SECTION 5

PRELIMINARY SITE CHARACTERIZATION EPA GROUNDWATER/SURFACE WATER INTERACTION STUDIES AND FOCUSED SAMPLING TECHNICAL MEMORANDUM

MOLYCORP MINE RI/FS

REVISION 0

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Molycorp, Inc.
Questa, New Mexico

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URS Corporation
8181 E. Tufts Ave
Denver, CO 80237

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SECTIONFIVE EPA Groundwater/Surface Water Interaction Studies and Focused Sampling

This section documents and summarizes abiotic analytical results for theGSI studies performed by EPA as part of the RI/FS at the Molycorp mine and tailings facility in Questa, New Mexico. Abiotic results from EPA's Focused Sampling (RI Addendum) of Red River along the mine site are also presented. Results for aquatic biota from the Focused Sampling are presented in Section 4.2.

Three GSI studies were conducted: GSI 1 in October 2003, GSI 2 in April 2004, and GSI 3 in September 2004. Sample locations, sampling methods, and field and laboratory test methods were developed through discussions and Technical Meetings between EPA, Molycorp, and contractors. EPA and members from EPA's Environmental Response Team performed the GSI studies, with assistance from Molycorp. The objectives of the studies were: (1) characterize the potential for exposure of aquatic organisms in Red River to groundwater discharges; (2) evaluate exposure, effects, chemistry, and system dynamics in areas up- and down-stream of the mine and tailings facility; and (3) evaluate exposure point concentrations in groundwater discharge zones. The study design included a triad of mini-piezometers at each location at depths of 20 to 30, and greater than 40 centimeters into the streambed. Mini-piezometers were measured for upwelling or downwelling conditions, and sampled. Exposure chambers against and within the streambed, and suspended in the water column with *Drunella* (indigenous mayfly) and *Hyalella azteca* (standard test organism) in the chambers were used to evaluate acute toxicity. A set of chambers was situated in the center of the piezometer triad.

Additionally, surface water and sediment samples were collected at each location. Abiotic analytical results for surface water, chamber water, piezometer water, and sediment samples are presented and summarized. Sample locations for the GSI studies are shown on Figure 5-1. The EPA Focused Sampling is described in an Addendum Work Plan (CDM 2004), and field work was performed in September and October 2004. The overall objective of the sampling was to assess multiple lines of evidence to evaluate impacts to the Red River in the vicinity of Springs 13 and 39, and other potential isolated source areas along the mine site. Other objectives were to determine the spatial extent of impact and recovery zones for isolated impact areas, evaluate metals loading to surface water, and identify candidate sources of poor quality water entering Red River. Molycorp performed the sampling under EPA supervision. The EPA Focused Sampling tasks included:

- Benthic macroinvertebrate population and diversity in Red River at approximate 1,000-foot spacings along the mine site (20 sample locations).
- Physical Habitat Assessment, water quality and sediment analysis at the same 1,000-foot spacings of the river (20 sample locations).
- Toxicity testing, acute *in situ* and chronic serial dilution testing using river water and groundwater from Springs 13 and 39.
- Groundwater inflow quantification using Radon 222 along Springs 13 and 39.

For the purposes of the Preliminary Site Characterization Summary report, the acute *in situ* toxicity component of the Focused Sampling Work Plan Addendum has been identified as GSI 3

and results are presented with the other two GSI studies. Analytical results from surface water and sediment samples collected as part of the Physical Habitat Assessment and Radon 222 studies are presented. Sample locations for the EPA Focused Sampling are shown on Figure 5-1.

Appendix A-5 contains tables of analyte concentrations and field measurements for all water and sediment samples collected during GSI studies and EPA Focused Sampling. No data analytical data were rejected as a result of data validation. Summary tables for each sampling event for particular locations along the river have been prepared. Summary tables contain the number of samples collected; percent detection; and minimum, maximum, mean, and median values. The summary tables also contain EPA Region 6 Risk-Based SLC for Human Health for surface water and groundwater, and promulgated New Mexico Surface Water Standards or pertinent National Recommended Ambient Water Quality Criteria for Ecological Freshwater and Freshwater Sediments.

Section 15.4 describes an evaluation of observed field or laboratory contaminants and provides a list by medium of analytes that are considered as attributable to laboratory or field contamination rather than being related to presence in the medium under evaluation. These compounds are not included in the summary results tables in this section, but results for analysis of these compounds are included in the printout of the RI sample analysis results in Appendix A-5.

Sections 5.1, 5.2 and 5.3 briefly discuss detected analytes for the three respective GSI studies. Section 5.4 discusses the same for the EPA Focused Sampling. Section 5.5 (Summary) discusses mean analyte concentrations that exceed Human Health or Ecological SLC, and how those concentrations compare to reference areas.

5.1 GSI 1

The first GSI study was performed October 6 through 10, 2003. Locations where samples were collected included: Zwergle (Upper Red River Upstream Reference), RR-5BB (Red River Reference near the upstream mine boundary), and RR-15, LR-1, LR-8A, and LR-16 (Red River along the mine site and tailings facility). Sample locations are shown on Figure 5-1. Surface water, chamber water, piezometer water, and sediment samples were collected at each location. Chambers were filled with indigenous mayflies (*Drunella*) and standard test organisms (*Hyalella azteca*). Several data for the test organisms was collected by EPA. Red River was at low-flow conditions during the study. Flow at the USGS gage at the Questa Ranger Station averaged 20 cubic feet per second (cfs). The following sections summarize analytical results for each type of sample collected.

5.1.1 Surface Water

A surface water sample was collected at each location at the start and end of each day of the four-day study. Samples were analyzed for 25 dissolved and total metals, 17 inorganics, TOC, total cyanide, and field parameters including pH, specific conductance, dissolved oxygen, and temperature. Ammonia was also measured in the field.

5.1.1.1 Reference Upper Red River - Zwergle

Table 5-1 contains summary statistics for analyte values and comparisons to Human Health and Ecological Chronic SLC. A total of five samples were collected and analyzed.

Seven inorganic analytes were detected. Of the detected analytes, bicarbonate (as $CaCO_3$), alkalinity, total dissolved solids, and TOC were always detected in each sample. Each sample was additionally tested for cyanide (total) and cyanide was not detected.

A total of 11 dissolved metal analytes were detected. Of the detected dissolved metals, barium, calcium, magnesium, manganese, potassium, and vanadium were detected in each sample. A total of 11 metal (total) analytes were detected. Of the detected total metals, barium, calcium, magnesium, manganese, potassium, and vanadium were detected in each sample.

5.1.1.2 Reference Red River Above Mine Site (RR-5BB)

Table 5-2 contains summary statistics for analyte values and comparisons to Human Health and Ecological Chronic SLC. A total of five samples were collected and analyzed.

Ten inorganic analytes were detected. Of the detected analytes, bicarbonate (as $CaCO_3$), chloride, fluoride, phosphorous, sulfate, alkalinity, total dissolved solids, TOC, and total suspended solids were always detected in each sample. Each sample was additionally tested for cyanide (total) and cyanide was not detected.

A total of 18 dissolved metal analytes were detected. Of the detected dissolved metals, barium, calcium, copper, magnesium, manganese, nickel, sodium, and vanadium were detected in each sample. A total of 17 metal (total) analytes were detected. Of the detected total metals, aluminum, barium, calcium, copper, iron, lead, magnesium, manganese, nickel, sodium, and vanadium were detected in each sample.

5.1.1.3 Red River

Table 5-3 contains summary statistics for analyte values and comparisons to Human Health and Ecological Chronic SLC. A total of 20 samples were collected and analyzed.

Twelve inorganic analytes were detected. Of the detected analytes, bicarbonate (as $CaCO_3$), chloride, fluoride, phosphorous, sulfate, alkalinity, total dissolved solids, and total suspended solids were always detected in each sample. Each sample was additionally tested for cyanide (total) and cyanide was not detected.

A total of 20 dissolved metal analytes were detected. Of the detected dissolved metals, barium, cadmium, calcium, magnesium, manganese, nickel, potassium, sodium, and zinc were detected in each sample. A total of 22 metal (total) analytes were detected. Of the detected total metals, aluminum, barium, cadmium, calcium, copper, magnesium, manganese, nickel, sodium, vanadium, and zinc were detected in each sample.

5.1.2 Chamber Water

Two chamber water samples were collected at each location each day. Chamber water against the streambed was composited and chamber water within the water column was composited at each location such that two samples were prepared at each location each day of the four-day study. Samples were analyzed for 25 dissolved metals and four inorganics; ammonia was analyzed in the field. Samples for analysis of total metals were not collected due to insufficient volume of water from the chambers.

5.1.2.1 Reference Upper Red River - Zwergle

Table 5-4 contains summary statistics for analyte values and comparisons to Human Health and Ecological Chronic SLC. A total of eight samples were collected and analyzed.

Two inorganic analytes were detected. Of the detected analytes, sulfate and TOC were always detected in each sample; fluoride was not detected.

A total of 14 dissolved metal analytes were detected. Of the detected dissolved metals, barium, calcium, magnesium, sodium, and vanadium were detected in each sample.

5.1.2.2 Reference Red River Above Mine Site (RR-5BB)

Table 5-5 contains summary statistics for analyte values and comparisons to Human Health and Ecological Chronic SLC. A total of eight samples were collected and analyzed.

Three inorganic analytes were detected. Of the detected analytes, fluoride, sulfate, and TOC were always detected in each sample.

A total of 20 dissolved metal analytes were detected. Of the detected dissolved metals, barium, calcium, copper, magnesium, manganese, nickel, and sodium were detected in each sample.

5.1.2.3 Red River

Table 5-6 contains summary statistics for analyte values and comparisons to Human Health and Ecological Chronic SLC. A total of 32 samples were collected and analyzed.

Three inorganic analytes were detected. Of the detected analytes, fluoride and sulfate were always detected in each sample.

A total of 19 dissolved metal analytes were detected. Of the detected dissolved metals, barium, cadmium, calcium, copper, magnesium, manganese, nickel, sodium, and zinc were detected in each sample.

5.1.3 Piezometer Water

Two piezometer water samples were collected at each location at the start and end of each day of the four-day study. Water from the three shallow piezometers was composited each day, as was

the water from the three deep piezometers. Samples were analyzed for 25 dissolved metals and three inorganics. Samples for analysis of total metals were not collected due to insufficient volume of water from the piezometers. Field parameters were measured each day from all shallow and deep piezometers.

5.1.3.1 Red River Upstream Reference – Zwergle

Table 5-7 contains summary statistics for analyte values and comparisons to Human Health and Ecological Chronic SLC. A total of 10 samples were collected and analyzed.

Two inorganic analytes were detected. Of the detected analytes, sulfate and TOC were always detected in each sample.

A total of 15 dissolved metal analytes were detected. Of the detected dissolved metals, barium, calcium, magnesium, manganese, vanadium, and zinc were detected in each sample.

5.1.3.2 Reference Red River Above Mine Site (R-5BB)

Table 5-8 contains summary statistics for analyte values and comparisons to Human Health SLC. A total of 10 samples were collected and analyzed.

All three inorganics were detected and fluoride and sulfate were always detected in each sample.

A total of 19 dissolved metal analytes were detected. Of the detected dissolved metals, aluminum, barium, cadmium, calcium, cobalt, copper, magnesium, manganese, nickel, selenium, sodium, and zinc were detected in each sample.

5.1.3.3 Red River

Table 5-9 contains summary statistics for analyte values and comparisons to Human Health SLC. A total of 40 samples were collected and analyzed.

The three inorganics consisting of fluoride, sulfate, and TOC were always detected in each sample.

A total of 22 dissolved metal analytes were detected. Of the detected dissolved metals, barium, calcium, magnesium, and sodium were detected in each sample.

5.1.4 Sediment

One sediment sample was collected at each location at the end of the four-day study on October 10, 2003. Sediment samples were collected within the area encompassed by the piezometer triad. Samples were analyzed for 25 metals (total, dry weight) and seven inorganic parameters. Samples were additionally tested for pH, specific conductivity, and percent solids by the laboratory.

5.1.4.1 Reference Upper Red River – Zwergle

Table 5-10 contains summary statistics for analyte values and comparisons to Human Health and Ecological Chronic SLC. One sample was collected and analyzed. All inorganic parameters were detected except for fluoride and nitrate. All metals were detected except for antimony, boron, mercury, silver, and thallium.

5.1.4.2 Reference Red River Above Mine Site (RR-5BB)

Table 5-11 contains summary statistics for analyte values and comparisons to Human Health and Ecological Chronic SLC. One sample was collected and analyzed. All inorganic parameters were detected except for nitrate. All metals were detected except for antimony, boron, cadmium, mercury, and silver.

5.1.4.3 Red River

Table 5-12 contains summary statistics for analyte values and comparisons to Human Health and Ecological Chronic SLC. Four samples were collected and analyzed. All inorganic parameters were detected in each sample except for nitrate. TOC was detected in three of the four samples. All metals were detected in each sample except for antimony, boron, mercury, silver, and thallium. Selenium was detected in three of the four samples.

5.2 GSI 2

The second GSI study was performed March 23 through 25, 2004. Locations where samples were collected included: Zwergle (Upper Red River Upstream Reference), RR-5BB (Red River Reference near the upstream mine boundary), and RR-11B2, RR-11B3, RR-13A, RR-13B, RR-15, LR-1, LR-8A, LR-16 (Red River along the mine site and tailings facility). Sample locations are shown on Figure 5-1. Surface water and piezometer water samples were collected; chamber water and sediment samples were not collected. Red River was at low-flow conditions during the study. Flow at the USGS gage at the Questa Ranger Station ranged from 22 to 27 cfs. The following sections summarize analytical results for each type of sample collected.

5.2.1 Surface Water

A surface water sample was collected at each location on each of the three days of the study. Samples were analyzed for 25 dissolved and total metals, 17 inorganics, TOC, total cyanide, and field parameters including pH, specific conductance, dissolved oxygen, temperature, and turbidity.

5.2.1.1 Reference Upper Red River – Zwergle

Table 5-13 contains summary statistics for analyte values and comparisons to Human Health and Ecological Chronic SLC. A total of three samples were collected and analyzed.

Ten inorganic analytes were detected. Of the detected analytes, bicarbonate (as $CaCO_3$), chloride, phosphorous, sulfate, alkalinity, total dissolved solids, and total suspended solids were always detected in each sample. Each sample was additionally tested for cyanide (total) and cyanide was not detected.

A total of 12 dissolved metal analytes were detected. Of the detected dissolved metals, barium, calcium, magnesium, and manganese were detected in each sample. A total of 14 metal (total) analytes were detected. Of the detected total metals, barium, calcium, magnesium, and manganese were detected in each sample.

5.2.1.2 Reference Red River Above Mine Site (RR-5BB)

Table 5-14 contains summary statistics for analyte values and comparisons to Human Health and Ecological Chronic SLC. A total of three samples were collected and analyzed.

Eleven inorganic analytes were detected. Of the detected analytes, bicarbonate (as $CaCO_3$), chloride, fluoride, phosphorous, sulfate, alkalinity, total dissolved solids, and total suspended solids were always detected in each sample. Each sample was additionally tested for cyanide (total) and cyanide was not detected.

A total of 14 dissolved metal analytes were detected. Of the detected dissolved metals, barium, calcium, cobalt, copper, magnesium, manganese, nickel, potassium, and sodium were detected in each sample. A total of 18 metal (total) analytes were detected. Of the detected total metals, aluminum, barium, calcium, copper, lead, magnesium, manganese, nickel, potassium, sodium, and zinc were detected in each sample.

5.2.1.3 Red River

Table 5-15 contains summary statistics for analyte values and comparisons to Human Health and Ecological Chronic SLC. A total of 24 samples were collected and analyzed.

Thirteen inorganic analytes were detected. Of the detected analytes, bicarbonate (as $CaCO_3$), chloride, fluoride, sulfate, alkalinity, total dissolved solids, and total suspended solids were always detected in each sample. Each sample was additionally tested for cyanide (total) and cyanide was not detected.

A total of 18 dissolved metal analytes were detected. Of the detected dissolved metals, barium, calcium, copper, magnesium, manganese, nickel, and sodium were detected in each sample. A total of 22 metal (total) analytes were detected. Of the detected total metals, aluminum, barium, calcium, copper, lead, magnesium, manganese, nickel, sodium, and zinc were detected in each sample.

5.2.2 Piezometer Water

Piezometer water was sampled only on the last day of the three-day study and only the shallow piezometers were sampled. A sample from each shallow piezometer was collected and analyzed. Compositing of piezometer water was not performed, as this was done in the first GSI study. Samples were analyzed for 25 dissolved metals and three inorganics. Samples for analysis of total metals were not collected due to insufficient volume of water from the piezometers. Field parameters were measured from all shallow and deep piezometers.

5.2.2.1 Reference Upper Red River – Zwergle

Table 5-16 contains summary statistics for analyte values and comparisons to Human Health SLC. A total of three samples were collected and analyzed.

Two of the three inorganic analytes were detected in each sample consisting of sulfate and TOC.

A total of 18 dissolved metal analytes were detected. Of the detected dissolved metals, barium, calcium, cobalt, magnesium, manganese, nickel, potassium, and zinc were detected in each sample.

5.2.2.2 Reference Red River Above Mine Site (RR-5BB)

Table 5-17 contains summary statistics for analyte values and comparisons to Human Health SLC. A total of three samples were collected and analyzed.

All three inorganics were detected; fluoride, sulfate, and TOC were always detected in each sample.

A total of 19 dissolved metal analytes were detected. Of the detected dissolved metals, aluminum, barium, beryllium, cadmium, calcium, cobalt, copper, magnesium, manganese, nickel, potassium, selenium, sodium, and zinc were detected in each sample.

5.2.2.3 Red River

Table 5-18 contains summary statistics for analyte values and comparisons to Human Health SLC. A total of 24 samples were collected and analyzed.

All three inorganics were detected; fluoride, sulfate, and TOC were always detected in each sample.

A total of 22 dissolved metal analytes were detected. Of the detected dissolved metals, barium, calcium, cobalt, magnesium, manganese, potassium, and sodium were detected in each sample.

5.3 GSI 3

The third GSI study was performed September 27 through October 1, 2004. Locations where samples were collected included: Zwergle (Upper Red River Reference), RR-5BB (Red River

Reference near the upstream mine boundary), and RR-11B2, RR-11B3, RR-13A, and RR-13B (Red River along the mine site). Locations along the tailings facility were not sampled. Sample locations are shown on Figure 5-1. Surface water, chamber water, piezometer water, and sediment samples were collected at each location. Chambers were filled with indigenous mayflies (*Drunella*). Several data for the test organisms was collected by EPA. Red River was at low-flow conditions during most of the study. However, on September 28 an afternoon rainstorm occurred that increased the flow at the USGS gage at the Questa Ranger Station from 20 to 40 cfs. By the end of the study the flow had decreased to 23 cfs. The following sections summarize analytical results for each type of sample collected.

5.3.1 Surface Water

A surface water sample was initially collected at each location and then on each subsequent day of the four-day study. Samples were analyzed for 25 dissolved metals; only two total metals (iron and aluminum); total and dissolved organic carbon; total cyanide; and field parameters including pH, specific conductance, dissolved oxygen, and temperature.

5.3.1.1 Reference Upper Red River – Zwergle

Table 5-19 contains summary statistics for analyte values and comparisons to Human Health and Ecological Chronic SLC. A total of five samples were collected and analyzed.

Seven inorganic analytes were detected. Of the detected analytes, bicarbonate (as $CaCO_3$), chloride, nitrate, sulfate, alkalinity, total dissolved solids, and total suspended solids were always detected in each sample. Each sample was additionally tested for cyanide (total) and cyanide was not detected.

A total of 16 dissolved metal analytes were detected. Of the detected dissolved metals, barium, calcium, magnesium, manganese, and sodium were detected in each sample. Total aluminum was detected in two of the five samples and total iron was detected in one of the five samples.

5.3.1.2 Reference Red River Above Mine Site (RR-5BB)

Table 5-20 contains summary statistics for analyte values and comparisons to Human Health and Ecological Chronic SLC. A total of five samples were collected and analyzed.

Ten inorganic analytes were detected. Of the detected analytes, bicarbonate (as $CaCO_3$), chloride, fluoride, nitrate, phosphorous, sulfate, alkalinity, total dissolved solids, and total suspended solids were always detected in each sample. Each sample was additionally tested for cyanide (total) and cyanide was not detected.

A total of 17 dissolved metal analytes were detected. Of the detected dissolved metals, barium, calcium, copper, magnesium, manganese, and sodium were detected in each sample. Total aluminum and iron were detected in each sample.

5.3.1.3 Red River

Table 5-21 contains summary statistics for analyte values and comparisons to Human Health and Ecological Chronic SLC. A total of 20 samples were collected and analyzed.

Eleven inorganic analytes were detected. Of the detected analytes, bicarbonate (as $CaCO_3$), chloride, fluoride, nitrate, phosphorous, sulfate, alkalinity, total dissolved solids, and total suspended solids were always detected in each sample. Each sample was additionally tested for cyanide (total) and cyanide was not detected.

A total of 17 dissolved metal analytes were detected. Of the detected dissolved metals, barium, calcium, magnesium, manganese, nickel, sodium, and zinc were detected in each sample. Total aluminum and iron were detected in each sample.

5.3.2 Chamber Water

One sample from within the sediment chamber was collected at the start of the four-day study and each subsequent day. Water from within the sediment chambers was composited at each location such that one sample was prepared at each location each day. Samples were analyzed for 25 dissolved metals and four inorganics (sulfate, fluoride, and dissolved and total organic carbon); ammonia was analyzed in the field. Samples for analysis of total metals were not collected due to insufficient volume of water from the chambers.

5.3.2.1 Reference Upper Red River – Zwergle

Table 5-22 contains summary statistics for analyte values and comparisons to Human Health and Ecological Chronic SLC. A total of five samples were collected and analyzed.

Three of the four inorganic analytes were detected in each sample. Fluoride was not detected in any of the samples.

A total of 11 dissolved metal analytes were detected. Of the detected dissolved metals, barium, calcium, magnesium, potassium, and sodium were detected in each sample.

5.3.2.2 Reference Red River Above Mine Site (RR-5BB)

Table 5-23 contains summary statistics for analyte values and comparisons to Human Health and Ecological Chronic SLC. A total of five samples were collected and analyzed.

All four inorganic analytes were detected in each sample.

A total of 18 dissolved metal analytes were detected. Of the detected dissolved metals, aluminum, barium, cadmium, calcium, cobalt, copper, magnesium, manganese, nickel, potassium, sodium, and zinc were detected in each sample.

5.3.2.3 Red River

Table 5-24 contains summary statistics for analyte values and comparisons to Human Health and ecological chronic SLC. A total of 20 samples were collected and analyzed.

All four inorganic analytes were detected in each sample.

A total of 19 dissolved metal analytes were detected. Of the detected dissolved metals, barium, calcium, magnesium, manganese, nickel, potassium, sodium, and zinc were detected in each sample.

5.3.3 Piezometer Water

One piezometer water sample was collected at each location at the start and end of each day of the four-day study. Water from the three shallow piezometers was composited each day into one sample; samples from deep piezometers were not collected. Samples were analyzed for 25 dissolved metals and eight inorganics. Samples for analysis of total metals were not collected due to insufficient volume of water from the piezometers. Field parameters were measured from each of the shallow piezometers each day.

5.3.3.1 Reference Upper Red River – Zwergle

Table 5-25 contains summary statistics for analyte values and comparisons to Human Health SLC. A total of five samples were collected and analyzed.

Five inorganic analytes were detected. Of the detected analytes, bicarbonate and alkalinity were always detected in each sample.

A total of 15 dissolved metal analytes were detected. Of the detected dissolved metals, barium, calcium, magnesium, manganese, potassium, sodium, and zinc were detected in each sample.

5.3.3.2 Reference Red River Above Mine Site (RR-5BB)

Table 5-26 contains summary statistics for analyte values and comparisons to Human Health SLC. A total of five samples were collected and analyzed.

Four inorganic analytes were detected. Of the detected analytes, fluoride and sulfate were always detected in each sample.

A total of 17 dissolved metal analytes were detected. Of the detected dissolved metals, aluminum, beryllium, cadmium, calcium, cobalt, copper, lead, magnesium, manganese, nickel, potassium, selenium, sodium, and zinc were detected in each sample.

5.3.3.3 Red River

Table 5-27 contains summary statistics for analyte values and comparisons to Human Health SLC. A total of five samples were collected and analyzed.

Six inorganic analytes were detected. Of the detected analytes, fluoride and sulfate were always detected in each sample.

A total of 20 dissolved metal analytes were detected. Of the detected dissolved metals, barium, cadmium, calcium, magnesium, manganese, nickel, potassium, sodium, and zinc were detected in each sample.

5.3.4 Sediment

One sediment sample was collected at each location at the end of the four-day study on October 1, 2004. Sediment samples were collected within the area encompassed by the piezometer triad. Samples were analyzed for 25 metals (total, dry weight) and six inorganic parameters.

5.3.4.1 Reference Upper Red River – Zwergle

Table 5-28 contains summary statistics for analyte values and comparisons to Human Health and Ecological Chronic SLC. One sample was collected and analyzed. All inorganic parameters were detected in each sample except for fluoride. All metals were detected in each sample except for antimony, boron, cadmium, mercury, selenium, silver, sodium, and thallium.

5.3.4.2 Reference Red River Above Mine Site (RR-5BB)

Table 5-29 contains summary statistics for analyte values and comparisons to Human Health and Ecological Chronic SLC. One sample was collected and analyzed. All inorganic parameters were detected in each sample except for fluoride and TOC. All metals were detected in each sample except for antimony, boron, cadmium, mercury, silver and thallium.

5.3.4.3 Red River

Table 5-30 contains summary statistics for analyte values and comparisons to Human Health and Ecological Chronic SLC. Four samples were collected and analyzed. All inorganic parameters were detected in each sample except for TOC. Fluoride was detected in three of the four samples. All metals were detected in each sample except for antimony, boron, cadmium, mercury, silver, and thallium. Selenium was detected in three of the four samples.

5.4 EPA FOCUSED SAMPLING

The EPA Focused Sampling was performed in September and October 2004. The overall objective of the sampling was to assess multiple lines of evidence to evaluate impacts to the Red River in the vicinity of Springs 13 and 39, and other potential isolated source areas along the mine site.

5.4.1 Physical Habitat Assessment

The physical habitat of Red River along the mine site was assessed as part of the EPA Focused Sampling. Analytical results from surface water and sediment samples that were collected as part of the assessment are presented. Aquatic biota data are presented in Section 4.2. Surface water and sediments from the north side of the river were collected at transects spaced approximately 1,000 feet apart along the mine site. A total of 20 locations (TR-1N through TR-20N) were sampled. Methods for surface water and sediment sampling are contained in the Focused Work Plan Addendum (CDM 2004). Sample locations for the Physical Habitat Assessment are shown on Figure 5-1.

5.4.1.1 Transect Area of Red River – Surface Water

Surface water samples were collected from September 23 through 26, 2004. Surface water samples were analyzed for 25 dissolved metals, two total metals (aluminum and iron), 14 inorganics, total cyanide, and field parameters.

Table 5-31 contains summary statistics for analyte values and comparisons to Human Health and Ecological Chronic SLC. A total of 20 samples were collected and analyzed.

