.06	0945	7.67		0.10		0.001			067PWT056
8.6.06	9:20	7.90		0.07		0.001			067PWT057
8.7.06	8:50	8.06		0.30		0.000			067PWT058
8.8.06	10:25	7.78		0.15		0.000			067PWT060
8.9.06	10:00	7.81		0.13		0.001			067PWT062
8.10.06	11:20	7.27		0.01		0.000			067PWT064 } entirely PC
8.10.06	11:25	7.27		0.01		0.000			067PWT065 } underdrain, no picolo discharge
8.11.06	9:35	8.03		0.19		0.000			067PWT066
8.12.06	1005	7.84		0.11		0.000			067PWT067 Last Day of Treatment
8.13.06	925	7.33							067PWT068
8.14.06	945	7.37							067PWT069
8.15.06	1140	7.28							067PWT070
8.16.06	1245	7.32							067PWT071
8.17.06	1120	7.24							067PWT073 (11:15), 074 (11:20) - Dup.
8.19.06	1030	7.44							067PWT079
8.20.06	1100	7.36							067PWT080

8.18.06 10:20 7.21

2006 Daily Chemistry for: Effluent

in mg/l except pH

Metals reported as: preliminary result (PR) x dilution factor (DF) = final result (FR); if no dilution factor used record only final result.

Date	Time	pH	Al		Fe		As		Sample ID # / Comments
			PR x DF =	FR	PR x DF =	FR	PR x DF =	FR	
8-21-06	9:45	7.37							067PWT081
8-22-06	12:00	7.59							067PWT082
8-23-06	945	7.20							067PWT084
8-24-06	10:45	7.36							067PWT085, 086
8-25-06	10:15	7.25							067PWT087

2006 Daily Chemistry for: Influent

in mg/l except pH

Metals reported as: preliminary result (PR) x dilution factor (DF) = final result (FR); if no dilution factor used record only final result.

Date	Time	pH	Al		Fe		Sample ID # / Comments
6·28·06	1245	2.8	.57 1000 PR x DF =	FR 570	1.294 1000 PR x DF =	FR 1294	~~056~~ DC
6·29·06	1230	2.6			(500)	over range @ 500 x dilution	Hach PR 2010 died; no field data
6·30·06	1400	2.6					Hach sent for repair
7·1·06	1700	2.5					
7·2·06	1515	2.6					
7·3·06	1030	2.7					067PWT004-Inf
7·4·06	1400	2.34					
7·5·06	1145	2.4					
7·6·06	10:15	2.4					
7·7·06	10:30	2.1					
7·8·06	13:50	2.5					
7·9·06	8:50	2.5					
7·10·06	10:30	2.5					067PWT015-Inf
7·11·06	1015	2.64					
7·12·06	1015	2.6					2pt pH calibration (7+10)
7·13·06							system down - no influent collected
7·14·06		2.6					
7·15·06	1115	2.5					
7·16·06	1130	2.5					

2006 Daily Chemistry for: Influent / AMD

in mg/l except pH

Metals reported as: preliminary result (PR) x dilution factor (DF) = final result (FR); if no dilution factor used record only final result.

Date	Time	pH	Al		Fe		As		Sample ID # / Comments
			PR x DF =	FR	PR x DF =	FR	PR x DF =	FR	
7.17.06	1115	2.5							067PWT026
7.18.06	1600	2.6							
7.19.06	945	2.6							
7.20.06	1010	2.62							
7.21.06	1000	2.6							
7.22.06	1745	2.7							
7.23.06	1620	2.6							
7.24.06	950	2.6							067PWT037
7.26.06	1100	2.5							[redacted]
7.27.06	1415	2.5							
7.28.06	1730	2.5							
7.29.06	1000	2.5							
7.30.06	1035	2.55							
7.31.06	1040	2.54							067PWT048
8.2.06	1005	2.52	0.52 · 1000	[redacted] 520	0.883 · 1000	883			
8.3.06	~~1050~~ 950	2.58	0.49 · 1000	490	0.729 · 1000	729			
8.4.06	1130	2.54	.47(1000)	470	.723 (1000)	723			
8.5.06	0950	2.53	0.47 · 1000	470	.687 · 1000	687			

2006 Daily Chemistry for: Influent /AMD

in mg/l except pH

Metals reported as: preliminary result (PR) x dilution factor (DF) = final result (FR); if no dilution factor used record only final result.

