POGO MINE

2008

ANNUAL ACTIVITY AND MONITORING REPORT

Submitted To:

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1 Introduction

Teck-Pogo Inc. has prepared this report to fulfill the requirements of the Alaska Department of Natural Resources (ADNR) Pogo Mine Millsite Lease ADL416949, ADNR Plan of Operations Approval F20039500, the U.S. Environmental Protection Agency (EPA) NPDES Permit AK005334-1, the Alaska Department of Environmental Conservation (ADEC) Waste Disposal Permit, 0131-BA002, and the ADEC Non-domestic Wastewater Disposal Permit, 2004-DB0070.

The Pogo mine is an underground gold mine located 38 miles northeast of the community of Delta Junction in eastern interior Alaska (see Figure 1). Teck-Pogo Inc. operates the mine on behalf of the Pogo Joint Venture, a JV between Sumitomo Metal Mining Co., Ltd. (51%), Sumitomo Corporation (9%), and Teck Cominco Limited (40%).

The Pogo mine began operations in 2006 with a 10 year mine life. Protection of the Goodpaster River is of prime importance to mine operations. The ore is processed on site to recover gold through a gravity recovery and flotation-concentrate/leach processes. A portion of the tailings are thickened and mixed with cement to form a paste and placed underground as backfill. The remaining tailings are dewatered by pressure filtration and placed in a tailings and waste rock storage facility called the drystack. A diversion ditch has been constructed to divert surface runoff around the drystack and water storage dam. All mill process water is recycled. A water treatment plant treats mine drainage from the underground workings and surface runoff water prior to permitted discharge.

A 49 mile all-season road connects the Pogo mine to the Richardson highway near Shaw Creek, located approximately 20 miles north of Delta Junction. Mine employees travel to the mine site by bus and live at the mine during their work rotations. Potable water and sewage treatment plants provide support for the accommodations.

2 Summary of 2008 Activities

2.1 MINE OPERATIONS

Pogo Mine is a mechanical drift and fill underground gold mine accessed via three portals denoted by their elevation, the 1875, the 1690, and the 1525. After blasting, the ore is loaded by 3 and 9 yd loaders into 30 and 50 ton trucks and hauled to a 3000 ton underground ore bin. The ore is then transported out of the mine on a 2,500 foot long conveyor via the 1690 portal to the surface mill.

The milling focus in 2008 was consistent operation through improved operations and equipment availability. The mill processed 2,236 tons per day in 2008 for a total of 818,237 tons for the year. The budget values were 900,100 tons. Gold produced was 343,296 troy ounces verses the 360,152 troy ounces budgeted.

No major mill modifications were undertaken in 2008. Spill containment was added around the CIP thickener, the Backfill Dilution Water tank, and the Filter Feed tank at the tailings building. In addition the leach circuit pre-aeration tank was taken off-line for repairs for the majority of the year.

The focus underground remains on the development needed to open up the additional ore headings that are needed to reach the full production rate of 2,500 tons per day. During the year 882,000 tons were mined and lateral development exceeded the plan at 14,427 ft.

Mining and crushing/screening gravel from the permitted borrow site near the north end of the airstrip provided road topping material required for underground and surface facilities.

Non-mineralized development rock was placed in select areas of the existing permitted laydown areas to augment the existing fills and raise the level of the work and storage areas above Goodpaster river flood levels.

At year end, Teck-Pogo had 287 employees, with an additional 98 persons employed by contractors in housekeeping and underground development.

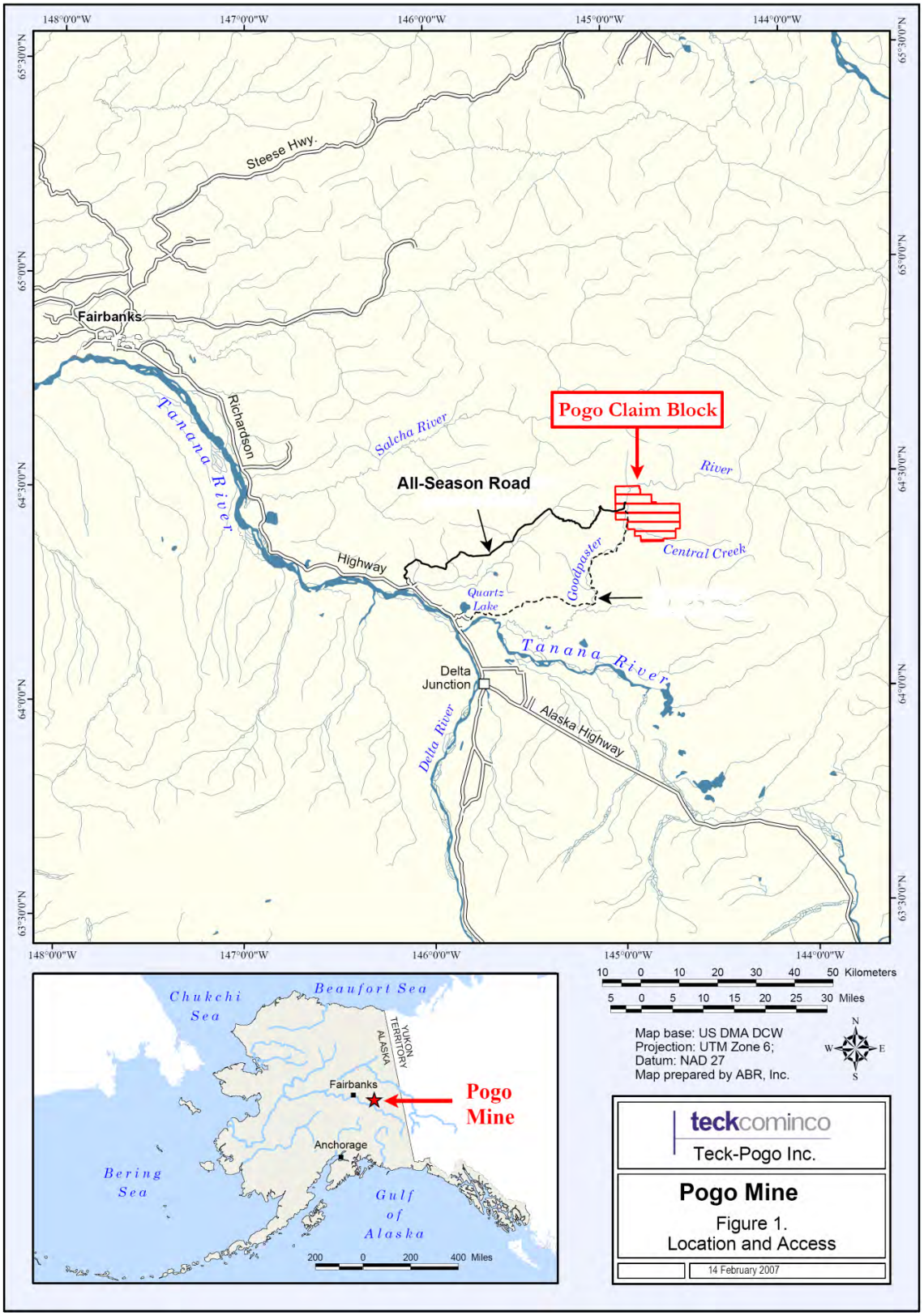


Figure 1. Location and Access

2.2 ALL-SEASON ROAD

Maintenance activities along the all-season road consisted of re-grading the entire road several times. Three sections of guardrail, totaling 2,200 feet, were added between mile 38 and mile 40. In the Giles Creek area of the road drainage rock was added as well.

Throughout the year, Teck-Pogo maintained a manned security station at the access road gate at Mile 0. During the August caribou season and the Sept. 1-15 moose hunting season, Teck-Pogo stationed a third party security guard at the intersection of the TAPS right-of-way and the Pogo road to advise roving hunters that the Pogo road is closed to the public. No trespassing signs remain posted on the road.

2.3 EXPLORATION

In 2008 Teck-Pogo carried out a surface and underground exploration drilling program on the Pogo Joint Venture property. A helicopter-supported, two-rig drill program, operating 24-hours a day from May 15 to September 15 with a combined crew of 24 workers, completed 20 holes totaling 37,449 feet. This included 18 holes (33,331 feet) drilled within the Pogo millsite lease. Underground exploration drilling within Pogo Mine, carried out intermittently with one drill rig from early June through the end of November, completed 16 holes totaling 13,529 feet. For the year, exploration drilling completed a total of 36 holes totaling 50, 978 feet.

2.4 PERMITTING ACTIVITIES

Significant permitting activities in 2008 included the completion of the third party environmental audit by Golder & Associates. The application to renew the EPA NPDES permit AK005334-1 was submitted September 29, 2008.

An extension for the renewal of the Alaska Department of Natural Resources (ADNR) Pogo Mine Millsite Lease ADL416949, ADNR Plan of Operations Approval F20039500, the Alaska Department of Environmental Conservation (ADEC) Waste Disposal Permit, 0131-BA002, the ADEC Non-domestic Wastewater Disposal Permit, 2004-DB0070, was received. Renewal documents are due June 1, 2009.

3 2008 Monitoring

A prescriptive program of environmental monitoring is conducted by Teck-Pogo as specified by permit requirements and in accordance with a DEC and EPA approved Quality Assurance Protection Plan (QAPP).

The objectives of the monitoring programs are:

- To monitor the water quality of the effluent discharged from the facility,
- To monitor water quality changes in the Goodpaster River and in the groundwater below the facility that may occur as a result of mining activities or discharges from the facility,
- To monitor fish tissue metals content in juvenile Chinook salmon from the Goodpaster River upstream and downstream from the project facilities,
- To monitor the mill processes associated with the treatment facilities, and
- To monitor the treatment facilities and the materials placed in the facilities.

Samples collected from the Water Treatment Plant (WTP), groundwater stations, and surface water stations were submitted to Test America Inc. Environmental Laboratory. Samples collected for the Sewage Treatment Plant (STP) influent and effluent were submitted to Analytica Laboratories.

This report covers the period of January 1, 2008 through December 31, 2008.

3.1 SUMMARY

Evaluation of the 2008 monitoring results indicates a 99.5% compliance rate with 2,144 quantitative water quality permit requirements. A summary of the results show:

- At the Mine Water Treatment Plant effluent, Outfall 011, there were no water quality or permit exceedances during the period.

- At the Off River Treatment Works (ORTW) discharge, Outfall 001, a permit exceedance occurred in May 2008 after a precipitation event. There was no discharge from Outfall 011 during the period.

- At the Off River Treatment Works (ORTW) discharge, Outfall 001, three permit exceedances took place in September, when analytical data showed the Cyanide WAD levels exceeded daily maximum of 8.5 ug/L, which also resulted in the exceedance of the monthly average at 4.3 ug/L. Resulting investigations indicated that the dilution ratio had been much lower than was realized thus affecting the levels of Cyanide WAD being discharged from the ORTW. Discharge from the ORTW recommenced October 8, and effluent has remained within permit limitations.

- Three wells are located below the RTP Dam, MW03-500, MW03-501, and MW03-502, monitor groundwater downstream of the RTP seepage collection system. Samples were collected on November 5, 2008. Cyanide WAD and Nitrates were elevated, indicating possible influence from the RTP seepage. Further samples are in the process of being collected and submitted for analysis to monitor and verify these levels.

- Liese Creek formed a seep in early October 280 feet below the RTP that showed elevated Cyanide WAD. A pump was place in the seep and it was returned to the seepage collection system. Later during the quarter, lower areas of Liese creek showed elevated surface water with Cyanide WAD levels, indicating the probable influence of RTP seepage. Corrective actions are scheduled to control RTP seepage.

- There were no adverse trends during the period in surface water samples or mill process samples.

A discussion of the results for each sampling program is provided below. Data for some monitoring programs are provided in Appendix A. Time series plots for all other locations are provided in Appendix B.

3.2 TREATED EFFLUENT MONITORING

The monitoring locations for treated effluent are shown on Figure 2.

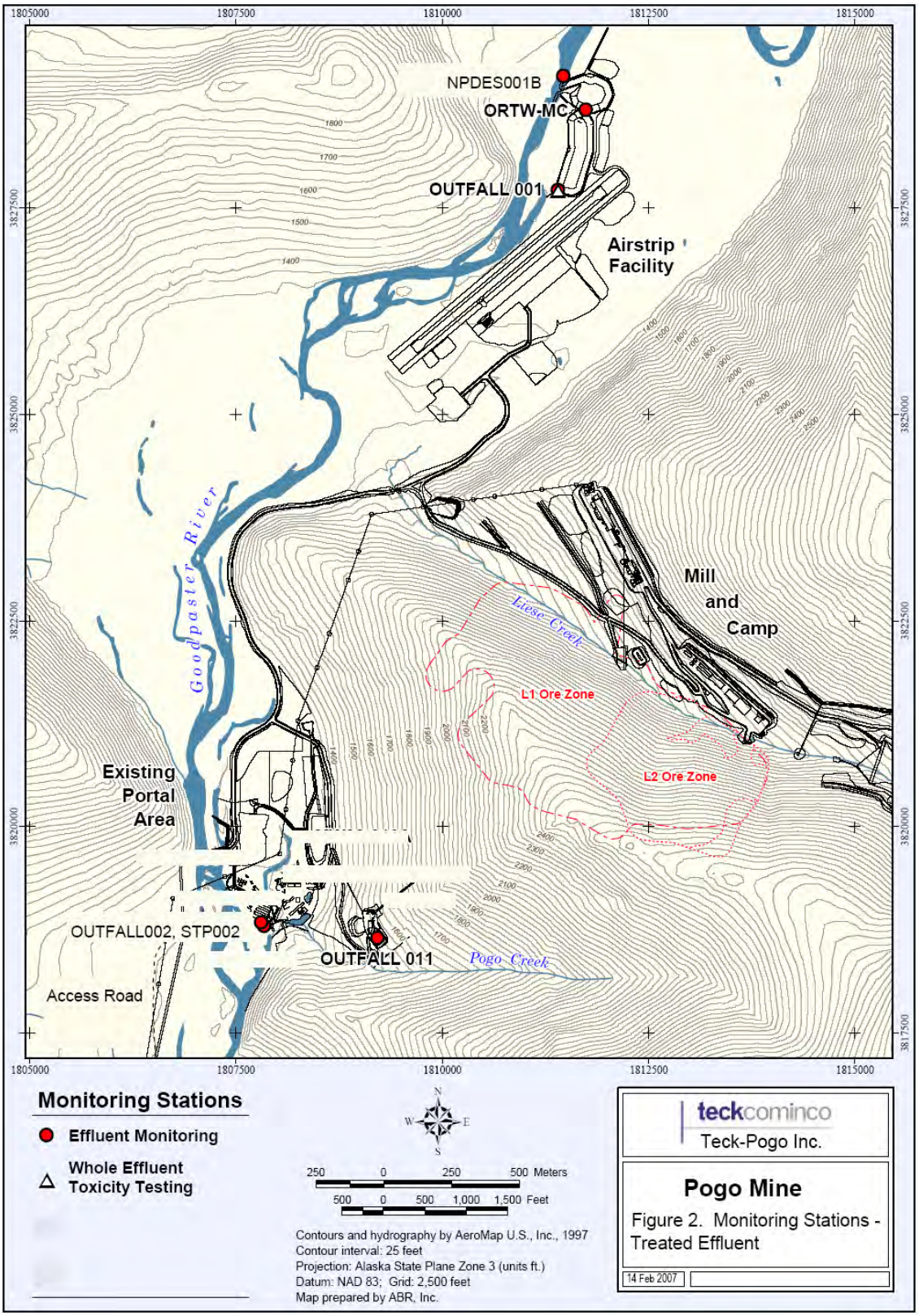
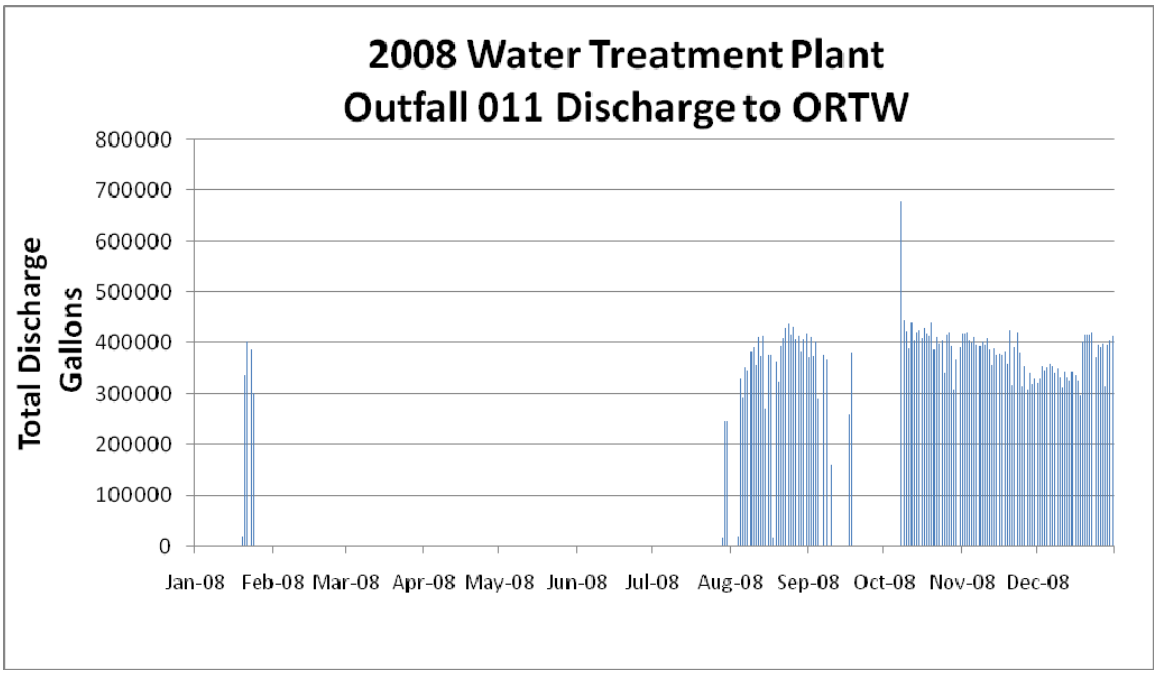


Figure 2. Monitoring Stations – Treated Effluent

3.2.1 Outfall 011- Treated Effluent from Mine Water Treatment Plant

Groundwater and drill water collected from the underground workings, together with surface runoff and groundwater collected in the RTP, are piped to the Mine Water Treatment plant located near the 1525 portal. After treatment, the water is either recycled to the mill, pumped to the RTP or discharged to the Off River Treatment Works (ORTW). Discharge to the ORTW occurred the third week of January, then discharged almost continuously from July 29 through December 31, with a three week hiatus after the Cyanide WAD exceedance occurred in September and was investigated. The volume of water discharged from the Water Treatment Plant is shown below.



Daily field parameters were collected at Outfall 011 along with weekly and quarterly laboratory samples for metals, TSS, Hardness, Weak-Acid Dissociable (WAD) Cyanide, Anions, Cations, and Total Dissolved Solids (TDS).

All results were within the limits and conditions set forth in Part I.B. of EPA NPDES Permit AK005334-1.

3.2.2 Outfall 001 – Discharge from Off River Treatment Works

Treated water from the Mine Water Treatment plant is piped to the ORTW. After mixing in the ORTW, water flows over the weir of Pond 2 of the ORTW and into the Goodpaster River. The sampling location is at the weir.

Daily field parameters were collected along with weekly laboratory samples for metals, WAD Cyanide, TDS, Turbidity, Sulfate, and Hardness. In addition, daily field parameters and weekly samples (Lead, Mercury, and Turbidity) were collected upstream from the discharge point (NPDES001B) to determine background water quality.

At the Off River Treatment Works (ORTW) discharge, Outfall 001, a permit exceedance occurred in May 2008 when the operator did not install stop logs at the outfall weir promptly enough after a precipitation event. The increased river flow exceeded the 15,600 gpm limit. There was no discharge from Outfall 011 during the period.

At the Off River Treatment Works (ORTW) discharge, Outfall 001, three permit exceedances took place in September, when analytical data showed that twice during the month the Cyanide WAD levels exceeded daily maximum of 8.5 ug/L, which also resulted in the exceedance of the monthly average at 4.3 ug/L. Discharge was stopped September 18, and an intensive sampling program, including surface water, the ORTW ponds, the RTP, the Water Treatment Plant, and underground water sources, was put into place to ascertain the problem areas. Duplicate laboratories were used to confirm the data. The resulting investigations indicated that the dilution ratio, due to problems with flow meter calibration, had been lower than was realized thus affecting the levels of cyanide WAD being discharged from the ORTW. Laboratory accuracy and precision for Cyanide WAD determinations at the low compliance levels were also demonstrated to be problematic. Discharge from the ORTW recommenced October 8, and effluent has remained within permit limitations.

Except as noted above, all results were within the limits and conditions set forth in Section I.A. of EPA NPDES Permit AK005334-1.

3.2.3 Outfall 002 – Treated Effluent from Sewage Treatment Plant

The Sewage Treatment Plant (STP) operated throughout 2008 generally in a range of between 20,000 and 35,000 gallons per day. Daily field parameters were collected to assess treated effluent prior to discharge in the mixing zone in the Goodpaster River. Weekly samples were also collected for Biological Oxygen Demand (BOD5), Total Suspended Solids (TSS), Fecal Coliform, Nitrates, and Chlorine. Influent data from STP002 were also collected for BOD5 and TSS on a quarterly basis.

Except as noted above, all results were within the limits and conditions set forth in Section I.B. of EPA NPDES Permit AK005334-1.

3.2.4 Whole Effluent Toxicity

Whole Effluent Toxicity (WET) testing is required under NPDES Permit AK-005334-1 at Outfall 001. The annual WET test was conducted June 26 through July 4 by CH2M Hill's Aquatic Toxicology Laboratory in Corvallis, Oregon. A split of the same sample was also sent to ENSR Laboratory in Fort Collins, CO.

Results from both laboratories are presented in Appendix A and indicate that the toxicity for both *Ceriodaphnia dubia* and Fathead minnow was 1.0 TU_c or less, well under the toxicity trigger of 2.0 TU_c.

All results were within the limits and conditions set forth in Section I.D. of EPA NPDES Permit AK005334-1.

3.3 SURFACE WATER MONITORING

3.3.1 Goodpaster River

The four surface water stations monitored to evaluate water quality along the Goodpaster River are SW01 located above the Pogo Mine, SW41 located downstream of Outfall 001, SW42 downstream of Outfall 002, and SW15 located downstream from all Pogo facilities.

Surface water station SW12 located on the Goodpaster River at the confluence

of Central Creek was also sampled concurrently with the fish tissue monitoring program in mid September.

The location of the surface water monitoring stations are shown in Figure 3.

Surface water samples are analyzed for cyanides, ionic balances, major cations and anions, and total and dissolved metals. Physical and aggregate properties of ammonia, conductivity, hardness, nitrates, pH, TDS, Total Settleable Solids (TSS), Turbidity, TKN, and Temperature were taken.

No adverse trends were observed.

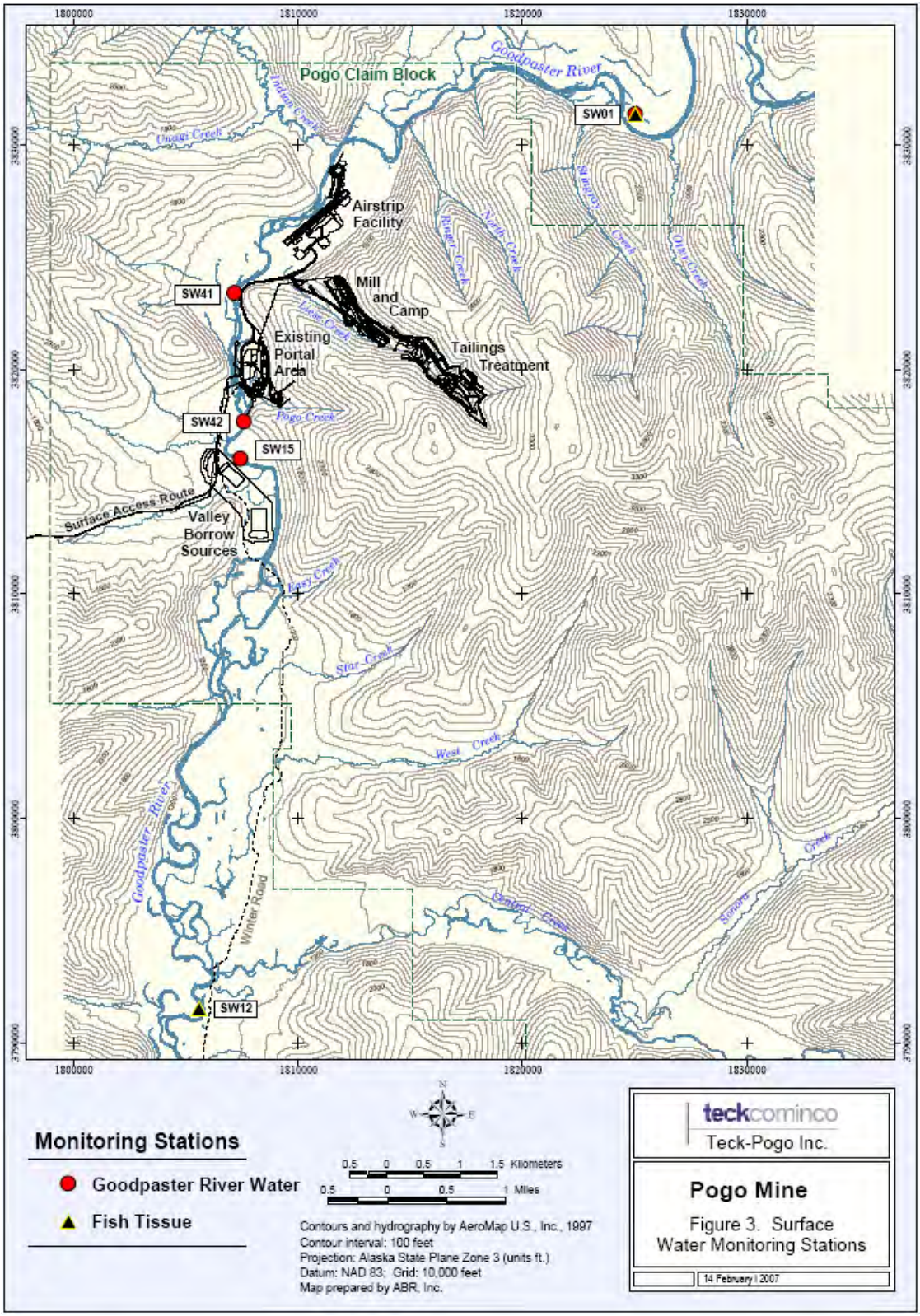


Figure 3. Monitoring Stations - Surface Water

3.3.2 Fish Tissue

In order to help assess long term trends in Goodpaster River quality, annual whole body analysis of juvenile Chinook salmon is required under NPDES permit AK-005334-1 at monitoring sites both upstream (SW01) and downstream (SW12) from the project facilities. Juvenile Chinook salmon were collected at these stations in late September. Due to the small sample size of the fish (about 3 gram wet weight), laboratory detection limits are variable not only between years, but often between individual fish from the same station.

No adverse trends were observed.

3.4 GROUNDWATER QUALITY MONITORING

The locations of the groundwater monitoring stations are shown in Figure 4.

3.4.1 Downgradient of DryStack and RTP Dam

Three wells located below the RTP Dam, MW03-500, MW03-501, and MW03-502, monitor groundwater downstream of the RTP seepage collection system. Samples were collected on November 5, 2008. Cyanide WAD and Nitrates were elevated, indicating possible influence from the RTP seepage. Action limits for Cyanide WAD are 5.2 ug/L and action limits for Nitrates are 10 mg/L. Cyanide WAD levels at MW03-500, MW03-501, and MW03-502 were at 9.98, 8.18 and 8.68 ug/L respectively. Nitrate levels were at 10.8, 10.3 and 12.1 mg/L. [1]Further samples are in the process of being collected and submitted for analysis to monitor and verify these levels.