Eleven inorganic analytes were detected. Of the detected analytes, bicarbonate (as $CaCO_3$), chloride, fluoride, phosphorous, sulfate, alkalinity, total dissolved solids, and total suspended solids were always detected in each sample. Each sample was additionally tested for cyanide (total) and cyanide was not detected.

A total of 15 dissolved metal analytes were detected. Of the detected dissolved metals, barium, calcium, copper, magnesium, manganese, nickel, and sodium were detected in each sample. Total aluminum and iron were detected in all samples.

5.4.1.2 Transect Area of Red River – North Bank Sediments

Sediment samples were collected from September 23 through 26, 2004. Sediment samples were collected along the north bank at each location. Samples were analyzed for 25 metals (total, dry weight) and six inorganic parameters.

Table 5-32 contains summary statistics for analyte values and comparisons to Human Health and Ecological Chronic SLC. A total of 20 samples were collected and analyzed. Four of the six inorganics analyzed were detected in each sample. TOC was not detected in any sample and

chloride was detected in 25 percent of the samples. All metals were detected in each sample except for antimony and mercury.

5.4.2 Radon 222 Study

Groundwater inflow to Red River near Springs 13 and 39 was evaluated by analyzing surface water and groundwater samples for Radon 222.

5.4.2.1 Radon Area of Red River – Surface Water

Surface water samples were collected at six locations along Spring 13 (SFM13-1 through SFM13-6) and eight locations along Spring 39 (SFM39-1 through SFM39-8) shown on Figure 5-1. USGS personnel analyzed the surface water samples in the field for Radon 222. Surface water samples from each location were additionally analyzed for 25 dissolved metals, two total metals (aluminum and iron), 14 inorganics, total cyanide, and field parameters. Methods for surface water sampling and field sampling and testing for Radon 222 are contained in the Focused Work Plan Addendum (CDM 2004).

Table 5-33 contains summary statistics for analyte values and comparisons to Human Health and Ecological Chronic SLC. A total of 14 samples were collected and analyzed.

A total of 10 inorganic analytes were detected. Carbonate, nitrite, and phosphorous were not detected in any samples.

A total of 17 dissolved metal analytes were detected. Of the detected dissolved metals, aluminum, barium, calcium, copper, magnesium, manganese, nickel, potassium, and sodium were detected in each sample. Total aluminum was detected in each sample. Total iron was detected in nine of the 14 samples.

Radon 222 concentrations in Red River along Springs 13 and 39 ranged from 2 to 89.8 picoCuries per liter (pCi/L).

5.4.2.2 Radon Area of Red River – Groundwater

Groundwater was field tested for Radon 222. Spring 13, Lower Spring 13, and Spring 13-Pump had radon values ranging from 637 to 783 pCi/L (Table 5-34). Spring 39-Pump and Lower Spring 39 had radon values ranging from 542 to 683 pCi/L (Table 5-35).

5.5 SUMMARY

The following summarizes detected analytes in surface water, chamber water, piezometers, and sediment samples collected during the GSI studies and EPA Focused Sampling. Analytes exceeding Human Health and Ecological Chronic SLC for surface water, chamber water, and sediment samples, and Human Health SLC for piezometer water samples are also discussed. A hardness of 100 mg/L was used for surface and chamber water metal analytes having hardness-

based SLC criteria. Comparisons between analytes that exceeded SLC for the mine site/tailings reach and upstream reference areas, Zwergle and RR-5BB, are presented.

5.5.1 GSI Studies

Surface Water

Surface water samples were collected during each of the three GSI studies. The number of inorganic and metal analytes detected in surface water samples was always lowest at the Zwergle upstream reference location. Seven to 10 inorganic and 11 to 16 metal analytes were detected at the Zwergle location. A greater number of inorganics and metal analytes were detected at the RR-5BB upstream reference. Numbers of detected analytes generally increased at locations along the mine site and tailings facility. Ten to 11 inorganics and 14 to 18 metal analytes were detected at RR-5BB. Eleven to 12 inorganics and 17 to 20 metal analytes were detected at locations along the mine site and tailings facility. Similar numbers of inorganics and metal analytes were detected at each surface water location during each of the three GSI studies.

All inorganic and metal analytes were below Human Health SLC, and all inorganics were below Human Health and Ecological Chronic SLC for the Red River upstream reference (Zwergle and RR-5BB) and Red River along the mine site and tailings facility.

Metal analytes exceeded Chronic Ecological SLC at the Red River reference locations and along the mine site and tailings facility. The table below lists the metal analytes exceeding the ecological SLC and shows the GSI study when the individual analytes were exceeded.

Metal analytes that exceeded ecological SLC were lowest at the upstream reference Zwergle; only barium and boron exceeded Chronic Ecological SLC. Aluminum (total), and dissolved barium and boron always exceeded Chronic Ecological SLC at the upstream reference RR-5BB. In addition to aluminum (total), and dissolved barium and boron, the Red River locations along the mine site and tailings facility had infrequent exceedances of dissolved cadmium, copper, and iron. The September 2004 GSI study had the fewest number of exceedances of the three GSI studies.

Metal Analytes Exceeding Chronic Ecological SLC in Surface Water from Red River and Reference Areas During GSI Studies

GSI Study	Zwergle Surface Water (Red River Reference Upstream of Mine)	RR-5BB Surface Water (Red River Reference Upstream of Mine)	Red River Surface Water Along Mine Site and Tailings Facility
1 (October 2003)	Ba	Al, Ba, B	Al, Ba, B, Cd, Cu
2 (March 2004)	Ba, B	Al, Ba, B	Al, Ba, B, Cd, Fe
3 (September 2004)	Ba	Al, Ba, B	Al, Ba

Note: Based on dissolved concentrations, except for aluminum and iron, which are based on total concentration.

Figures 5-2 through 5-7 are bar graphs of mean concentrations of metal analytes that exceeded Chronic Ecological SLC in Red River or in reference areas. The graphs compare mean concentrations for aluminum (total), dissolved barium, boron, cadmium, copper, and iron (total), respectively, for the three GSI studies during which surface water samples were collected. A white bar on the graphs indicates the 560 percent or more of the values were not detected, and a mean was not calculated. In these cases, the maximum detected value or the maximum reporting limit whichever was greater, was plotted.

The mean concentration of total aluminum (Figure 5-2) in Red River was generally two to three times greater than the mean concentration at the RR-5BB upstream reference location. Mean concentrations of total aluminum at the Red River locations and at the RR-5BB upstream reference location were greater than the aluminum ecological SLC during each GSI study.

The mean concentration of dissolved barium (Figure 5-3) in Red River was generally similar to mean concentrations at the RR-5BB and Zwergle upstream reference locations. Mean concentrations of dissolved barium at the Red River locations and at the RR-5BB and Zwergle upstream reference locations were greater than the barium ecological SLC during each GSI study.

The mean concentration of dissolved boron (Figure 5-4) in Red River was generally similar to mean concentration at the RR-5BB upstream reference location for the first GSI study. When detected in greater than 50 percent of the samples, boron concentrations at the RR-5BB upstream reference location and locations along the mine and tailings facility exceeded the ecological SLC.

The mean concentration of dissolved cadmium is shown on Figure 5-5. Only during the first GSI study was the cadmium ecological SLC exceeded at Red River locations. Otherwise, dissolved cadmium had less than 50 percent detections at Red River and reference locations.

The mean concentration of dissolved copper is shown on Figure 5-6. The mean concentration of copper at locations along the Red River were similar to mean concentrations at the RR-5BB upstream reference. All mean copper concentrations were below SLC.

The mean concentration of total iron is shown on Figure 5-7. The mean concentration of iron at locations along the Red River were slightly higher than at the RR-5BB upstream reference. All mean iron concentrations were below SLC.

Chamber Water

Chamber water samples were collected during the first and third GSI studies. The number of dissolved metal analytes detected in chamber water samples was always lowest at the Zwergle upstream reference location. Eleven to 14 dissolved metal analytes were detected at the Zwergle reference location. Eighteen to 20 dissolved metal analytes were detected at RR-5BB upstream reference location and 19 dissolved metals were detected along the mine site and tailings facility. Similar numbers of dissolved metal analytes were detected at each chamber water location during each of the two GSI studies during which chamber water was collected.

All inorganic and metal analytes were below Human Health SLC for the Red River upstream reference (Zwergle and RR-5BB) and Red River locations along the mine site and tailings facility.

Metal analytes exceeded chronic ecological SLC in the chamber water from Red River reference areas and locations along the mine site and tailings facility. The table below lists the metal analytes exceeding the ecological SLC and shows the GSI study when the individual analytes were exceeded. Note that chamber water was only analyzed for dissolved metals due to limited volumes of water. Therefore, comparison of aluminum and iron to ecological chronic SLC could not be made because the SLC are based on total concentrations.

Metal analytes that exceeded ecological SLC were lowest at the upstream reference Zwergle. Only barium exceeded chronic ecological SLC at Zwergle. Barium, cadmium, copper, nickel, and zinc exceeded ecological SLC further downstream at the upstream reference RR-5BB during at least one of the GSI studies. The Red River locations along the mine site and tailings facility had exceedances of barium, boron, cadmium, and zinc. The October 2003 GSI study had the fewest number of exceedances of the two GSI studies during which chamber water was sampled.

Metal Analytes Exceeding Chronic Ecological SLC in Chamber Water from Red River and Reference Areas During GSI Studies

GSI Study	Zwergle Chamber Water (Red River Reference Upstream of Mine)	RR-5BB Chamber Water (Red River Reference Upstream of Mine)	Red River Chamber Water Along Mine Site and Tailings Facility
1 (October 2003)	Ba	Ba, B	Ba, B, Cd
3 (September 2004)	Ba	Ba, Cd, Cu, Ni, Zn	Ba, Cd, Zn

Figures 5-8 through 5-12 are bar graphs of mean concentrations of metal analytes that exceeded chronic ecological SLC in Red River or in reference areas in greater than 50 percent of the samples. The graphs compare mean concentrations for dissolved barium, cadmium, copper, nickel, and zinc respectively, for the two GSI studies during which chamber water samples were collected. Although boron exceeded ecological SLC at some locations, boron was detected in less than 50 percent of the samples. A white bar on the graphs indicates the 50 percent or more of the values were not detected, and a mean was not calculated. In these cases, the maximum detected value or the maximum reporting limit, whichever was greater, was plotted.

The mean concentration of dissolved barium (Figure 5-8) in chamber water from Red River locations along the mine and tailings facility was generally similar to the mean concentration at the Zwergle and RR-5BB upstream reference locations. Mean concentrations of barium at all locations exceeded the chronic ecological SLC during each GSI study.

The mean concentration of dissolved cadmium in chamber water is shown on Figure 5-9. The chronic ecological standard at the upstream RR-5BB reference location was exceeded by approximately four times during the third GSI study, but the SLC was not exceeded during the

first study. The chronic ecological SLC at locations along the mine site and tailings facility was slightly exceeded during both GSI studies.

The mean concentration of dissolved copper in chamber water is shown on Figure 5-10. The only location to exceed the chronic ecological SLC was at the upstream RR-5BB reference during the third GSI study. Otherwise, all other locations were below the ecological SLC.

The mean concentration of dissolved nickel in chamber water is shown on Figure 5-11. The only location to exceed the chronic ecological SLC was at the upstream RR-5BB reference during the third GSI study. Otherwise all other locations were below the ecological SLC.

The mean concentration of dissolved zinc in chamber water is shown on Figure 5-12. The chronic ecological SLC for zinc was not exceeded at any location during the first GSI study. The upstream RR-5BB reference exceeded the ecological SLC during the third GSI study.

Piezometer Water

Piezometer water was collected during each of the three GSI studies. The number of dissolved metal analytes detected in piezometer water samples was always lowest at the Zwergle upstream reference location. Between 15 and 18 metal analytes were detected at the Zwergle location. A greater number of metal analytes were detected at the RR-5BB upstream reference and numbers of detected analytes generally increased at downstream locations along the mine site and tailings facility. Between 17 and 19 dissolved metal analytes were detected at the RR-5BB piezometers and 22 dissolved metal analytes were detected at piezometer locations along the mine site and tailings facility. Similar numbers of metal analytes were detected at each piezometer location during each of the three GSI studies.

All inorganic analytes were below Human Health SLC in the Zwergle and RR-5BB upstream reference piezometers. One inorganic analyte, fluoride, exceeded Human Health SLC in piezometer water along the mine and tailings facility.

The table below lists the dissolved metal analytes exceeding the Human Health SLC and shows the GSI study when the individual analytes were exceeded. Note that Human Health SLC are normally compared to total concentrations; however, only the dissolved fraction was analyzed because of insufficient volume of water from the piezometers to analyze total metal fractions. Consequently, this type of comparison to Human Health SLC may not be valid. Human Health SLC for dissolved metal analytes were not exceeded in piezometer water from the Zwergle upstream reference. The Human Health SLC for dissolved manganese was exceeded at the RR-5BB upstream reference location during each GSI study. Aluminum, iron, manganese, and molybdenum Human Health SLC were exceeded in piezometer water at locations along the mine site and/or tailings facility during one or more of the GSI studies.

Metal Analytes Exceeding Human Health SLC in Piezometer Water from Red River and Reference Areas During GSI Studies			
GSI Study	Zwergle Piezometers (Red River Reference Upstream of Mine)	RR-5BB Piezometers (Red River Reference Upstream of Mine)	Red River Piezometers Along Mine Site and Tailings Facility
1 (October 2003)	None	Mn	Mo
2 (March 2004)	None	Mn	Al, Fe, Mn, Mo
3 (September 2004)	None	Mn	Al, Fe, Mn

Note: Human Health SLC are normally compared to total concentrations; however, only the dissolved fraction was analyzed because of insufficient volume of water from the piezometers to analyze total metal fractions. Consequently, comparison to Human Health SLC may not be valid.

Figures 5-13 through 5-17 are bar graphs of mean concentrations of inorganics and dissolved metal analytes that exceeded Human Health SLC in piezometer water at Red River locations along the mine site and tailings facility, and reference areas. The graphs compare mean concentrations for fluoride, dissolved aluminum, iron, manganese, and molybdenum, respectively, for the three GSI studies during which piezometer water samples were collected. A white bar on the graphs indicates the 50 percent or more of the values were not detected, and a mean was not calculated. In these cases, the maximum detected value or the maximum reporting limit, whichever was greater, was plotted.

The mean concentrations of fluoride are shown on Figure 5-13. The only piezometers to have fluoride above the SLC were along the mine site and tailings facility. The mean concentrations of fluoride for piezometers along the mine site and tailings facility for the first and second GSI studies are below the Human Health SLC.

The mean concentrations of aluminum (dissolved) are shown on Figure 5-14. Mean concentrations in piezometers along the mine site and tailings, and at the RR-5BB upstream reference were below Human Health SLC.

The mean concentrations of iron (dissolved) are shown on Figure 5-15. Mean concentrations of iron along Red River piezometers and reference piezometers were below Human Health SLC.

Mean concentrations of manganese (dissolved) are shown on Figure 5-16. Mean concentrations of dissolved manganese exceeded Human Health SLC at reference piezometers and piezometers along the mine site and tailings facility during one or more of the GSI studies. The RR-5BB upstream reference piezometers exceeded the Human Health SLC, whereas, the Zwergle upstream reference piezometers did not. Mean concentrations of dissolved manganese were slightly greater at piezometers along the mine site and tailings facility than piezometers at the RR-5BB upstream references, during the second and third GSI studies.

The mean concentrations of molybdenum (dissolved) are shown on Figure 5-17. The only piezometer samples having molybdenum above SLC were during the second GSI study for locations along the mine site and tailings facility; however, the mean concentration was below the Human Health SLC.

Sediment

Sediment samples were collected and analyzed during the first and third GSI studies. The number of inorganic and metal analytes detected in sediment samples was nearly the same at the upstream Zwergle and RR-5BB locations and at locations along the mine site and tailings facility. Five to six of the seven inorganics and 20 of the 25 metals were detected in sediment samples.

The only inorganic that was analyzed in sediments that has a SLC (Human Health) was fluoride. All sediment samples at the Zwergle and RR-5BB reference locations and locations along the mine site and tailings facility were below the fluoride Human Health SLC.

Metal (total) analytes in sediment samples exceeded Human Health and Ecological SLC. The only metals to exceed Human Health SLC were arsenic and iron. The Human Health SLC for arsenic was exceeded at the Zwergle and RR-5BB upstream reference locations and at locations along the mine site and tailings facility during both GSI studies. The Human Health SLC for iron was only exceeded at the upstream Zwergle reference during the third GSI study.

The table below lists the metal (total) analytes exceeding ecological SLC in sediment samples from the two GSI studies. Metal (total) analytes that exceeded ecological SLC included copper, iron, lead, manganese, and nickel.

Metal Analytes Exceeding Ecological SLC in Sediments from Red River and Reference Areas During GSI Studies

GSI Study	Zwergle Sediment (Red River Reference Upstream of Mine)	RR-5BB Sediment (Red River Reference Upstream of Mine)	Red River Sediment Along Mine Site and Tailings Facility
1 (October 2003)	Mn	Cu, Pb	Cu, Pb, Ni, Zn
3 (September 2004)	Fe, Mn, Ni	None	Cu, Pb, Ni

Figures 5-18 through 5-23 are bar graphs of mean concentrations of metal (total) analytes that exceeded ecological SLC in sediment samples at Red River locations along the mine site and tailings facility, and reference areas. The graphs compare mean concentrations for copper, iron, lead, manganese, nickel, and zinc, respectively, for the two GSI studies during which sediment samples were collected. A white bar on the graphs indicates the 50 percent or more of the values were not detected, and a mean was not calculated. In these cases, the maximum detected value or the maximum reporting limit, whichever was greater, was plotted.

The mean concentrations of copper (total) are shown on Figure 5-18. The mean concentration of copper slightly exceeded the ecological SLC at the upstream RR-5BB reference during the first GSI study. The mean concentrations of copper from locations along the mine site and tailings facility were slightly below the ecologic SLC for both GSI studies.

The mean concentrations of iron (total) are shown on Figure 5-19. The only location having a mean iron concentration that exceeded the ecological SLC was at the Zwergle upstream reference during the third GSI study.

Mean concentrations of lead (total) are shown on Figure 5-20. The mean concentration of lead exceeded the ecological SLC at the upstream RR-5BB reference during the first GSI study. The mean concentrations of lead from locations along the mine site and tailings facility were below the ecologic SLC for both GSI studies.

The mean concentrations of manganese (total) are shown on Figure 5-21. The only location having a mean manganese concentration that exceeded the ecological SLC was at the Zwergle upstream reference during both GSI studies.

Mean concentrations of nickel (total) are shown on Figure 5-22. The mean concentration of nickel exceeded the ecological SLC at locations along the mine site and tailings facility during the first GSI study, and at the upstream Zwergle reference and locations along the mine site during the third GSI study.

The mean concentrations of zinc (total) are shown on Figure 5-23. The only locations having a mean zinc concentration that exceeded the ecological SLC were along the mine site and tailings facility during the first GSI study.

5.5.2 EPA Focused Sampling

The following summarizes detected analytes in surface water and sediment samples collected during the EPA Focused Sampling in September and October 2004. Analytes exceeding Human Health and Ecological Chronic SLC for surface water and sediment samples are also discussed. A hardness of 100 mg/L was used for surface water metal analytes having hardness-based SLC criteria.

5.5.2.1 Transect Area Surface Water

Eleven of the 14 inorganic analytes and 15 of the 25 dissolved metal analytes were detected in surface water samples. None of the inorganic analytes exceeded Human Health or ecological SLC.

None of the metal analytes exceed Human Health SLC. Aluminum (total), and dissolved barium, copper and lead exceeded chronic ecological SLC. Only aluminum and barium exceeded the Ecological SLC in greater than 50 percent of the samples.

Surface water samples were not collected in reference areas; therefore, a comparison to reference concentrations was not done.

5.5.2.2 Transect Area North Bank Sediments

Five of the six inorganic analytes and 23 of the 25 total metal analytes were detected in sediment samples. None of the inorganic analytes exceeded Human Health or ecological SLC.

Arsenic was the only metal analyte to exceed Human Health SLC. Arsenic exceeded the Human Health SLC in all samples.

Metal analytes exceeding the ecological SLC included: arsenic (20), cadmium (100), copper (45), iron (30), lead (35), manganese (20), nickel (100), and zinc (50); numbers in parentheses represent the percentage of samples exceeding the ecological SLC.

Sediment samples were not collected in reference areas; therefore, a comparison to reference concentrations was not done.

5.5.2.3 Radon 222 Study

Ten of the 14 inorganic analytes and 17 of the 25 dissolved metal analytes were detected in surface water samples collected during the Radon 222 study.

None of the inorganic analytes exceeded Human Health or chronic ecological SLC.

None of the dissolved metal analytes exceeded Human Health SLC. Two metals, total aluminum, and dissolved barium, exceeded the chronic ecological SLC in each of the surface water samples.

Surface water samples were not collected in reference areas; therefore, a comparison to reference concentrations was not done.

SECTION 5

EPA GROUNDWATER/SURFACE WATER INTERACTION STUDIES AND FOCUSED SAMPLING

TABLES

Table 5-1

Groundwater/Surface Water Interaction - Surface Water GSI 1

RI/FS Reference Upper Red River - Zwergle

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Field													
Ammonia	T	mg/L	5	NA	No SLC			0.1	0.1	ND	ND		
DO	T	mg/l	5	NA	No SLC					8	10.3	9.3	9.4
EH	T	millivolts	5	NA	No SLC					195	325	262	0
pH	T	SU	5	NA	No SLC					7.8	8.4	8.2	8.2
Specific Conductance	T	uS/cm	5	NA	No SLC					195	214	204	202
Temperature	T	Celsius	5	NA	No SLC					4.5	10.6	7.4	7.4
Turbidity	T	NTU	4	NA	No SLC					0.8	11.6	5.3	4.4
Inorganics													
Hardness	D	mg/L	5	100	No SLC					94.7	107	101	101
Ammonia	T	mg/L	5	20	No SLC			0.04	0.04	ND	0.042		
Bicarbonate (as CaCO3)	T	mg/L	5	100	No SLC					83.6	87.5	85.4	85.9
Biochemical Oxygen Demand	T	mg/L	5	0	No SLC			1.3	1.5	ND	ND		
Carbonate (as CaCO3)	T	mg/L	5	0	No SLC			1	1	ND	ND		
Chemical Oxygen Demand	T	mg/L	5	0	No SLC			20	20	ND	ND		
Chloride	T	mg/L	5	0	HH DW (HQ=1)	250	0	1.2	1.5	ND	ND		
Chloride	T	mg/L	5	0	ECO Chronic	230	0	1.2	1.5	ND	ND		
Cyanide	T	mg/L	5	0	HH DW (HQ=1)	0.73	0	0.01	0.01	ND	ND		
Cyanide	T	mg/L	5	0	ECO Chronic	0.0052	0	0.01	0.01	ND	ND		
Fluoride	T	mg/L	5	0	HH DW (HQ=1)	2.2	0	0.1	0.1	ND	ND		
Hardness	T	mg/L	5	100	No SLC					98.8	111	103	103
Hydroxide (as CaCO3)	T	mg/L	5	0	No SLC			1	1	ND	ND		
Nitrate	T	mg/L	5	0	HH DW (HQ=1)	10	0	0.2	0.24	ND	ND		
Nitrite	T	mg/L	5	0	HH DW (HQ=1)	1	0	0.005	0.005	ND	ND		
pH	T	SU	5	100	No SLC					7.5	7.9	7.7	7.8
Phosphate, Ortho As P	T	mg/L	5	0	No SLC			0.01	0.01	ND	ND		
Phosphorus	T	mg/L	5	0	No SLC			0.01	0.01	ND	ND		

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-1

Groundwater/Surface Water Interaction - Surface Water GSI 1

RI/FS Reference Upper Red River - Zwergle

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Specific Conductance	T	umhos/cm	5	100	No SLC					172	185	180	182
Sulfate	T	mg/L	5	40	HH DW (HQ=1)	1500	0	18.1	18.5	ND	27.4		
Total Alkalinity	T	mg/L	5	100	No SLC					83.6	87.5	85.4	85.9
Total Dissolved Solids	T	mg/L	5	100	No SLC					114	152	127	124
Total Kjeldahl Nitrogen	T	mg/L	5	0	No SLC			0.24	0.24	ND	ND		
Total Organic Carbon	T	mg/L	5	100	No SLC					1.3	2.3	1.8	1.6
Total Suspended Solids	T	mg/L	5	60	No SLC			0.5	0.5	ND	0.84	0.55	0.6
Metals													
Aluminum	D	mg/L	5	0	HH DW (HQ=1)	37	0	0.022	0.031	ND	ND		
Antimony	D	mg/L	5	0	ECO Chronic	0.69	0	0.0005	0.00059	ND	ND		
Antimony	D	mg/L	5	0	HH DW (HQ=1)	0.015	0	0.0005	0.00059	ND	ND		
Arsenic	D	mg/L	5	20	ECO Chronic	0.15	0	0.0002	0.0002	ND	0.00026		
Arsenic	D	mg/L	5	20	HH DW (HQ=1)	0.01	0	0.0002	0.0002	ND	0.00026		
Barium	D	mg/L	5	100	HH DW (HQ=1)	2.6	0			0.029	0.033	0.031	0.031
Barium	D	mg/L	5	100	ECO Chronic	0.004	100			0.029	0.033	0.031	0.031
Beryllium	D	mg/L	5	0	HH DW (HQ=1)	0.073	0	0.0003	0.0004	ND	ND		
Beryllium	D	mg/L	5	0	ECO Chronic	0.0053	0	0.0003	0.0004	ND	ND		
Boron	D	mg/L	5	0	HH DW (HQ=1)	3.3	0	0.0063	0.0064	ND	ND		
Boron	D	mg/L	5	0	ECO Chronic	0.0016	0	0.0063	0.0064	ND	ND		
Cadmium	D	mg/L	5	0	HH DW (HQ=1)	0.018	0	0.0002	0.0002	ND	ND		
Cadmium	D	mg/L	5	0	ECO Chronic	0.00025	0	0.0002	0.0002	ND	ND		
Calcium	D	mg/L	5	100	No SLC					30.9	34.8	32.9	32.8
Chromium	D	mg/L	5	40	HH DW (HQ=1)	0.1	0	0.0011	0.0011	ND	0.0014		
Chromium	D	mg/L	5	40	ECO Chronic	0.074	0	0.0011	0.0011	ND	0.0014		
Cobalt	D	mg/L	5	0	ECO Chronic	1.5	0	0.0029	0.0031	ND	ND		
Cobalt	D	mg/L	5	0	HH DW (HQ=1)	0.73	0	0.0029	0.0031	ND	ND		
Copper	D	mg/L	5	20	ECO Chronic	0.009	0	0.0017	0.0017	ND	0.0017		

