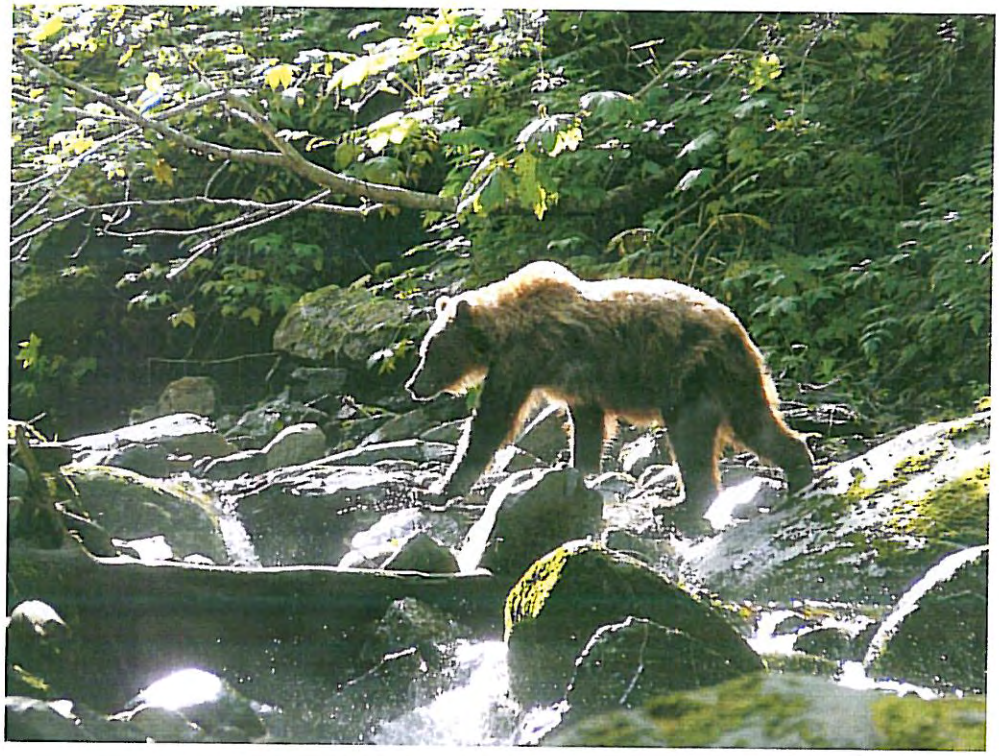
NPDES ANNUAL REPORT 2009

VOLUME 1:
AQUATIC RESOURCES

VOLUME 2:
WATER QUALITY



Coeur Alaska Inc.

Kensington Gold Project

NPDES ANNUAL REPORT

Volume 2: Water Quality

2009

Table of Contents

1.0 Introduction 6

2.0 Methods 6
2.1 Monitoring Currently Active 6
2.2 Monitoring Currently Halted 7
2.3 Monitoring Currently Planned 7
2.4 Changes during 2008 Monitoring 7

3.0 QC Summary 8
3.1 Plan QC 8
3.1.1 Precision- Field Blind Duplicate Comparison 9
3.1.2 Accuracy 9
3.1.3 Representativeness 10
3.1.4 Comparability 10
3.1.5 Completeness 10
3.2 Detection 11
3.3 Outlier(s) 11

4.0 General Major Chemistry 12

5.0 Summary Statistics 12

6.0 Watersheds 12
6.1 Receiving Waters- Johnson Creek 13
6.1.1 Major Chemistry 13
6.1.2 Trace Chemistry 15
6.2 Receiving Waters- Slate Creek 16
6.2.1 Major Chemistry 16
6.2.2 Trace Chemistry 18
6.3 Receiving Waters- Sherman Creek 20
6.3.1 Major Chemistry 20
6.3.2 Trace Chemistry 21
6.4 Receiving Waters- Ophir Creek 22
6.4.1 Major Chemistry 23
6.4.2 Trace Chemistry 24

7.0 Discharges 24
7.1 Outfall 001 24
7.1.1 Major Chemistry 24
7.1.2 Trace Chemistry 25
7.1.3 Whole Effluent Toxicity Testing 26
7.2 Outfall 002 27
7.3 Outfall 003 27

List of Tables

Table 1 Non-Detect Parameters at Sherman, Slate and Johnson Creek Stations

Table 2 Non-Detect Parameters at Ophir Creek and Outfall 001 Stations

Table 3 Potential Outliers in Receiving Water Monitoring Data

Table 4 Station JS2 2009 Water Quality Data Summary Statistics

Table 5 Station JS5 2009 Water Quality Data Summary Statistics

Table 6 Station JS4 2009 Water Quality Data Summary Statistics

Table 7 Station MLA 2009 Water Quality Data Summary Statistics

Table 8 Station SLB 2009 Water Quality Data Summary Statistics

Table 9 Station SLC 2009 Water Quality Data Summary Statistics

Table 10 Station SH109 2009 Water Quality Data Summary Statistics

Table 11 Station SH113 2009 Water Quality Data Summary Statistics

Table 12 Station SH105 2009 Water Quality Data Summary Statistics

Table 13 Station SH111 2009 Water Quality Data Summary Statistics

Table 14 Station SH103 2009 Water Quality Data Summary Statistics

Table 15 Outfall 001 Effluent 2009 Water Quality Data Summary Statistics

Table 16 Applicable Alaska Water Quality Standards

Table 17 Mine Water Treatment Plant Residue Trench Dimensions

List of Figures

Figure 1 Project Area Map

Figure 2 Outfall Locations

Figure 3 Water Treatment Facility Outfall Sites

Figure 4 Sherman Creek Monitoring Sites

Figure 5 Slate and Johnson Creek Monitoring Sites

Figure 6a Johnson Creek Monitoring Results 2009, Field Parameters

Figure 6b Johnson Creek Monitoring Results 2009, Major Chemistry

Figure 6c Johnson Creek Monitoring Results 2009, Trace Chemistry

Figure 7a Slate Creek Monitoring Results 2009, Field Parameters

Figure 7b Slate Creek Monitoring Results 2009, Major Chemistry

Figure 7c Slate Creek Monitoring Results 2009, Trace Chemistry

Figure 8a Sherman Creek Monitoring Results 2009, Field Parameters

Figure 8b Sherman Creek Monitoring Results 2009, Major Chemistry

Figure 8c Sherman Creek Monitoring Results 2009, Trace Chemistry

Figure 9a Ophir Creek Monitoring Results 2009, Field Parameters

Figure 9b Ophir Creek Monitoring Results 2009, Major Chemistry

Figure 9c Ophir Creek Monitoring Results 2009, Trace Chemistry

Figure 10a Outfall 001 Effluent Monitoring Results 2009, Field Parameters

Figure 10b Outfall 001 Effluent Monitoring Results 2009, Major Chemistry

Figure 10c Outfall 001 Effluent Monitoring Results 2009, Trace Chemistry

Figure 10d Outfall 001 Effluent Monitoring Results 2009, Other Parameters

Figure 11 Mine Water Treatment Plant Residue Trench Locations

List of Appendices

APPENDIX A – Duplicate Comparison

APPENDIX B – Variance Reports

APPENDIX C – Discharge Monitoring Report Results

1.0 Introduction

This volume of the Annual Water Quality Monitoring Summary report contains the results of water quality monitoring conducted in 2009 in accordance with the requirements of the National Pollutant Discharge Elimination System (NPDES) Permit for the Kensington Gold Project, near Juneau, Alaska (Permit No. AK-005057-1). A graphical presentation of water quality data collected at both discharge and receiving water monitoring stations, along with tabular summary statistics is included in this summary report. Construction of the Tailings Storage Facility at Lower Slate Lake began in late August 2009 after the Corps of Engineers permit was reissued in August 2009.

2.0 Methods

Monitoring of water quality at Outfall 001 (treated mine outflow discharge) occurred during 2009 as required by the NPDES permit. Outfalls 002 (Tailings Storage Facility) and 003 (Kensington Camp domestic waste water discharge) were not discharging during 2009, therefore no monitoring occurred at these sites. In addition to outfall sampling, monitoring was conducted at four receiving water streams (Johnson, Slate, Sherman and Ophir Creeks) for ambient upstream and downstream water quality. The following list describes the sampling activities at these outfall and receiving water stations:

2.1 Monitoring Currently Active

- Continuous monitoring of flow and pH at Outfall 001 effluent; daily samples from the influent and effluent of Outfall 001 for total suspended solids (TSS) analysis; weekly water sampling at Outfall 001 influent and effluent for analysis of field, general and trace parameters; quarterly sampling of the effluent for TDS, anions and cations; monthly sampling of the effluent for whole effluent toxicity testing.
- Monthly receiving water field, general and trace parameters from stations MLA, SLB, SLC on Slate Creek; stations SH113, SH105, SH109 on Sherman; stations JS2, JS4, JS5 on Johnson Creek.

- Stations SH111 and SH103 on Ophir Creek were sampled under a new schedule as of June 2009 according to the Residual Disposal Management Plan for the Mine Water Treatment Plant, which states that samples be collected from these sites only in the months of May, July, September and November. This plan was approved by the Alaska Department of Environmental Protection as part of the approval process for placing solids from the water treatment plant in the Comet Development Rock Stockpile.

2.2 Monitoring Currently Suspended

- Weekly monitoring of flow, pH, TSS, biochemical oxygen demand (BOD 5 day test) and fecal coliform at Outfall 003 (effluent from the Kensington domestic waste water treatment plant); quarterly monitoring of Outfall 003 influent for BOD and TSS.

2.3 Monitoring Currently Planned

- Following construction of Outfall 002, continuous monitoring of flow and pH in the effluent; daily samples from Outfall 002 effluent for total suspended solids (TSS) analysis; weekly water sampling at Outfall 002 effluent for analysis of field, general and trace parameters; quarterly sampling of the effluent for TDS, anions and cations; monthly sampling of the effluent for whole effluent toxicity testing.
- Upon completion of the tailings storage facility, flows within the tailings dam seepage collection system (TSF-SCS) will be contained and pumped back to the tailings facility. Quarterly monitoring at this location is proposed to characterize the quality of seepage flows – if any.

2.4 Changes during 2009 Monitoring

None of the problems experienced with the Outfall 001 effluent auto-sampling in 2008 were repeated in 2009. The water treatment plant was running well throughout 2009. The only change to monitoring in 2009 occurred via the new Residual Disposal Management Plan for the Mine Water Treatment Plant approved by the Alaska Department of Environmental Conservation

in June 2009 whereby stations on Ophir Creek are monitored in May, July, September and November.

Approval was received from the Alaska Department of Environmental Conservation for the disposal of mine waste water treatment plant residue in the Comet development rock stockpile in a letter dated May 19, 2009. Additionally, the Solid Waste permit SWZA015-13 was modified so that the residue can be managed as an exempt waste as per Title 18, Chapter 60 of the Alaska Administrative Code 18 AAC 60.005 (e). As shown on Figure 11, four trenches were excavated and utilized for the disposal of the residue during 2009. The dimension for each of the trenches is shown in Table 17.

3.0 QC Summary

3.1 Plan QC

Coeur Alaska has complied with the approved quality assurance plan for the 2009 water quality data. At least ten percent of all lab reports are reviewed for issues pertinent to the five categories of quality control;

- Precision
- Accuracy
- Comparability
- Representativeness
- Completeness

Based on the results of this review, lab reports, individual samples, or individual parameters within samples may be qualified on a variety of issues as;

- Accepted
- Estimated
- Rejected

No data were rejected from the 2009 dataset, but some parameters within individual samples were flagged as estimated within the database when one or more of the quality controls were not met. During 2008, Coeur implemented the practice of completing the QA/QC review of

all data gathered for the NPDES permit on a monthly basis in conjunction with preparation of the monthly Discharge Monitoring Report. This was repeated in 2009 and allowed for a timely resolution of many issues identified during the QA/QC review with the contract laboratory or field personnel.

Based on issues identified in the QA/QC review of the 2009 data set, the following are recommendations for the 2010 monitoring year:

1. Obtain a new DO meter since the equipment currently in use is not 100% reliable.
2. Continue to ship daily Outfall 001 TSS samples with the same frequency to ensure the hold time is met.

3.1.1 Precision- Field Blind Duplicate Comparison

Precision is a qualitative measure of the reproducibility of a measurement under a given set of conditions. Precision in the analytical results of laboratory analysis is determined by laboratory quality control measures such as duplicate matrix spikes and sample duplicates. The plan criterion for laboratory precision is a relative percent difference between duplicate samples of less than or equal to 20%. In addition, field blind duplicate sample pairs, which are collected throughout the year, are also used as a quality control for precision in the laboratory results.

Receiving water sample field duplicates are selected and collected on a random basis. The total number of receiving water field duplicates collected during 2009 was 26. The relative percent difference (RPD) was calculated for each duplicated parameter. Only 5.4% of all duplicated parameter results were greater than 20% RPD and therefore did not pass the precision criteria. This was a decrease from previous years with 7% failure of precision in 2008 and 11.7% in 2007. The parameters having the greatest RPD between field duplicate samples in 2009 were turbidity, total dissolved solids, zinc, aluminum and mercury. Turbidity showed more than 20% difference in almost half the blind duplicates. No field blind duplicates were collected from the influent or effluent sampling sites of Outfall 001 in 2009. Most of the parameters tested in blind duplicates at 001 Outfall in 2008 passed the 20% difference test. The results of comparisons between duplicate sets are tabulated in **Appendix A**.

3.1.2 Accuracy

Accuracy in the analytical results of laboratory analysis is determined by percent recovery of laboratory quality control measures such as matrix spikes, control samples and method blanks. The criterion for accuracy in most analytical procedures is a percent recovery between 85 and 115 percent. Less than 1 % of all sample results failed this criterion and were qualified appropriately in the database. Accuracy in field measurements is controlled and verified by using calibrated instruments. Field meters were always calibrated prior to their use during 2009 monitoring.

3.1.3 Representativeness

Representativeness is controlled by sampling plan design, sampling techniques and sample handling procedures.

3.1.4 Comparability

Comparability is maintained by using consistent sampling and analytical methods as well as consistent units of measurement. Colombia Analytical Services located in Kelso, Washington has conducted all NPDES water quality analyses since March 2008. This has helped maintain comparability within data sets. In addition, the sample and data management process is streamlined.

3.1.5 Completeness

As stated in the quality assurance plan for the Kensington Gold Project, the completeness criterion goal for monitoring data is 90% due to the extreme conditions observed on site. Overall data capture was greater than 99% during the 2009 monitoring year. Only a small number of field instrument malfunctions resulted in loss of field data, resulted in achieving slightly less than 100 % completeness. Only one water quality sample was missed during 2009.

3.2 Detection

The laboratory Practical Quantitation Limit (PQL) remained consistent for each analytical method during 2009 water quality monitoring. Dissolved arsenic, chromium, lead, selenium and silver were not detected in any samples collected from the receiving water stations on Slate, Sherman, Ophir and Johnson Creeks. Dissolved aluminum, iron and manganese were detected in virtually all samples collected from Slate Creek stations. Dissolved metals in Johnson Creek samples were either detected in a fraction of samples or none at all. Johnson Creek contained low levels of manganese in winter months with zinc detected in a few summer or fall samples. Copper detected on three occasions in Johnson samples. Dissolved aluminum was the only metal detected in all samples collected from Sherman Creek and Ophir Creek stations. Manganese was found in all samples downstream of the 001 effluent and most samples at SH113. Copper was found in a few samples from Sherman and Ophir. Iron was found in one sample from Sherman Creek, but not in Ophir. Comparing the number of undetected metals per site between the three receiving water streams, Johnson Creek samples had the highest, then Ophir, Sherman and Slate Creeks. As expected, sulfate, TDS and hardness parameters were detected in all samples collected from all stations on each of the three receiving water creeks. Ultra low detection limits, provided through the use of method 1631, were used to determine mercury concentrations in the receiving waters. Mercury was detected in one sample from Johnson Creek in 2009. At Sherman Creek, no mercury was detected at SH113, but it was detected in one sample from SH109 and two samples from SH105. All samples collected from Ophir Creek remained below the detection limit. In the case of Slate Creek, all but eight samples were above the low-level detection limit. A complete list of parameters that remained undetected at each monitoring station during 2009 is shown in Table 1 and Table 2.

3.3 Outlier(s)

A variance analysis was conducted on each monthly set of monitoring data. Variance analysis reports compare sample results to historical results for the same parameters at the same sampling stations. Those results that exceeded the threshold level of two standard deviations are listed in the table for the appropriate month in **Appendix B.** Other field measurements or

analytical results were identified by data time series plots as potential outliers. Table 3 contains potential outliers in receiving water monitoring data determined using a combination of trend and statistical analysis.

4.0 General Major Chemistry

Area waters generally:

- Have peak water temperature in August or September
- Are at or near oxygen saturation
- Have mildly basic pH
- Seasonal fluctuation of conductivity with peak in winter (excluding Slate Creek)
- Contain low levels of sulfate (<10ppm, excluding Sherman Creek)
- Are generally soft (in most cases <100ppm hardness, excluding SH103)
- Have low concentrations of dissolved metals

5.0 Summary Statistics

Summary statistics were calculated for all parameters at each discharge and receiving water station. The calculations include the minimum, maximum, arithmetic mean and standard deviations for each monitoring station contained in the 2009 data set. The results are presented in Tables 4 through 15. Also included in the summary tables are the total number of samples collected, total number of non-detect results and the percentage of non-detects.

6.0 Watersheds

Upstream/downstream receiving water monitoring stations are present on Johnson, Slate, Ophir and Sherman Creeks. A comparison of the chemistry between these station pairs is discussed below. Tables 1 and 2 contain the monitoring parameters that remained undetected for the entire year at each station. These parameters will not be addressed in this section of the report. The absence of the majority of dissolved metals is typical of results obtained in all project area watersheds. In general, monitoring results indicate the water quality in the area of the project is very good with very little impact from project activities.

6.1 Receiving Waters- Johnson Creek

Monitoring Sites

- JS2- Johnson Creek upstream of disturbance
- JS5- Johnson Creek downstream of process area
- JS4- Johnson Creek downstream

6.1.1 Major Chemistry

Water quality monitoring on Johnson Creek was intended to identify potential impacts from Mill facility construction. Data collected during 2009 was similar in water quality trends to the data collected in 2007 and 2008. Water quality from upstream to downstream on Johnson Creek shows consistent seasonal trends of temperature, TDS, nitrate, pH, and sulfate. Upstream temperature appears to be higher than downstream during the winter months and lower during the summer months.

Some elevation of DO, pH, conductivity, turbidity, TDS, sulfate, hardness, and color is seen from upstream to downstream, particularly in winter months (Figures 6a, 6b). Dissolved oxygen was very similar at all sites in summer months, but slightly higher at downstream sites in fall. Measurements of pH appeared slightly higher at downstream sites during most months of the year with the exception of January when pH declined downstream. The highest pH was measured

in April at JS-5. This site lies in between JS-2 and JS-4 and had a higher pH in March, April and September. Conductivity measurements were much higher downstream than upstream in winter months. Values ranged from 80 to 120umhos/cm from January through April and October through December at JS4 and JS5, but were less than 50umhos/cm throughout the year at JS2. From May to September, downstream sites ranged from 30 to 55umhos/cm, while JS2 was less than 35umhos/cm.

Turbidity was less than 3ntus at all sites throughout the year with the exception of JS5, which was 3.5ntus in April. Slightly higher turbidity than background was observed at JS4 and JS5 from August to December. Total dissolved solids were typically low at JS2 (less than 35mg/L year-round with none detected in June or July), but downstream sites ranged from 50 to 70mg/L from January through April and 40 to 80mg/L from September through December. TDS values were less than 40 at all sites from May to August. Sulfate was consistently low (0.8 to 2.4mg/L) at JS2, whereas the two downstream sites were low in summer (less than 4mg/L from May through August) and increased in sulfate through winter months (exceeding 10mg/L in April). Hardness was slightly higher in winter than summer at JS2, with a low of 8.4mg/L in August and high of 18.5mg/L in April. The downstream sites were markedly higher in winter, with JS5 ranging from 33 to 50mg/L from January to April and 32 to 40 from October through December. JS4 was slightly higher at 40 to 55 during winter months. All sites were less than 25mg/l from May through September. Color was only detected at JS2 during January, October and November and at JS4 in January, February, April, and August through December. Color was measurable at JS5 throughout the year except in March and July. Color was highest at JS4 in April and September.

Ammonia was not detected at any sites on Johnson Creek throughout 2009. Nitrate results were very similar at all sites throughout the year except for March when JS2 was twice as high as the downstream sites. There was an increase in ammonia at all sites from January through May then steep to decline to undetectable levels in August followed by a gradual increase in fall. Chloride was only detected at JS2 from March through May and at JS4 and JS5 in April and May as well as JS4 in December. TSS was only detected at all sites in August after heavy rain and also at JS5 in September.

6.1.2 Trace Chemistry

The majority of dissolved metals tested at Johnson Creek were not detected at any sites at any time of the year. These included arsenic, cadmium, chromium, iron, lead, nickel, selenium and silver. Downstream (JS5) dissolved aluminum and manganese appeared to remain at or above upstream (JS2) levels throughout 2009, although all values were within the most stringent water quality standards (Figure 6c). Downstream aluminum was at JS4 in April and May (around 20ug/L) and again in September with 31.8ug/L. JS2 remained below 5ug/L throughout the year. The lowest level at JS-4 was 4.8ug/L in July. Manganese was also elevated at JS4 in February (5ug/L), April (6ug/L), August (8ug/L) and December (6ug/L) with levels only detected at JS2 in February, March, April and December (1-2ug/L). Levels of manganese at JS5 were in between those at JS2 and JS4 throughout the year except for March when JS2 just exceeded JS5.

Copper was only detected at JS5 in April and September and at JS4 in September and did not exceed the hardness-based WQS. Only two samples analyzed for dissolved mercury had a detectable result and these were at JS4 in April and September. Dissolved zinc was only detected in Johnson Creek during July (JS4), August (JS4 and JS5) and October (all sites). The highest level was observed at JS4 in October at 7.3ug/L, which was still well below the most stringent water quality standard.

Comparison with 2006 to 2008 data shows that Johnson Creek appeared to have a more stable pH during 2009 than 2008. The ph in 2009 was slightly higher than 2008 ranging from pH 6.88 to 8.0. Turbidity was slightly higher in 2009 than previous years with a peak of 3.5ntus in April (similar to April 2007) and slightly elevated levels in fall (<3ntus). TSS was only detected in August and September 2009 compared to once in 2008, but 2006 and 2007 showed more frequent and higher detection levels. Mercury was only detected twice in 2009 and once in 2008 compared to much more frequently in 2006 and 2007. Manganese levels remained low in 2009 after being detected at higher levels in 2006, while Nickel has not been detected in Johnson Creek since September of 2007. Nitrate levels showed a similar pattern to previous years with the peak in May slightly higher in 2009 than 2007 or 2008, but lower than 2006. Sulfate levels also showed a similar pattern to previous years, being lowest in June and July and increasing from August with a slightly higher peak in April 2009 than previously (<12mg/L). Ammonia was not detected in

2009, but was previously detected at the end of 2006 and 2007 and in January of 2008.

6.2 Receiving Waters- Slate Creek

Monitoring Sites

- MLA- Middle Lake Slate Creek upstream of disturbance
- SLB – East Fork Slate Creek upstream of confluence with West Fork Slate Creek
- SLC- Slate Creek downstream of confluence with West Fork Slate Creek

6.2.1 Major Chemistry

Water quality monitoring on Slate Creek in 2009 was intended to identify potential impacts from the Tailings Storage Facility (TSF) construction. Figures 7a through 7b are graphical presentations of analytical results gathered throughout the year.

As with the other receiving waters, Slate Creek's monitoring data exhibited trends in accordance with expected seasonal changes, increasing in summer and decreasing in winter. Compared to the other streams, Slate Creek was the warmest- most likely due to the presence of lakes in the system that warm up in summer due to their large surface area. Water temperature reached a maximum of 18.2° C at MLA in July. MLA is the site furthest upstream, then SLB and finally SLC is furthest downstream. Some increase of pH, DO and chloride was evident from upstream to downstream (Figures 7a, 7b). An exception to this trend is pH, which was slightly higher at SLB than SLC in January (7.6), March (7.97), August (8.23), November (7.8) and December (7.96). MLA had the highest pH in June at 7.9. The lowest pH was recorded at MLA at 7.1 in March and April.

Dissolved oxygen measured at Slate Creek stations showed a seasonal trend similar to those of the other receiving water streams. MLA typically had lower DO measurements than the downstream sites while SLB and SLC trended closely together. An exception was the month of

June, when SLB and SLC were both lower than MLA. The lowest DO was observed at MLA in July at 8.5mg/L. Dissolved oxygen increases as temperature decreases and is likely lower in the lake (near MLA) than downstream where several cascades help mix oxygen into the water. Conductivity was highest at MLA in June, July and December, while SLB had the highest conductivity in January, May, August and September and SLC was highest in February, March, October and November. Conductivity was low at all sites in May, ranging from 60 to 73umhos/cm and was high at SLC in March (132umhos/cm) and high at all sites in July (125-148umhos/cm). SLC was also high at 136umhos/cm in October.

Sulfate at MLA remained relatively stable during the entire year at around 2.5mg/L with a small spike in May of 6.4mg/L. Sulfate ranged from 5 to 10mg/L at SLB and SLC throughout most of the year with a spike to 16.5mg/L at SLB in September. Sulfate at SLC followed a similar pattern to SLB, but values were lower likely due to dilution by the West Fork of Slate Creek. Turbidity was low (less than 1ntu) at all sites from February through August, then increased at all sites during fall. SLB and SLC were slightly higher than MLA in September, October and December. Ammonia was only detected at one site, SLC at low level in July 2009. Nitrate was detected at low levels at each site from April to June. Nitrate results for Slake Creek were by far the lowest of all the streams.

Chloride results in Slate Creek samples were slightly higher than results from Johnson Creek for most of the year, but still well within water quality standards. Chloride was normally highest at SLC (2mg/L) with both MLA and SLB typically being 1mg/L indicating a possible difference in chloride levels between East and West Fork Slate Creek.

Hardness followed a similar pattern throughout the year at all three stations. Hardness was low at all sites in May (<35mg/L), high in March (45-55mg/L) and July (>55mg/L). TDS was typically lower at SLC than upstream sites, with all sites fluctuating with a similar pattern. All three sites declined from March to May, increased to July then declined again. High TDS was observed at SLB in March (85mg/L) and MLA in July (84 mg/L) and low TDS was observed at MLA in January (26mg/L) and at SLC in May (29mg/l).

TSS was below detection limits at all three stations for all of 2009. Color appeared to decrease from upstream to downstream, and was lowest at all sites during lower flows in the

summer (10 to 15 CU). Some color is attributable to tannins in the water associated with vegetation die-off in the lakes. The West Fork has no lakes so would be expected to have less color and have a dilution effect on SLC. The highest level was reached in November at SLB when color reached 125 CU. Color at MLA in November was 90 CU.

6.2.2 Trace Chemistry

All three sampling stations on Slate Creek showed high flow seasonal spikes in spring and fall for aluminum, cadmium, copper, iron, nickel, mercury and manganese (Figure 7c). Aluminum tended to be relatively low at all three sites in June, July and August (<50ug/L). No sites exceeded the water quality standard (WQS) of 87ug/L at any time during 2009, although MLA reached 82ug/l in January and SLB reached 85ug/L in September. In general, aluminum had a decreasing trend between SLB and SLC, with SLC having the lowest in concentration of all three stations in February, April, May and September through December.

Cadmium was not detected at MLA at any time during 2009. The WQS for cadmium for SLB and SLC varied with hardness from 0.10ug/L to 0.18ug/L. Cadmium levels at SLB exceeded this standard at times during the year, peaking at 0.6ug/L in April, 0.5ug/L in May and 0.3ug/L in October. These values were lower than 2008 levels. SLC also exceeded the WQS in January (0.3ug/L) and March, May and October (all 0.2ug/L). Cadmium was lowest at SLB and SLC in June, July, August and December. Copper was not detected at MLA, but was detected in ten months at SLB and seven months at SLC. Copper at SLB exceeded the WQS of 5ug/L in September by reaching 14.2ug/L. SLC reached 3.8ug/L in September, which did not exceed the WQS. Iron levels were similar at SLB and MLA, which were both slightly higher than SLC. The highest level of iron recorded was 0.252mg/L at MLA. All samples were well below the WQS of 1mg/L.

The WQS used for manganese is 50ug/L, which was exceeded at MLA in November (70.4ug/L) and at SLB in January (67.5ug/L), May (77.9ug/L) and October (51ug/L). There was a general pattern of higher manganese at MLA then declining levels at the sites downstream at low flow times of year, i.e., February through April and June through September. The high level of manganese at MLA in November also occurred the previous year suggesting a seasonal trend.

Nickel did not exceed the hardness-based water quality standards at any sites in 2009. Nickel tended to be highest at SLB and was not detected at MLA. Nickel remained less than 5ug/L at SLB and less than 3ug/L at SLC. Zinc was only detected at MLA at a low level in July, but SLB just exceeded the WQS of 57.5ug/L in January when it reached 58.3ug/L and again in May when the WQS was 44.9ug/L and zinc reached 45.9ug/L. Zinc levels at SLC were typically half those at SLB with the exception of March when levels at SLC were twice those of SLB.

Mercury was detected at very low levels in the majority of samples collected from all Slate Creek monitoring stations. No mercury was detected at MLA in February or June or at SLB in July through September or at SLC in March. Slightly elevated levels of dissolved mercury were found at SLC in fall 2009 up to 0.005ug/L. SLB was 0.0033ug/L in October and MLA was 0.0034 in November. Levels remained below 0.0025ug/L at all sites during the rest of the year.

A comparison of Slate Creek data with previous years shows that pH was slightly higher at all sites in summer of 2009, but still within acceptable levels. Sulfate was highest at SLC in 2006, but increased at SLB in September every year from 2006 through 2009. Nitrate had declined to non-detect levels in 2008, but appeared again at all sites from March to June 2009.

Cadmium was not consistently detected at SLB until August 2007, reaching a peak in April 2008. Although the water quality standard for cadmium was exceeded in 2009, cadmium levels appear to be declining again. Aluminum was also present at lower levels in 2009 than 2007 and 2008. Copper was mostly present at lower levels in 2009 than 2008, but was detected at 14ug/L in September 2009, exceeding the WQS. Mercury had a peak of almost 0.01ug/L at SLB in 2008, but only reached 0.003ug/L at SLB in 2009. Zinc also appeared to decline from a peak in April 2008 to reach much lower levels in fall 2009. Nickel was present at SLB and SLC at low level during 2006, increased in August 2007 and peaked in April 2008, but remained less than 5ug/L in 2009. Manganese first showed elevated levels at SLB in September 2006, then peaked again in November 2007, April 2008, November 2008, January 2009 and May 2009, however, peak levels in 2009 were lower than previous years. The background site MLA exceeded the WQS for manganese in September and December 2006, March, April, August, November and December 2007, November 2008 and November 2009. Iron was higher at MLA than downstream sites during the first part of 2006 and January through April of 2007. SLB exceeded MLA during 2008,

but by October 2009, iron levels at SLB were once again lower than MLA.

6.3 Receiving Waters- Sherman Creek

Monitoring Sites

- SH109- Upper Sherman Creek upstream of disturbance
- SH113- Sherman Creek downstream of Outfall 001
- SH105- Sherman Creek downstream at mouth of creek

6.3.1 Major Chemistry

Water monitoring on Sherman Creek was intended to help identify any potential impacts from mine construction and water treatment activities (Figures 8a, 8b). Temperature was typically highest at SH113 just downstream from the 001 effluent and coolest at SH109 upstream of the effluent during 2009. The difference between these two sites was greatest in April (1.3 ° C), June and December (both months 1.4oC warmer at SH113). There was no difference in temperature between these sites in July and August. SH105 was 1.1 ° C warmer than SH113 in May. Dissolved oxygen did not show a clear trend between sites throughout the year. Measurements of DO tended to decline in summer as water temperature increased. Measurements of pH were higher at SH105 than sites downstream from February through May. The highest pH was 8.1 at SH105 in February. Sh109 and SH113 both had relatively low pH values (just over 7) in April. Monitoring station SH105 appears to have the greatest distribution in pH values of all the Sherman Creek sites.

Conductivity was highest at site SH113 (middle site) and lowest at SH109 (upper site) throughout the year, except for August when SH113 had a low conductivity of 45umhos/cm. The highest conductivity was 280umhos/cm measured in March at SH113. All three sites showed lowest conductivity from May to July and highest levels January to April. Turbidity was less than 0.5 NTUs throughout the year at all sites with the exception of January when it reached 1.6ntus at SH113 and in December when it reached only 1ntu at SH105. Total dissolved solids were higher during winter months, particularly at SH113 and SH109. TDS was highest at SH113 and lowest at SH109 except in June when SH105 exceeded both. The highest TDS observed was 168mg/L at SH113 in March and the lowest was 28mg/L at SH109 in August.

Ammonia was detected in one sample at SH113 in August and was only present at the detection level. Ammonia was also detected at SH105 in May at 0.2mg/L. It remained undetected in samples collected at SH109 during 2009. Nitrate levels were highest April through June at all three sites. Nitrate was highest at SH109 and lowest at SH113 in the winter months, then in July and August, nitrate was not detected at SH105 and only low levels were found at the other two sites in July. Sulfate, chloride and hardness tended to be highest at SH113 and lowest at SH105 increase upstream throughout the year. Sulfate tended to be higher in winter and lower in summer though this pattern was less evident at SH109. The highest sulfate was found at SH113 in March (57.5mg/L). The lowest sulfate level recorded at SH113 was 10mg/L in May. Sulfate was less than 40mg/L at SH105 throughout the year and less than 12mg/L at SH109. Chloride was 4-6mg/L at SH113ng in most fall and winter months and dropped to 2mg/L in summer. Chloride followed a similar pattern at the other sites at lower levels, remaining undetected at SH109 in January, February and June through September. Hardness was typically highest at SH113 with the highest values recorded January through April. SH105 downstream was very similar to the background site SH109 from May through October. Hardness declined steeply between April and May likely as flow increased with snowmelt.

Total suspended solids were only detected in one out of 36 samples collected from Sherman Creek in 2009. TSS was 220mg/L at SH105 in March. SH113 and SH109 did not have a detected level at any time through the year. Color generally increased from upstream to downstream when it was detected. Color peaked at 25CUs at SH105 in April and again at 15CUs in October at the same site. All other samples were 10CUs or less with low levels in summer.

Higher results obtained at Station SH113 for temperature, conductivity, sulfate, chloride, TDS and hardness, are likely attributable to discharge from Outfall 001.

6.3.2 Trace Chemistry

Trace metals not detected in Sherman Creek during 2009 were arsenic, cadmium, chromium, lead, selenium and silver. Aluminum was higher at SH105 near the stream mouth than both SH109 and SH113 during February through May and September through December. This suggests there is some source of aluminum downstream of the 001 effluent. Aluminum was low at

all sites in summer. Copper was only detected in two samples at SH105 (May and October), one sample at SH113 (May) and three samples at SH105 (April, September and October) and all samples were just above detection levels. Manganese was highest at SH113 and lowest at SH109 with the greatest difference occurring in February through April and August through December, Manganese levels at SH113 never exceeded 26ug/L and were less than 2ug/L at SH109 and less than 6ug/L at SH105. Low-level mercury was only detected on three occasions. Mercury was detected at SH109 in January at a concentration of 0.00269ug/L and was also found at SH105, once in January and once in April both concentrations were below 0.0015ug/L. No mercury was detected at SH113 in 2009. Nickel was only found at the detection level in December at SH113. No other sample results had detectable levels of nickel. Zinc was only detected at SH109 at just above the detection level in August. Zinc was also found at SH113 and SH105 in August and October at similar levels (3.5 and 5ug/L respectively). Iron was only detected once in Sherman Creek at SH113 in January at a concentration of 0.236mg/L.

A comparison with previous data shows that Sherman Creek appeared to have slightly lower pH in the latter half of 2008 than previous years, but returned to normal levels in 2009. pH at the background site SH109 was lower than usual in April and December 2009. Turbidity was lower after January 2009 at SH113 than 2007 or 2008. Ammonia was present at a low level in late 2006 and early 2007, spring of 2007 and December 2007, then it remained undetected until June and August 2009.

Chloride appeared to have an increasing trend from July 2007 to March 2008, but was present at much lower levels (less than 4mg/L) from May 2008 and remained below 6mg/L during 2009. Nickel seems to have declined since a peak in July 2007 (not detected between June 2008 and November 2009). Manganese was low until July 2007, increasing at SH113 at high flow in fall of 2007 and spring and fall of 2008. Levels were lower in 2009, showing lower peaks in spring and fall. Iron was detected at SH105 in previous years (twice in 2006 and twice in 2007), was not detected in 2008 and appeared once in January 2009 at SH113 at low level. Sulfate, TDS and conductivity follow hardness patterns, peaking at SH113 in February 2008 and March 2009, and present at lower levels in summer. Nitrate first peaked in February and May 2007 and again in October and November 2007 and February 2008 then it remained fairly low until April to June of

2009 when levels were similar to November 2007.

6.4 Receiving Waters- Ophir Creek

Monitoring Sites

- SH111- Ophir Creek upstream of Comet Development Rock Stockp
- SH103- Ophir Creek downstream of Comet Development Rock Sto

6.4.1 Major Chemistry

Water monitoring on Ophir Creek was intended to help identify any potential in mine construction and development activities associated with the Comet Develop Stockpile. Figures 9a through 9c are graphical presentations of analytical resul throughout 2009. Monitoring station SH111 is typically unavailable for sampling in months due to frozen conditions and may have insufficient water for sampling in su data reflects the intermittent surface stream flow that occurred between spring and fall c

As with the other receiving waters, Ophir Creek's monitoring data exhibited r in accordance with expected seasonal changes. However, unlike the other receiv dissolved oxygen at SH111 and SH103 was not necessarily lowest during the summer is relatively low year-round. One explanation for this anomaly may be that since Oph very little flow, if any, during the winter months. As a result, minimal aeration occurs period and oxygen in the air is less readily diffused into the water at these monitoring st

Measured conductivity at SH103 was highest of all 11 monitoring sites on receiving waters. The summer and fall months when stream flow increases, conductivi went from 122umhos/cm in May to 50umhos/cm in July and then back up to 125 um September. The background site SH111 showed similar, yet less dramatic trends 40umhos/cm in July up to 73 umhos/cm in November.

Total dissolved solids (and its constituents) at SH111 exhibited consistent co during the months when monitoring was possible (May, July, September, Novembe

all sites in summer. Copper was only detected in two samples at SH105 (May and October), one sample at SH113 (May) and three samples at SH105 (April, September and October) and all samples were just above detection levels. Manganese was highest at SH113 and lowest at SH109 with the greatest difference occurring in February through April and August through December, Manganese levels at SH113 never exceeded 26ug/L and were less than 2ug/L at SH109 and less than 6ug/L at SH105. Low-level mercury was only detected on three occasions. Mercury was detected at SH109 in January at a concentration of 0.00269ug/L and was also found at SH105, once in January and once in April both concentrations were below 0.0015ug/L. No mercury was detected at SH113 in 2009. Nickel was only found at the detection level in December at SH113. No other sample results had detectable levels of nickel. Zinc was only detected at SH109 at just above the detection level in August. Zinc was also found at SH113 and SH105 in August and October at similar levels (3.5 and 5ug/L respectively). Iron was only detected once in Sherman Creek at SH113 in January at a concentration of 0.236mg/L.

A comparison with previous data shows that Sherman Creek appeared to have slightly lower pH in the latter half of 2008 than previous years, but returned to normal levels in 2009. pH at the background site SH109 was lower than usual in April and December 2009. Turbidity was lower after January 2009 at SH113 than 2007 or 2008. Ammonia was present at a low level in late 2006 and early 2007, spring of 2007 and December 2007, then it remained undetected until June and August 2009.

Chloride appeared to have an increasing trend from July 2007 to March 2008, but was present at much lower levels (less than 4mg/L) from May 2008 and remained below 6mg/L during 2009. Nickel seems to have declined since a peak in July 2007 (not detected between June 2008 and November 2009). Manganese was low until July 2007, increasing at SH113 at high flow in fall of 2007 and spring and fall of 2008. Levels were lower in 2009, showing lower peaks in spring and fall. Iron was detected at SH105 in previous years (twice in 2006 and twice in 2007), was not detected in 2008 and appeared once in January 2009 at SH113 at low level. Sulfate, TDS and conductivity follow hardness patterns, peaking at SH113 in February 2008 and March 2009, and present at lower levels in summer. Nitrate first peaked in February and May 2007 and again in October and November 2007 and February 2008 then it remained fairly low until April to June of

2009 when levels were similar to November 2007.

6.4 Receiving Waters- Ophir Creek

Monitoring Sites

- SH111- Ophir Creek upstream of Comet Development Rock Stockpile
- SH103- Ophir Creek downstream of Comet Development Rock Stockpile

6.4.1 Major Chemistry

Water monitoring on Ophir Creek was intended to help identify any potential impacts from mine construction and development activities associated with the Comet Development Rock Stockpile. Figures 9a through 9c are graphical presentations of analytical results gathered throughout 2009. Monitoring station SH111 is typically unavailable for sampling in the winter months due to frozen conditions and may have insufficient water for sampling in summer. The data reflects the intermittent surface stream flow that occurred between spring and fall of 2009.

As with the other receiving waters, Ophir Creek's monitoring data exhibited many trends in accordance with expected seasonal changes. However, unlike the other receiving waters, dissolved oxygen at SH111 and SH103 was not necessarily lowest during the summer months, but is relatively low year-round. One explanation for this anomaly may be that since Ophir Creek has very little flow, if any, during the winter months. As a result, minimal aeration occurs during this period and oxygen in the air is less readily diffused into the water at these monitoring stations.

Measured conductivity at SH103 was highest of all 11 monitoring sites on the project receiving waters. The summer and fall months when stream flow increases, conductivity at SH103 went from 122umhos/cm in May to 50umhos/cm in July and then back up to 125 umhos/com in September. The background site SH111 showed similar, yet less dramatic trends going from 40umhos/cm in July up to 73 umhos/cm in November.

Total dissolved solids (and its constituents) at SH111 exhibited consistent concentrations during the months when monitoring was possible (May, July, September, November). These

results are consistent with conductivity and turbidity trends reflecting rapid snowmelt in spring. Samples collected at SH111 had a slightly higher pH than the samples collected downstream at SH103, while all samples collected on Ophir Creek remained between 7.20 and 7.77 pH units. Ammonia and total suspended solids were not detected in any Ophir Creek samples in 2009. Color was only detected at SH103 September and November at low level and not detected at all at SH111.

6.4.2 Trace Chemistry

Non-detected elements for both SH111 and SH103 included arsenic, cadmium, chromium, iron, lead, mercury, nickel, selenium, silver and zinc. In addition, chloride, copper, manganese, nickel or zinc were never detected at SH111. Low levels of dissolved aluminum were measured in all samples collected at both Ophir Creek sites during 2009 with little difference between the sites. SH111 and SH103 had by far the lowest concentrations of dissolved aluminum of all the receiving waters with very little variation throughout the year, as was the case in 2008. Low levels of copper and manganese were found in SH103, but all results were well below state water quality standards.

7.0 Discharges

7.1 Outfall 001

The Comet water treatment plant (WTP) discharge (Outfall 001) was sampled weekly, resulting in at least four times the data compared to most receiving water stations. This larger group of sample results is a greater opportunity to identify trends (Figures 10a – 10d). Discharge Monitoring Reports containing results of required monitoring (Permit No. AK-005057-1) were submitted each month during 2009. The results can also be found in this annual report in **Appendix C**.

7.1.1 Major Chemistry

Dissolved oxygen (DO) in the effluent tended to be higher in winter and lower during

the summer season, but was always well within a healthy concentration for freshwater life. DO is negatively correlated with temperature and measured values of effluent range from 12.77 to 15.21 mg/l in January and February when water temperature averages 2.5 ° C, declining to typically less than 12mg/l in mid-summer when water temperature reached 10 ° C. Effluent DO increased again in October and November to above 11mg/l as water temperatures declined below 7 ° C. A couple of sampling events in summer were also high (over 14mg/L).

Grab samples from the effluent and background station SH109 are collected weekly in conjunction with the influent/effluent composite samples. The difference between background turbidity and effluent turbidity remained low for most of the year (well under the limit of 5 NTUs). In January the spike in turbidity (4.4 NTUs) was most likely caused by a warm weather front that brought 10 ° C (about 50° F) temperatures and dramatic snow melt.

Both TDS and sulfate (associated with sodium and magnesium) were well below permit limits in 2009. Throughout the year, major cations (represented by hardness) and anions (represented by sulfate), plus total dissolved solids show similar trends. Effluent TDS, sulfate and hardness were highest in concentration during February, March, and April then decreased during May. Downstream hardness, measured at SH113, was over 100 mg/l from February through March then declined to less than 75 mg/l through the summer months. Downstream hardness then fluctuated between 50 and 80mg/L from September to December. TDS was 200 to 300mg/L from January through April, but was mostly under 200mg/L for the remainder of the year. Sulfate had a similar pattern varying from 30 to 40mg/L during January to May then remaining less than 25 mg/L thereafter.

Daily samples were collected for TSS analysis and only 7 samples contained detectable levels of TSS well below the WQS. These were collected in February, March, September and November. Nitrate and ammonia remained well below daily maximum permit limitations throughout the year. Both ammonia and nitrate were slightly higher for brief periods in January, April and August with lower values during the rest of the year.

7.1.2 Trace Chemistry

Arsenic, cadmium, chromium, copper, lead and silver were undetected in effluent samples

during 2009. Aluminum, iron and mercury were found in low concentrations January through March but are essentially at or near the detection limit the rest of the year. Their occurrence during the beginning of the year was probably linked to low flow. Zinc concentrations varied slightly throughout the year but also stayed near the detection limit most of the year. Nickel concentrations varied throughout 2009 with no apparent trends. Nickel was below detection limits seven out of 63 samples collected. Nickel concentrations peaked a few times during the year at concentrations over 3.5ug/L with the highest being 4.1ug/L on April 4th. Nickel stayed below permit limits for all of 2009.

Selenium also varied throughout the year with no apparent trends and was below the detection limits in six out of 63 samples during 2009. The highest concentration of Selenium was 2.0 ug/L on December 3rd. Selenium levels remained mostly below 1.8ug/L and well below the permit limit throughout the year. Manganese concentrations for the effluent ranged mostly between 25ug/L and 75ug/L with a yearly average around 55 ug/L. A few elevated concentrations were found on September 1st and 22nd with values of 187 ug/L and 143 ug/L respectively.

In 2009 all total recoverable metals monitored from the 001 effluent discharge were, for the most part, at or only slightly above detection limits in the discharge water and well under permitted limits.

7.1.3 Whole Effluent Toxicity Testing

Whole Effluent Toxicity (WET) Tests were conducted monthly on the 24hour composite samples collected from Outfall 001 effluent. The following three tests were rotated throughout the year such that each test was conducted once a quarter:

- *Pimephales promelas* (fathead minnow)- static, renewal, larval survival and growth test.
- *Ceriodaphnia dubia* (water flea)- 7-day static, renewal, survival and reproduction test.
- *Selanastrum capricornutum* (green algae)- 4-day static, growth.

A total of 16 WET tests were conducted during 2009. In February, the monthly average permit limit (1.1 TU) was exceeded when the WET test with *Pimephales promelas* failed survival and reproduction, resulting in a monthly average toxic unit value of 1.7 TU. No cause for the

exceedence was determined. As required by Section 1.D.4 of the NPDES permit number AK-005057-1 four additional biweekly tests over an eight week period were conducted. All additional tests passed.

7.2 Outfall 002

Outfall 002 is the tailing treatment facility, which has not yet been constructed and therefore, no discharge occurred during 2009.

7.3 Outfall 003

Outfall 003 is the Comet Beach Camp sewage treatment plant with a marine discharge. The plant was decommissioned at the end of October 2007 as a result of the camp population moving to the Jualin facilities. Since there was no longer any discharge from this outfall, monitoring ceased.

7.4 Storm Water Land Infiltration System

The storm water infiltration system was approved by the Alaska Department of Environmental Conservation and constructed during the year. The infiltration system receives treated water from the package water treatment plant. The system operated as designed with successful infiltration of the treated storm water with one exception. On December 24, 25 and 26, 2009 the up-gradient diversion pipeline failed allowing water that would have normally been diverted to flow into the collection sump for the package water treatment plant. This excess flow of water caused the sump to overflow and a small amount of untreated water escaped the collection system. The incident was reported to the Alaska Department of Environmental Conservation on December 28th

Tables

Table 1: Non-detect Parameters at Sherman, Slate and Johnson Creek Stations

SHERMAN CREEK

SH109

Parameter	PQL	Units
Ammonia	<0.1	mg/L
D-Arsenic	<2.5	ug/L
D-Cadmium	<0.1	ug/L
D-Chromium	<2.5	ug/L
D-Iron	<0.05	mg/L
D-Lead	<0.16	ug/L
D-Nickel	<1	ug/L
D-Selenium	<1	ug/L
D-Silver	<0.1	ug/L

SH113

Parameter	PQL	Units
D-Arsenic	<2.5	ug/L
D-Cadmium	<0.1	ug/L
D-Chromium	<2.5	ug/L
D-Iron	<0.05	mg/L
D-Lead	<0.16	ug/L
D-Selenium	<1	ug/L
D-Silver	<0.1	ug/L

SH105

Parameter	PQL	Units
Ammonia	<0.1	mg/L
D-Arsenic	<2.5	ug/L
D-Cadmium	<0.1	ug/L
D-Chromium	<2.5	ug/L
D-Iron	<0.05	mg/L
D-Lead	<0.16	ug/L
D-Nickel	<1	ug/L
D-Selenium	<1	ug/L
D-Silver	<0.1	ug/L

SLATE CREEK

MLA

Parameter	PQL	Units
Nitrate as N	<0.05	mg/L
TSS	<5	mg/L
D-Arsenic	<2.5	ug/L
D-Cadmium	<0.1	ug/L
D-Chromium	<2.5	ug/L
D-Copper	<1	ug/L
D-Lead	<0.16	ug/L
D-Nickel	<1	ug/L
D-Selenium	<1	ug/L
D-Silver	<0.1	ug/L

SLB

Parameter	PQL	Units
TSS	<5	mg/L
D-Arsenic	<2.5	ug/L
D-Chromium	<2.5	ug/L
D-Lead	<0.16	ug/L
D-Selenium	<1	ug/L
D-Silver	<0.1	ug/L

SLC

Parameter	PQL	Units
TSS	<5	mg/L
D-Arsenic	<2.5	ug/L
D-Chromium	<2.5	ug/L
D-Lead	<0.16	ug/L
D-Selenium	<1	ug/L
D-Silver	<0.1	ug/L

JOHNSON CREEK

JS-2

Parameter	PQL	Units
Chloride	<1	mg/L
D-Arsenic	<2.5	ug/L
D-Cadmium	<0.1	ug/L
D-Chromium	<2.5	ug/L
D-Copper	<1	ug/L
D-Iron	<0.05	mg/L
D-Lead	<0.16	ug/L
D-Mercury	<0.001	ug/L
D-Nickel	<1	ug/L
D-Selenium	<1	ug/L
D-Silver	<0.1	ug/L

JS-5

Parameter	PQL	Units
TSS	<5	mg/L
D-Arsenic	<2.5	ug/L
D-Cadmium	<0.1	ug/L
D-Chromium	<2.5	ug/L
D-Copper	<1	ug/L
D-Iron	<0.05	mg/L
D-Lead	<0.16	ug/L
D-Mercury	<0.001	ug/L
D-Nickel	<1	ug/L
D-Selenium	<1	ug/L
D-Silver	<0.1	ug/L

JS-4

Parameter	PQL	Units
TSS	<5	mg/L
D-Arsenic	<2.5	ug/L
D-Cadmium	<0.1	ug/L
D-Chromium	<2.5	ug/L
D-Copper	<1	ug/L
D-Iron	<0.05	mg/L
D-Lead	<0.16	ug/L
D-Nickel	<1	ug/L
D-Selenium	<1	ug/L
D-Silver	<0.1	ug/L

Table 2: Non-detect Parameters at Ophir Creek and Outfall 001 Stations

OPHIR CREEK						
SH111				SH103		
Parameter	PQL	Units		Parameter	PQL	Units
Ammonia	<0.1	mg/L		D-Arsenic	<2.5	ug/L
Chloride	<1	mg/L		D-Cadmium	<0.1	ug/L
TSS	<5	mg/L		D-Chromium	<2.5	ug/L
D-Arsenic	<2.5	ug/L		D-Iron	<0.05	mg/L
D-Cadmium	<0.1	ug/L		D-Lead	<0.16	ug/L
D-Chromium	<2.5	ug/L		D-Mercury	<0.001	ug/L
D-Iron	<0.05	mg/L		D-Nickel	<1	ug/L
D-Lead	<0.16	ug/L		D-Selenium	<1	ug/L
D-Manganese	<1	ug/L		D-Silver	<0.1	ug/L
D-Nickel	<1	ug/L		D-Zinc	<2.5	ug/L
D-Selenium	<1	ug/L				
D-Silver	<0.1	ug/L				
D-Zinc	<2.5	ug/L				

OUTFALL 001						
001 Effluent				001 Influent		
Parameter	PQL	Units		Parameter	PQL	Units
TR-Arsenic	<2.5	ug/L		No parameter remained non-detect for all of 2009		
TR-Cadmium	<0.1	ug/L				
TR-Silver	<0.1	ug/L				

Table 3: Potential Outliers identified from Variance Tables 2009					
Parameter	**Value**	**Units**	**Date**	**Site**	**Average**
Zinc	72.6	ug/L	4/17/2009	SH113	3.7ug/L
Aluminium	60.7	ug/L	8/11/2009	JS-2	11.6ug/L
Copper	14.2	ug/L	9/10/2009	SLB	1.44ug/L
Conductivity	11.34	umhos/cm	11/4/2009	SLC	103umhos/cm

Table 4: Station JS2 2009 Water Quality Data Summary Statistics

Parameter	Units	Min	Max	Range (Max - Min)	Number of Samples	Number of NonDetects	Percent NonDetects	Arithmetic Mean	Standard Deviation
Temp	oC	1.5	6.6	5.1	12	0	0.0%	4.08	1.7
Dissolved Oxygen	mg/L	10.85	13.95	3.1	12	0	0.0%	12.05	0.9
pH	pH	6.96	7.67	0.71	12	0	0.0%	7.31	0.2
Conductivity	umhos/cm	21.7	47.7	26	12	0	0.0%	37.79	8.6
Turbidity	NTU	<0.1	0.9	0.9	12	2	16.7%	0.27	0.2
Nitrate as N	mg/L	<0.05	0.59	0.59	12	2	16.7%	0.27	0.2
Ammonia as N	mg/L	<0.05	<0.1	0	12	12	100.0%	0.00	0.0
Sulfate	mg/L	0.8	2.4	1.6	12	0	0.0%	1.56	0.6
Chloride	mg/L	<0.2	1	1	12	9	75.0%	0.25	0.2
Total Dissolved Solids	mg/L	<10	35	35	12	2	16.7%	20.17	8.6
Total Suspended Solids	mg/L	<4	5	5	12	11	91.7%	0.42	0.3
Hardness, Total	mg/L	8.4	18.5	10.1	12	0	0.0%	14.38	3.5
Dissolved Aluminum	ug/L	1	4.6	3.6	12	0	0.0%	2.78	1.5
Dissolved Arsenic	ug/L	<2.5	<2.5	0	12	12	100.0%	0.00	0.0
Dissolved Cadmium	ug/L	<0.1	<0.1	0	12	12	100.0%	0.00	0.0
Dissolved Chromium	ug/L	<2.5	<2.5	0	12	12	100.0%	0.00	0.0
Dissolved Copper	ug/L	<1	<1	0	12	12	100.0%	0.00	0.0
Dissolved Iron	mg/L	<0.05	<0.05	0	12	12	100.0%	0.00	0.0
Dissolved Lead	ug/L	<0.16	<0.16	0	12	12	100.0%	0.00	0.0
Dissolved Manganese	ug/L	<1	2.2	2.2	12	8	66.7%	0.49	0.4
Mercury Dissolved	ug/L	<0.001	<0.001	0	12	12	100.0%	0.00	0.0
Dissolved Nickel	ug/L	<1	<1	0	12	12	100.0%	0.00	0.0
Dissolved Selenium	ug/L	<1	<1	0	12	12	100.0%	0.00	0.0
Dissolved Silver	ug/L	<0.1	<0.1	0	12	12	100.0%	0.00	0.0
Dissolved Zinc	ug/L	<2.5	3.3	3.3	12	11	91.7%	0.28	0.2
Color	color unit	<5	5	5	12	9	75.0%	1.25	0.0

*Non-detects are assigned a value of zero in the arithmetic mean calculation

**Non-detects are assigned a value equal to the detection limit in standard deviation calculation

Table 5: Station JS5 2009 Water Quality Data Summary Statistics

Parameter	Units	Min	Max	Range (Max - Min)	Number of Samples	Number of NonDetects	Percent NonDetects	Arithmetic Mean	Standard Deviation
Temp	oC	0.6	6.8	6.2	12	0	0.0%	3.74	2.2
Dissolved Oxygen	mg/L	0	14.13	14.13	11	0	0.0%	11.20	1.0
pH	pH	6.88	8	1.12	12	0	0.0%	7.62	0.4
Conductivity	umhos/cm	29.6	117.3	87.7	12	0	0.0%	73.16	30.3
Turbidity	NTU	<0.1	3.5	3.5	12	2	16.7%	0.83	1.1
Nitrate as N	mg/L	<0.05	0.63	0.63	12	1	8.3%	0.26	0.2
Ammonia as N	mg/L	<0.05	<0.1	0	12	12	100.0%	0.00	0.0
Sulfate	mg/L	1.5	10.5	9	12	0	0.0%	4.57	2.6
Chloride	mg/L	<0.2	2	2	12	10	83.3%	0.25	0.4
Total Dissolved Solids	mg/L	12	67	55	12	0	0.0%	40.75	19.0
Total Suspended Solids	mg/L	<4	7	7	12	10	83.3%	0.92	0.9
Hardness, Total	mg/L	11.9	49.4	37.5	12	0	0.0%	29.11	13.0
Dissolved Aluminum	ug/L	3.3	12.3	9	12	0	0.0%	6.82	2.9
Dissolved Arsenic	ug/L	<2.5	<2.5	0	12	12	100.0%	0.00	0.0
Dissolved Cadmium	ug/L	<0.1	<0.1	0	12	12	100.0%	0.00	0.0
Dissolved Chromium	ug/L	<2.5	<2.5	0	12	12	100.0%	0.00	0.0
Dissolved Copper	ug/L	<1	1.2	1.2	12	10	83.3%	0.19	0.1
Dissolved Iron	mg/L	<0.05	<0.05	0	12	12	100.0%	0.00	0.0
Dissolved Lead	ug/L	<0.16	<0.16	0	12	12	100.0%	0.00	0.0
Dissolved Manganese	ug/L	<1	3.7	3.7	12	3	25.0%	1.57	0.9
Mercury Dissolved	ug/L	<0.001	<0.001	0	12	12	100.0%	0.00	0.0
Dissolved Nickel	ug/L	<1	<1	0	12	12	100.0%	0.00	0.0
Dissolved Selenium	ug/L	<1	<1	0	12	12	100.0%	0.00	0.0
Dissolved Silver	ug/L	<0.1	<0.1	0	12	12	100.0%	0.00	0.0
Dissolved Zinc	ug/L	<2.5	3.1	3.1	12	10	83.3%	0.51	0.2
Color	color unit	<5	10	10	12	4	33.3%	4.17	1.9

*Non-detects are assigned a value of zero in the arithmetic mean calculation

**Non-detects are assigned a value equal to the detection limit in standard deviation calculation

Table 6: Station JS4 2009 Water Quality Data Summary Statistics

Parameter	Units	Min	Max	Range (Max - Min)	Number of Samples	Number of NonDetects	Percent NonDetects	Arithmetic Mean	Standard Deviation
Temp	oC	0.4	7.2	6.8	12	0	0.0%	3.53	2.6
Dissolved Oxygen	mg/L	11.03	14.79	3.76	12	0	0.0%	12.55	1.1
pH	pH	6.78	7.94	1.16	12	0	0.0%	7.63	0.4
Conductivity	umhos/cm	38.1	126	87.9	12	0	0.0%	85.90	33.4
Turbidity	NTU	0.2	2.2	2	12	0	0.0%	0.98	0.8
Nitrate as N	mg/L	<0.05	0.6	0.6	12	1	8.3%	0.26	0.2
Ammonia as N	mg/L	<0.05	<0.1	0	12	12	100.0%	0.00	0.0
Sulfate	mg/L	2	11.5	9.5	12	0	0.0%	5.68	2.9
Chloride	mg/L	<0.2	2	2	12	9	75.0%	0.33	0.4
Total Dissolved Solids	mg/L	21	78	57	12	0	0.0%	49.92	19.7
Total Suspended Solids	mg/L	<4	5	5	12	11	91.7%	0.42	0.3
Hardness, Total	mg/L	15.5	54.5	39	12	0	0.0%	35.50	15.1
Dissolved Aluminum	ug/L	4.8	31.8	27	12	0	0.0%	13.33	8.1
Dissolved Arsenic	ug/L	<2.5	<2.5	0	12	12	100.0%	0.00	0.0
Dissolved Cadmium	ug/L	<0.1	<0.1	0	12	12	100.0%	0.00	0.0
Dissolved Chromium	ug/L	<2.5	<2.5	0	12	12	100.0%	0.00	0.0
Dissolved Copper	ug/L	<1	1.9	1.9	12	11	91.7%	0.16	0.3
Dissolved Iron	mg/L	<0.05	<0.05	0	12	12	100.0%	0.00	0.0
Dissolved Lead	ug/L	<0.16	<0.16	0	12	12	100.0%	0.00	0.0
Dissolved Manganese	ug/L	<1	8.1	8.1	12	2	16.7%	3.58	2.2
Mercury Dissolved	ug/L	<0.001	0.0017	0.0017	12	10	83.3%	0.00	0.0
Dissolved Nickel	ug/L	<1	<1	0	12	12	100.0%	0.00	0.0
Dissolved Selenium	ug/L	<1	<1	0	12	12	100.0%	0.00	0.0
Dissolved Silver	ug/L	<0.1	<0.1	0	12	12	100.0%	0.00	0.0
Dissolved Zinc	ug/L	<2.5	7.3	7.3	12	9	75.0%	1.12	1.4
Color	color unit	<5	25	25	12	2	16.7%	7.50	6.2

*Non-detects are assigned a value of zero in the arithmetic mean calculation

**Non-detects are assigned a value equal to the detection limit in standard deviation calculation

Table 7: Station MLA 2009 Water Quality Data Summary Statistics

Parameter	Units	Min	Max	Range (Max - Min)	Number of Samples	Number of NonDetects	Percent NonDetects	Arithmetic Mean	Standard Deviation
Temp	oC	0.1	18.2	18.1	12	0	0.0%	5.71	6.5
Dissolved Oxygen	mg/L	8.51	13.15	4.64	12	0	0.0%	10.91	1.3
pH	pH	7.11	8.13	1.02	12	0	0.0%	7.56	0.3
Conductivity	umhos/cm	60.1	148.1	88	12	0	0.0%	105.84	24.6
Turbidity	NTU	0.3	2.9	2.6	12	0	0.0%	0.86	0.8
Nitrate as N	mg/L	<0.05	0.33	0.33	12	9	75.0%	0.08	0.1
Ammonia as N	mg/L	<0.1	<0.1	0	12	12	100.0%	0.00	0.0
Sulfate	mg/L	1.4	6.4	5	12	0	0.0%	2.52	1.3
Chloride	mg/L	<1	2	2	12	1	8.3%	1.05	0.3
Total Dissolved Solids	mg/L	26	84	58	12	0	0.0%	64.00	16.0
Total Suspended Solids	mg/L	<4	<4	0	12	12	100.0%	0.00	0.0
Hardness, Total	mg/L	27.1	68.1	41	12	0	0.0%	49.58	12.4
Dissolved Aluminum	ug/L	22.9	81.7	58.8	12	0	0.0%	55.38	20.4
Dissolved Arsenic	ug/L	<2.5	<2.5	0	12	12	100.0%	0.00	0.0
Dissolved Cadmium	ug/L	<0.1	<0.1	0	12	12	100.0%	0.00	0.0
Dissolved Chromium	ug/L	<2.5	<2.5	0	12	12	100.0%	0.00	0.0
Dissolved Copper	ug/L	<1	<1	0	12	12	100.0%	0.00	0.0
Dissolved Iron	mg/L	<0.05	0.252	0.252	12	3	25.0%	0.11	0.1
Dissolved Lead	ug/L	<0.16	<0.16	0	12	12	100.0%	0.00	0.0
Dissolved Manganese	ug/L	4.2	70.4	66.2	12	0	0.0%	27.03	18.5
Mercury Dissolved	ug/L	<0.001	0.0034	0.0034	12	3	25.0%	0.00	0.0
Dissolved Nickel	ug/L	<1	<1	0	12	12	100.0%	0.00	0.0
Dissolved Selenium	ug/L	<1	<1	0	12	12	100.0%	0.00	0.0
Dissolved Silver	ug/L	<0.1	<0.1	0	12	12	100.0%	0.00	0.0
Dissolved Zinc	ug/L	<2.5	6.3	6.3	12	11	91.7%	0.53	1.1
Color	color unit	15	90	75	12	0	0.0%	53.33	23.4

*Non-detects are assigned a value of zero in the arithmetic mean calculation

**Non-detects are assigned a value equal to the detection limit in standard deviation calculation

Table 8: Station SLB 2009 Water Quality Data Summary Statistics

Parameter	Units	Min	Max	Range (Max - Min)	Number of Samples	Number of NonDetects	Percent NonDetects	Arithmetic Mean	Standard Deviation
Temp	oC	0.1	17.1	17	12	0	0.0%	5.98	6.9
Dissolved Oxygen	mg/L	8.89	14.35	5.46	11	0	0.0%	11.51	1.8
pH	pH	7.57	8.23	0.66	12	0	0.0%	7.92	0.2
Conductivity	umhos/cm	72.9	126.6	53.7	12	0	0.0%	104.42	15.6
Turbidity	NTU	0.2	4.2	4	12	0	0.0%	1.56	1.5
Nitrate as N	mg/L	<0.05	0.34	0.34	12	9	75.0%	0.08	0.1
Ammonia as N	mg/L	<0.1	<0.1	0	12	12	100.0%	0.00	0.0
Sulfate	mg/L	2.7	16.5	13.8	12	0	0.0%	7.95	3.3
Chloride	mg/L	<1	2	2	12	1	8.3%	1.20	0.4
Total Dissolved Solids	mg/L	52	85	33	12	0	0.0%	64.33	9.8
Total Suspended Solids	mg/L	<4	<4	0	12	12	100.0%	0.00	0.0
Hardness, Total	mg/L	31.4	55.8	24.4	12	0	0.0%	47.25	7.4
Dissolved Aluminum	ug/L	28.1	85	56.9	12	0	0.0%	57.80	20.4
Dissolved Arsenic	ug/L	<2.5	<2.5	0	12	12	100.0%	0.00	0.0
Dissolved Cadmium	ug/L	<0.1	0.6	0.6	12	4	33.3%	0.19	0.2
Dissolved Chromium	ug/L	<2.5	<2.5	0	12	12	100.0%	0.00	0.0
Dissolved Copper	ug/L	<1	14.2	14.2	12	2	16.7%	2.30	3.7
Dissolved Iron	mg/L	<0.05	0.209	0.209	12	1	8.3%	0.11	0.0
Dissolved Lead	ug/L	<0.16	<0.16	0	12	12	100.0%	0.00	0.0
Dissolved Manganese	ug/L	1.1	77.9	76.8	12	0	0.0%	26.59	25.4
Mercury Dissolved	ug/L	<0.001	0.0033	0.0033	12	3	25.0%	0.00	0.0
Dissolved Nickel	ug/L	<1	4.3	4.3	12	1	8.3%	2.30	1.1
Dissolved Selenium	ug/L	<1	<1	0	12	12	100.0%	0.00	0.0
Dissolved Silver	ug/L	<0.1	<0.1	0	12	12	100.0%	0.00	0.0
Dissolved Zinc	ug/L	7.8	58.3	50.5	12	0	0.0%	24.34	16.4
Color	color unit	15	125	110	12	0	0.0%	49.58	29.9

*Non-detects are assigned a value of zero in the arithmetic mean calculation

**Non-detects are assigned a value equal to the detection limit in standard deviation calculation

Table 9: Station SLC 2009 Water Quality Data Summary Statistics

Parameter	Units	Min	Max	Range (Max - Min)	Number of Samples	Number of NonDetects	Percent NonDetects	Arithmetic Mean	Standard Deviation
Temp	oC	0.3	14.9	14.6	12	0	0.0%	5.16	5.7
Dissolved Oxygen	mg/L	9.59	14.49	4.9	11	0	0.0%	11.87	1.5
pH	pH	7.45	8.2	0.75	12	0	0.0%	7.88	0.2
Conductivity	umhos/cm	67.7	135.7	68	12	0	0.0%	104.73	21.3
Turbidity	NTU	0.2	2.4	2.2	12	0	0.0%	1.01	0.8
Nitrate as N	mg/L	<0.05	0.33	0.33	12	8	66.7%	0.09	0.1
Ammonia as N	mg/L	<0.1	0.2	0.2	12	11	91.7%	0.02	0.0
Sulfate	mg/L	4.2	8.8	4.6	12	0	0.0%	6.27	1.5
Chloride	mg/L	1	2	1	12	0	0.0%	1.82	0.4
Total Dissolved Solids	mg/L	29	69	40	12	0	0.0%	55.83	12.8
Total Suspended Solids	mg/L	<4	<4	0	12	12	100.0%	0.00	0.0
Hardness, Total	mg/L	28.4	57.1	28.7	12	0	0.0%	45.13	8.6
Dissolved Aluminum	ug/L	22.5	68.6	46.1	12	0	0.0%	45.43	14.0
Dissolved Arsenic	ug/L	<2.5	<2.5	0	12	12	100.0%	0.00	0.0
Dissolved Cadmium	ug/L	<0.1	0.3	0.3	12	6	50.0%	0.09	0.1
Dissolved Chromium	ug/L	<2.5	<2.5	0	12	12	100.0%	0.00	0.0
Dissolved Copper	ug/L	<1	3.8	3.8	12	5	41.7%	0.93	0.8
Dissolved Iron	mg/L	<0.05	0.108	0.108	12	3	25.0%	0.06	0.0
Dissolved Lead	ug/L	<0.16	<0.16	0	12	12	100.0%	0.00	0.0
Dissolved Manganese	ug/L	<1	35.7	35.7	12	1	8.3%	13.08	11.8
Mercury Dissolved	ug/L	<0.001	0.0049	0.0049	12	2	16.7%	0.00	0.0
Dissolved Nickel	ug/L	<1	2.9	2.9	12	4	33.3%	1.25	0.7
Dissolved Selenium	ug/L	<1	<1	0	12	12	100.0%	0.00	0.0
Dissolved Silver	ug/L	<0.1	<0.1	0	12	12	100.0%	0.00	0.0
Dissolved Zinc	ug/L	3.8	30.9	27.1	12	0	0.0%	12.68	10.1
Color	color unit	10	70	60	12	0	0.0%	38.33	16.6

*Non-detects are assigned a value of zero in the arithmetic mean calculation

**Non-detects are assigned a value equal to the detection limit in standard deviation calculation

Table 10: Station SH109 2009 Water Quality Data Summary Statistics

Parameter	Units	Min	Max	Range (Max - Min)	Number of Samples	Number of NonDetects	Percent NonDetects	Arithmetic Mean	Standard Deviation
Temp	oC	0.1	10.7	10.6	12	0	0.0%	3.35	3.5
Dissolved Oxygen	mg/L	11.02	14.92	3.9	12	0	0.0%	12.74	1.4
pH	pH	7.1	7.9	0.8	12	0	0.0%	7.68	0.3
Conductivity	umhos/cm	60.7	126.3	65.6	12	0	0.0%	96.45	22.3
Turbidity	NTU	0	0.5	0.5	12	0	0.0%	0.23	0.1
Nitrate as N	mg/L	<0.05	0.59	0.59	12	2	16.7%	0.24	0.2
Ammonia as N	mg/L	<0.1	<0.1	0	12	12	100.0%	0.00	0.0
Sulfate	mg/L	3.4	11	7.6	12	0	0.0%	7.07	2.8
Chloride	mg/L	<1	1	1	12	7	58.3%	0.42	0.0
Total Dissolved Solids	mg/L	28	87	59	12	0	0.0%	53.00	18.6
Total Suspended Solids	mg/L	<4	<4	0	12	12	100.0%	0.00	0.0
Hardness, Total	mg/L	22.6	52.2	29.6	12	0	0.0%	39.72	10.2
Dissolved Aluminum	ug/L	4.8	13.4	8.6	12	0	0.0%	7.64	2.5
Dissolved Arsenic	ug/L	<2.5	<2.5	0	12	12	100.0%	0.00	0.0
Dissolved Cadmium	ug/L	<0.1	<0.1	0	12	12	100.0%	0.00	0.0
Dissolved Chromium	ug/L	<2.5	<2.5	0	12	12	100.0%	0.00	0.0
Dissolved Copper	ug/L	<1	1.1	1.1	12	10	83.3%	0.18	0.0
Dissolved Iron	mg/L	<0.05	<0.05	0	12	12	100.0%	0.00	0.0
Dissolved Lead	ug/L	<0.16	<0.16	0	12	12	100.0%	0.00	0.0
Dissolved Manganese	ug/L	<1	1.2	1.2	12	8	66.7%	0.38	0.1
Mercury Dissolved	ug/L	<0.001	0.0027	0.0027	12	11	91.7%	0.00	0.0
Dissolved Nickel	ug/L	<1	<1	0	12	12	100.0%	0.00	0.0
Dissolved Selenium	ug/L	<1	<1	0	12	12	100.0%	0.00	0.0
Dissolved Silver	ug/L	<0.1	<0.1	0	12	12	100.0%	0.00	0.0
Dissolved Zinc	ug/L	<2.5	2.6	206	12	11	91.7%	0.22	0.0
Color	color unit	<5	10	10	12	4	33.3%	4.17	1.9