[1] Samples collected on February 10, 2009 show a decrease in both Cyanide WAD and Nitrate. Duplicate samples for Cyanide WAD were analyzed by TestAmerica and Analytic Group Laboratories. Cyanide WAD results were: MW03-500 at 5.1 and 6.15 ug/L, MW03-501 at 4.2 and 4.9 ug/L, and MW03-502 at 4.0 and 4.42 ug/L. Only one result for MW03-500 was above the action limit of 5.2 ug/L. All the Nitrate results for the three monitoring wells were below the action limit of 10 mg/L.

Liese Creek formed a seep in early October 280 feet below the RTP that showed Cyanide WAD levels ranging from 10.8 ug/l to 19.8 ug/L. A pump was placed in the seep and the returned water was cycled to the seepage collection system. Later during the quarter, lower areas of Liese creek showed surface water with Cynaide WAD levels ranging from 3.2 ug/L to 8.45 ug/L, indicating the probable influence of RTP seepage. Duplicate samples were sent to two different laboratories to be analyzed for Cyanide WAD. Below is a summary comparing the analytical results. The summary demonstrates that the laboratory accuracy and precision for Cyanide WAD determinations is problematic at Pogo's low compliance levels. After 2/4/2009 no surface flows for Liese creek could be found.

Cyanide WAD Comparison between Labs

	Test America Lab	Analytica Group Lab
11/19/2008	6.78 ug/L	No sample taken
11/25/2008	6.98 ug/L	No sample taken
12/10/2008	5.6 ug/L	No sample taken
12/21/2008	8.45 ug/L	4.4 ug/L
12/23/2008	5.28 ug/L	4.4 ug/L
12/28/2008	5.4 ug/L	3.4 ug/L
1/6/2008	4.38 ug/L	4.6 ug/L
1/21/2009	4.25 ug/L	3.2 ug/L
1/28/2009	5.18 ug/L	4.2 ug/L
2/4/2009	4.6 ug/L	3.6 ug/L

Corrective actions are scheduled to control RTP seepage. Grouting of the RTP is planned to begin in May of 2010 to greatly reduce permeability of the embankment. The RTP is currently being operated at lower elevations to reduce pressures and seepage levels. The continued operation of low volumes in the RTP will be accomplished by the implementation of recycling mine services water underground rather than retaining this water in the RTP, increasing treatment plant capacity and continuing the use of RTP water in the Mill Process.

3.4.2 Downgradient of the Solid Waste Facility

Monitoring wells MW04-503 and MW04-504 were installed to detect potential impacts to groundwater down gradient of the originally proposed solid waste facility. Construction of this solid waste disposal facility has been postponed and sampling of these wells has been suspended, as it is now anticipated that solid waste will be disposed in the drystack in accordance with Permit 0131-BA002. In the interim, solid waste is hauled off-site to an approved landfill.

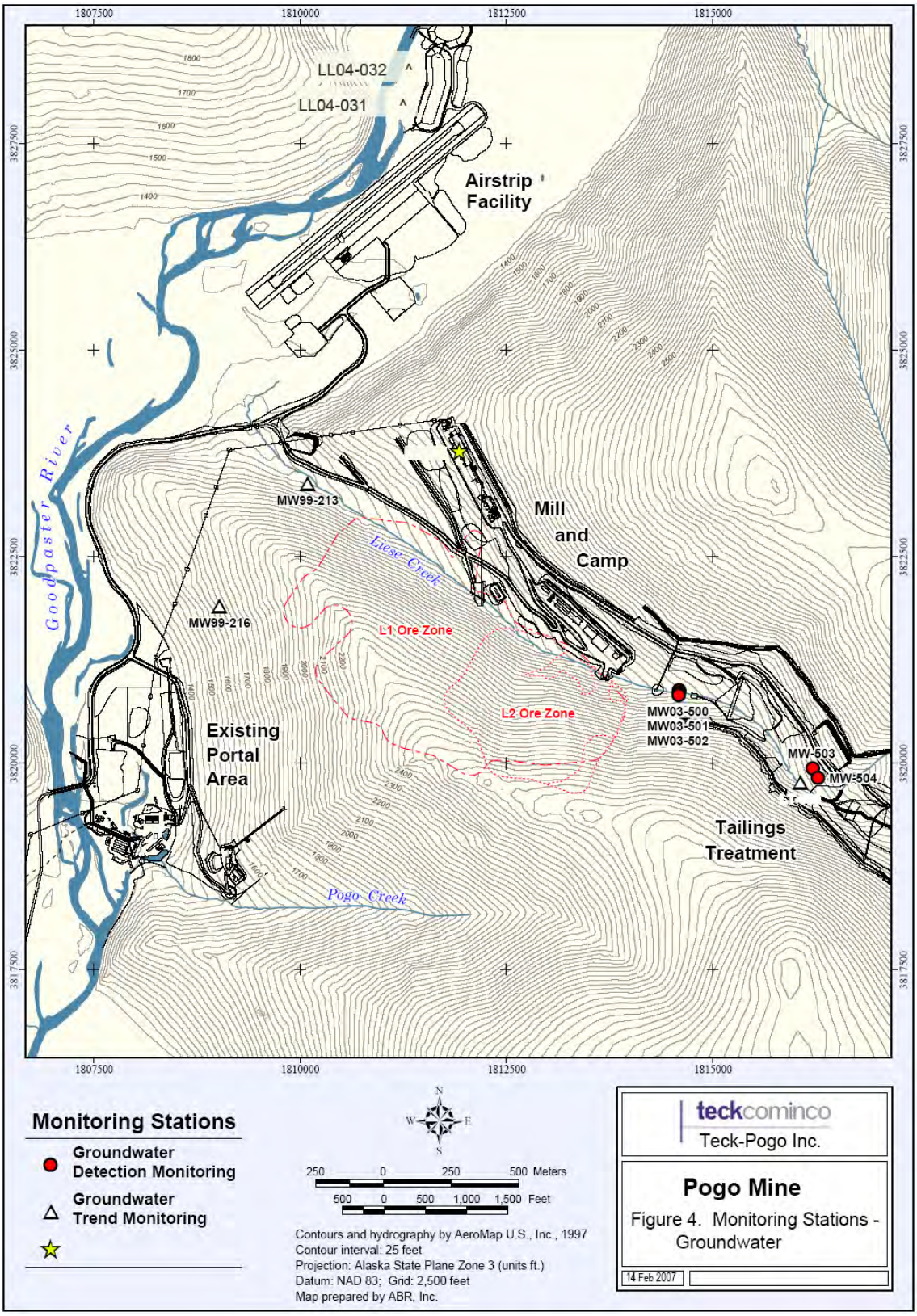


Figure 4. Monitoring Stations - Groundwater

3.4.3 Downgradient of Ore Zone

Monitoring wells MW04-213 and MW99-216 provide information on water quality trends down-gradient from the ore zones. Samples were collected on May 28, and September 16. No adverse trends were observed.

3.4.4 Downgradient of ORTW

Monitoring stations LL04-031 and LL04-032 provide information on ground water quality trends between the ORTW and the Goodpaster River. No adverse trends were observed.

3.5 PROCESS CONTROL MONITORING

The objective of these programs is to monitor the processes associated with the treatment facilities.

3.5.1 Water Balance

The beginning RTP reservoir volume for 2008 was 17.9 million gallons. During the year, 86.3 million gallons were collected in the RTP, 12.3 million gallons of treated water were recycled to the RTP, 55.3 million gallons were pumped from the RTP for underground drill water, 21.2 million gallons were pumped from the RTP to the mill process, and 24.4 million gallons were pumped from the RTP to the water treatment plant leaving an ending RTP volume of 14.0 million gallons. 38.6 million gallons of mine drainage and RTP water were treated and discharged via the off-river treatment works during the year.

3.5.2 CIP Tailings Cyanide Destruction

After gold is recovered from the ore in the carbon-in-pulp (CIP) tanks, and prior to disposal as part of the paste backfill, DEC permit 0131-BA002 requires that the CIP tailings shall be subjected to cyanide destruction using the SO2/air process or other suitable cyanide destruction process. After cyanide destruction, the CIP tailings are stored in the CIP stock tank prior to being

mixed with cement and used for backfill in the mine. Samples to confirm cyanide destruction are taken at the stock tank and reported in Appendix A as PC001. At least 90% of the samples shall contain less than 10 mg/kg of WAD cyanide and none of the samples shall contain more than 20 mg/kg of WAD cyanide.

During 2008, 100% of the CIP stock tank samples returned values of less than 10 ppm and none returned a value greater than 20 ppm.

3.5.3 Mineralized Development Rock Geochemistry

Composite samples of development rock materials placed in the drystack facility were collected on March 5, June 19, November 3 and December 17. These samples were analyzed for whole-rock chemistry and ABA and are reported in Appendix A as PC002. No adverse trends were observed.

3.5.4 Flotation Tailings Geochemistry

Flotation tailings geochemistry samples were collected on March 11, June 17, September 9 and December 9 at PC003, the underflow of the filter-feed tank at the end of the mill circuit, prior to disposal on the drystack. The results are presented in Appendix A. No adverse trends were observed.

3.5.5 Flotation Tailings Interstitial Water Chemistry

The interstitial water from the tailings samples collected at PC003 on March 11, June 17, September 9, and December 9 were recovered and analyzed. The results are presented in Appendix B. There were no adverse trends observed.

3.6 VISUAL MONITORING

3.6.1 Facility Inspection

The objective of the facility inspection program is to monitor the surface waste disposal facilities for signs of damage or potential damage.

Weekly visual inspections of the RTP dam were completed throughout 2008. No settlement or geotechnical concerns were observed via visual inspection.

3.6.2 Biological Survey

The objective of the visual biological survey program is to monitor wildlife interaction with the surface waste disposal facilities.

No wildlife issues with the RTP or drystack occurred during the year.

3.7 DEVELOPMENT ROCK SEGREGATION AND STORAGE

During 2008, 1,049 rounds were taken and sampled in accordance with the Rock Segregation Procedure. 444 rounds (42%) exceeded either the As or S threshold, with 444 rounds (97%) of these placed internally in the drystack. 61 rounds (5.8%) were not sampled due to operational challenges. Of these rounds, 61 rounds (100%) were placed in the drystack. All mineralized rock was placed in the drystack tailings at least twenty feet from the margins and covered with a minimum of 2 feet of compacted tailings.

3.8 WASTE DISPOSAL

During 2008, 740,000 dry tons of flotation tailings and 134,000 tons of mineralized rock were placed in the drystack. During the year, 268,000 dry tons of tailings were placed underground as paste backfill.

The quantities of miscellaneous waste materials placed either into the drystack or underground during the year are shown below:

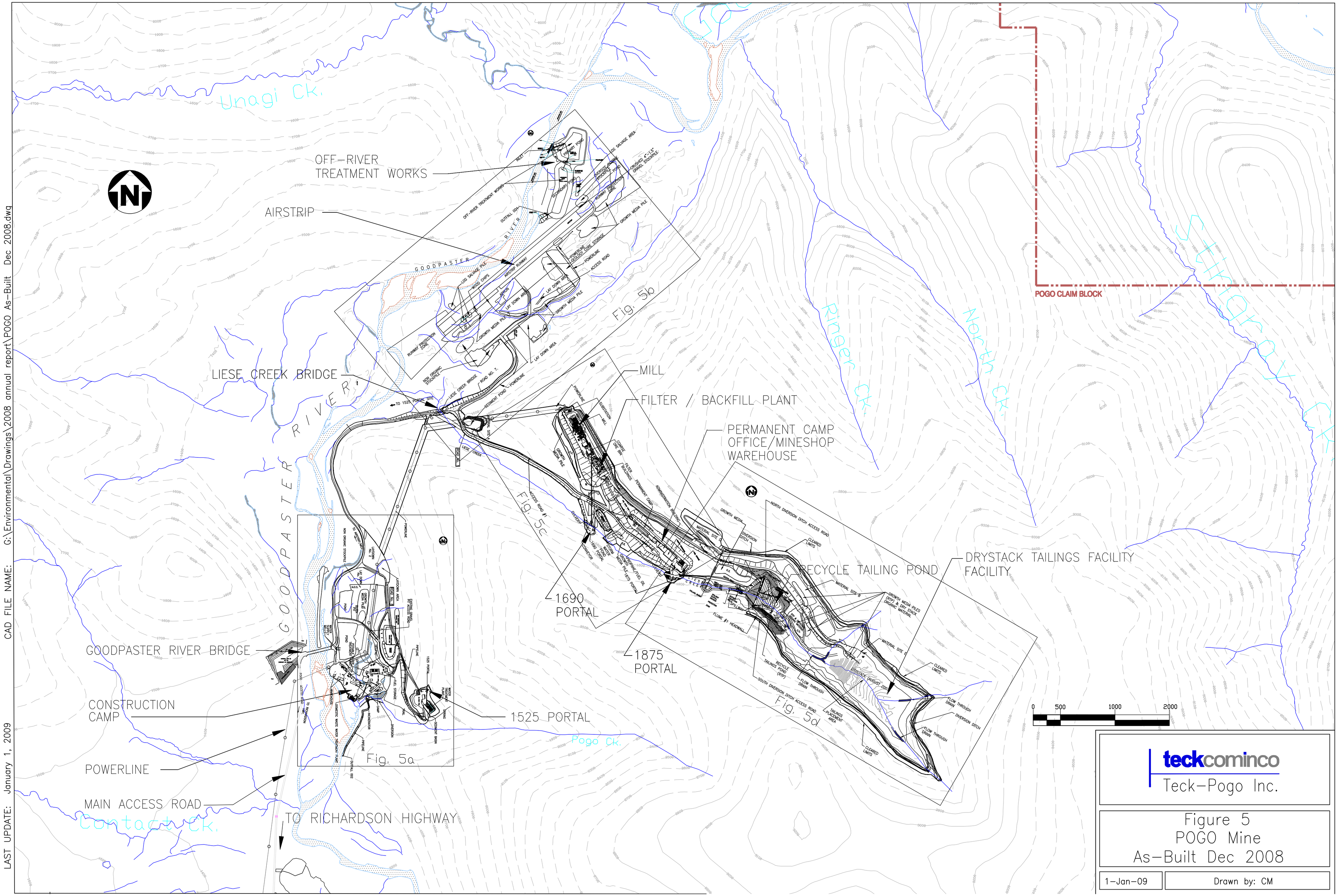
Material	Disposal Location	Quantity
Grinding Media Flotation Debris Screen Residue	Drystack	107 tons
Concrete	Drystack	0 tons
Shotcrete	Drystack	0 tons
Water Treatment Plant sludge	Underground	575 yds
Paste pump cleanup	Underground	843 yds

3.9 GEOTECHNICAL MONITORING

No flotation tailings were used to construct the drystack shell during 2008 so geotechnical tailings tests were not conducted.

4 2008 As-built Maps

Figure 5 provides an overview of all facilities within the Pogo millsite lease boundary as of yearend 2008. Figures 5a through 5d provide additional detail for the major areas of the mine.



teckcominco
Teck-Pogo Inc.

Figure 5
POGO Mine
As-Built Dec 2008

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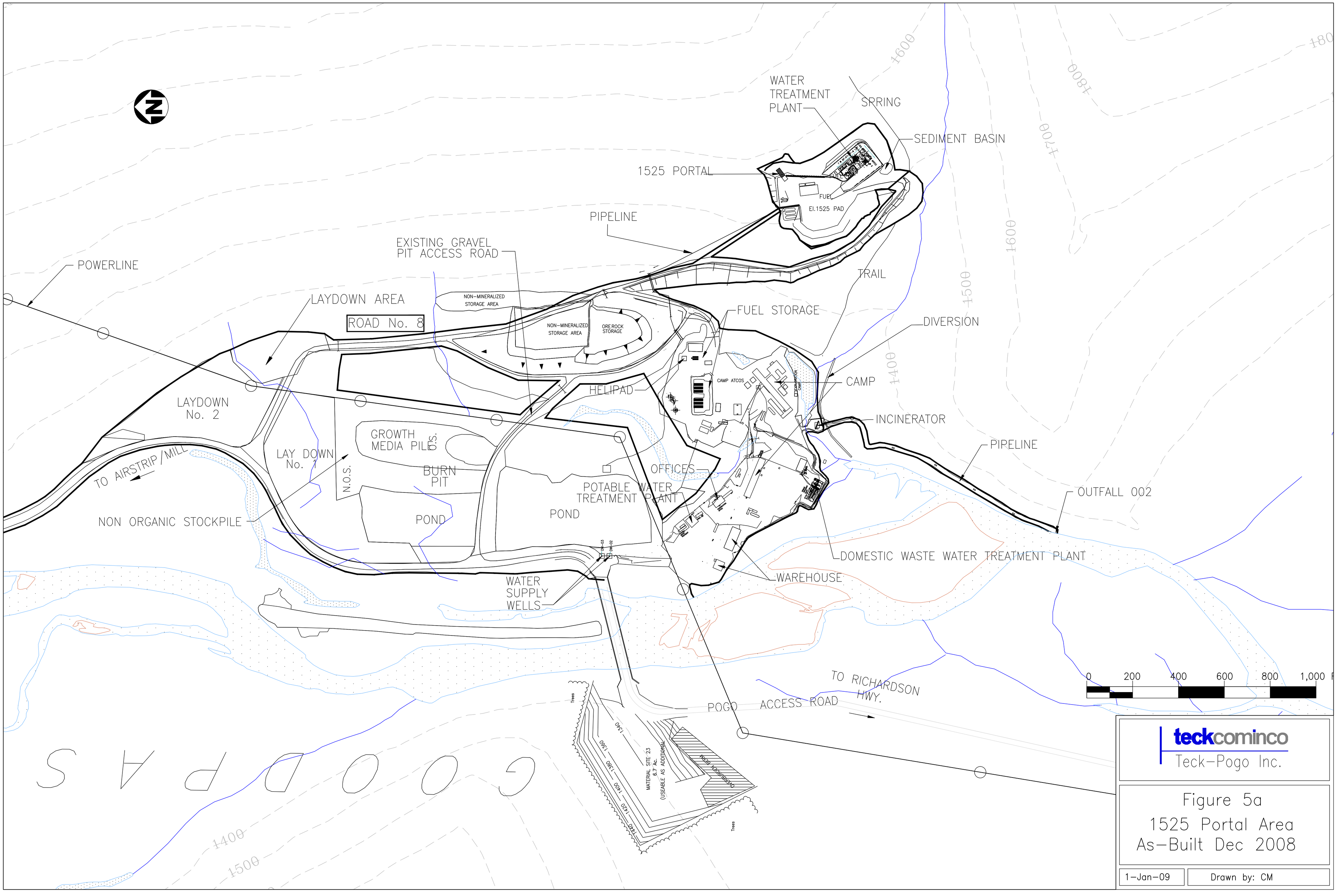

teckcominco
Teck–Pogo Inc.

Figure 5a
1525 Portal Area
As–Built Dec 2008

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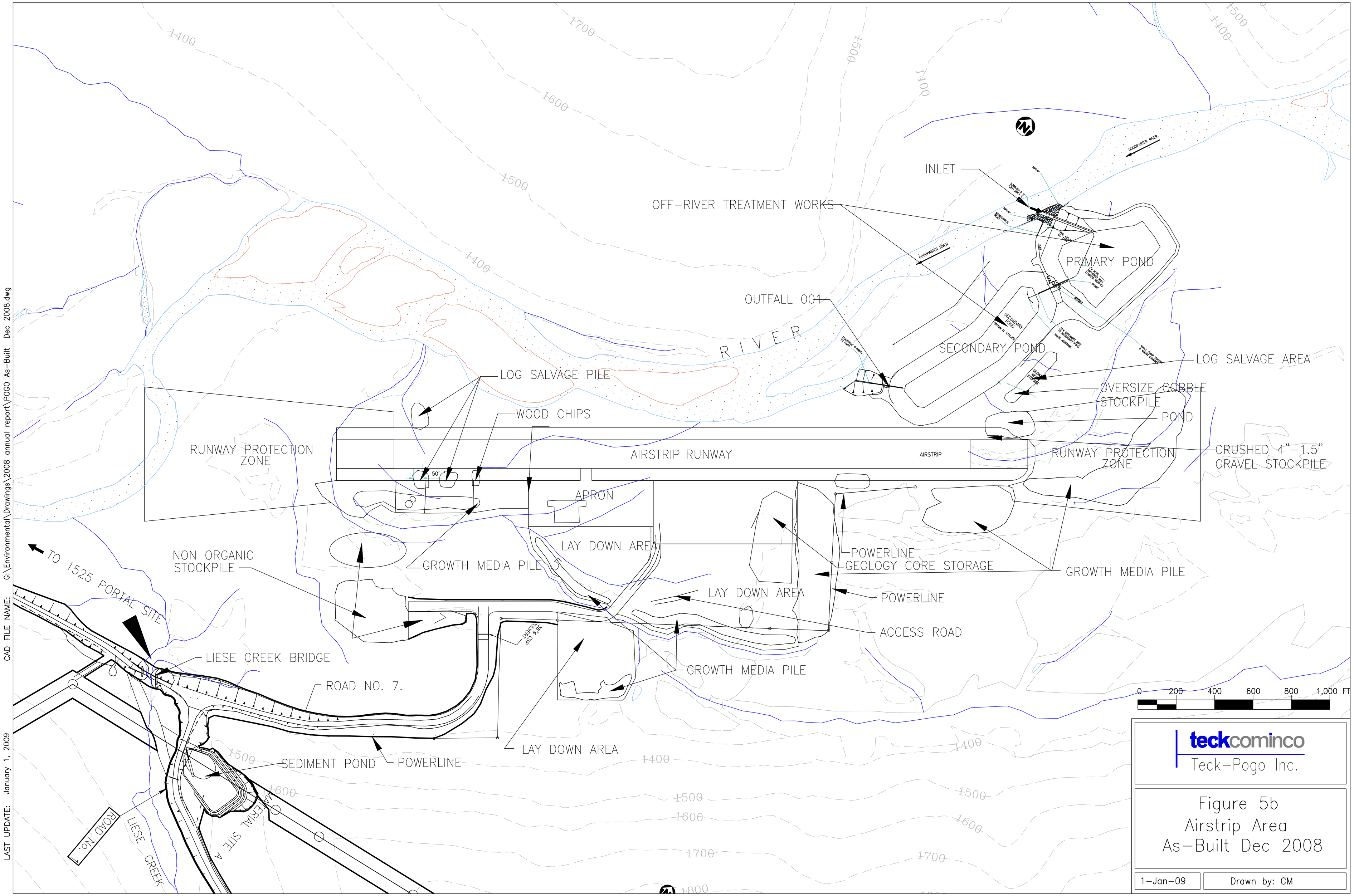

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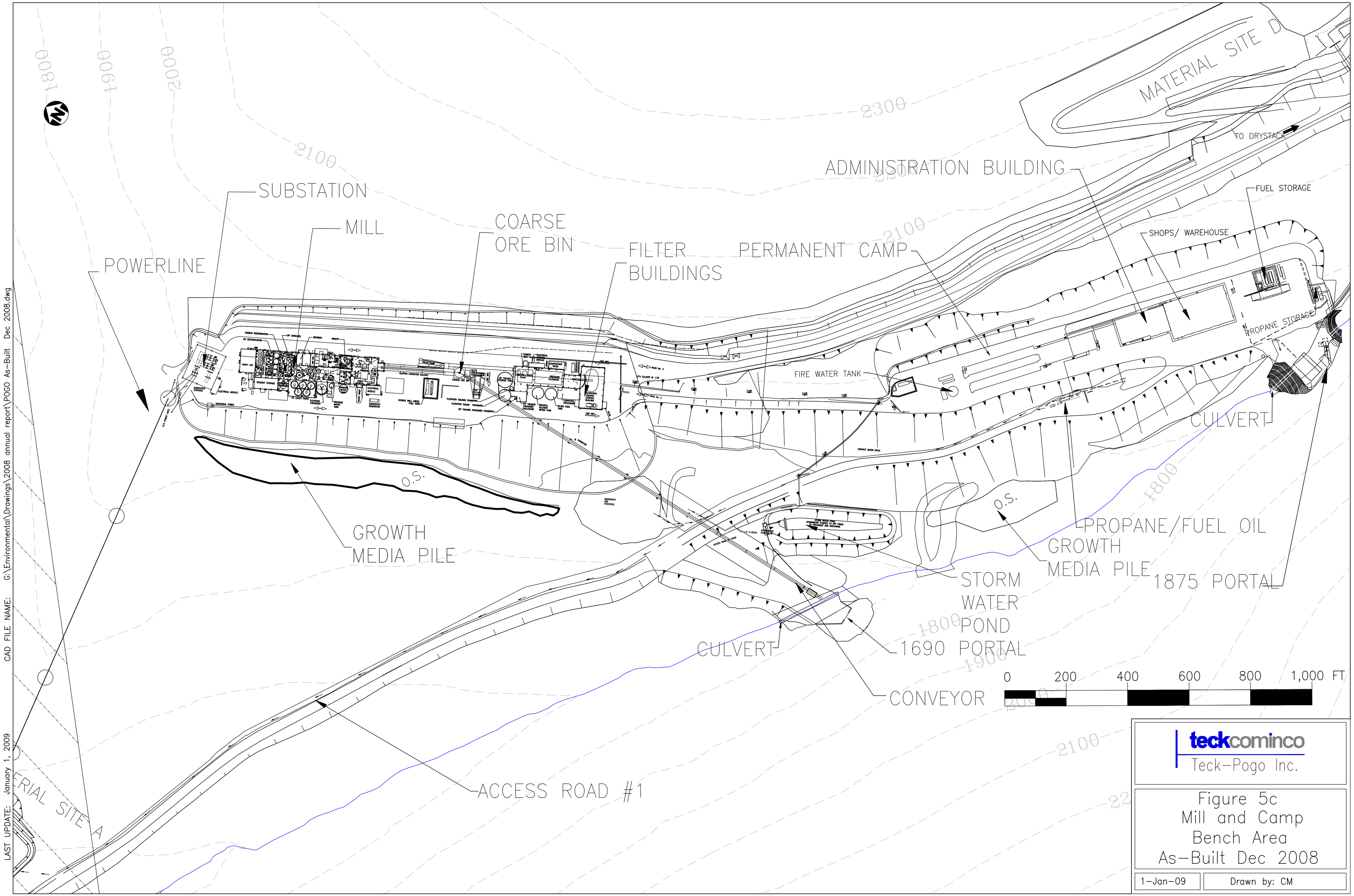
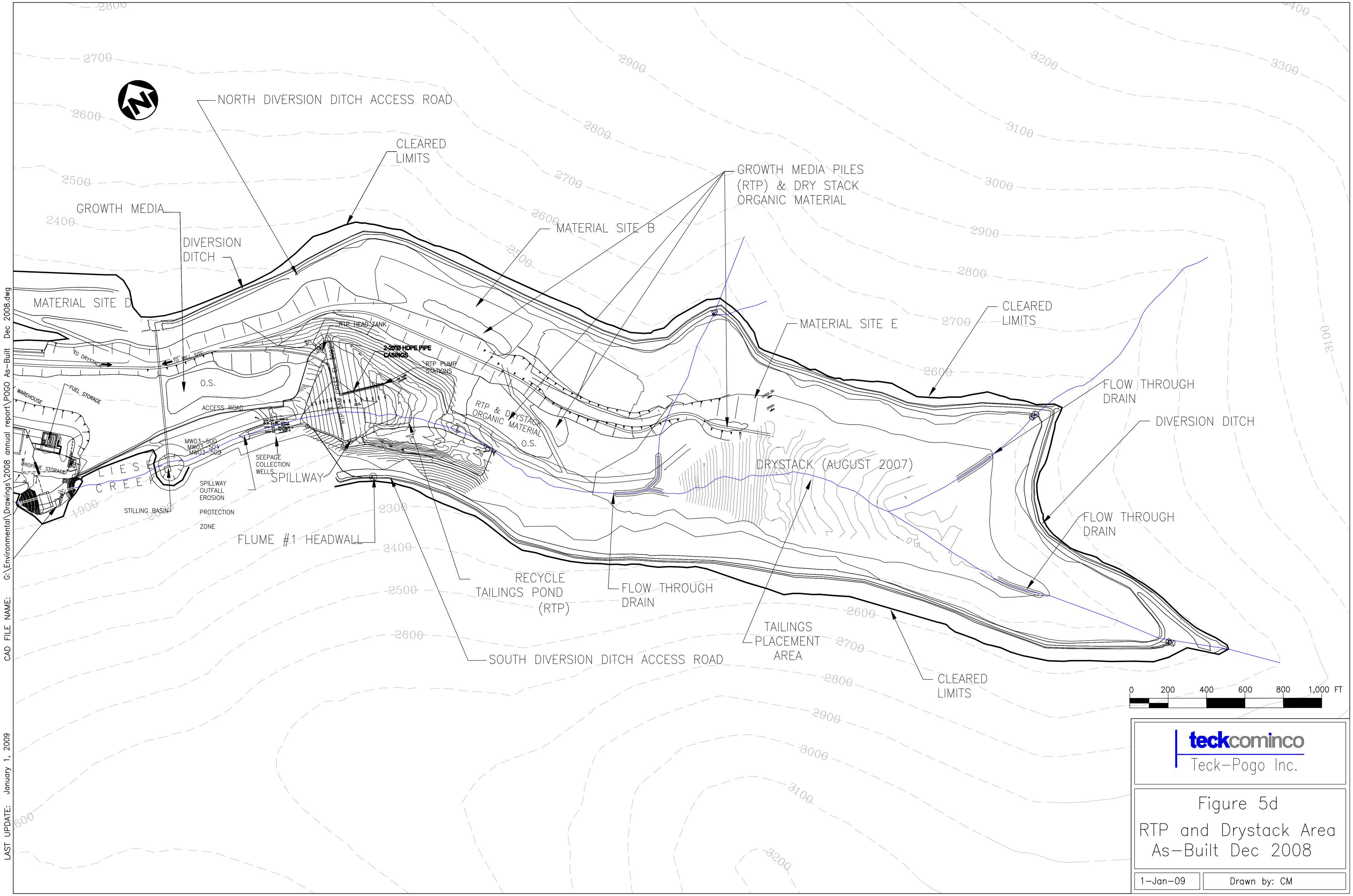

MATERIAL SITE D
TO DRYSTACK
ADMINISTRATION BUILDING
FUEL STORAGE
SHOPS/ WAREHOUSE
SUBSTATION
MILL
COARSE ORE BIN
FILTER BUILDINGS
PERMANENT CAMP
POWERLINE
PROPANE STORAGE
FIRE WATER TANK
CULVERT
O.S.
GROWTH MEDIA PILE
PROPANE/FUEL OIL
GROWTH MEDIA PILE
1875 PORTAL
STORM WATER POND
1690 PORTAL
CULVERT
CONVEYOR
ACCESS ROAD #1
MATERIAL SITE A
1800
1900
2000
2100
2300
0 200 400 600 800 1,000 FT
teckcominco
Teck–Pogo Inc.
Figure 5c
Mill and Camp
Bench Area
As–Built Dec 2008
1–Jan–09
Drawn by: CM
LAST UPDATE: January 1, 2009
CAD FILE NAME: G:\Environmental\Drawings\2008 annual report\POGO As–Built Dec 2008.dwg



teckcominco
Teck–Pogo Inc.