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-1

Groundwater/Surface Water Interaction - Surface Water GSI 1

RI/FS Reference Upper Red River - Zwergle

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Copper	D	mg/L	5	20	HH DW (HQ=1)	1.4	0	0.0017	0.0017	ND	0.0017		
Iron	D	mg/L	5	0	HH DW (HQ=1)	11	0	0.028	0.03	ND	ND		
Lead	D	mg/L	5	0	HH DW (HQ=1)	0.015	0	0.0002	0.0002	ND	ND		
Lead	D	mg/L	5	0	ECO Chronic	0.0025	0	0.0002	0.0002	ND	ND		
Magnesium	D	mg/L	5	100	No SLC					4.3	4.8	4.5	4.5
Manganese	D	mg/L	5	100	ECO Chronic	1.7	0			0.0012	0.005	0.003	0.0029
Manganese	D	mg/L	5	100	HH DW (HQ=1)	1.7	0			0.0012	0.005	0.003	0.0029
Mercury	D	mg/L	5	0	ECO Chronic	0.00077	0	0.0001	0.0001	ND	ND		
Mercury	D	mg/L	5	0	HH DW (HQ=1)	0.011	0	0.0001	0.0001	ND	ND		
Molybdenum	D	mg/L	5	60	ECO Chronic	2.2	0	0.00095	0.00098	ND	0.00097	0.00073	0.0008
Molybdenum	D	mg/L	5	60	HH DW (HQ=1)	0.18	0	0.00095	0.00098	ND	0.00097	0.00073	0.0008
Nickel	D	mg/L	5	0	ECO Chronic	0.052	0	0.0016	0.0016	ND	ND		
Nickel	D	mg/L	5	0	HH DW (HQ=1)	0.73	0	0.0016	0.0016	ND	ND		
Potassium	D	mg/L	5	100	No SLC					0.47	1.3	0.88	0.81
Selenium	D	mg/L	5	0	ECO Chronic	0.046	0	0.0003	0.00079	ND	ND		
Selenium	D	mg/L	5	0	HH DW (HQ=1)	0.18	0	0.0003	0.00079	ND	ND		
Silver	D	mg/L	5	0	ECO Chronic	0.00032	0	0.0001	0.0001	ND	ND		
Silver	D	mg/L	5	0	HH DW (HQ=1)	0.18	0	0.0001	0.0001	ND	ND		
Sodium	D	mg/L	5	60	No SLC			2.6	3.1	ND	2.8	2.2	2.5
Thallium	D	mg/L	5	0	HH DW (HQ=1)	0.0026	0	0.0001	0.0001	ND	ND		
Vanadium	D	mg/L	5	100	ECO Chronic	0.019	0			0.00016	0.00024	0.00022	0.00023
Vanadium	D	mg/L	5	100	HH DW (HQ=1)	0.26	0			0.00016	0.00024	0.00022	0.00023
Zinc	D	mg/L	5	0	ECO Chronic	0.12	0	0.002	0.0079	ND	ND		
Zinc	D	mg/L	5	0	HH DW (HQ=1)	11	0	0.002	0.0079	ND	ND		
Aluminum	T	mg/L	5	0	ECO Chronic	0.087	0	0.022	0.095	ND	ND		
Aluminum	T	mg/L	5	0	HH DW (HQ=1)	37	0	0.022	0.095	ND	ND		
Antimony	T	mg/L	5	0	HH DW (HQ=1)	0.015	0	0.0005	0.00084	ND	ND		

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-1

Groundwater/Surface Water Interaction - Surface Water GSI 1

RI/FS Reference Upper Red River - Zwergle

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Arsenic	T	mg/L	5	0	HH DW (HQ=1)	0.01	0	0.0002	0.0002	ND	ND		
Barium	T	mg/L	5	100	HH DW (HQ=1)	2.6	0			0.03	0.035	0.032	0.032
Beryllium	T	mg/L	5	0	HH DW (HQ=1)	0.073	0	0.0003	0.0004	ND	ND		
Boron	T	mg/L	5	0	HH DW (HQ=1)	3.3	0	0.0063	0.0064	ND	ND		
Cadmium	T	mg/L	5	0	HH DW (HQ=1)	0.018	0	0.0002	0.0002	ND	ND		
Calcium	T	mg/L	5	100	No SLC					32.2	36.2	33.7	33.5
Chromium	T	mg/L	5	20	HH DW (HQ=1)	0.1	0	0.0011	0.0013	ND	0.0024		
Cobalt	T	mg/L	5	0	HH DW (HQ=1)	0.73	0	0.0029	0.0031	ND	ND		
Copper	T	mg/L	5	0	HH DW (HQ=1)	1.4	0	0.0017	0.0017	ND	ND		
Iron	T	mg/L	5	20	ECO Chronic	1	0	0.028	0.081	ND	0.051		
Iron	T	mg/L	5	20	HH DW (HQ=1)	11	0	0.028	0.081	ND	0.051		
Lead	T	mg/L	5	20	HH DW (HQ=1)	0.015	0	0.0002	0.0002	ND	0.0022		
Magnesium	T	mg/L	5	100	No SLC					4.5	5	4.6	4.6
Manganese	T	mg/L	5	100	HH DW (HQ=1)	1.7	0			0.0024	0.0044	0.0029	0.0026
Mercury	T	mg/L	5	0	HH DW (HQ=1)	0.011	0	0.0001	0.0001	ND	ND		
Molybdenum	T	mg/L	5	60	HH DW (HQ=1)	0.18	0	0.00091	0.001	ND	0.001	0.00077	0.00093
Nickel	T	mg/L	5	0	HH DW (HQ=1)	0.73	0	0.0016	0.0016	ND	ND		
Potassium	T	mg/L	5	100	No SLC					0.62	1.5	0.96	0.94
Selenium	T	mg/L	5	0	HH DW (HQ=1)	0.18	0	0.0003	0.0003	ND	ND		
Silver	T	mg/L	5	0	HH DW (HQ=1)	0.18	0	0.0001	0.0001	ND	ND		
Sodium	T	mg/L	5	60	No SLC			3	3.2	ND	2.9	2.2	2.4
Thallium	T	mg/L	5	0	HH DW (HQ=1)	0.0026	0	0.0001	0.0001	ND	ND		
Vanadium	T	mg/L	5	100	HH DW (HQ=1)	0.037	0			0.00026	0.00037	0.00032	0.00033
Zinc	T	mg/L	5	0	HH DW (HQ=1)	11	0	0.002	0.01	ND	ND		

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-2

Groundwater/Surface Water Interaction - Surface Water GSI 1

RI/FS Reference Red River Above Mine Site

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Field													
Ammonia	T	mg/L	5	NA	No SLC			0.1	0.1	ND	ND		
DO	T	mg/l	5	NA	No SLC					8.7	10.1	9.5	9.5
EH	T	millivolts	5	NA	No SLC					133	285	191	0
pH	T	SU	5	NA	No SLC					7.7	7.9	7.8	7.8
Specific Conductance	T	uS/cm	5	NA	No SLC					255	278	265	264
Temperature	T	Celsius	5	NA	No SLC					6.3	10	7.9	6.7
Turbidity	T	NTU	4	NA	No SLC					6	12.4	9.1	9.1
Inorganics													
Hardness	D	mg/L	5	100	No SLC					121	126	124	125
Ammonia	T	mg/L	5	60	No SLC			0.04	0.04	ND	0.095	0.052	0.062
Bicarbonate (as CaCO3)	T	mg/L	5	100	No SLC					71.1	74.8	73.2	73.3
Biochemical Oxygen Demand	T	mg/L	5	0	No SLC			1.3	1.5	ND	ND		
Carbonate (as CaCO3)	T	mg/L	5	0	No SLC			1	1	ND	ND		
Chemical Oxygen Demand	T	mg/L	5	0	No SLC			20	20	ND	ND		
Chloride	T	mg/L	5	100	ECO Chronic	230	0			2.5	2.8	2.6	2.6
Chloride	T	mg/L	5	100	HH DW (HQ=1)	250	0			2.5	2.8	2.6	2.6
Cyanide	T	mg/L	5	0	ECO Chronic	0.0052	0	0.01	0.01	ND	ND		
Cyanide	T	mg/L	5	0	HH DW (HQ=1)	0.73	0	0.01	0.01	ND	ND		
Fluoride	T	mg/L	5	100	HH DW (HQ=1)	2.2	0			0.24	0.28	0.26	0.27
Hardness	T	mg/L	5	100	No SLC					121	132	126	125
Hydroxide (as CaCO3)	T	mg/L	5	0	No SLC			1	1	ND	ND		
Nitrate	T	mg/L	5	0	HH DW (HQ=1)	10	0	0.31	0.4	ND	ND		
Nitrite	T	mg/L	5	0	HH DW (HQ=1)	1	0	0.005	0.005	ND	ND		
pH	T	SU	5	100	No SLC					6.9	7.6	7.4	7.5
Phosphate, Ortho As P	T	mg/L	5	0	No SLC			0.01	0.013	ND	ND		
Phosphorus	T	mg/L	5	100	No SLC					0.022	0.036	0.028	0.026

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-2

Groundwater/Surface Water Interaction - Surface Water GSI 1

RI/FS Reference Red River Above Mine Site

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Specific Conductance	T	umhos/cm	5	100	No SLC					230	243	237	238
Sulfate	T	mg/L	5	100	HH DW (HQ=1)	1500	0			50.1	65.1	54.8	52.2
Total Alkalinity	T	mg/L	5	100	No SLC					71.1	74.8	73.2	73.3
Total Dissolved Solids	T	mg/L	5	100	No SLC					168	200	181	174
Total Kjeldahl Nitrogen	T	mg/L	5	0	No SLC			0.24	0.24	ND	ND		
Total Organic Carbon	T	mg/L	5	100	No SLC					1	1.8	1.3	1.2
Total Suspended Solids	T	mg/L	5	100	No SLC					2.8	4.5	3.3	3
Metals													
Aluminum	D	mg/L	5	80	HH DW (HQ=1)	37	0	0.16	0.16	ND	0.15	0.1	0.098
Antimony	D	mg/L	5	0	HH DW (HQ=1)	0.015	0	0.0005	0.0013	ND	ND		
Antimony	D	mg/L	5	0	ECO Chronic	0.69	0	0.0005	0.0013	ND	ND		
Arsenic	D	mg/L	5	0	ECO Chronic	0.15	0	0.0002	0.0002	ND	ND		
Arsenic	D	mg/L	5	0	HH DW (HQ=1)	0.01	0	0.0002	0.0002	ND	ND		
Barium	D	mg/L	5	100	HH DW (HQ=1)	2.6	0			0.037	0.039	0.038	0.038
Barium	D	mg/L	5	100	ECO Chronic	0.004	100			0.037	0.039	0.038	0.038
Beryllium	D	mg/L	5	0	ECO Chronic	0.0053	0	0.0003	0.0004	ND	ND		
Beryllium	D	mg/L	5	0	HH DW (HQ=1)	0.073	0	0.0003	0.0004	ND	ND		
Boron	D	mg/L	5	80	ECO Chronic	0.0016	100	0.0063	0.0063	ND	0.0094	0.0071	0.0076
Boron	D	mg/L	5	80	HH DW (HQ=1)	3.3	0	0.0063	0.0063	ND	0.0094	0.0071	0.0076
Cadmium	D	mg/L	5	40	HH DW (HQ=1)	0.018	0	0.0002	0.0002	ND	0.00023		
Cadmium	D	mg/L	5	40	ECO Chronic	0.00025	0	0.0002	0.0002	ND	0.00023		
Calcium	D	mg/L	5	100	No SLC					36.3	37.8	37.2	37.7
Chromium	D	mg/L	5	20	HH DW (HQ=1)	0.1	0	0.0011	0.0013	ND	0.005		
Chromium	D	mg/L	5	20	ECO Chronic	0.074	0	0.0011	0.0013	ND	0.005		
Cobalt	D	mg/L	5	20	HH DW (HQ=1)	0.73	0	0.0029	0.0031	ND	0.0038		
Cobalt	D	mg/L	5	20	ECO Chronic	1.5	0	0.0029	0.0031	ND	0.0038		
Copper	D	mg/L	5	100	HH DW (HQ=1)	1.4	0			0.0027	0.0076	0.0044	0.0041

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-2

Groundwater/Surface Water Interaction - Surface Water GSI 1

RI/FS Reference Red River Above Mine Site

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Copper	D	mg/L	5	100	ECO Chronic	0.009	0			0.0027	0.0076	0.0044	0.0041
Iron	D	mg/L	5	40	HH DW (HQ=1)	11	0	0.028	0.039	ND	0.7		
Lead	D	mg/L	5	20	HH DW (HQ=1)	0.015	0	0.0002	0.0002	ND	0.00059		
Lead	D	mg/L	5	20	ECO Chronic	0.0025	0	0.0002	0.0002	ND	0.00059		
Magnesium	D	mg/L	5	100	No SLC					7.3	7.7	7.5	7.4
Manganese	D	mg/L	5	100	ECO Chronic	1.7	0			0.09	0.095	0.092	0.092
Manganese	D	mg/L	5	100	HH DW (HQ=1)	1.7	0			0.09	0.095	0.092	0.092
Mercury	D	mg/L	5	0	HH DW (HQ=1)	0.011	0	0.0001	0.0001	ND	ND		
Mercury	D	mg/L	5	0	ECO Chronic	0.00077	0	0.0001	0.0001	ND	ND		
Molybdenum	D	mg/L	5	80	HH DW (HQ=1)	0.18	0	0.0013	0.0013	ND	0.0013	0.0011	0.0012
Molybdenum	D	mg/L	5	80	ECO Chronic	2.2	0	0.0013	0.0013	ND	0.0013	0.0011	0.0012
Nickel	D	mg/L	5	100	ECO Chronic	0.052	0			0.0043	0.0053	0.0048	0.0046
Nickel	D	mg/L	5	100	HH DW (HQ=1)	0.73	0			0.0043	0.0053	0.0048	0.0046
Potassium	D	mg/L	5	80	No SLC			1.5	1.5	ND	1.5	1.1	1.1
Selenium	D	mg/L	5	0	ECO Chronic	0.046	0	0.0003	0.00036	ND	ND		
Selenium	D	mg/L	5	0	HH DW (HQ=1)	0.18	0	0.0003	0.00036	ND	ND		
Silver	D	mg/L	5	0	HH DW (HQ=1)	0.18	0	0.0001	0.0001	ND	ND		
Silver	D	mg/L	5	0	ECO Chronic	0.00032	0	0.0001	0.0001	ND	ND		
Sodium	D	mg/L	5	100	No SLC					4.6	4.9	4.7	4.6
Thallium	D	mg/L	5	0	HH DW (HQ=1)	0.0026	0	0.0001	0.0001	ND	ND		
Vanadium	D	mg/L	5	100	HH DW (HQ=1)	0.26	0			0.0001	0.00015	0.00012	0.00012
Vanadium	D	mg/L	5	100	ECO Chronic	0.019	0			0.0001	0.00015	0.00012	0.00012
Zinc	D	mg/L	5	80	HH DW (HQ=1)	11	0	0.029	0.029	ND	0.024	0.02	0.02
Zinc	D	mg/L	5	80	ECO Chronic	0.12	0	0.029	0.029	ND	0.024	0.02	0.02
Aluminum	T	mg/L	5	100	HH DW (HQ=1)	37	0			0.27	0.37	0.33	0.32
Aluminum	T	mg/L	5	100	ECO Chronic	0.087	100			0.27	0.37	0.33	0.32
Antimony	T	mg/L	5	0	HH DW (HQ=1)	0.015	0	0.0005	0.0012	ND	ND		

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-2

Groundwater/Surface Water Interaction - Surface Water GSI 1

RI/FS Reference Red River Above Mine Site

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Arsenic	T	mg/L	5	0	HH DW (HQ=1)	0.01	0	0.0002	0.0002	ND	ND		
Barium	T	mg/L	5	100	HH DW (HQ=1)	2.6	0			0.04	0.043	0.041	0.041
Beryllium	T	mg/L	5	0	HH DW (HQ=1)	0.073	0	0.0003	0.0004	ND	ND		
Boron	T	mg/L	5	80	HH DW (HQ=1)	3.3	0	0.0063	0.0063	ND	0.011	0.007	0.0065
Cadmium	T	mg/L	5	60	HH DW (HQ=1)	0.018	0	0.0002	0.0002	ND	0.00027	0.00019	0.00023
Calcium	T	mg/L	5	100	No SLC					36.5	39.5	37.7	37.5
Chromium	T	mg/L	5	60	HH DW (HQ=1)	0.1	0	0.0011	0.0011	ND	0.0022	0.0012	0.0012
Cobalt	T	mg/L	5	0	HH DW (HQ=1)	0.73	0	0.0029	0.0031	ND	ND		
Copper	T	mg/L	5	100	HH DW (HQ=1)	1.4	0			0.0076	0.01	0.0089	0.009
Iron	T	mg/L	5	100	HH DW (HQ=1)	11	0			0.24	0.38	0.28	0.27
Iron	T	mg/L	5	100	ECO Chronic	1	0			0.24	0.38	0.28	0.27
Lead	T	mg/L	5	100	HH DW (HQ=1)	0.015	0			0.00043	0.0011	0.00061	0.00052
Magnesium	T	mg/L	5	100	No SLC					7.2	8.1	7.6	7.6
Manganese	T	mg/L	5	100	HH DW (HQ=1)	1.7	0			0.093	0.1	0.098	0.099
Mercury	T	mg/L	5	0	HH DW (HQ=1)	0.011	0	0.0001	0.0001	ND	ND		
Molybdenum	T	mg/L	5	80	HH DW (HQ=1)	0.18	0	0.0012	0.0012	ND	0.0014	0.0011	0.0011
Nickel	T	mg/L	5	100	HH DW (HQ=1)	0.73	0			0.0047	0.0055	0.0051	0.0051
Potassium	T	mg/L	5	80	No SLC			1.8	1.8	ND	1.3	1.1	1.1
Selenium	T	mg/L	5	0	HH DW (HQ=1)	0.18	0	0.0003	0.0003	ND	ND		
Silver	T	mg/L	5	0	HH DW (HQ=1)	0.18	0	0.0001	0.0001	ND	ND		
Sodium	T	mg/L	5	100	No SLC					4.5	5	4.7	4.7
Thallium	T	mg/L	5	0	HH DW (HQ=1)	0.0026	0	0.0001	0.0001	ND	ND		
Vanadium	T	mg/L	5	100	HH DW (HQ=1)	0.037	0			0.00025	0.0005	0.00033	0.00027
Zinc	T	mg/L	5	80	HH DW (HQ=1)	11	0	0.035	0.035	ND	0.03	0.026	0.028

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-3

Groundwater/Surface Water Interaction - Surface Water GSI 1

RI/FS Red River

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Field													
Ammonia	T	mg/L	20	NA	No SLC			0.1	0.1	ND	ND		
DO	T	mg/L	20	NA	No SLC					8	10.5	9.2	9.3
EH	T	millivolts	20	NA	No SLC					32	388	206	0
pH	T	SU	20	NA	No SLC					6.8	8	7.5	7.5
Specific Conductance	T	uS/cm	20	NA	No SLC					269	518	382	370
Temperature	T	Celsius	20	NA	No SLC					6.3	13.5	9.8	9.9
Turbidity	T	NTU	17	NA	No SLC					0	16.3	10	10.4
Inorganics													
Hardness	D	mg/L	20	100	No SLC					159	200	179	180
Ammonia	T	mg/L	20	55	No SLC			0.04	0.04	ND	0.11	0.042	0.042
Bicarbonate (as CaCO3)	T	mg/L	20	100	No SLC					57.7	70.8	64.9	64.3
Biochemical Oxygen Demand	T	mg/L	20	0	No SLC			1.3	1.5	ND	ND		
Carbonate (as CaCO3)	T	mg/L	20	0	No SLC			1	1	ND	ND		
Chemical Oxygen Demand	T	mg/L	20	0	No SLC			20	20	ND	ND		
Chloride	T	mg/L	20	100	ECO Chronic	230	0			3	4.1	3.6	3.6
Chloride	T	mg/L	20	100	HH DW (HQ=1)	250	0			3	4.1	3.6	3.6
Cyanide	T	mg/L	20	0	ECO Chronic	0.0052	0	0.01	0.01	ND	ND		
Cyanide	T	mg/L	20	0	HH DW (HQ=1)	0.73	0	0.01	0.01	ND	ND		
Fluoride	T	mg/L	20	100	HH DW (HQ=1)	2.2	0			0.69	1.7	0.87	0.79
Hardness	T	mg/L	20	100	No SLC					159	199	180	182
Hydroxide (as CaCO3)	T	mg/L	20	0	No SLC			1	1	ND	ND		
Nitrate	T	mg/L	20	0	HH DW (HQ=1)	10	0	0.26	0.43	ND	ND		
Nitrite	T	mg/L	20	0	HH DW (HQ=1)	1	0	0.005	0.005	ND	ND		
pH	T	SU	20	100	No SLC					7.1	7.6	7.3	7.4
Phosphate, Ortho As P	T	mg/L	20	5	No SLC			0.01	0.065	ND	0.052		
Phosphorus	T	mg/L	20	100	No SLC					0.015	0.029	0.021	0.02

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-3

Groundwater/Surface Water Interaction - Surface Water GSI 1

RI/FS Red River

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Specific Conductance	T	umhos/cm	20	100	No SLC					304	391	348	339
Sulfate	T	mg/L	20	100	HH DW (HQ=1)	1500	0			91.7	130	108	108
Total Alkalinity	T	mg/L	20	100	No SLC					57.7	70.8	64.9	64.3
Total Dissolved Solids	T	mg/L	20	100	No SLC					210	314	263	265
Total Kjeldahl Nitrogen	T	mg/L	20	5	No SLC			0.24	0.24	ND	0.35		
Total Organic Carbon	T	mg/L	20	85	No SLC			1	1	ND	2.3	1.4	1.3
Total Suspended Solids	T	mg/L	20	100	No SLC					5.9	15.2	9	8.6
Metals													
Aluminum	D	mg/L	20	70	HH DW (HQ=1)	37	0	0.054	0.18	ND	1	0.17	0.11
Antimony	D	mg/L	20	0	HH DW (HQ=1)	0.015	0	0.0005	0.0013	ND	ND		
Antimony	D	mg/L	20	0	ECO Chronic	0.69	0	0.0005	0.0013	ND	ND		
Arsenic	D	mg/L	20	0	HH DW (HQ=1)	0.01	0	0.0002	0.0002	ND	ND		
Arsenic	D	mg/L	20	0	ECO Chronic	0.15	0	0.0002	0.0002	ND	ND		
Barium	D	mg/L	20	100	ECO Chronic	0.004	100			0.034	0.041	0.036	0.036
Barium	D	mg/L	20	100	HH DW (HQ=1)	2.6	0			0.034	0.041	0.036	0.036
Beryllium	D	mg/L	20	0	HH DW (HQ=1)	0.073	0	0.0003	0.0004	ND	ND		
Beryllium	D	mg/L	20	0	ECO Chronic	0.0053	0	0.0003	0.0004	ND	ND		
Boron	D	mg/L	20	80	ECO Chronic	0.0016	100	0.0063	0.008	ND	0.014	0.0088	0.0095
Boron	D	mg/L	20	80	HH DW (HQ=1)	3.3	0	0.0063	0.008	ND	0.014	0.0088	0.0095
Cadmium	D	mg/L	20	100	ECO Chronic	0.00025	100			0.00027	0.00051	0.00037	0.00033
Cadmium	D	mg/L	20	100	HH DW (HQ=1)	0.018	0			0.00027	0.00051	0.00037	0.00033
Calcium	D	mg/L	20	100	No SLC					47.3	60.2	53.6	54.1
Chromium	D	mg/L	20	30	ECO Chronic	0.074	0	0.0011	0.0013	ND	0.0069		
Chromium	D	mg/L	20	30	HH DW (HQ=1)	0.1	0	0.0011	0.0013	ND	0.0069		
Cobalt	D	mg/L	20	40	ECO Chronic	1.5	0	0.0029	0.0031	ND	0.0045		
Cobalt	D	mg/L	20	40	HH DW (HQ=1)	0.73	0	0.0029	0.0031	ND	0.0045		
Copper	D	mg/L	20	95	ECO Chronic	0.009	5.3	0.0017	0.0017	ND	0.0097	0.0032	0.0028

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-3

Groundwater/Surface Water Interaction - Surface Water GSI 1

RI/FS Red River

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Copper	D	mg/L	20	95	HH DW (HQ=1)	1.4	0	0.0017	0.0017	ND	0.0097	0.0032	0.0028
Iron	D	mg/L	20	10	HH DW (HQ=1)	11	0	0.028	0.05	ND	0.32		
Lead	D	mg/L	20	10	HH DW (HQ=1)	0.015	0	0.0002	0.0002	ND	0.00062		
Lead	D	mg/L	20	10	ECO Chronic	0.0025	0	0.0002	0.0002	ND	0.00062		
Magnesium	D	mg/L	20	100	No SLC					9.8	12	10.9	10.8
Manganese	D	mg/L	20	100	ECO Chronic	1.7	0			0.16	0.26	0.21	0.2
Manganese	D	mg/L	20	100	HH DW (HQ=1)	1.7	0			0.16	0.26	0.21	0.2
Mercury	D	mg/L	20	5	ECO Chronic	0.00077	0	0.0001	0.00016	ND	0.0001		
Mercury	D	mg/L	20	5	HH DW (HQ=1)	0.011	0	0.0001	0.00016	ND	0.0001		
Molybdenum	D	mg/L	20	95	ECO Chronic	2.2	0	0.0025	0.0025	ND	0.051	0.022	0.012
Molybdenum	D	mg/L	20	95	HH DW (HQ=1)	0.18	0	0.0025	0.0025	ND	0.051	0.022	0.012
Nickel	D	mg/L	20	100	ECO Chronic	0.052	0			0.0099	0.018	0.013	0.014
Nickel	D	mg/L	20	100	HH DW (HQ=1)	0.73	0			0.0099	0.018	0.013	0.014
Potassium	D	mg/L	20	100	No SLC					1.1	2.2	1.5	1.5
Selenium	D	mg/L	20	15	HH DW (HQ=1)	0.18	0	0.0003	0.00066	ND	0.00044		
Selenium	D	mg/L	20	15	ECO Chronic	0.046	0	0.0003	0.00066	ND	0.00044		
Silver	D	mg/L	20	0	ECO Chronic	0.00032	0	0.0001	0.0001	ND	ND		
Silver	D	mg/L	20	0	HH DW (HQ=1)	0.18	0	0.0001	0.0001	ND	ND		
Sodium	D	mg/L	20	100	No SLC					4.6	11	7.8	7.3
Thallium	D	mg/L	20	0	HH DW (HQ=1)	0.0026	0	0.0001	0.0001	ND	ND		
Vanadium	D	mg/L	20	65	HH DW (HQ=1)	0.26	0	0.0001	0.0001	ND	0.00032	0.00015	0.00012
Vanadium	D	mg/L	20	65	ECO Chronic	0.019	0	0.0001	0.0001	ND	0.00032	0.00015	0.00012
Zinc	D	mg/L	20	100	HH DW (HQ=1)	11	0			0.031	0.11	0.064	0.064
Zinc	D	mg/L	20	100	ECO Chronic	0.12	0			0.031	0.11	0.064	0.064
Aluminum	T	mg/L	20	100	HH DW (HQ=1)	37	0			0.15	1.6	1.1	1
Aluminum	T	mg/L	20	100	ECO Chronic	0.087	100			0.15	1.6	1.1	1
Antimony	T	mg/L	20	0	HH DW (HQ=1)	0.015	0	0.0005	0.0013	ND	ND		