*Non-detects are assigned a value of zero in the arithmetic mean calculation

**Non-detects are assigned a value equal to the detection limit in standard deviation calculation

Table 11: Station SH113 2009 Water Quality Data Summary Statistics

Parameter	Units	Min	Max	Range (Max - Min)	Number of Samples	Number of NonDetects	Percent NonDetects	Arithmetic Mean	Standard Deviation
Temp	oC	0.2	10.7	10.5	12	0	0.0%	4.01	3.3
Dissolved Oxygen	mg/L	0	14.68	14.68	11	0	0.0%	11.51	1.2
pH	pH	7.19	7.81	0.62	12	0	0.0%	7.61	0.2
Conductivity	umhos/cm	45.1	280	234.9	12	0	0.0%	170.88	72.3
Turbidity	NTU	<0.1	1.6	1.6	12	1	8.3%	0.42	0.4
Nitrate as N	mg/L	<0.05	0.54	0.54	12	1	8.3%	0.20	0.2
Ammonia as N	mg/L	<0.1	0.1	0.1	12	11	91.7%	0.01	0.0
Sulfate	mg/L	10	57.5	47.5	12	0	0.0%	30.24	15.9
Chloride	mg/L	2	6	4	12	0	0.0%	4.17	1.6
Total Dissolved Solids	mg/L	49	168	119	12	0	0.0%	101.50	42.4
Total Suspended Solids	mg/L	<4	<4	0	12	12	100.0%	0.00	0.0
Hardness, Total	mg/L	35.5	116	80.5	12	0	0.0%	73.40	25.3
Dissolved Aluminum	ug/L	3	17.8	14.8	12	0	0.0%	8.63	3.9
Dissolved Arsenic	ug/L	<2.5	<2.5	0	12	12	100.0%	0.00	0.0
Dissolved Cadmium	ug/L	<0.1	<0.1	0	12	12	100.0%	0.00	0.0
Dissolved Chromium	ug/L	<2.5	<2.5	0	12	12	100.0%	0.00	0.0
Dissolved Copper	ug/L	<1	1.1	1.1	12	11	91.7%	0.09	0.0
Dissolved Iron	mg/L	<0.05	0.236	0.236	12	11	91.7%	0.02	0.1
Dissolved Lead	ug/L	<0.16	<0.16	0	12	12	100.0%	0.00	0.0
Dissolved Manganese	ug/L	3.9	25.5	21.6	12	0	0.0%	15.72	7.3
Mercury Dissolved	ug/L	<0.001	<0.001	0	12	12	100.0%	0.00	0.0
Dissolved Nickel	ug/L	<1	1.1	1.1	12	11	91.7%	0.09	0.0
Dissolved Selenium	ug/L	<1	<1	0	12	12	100.0%	0.00	0.0
Dissolved Silver	ug/L	<0.1	<0.1	0	12	12	100.0%	0.00	0.0
Dissolved Zinc	ug/L	<2.5	5.7	5.7	12	9	75.0%	1.01	0.9
Color	color unit	<5	10	10	12	1	8.3%	5.83	2.3

*Non-detects are assigned a value of zero in the arithmetic mean calculation

**Non-detects are assigned a value equal to the detection limit in standard deviation calculation

Table 12: Station SH105 2009 Water Quality Data Summary Statistics

Parameter	Units	Min	Max	Range (Max - Min)	Number of Samples	Number of NonDetects	Percent NonDetects	Arithmetic Mean	Standard Deviation
Temp	oC	0.2	10.3	10.1	12	0	0.0%	3.92	3.4
Dissolved Oxygen	mg/L	0	14.82	14.82	11	0	0.0%	11.57	1.2
pH	pH	7.2	8.11	0.91	12	0	0.0%	7.75	0.3
Conductivity	umhos/cm	69	198.1	129.1	12	0	0.0%	128.30	47.9
Turbidity	NTU	0.2	1	0.8	12	0	0.0%	0.37	0.2
Nitrate as N	mg/L	0.05	0.57	0.52	12	0	0.0%	0.23	0.2
Ammonia as N	mg/L	<0.1	0.2	0.2	12	11	91.7%	0.02	0.0
Sulfate	mg/L	6.2	37.9	31.7	12	0	0.0%	18.79	11.5
Chloride	mg/L	<1	5	5	12	1	8.3%	2.58	1.5
Total Dissolved Solids	mg/L	34	122	88	12	0	0.0%	79.08	34.6
Total Suspended Solids	mg/L	<4	220	220	12	11	91.7%	18.33	62.4
Hardness, Total	mg/L	29.1	81.6	52.5	12	0	0.0%	52.82	20.4
Dissolved Aluminum	ug/L	5.5	31.2	25.7	12	0	0.0%	16.10	7.8
Dissolved Arsenic	ug/L	<2.5	<2.5	0	12	12	100.0%	0.00	0.0
Dissolved Cadmium	ug/L	<0.1	<0.1	0	12	12	100.0%	0.00	0.0
Dissolved Chromium	ug/L	<2.5	<2.5	0	12	12	100.0%	0.00	0.0
Dissolved Copper	ug/L	<1	1.2	1.2	12	9	75.0%	0.27	0.1
Dissolved Iron	mg/L	<0.05	<0.05	0	12	12	100.0%	0.00	0.0
Dissolved Lead	ug/L	<0.16	<0.16	0	12	12	100.0%	0.00	0.0
Dissolved Manganese	ug/L	1.4	5.5	4.1	12	0	0.0%	3.63	1.5
Mercury Dissolved	ug/L	<0.001	0.0014	0.0014	12	10	83.3%	0.00	0.0
Dissolved Nickel	ug/L	<1	<1	0	12	12	100.0%	0.00	0.0
Dissolved Selenium	ug/L	<1	<1	0	12	12	100.0%	0.00	0.0
Dissolved Silver	ug/L	<0.1	<0.1	0	12	12	100.0%	0.00	0.0
Dissolved Zinc	ug/L	<2.5	5.2	5.2	12	10	83.3%	0.71	0.8
Color	color unit	<5	25	25	12	1	8.3%	8.33	6.1

*Non-detects are assigned a value of zero in the arithmetic mean calculation

**Non-detects are assigned a value equal to the detection limit in standard deviation calculation

Table 13: Station SH111 2009 Water Quality Data Summary Statistics

Parameter	Units	Min	Max	Range (Max - Min)	Number of Samples	Number of NonDetects	Percent NonDetects	Arithmetic Mean	Standard Deviation
Temp	oC	1.8	7.8	6	4	0	0.0%	4.80	2.6
Dissolved Oxygen	mg/L	11.38	12.77	1.39	4	0	0.0%	12.05	0.6
pH	pH	7.45	7.97	0.52	4	0	0.0%	7.74	0.2
Conductivity	umhos/cm	40.6	73.4	32.8	4	0	0.0%	55.30	13.5
Turbidity	NTU	<0.1	0.4	0.4	4	1	25.0%	0.23	0.1
Nitrate as N	mg/L	0.06	0.79	0.73	4	0	0.0%	0.31	0.3
Ammonia as N	mg/L	<0.1	<0.1	0	4	4	100.0%	0.00	0.0
Sulfate	mg/L	1.5	3.7	2.2	4	0	0.0%	2.50	0.9
Chloride	mg/L	<1	<1	0	4	4	100.0%	0.00	0.0
Total Dissolved Solids	mg/L	16	53	37	4	0	0.0%	30.25	16.0
Total Suspended Solids	mg/L	<4	<4	0	4	4	100.0%	0.00	0.0
Hardness, Total	mg/L	16.6	29.9	13.3	4	0	0.0%	22.63	5.7
Dissolved Aluminum	ug/L	2.7	3.8	1.1	4	0	0.0%	3.38	0.5
Dissolved Arsenic	ug/L	<2.5	<2.5	0	4	4	100.0%	0.00	0.0
Dissolved Cadmium	ug/L	<0.1	<0.1	0	4	4	100.0%	0.00	0.0
Dissolved Chromium	ug/L	<2.5	<2.5	0	4	4	100.0%	0.00	0.0
Dissolved Copper	ug/L	<1	<1	0	4	4	100.0%	0.00	0.0
Dissolved Iron	mg/L	<0.05	<0.05	0	4	4	100.0%	0.00	0.0
Dissolved Lead	ug/L	<0.16	<0.16	0	4	4	100.0%	0.00	0.0
Dissolved Manganese	ug/L	<1	<1	0	4	4	100.0%	0.00	0.0
Mercury Dissolved	ug/L	<0.001	<0.001	0	4	4	100.0%	0.00	0.0
Dissolved Nickel	ug/L	<1	<1	0	4	4	100.0%	0.00	0.0
Dissolved Selenium	ug/L	<1	<1	0	4	4	100.0%	0.00	0.0
Dissolved Silver	ug/L	<0.1	<0.1	0	4	4	100.0%	0.00	0.0
Dissolved Zinc	ug/L	<2.5	<2.5	0	4	4	100.0%	0.00	0.0
Color	color unit	<5	<5	0	4	4	100.0%	0.00	0.0

*Non-detects are assigned a value of zero in the arithmetic mean calculation

**Non-detects are assigned a value equal to the detection limit in standard deviation calculation

Table 14: Station SH103 2009 Water Quality Data Summary Statistics

Parameter	Units	Min	Max	Range (Max - Min)	Number of Samples	Number of NonDetects	Percent NonDetects	Arithmetic Mean	Standard Deviation
Temp	oC	0.9	7.1	6.2	7	0	0.0%	3.36	2.4
Dissolved Oxygen	mg/L	11.16	12.24	1.08	7	0	0.0%	11.78	0.4
pH	pH	6.95	7.49	0.54	7	0	0.0%	7.32	0.2
Conductivity	umhos/cm	50.3	657	606.7	7	0	0.0%	394.36	282.7
Turbidity	NTU	<0.1	0.4	0.4	6	2	33.3%	0.15	0.1
Nitrate as N	mg/L	0.07	2.64	2.57	6	0	0.0%	1.03	1.0
Ammonia as N	mg/L	<0.1	<0.1	0	6	6	100.0%	0.00	0.0
Sulfate	mg/L	4.2	270	265.8	6	0	0.0%	129.00	124.7
Chloride	mg/L	<1	3	3	6	2	33.3%	1.50	1.0
Total Dissolved Solids	mg/L	24	474	450	6	0	0.0%	222.67	200.7
Total Suspended Solids	mg/L	<4	<4	0	6	6	100.0%	0.00	0.0
Hardness, Total	mg/L	20.1	291	270.9	6	0	0.0%	145.57	120.9
Dissolved Aluminum	ug/L	2.4	5.2	2.8	6	0	0.0%	3.43	1.1
Dissolved Arsenic	ug/L	<2.5	<2.5	0	6	6	100.0%	0.00	0.0
Dissolved Cadmium	ug/L	<0.1	<0.1	0	6	6	100.0%	0.00	0.0
Dissolved Chromium	ug/L	<2.5	<2.5	0	6	6	100.0%	0.00	0.0
Dissolved Copper	ug/L	<1	1.3	1.3	6	3	50.0%	0.57	0.1
Dissolved Iron	mg/L	<0.05	<0.05	0	6	6	100.0%	0.00	0.0
Dissolved Lead	ug/L	<0.16	<0.16	0	6	6	100.0%	0.00	0.0
Dissolved Manganese	ug/L	<1	4.2	4.2	6	1	16.7%	2.05	1.5
Mercury Dissolved	ug/L	<0.001	<0.001	0	6	6	100.0%	0.00	0.0
Dissolved Nickel	ug/L	<1	1.4	1.4	6	5	83.3%	0.23	0.2
Dissolved Selenium	ug/L	<1	<1	0	6	6	100.0%	0.00	0.0
Dissolved Silver	ug/L	<0.1	<0.1	0	6	6	100.0%	0.00	0.0
Dissolved Zinc	ug/L	<2.5	3.9	3.9	6	5	83.3%	0.65	0.6
Color	color unit	<5	5	5	6	3	50.0%	2.50	0.0

*Non-detects are assigned a value of zero in the arithmetic mean calculation

**Non-detects are assigned a value equal to the detection limit in standard deviation calculation

Table 15: Station CAK-001EFF (Outfall 001 Effluent) 2009 Water Quality Data Summary Statistics

Parameter	Units	Min	Max	Range (Max - Min)	Number of Samples	Number of NonDetects	Percent NonDetects	Arithmetic Mean	Standard Deviation
Temp	oC	0.1	11.5	11.4	65	0	0.00%	5.88	2.79
Dissolved oxygen	mg/L	10.38	15.21	4.83	65	0	0.00%	12.05	1.16
Lab Turbidity	NTU	<0.1	4.4	4.4	64	3	4.69%	0.5	0.9
Ammonia as N	mg/L	<0.05	0.3	0.3	64	58	90.63%	0.02	0.04
Nitrate as N	mg/L	<0.05	0.56	0.56	64	3	4.69%	0.19	0.15
Sulfate (as S)	mg/L	20.6	43.3	22.7	63	0	0.00%	27.9	5.6
Total Dissolved Solids	mg/L	71	305	234	64	0	0.00%	204	44.7
Total Suspended Solids	mg/L	<1.0	8	8	363	356	98.07%	0.1	0.51
Total Recoverable Aluminum	ug/L	<1	29.9	29	64	12	18.75%	4	6
Total Recoverable Arsenic	ug/L	<2.5	<2.5	0	64	64	100.00%	0.0	0.0
Total Recoverable Cadmium	ug/L	<0.1	<0.1	0	64	64	100.00%	0.0	0.0
Total Chromium	ug/L	<2.5	<2.5	0	64	64	100.00%	0.00	0.00
Total Recoverable Copper	ug/L	<1	<1	0	64	64	100.00%	0.0	0.0
Total Recoverable Iron	mg/L	<0.05	0.429	0	64	48	75.00%	0.06	0.10
Total Recoverable Lead	ug/L	<0.16	<0.16	0	64	64	100.00%	0.00	0.00
Total Recoverable Manganese	ug/L	23.9	187	163.1	64	0	0.00%	55	26
Total Recoverable Nickel	ug/L	<1	4.1	4.1	64	7	10.94%	1.6	0.8
Total Recoverable Selenium	ug/L	<1	2	2	64	6	9.38%	1.2	0.2
Total Recoverable Silver	ug/L	<0.1	<0.1	0	64	64	100.00%	0.0	0.0
Total Recoverable Zinc	ug/L	<2.5	10.8	10.8	64	13	20.31%	3.5	1.7
Total Mercury (1631)	ug/L	<0.001	0.0014	0.0014	64	62	96.88%	0.0000	0.0001
Hardness (Downstream of Outfall)	mg/L	29.6	126	96.4	64	0	0.00%	73.6	25.7

* Non-detects are treated as 0.0 in range and arithmetic mean calculation

**Non-detects are assigned a value equal to the detection limit in standard deviation calculation

Table 16: Applicable Alaska Water Quality Standards

Parameter	Water Quality Standard Used	Hardness Based Y/N	Value or Formula if hardness based	Units
aluminum	Chronic Toxicity	N	87	ug/l
arsenic	Drinking Water	N	10	ug/l
cadmium	Chronic Toxicity	Y	EXP(0.7409*(LN Hardness)-4.719	ug/l
chloride	Chronic Toxicity	N	230	mg/l
chromium	Drinking Water	N	100	ug/l
copper	Chronic Toxicity	Y	EXP(0.8545*(LN Hardness)-1.702	ug/l
iron	Chronic Toxicity	N	1	mg/l
lead	Chronic Toxicity	Y	EXP(1.273*(LN Hardness)-4.705	ug/l
manganese	Human Health*	N	50	ug/l
mercury	Human Health*	N	0.05	ug/l
nickel	Chronic Toxicity	Y	EXP(0.846*(LN Hardness)+0.0584	ug/l
nitrate (as N)	Drinking Water	N	10	mg/l
selenium***	Chronic Toxicity	N	5	ug/l
silver	Acute Toxicity	Y	EXP(1.72*(LN Hardness)-6.52	ug/l
zinc	Acute Toxicity	Y	EXP(0.8473*(LN Hardness)+0.884	ug/l

Chronic and Acute Toxicity refer to aquatic life in freshwater
*Human Health Criteria for NonCarcinogens

Table 17

Coeur Alaska - Kensington Gold Mine
Mine Water Treatment Plant Sludge Disposal
Cell Dimensions

Number	Length (ft)	Width (ft)	Depth (ft)
1	25	12	10
2	20	18	10
3	30	25	10
4	40	30	10
5			
6			

Figures

Figure 1: Project Area Map

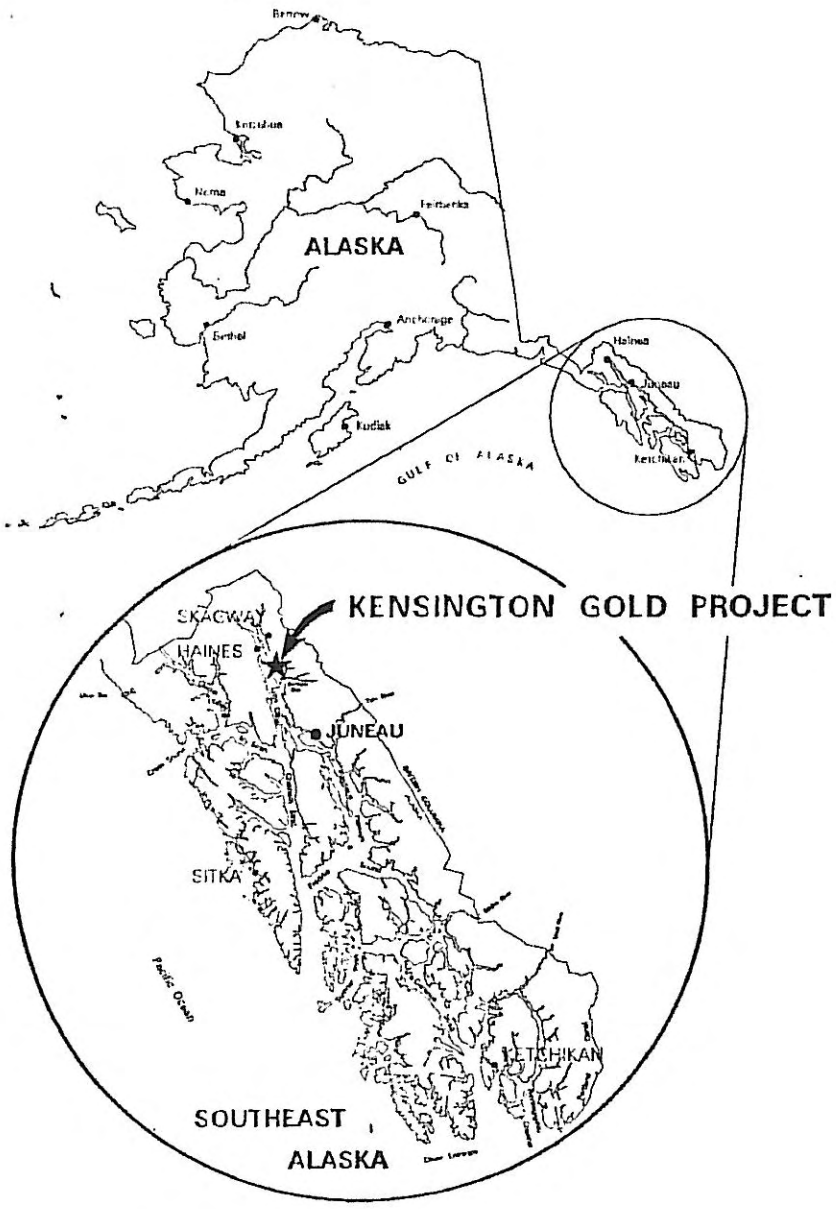


Figure 2: Location of streams and permitted outfalls near Kensington and Jualin Mines, Lynn Canal, southeast Alaska. Water quality monitoring is conducted on Sherman, Ophir, Slate and Johnson Creeks.

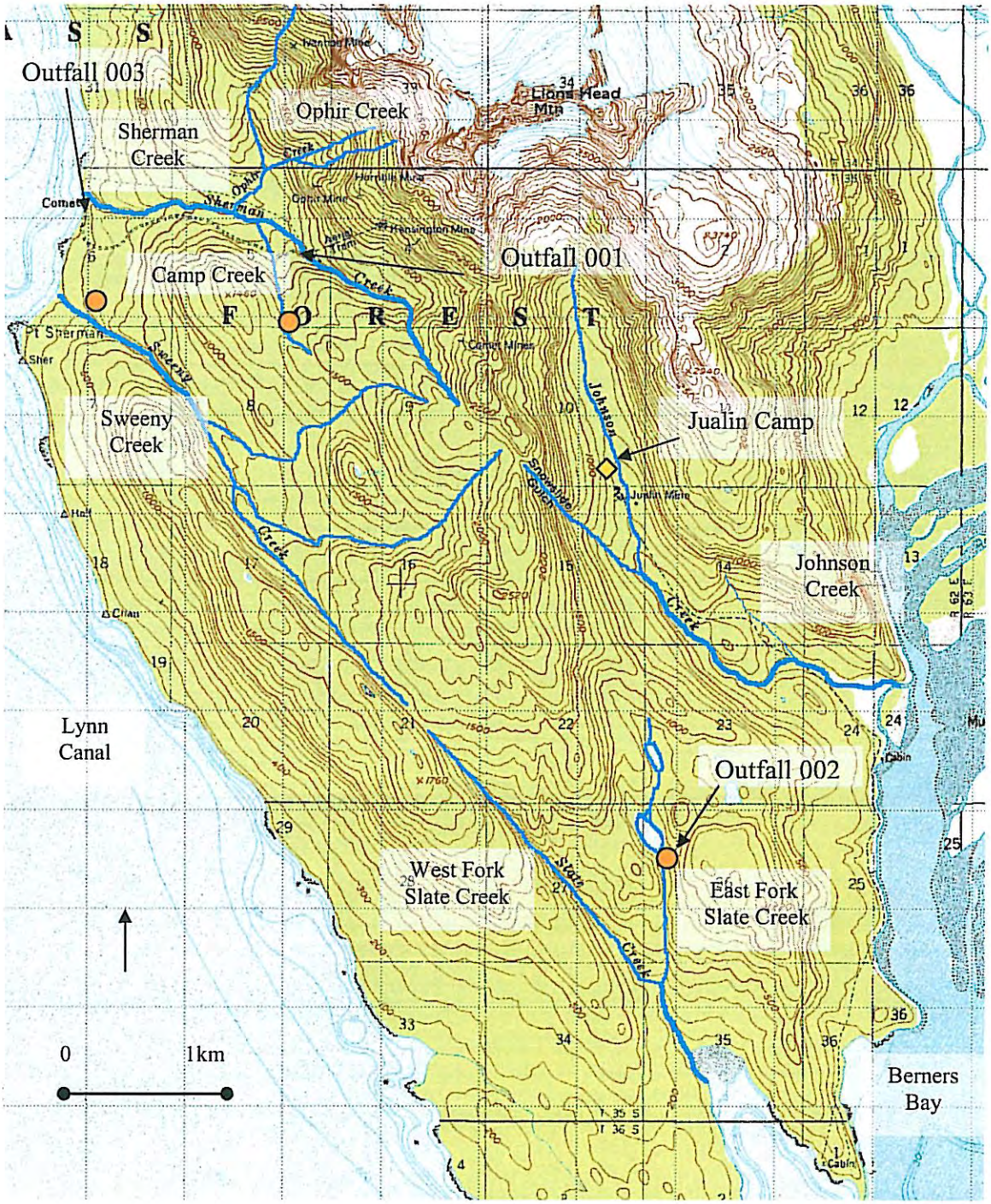


Figure 3: Water Treatment Facility Monitoring Sites.

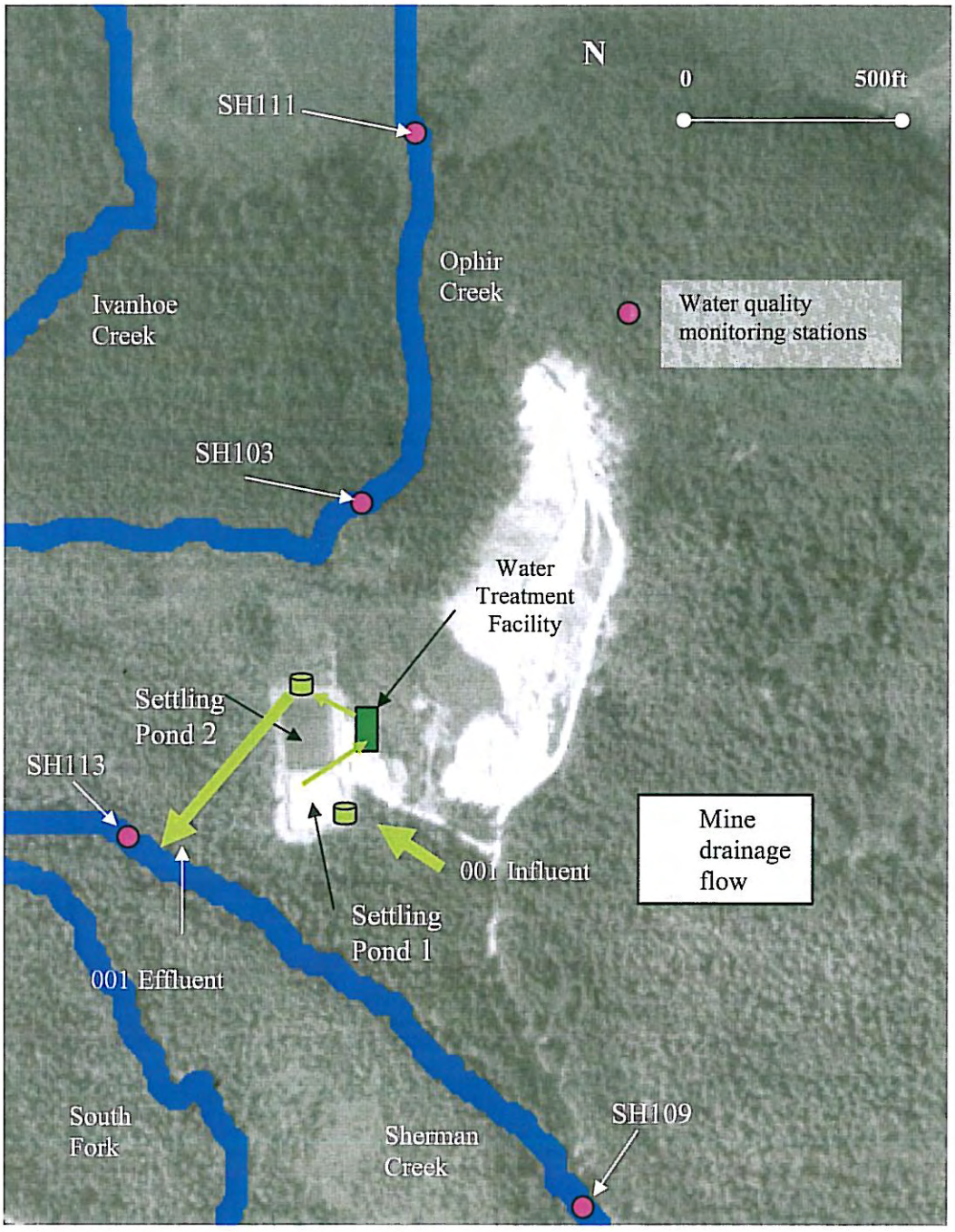


Figure 4: Location of receiving water quality monitoring stations on Sherman and Ophir Creeks.

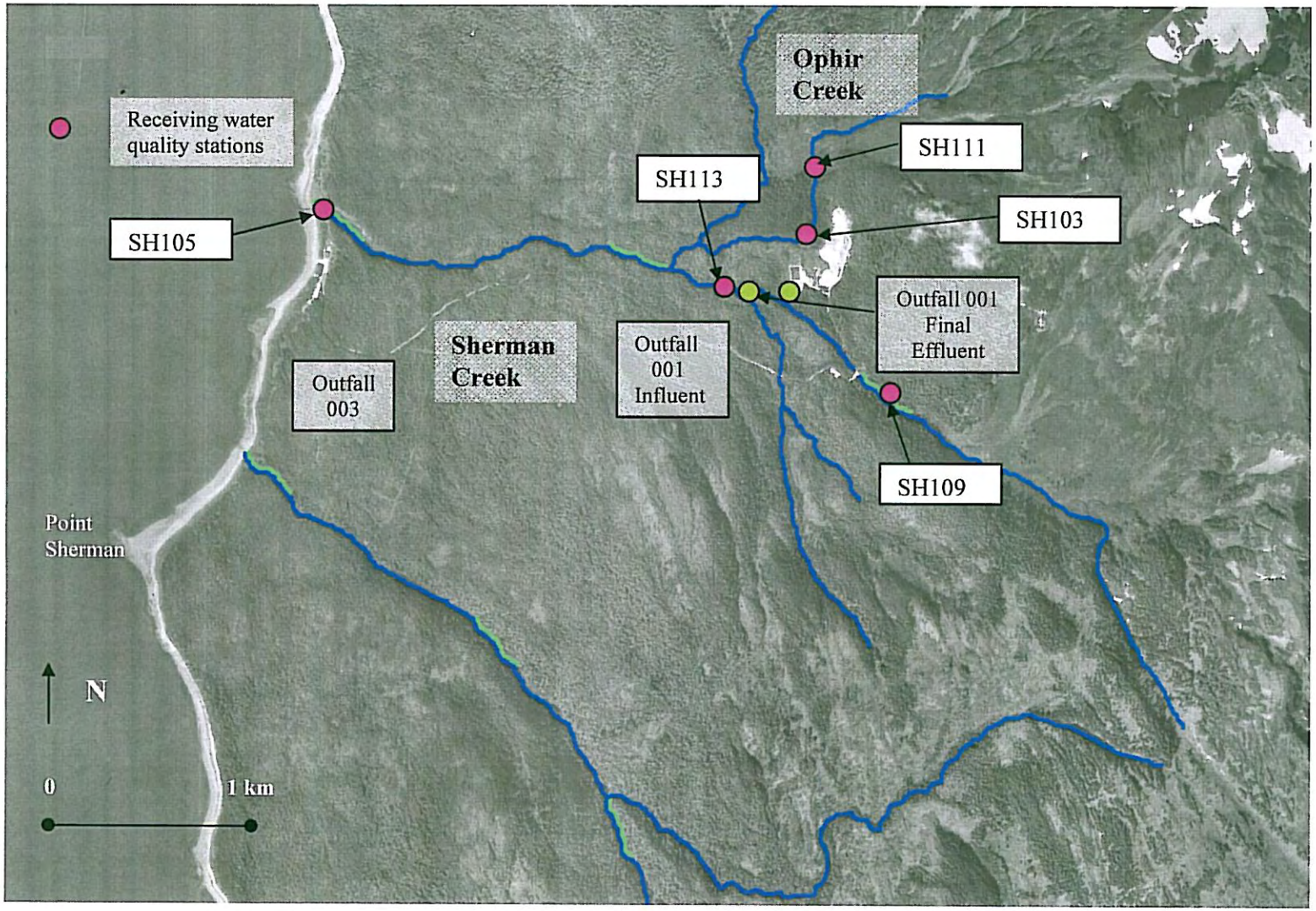


Figure 5: Locations of receiving water quality monitoring stations on Slate and Johnson Creeks.

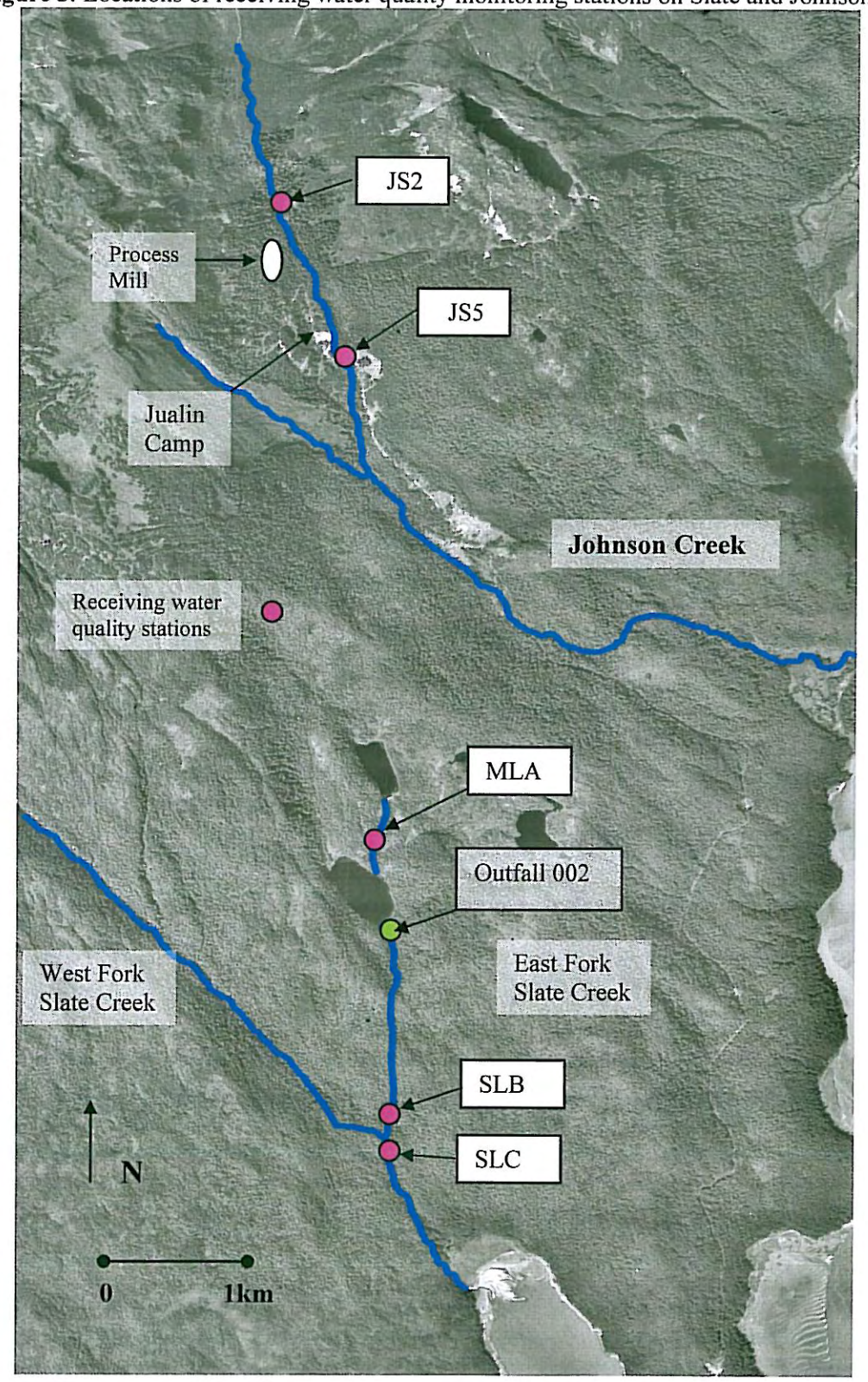
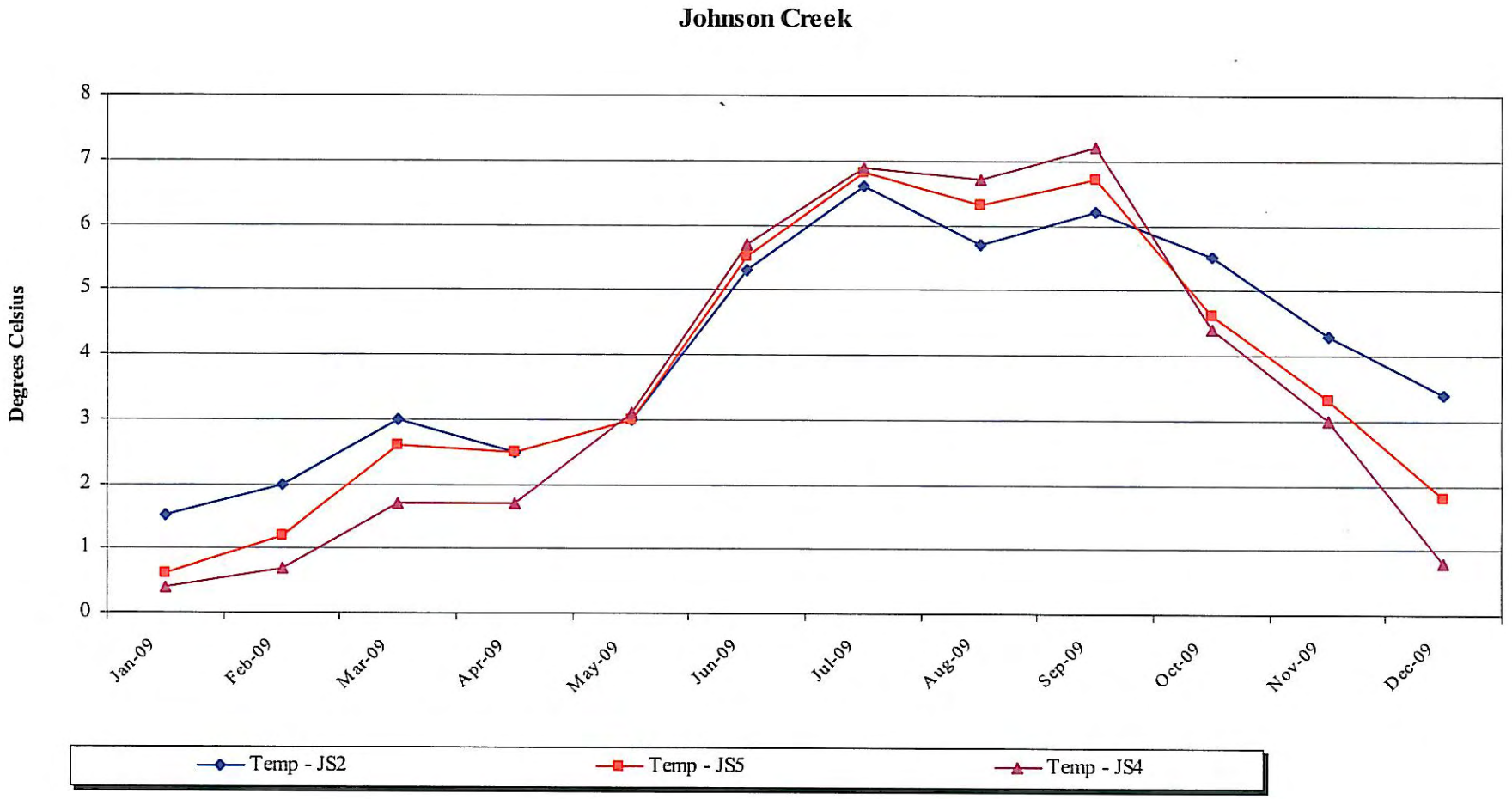


Figure 6a: Johnson Creek Monitoring Results 2009, Field Parameters



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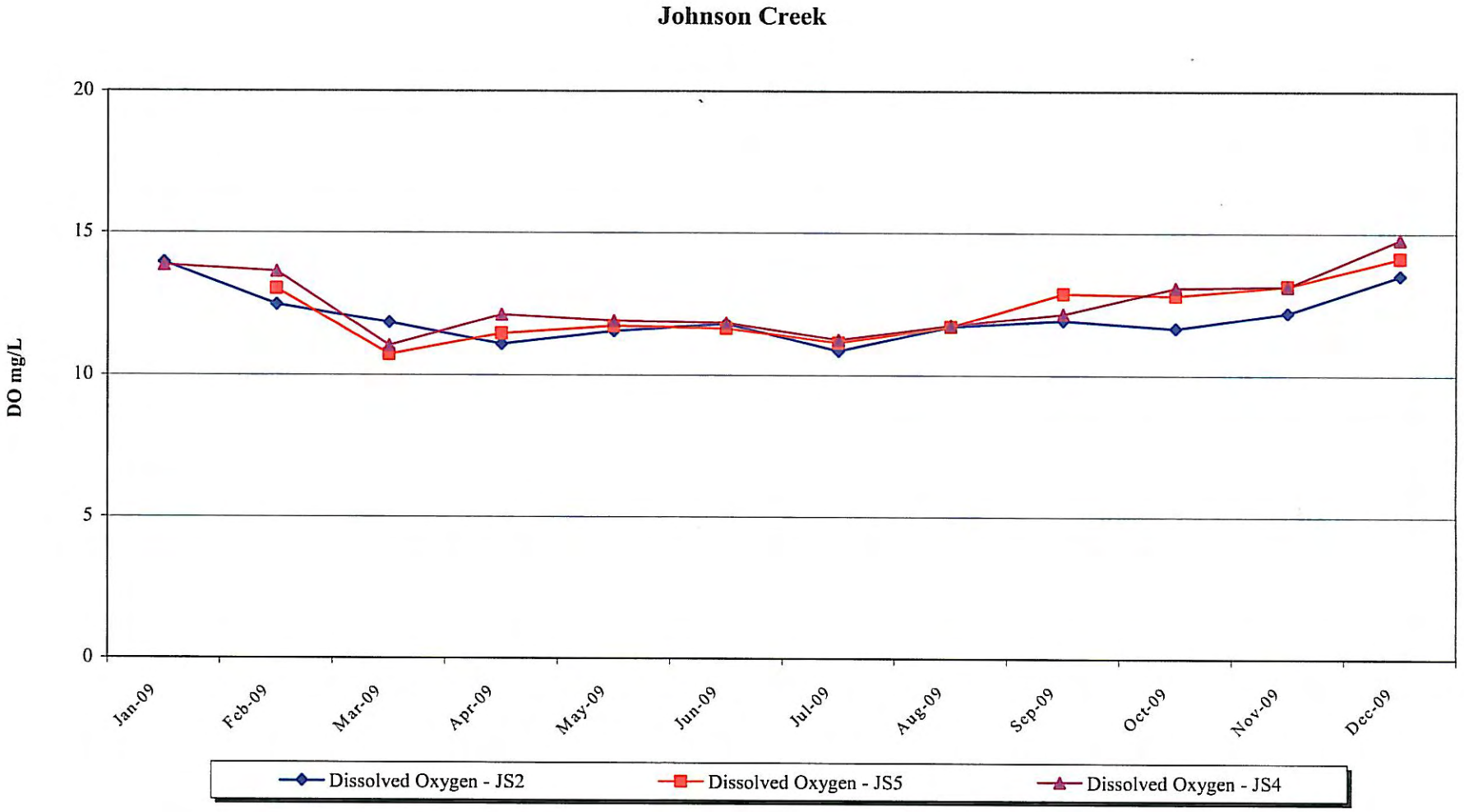

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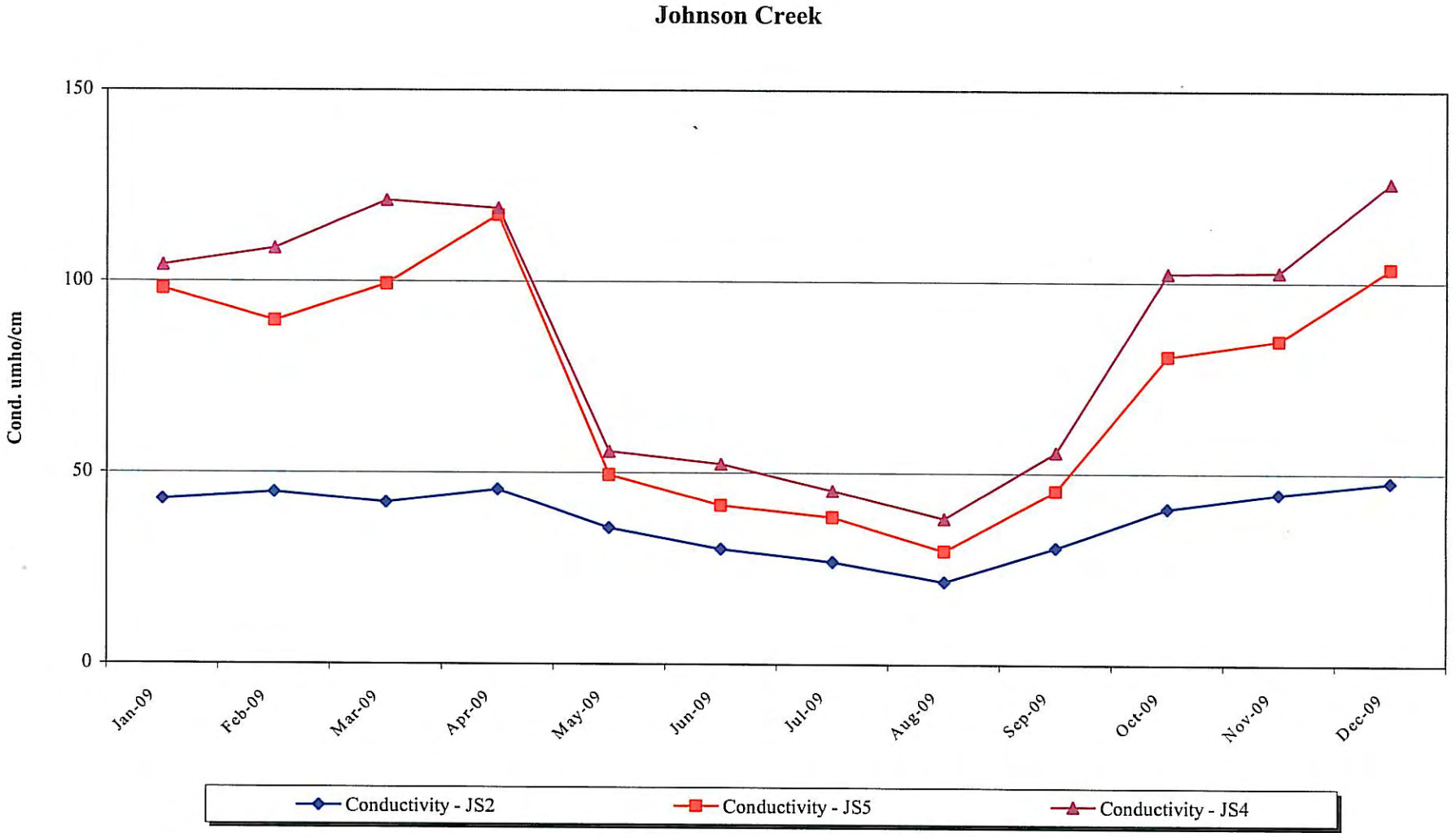

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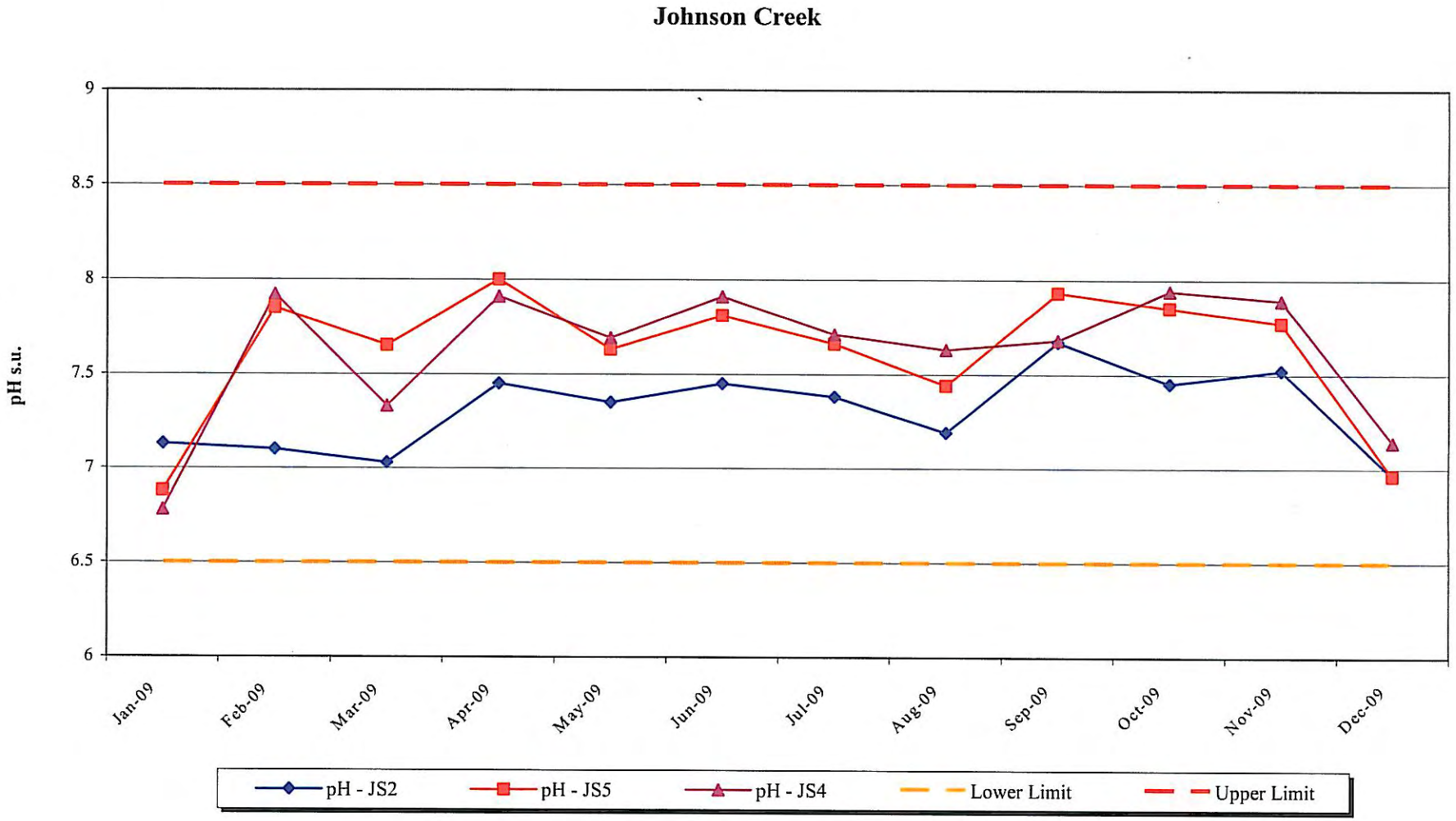


Figure 6b: Johnson Creek Monitoring Results 2009, Major Chemistry

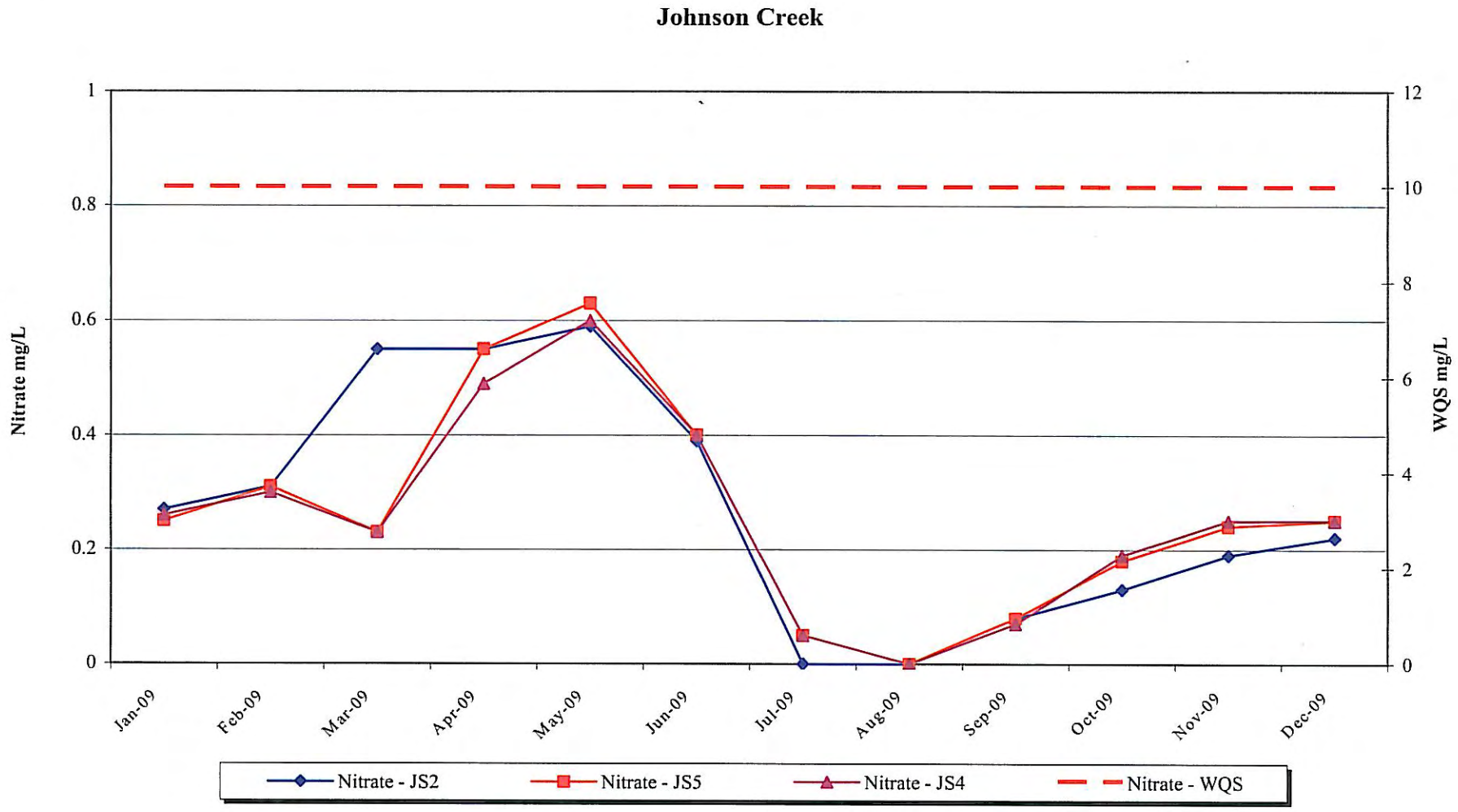
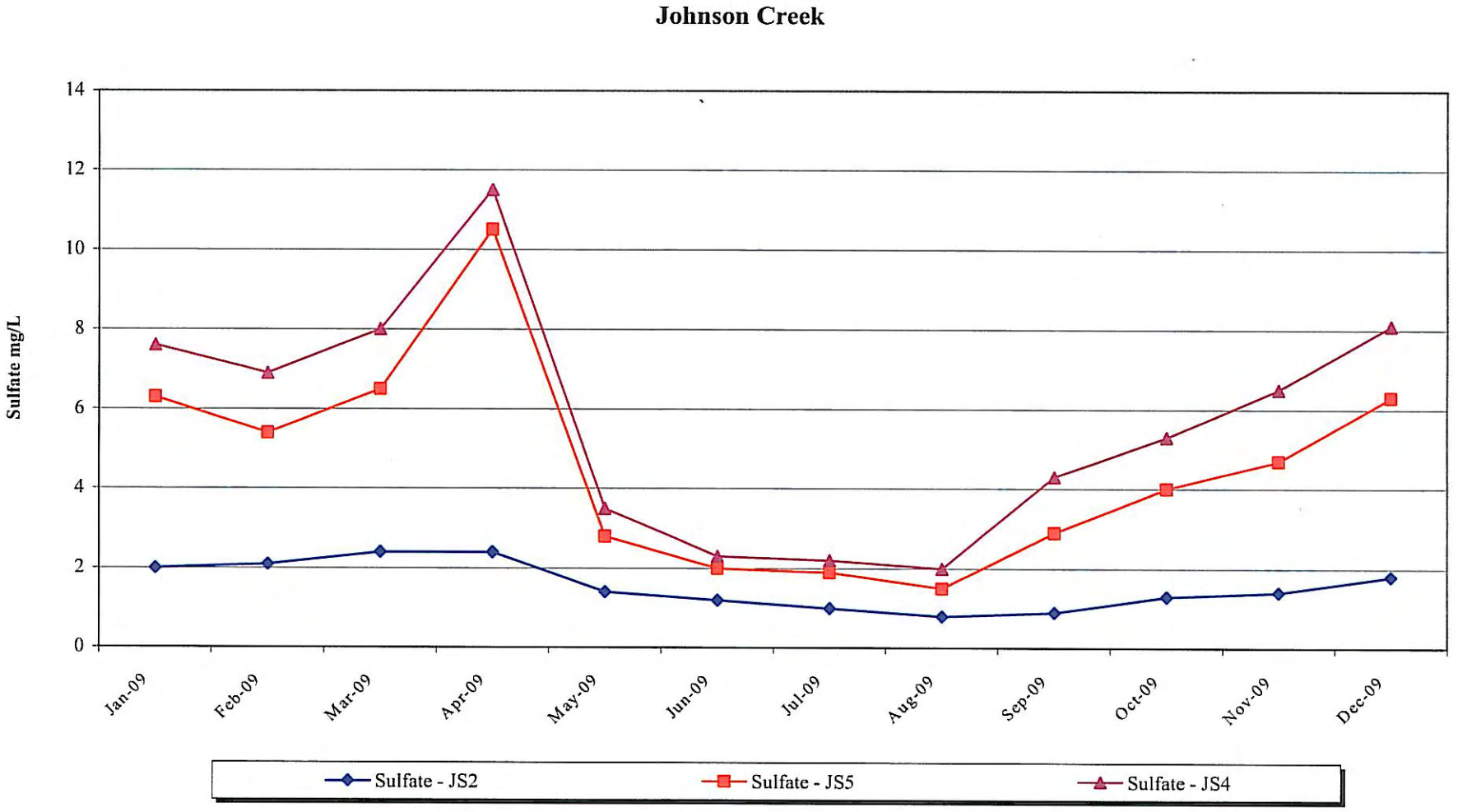


Figure 6b: Johnson Creek Monitoring Results 2009, Major Chemistry



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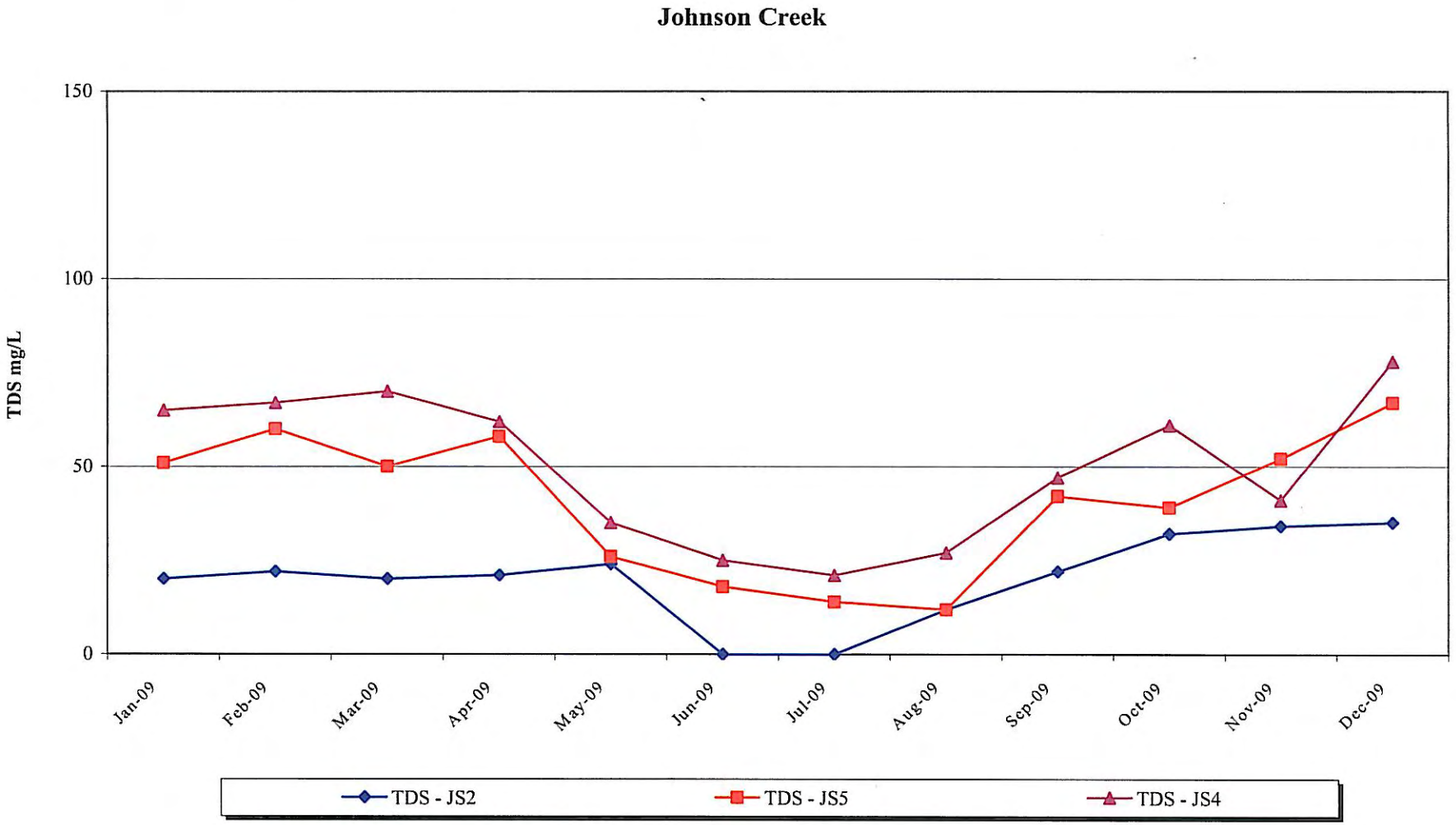

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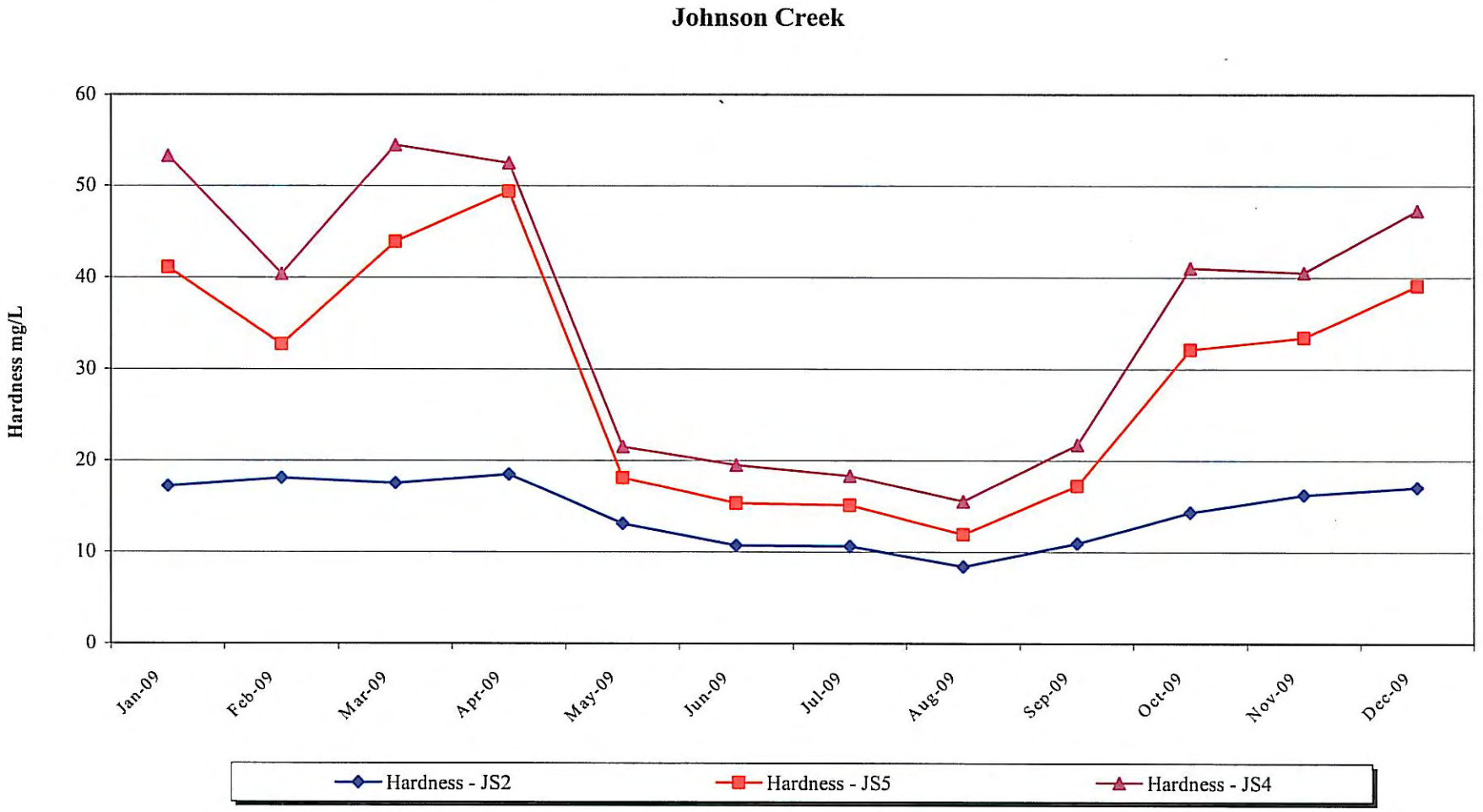

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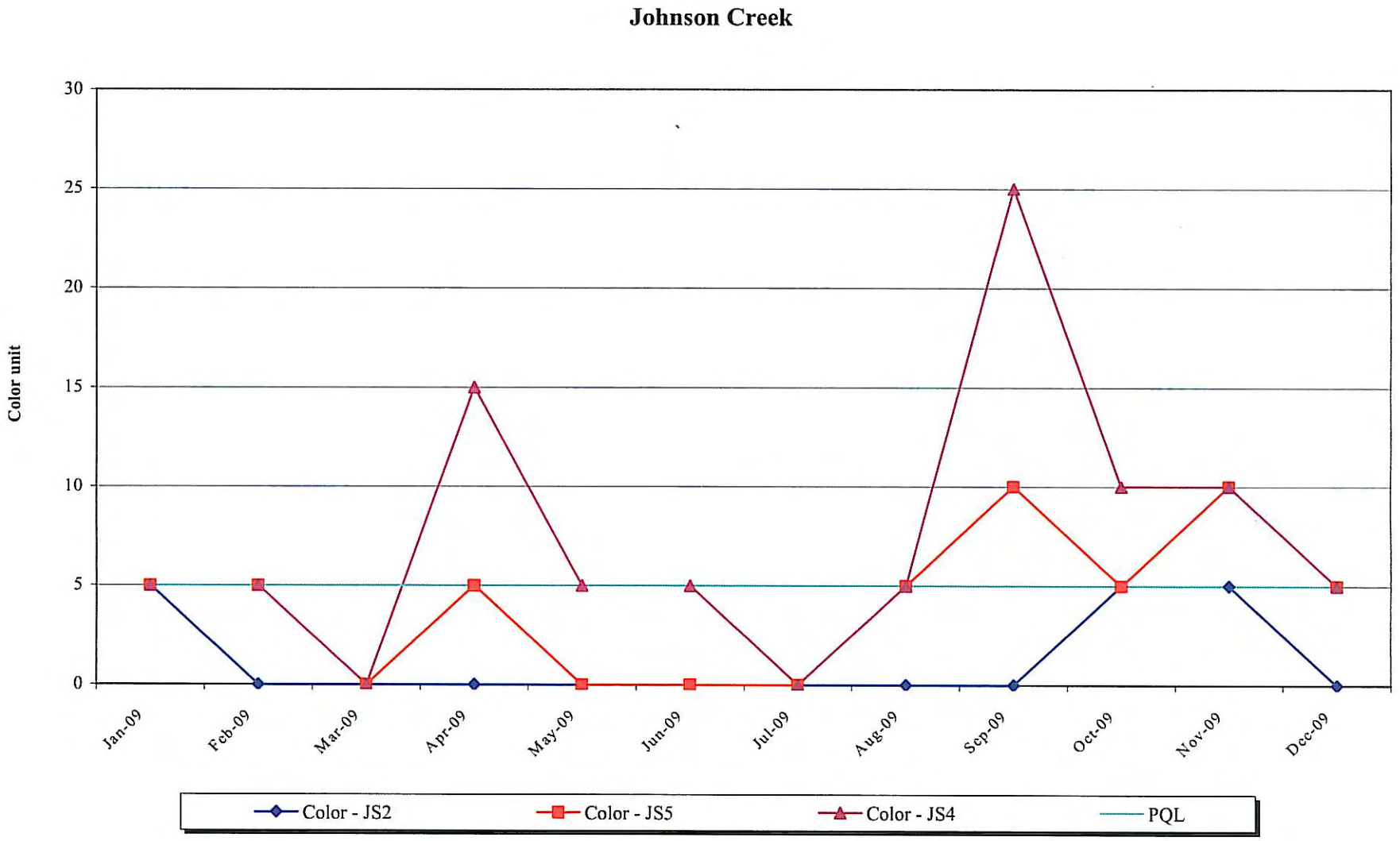

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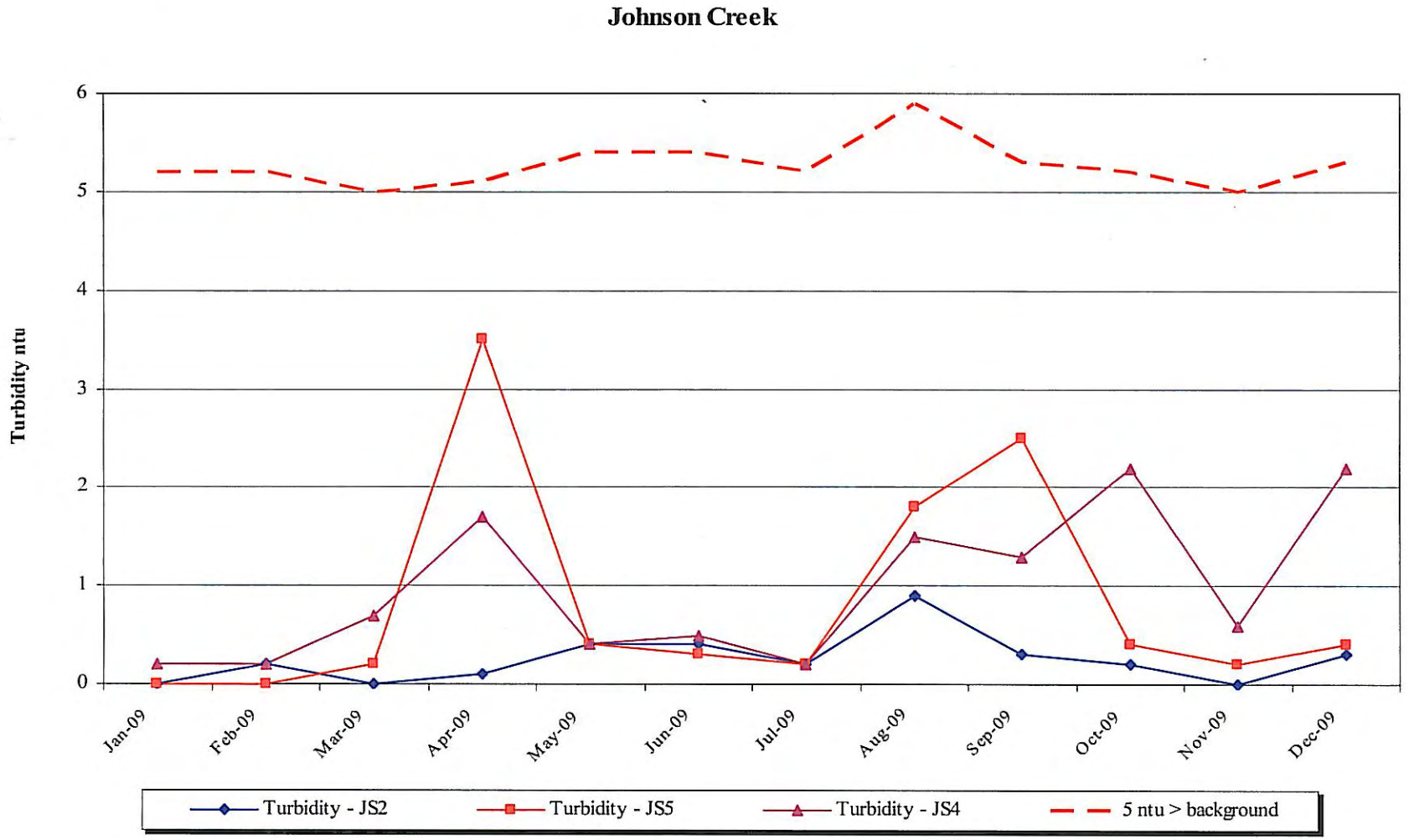