Figure 5d
RTP and Drystack Area
As–Built Dec 2008

1–Jan–09 | Drawn by: CM

LAST UPDATE: January 1, 2009 CAD FILE NAME: G:\Environmental\Drawings\2008 annual report\POGO As–Built Dec 2008.dwg

5 Reclamation and Financial Responsibility

Teck-Pogo has submitted detailed reclamation and closure plans for the all-season road and the Pogo millsite lease. Details for the all-season road reclamation were presented in Appendix H of the June 2002 Pogo Project Right-of-Way Application. Details for the Pogo millsite were presented in Appendix F of the October 2003 Pogo Project Reclamation and Closure Plan. An updated reclamation and closure cost estimate was completed by Teck-Pogo and submitted to the agencies in February 2005 and again in October 2008. The draft is currently under review by the Department of Natural Resources.

As previously approved by the State of Alaska, the required financial assurance totals $4,518,865 for the access road and powerline and $23,079,740 for the mine site facility. As of June 1, 2006, the Pogo Joint Venture has placed irrevocable letters of credit with the State of Alaska in full for these amounts.

A summary of the reclamation and closure costs is provided in Table 5.1.

5.1 ALL-SEASON ROAD AND TRANSMISSION LINE

Material Sites that will either continue to be used or which require further reclamation include MS 7, 15, 16, 18, and 23. The financial assurance currently in place for the all-season road is believed to be more than adequate. A review of reclamation and closure costs was completed as part of the 5 year review of the Pogo plan of operations and is under review by ADNR.

5.2 POGO MILLSITE LEASE

Construction of the Pogo mine began during 2004. During 2008, Teck-Pogo conducted activities in accordance with approved plans. There have been no significant changes to the facility or operations as compared to the approved plans. To date, there has been no concurrent reclamation completed. Reclamation of Material Site D had been planned for 2007. However, review of the closure plan requirements showed that colluviums from Material Site D could be efficiently used during ultimate closure of the drystack, so the Material Site D work has been put on hold. A review of reclamation and closure costs is currently being completed as part of the 5 year review of the Pogo plan

of operations in 2008.

Table 5.1
Pogo Mine
Summary of Reclamation and Closure Cost Estimate
Updated as of Feb 2005

			Road	T-Line	Minesite
Phase I	Post Construction		$ 483,000	$ 138,000	$ 437,221
Phase II	Concurrent with Mining		$ 110,000	$ 9,000	$ 778,514
Phase III	Final Reclamation and Closure		$ 1,096,515	$ 1,570,000	$ 9,102,377
Phase IV	Post Closure Reclamation		$ 37,000	$ 6,000	$ 6,105,010
Phase V	Post Closure Monitoring				$ 1,195,000
	Total Direct Costs		$ 1,726,515	$ 1,723,000	$ 17,618,122
Contractor Profit & Overhead		10%	$ 172,652	$ 172,300	$ 1,761,812
Contingency		10%	$ 172,652	$ 172,300	$ 1,761,812
Agency Administration Costs		3%	$ 51,795	$ 51,690	$ 528,544
Contractor Mob/Demob		5%	$ 86,326	$ 86,150	$ 880,906
Engineering Redesign		3%	$ 51,795	$ 51,690	$ 528,544
	Total Indirect Costs		$ 535,220	$ 534,130	$ 5,461,618
Total Road			$ 2,261,735		
Total Transmission Line				$ 2,257,130	
Total MillSite					$ 23,079,740
Total Road & Transmission Line				$ 4,518,865	
Total Project					$ 27,598,605

6 Planned 2009 Activities

6.1 OPERATIONS

The mill will continue to focus on circuit optimization and recovery improvements along with optimization of Mine Water Treatment Plants 1 & 2.

A continued focus on underground development is required to open up the additional ore headings that are needed to reach the full production rate of 2,500 tons per day. Mining in 2009 is budgeted for 900,000 tons of ore and 13,500 feet of lateral development. The development contractor will remain on site throughout the year with 40-50 employees operating out of the construction camp.

Grouting of the RTP is planned to begin in May of 2010 to greatly reduce permeability of the embankment.

Site water management is under investigation and some key items have been identified with the implementation of recycling underground service water and the study of the Liese Creek bypass.

Mining of additional gravel from the permitted borrow site near the north end of the airstrip will provide road topping material required for underground and surface facilities.

During the summer of 2009 a new 85 person camp, to replace temporary facilities, is scheduled for construction in Laydown Area #2. Non-mineralized development rock will be placed in select areas of the existing permitted laydown areas to augment the existing fills and raise the level of the work and storage areas above Goodpaster river flood levels.

New surface disturbance will be limited to expansion of the drystack tailings storage area within the permitted footprint.

6.2 ALL-SEASON ROAD

Routine maintenance, including replacing road delineators and adding drainage rock to prevent erosion is planned for 2009. A 3-year plan is in place upgrade the road surface by placing additional rock. Whether material can be used from existing material sites, or purchased from outside sources, has not yet been determined.

6.3 EXPLORATION

The 2009 exploration program is planning for approximately 45 surface drill holes totaling 48,000 feet. Helicopter-supported drilling (10 sites, 35 holes) would run from early June through the end of August. The remainder of the drilling (10 to 12 holes) would be completed in September from seven road-based drill sites. The 2009 underground exploration drill plan entails approximately 30 holes totaling 20,000 feet of drilling that would be carried out intermittently throughout the year.

6.4 PERMITTING ACTIVITIES

Significant permitting activities planned for 2009 include the renewal of the Alaska Department of Natural Resources (ADNR) Pogo Mine Millsite Lease ADL416949, ADNR Plan of Operations Approval F20039500, the Alaska Department of Environmental Conservation (ADEC) Waste Disposal Permit, 0131-BA002, the ADEC Non-domestic Wastewater Disposal Permit, 2004-DB0070, as well as the renewal of the U.S. Environmental Protection Agency (EPA) NPDES Permit AK005334-1.

Appendix A. Table 1. Pogo Mine Effluent Toxicity Testing (WET) 2008

Species	NOEC (%)	LOEC (%)	IC_{25} (%)	TUc
Ceridaphinia dubia	100	>100	>100	1.00
Pimephales promelas	25	50	>100	1.00

NOEC=No Observed Effect Concentration

LOEC=Low Observed Effect Concentration

IC_{25} = Inhibition Concentration (25%)

Tuc = Toxic Units (Chronic)

Appendix A. Table 2. Whole Rock Geochemistry for Rock placed into Drystack 2008

PC002	units	1st Quarter 5-Mar-08	2nd Quarter 19-Jun-08	3rd Quarter 3-Nov-08	4th Quarter 17-Dec-08
Arsenic, Total	mg/kg	449.0	80	357	702
Copper, Total	mg/kg	48.1	24.1	32.7	62.9
Iron, Total	mg/kg	388	2610	3960	4540
Lead, Total	mg/kg	18.5	2.1	28.2	14.2
Zinc, Total	mg/kg	62	46	78	74
pH, Paste	pH units	8.7	8.5	8.4	8.8
Total Sulfur, (Leco)	%	0.54	0.11	0.33	0.1
Sulfate Sulfur (Carbonate Leach)	%	0.02	0.01	0.05	0.01
Sulfate Sulfur (HCL Leachable)	%	0.01	<0.01	0.04	<0.01
Sulfide Sulfur (Calculated)	%	0.52	0.10	0.28	0.51
Neutralization Potential	tCaCO3/1000t	35	25	34	41
Maximum Potential Acidity	tCaCO3/1000t	16.9	3.4	10.3	16.3
Ratio (NP/MPA)	su	2.07	7.27	3.30	2.52
Inorganic Carbon	%	1.90	1.00	1.10	2.10
Carbon	%	0.51	0.27	0.31	57

Appendix A. Table 3. Geochemistry of Flotation Tailings Solids placed into Drystack 2008

PC003	units	1st Quarter 11-Mar-08	2nd Quarter 17-Jun-08	3rd Quarter 9-Sep-08	4th Quarter 9-Dec-08
Arsenic, Total	mg/kg	777.0	926.0	1435	2500
Copper, Total	mg/kg	27.3	23.3	23.8	64.1
Iron, Total	mg/kg	2760	2460	2130	3130
Lead, Total	mg/kg	11.8	10.3	22.1	11.9
Zinc, Total	mg/kg	18	18	31	18
pH, Paste	pH units	8.4	8.2	8.1	8.3
Total Sulfur, (Leco)	%	0.16	0.11	0.18	0.25
Sulfate Sulfur (Carbonate Leach)	%	0.03	0.03	0.02	0.02
Sulfate Sulfur (HCL Leachable)	%	0.03	0.02	<0.01	<0.01
Sulfide Sulfur (Calculated)	%	0.13	0.08	0.16	0.23
Neutralization Potential	tCaCO3/1000t	57	44	28	69
Maximum Potential Acidity	tCaCO3/1000t	5	3.4	5.6	7.8
Ratio (NP/MPA)	su	11.4	12.8	4.98	8.83
Inorganic Carbon	%	2.2	1.90	1.7	1.9
Carbon	%	0.59	0.51	0.45	0.52

Table B1. Time Series for Effluent Monitoring Program

Chart B1.1. Values over time for Lead, total (ug/L)

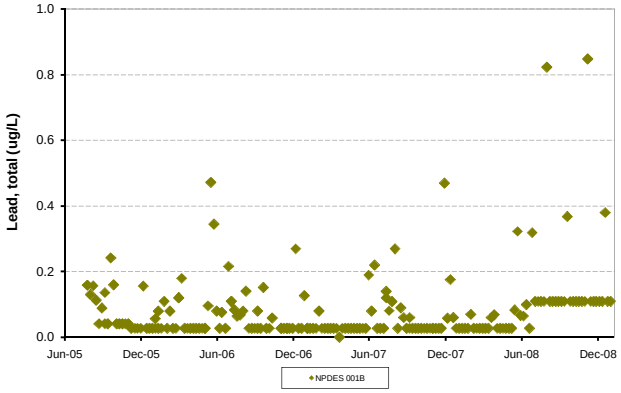


Chart B1.2. Values over time for Mercury, total (ug/L)

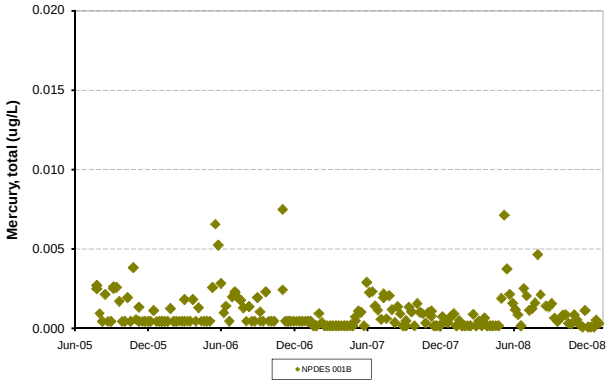


Chart B1.3. Values over time for Turbidity, field (NTU)

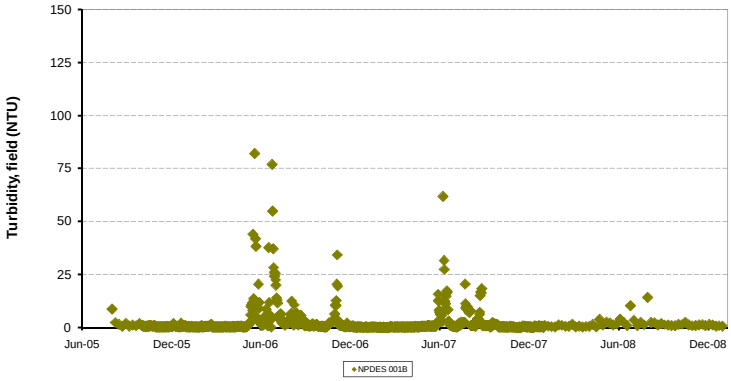


Table B1. Time Series for Effluent Monitoring Program (continued)

Chart B1.4A. Values over time for Cyanide WAD (ug/L)

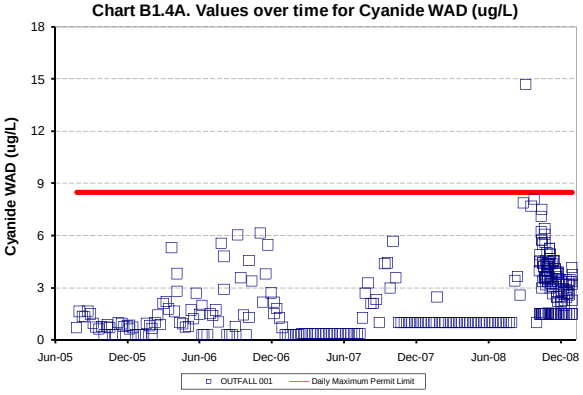


Chart B1.4B. Monthly average over time for Cyanide WAD (ug/L)

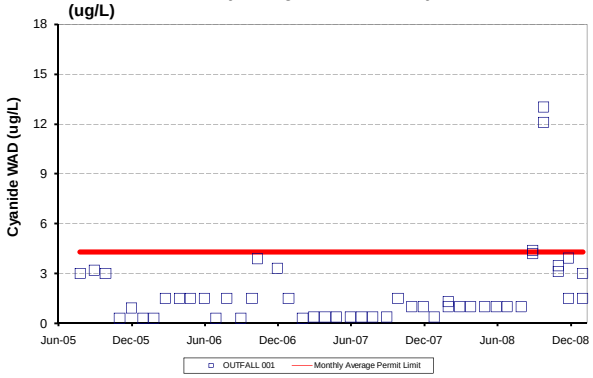


Chart B1.5A. Values over time for Sulfate (mg/L)

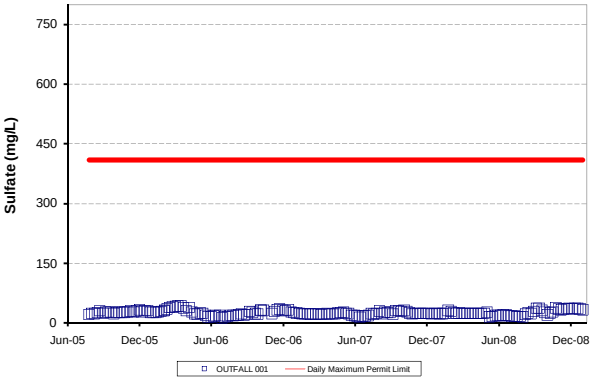


Chart B1.5.B Monthly average over time for Sulfate (mg/L)

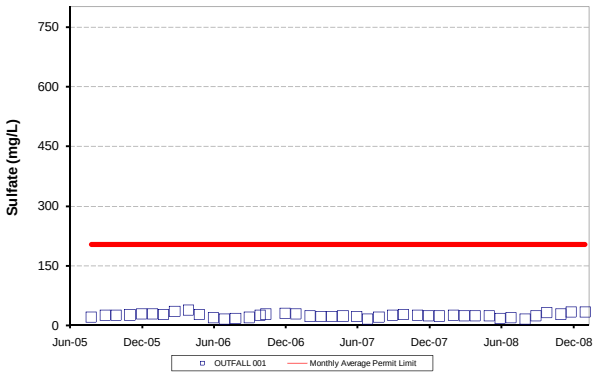


Chart B1.6A. Values over time for Arsenic, total (ug/L)

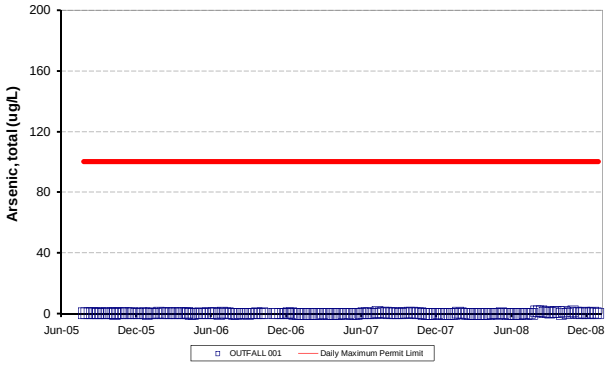


Chart B1.6.B Monthly average over time for Arsenic, total (ug/L)

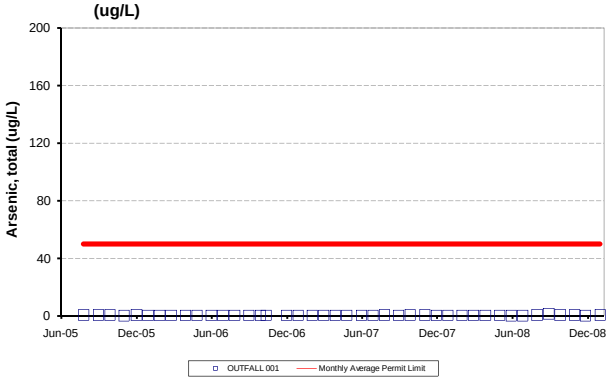


Table B2. Time Series for Groundwater Monitoring Program

Chart B2.1. Values over time for Chloride (mg/L)

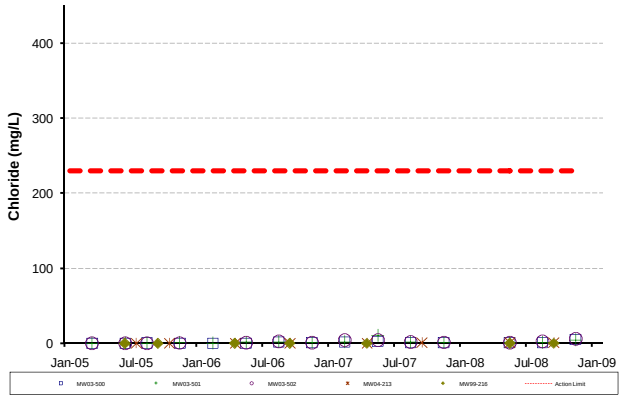


Chart B2.2. Values over time for Cyanide WAD (ug/L)

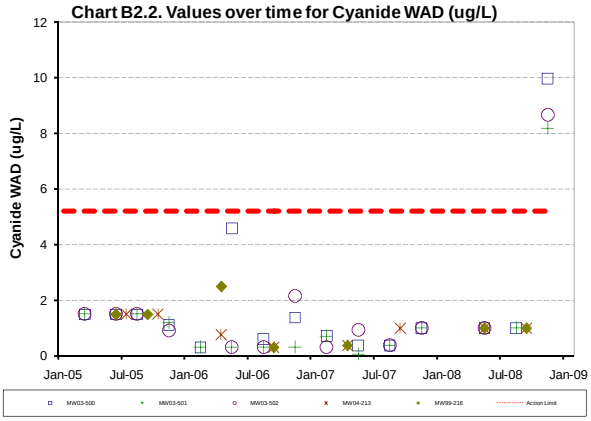


Chart B2.3. Values over time for Nitrate-N (mg/L)

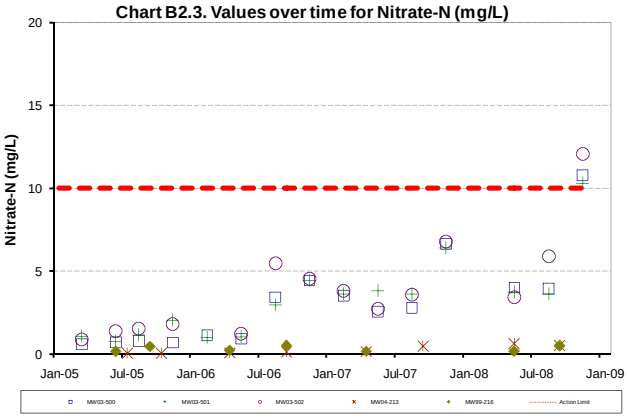


Chart B2.4. Values over time for Sulfate (mg/L)

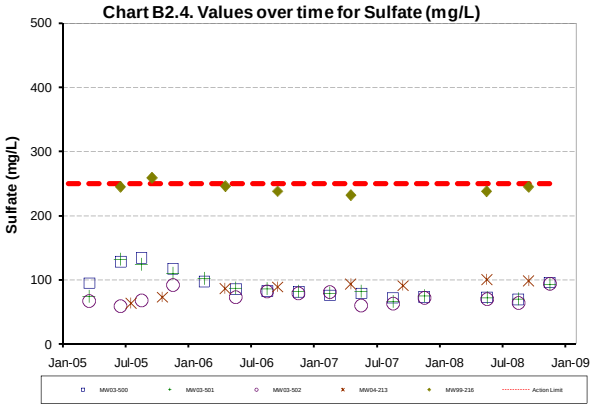


Chart B2.5. Values over time for Arsenic, dissolved (ug/L)

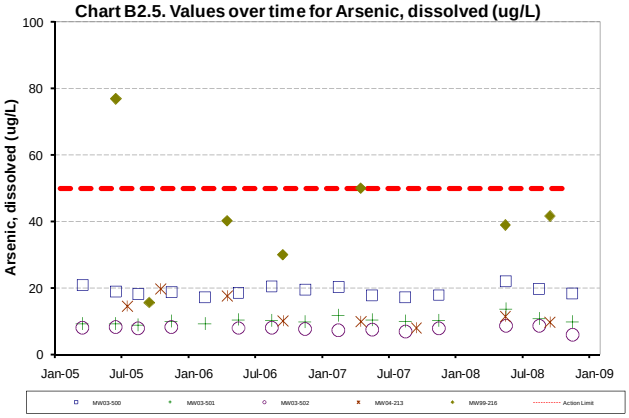


Chart B2.6. Values over time for Cadmium, dissolved (ug/L)
(Cadmium is hardness dependent. For graphing purposes, the lowest hardness value in the data series was used)

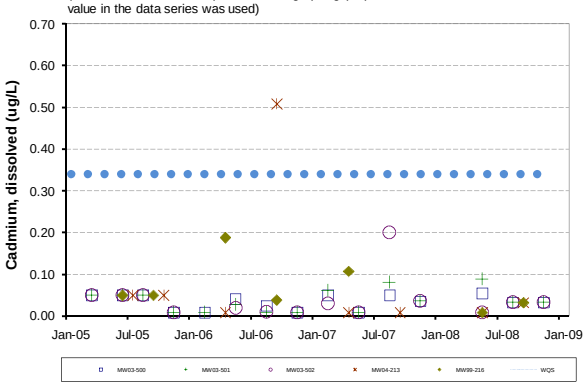
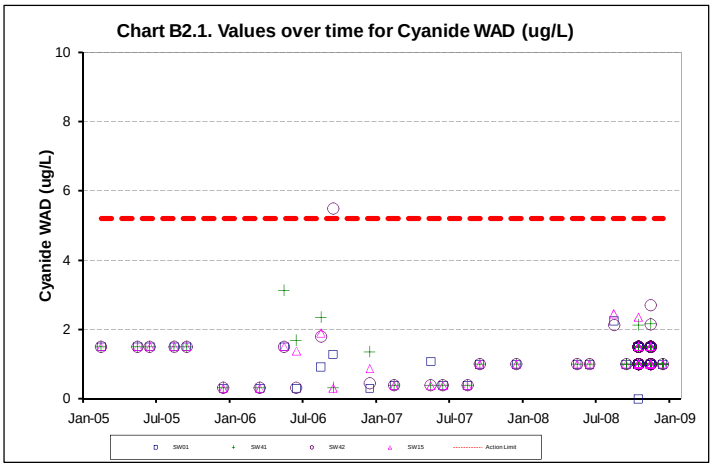
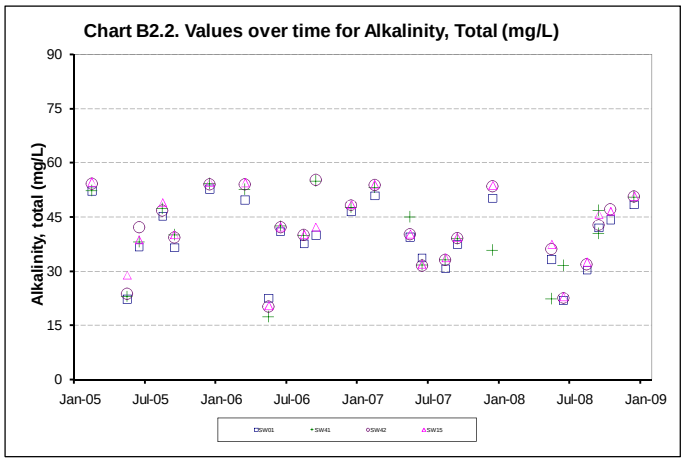
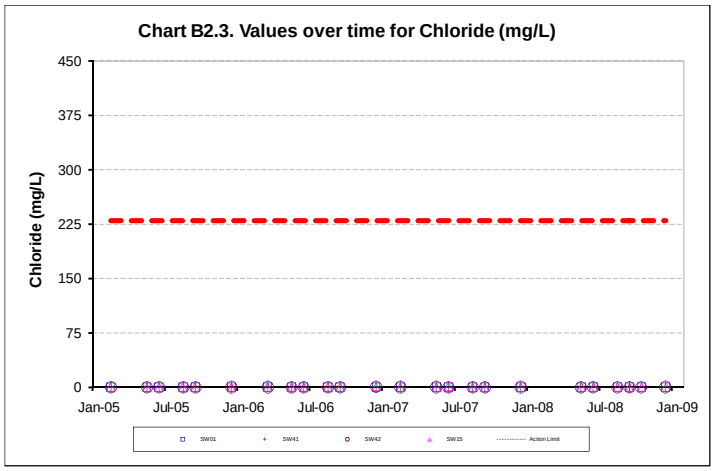
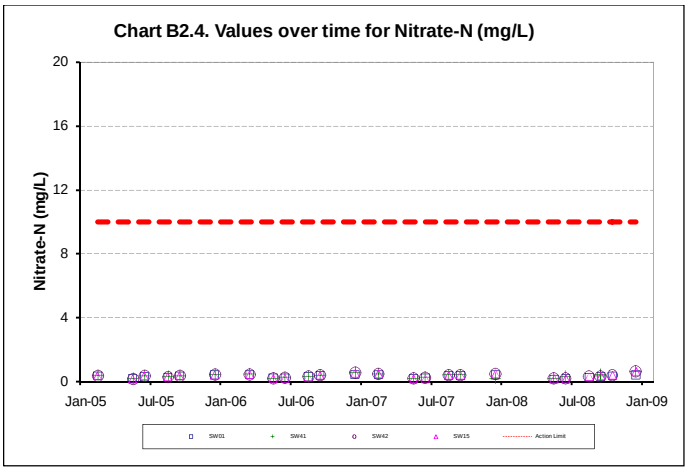