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-3

Groundwater/Surface Water Interaction - Surface Water GSI 1

RI/FS Red River

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Arsenic	T	mg/L	20	10	HH DW (HQ=1)	0.01	0	0.0002	0.0002	ND	0.00028		
Barium	T	mg/L	20	100	HH DW (HQ=1)	2.6	0			0.035	0.046	0.04	0.04
Beryllium	T	mg/L	20	30	HH DW (HQ=1)	0.073	0	0.0003	0.0004	ND	0.00053		
Boron	T	mg/L	20	75	HH DW (HQ=1)	3.3	0	0.0063	0.0085	ND	0.014	0.0085	0.0092
Cadmium	T	mg/L	20	100	HH DW (HQ=1)	0.018	0			0.00025	0.00062	0.00041	0.0004
Calcium	T	mg/L	20	100	No SLC					47.4	59.9	54	54.6
Chromium	T	mg/L	20	35	HH DW (HQ=1)	0.1	0	0.0011	0.0013	ND	0.0032		
Cobalt	T	mg/L	20	15	HH DW (HQ=1)	0.73	0	0.0029	0.0031	ND	0.0033		
Copper	T	mg/L	20	100	HH DW (HQ=1)	1.4	0			0.0031	0.017	0.011	0.011
Iron	T	mg/L	20	95	ECO Chronic	1	0	0.028	0.028	ND	0.51	0.32	0.3
Iron	T	mg/L	20	95	HH DW (HQ=1)	11	0	0.028	0.028	ND	0.51	0.32	0.3
Lead	T	mg/L	20	95	HH DW (HQ=1)	0.015	0	0.0002	0.0002	ND	0.0012	0.00064	0.00057
Magnesium	T	mg/L	20	100	No SLC					9.8	12.1	11	11.1
Manganese	T	mg/L	20	100	HH DW (HQ=1)	1.7	0			0.18	0.27	0.22	0.21
Mercury	T	mg/L	20	5	HH DW (HQ=1)	0.011	0	0.0001	0.0001	ND	0.0001		
Molybdenum	T	mg/L	20	95	HH DW (HQ=1)	0.18	0	0.0025	0.0025	ND	0.048	0.022	0.01
Nickel	T	mg/L	20	100	HH DW (HQ=1)	0.73	0			0.011	0.021	0.014	0.013
Potassium	T	mg/L	20	95	No SLC			2	2	ND	2	1.5	1.4
Selenium	T	mg/L	20	40	HH DW (HQ=1)	0.18	0	0.0003	0.00071	ND	0.00049		
Silver	T	mg/L	20	0	HH DW (HQ=1)	0.18	0	0.0001	0.0001	ND	ND		
Sodium	T	mg/L	20	100	No SLC					5.2	10.8	7.8	6.9
Thallium	T	mg/L	20	0	HH DW (HQ=1)	0.0026	0	0.0001	0.0001	ND	ND		
Vanadium	T	mg/L	20	100	HH DW (HQ=1)	0.037	0			0.00011	0.00063	0.00032	0.00029
Zinc	T	mg/L	20	100	HH DW (HQ=1)	11	0			0.053	0.13	0.094	0.088

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-4

Groundwater/Surface Water Interaction - Chamber Water GSI 1

RI/FS Reference Upper Red River - Zwergle

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Field													
Ammonia	T	mg/L	8	NA	No SLC			0.1	0.1	ND	ND		
Inorganics													
Hardness	D	mg/L	8	100	No SLC					90.5	102	94.6	92.4
Fluoride	T	mg/L	8	0	HH DW (HQ=1)	2.2	0	0.1	0.1	ND	ND		
Sulfate	T	mg/L	8	100	HH DW (HQ=1)	1500	0			18.9	30.7	22.1	20.5
Total Organic Carbon	T	mg/L	7	100	No SLC					1.7	3.8	2.4	2.1
Metals													
Aluminum	D	mg/L	8	0	HH DW (HQ=1)	37	0	0.022	0.031	ND	ND		
Antimony	D	mg/L	8	50	HH DW (HQ=1)	0.015	0	0.0005	0.0037	ND	0.0021	0.00083	0.0006
Antimony	D	mg/L	8	50	ECO Chronic	0.69	0	0.0005	0.0037	ND	0.0021	0.00083	0.0006
Arsenic	D	mg/L	8	0	HH DW (HQ=1)	0.01	0	0.0002	0.0002	ND	ND		
Arsenic	D	mg/L	8	0	ECO Chronic	0.15	0	0.0002	0.0002	ND	ND		
Barium	D	mg/L	8	100	HH DW (HQ=1)	2.6	0			0.028	0.034	0.031	0.031
Barium	D	mg/L	8	100	ECO Chronic	0.004	100			0.028	0.034	0.031	0.031
Beryllium	D	mg/L	8	12.5	HH DW (HQ=1)	0.073	0	0.0002	0.0004	ND	0.00051		
Beryllium	D	mg/L	8	12.5	ECO Chronic	0.0053	0	0.0002	0.0004	ND	0.00051		
Boron	D	mg/L	8	0	ECO Chronic	0.0016	0	0.0063	0.0064	ND	ND		
Boron	D	mg/L	8	0	HH DW (HQ=1)	3.3	0	0.0063	0.0064	ND	ND		
Cadmium	D	mg/L	8	0	ECO Chronic	0.00025	0	0.0002	0.0002	ND	ND		
Cadmium	D	mg/L	8	0	HH DW (HQ=1)	0.018	0	0.0002	0.0002	ND	ND		
Calcium	D	mg/L	8	100	No SLC					29.6	33.3	30.9	30.2
Chromium	D	mg/L	8	0	HH DW (HQ=1)	0.1	0	0.0011	0.0023	ND	ND		
Chromium	D	mg/L	8	0	ECO Chronic	0.074	0	0.0011	0.0023	ND	ND		
Cobalt	D	mg/L	8	25	ECO Chronic	1.5	0	0.0029	0.0032	ND	0.0089		
Cobalt	D	mg/L	8	25	HH DW (HQ=1)	0.73	0	0.0029	0.0032	ND	0.0089		
Copper	D	mg/L	8	12.5	HH DW (HQ=1)	1.4	0	0.0017	0.0017	ND	0.0018		

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-4

Groundwater/Surface Water Interaction - Chamber Water GSI 1

RI/FS Reference Upper Red River - Zwergle

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Copper	D	mg/L	8	12.5	ECO Chronic	0.009	0	0.0017	0.0017	ND	0.0018		
Iron	D	mg/L	8	0	HH DW (HQ=1)	11	0	0.028	0.046	ND	ND		
Lead	D	mg/L	8	0	ECO Chronic	0.0025	0	0.0002	0.0002	ND	ND		
Lead	D	mg/L	8	0	HH DW (HQ=1)	0.015	0	0.0002	0.0002	ND	ND		
Magnesium	D	mg/L	8	100	No SLC					4.1	4.6	4.2	4.2
Manganese	D	mg/L	8	62.5	ECO Chronic	1.7	0	0.0012	0.0017	ND	0.014	0.0046	0.0024
Manganese	D	mg/L	8	62.5	HH DW (HQ=1)	1.7	0	0.0012	0.0017	ND	0.014	0.0046	0.0024
Molybdenum	D	mg/L	8	50	ECO Chronic	2.2	0	0.00084	0.001	ND	0.00088	0.00064	0.00063
Molybdenum	D	mg/L	8	50	HH DW (HQ=1)	0.18	0	0.00084	0.001	ND	0.00088	0.00064	0.00063
Nickel	D	mg/L	8	0	ECO Chronic	0.052	0	0.0016	0.0016	ND	ND		
Nickel	D	mg/L	8	0	HH DW (HQ=1)	0.73	0	0.0016	0.0016	ND	ND		
Potassium	D	mg/L	8	75	No SLC			0.84	0.98	ND	0.83	0.7	0.77
Selenium	D	mg/L	8	12.5	HH DW (HQ=1)	0.18	0	0.0003	0.0003	ND	0.00033		
Selenium	D	mg/L	8	12.5	ECO Chronic	0.046	0	0.0003	0.0003	ND	0.00033		
Silver	D	mg/L	8	0	HH DW (HQ=1)	0.18	0	0.0001	0.0001	ND	ND		
Silver	D	mg/L	8	0	ECO Chronic	0.00032	0	0.0001	0.0001	ND	ND		
Sodium	D	mg/L	8	100	No SLC					2.2	2.6	2.4	2.5
Thallium	D	mg/L	8	0	HH DW (HQ=1)	0.0026	0	0.0001	0.0001	ND	ND		
Vanadium	D	mg/L	8	100	HH DW (HQ=1)	0.26	0			0.00014	0.00027	0.00021	0.0002
Vanadium	D	mg/L	8	100	ECO Chronic	0.019	0			0.00014	0.00027	0.00021	0.0002
Zinc	D	mg/L	8	25	HH DW (HQ=1)	11	0	0.0058	0.012	ND	0.018		
Zinc	D	mg/L	8	25	ECO Chronic	0.12	0	0.0058	0.012	ND	0.018		

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-5

Groundwater/Surface Water Interaction - Chamber Water GSI 1

RI/FS Reference Red River Above Mine Site

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Field													
Ammonia	T	mg/L	8	NA	No SLC			0.1	0.1	ND	ND		
Inorganics													
Hardness	D	mg/L	8	100	No SLC					113	123	118	118
Fluoride	T	mg/L	8	100	HH DW (HQ=1)	2.2	0			0.23	0.28	0.26	0.26
Sulfate	T	mg/L	8	100	HH DW (HQ=1)	1500	0			26.4	71.1	50.1	50.8
Total Organic Carbon	T	mg/L	8	100	No SLC					1.4	4.5	2.5	2.3
Metals													
Aluminum	D	mg/L	8	62.5	HH DW (HQ=1)	37	0	0.1	0.11	ND	0.11	0.084	0.097
Antimony	D	mg/L	8	37.5	ECO Chronic	0.69	0	0.0005	0.003	ND	0.0028		
Antimony	D	mg/L	8	37.5	HH DW (HQ=1)	0.015	0	0.0005	0.003	ND	0.0028		
Arsenic	D	mg/L	8	0	HH DW (HQ=1)	0.01	0	0.0002	0.0002	ND	ND		
Arsenic	D	mg/L	8	0	ECO Chronic	0.15	0	0.0002	0.0002	ND	ND		
Barium	D	mg/L	8	100	HH DW (HQ=1)	2.6	0			0.033	0.04	0.037	0.037
Barium	D	mg/L	8	100	ECO Chronic	0.004	100			0.033	0.04	0.037	0.037
Beryllium	D	mg/L	8	25	HH DW (HQ=1)	0.073	0	0.0002	0.0004	ND	0.00047		
Beryllium	D	mg/L	8	25	ECO Chronic	0.0053	0	0.0002	0.0004	ND	0.00047		
Boron	D	mg/L	8	25	ECO Chronic	0.0016	100	0.0063	0.0096	ND	0.0085		
Boron	D	mg/L	8	25	HH DW (HQ=1)	3.3	0	0.0063	0.0096	ND	0.0085		
Cadmium	D	mg/L	8	0	ECO Chronic	0.00025	0	0.0002	0.0002	ND	ND		
Cadmium	D	mg/L	8	0	HH DW (HQ=1)	0.018	0	0.0002	0.0002	ND	ND		
Calcium	D	mg/L	8	100	No SLC					33.8	36.9	35.5	35.5
Chromium	D	mg/L	8	0	HH DW (HQ=1)	0.1	0	0.0011	0.0023	ND	ND		
Chromium	D	mg/L	8	0	ECO Chronic	0.074	0	0.0011	0.0023	ND	ND		
Cobalt	D	mg/L	8	25	ECO Chronic	1.5	0	0.0029	0.0032	ND	0.01		
Cobalt	D	mg/L	8	25	HH DW (HQ=1)	0.73	0	0.0029	0.0032	ND	0.01		
Copper	D	mg/L	8	100	ECO Chronic	0.009	0			0.0037	0.0047	0.004	0.0038

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-5

Groundwater/Surface Water Interaction - Chamber Water GSI 1

RI/FS Reference Red River Above Mine Site

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Copper	D	mg/L	8	100	HH DW (HQ=1)	1.4	0			0.0037	0.0047	0.004	0.0038
Iron	D	mg/L	8	25	HH DW (HQ=1)	11	0	0.028	0.046	ND	0.09		
Lead	D	mg/L	8	0	ECO Chronic	0.0025	0	0.0002	0.0002	ND	ND		
Lead	D	mg/L	8	0	HH DW (HQ=1)	0.015	0	0.0002	0.0002	ND	ND		
Magnesium	D	mg/L	8	100	No SLC					6.8	7.4	7.1	7.2
Manganese	D	mg/L	8	100	ECO Chronic	1.7	0			0.087	0.1	0.091	0.089
Manganese	D	mg/L	8	100	HH DW (HQ=1)	1.7	0			0.087	0.1	0.091	0.089
Molybdenum	D	mg/L	8	50	ECO Chronic	2.2	0	0.001	0.0012	ND	0.0011	0.00078	0.00078
Molybdenum	D	mg/L	8	50	HH DW (HQ=1)	0.18	0	0.001	0.0012	ND	0.0011	0.00078	0.00078
Nickel	D	mg/L	8	100	ECO Chronic	0.052	0			0.0041	0.0054	0.0047	0.0047
Nickel	D	mg/L	8	100	HH DW (HQ=1)	0.73	0			0.0041	0.0054	0.0047	0.0047
Potassium	D	mg/L	8	75	No SLC			1.4	1.4	ND	1.2	1.1	1.1
Selenium	D	mg/L	8	37.5	ECO Chronic	0.046	0	0.0003	0.0003	ND	0.00047		
Selenium	D	mg/L	8	37.5	HH DW (HQ=1)	0.18	0	0.0003	0.0003	ND	0.00047		
Silver	D	mg/L	8	0	ECO Chronic	0.00032	0	0.0001	0.0001	ND	ND		
Silver	D	mg/L	8	0	HH DW (HQ=1)	0.18	0	0.0001	0.0001	ND	ND		
Sodium	D	mg/L	8	100	No SLC					4	4.8	4.3	4.3
Thallium	D	mg/L	8	0	HH DW (HQ=1)	0.0026	0	0.0001	0.0001	ND	ND		
Vanadium	D	mg/L	8	25	ECO Chronic	0.019	0	0.0001	0.0001	ND	0.00013		
Vanadium	D	mg/L	8	25	HH DW (HQ=1)	0.26	0	0.0001	0.0001	ND	0.00013		
Zinc	D	mg/L	8	87.5	ECO Chronic	0.12	0	0.025	0.025	ND	0.031	0.026	0.027
Zinc	D	mg/L	8	87.5	HH DW (HQ=1)	11	0	0.025	0.025	ND	0.031	0.026	0.027

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-6

Groundwater/Surface Water Interaction - Chamber Water GSI 1

RI/FS Red River

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Field													
Ammonia	T	mg/L	32	NA	No SLC			0.1	0.1	ND	ND		
Inorganics													
Hardness	D	mg/L	32	100	No SLC					146	191	167	168
Fluoride	T	mg/L	32	100	HH DW (HQ=1)	2.2	0			0.69	0.86	0.78	0.77
Sulfate	T	mg/L	32	100	HH DW (HQ=1)	1500	0			83.5	126	103	104
Total Organic Carbon	T	mg/L	31	96.8	No SLC			1	1	ND	5.8	2.8	2.3
Metals													
Aluminum	D	mg/L	32	62.5	HH DW (HQ=1)	37	0	0.1	0.28	ND	0.22	0.11	0.096
Antimony	D	mg/L	32	31.3	HH DW (HQ=1)	0.015	0	0.0005	0.0031	ND	0.0038		
Antimony	D	mg/L	32	31.3	ECO Chronic	0.69	0	0.0005	0.0031	ND	0.0038		
Arsenic	D	mg/L	32	0	HH DW (HQ=1)	0.01	0	0.0002	0.0002	ND	ND		
Arsenic	D	mg/L	32	0	ECO Chronic	0.15	0	0.0002	0.0002	ND	ND		
Barium	D	mg/L	32	100	HH DW (HQ=1)	2.6	0			0.032	0.041	0.035	0.035
Barium	D	mg/L	32	100	ECO Chronic	0.004	100			0.032	0.041	0.035	0.035
Beryllium	D	mg/L	32	25	HH DW (HQ=1)	0.073	0	0.0002	0.0004	ND	0.0009		
Beryllium	D	mg/L	32	25	ECO Chronic	0.0053	0	0.0002	0.0004	ND	0.0009		
Boron	D	mg/L	32	43.8	HH DW (HQ=1)	3.3	0	0.0063	0.013	ND	0.013		
Boron	D	mg/L	32	43.8	ECO Chronic	0.0016	100	0.0063	0.013	ND	0.013		
Cadmium	D	mg/L	32	100	HH DW (HQ=1)	0.018	0			0.00026	0.00059	0.0004	0.00039
Cadmium	D	mg/L	32	100	ECO Chronic	0.00025	100			0.00026	0.00059	0.0004	0.00039
Calcium	D	mg/L	32	100	No SLC					43.5	57.7	50.2	50.6
Chromium	D	mg/L	32	0	ECO Chronic	0.074	0	0.0011	0.0023	ND	ND		
Chromium	D	mg/L	32	0	HH DW (HQ=1)	0.1	0	0.0011	0.0023	ND	ND		
Cobalt	D	mg/L	32	31.3	ECO Chronic	1.5	0	0.0029	0.0032	ND	0.011		
Cobalt	D	mg/L	32	31.3	HH DW (HQ=1)	0.73	0	0.0029	0.0032	ND	0.011		
Copper	D	mg/L	32	100	ECO Chronic	0.009	0			0.0025	0.0055	0.0035	0.003

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-6

Groundwater/Surface Water Interaction - Chamber Water GSI 1

RI/FS Red River

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Copper	D	mg/L	32	100	HH DW (HQ=1)	1.4	0			0.0025	0.0055	0.0035	0.003
Iron	D	mg/L	32	0	HH DW (HQ=1)	11	0	0.028	0.062	ND	ND		
Lead	D	mg/L	32	0	HH DW (HQ=1)	0.015	0	0.0002	0.0002	ND	ND		
Lead	D	mg/L	32	0	ECO Chronic	0.0025	0	0.0002	0.0002	ND	ND		
Magnesium	D	mg/L	32	100	No SLC					9.1	11.4	10.2	10.2
Manganese	D	mg/L	32	100	HH DW (HQ=1)	1.7	0			0.15	0.25	0.2	0.2
Manganese	D	mg/L	32	100	ECO Chronic	1.7	0			0.15	0.25	0.2	0.2
Molybdenum	D	mg/L	32	100	ECO Chronic	2.2	0			0.0023	0.047	0.017	0.011
Molybdenum	D	mg/L	32	100	HH DW (HQ=1)	0.18	0			0.0023	0.047	0.017	0.011
Nickel	D	mg/L	32	100	ECO Chronic	0.052	0			0.008	0.017	0.013	0.013
Nickel	D	mg/L	32	100	HH DW (HQ=1)	0.73	0			0.008	0.017	0.013	0.013
Potassium	D	mg/L	32	90.6	No SLC			1.5	1.5	ND	1.8	1.4	1.4
Selenium	D	mg/L	32	18.8	HH DW (HQ=1)	0.18	0	0.0003	0.0003	ND	0.00053		
Selenium	D	mg/L	32	18.8	ECO Chronic	0.046	0	0.0003	0.0003	ND	0.00053		
Silver	D	mg/L	32	0	ECO Chronic	0.00032	0	0.0001	0.0001	ND	ND		
Silver	D	mg/L	32	0	HH DW (HQ=1)	0.18	0	0.0001	0.0001	ND	ND		
Sodium	D	mg/L	32	100	No SLC					4.4	11.1	7.1	6.7
Thallium	D	mg/L	32	0	HH DW (HQ=1)	0.0026	0	0.0001	0.0001	ND	ND		
Vanadium	D	mg/L	32	31.3	HH DW (HQ=1)	0.26	0	0.0001	0.0001	ND	0.00032		
Vanadium	D	mg/L	32	31.3	ECO Chronic	0.019	0	0.0001	0.0001	ND	0.00032		
Zinc	D	mg/L	32	100	ECO Chronic	0.12	0			0.044	0.11	0.068	0.068
Zinc	D	mg/L	32	100	HH DW (HQ=1)	11	0			0.044	0.11	0.068	0.068

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-7

Groundwater/Surface Water Interaction - Piezometers GSI 1

RI/FS Reference Upper Red River - Zwergle

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Field													
DO	T	mg/L	30	NA	No SLC					4.3	25.1	10.1	7.8
eh	T	millivolts	30	NA	No SLC					89	336	164	158
pH	T	SU	30	NA	No SLC					5.6	7.7	7.2	7.4
Specific Conductance	T	uS/cm	30	NA	No SLC					137	207	166	171
Temperature	T	Celsius	30	NA	No SLC					6.3	15.7	9	8.8
Inorganics													
Hardness	D	mg/L	10	100	No SLC					91.8	111	103	103
Fluoride	T	mg/L	10	0	HH DW (HQ=1)	2.2	0	0.1	0.1	ND	ND		
Sulfate	T	mg/L	10	100	HH DW (HQ=1)	1500	0			18.3	22.3	20.4	20.2
Total Organic Carbon	T	mg/L	10	100	No SLC					1.3	3.2	2.2	1.9
Metals													
Aluminum	D	mg/L	10	0	HH DW (HQ=1)	37	0	0.022	0.031	ND	ND		
Antimony	D	mg/L	10	0	HH DW (HQ=1)	0.015	0	0.0005	0.0014	ND	ND		
Arsenic	D	mg/L	10	40	HH DW (HQ=1)	0.01	0	0.0002	0.0002	ND	0.00024		
Barium	D	mg/L	10	100	HH DW (HQ=1)	2.6	0			0.052	0.061	0.055	0.055
Beryllium	D	mg/L	10	0	HH DW (HQ=1)	0.073	0	0.0003	0.0004	ND	ND		
Boron	D	mg/L	10	10	HH DW (HQ=1)	3.3	0	0.0063	0.0064	ND	0.0088		
Cadmium	D	mg/L	10	0	HH DW (HQ=1)	0.018	0	0.0002	0.0002	ND	ND		
Calcium	D	mg/L	10	100	No SLC					29.9	36	33.3	33.5
Chromium	D	mg/L	10	0	HH DW (HQ=1)	0.1	0	0.0011	0.0013	ND	ND		
Cobalt	D	mg/L	10	40	HH DW (HQ=1)	0.73	0	0.0029	0.0029	ND	0.011		
Copper	D	mg/L	10	0	HH DW (HQ=1)	1.4	0	0.0017	0.012	ND	ND		
Iron	D	mg/L	10	0	HH DW (HQ=1)	11	0	0.028	0.049	ND	ND		
Lead	D	mg/L	10	10	HH DW (HQ=1)	0.015	0	0.0002	0.0002	ND	0.00031		
Magnesium	D	mg/L	10	100	No SLC					4.1	5.1	4.7	4.7
Manganese	D	mg/L	10	100	HH DW (HQ=1)	1.7	0			0.017	0.26	0.11	0.097

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-7

Groundwater/Surface Water Interaction - Piezometers GSI 1

RI/FS Reference Upper Red River - Zwergle

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Molybdenum	D	mg/L	10	20	HH DW (HQ=1)	0.18	0	0.00081	0.0032	ND	0.0014		
Nickel	D	mg/L	10	10	HH DW (HQ=1)	0.73	0	0.0016	0.0016	ND	0.0019		
Potassium	D	mg/L	10	80	No SLC			0.52	0.52	ND	1.1	0.79	0.9
Selenium	D	mg/L	10	20	HH DW (HQ=1)	0.18	0	0.0003	0.0003	ND	0.00045		
Silver	D	mg/L	10	0	HH DW (HQ=1)	0.18	0	0.0001	0.0001	ND	ND		
Sodium	D	mg/L	10	60	No SLC			2.9	3.3	ND	3.1	2.3	2.5
Thallium	D	mg/L	10	0	HH DW (HQ=1)	0.0026	0	0.0001	0.0001	ND	ND		
Vanadium	D	mg/L	10	100	HH DW (HQ=1)	0.26	0			0.00039	0.0012	0.00057	0.00051
Zinc	D	mg/L	10	100	HH DW (HQ=1)	11	0			0.041	0.064	0.054	0.055

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-8

Groundwater/Surface Water Interaction - Piezometers GSI 1

RI/FS Reference Red River Above Mine Site

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Field													
do	T	mg/L	24	NA	No SLC					3.6	11	6.4	6.1
eh	T	millivolts	30	NA	No SLC					121	405	355	372
pH	T	SU	30	NA	No SLC					3.8	5	4.3	4.3
Specific Conductance	T	uS/cm	30	NA	No SLC					365	699	611	604
Temperature	T	Celsius	30	NA	No SLC					8	9.3	8.6	8.6
Inorganics													
Hardness	D	mg/L	10	100	No SLC					336	362	349	350
Fluoride	T	mg/L	10	100	HH DW (HQ=1)	2.2	0			1.3	1.4	1.4	1.4
Sulfate	T	mg/L	10	100	HH DW (HQ=1)	1500	0			357	434	385	383
Total Organic Carbon	T	mg/L	10	100	No SLC					1.5	4.7	2.7	2
Metals													
Aluminum	D	mg/L	10	100	HH DW (HQ=1)	37	0			12.2	13.6	12.9	12.8
Antimony	D	mg/L	10	0	HH DW (HQ=1)	0.015	0	0.0005	0.0015	ND	ND		
Arsenic	D	mg/L	10	0	HH DW (HQ=1)	0.01	0	0.0002	0.0002	ND	ND		
Barium	D	mg/L	10	100	HH DW (HQ=1)	2.6	0			0.014	0.019	0.016	0.016
Beryllium	D	mg/L	10	60	HH DW (HQ=1)	0.073	0	0.0026	0.003	ND	0.0029	0.0022	0.0027
Boron	D	mg/L	10	40	HH DW (HQ=1)	3.3	0	0.0063	0.0064	ND	0.0083		
Cadmium	D	mg/L	10	100	HH DW (HQ=1)	0.018	0			0.0021	0.0024	0.0022	0.0023
Calcium	D	mg/L	10	100	No SLC					90.2	97.2	93.8	94
Chromium	D	mg/L	10	70	HH DW (HQ=1)	0.1	0	0.0011	0.0013	ND	0.0024	0.0014	0.0016
Cobalt	D	mg/L	10	100	HH DW (HQ=1)	0.73	0			0.039	0.048	0.044	0.043
Copper	D	mg/L	10	100	HH DW (HQ=1)	1.4	0			0.056	0.078	0.064	0.064
Iron	D	mg/L	10	30	HH DW (HQ=1)	11	0	0.066	0.16	ND	0.12		
Lead	D	mg/L	10	80	HH DW (HQ=1)	0.015	0	0.0002	0.0002	ND	0.0004	0.00025	0.00027
Magnesium	D	mg/L	10	100	No SLC					26.8	28.9	27.8	27.8
Manganese	D	mg/L	10	100	HH DW (HQ=1)	1.7	100			1.9	2.1	2	2