Date	Time	pH	Al		Fe		As		Sample ID # / Comments
			PR x DF =	FR	PR x DF =	FR	PR x DF =	FR	
8.6.06	9:30	2.40	0.47·1000	470	.691·1000	691			
8·2·06	9:00	2.48	0.45·1000	450	.648·1000	648			067PW T059
8·8·06	10:35	2.64	.45(1000)	450	.692(1000)	692			
8·9·06	10:20	2.46	.46(1000)	460	.689(1000)	689			
8·10·06	11:10	2.52	.48(1000)	480	.696(1000)	696			
8·11·06	9:50	2.50	.51(1000)	510	.658(1000)	658			
8·12·06	1020	2.52	0.42(1000)	420	.775(1000)	775			

ALITY CONTROL BOARD SAMPLE TRACKING FORM

ple ID Number	Date Collected	staff initials	Project Description	Lab	Comments
056BP201	10.18.05	LS	TR - Eff	AC2	last sample!
056BP202	10.2.05	LS	picolo - TR		
056BP203	10.2.05	LS	picolo - Diss		
056BP204	10.2.05	LS	PCUD - TR		
056BP205	10.2.05	LS	PCUD - Diss		
056BP206	10.5.05	BG	PCUD - TR		
056BP207	10.5.05	BG	PCUD - Diss		
056BP208	10.5.05	BG	picolo - Diss.		
056BP209	10.5.05	BG	picolo - TR		
056BP210	6.27.06	LS, BG	TR Se, Dissolved		Labs collected from line into P.C.
056BP211	6.28.06	LS, SW	TR Se, + Dissolved metals		collected from P.C.
056BP212	6.29.06	BG	TR Se + Dissolved metals		collected from P.C.
056BP213	6.30.06	DSC	TR Se & Dissolved metals		collected from weir V-notch
~~056BP214~~					
056BP215					
056BP216					
056BP217					
056BP218					
056BP219					
056BP220					
056BP221					
056BP222					
056BP223					
056BP224					
056BP225					

June summer 2006

Use 067PLOT Starting July 1, 2006

LAHONTAN REGION
WATER QUALITY CONTROL BOARD

LEVIATHAN MINE MULTIPHASIC SYSTEM
SAMPLE TRACKING FORM

Y 06-07

Sample ID Number	Date Collected	staff initials	Project Description	Lab	Comments
~~067PWT000~~					
067PWT001	7/1/06	BG	TR Se + Dissolved Metals	WECK	collected from weir
067PWT002	7/2/06	BG	TR Se + Dissolved Metals		" "
067PWT003	7.3.06	DSC	TR Se & Dissolved Metals + SO4 + TDS		" " V-notch (Effluent sample)
067PWT004	7.3.06	DSC	TR Se + Diss Metals + SO4 + TDS		collected from R-1 inlet (Influent sample)
067PWT005	7.4.06	DSC	TR Se + Dissolved metals		collected from weir V-notch
067PWT006	7.5.06	LS, SW	TR Se + Dissolved metals		Eff "
067PWT007	7.5.06	LS, SW	TR Se + Diss. metals		FMB
067PWT008	7.6.06	LS, SW	TR Se + Diss. metals	Weck	Eff collected @ weir box
067PWT009	7.6.06	LS, SW	TR Se + Diss. metals		Eff Dup "
067PWT010	7.7.06	LS, SW	TR Se + Diss. Metals		Eff collected @ weir box
067PWT011	7.7.06	LS, SW	TR Se + Diss Metals		ERB collected after acid bath
067PWT012	7.8.06	LS	TR Se + Diss. Metals		Eff
067PWT013	7.9.06	LS	TR Se + Diss Metals		Eff
067PWT014	7.10.06	LS	TR Se + Diss. Metals, SO_4, TDS		Eff Full suite
067PWT015	7.10.06	LS, SW	TR Se, Diss. Metals, SO_4, TDS		Inf Full suite
067PWT016	7.11.06	LS	TR Se, Diss Metals		Eff
067PWT017	7.11.06	LS	TR Se, Diss. Metals		FMB
067PWT018	7.12.06	BG	TR Se, Diss. Metals		Eff
067PWT019	7.13.06	BG	TR Se, Diss Metals		Eff
067PWT020	7.13.06	BG	TR Se, Diss Metals		Eff-dup
067PWT021	7.14.06	BG	TR Se, Diss Metals		Eff
067PWT022	7.14.06	BG	TR Se, Diss Metals		ERB
067PWT023	7.15.06	LS	TR Se, Diss Metals		Eff
067PWT024	7.16.06	LS	TR Se, Diss Metals		Eff
067PWT025	7.17.06	LS	TR Se, Diss Metals, TDS, SO_4		Eff