Figure 6b: Johnson Creek Monitoring Results 2009, Major Chemistry

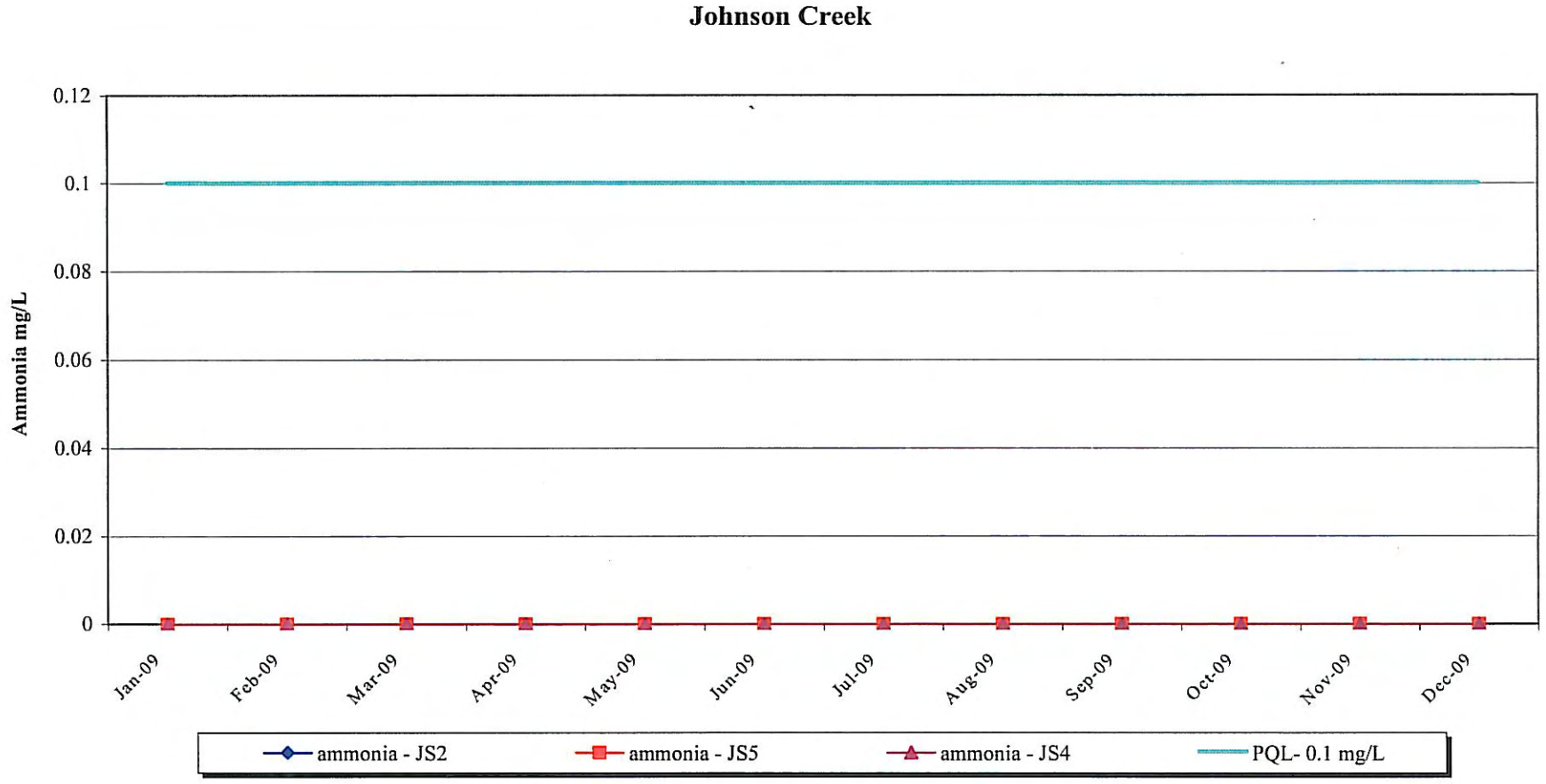


Figure 6b: Johnson Creek Monitoring Results 2009, Major Chemistry

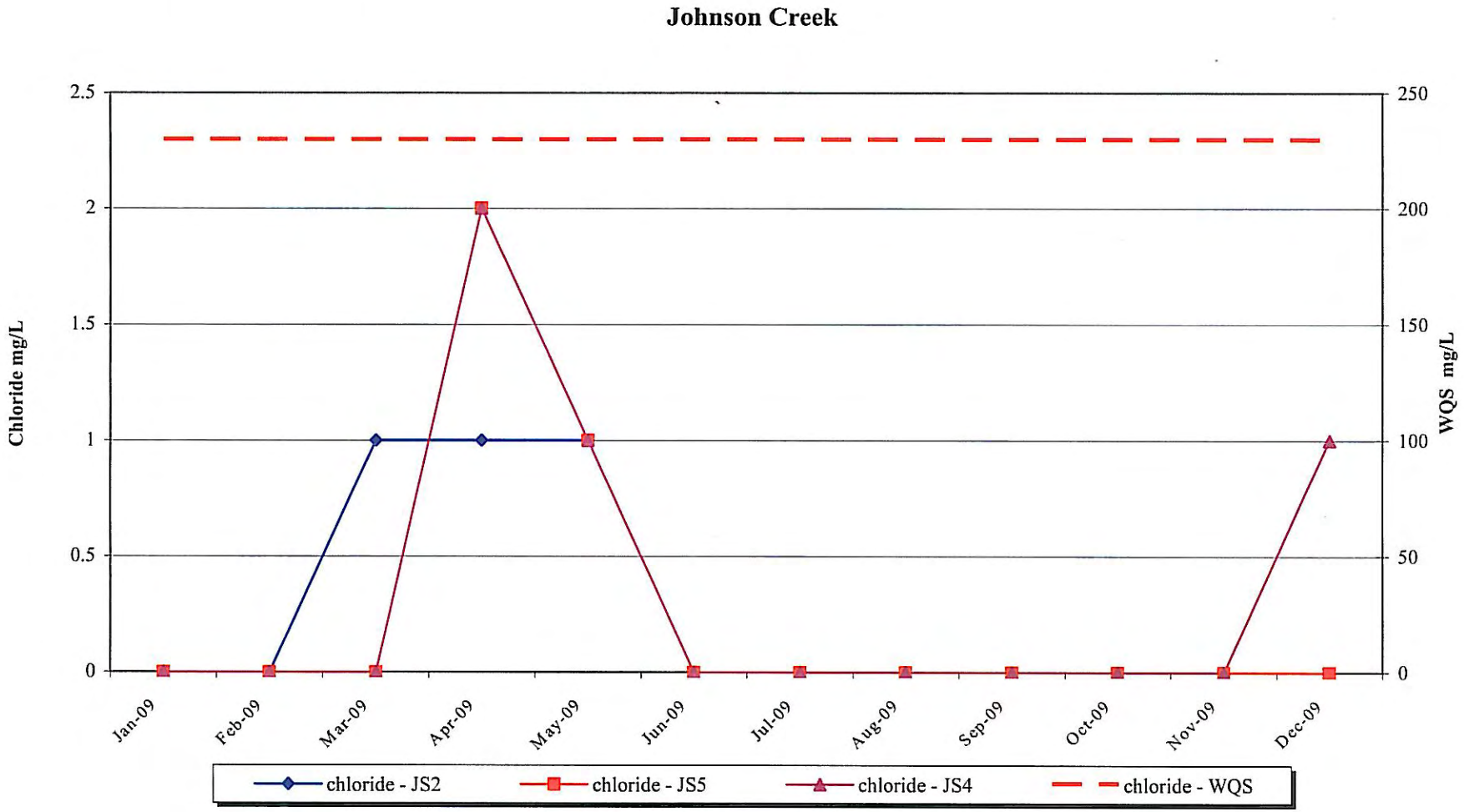


Figure 6b: Johnson Creek Monitoring Results 2009, Major Chemistry

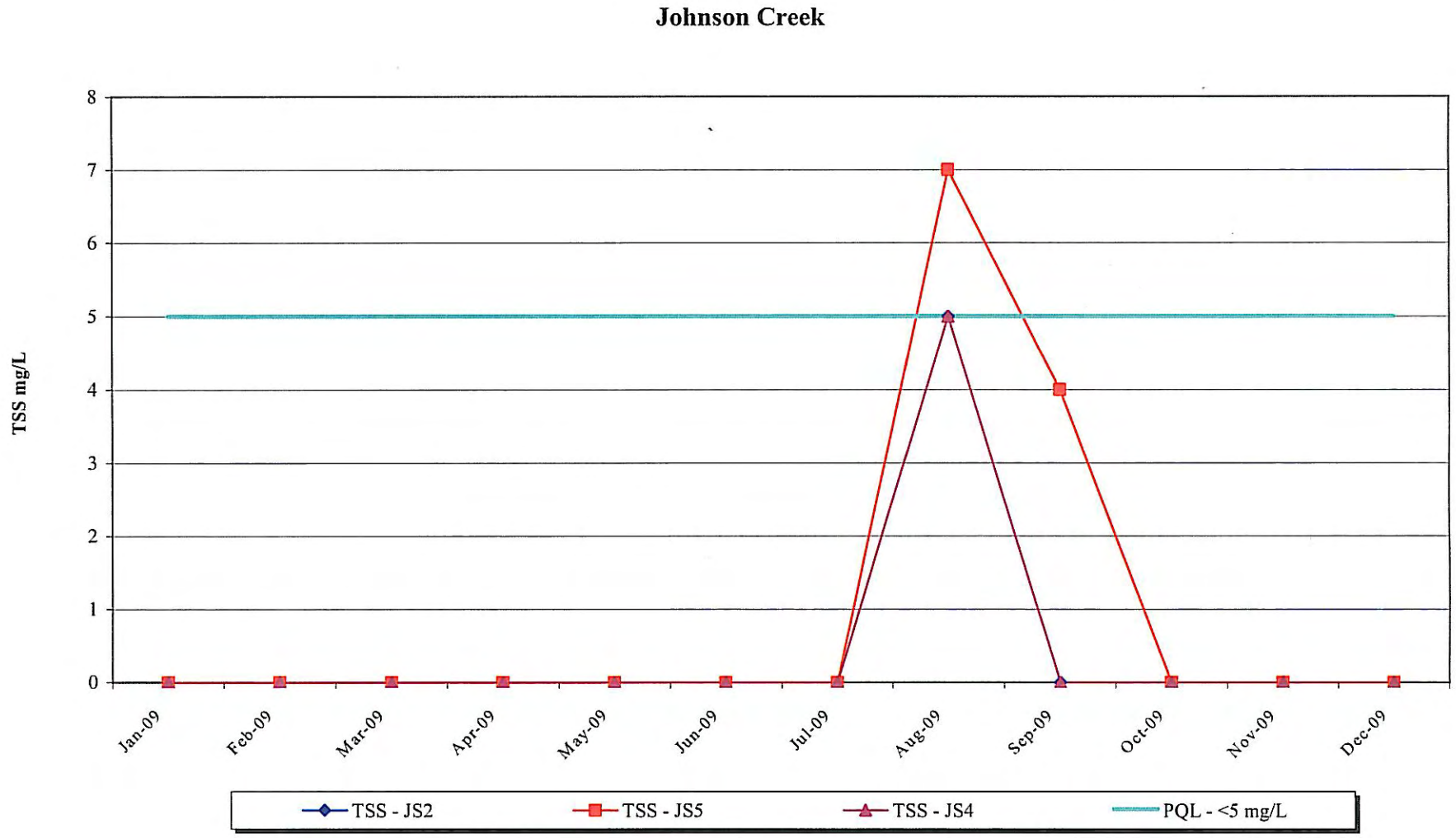
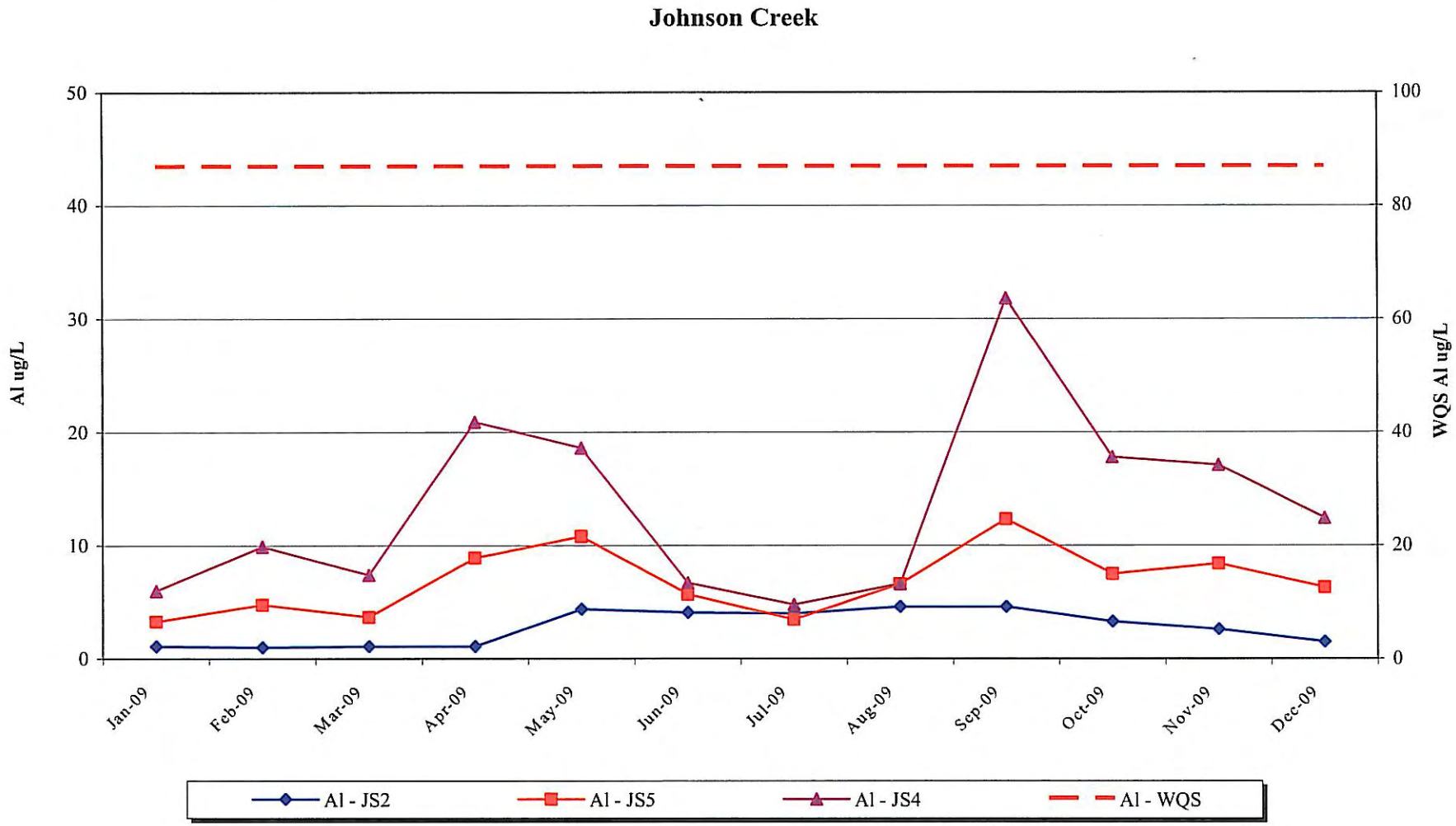


Figure 6c: Johnson Creek Monitoring Results 2009, Trace Chemistry



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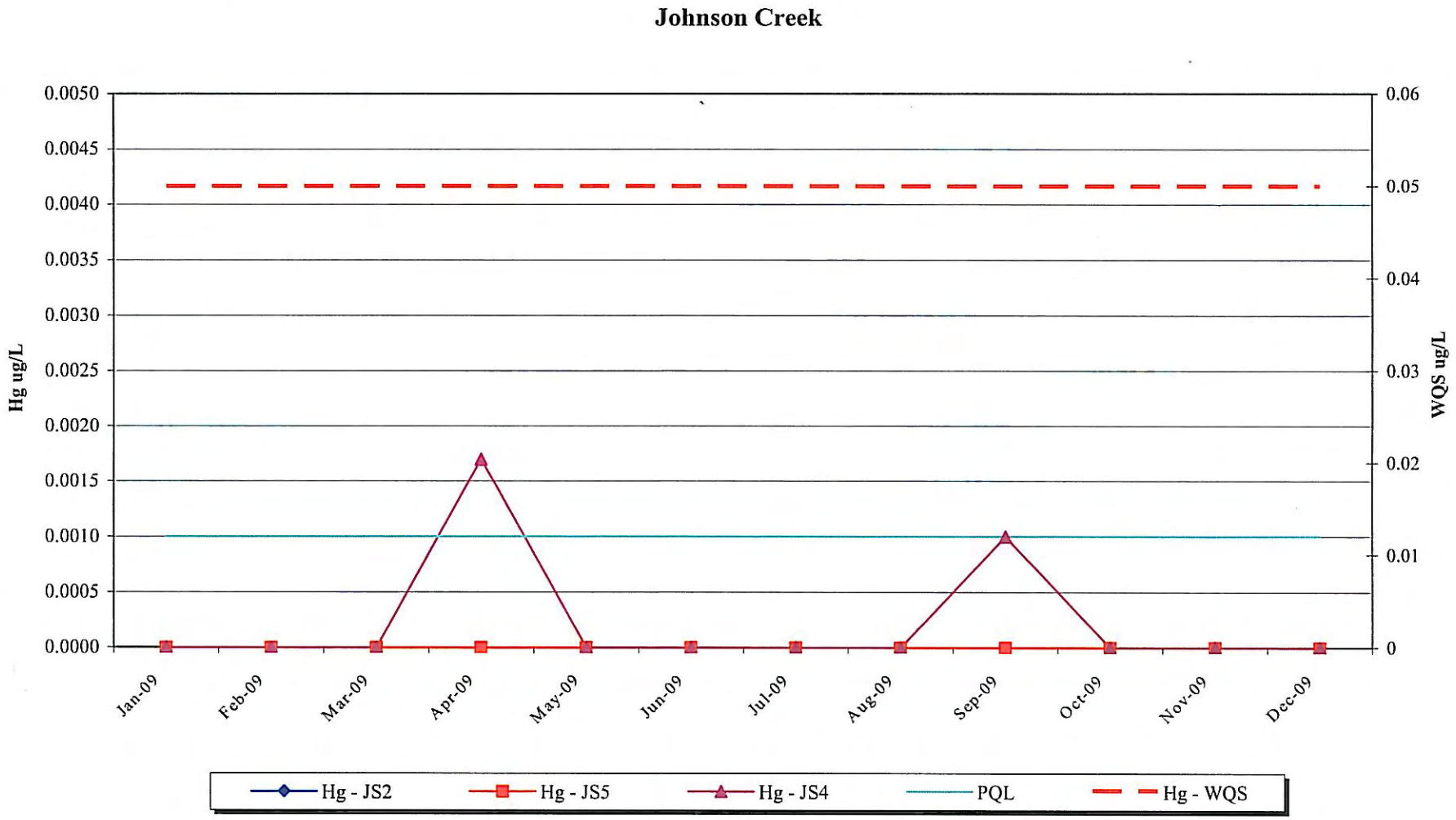
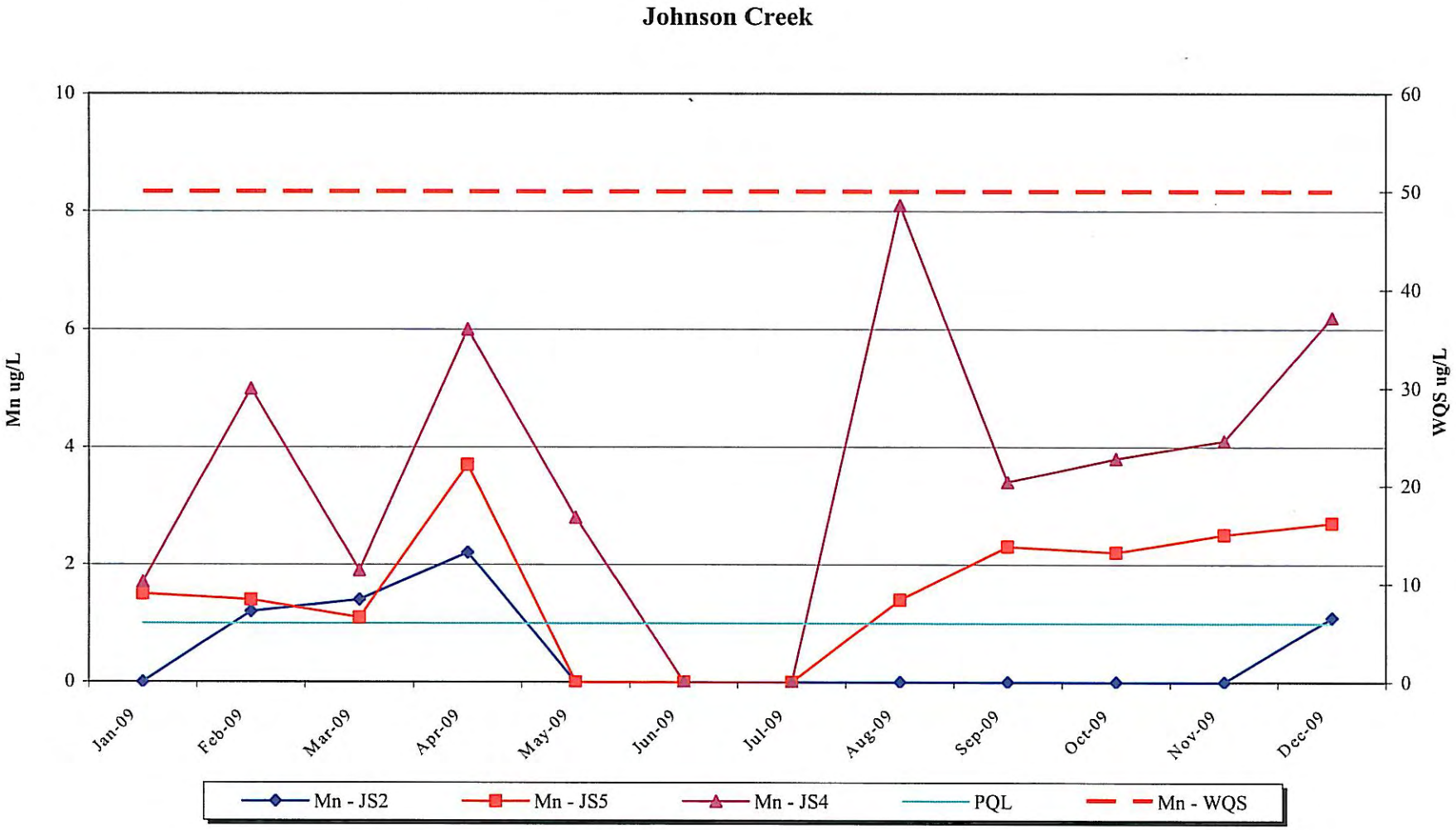


Figure 6c: Johnson Creek Monitoring Results 2009, Trace Chemistry



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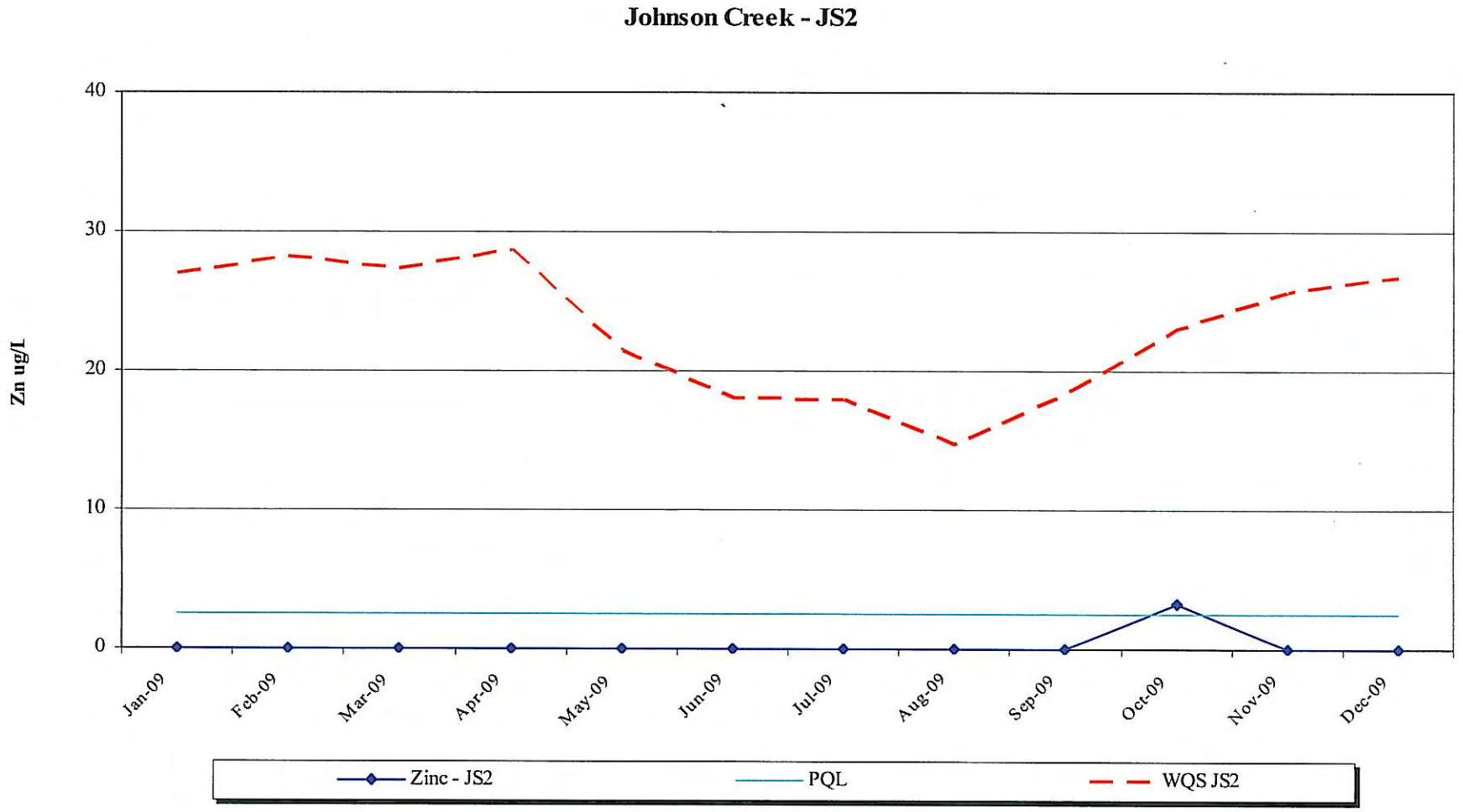


Figure 6c: Johnson Creek Monitoring Results 2009, Trace Chemistry

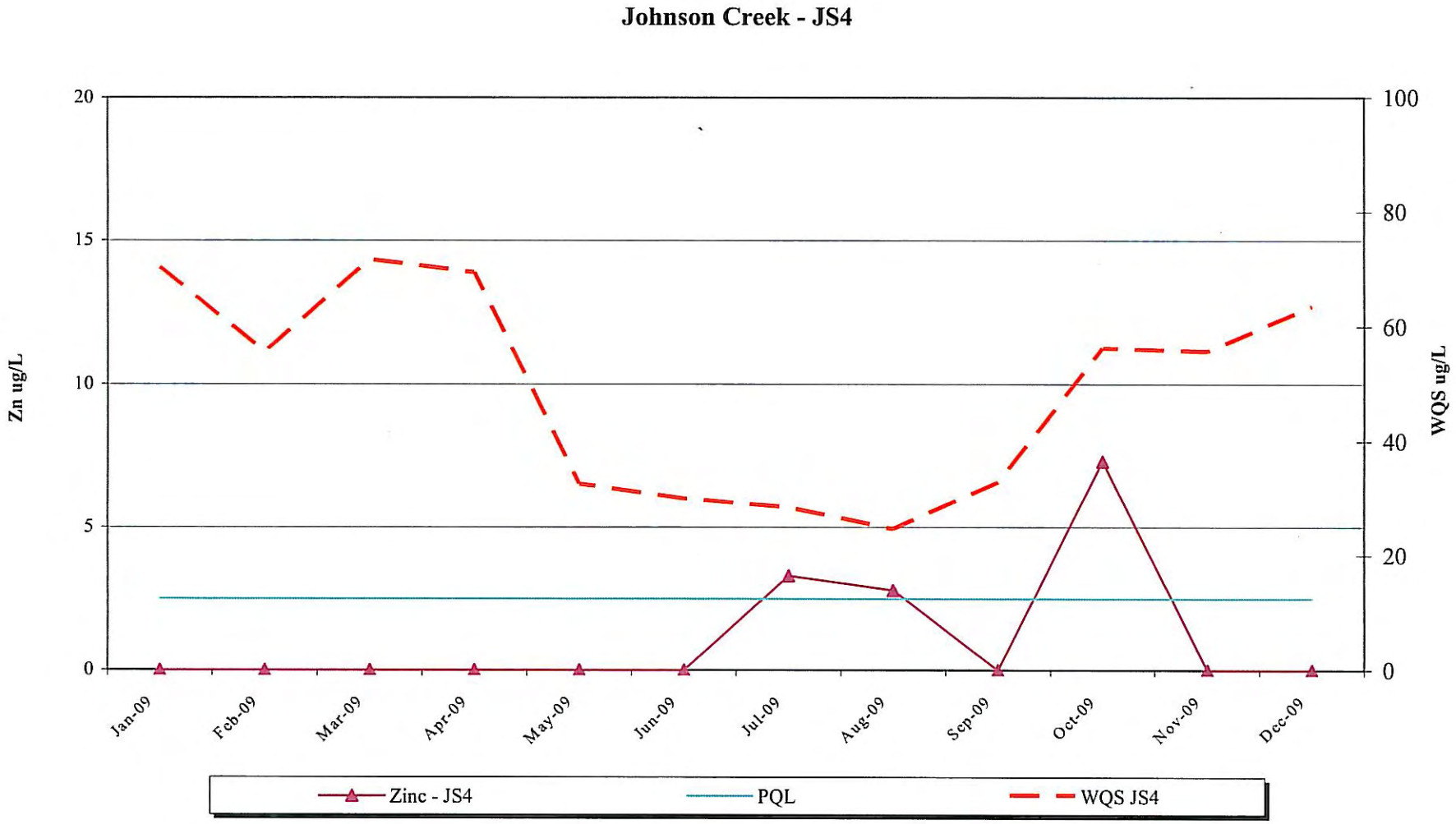


Figure 6c: Johnson Creek Monitoring Results 2009, Trace Chemistry

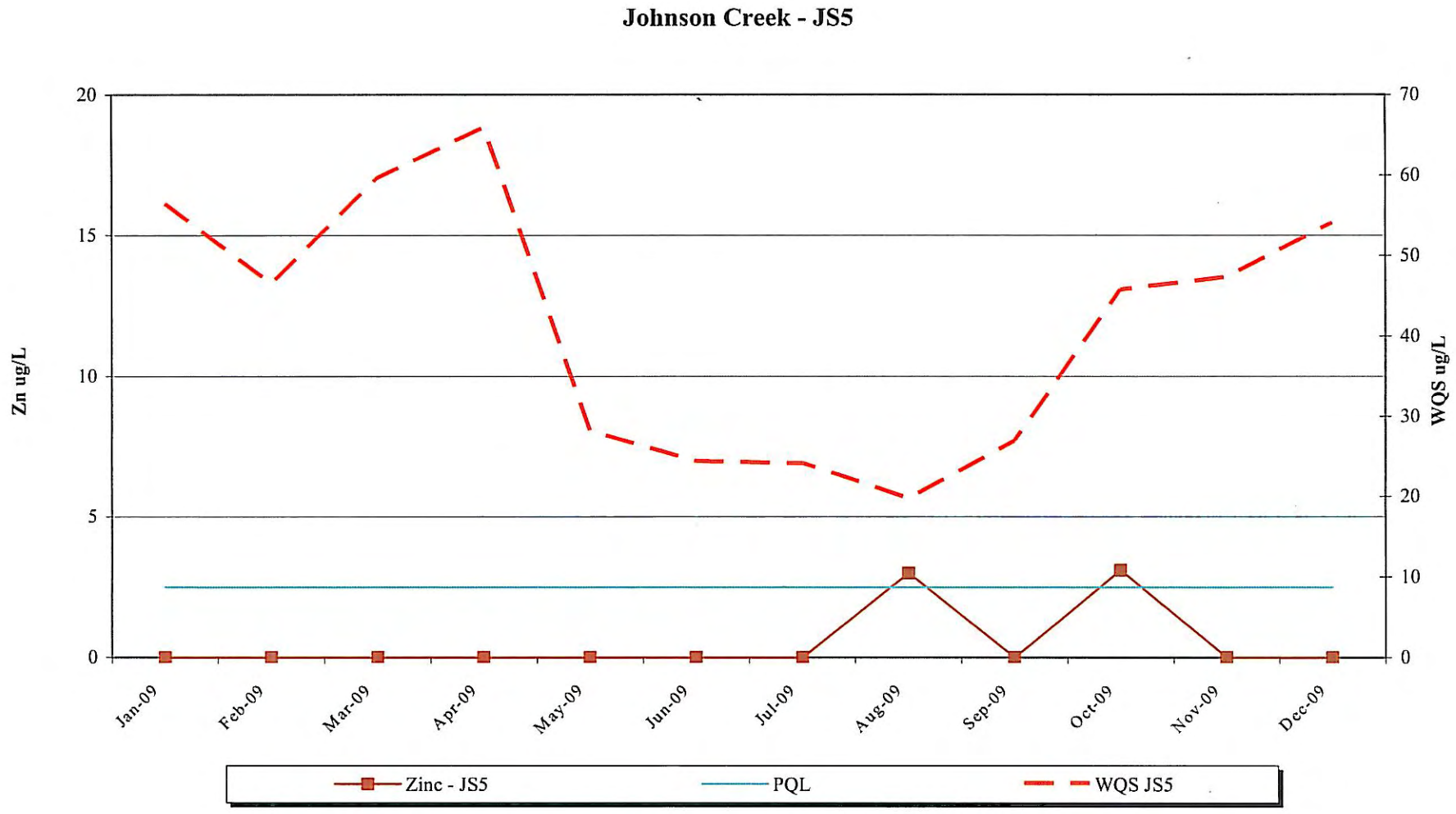


Figure 7a: Slate Creek Monitoring Results 2009, Field Parameters

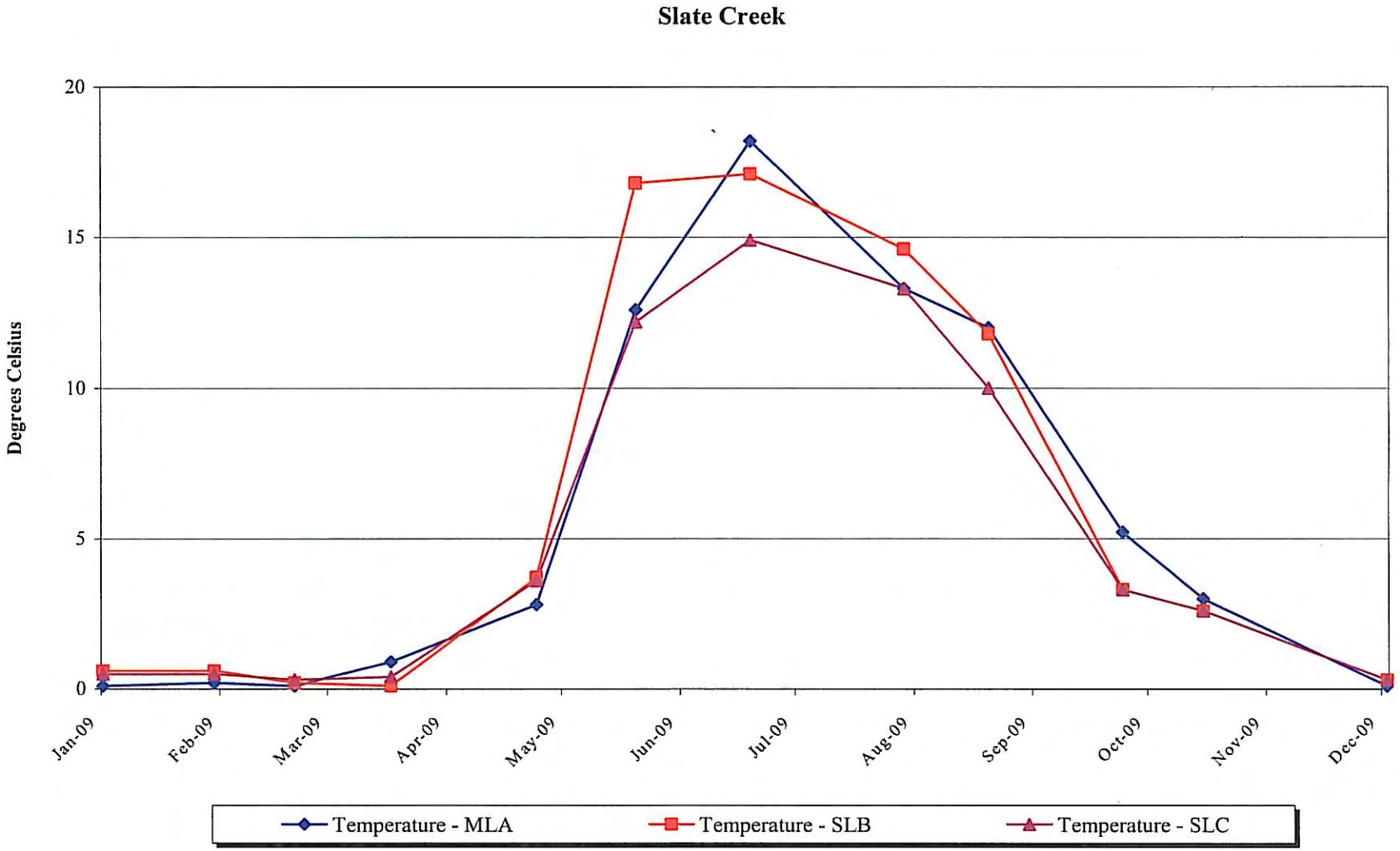


Figure 7a: Slate Creek Monitoring Results 2009, Field Parameters

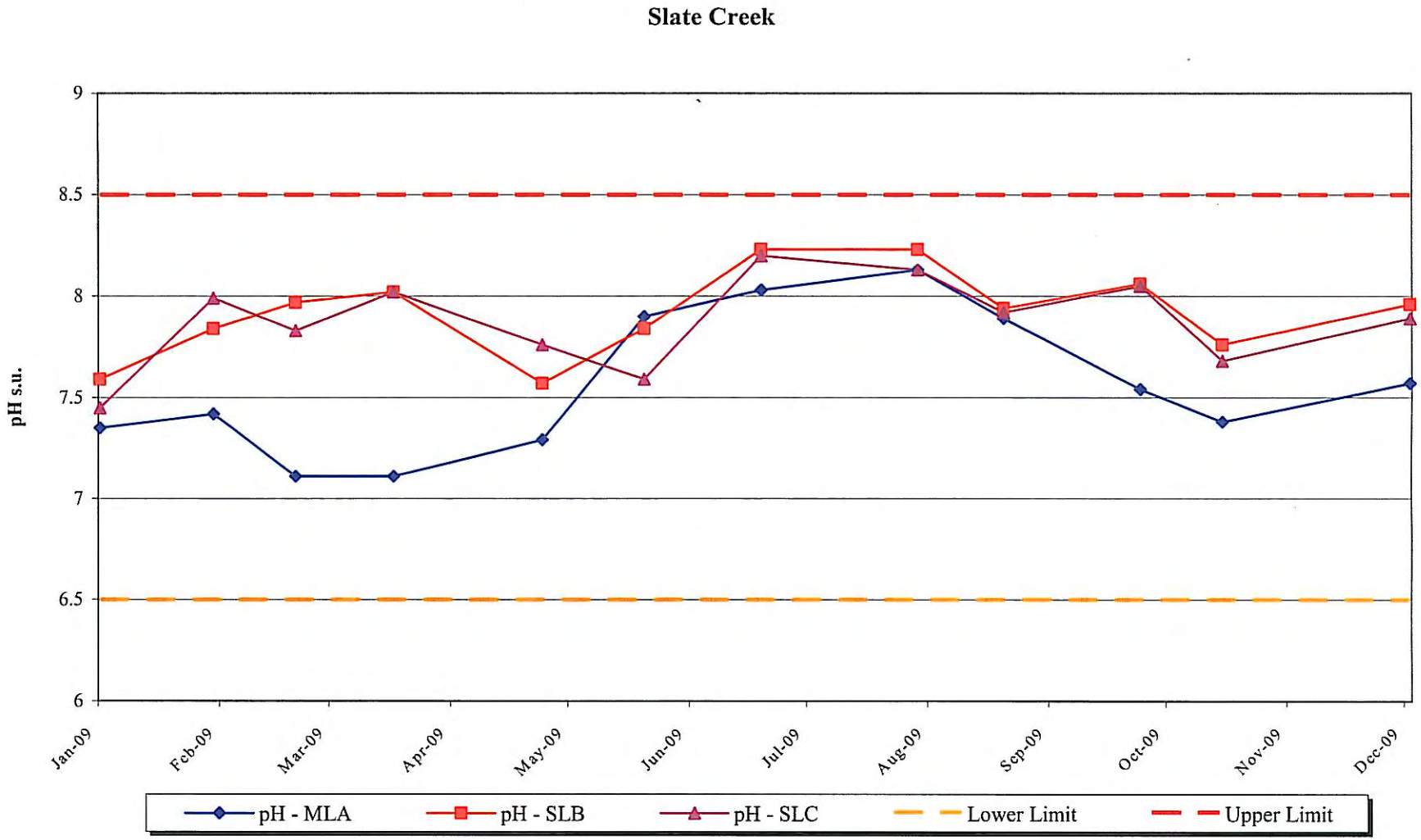


Figure 7a: Slate Creek Monitoring Results 2009, Field Parameters

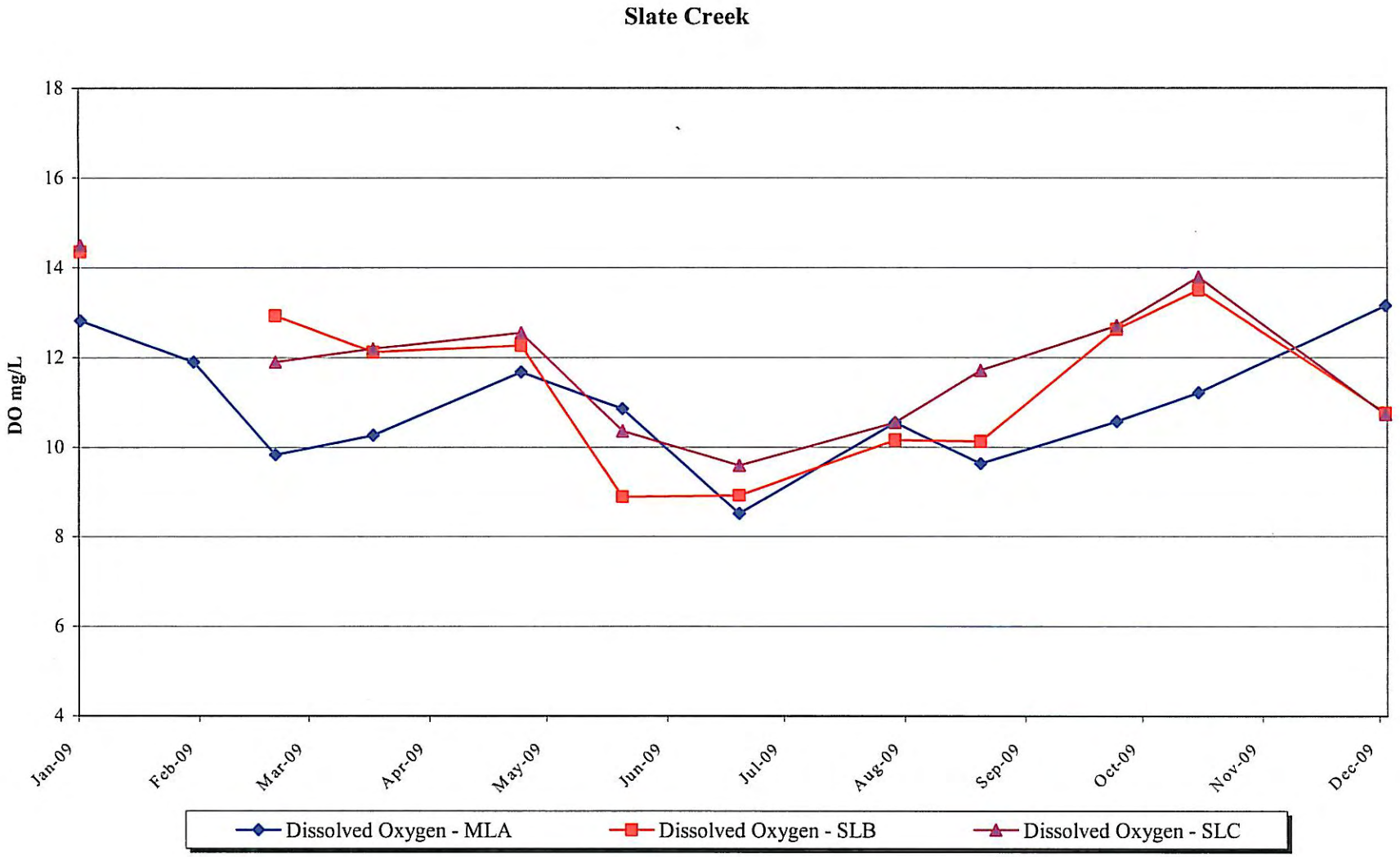


Figure 7a: Slate Creek Monitoring Results 2009, Field Parameters

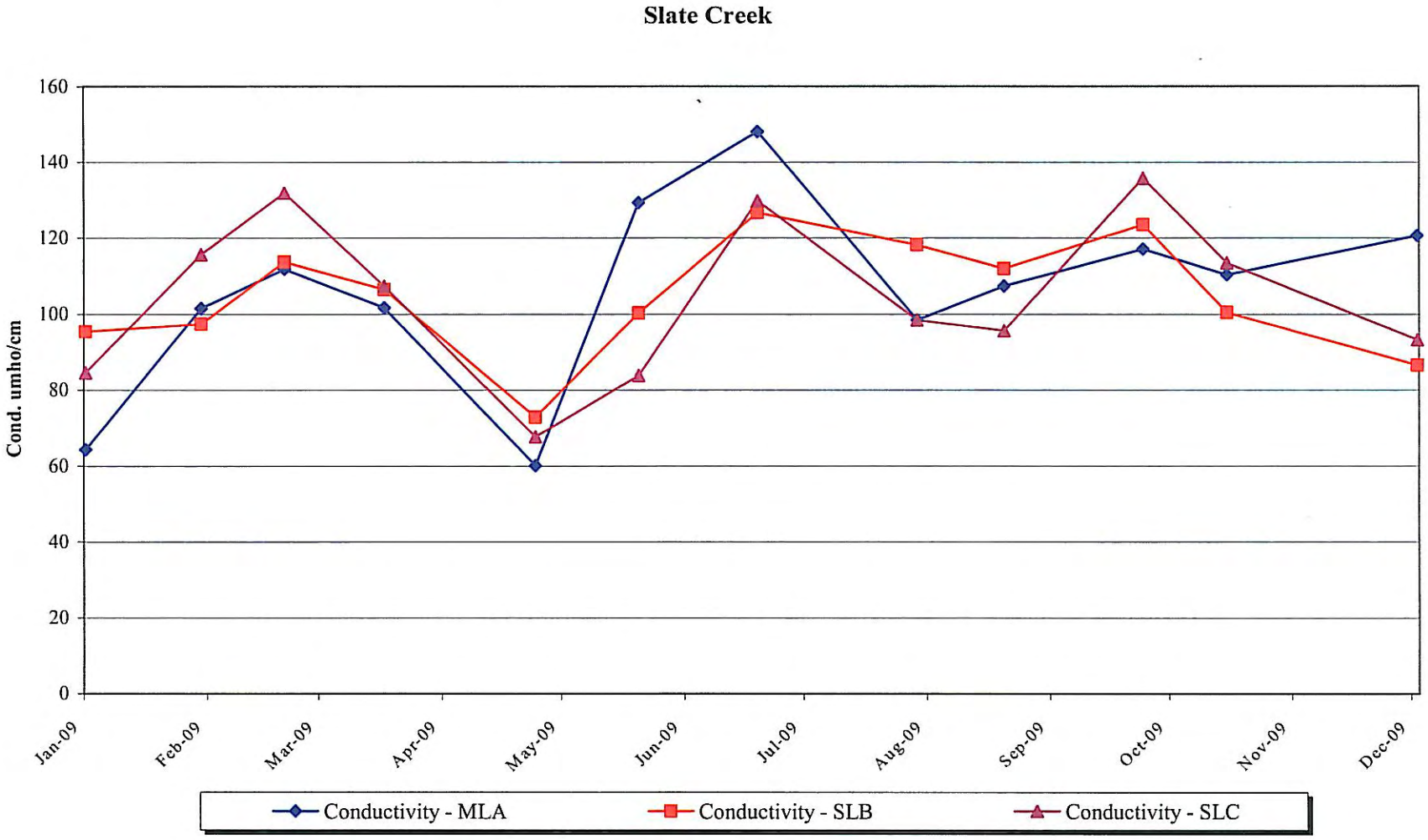


Figure 7b: Slate Creek Monitoring Results 2009, Major Chemistry

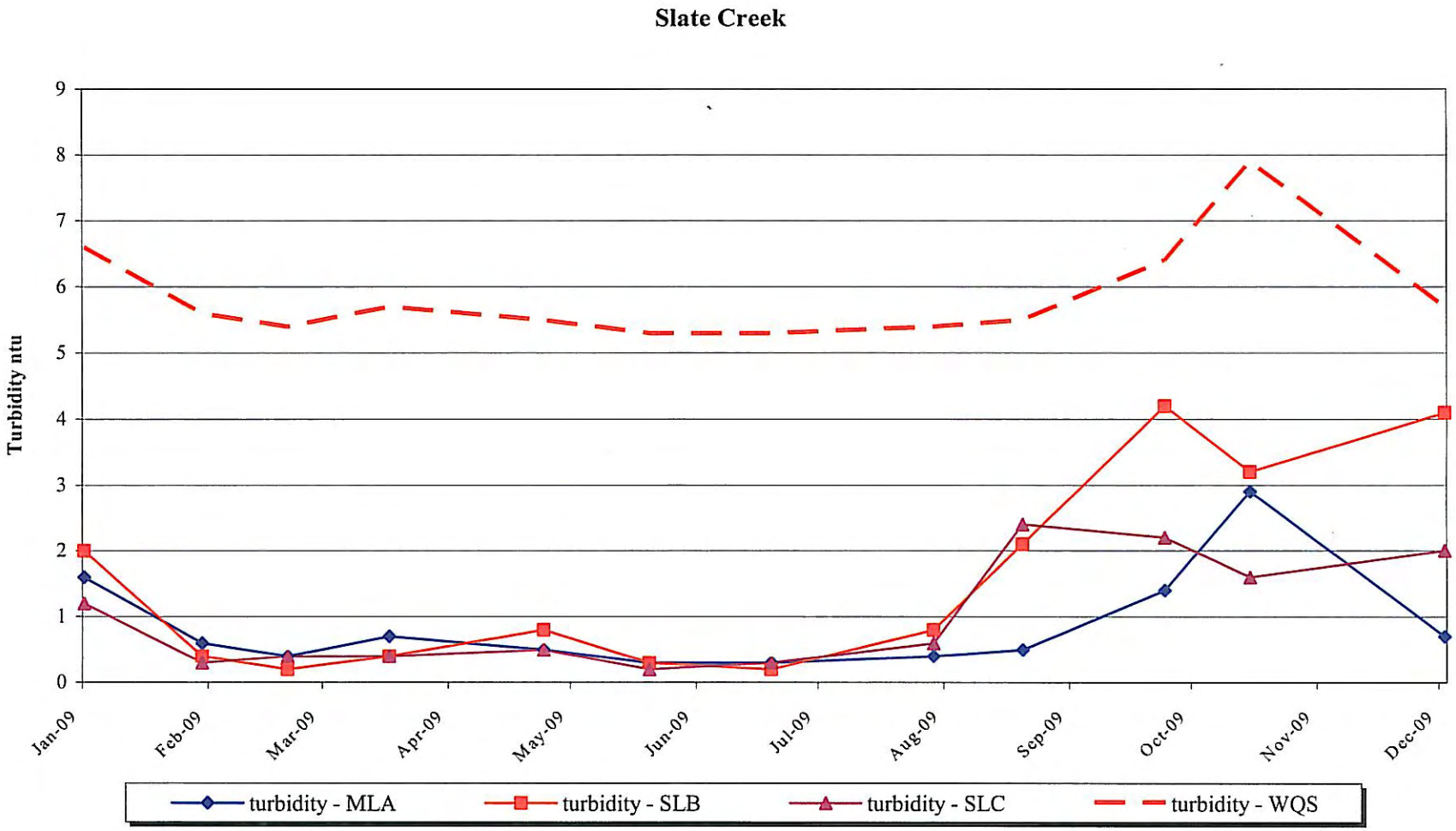


Figure 7b: Slate Creek Monitoring Results 2009, Major Chemistry

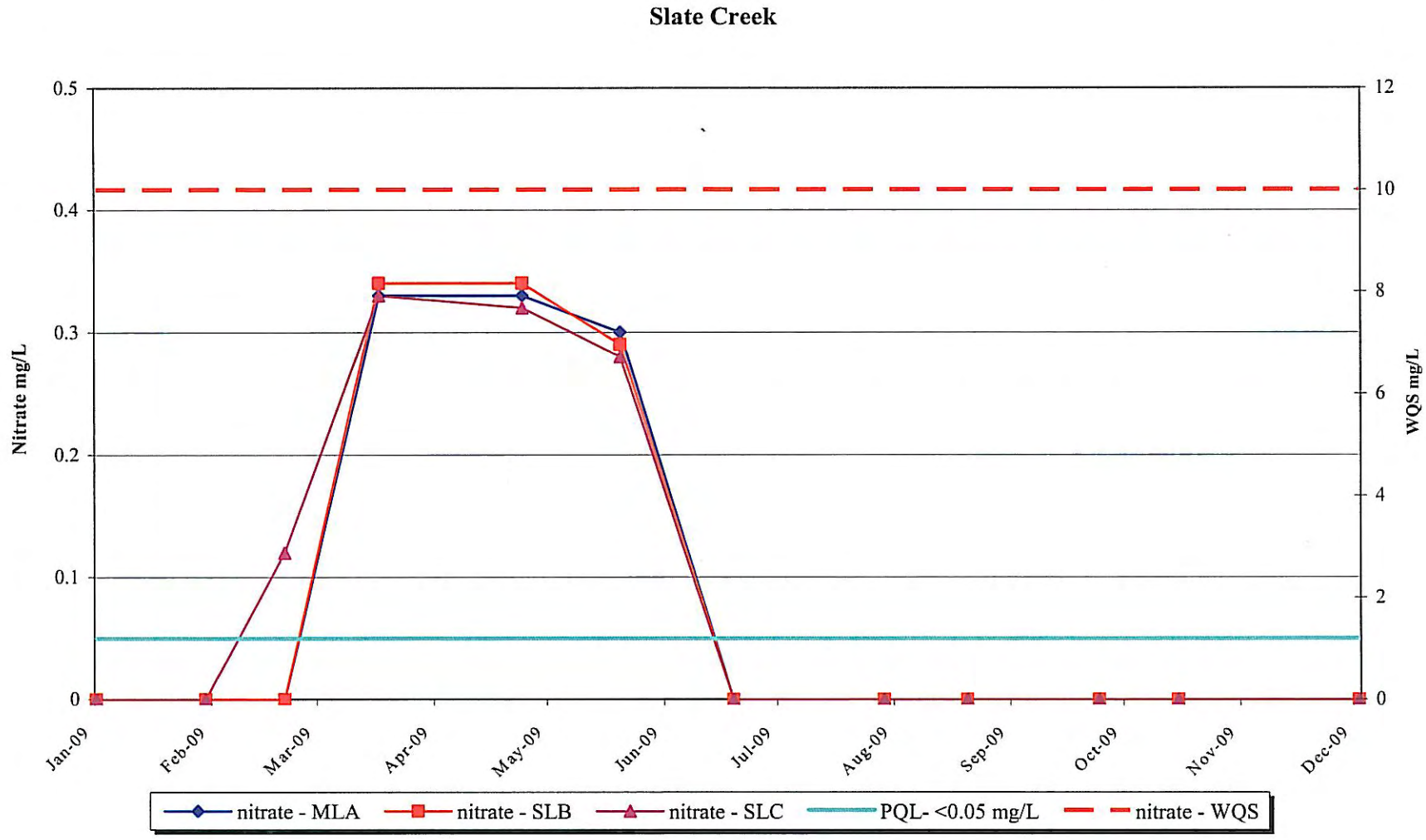


Figure 7b: Slate Creek Monitoring Results 2009, Major Chemistry

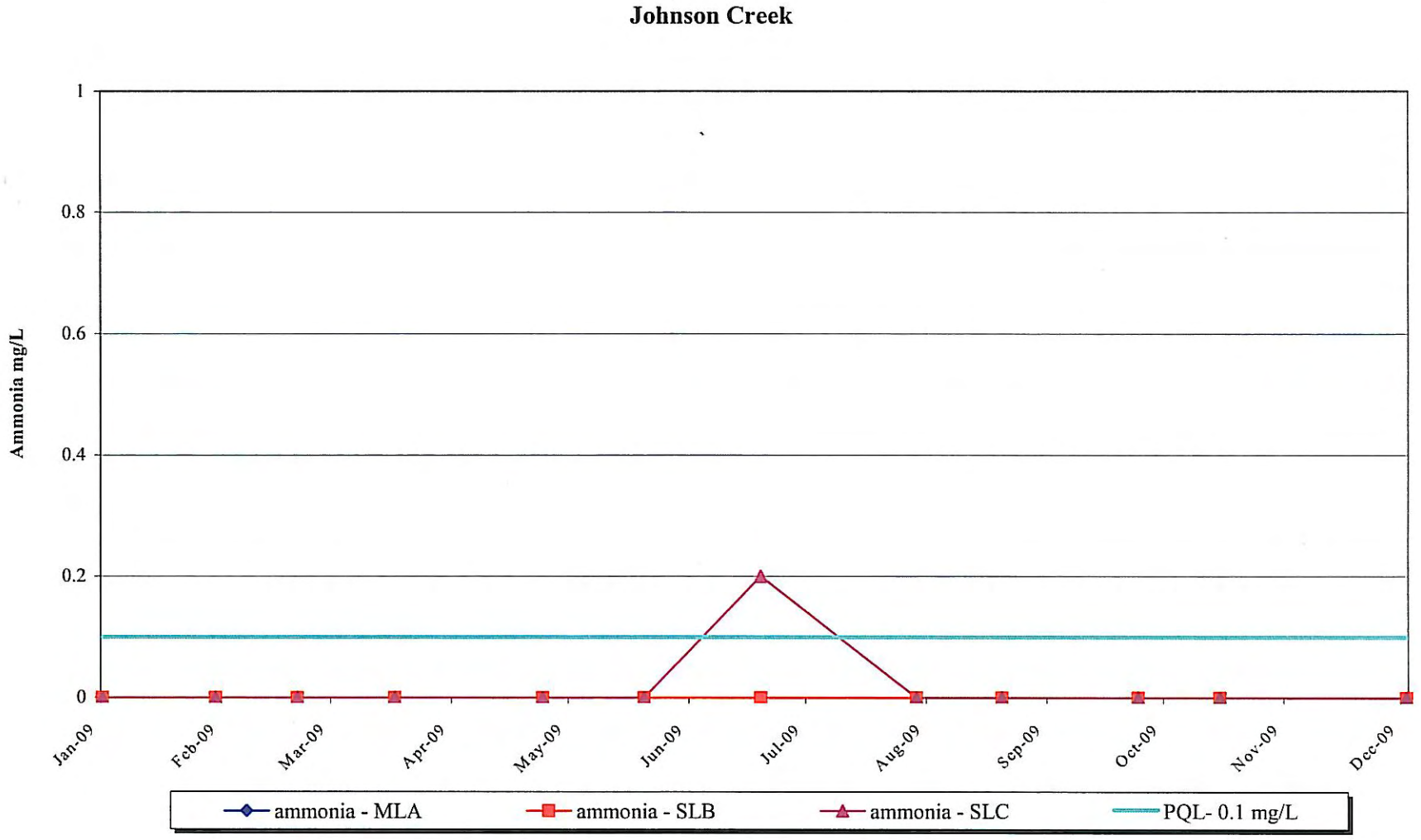


Figure 7b: Slate Creek Monitoring Results 2009, Major Chemistry

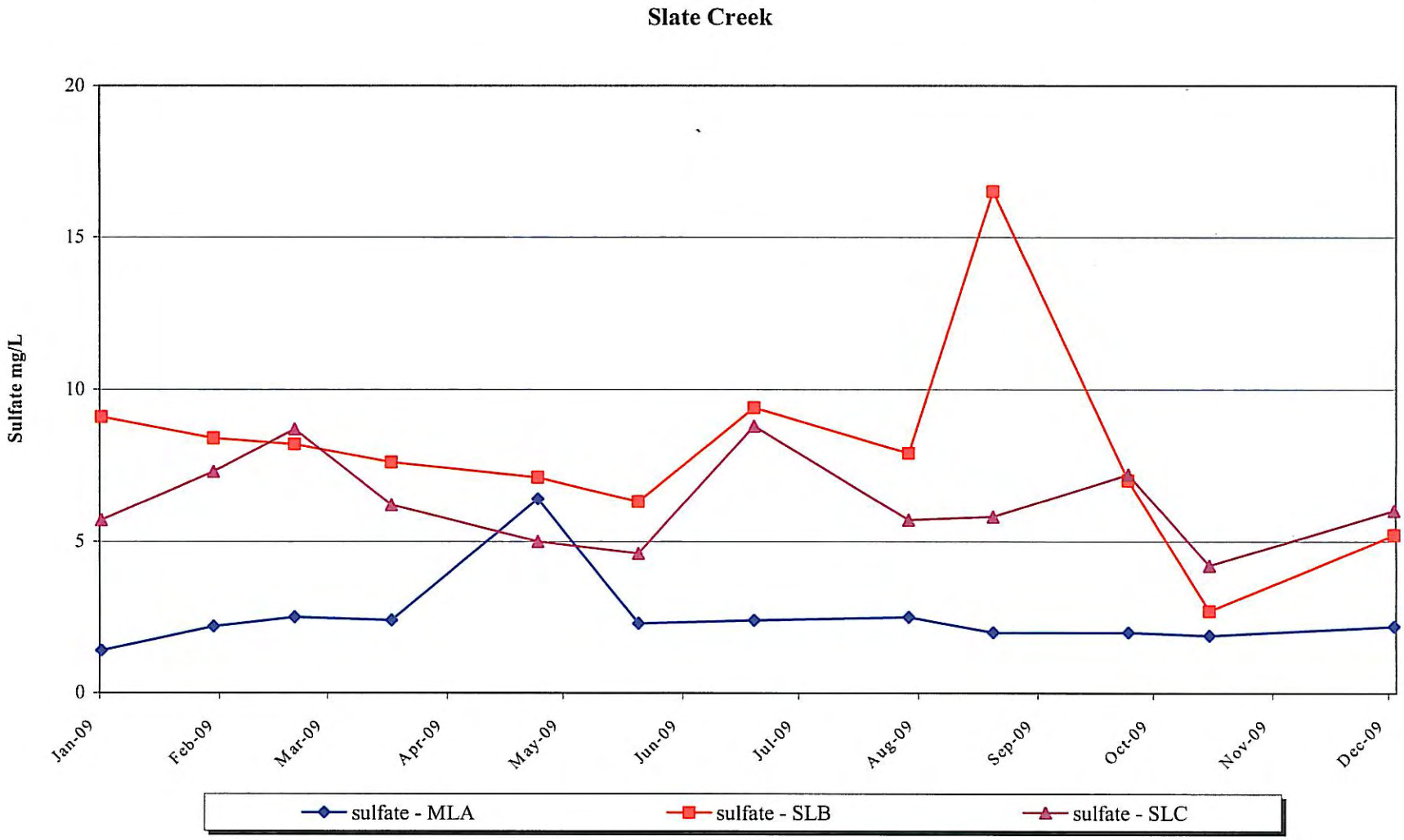
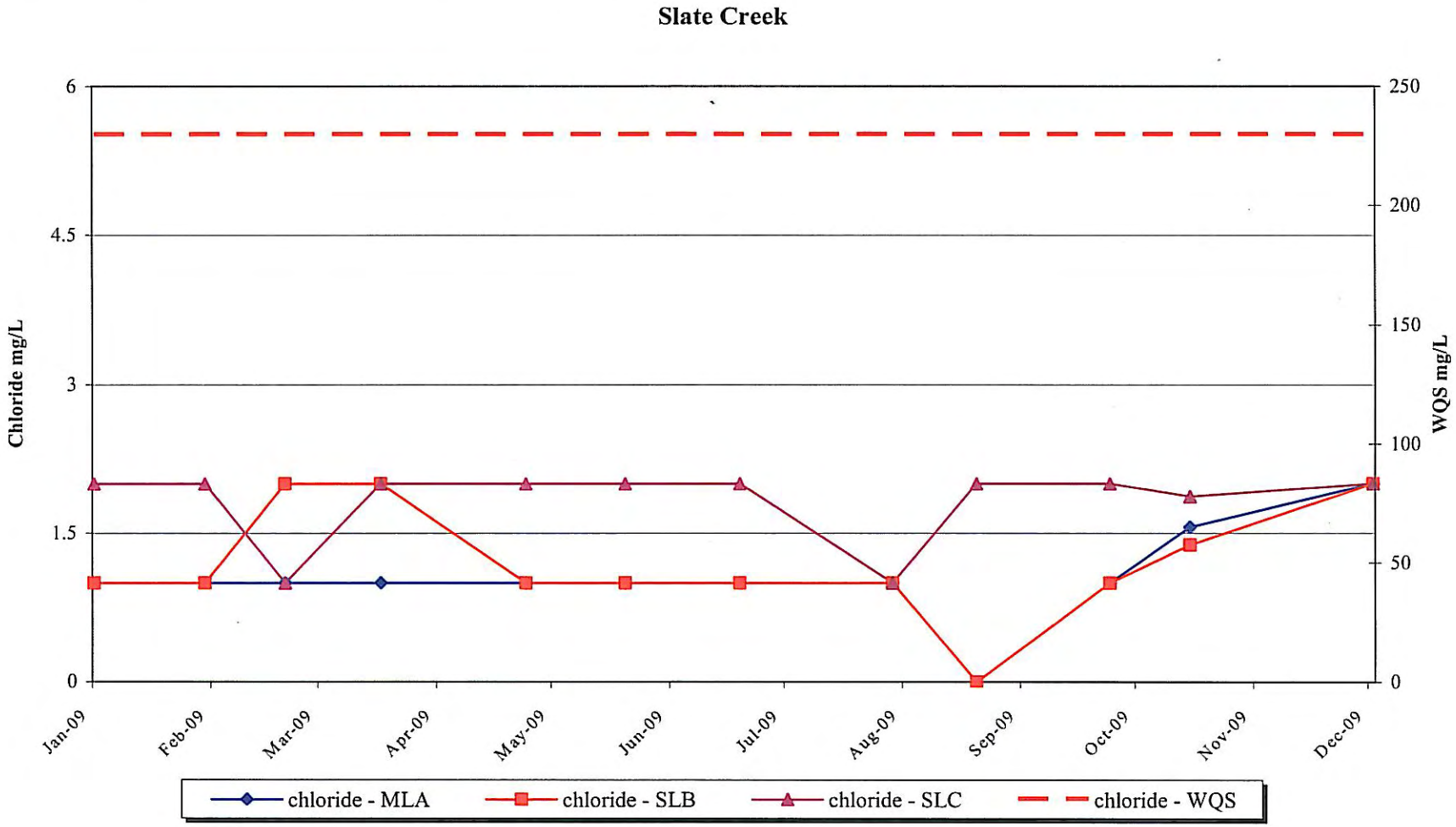


Figure 7b: Slate Creek Monitoring Results 2009, Major Chemistry



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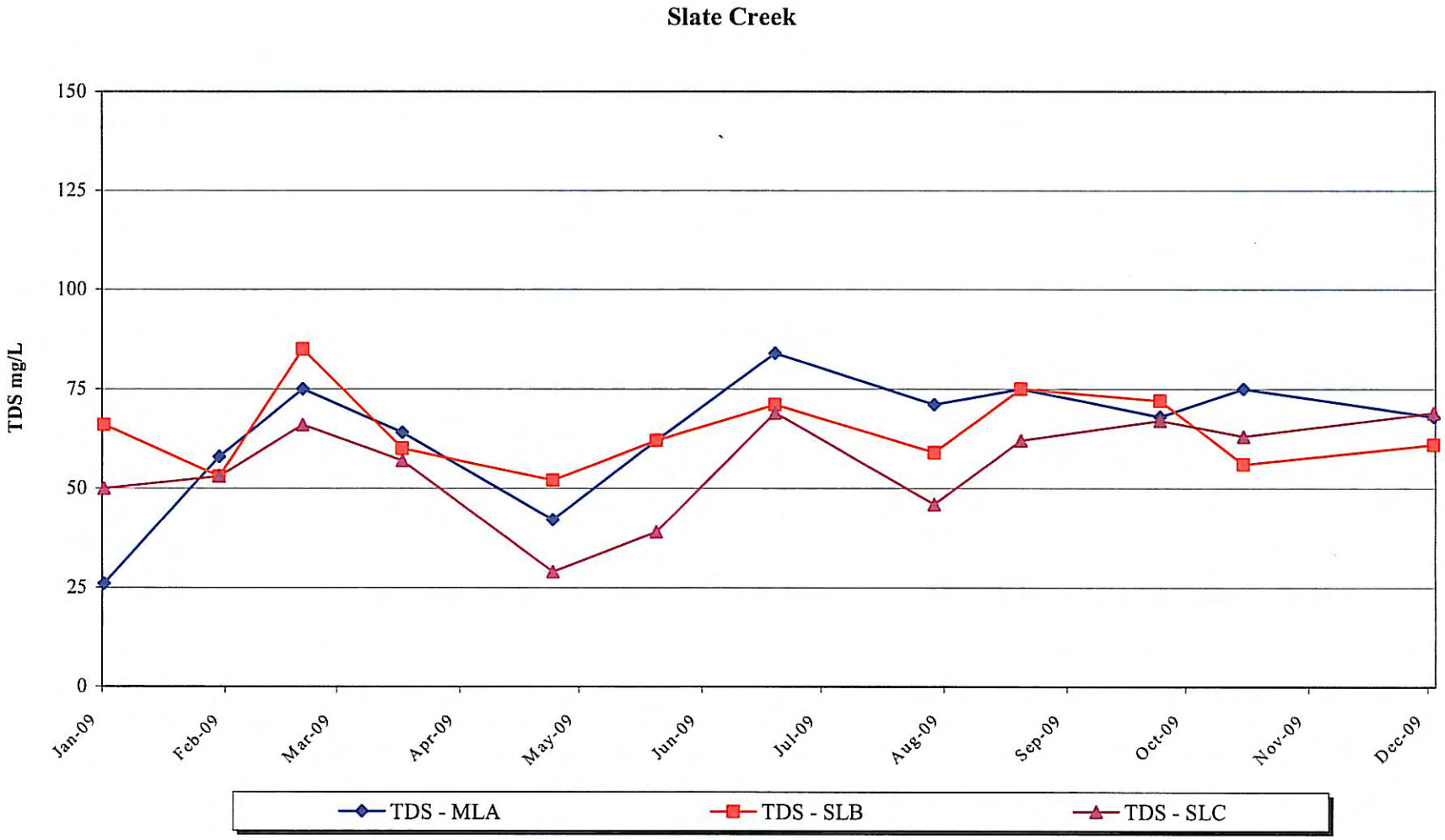