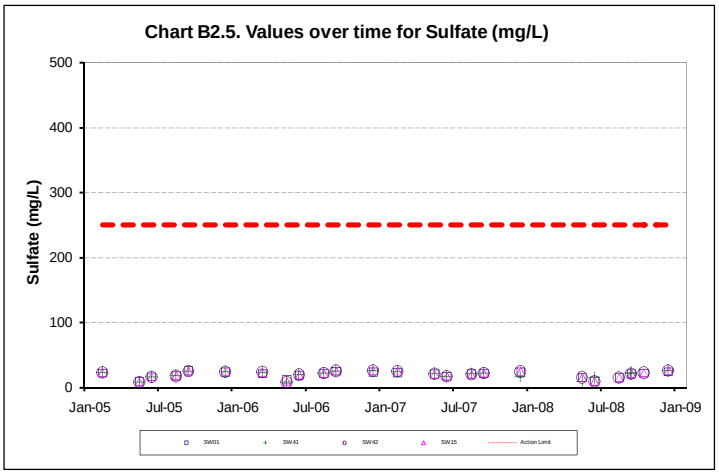
Table B2. Time Series for Receiving Environment











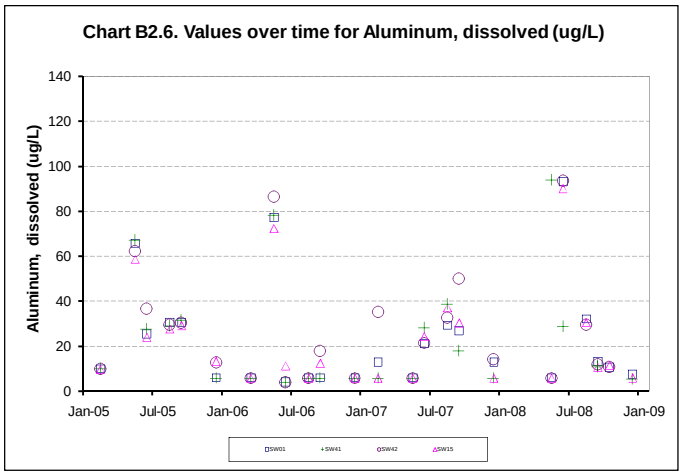
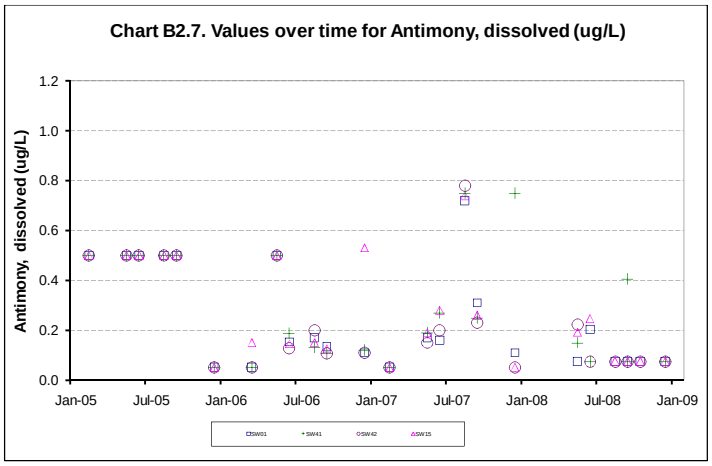
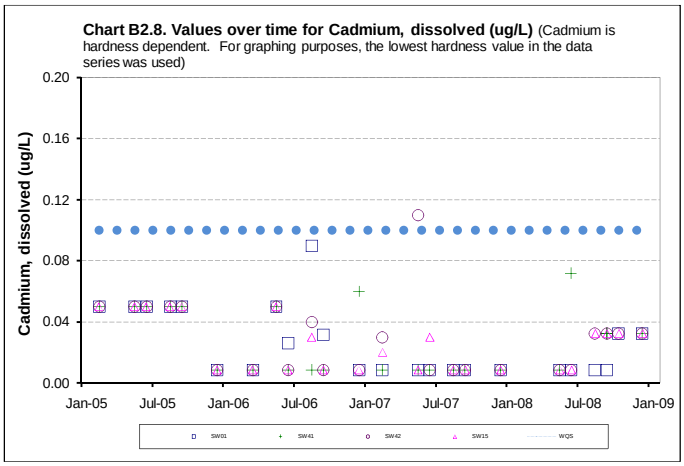
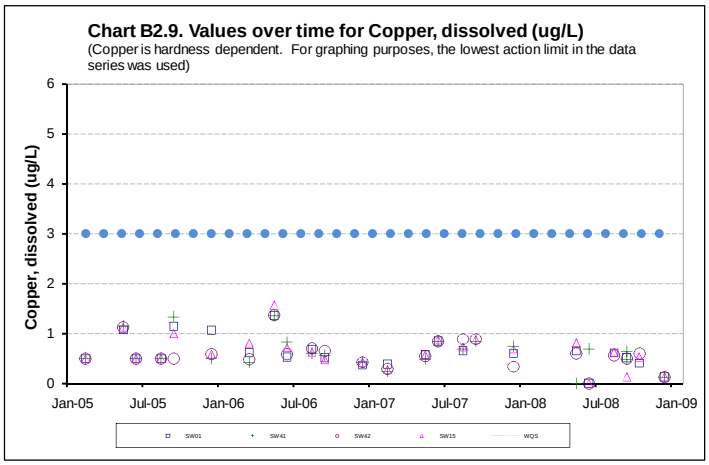
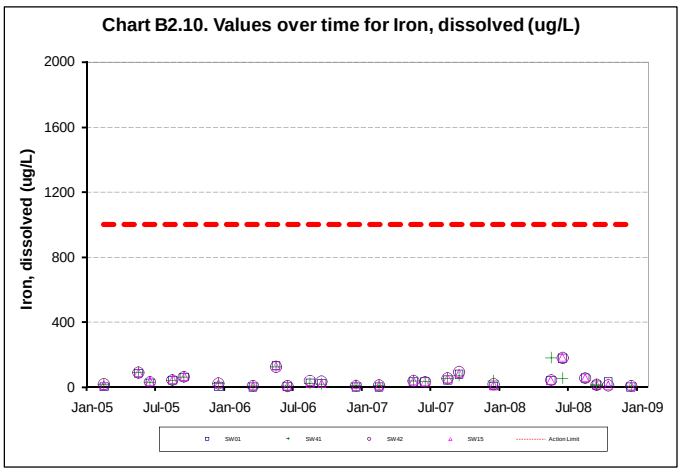


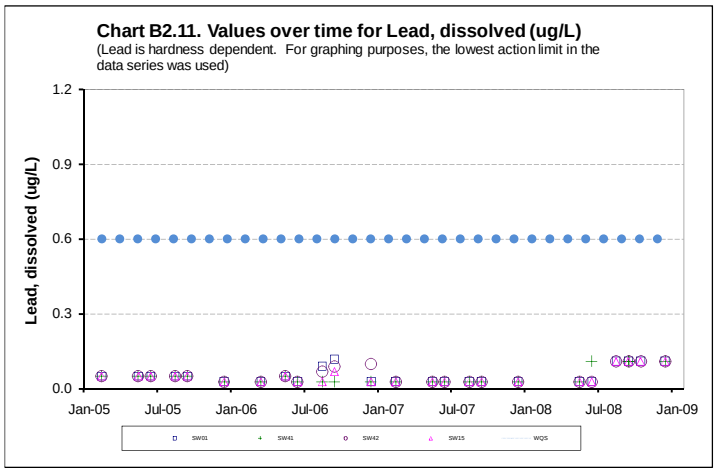
Table B2. Time Series for Receiving Environment (continued)

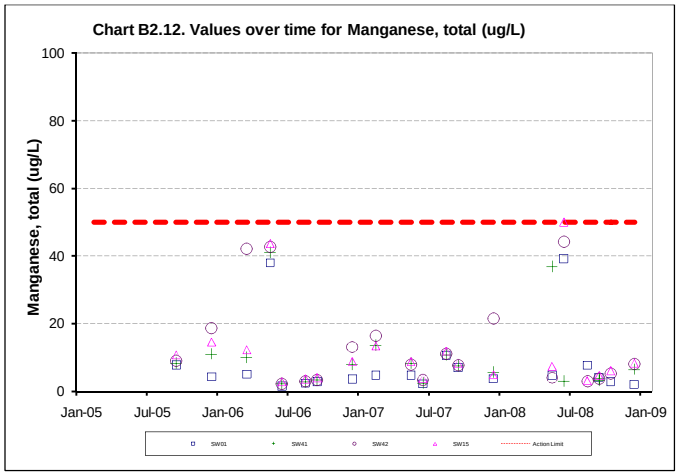












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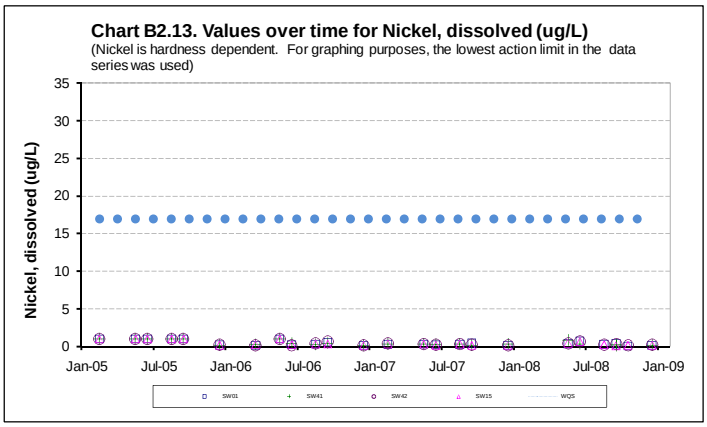

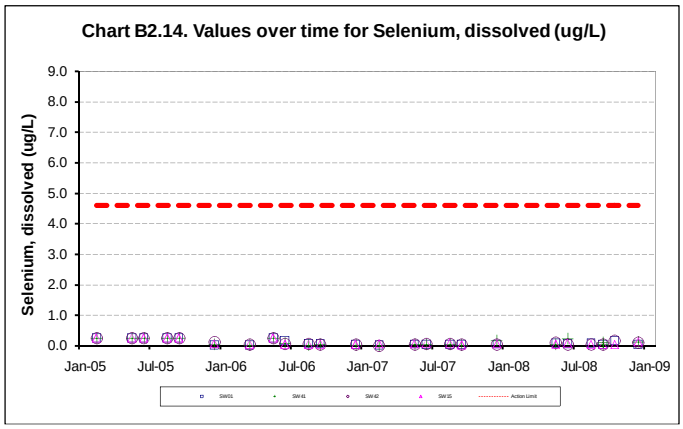

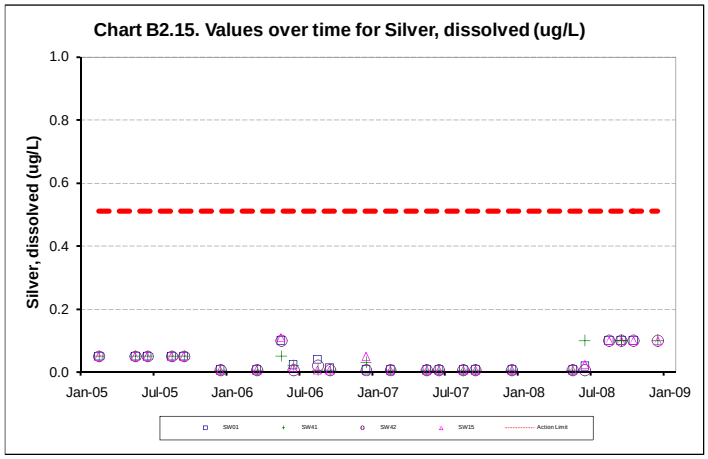

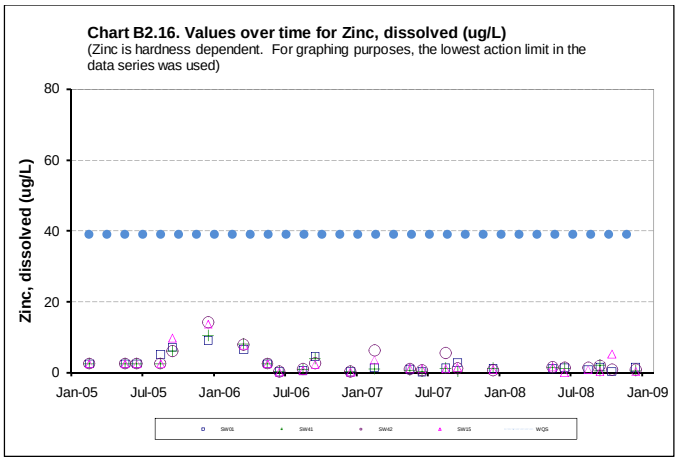

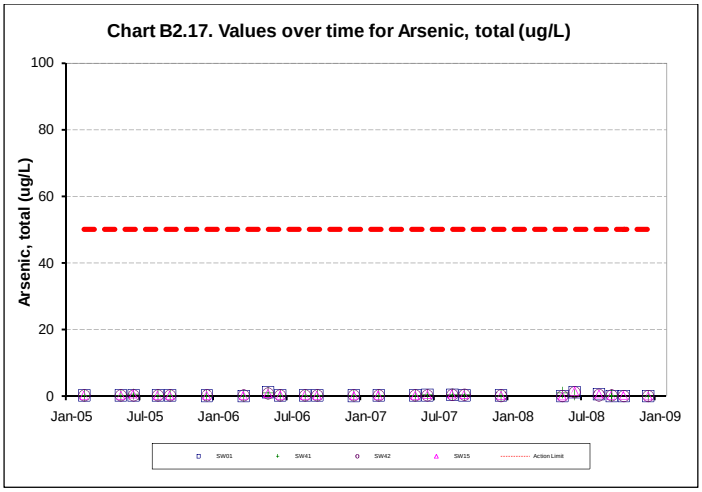

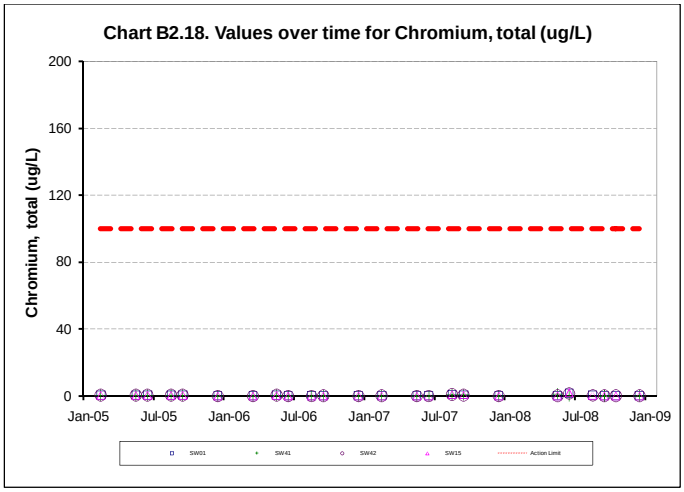

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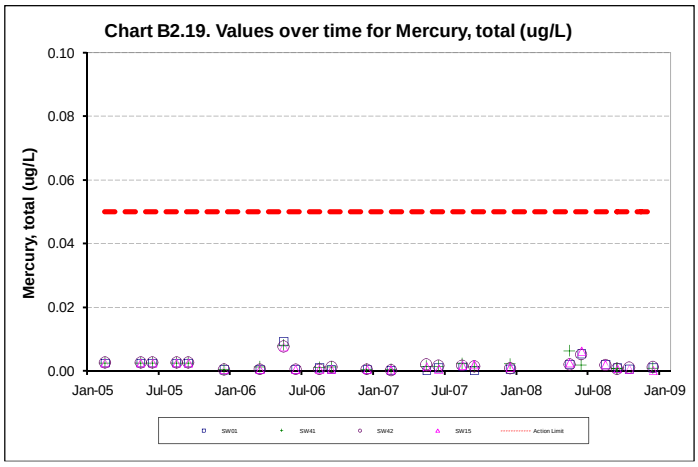
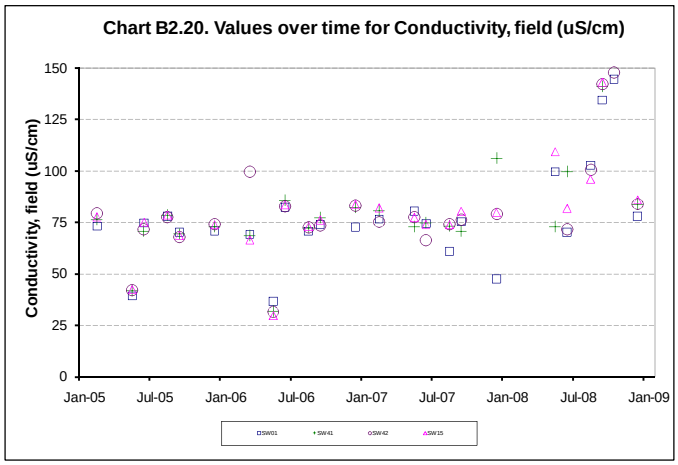
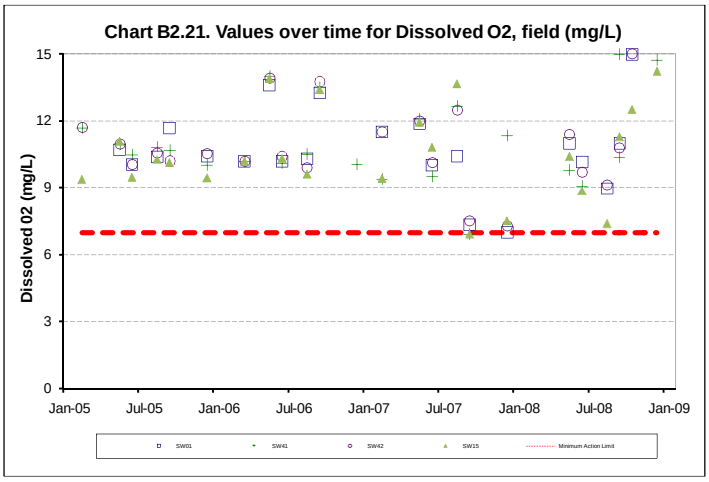
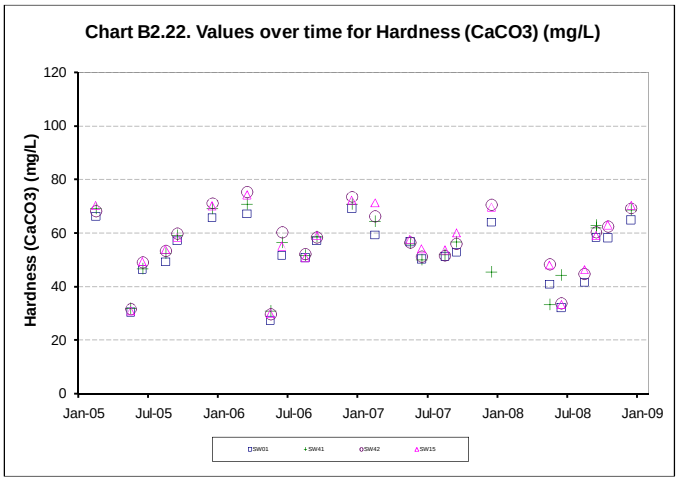
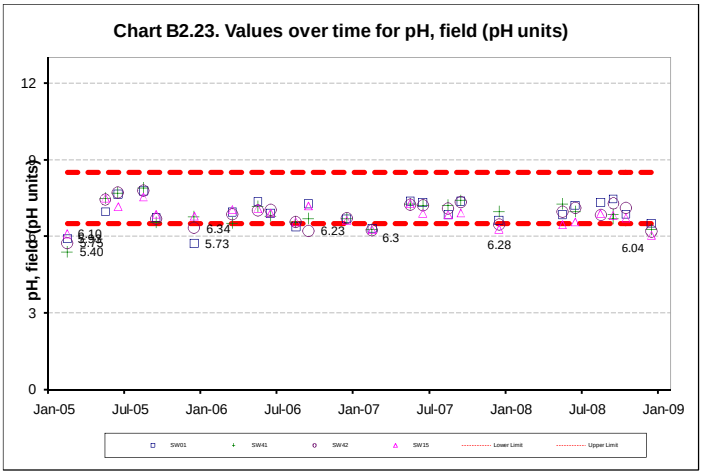










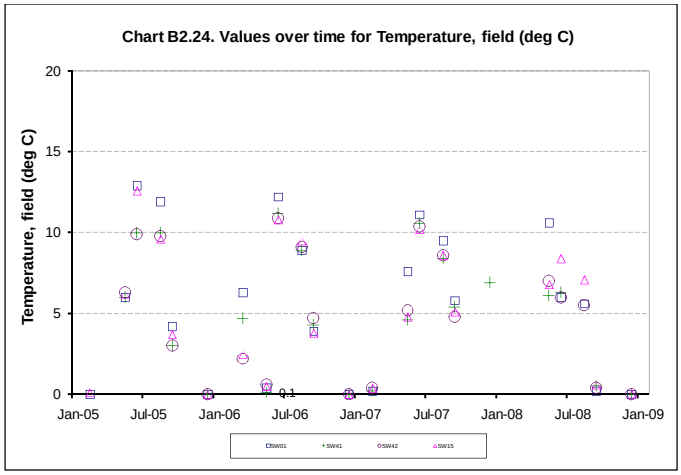
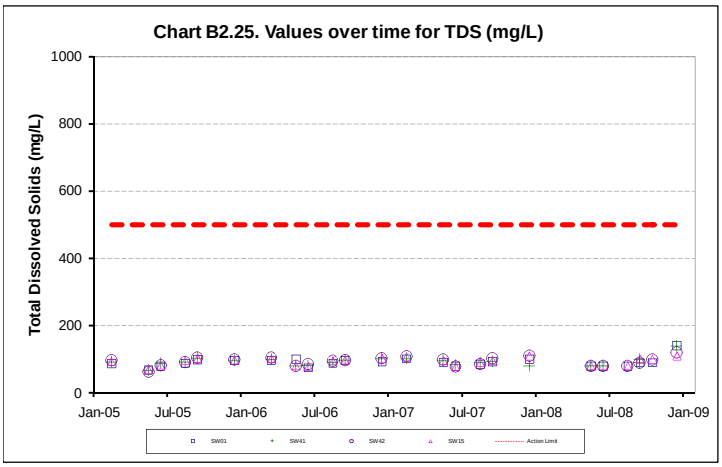
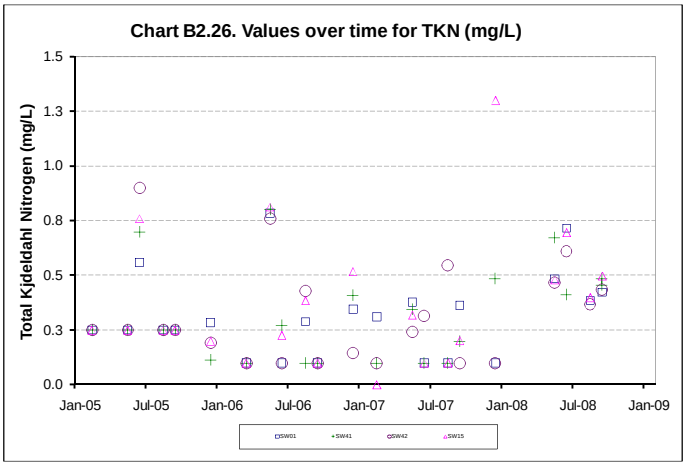
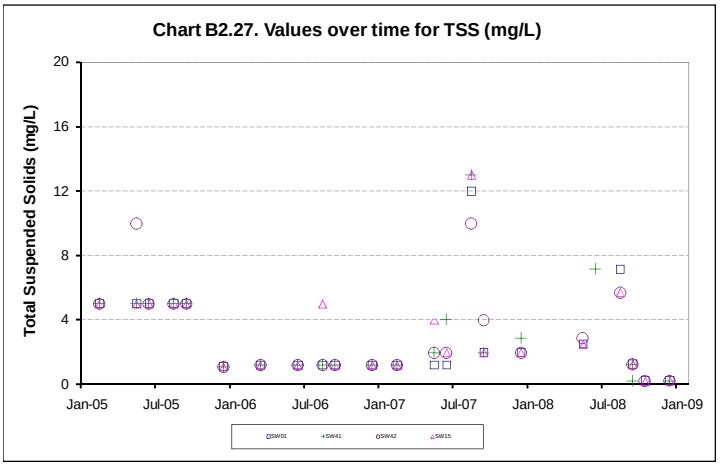


Table B2. Time Series for Receiving Environment (continued)







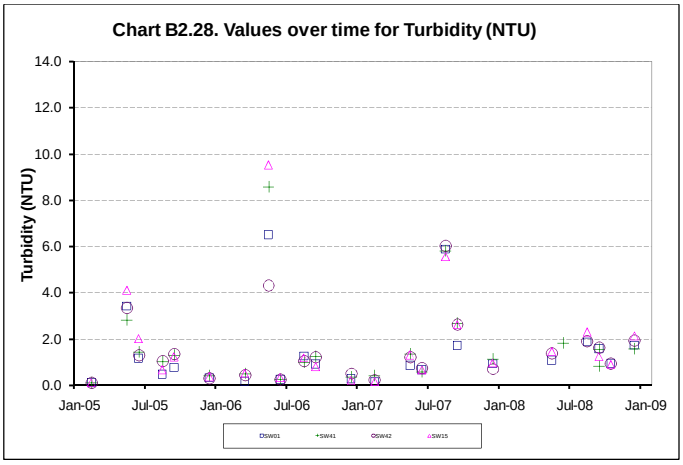


Table B2. Time Series for Groundwater Monitoring Program (continued)

Chart B2.7. Values over time for Chromium, dissolved (ug/L)