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-8

Groundwater/Surface Water Interaction - Piezometers GSI 1

RI/FS Reference Red River Above Mine Site

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Molybdenum	D	mg/L	10	0	HH DW (HQ=1)	0.18	0	0.0002	0.0024	ND	ND		
Nickel	D	mg/L	10	100	HH DW (HQ=1)	0.73	0			0.1	0.12	0.11	0.11
Potassium	D	mg/L	10	80	No SLC			0.94	1.3	ND	1.3	1.1	1.2
Selenium	D	mg/L	10	100	HH DW (HQ=1)	0.18	0			0.00086	0.0016	0.0013	0.0013
Silver	D	mg/L	10	0	HH DW (HQ=1)	0.18	0	0.0001	0.0001	ND	ND		
Sodium	D	mg/L	10	100	No SLC					7.2	8.5	8	8.1
Thallium	D	mg/L	10	0	HH DW (HQ=1)	0.0026	0	0.0001	0.0001	ND	ND		
Vanadium	D	mg/L	10	10	HH DW (HQ=1)	0.26	0	0.0001	0.0001	ND	0.00013		
Zinc	D	mg/L	10	100	HH DW (HQ=1)	11	0			0.6	0.79	0.69	0.69

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-9

Groundwater/Surface Water Interaction - Piezometers GSI 1

RI/FS Red River

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Field													
DO	T	mg/L	112	NA	No SLC					1.8	13.3	6.4	6.4
eh	T	millivolts	119	NA	No SLC					90	287	171	164
pH	T	SU	120	NA	No SLC					5	8	6.9	6.9
Specific Conductance	T	uS/cm	120	NA	No SLC					253	1170	552	422
Temperature	T	Celsius	120	NA	No SLC					1.3	16.6	12.2	12.1
Turbidity	T	NTU	6	NA	No SLC					67	710	231	145
Inorganics													
Hardness	D	mg/L	40	100	No SLC					114	615	278	205
Fluoride	T	mg/L	40	100	HH DW (HQ=1)	2.2	0			0.43	1.3	0.82	0.78
Sulfate	T	mg/L	40	100	HH DW (HQ=1)	1500	0			61	547	198	143
Total Organic Carbon	T	mg/L	40	97.5	No SLC			1	1	ND	7.4	2.4	2
Metals													
Aluminum	D	mg/L	40	27.5	HH DW (HQ=1)	37	0	0.022	0.15	ND	1		
Antimony	D	mg/L	40	2.5	HH DW (HQ=1)	0.015	0	0.0005	0.0014	ND	0.00072		
Arsenic	D	mg/L	40	57.5	HH DW (HQ=1)	0.01	0	0.0002	0.0002	ND	0.0019	0.00055	0.00027
Barium	D	mg/L	40	100	HH DW (HQ=1)	2.6	0			0.027	0.11	0.048	0.036
Beryllium	D	mg/L	40	12.5	HH DW (HQ=1)	0.073	0	0.0003	0.001	ND	0.00089		
Boron	D	mg/L	40	87.5	HH DW (HQ=1)	3.3	0	0.0063	0.033	ND	0.13	0.047	0.044
Cadmium	D	mg/L	40	25	HH DW (HQ=1)	0.018	0	0.0001	0.0002	ND	0.0014		
Calcium	D	mg/L	40	100	No SLC					30.2	190	83.6	60.8
Chromium	D	mg/L	40	25	HH DW (HQ=1)	0.1	0	0.0011	0.0057	ND	0.0035		
Cobalt	D	mg/L	40	55	HH DW (HQ=1)	0.73	0	0.0029	0.0031	ND	0.013	0.0046	0.0032
Copper	D	mg/L	40	45	HH DW (HQ=1)	1.4	0	0.0003	0.015	ND	0.0058		
Iron	D	mg/L	40	2.5	HH DW (HQ=1)	11	0	0.028	0.28	ND	0.2		
Lead	D	mg/L	40	10	HH DW (HQ=1)	0.015	0	0.0001	0.0002	ND	0.0035		
Magnesium	D	mg/L	40	100	No SLC					9.3	34.1	16.8	12.8

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-9

Groundwater/Surface Water Interaction - Piezometers GSI 1

RI/FS Red River

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Manganese	D	mg/L	40	97.5	HH DW (HQ=1)	1.7	0	0.0012	0.0012	ND	1.1	0.19	0.0085
Mercury	D	mg/L	1	0	HH DW (HQ=1)	0.011	0	0.0001	0.0001	ND	ND		
Molybdenum	D	mg/L	40	72.5	HH DW (HQ=1)	0.18	34.5	0.0012	0.011	ND	0.57	0.16	0.09
Nickel	D	mg/L	40	65	HH DW (HQ=1)	0.73	0	0.0016	0.0028	ND	0.026	0.0063	0.0022
Potassium	D	mg/L	40	72.5	No SLC			0.52	3.1	ND	3.7	1.9	1.6
Selenium	D	mg/L	40	80	HH DW (HQ=1)	0.18	0	0.0003	0.0003	ND	0.00099	0.00046	0.00048
Silver	D	mg/L	40	0	HH DW (HQ=1)	0.18	0	0.0001	0.0001	ND	ND		
Sodium	D	mg/L	40	100	No SLC					5.3	62.6	31.5	31.6
Thallium	D	mg/L	40	0	HH DW (HQ=1)	0.0026	0	0.0001	0.0001	ND	ND		
Vanadium	D	mg/L	40	80	HH DW (HQ=1)	0.26	0	0.0001	0.0001	ND	0.0065	0.0018	0.00065
Zinc	D	mg/L	40	97.5	HH DW (HQ=1)	11	0	0.025	0.025	ND	1	0.19	0.061

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-10

Groundwater/Surface Water Interaction - Sediment GSI 1

RI/FS Reference Upper Red River - Zwergle

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Inorganics													
Ammonia	T	mg/kg-dry	1	100	No SLC					12.6	12.6	12.6	12.6
Cation-Exchange Capacity	T	meq/100g	1	100	No SLC					10	10	10	10
Chloride	T	mg/kg-dry	1	100	No SLC					4.2	4.2	4.2	4.2
Fluoride	T	mg/kg-dry	1	0	HH Soil (HQ=1)	3700	0	0.25	0.25	ND	ND		
Nitrate	T	mg/kg-dry	1	0	No SLC			2.5	2.5	ND	ND		
Organic Soils	T	%	1	100	No SLC					1.9	1.9	1.9	1.9
pH	T	SU	1	100	No SLC					7.1	7.1	7.1	7.1
Phosphorus	T	mg/kg-dry	1	100	No SLC					810	810	810	810
Sodium Absorption Ratio	T	ratio	1	0	No SLC			0.06	0.06	ND	ND		
Solids, Percent	T	%	1	100	No SLC					82.7	82.7	82.7	82.7
Specific Conductance	T	umhos/cm	1	100	No SLC					133	133	133	133
Sulfate	T	mg/kg-dry	1	100	No SLC					24.1	24.1	24.1	24.1
Total Kjeldahl Nitrogen	T	mg/kg-dry	1	100	No SLC					103	103	103	103
Total Organic Carbon	T	mg/kg-dry	1	100	No SLC					280	280	280	280
Metals													
Aluminum	T	mg/kg-dry	1	100	HH Soil (HQ=1)	76000	0			8230	8230	8230	8230
Aluminum	T	mg/kg-dry	1	100	ECO Sed	25500	0			8230	8230	8230	8230
Antimony	T	mg/kg-dry	1	0	HH Soil (HQ=1)	31	0	0.5	0.5	ND	ND		
Antimony	T	mg/kg-dry	1	0	ECO Sed	2	0	0.5	0.5	ND	ND		
Arsenic	T	mg/kg-dry	1	100	HH Soil (HQ=1)	0.39	100			0.94	0.94	0.94	0.94
Arsenic	T	mg/kg-dry	1	100	ECO Sed	5.9	0			0.94	0.94	0.94	0.94
Barium	T	mg/kg-dry	1	100	HH Soil (HQ=1)	5500	0			98.2	98.2	98.2	98.2
Beryllium	T	mg/kg-dry	1	100	HH Soil (HQ=1)	150	0			0.44	0.44	0.44	0.44
Boron	T	mg/kg-dry	1	0	HH Soil (HQ=1)	5500	0	0.89	0.89	ND	ND		
Cadmium	T	mg/kg-dry	1	100	HH Soil (HQ=1)	39	0			0.16	0.16	0.16	0.16
Cadmium	T	mg/kg-dry	1	100	ECO Sed	0.6	0			0.16	0.16	0.16	0.16

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-10

Groundwater/Surface Water Interaction - Sediment GSI 1

RI/FS Reference Upper Red River - Zwergle

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Calcium	T	mg/kg-dry	1	100	No SLC					5720	5720	5720	5720
Chromium	T	mg/kg-dry	1	100	HH Soil (HQ=1)	210	0			16.7	16.7	16.7	16.7
Chromium	T	mg/kg-dry	1	100	ECO Sed	37.3	0			16.7	16.7	16.7	16.7
Cobalt	T	mg/kg-dry	1	100	HH Soil (HQ=1)	900	0			8.6	8.6	8.6	8.6
Cobalt	T	mg/kg-dry	1	100	ECO Sed	50	0			8.6	8.6	8.6	8.6
Copper	T	mg/kg-dry	1	100	ECO Sed	35.7	0			17.2	17.2	17.2	17.2
Copper	T	mg/kg-dry	1	100	HH Soil (HQ=1)	2900	0			17.2	17.2	17.2	17.2
Iron	T	mg/kg-dry	1	100	ECO Sed	20000	0			18200	18200	18200	18200
Iron	T	mg/kg-dry	1	100	HH Soil (HQ=1)	23000	0			18200	18200	18200	18200
Lead	T	mg/kg-dry	1	100	HH Soil (HQ=1)	400	0			9.7	9.7	9.7	9.7
Lead	T	mg/kg-dry	1	100	ECO Sed	35	0			9.7	9.7	9.7	9.7
Magnesium	T	mg/kg-dry	1	100	No SLC					5280	5280	5280	5280
Manganese	T	mg/kg-dry	1	100	ECO Sed	460	100			642	642	642	642
Manganese	T	mg/kg-dry	1	100	HH Soil (HQ=1)	3200	0			642	642	642	642
Mercury	T	mg/kg-dry	1	0	ECO Sed	0.17	0	0.016	0.016	ND	ND		
Mercury	T	mg/kg-dry	1	0	HH Soil (HQ=1)	23	0	0.016	0.016	ND	ND		
Molybdenum	T	mg/kg-dry	1	100	HH Soil (HQ=1)	390	0			0.49	0.49	0.49	0.49
Nickel	T	mg/kg-dry	1	100	ECO Sed	18	0			14.2	14.2	14.2	14.2
Nickel	T	mg/kg-dry	1	100	HH Soil (HQ=1)	1600	0			14.2	14.2	14.2	14.2
Potassium	T	mg/kg-dry	1	100	No SLC					1260	1260	1260	1260
Selenium	T	mg/kg-dry	1	100	HH Soil (HQ=1)	390	0			0.36	0.36	0.36	0.36
Selenium	T	mg/kg-dry	1	100	ECO Sed	2	0			0.36	0.36	0.36	0.36
Silver	T	mg/kg-dry	1	0	ECO Sed	1	0	0.15	0.15	ND	ND		
Silver	T	mg/kg-dry	1	0	HH Soil (HQ=1)	390	0	0.15	0.15	ND	ND		
Sodium	T	mg/kg-dry	1	100	No SLC					287	287	287	287
Thallium	T	mg/kg-dry	1	0	HH Soil (HQ=1)	5.5	0	0.1	0.1	ND	ND		
Vanadium	T	mg/kg-dry	1	100	HH Soil (HQ=1)	78	0			31.7	31.7	31.7	31.7

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-10

Groundwater/Surface Water Interaction - Sediment GSI 1

RI/FS Reference Upper Red River - Zwergle

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Zinc	T	mg/kg-dry	1	100	HH Soil (HQ=1)	23000	0			54.1	54.1	54.1	54.1
Zinc	T	mg/kg-dry	1	100	ECO Sed	123	0			54.1	54.1	54.1	54.1

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-11

Groundwater/Surface Water Interaction - Sediment GSI 1

RI/FS Reference Red River Above Mine Site

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Inorganics													
Ammonia	T	mg/kg-dry	1	100	No SLC					19.8	19.8	19.8	19.8
Cation-Exchange Capacity	T	meq/100g	1	100	No SLC					6.6	6.6	6.6	6.6
Chloride	T	mg/kg-dry	1	100	No SLC					6.7	6.7	6.7	6.7
Fluoride	T	mg/kg-dry	1	100	HH Soil (HQ=1)	3700	0			1.1	1.1	1.1	1.1
Nitrate	T	mg/kg-dry	1	0	No SLC			2.7	2.7	ND	ND		
Organic Soils	T	%	1	100	No SLC					2.4	2.4	2.4	2.4
pH	T	SU	1	100	No SLC					4.8	4.8	4.8	4.8
Phosphorus	T	mg/kg-dry	1	100	No SLC					846	846	846	846
Sodium Absorption Ratio	T	ratio	1	100	No SLC					0.07	0.07	0.07	0.07
Solids, Percent	T	%	1	100	No SLC					76	76	76	76
Specific Conductance	T	umhos/cm	1	100	No SLC					276	276	276	276
Sulfate	T	mg/kg-dry	1	100	No SLC					247	247	247	247
Total Kjeldahl Nitrogen	T	mg/kg-dry	1	100	No SLC					40.9	40.9	40.9	40.9
Total Organic Carbon	T	mg/kg-dry	1	100	No SLC					233	233	233	233
Metals													
Aluminum	T	mg/kg-dry	1	100	ECO Sed	25500	0			6520	6520	6520	6520
Aluminum	T	mg/kg-dry	1	100	HH Soil (HQ=1)	76000	0			6520	6520	6520	6520
Antimony	T	mg/kg-dry	1	0	ECO Sed	2	0	0.6	0.6	ND	ND		
Antimony	T	mg/kg-dry	1	0	HH Soil (HQ=1)	31	0	0.6	0.6	ND	ND		
Arsenic	T	mg/kg-dry	1	100	ECO Sed	5.9	0			5.8	5.8	5.8	5.8
Arsenic	T	mg/kg-dry	1	100	HH Soil (HQ=1)	0.39	100			5.8	5.8	5.8	5.8
Barium	T	mg/kg-dry	1	100	HH Soil (HQ=1)	5500	0			409	409	409	409
Beryllium	T	mg/kg-dry	1	100	HH Soil (HQ=1)	150	0			0.47	0.47	0.47	0.47
Boron	T	mg/kg-dry	1	0	HH Soil (HQ=1)	5500	0	0.84	0.84	ND	ND		
Cadmium	T	mg/kg-dry	1	0	HH Soil (HQ=1)	39	0	0.17	0.17	ND	ND		
Cadmium	T	mg/kg-dry	1	0	ECO Sed	0.6	0	0.17	0.17	ND	ND		

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-11

Groundwater/Surface Water Interaction - Sediment GSI 1

RI/FS Reference Red River Above Mine Site

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Calcium	T	mg/kg-dry	1	100	No SLC					796	796	796	796
Chromium	T	mg/kg-dry	1	100	ECO Sed	37.3	0			11.7	11.7	11.7	11.7
Chromium	T	mg/kg-dry	1	100	HH Soil (HQ=1)	210	0			11.7	11.7	11.7	11.7
Cobalt	T	mg/kg-dry	1	100	HH Soil (HQ=1)	900	0			6.9	6.9	6.9	6.9
Cobalt	T	mg/kg-dry	1	100	ECO Sed	50	0			6.9	6.9	6.9	6.9
Copper	T	mg/kg-dry	1	100	HH Soil (HQ=1)	2900	0			36.1	36.1	36.1	36.1
Copper	T	mg/kg-dry	1	100	ECO Sed	35.7	100			36.1	36.1	36.1	36.1
Iron	T	mg/kg-dry	1	100	ECO Sed	20000	0			19700	19700	19700	19700
Iron	T	mg/kg-dry	1	100	HH Soil (HQ=1)	23000	0			19700	19700	19700	19700
Lead	T	mg/kg-dry	1	100	HH Soil (HQ=1)	400	0			42.9	42.9	42.9	42.9
Lead	T	mg/kg-dry	1	100	ECO Sed	35	100			42.9	42.9	42.9	42.9
Magnesium	T	mg/kg-dry	1	100	No SLC					3650	3650	3650	3650
Manganese	T	mg/kg-dry	1	100	HH Soil (HQ=1)	3200	0			266	266	266	266
Manganese	T	mg/kg-dry	1	100	ECO Sed	460	0			266	266	266	266
Mercury	T	mg/kg-dry	1	0	HH Soil (HQ=1)	23	0	0.02	0.02	ND	ND		
Mercury	T	mg/kg-dry	1	0	ECO Sed	0.17	0	0.02	0.02	ND	ND		
Molybdenum	T	mg/kg-dry	1	100	HH Soil (HQ=1)	390	0			5.3	5.3	5.3	5.3
Nickel	T	mg/kg-dry	1	100	HH Soil (HQ=1)	1600	0			13.4	13.4	13.4	13.4
Nickel	T	mg/kg-dry	1	100	ECO Sed	18	0			13.4	13.4	13.4	13.4
Potassium	T	mg/kg-dry	1	100	No SLC					1950	1950	1950	1950
Selenium	T	mg/kg-dry	1	100	HH Soil (HQ=1)	390	0			1.6	1.6	1.6	1.6
Selenium	T	mg/kg-dry	1	100	ECO Sed	2	0			1.6	1.6	1.6	1.6
Silver	T	mg/kg-dry	1	0	ECO Sed	1	0	0.2	0.2	ND	ND		
Silver	T	mg/kg-dry	1	0	HH Soil (HQ=1)	390	0	0.2	0.2	ND	ND		
Sodium	T	mg/kg-dry	1	100	No SLC					152	152	152	152
Thallium	T	mg/kg-dry	1	100	HH Soil (HQ=1)	5.5	0			0.13	0.13	0.13	0.13
Vanadium	T	mg/kg-dry	1	100	HH Soil (HQ=1)	78	0			13.2	13.2	13.2	13.2

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-11

Groundwater/Surface Water Interaction - Sediment GSI 1

RI/FS Reference Red River Above Mine Site

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Zinc	T	mg/kg-dry	1	100	ECO Sed	123	0			61.6	61.6	61.6	61.6
Zinc	T	mg/kg-dry	1	100	HH Soil (HQ=1)	23000	0			61.6	61.6	61.6	61.6

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-12

Groundwater/Surface Water Interaction - Sediment GSI 1

RI/FS Red River

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Inorganics													
Ammonia	T	mg/kg-dry	4	100	No SLC					13	24.4	17.9	17.1
Cation-Exchange Capacity	T	meq/100g	4	25	No SLC			6	6	ND	6.1		
Chloride	T	mg/kg-dry	4	100	No SLC					3.2	5	4.2	4.2
Fluoride	T	mg/kg-dry	4	100	HH Soil (HQ=1)	3700	0			0.36	0.71	0.52	0.5
Nitrate	T	mg/kg-dry	4	0	No SLC			2.5	2.6	ND	ND		
Organic Soils	T	%	4	100	No SLC					1.8	2.1	1.9	1.9
pH	T	SU	4	100	No SLC					6.4	7.2	6.9	7
Phosphorus	T	mg/kg-dry	4	100	No SLC					429	479	448	442
Sodium Absorption Ratio	T	ratio	4	100	No SLC					0.08	0.53	0.34	0.38
Solids, Percent	T	%	4	100	No SLC					78	82.1	80.5	81
Specific Conductance	T	umhos/cm	4	100	No SLC					104	217	142	124
Sulfate	T	mg/kg-dry	4	100	No SLC					25.9	121	62.9	52.3
Total Kjeldahl Nitrogen	T	mg/kg-dry	4	100	No SLC					30.7	52.9	40.6	39.4
Total Organic Carbon	T	mg/kg-dry	4	75	No SLC			125	125	ND	856	552	645
Metals													
Aluminum	T	mg/kg-dry	4	100	HH Soil (HQ=1)	76000	0			4640	5660	5060	4960
Aluminum	T	mg/kg-dry	4	100	ECO Sed	25500	0			4640	5660	5060	4960
Antimony	T	mg/kg-dry	4	0	HH Soil (HQ=1)	31	0	0.46	0.58	ND	ND		
Antimony	T	mg/kg-dry	4	0	ECO Sed	2	0	0.46	0.58	ND	ND		
Arsenic	T	mg/kg-dry	4	100	ECO Sed	5.9	0			2.1	4.9	3.7	4
Arsenic	T	mg/kg-dry	4	100	HH Soil (HQ=1)	0.39	100			2.1	4.9	3.7	4
Barium	T	mg/kg-dry	4	100	HH Soil (HQ=1)	5500	0			87.3	224	158	161
Beryllium	T	mg/kg-dry	4	100	HH Soil (HQ=1)	150	0			0.55	0.72	0.64	0.63
Boron	T	mg/kg-dry	4	0	HH Soil (HQ=1)	5500	0	0.63	0.81	ND	ND		
Cadmium	T	mg/kg-dry	4	100	ECO Sed	0.6	0			0.28	0.5	0.37	0.34
Cadmium	T	mg/kg-dry	4	100	HH Soil (HQ=1)	39	0			0.28	0.5	0.37	0.34

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-12

Groundwater/Surface Water Interaction - Sediment GSI 1

RI/FS Red River

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Calcium	T	mg/kg-dry	4	100	No SLC					1240	1490	1370	1370
Chromium	T	mg/kg-dry	4	100	HH Soil (HQ=1)	210	0			7.9	11	9.4	9.3
Chromium	T	mg/kg-dry	4	100	ECO Sed	37.3	0			7.9	11	9.4	9.3
Cobalt	T	mg/kg-dry	4	100	HH Soil (HQ=1)	900	0			5.3	7.5	6.5	6.6
Cobalt	T	mg/kg-dry	4	100	ECO Sed	50	0			5.3	7.5	6.5	6.6
Copper	T	mg/kg-dry	4	100	ECO Sed	35.7	25			27.4	40.1	32.5	31.3
Copper	T	mg/kg-dry	4	100	HH Soil (HQ=1)	2900	0			27.4	40.1	32.5	31.3
Iron	T	mg/kg-dry	4	100	ECO Sed	20000	0			11900	16000	13500	13100
Iron	T	mg/kg-dry	4	100	HH Soil (HQ=1)	23000	0			11900	16000	13500	13100
Lead	T	mg/kg-dry	4	100	HH Soil (HQ=1)	400	0			24.8	40.3	32.2	31.9
Lead	T	mg/kg-dry	4	100	ECO Sed	35	25			24.8	40.3	32.2	31.9
Magnesium	T	mg/kg-dry	4	100	No SLC					2460	2990	2710	2690
Manganese	T	mg/kg-dry	4	100	HH Soil (HQ=1)	3200	0			265	436	371	391
Manganese	T	mg/kg-dry	4	100	ECO Sed	460	0			265	436	371	391
Mercury	T	mg/kg-dry	4	0	HH Soil (HQ=1)	23	0	0.017	0.019	ND	ND		
Mercury	T	mg/kg-dry	4	0	ECO Sed	0.17	0	0.017	0.019	ND	ND		
Molybdenum	T	mg/kg-dry	4	100	HH Soil (HQ=1)	390	0			4.9	8.8	5.9	5
Nickel	T	mg/kg-dry	4	100	HH Soil (HQ=1)	1600	0			20.4	25.4	22.5	22.1
Nickel	T	mg/kg-dry	4	100	ECO Sed	18	100			20.4	25.4	22.5	22.1
Potassium	T	mg/kg-dry	4	100	No SLC					1220	1430	1320	1320
Selenium	T	mg/kg-dry	4	75	ECO Sed	2	0	0.34	0.34	ND	0.93	0.59	0.63
Selenium	T	mg/kg-dry	4	75	HH Soil (HQ=1)	390	0	0.34	0.34	ND	0.93	0.59	0.63
Silver	T	mg/kg-dry	4	0	HH Soil (HQ=1)	390	0	0.15	0.18	ND	ND		
Silver	T	mg/kg-dry	4	0	ECO Sed	1	0	0.15	0.18	ND	ND		
Sodium	T	mg/kg-dry	4	100	No SLC					89.2	93	90.8	90.5
Thallium	T	mg/kg-dry	4	0	HH Soil (HQ=1)	5.5	0	0.092	0.12	ND	ND		
Vanadium	T	mg/kg-dry	4	100	HH Soil (HQ=1)	78	0			9.5	11.4	10.2	10

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-12

Groundwater/Surface Water Interaction - Sediment GSI 1

RI/FS Red River

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Zinc	T	mg/kg-dry	4	100	HH Soil (HQ=1)	23000	0			136	175	153	151
Zinc	T	mg/kg-dry	4	100	ECO Sed	123	100			136	175	153	151

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-13

Groundwater/Surface Water Interaction - Surface Water GSI 2

RI/FS Reference Upper Red River - Zwergle

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Field													
DO	T	mg/L	3	NA	No SLC					9.5	11.9	10.5	10
Eh	T	millivolts	3	NA	No SLC					145	382	246	211
pH	T	SU	3	NA	No SLC					8	8.2	8.1	8.1
Specific Conductance	T	uS/cm	3	NA	No SLC					129	142	136	138
Temperature	T	Celsius	3	NA	No SLC					1	2	1.6	1.7
Turbidity	T	NTU	2	NA	No SLC					4.1	8.7	6.4	6.4
Inorganics													
Hardness	D	mg/L	3	100	No SLC					95.9	107	101	99.7
Ammonia	T	mg/L	3	33.3	No SLC			0.044	0.058	ND	0.047		
Bicarbonate (as CaCO3)	T	mg/L	3	100	No SLC					87	90.8	88.4	87.5
Biochemical Oxygen Demand	T	mg/L	3	0	No SLC			1.4	1.4	ND	ND		
Carbonate (as CaCO3)	T	mg/L	3	0	No SLC			1	1	ND	ND		
Chemical Oxygen Demand	T	mg/L	3	0	No SLC			20	20	ND	ND		
Chloride	T	mg/L	3	100	ECO Chronic	230	0			2.1	11.9	5.5	2.4
Chloride	T	mg/L	3	100	HH DW (HQ=1)	250	0			2.1	11.9	5.5	2.4
Cyanide	T	mg/L	3	0	HH DW (HQ=1)	0.73	0	0.01	0.01	ND	ND		
Cyanide	T	mg/L	3	0	ECO Chronic	0.0052	0	0.01	0.01	ND	ND		
Fluoride	T	mg/L	3	0	HH DW (HQ=1)	2.2	0	0.1	0.1	ND	ND		
Hardness	T	mg/L	3	100	No SLC					98.2	106	101	98.7
Hydroxide (as CaCO3)	T	mg/L	3	0	No SLC			1	1	ND	ND		
Nitrate	T	mg/L	3	66.7	HH DW (HQ=1)	10	0	0.2	0.2	ND	0.48	0.35	0.47
Nitrite	T	mg/L	3	0	HH DW (HQ=1)	1	0	0.005	0.005	ND	ND		
pH	T	SU	3	100	No SLC					7.4	7.6	7.5	7.6
Phosphate, Ortho As P	T	mg/L	3	33.3	No SLC			0.01	0.01	ND	0.021		
Phosphorus	T	mg/L	3	100	No SLC					0.013	0.016	0.015	0.016
Specific Conductance	T	umhos/cm	3	100	No SLC					151	165	157	155