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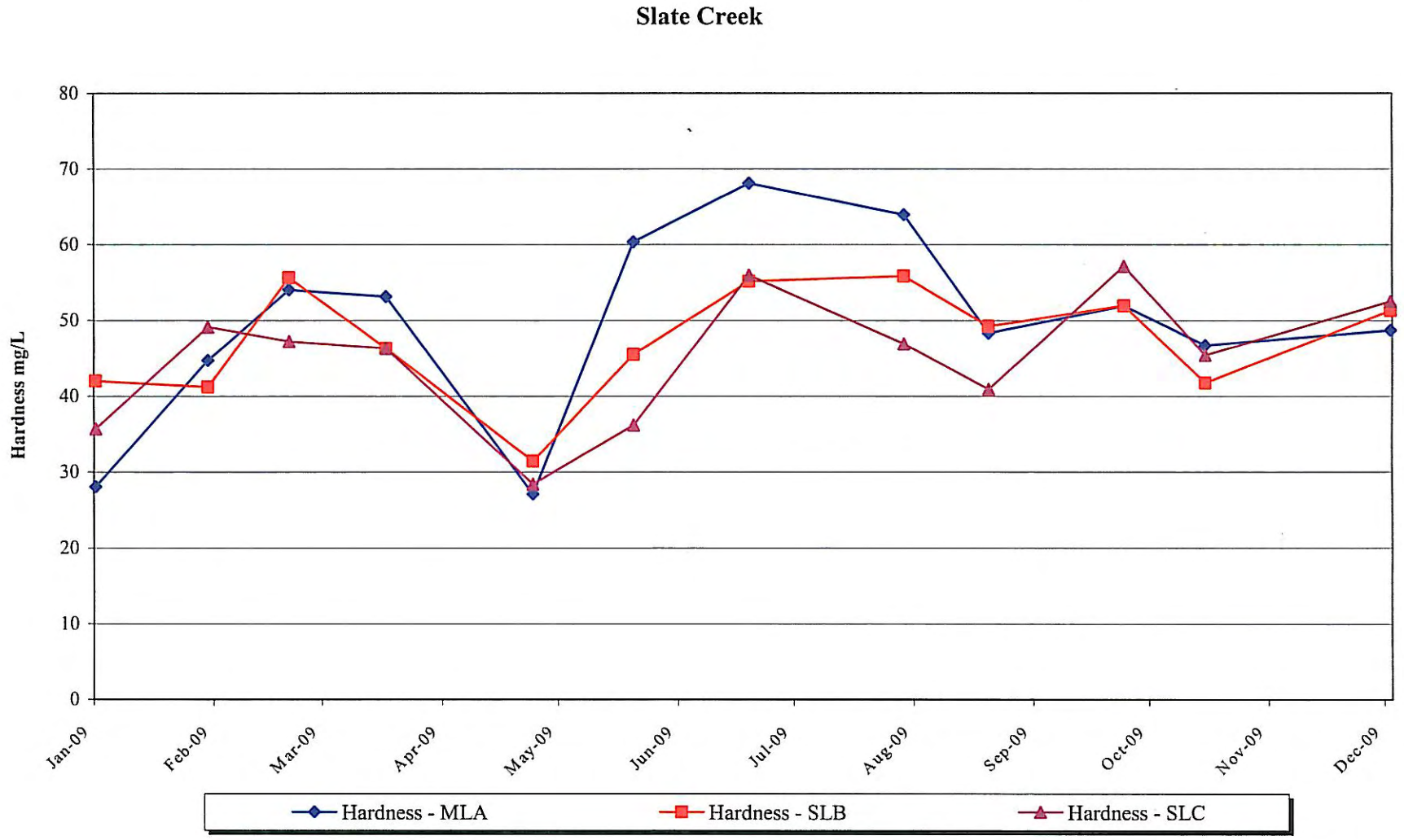
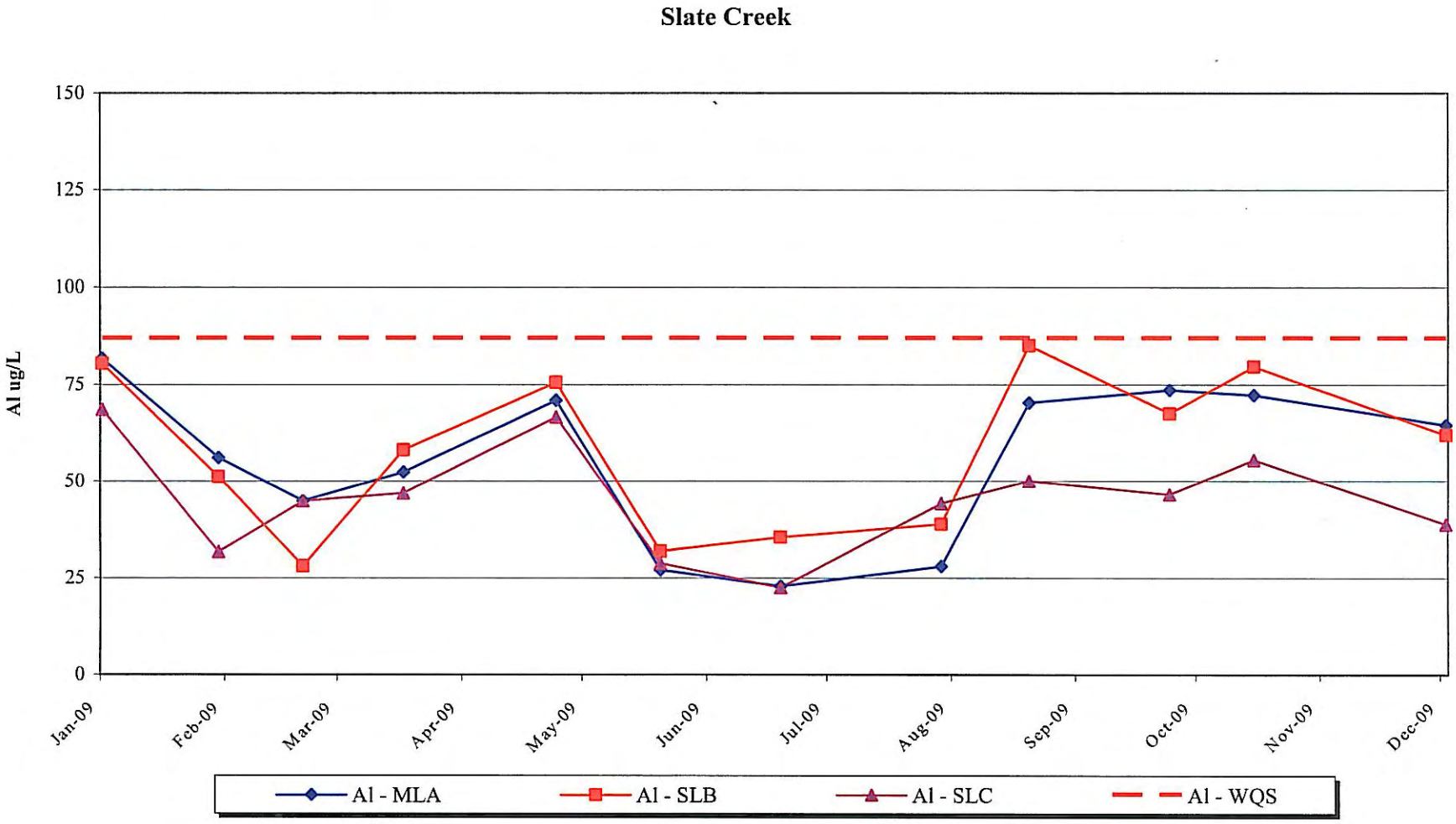


Figure 7b: Slate Creek Monitoring Results 2009, Major Chemistry

Figure 7c: Slate Creek Monitoring Results 2009, Trace Chemistry



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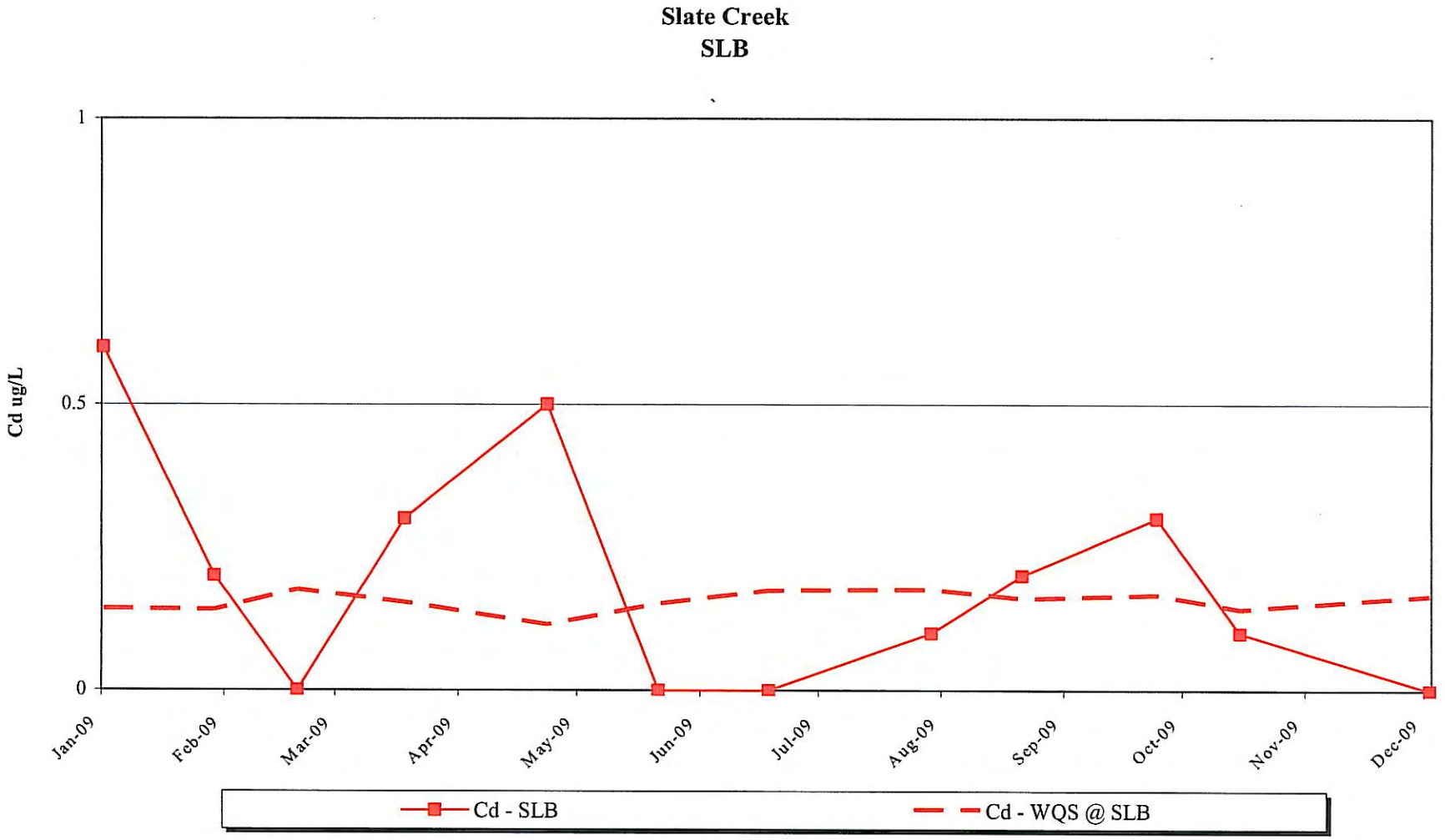

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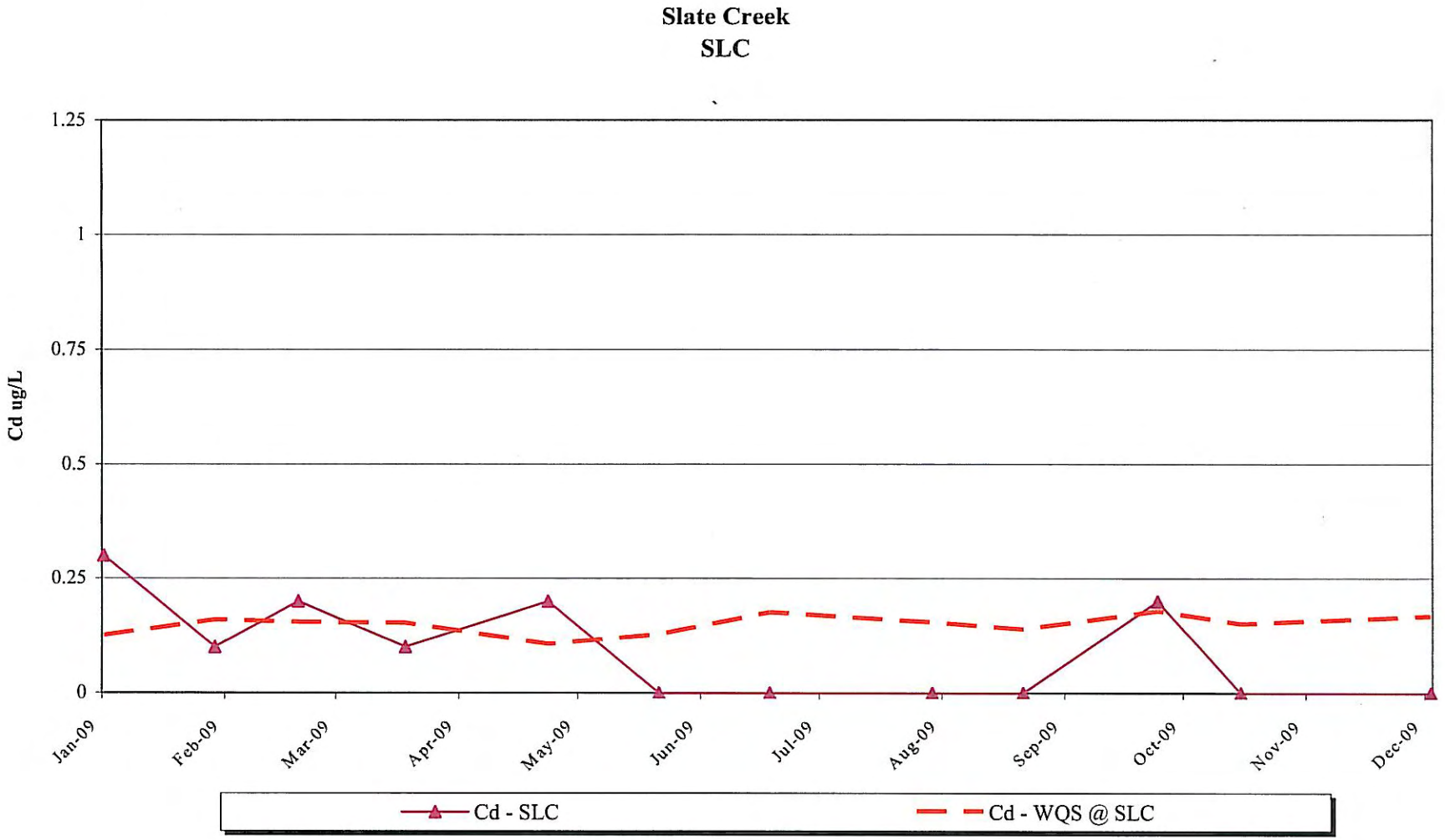

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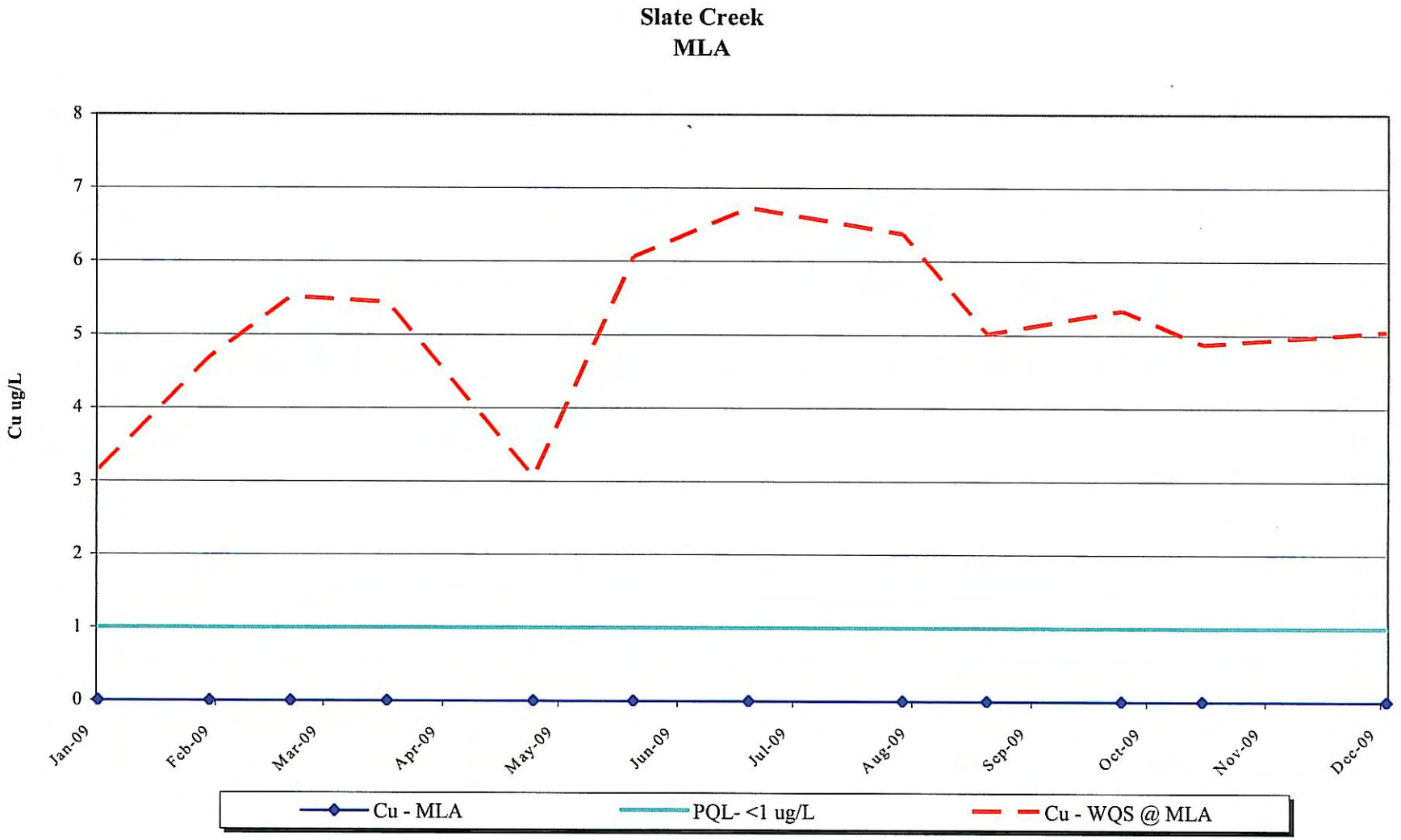

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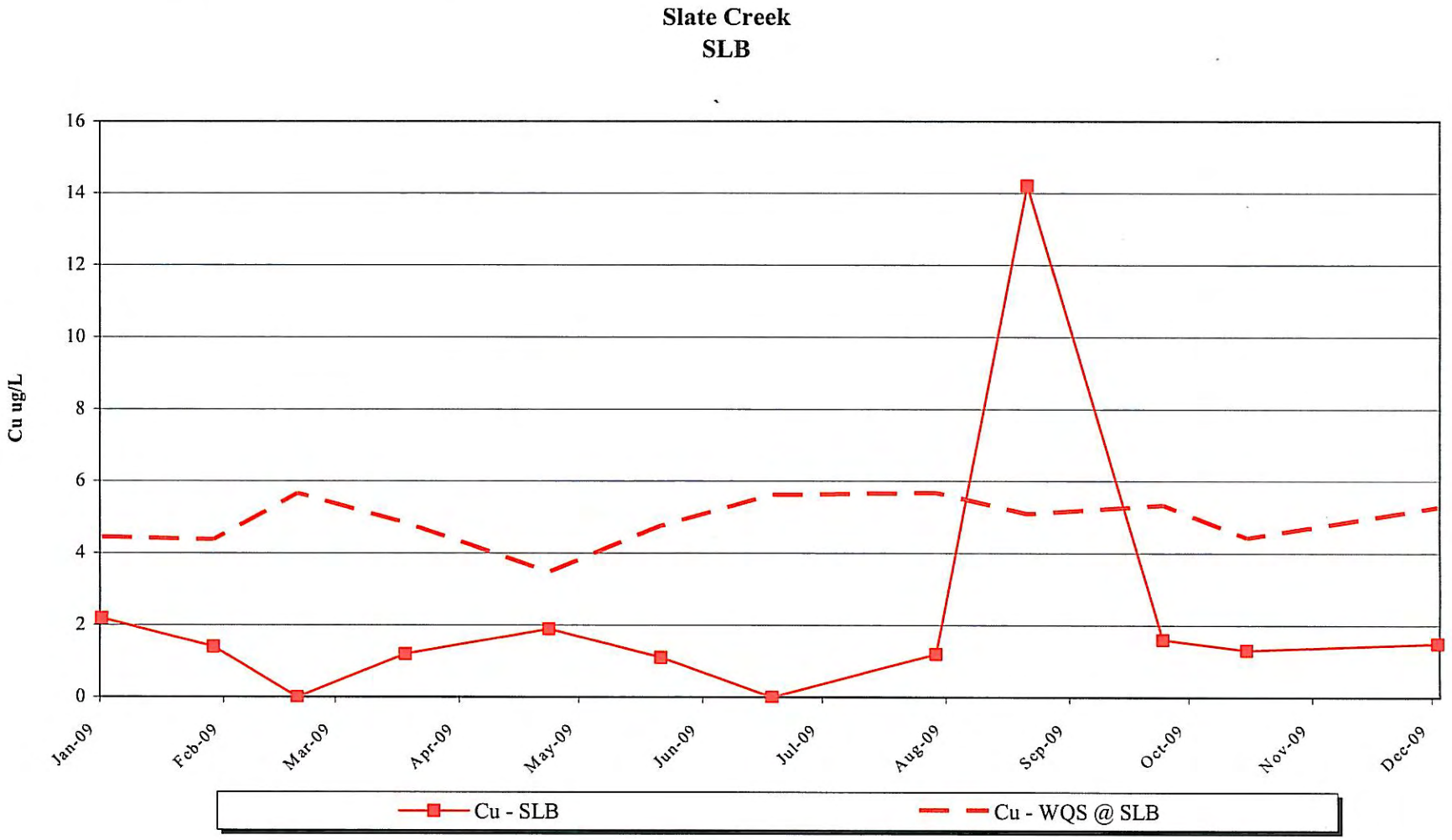

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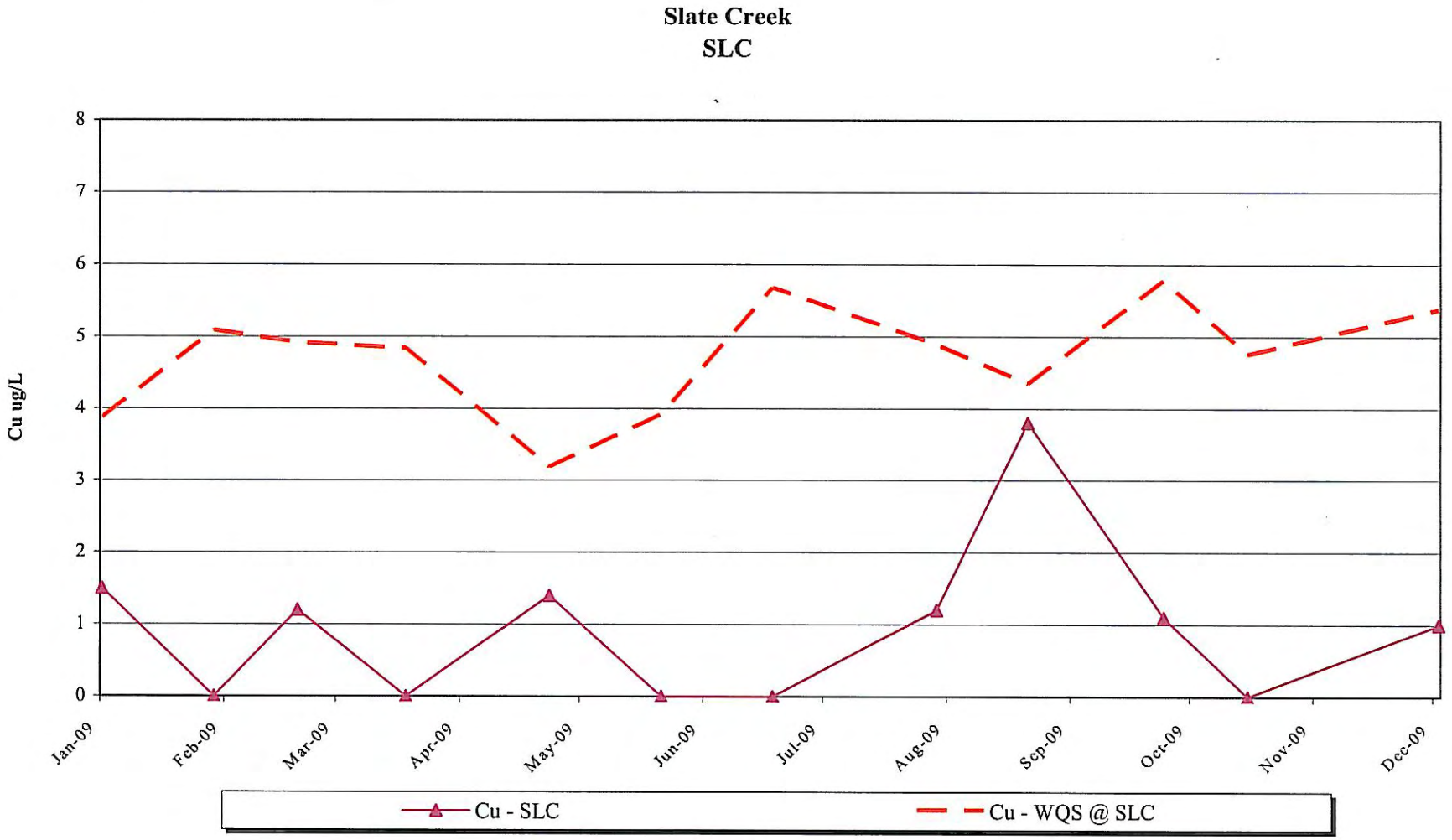

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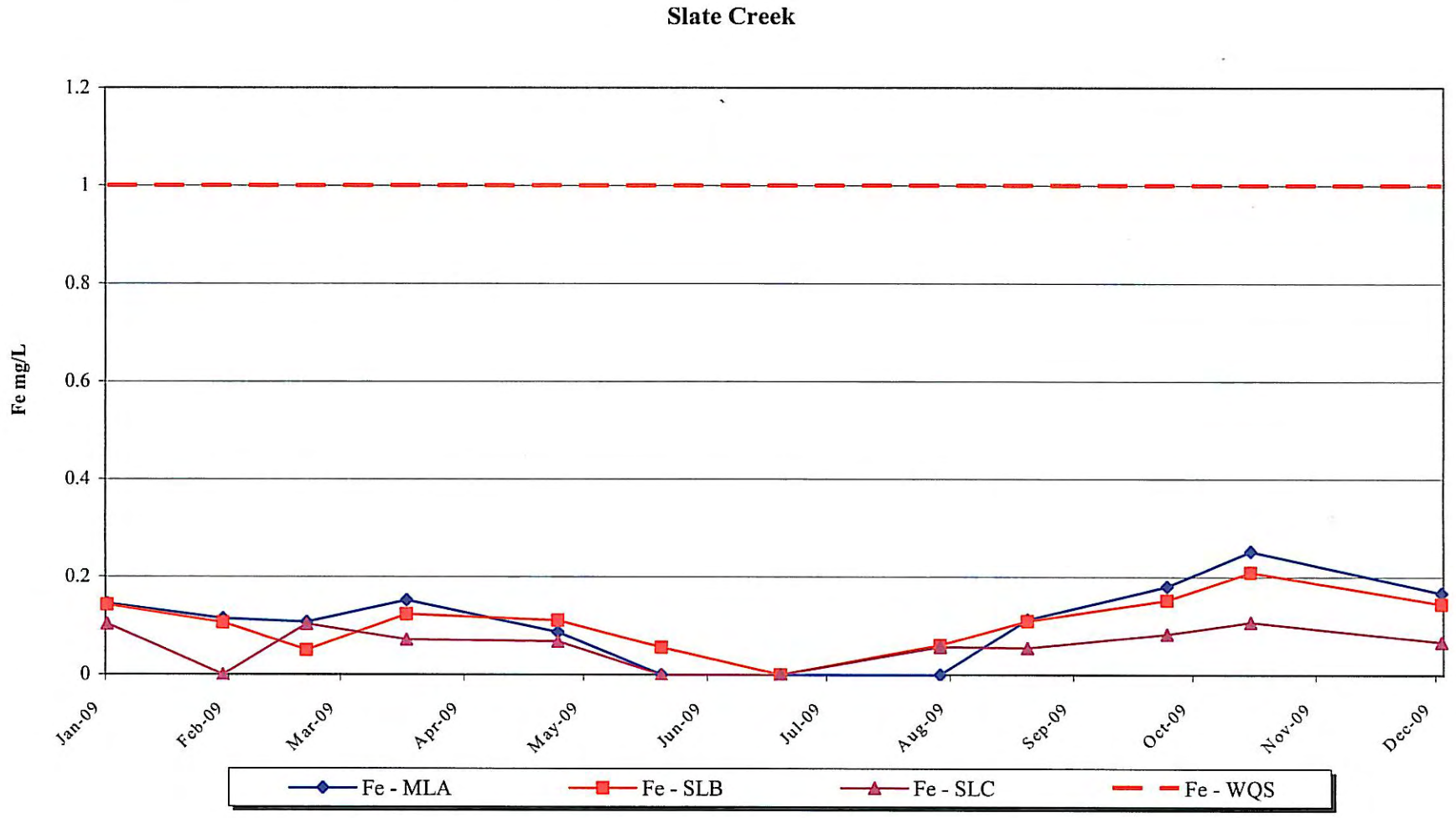

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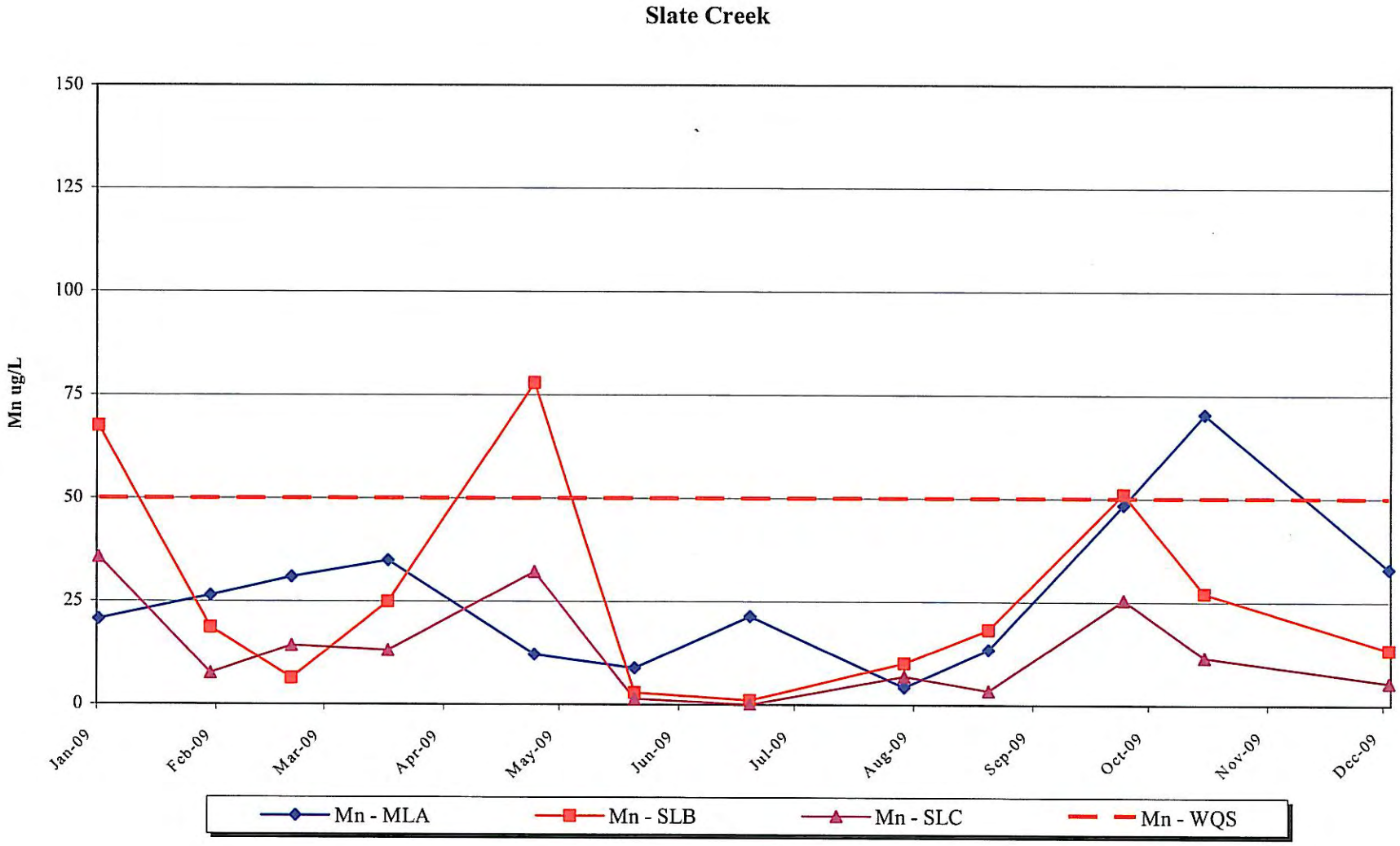

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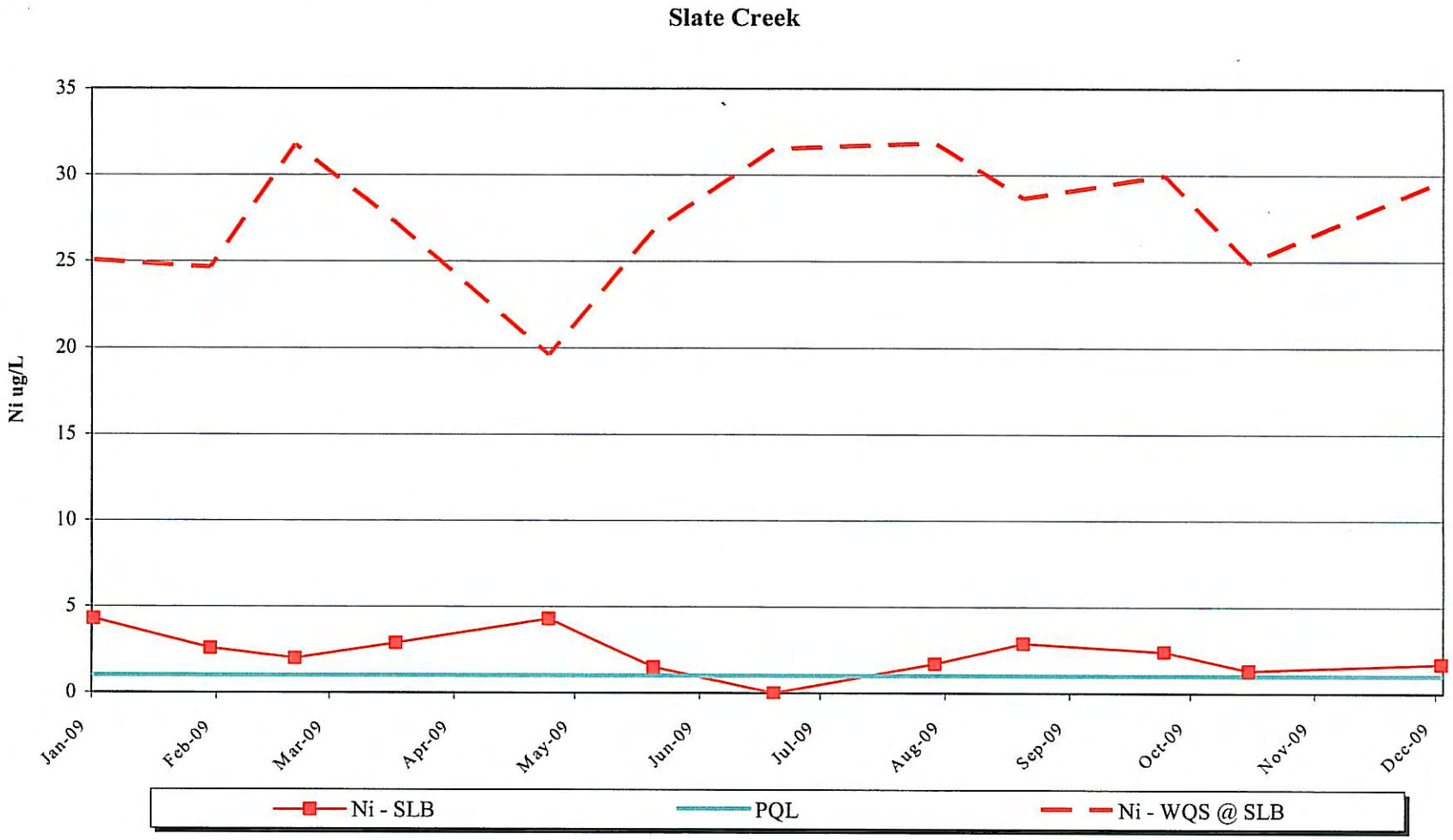

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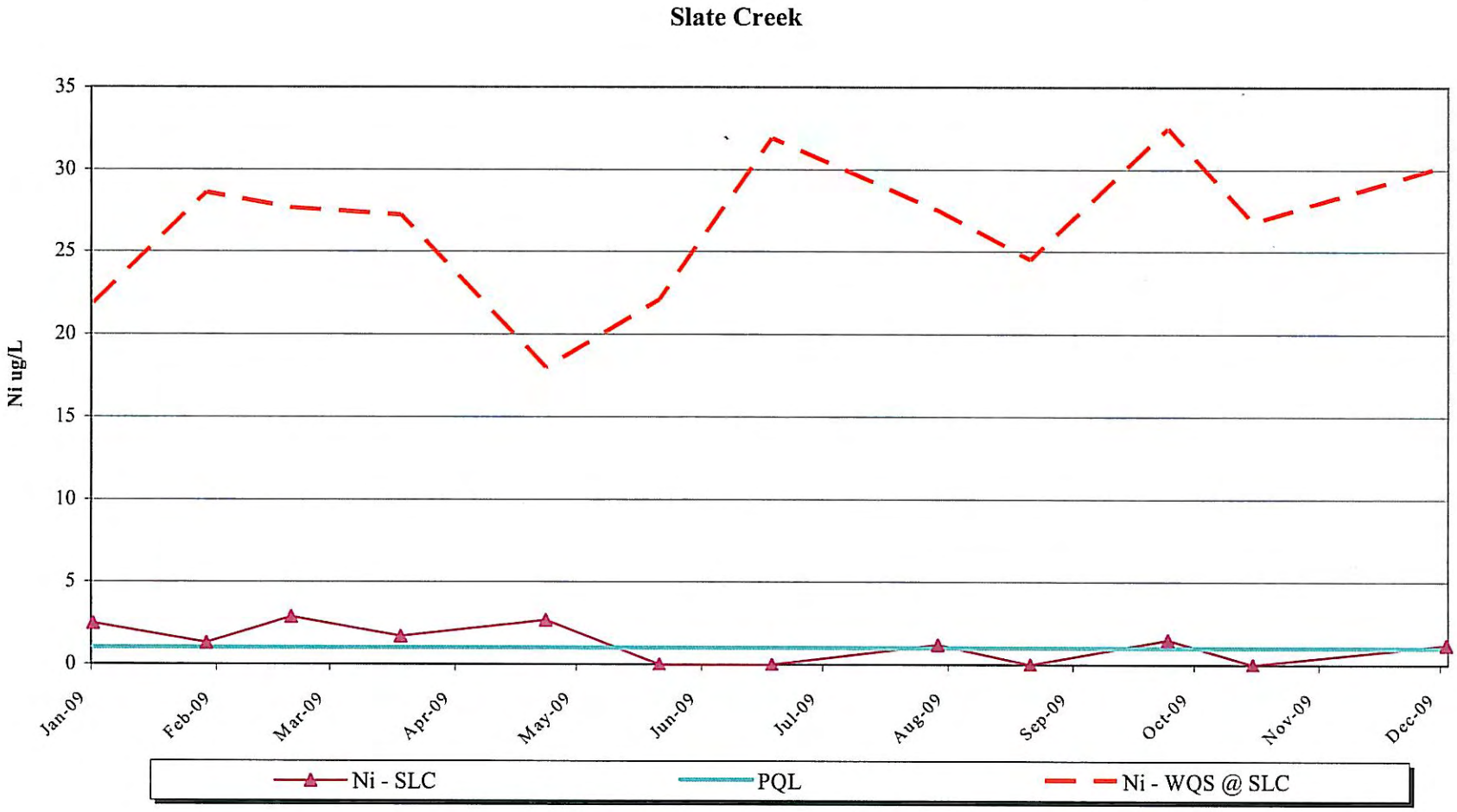

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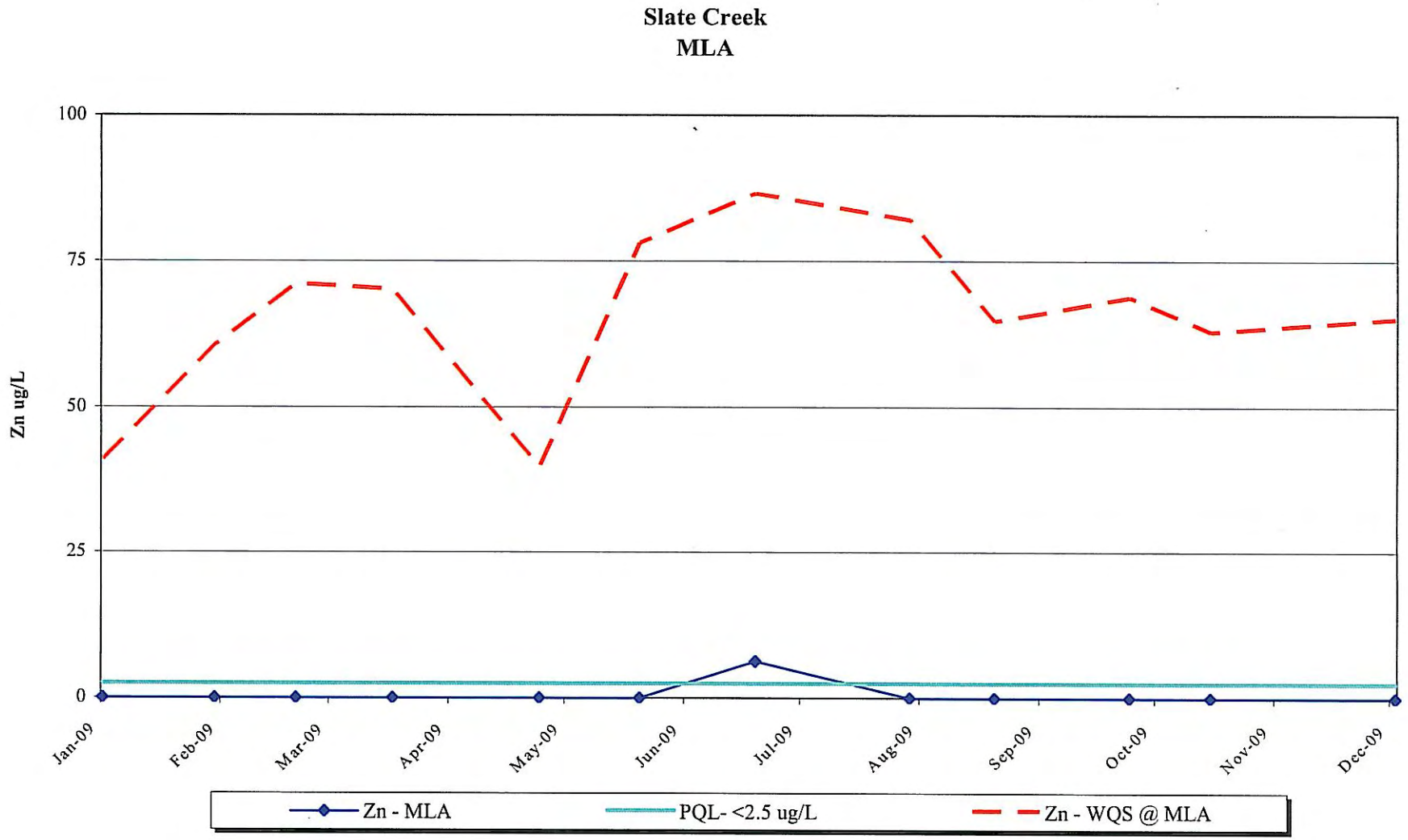

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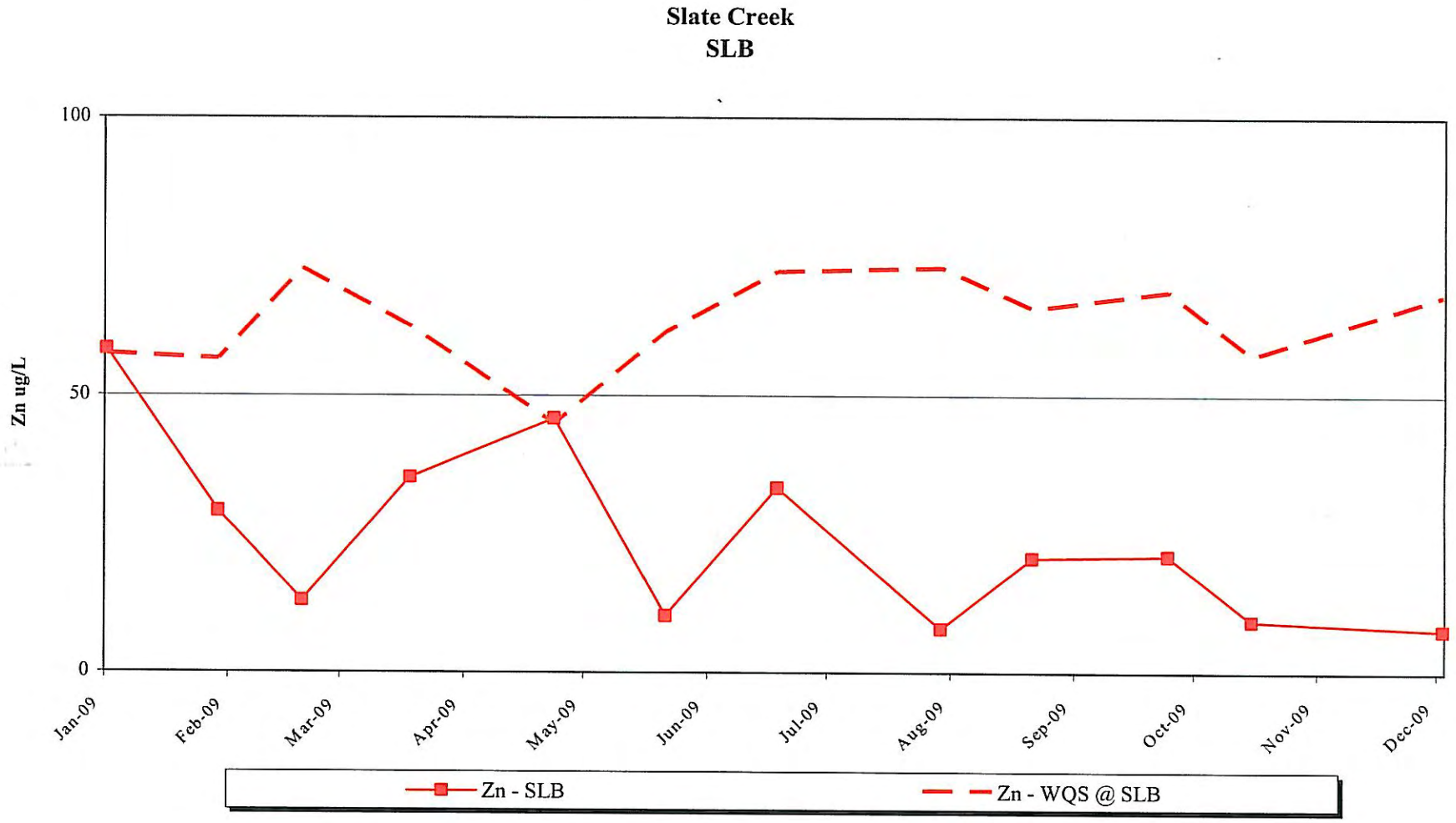

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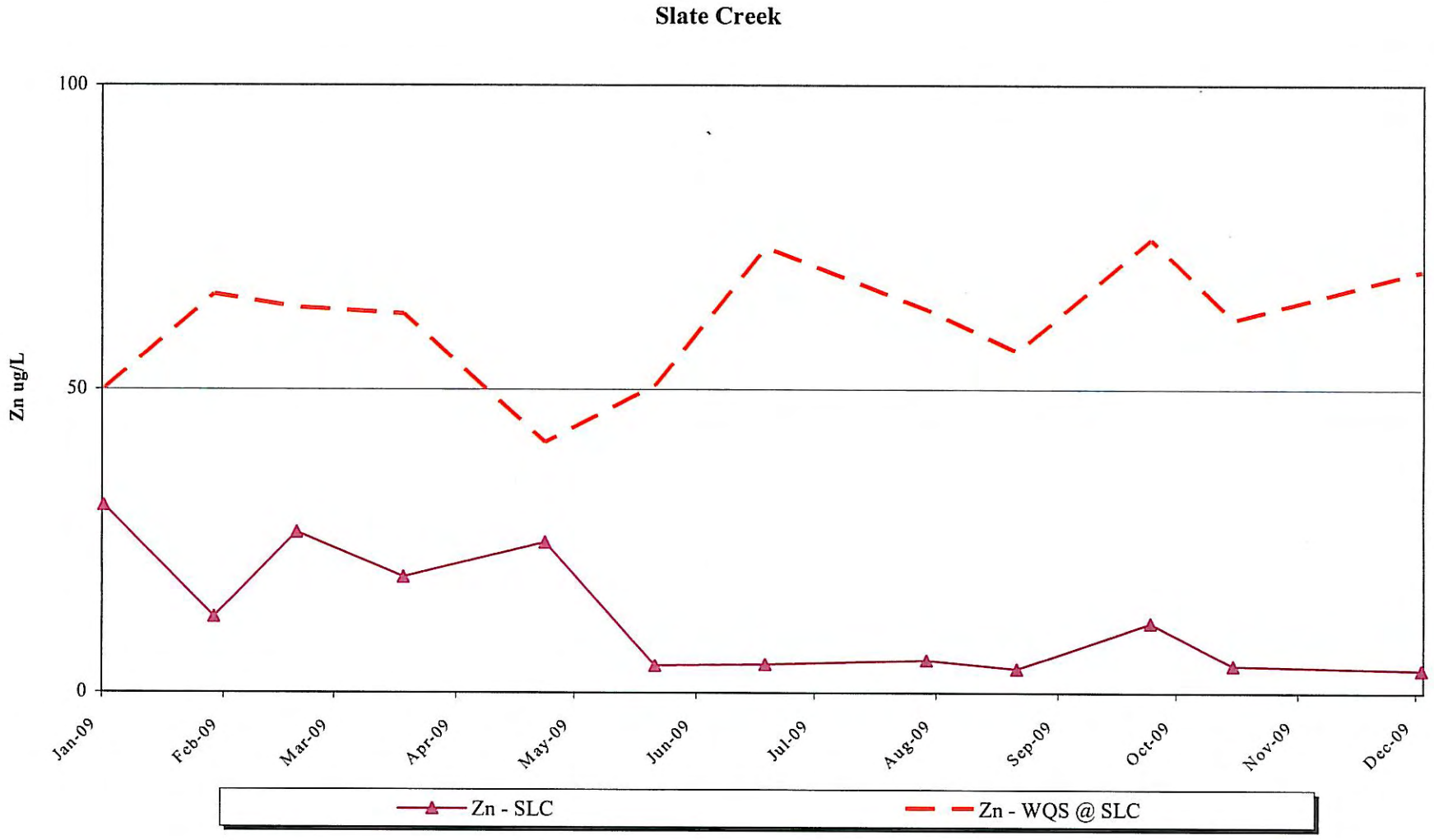


Figure 7c: Slate Creek Monitoring Results 2009, Trace Chemistry

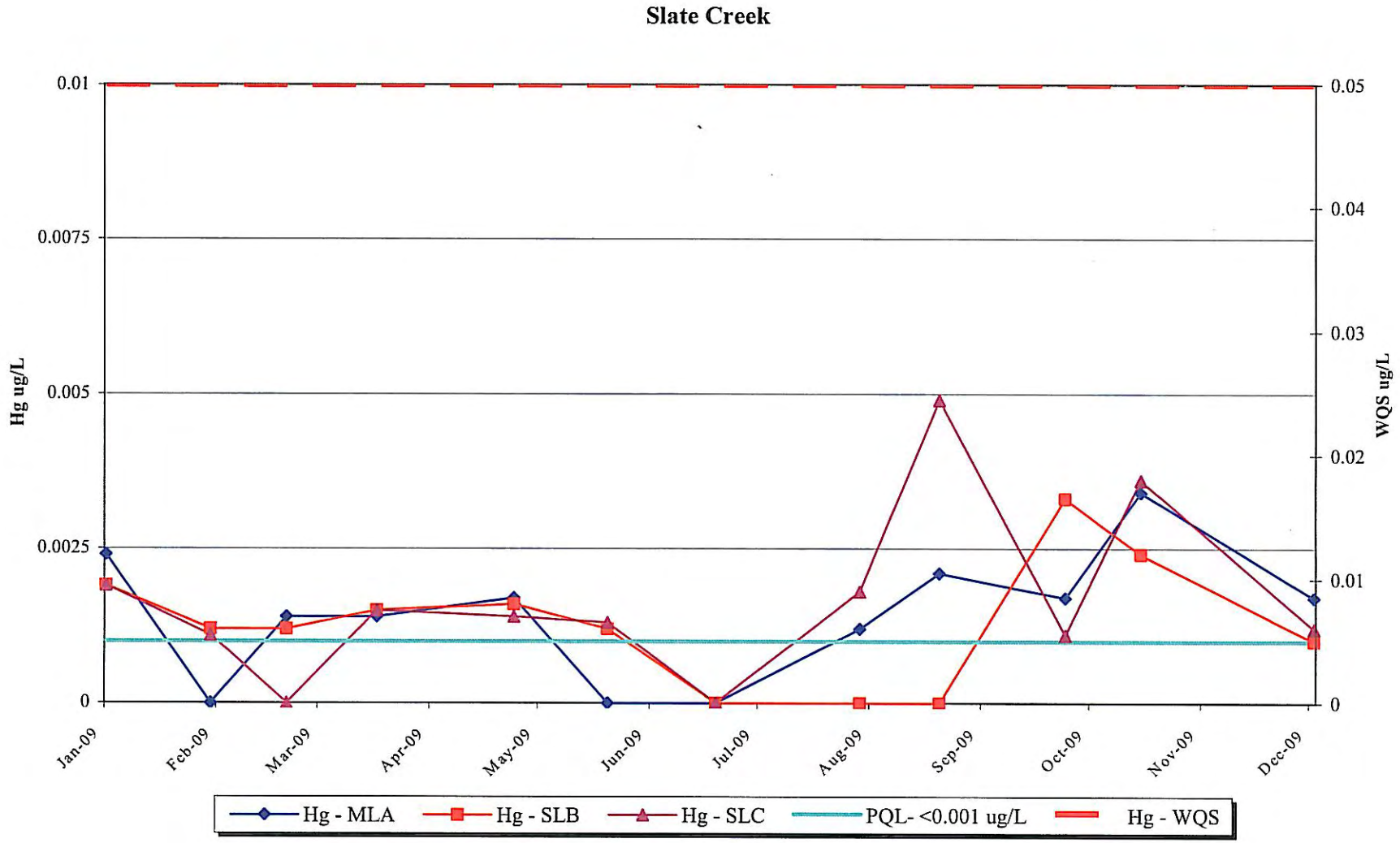


Figure 8a: Sherman Creek Monitoring Results 2009, Field Parameters

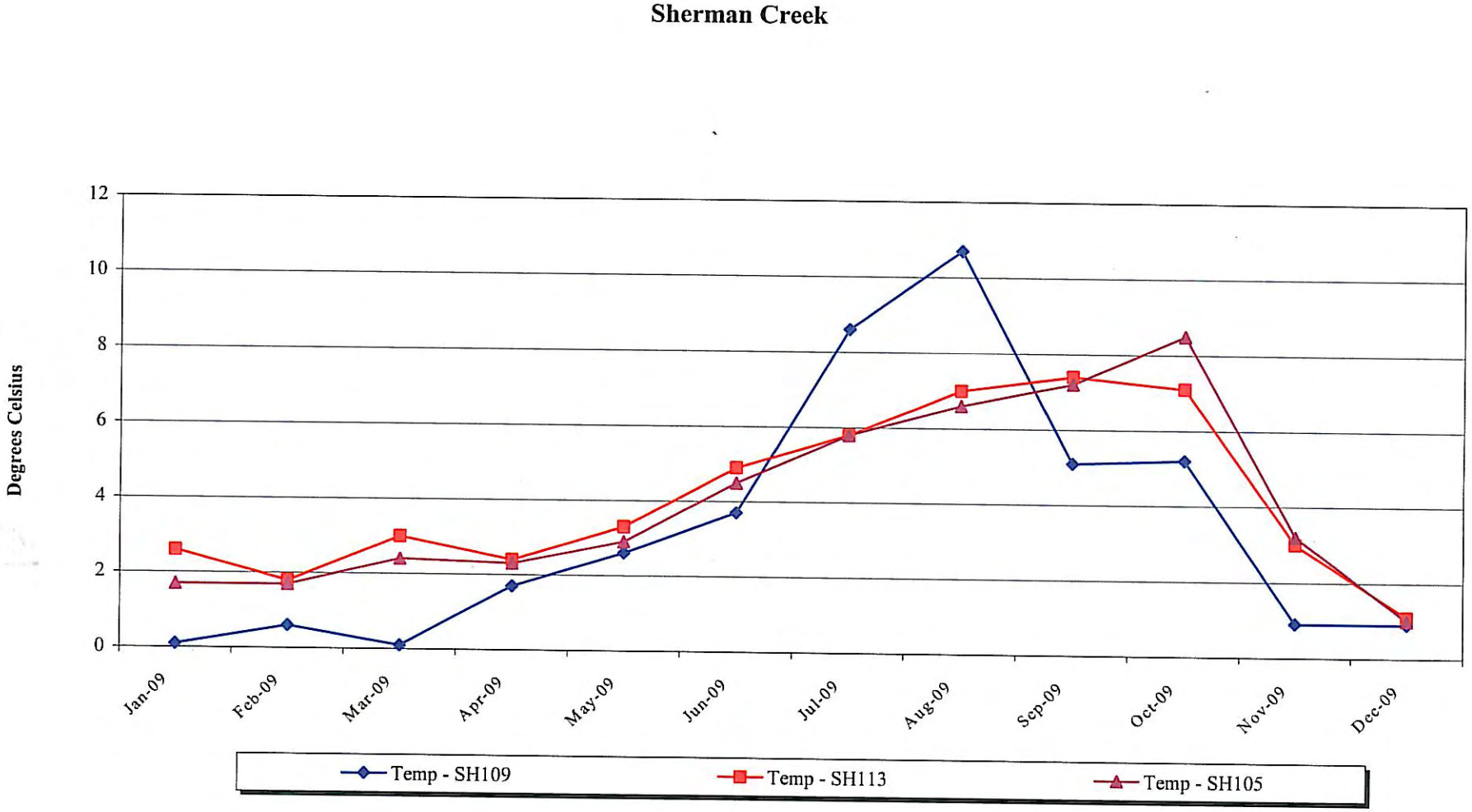
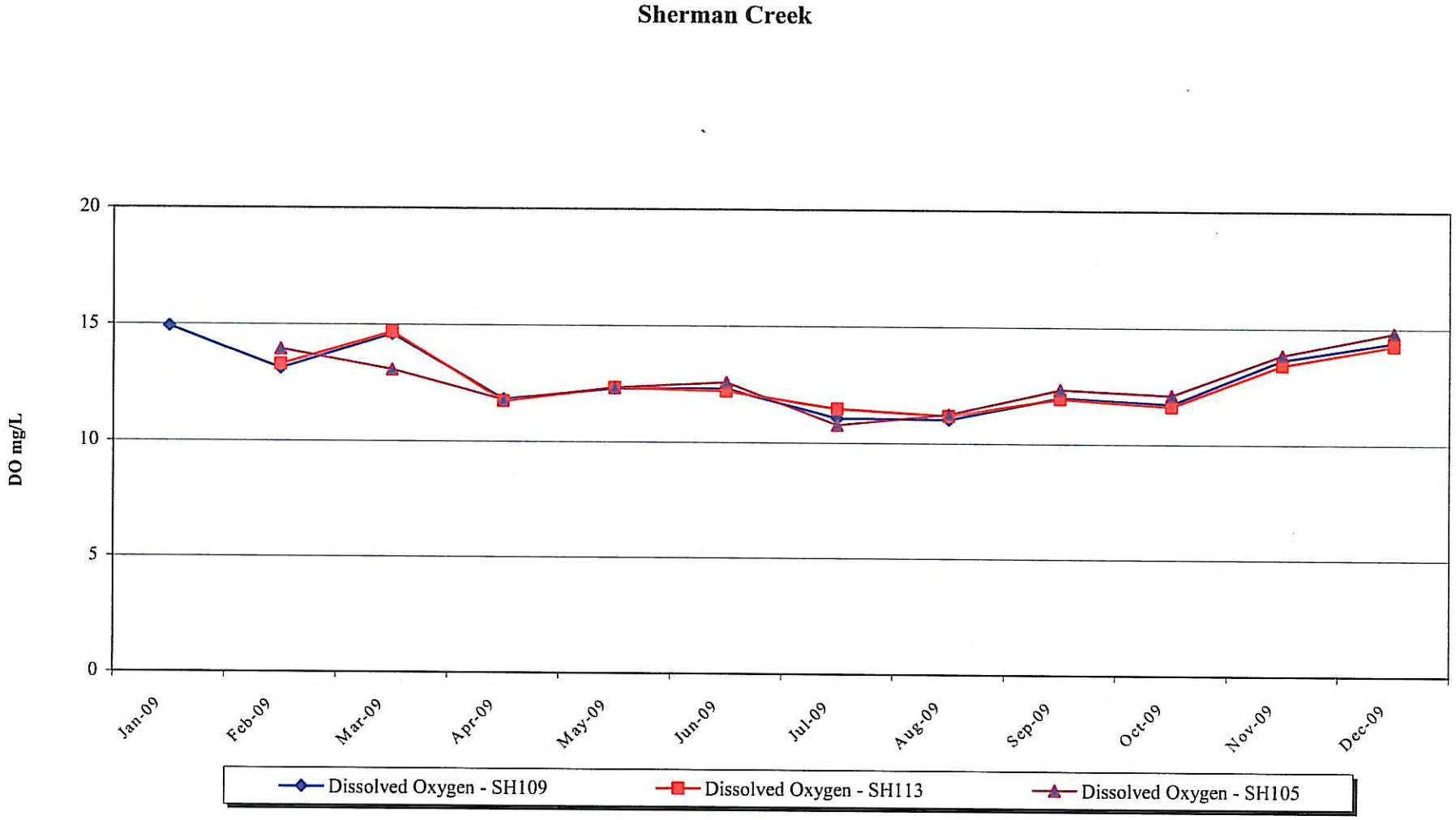


Figure 8a: Sherman Creek Monitoring Results 2009, Field Parameters



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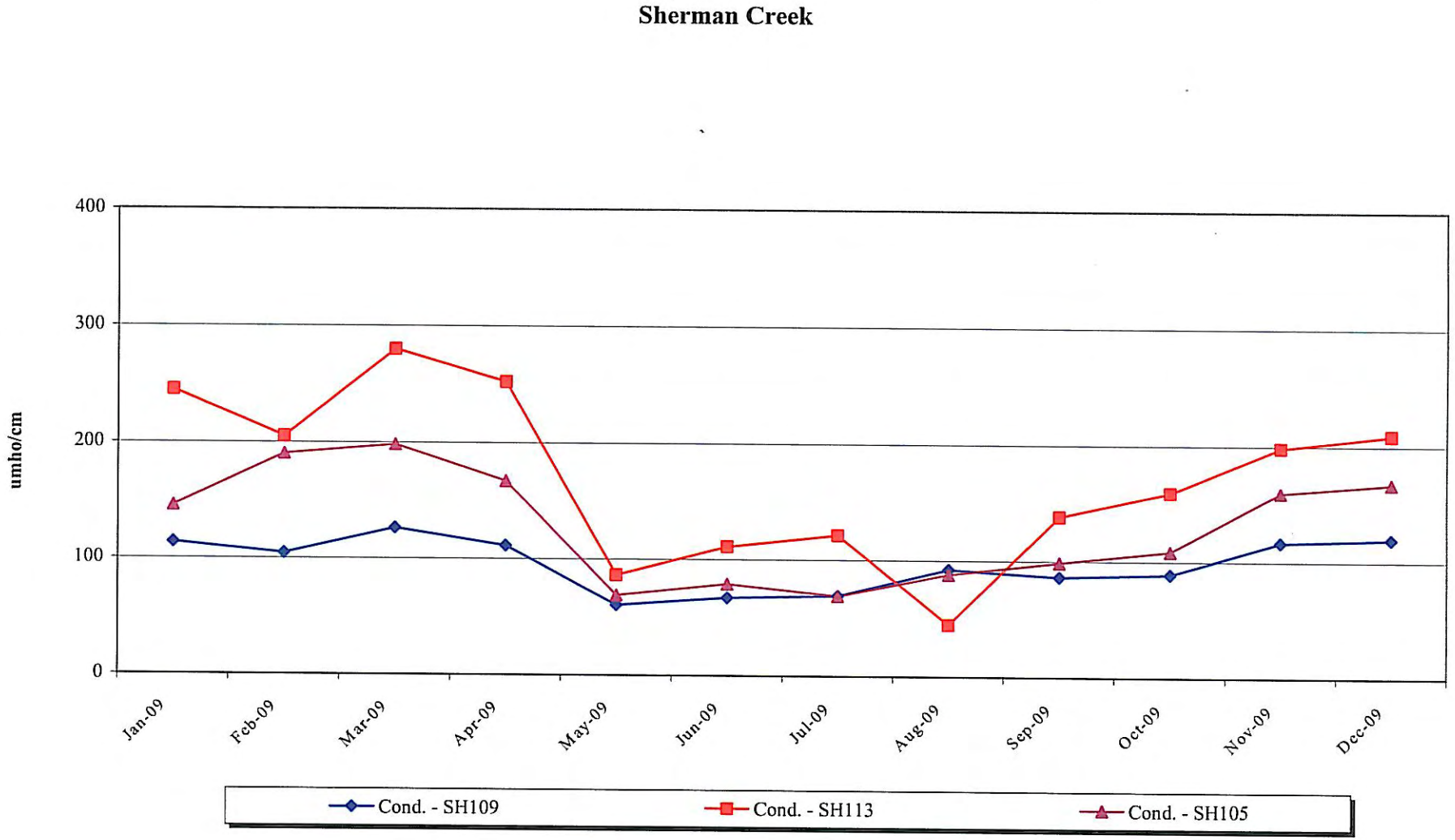

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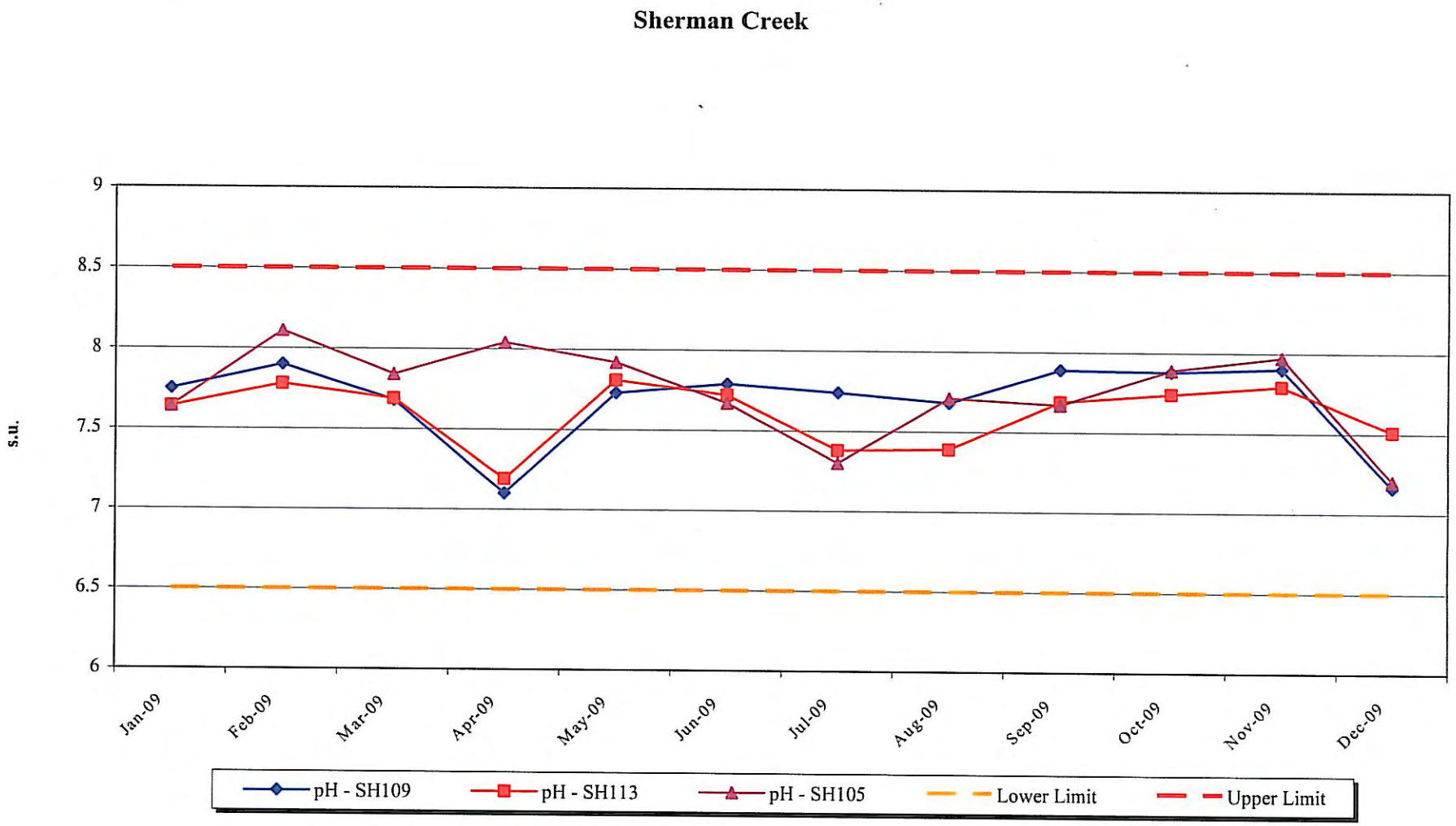
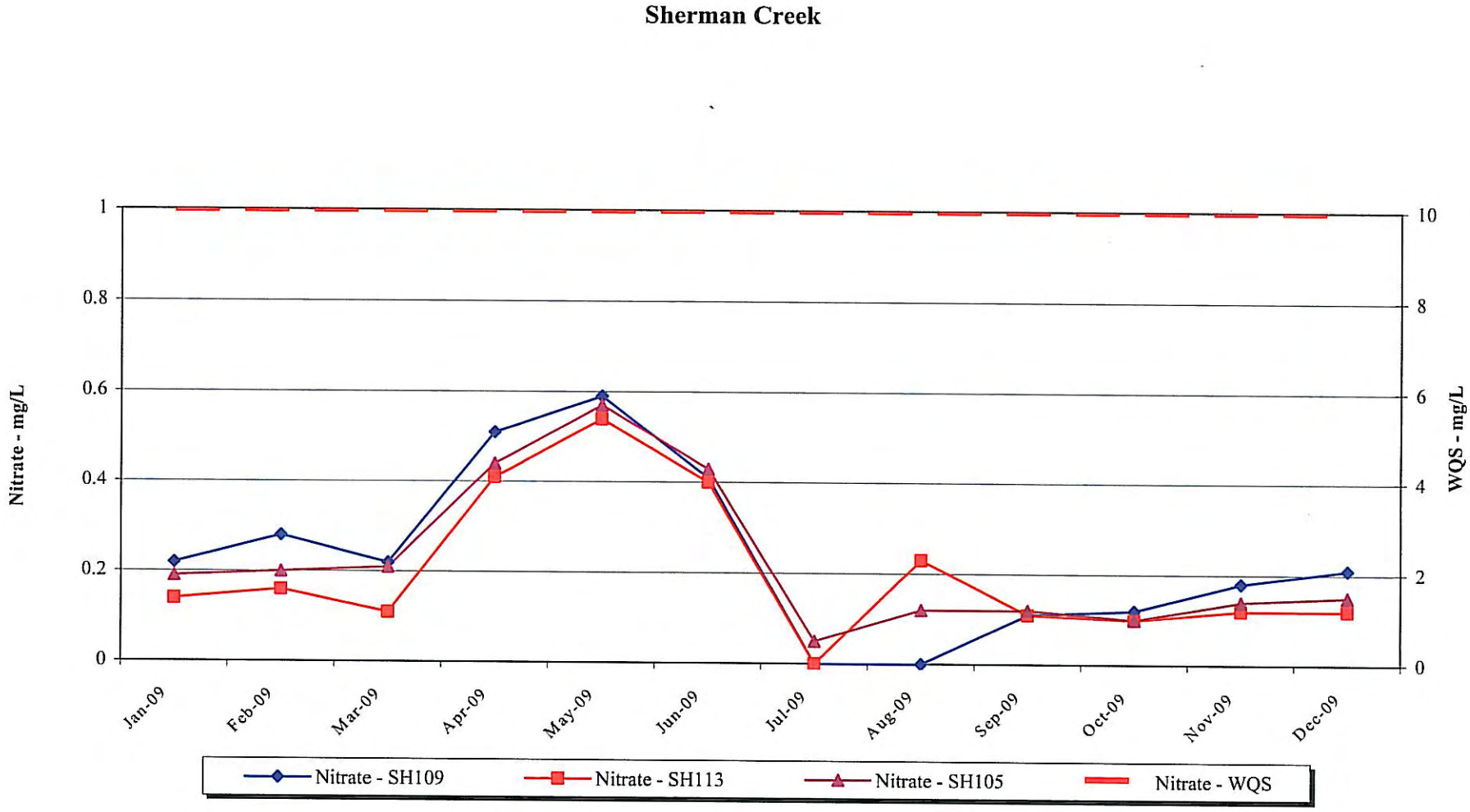