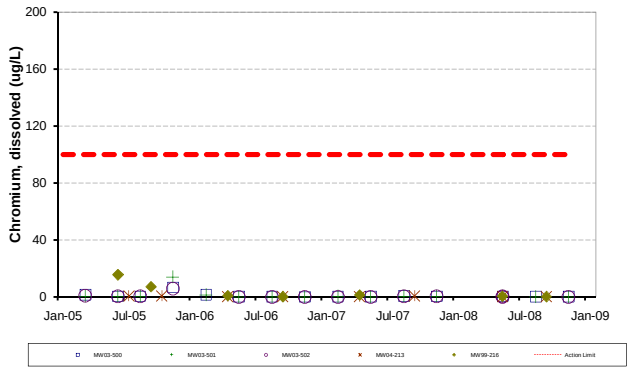


Chart B2.8. Values over time for Copper, dissolved (ug/L)
(Copper is hardness dependent. For graphing purposes, the lowest hardness value in the data series was used)

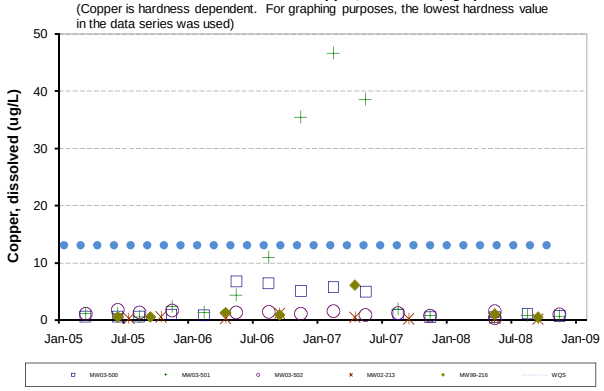


Chart B2.9. Values over time for Iron, dissolved (ug/L)

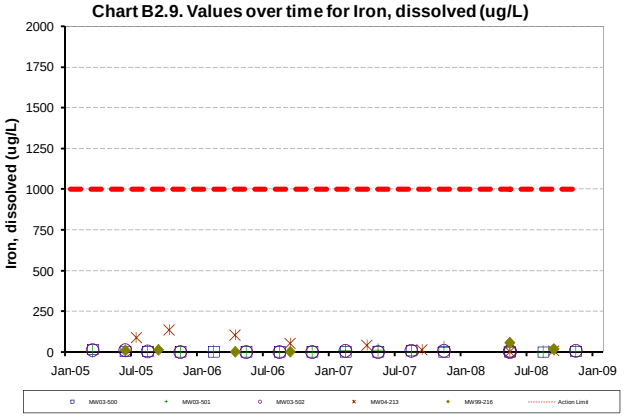


Chart B2.10. Values over time for Lead, dissolved (ug/L)
(Lead is hardness dependent. For graphing purposes, the lowest hardness value in the data series was used)

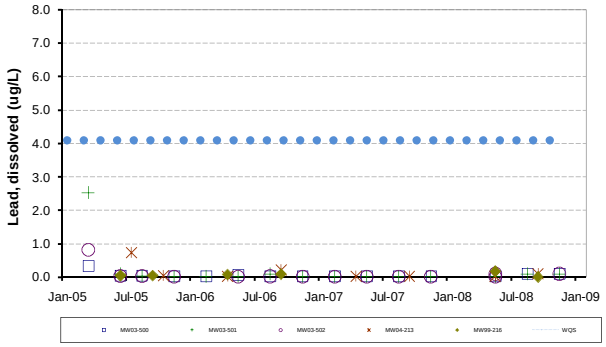


Chart B2.11. Values over time for Manganese, dissolved (ug/L)

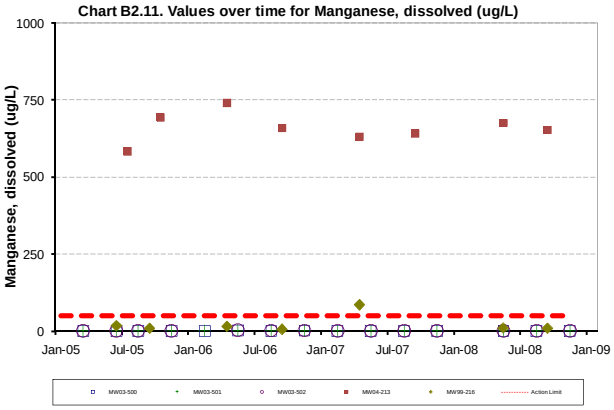


Chart B2.12. Values over time for Mercury, dissolved (ug/L)

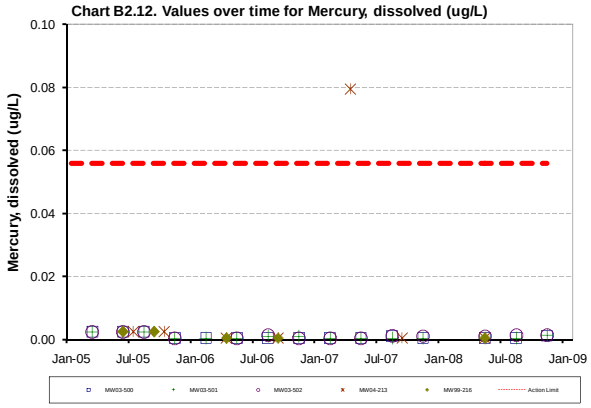


Table B2. Time Series for Groundwater Monitoring Program (continued)

Chart B2.13. Values over time for Nickel, dissolved (ug/L)
(Nickel is hardness dependent. For graphing purposes, the lowest hardness value in the data series was used)

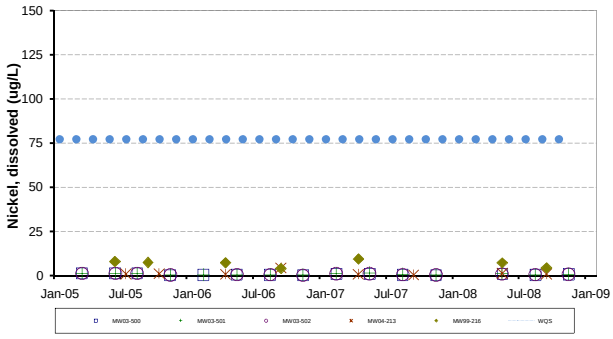


Chart B2.14. Values over time for Selenium, dissolved (ug/L)

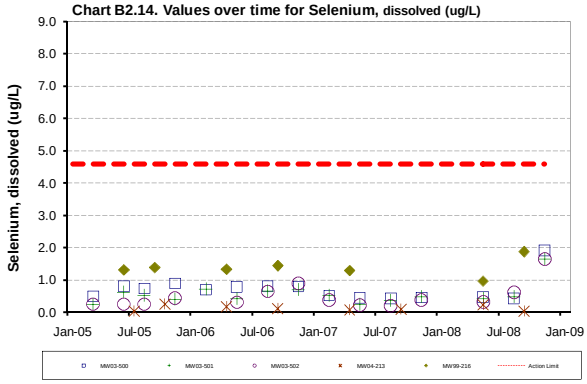


Chart B2.15. Values over time for Silver, dissolved (ug/L)

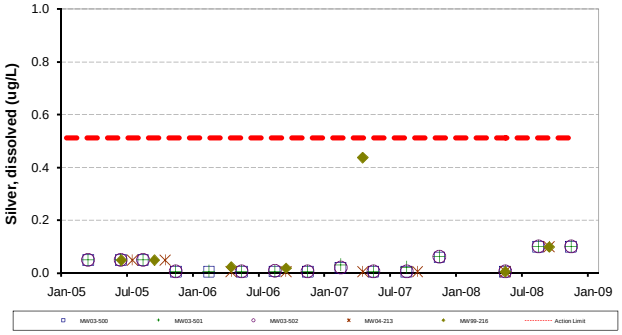


Chart B2.16. Values over time for Zinc, dissolved (ug/L)
(Zinc is hardness dependent. For graphing purposes, the lowest hardness value in the data series was used)

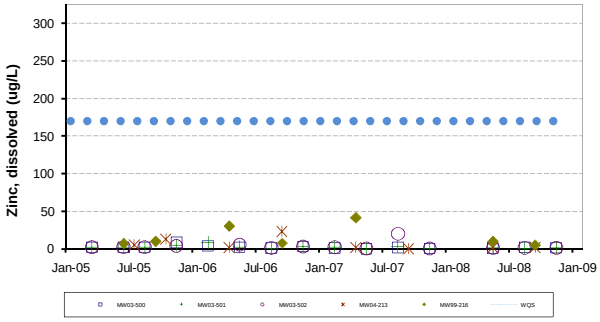


Chart B2.17. Values over time for Hardness (CaCO3) (mg/L)

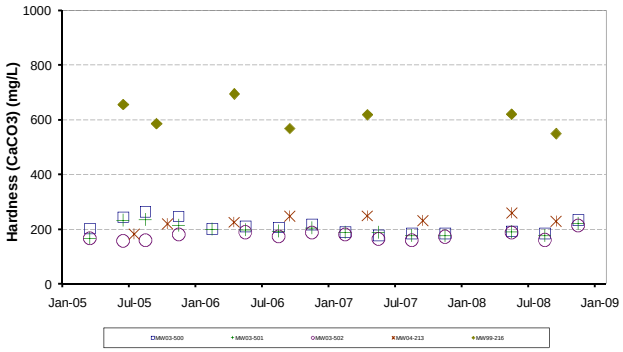


Chart B2.18. Values over time for pH, field (pH units)

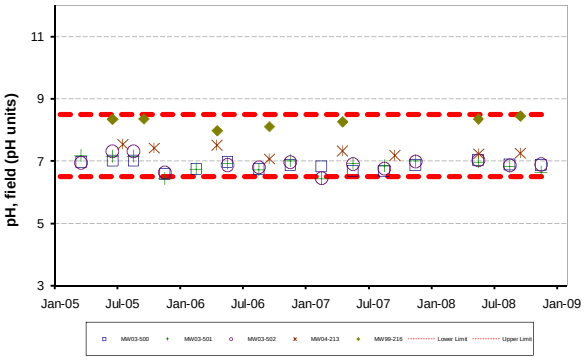


Table B2. Time Series for Groundwater Monitoring Program (continued)

Chart B2.19. Values over time for TDS (mg/L)

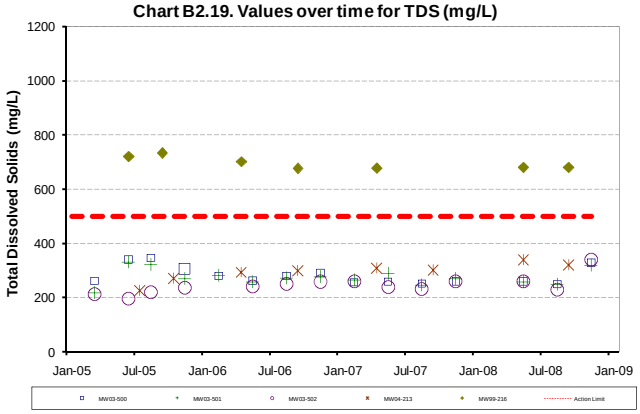


Chart B2.20. Values over time for TKN (mg/L)

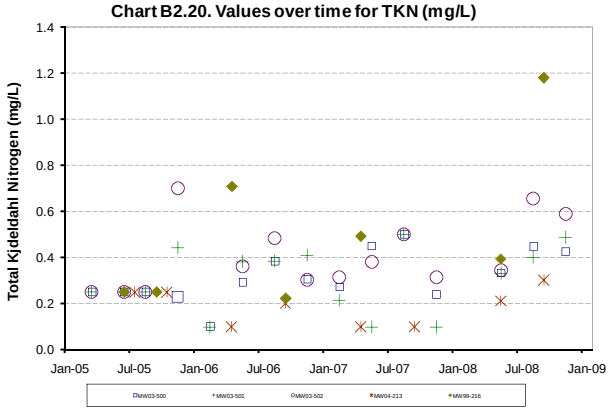


Chart B2.21. Values over time for Cyanide WAD (ug/L)

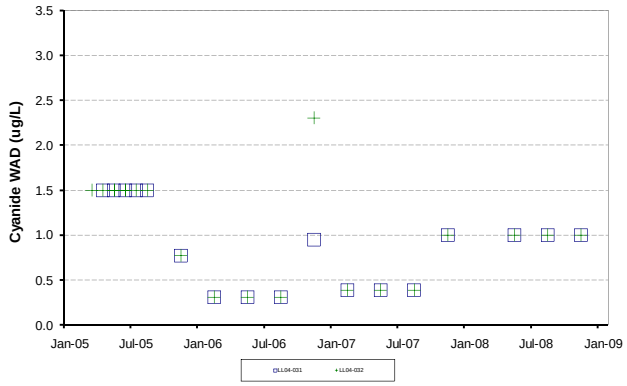


Chart B2.22. Values over time for Sulfate (mg/L)

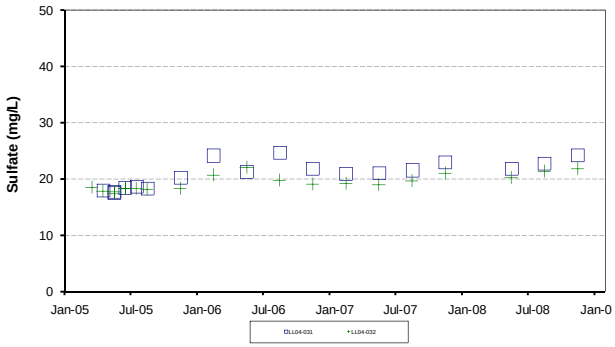


Chart B2.23. Values over time for Arsenic, total (ug/L)

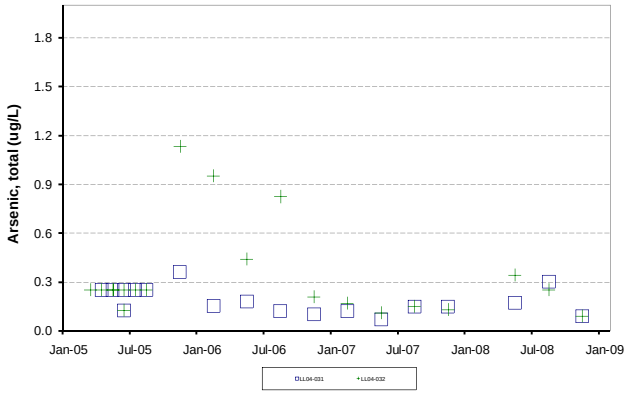


Chart B2.24. Values over time for Cadmium, total (ug/L)

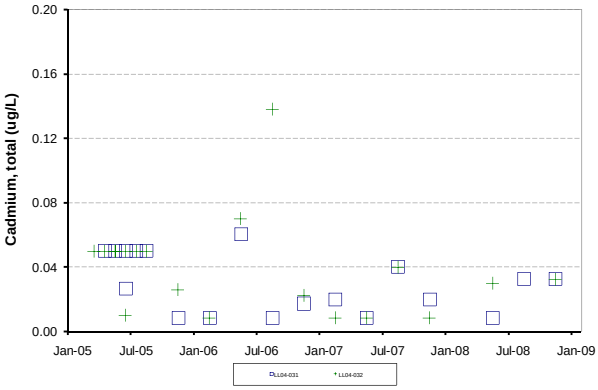


Table B2. Time Series for Groundwater Monitoring Program (continued)

Chart B2.25. Values over time for Chromium, total (ug/L)

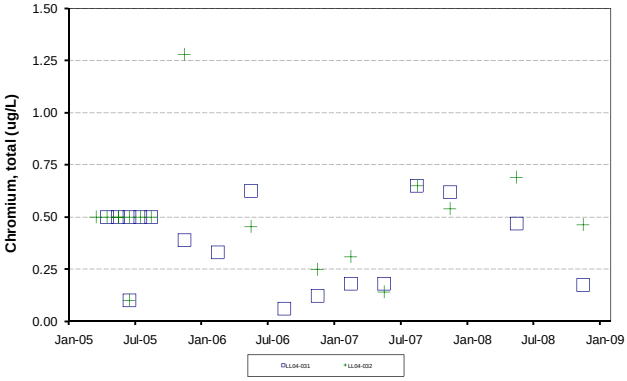


Chart B2.26. Values over time for Copper, total (ug/L)

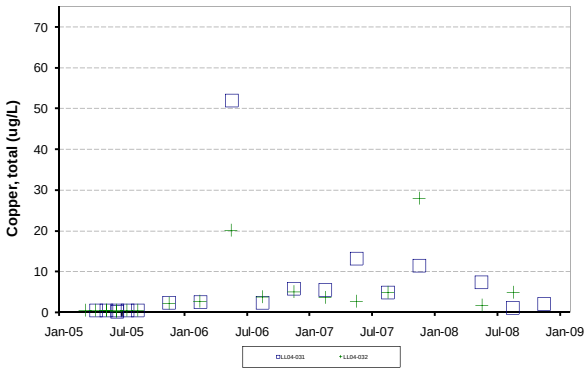


Chart B2.27. Values over time for Lead, total (ug/L)

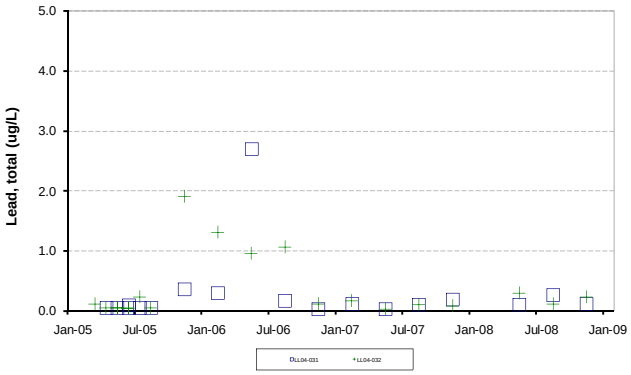


Chart B2.28. Values over time for Manganese, total (ug/L)

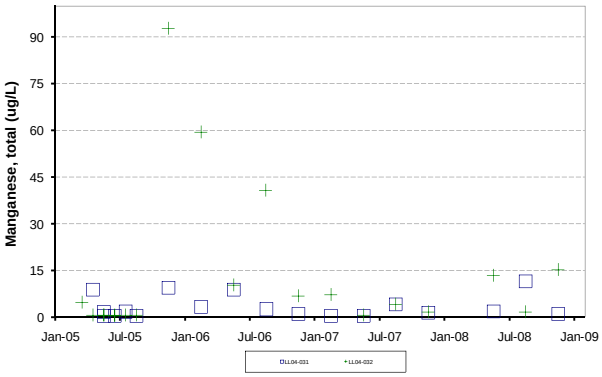


Chart B2.29. Values over time for Mercury, total (ug/L)

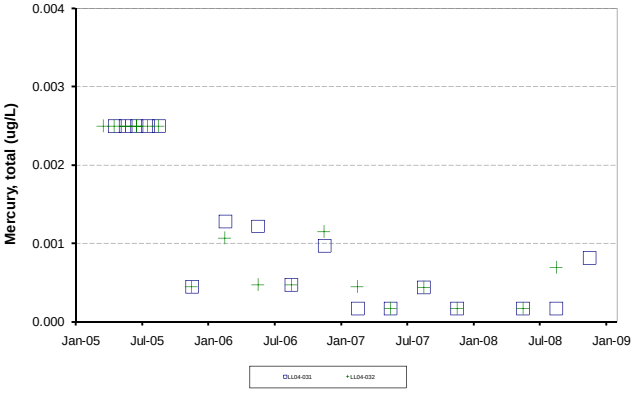


Chart B2.30. Values over time for Nickel, total (ug/L)

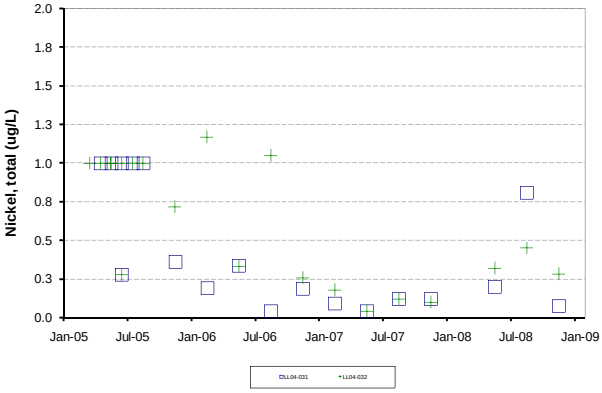


Table B2. Time Series for Groundwater Monitoring Program (continued)

Chart B2.31. Values over time for Zinc, total (ug/L)

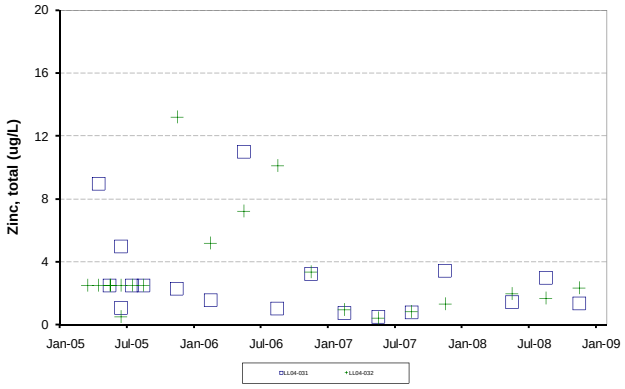


Chart B2.32. Values over time for Hardness (CaCO3) (mg/L)

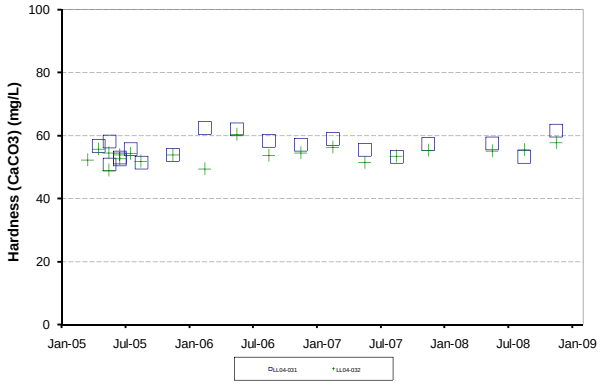


Chart B2.33. Values over time for pH, field (pH units)

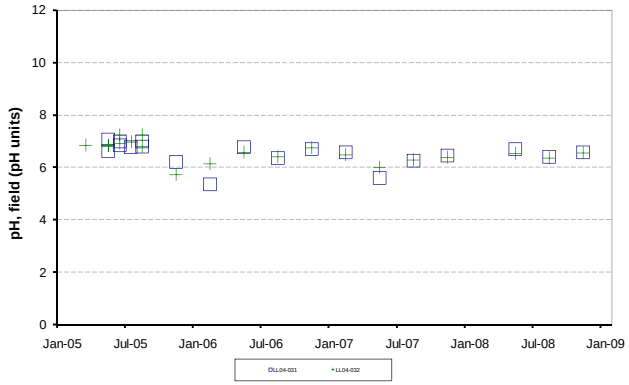


Chart B2.34. Values over time for TDS (mg/L)

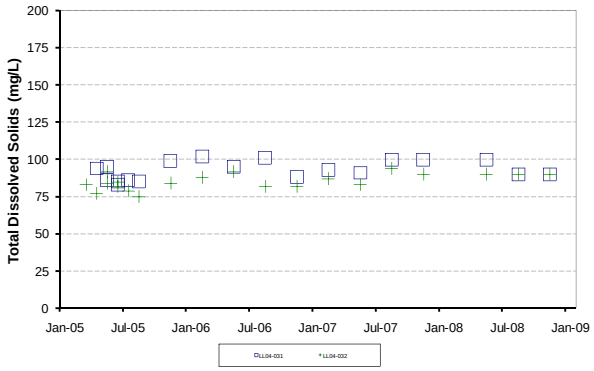


Chart B2.35. Values over time for Elevation (feet)

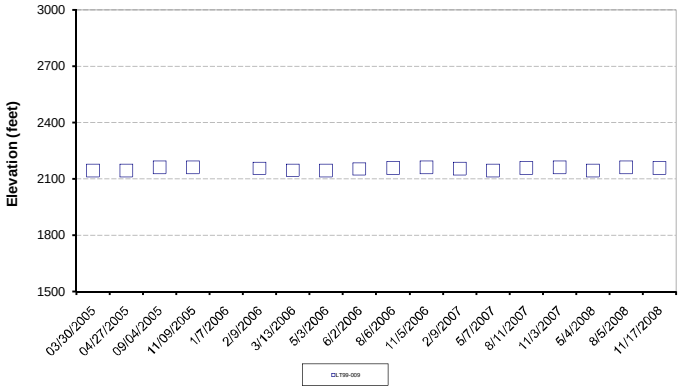


Table B1. Time Series for Effluent Monitoring Program (continued)

Chart B1.7A. Values over time for Cadmium, total (ug/L)

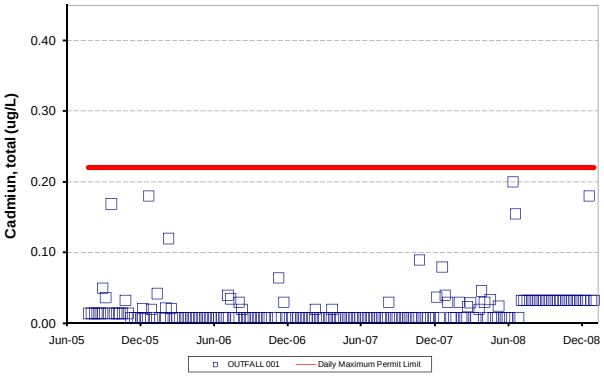


Chart B1.7.B Monthly average over time for Cadmium, total (ug/L)

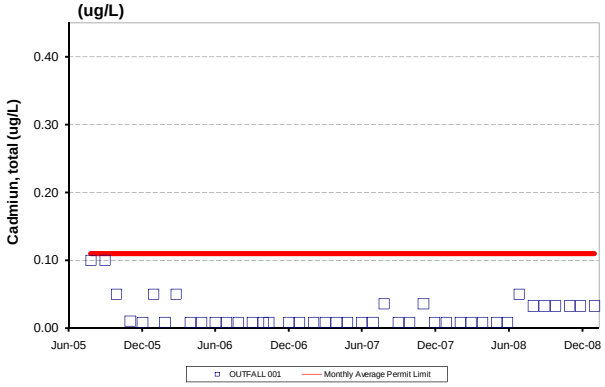


Chart B1.8. Values over time for Chromium, total (ug/L)

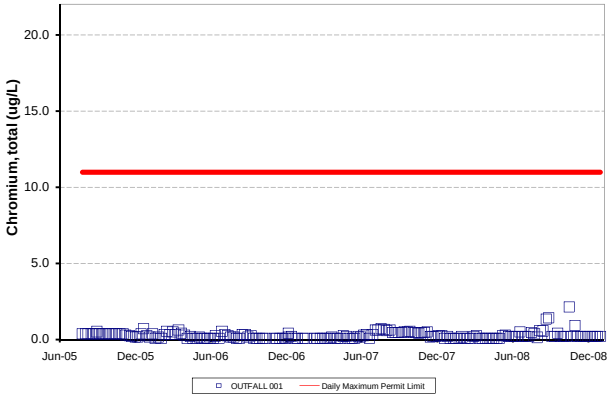


Chart B1.9A. Values over time for Copper, total (ug/L)

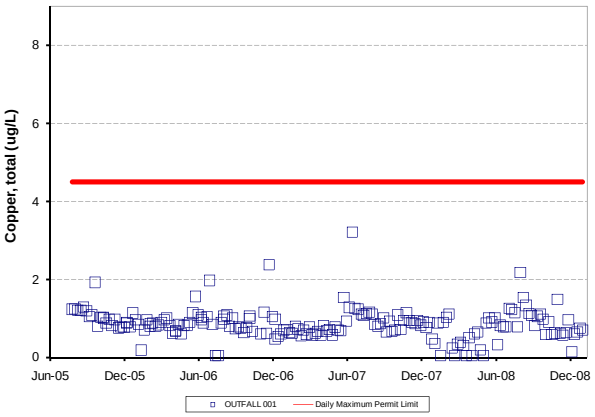


Chart B1.9.B Monthly average over time for Copper, total (ug/L)