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-13

Groundwater/Surface Water Interaction - Surface Water GSI 2

RI/FS Reference Upper Red River - Zwergle

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Sulfate	T	mg/L	3	100	HH DW (HQ=1)	1500	0			14.6	15.4	15.1	15.3
Total Alkalinity	T	mg/L	3	100	No SLC					87	90.8	88.4	87.5
Total Dissolved Solids	T	mg/L	3	100	No SLC					122	162	145	150
Total Kjeldahl Nitrogen	T	mg/L	3	0	No SLC			0.24	0.24	ND	ND		
Total Organic Carbon	T	mg/L	3	0	No SLC			1.5	2.6	ND	ND		
Total Suspended Solids	T	mg/L	3	100	No SLC					3	4.3	3.7	3.9
Metals													
Aluminum	D	mg/L	3	0	HH DW (HQ=1)	37	0	0.018	0.062	ND	ND		
Antimony	D	mg/L	3	0	ECO Chronic	0.69	0	0.0004	0.0004	ND	ND		
Antimony	D	mg/L	3	0	HH DW (HQ=1)	0.015	0	0.0004	0.0004	ND	ND		
Arsenic	D	mg/L	3	0	ECO Chronic	0.15	0	0.0002	0.0002	ND	ND		
Arsenic	D	mg/L	3	0	HH DW (HQ=1)	0.01	0	0.0002	0.0002	ND	ND		
Barium	D	mg/L	3	100	HH DW (HQ=1)	2.6	0			0.037	0.039	0.038	0.038
Barium	D	mg/L	3	100	ECO Chronic	0.004	100			0.037	0.039	0.038	0.038
Beryllium	D	mg/L	3	0	ECO Chronic	0.0053	0	0.0002	0.001	ND	ND		
Beryllium	D	mg/L	3	0	HH DW (HQ=1)	0.073	0	0.0002	0.001	ND	ND		
Boron	D	mg/L	3	33.3	HH DW (HQ=1)	3.3	0	0.0025	0.012	ND	0.0031		
Boron	D	mg/L	3	33.3	ECO Chronic	0.0016	100	0.0025	0.012	ND	0.0031		
Cadmium	D	mg/L	3	0	ECO Chronic	0.00025	0	0.0002	0.0002	ND	ND		
Cadmium	D	mg/L	3	0	HH DW (HQ=1)	0.018	0	0.0002	0.0002	ND	ND		
Calcium	D	mg/L	3	100	No SLC					30.3	34.2	32.1	31.7
Chromium	D	mg/L	3	33.3	HH DW (HQ=1)	0.1	0	0.00069	0.0008	ND	0.00089		
Chromium	D	mg/L	3	33.3	ECO Chronic	0.074	0	0.00069	0.0008	ND	0.00089		
Cobalt	D	mg/L	3	66.7	ECO Chronic	1.5	0	0.0037	0.0037	ND	0.0051	0.0033	0.0029
Cobalt	D	mg/L	3	66.7	HH DW (HQ=1)	0.73	0	0.0037	0.0037	ND	0.0051	0.0033	0.0029
Copper	D	mg/L	3	66.7	ECO Chronic	0.009	0	0.0008	0.0008	ND	0.0013	0.00088	0.00095
Copper	D	mg/L	3	66.7	HH DW (HQ=1)	1.4	0	0.0008	0.0008	ND	0.0013	0.00088	0.00095

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-13

Groundwater/Surface Water Interaction - Surface Water GSI 2

RI/FS Reference Upper Red River - Zwergle

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Iron	D	mg/L	3	0	HH DW (HQ=1)	11	0	0.019	0.042	ND	ND		
Lead	D	mg/L	3	0	ECO Chronic	0.0025	0	0.0004	0.0004	ND	ND		
Lead	D	mg/L	3	0	HH DW (HQ=1)	0.015	0	0.0004	0.0004	ND	ND		
Magnesium	D	mg/L	3	100	No SLC					4.9	5.2	5	5
Manganese	D	mg/L	3	100	HH DW (HQ=1)	1.7	0			0.0081	0.0088	0.0084	0.0083
Manganese	D	mg/L	3	100	ECO Chronic	1.7	0			0.0081	0.0088	0.0084	0.0083
Mercury	D	mg/L	3	0	ECO Chronic	0.00077	0	0.0001	0.0001	ND	ND		
Mercury	D	mg/L	3	0	HH DW (HQ=1)	0.011	0	0.0001	0.0001	ND	ND		
Molybdenum	D	mg/L	3	0	ECO Chronic	2.2	0	0.0013	0.003	ND	ND		
Molybdenum	D	mg/L	3	0	HH DW (HQ=1)	0.18	0	0.0013	0.003	ND	ND		
Nickel	D	mg/L	3	66.7	ECO Chronic	0.052	0	0.0009	0.0009	ND	0.0015	0.001	0.0011
Nickel	D	mg/L	3	66.7	HH DW (HQ=1)	0.73	0	0.0009	0.0009	ND	0.0015	0.001	0.0011
Potassium	D	mg/L	3	66.7	No SLC			1.1	1.1	ND	0.9	0.56	0.55
Selenium	D	mg/L	3	0	ECO Chronic	0.046	0	0.0007	0.0007	ND	ND		
Selenium	D	mg/L	3	0	HH DW (HQ=1)	0.18	0	0.0007	0.0007	ND	ND		
Silver	D	mg/L	3	0	ECO Chronic	0.00032	0	0.0001	0.0001	ND	ND		
Silver	D	mg/L	3	0	HH DW (HQ=1)	0.18	0	0.0001	0.0001	ND	ND		
Sodium	D	mg/L	3	66.7	No SLC			3.7	3.7	ND	3.3	2.8	3.2
Thallium	D	mg/L	3	0	HH DW (HQ=1)	0.0026	0	0.0001	0.00011	ND	ND		
Vanadium	D	mg/L	3	33.3	HH DW (HQ=1)	0.26	0	0.00045	0.00046	ND	0.00026		
Vanadium	D	mg/L	3	33.3	ECO Chronic	0.019	0	0.00045	0.00046	ND	0.00026		
Zinc	D	mg/L	3	0	HH DW (HQ=1)	11	0	0.0015	0.0091	ND	ND		
Zinc	D	mg/L	3	0	ECO Chronic	0.12	0	0.0015	0.0091	ND	ND		
Aluminum	T	mg/L	3	66.7	HH DW (HQ=1)	37	0	0.059	0.059	ND	0.081	0.055	0.055
Aluminum	T	mg/L	3	66.7	ECO Chronic	0.087	0	0.059	0.059	ND	0.081	0.055	0.055
Antimony	T	mg/L	3	0	HH DW (HQ=1)	0.015	0	0.0004	0.0004	ND	ND		
Arsenic	T	mg/L	3	0	HH DW (HQ=1)	0.01	0	0.0002	0.0002	ND	ND		

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-13

Groundwater/Surface Water Interaction - Surface Water GSI 2

RI/FS Reference Upper Red River - Zwergle

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Barium	T	mg/L	3	100	HH DW (HQ=1)	2.6	0			0.038	0.04	0.039	0.04
Beryllium	T	mg/L	3	0	HH DW (HQ=1)	0.073	0	0.0002	0.001	ND	ND		
Boron	T	mg/L	3	33.3	HH DW (HQ=1)	3.3	0	0.0029	0.012	ND	0.004		
Cadmium	T	mg/L	3	0	HH DW (HQ=1)	0.018	0	0.0002	0.0002	ND	ND		
Calcium	T	mg/L	3	100	No SLC					31.1	34	32.1	31.3
Chromium	T	mg/L	3	33.3	HH DW (HQ=1)	0.1	0	0.00075	0.0008	ND	0.00064		
Cobalt	T	mg/L	3	0	HH DW (HQ=1)	0.73	0	0.0011	0.0037	ND	ND		
Copper	T	mg/L	3	66.7	HH DW (HQ=1)	1.4	0	0.0008	0.0008	ND	0.0016	0.0011	0.0013
Iron	T	mg/L	3	66.7	HH DW (HQ=1)	11	0	0.082	0.082	ND	0.073	0.05	0.041
Iron	T	mg/L	3	66.7	ECO Chronic	1	0	0.082	0.082	ND	0.073	0.05	0.041
Lead	T	mg/L	3	0	HH DW (HQ=1)	0.015	0	0.0004	0.0004	ND	ND		
Magnesium	T	mg/L	3	100	No SLC					5	5.2	5	5
Manganese	T	mg/L	3	100	HH DW (HQ=1)	1.7	0			0.0075	0.011	0.0087	0.0077
Mercury	T	mg/L	3	0	HH DW (HQ=1)	0.011	0	0.0001	0.0001	ND	ND		
Molybdenum	T	mg/L	3	0	HH DW (HQ=1)	0.18	0	0.0015	0.003	ND	ND		
Nickel	T	mg/L	3	33.3	HH DW (HQ=1)	0.73	0	0.0009	0.0009	ND	0.0011		
Potassium	T	mg/L	3	66.7	No SLC			1.1	1.1	ND	0.95	0.64	0.55
Selenium	T	mg/L	3	0	HH DW (HQ=1)	0.18	0	0.0007	0.0007	ND	ND		
Silver	T	mg/L	3	0	HH DW (HQ=1)	0.18	0	0.0001	0.0001	ND	ND		
Sodium	T	mg/L	3	66.7	No SLC			3.8	3.8	ND	3.2	2.7	3.2
Thallium	T	mg/L	3	0	HH DW (HQ=1)	0.0026	0	0.0001	0.00011	ND	ND		
Vanadium	T	mg/L	3	33.3	HH DW (HQ=1)	0.037	0	0.00051	0.00056	ND	0.00034		
Zinc	T	mg/L	3	0	HH DW (HQ=1)	11	0	0.0015	0.0091	ND	ND		

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-14

Groundwater/Surface Water Interaction - Surface Water GSI 2

RI/FS Reference Red River Above Mine Site

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Field													
DO	T	mg/L	2	NA	No SLC					8.3	10.6	9.4	9.4
Eh	T	millivolts	3	NA	No SLC					142	172	154	147
pH	T	SU	3	NA	No SLC					7.7	8.1	7.9	8.1
Specific Conductance	T	uS/cm	3	NA	No SLC					210	223	218	221
Temperature	T	Celsius	3	NA	No SLC					7.9	8.5	8.1	8.1
Turbidity	T	NTU	3	NA	No SLC					7.8	9.1	8.4	8.2
Inorganics													
Hardness	D	mg/L	3	100	No SLC					121	129	125	124
Ammonia	T	mg/L	3	33.3	No SLC			0.067	0.09	ND	0.051		
Bicarbonate (as CaCO3)	T	mg/L	3	100	No SLC					69.1	72.3	71.1	71.8
Biochemical Oxygen Demand	T	mg/L	3	0	No SLC			1.4	1.4	ND	ND		
Carbonate (as CaCO3)	T	mg/L	3	0	No SLC			1	1	ND	ND		
Chemical Oxygen Demand	T	mg/L	3	0	No SLC			20	20	ND	ND		
Chloride	T	mg/L	3	100	HH DW (HQ=1)	250	0			4.2	5.5	5	5.3
Chloride	T	mg/L	3	100	ECO Chronic	230	0			4.2	5.5	5	5.3
Cyanide	T	mg/L	3	0	ECO Chronic	0.0052	0	0.01	0.01	ND	ND		
Cyanide	T	mg/L	3	0	HH DW (HQ=1)	0.73	0	0.01	0.01	ND	ND		
Fluoride	T	mg/L	3	100	HH DW (HQ=1)	2.2	0			0.26	0.27	0.26	0.26
Hardness	T	mg/L	3	100	No SLC					122	130	125	123
Hydroxide (as CaCO3)	T	mg/L	3	0	No SLC			1	1	ND	ND		
Nitrate	T	mg/L	3	66.7	HH DW (HQ=1)	10	0	0.2	0.2	ND	0.49	0.34	0.44
Nitrite	T	mg/L	3	0	HH DW (HQ=1)	1	0	0.005	0.005	ND	ND		
pH	T	SU	3	100	No SLC					6.9	7.4	7.2	7.4
Phosphate, Ortho As P	T	mg/L	3	0	No SLC			0.01	0.01	ND	ND		
Phosphorus	T	mg/L	3	100	No SLC					0.044	0.06	0.053	0.054
Specific Conductance	T	umhos/cm	3	100	No SLC					206	226	213	208

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-14

Groundwater/Surface Water Interaction - Surface Water GSI 2

RI/FS Reference Red River Above Mine Site

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Sulfate	T	mg/L	3	100	HH DW (HQ=1)	1500	0			48.3	54.6	52.3	54.1
Total Alkalinity	T	mg/L	3	100	No SLC					69.1	72.3	71.1	71.8
Total Dissolved Solids	T	mg/L	3	100	No SLC					168	188	181	188
Total Kjeldahl Nitrogen	T	mg/L	3	33.3	No SLC			0.24	0.25	ND	0.26		
Total Organic Carbon	T	mg/L	3	0	No SLC			1.6	2.7	ND	ND		
Total Suspended Solids	T	mg/L	3	100	No SLC					8.5	14.1	10.4	8.5
Metals													
Aluminum	D	mg/L	3	66.7	HH DW (HQ=1)	37	0	0.12	0.12	ND	0.11	0.073	0.062
Antimony	D	mg/L	3	0	HH DW (HQ=1)	0.015	0	0.0004	0.0004	ND	ND		
Antimony	D	mg/L	3	0	ECO Chronic	0.69	0	0.0004	0.0004	ND	ND		
Arsenic	D	mg/L	3	0	ECO Chronic	0.15	0	0.0002	0.0002	ND	ND		
Arsenic	D	mg/L	3	0	HH DW (HQ=1)	0.01	0	0.0002	0.0002	ND	ND		
Barium	D	mg/L	3	100	HH DW (HQ=1)	2.6	0			0.036	0.039	0.037	0.036
Barium	D	mg/L	3	100	ECO Chronic	0.004	100			0.036	0.039	0.037	0.036
Beryllium	D	mg/L	3	0	ECO Chronic	0.0053	0	0.00022	0.00056	ND	ND		
Beryllium	D	mg/L	3	0	HH DW (HQ=1)	0.073	0	0.00022	0.00056	ND	ND		
Boron	D	mg/L	3	66.7	HH DW (HQ=1)	3.3	0	0.0061	0.0061	ND	0.0037	0.0033	0.0032
Boron	D	mg/L	3	66.7	ECO Chronic	0.0016	100	0.0061	0.0061	ND	0.0037	0.0033	0.0032
Cadmium	D	mg/L	3	0	ECO Chronic	0.00025	0	0.0002	0.0002	ND	ND		
Cadmium	D	mg/L	3	0	HH DW (HQ=1)	0.018	0	0.0002	0.0002	ND	ND		
Calcium	D	mg/L	3	100	No SLC					36.1	38.5	37.3	37.3
Chromium	D	mg/L	3	33.3	HH DW (HQ=1)	0.1	0	0.00069	0.0008	ND	0.00048		
Chromium	D	mg/L	3	33.3	ECO Chronic	0.074	0	0.00069	0.0008	ND	0.00048		
Cobalt	D	mg/L	3	100	HH DW (HQ=1)	0.73	0			0.0035	0.006	0.0047	0.0047
Cobalt	D	mg/L	3	100	ECO Chronic	1.5	0			0.0035	0.006	0.0047	0.0047
Copper	D	mg/L	3	100	ECO Chronic	0.009	0			0.004	0.0043	0.0041	0.004
Copper	D	mg/L	3	100	HH DW (HQ=1)	1.4	0			0.004	0.0043	0.0041	0.004

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-14

Groundwater/Surface Water Interaction - Surface Water GSI 2

RI/FS Reference Red River Above Mine Site

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Iron	D	mg/L	3	0	HH DW (HQ=1)	11	0	0.019	0.028	ND	ND		
Lead	D	mg/L	3	0	ECO Chronic	0.0025	0	0.0004	0.0004	ND	ND		
Lead	D	mg/L	3	0	HH DW (HQ=1)	0.015	0	0.0004	0.0004	ND	ND		
Magnesium	D	mg/L	3	100	No SLC					7.4	8	7.6	7.5
Manganese	D	mg/L	3	100	HH DW (HQ=1)	1.7	0			0.084	0.084	0.084	0.084
Manganese	D	mg/L	3	100	ECO Chronic	1.7	0			0.084	0.084	0.084	0.084
Mercury	D	mg/L	3	0	ECO Chronic	0.00077	0	0.0001	0.0001	ND	ND		
Mercury	D	mg/L	3	0	HH DW (HQ=1)	0.011	0	0.0001	0.0001	ND	ND		
Molybdenum	D	mg/L	3	33.3	ECO Chronic	2.2	0	0.0012	0.0013	ND	0.0021		
Molybdenum	D	mg/L	3	33.3	HH DW (HQ=1)	0.18	0	0.0012	0.0013	ND	0.0021		
Nickel	D	mg/L	3	100	ECO Chronic	0.052	0			0.0036	0.0051	0.0042	0.004
Nickel	D	mg/L	3	100	HH DW (HQ=1)	0.73	0			0.0036	0.0051	0.0042	0.004
Potassium	D	mg/L	3	100	No SLC					0.79	1.3	1.1	1.2
Selenium	D	mg/L	3	0	HH DW (HQ=1)	0.18	0	0.0007	0.0007	ND	ND		
Selenium	D	mg/L	3	0	ECO Chronic	0.046	0	0.0007	0.0007	ND	ND		
Silver	D	mg/L	3	0	ECO Chronic	0.00032	0	0.0001	0.0001	ND	ND		
Silver	D	mg/L	3	0	HH DW (HQ=1)	0.18	0	0.0001	0.0001	ND	ND		
Sodium	D	mg/L	3	100	No SLC					4.9	5.8	5.3	5.1
Thallium	D	mg/L	3	0	HH DW (HQ=1)	0.0026	0	0.0001	0.00014	ND	ND		
Vanadium	D	mg/L	3	0	ECO Chronic	0.019	0	0.0002	0.00023	ND	ND		
Vanadium	D	mg/L	3	0	HH DW (HQ=1)	0.26	0	0.0002	0.00023	ND	ND		
Zinc	D	mg/L	3	66.7	ECO Chronic	0.12	0	0.014	0.014	ND	0.013	0.011	0.012
Zinc	D	mg/L	3	66.7	HH DW (HQ=1)	11	0	0.014	0.014	ND	0.013	0.011	0.012
Aluminum	T	mg/L	3	100	ECO Chronic	0.087	100			0.34	0.51	0.42	0.43
Aluminum	T	mg/L	3	100	HH DW (HQ=1)	37	0			0.34	0.51	0.42	0.43
Antimony	T	mg/L	3	0	HH DW (HQ=1)	0.015	0	0.0004	0.0004	ND	ND		
Arsenic	T	mg/L	3	0	HH DW (HQ=1)	0.01	0	0.0002	0.0002	ND	ND		

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-14

Groundwater/Surface Water Interaction - Surface Water GSI 2

RI/FS Reference Red River Above Mine Site

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Barium	T	mg/L	3	100	HH DW (HQ=1)	2.6	0			0.041	0.043	0.042	0.042
Beryllium	T	mg/L	3	0	HH DW (HQ=1)	0.073	0	0.00024	0.00053	ND	ND		
Boron	T	mg/L	3	33.3	HH DW (HQ=1)	3.3	0	0.0041	0.0068	ND	0.0037		
Cadmium	T	mg/L	3	0	HH DW (HQ=1)	0.018	0	0.0002	0.0002	ND	ND		
Calcium	T	mg/L	3	100	No SLC					36.9	38.8	37.5	36.9
Chromium	T	mg/L	3	33.3	HH DW (HQ=1)	0.1	0	0.0008	0.00086	ND	0.00068		
Cobalt	T	mg/L	3	66.7	HH DW (HQ=1)	0.73	0	0.0011	0.0011	ND	0.0023	0.0014	0.0012
Copper	T	mg/L	3	100	HH DW (HQ=1)	1.4	0			0.011	0.013	0.012	0.013
Iron	T	mg/L	3	66.7	HH DW (HQ=1)	11	0	0.42	0.42	ND	0.38	0.3	0.3
Iron	T	mg/L	3	66.7	ECO Chronic	1	0	0.42	0.42	ND	0.38	0.3	0.3
Lead	T	mg/L	3	100	HH DW (HQ=1)	0.015	0			0.00041	0.00072	0.00055	0.00051
Magnesium	T	mg/L	3	100	No SLC					7.4	8.1	7.7	7.6
Manganese	T	mg/L	3	100	HH DW (HQ=1)	1.7	0			0.096	0.1	0.099	0.096
Mercury	T	mg/L	3	0	HH DW (HQ=1)	0.011	0	0.0001	0.0001	ND	ND		
Molybdenum	T	mg/L	3	33.3	HH DW (HQ=1)	0.18	0	0.0011	0.0012	ND	0.0017		
Nickel	T	mg/L	3	100	HH DW (HQ=1)	0.73	0			0.0038	0.0052	0.0045	0.0045
Potassium	T	mg/L	3	100	No SLC					0.71	1.3	1.1	1.2
Selenium	T	mg/L	3	0	HH DW (HQ=1)	0.18	0	0.0007	0.0007	ND	ND		
Silver	T	mg/L	3	0	HH DW (HQ=1)	0.18	0	0.0001	0.0001	ND	ND		
Sodium	T	mg/L	3	100	No SLC					4.8	5.9	5.3	5
Thallium	T	mg/L	3	0	HH DW (HQ=1)	0.0026	0	0.0001	0.00015	ND	ND		
Vanadium	T	mg/L	3	33.3	HH DW (HQ=1)	0.037	0	0.0002	0.00045	ND	0.0004		
Zinc	T	mg/L	3	100	HH DW (HQ=1)	11	0			0.027	0.032	0.029	0.028

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-15

Groundwater/Surface Water Interaction - Surface Water GSI 2

RI/FS Red River

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Field													
DO	T	mg/L	16	NA	No SLC					6.4	13	9.8	9.9
Eh	T	millivolts	24	NA	No SLC					16.6	332	175	179
pH	T	SU	24	NA	No SLC					6.7	8.2	7.5	7.6
Specific Conductance	T	uS/cm	24	NA	No SLC					126	284	245	254
Temperature	T	Celsius	24	NA	No SLC					6	9.2	8	7.9
Turbidity	T	NTU	24	NA	No SLC					8.4	24	11.9	11.5
Inorganics													
Hardness	D	mg/L	24	100	No SLC					117	171	142	140
Ammonia	T	mg/L	24	33.3	No SLC			0.048	0.18	ND	0.13		
Bicarbonate (as CaCO3)	T	mg/L	24	100	No SLC					52.7	68	62.6	62.5
Biochemical Oxygen Demand	T	mg/L	24	0	No SLC			1.4	1.4	ND	ND		
Carbonate (as CaCO3)	T	mg/L	24	0	No SLC			1	1	ND	ND		
Chemical Oxygen Demand	T	mg/L	24	16.7	No SLC			20	20	ND	44.7		
Chloride	T	mg/L	24	100	ECO Chronic	230	0			2.2	5	4.2	4.5
Chloride	T	mg/L	24	100	HH DW (HQ=1)	250	0			2.2	5	4.2	4.5
Cyanide	T	mg/L	24	0	HH DW (HQ=1)	0.73	0	0.01	0.01	ND	ND		
Cyanide	T	mg/L	24	0	ECO Chronic	0.0052	0	0.01	0.01	ND	ND		
Fluoride	T	mg/L	24	100	HH DW (HQ=1)	2.2	0			0.34	0.66	0.54	0.56
Hardness	T	mg/L	24	100	No SLC					116	167	142	141
Hydroxide (as CaCO3)	T	mg/L	24	0	No SLC			1	1	ND	ND		
Nitrate	T	mg/L	24	66.7	HH DW (HQ=1)	10	0	0.2	0.2	ND	0.51	0.35	0.46
Nitrite	T	mg/L	24	0	HH DW (HQ=1)	1	0	0.005	0.005	ND	ND		
pH	T	SU	24	100	No SLC					7	7.6	7.3	7.3
Phosphate, Ortho As P	T	mg/L	24	0	No SLC			0.01	0.01	ND	ND		
Phosphorus	T	mg/L	24	95.8	No SLC			0.01	0.01	ND	0.079	0.047	0.051
Specific Conductance	T	umhos/cm	24	100	No SLC					204	321	246	243

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-15

Groundwater/Surface Water Interaction - Surface Water GSI 2

RI/FS Red River

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Sulfate	T	mg/L	24	100	HH DW (HQ=1)	1500	0			47	108	78.3	78.3
Total Alkalinity	T	mg/L	24	100	No SLC					52.7	68	62.6	62.5
Total Dissolved Solids	T	mg/L	24	100	No SLC					176	334	222	211
Total Kjeldahl Nitrogen	T	mg/L	24	8.3	No SLC			0.24	0.5	ND	0.26		
Total Organic Carbon	T	mg/L	24	4.2	No SLC			1.5	8.5	ND	2.6		
Total Suspended Solids	T	mg/L	24	100	No SLC					9.7	60	19.4	17.3
Metals													
Aluminum	D	mg/L	24	95.8	HH DW (HQ=1)	37	0	0.095	0.095	ND	0.37	0.17	0.14
Antimony	D	mg/L	24	0	HH DW (HQ=1)	0.015	0	0.0004	0.0004	ND	ND		
Antimony	D	mg/L	24	0	ECO Chronic	0.69	0	0.0004	0.0004	ND	ND		
Arsenic	D	mg/L	24	0	ECO Chronic	0.15	0	0.0002	0.0002	ND	ND		
Arsenic	D	mg/L	24	0	HH DW (HQ=1)	0.01	0	0.0002	0.0002	ND	ND		
Barium	D	mg/L	24	100	ECO Chronic	0.004	100			0.029	0.039	0.033	0.033
Barium	D	mg/L	24	100	HH DW (HQ=1)	2.6	0			0.029	0.039	0.033	0.033
Beryllium	D	mg/L	24	0	ECO Chronic	0.0053	0	0.0002	0.001	ND	ND		
Beryllium	D	mg/L	24	0	HH DW (HQ=1)	0.073	0	0.0002	0.001	ND	ND		
Boron	D	mg/L	24	41.7	HH DW (HQ=1)	3.3	0	0.0035	0.012	ND	0.0086		
Boron	D	mg/L	24	41.7	ECO Chronic	0.0016	100	0.0035	0.012	ND	0.0086		
Cadmium	D	mg/L	24	25	ECO Chronic	0.00025	33.3	0.0002	0.0002	ND	0.00035		
Cadmium	D	mg/L	24	25	HH DW (HQ=1)	0.018	0	0.0002	0.0002	ND	0.00035		
Calcium	D	mg/L	24	100	No SLC					35.4	52.1	42.7	41.8
Chromium	D	mg/L	24	8.3	ECO Chronic	0.074	0	0.00055	0.0014	ND	0.00087		
Chromium	D	mg/L	24	8.3	HH DW (HQ=1)	0.1	0	0.00055	0.0014	ND	0.00087		
Cobalt	D	mg/L	24	91.7	ECO Chronic	1.5	0	0.0011	0.0011	ND	0.0086	0.0049	0.005
Cobalt	D	mg/L	24	91.7	HH DW (HQ=1)	0.73	0	0.0011	0.0011	ND	0.0086	0.0049	0.005
Copper	D	mg/L	24	100	HH DW (HQ=1)	1.4	0			0.0025	0.0065	0.0044	0.0043
Copper	D	mg/L	24	100	ECO Chronic	0.009	0			0.0025	0.0065	0.0044	0.0043