Figure 8b: Sherman Creek Monitoring Results 2009, Major Chemistry



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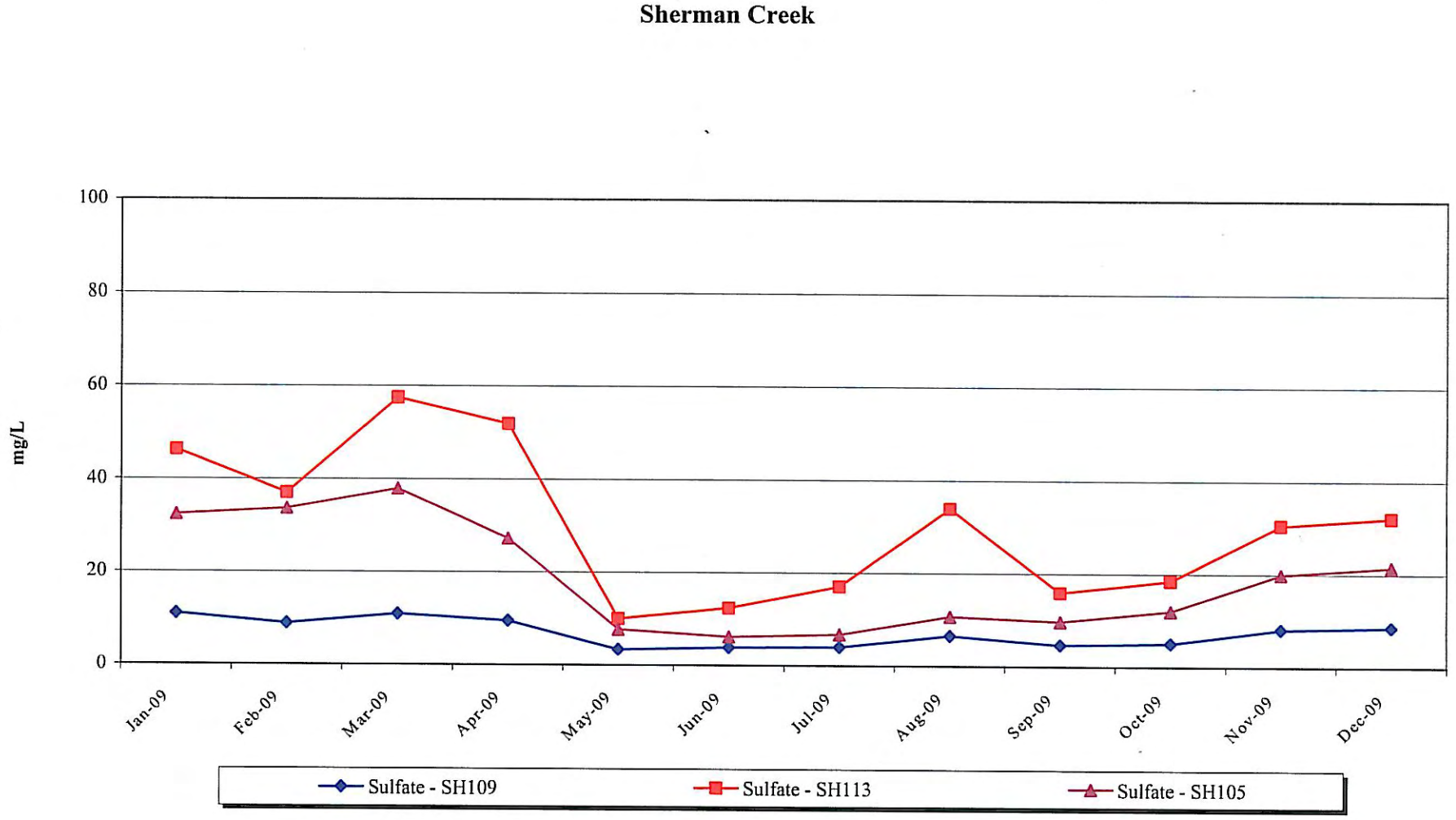

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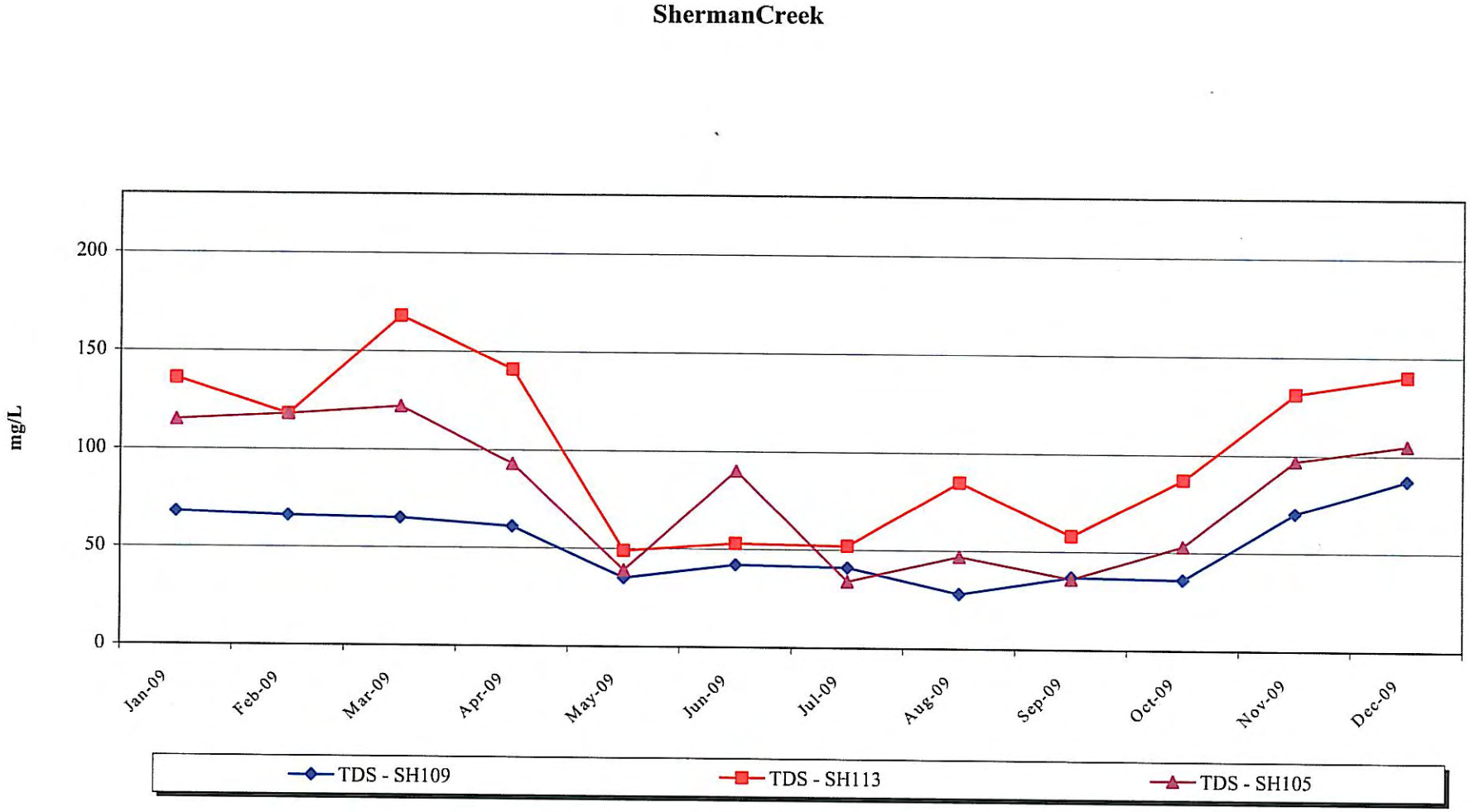

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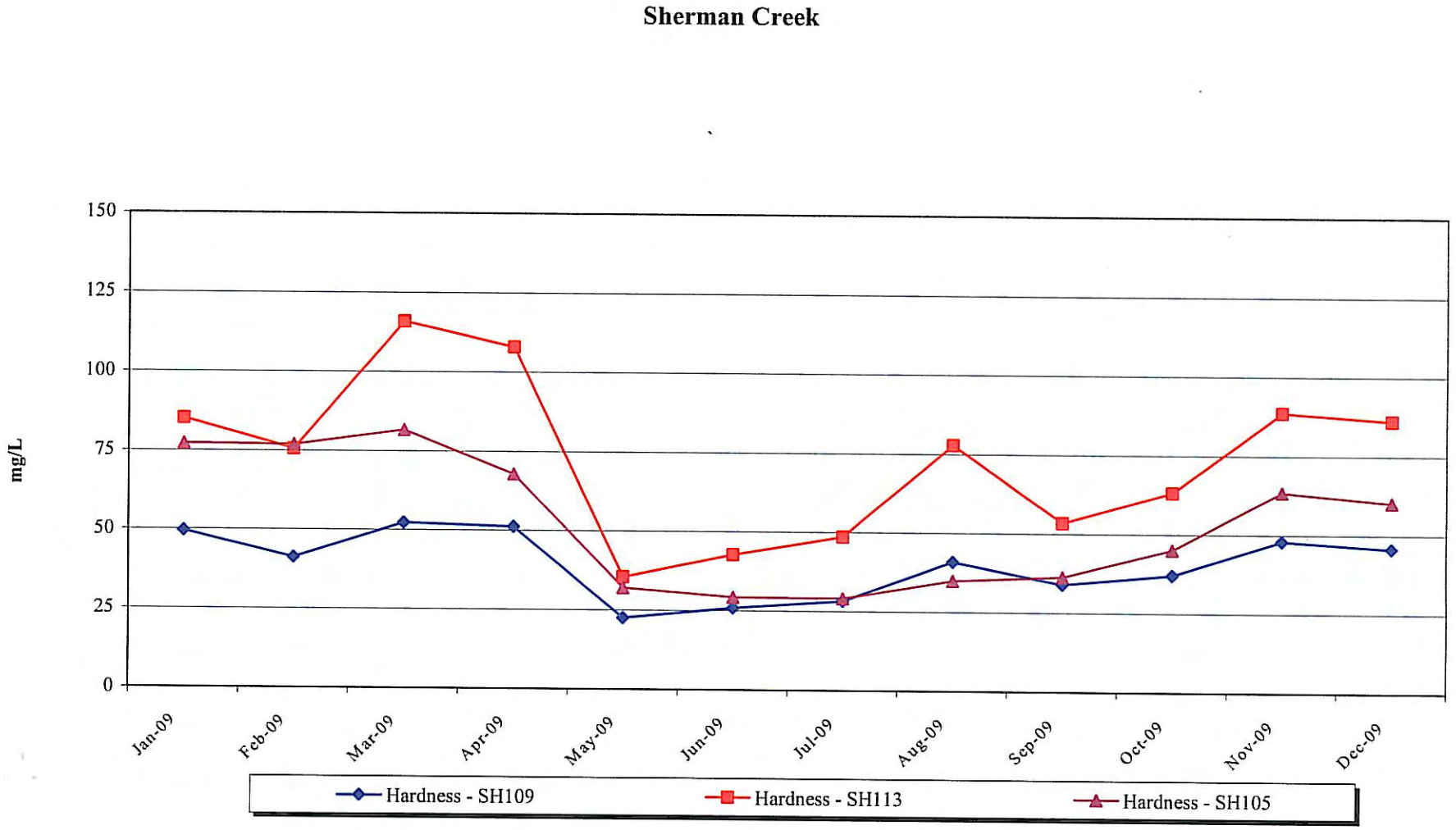

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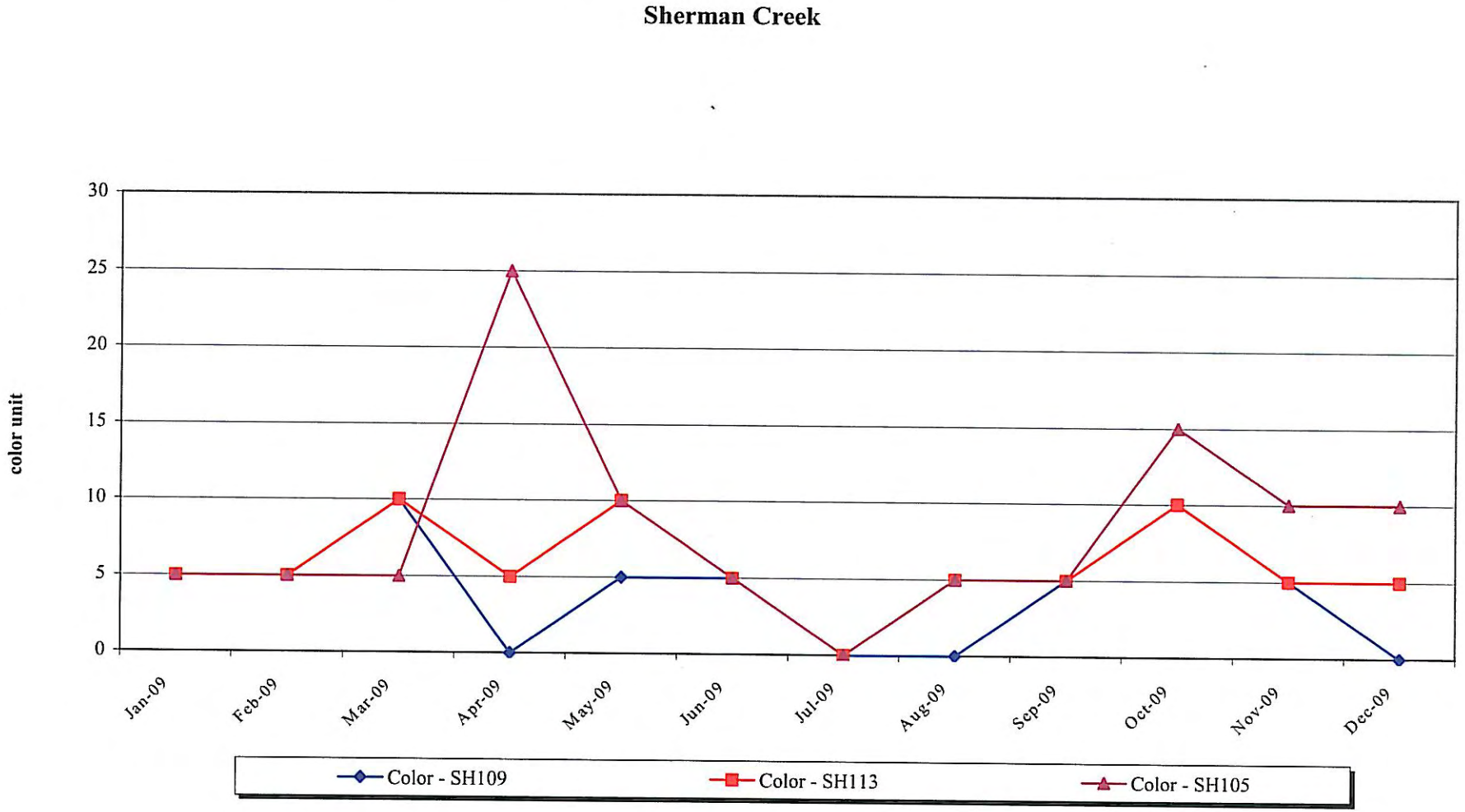

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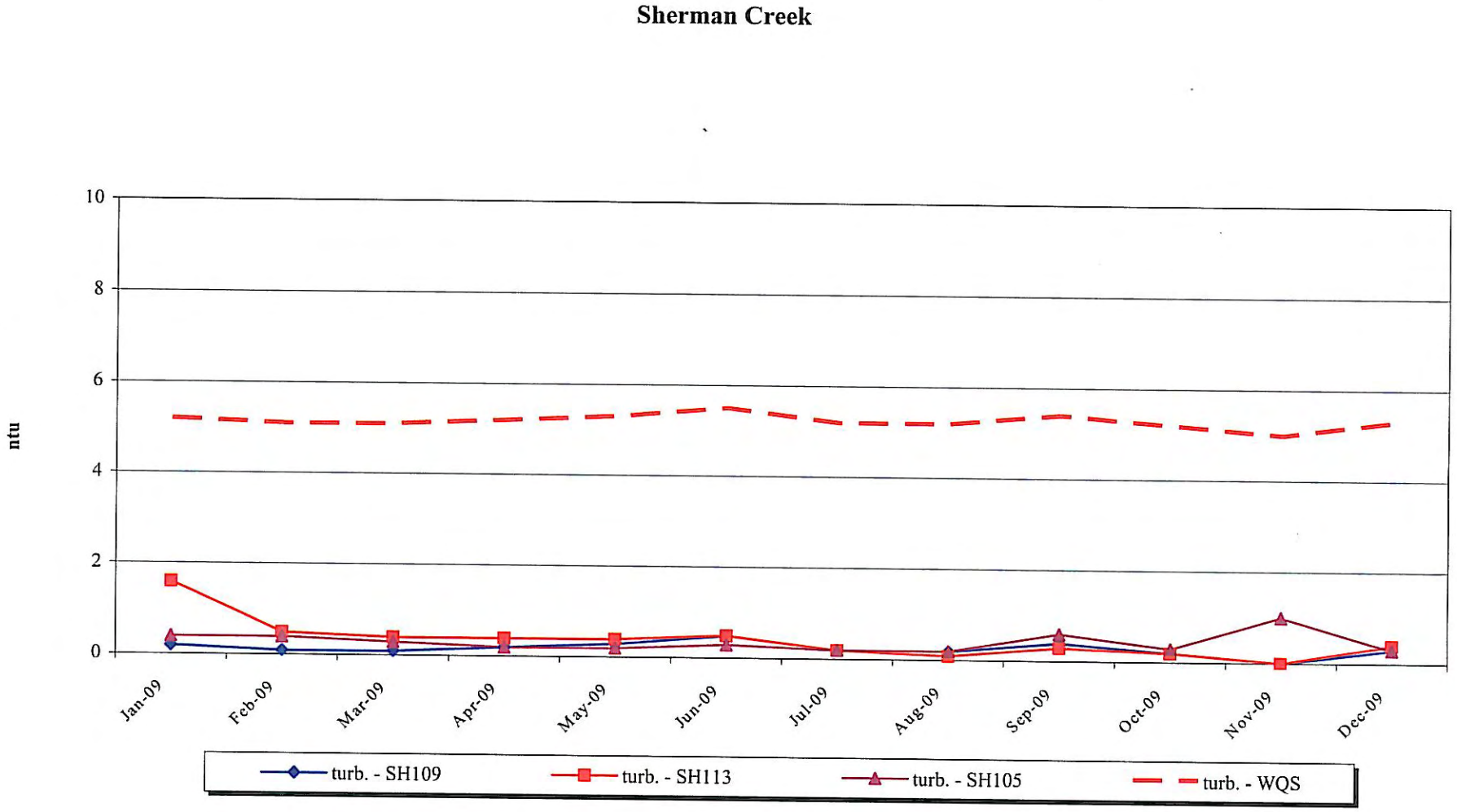

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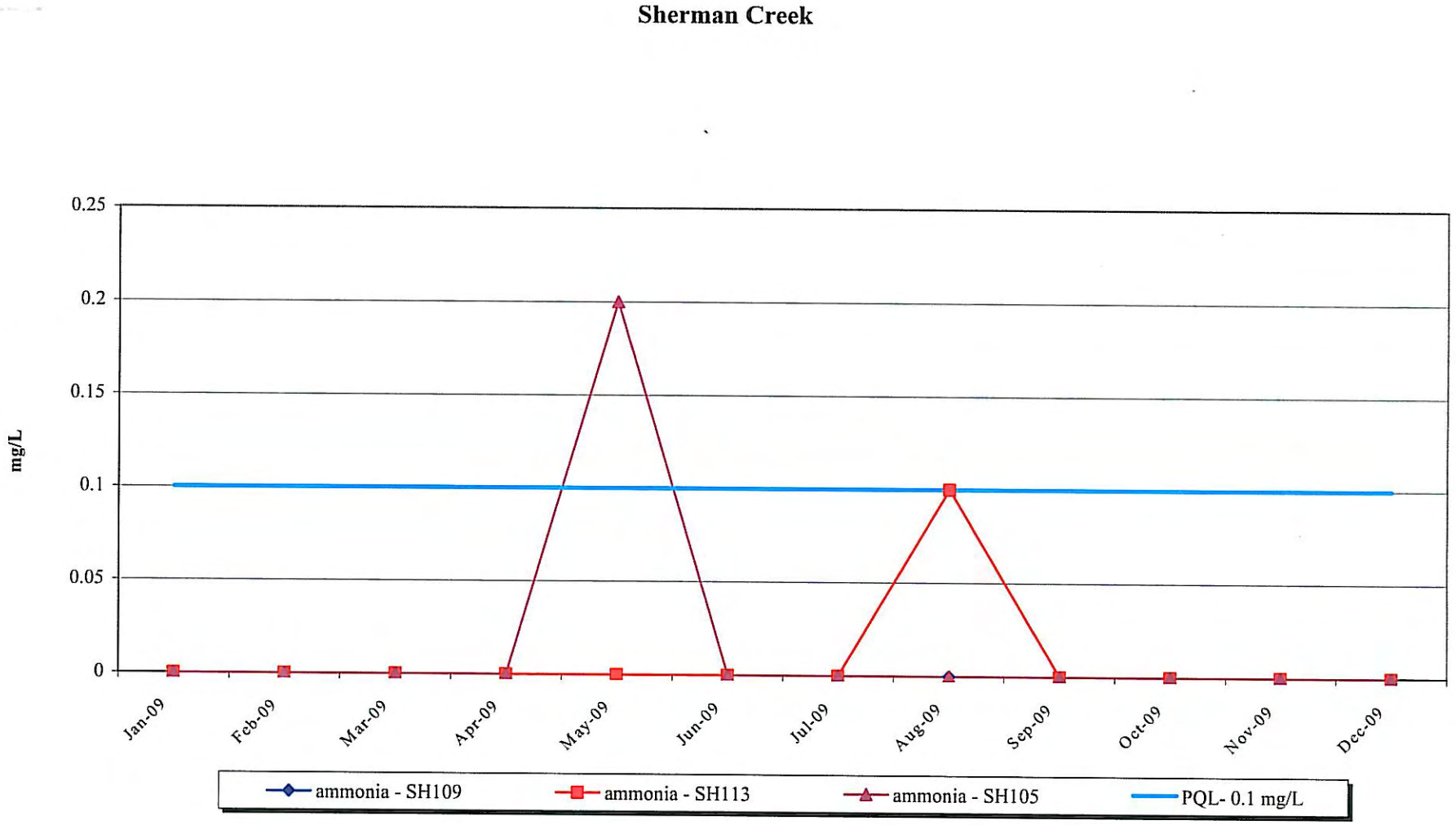

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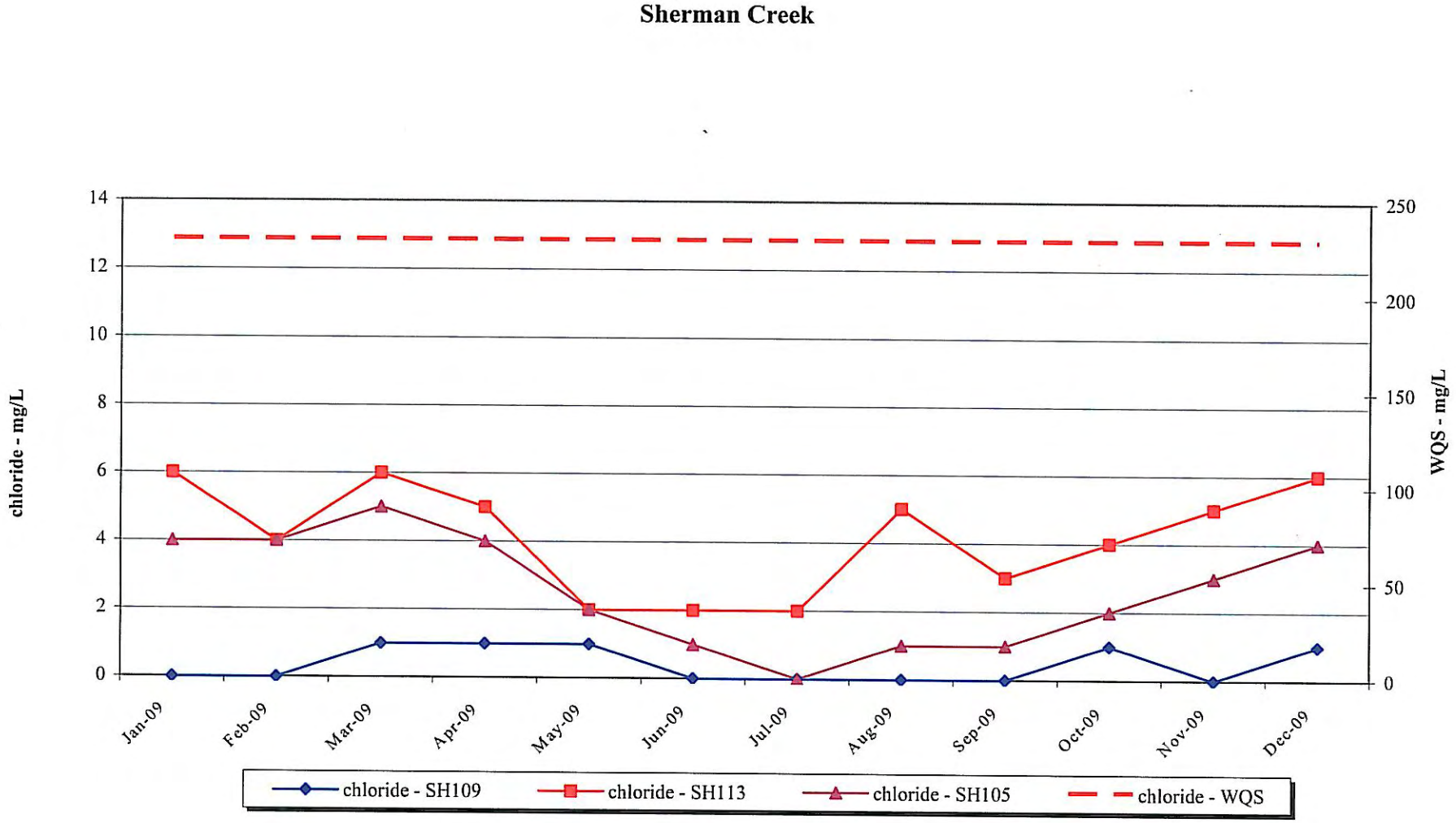


Figure 8b: Sherman Creek Monitoring Results 2009, Major Chemistry

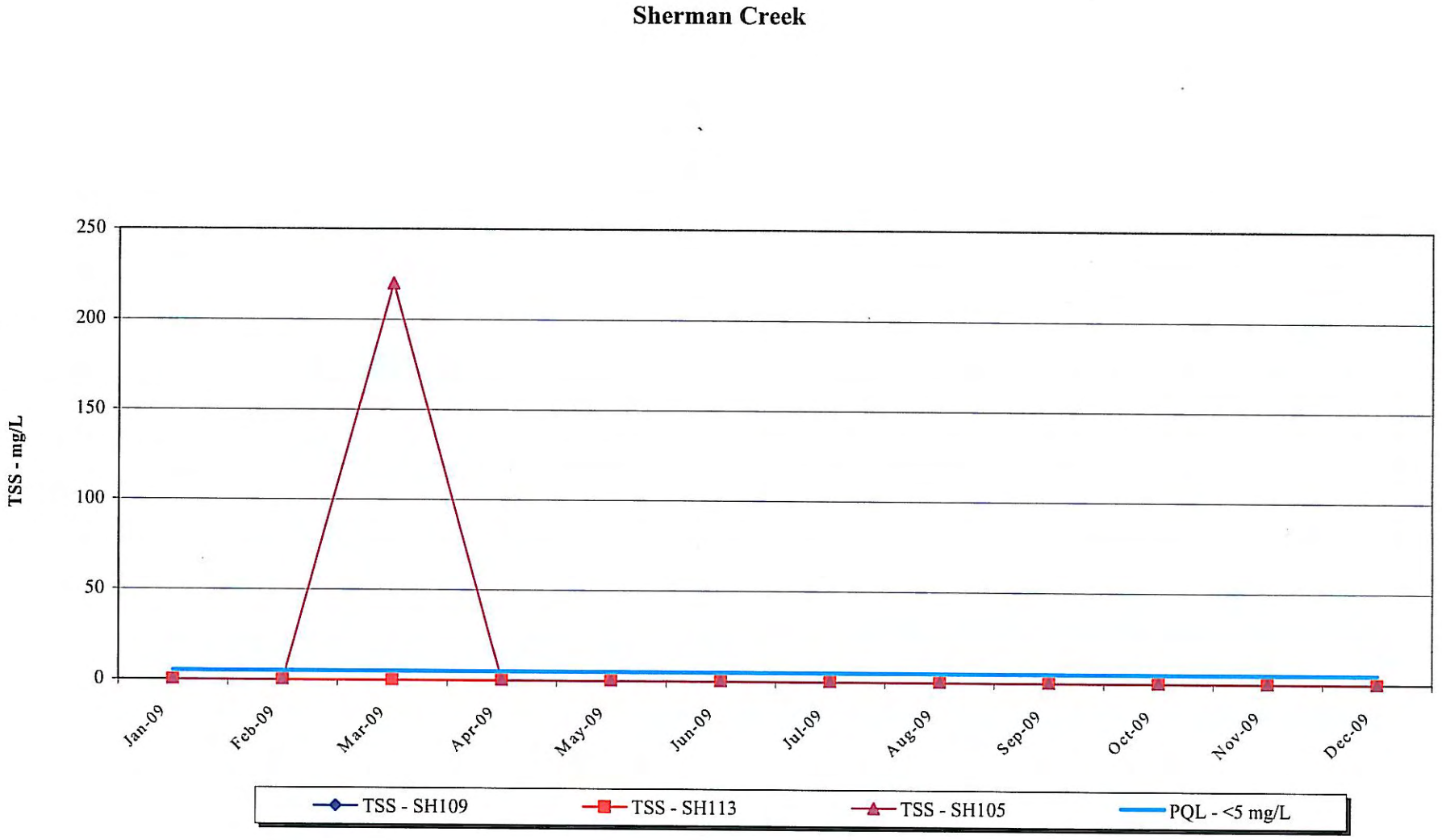
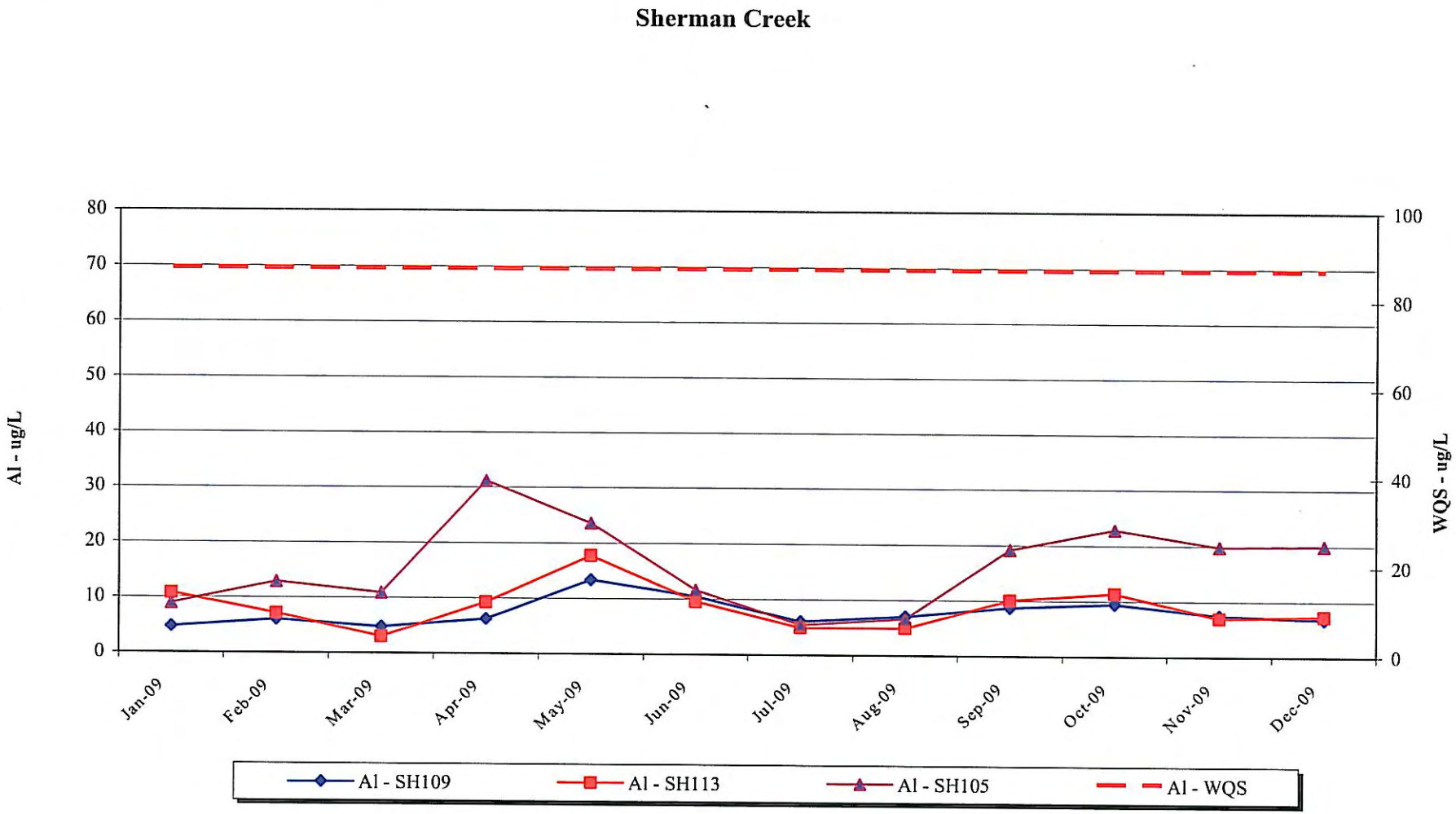


Figure 8c: Sherman Creek Monitoring Results 2009, Trace Chemistry



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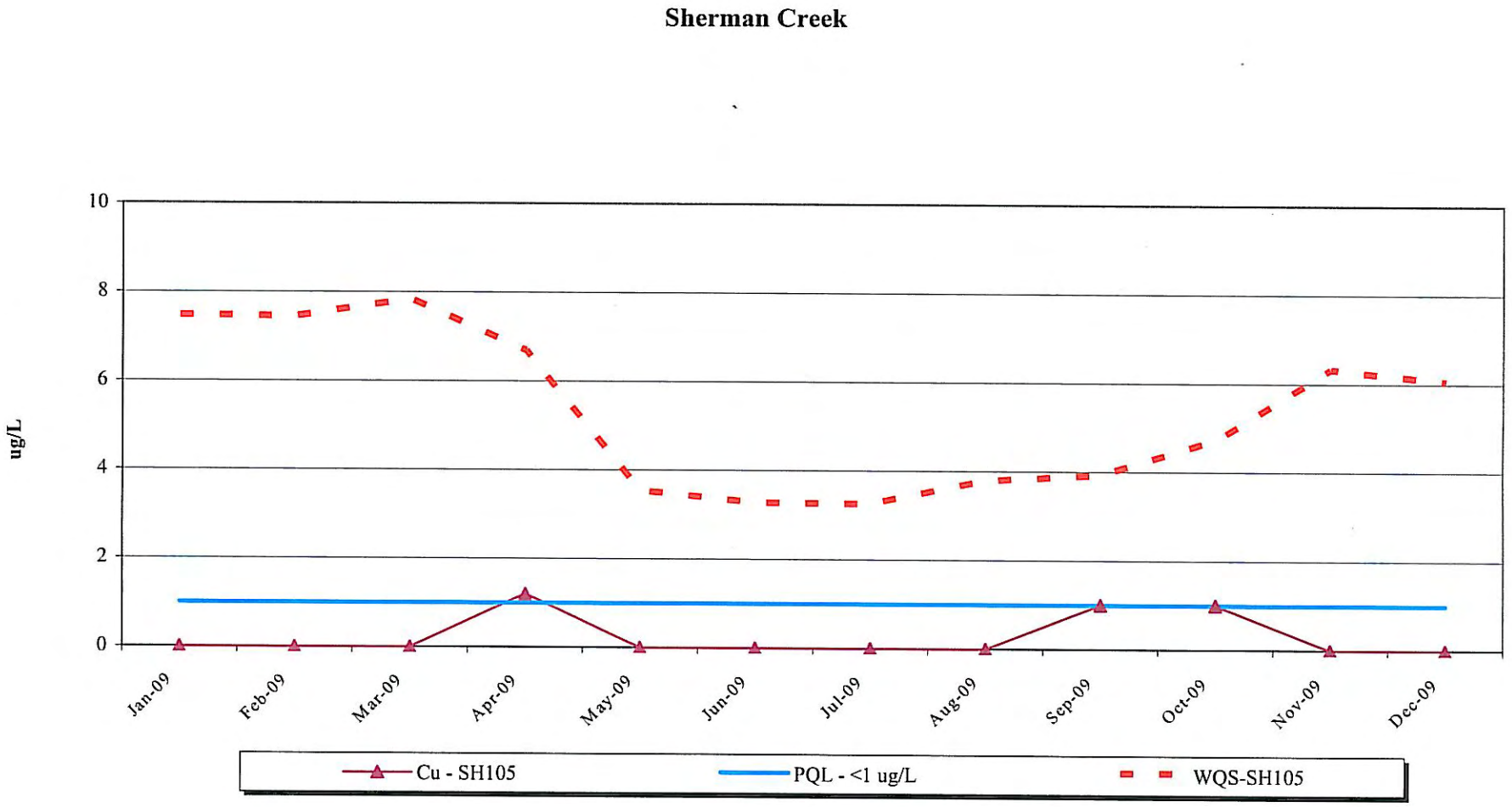

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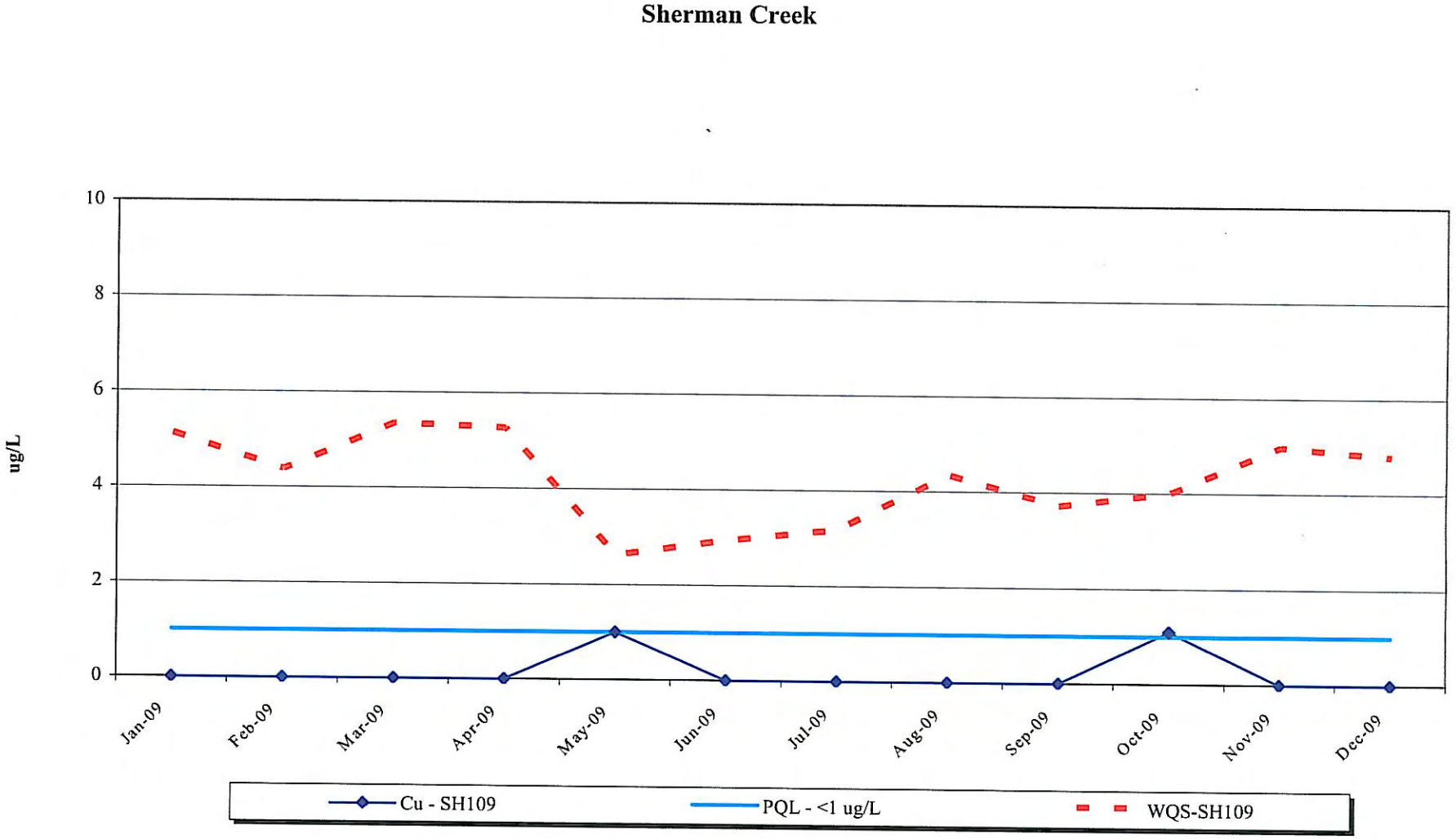

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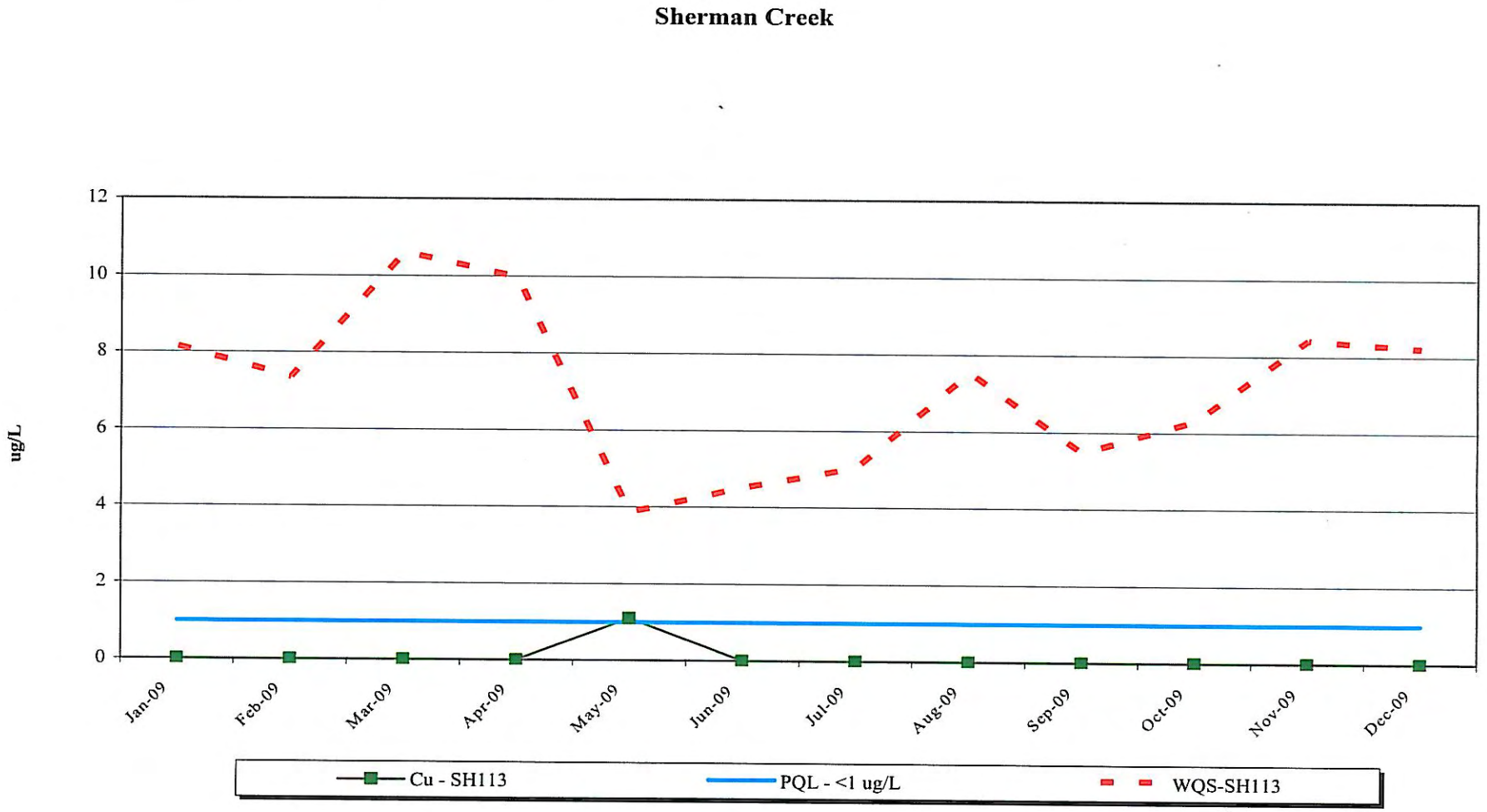

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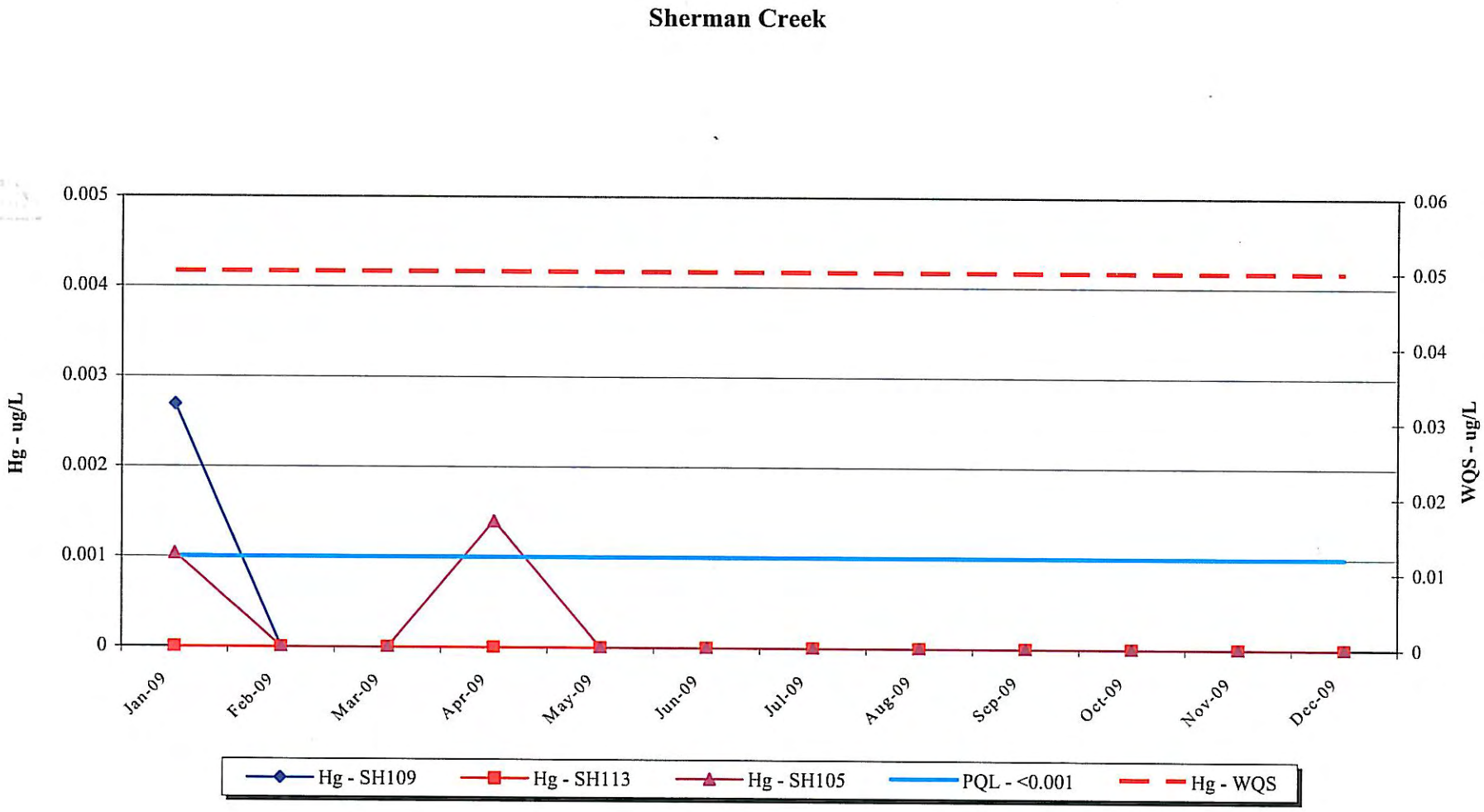

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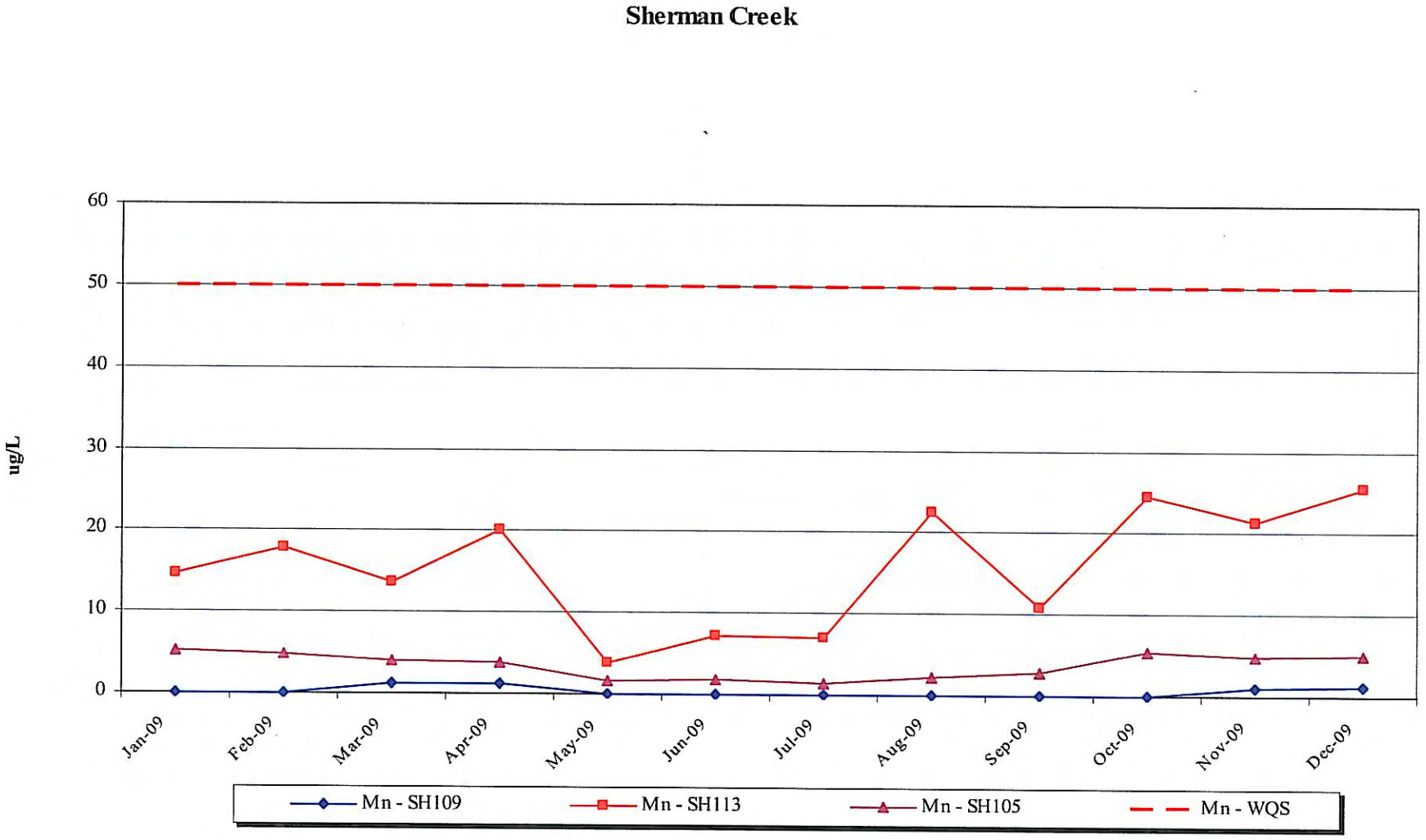

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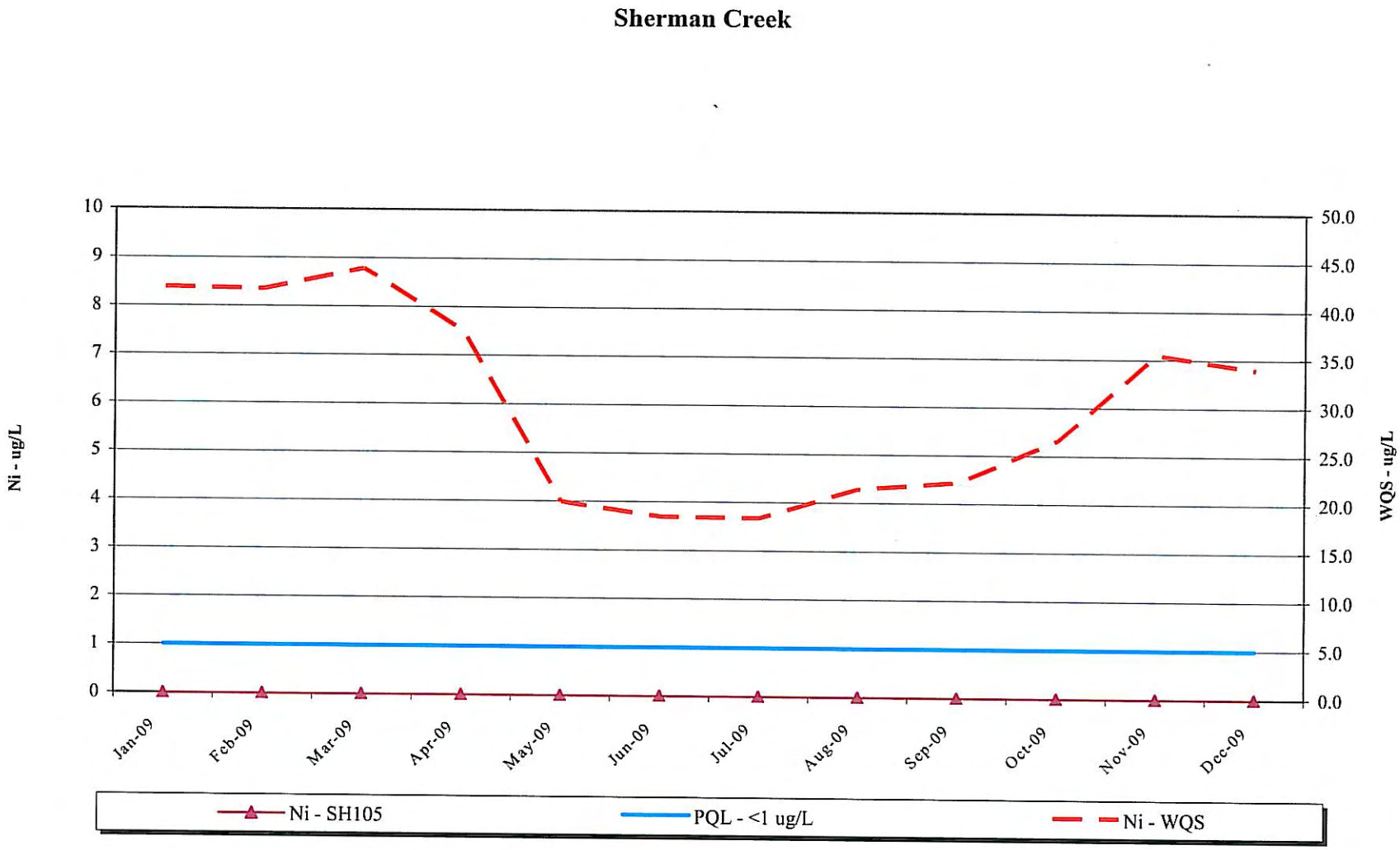

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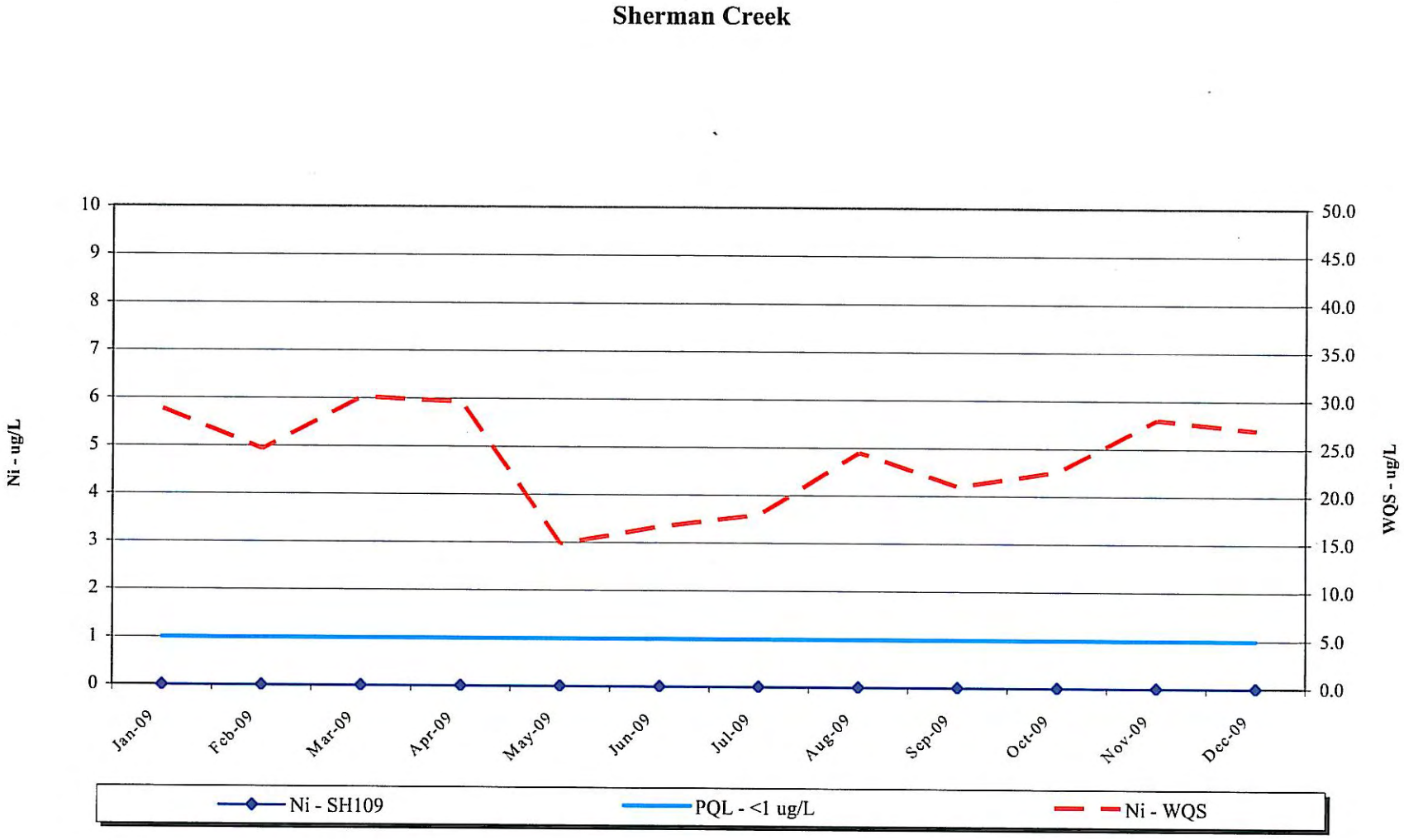

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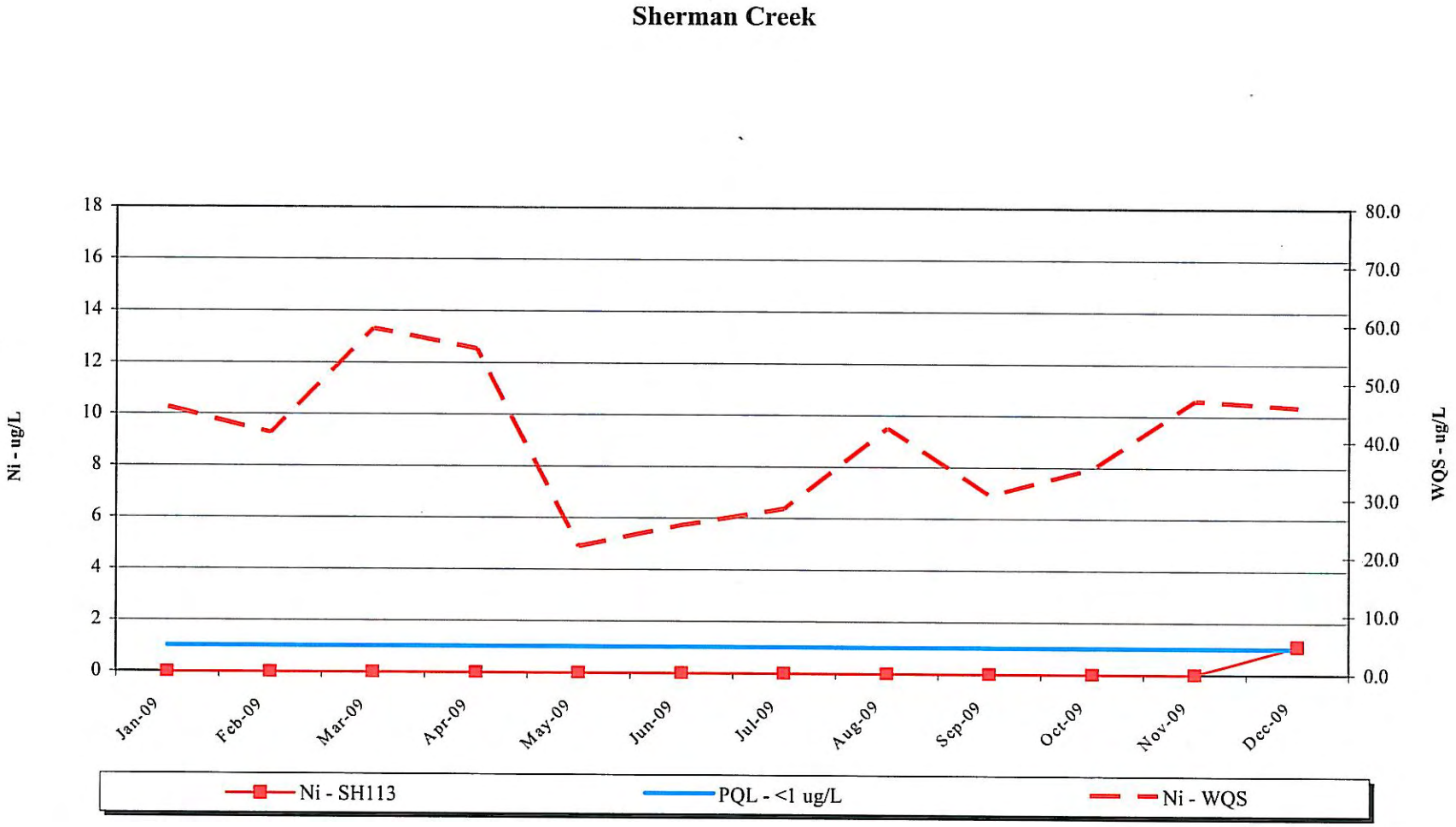

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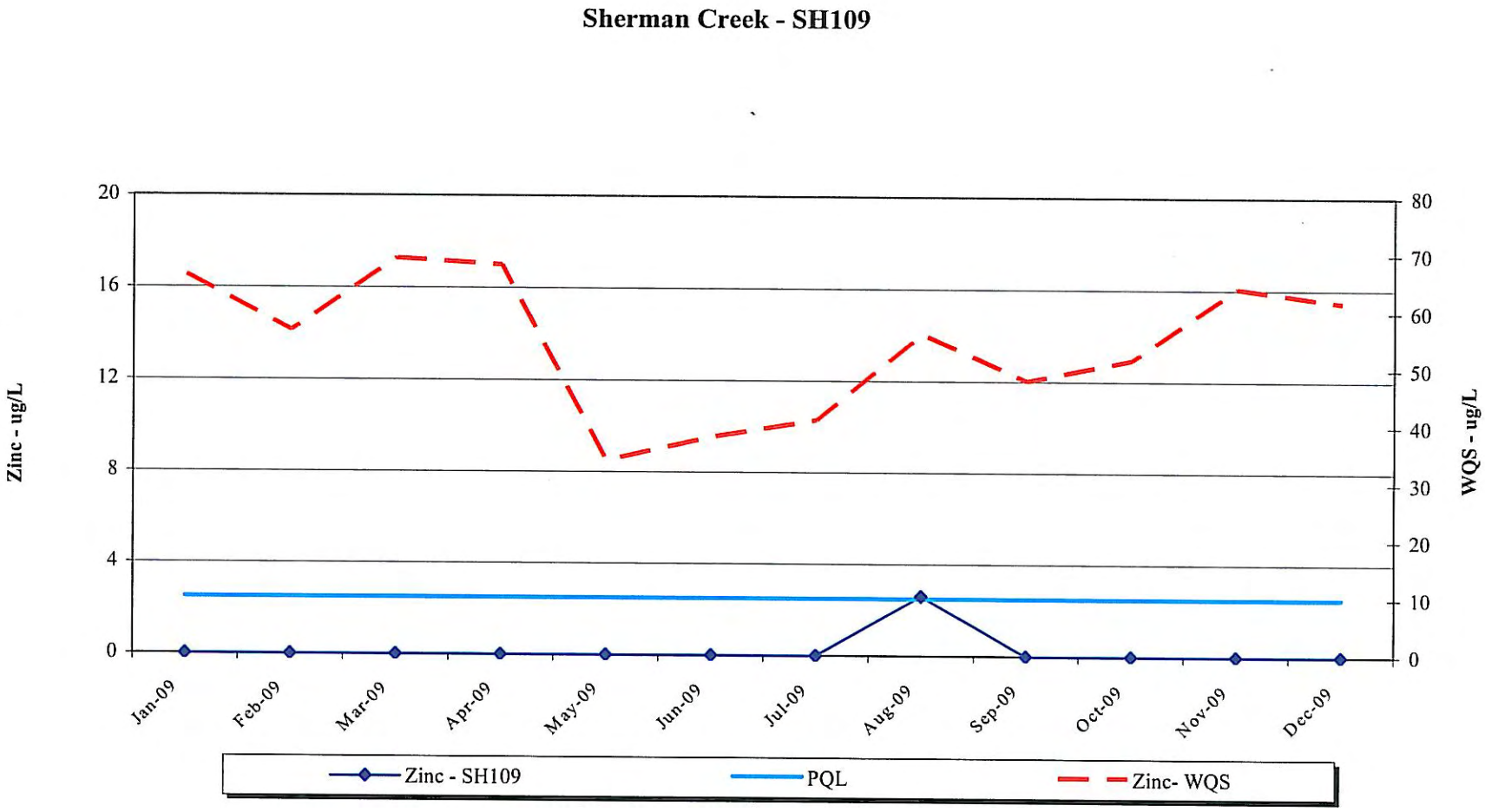

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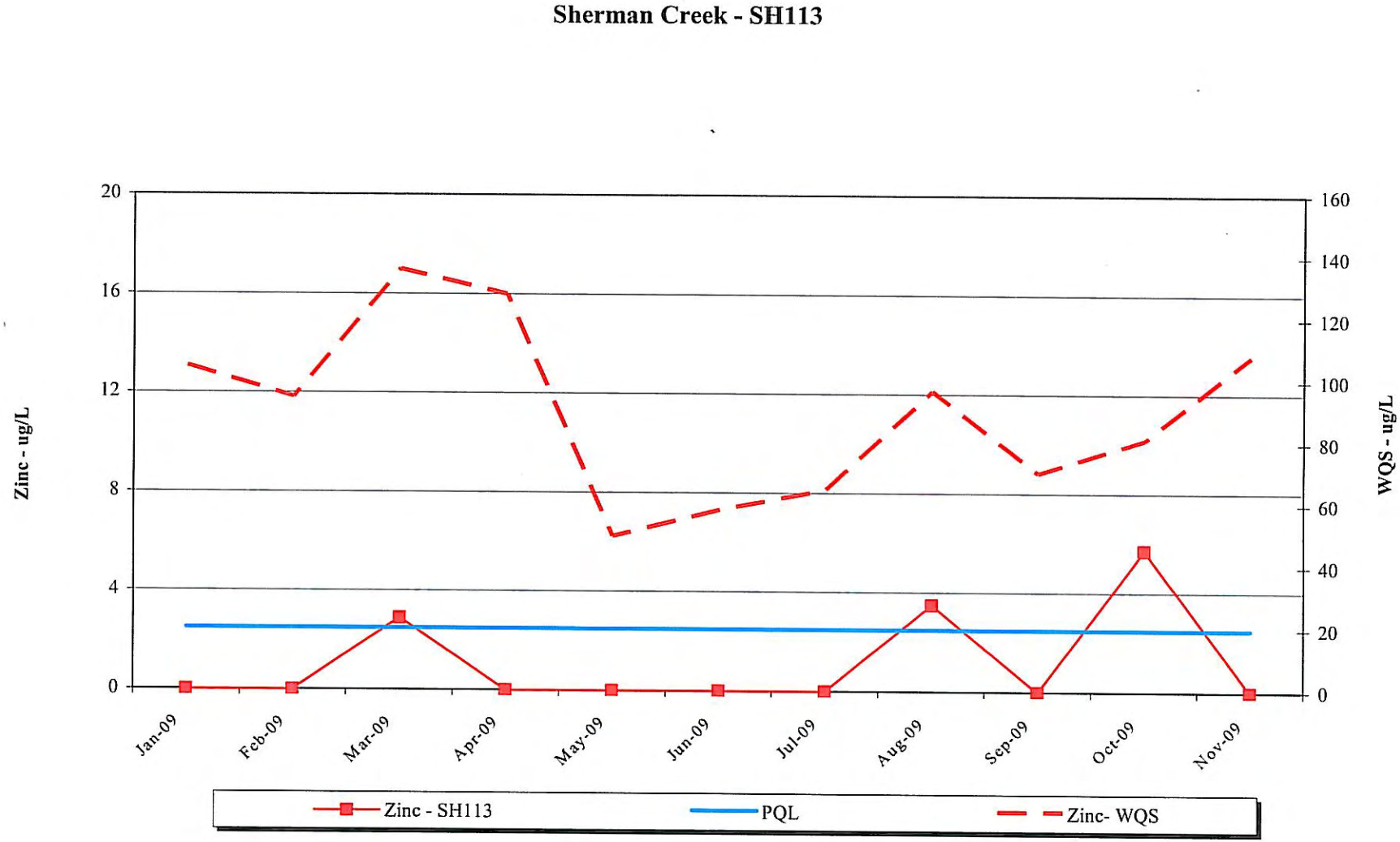