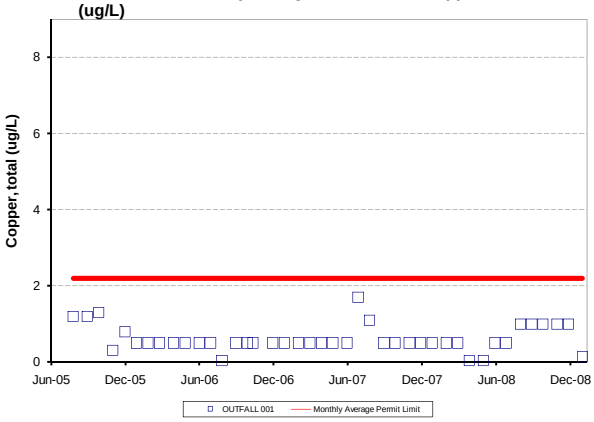


Table B1. Time Series for Effluent Monitoring Program (continued)

Chart B1.10A. Values over time for Lead, total (ug/L)

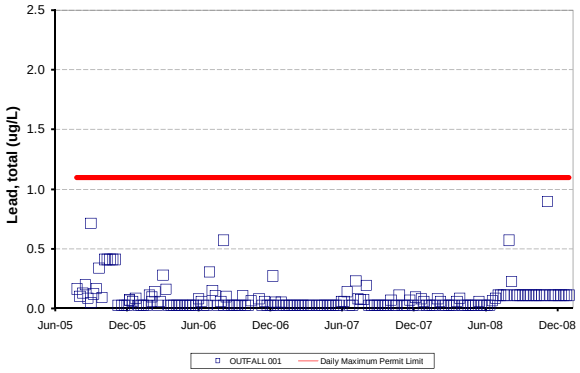


Chart B1.10B. Monthly average over time for Lead, total (ug/L)

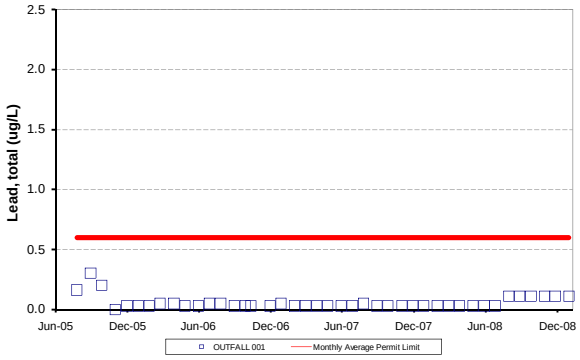


Chart B1.11A. Values over time for Manganese, total (ug/L)

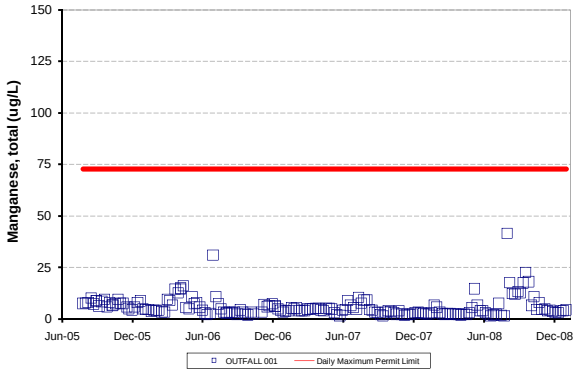


Chart B1.11B. Monthly average over time for Manganese, total (ug/L)

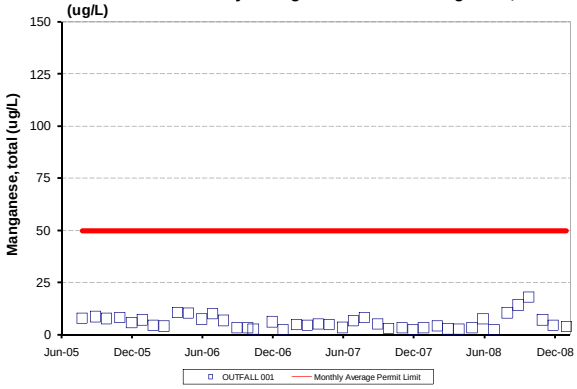


Chart B1.12A. Values over time for Mercury, total (ug/L)

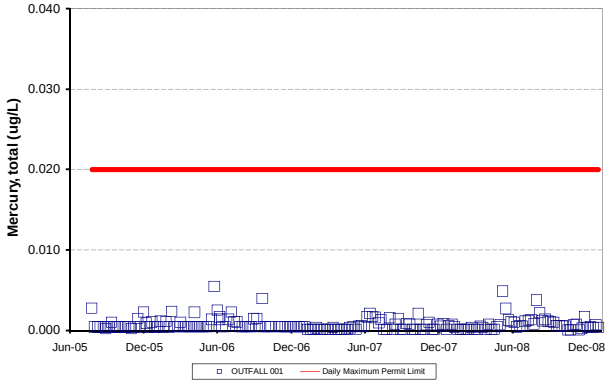


Chart B1.12B. Monthly average over time for Mercury, total (ug/L)

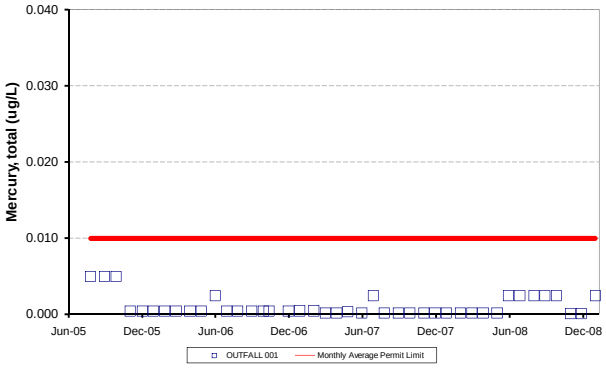


Table B1. Time Series for Effluent Monitoring Program (continued)

Chart B1.13A. Values over time for Nickel, total (ug/L)

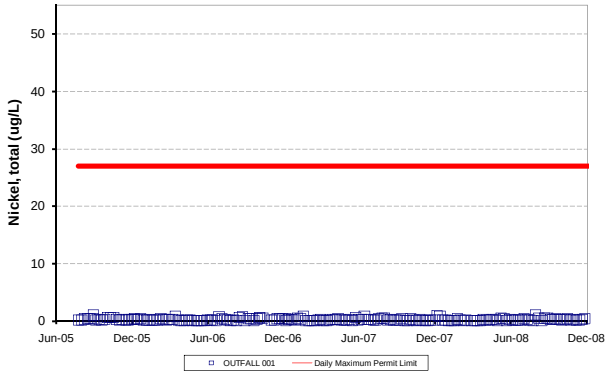


Chart B1.13B. Monthly average over time for Nickel, total (ug/L)

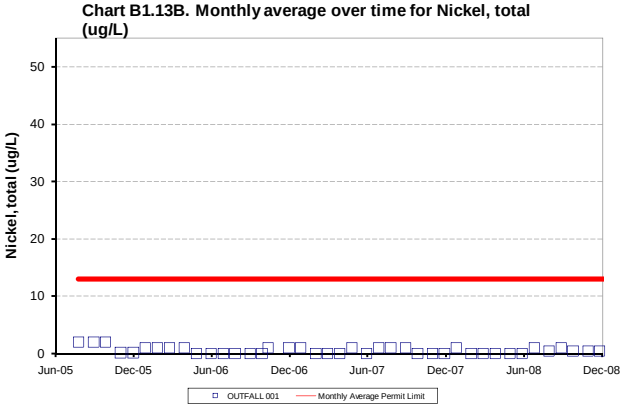


Chart B1.14A. Values over time for Zinc, total (ug/L)

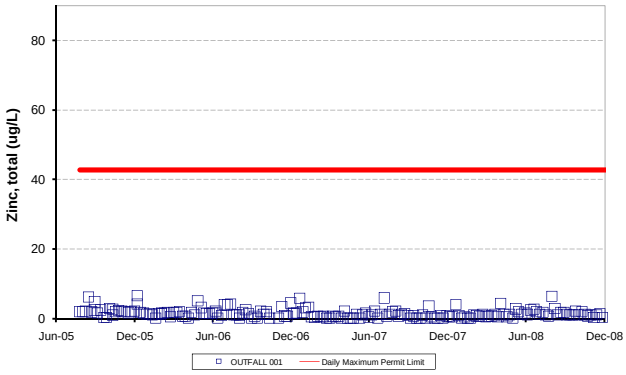


Chart B1.14B. Monthly average over time for Zinc, total (ug/L)

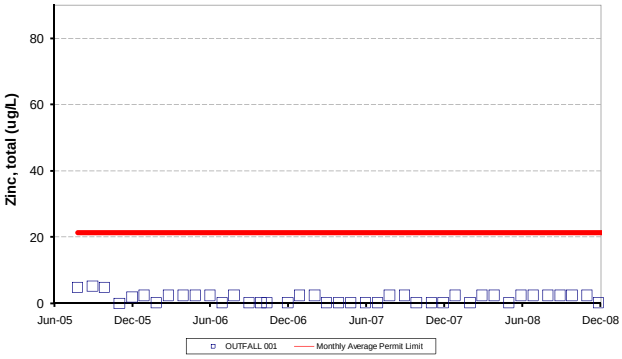


Chart B1.15. Values over time for Hardness (CaCO3) (mg/L)

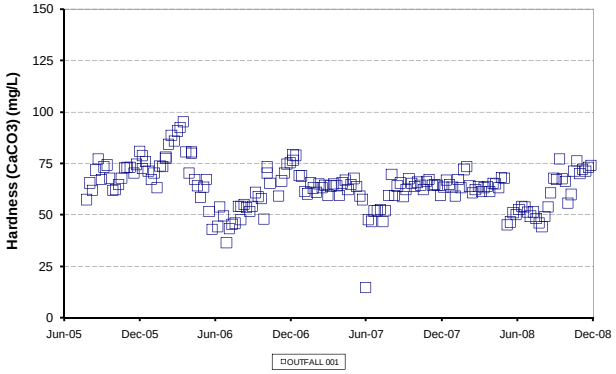


Chart B1.16. Values over time for pH, field (pH units)

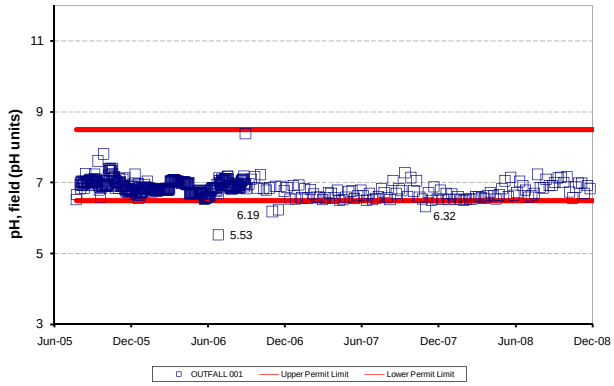


Table B1. Time Series for Effluent Monitoring Program (continued)

Chart B1.17A. Values over time for TDS (mg/L)

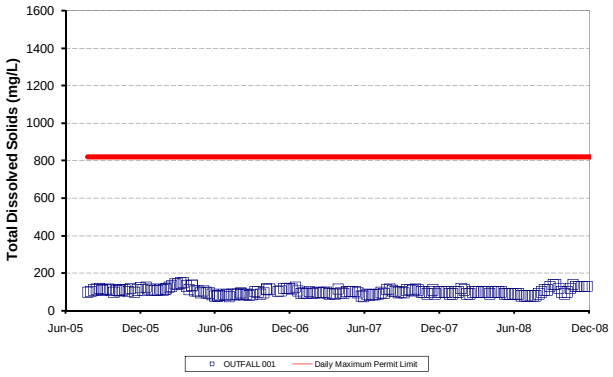


Chart B1.17B. Monthly average over time for TDS (mg/L)

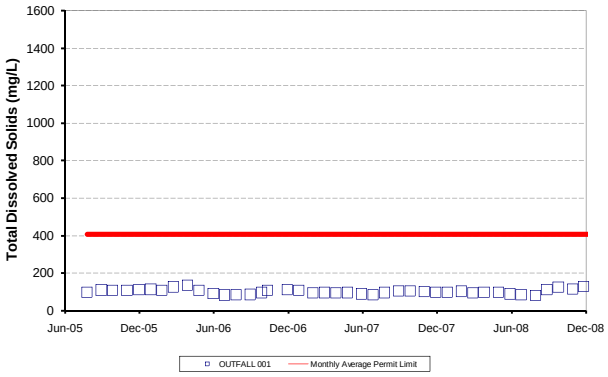


Chart B1.18. Values over time for Turbidity, lab (NTU)

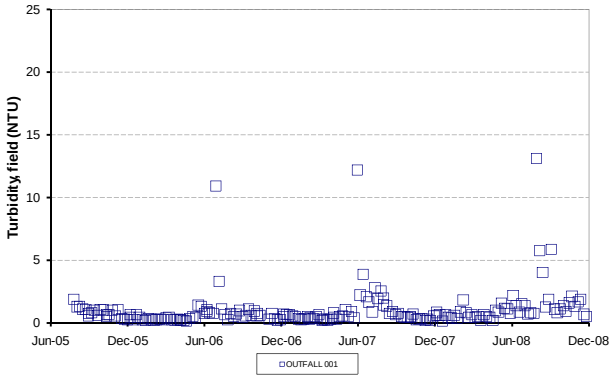


Chart B1.19. Values over time for Flow (gpm)

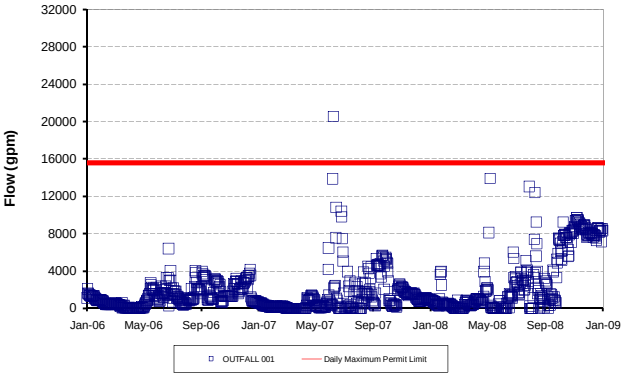


Chart B1.20. Values over time for Dilution Ratio

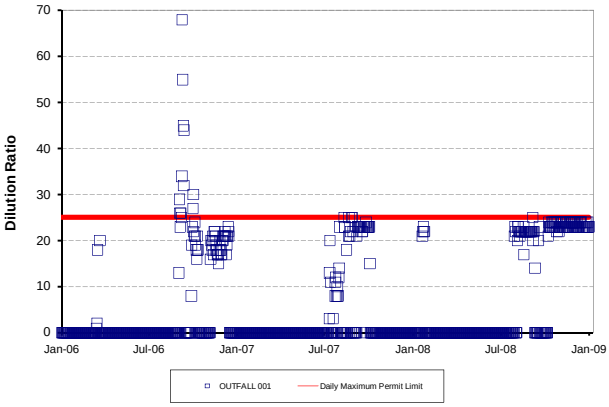


Chart B1.21. Values over time for Cyanide WAD (ug/L)

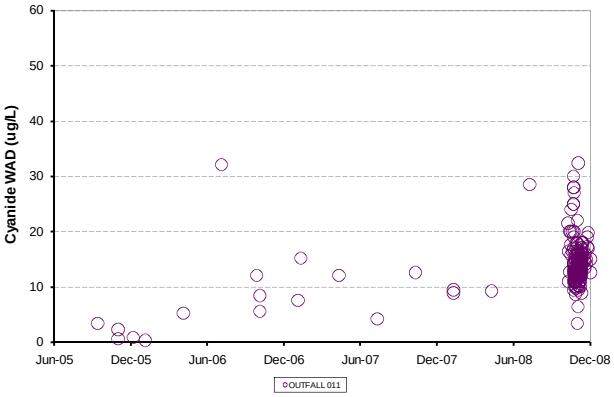


Table B1. Time Series for Effluent Monitoring Program (continued)

Chart B1.22. Values over time for Chloride (mg/L)

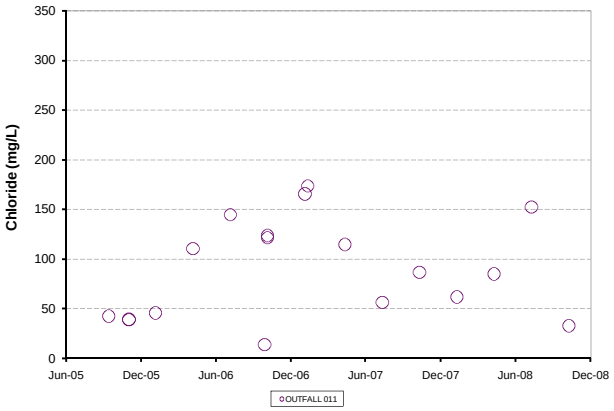


Chart B1.23. Values over time for Sulfate (mg/L)

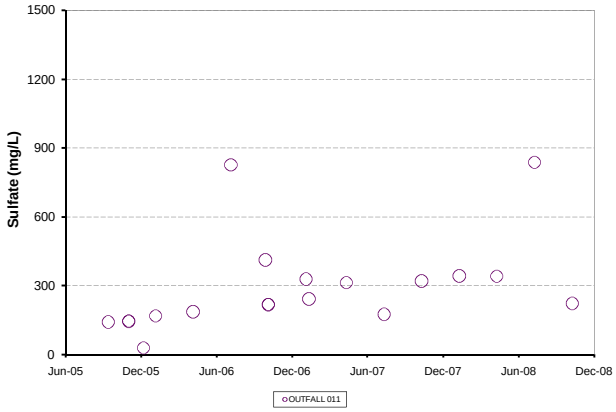


Chart B1.24. Values over time for Aluminum, total (ug/L)

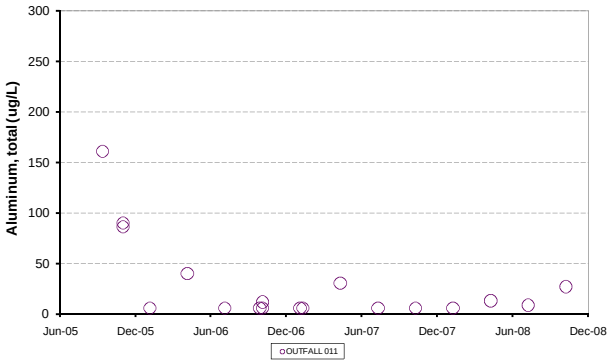


Chart B1.25. Values over time for Arsenic, total (ug/L)

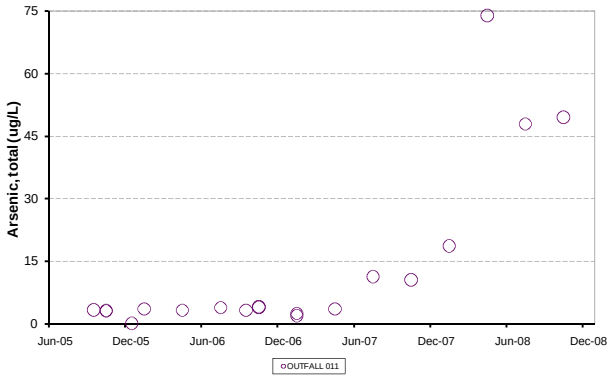


Chart B1.26A. Values over time for Cadmium, total (ug/L)

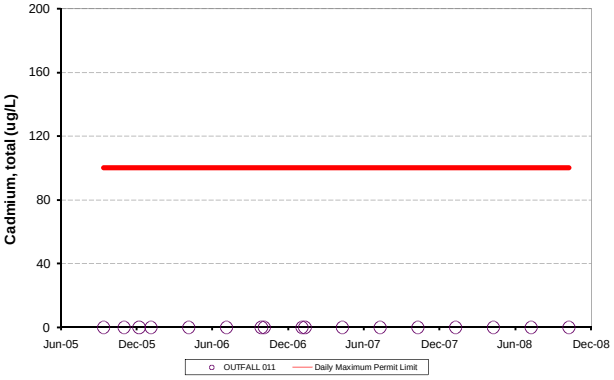


Chart B1.26B. Quarterly average over time for Cadmium, total (ug/L)

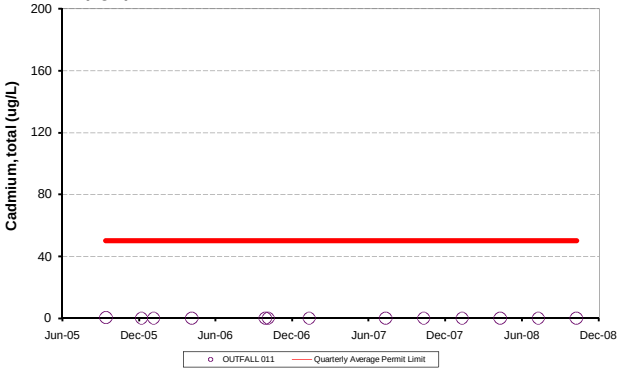


Table B1. Time Series for Effluent Monitoring Program (continued)

Chart B1.27. Values over time for Chromium, total (ug/L)

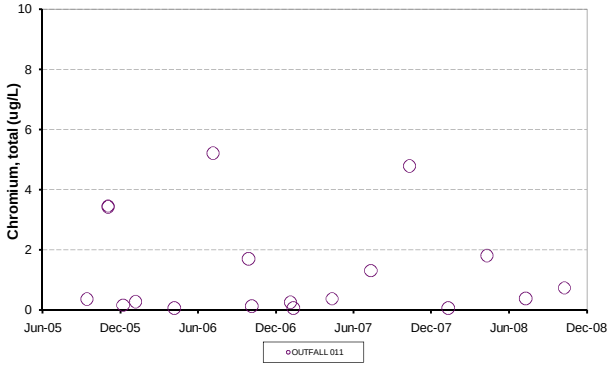


Chart B1.28A. Values over time for Copper, total (ug/L)

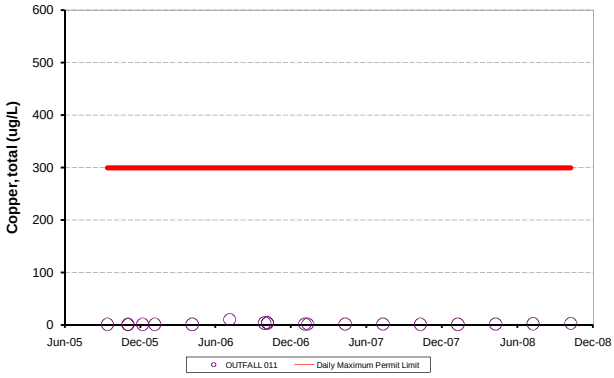


Chart B1.28B. Quarterly average over time for Copper, total (ug/L)

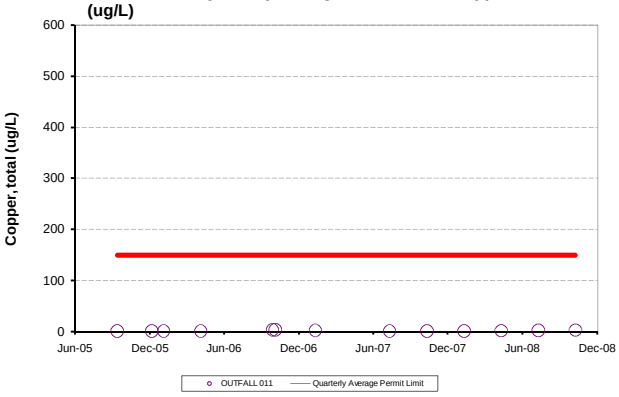


Chart B1.29A. Values over time for Iron, total (ug/L)

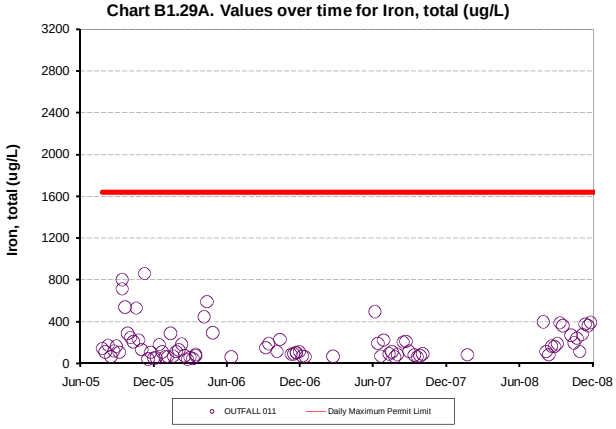


Chart B1.29B. Monthly average values over time for Iron, total (ug/L)

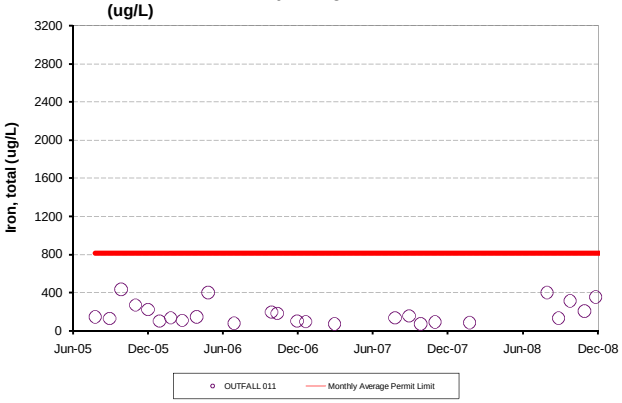


Table B1. Time Series for Effluent Monitoring Program (continued)

Chart B1.30A. Values over time for Lead, total (ug/L)

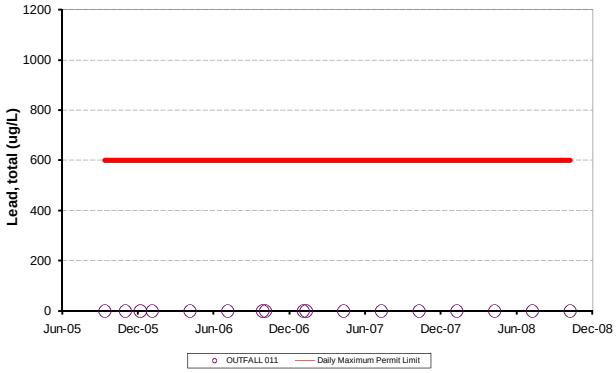


Chart B1.30B. Quarterly average over time for Lead, total (ug/L)

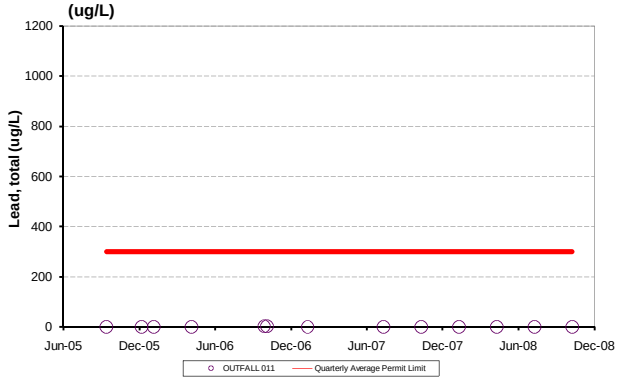


Chart B1.31A. Values over time for Mercury, total (ug/L)