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-15

Groundwater/Surface Water Interaction - Surface Water GSI 2

RI/FS Red River

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Iron	D	mg/L	24	12.5	HH DW (HQ=1)	11	0	0.019	0.042	ND	0.056		
Lead	D	mg/L	24	0	HH DW (HQ=1)	0.015	0	0.0004	0.0004	ND	ND		
Lead	D	mg/L	24	0	ECO Chronic	0.0025	0	0.0004	0.0004	ND	ND		
Magnesium	D	mg/L	24	100	No SLC					7	10	8.6	8.5
Manganese	D	mg/L	24	100	ECO Chronic	1.7	0			0.073	0.25	0.15	0.16
Manganese	D	mg/L	24	100	HH DW (HQ=1)	1.7	0			0.073	0.25	0.15	0.16
Mercury	D	mg/L	24	0	ECO Chronic	0.00077	0	0.0001	0.0001	ND	ND		
Mercury	D	mg/L	24	0	HH DW (HQ=1)	0.011	0	0.0001	0.0001	ND	ND		
Molybdenum	D	mg/L	24	37.5	ECO Chronic	2.2	0	0.0018	0.0044	ND	0.062		
Molybdenum	D	mg/L	24	37.5	HH DW (HQ=1)	0.18	0	0.0018	0.0044	ND	0.062		
Nickel	D	mg/L	24	100	HH DW (HQ=1)	0.73	0			0.0054	0.012	0.0088	0.0088
Nickel	D	mg/L	24	100	ECO Chronic	0.052	0			0.0054	0.012	0.0088	0.0088
Potassium	D	mg/L	24	79.2	No SLC			1.1	1.1	ND	1.4	1	1.1
Selenium	D	mg/L	24	0	ECO Chronic	0.046	0	0.0007	0.0007	ND	ND		
Selenium	D	mg/L	24	0	HH DW (HQ=1)	0.18	0	0.0007	0.0007	ND	ND		
Silver	D	mg/L	24	0	ECO Chronic	0.00032	0	0.0001	0.0001	ND	ND		
Silver	D	mg/L	24	0	HH DW (HQ=1)	0.18	0	0.0001	0.0001	ND	ND		
Sodium	D	mg/L	24	100	No SLC					4.4	9.9	6.3	5.4
Thallium	D	mg/L	24	8.3	HH DW (HQ=1)	0.0026	0	0.0001	0.00012	ND	0.00011		
Vanadium	D	mg/L	24	4.2	HH DW (HQ=1)	0.26	0	0.0002	0.0005	ND	0.0003		
Vanadium	D	mg/L	24	4.2	ECO Chronic	0.019	0	0.0002	0.0005	ND	0.0003		
Zinc	D	mg/L	24	95.8	HH DW (HQ=1)	11	0	0.027	0.027	ND	0.065	0.036	0.035
Zinc	D	mg/L	24	95.8	ECO Chronic	0.12	0	0.027	0.027	ND	0.065	0.036	0.035
Aluminum	T	mg/L	24	100	HH DW (HQ=1)	37	0			0.61	2	1.3	1.4
Aluminum	T	mg/L	24	100	ECO Chronic	0.087	100			0.61	2	1.3	1.4
Antimony	T	mg/L	24	0	HH DW (HQ=1)	0.015	0	0.0004	0.0004	ND	ND		
Arsenic	T	mg/L	24	25	HH DW (HQ=1)	0.01	0	0.0002	0.0002	ND	0.00035		

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-15

Groundwater/Surface Water Interaction - Surface Water GSI 2

RI/FS Red River

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Barium	T	mg/L	24	100	HH DW (HQ=1)	2.6	0			0.035	0.048	0.039	0.038
Beryllium	T	mg/L	24	33.3	HH DW (HQ=1)	0.073	0	0.0002	0.001	ND	0.00049		
Boron	T	mg/L	24	41.7	HH DW (HQ=1)	3.3	0	0.0037	0.012	ND	0.0081		
Cadmium	T	mg/L	24	66.7	HH DW (HQ=1)	0.018	0	0.0002	0.0002	ND	0.00038	0.00023	0.00026
Calcium	T	mg/L	24	100	No SLC					34.8	50.4	42.7	42.3
Chromium	T	mg/L	24	8.3	HH DW (HQ=1)	0.1	0	0.00068	0.0014	ND	0.0008		
Cobalt	T	mg/L	24	29.2	HH DW (HQ=1)	0.73	0	0.0011	0.0037	ND	0.0028		
Copper	T	mg/L	24	100	HH DW (HQ=1)	1.4	0			0.0086	0.023	0.016	0.016
Iron	T	mg/L	24	95.8	HH DW (HQ=1)	11	0	0.38	0.38	ND	1.1	0.43	0.41
Iron	T	mg/L	24	95.8	ECO Chronic	1	4.3	0.38	0.38	ND	1.1	0.43	0.41
Lead	T	mg/L	24	100	HH DW (HQ=1)	0.015	0			0.00049	0.0031	0.00086	0.0007
Magnesium	T	mg/L	24	100	No SLC					7	10	8.6	8.5
Manganese	T	mg/L	24	100	HH DW (HQ=1)	1.7	0			0.088	0.28	0.18	0.19
Mercury	T	mg/L	24	0	HH DW (HQ=1)	0.011	0	0.0001	0.0001	ND	ND		
Molybdenum	T	mg/L	24	33.3	HH DW (HQ=1)	0.18	0	0.0019	0.0055	ND	0.049		
Nickel	T	mg/L	24	100	HH DW (HQ=1)	0.73	0			0.0069	0.014	0.0099	0.01
Potassium	T	mg/L	24	79.2	No SLC			1.1	1.1	ND	1.5	1	1.2
Selenium	T	mg/L	24	0	HH DW (HQ=1)	0.18	0	0.0007	0.0007	ND	ND		
Silver	T	mg/L	24	0	HH DW (HQ=1)	0.18	0	0.0001	0.0001	ND	ND		
Sodium	T	mg/L	24	100	No SLC					4.5	9.7	6.2	5.5
Thallium	T	mg/L	24	20.8	HH DW (HQ=1)	0.0026	0	0.0001	0.00013	ND	0.00011		
Vanadium	T	mg/L	24	37.5	HH DW (HQ=1)	0.037	0	0.0002	0.00089	ND	0.0011		
Zinc	T	mg/L	24	100	HH DW (HQ=1)	11	0			0.049	0.1	0.073	0.073

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-16

Groundwater/Surface Water Interaction - Piezometers GSI 2

RI/FS Reference Upper Red River - Zwergle

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Field													
DO	T	mg/L	6	NA	No SLC					7.6	9.1	8.5	8.5
eH	T	millivolts	9	NA	No SLC					153	382	251	213
ph	T	SU	9	NA	No SLC					7.6	8.1	7.8	7.8
Specific Conductance	T	mS/cm	9	NA	No SLC					0.15	0.16	0.16	0.15
Temperature	T	Celsius	9	NA	No SLC					3	4.4	3.6	3.5
Inorganics													
Hardness	D	mg/L	3	100	No SLC					96.1	115	104	101
Fluoride	T	mg/L	3	0	HH DW (HQ=1)	2.2	0	0.1	0.1	ND	ND		
Sulfate	T	mg/L	3	100	HH DW (HQ=1)	1500	0			15.5	18.3	16.4	15.5
Total Organic Carbon	T	mg/L	3	100	No SLC					1.9	2.6	2.2	2.2
Metals													
Aluminum	D	mg/L	3	33.3	HH DW (HQ=1)	37	0	0.05	0.061	ND	2.9		
Antimony	D	mg/L	3	0	HH DW (HQ=1)	0.015	0	0.0004	0.0004	ND	ND		
Arsenic	D	mg/L	3	33.3	HH DW (HQ=1)	0.01	0	0.0002	0.0002	ND	0.00046		
Barium	D	mg/L	3	100	HH DW (HQ=1)	2.6	0			0.047	0.085	0.06	0.048
Beryllium	D	mg/L	3	0	HH DW (HQ=1)	0.073	0	0.0002	0.0002	ND	ND		
Boron	D	mg/L	3	0	HH DW (HQ=1)	3.3	0	0.0039	0.0045	ND	ND		
Cadmium	D	mg/L	3	0	HH DW (HQ=1)	0.018	0	0.0002	0.0002	ND	ND		
Calcium	D	mg/L	3	100	No SLC					31.1	36.3	33.4	32.8
Chromium	D	mg/L	3	33.3	HH DW (HQ=1)	0.1	0	0.0008	0.0015	ND	0.0017		
Cobalt	D	mg/L	3	100	HH DW (HQ=1)	0.73	0			0.0088	0.012	0.011	0.011
Copper	D	mg/L	3	33.3	HH DW (HQ=1)	1.4	0	0.0008	0.0089	ND	0.0011		
Iron	D	mg/L	3	33.3	HH DW (HQ=1)	11	0	0.032	0.072	ND	2.5		
Lead	D	mg/L	3	33.3	HH DW (HQ=1)	0.015	0	0.0004	0.0004	ND	0.0061		
Magnesium	D	mg/L	3	100	No SLC					4.5	6	5	4.7
Manganese	D	mg/L	3	100	HH DW (HQ=1)	1.7	0			0.018	0.25	0.097	0.021

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-16

Groundwater/Surface Water Interaction - Piezometers GSI 2

RI/FS Reference Upper Red River - Zwergle

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Molybdenum	D	mg/L	3	66.7	HH DW (HQ=1)	0.18	0	0.0039	0.0039	ND	0.0017	0.0017	0.0017
Nickel	D	mg/L	3	100	HH DW (HQ=1)	0.73	0			0.0013	0.0055	0.0027	0.0014
Potassium	D	mg/L	3	100	No SLC					0.3	1.9	1	0.84
Selenium	D	mg/L	3	0	HH DW (HQ=1)	0.18	0	0.0007	0.0007	ND	ND		
Silver	D	mg/L	3	0	HH DW (HQ=1)	0.18	0	0.0001	0.0001	ND	ND		
Sodium	D	mg/L	3	66.7	No SLC			3.7	3.7	ND	3.6	2.9	3.3
Thallium	D	mg/L	3	33.3	HH DW (HQ=1)	0.0026	0	0.0001	0.0001	ND	0.00014		
Vanadium	D	mg/L	3	33.3	HH DW (HQ=1)	0.26	0	0.00072	0.00073	ND	0.0068		
Zinc	D	mg/L	3	100	HH DW (HQ=1)	11	0			0.05	0.22	0.11	0.051

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-17

Groundwater/Surface Water Interaction - Piezometers GSI 2

RI/FS Reference Red River Above Mine Site

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Field													
DO	T	mg/L	6	NA	No SLC					4.1	6.7	5.5	5.5
eH	T	millivolts	9	NA	No SLC					269	321	298	298
ph	T	SU	9	NA	No SLC					4.2	4.7	4.5	4.5
Specific Conductance	T	mS/cm	9	NA	No SLC					0.6	0.68	0.64	0.64
Temperature	T	Celsius	9	NA	No SLC					7.4	8.3	7.8	7.8
Inorganics													
Hardness	D	mg/L	3	100	No SLC					312	343	330	335
Fluoride	T	mg/L	3	100	HH DW (HQ=1)	2.2	0			1.3	1.3	1.3	1.3
Sulfate	T	mg/L	3	100	HH DW (HQ=1)	1500	0			377	393	387	391
Total Organic Carbon	T	mg/L	3	100	No SLC					2.7	3.5	3.1	3.2
Metals													
Aluminum	D	mg/L	3	100	HH DW (HQ=1)	37	0			12.6	13.3	13	13
Antimony	D	mg/L	3	0	HH DW (HQ=1)	0.015	0	0.0004	0.0004	ND	ND		
Arsenic	D	mg/L	3	0	HH DW (HQ=1)	0.01	0	0.0002	0.0002	ND	ND		
Barium	D	mg/L	3	100	HH DW (HQ=1)	2.6	0			0.0097	0.013	0.011	0.012
Beryllium	D	mg/L	3	100	HH DW (HQ=1)	0.073	0			0.0023	0.0026	0.0024	0.0024
Boron	D	mg/L	3	0	HH DW (HQ=1)	3.3	0	0.0045	0.0062	ND	ND		
Cadmium	D	mg/L	3	100	HH DW (HQ=1)	0.018	0			0.0022	0.0024	0.0023	0.0022
Calcium	D	mg/L	3	100	No SLC					84	92.4	88.9	90.2
Chromium	D	mg/L	3	0	HH DW (HQ=1)	0.1	0	0.0008	0.0021	ND	ND		
Cobalt	D	mg/L	3	100	HH DW (HQ=1)	0.73	0			0.049	0.055	0.052	0.051
Copper	D	mg/L	3	100	HH DW (HQ=1)	1.4	0			0.057	0.057	0.057	0.057
Iron	D	mg/L	3	0	HH DW (HQ=1)	11	0	0.074	0.098	ND	ND		
Lead	D	mg/L	3	33.3	HH DW (HQ=1)	0.015	0	0.0004	0.0004	ND	0.00061		
Magnesium	D	mg/L	3	100	No SLC					24.9	27.2	26.3	26.8
Manganese	D	mg/L	3	100	HH DW (HQ=1)	1.7	100			1.9	2	2	1.9

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-17

Groundwater/Surface Water Interaction - Piezometers GSI 2

RI/FS Reference Red River Above Mine Site

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Molybdenum	D	mg/L	3	33.3	HH DW (HQ=1)	0.18	0	0.001	0.0026	ND	0.0011		
Nickel	D	mg/L	3	100	HH DW (HQ=1)	0.73	0			0.099	0.11	0.1	0.1
Potassium	D	mg/L	3	100	No SLC					1	1.4	1.2	1.3
Selenium	D	mg/L	3	100	HH DW (HQ=1)	0.18	0			0.0013	0.0014	0.0013	0.0013
Silver	D	mg/L	3	0	HH DW (HQ=1)	0.18	0	0.0001	0.0001	ND	ND		
Sodium	D	mg/L	3	100	No SLC					7.9	8.1	8	8
Thallium	D	mg/L	3	33.3	HH DW (HQ=1)	0.0026	0	0.0001	0.0001	ND	0.00011		
Vanadium	D	mg/L	3	33.3	HH DW (HQ=1)	0.26	0	0.00056	0.00058	ND	0.00024		
Zinc	D	mg/L	3	100	HH DW (HQ=1)	11	0			0.55	0.59	0.56	0.56

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-18

Groundwater/Surface Water Interaction - Piezometers GSI 2

RI/FS Red River

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Field													
DO	T	mg/L	45	NA	No SLC					4.8	12.2	7.6	7.5
eH	T	millivolts	72	NA	No SLC					136	288	212	207
ph	T	SU	72	NA	No SLC					3.8	8.2	6.5	6.9
Specific Conductance	T	mS/cm	72	NA	No SLC					0.25	5.1	0.76	0.49
Temperature	T	Celsius	72	NA	No SLC					5.3	13	8.1	7.7
Inorganics													
Hardness	D	mg/L	24	100	No SLC					111	791	353	272
Fluoride	T	mg/L	24	100	HH DW (HQ=1)	2.2	37.5			0.62	3.6	1.8	1.2
Sulfate	T	mg/L	24	100	HH DW (HQ=1)	1500	0			66.5	1310	395	230
Total Organic Carbon	T	mg/L	24	100	No SLC					1.4	41.4	6.6	4
Metals													
Aluminum	D	mg/L	24	37.5	HH DW (HQ=1)	37	33.3	0.018	0.48	ND	94.9		
Antimony	D	mg/L	24	0	HH DW (HQ=1)	0.015	0	0.0004	0.0004	ND	ND		
Arsenic	D	mg/L	24	25	HH DW (HQ=1)	0.01	0	0.0002	0.0002	ND	0.0018		
Barium	D	mg/L	24	100	HH DW (HQ=1)	2.6	0			0.011	0.081	0.035	0.028
Beryllium	D	mg/L	24	29.2	HH DW (HQ=1)	0.073	0	0.0002	0.0002	ND	0.015		
Boron	D	mg/L	24	25	HH DW (HQ=1)	3.3	0	0.0018	0.083	ND	0.079		
Cadmium	D	mg/L	24	62.5	HH DW (HQ=1)	0.018	0	0.0002	0.0002	ND	0.013	0.0024	0.00029
Calcium	D	mg/L	24	100	No SLC					29.6	245	103	77.3
Chromium	D	mg/L	24	0	HH DW (HQ=1)	0.1	0	0.0008	0.0043	ND	ND		
Cobalt	D	mg/L	24	100	HH DW (HQ=1)	0.73	0			0.0097	0.18	0.043	0.016
Copper	D	mg/L	24	66.7	HH DW (HQ=1)	1.4	0	0.0008	0.0053	ND	0.92	0.15	0.0022
Iron	D	mg/L	24	25	HH DW (HQ=1)	11	66.7	0.019	0.21	ND	31.2		
Lead	D	mg/L	24	29.2	HH DW (HQ=1)	0.015	0	0.0004	0.0004	ND	0.0012		
Magnesium	D	mg/L	24	100	No SLC					9.1	56.6	23.5	17.9
Manganese	D	mg/L	24	100	HH DW (HQ=1)	1.7	25			0.015	14.1	2.3	0.036

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-18

Groundwater/Surface Water Interaction - Piezometers GSI 2

RI/FS Red River

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Molybdenum	D	mg/L	24	45.8	HH DW (HQ=1)	0.18	27.3	0.001	0.011	ND	0.5		
Nickel	D	mg/L	24	95.8	HH DW (HQ=1)	0.73	0	0.0009	0.0009	ND	0.34	0.068	0.013
Potassium	D	mg/L	24	100	No SLC					0.86	3.5	1.9	1.8
Selenium	D	mg/L	24	45.8	HH DW (HQ=1)	0.18	0	0.0007	0.0007	ND	0.0023		
Silver	D	mg/L	24	0	HH DW (HQ=1)	0.18	0	0.0001	0.0001	ND	ND		
Sodium	D	mg/L	24	100	No SLC					6.7	65.8	21.8	14.6
Thallium	D	mg/L	24	16.7	HH DW (HQ=1)	0.0026	0	0.0001	0.0001	ND	0.00021		
Vanadium	D	mg/L	24	41.7	HH DW (HQ=1)	0.26	0	0.00053	0.0013	ND	0.0064		
Zinc	D	mg/L	24	91.7	HH DW (HQ=1)	11	0	0.011	0.013	ND	3.1	0.57	0.069

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-19

Groundwater/Surface Water Interaction - Surface Water GSI 3

RI/FS Reference Upper Red River - Zwergle

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Field													
DO	T	mg/L	5	NA	No SLC					10	10.5	10.2	10.2
EH	T	millivolts	5	NA	No SLC					163	245	211	0
pH	T	SU	5	NA	No SLC					7.4	8.1	7.8	7.8
Specific Conductance	T	uS/cm	5	NA	No SLC					196	210	200	198
Temperature	T	Celsius	5	NA	No SLC					3	5.2	3.9	3.8
Turbidity	T	NTU	5	NA	No SLC					0	1.5	0.42	0.1
Inorganics													
Dissolved Organic Carbon	D	mg/L	5	0	No SLC			1	1.7	ND	ND		
Hardness	D	mg/L	5	100	No SLC					102	116	109	106
Bicarbonate (as CaCO3)	T	mg/L	5	100	No SLC					84.7	87.9	86.5	86.7
Carbonate (as CaCO3)	T	mg/L	5	0	No SLC			1	1	ND	ND		
Chloride	T	mg/L	5	100	HH DW (HQ=1)	250	0			1.2	1.5	1.4	1.4
Chloride	T	mg/L	5	100	ECO Chronic	230	0			1.2	1.5	1.4	1.4
Cyanide	T	mg/L	5	0	HH DW (HQ=1)	0.73	0	0.01	0.01	ND	ND		
Cyanide	T	mg/L	5	0	ECO Chronic	0.0052	0	0.01	0.01	ND	ND		
Fluoride	T	mg/L	5	0	HH DW (HQ=1)	2.2	0	0.1	0.1	ND	ND		
Hydroxide (as CaCO3)	T	mg/L	5	0	No SLC			1	1	ND	ND		
Nitrate+Nitrite as N	T	mg/L	5	100	No SLC					0.18	0.21	0.19	0.18
Nitrite	T	mg/L	5	0	HH DW (HQ=1)	1	0	0.005	0.005	ND	ND		
Phosphate, Ortho As P	T	mg/L	5	0	No SLC			0.01	0.01	ND	ND		
Phosphorus	T	mg/L	5	0	No SLC			0.01	0.01	ND	ND		
Sulfate	T	mg/L	5	100	HH DW (HQ=1)	1500	0			24.1	26.7	25.3	25.6
Total Alkalinity	T	mg/L	5	100	No SLC					84.7	87.9	86.5	86.7
Total Dissolved Solids	T	mg/L	5	100	No SLC					100	204	142	108
Total Organic Carbon	T	mg/L	5	0	No SLC			1	1	ND	ND		
Total Suspended Solids	T	mg/L	5	100	No SLC					0.6	2.5	1.6	1.7

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-19

Groundwater/Surface Water Interaction - Surface Water GSI 3

RI/FS Reference Upper Red River - Zwergle

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Metals													
Aluminum	D	mg/L	5	0	HH DW (HQ=1)	37	0	0.034	0.034	ND	ND		
Antimony	D	mg/L	5	0	HH DW (HQ=1)	0.015	0	0.00049	0.002	ND	ND		
Antimony	D	mg/L	5	0	ECO Chronic	0.69	0	0.00049	0.002	ND	ND		
Arsenic	D	mg/L	5	20	HH DW (HQ=1)	0.01	0	0.0001	0.0001	ND	0.00012		
Arsenic	D	mg/L	5	20	ECO Chronic	0.15	0	0.0001	0.0001	ND	0.00012		
Barium	D	mg/L	5	100	HH DW (HQ=1)	2.6	0			0.029	0.033	0.031	0.031
Barium	D	mg/L	5	100	ECO Chronic	0.004	100			0.029	0.033	0.031	0.031
Beryllium	D	mg/L	5	0	HH DW (HQ=1)	0.073	0	0.0003	0.0003	ND	ND		
Beryllium	D	mg/L	5	0	ECO Chronic	0.0053	0	0.0003	0.0003	ND	ND		
Boron	D	mg/L	5	0	HH DW (HQ=1)	3.3	0	0.0069	0.0069	ND	ND		
Boron	D	mg/L	5	0	ECO Chronic	0.0016	0	0.0069	0.0069	ND	ND		
Cadmium	D	mg/L	5	0	HH DW (HQ=1)	0.018	0	0.0001	0.0001	ND	ND		
Cadmium	D	mg/L	5	0	ECO Chronic	0.00025	0	0.0001	0.0001	ND	ND		
Calcium	D	mg/L	5	100	No SLC					33.4	38.3	35.8	34.9
Chromium	D	mg/L	5	20	ECO Chronic	0.074	0	0.0011	0.0011	ND	0.0027		
Chromium	D	mg/L	5	20	HH DW (HQ=1)	0.1	0	0.0011	0.0011	ND	0.0027		
Cobalt	D	mg/L	5	80	HH DW (HQ=1)	0.73	0	0.0031	0.0031	ND	0.0046	0.0037	0.0043
Cobalt	D	mg/L	5	80	ECO Chronic	1.5	0	0.0031	0.0031	ND	0.0046	0.0037	0.0043
Copper	D	mg/L	5	40	ECO Chronic	0.009	0	0.0003	0.0003	ND	0.00083		
Copper	D	mg/L	5	40	HH DW (HQ=1)	1.4	0	0.0003	0.0003	ND	0.00083		
Iron	D	mg/L	5	0	HH DW (HQ=1)	11	0	0.036	0.036	ND	ND		
Lead	D	mg/L	5	0	ECO Chronic	0.0025	0	0.0001	0.0001	ND	ND		
Lead	D	mg/L	5	0	HH DW (HQ=1)	0.015	0	0.0001	0.0001	ND	ND		
Magnesium	D	mg/L	5	100	No SLC					4.4	5	4.7	4.6
Manganese	D	mg/L	5	100	ECO Chronic	1.7	0			0.0055	0.01	0.0083	0.0087
Manganese	D	mg/L	5	100	HH DW (HQ=1)	1.7	0			0.0055	0.01	0.0083	0.0087

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-19

Groundwater/Surface Water Interaction - Surface Water GSI 3

RI/FS Reference Upper Red River - Zwergle

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Mercury	D	mg/L	5	0	HH DW (HQ=1)	0.011	0	0.0001	0.0001	ND	ND		
Mercury	D	mg/L	5	0	ECO Chronic	0.00077	0	0.0001	0.0001	ND	ND		
Molybdenum	D	mg/L	5	80	ECO Chronic	2.2	0	0.0016	0.0016	ND	0.00089	0.00077	0.00081
Molybdenum	D	mg/L	5	80	HH DW (HQ=1)	0.18	0	0.0016	0.0016	ND	0.00089	0.00077	0.00081
Nickel	D	mg/L	5	20	ECO Chronic	0.052	0	0.0003	0.0003	ND	0.00032		
Nickel	D	mg/L	5	20	HH DW (HQ=1)	0.73	0	0.0003	0.0003	ND	0.00032		
Potassium	D	mg/L	5	80	No SLC			1.2	1.2	ND	1.1	0.75	0.62
Selenium	D	mg/L	5	0	HH DW (HQ=1)	0.18	0	0.0003	0.0003	ND	ND		
Selenium	D	mg/L	5	0	ECO Chronic	0.046	0	0.0003	0.0003	ND	ND		
Silver	D	mg/L	5	0	HH DW (HQ=1)	0.18	0	0.0001	0.0001	ND	ND		
Silver	D	mg/L	5	0	ECO Chronic	0.00032	0	0.0001	0.0001	ND	ND		
Sodium	D	mg/L	5	100	No SLC					2.1	2.7	2.5	2.6
Thallium	D	mg/L	5	0	HH DW (HQ=1)	0.0026	0	0.0001	0.0001	ND	ND		
Vanadium	D	mg/L	5	40	HH DW (HQ=1)	0.26	0	0.0001	0.0001	ND	0.00022		
Vanadium	D	mg/L	5	40	ECO Chronic	0.019	0	0.0001	0.0001	ND	0.00022		
Zinc	D	mg/L	5	80	HH DW (HQ=1)	11	0	0.003	0.003	ND	0.0053	0.0029	0.0023
Zinc	D	mg/L	5	80	ECO Chronic	0.12	0	0.003	0.003	ND	0.0053	0.0029	0.0023
Aluminum	T	mg/L	5	40	HH DW (HQ=1)	37	0	0.034	0.035	ND	0.041		
Aluminum	T	mg/L	5	40	ECO Chronic	0.087	0	0.034	0.035	ND	0.041		
Iron	T	mg/L	5	20	HH DW (HQ=1)	11	0	0.036	0.036	ND	0.051		
Iron	T	mg/L	5	20	ECO Chronic	1	0	0.036	0.036	ND	0.051		