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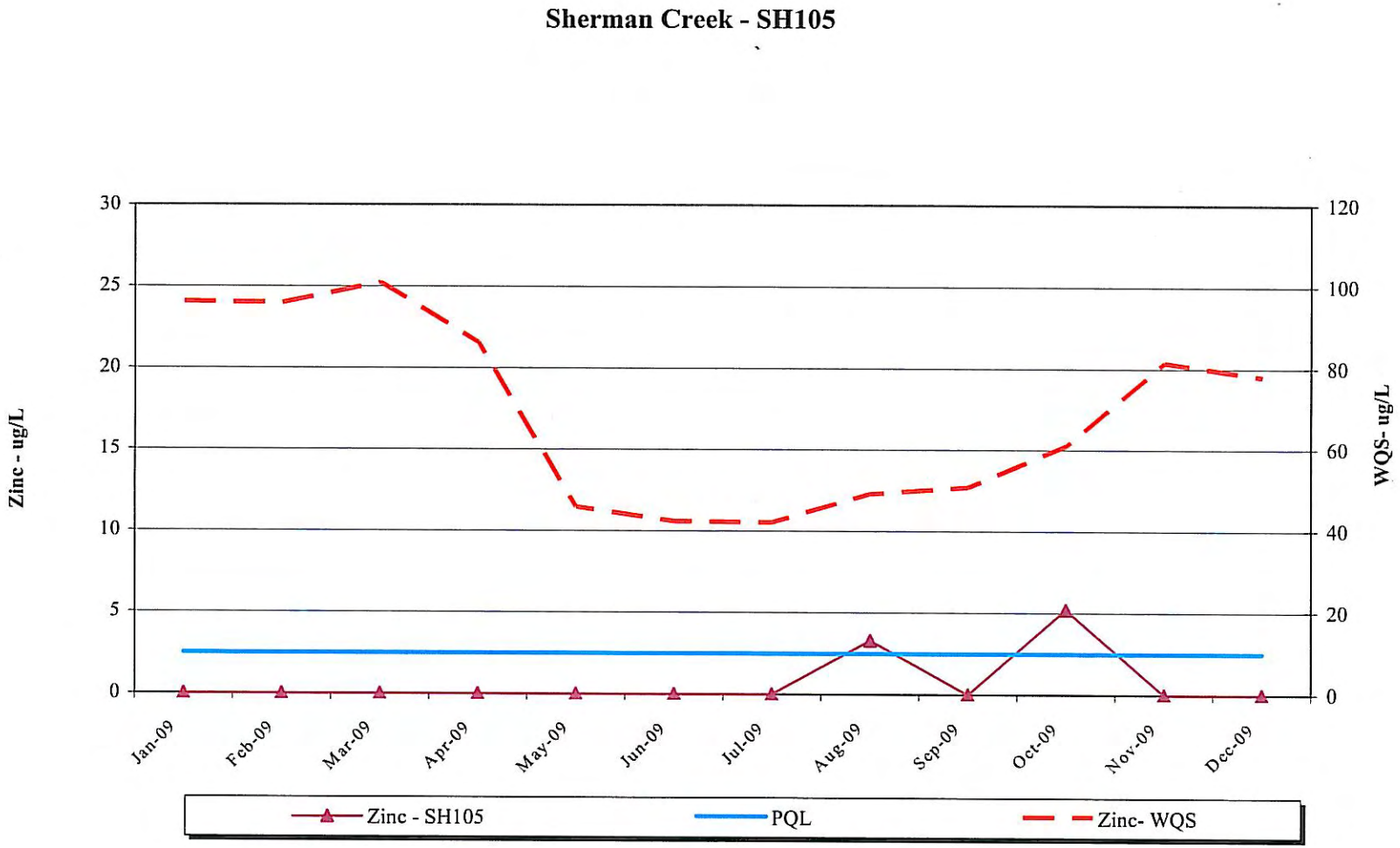
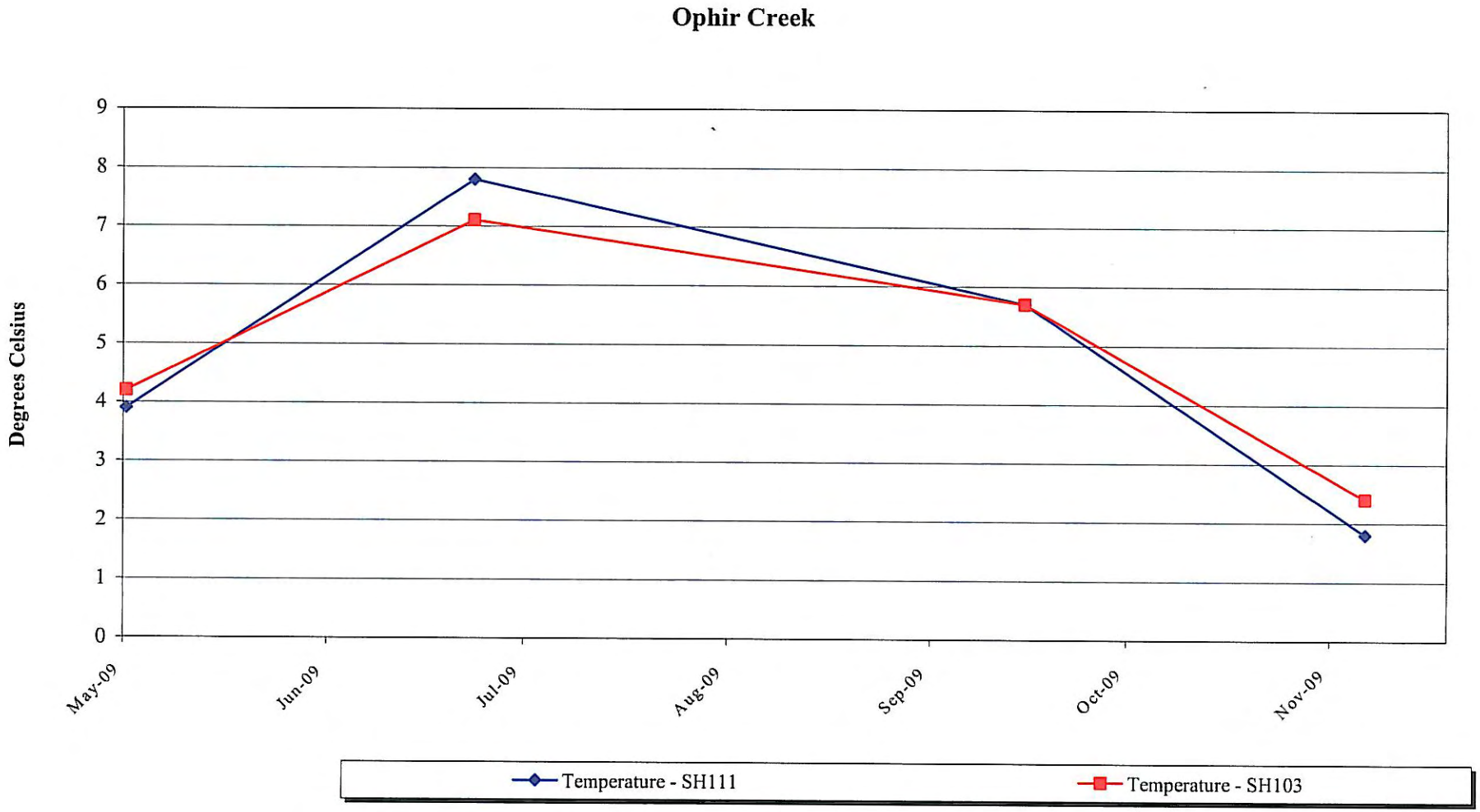


Figure 9a: Ophir Creek Monitoring Results 2009, Field Parameters



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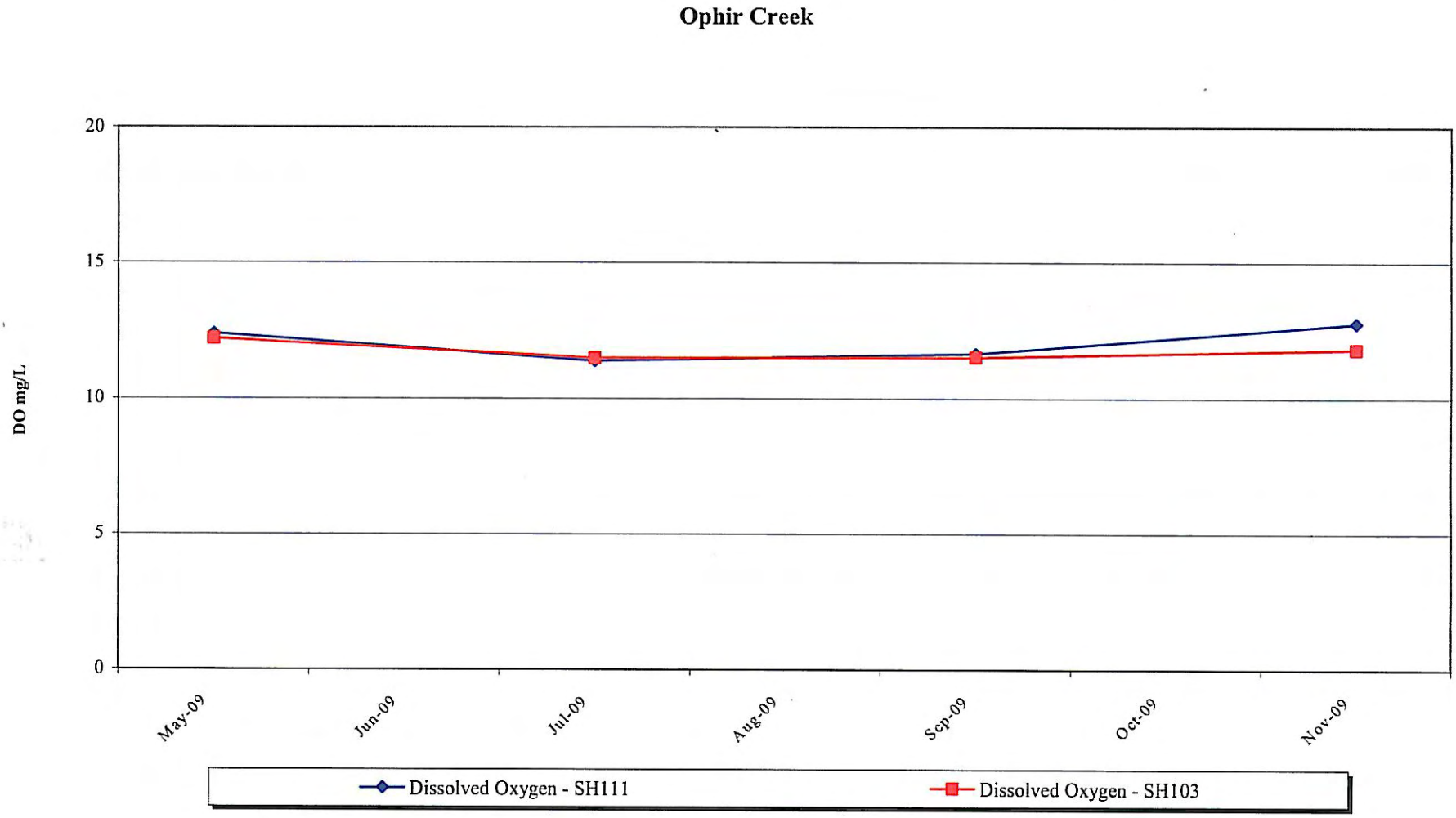

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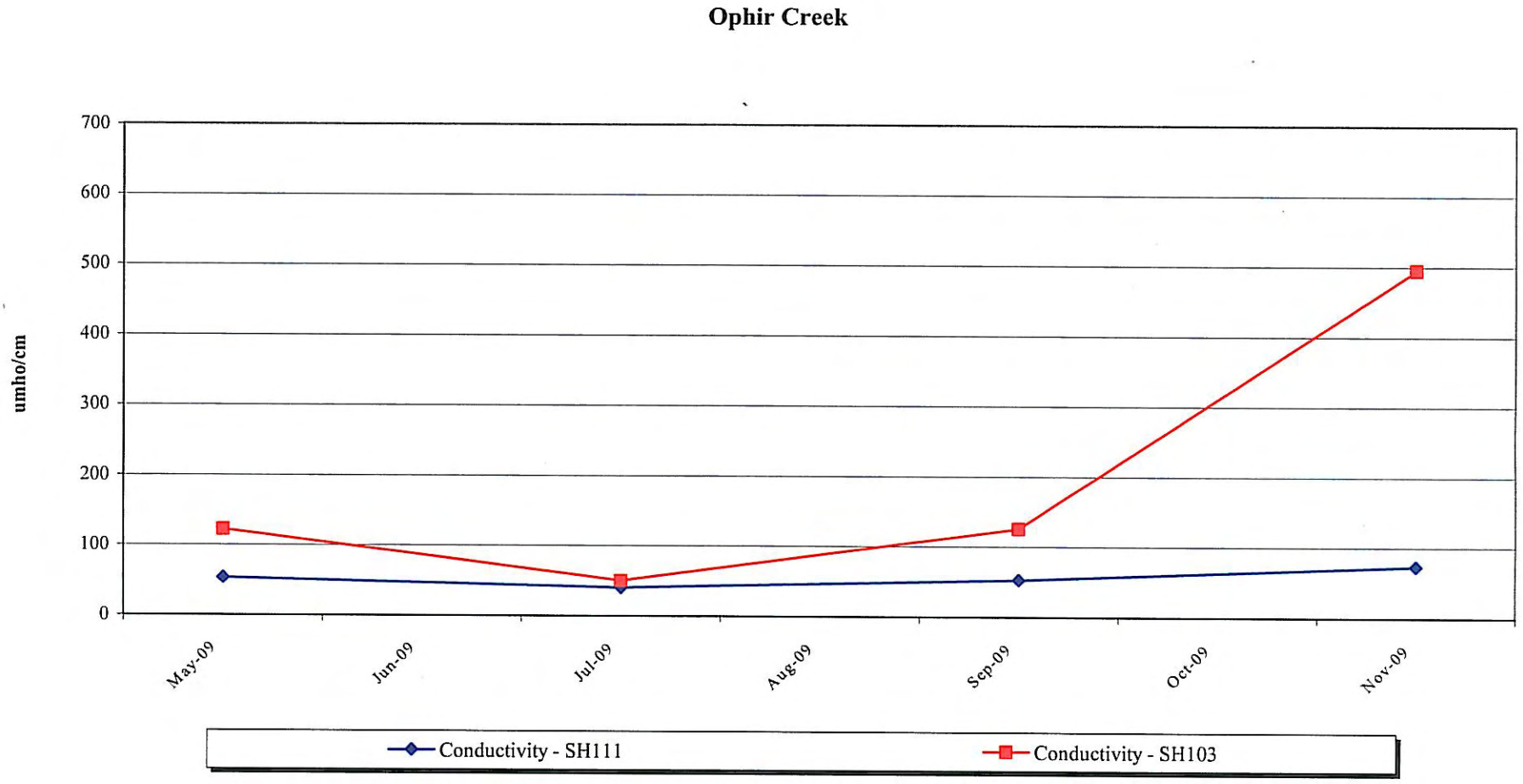

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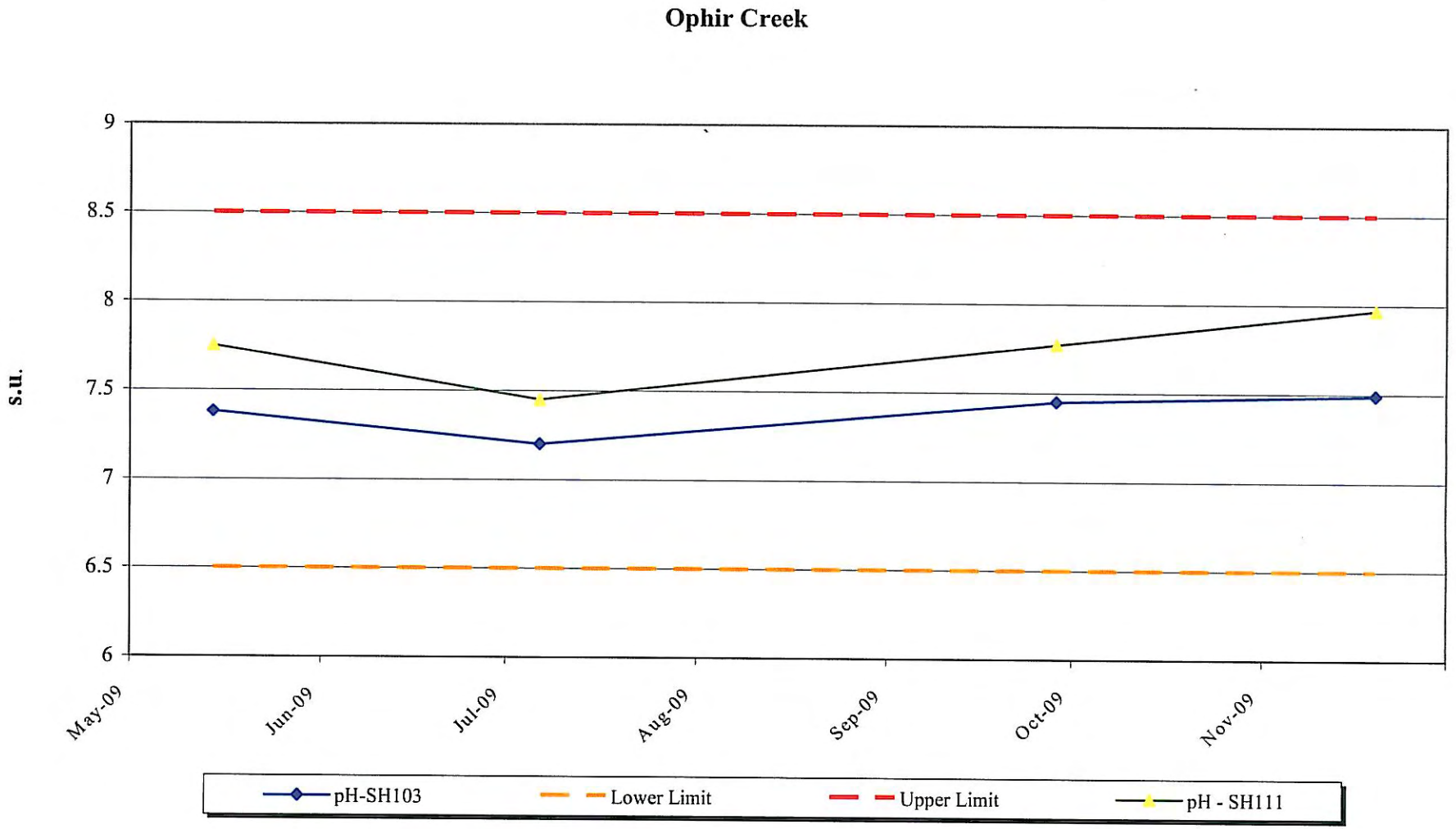
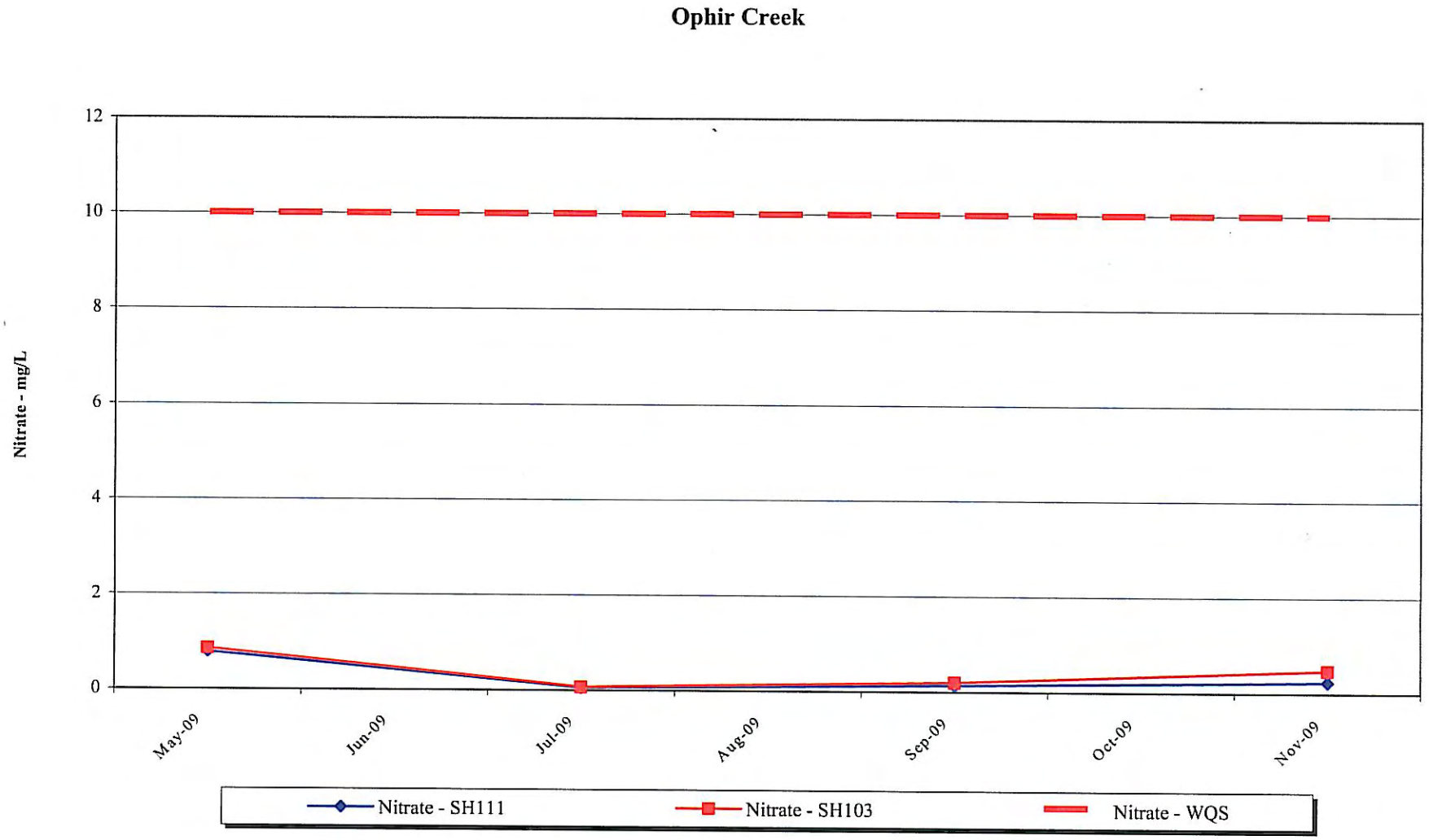


Figure 9b: Ophir Creek Monitoring Results 2009, Major Chemistry



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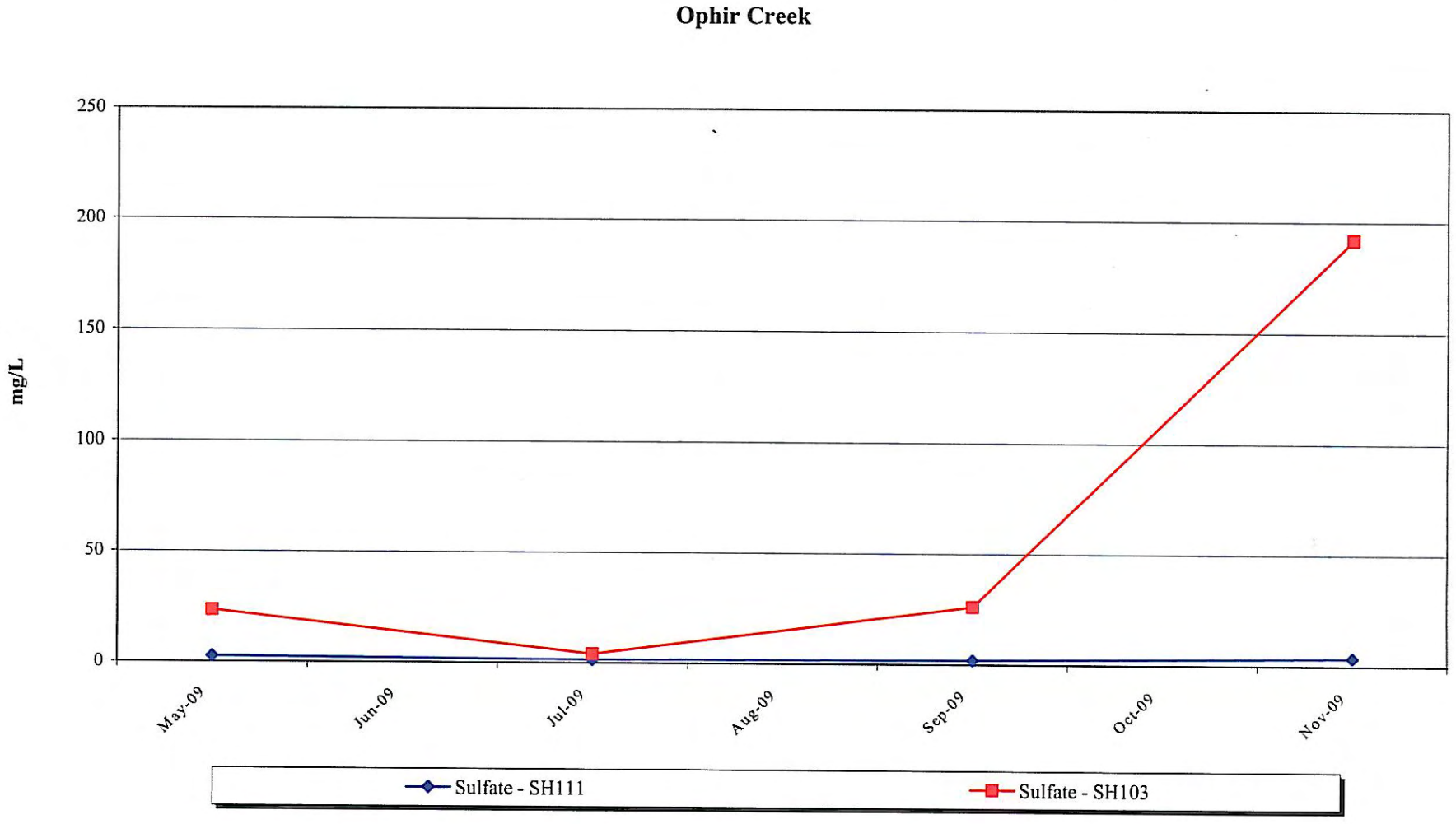

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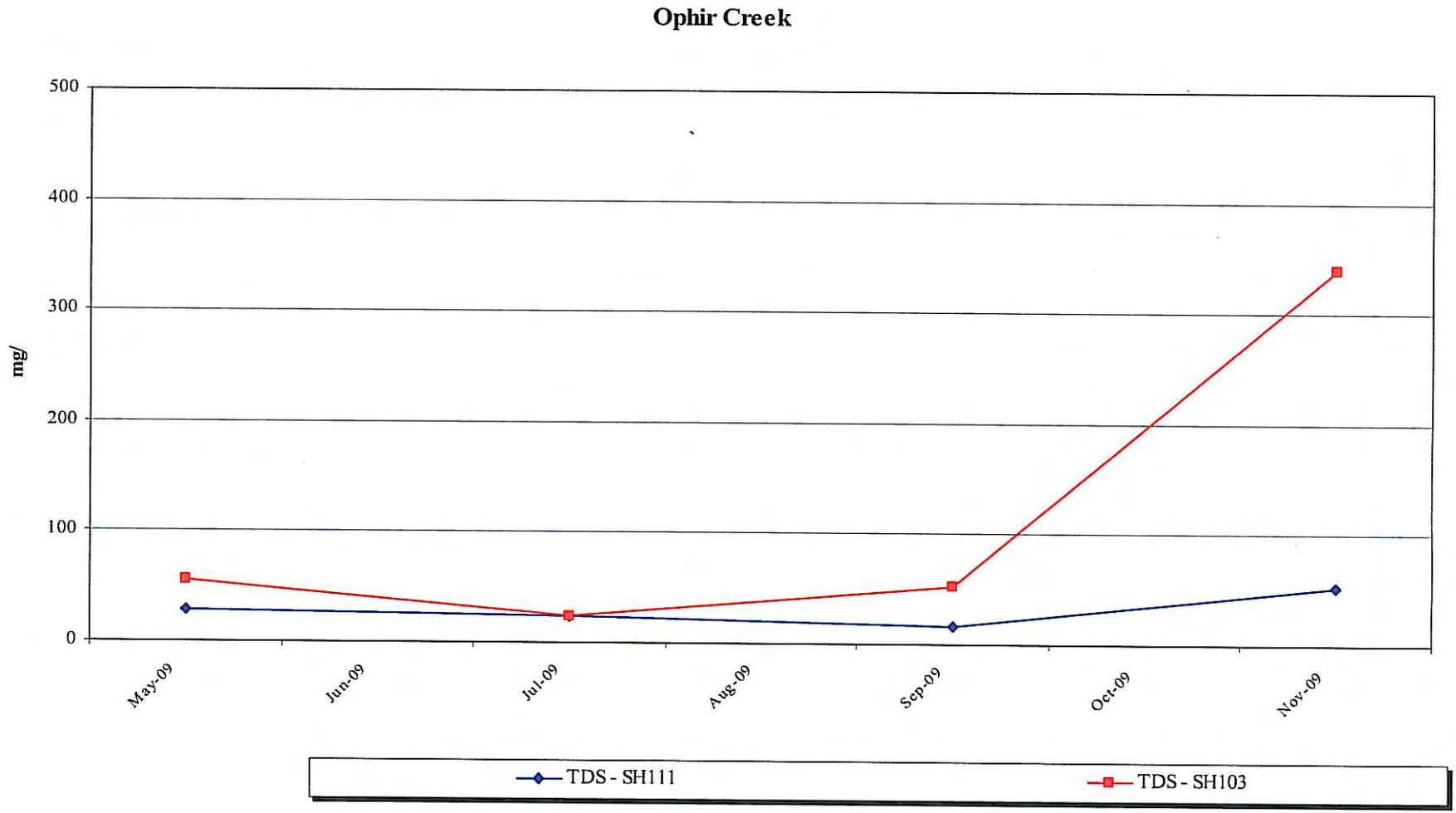


Figure 9b: Ophir Creek Monitoring Results 2009, Major Chemistry

Ophir Creek

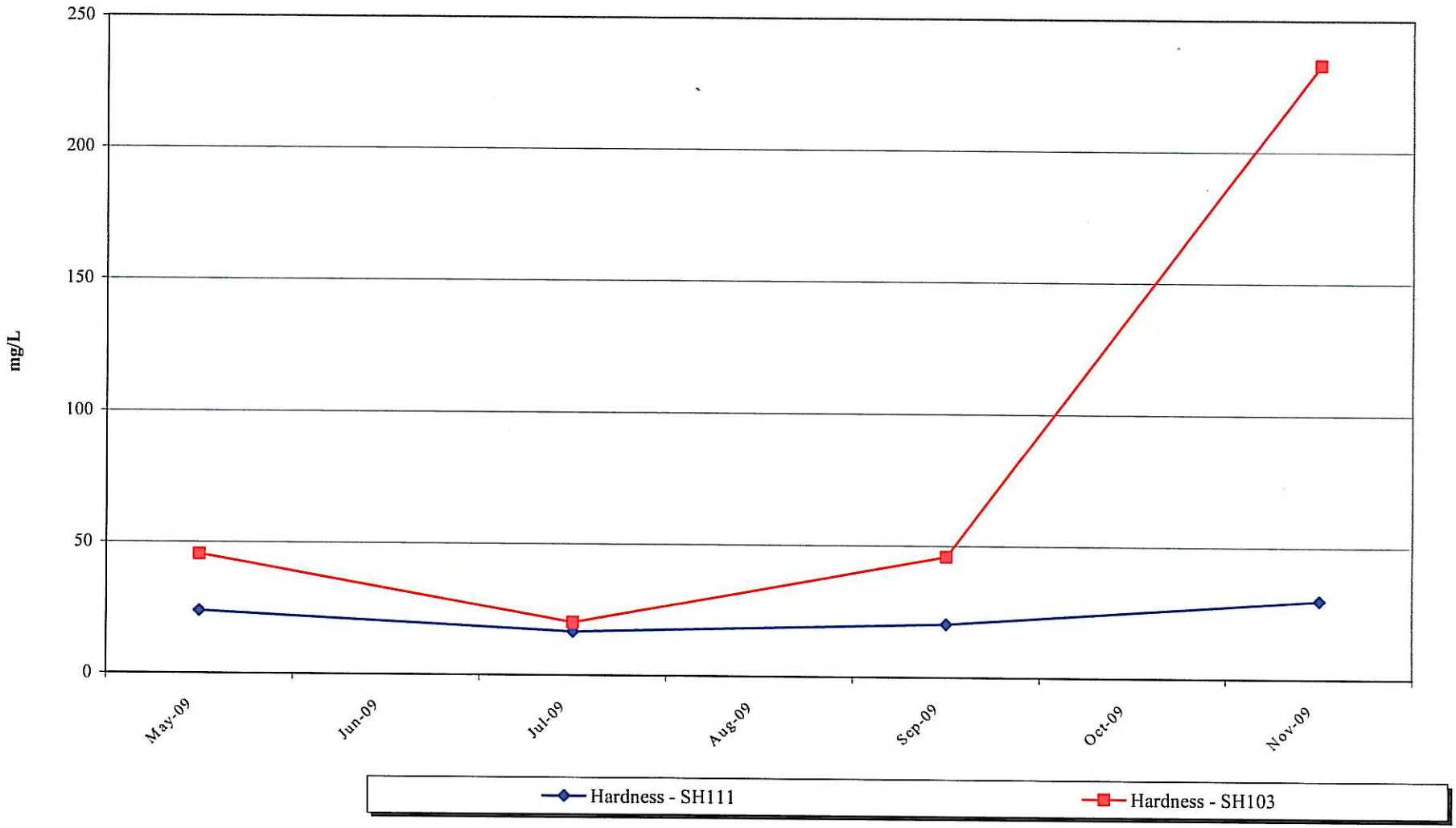
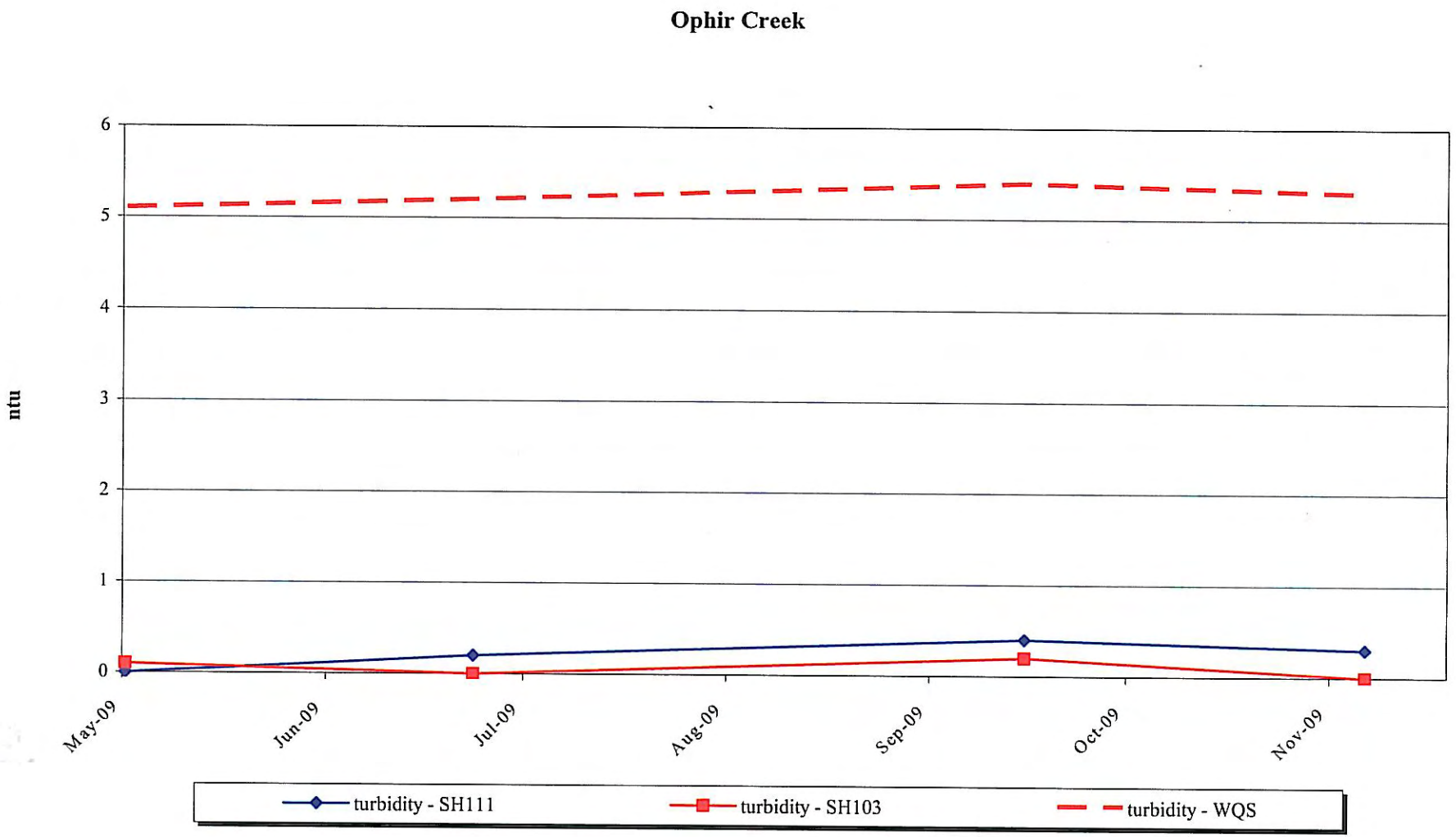

250
200
150
100
50
0
mg/L
May-09
Jun-09
Jul-09
Aug-09
Sep-09
Oct-09
Nov-09
Hardness - SH111
Hardness - SH103

Figure 9b: Ophir Creek Monitoring Results 2009, Major Chemistry



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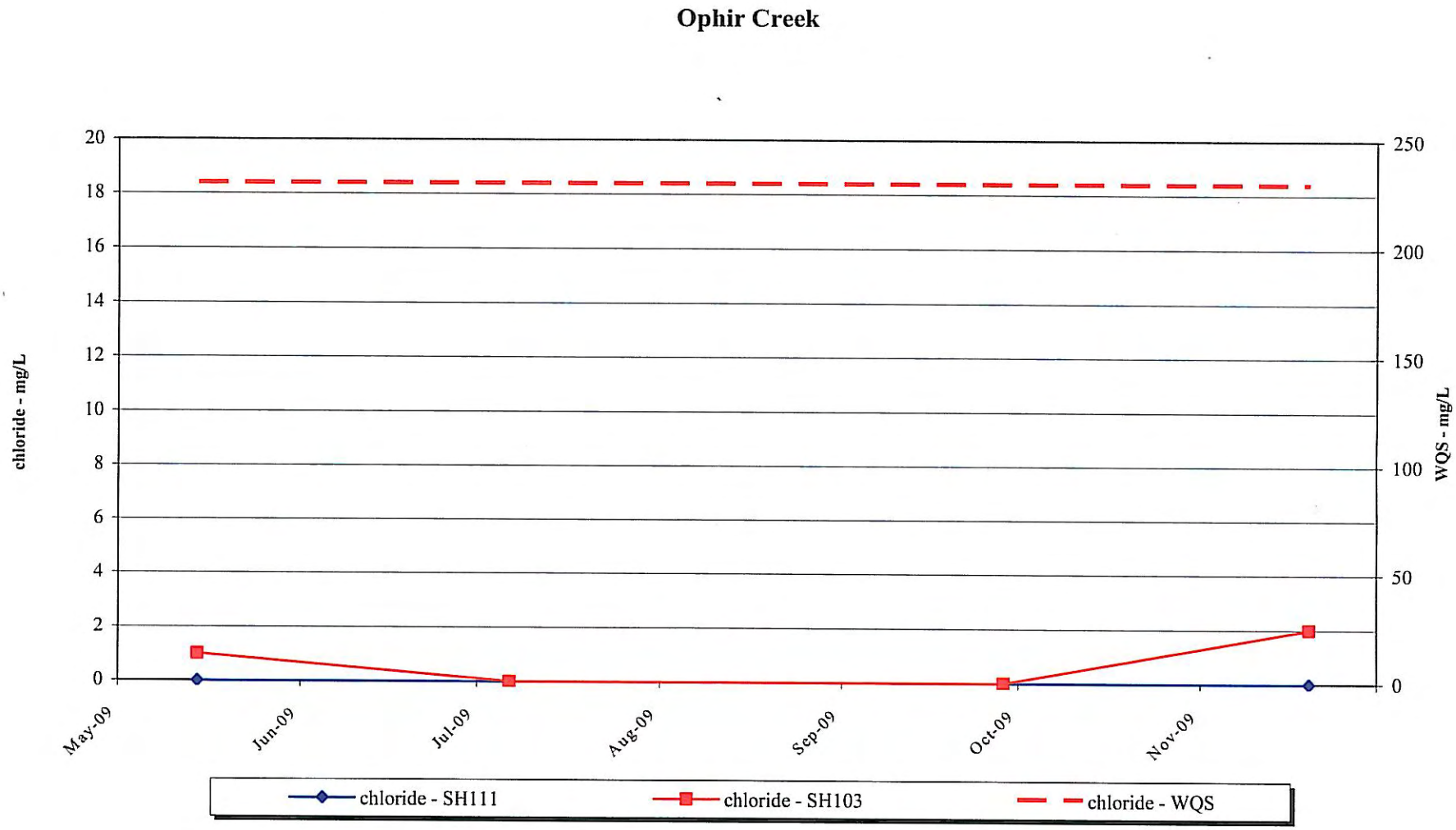

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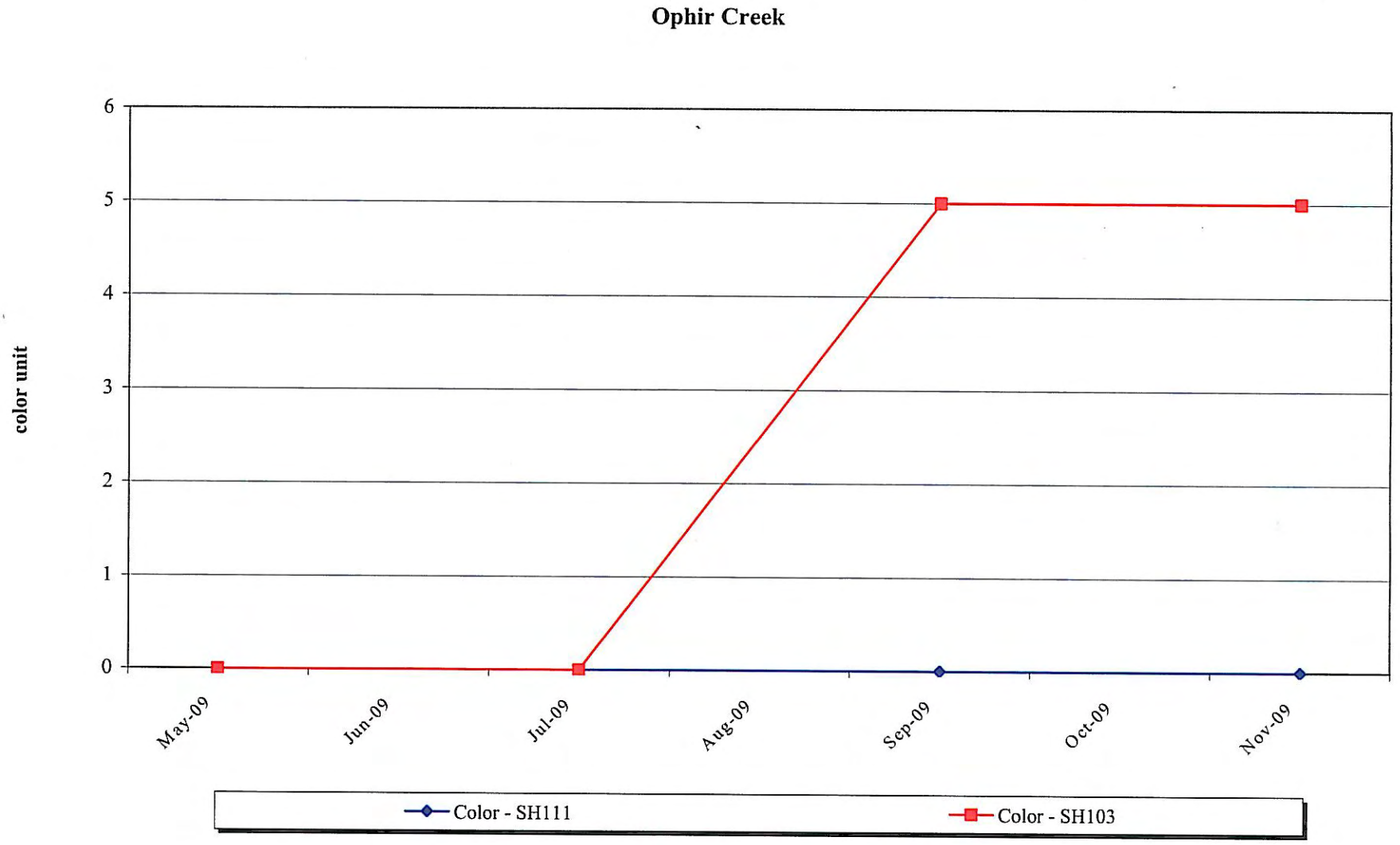