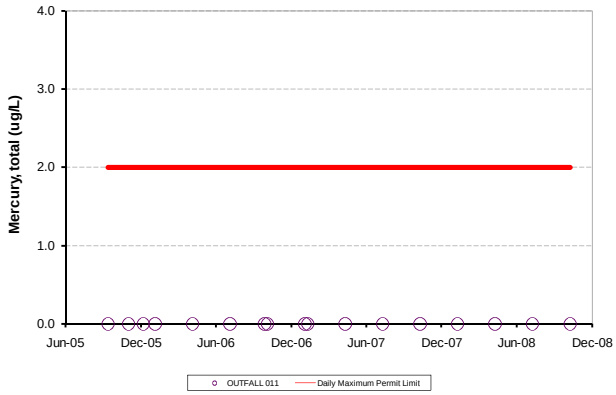


Chart B1.31B. Quarterly average over time for Mercury, total (ug/L)

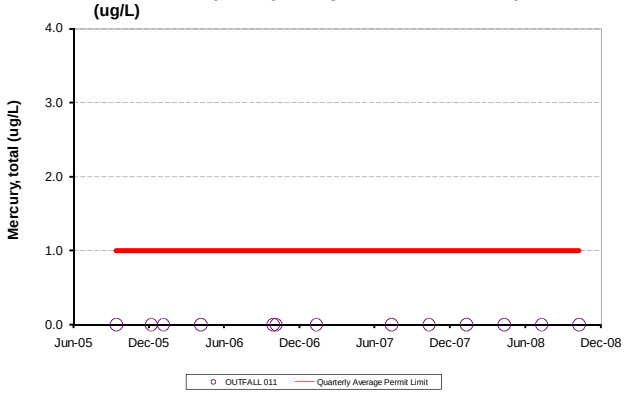


Chart B1.32. Values over time for Nickel, total (ug/L)

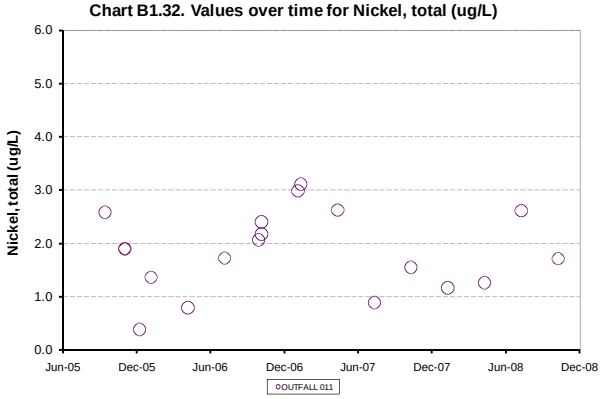


Chart B1.33. Values over time for Selenium, total (ug/L)

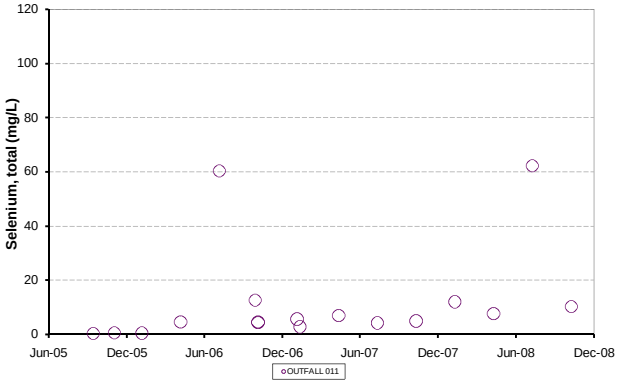


Table B1. Time Series for Effluent Monitoring Program (continued)

Chart B1.34. Values over time for Silver, total (ug/L)

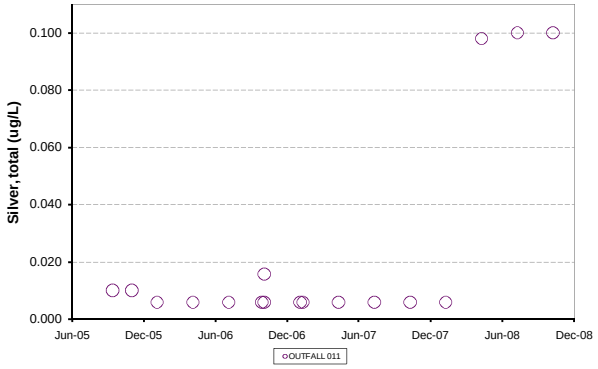


Chart B1.35A. Values over time for Zinc, total (ug/L)

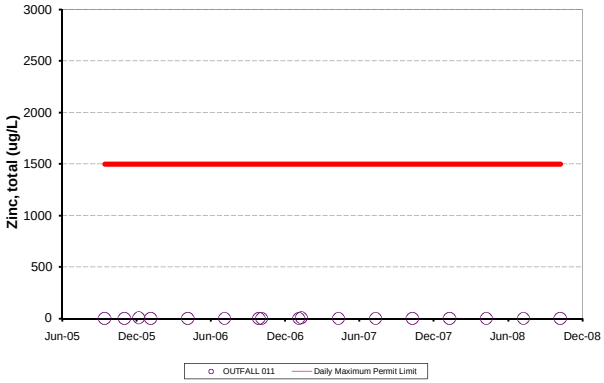


Chart B1.35B. Quarterly average over time for Zinc, total (ug/L)

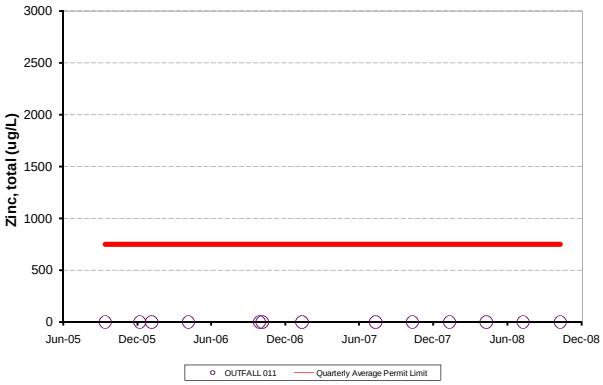


Chart B1.36. Values over time for Hardness (CaCO3) (mg/L)

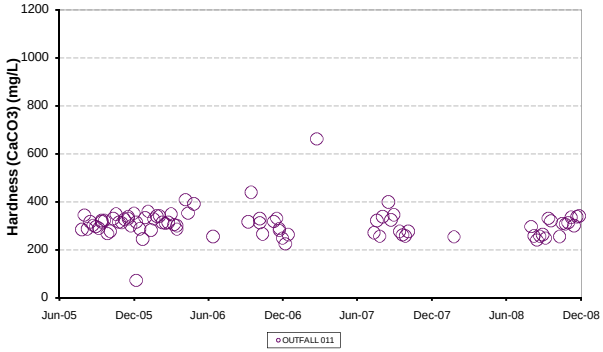


Chart B1.37. Values over time for pH, field (pH units)

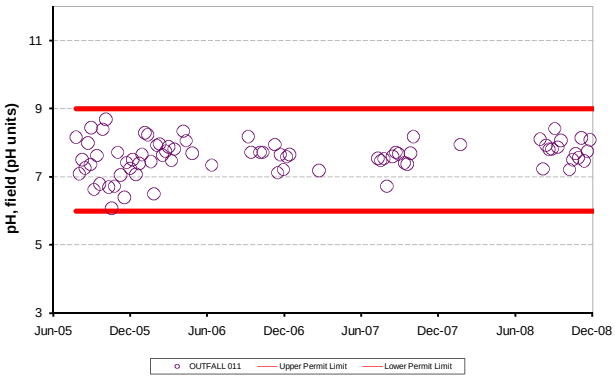


Table B1. Time Series for Effluent Monitoring Program (continued)

Chart B1.38. Values over time for TDS (mg/L)

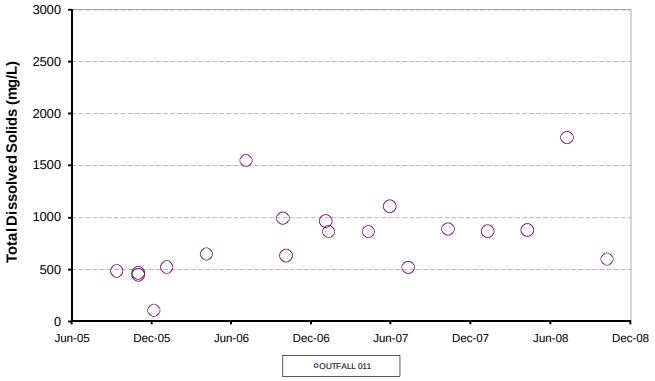


Chart B1.39A. Values over time for TSS (mg/L)

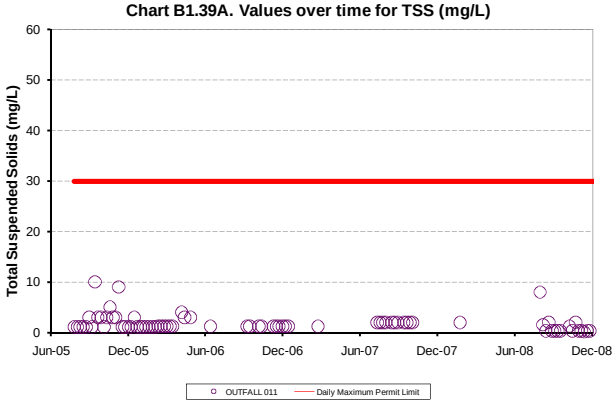


Chart B1.39B. Monthly average over time for TSS (mg/L)

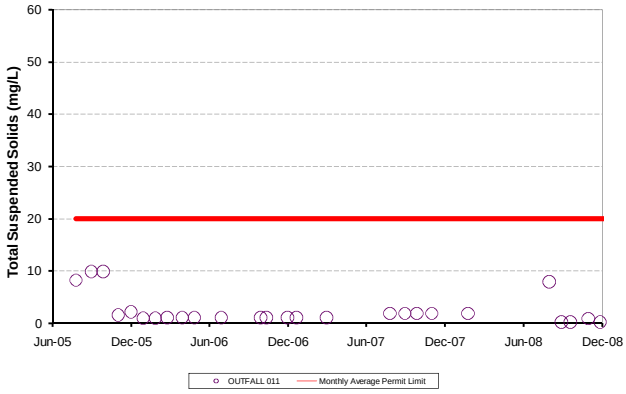


Chart B1.40. Values over time for Flow (gpm)

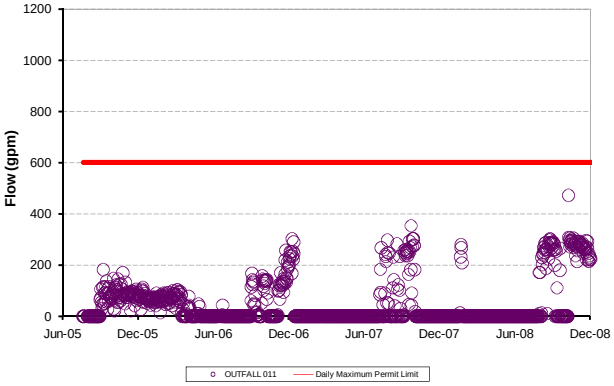


Table B1. Time Series for Effluent Monitoring Program (continued)

Chart B1.41A. Values over time for Nitrate-N (mg/L)

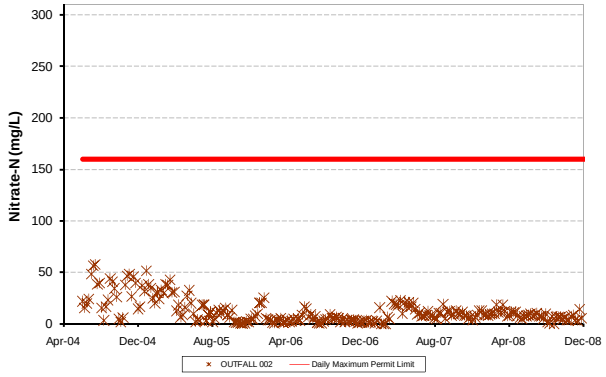


Chart B1.41B. Monthly average over time for Nitrate-N (mg/L)

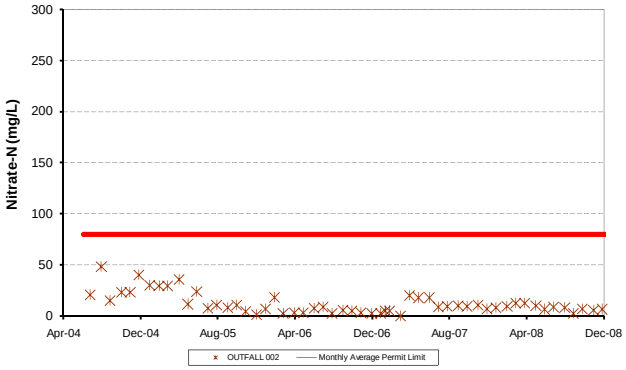


Chart B1.42A. Values over time for BOD, 5 day (mg/L)

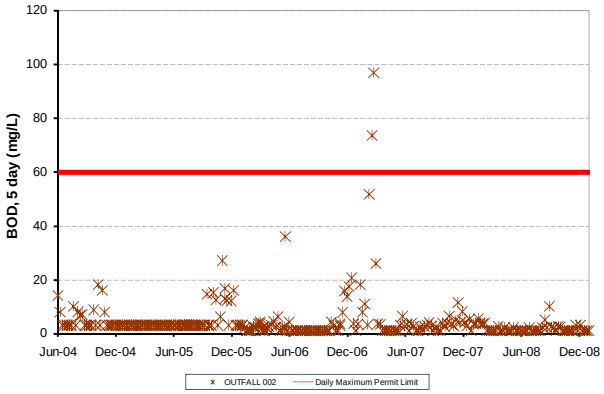


Chart B1.42B. Weekly average over time for BOD, 5 day (mg/L)

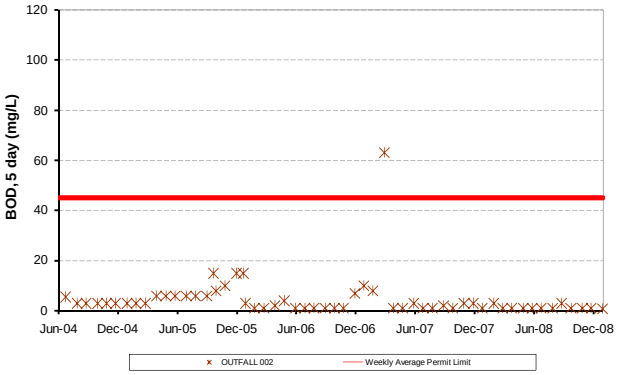


Chart B1.42C. Monthly average over time for BOD, 5 day (mg/L)

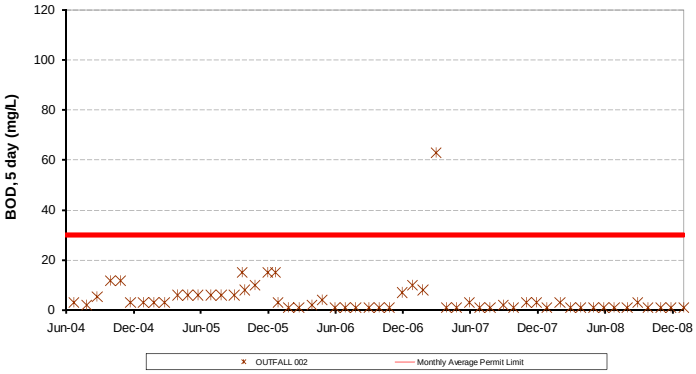


Table B1. Time Series for Effluent Monitoring Program (continued)

Chart B1.43. Values over time for Dissolved O2 (mg/L)

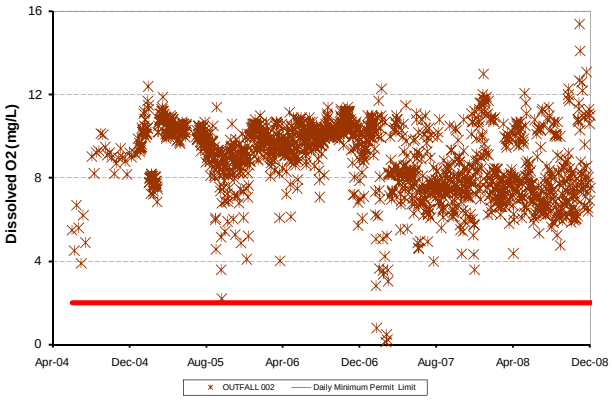


Chart B1.44. Values over time for pH, field (pH units)

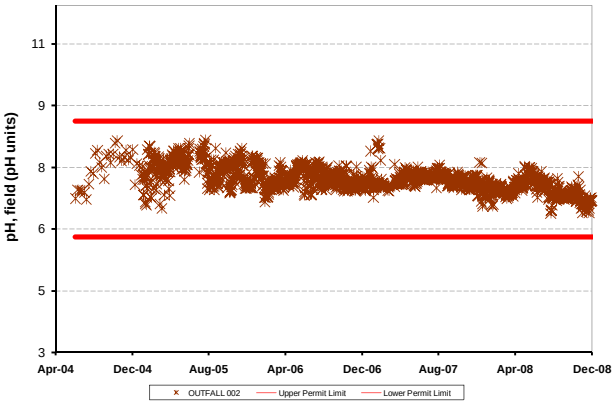


Chart B1.45A Values over time for TSS (mg/L)

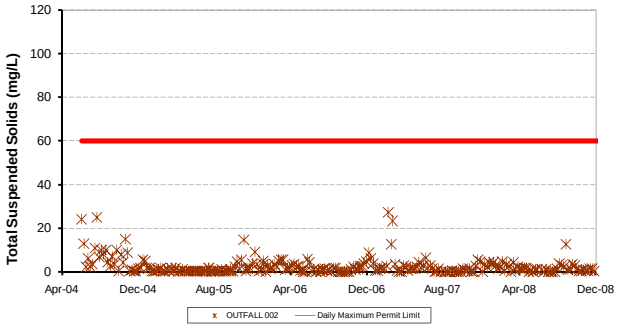


Chart B1.45B Weekly average over time for TSS (mg/L)

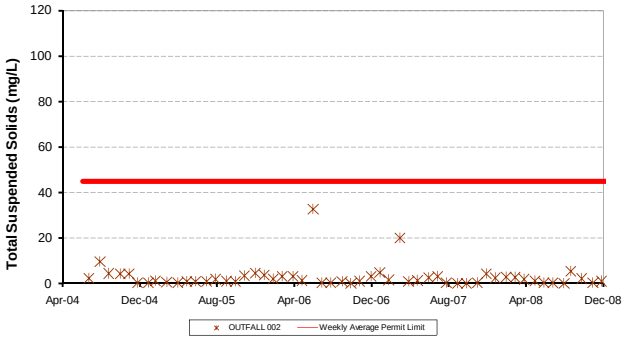


Chart B1.45C Monthly average over time for TSS (mg/L)

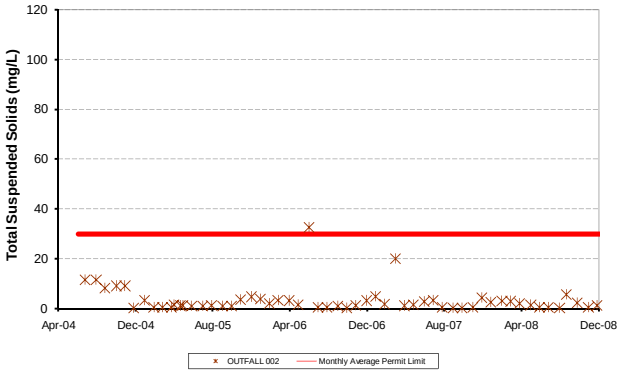


Table B1. Time Series for Effluent Monitoring Program (continued)

Chart B1.46A Values over time for Fecal Coliform (#/100mL)

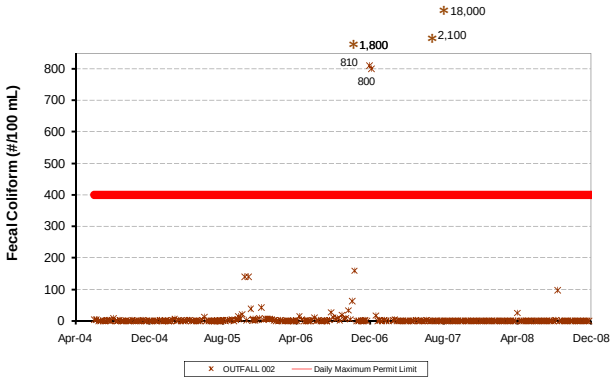


Chart B1.46B Monthly average over time for Fecal Coliform (#/100mL)

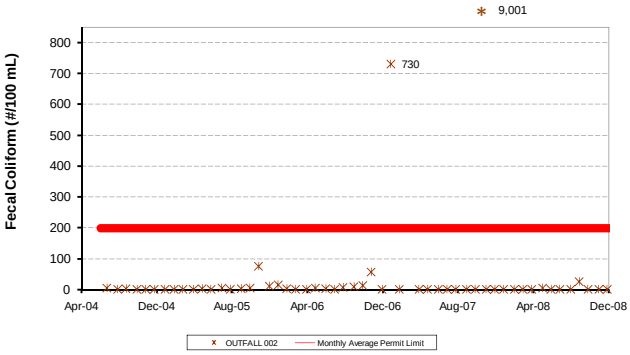


Chart B1.47. Values over time for Flow (gpd)

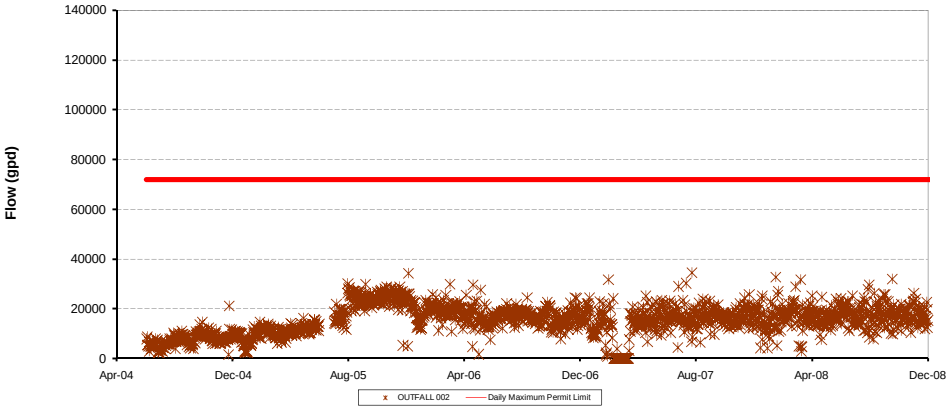


Table B1. Time Series for Effluent Monitoring Program (continued)

Chart B1.48. Values over time for BOD, 5 day (% removal)

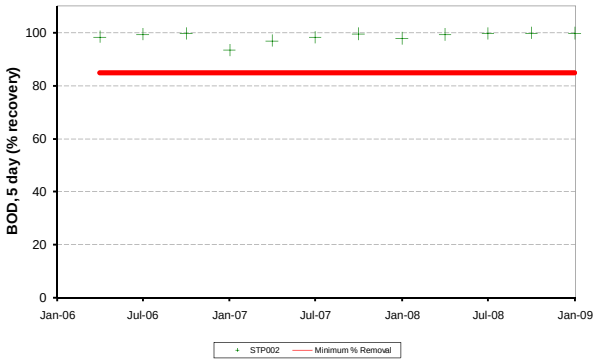


Chart B1.49. Values over time for TSS (% removal)

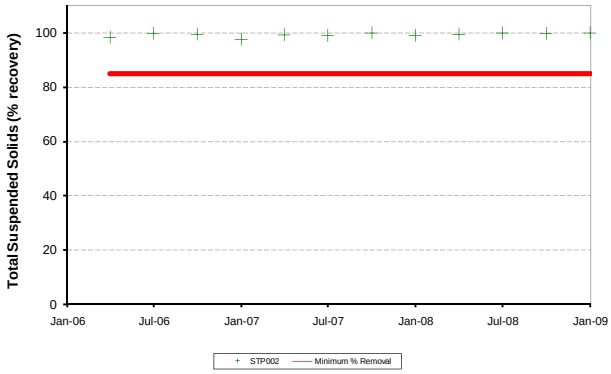
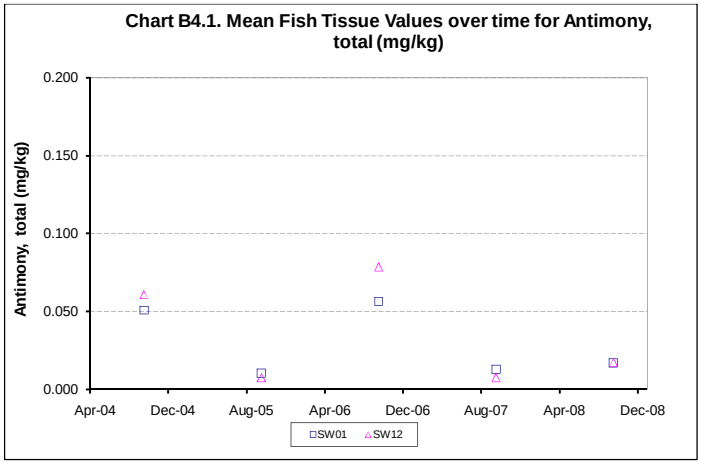
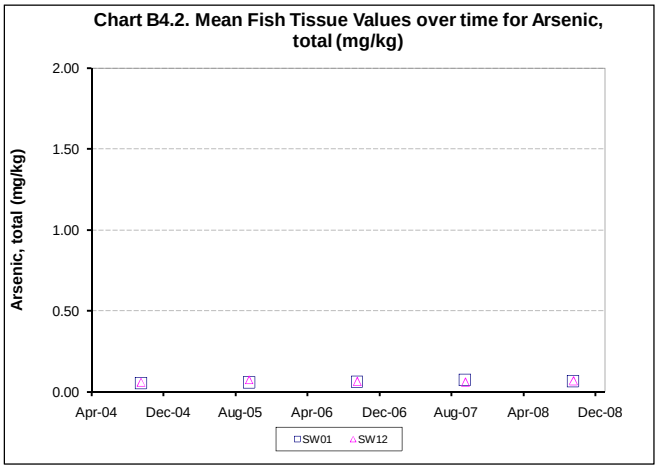
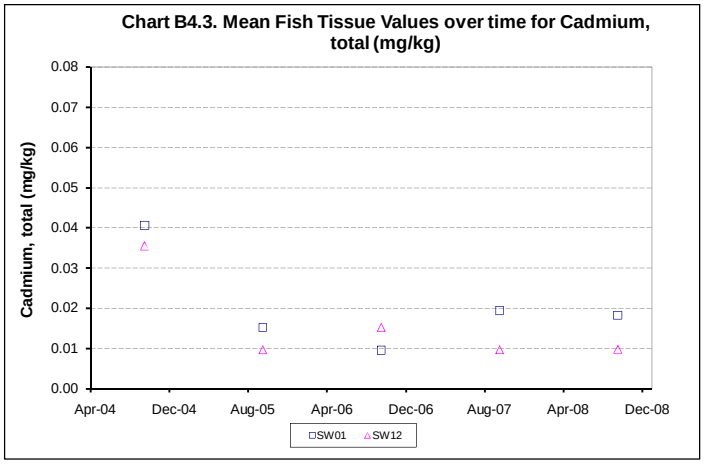
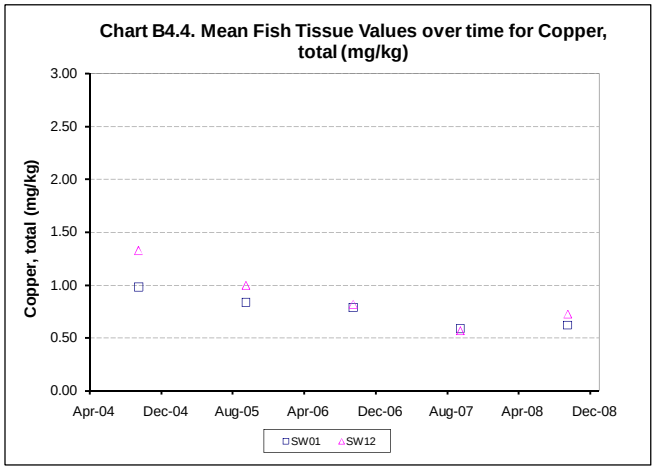