discha to cree

LAHONTAN REGION
WATER QUALITY CONTROL BOARD

LEVIATHAN MINE MULTIPHASIC SYSTEM
SAMPLE TRACKING FORM

FY 06-07

Sample ID Number	Date Collected	staff initials	Project Description	Lab	Comments
067PWT026	7.17.06	LS, SW	TR Se, Diss Metals, TDS, SO4	Weck	Influent
067PWT027	7.18.06	BG	TR Se, Diss Metals		Eff
067PWT028	7.18.06	BG	TR Se, Diss Metals		FMB
067PWT029	7.19.06	BG	TR Se, Diss Metals		Eff
067PWT030	7.20.06	SW, LS	TR Se, Diss. Metals		Eff
067PWT031	7.20.06	SW, LS	TR Se, Diss. Metals		Eff-Dup
067PWT032	7.21.06	SW, BG	TR Se, Diss Metal		Eff
067PWT033	7.21.06	SW, BG	TR Se, Diss Metal		ERB
067PWT034	7.22.06	BG	TR Se, Diss Metal		eff
067PWT035	7.23.06	BG	TR Se, Diss Metal		Eff
067PWT036	7.24.06	SW, LS	TR Se, Diss Metal, TDS, SO4		eff
067PWT037	7.24.06	SW, LS	TR Se, Diss Metal, TDS, SO4		inf
067PWT038	7.25.06	LS	TR Se, Diss. Metals		Eff
067PWT039	7.25.06	LS	TR Se, Diss. Metals		~~Eff~~ FMB
067PWT040	7.26.06	SW, LS	TR Se. + Diss. Metals		Eff
067PWT041	7.27.06	BG	TR Se + Diss Metals		Eff
067PWT042	7.27.06	BG	TR Se + Diss Metals		Dup - Eff
067PWT043	7.28.06	BG	TR Se + Diss Metals		Eff
067PWT044	7.28.06	BG	TR Se + Diss Metals		ERB
067PWT045	7.29.06	BG	TR Se + Diss Metals		Eff
067PWT046	7.30.06	SW	TR Se + Diss Metals		Eff
067PWT047	7.31.06	LS	TR Se, Diss. Metals, TDS, SO4		Eff
067PWT048	7.31.06	LS	TR Se, Diss. Metals, TDS, SO4		Inf.
067PWT049	8.1.06	LS	TR Se, Diss. Metals		Eff
067PWT050	8.1.06	LS	TR Se, Diss. Metals		FMB

LAHO[illegible]AN REGION
WATE[illegible] QUALITY CONTROL BOARD

LEVIATHAN MIN[illegible]IPHASIC SYSTEM
SAMPLE TR[illegible]CKING FORM

[illegible] 06-07

Sample ID Number	Date Collected	staff initials	Project Description	Lab	Comments
067PWT051	8·2·06	SW, LS	TR Se, Diss. Metals	Weck	Eff
067PWT052	8·3·06	SW	TR Se, Diss. Metals		Eff
067PWT053	8·3·06	SW	TRSe, Diss. Metals		Eff-Dup
067PWT054	8·4·06	LS	TR Se, Diss. Metals		Eff
067PWT055	8·4·06	LS	TR Se, Diss. Metals		ERB
067PWT056	8·5·06	SW	TR Se, Diss. Metals		Eff
067PWT057	8·6·06	SW	TRSe, Diss. Metals		Eff
067PWT058	8·7·06	SW	TRSe, Diss. Metals, TDS, SO_4		Eff
067PWT059	8·7·06	SW	TRSe, Diss. Metals, TDS, SO_4		Inf
067PWT060	8·8·06	LS	TR Se, Diss. Metals		Eff
067PWT061	8·8·06	LS	TR Se, Diss. Metals		FMB
067PWT062	8·9·06	LS	TR Se, Diss Metals		Eff
067PWT063	8·10·06	LS	TR Se, Diss. Metals		ERB
067PWT064	8·10·06	LS	TR Se, Diss Metals		Eff
067PWT065	8·10·06	LS	TR Se, Diss Metals		Eff Dup
067PWT066	8·11·06	SW	TR Se + Diss. Met.		Eff
067PWT067	8·12·06	SW	TR Se + Diss. Metals		Eff - Last Day of Treatment
067PWT068	8·13·06	SW	TRSe + Diss. Metals		Eff
067PWT069	8·14·06	SW	TRSe + Diss. Metals		Eff
067PWT070	8·15·06	LS	TR Se + Diss. Metals		Eff
067PWT071	8·16·06	LS	TR Se, Diss Metals		Eff
067PWT072	8·16·06	LS	TR Se, Diss. Metals		FMB
067PWT073	8·17·06	LS	TR Se, Diss. Metals		Eff
067PWT074	8·17·06	LS	TR Se, Diss Metals		Eff-Duplicate
067PWT075	6·19·06	LS, DSC	Pit Clarifier Sludge - Location A		2005 Sludge Sampling