Figure 9c: Ophir Creek Monitoring Results 2009, Trace Chemistry

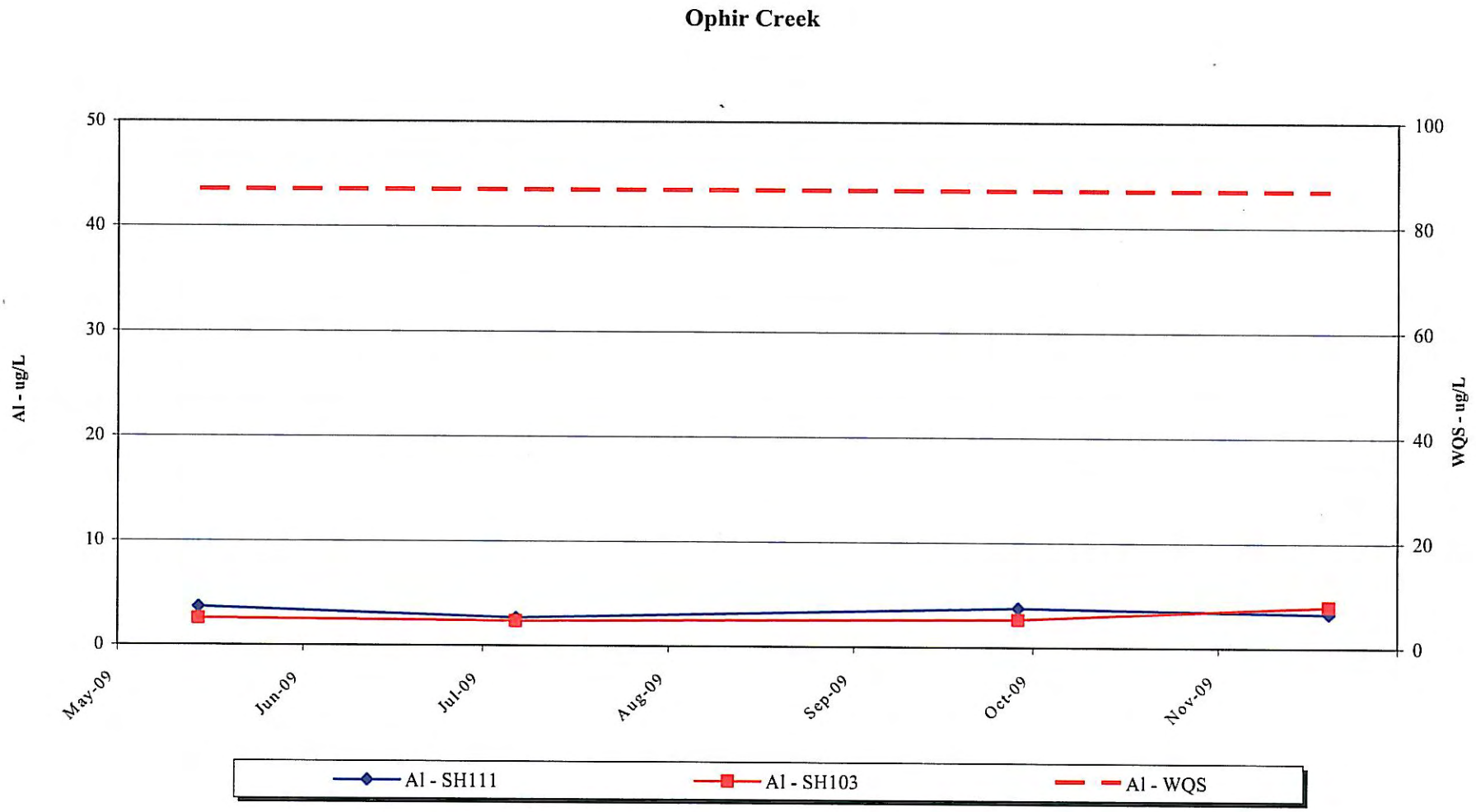


Figure 9c: Ophir Creek Monitoring Results 2009, Trace Chemistry

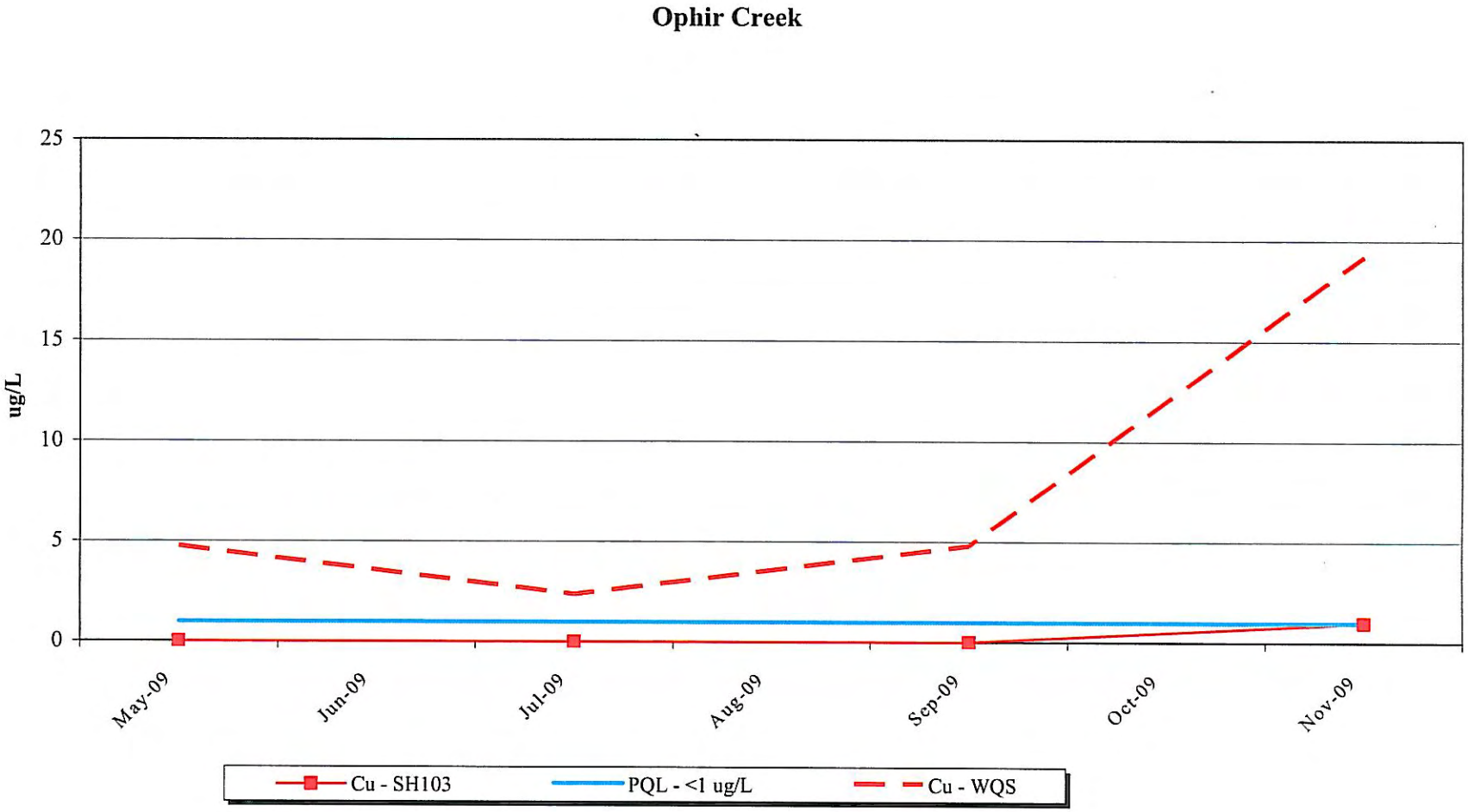


Figure 9c: Ophir Creek Monitoring Results 2009, Trace Chemistry

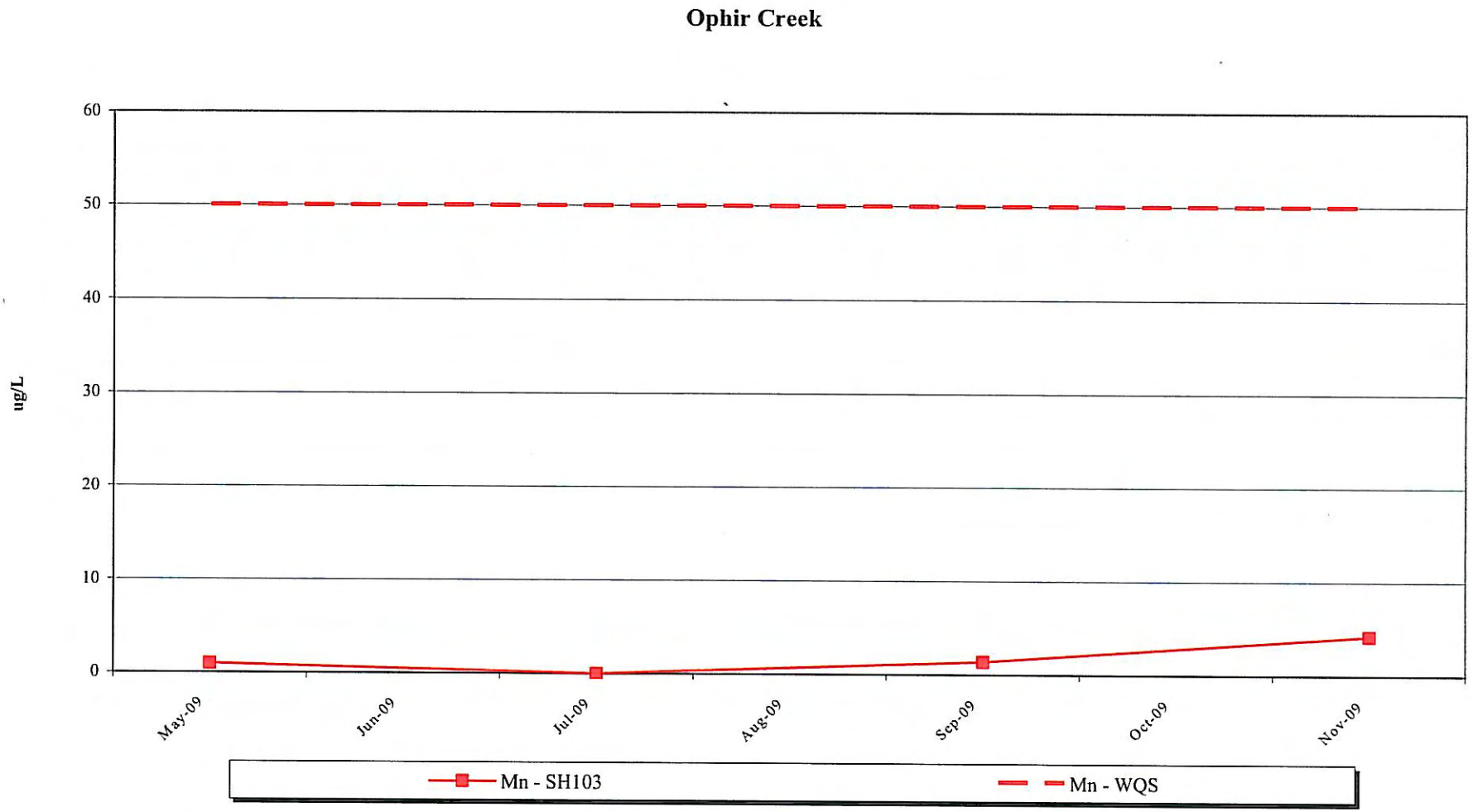


Figure 10a: Outfall 001 Effluent Monitoring Results 2009, Field Parameters

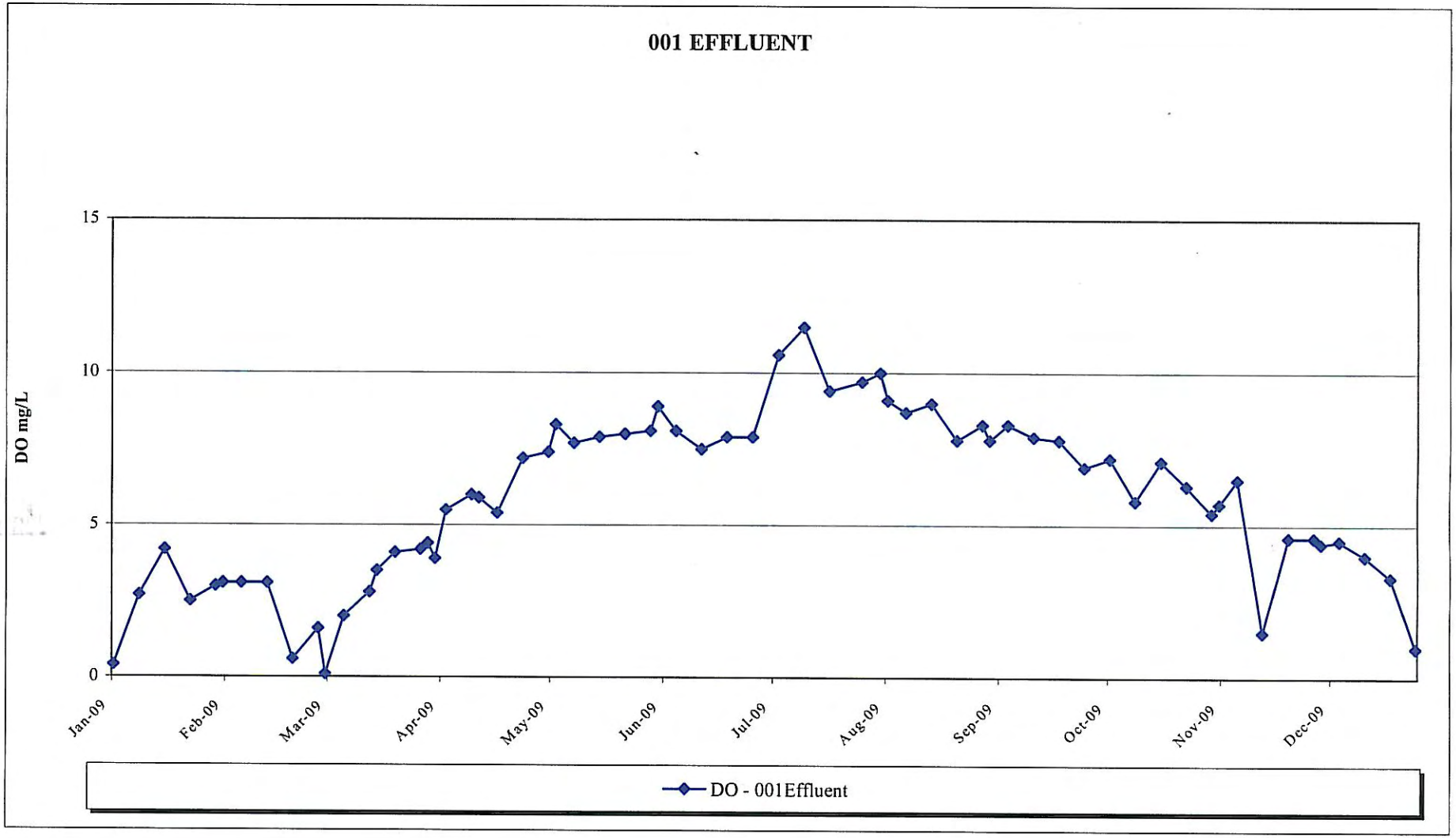


Figure 10a: Outfall 001 Effluent Monitoring Results 2009, Field Parameters

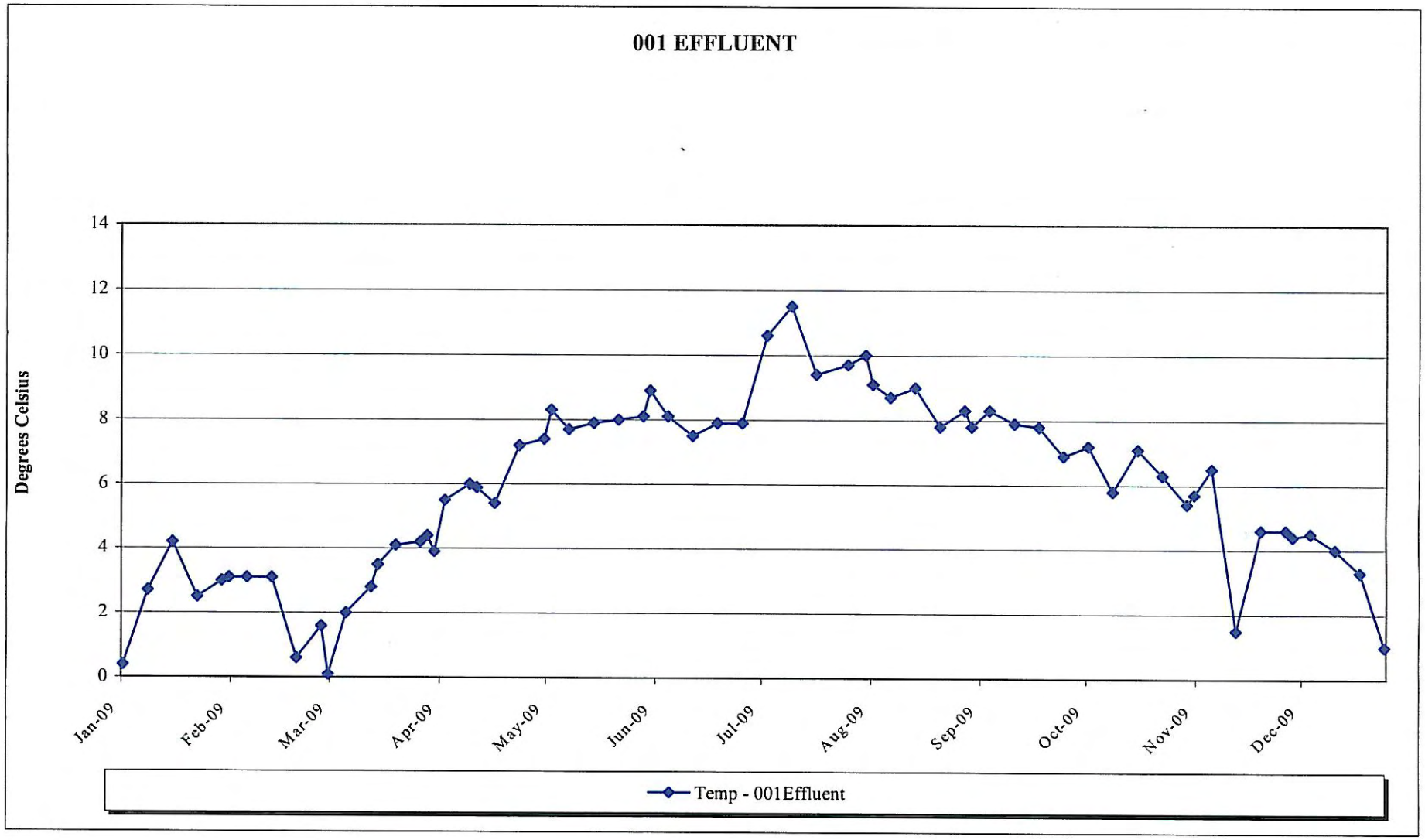


Figure 10b: Outfall 001 Effluent Monitoring Results 2009, Major Chemistry

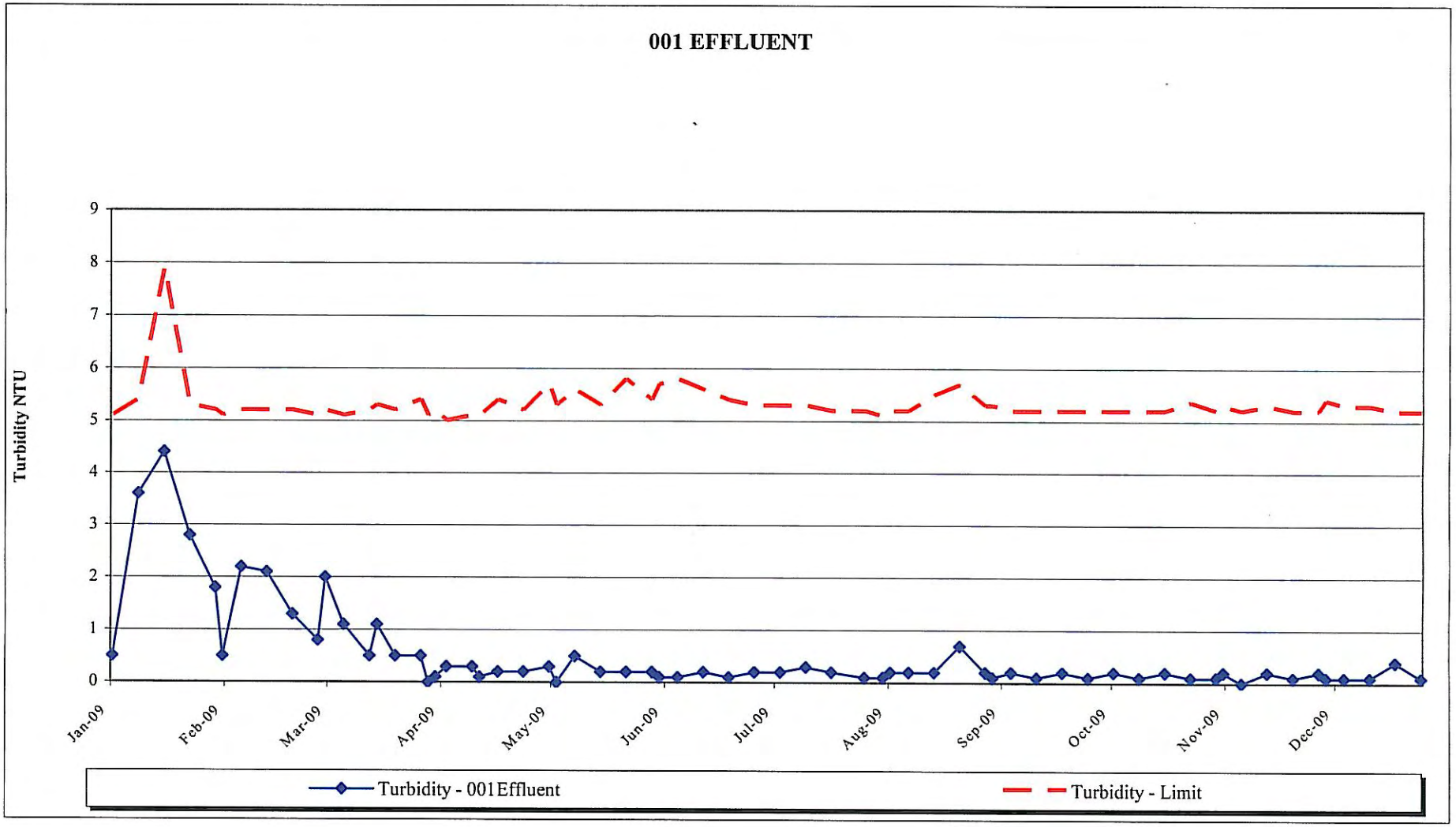


Figure 10b: Outfall 001 Effluent Monitoring Results 2009, Major Chemistry

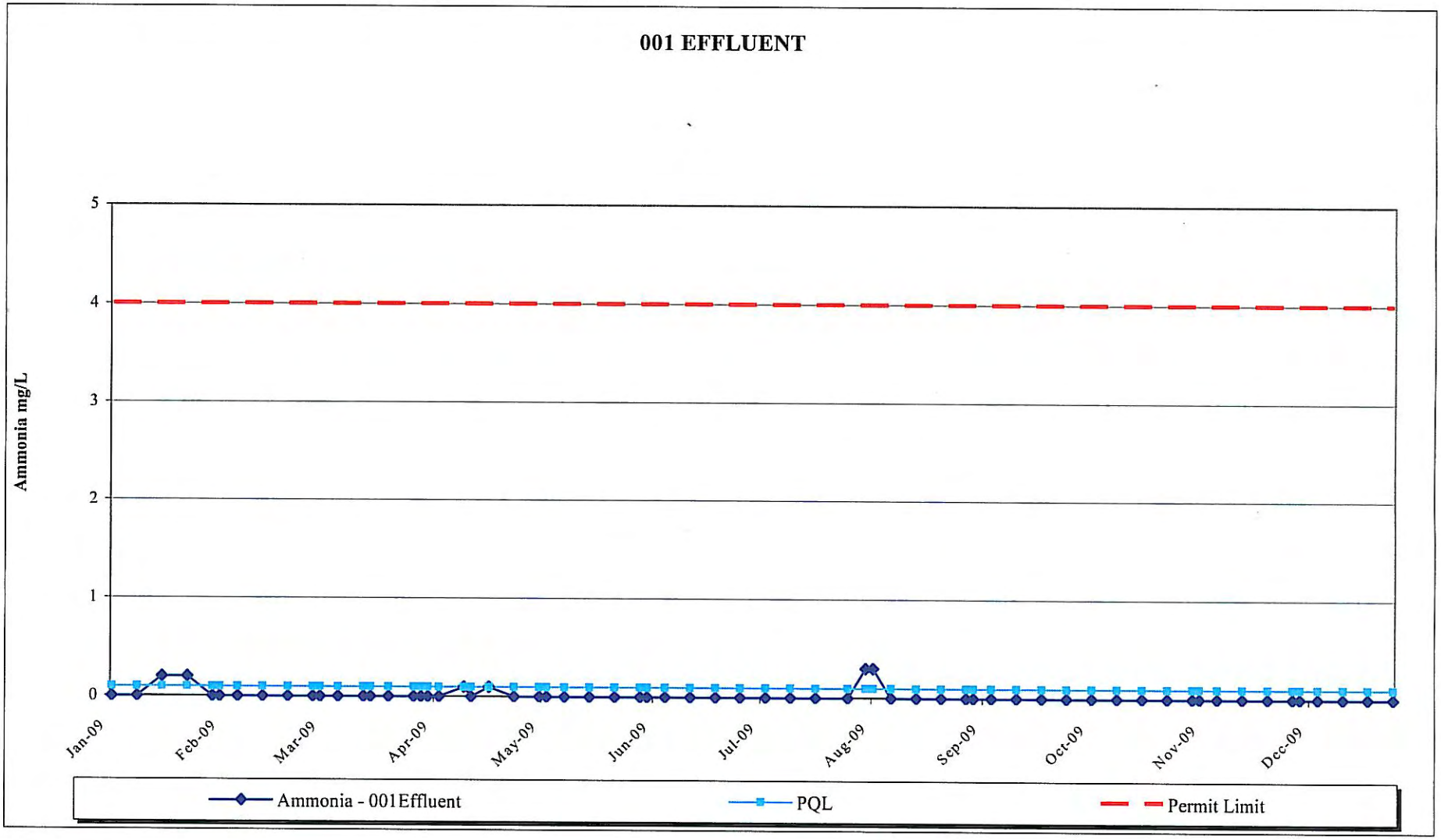


Figure 10b: Outfall 001 Effluent Monitoring Results 2009, Major Chemistry

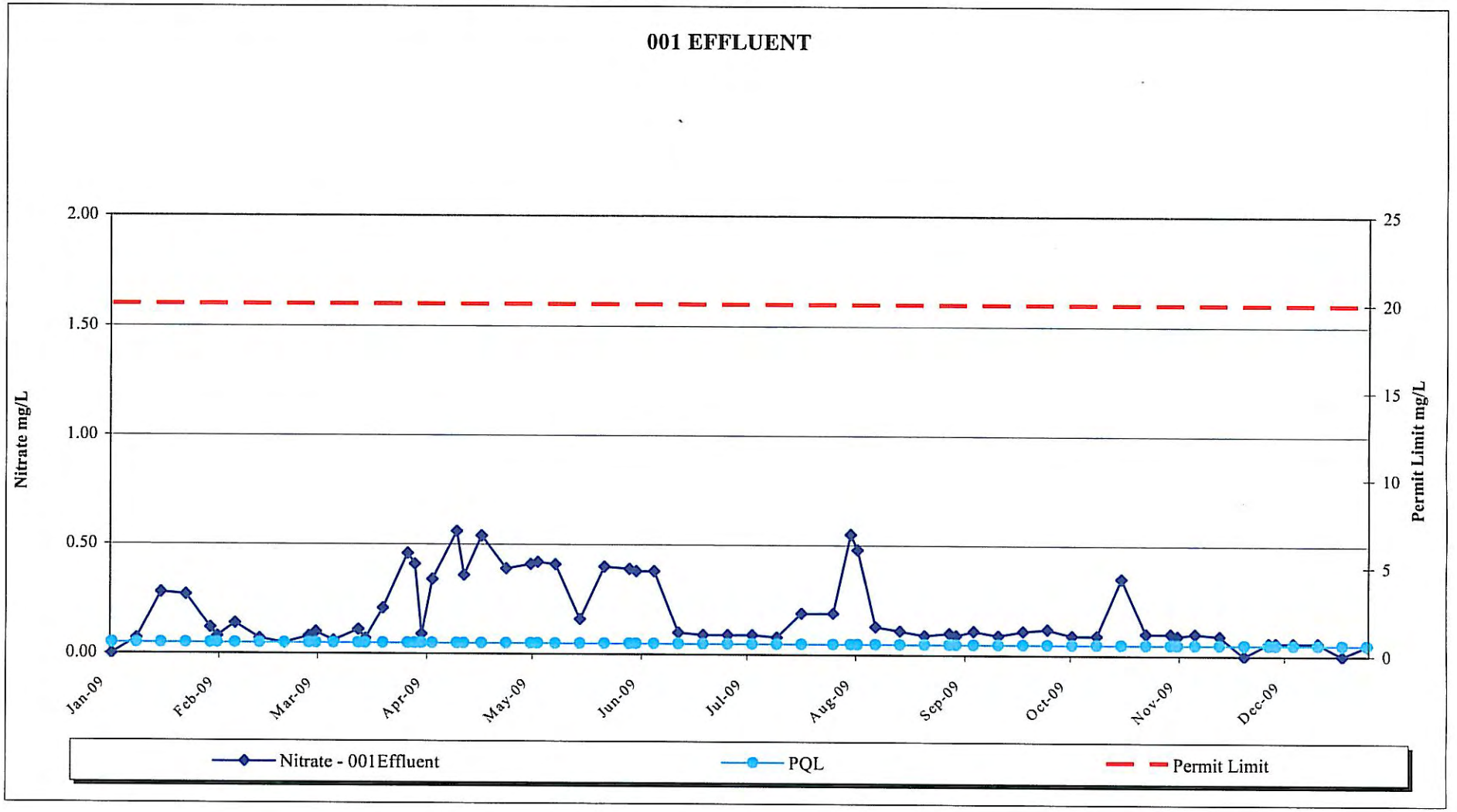


Figure 10b: Outfall 001 Effluent Monitoring Results 2009, Major Chemistry

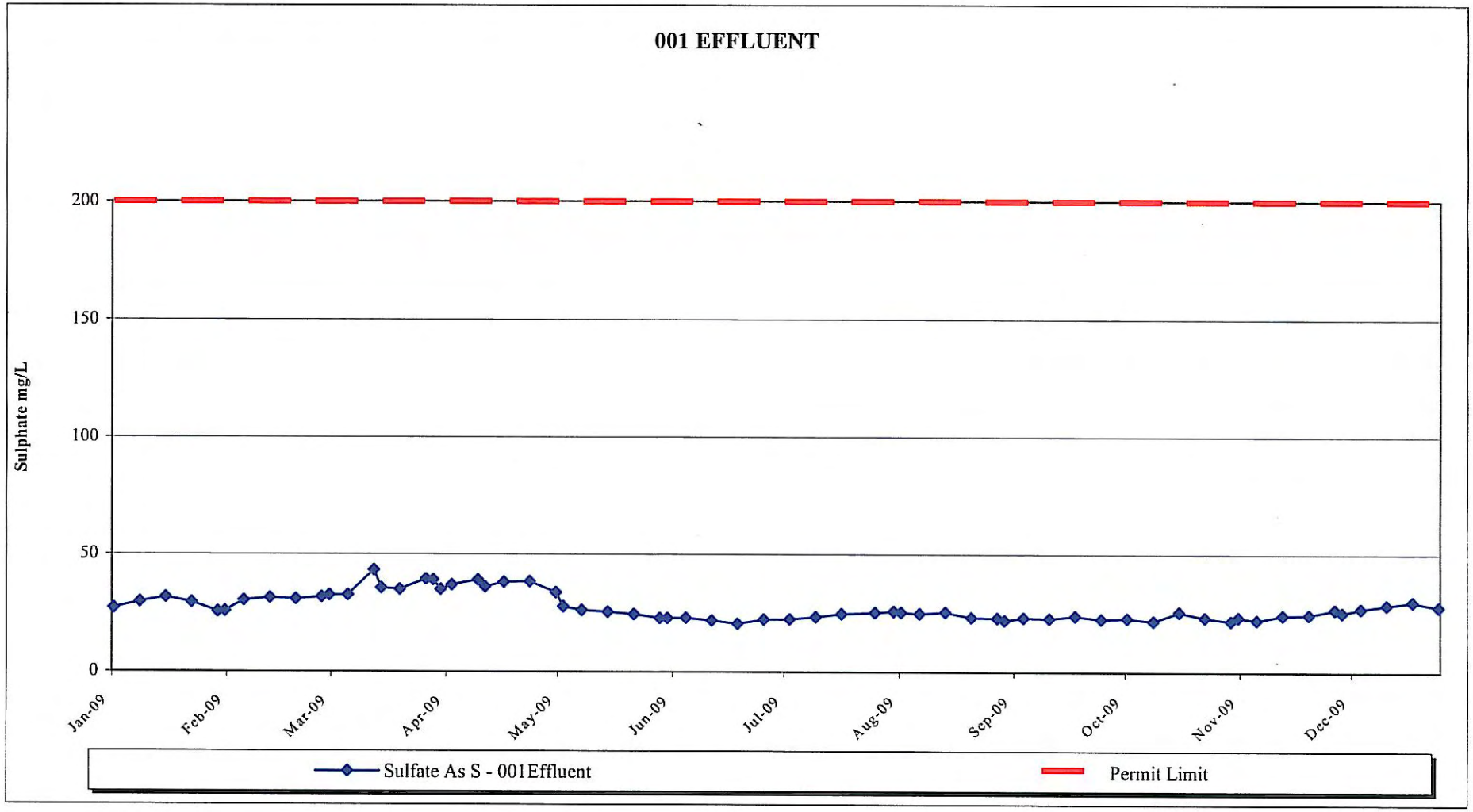


Figure 10b: Outfall 001 Effluent Monitoring Results 2009, Major Chemistry

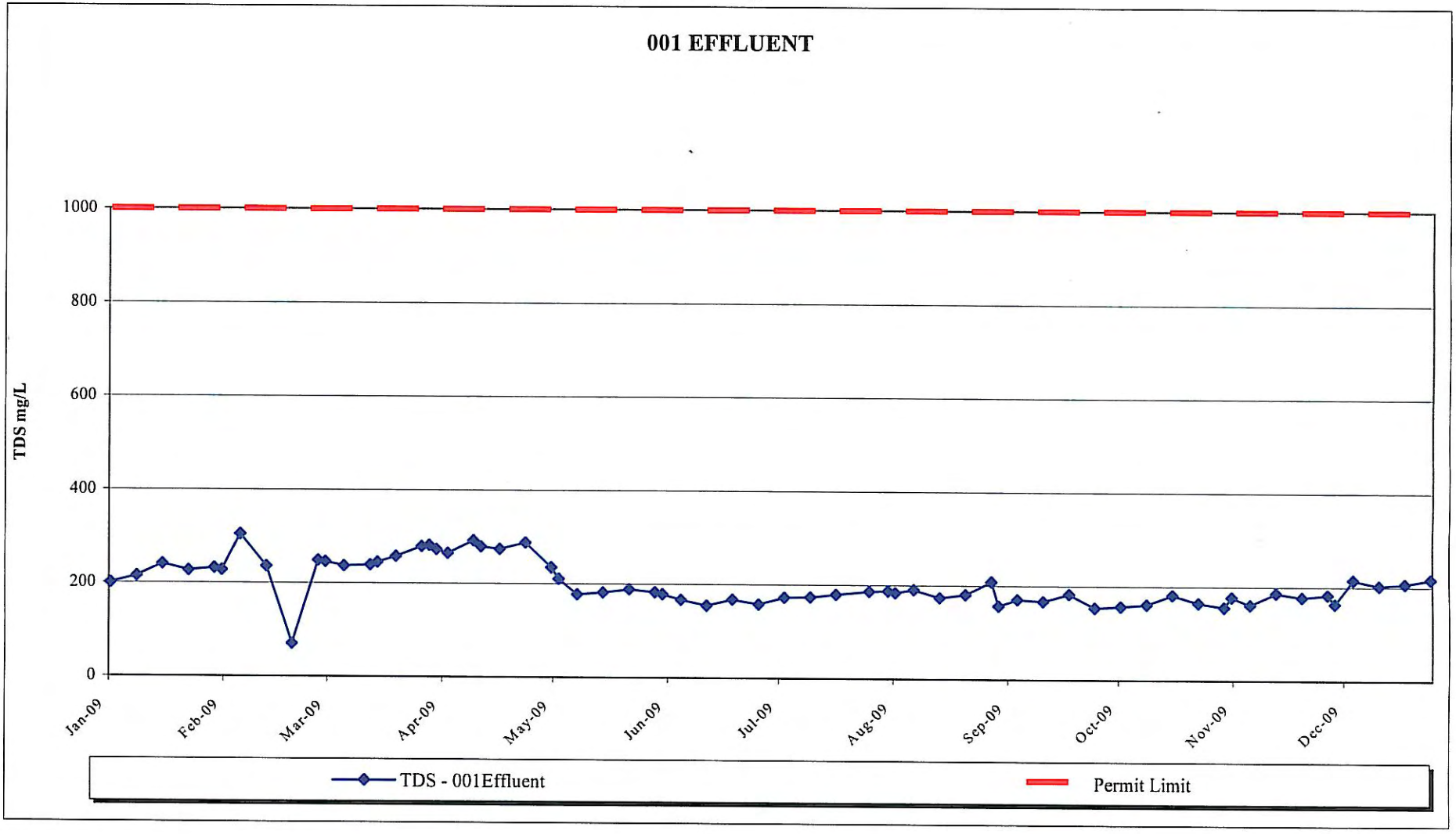


Figure 10c: Outfall 001 Effluent Monitoring Results 2009, Trace Chemistry

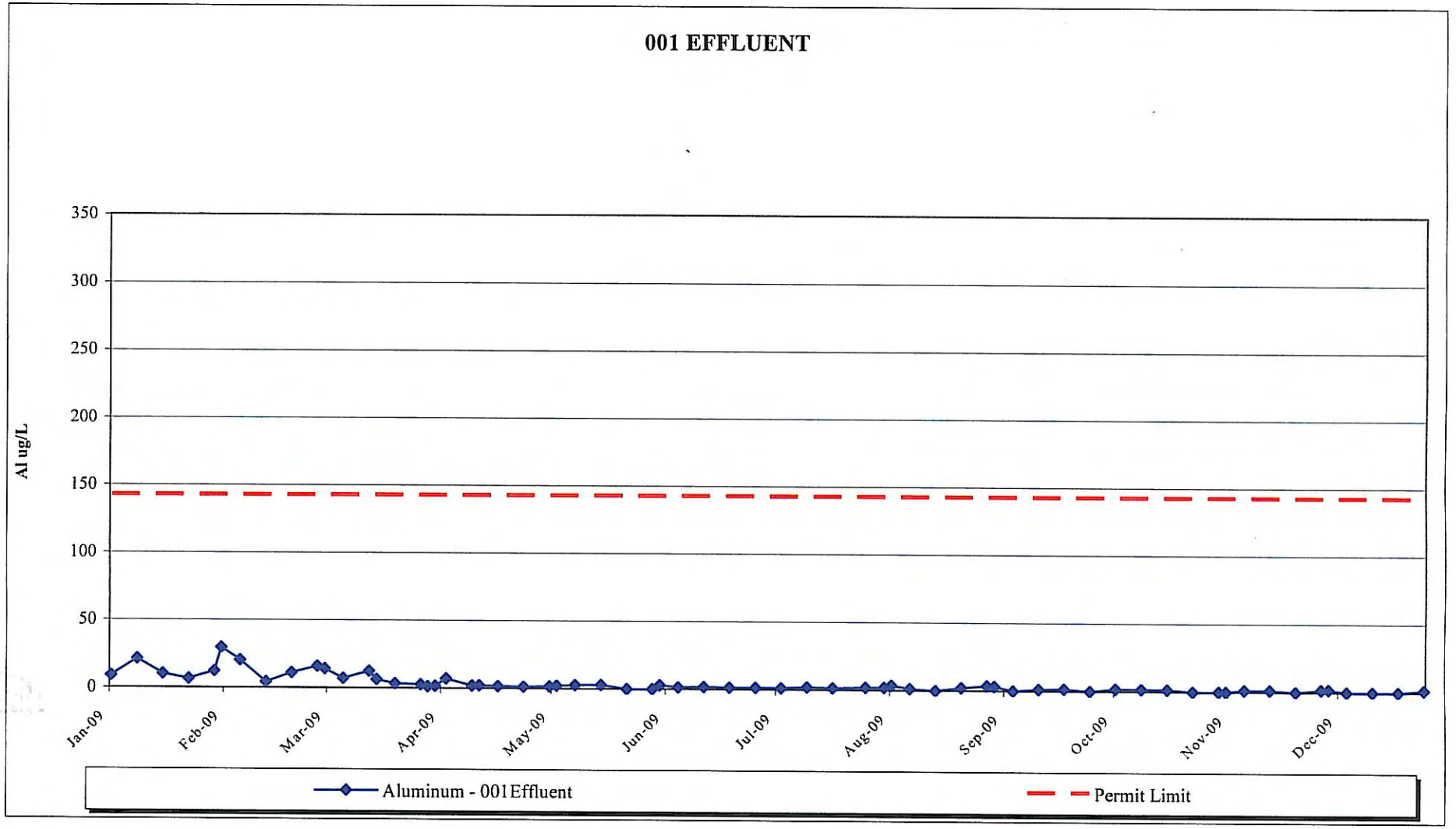


Figure 10c: Outfall 001 Effluent Monitoring Results 2009, Trace Chemistry

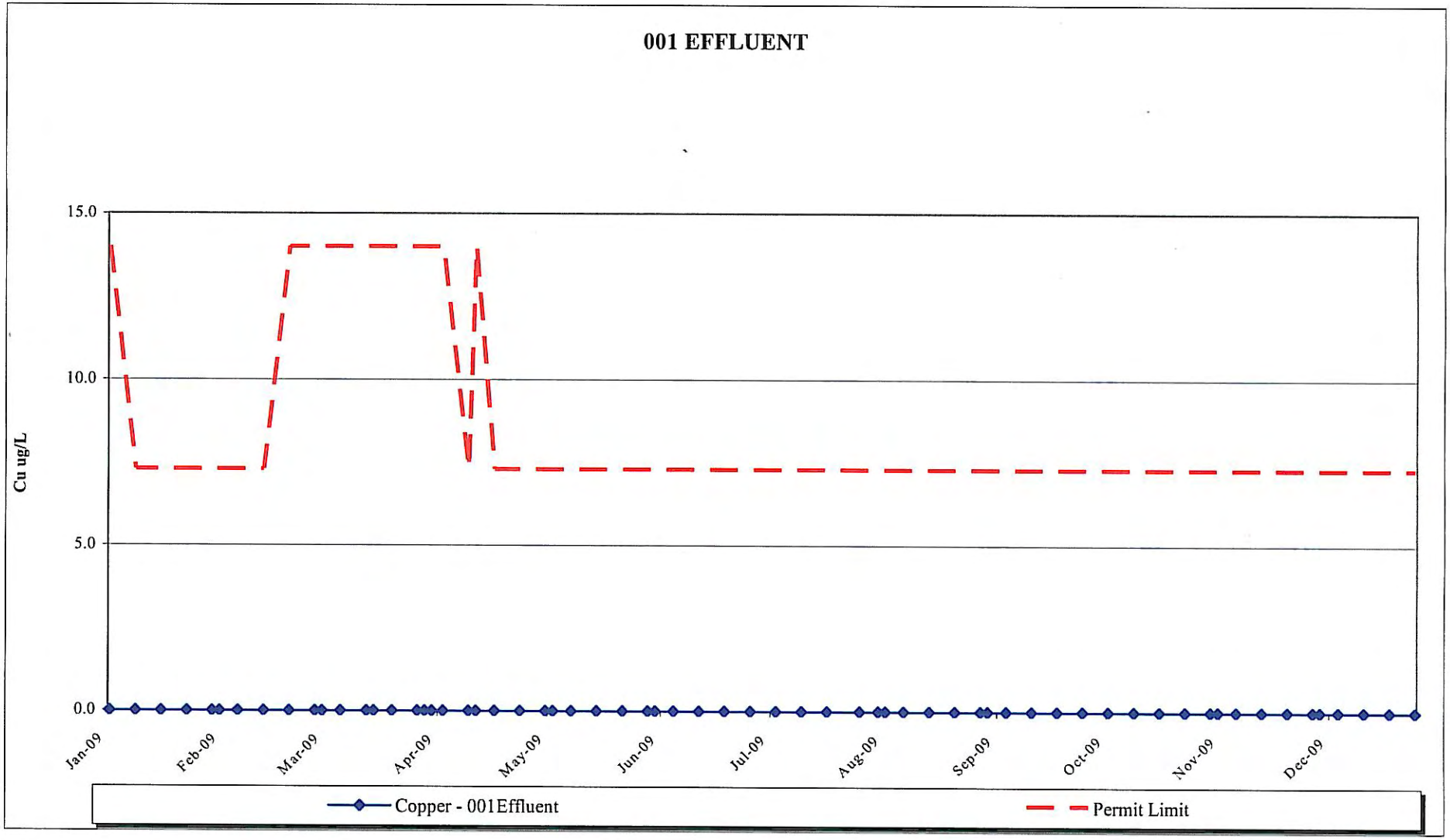


Figure 10c: Outfall 001 Effluent Monitoring Results 2009, Trace Chemistry

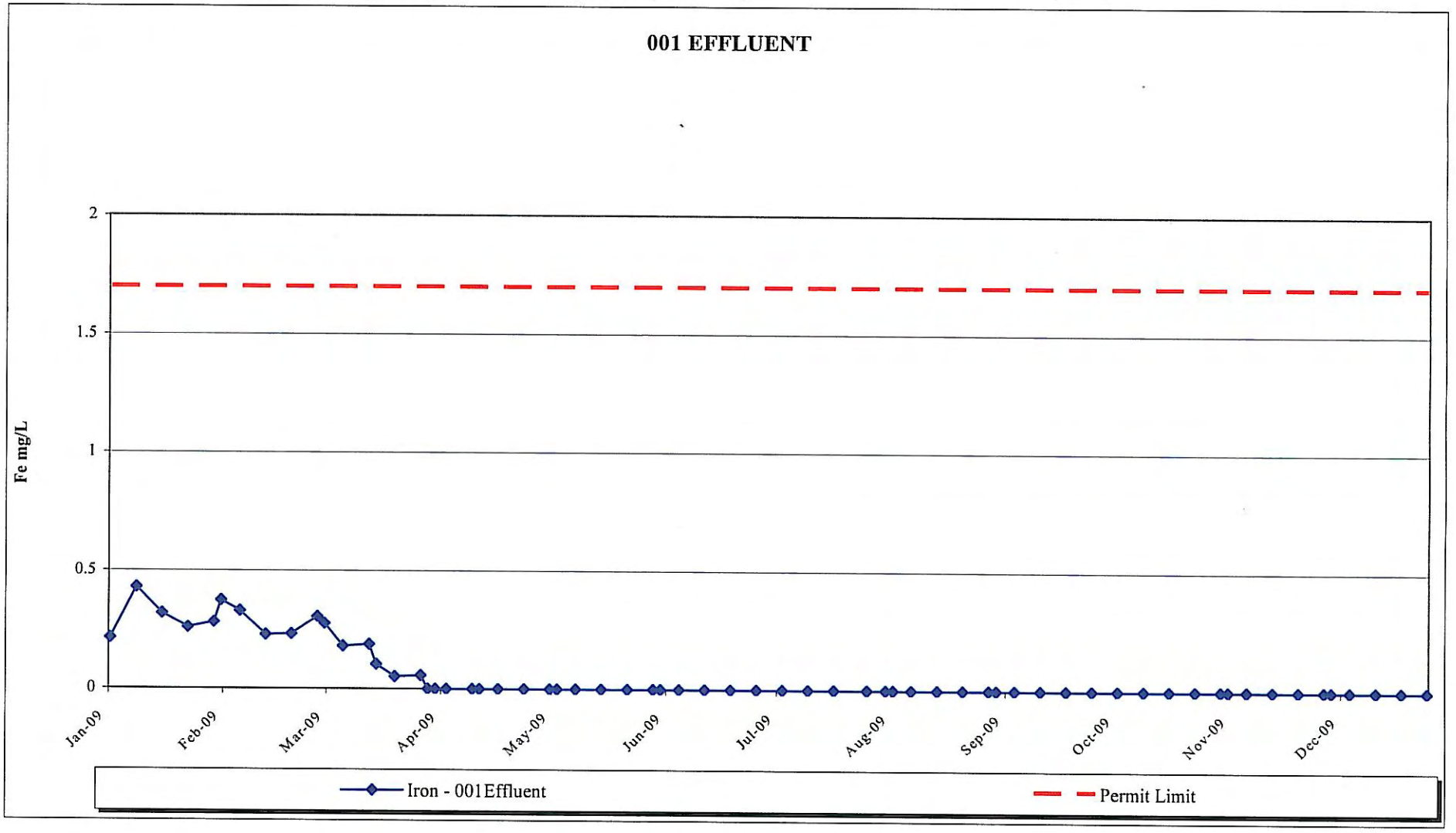


Figure 10c: Outfall 001 Effluent Monitoring Results 2009, Trace Chemistry

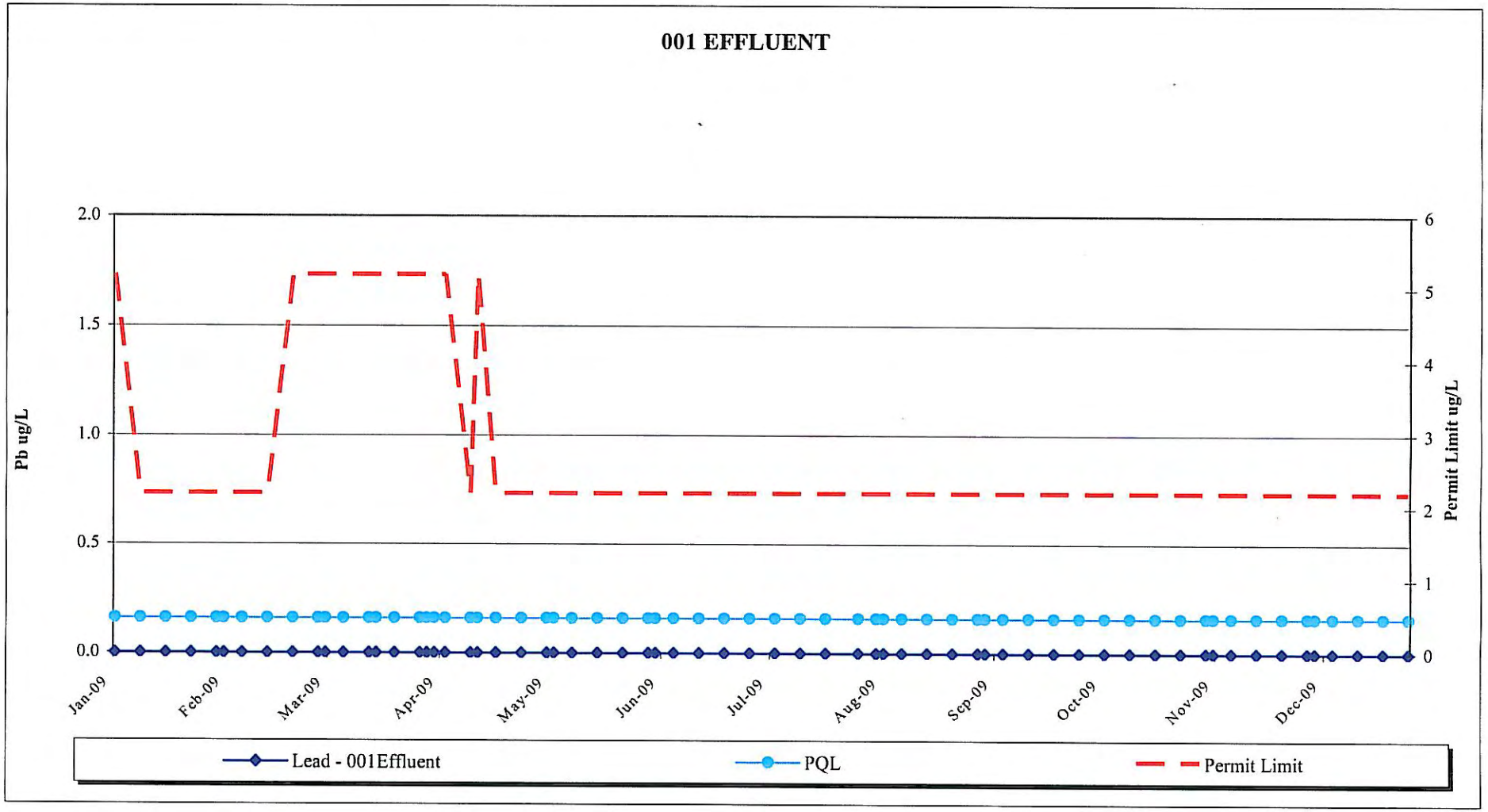


Figure 10c: Outfall 001 Effluent Monitoring Results 2009, Trace Chemistry

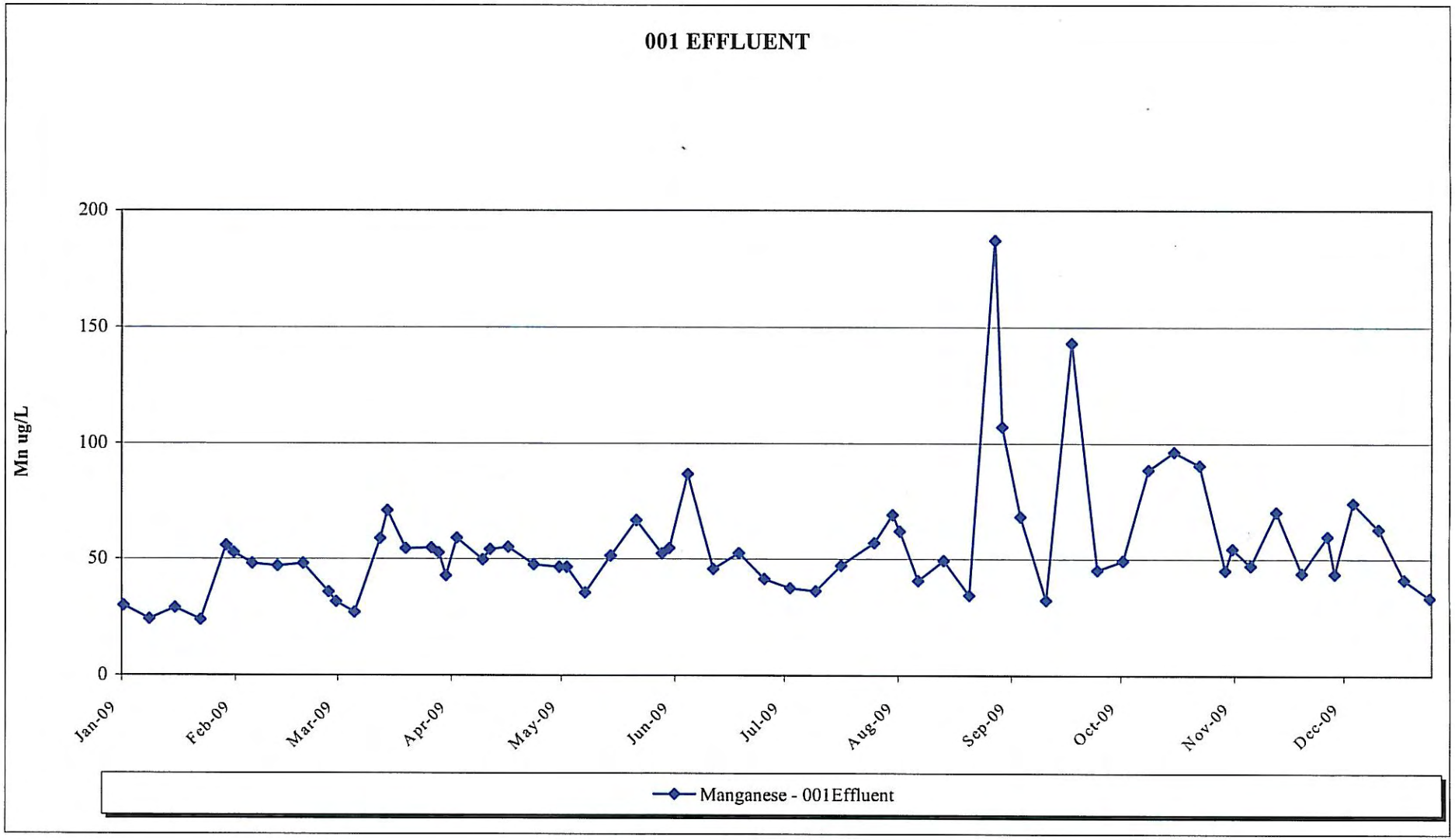


Figure 10c: Outfall 001 Effluent Monitoring Results 2009, Trace Chemistry

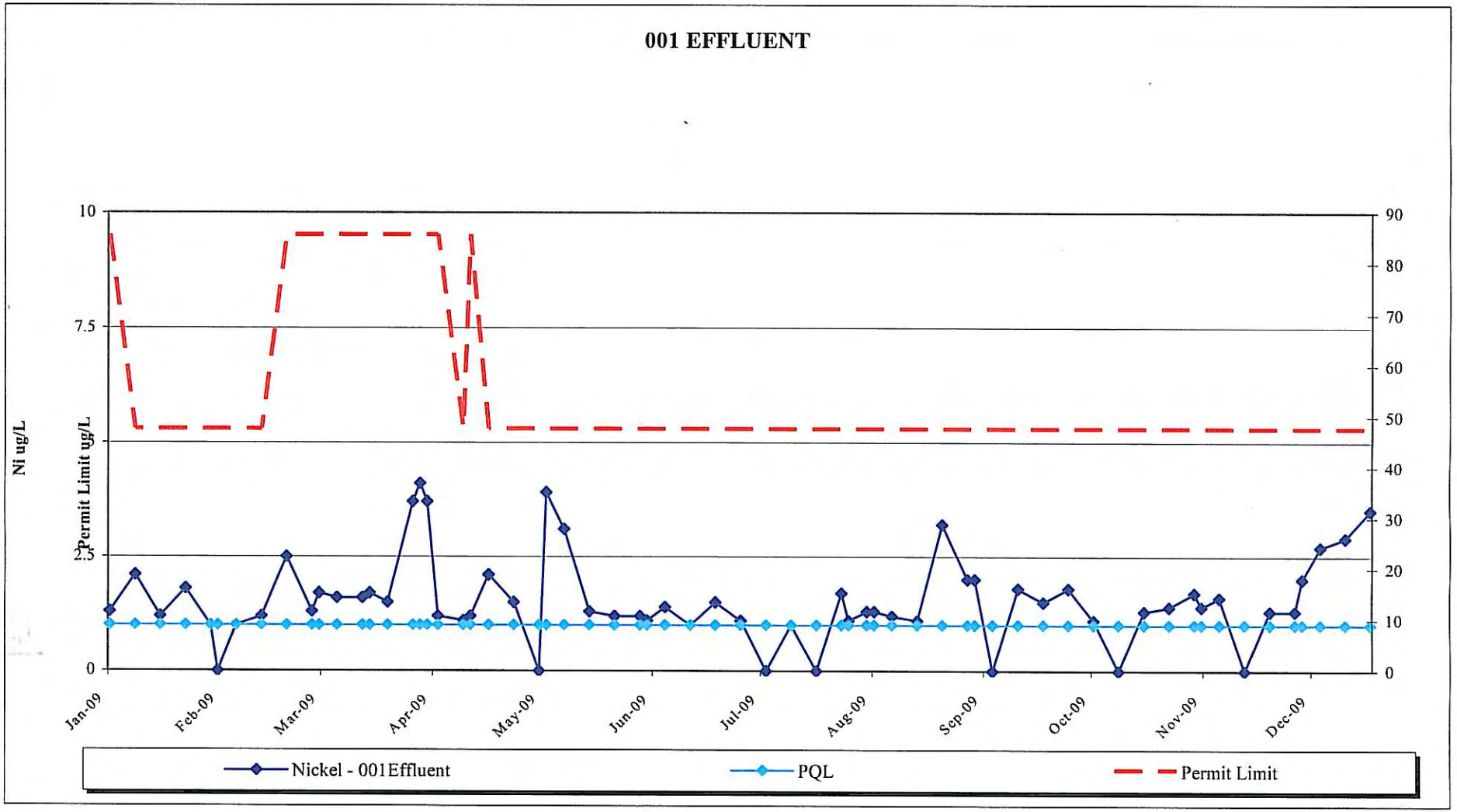


Figure 10c: Outfall 001 Effluent Monitoring Results 2009, Trace Chemistry

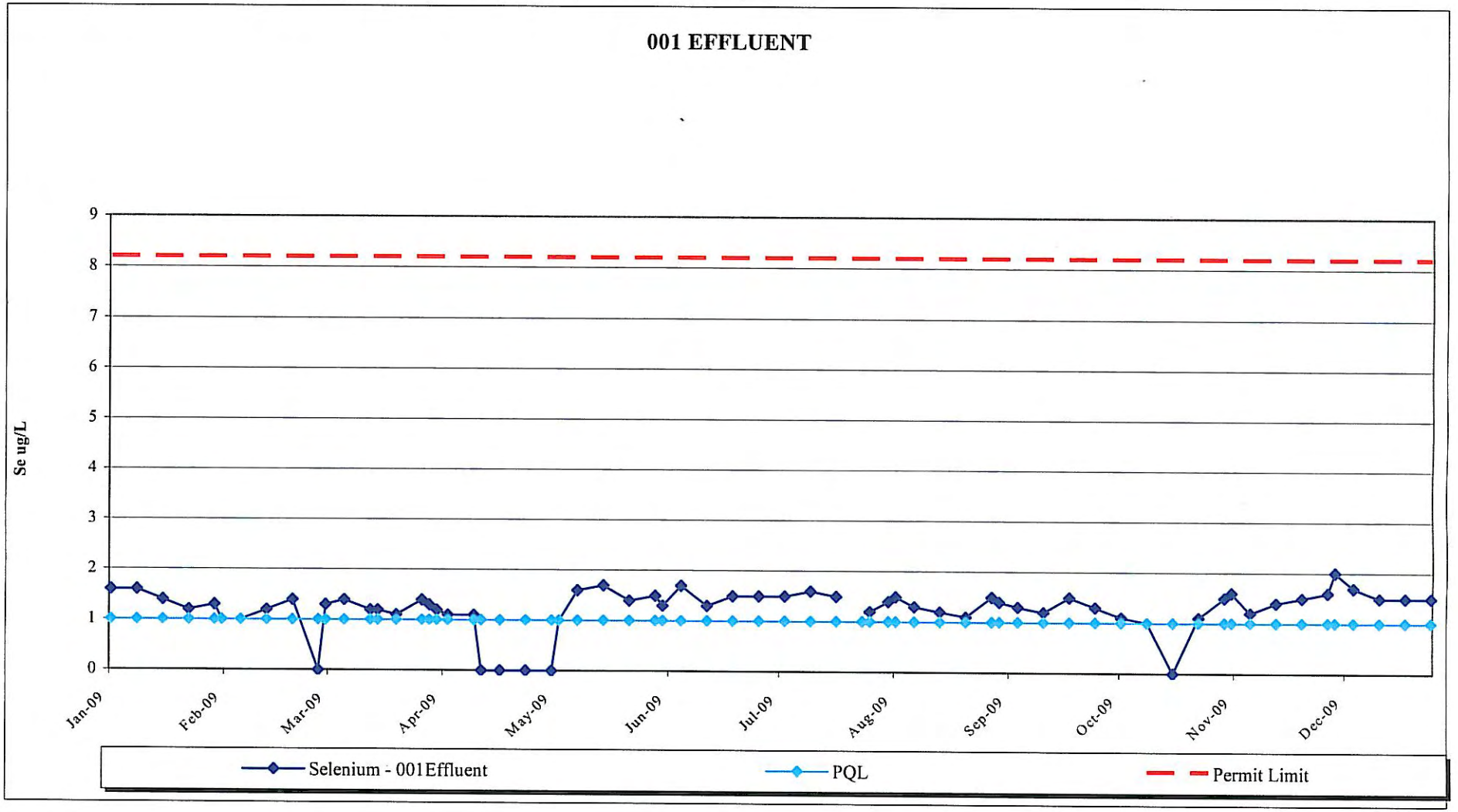


Figure 10c: Outfall 001 Effluent Monitoring Results 2009, Trace Chemistry

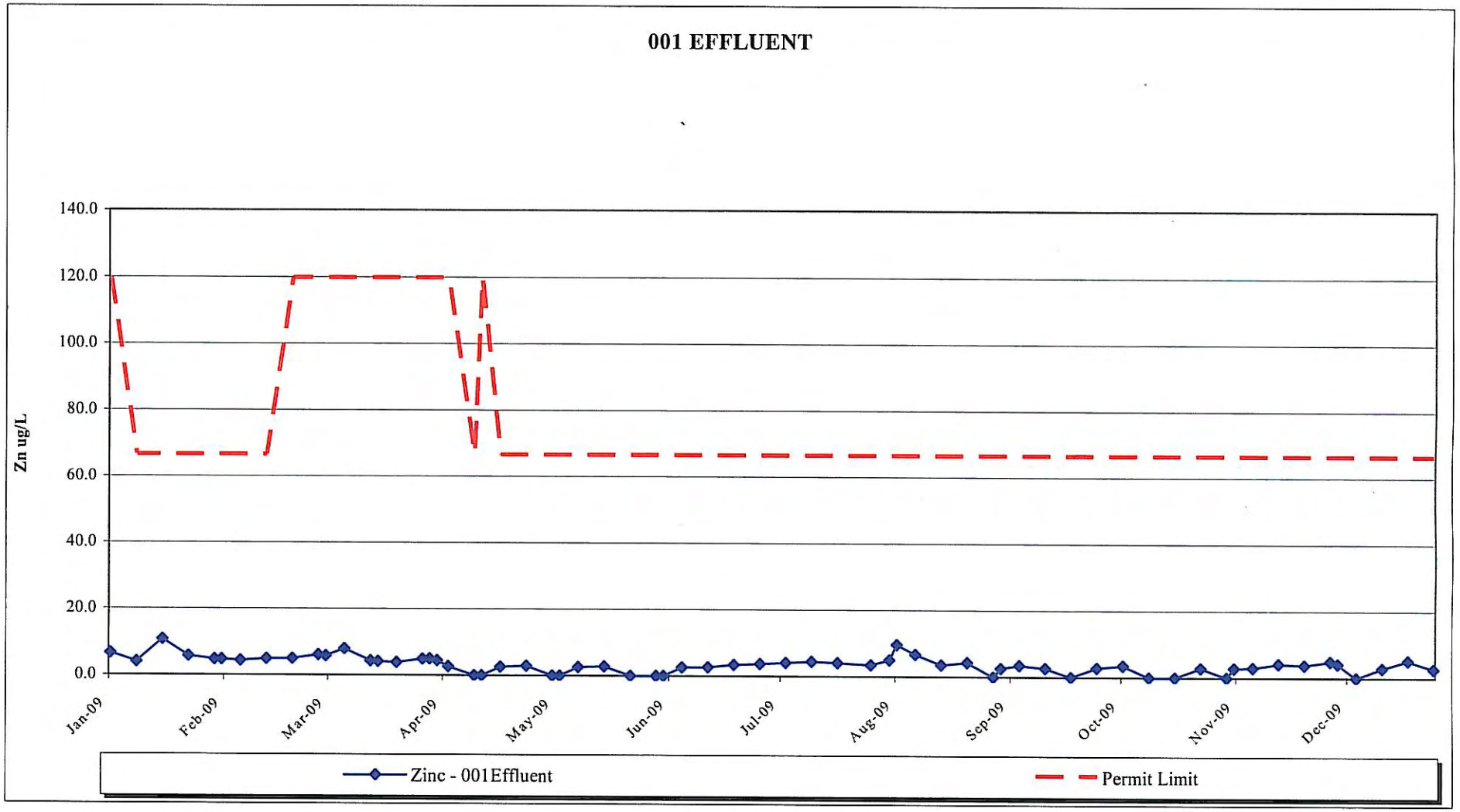


Figure 10c: Outfall 001 Effluent Monitoring Results 2009, Trace Chemistry

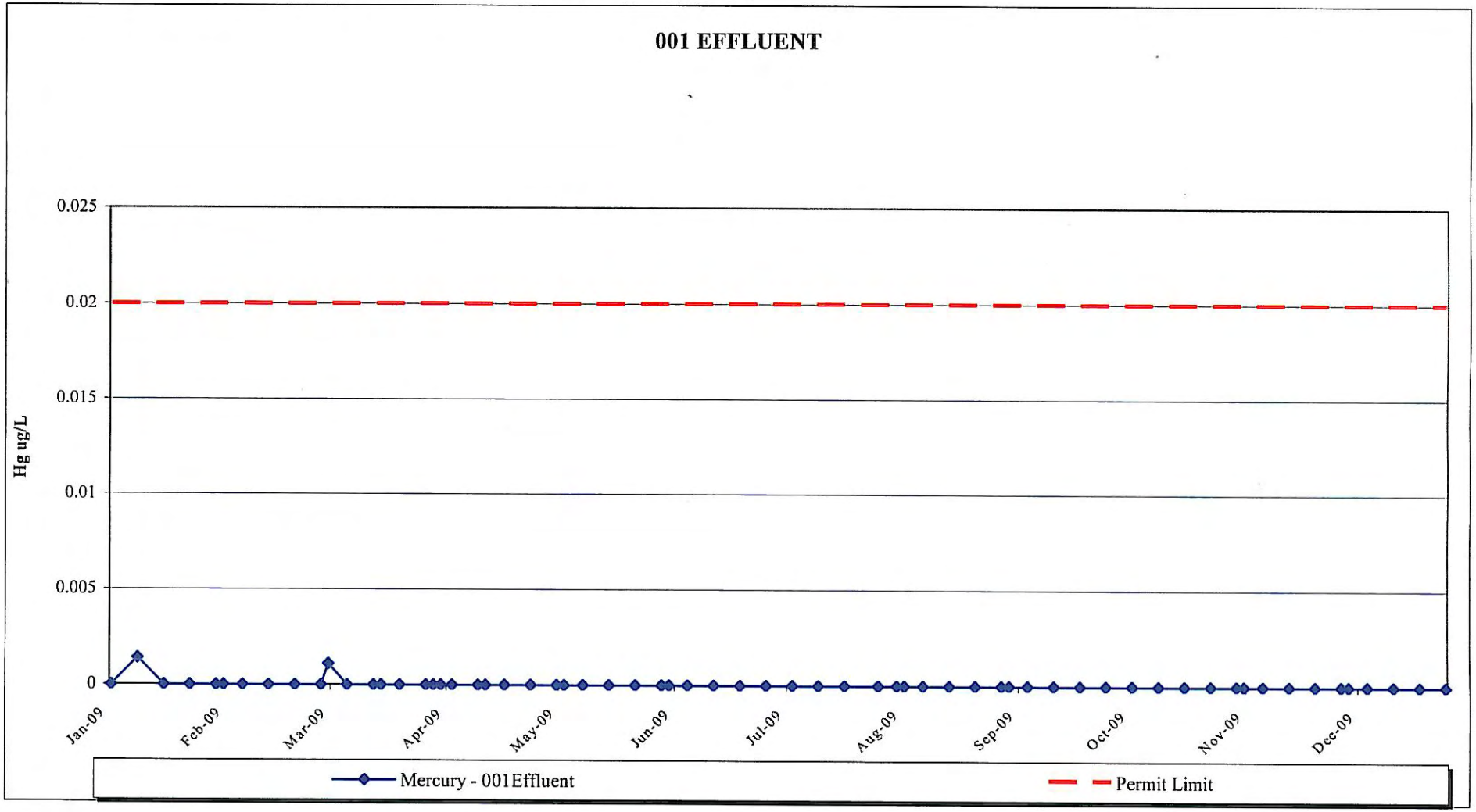


Figure 10d: Outfall 001 Effluent Monitoring Results 2009, Other Parameters

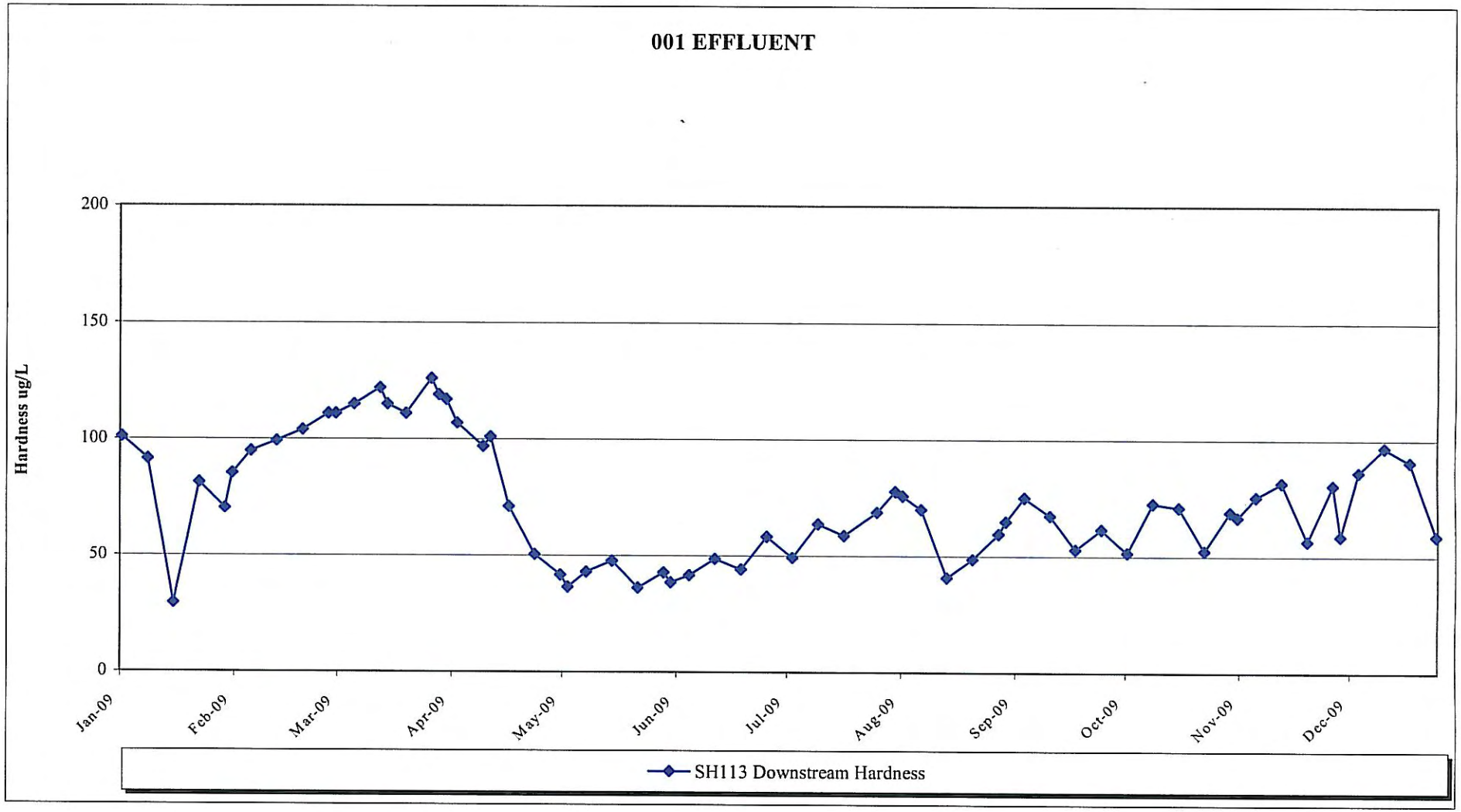


Figure 10d: Outfall 001 Effluent Monitoring Results 2009, Other Parameters

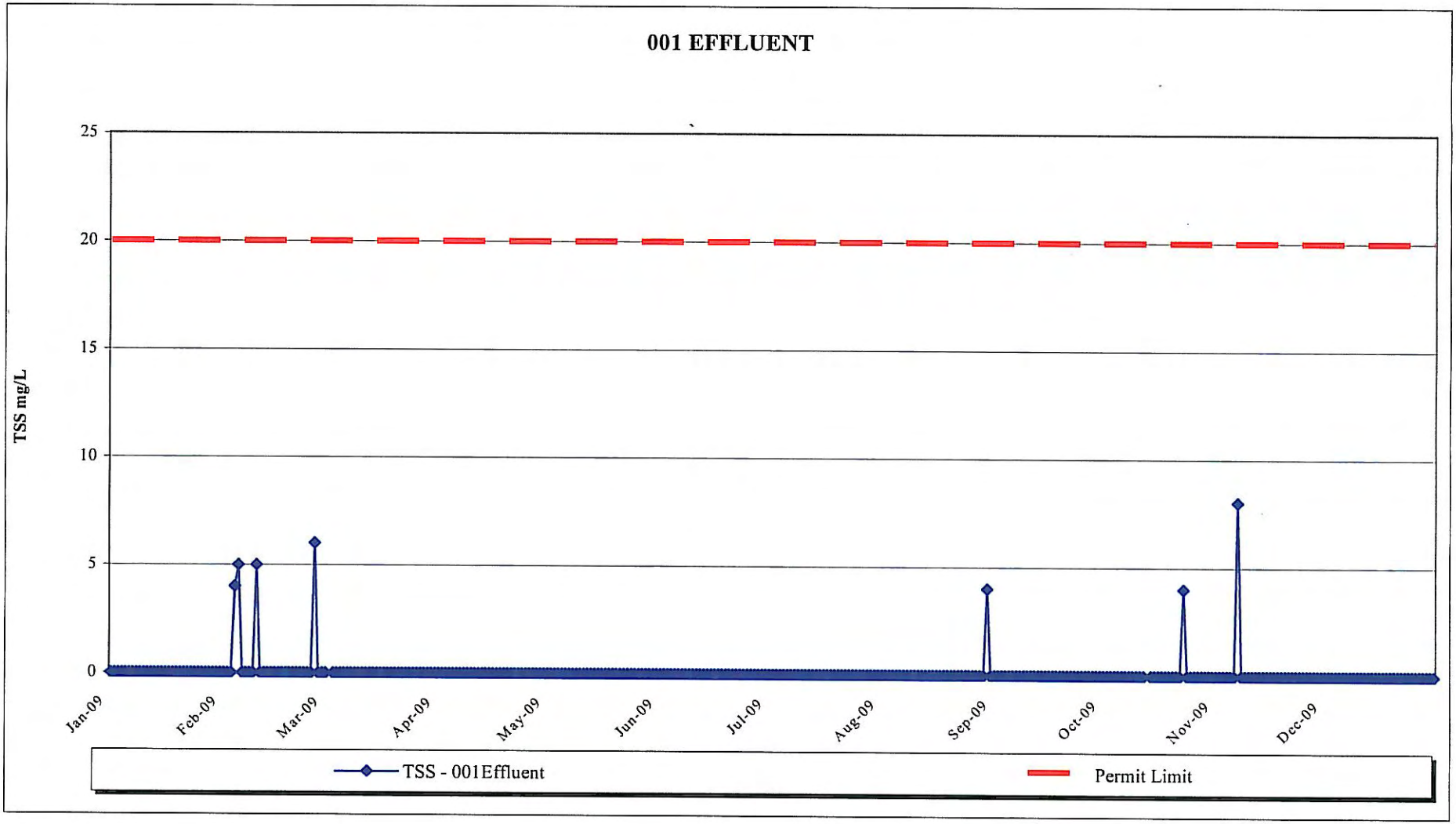


Figure 10d: Outfall 001 Effluent Monitoring Results 2009, Other Parameters

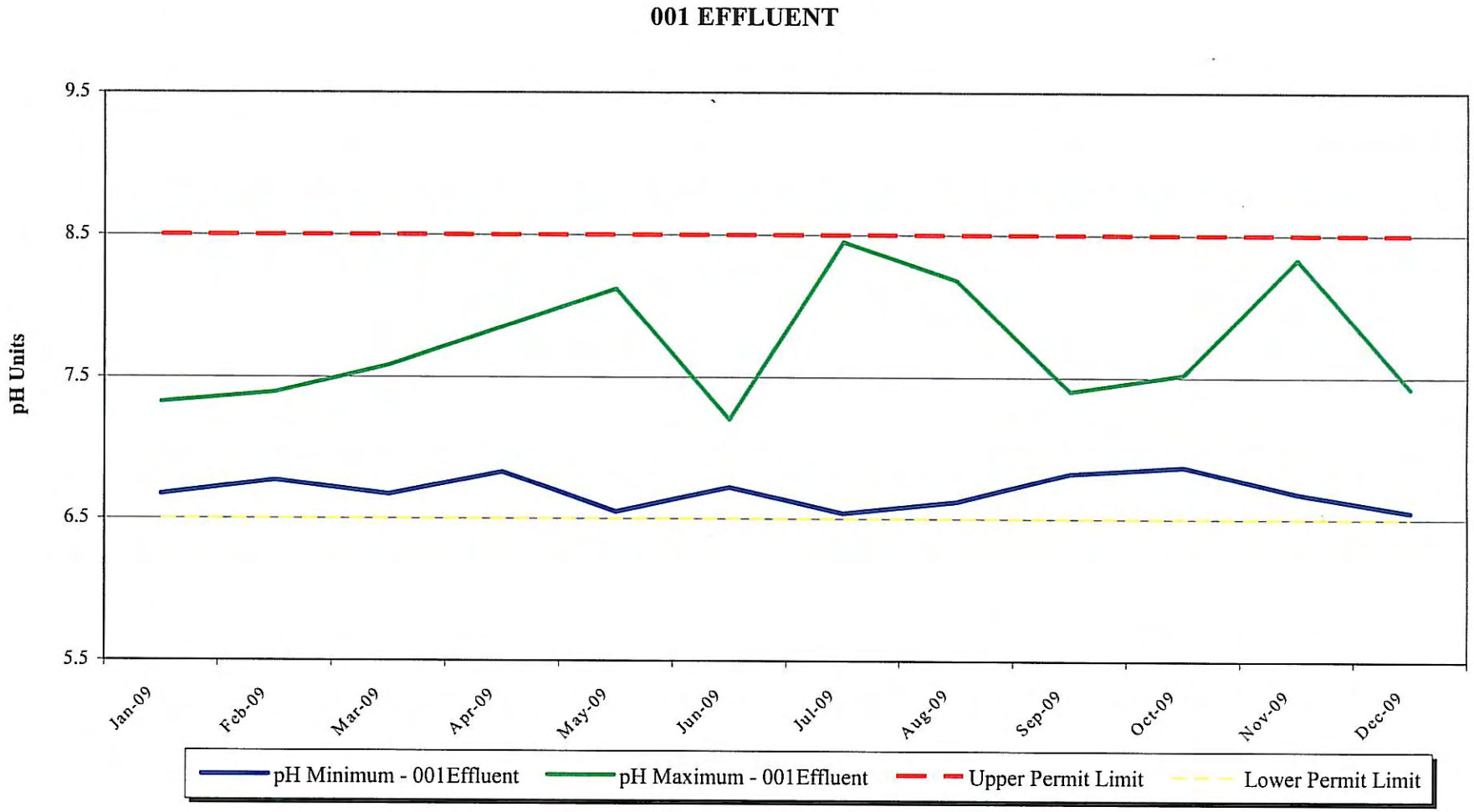


Figure 10d: Outfall 001 Effluent Monitoring Results 2009, Other Parameters

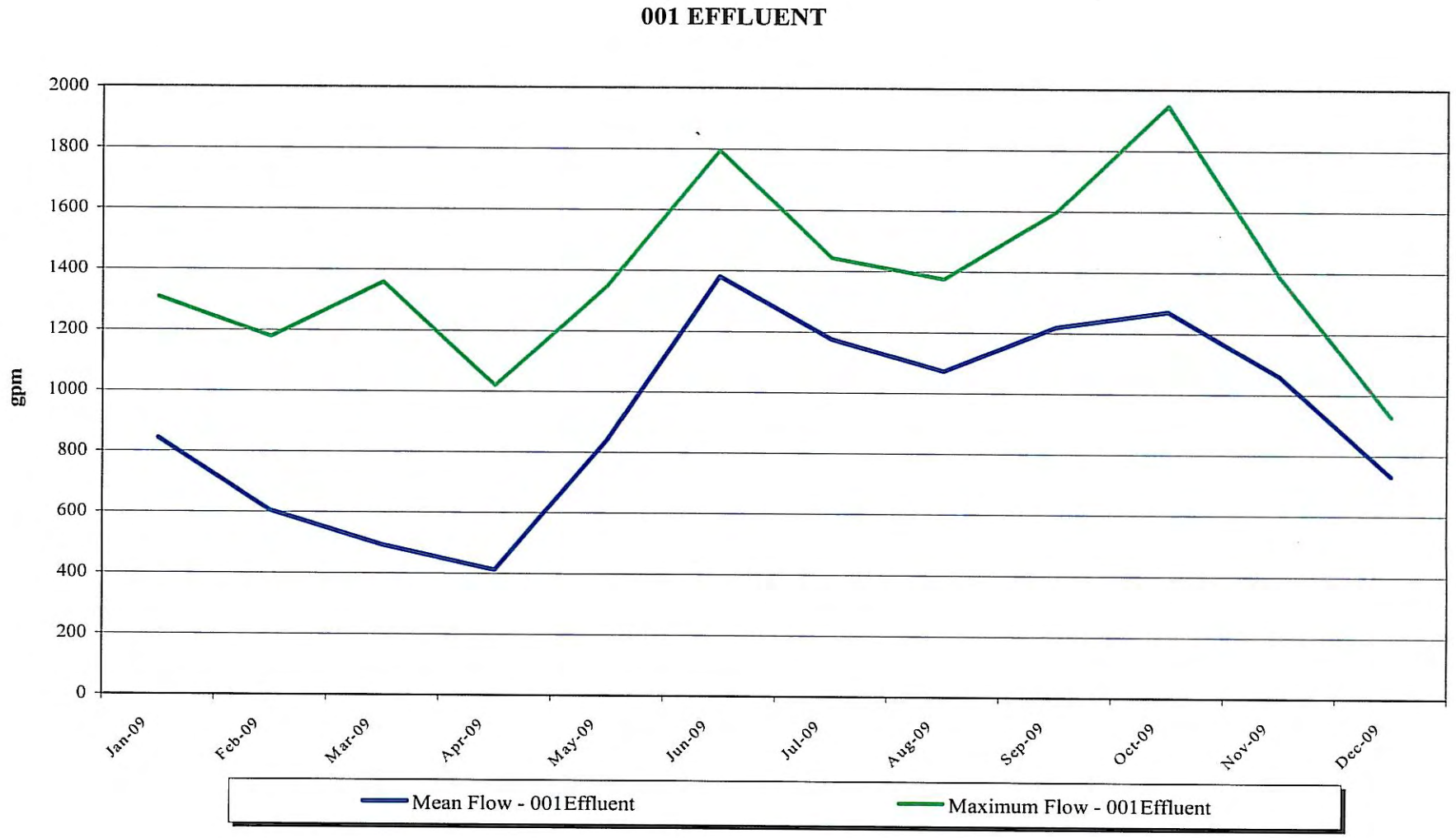
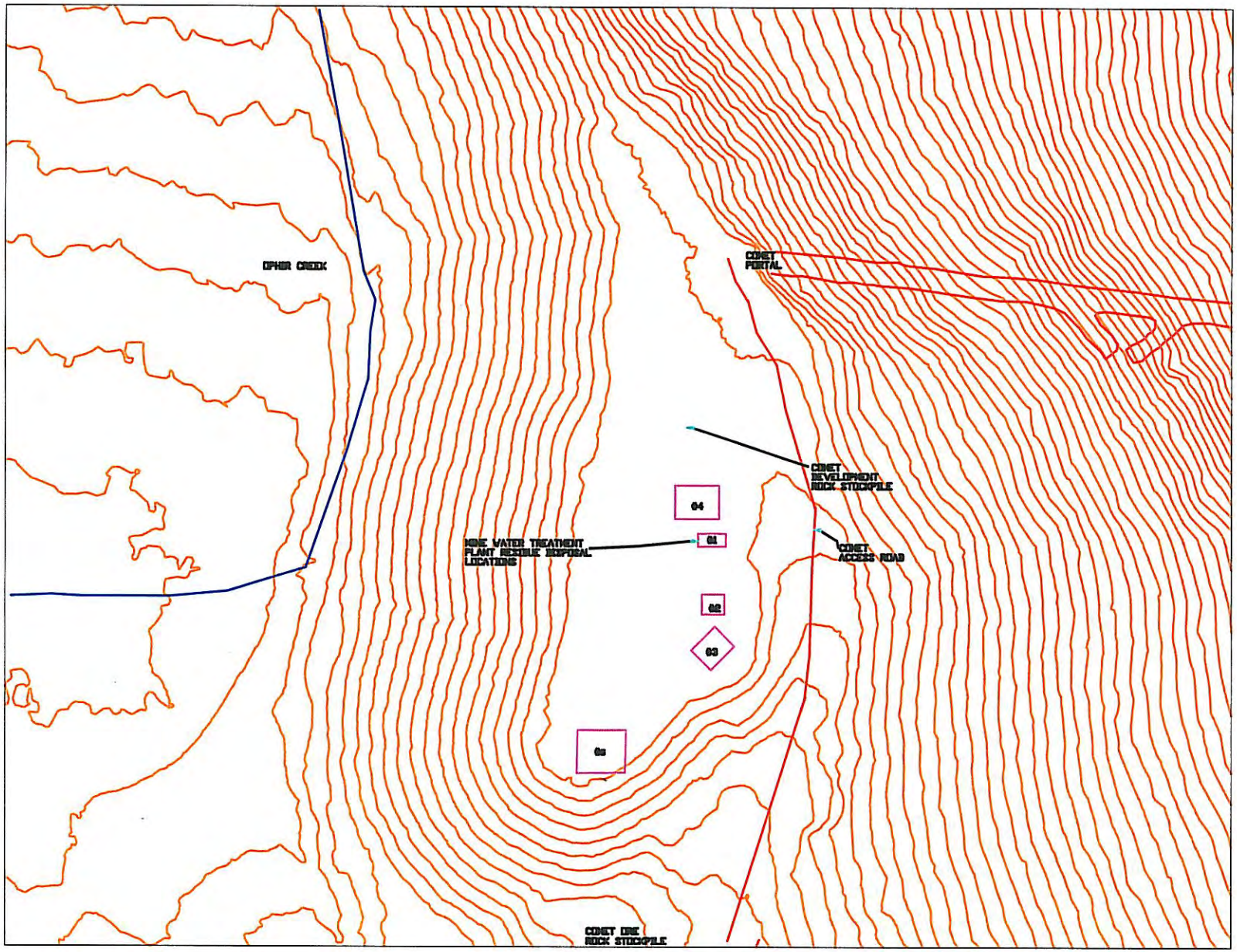


FIGURE 11 – MINE WATER TREATMENT PLANT RESIDUE DISPOSAL LOCATIONS AND DIMENSIONS



Appendix A – Duplicate Comparison

Receiving Waters Field Duplicate Comparison

		Duplicate	Sample				
	Stn.Code	CAK-099	MLA				
	Sample No.	CAK-MLA-20090121d	CAK-MLA-20090121				
	Collect Date/Time	1/21/2009	1/21/2009	Mean	Difference	% Difference	>20% ?
Turbidity Lab	NTU	1.7	1.6	1.65	0.1	6.1	
Color	Color Unit	80	70	75	10	13.3	
Total Suspended Solids	mg/L	4	4	4	0	0.0	
Ammonia as N	mg/L	0.1	0.1	0.1	0	0.0	
Nitrate as N	mg/L	0.05	0.05	0.05	0	0.0	
Hardness, Total	mg/L	27.9	28.1	28	0.2	0.7	
Chloride	mg/L	1	1	1	0	0.0	
Sulfate	mg/L	1.4	1.4	1.4	0	0.0	
Total Dissolved Solids	mg/L	24	26	25	2	8.0	
Dissolved Aluminum	ug/L	82.6	81.7	82.15	0.9	1.1	
Dissolved Arsenic	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Cadmium	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Chromium	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Copper	ug/L	1	1	1	0	0.0	
Dissolved Iron	mg/L	0.144	0.145	0.1445	0.001	0.7	
Dissolved Lead	ug/L	0.16	0.16	0.16	0	0.0	
Dissolved Manganese	ug/L	20.9	20.6	20.75	0.3	1.4	
Dissolved Nickel	ug/L	1	1	1	0	0.0	
Dissolved Selenium	ug/L	1	1	1	0	0.0	
Dissolved Silver	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Zinc	ug/L	2.5	2.5	2.5	0	0.0	
Mercury Dissolved	ug/L	0.0026	0.0024	0.0025	0.0002	8.0	

Receiving Waters Field Duplicate Comparison

		Duplicate	Sample				
	Stn.Code	CAK-099	SH103				
	Sample No.	CAK-SH103-20090204d	CAK-SH103-20090204				
	Collect Date/Time	2/4/2009	2/4/2009	Mean	Difference	% Difference	>20% ?
Turbidity Lab	NTU	0.1	0.2	0.15	0.1	66.7	Yes
Color	Color Unit	5	5	5	0	0.0	
Total Suspended Solids	mg/L	4	4	4	0	0.0	
Ammonia as N	mg/L	0.1	0.1	0.1	0	0.0	
Nitrate as N	mg/L	2.63	2.64	2.635	0.01	0.4	
Hardness, Total	mg/L	212	238	225	26	11.6	
Chloride	mg/L	3	3	3	0	0.0	
Sulfate	mg/L	266	258	262	8	3.1	
Total Dissolved Solids	mg/L	391	390	390.5	1	0.3	
Dissolved Aluminum	ug/L	3.9	3.7	3.8	0.2	5.3	
Dissolved Arsenic	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Cadmium	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Chromium	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Copper	ug/L	1.2	1.1	1.15	0.1	8.7	
Dissolved Iron	mg/L	0.05	0.05	0.05	0	0.0	
Dissolved Lead	ug/L	0.16	0.16	0.16	0	0.0	
Dissolved Manganese	ug/L	1.6	1.6	1.6	0	0.0	
Dissolved Nickel	ug/L	1	1	1	0	0.0	
Dissolved Selenium	ug/L	1	1	1	0	0.0	
Dissolved Silver	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Zinc	ug/L	2.5	3.9	3.2	1.4	43.8	Yes
Mercury Dissolved	ug/L	0.001	0.001	0.001	0	0.0	

Receiving Waters Field Duplicate Comparison

		Duplicate	Sample				
	Stn.Code	CAK-099	JS4				
	Sample No.	CAK-JS4-20090205d	CAK-JS4-20090205				
	Collect Date/Time	2/5/2009	2/5/2009	Mean	Difference	% Difference	>20% ?
Turbidity Lab	NTU	0.1	0.2	0.15	0.1	66.7	Yes
Color	Color Unit	5	5	5	0	0.0	
Total Suspended Solids	mg/L	4	4	4	0	0.0	
Ammonia as N	mg/L	0.1	0.1	0.1	0	0.0	
Nitrate as N	mg/L	0.3	0.3	0.3	0	0.0	
Hardness, Total	mg/L	40.9	40.4	40.65	0.5	1.2	
Chloride	mg/L	1	1	1	0	0.0	
Sulfate	mg/L	6.5	6.9	6.7	0.4	6.0	
Total Dissolved Solids	mg/L	65	67	66	2	3.0	
Dissolved Aluminum	ug/L	10.1	9.9	10	0.2	2.0	
Dissolved Arsenic	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Cadmium	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Chromium	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Copper	ug/L	1	1	1	0	0.0	
Dissolved Iron	mg/L	0.05	0.05	0.05	0	0.0	
Dissolved Lead	ug/L	0.16	0.16	0.16	0	0.0	
Dissolved Manganese	ug/L	5	5	5	0	0.0	
Dissolved Nickel	ug/L	1	1	1	0	0.0	
Dissolved Selenium	ug/L	1	1	1	0	0.0	
Dissolved Silver	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Zinc	ug/L	2.5	2.5	2.5	0	0.0	
Mercury Dissolved	ug/L	0.001	0.001	0.001	0	0.0	

Receiving Waters Field Duplicate Comparison

		Duplicate	Sample				
	Stn.Code	CAK-099	MLA				
	Sample No.	CAK-MLA-20090219d	CAK-MLA-20090219				
	Collect Date/Time	2/19/2009	2/19/2009	Mean	Difference	% Difference	>20% ?
Turbidity Lab	NTU	0.6	0.6	0.6	0	0.0	
Color	Color Unit	50	50	50	0	0.0	
Total Suspended Solids	mg/L	4	4	4	0	0.0	
Ammonia as N	mg/L	0.1	0.1	0.1	0	0.0	
Nitrate as N	mg/L	0.05	0.05	0.05	0	0.0	
Hardness, Total	mg/L	44.9	44.7	44.8	0.2	0.4	
Chloride	mg/L	1	1	1	0	0.0	
Sulfate	mg/L	2.2	2.2	2.2	0	0.0	
Total Dissolved Solids	mg/L	62	58	60	4	6.7	
Dissolved Aluminum	ug/L	55.6	56.1	55.85	0.5	0.9	
Dissolved Arsenic	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Cadmium	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Chromium	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Copper	ug/L	1	1	1	0	0.0	
Dissolved Iron	mg/L	0.117	0.115	0.116	0.002	1.7	
Dissolved Lead	ug/L	0.16	0.16	0.16	0	0.0	
Dissolved Manganese	ug/L	26.8	26.4	26.6	0.4	1.5	
Dissolved Nickel	ug/L	1	1	1	0	0.0	
Dissolved Selenium	ug/L	1	1	1	0	0.0	
Dissolved Silver	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Zinc	ug/L	2.5	2.5	2.5	0	0.0	
Mercury Dissolved	ug/L	0.0018	0.001	0.0014	0.0008	57.1	Yes

Receiving Waters Field Duplicate Comparison

		Duplicate	Sample				
	Stn.Code	CAK-099	SH109				
	Sample No.	CAK-SH109-20090310d	CAK-SH109-20090310				
	Collect Date/Time	3/10/2009	3/10/2009	Mean	Difference	% Difference	>20% ?
Turbidity Lab	NTU	0.1	0.1	0.1	0	0.0	
Color	Color Unit	5	10	7.5	5	66.7	Yes
Total Suspended Solids	mg/L	4	4	4	0	0.0	
Ammonia as N	mg/L	0.1	0.1	0.1	0	0.0	
Nitrate as N	mg/L	0.21	0.22	0.215	0.01	4.7	
Hardness, Total	mg/L	51	52.2	51.6	1.2	2.3	
Chloride	mg/L	1	1	1	0	0.0	
Sulfate	mg/L	10.8	10.9	10.85	0.1	0.9	
Total Dissolved Solids	mg/L	62	65	63.5	3	4.7	
Dissolved Aluminum	ug/L	4.4	4.8	4.6	0.4	8.7	
Dissolved Arsenic	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Cadmium	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Chromium	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Copper	ug/L	1	1	1	0	0.0	
Dissolved Iron	mg/L	0.05	0.05	0.05	0	0.0	
Dissolved Lead	ug/L	0.16	0.16	0.16	0	0.0	
Dissolved Manganese	ug/L	1.2	1.2	1.2	0	0.0	
Dissolved Nickel	ug/L	1	1	1	0	0.0	
Dissolved Selenium	ug/L	1	1	1	0	0.0	
Dissolved Silver	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Zinc	ug/L	2.5	2.5	2.5	0	0.0	
Mercury Dissolved	ug/L	0.001	0.001	0.001	0	0.0	

Receiving Waters Field Duplicate Comparison

		Duplicate	Sample				
	Stn.Code	CAK-099	SLC				
	Sample No.	CAK-SLC-20090407d	CAK-SLC-20090407				
	Collect Date/Time	4/7/2009	4/7/2009	Mean	Difference	% Difference	>20% ?
Turbidity Lab	NTU	0.2	0.4	0.3	0.2	66.7	Yes
Color	Color Unit	35	35	35	0	0.0	
Total Suspended Solids	mg/L	4	4	4	0	0.0	
Ammonia as N	mg/L	0.1	0.1	0.1	0	0.0	
Nitrate as N	mg/L	0.34	0.33	0.335	0.01	3.0	
Hardness, Total	mg/L	46.6	46.3	46.45	0.3	0.6	
Chloride	mg/L	2	2	2	0	0.0	
Sulfate	mg/L	6.1	6.2	6.15	0.1	1.6	
Total Dissolved Solids	mg/L	53	57	55	4	7.3	
Dissolved Aluminum	ug/L	46.5	46.9	46.7	0.4	0.9	
Dissolved Arsenic	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Cadmium	ug/L	0.2	0.1	0.15	0.1	66.7	Yes
Dissolved Chromium	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Copper	ug/L	1	1	1	0	0.0	
Dissolved Iron	mg/L	0.074	0.072	0.073	0.002	2.7	
Dissolved Lead	ug/L	0.16	0.16	0.16	0	0.0	
Dissolved Manganese	ug/L	12.7	13.1	12.9	0.4	3.1	
Dissolved Nickel	ug/L	1.7	1.7	1.7	0	0.0	
Dissolved Selenium	ug/L	1	1	1	0	0.0	
Dissolved Silver	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Zinc	ug/L	18.7	19.1	18.9	0.4	2.1	
Mercury Dissolved	ug/L	0.0017	0.0015	0.0016	0.0002	12.5	

Receiving Waters Field Duplicate Comparison

	Stn.Code Sample No. Collect Date/Time	Duplicate CAK-099 CAK-JS4-20090506d 5/6/2009	Sample JS4 CAK-JS4-20090506 5/6/2009	Mean	Difference	% Difference	>20% ?
Turbidity Lab	NTU	0.4	0.4	0.4	0	0.0	
Color	Color Unit	5	5	5	0	0.0	
Total Suspended Solids	mg/L	4	4	4	0	0.0	
Ammonia as N	mg/L	0.1	0.1	0.1	0	0.0	
Nitrate as N	mg/L	0.61	0.6	0.605	0.01	1.7	
Hardness, Total	mg/L	21.9	21.5	21.7	0.4	1.8	
Chloride	mg/L	1	1	1	0	0.0	
Sulfate	mg/L	3.5	3.5	3.5	0	0.0	
Total Dissolved Solids	mg/L	35	35	35	0	0.0	
Dissolved Aluminum	ug/L	17.8	18.6	18.2	0.8	4.4	
Dissolved Arsenic	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Cadmium	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Chromium	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Copper	ug/L	1	1	1	0	0.0	
Dissolved Iron	mg/L	0.05	0.05	0.05	0	0.0	
Dissolved Lead	ug/L	0.16	0.16	0.16	0	0.0	
Dissolved Manganese	ug/L	2.8	2.8	2.8	0	0.0	
Dissolved Nickel	ug/L	1	1	1	0	0.0	
Dissolved Selenium	ug/L	1	1	1	0	0.0	
Dissolved Silver	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Zinc	ug/L	2.5	2.5	2.5	0	0.0	
Mercury Dissolved	ug/L	0.001	0.001	0.001	0	0.0	

Receiving Waters Field Duplicate Comparison

		Duplicate	Sample				
	Stn.Code	CAK-099	SH105				
	Sample No.	CAK-SH105-20090512d	CAK-SH105-20090512				
	Collect Date/Time	5/12/2009	5/12/2009	Mean	Difference	% Difference	>20% ?
Turbidity Lab	NTU	0.5	0.2	0.35	0.3	85.7	Yes
Color	Color Unit	15	10	12.5	5	40.0	Yes
Total Suspended Solids	mg/L	4	4	4	0	0.0	
Ammonia as N	mg/L	0.1	0.2	0.15	0.1	66.7	Yes
Nitrate as N	mg/L	0.58	0.57	0.575	0.01	1.7	
Hardness, Total	mg/L	30.6	32.1	31.35	1.5	4.8	
Chloride	mg/L	2	2	2	0	0.0	
Sulfate	mg/L	7.7	7.7	7.7	0	0.0	
Total Dissolved Solids	mg/L	43	39	41	4	9.8	
Dissolved Aluminum	ug/L	23.1	23.6	23.35	0.5	2.1	
Dissolved Arsenic	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Cadmium	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Chromium	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Copper	ug/L	1	1	1	0	0.0	
Dissolved Iron	mg/L	0.05	0.05	0.05	0	0.0	
Dissolved Lead	ug/L	0.16	0.16	0.16	0	0.0	
Dissolved Manganese	ug/L	1.6	1.7	1.65	0.1	6.1	
Dissolved Nickel	ug/L	1	1	1	0	0.0	
Dissolved Selenium	ug/L	1	1	1	0	0.0	
Dissolved Silver	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Zinc	ug/L	2.5	2.5	2.5	0	0.0	
Mercury Dissolved	ug/L	0.001	0.001	0.001	0	0.0	