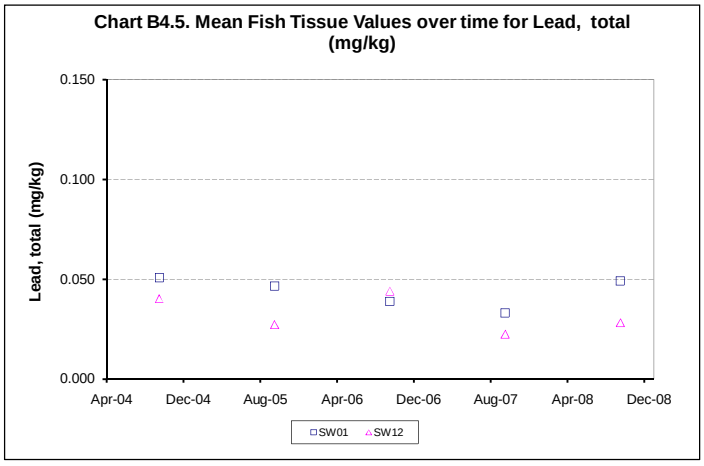
Table B4. Time Series for Fish Tissue Monitoring











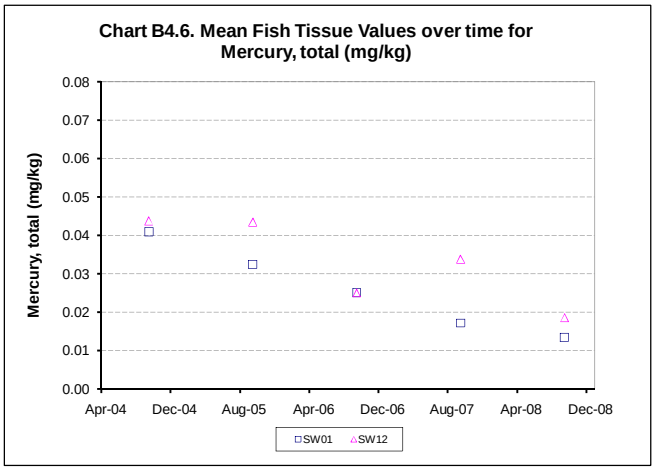
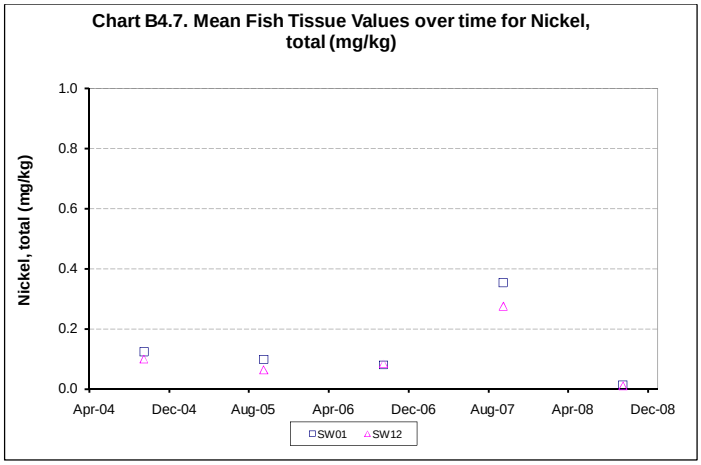
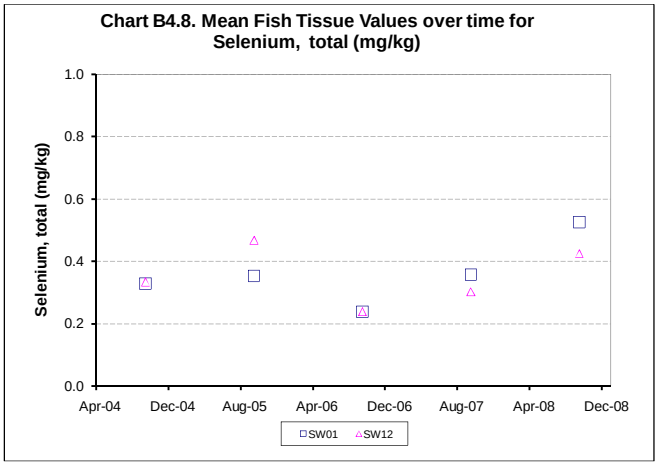
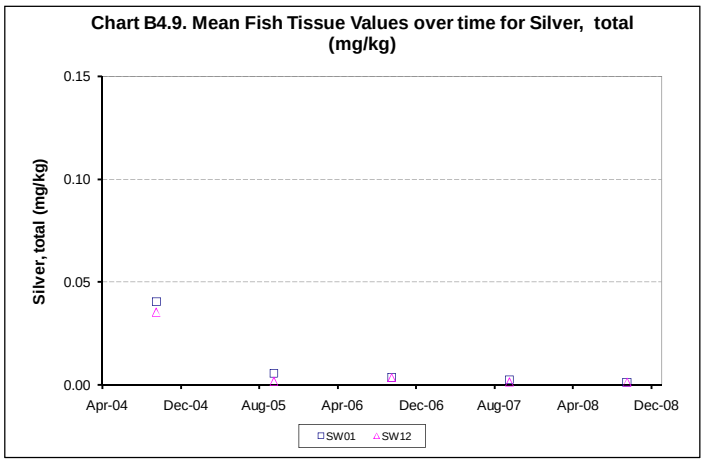


Table B4. Time Series for Fish Tissue Monitoring (continued)







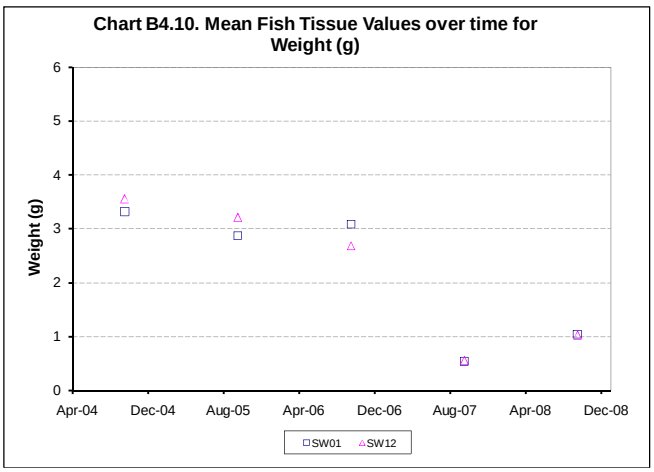
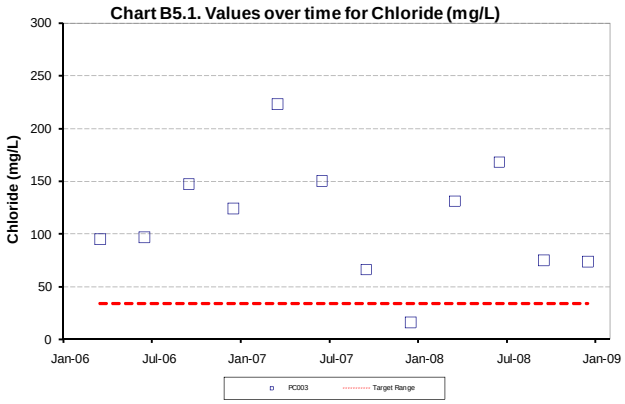
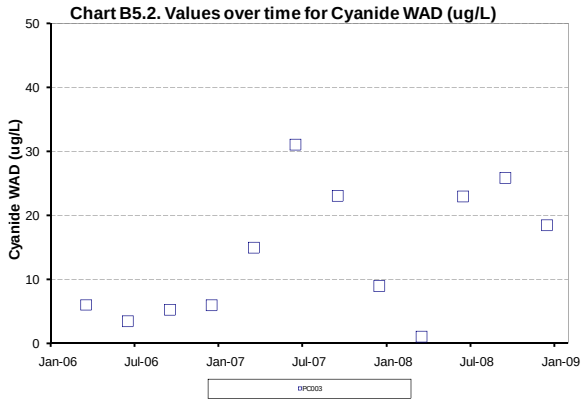
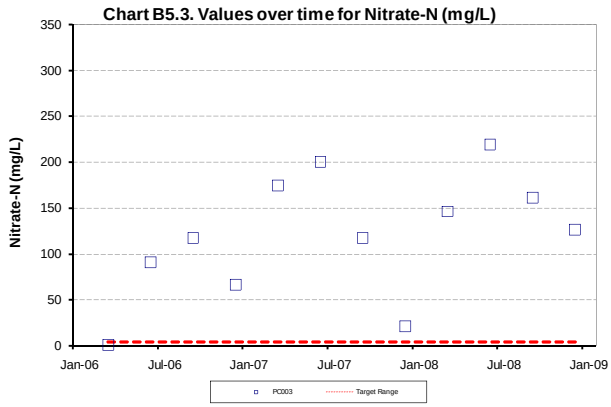
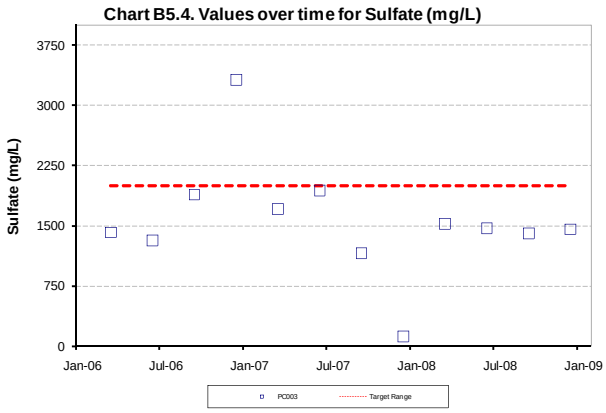


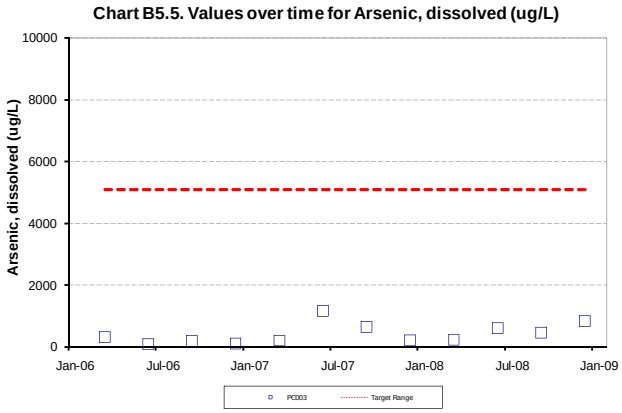
Table B5. Time Series for Flotation Interstitial Water











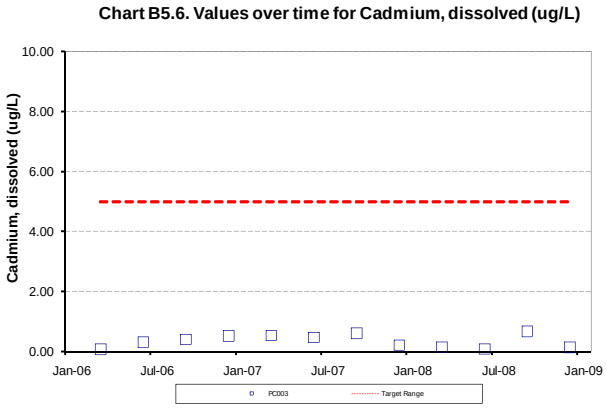


Table B5. Time Series for Flotation Interstitial Water (continued)

Chart B5.7. Values over time for Chromium, dissolved (ug/L)

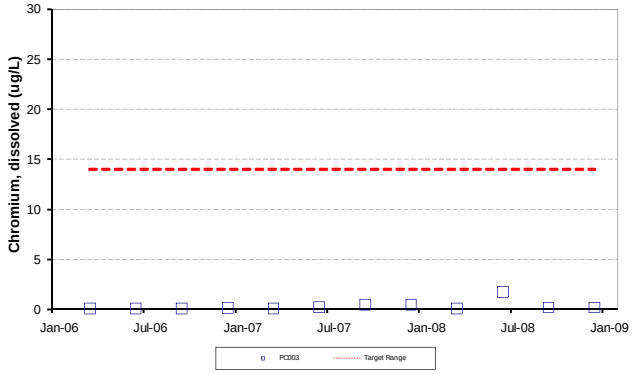


Chart B5.8. Values over time for Copper, dissolved (ug/L)

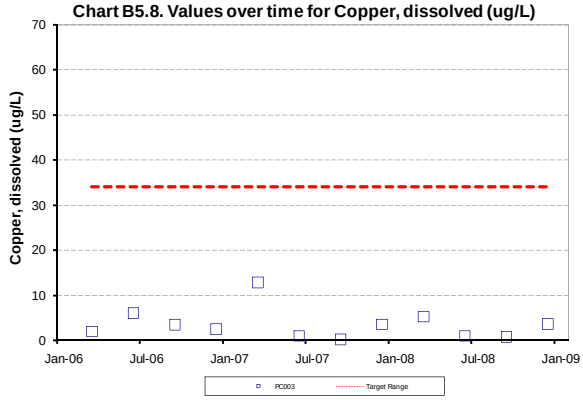


Chart B5.9. Values over time for Iron, dissolved (ug/L)

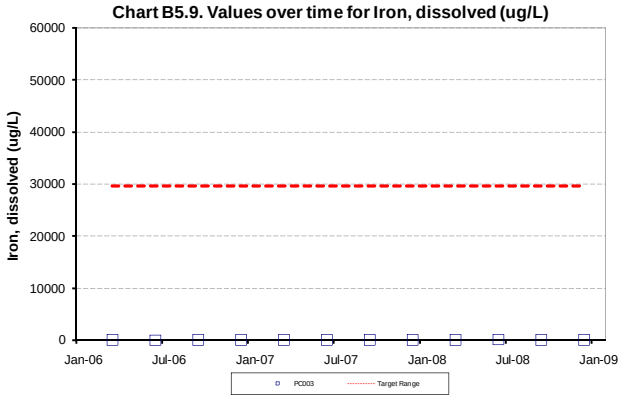


Chart B5.10. Values over time for Lead, dissolved (ug/L)

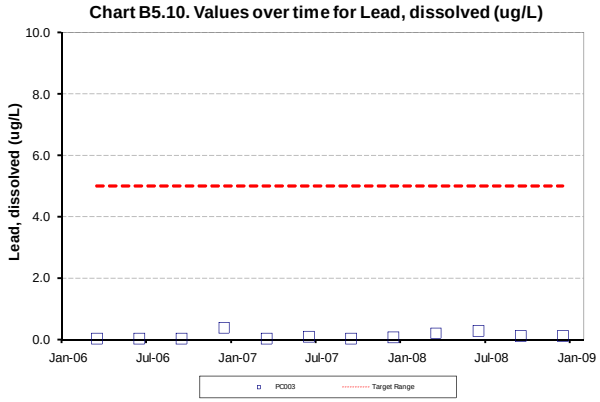


Chart B5.11. Values over time for Manganese, dissolved (ug/L)

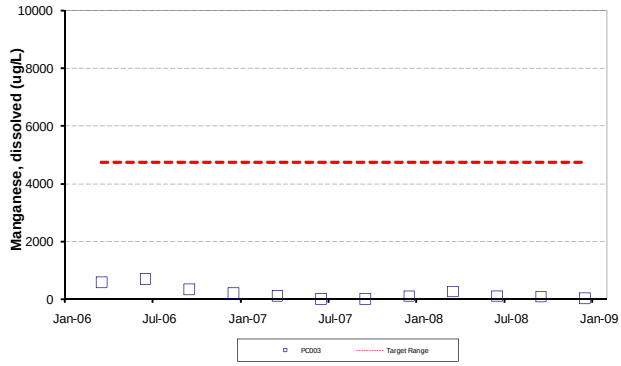


Chart B5.12. Values over time for Mercury, dissolved (ug/L)

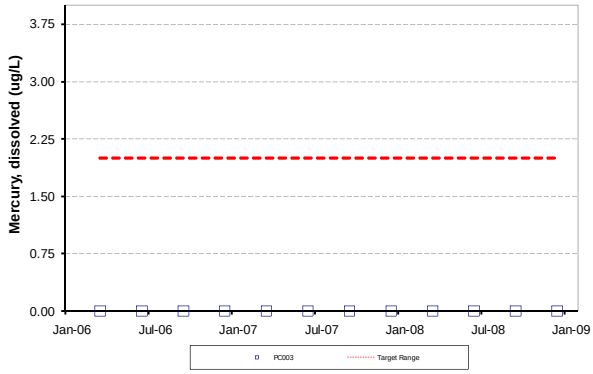


Table B5. Time Series for Flotation Interstitial Water (continued)

Chart B5.13. Values over time for Nickel, dissolved (ug/L)

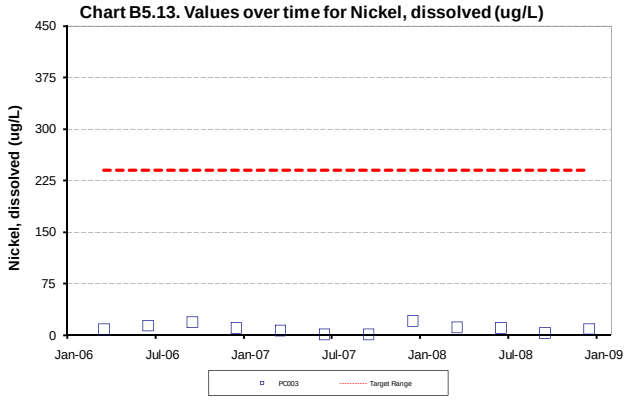


Chart B5.14. Values over time for Selenium, dissolved (ug/L)

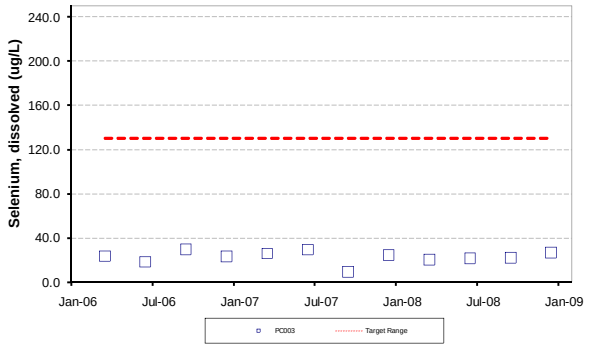


Chart B5.15. Values over time for Silver, dissolved (ug/L)

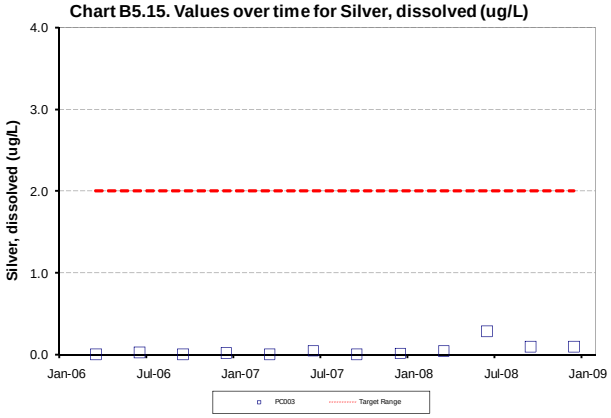


Chart B5.16. Values over time for Zinc, dissolved (ug/L)

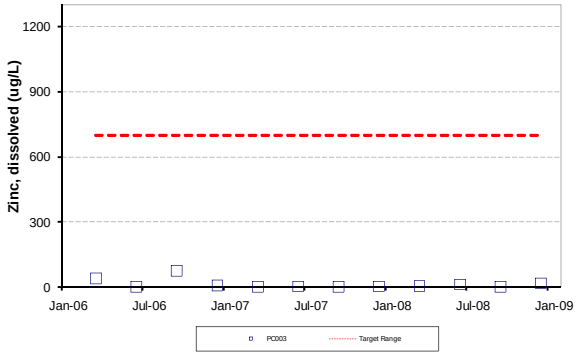


Chart B5.17. Values over time for Hardness (CaCO3) (mg/L)

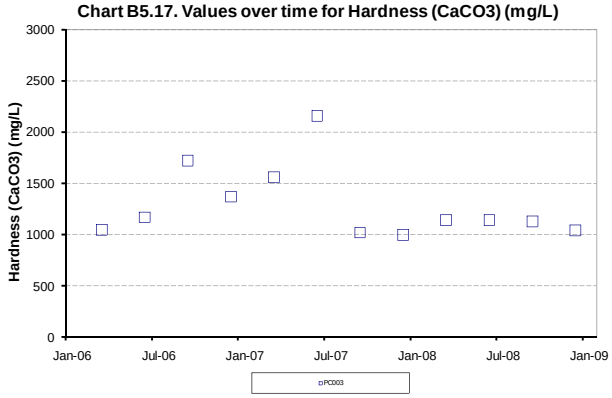


Chart B5.18. Values over time for pH, field (pH units)

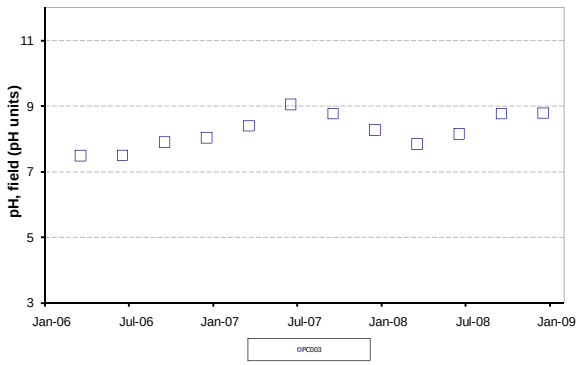
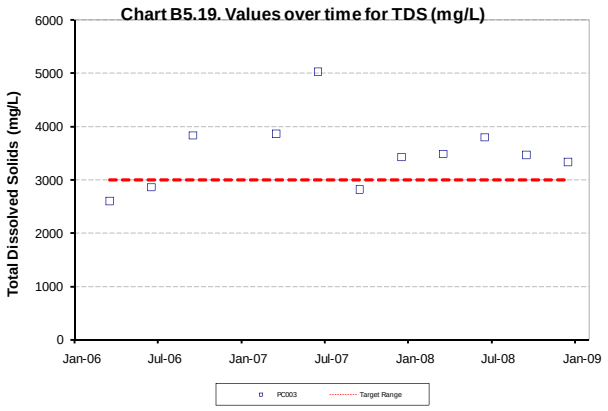


Table B5. Time Series for Flotation Interstitial Water (continued)



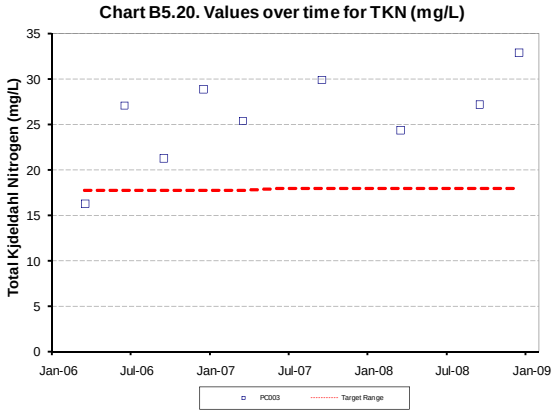
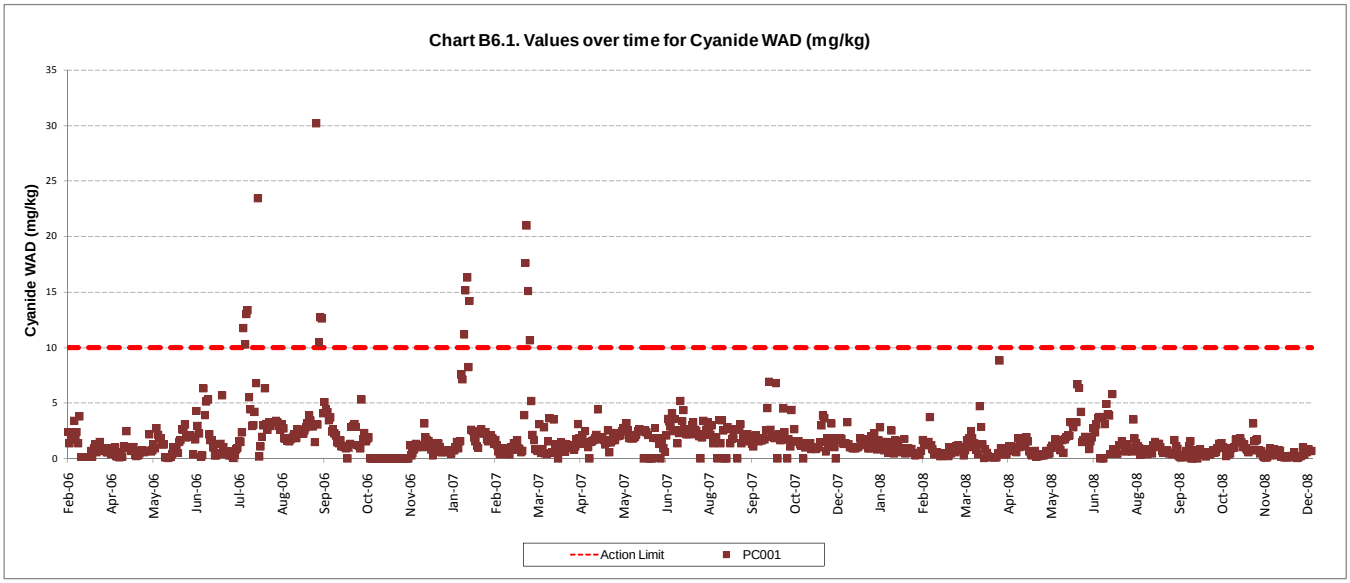


Table B6. Time Series for Backfill Tailings



Notes:
1. Sample results that exceed any action limit or Water Quality Standard (WQS) are noted on the chart by inclusion of their value.
2. The minimum hardness dependent WQS for cadmium, copper, lead, nickel, and zinc are shown by calculating the standard for the lowest hardness value in the data series. The value is only an exceedance if noted as described in number 1 above.
3. Sample results reported as less than the detection or reporting limits are presented as one-half that value.
4. To enhance the ability to discern potential trends, concentration plots showing metals measured as dissolved may contain metals measured as total. Please refer to the associated data table for these data, which have a qualifier of "T"

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March 1, 2009

Mike Gearheard
Region 10, Director, Office of Water
United States Environmental Protection Agency
1200 Sixth Avenue, OW-133
Seattle, Washington 98101

Mr. Tim Pilon
Technical Engineer
Alaska Department of Environmental Conservation
Division of Water
610 University Avenue
Fairbanks, Alaska 99709-3643

RE: ***Pogo Project 2008 Annual Activity and Monitoring Report***
Permit AK005334-1, NPDES
Permit 2004-DB0070, Non-Domestic Wastewater Disposal
Permit 0131-BA002, Waste Disposal

Dear Mr. Gearheard and Mr. Pilon:

Please find enclosed the 2008 Annual Activity and Monitoring Report for the for Pogo Mine Site, located 38 miles northeast of Delta Junction, Alaska. This report is required under U.S. Environmental Protection Agency (EPA) NPDES Permit AK-005334-1, Section I.E.6., Alaska Department of Environmental Conservation (ADEC) Non-Domestic Wastewater Disposal Permit 2004-DB0070, Part 1.5.1 and ADEC Waste Disposal Permit 0131-BA002, Part 1.6.1.

Please contact me with any questions.

Sincerely,

Mitchell L. Payes, RPIH
EH&S Superintendant

Enclosure: Pogo Project 2008 Annual Activity and Monitoring Report

cc: Eva Chun, EPA, Region 10
Jack DiMarchi, ADNR, Division of Mining, Land, and Water

Reviewed by: Stacy L Staley