LAHC AN REGION
WATER QUALITY CONTROL BOARD

LEVIATHAN MIN PHASIC SYSTEM
SAMPLE TRACKING FORM

06-07

Sample ID Number	Date Collected	staff initials	Project Description	Lab	Comments
067PWT076	6·19·06	LS, DSC	Pit Clarifier Sludge - Loc. B	Weck	2005 Sludge Sampling
067PWT077	6·19·06	LS, DSC	Pit Clarifier Sludge - Loc. C	Weck	2005 Sludge Sampling
067PWT078	8·18·06	LS	TR Se, Dissolved Metals	Weck	Eff (2006 Treatment)
067PWT079	8·19·06	SW	TR Se, Diss Metals	Weck	Eff (2006)
067PWT080	8·20·06	SW	TRSe, Diss. Met.	Weck	Eff
067PWT081	8·21·06	SW	TRSe, Diss. Met.	Weck	Eff
067PWT082	8·22·06	SW	TR Se, Diss. Metals	Weck	Eff
067PWT083	8·22·06	SW	TRSe, Diss. Met.	Weck	~~Eff~~ FMB
067PWT084	8·23·06	LS	TR Se, Diss. Metals	Weck	Eff
067PWT085	8·24·06	SW	TR Se, Diss. Metals	Weck	Eff
067PWT086	8·24·06	SW	TR Se, Diss. Metals	Weck	Eff - Dup
067PWT087	8·25·06	LS	TR Se, Diss Metals	Weck	Eff - Last Day of Sample Collection
067PWT088	10·17·06	LS, DSC	2006 PLOT - P.C. Sludge - A		Sludge 0-23"
067PWT089	10·17·06		" - B		" 0-24"
067PWT090	10·17·06		" - C		" 0-24"
067PWT091					
067PWT092					
067PWT093					
067PWT094					
067PWT095					
067PWT096					
067PWT097					
067PWT098					
067PWT099					
067PWT100					

Attachment C

Daily Summary of Discharge Flow Data

2006 Pit Clarifier Discharge Summary

Date	average discharge (gpm)	minutes	daily flow (gallons)
6/30/2006	123.19	795	97,935
7/1/2006	160.91	1440	231,709
7/2/2006	205.00	1440	295,200
7/3/2006	242.65	1440	349,417
7/4/2006	269.95	1440	388,729
7/5/2006	229.67	1440	330,723
7/6/2006	217.13	1440	312,660
7/7/2006	217.13	1440	312,660
7/8/2006	182.14	1440	262,280
7/9/2006	106.60	1440	153,510
7/10/2006	182.14	1440	262,280
7/11/2006	229.67	1440	330,723
7/12/2006	171.32	1440	246,702
7/13/2006	141.27	1440	203,435
7/14/2006	141.27	1440	203,435
7/15/2006	193.37	1440	278,448
7/16/2006	205.00	1440	295,200
7/17/2006	217.13	1440	312,660
7/18/2006	242.65	1440	349,417
7/19/2006	229.67	1440	330,723
7/20/2006	229.67	1440	330,723
7/21/2006	217.13	1440	312,660
7/22/2006	217.13	1440	312,660
7/23/2006	123.19	1440	177,392
7/24/2006	256.08	1440	368,751
7/25/2006	242.65	1440	349,417
7/26/2006	229.67	1440	330,723
7/27/2006	217.13	1440	312,660
7/28/2006	217.13	1440	312,660
7/29/2006	217.13	1440	312,660
7/30/2006	205.00	1440	295,200
7/31/2006	229.67	1440	330,723
8/1/2006	193.37	1440	278,448
8/2/2006	205.00	1440	295,200
8/3/2006	205.00	1440	295,200
8/4/2006	217.13	1440	312,660
8/5/2006	217.13	1440	312,660
8/6/2006	217.13	1440	312,660
8/7/2006	229.67	1440	330,723
8/8/2006	217.13	1440	312,660
8/9/2006	217.13	1440	312,660
8/10/2006	171.32	1440	246,702

2006 Pit Clarifier Discharge Summary continued

Date	average discharge (gpm)	minutes	daily flow (gallons)	
8/11/2006	193.37	1440	278,448	
8/12/2006	205.00	1440	295,200	last day of treatment
8/13/2006	49.19	1440	70,831	
8/14/2006	28.22	1440	40,637	
8/15/2006	21.75	1440	31,320	
8/16/2006	18.89	1440	27,202	
8/17/2006	13.91	1440	20,030	
8/18/2006	9.82	1440	14,141	
8/19/2006	8.10	1440	11,664	
8/20/2006	7.48	1440	10,771	
8/21/2006	6.85	1440	9,864	
8/22/2006	6.23	1440	8,971	
8/23/2006	5.61	1440	8,078	
8/24/2006	5.61	1440	8,078	
8/25/2006	4.98	1440	7,171	
8/26/2006	4.36	1440	6,278	
8/27/2006	3.74	1440	5,386	
Total Discharge			**13,157,724**	**gallons**