Receiving Waters Field Duplicate Comparison

	Stn.Code	Duplicate CAK-099	Sample SLC				
	Sample No.	CAK-SLC-20090513d	CAK-SLC-20090513				
	Collect Date/Time	5/13/2009	5/13/2009	Mean	Difference	% Difference	>20% ?
Turbidity Lab	NTU	0.5	0.5	0.5	0	0.0	
Color	Color Unit	45	40	42.5	5	11.8	
Total Suspended Solids	mg/L	4	4	4	0	0.0	
Ammonia as N	mg/L	0.1	0.1	0.1	0	0.0	
Nitrate as N	mg/L	0.32	0.32	0.32	0	0.0	
Hardness, Total	mg/L	28.7	28.4	28.55	0.3	1.1	
Chloride	mg/L	2	2	2	0	0.0	
Sulfate	mg/L	5	5	5	0	0.0	
Total Dissolved Solids	mg/L	38	29	33.5	9	26.9	Yes
Dissolved Aluminum	ug/L	59.6	66.6	63.1	7	11.1	
Dissolved Arsenic	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Cadmium	ug/L	0.2	0.2	0.2	0	0.0	
Dissolved Chromium	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Copper	ug/L	1.2	1.4	1.3	0.2	15.4	
Dissolved Iron	mg/L	0.074	0.068	0.071	0.006	8.5	
Dissolved Lead	ug/L	0.16	0.16	0.16	0	0.0	
Dissolved Manganese	ug/L	28.8	32.2	30.5	3.4	11.1	
Dissolved Nickel	ug/L	2.4	2.7	2.55	0.3	11.8	
Dissolved Selenium	ug/L	1	1	1	0	0.0	
Dissolved Silver	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Zinc	ug/L	22.2	24.8	23.5	2.6	11.1	
Mercury Dissolved	ug/L	0.002	0.0014	0.0017	0.0006	35.3	Yes

Receiving Waters Field Duplicate Comparison

		Duplicate	Sample				
	Stn.Code	CAK-099	JS2				
	Sample No.	CAK-JS2-20090604d	CAK-JS2-20090604				
	Collect Date/Time	6/4/2009	6/4/2009	Mean	Difference	% Difference	>20% ?
Turbidity Lab	NTU	0.3	0.4	0.35	0.1	28.6	Yes
Color	Color Unit	5	5	5	0	0.0	
Total Suspended Solids	mg/L	4	4	4	0	0.0	
Ammonia as N	mg/L	0.1	0.1	0.1	0	0.0	
Nitrate as N	mg/L	0.39	0.39	0.39	0	0.0	
Hardness, Total	mg/L	10.5	10.7	10.6	0.2	1.9	
Chloride	mg/L	1	1	1	0	0.0	
Sulfate	mg/L	1.2	1.2	1.2	0	0.0	
Total Dissolved Solids	mg/L	10	10	10	0	0.0	
Dissolved Aluminum	ug/L	4.1	4.1	4.1	0	0.0	
Dissolved Arsenic	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Cadmium	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Chromium	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Copper	ug/L	1	1	1	0	0.0	
Dissolved Iron	mg/L	0.05	0.05	0.05	0	0.0	
Dissolved Lead	ug/L	0.16	0.16	0.16	0	0.0	
Dissolved Manganese	ug/L	1	1	1	0	0.0	
Dissolved Nickel	ug/L	1	1	1	0	0.0	
Dissolved Selenium	ug/L	1	1	1	0	0.0	
Dissolved Silver	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Zinc	ug/L	2.5	2.5	2.5	0	0.0	
Mercury Dissolved	ug/L	0.001	0.001	0.001	0	0.0	

Receiving Waters Field Duplicate Comparison

		Duplicate	Sample				
	Stn.Code	CAK-099	SH113				
	Sample No.	CAK-SH113-20090706d	CAK-SH113-20090706				
	Collect Date/Time	7/6/2009	7/6/2009	Mean	Difference	% Difference	>20% ?
Turbidity Lab	NTU	0.2	0.2	0.2	0	0.0	
Color	Color Unit	5	5	5	0	0.0	
Total Suspended Solids	mg/L	4	4	4	0	0.0	
Ammonia as N	mg/L	0.1	0.1	0.1	0	0.0	
Nitrate as N	mg/L	0.05	0.05	0.05	0	0.0	
Hardness, Total	mg/L	48.9	48.6	48.75	0.3	0.6	
Chloride	mg/L	2	2	2	0	0.0	
Sulfate	mg/L	17.1	17.1	17.1	0	0.0	
Total Dissolved Solids	mg/L	54	52	53	2	3.8	
Dissolved Aluminum	ug/L	5	5	5	0	0.0	
Dissolved Arsenic	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Cadmium	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Chromium	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Copper	ug/L	1	1	1	0	0.0	
Dissolved Iron	mg/L	0.05	0.05	0.05	0	0.0	
Dissolved Lead	ug/L	0.16	0.16	0.16	0	0.0	
Dissolved Manganese	ug/L	7.2	7	7.1	0.2	2.8	
Dissolved Nickel	ug/L	1	1	1	0	0.0	
Dissolved Selenium	ug/L	1	1	1	0	0.0	
Dissolved Silver	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Zinc	ug/L	2.5	2.5	2.5	0	0.0	
Mercury Dissolved	ug/L	0.001	0.001	0.001	0	0.0	

Receiving Waters Field Duplicate Comparison

	Stn.Code	Duplicate CAK-099	Sample SLC				
	Sample No.	CAK-SLC-20090708d	CAK-SLC-20090708				
	Collect Date/Time	7/8/2009	7/8/2009	Mean	Difference	% Difference	>20% ?
Turbidity Lab	NTU	0.2	0.3	0.25	0.1	40.0	Yes
Color	Color Unit	10	10	10	0	0.0	
Total Suspended Solids	mg/L	4	4	4	0	0.0	
Ammonia as N	mg/L	0.1	0.2	0.15	0.1	66.7	Yes
Nitrate as N	mg/L	0.05	0.05	0.05	0	0.0	
Hardness, Total	mg/L	54.9	55.9	55.4	1	1.8	
Chloride	mg/L	2	2	2	0	0.0	
Sulfate	mg/L	8.7	8.8	8.75	0.1	1.1	
Total Dissolved Solids	mg/L	70	69	69.5	1	1.4	
Dissolved Aluminum	ug/L	22.4	22.5	22.45	0.1	0.4	
Dissolved Arsenic	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Cadmium	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Chromium	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Copper	ug/L	1	1	1	0	0.0	
Dissolved Iron	mg/L	0.05	0.05	0.05	0	0.0	
Dissolved Lead	ug/L	0.16	0.16	0.16	0	0.0	
Dissolved Manganese	ug/L	1	1	1	0	0.0	
Dissolved Nickel	ug/L	1	1	1	0	0.0	
Dissolved Selenium	ug/L	1	1	1	0	0.0	
Dissolved Silver	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Zinc	ug/L	5.9	4.7	5.3	1.2	22.6	Yes
Mercury Dissolved	ug/L	0.001	0.001	0.001	0	0.0	

Receiving Waters Field Duplicate Comparison

		Duplicate	Sample				
	Stn.Code	CAK-099	JS5				
	Sample No.	CAK-JS5-20090714d	CAK-JS5-20090714				
	Collect Date/Time	7/14/2009	7/14/2009	Mean	Difference	% Difference	>20% ?
Turbidity Lab	NTU	0.2	0.2	0.2	0	0.0	
Color	Color Unit	5	5	5	0	0.0	
Total Suspended Solids	mg/L	4	4	4	0	0.0	
Ammonia as N	mg/L	0.1	0.1	0.1	0	0.0	
Nitrate as N	mg/L	0.05	0.05	0.05	0	0.0	
Hardness, Total	mg/L	15.4	15.1	15.25	0.3	2.0	
Chloride	mg/L	1	1	1	0	0.0	
Sulfate	mg/L	1.9	1.9	1.9	0	0.0	
Dissolved Aluminum	ug/L	4	3.5	3.75	0.5	13.3	
Dissolved Arsenic	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Cadmium	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Chromium	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Copper	ug/L	1	1	1	0	0.0	
Dissolved Iron	mg/L	0.05	0.05	0.05	0	0.0	
Dissolved Lead	ug/L	0.16	0.16	0.16	0	0.0	
Dissolved Manganese	ug/L	1	1	1	0	0.0	
Dissolved Nickel	ug/L	1	1	1	0	0.0	
Dissolved Selenium	ug/L	1	1	1	0	0.0	
Dissolved Silver	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Zinc	ug/L	2.5	2.5	2.5	0	0.0	
Mercury Dissolved	ug/L	0.001	0.001	0.001	0	0.0	

Receiving Waters Field Duplicate Comparison

		Duplicate	Sample				
	Stn.Code	CAK-099	SH109				
	Sample No.	CAK-SH109-20090805d	CAK-SH109-20090805				
	Collect Date/Time	8/5/2009	8/5/2009	Mean	Difference	% Difference	>20% ?
Turbidity Lab	NTU	0.2	0.2	0.2	0	0.0	
Color	Color Unit	5	5	5	0	0.0	
Total Suspended Solids	mg/L	4	4	4	0	0.0	
Ammonia as N	mg/L	0.1	0.1	0.1	0	0.0	
Nitrate as N	mg/L	0.05	0.05	0.05	0	0.0	
Hardness, Total	mg/L	39.9	40.9	40.4	1	2.5	
Chloride	mg/L	1	1	1	0	0.0	
Sulfate	mg/L	6.7	6.6	6.65	0.1	1.5	
Dissolved Aluminum	ug/L	7.4	7.1	7.25	0.3	4.1	
Dissolved Arsenic	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Cadmium	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Chromium	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Copper	ug/L	1	1	1	0	0.0	
Dissolved Iron	mg/L	0.05	0.05	0.05	0	0.0	
Dissolved Lead	ug/L	0.16	0.16	0.16	0	0.0	
Dissolved Manganese	ug/L	1	1	1	0	0.0	
Dissolved Nickel	ug/L	1	1	1	0	0.0	
Dissolved Selenium	ug/L	1	1	1	0	0.0	
Dissolved Silver	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Zinc	ug/L	2.9	2.6	2.75	0.3	10.9	
Mercury Dissolved	ug/L	0.001	0.001	0.001	0	0.0	

Receiving Waters Field Duplicate Comparison

		Duplicate	Sample				
	Stn.Code	CAK-099	JS2				
	Sample No.	CAK-JS2-20090811d	CAK-JS2-20090811				
	Collect Date/Time	8/11/2009	8/11/2009	Mean	Difference	% Difference	>20% ?
Turbidity Lab	NTU	0.7	0.9	0.8	0.2	25.0	Yes
Color	Color Unit	5	5	5	0	0.0	
Total Suspended Solids	mg/L	5	5	5	0	0.0	
Ammonia as N	mg/L	0.1	0.1	0.1	0	0.0	
Nitrate as N	mg/L	0.05	0.05	0.05	0	0.0	
Hardness, Total	mg/L	8.2	8.4	8.3	0.2	2.4	
Chloride	mg/L	1	1	1	0	0.0	
Sulfate	mg/L	0.8	0.8	0.8	0	0.0	
Total Dissolved Solids	mg/L	11	12	11.5	1	8.7	
Dissolved Aluminum	ug/L	6.2	4.6	5.4	1.6	29.6	Yes
Dissolved Arsenic	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Cadmium	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Chromium	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Copper	ug/L	1	1	1	0	0.0	
Dissolved Iron	mg/L	0.05	0.05	0.05	0	0.0	
Dissolved Lead	ug/L	0.16	0.16	0.16	0	0.0	
Dissolved Manganese	ug/L	1	1	1	0	0.0	
Dissolved Nickel	ug/L	1	1	1	0	0.0	
Dissolved Selenium	ug/L	1	1	1	0	0.0	
Dissolved Silver	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Zinc	ug/L	2.5	2.5	2.5	0	0.0	
Mercury Dissolved	ug/L	0.001	0.001	0.001	0	0.0	

Receiving Waters Field Duplicate Comparison

		Duplicate	Sample				
	Stn.Code	CAK-099	MLA				
	Sample No.	CAK-MLA-20090818d	CAK-MLA-20090818				
	Collect Date/Time	8/18/2009	8/18/2009	Mean	Difference	% Difference	>20% ?
Turbidity Lab	NTU	0.4	0.4	0.4	0	0.0	
Color	Color Unit	30	30	30	0	0.0	
Total Suspended Solids	mg/L	4	4	4	0	0.0	
Ammonia as N	mg/L	0.1	0.1	0.1	0	0.0	
Nitrate as N	mg/L	0.05	0.05	0.05	0	0.0	
Hardness, Total	mg/L	64.8	63.9	64.35	0.9	1.4	
Chloride	mg/L	1	1	1	0	0.0	
Sulfate	mg/L	2.5	2.5	2.5	0	0.0	
Total Dissolved Solids	mg/L	67	71	69	4	5.8	
Dissolved Aluminum	ug/L	28.2	28	28.1	0.2	0.7	
Dissolved Arsenic	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Cadmium	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Chromium	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Copper	ug/L	1	1	1	0	0.0	
Dissolved Iron	mg/L	0.05	0.05	0.05	0	0.0	
Dissolved Lead	ug/L	0.16	0.16	0.16	0	0.0	
Dissolved Manganese	ug/L	4.5	4.2	4.35	0.3	6.9	
Dissolved Nickel	ug/L	1	1	1	0	0.0	
Dissolved Selenium	ug/L	1	1	1	0	0.0	
Dissolved Silver	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Zinc	ug/L	2.5	2.5	2.5	0	0.0	
Mercury Dissolved	ug/L	0.001	0.0012	0.0011	0.0002	18.2	

Receiving Waters Field Duplicate Comparison

		Duplicate	Sample				
	Stn.Code	CAK-099	JS2				
	Sample No.	CAK-JS2-20090917d	CAK-JS2-20090917				
	Collect Date/Time	9/17/2009	9/17/2009	Mean	Difference	% Difference	>20% ?
Turbidity Lab	NTU	0.4	0.3	0.35	0.1	28.6	Yes
Color	Color Unit	5	5	5	0	0.0	
Total Suspended Solids	mg/L	4	4	4	0	0.0	
Ammonia as N	mg/L	0.1	0.1	0.1	0	0.0	
Nitrate as N	mg/L	0.08	0.08	0.08	0	0.0	
Hardness, Total	mg/L	10.4	10.9	10.65	0.5	4.7	
Chloride	mg/L	1	1	1	0	0.0	
Sulfate	mg/L	0.9	0.9	0.9	0	0.0	
Dissolved Aluminum	ug/L	4.6	4.6	4.6	0	0.0	
Dissolved Arsenic	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Cadmium	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Chromium	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Copper	ug/L	1	1	1	0	0.0	
Dissolved Iron	mg/L	0.05	0.05	0.05	0	0.0	
Dissolved Lead	ug/L	0.16	0.16	0.16	0	0.0	
Dissolved Manganese	ug/L	1	1	1	0	0.0	
Dissolved Nickel	ug/L	1	1	1	0	0.0	
Dissolved Selenium	ug/L	1	1	1	0	0.0	
Dissolved Silver	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Zinc	ug/L	2.5	2.5	2.5	0	0.0	
Mercury Dissolved	ug/L	0.001	0.001	0.001	0	0.0	

Receiving Waters Field Duplicate Comparison

	Stn.Code Sample No. Collect Date/Time	Duplicate CAK-099 CAK-SH109-20090928d 9/28/2009	Sample SH109 CAK-SH109-20090928 9/28/2009	Mean	Difference	% Difference	>20% ?
Turbidity Lab	NTU	0.4	0.4	0.4	0	0.0	
Color	Color Unit	5	5	5	0	0.0	
Total Suspended Solids	mg/L	4	4	4	0	0.0	
Ammonia as N	mg/L	0.1	0.1	0.1	0	0.0	
Nitrate as N	mg/L	0.11	0.11	0.11	0	0.0	
Hardness, Total	mg/L	34.1	34	34.05	0.1	0.3	
Chloride	mg/L	1	1	1	0	0.0	
Sulfate	mg/L	4.7	4.7	4.7	0	0.0	
Total Dissolved Solids	mg/L	21	37	29	16	55.2	Yes
Dissolved Aluminum	ug/L	9.7	8.8	9.25	0.9	9.7	
Dissolved Arsenic	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Cadmium	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Chromium	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Copper	ug/L	1	1	1	0	0.0	
Dissolved Iron	mg/L	0.05	0.05	0.05	0	0.0	
Dissolved Lead	ug/L	0.16	0.16	0.16	0	0.0	
Dissolved Manganese	ug/L	1	1	1	0	0.0	
Dissolved Nickel	ug/L	1	1	1	0	0.0	
Dissolved Selenium	ug/L	1	1	1	0	0.0	
Dissolved Silver	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Zinc	ug/L	2.5	2.5	2.5	0	0.0	
Mercury Dissolved	ug/L	0.001	0.001	0.001	0	0.0	

Receiving Waters Field Duplicate Comparison

		Duplicate	Sample				
	Stn.Code	CAK-099	JS5				
	Sample No.	CAK-JS5-20091012d	CAK-JS5-20091012				
	Collect Date/Time	10/12/2009	10/12/2009	Mean	Difference	% Difference	>20% ?
Turbidity Lab	NTU	0.6	0.4	0.5	0.2	40.0	Yes
Color	Color Unit	5	5	5	0	0.0	
Total Suspended Solids	mg/L	4	4	4	0	0.0	
Ammonia as N	mg/L	0.1	0.1	0.1	0	0.0	
Nitrate as N	mg/L	0.18	0.18	0.18	0	0.0	
Hardness, Total	mg/L	31.6	32.1	31.85	0.5	1.6	
Chloride	mg/L	1	1	1	0	0.0	
Sulfate	mg/L	4	4	4	0	0.0	
Total Dissolved Solids	mg/L	37	39	38	2	5.3	
Dissolved Aluminum	ug/L	6.1	7.5	6.8	1.4	20.6	Yes
Dissolved Arsenic	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Cadmium	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Chromium	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Copper	ug/L	1	1	1	0	0.0	
Dissolved Iron	mg/L	0.05	0.05	0.05	0	0.0	
Dissolved Lead	ug/L	0.16	0.16	0.16	0	0.0	
Dissolved Manganese	ug/L	2.1	2.2	2.15	0.1	4.7	
Dissolved Nickel	ug/L	1	1	1	0	0.0	
Dissolved Selenium	ug/L	1	1	1	0	0.0	
Dissolved Silver	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Zinc	ug/L	2.5	3.1	2.8	0.6	21.4	Yes
Mercury Dissolved	ug/L	0.001	0.001	0.001	0	0.0	

Receiving Waters Field Duplicate Comparison

	Stn.Code Sample No. Collect Date/Time	Duplicate CAK-099 CAK-SLB-20091014d 10/14/2009	Sample SLB CAK-SLB-20091014 10/14/2009	Mean	Difference	% Difference	>20% ?
Turbidity Lab	NTU	3.9	4.2	4.05	0.3	7.4	
Color	Color Unit	70	80	75	10	13.3	
Total Suspended Solids	mg/L	4	4	4	0	0.0	
Ammonia as N	mg/L	0.1	0.1	0.1	0	0.0	
Nitrate as N	mg/L	0.05	0.05	0.05	0	0.0	
Hardness, Total	mg/L	52.9	51.9	52.4	1	1.9	
Chloride	mg/L	1	1	1	0	0.0	
Sulfate	mg/L	7	7	7	0	0.0	
Total Dissolved Solids	mg/L	83	72	77.5	11	14.2	
Dissolved Aluminum	ug/L	66.5	67.5	67	1	1.5	
Dissolved Arsenic	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Cadmium	ug/L	0.3	0.3	0.3	0	0.0	
Dissolved Chromium	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Copper	ug/L	1.6	1.6	1.6	0	0.0	
Dissolved Iron	mg/L	0.145	0.152	0.1485	0.007	4.7	
Dissolved Lead	ug/L	0.16	0.16	0.16	0	0.0	
Dissolved Manganese	ug/L	51.5	51	51.25	0.5	1.0	
Dissolved Nickel	ug/L	2.4	2.4	2.4	0	0.0	
Dissolved Selenium	ug/L	1	1	1	0	0.0	
Dissolved Silver	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Zinc	ug/L	20.3	21.1	20.7	0.8	3.9	
Mercury Dissolved	ug/L	0.001	0.0033	0.00215	0.0023	107.0	Yes

Receiving Waters Field Duplicate Comparison

	Stn.Code	Duplicate CAK-099	Sample MLA				
	Sample No.	CAK-MLA-20091104d	CAK-MLA-20091104				
	Collect Date/Time	11/4/2009	11/4/2009	Mean	Difference	% Difference	>20% ?
Turbidity Lab	NTU	2.7	2.9	2.8	0.2	7.1	
Color	Color Unit	90	90	90	0	0.0	
Total Suspended Solids	mg/L	4	4	4	0	0.0	
Ammonia as N	mg/L	0.1	0.1	0.1	0	0.0	
Nitrate as N	mg/L	0.05	0.05	0.05	0	0.0	
Hardness, Total	mg/L	46.4	46.7	46.55	0.3	0.6	
Chloride	mg/L	1.4	1.56	1.48	0.16	10.8	
Sulfate	mg/L	1.9	1.9	1.9	0	0.0	
Total Dissolved Solids	mg/L	53	75	64	22	34.4	Yes
Dissolved Aluminum	ug/L	68.9	72.2	70.55	3.3	4.7	
Dissolved Arsenic	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Cadmium	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Chromium	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Copper	ug/L	1	1	1	0	0.0	
Dissolved Iron	mg/L	0.234	0.252	0.243	0.018	7.4	
Dissolved Lead	ug/L	0.16	0.16	0.16	0	0.0	
Dissolved Manganese	ug/L	68.4	70.4	69.4	2	2.9	
Dissolved Nickel	ug/L	1	1	1	0	0.0	
Dissolved Selenium	ug/L	1	1	1	0	0.0	
Dissolved Silver	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Zinc	ug/L	5	2.5	3.75	2.5	66.7	Yes
Mercury Dissolved	ug/L	0.0016	0.0034	0.0025	0.0018	72.0	Yes

Receiving Waters Field Duplicate Comparison

		Duplicate	Sample				
	Stn.Code Sample No. Collect Date/Time	CAK-099 CAK-JS4-20091109d 11/9/2009	JS4 CAK-JS4-20091109 11/9/2009	Mean	Difference	% Difference	>20% ?
Turbidity Lab	NTU	0.4	0.6	0.5	0.2	40.0	Yes
Color	Color Unit	10	10	10	0	0.0	
Total Suspended Solids	mg/L	4	4	4	0	0.0	
Ammonia as N	mg/L	0.1	0.1	0.1	0	0.0	
Nitrate as N	mg/L	0.25	0.25	0.25	0	0.0	
Hardness, Total	mg/L	41.4	40.5	40.95	0.9	2.2	
Chloride	mg/L	1	1	1	0	0.0	
Sulfate	mg/L	6.5	6.5	6.5	0	0.0	
Total Dissolved Solids	mg/L	56	41	48.5	15	30.9	Yes
Dissolved Aluminum	ug/L	17.6	17.1	17.35	0.5	2.9	
Dissolved Arsenic	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Cadmium	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Chromium	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Copper	ug/L	1	1	1	0	0.0	
Dissolved Iron	mg/L	0.05	0.05	0.05	0	0.0	
Dissolved Lead	ug/L	0.16	0.16	0.16	0	0.0	
Dissolved Manganese	ug/L	4.1	4.1	4.1	0	0.0	
Dissolved Nickel	ug/L	1	1	1	0	0.0	
Dissolved Selenium	ug/L	1	1	1	0	0.0	
Dissolved Silver	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Zinc	ug/L	2.5	2.5	2.5	0	0.0	
Mercury Dissolved	ug/L	0.001	0.001	0.001	0	0.0	

Receiving Waters Field Duplicate Comparison

	Stn.Code Sample No. Collect Date/Time	Duplicate CAK-099 CAK-SH105-20091119d 11/19/2009	Sample SH105 CAK-SH105-20091119 11/19/2009	Mean	Difference	% Difference	>20% ?
Turbidity Lab	NTU	0.3	1	0.65	0.7	107.7	Yes
Color	Color Unit	10	10	10	0	0.0	
Total Suspended Solids	mg/L	4	4	4	0	0.0	
Ammonia as N	mg/L	0.1	0.1	0.1	0	0.0	
Nitrate as N	mg/L	0.15	0.14	0.145	0.01	6.9	
Hardness, Total	mg/L	62.3	63.4	62.85	1.1	1.8	
Chloride	mg/L	3	3	3	0	0.0	
Sulfate	mg/L	20	19.9	19.95	0.1	0.5	
Total Dissolved Solids	mg/L	102	97	99.5	5	5.0	
Dissolved Aluminum	ug/L	19.4	19.8	19.6	0.4	2.0	
Dissolved Arsenic	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Cadmium	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Chromium	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Copper	ug/L	1	1	1	0	0.0	
Dissolved Iron	mg/L	0.05	0.05	0.05	0	0.0	
Dissolved Lead	ug/L	0.16	0.16	0.16	0	0.0	
Dissolved Manganese	ug/L	4.7	4.9	4.8	0.2	4.2	
Dissolved Nickel	ug/L	1	1	1	0	0.0	
Dissolved Selenium	ug/L	1	1	1	0	0.0	
Dissolved Silver	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Zinc	ug/L	2.5	2.5	2.5	0	0.0	
Mercury Dissolved	ug/L	0.001	0.001	0.001	0	0.0	

Receiving Waters Field Duplicate Comparison

		Duplicate	Sample				
	Stn.Code	CAK-099	JS4				
	Sample No.	CAK-JS4-20091207d	CAK-JS4-20091207				
	Collect Date/Time	12/7/2009	12/7/2009	Mean	Difference	% Difference	>20% ?
Turbidity Lab	NTU	1.8	2.2	2	0.4	20.0	
Color	Color Unit	5	5	5	0	0.0	
Total Suspended Solids	mg/L	4	4	4	0	0.0	
Ammonia as N	mg/L	0.1	0.1	0.1	0	0.0	
Nitrate as N	mg/L	0.26	0.25	0.255	0.01	3.9	
Hardness, Total	mg/L	47.8	47.3	47.55	0.5	1.1	
Chloride	mg/L	1	1	1	0	0.0	
Sulfate	mg/L	8.2	8.1	8.15	0.1	1.2	
Total Dissolved Solids	mg/L	82	78	80	4	5.0	
Dissolved Aluminum	ug/L	11.9	12.4	12.15	0.5	4.1	
Dissolved Arsenic	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Cadmium	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Chromium	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Copper	ug/L	1	1	1	0	0.0	
Dissolved Iron	mg/L	0.05	0.05	0.05	0	0.0	
Dissolved Lead	ug/L	0.16	0.16	0.16	0	0.0	
Dissolved Manganese	ug/L	6.2	6.2	6.2	0	0.0	
Dissolved Nickel	ug/L	1	1	1	0	0.0	
Dissolved Selenium	ug/L	1	1	1	0	0.0	
Dissolved Silver	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Zinc	ug/L	2.5	2.5	2.5	0	0.0	
Mercury Dissolved	ug/L	0.001	0.001	0.001	0	0.0	

Receiving Waters Field Duplicate Comparison

		Duplicate	Sample				
	Stn.Code Sample No. Collect Date/Time	CAK-099 CAK-SH105-20091208d 12/8/2009	SH105 CAK-SH105-20091208 12/8/2009	Mean	Difference	% Difference	>20% ?
Turbidity Lab	NTU	0.2	0.3	0.25	0.1	40.0	Yes
Color	Color Unit	10	10	10	0	0.0	
Total Suspended Solids	mg/L	4	4	4	0	0.0	
Ammonia as N	mg/L	0.1	0.1	0.1	0	0.0	
Nitrate as N	mg/L	0.16	0.15	0.155	0.01	6.5	
Hardness, Total	mg/L	57.6	60.2	58.9	2.6	4.4	
Chloride	mg/L	4	4	4	0	0.0	
Sulfate	mg/L	21.4	21.5	21.45	0.1	0.5	
Dissolved Aluminum	ug/L	20.1	20	20.05	0.1	0.5	
Dissolved Arsenic	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Cadmium	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Chromium	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Copper	ug/L	1	1	1	0	0.0	
Dissolved Iron	mg/L	0.05	0.05	0.05	0	0.0	
Dissolved Lead	ug/L	0.16	0.16	0.16	0	0.0	
Dissolved Manganese	ug/L	5.2	5.1	5.15	0.1	1.9	
Dissolved Nickel	ug/L	1	1	1	0	0.0	
Dissolved Selenium	ug/L	1	1	1	0	0.0	
Dissolved Silver	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Zinc	ug/L	2.5	2.5	2.5	0	0.0	
Mercury Dissolved	ug/L	0.001	0.001	0.001	0	0.0	

Receiving Waters Field Duplicate Comparison

		Duplicate	Sample				
	Stn.Code	CAK-099	SLC				
	Sample No.	CAK-SLC-20091222d	CAK-SLC-20091222				
	Collect Date/Time	12/22/2009	12/22/2009	Mean	Difference	% Difference	>20% ?
Turbidity Lab	NTU	2.1	2	2.05	0.1	4.9	
Color	Color Unit	25	25	25	0	0.0	
Total Suspended Solids	mg/L	4	4	4	0	0.0	
Ammonia as N	mg/L	0.1	0.1	0.1	0	0.0	
Nitrate as N	mg/L	0.05	0.05	0.05	0	0.0	
Hardness, Total	mg/L	52.7	52.5	52.6	0.2	0.4	
Chloride	mg/L	2	2	2	0	0.0	
Sulfate	mg/L	6	6	6	0	0.0	
Total Dissolved Solids	mg/L	71	69	70	2	2.9	
Dissolved Aluminum	ug/L	38.7	38.8	38.75	0.1	0.3	
Dissolved Arsenic	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Cadmium	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Chromium	ug/L	2.5	2.5	2.5	0	0.0	
Dissolved Copper	ug/L	1	1	1	0	0.0	
Dissolved Iron	mg/L	0.069	0.0672	0.0681	0.0018	2.6	
Dissolved Lead	ug/L	0.16	0.16	0.16	0	0.0	
Dissolved Manganese	ug/L	5.3	5.4	5.35	0.1	1.9	
Dissolved Nickel	ug/L	1.2	1.2	1.2	0	0.0	
Dissolved Selenium	ug/L	1	1	1	0	0.0	
Dissolved Silver	ug/L	0.1	0.1	0.1	0	0.0	
Dissolved Zinc	ug/L	9	3.8	6.4	5.2	81.3	Yes
Mercury Dissolved	ug/L	0.001	0.0012	0.0011	0.0002	18.2	

Appendix B – Variance Reports

Outfall 001

Sample No.	Stn.Code	Collect Date/Time	Units	N	Avg	St.Dev.	Num.SD	-2S --- 0 --- +2S	Most Recent Results -->				
CAK-001EFF-20090106	**001 Effluent**	**1/7/2013**											
	Dissolved Oxygen	15.21	mg/L	620	11.8	1.22	**2.8**	+---+--0---+---+ X	17.83	13.06	13.11	12.14	13.58
	Lab Conductivity	365	umhos/cm	2	342	2.83	**8.1**	+---+--0---+---+ X	340	344			
	pH lab	7.43	pH	423	8.08	0.152	**-4.3**	X +--+--0---+--+	7.42	7.78	7.56	7.32	8.1
CAK-001EFF-20090120	**001 Effluent**	**1/21/2013**											
	Lab Turbidity	4.4	NTU	149	1.32	1.35	**2.3**	+---+--0---+---+ X	3.6	0.5	3.5	2.5	3.1
CAK-001EFF-20090203	**001 Effluent**	**2/4/2013**											
	Total Recoverable Nickel	1	ug/L	652	8.03	3.49	**-2**	X +--+--0---+--+	1.8	1.2	2.1	1.3	4
CAK-001EFF-20090407	**001 Effluent**	**4/8/2013**											
	Lab Conductivity	411	umhos/cm	3	350	13.4	**4.6**	+---+--0---+---+ X	365	340	344		
	pH lab	7.7	pH	424	8.08	0.155	**-2.4**	X +--+--0---+--+	7.43	7.42	7.78	7.56	7.32
CAK-001EFF-20090609	**001 Effluent**	**6/10/2013**											
	Dissolved Oxygen	14.8	mg/L	650	11.8	1.22	**2.4**	+---+--0---+---+ X	11.02	11.48	10.92	11.18	11.13
CAK-001EFF-20090714	**001 Effluent**	**7/15/2013**											
	Lab Conductivity	293	umhos/cm	4	365	32.6	**-2.2**	X +--+--0---+--+	411	365	340	344	
CAK-001EFF-20090825	**001 Effluent**	**8/26/2013**											
	Sulfate	23.3	mg/L	197	148	61.6	**-2**	X +--+--0---+--+	67.5	120	89	72.5	80.4
CAK-001EFF-20091013	**001 Effluent**	**10/14/2013**											
	pH lab	7.44	pH	426	8.08	0.156	**-4.1**	X +--+--0---+--+	7.94	7.7	7.43	7.42	7.78
CAK-001EFF-20091103	**001 Effluent**	**11/4/2013**											
	Sulfate	21.8	mg/L	199	147	62.2	**-2**	X +--+--0---+--+	55.1	23.3	67.5	120	89
CAK-001EFF-20091229	**001 Effluent**	**12/30/2013**											
	Dissolved Oxygen	14.3	mg/L	684	11.8	1.22	**2**	+---+--0---+---+ X	13.37	12.77	12.87	13.17	13.61

January 2009 Receiving Waters

Sample No.	Stn.Code	Collect Date/Time	Units	N	Avg	St.Dev.	Num.SD	-2S --- 0 --- +2S	Most Recent Results -->				
CAK-JS2-20090106	JS2	1/7/2013											
	Dissolved Oxygen	13.95	mg/L	39	12	0.876	2.2	+—+—0—+—+X	12.55	11.42	11.1	11.3	12
CAK-SH109-20090107	SH109	1/8/2013											
	Alkalinity, Total as CaCO3	53	mg/L	43	36.8	7.14	2.3	+—+—0—+—+X	35	32	33	37	37
	Dissolved Oxygen	14.92	mg/L	55	12.2	1.24	2.2	+—+—0—+—+X	14.24	12.82	11.6	11.73	11.56
	Mercury Dissolved	0.00269	ug/L	36	0.000992	0.000253	6.7	+—+—0—+—+X	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
CAK-SH113-20090107	SH113	1/8/2013											
	Dissolved Iron	0.236	mg/L	23	<0.05	0	-	+—+—0—+—+X	<0.05	<0.05	<0.05	<0.05	<0.05
CAK-SH105-20090107	SH105	1/8/2013											
	Hardness, Total	77.2	mg/L	52	45.3	15.2	2.1	+—+—0—+—+X	54.6	44.9	33.1	38.4	39

February 2009 Receiving Waters

Sample No.	Stn.Code	Collect Date/Time	Units	N	Avg	St.Dev.	Num.SD	-2S --- 0 --- +2S	Most Recent Results -->				
CAK-SH109-20090204	SH109	2/5/2013											
	Alkalinity, Total as CaCO3	57	mg/L	44	37.2	7.46	2.7	+—+—0—+—+X	53	35	32	33	37
CAK-SH105-20090217	SH105	2/18/2013											
	pH field	8.11	pH	56	7.55	0.25	2.2	+—+—0—+—+X	7.64	7.52	7.4	6.85	7.47

March 2009 Receiving Waters

Sample No.	Stn.Code	Collect Date/Time	Units	N	Avg	St.Dev.	Num.SD	-2S --- 0 --- +2S	Most Recent Results -->				
CAK-JS2-20090324	JS2	3/25/2013											
	Alkalinity, Total as CaCO3	26	mg/L	41	16	4.28	2.3	+—+—0—+—+X	21	20	16	15	17
	Nitrate as N	0.55	mg/L	32	0.191	0.116	3.1	+—+—0—+—+X	0.31	0.27	0.36	0.28	0.26
	Sulfate	2.4	mg/L	44	1.44	0.403	2.4	+—+—0—+—+X	2.1	2	1.6	1.3	1.3
CAK-SH105-20090324	SH105	3/25/2013											
	Conductivity	198.1	umhos/cm	57	112	40.4	2.1	+—+—0—+—+X	190	145.5	111.2	109.7	74.4
	Hardness, Total	81.6	mg/L	54	46.5	16.1	2.2	+—+—0—+—+X	76.9	77.2	54.6	44.9	33.1
	Sulfate	37.9	mg/L	48	14.9	9.85	2.3	+—+—0—+—+X	33.6	32.3	20.1	16	7.3

April 2009 Receiving Waters

Sample No.	Stn.Code	Collect Date/Time	Units	N	Avg	St.Dev.	Num.SD	-2S --- 0 -- +2S	Most Recent Results -->				
CAK-JS2-20090406	JS2	4/7/2013											
Nitrate as N		0.55	mg/L	33	0.202	0.13	2.7	+—+—0—+—+ X	0.55	0.31	0.27	0.36	0.28
Sulfate		2.4	mg/L	45	1.46	0.423	2.2	+—+—0—+—+ X	2.4	2.1	2	1.6	1.3
CAK-JS4-20090406	JS4	4/7/2013											
Chloride		2	mg/L	45	0.953	0.245	4.3	+—+—0—+—+ X	<1	<1	<0.2	<1	<1
Mercury Dissolved		0.0017	ug/L	40	0.00104	0.000327	2	+—+—0—+—+ X	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Nitrate as N		0.49	mg/L	33	0.23	0.105	2.5	+—+—0—+—+ X	0.23	0.3	0.26	0.29	0.25
Sulfate		11.5	mg/L	45	4.93	2.06	3.2	+—+—0—+—+ X	8	6.9	7.6	6.1	4.9
CAK-JS5-20090406	JS5	4/7/2013											
Chloride		2	mg/L	45	0.92	0.219	4.9	+—+—0—+—+ X	<1	<1	<0.2	<1	<1
Lab Turbidity		3.5	NTU	31	0.402	0.288	11	+—+—0—+—+ X	0.2	<0.1	<0.1	0.4	0.6
Nitrate as N		0.55	mg/L	33	0.242	0.123	2.5	+—+—0—+—+ X	0.23	0.31	0.25	0.31	0.26
Sulfate		10.5	mg/L	45	4.12	1.87	3.4	+—+—0—+—+ X	6.5	5.4	6.3	5	3.7
CAK-MLA-20090406	MLA	4/7/2013											
Nitrate as N		0.33	mg/L	38	0.0618	0.073	3.7	+—+—0—+—+ X	<0.05	<0.05	<0.05	<0.05	<0.05
CAK-SLB-20090407	SLB	4/8/2013											
Nitrate as N		0.34	mg/L	37	0.0635	0.0739	3.7	+—+—0—+—+ X	<0.05	<0.05	<0.05	<0.05	<0.05
CAK-SLC-20090407	SLC	4/8/2013											
Nitrate as N		0.33	mg/L	36	0.0692	0.0769	3.4	+—+—0—+—+ X	0.12	<0.05	<0.05	<0.05	<0.05
CAK-SH109-20090407	SH109	4/8/2013											
Nitrate as N		0.51	mg/L	34	0.155	0.089	4	+—+—0—+—+ X	0.22	0.28	0.22	0.27	0.18
pH field		7.1	pH	59	7.62	0.245	-2.1	X +—+—0—+—+	7.68	7.9	7.75	7.58	7.31
CAK-SH113-20090407	SH113	4/8/2013											
pH field		7.19	pH	26	7.59	0.126	-3.2	X +—+—0—+—+	7.69	7.78	7.64	7.73	7.45

May 2009 Receiving Waters

Sample No.	Stn.Code	Collect Date/Time	Units	N	Avg	St.Dev.	Num.SD	-2S --- 0 --- +2S	Most Recent Results -->				
CAK-JS2-20090506	JS2	5/6/2009											
	Nitrate as N	0.59	mg/L	34	0.212	0.142	2.7	+—+–0—+—+ X	0.55	0.55	0.31	0.27	0.36
CAK-JS4-20090506	JS4	5/6/2009											
	Nitrate as N	0.6	mg/L	34	0.238	0.113	3.2	+—+–0—+—+ X	0.49	0.23	0.3	0.26	0.29
CAK-JS5-20090506	JS5	5/6/2009											
	Nitrate as N	0.63	mg/L	34	0.251	0.132	2.9	+—+–0—+—+ X	0.55	0.23	0.31	0.25	0.31
CAK-SH113-20090507	SH113	5/7/2009											
	Nitrate as N	0.54	mg/L	27	0.215	0.159	2	+—+–0—+—+ X	0.41	0.11	0.16	0.14	0.17
CAK-SLC-20090513	SLC	5/13/2009											
	Nitrate as N	0.32	mg/L	37	0.0762	0.0871	2.8	+—+–0—+—+ X	0.33	0.12	<0.05	<0.05	<0.05
CAK-SLB-20090513	SLB	5/13/2009											
	Nitrate as N	0.34	mg/L	38	0.0708	0.0856	3.1	+—+–0—+—+ X	0.34	<0.05	<0.05	<0.05	<0.05
CAK-SH105-20090512	SH105	5/12/2009											
	Ammonia as N	0.2	mg/L	57	0.0931	0.0237	4.5	+—+–0—+—+ X	<0.1	<0.1	<0.1	<0.1	<0.1
CAK-MLA-20090514	MLA	5/14/2009											
	Nitrate as N	0.33	mg/L	39	0.0687	0.0839	3.1	+—+–0—+—+ X	0.33	<0.05	<0.05	<0.05	<0.05
	Sulfate	6.4	mg/L	53	1.85	0.36	13	+—+–0—+—+ X	2.4	2.5	2.2	1.4	1.6
CAK-SH111-20090514	SH111	5/14/2009											
	Nitrate as N	0.79	mg/L	16	0.16	0.163	3.9	+—+–0—+—+ X	0.33	0.14	0.07	<0.05	0.06

June 2009 Receiving Waters

Sample No.	Stn.Code	Collect Date/Time	Units	N	Avg	St.Dev.	Num.SD	-2S --- 0 --- +2S	Most Recent Results -->				
CAK-JS5-20090604	JS5	6/4/2009											
	Alkalinity, Total as CaCO3	5	mg/L	44	29.4	9.29	-2.6	X +–+–0—+–+	14	39	38	35	40
CAK-MLA-20090609	MLA	6/6/2009											
	Alkalinity, Total as CaCO3	112	mg/L	51	47	13.1	5	+—+–0—+—+ X	29	51	56	46	29
	Nitrate as N	0.3	mg/L	40	0.0752	0.0925	2.4	+—+–0—+—+ X	0.33	0.33	<0.05	<0.05	<0.05
CAK-SLB-20090610	SLB	6/9/2009											
	Dissolved Oxygen	8.89	mg/L	42	12.1	1.59	-2	X +–+–0—+–+	12.27	12.12	12.93	E	14.35
	Nitrate as N	0.29	mg/L	39	0.0777	0.0949	2.2	+—+–0—+—+ X	0.34	0.34	<0.05	<0.05	<0.05
	Temperature	16.8	oC	45	5.14	5.31	2.2	+—+–0—+—+ X	3.7	0.1	0.2	0.6	0.6
CAK-JS2-20090604	JS2	6/9/2009											
	Alkalinity, Total as CaCO3	6	mg/L	44	16.3	4.39	-2.3	X +–+–0—+–+	15	17	26	21	20
CAK-SLC-20090610	SLC	6/10/2009											
	Nitrate as N	0.28	mg/L	38	0.0827	0.0946	2.1	+—+–0—+—+ X	0.32	0.33	0.12	<0.05	<0.05

July 2009 Receiving Waters

Sample No.	Stn.Code	Collect Date/Time	Units	N	Avg	St.Dev.	Num.SD	-2S --- 0 --- +2S	Most Recent Results -->				
CAK-SLB-20090708	SLB	7/8/2009											
	Temperature	17.1	oC	46	5.39	5.52	2.1	+—+—0—+—+ X	16.8	3.7	0.1	0.2	0.6
CAK-SLC-20090708	SLC	7/8/2009											
	Temperature	14.9	oC	45	4.94	4.83	2.1	+—+—0—+—+ X	12.2	3.6	0.4	0.3	0.5
CAK-MLA-20090709	MLA	7/9/2009											
	Dissolved Zinc	6.3	ug/L	54	2.87	1.61	2.1	+—+—0—+—+ X	<2.5	<2.5	<2.5	<2.5	<2.5
	pH field	8.03	pH	53	7.39	0.303	2.1	+—+—0—+—+ X	7.9	7.29	7.11	7.11	7.42
	Temperature	18.2	oC	44	5.13	5.33	2.5	+—+—0—+—+ X	12.6	2.8	0.9	0.1	0.2
CAK-001EFF-20090714	001 Effluent	7/14/2009											
	Lab Conductivity	293	umhos/cm	4	365	32.6	-2.2	X +—+—0—+—+	411	365	340	344	

August 2009 Receiving Waters

Sample No.	Stn.Code	Collect Date/Time	Units	N	Avg	St.Dev.	Num.SD	-2S --- 0 --- +2S	Most Recent Results -->				
CAK-SH109-20090805	SH109	8/5/2009											
	Temperature	10.7	oC	62	3.6	2.89	2.5	+—+—0—+—+ X	8.6	3.7	2.6	1.7	0.1
CAK-SH113-20090805	SH113	8/5/2009											
	Temperature	10.7	oC	30	3.85	2.67	2.6	+—+—0—+—+ X	8.6	5.1	3.3	3	0.7
CAK-JS2-20090811	JS2	8/11/2009											
	Lab Turbidity	0.9	NTU	35	0.278	0.201	3.1	+—+—0—+—+ X	0.2	0.4	0.4	0.1	<0.1
CAK-JS5-20090811	JS5	8/11/2009											
	Lab Turbidity	1.8	NTU	35	0.482	0.592	2.2	+—+—0—+—+ X	0.2	0.3	0.4	3.5	0.2
CAK-MLA-20090818	MLA	8/18/2009											
	pH field	8.13	pH	55	7.41	0.315	2.3	+—+—0—+—+ X	7.85	8.03	7.9	7.29	7.11

September 2009 Receiving Waters

Sample No.	Stn.Code	Collect Date/Time	Units	N	Avg	St.Dev.	Num.SD	-2S --- 0 --- +2S	Most Recent Results -->				
CAK-SLB-20090910	SLB	9/10/2009											
	Dissolved Copper	14.2	ug/L	54	1.44	0.998	13	+—+—0—+—+ X	1.2	<1	1.1	1.9	1.2
	Sulfate	16.5	mg/L	54	5.73	4.02	2.7	+—+—0—+—+ X	7.9	9.4	6.3	7.1	7.6
CAK-SLC-20090910	SLC	9/10/2009											
	Mercury Dissolved	0.0049	ug/L	50	0.00165	0.000661	4.9	+—+—0—+—+ X	0.0018	<0.0010	0.0013	0.0014	0.0015
CAK-JS4-20090917	JS4	9/17/2009											
	Dissolved Aluminum	31.8	ug/L	50	12.2	9.59	2	+—+—0—+—+ X	6.6	4.8	6.7	18.6	20.9
	Dissolved Copper	1.9	ug/L	50	0.965	0.14	6.7	+—+—0—+—+ X	<1	<1	<1	<1	<1
CAK-JS5-20090917	JS5	9/17/2009											
	Lab Turbidity	2.5	NTU	36	0.518	0.623	3.2	+—+—0—+—+ X	1.8	0.2	0.3	0.4	3.5
CAK-SH111-20090928	SH111	9/28/2009											
	pH lab	7.83	pH	11	7.59	0.0819	2.9	+—+—0—+—+ X	7.69	7.6	7.5	7.6	7.7

October 2009 Receiving Waters

Sample No.	Stn.Code	Collect Date/Time	Units	N	Avg	St.Dev.	Num.SD	-2S --- 0 --- +2S	Most Recent Results -->				
CAK-JS2-20091012	JS2	10/12/2009											
pH lab		7.76	pH	12	7.44	0.108	2.9	+—+—0—+—+ X	7.6	7.3	7.4	7.6	7.5
CAK-JS4-20091012	JS4	10/12/2009											
Dissolved Zinc		7.3	ug/L	51	2.64	0.963	4.8	+—+—0—+—+ X	<2.5	2.8	3.3	<2.5	<2.5
Lab Turbidity		2.2	NTU	37	0.604	0.664	2.4	+—+—0—+—+ X	1.3	1.5	0.2	0.5	0.4
CAK-SLB-20091014	SLB	10/14/2009											
Lab Turbidity		4.2	NTU	36	1.25	1.4	2.1	+—+—0—+—+ X	2.1	0.8	0.2	0.3	0.8
CAK-SH113-20091019	SH113	10/19/2009											
Dissolved Zinc		5.7	ug/L	32	2.92	0.982	2.8	+—+—0—+—+ X	<2.5	3.5	<2.5	<2.5	<2.5

November 2009 Receiving Waters

Sample No.	Stn.Code	Collect Date/Time	Units	N	Avg	St.Dev.	Num.SD	-2S --- 0 --- +2S	Most Recent Results -->				
CAK-SLB-20091104	SLB	11/4/2009											
Color		125	Color Unit	50	61.2	31.7	2	+—+—0—+—+ X	80	50	20	15	30
CAK-SLC-20091104	SLC	11/4/2009											
Conductivity		11.34	umhos/cm	56	103	23.8	-3.8	X +—+—0—+—+	135.7	95.6	98.4	132.2	129.7
Mercury Dissolved		0.0036	ug/L	52	0.00171	0.000793	2.4	+—+—0—+—+ X	0.0011	0.0049	0.0018	<0.0010	0.0013
CAK-MLA-20091104	MLA	11/4/2009											
Dissolved Iron		0.252	mg/L	59	0.133	0.0544	2.2	+—+—0—+—+ X	0.18	0.113	<0.05	<0.05	<0.05
Lab Turbidity		2.9	NTU	40	0.933	0.936	2.1	+—+—0—+—+ X	1.4	0.5	0.4	0.3	0.3
Mercury Dissolved		0.0034	ug/L	54	0.00167	0.000716	2.4	+—+—0—+—+ X	0.0017	0.0021	0.0012	<0.0010	<0.0010

December 2009 Receiving Waters

Sample No.	Stn.Code	Collect Date/Time	Units	N	Avg	St.Dev.	Num.SD	-2S --- 0 --- +2S	Most Recent Results -->				
CAK-JS4-20091207	JS4	12/7/2009											
Dissolved Oxygen		14.79	mg/L	50	12.5	0.872	2.6	+—+—0—+—+ X	13.14	13.08	12.16	11.75	11.24
Lab Turbidity		2.2	NTU	39	0.644	0.695	2.2	+—+—0—+—+ X	0.6	2.2	1.3	1.5	0.2
CAK-JS5-20091207	JS5	12/7/2009											
Dissolved Oxygen		14.13	mg/L	49	12.2	0.84	2.3	+—+—0—+—+ X	13.15	12.81	12.87	11.7	11.14
CAK-SH105-20091208	SH105	12/8/2009											
Dissolved Oxygen		14.82	mg/L	63	12.5	1.13	2	+—+—0—+—+ X	13.86	12.1	12.33	11.25	10.77

Appendix C – Discharge Monitoring Reports Results

OUTFALL 001- Influent

2009 Discharge Monitoring Report Results

		January		*February*		*March*	
Parameter	**Units**	**MO AVG**	**DAILY MX**	**MO AVG**	**DAILY MX**	**MO AVG**	**DAILY MX**
Total Suspended Solids	mg/L	30	111	66	73	55.00	231
Total Recoverable Arsenic	ug/L	0.0	<2.5	0.0	<2.5	0.0	<2.5
Total Recoverable Iron	ug/L	875	967	4,180	5,470	3,018	4,330
Total Recoverable Selenium	ug/L	1.8	2	1.4	1.5	1.46	1.6
Total Chromium	ug/L	0.0	<2.5	0.00	<2.5	0.0	<2.5
Total Recoverable Nickel	ug/L	0.9	2.1	1.2	2.6	1.6	3.7
Total Recoverable Silver	ug/L	0.00	<0.1	0.03	0.1	0.02	0.1
Total Recoverable Zinc	ug/L	10.6	11.1	16.5	20.3	15.4	20.6
Total Recoverable Aluminum	ug/L	340	402	2,488	3,330	1,862	2,610
Total Recoverable Cadmium	ug/L	0.00	<0.1	0.00	<0.1	0	<0.1
Total Recoverable Lead	ug/L	0.40	0.42	1.70	2.13	1.25	1.78
Total Recoverable Copper	ug/L	3.1	3.4	8.95	10.4	7.46	10.9
Total Recoverable Manganese	ug/L	32.1	34	119.0	142	92	133
Mercury Total	ug/L	0.0022	0.0029	0.005	0.007	0.0035	0.0062

* Values reported as less than MDL were replaced with zero for calculating monthly averages

OUTFALL 001- Influent

2009 Discharge Monitoring Report Results

		April		*May*		*June*	
Parameter	**Units**	**MO AVG**	**DAILY MX**	**MO AVG**	**DAILY MX**	**MO AVG**	**DAILY MX**
Total Suspended Solids	mg/L	76	239	144	256	63	279
Total Recoverable Arsenic	ug/L	0.0	<2.5	0.0	<2.5	0.0	<2.5
Total Recoverable Iron	ug/L	3,156	6,260	4,648	5,540	3,422	8,800
Total Recoverable Selenium	ug/L	1.2	1.2	1.30	1.90	1.70	1.90
Total Chromium	ug/L	0.0	<2.5	0.0	<2.5	0.0	<2.5
Total Recoverable Nickel	ug/L	1.1	2.1	1.7	3.3	0.5	1.3
Total Recoverable Silver	ug/L	0.00	<0.1	0.00	<0.1	0.0	<0.1
Total Recoverable Zinc	ug/L	1.8	2.9	18.7	21.8	15.3	28.9
Total Recoverable Aluminum	ug/L	2,266	4,840	3,030	3,830	2,496	6,840
Total Recoverable Cadmium	ug/L	0.00	<0.1	0.00	<0.1	0.0	<0.1
Total Recoverable Lead	ug/L	1.20	2.2	1.80	2.3	1.5	4.0
Total Recoverable Copper	ug/L	6.8	12.5	14.7	16.8	13.8	38.4
Total Recoverable Manganese	ug/L	86.0	144	131.0	153	111.0	276
Mercury Total	ug/L	0.0036	0.0084	0.0048	0.0053	0.0038	0.0091

* Values reported as less than MDL were replaced with zero for calculating monthly averages

OUTFALL 001- Influent

2009 Discharge Monitoring Report Results

		July		*August*		*September*	
Parameter	**Units**	**MO AVG**	**DAILY MX**	**MO AVG**	**DAILY MX**	**MO AVG**	**DAILY MX**
Total Suspended Solids	mg/L	53	205	137	1670	118.00	329
Total Recoverable Arsenic	ug/L	0.0	<2.5	0.0	<2.5	0.0	<2.5
Total Recoverable Iron	ug/L	2,965	5,000	4,032	7,350	5,222	10,400
Total Recoverable Selenium	ug/L	1.6	1.7	1.7	1.8	1.50	1.7
Total Chromium	ug/L	0.0	<2.5	0.6	3.1	0.00	<2.5
Total Recoverable Nickel	ug/L	0.3	1	0.7	1.5	1.4	3
Total Recoverable Silver	ug/L	0.00	<0.1	0.1	0.2	0.2	0.8
Total Recoverable Zinc	ug/L	14.4	19.9	17.6	29.5	17.2	37.5
Total Recoverable Aluminum	ug/L	2027	3270	2606	3870	3394	7590
Total Recoverable Cadmium	ug/L	0.00	<0.1	0.00	<0.1	0.00	0.10
Total Recoverable Lead	ug/L	1.30	2.5	2.30	4.4	3.9	9.8
Total Recoverable Copper	ug/L	10.6	20	11.20	19.4	16.9	46.6
Total Recoverable Manganese	ug/L	89.0	151	101.0	169	170	446
Mercury Total	ug/L	0.0051	0.0104	0.0081	0.0154	0.0163	0.0452

* Values reported as less than MDL were replaced with zero for calculating monthly averages

OUTFALL 001- Effluent

2009 Discharge Monitoring Report Results

		January		*February*		*March*	
Parameter	**Units**	**MINIMUM**	**MAXIMUM**	**MINIMUM**	**MAXIMUM**	**MINIMUM**	**MAXIMUM**
pH	pH units	6.67	7.32	6.77	7.39	6.67	7.58
Hardness Downstream of Outfall	mg/L	30	101	70	104	111	126
Parameter	**Units**	**MO AVG**	**DAILY MX**	**MO AVG**	**DAILY MX**	**MO AVG**	**DAILY MX**
Temperature	oC	2.5	4.20	2.58	3.10	2.61	4.20
Turbidity	NTU	2.80	4.40	1.58	2.20	0.93	2.0
Background Turbidity	NTU	0.90	2.90	0.18	0.20	0.21	0.4
Turbidity Difference	NTU	1.9	3.2	1.4	2.0	0.71	1.8
Sulfate (as S)	mg/L	29.5	31.7	29.0	32.0	36.0	43.0
Dissolved oxygen	mg/L	13.26	15.21	12.77	13.57	12.27	14.40
Total Suspended Solids	mg/L	0	<4	1	6	0.00	<4
Ammonia as N	mg/L	0.1	0.2	0.00	<0.1	0.00	<0.1
Nitrate as N	mg/L	0.16	0.28	0.09	0.14	0.16	0.46
Total Recoverable Arsenic	ug/L	0.0	<2.5	0.00	<2.5	0.0	<2.5
Total Recoverable Iron	ug/L	305	429	289	374	166	306
Total Recoverable Selenium	ug/L	1.50	1.60	1.18	1.40	1.09	1.40
Total Chromium	ug/L	0.00	<2.5	0.00	<2.5	0.00	<2.5
Total Recoverable Nickel- "O"	ug/L	1.6	2.1	0.8	1.20	***	***
Total Recoverable Nickel- "P"	ug/L	***	1.30	2.50	2.50	1.90	3.70
Total Recoverable Nickel- "Q"	ug/L	***	***	***	***	***	***
Total Recoverable Silver- "O"	ug/L	0	<0.1	0.0	<0.1	***	***
Total Recoverable Silver- "P"	ug/L	***	<0.1	0.00	<0.1	0.00	<0.1
Total Recoverable Silver- "Q"	ug/L	***	***	***	***	***	***
Total Recoverable Zinc- "O"	ug/L	6.8	10.8	4.7	4.9	***	***
Total Recoverable Zinc- "P"	ug/L	***	6.6	5.0	5.0	5.3	8.0
Total Recoverable Zinc- "Q"	ug/L	***	***	***	***	***	***
Total Recoverable Aluminum	ug/L	11.9	21.30	15.7	29.9	9.00	16.1
Total Recoverable Cadmium- "O"	ug/L	0.0	<0.1	0	<0.1	***	***
Total Recoverable Cadmium- "P"	ug/L	***	<0.1	0.00	<0.1	0.00	<0.1
Total Recoverable Cadmium- "Q"	ug/L	***	***	***	***	***	***
Total Recoverable Lead- "O"	ug/L	0.0	<0.16	0.00	<0.16	***	***
Total Recoverable Lead- "P"	ug/L	***	<0.16	0.00	<0.16	0	<0.16
Total Recoverable Lead- "Q"	ug/L	***	***	***	***	***	***
Total Recoverable Copper- "O"	ug/L	0.0	<1	0.0	<1	***	***
Total Recoverable Copper- "P"	ug/L	***	<1	0.00	<1	0.00	<1
Total Recoverable Copper- "Q"	ug/L	***	***	***	***	***	***
Total Recoverable Manganese	ug/L	26.80	30.00	50.38	55.90	47.66	70.80
Total Dissolved Solids	mg/L	221	241	214	305	250	279
Mercury Total	ug/L	0.0004	0.0014	0.0000	<0.001	0.0002	0.0011

*Values reported as less than PQL were replaced with zero for calculating monthly averages

***No value to report: Downstream hardness not within criteria

OUTFALL 001- Effluent

2009 Discharge Monitoring Report Results

		April		*May*		*June*	
Parameter	**Units**	**MINIMUM**	**MAXIMUM**	**MINIMUM**	**MAXIMUM**	**MINIMUM**	**MAXIMUM**
pH	pH units	6.83	7.85	6.55	8.12	6.72	7.2
Hardness Downstream of Outfall	mg/L	51	119	36	48	39	58
Parameter	**Units**	**MO AVG**	**DAILY MX**	**MO AVG**	**DAILY MX**	**MO AVG**	**DAILY MX**
Temperature	oC	5.5	7.2	7.9	8.3	8.1	8.9
Turbidity	NTU	0.2	0.3	0.2	0.50	0.20	0.20
Background Turbidity	NTU	0.2	0.40	0.50	0.80	0.50	0.8
Turbidity Difference	NTU	0.00	0.3	-0.3	-0.10	-0.40	-0.10
Sulfate (as S)	mg/L	37.6	39.1	27.6	33.7	22.4	23.1
Dissolved oxygen	mg/L	12.27	13.74	11.11	11.26	12.00	14.80
Total Suspended Solids	mg/L	0	<4	0	<4	0.00	<4
Ammonia as N	mg/L	0	0.10	0	<0.1	0.00	<0.1
Nitrate as N	mg/L	0.38	0.56	0.36	0.42	0.24	0.39
Total Recoverable Arsenic	ug/L	0.00	<2.5	0.00	<2.5	0.00	<2.5
Total Recoverable Iron	ug/L	0	<50	0	<50	0	<50
Total Recoverable Selenium	ug/L	0.70	1.30	1.10	1.70	1.50	1.70
Total Chromium	ug/L	0.0	<2.5	0.00	<2.5	0.00	<2.5
Total Recoverable Nickel- "O"	ug/L	1.60	2.10	1.90	3.90	1.2	1.5
Total Recoverable Nickel- "P"	ug/L	2.6	4.10	***	***	***	***
Total Recoverable Nickel- "Q"	ug/L	***	***	***	***	***	***
Total Recoverable Silver- "O"	ug/L	0.00	<0.1	0.00	<0.1	1.20	1.5
Total Recoverable Silver- "P"	ug/L	0	<0.1	***	***	***	***
Total Recoverable Silver- "Q"	ug/L	***	***	***	***	***	***
Total Recoverable Zinc- "O"	ug/L	1.8	2.9	1.1	2.8	0.0	<0.1
Total Recoverable Zinc- "P"	ug/L	3.1	5.0	***	***	2.1	3.7
Total Recoverable Zinc- "Q"	ug/L	***	***	***	***	***	***
Total Recoverable Aluminum	ug/L	2.5	7.2	1.9	2.9	1.5	3.0
Total Recoverable Cadmium- "O"	ug/L	0.00	<0.1	0.00	<0.1	0.00	<0.1
Total Recoverable Cadmium- "P"	ug/L	0	<0.1	***	***	***	***
Total Recoverable Cadmium- "Q"	ug/L	***	***	***	***	***	***
Total Recoverable Lead- "O"	ug/L	0.00	<0.16	0.00	<0.16	0.00	<0.16
Total Recoverable Lead- "P"	ug/L	0	<0.16	***	***	***	***
Total Recoverable Lead- "Q"	ug/L	***	***	***	***	***	***
Total Recoverable Copper- "O"	ug/L	0.00	<1	0.00	<1	0.00	<1
Total Recoverable Copper- "P"	ug/L	0	<1	***	***	***	***
Total Recoverable Copper- "Q"	ug/L	***	***	***	***	***	***
Total Recoverable Manganese	ug/L	51.60	59.10	49.40	66.70	55.60	86.60
Total Dissolved Solids	mg/L	279	292	199	235	168	183
Mercury Total	ug/L	0.000	<0.001	0.000	<0.001	0.000	<0.001

*Values reported as less than PQL were replaced with zero for calculating monthly averages

***No value to report: Downstream hardness not within criteria

OUTFALL 001- Effluent

2009 Discharge Monitoring Report Results

		April		*May*		*June*	
Parameter	**Units**	**MINIMUM**	**MAXIMUM**	**MINIMUM**	**MAXIMUM**	**MINIMUM**	**MAXIMUM**
pH	pH units	6.83	7.85	6.55	8.12	6.72	7.2
Hardness Downstream of Outfall	mg/L	51	119	36	48	39	58
Parameter	**Units**	**MO AVG**	**DAILY MX**	**MO AVG**	**DAILY MX**	**MO AVG**	**DAILY MX**
Temperature	oC	5.5	7.2	7.9	8.3	8.1	8.9
Turbidity	NTU	0.2	0.3	0.2	0.50	0.20	0.20
Background Turbidity	NTU	0.2	0.40	0.50	0.80	0.50	0.8
Turbidity Difference	NTU	0.00	0.3	-0.3	-0.10	-0.40	-0.10
Sulfate (as S)	mg/L	37.6	39.1	27.6	33.7	22.4	23.1
Dissolved oxygen	mg/L	12.27	13.74	11.11	11.26	12.00	14.80
Total Suspended Solids	mg/L	0	<4	0	<4	0.00	<4
Ammonia as N	mg/L	0	0.10	0	<0.1	0.00	<0.1
Nitrate as N	mg/L	0.38	0.56	0.36	0.42	0.24	0.39
Total Recoverable Arsenic	ug/L	0.00	<2.5	0.00	<2.5	0.00	<2.5
Total Recoverable Iron	ug/L	0	<50	0	<50	0	<50
Total Recoverable Selenium	ug/L	0.70	1.30	1.10	1.70	1.50	1.70
Total Chromium	ug/L	0.0	<2.5	0.00	<2.5	0.00	<2.5
Total Recoverable Nickel- "O"	ug/L	1.60	2.10	1.90	3.90	1.2	1.5
Total Recoverable Nickel- "P"	ug/L	2.6	4.10	***	***	***	***
Total Recoverable Nickel- "Q"	ug/L	***	***	***	***	***	***
Total Recoverable Silver- "O"	ug/L	0.00	<0.1	0.00	<0.1	1.20	1.5
Total Recoverable Silver- "P"	ug/L	0	<0.1	***	***	***	***
Total Recoverable Silver- "Q"	ug/L	***	***	***	***	***	***
Total Recoverable Zinc- "O"	ug/L	1.8	2.9	1.1	2.8	0.0	<0.1
Total Recoverable Zinc- "P"	ug/L	3.1	5.0	***	***	2.1	3.7
Total Recoverable Zinc- "Q"	ug/L	***	***	***	***	***	***
Total Recoverable Aluminum	ug/L	2.5	7.2	1.9	2.9	1.5	3.0
Total Recoverable Cadmium- "O"	ug/L	0.00	<0.1	0.00	<0.1	0.00	<0.1
Total Recoverable Cadmium- "P"	ug/L	0	<0.1	***	***	***	***
Total Recoverable Cadmium- "Q"	ug/L	***	***	***	***	***	***
Total Recoverable Lead- "O"	ug/L	0.00	<0.16	0.00	<0.16	0.00	<0.16
Total Recoverable Lead- "P"	ug/L	0	<0.16	***	***	***	***
Total Recoverable Lead- "Q"	ug/L	***	***	***	***	***	***
Total Recoverable Copper- "O"	ug/L	0.00	<1	0.00	<1	0.00	<1
Total Recoverable Copper- "P"	ug/L	0	<1	***	***	***	***
Total Recoverable Copper- "Q"	ug/L	***	***	***	***	***	***
Total Recoverable Manganese	ug/L	51.60	59.10	49.40	66.70	55.60	86.60
Total Dissolved Solids	mg/L	279	292	199	235	168	183
Mercury Total	ug/L	0.000	<0.001	0.000	<0.001	0.000	<0.001

*Values reported as less than PQL were replaced with zero for calculating monthly averages

***No value to report: Downstream hardness not within criteria

OUTFALL 001- Effluent

2009 Discharge Monitoring Report Results

		July		*August*		*September*	
Parameter	**Units**	**MINIMUM**	**MAXIMUM**	**MINIMUM**	**MAXIMUM**	**MINIMUM**	**MAXIMUM**
pH	pH units	6.54	8.45	6.62	8.18	6.82	7.4
Hardness Downstream of Outfall	mg/L	49	69	41	78	53	75
Parameter	**Units**	**MO AVG**	**DAILY MX**	**MO AVG**	**DAILY MX**	**MO AVG**	**DAILY MX**
Temperature	oC	10.3	11.5	8.9	10.0	7.8	8.3
Turbidity	NTU	0.2	0.3	0.3	0.7	0.20	0.2
Background Turbidity	NTU	0.30	0.3	0.30	0.3	0.20	0.3
Turbidity Difference	NTU	-0.1	0	-0.1	0	-0.10	0
Sulfate (as S)	mg/L	24	25.3	25	25.9	23	23.9
Dissolved oxygen	mg/L	11.39	14.11	11.12	11.57	11.27	11.7
Total Suspended Solids	mg/L	0	<4	0	4	0.00	<4
Ammonia as N	mg/L	0	<0.1	0.1	0.3	0.00	<0.1
Nitrate as N	mg/L	0.14	0.19	0.27	0.55	0.10	0.12
Total Recoverable Arsenic	ug/L	0.0	<2.5	0.0	<2.5	0.0	<2.5
Total Recoverable Iron	ug/L	0	<50	0	<50	0	<50
Total Recoverable Selenium	ug/L	1.5	1.6	1.3	1.5	1.4	1.5
Total Chromium	ug/L	0.0	<2.5	0.0	<2.5	0.0	<2.5
Total Recoverable Nickel- "O"	ug/L	0.7	1.7	1.2	1.3	1.8	3.2
Total Recoverable Nickel- "P"	ug/L	***	***	***	***	***	***
Total Recoverable Nickel- "Q"	ug/L	***	***	***	***	***	***
Total Recoverable Silver- "O"	ug/L	0.0	<0.1	0.0	<0.1	0	<0.1
Total Recoverable Silver- "P"	ug/L	***	***	***	***	***	***
Total Recoverable Silver- "Q"	ug/L	***	***	***	***	***	***
Total Recoverable Zinc- "O"	ug/L	4.1	4.5	5.8	9.6	1.9	3.5
Total Recoverable Zinc- "P"	ug/L	***	***	***	***	***	***
Total Recoverable Zinc- "Q"	ug/L	***	***	***	***	***	***
Total Recoverable Aluminum	ug/L	1.7	2.1	1.9	3.7	1.60	3.6
Total Recoverable Cadmium- "O"	ug/L	0.00	<0.1	0	<0.1	0	<0.1
Total Recoverable Cadmium- "P"	ug/L	***	***	***	***	***	***
Total Recoverable Cadmium- "Q"	ug/L	***	***	***	***	***	***
Total Recoverable Lead- "O"	ug/L	0.00	<0.16	0	<0.16	0	<0.16
Total Recoverable Lead- "P"	ug/L	***	***	***	***	***	***
Total Recoverable Lead- "Q"	ug/L	***	***	***	***	***	***
Total Recoverable Copper- "O"	ug/L	0.0	<1	0	<1	0	<1
Total Recoverable Copper- "P"	ug/L	***	***	***	***	***	***
Total Recoverable Copper- "Q"	ug/L	***	***	***	***	***	***
Total Recoverable Manganese	ug/L	44.60	57.00	51.10	69.00	97.10	187.00
Total Dissolved Solids	mg/L	179	187	184	191	174	209
Mercury Total	ug/L	0.0000	<0.001	0.0000	<0.001	0.0000	<0.001

*Values reported as less than PQL were replaced with zero for calculating monthly averages

***No value to report: Downstream hardness not within criteria

001 Final Effluent
TDS Quarterly Anions/Cations, January 2009
sampled 1/06/2009

Parameters	*Units*	*Results*
Alkalinity	mg/L	61
Boron	mg/L	<0.03
Calcium	mg/L	52.4
Chloride	mg/L	12
Conductivity	umhos/cm	365
Fluoride	mg/L	<0.2
Hardness	mg/L	147
Potassium	mg/L	<1
Magnesium	mg/L	3.98
Sodium	mg/L	5.47
Sulfate, Total	mg/L	89
pH (Lab)	pH	7.43

001 Final Effluent
TDS Quarterly Anions/Cations, April 2009
sampled 4/7/2009

Parameters	*Units*	*Results*
Alkalinity	mg/L	67
Boron	mg/L	0.037
Calcium	mg/L	68.6
Chloride	mg/L	11
Conductivity	umhos/cm	411
Fluoride	mg/L	<0.2
Hardness	mg/L	191
Potassium	mg/L	<1
Magnesium	mg/L	4.71
Sodium	mg/L	8.81
Sulfate, Total	mg/L	120
pH (Lab)	pH	7.7

001 Final Effluent
TDS Quarterly Anions/Cations, July 2009
sampled 7/14/2009

Parameters	*Units*	*Results*
Alkalinity	mg/L	44
Boron	mg/L	<0.03
Calcium	mg/L	42.1
Chloride	mg/L	12
Conductivity	umhos/cm	293
Fluoride	mg/L	<0.2
Hardness	mg/L	120
Potassium	mg/L	<1
Magnesium	mg/L	3.67
Sodium	mg/L	4.32
Sulfate, Total	mg/L	67.5
pH (Lab)	pH	7.94

001 Final Effluent
TDS Quarterly Anions/Cations, October 2009
sampled 10/13/2009

Parameters	*Units*	*Results*
Alkalinity	mg/L	61
Boron	mg/L	<0.03
Calcium	mg/L	44.1
Chloride	mg/L	13
Conductivity	umhos/cm	284
Fluoride	mg/L	<0.2
Hardness	mg/L	124
Potassium	mg/L	<1
Magnesium	mg/L	3.53
Sodium	mg/L	3.76
Sulfate, Total	mg/L	55.1
pH (Lab)	pH	7.44