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-20

Groundwater/Surface Water Interaction - Surface Water GSI 3

RI/FS Reference Red River Above Mine Site

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Field													
DO	T	mg/L	5	NA	No SLC					9.1	9.7	9.4	9.4
EH	T	millivolts	5	NA	No SLC					148	330	243	0
pH	T	SU	5	NA	No SLC					6.8	8.4	7.9	7.9
Specific Conductance	T	uS/cm	5	NA	No SLC					241	269	250	247
Temperature	T	Celsius	5	NA	No SLC					6.1	9.5	7.1	6.9
Turbidity	T	NTU	5	NA	No SLC					0	13.7	4.4	3.7
Inorganics													
Dissolved Organic Carbon	D	mg/L	5	0	No SLC			1.3	1.8	ND	ND		
Hardness	D	mg/L	5	100	No SLC					118	135	129	130
Bicarbonate (as CaCO3)	T	mg/L	5	100	No SLC					72.3	78	74.4	74.1
Carbonate (as CaCO3)	T	mg/L	5	0	No SLC			1	1	ND	ND		
Chloride	T	mg/L	5	100	ECO Chronic	230	0			2.6	2.9	2.7	2.7
Chloride	T	mg/L	5	100	HH DW (HQ=1)	250	0			2.6	2.9	2.7	2.7
Cyanide	T	mg/L	5	0	ECO Chronic	0.0052	0	0.01	0.01	ND	ND		
Cyanide	T	mg/L	5	0	HH DW (HQ=1)	0.73	0	0.01	0.01	ND	ND		
Fluoride	T	mg/L	5	100	HH DW (HQ=1)	2.2	0			0.22	0.26	0.25	0.26
Hydroxide (as CaCO3)	T	mg/L	5	0	No SLC			1	1	ND	ND		
Nitrate+Nitrite as N	T	mg/L	5	100	No SLC					0.34	0.5	0.41	0.4
Nitrite	T	mg/L	5	20	HH DW (HQ=1)	1	0	0.005	0.005	ND	0.0055		
Phosphate, Ortho As P	T	mg/L	5	0	No SLC			0.01	0.01	ND	ND		
Phosphorus	T	mg/L	5	100	No SLC					0.022	0.039	0.029	0.028
Sulfate	T	mg/L	5	100	HH DW (HQ=1)	1500	0			53.5	58.3	55.3	53.9
Total Alkalinity	T	mg/L	5	100	No SLC					72.3	78	74.4	74.1
Total Dissolved Solids	T	mg/L	5	100	No SLC					138	236	174	142
Total Organic Carbon	T	mg/L	5	0	No SLC			1	1.7	ND	ND		
Total Suspended Solids	T	mg/L	5	100	No SLC					2.2	10.5	6.5	6.3

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-20

Groundwater/Surface Water Interaction - Surface Water GSI 3

RI/FS Reference Red River Above Mine Site

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Metals													
Aluminum	D	mg/L	5	80	HH DW (HQ=1)	37	0	0.15	0.15	ND	0.1	0.083	0.079
Antimony	D	mg/L	5	0	HH DW (HQ=1)	0.015	0	0.0003	0.0015	ND	ND		
Antimony	D	mg/L	5	0	ECO Chronic	0.69	0	0.0003	0.0015	ND	ND		
Arsenic	D	mg/L	5	0	HH DW (HQ=1)	0.01	0	0.0001	0.0001	ND	ND		
Arsenic	D	mg/L	5	0	ECO Chronic	0.15	0	0.0001	0.0001	ND	ND		
Barium	D	mg/L	5	100	ECO Chronic	0.004	100			0.034	0.039	0.036	0.035
Barium	D	mg/L	5	100	HH DW (HQ=1)	2.6	0			0.034	0.039	0.036	0.035
Beryllium	D	mg/L	5	20	ECO Chronic	0.0053	0	0.0003	0.0003	ND	0.00032		
Beryllium	D	mg/L	5	20	HH DW (HQ=1)	0.073	0	0.0003	0.0003	ND	0.00032		
Boron	D	mg/L	5	20	ECO Chronic	0.0016	100	0.0069	0.0069	ND	0.0073		
Boron	D	mg/L	5	20	HH DW (HQ=1)	3.3	0	0.0069	0.0069	ND	0.0073		
Cadmium	D	mg/L	5	0	ECO Chronic	0.00025	0	0.0001	0.0001	ND	ND		
Cadmium	D	mg/L	5	0	HH DW (HQ=1)	0.018	0	0.0001	0.0001	ND	ND		
Calcium	D	mg/L	5	100	No SLC					35.7	41	39	39.4
Chromium	D	mg/L	5	20	HH DW (HQ=1)	0.1	0	0.0011	0.0011	ND	0.002		
Chromium	D	mg/L	5	20	ECO Chronic	0.074	0	0.0011	0.0011	ND	0.002		
Cobalt	D	mg/L	5	80	HH DW (HQ=1)	0.73	0	0.0031	0.0031	ND	0.0075	0.0052	0.0054
Cobalt	D	mg/L	5	80	ECO Chronic	1.5	0	0.0031	0.0031	ND	0.0075	0.0052	0.0054
Copper	D	mg/L	5	100	HH DW (HQ=1)	1.4	0			0.0028	0.0039	0.0033	0.0031
Copper	D	mg/L	5	100	ECO Chronic	0.009	0			0.0028	0.0039	0.0033	0.0031
Iron	D	mg/L	5	40	HH DW (HQ=1)	11	0	0.036	0.036	ND	0.071		
Lead	D	mg/L	5	0	HH DW (HQ=1)	0.015	0	0.0001	0.0001	ND	ND		
Lead	D	mg/L	5	0	ECO Chronic	0.0025	0	0.0001	0.0001	ND	ND		
Magnesium	D	mg/L	5	100	No SLC					6.9	8	7.6	7.7
Manganese	D	mg/L	5	100	ECO Chronic	1.7	0			0.066	0.1	0.092	0.097
Manganese	D	mg/L	5	100	HH DW (HQ=1)	1.7	0			0.066	0.1	0.092	0.097

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-20

Groundwater/Surface Water Interaction - Surface Water GSI 3

RI/FS Reference Red River Above Mine Site

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Mercury	D	mg/L	5	0	HH DW (HQ=1)	0.011	0	0.0001	0.0001	ND	ND		
Mercury	D	mg/L	5	0	ECO Chronic	0.00077	0	0.0001	0.0001	ND	ND		
Molybdenum	D	mg/L	5	80	ECO Chronic	2.2	0	0.0017	0.0017	ND	0.0012	0.001	0.0011
Molybdenum	D	mg/L	5	80	HH DW (HQ=1)	0.18	0	0.0017	0.0017	ND	0.0012	0.001	0.0011
Nickel	D	mg/L	5	80	ECO Chronic	0.052	0	0.0036	0.0036	ND	0.0049	0.004	0.0042
Nickel	D	mg/L	5	80	HH DW (HQ=1)	0.73	0	0.0036	0.0036	ND	0.0049	0.004	0.0042
Potassium	D	mg/L	5	80	No SLC			1.4	1.4	ND	1.5	1.2	1.3
Selenium	D	mg/L	5	0	HH DW (HQ=1)	0.18	0	0.0003	0.0003	ND	ND		
Selenium	D	mg/L	5	0	ECO Chronic	0.046	0	0.0003	0.0003	ND	ND		
Silver	D	mg/L	5	0	HH DW (HQ=1)	0.18	0	0.0001	0.0001	ND	ND		
Silver	D	mg/L	5	0	ECO Chronic	0.00032	0	0.0001	0.0001	ND	ND		
Sodium	D	mg/L	5	100	No SLC					3.8	4.8	4.4	4.6
Thallium	D	mg/L	5	0	HH DW (HQ=1)	0.0026	0	0.0001	0.0001	ND	ND		
Vanadium	D	mg/L	5	20	ECO Chronic	0.019	0	0.0001	0.0001	ND	0.00018		
Vanadium	D	mg/L	5	20	HH DW (HQ=1)	0.26	0	0.0001	0.0001	ND	0.00018		
Zinc	D	mg/L	5	80	HH DW (HQ=1)	11	0	0.016	0.016	ND	0.032	0.02	0.02
Zinc	D	mg/L	5	80	ECO Chronic	0.12	0	0.016	0.016	ND	0.032	0.02	0.02
Aluminum	T	mg/L	5	100	ECO Chronic	0.087	100			0.2	0.62	0.34	0.33
Aluminum	T	mg/L	5	100	HH DW (HQ=1)	37	0			0.2	0.62	0.34	0.33
Iron	T	mg/L	5	100	ECO Chronic	1	0			0.12	0.84	0.34	0.26
Iron	T	mg/L	5	100	HH DW (HQ=1)	11	0			0.12	0.84	0.34	0.26

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-21

Groundwater/Surface Water Interaction - Surface Water GSI 3

RI/FS Red River

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Field													
DO	T	mg/L	20	NA	No SLC					9	10.2	9.4	9.3
EH	T	millivolts	20	NA	No SLC					50.7	343	163	0
pH	T	SU	20	NA	No SLC					7	8.5	7.7	7.8
Specific Conductance	T	uS/cm	20	NA	No SLC					242	295	274	278
Temperature	T	Celsius	20	NA	No SLC					4.8	10.6	8.2	8.2
Turbidity	T	NTU	20	NA	No SLC					0	66.6	16.4	8.9
Inorganics													
Dissolved Organic Carbon	D	mg/L	20	45	No SLC			1.1	4.8	ND	10.1		
Hardness	D	mg/L	20	100	No SLC					124	159	140	142
Bicarbonate (as CaCO3)	T	mg/L	20	100	No SLC					64.3	75.5	68	68
Carbonate (as CaCO3)	T	mg/L	20	0	No SLC			1	1	ND	ND		
Chloride	T	mg/L	20	100	HH DW (HQ=1)	250	0			1.4	3.1	2.6	2.6
Chloride	T	mg/L	20	100	ECO Chronic	230	0			1.4	3.1	2.6	2.6
Cyanide	T	mg/L	20	0	HH DW (HQ=1)	0.73	0	0.01	0.01	ND	ND		
Cyanide	T	mg/L	20	0	ECO Chronic	0.0052	0	0.01	0.01	ND	ND		
Fluoride	T	mg/L	20	100	HH DW (HQ=1)	2.2	0			0.37	0.58	0.5	0.5
Hydroxide (as CaCO3)	T	mg/L	20	0	No SLC			1	1	ND	ND		
Nitrate+Nitrite as N	T	mg/L	20	100	No SLC					0.26	0.38	0.31	0.3
Nitrite	T	mg/L	20	0	HH DW (HQ=1)	1	0	0.005	0.005	ND	ND		
Phosphate, Ortho As P	T	mg/L	20	10	No SLC			0.01	0.01	ND	0.47		
Phosphorus	T	mg/L	20	100	No SLC					0.014	0.17	0.039	0.029
Sulfate	T	mg/L	20	100	HH DW (HQ=1)	1500	0			53.5	83.2	70	70.5
Total Alkalinity	T	mg/L	20	100	No SLC					64.3	75.5	67.9	67.8
Total Dissolved Solids	T	mg/L	20	100	No SLC					128	266	191	175
Total Organic Carbon	T	mg/L	20	0	No SLC			1	2.5	ND	ND		
Total Suspended Solids	T	mg/L	20	100	No SLC					4.3	55.6	16	7

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-21

Groundwater/Surface Water Interaction - Surface Water GSI 3

RI/FS Red River

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Metals													
Aluminum	D	mg/L	20	90	HH DW (HQ=1)	37	0	0.15	0.18	ND	0.3	0.2	0.21
Antimony	D	mg/L	20	0	HH DW (HQ=1)	0.015	0	0.0003	0.0022	ND	ND		
Antimony	D	mg/L	20	0	ECO Chronic	0.69	0	0.0003	0.0022	ND	ND		
Arsenic	D	mg/L	20	0	ECO Chronic	0.15	0	0.0001	0.0001	ND	ND		
Arsenic	D	mg/L	20	0	HH DW (HQ=1)	0.01	0	0.0001	0.0001	ND	ND		
Barium	D	mg/L	20	100	HH DW (HQ=1)	2.6	0			0.029	0.041	0.034	0.034
Barium	D	mg/L	20	100	ECO Chronic	0.004	100			0.029	0.041	0.034	0.034
Beryllium	D	mg/L	20	5	HH DW (HQ=1)	0.073	0	0.0003	0.0005	ND	0.00033		
Beryllium	D	mg/L	20	5	ECO Chronic	0.0053	0	0.0003	0.0005	ND	0.00033		
Boron	D	mg/L	20	0	HH DW (HQ=1)	3.3	0	0.0067	0.008	ND	ND		
Boron	D	mg/L	20	0	ECO Chronic	0.0016	0	0.0067	0.008	ND	ND		
Cadmium	D	mg/L	20	30	HH DW (HQ=1)	0.018	0	0.0001	0.0001	ND	0.00016		
Cadmium	D	mg/L	20	30	ECO Chronic	0.00025	0	0.0001	0.0001	ND	0.00016		
Calcium	D	mg/L	20	100	No SLC					37.7	47.9	42.5	42.9
Chromium	D	mg/L	20	0	HH DW (HQ=1)	0.1	0	0.0009	0.0011	ND	ND		
Chromium	D	mg/L	20	0	ECO Chronic	0.074	0	0.0009	0.0011	ND	ND		
Cobalt	D	mg/L	20	40	ECO Chronic	1.5	0	0.0031	0.0031	ND	0.0068		
Cobalt	D	mg/L	20	40	HH DW (HQ=1)	0.73	0	0.0031	0.0031	ND	0.0068		
Copper	D	mg/L	20	95	ECO Chronic	0.009	0	0.0017	0.0017	ND	0.0046	0.0028	0.0027
Copper	D	mg/L	20	95	HH DW (HQ=1)	1.4	0	0.0017	0.0017	ND	0.0046	0.0028	0.0027
Iron	D	mg/L	20	30	HH DW (HQ=1)	11	0	0.036	0.061	ND	0.058		
Lead	D	mg/L	20	0	ECO Chronic	0.0025	0	0.0001	0.0001	ND	ND		
Lead	D	mg/L	20	0	HH DW (HQ=1)	0.015	0	0.0001	0.0001	ND	ND		
Magnesium	D	mg/L	20	100	No SLC					7.1	9.6	8.3	8.4
Manganese	D	mg/L	20	100	ECO Chronic	1.7	0			0.075	0.14	0.11	0.1
Manganese	D	mg/L	20	100	HH DW (HQ=1)	1.7	0			0.075	0.14	0.11	0.1

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-21

Groundwater/Surface Water Interaction - Surface Water GSI 3

RI/FS Red River

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Mercury	D	mg/L	20	0	ECO Chronic	0.00077	0	0.0001	0.0001	ND	ND		
Mercury	D	mg/L	20	0	HH DW (HQ=1)	0.011	0	0.0001	0.0001	ND	ND		
Molybdenum	D	mg/L	20	70	ECO Chronic	2.2	0	0.0021	0.0035	ND	0.0081	0.0022	0.002
Molybdenum	D	mg/L	20	70	HH DW (HQ=1)	0.18	0	0.0021	0.0035	ND	0.0081	0.0022	0.002
Nickel	D	mg/L	20	100	HH DW (HQ=1)	0.73	0			0.0064	0.01	0.0085	0.0085
Nickel	D	mg/L	20	100	ECO Chronic	0.052	0			0.0064	0.01	0.0085	0.0085
Potassium	D	mg/L	20	80	No SLC			1.3	1.6	ND	1.5	1.1	1.2
Selenium	D	mg/L	20	5	ECO Chronic	0.046	0	0.0003	0.0003	ND	0.00037		
Selenium	D	mg/L	20	5	HH DW (HQ=1)	0.18	0	0.0003	0.0003	ND	0.00037		
Silver	D	mg/L	20	0	ECO Chronic	0.00032	0	0.0001	0.0001	ND	ND		
Silver	D	mg/L	20	0	HH DW (HQ=1)	0.18	0	0.0001	0.0001	ND	ND		
Sodium	D	mg/L	20	100	No SLC					3.7	4.8	4.4	4.4
Thallium	D	mg/L	20	0	HH DW (HQ=1)	0.0026	0	0.0001	0.0001	ND	ND		
Vanadium	D	mg/L	20	30	ECO Chronic	0.019	0	0.0001	0.0001	ND	0.00019		
Vanadium	D	mg/L	20	30	HH DW (HQ=1)	0.26	0	0.0001	0.0001	ND	0.00019		
Zinc	D	mg/L	20	100	ECO Chronic	0.12	0			0.023	0.057	0.039	0.04
Zinc	D	mg/L	20	100	HH DW (HQ=1)	11	0			0.023	0.057	0.039	0.04
Aluminum	T	mg/L	20	100	HH DW (HQ=1)	37	0			0.38	1.6	0.71	0.76
Aluminum	T	mg/L	20	100	ECO Chronic	0.087	100			0.38	1.6	0.71	0.76
Iron	T	mg/L	20	100	ECO Chronic	1	15			0.1	1.5	0.41	0.25
Iron	T	mg/L	20	100	HH DW (HQ=1)	11	0			0.1	1.5	0.41	0.25

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-22

Groundwater/Surface Water Interaction - Chamber Water GSI 3

RI/FS Reference Upper Red River - Zwergle

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Inorganics													
Dissolved Organic Carbon	D	mg/L	5	100	No SLC					1.5	2.7	2.1	2.2
Hardness	D	mg/L	5	100	No SLC					96	109	103	104
Fluoride	T	mg/L	4	0	HH DW (HQ=1)	2.2	0	0.1	0.1	ND	ND		
Sulfate	T	mg/L	5	100	HH DW (HQ=1)	1500	0			23.2	28.9	25.6	24.8
Total Organic Carbon	T	mg/L	5	100	No SLC					1.3	2.6	1.9	1.9
Metals													
Aluminum	D	mg/L	5	0	HH DW (HQ=1)	37	0	0.034	0.047	ND	ND		
Antimony	D	mg/L	5	0	HH DW (HQ=1)	0.015	0	0.0003	0.0011	ND	ND		
Antimony	D	mg/L	5	0	ECO Chronic	0.69	0	0.0003	0.0011	ND	ND		
Arsenic	D	mg/L	5	0	ECO Chronic	0.15	0	0.0001	0.00022	ND	ND		
Arsenic	D	mg/L	5	0	HH DW (HQ=1)	0.01	0	0.0001	0.00022	ND	ND		
Barium	D	mg/L	5	100	ECO Chronic	0.004	100			0.03	0.034	0.031	0.031
Barium	D	mg/L	5	100	HH DW (HQ=1)	2.6	0			0.03	0.034	0.031	0.031
Beryllium	D	mg/L	5	0	ECO Chronic	0.0053	0	0.0003	0.0003	ND	ND		
Beryllium	D	mg/L	5	0	HH DW (HQ=1)	0.073	0	0.0003	0.0003	ND	ND		
Boron	D	mg/L	5	0	HH DW (HQ=1)	3.3	0	0.0069	0.0069	ND	ND		
Boron	D	mg/L	5	0	ECO Chronic	0.0016	0	0.0069	0.0069	ND	ND		
Cadmium	D	mg/L	5	0	HH DW (HQ=1)	0.018	0	0.0001	0.0001	ND	ND		
Cadmium	D	mg/L	5	0	ECO Chronic	0.00025	0	0.0001	0.0001	ND	ND		
Calcium	D	mg/L	5	100	No SLC					31.6	36	34.1	34.1
Chromium	D	mg/L	5	20	HH DW (HQ=1)	0.1	0	0.0009	0.0028	ND	0.0016		
Chromium	D	mg/L	5	20	ECO Chronic	0.074	0	0.0009	0.0028	ND	0.0016		
Cobalt	D	mg/L	5	0	HH DW (HQ=1)	0.73	0	0.0031	0.0031	ND	ND		
Cobalt	D	mg/L	5	0	ECO Chronic	1.5	0	0.0031	0.0031	ND	ND		
Copper	D	mg/L	5	20	HH DW (HQ=1)	1.4	0	0.0003	0.0015	ND	0.00061		
Copper	D	mg/L	5	20	ECO Chronic	0.009	0	0.0003	0.0015	ND	0.00061		

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-22

Groundwater/Surface Water Interaction - Chamber Water GSI 3

RI/FS Reference Upper Red River - Zwergle

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Iron	D	mg/L	5	0	HH DW (HQ=1)	11	0	0.036	0.043	ND	ND		
Lead	D	mg/L	5	0	HH DW (HQ=1)	0.015	0	0.0001	0.0001	ND	ND		
Lead	D	mg/L	5	0	ECO Chronic	0.0025	0	0.0001	0.0001	ND	ND		
Magnesium	D	mg/L	5	100	No SLC					4.1	4.7	4.5	4.5
Manganese	D	mg/L	5	40	HH DW (HQ=1)	1.7	0	0.001	0.001	ND	0.0014		
Manganese	D	mg/L	5	40	ECO Chronic	1.7	0	0.001	0.001	ND	0.0014		
Molybdenum	D	mg/L	5	20	HH DW (HQ=1)	0.18	0	0.00053	0.0022	ND	0.0011		
Molybdenum	D	mg/L	5	20	ECO Chronic	2.2	0	0.00053	0.0022	ND	0.0011		
Nickel	D	mg/L	5	40	HH DW (HQ=1)	0.73	0	0.0003	0.0003	ND	0.00057		
Nickel	D	mg/L	5	40	ECO Chronic	0.052	0	0.0003	0.0003	ND	0.00057		
Potassium	D	mg/L	5	100	No SLC					0.71	0.94	0.84	0.88
Selenium	D	mg/L	5	0	ECO Chronic	0.046	0	0.0003	0.0003	ND	ND		
Selenium	D	mg/L	5	0	HH DW (HQ=1)	0.18	0	0.0003	0.0003	ND	ND		
Silver	D	mg/L	5	0	ECO Chronic	0.00032	0	0.0001	0.0001	ND	ND		
Silver	D	mg/L	5	0	HH DW (HQ=1)	0.18	0	0.0001	0.0001	ND	ND		
Sodium	D	mg/L	5	100	No SLC					2.2	2.7	2.4	2.3
Thallium	D	mg/L	5	0	HH DW (HQ=1)	0.0026	0	0.0001	0.0001	ND	ND		
Vanadium	D	mg/L	5	40	ECO Chronic	0.019	0	0.0001	0.00039	ND	0.00026		
Vanadium	D	mg/L	5	40	HH DW (HQ=1)	0.26	0	0.0001	0.00039	ND	0.00026		
Zinc	D	mg/L	5	60	ECO Chronic	0.12	0	0.0019	0.0029	ND	0.0061	0.0032	0.0026
Zinc	D	mg/L	5	60	HH DW (HQ=1)	11	0	0.0019	0.0029	ND	0.0061	0.0032	0.0026

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-23

Groundwater/Surface Water Interaction - Chamber Water GSI 3

RI/FS Reference Red River Above Mine Site

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Inorganics													
Dissolved Organic Carbon	D	mg/L	5	100	No SLC					1.3	2.5	2	2.3
Hardness	D	mg/L	5	100	No SLC					151	289	252	277
Fluoride	T	mg/L	5	100	HH DW (HQ=1)	2.2	0			0.4	1.2	0.94	1.2
Sulfate	T	mg/L	5	100	HH DW (HQ=1)	1500	0			119	306	252	293
Total Organic Carbon	T	mg/L	5	100	No SLC					1.1	1.9	1.4	1.2
Metals													
Aluminum	D	mg/L	5	100	HH DW (HQ=1)	37	0			0.085	7.3	4.3	6.1
Antimony	D	mg/L	5	0	ECO Chronic	0.69	0	0.0003	0.0012	ND	ND		
Antimony	D	mg/L	5	0	HH DW (HQ=1)	0.015	0	0.0003	0.0012	ND	ND		
Arsenic	D	mg/L	5	0	ECO Chronic	0.15	0	0.0001	0.0001	ND	ND		
Arsenic	D	mg/L	5	0	HH DW (HQ=1)	0.01	0	0.0001	0.0001	ND	ND		
Barium	D	mg/L	5	100	ECO Chronic	0.004	100			0.024	0.04	0.033	0.036
Barium	D	mg/L	5	100	HH DW (HQ=1)	2.6	0			0.024	0.04	0.033	0.036
Beryllium	D	mg/L	5	80	ECO Chronic	0.0053	0	0.0003	0.0003	ND	0.0018	0.0012	0.0014
Beryllium	D	mg/L	5	80	HH DW (HQ=1)	0.073	0	0.0003	0.0003	ND	0.0018	0.0012	0.0014
Boron	D	mg/L	5	0	HH DW (HQ=1)	3.3	0	0.0069	0.0069	ND	ND		
Boron	D	mg/L	5	0	ECO Chronic	0.0016	0	0.0069	0.0069	ND	ND		
Cadmium	D	mg/L	5	100	ECO Chronic	0.00025	80			0.00025	0.0018	0.0012	0.0014
Cadmium	D	mg/L	5	100	HH DW (HQ=1)	0.018	0			0.00025	0.0018	0.0012	0.0014
Calcium	D	mg/L	5	100	No SLC					44.1	80.9	70.4	76.2
Chromium	D	mg/L	5	20	ECO Chronic	0.074	0	0.0009	0.0011	ND	0.0021		
Chromium	D	mg/L	5	20	HH DW (HQ=1)	0.1	0	0.0009	0.0011	ND	0.0021		
Cobalt	D	mg/L	5	100	ECO Chronic	1.5	0			0.0048	0.027	0.021	0.027
Cobalt	D	mg/L	5	100	HH DW (HQ=1)	0.73	0			0.0048	0.027	0.021	0.027
Copper	D	mg/L	5	100	ECO Chronic	0.009	80			0.005	0.046	0.03	0.036
Copper	D	mg/L	5	100	HH DW (HQ=1)	1.4	0			0.005	0.046	0.03	0.036

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-23

Groundwater/Surface Water Interaction - Chamber Water GSI 3

RI/FS Reference Red River Above Mine Site

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Iron	D	mg/L	5	0	HH DW (HQ=1)	11	0	0.036	0.078	ND	ND		
Lead	D	mg/L	5	80	ECO Chronic	0.0025	0	0.0001	0.0001	ND	0.00023	0.00015	0.00015
Lead	D	mg/L	5	80	HH DW (HQ=1)	0.015	0	0.0001	0.0001	ND	0.00023	0.00015	0.00015
Magnesium	D	mg/L	5	100	No SLC					9.9	21.2	18.4	21.1
Manganese	D	mg/L	5	100	ECO Chronic	1.7	0			0.35	1.4	1.1	1.3
Manganese	D	mg/L	5	100	HH DW (HQ=1)	1.7	0			0.35	1.4	1.1	1.3
Molybdenum	D	mg/L	5	20	ECO Chronic	2.2	0	0.0004	0.002	ND	0.00099		
Molybdenum	D	mg/L	5	20	HH DW (HQ=1)	0.18	0	0.0004	0.002	ND	0.00099		
Nickel	D	mg/L	5	100	HH DW (HQ=1)	0.73	0			0.017	0.079	0.058	0.066
Nickel	D	mg/L	5	100	ECO Chronic	0.052	80			0.017	0.079	0.058	0.066
Potassium	D	mg/L	5	100	No SLC					1.2	1.6	1.5	1.5
Selenium	D	mg/L	5	80	HH DW (HQ=1)	0.18	0	0.0003	0.0003	ND	0.00094	0.00062	0.00055
Selenium	D	mg/L	5	80	ECO Chronic	0.046	0	0.0003	0.0003	ND	0.00094	0.00062	0.00055
Silver	D	mg/L	5	0	ECO Chronic	0.00032	0	0.0001	0.0001	ND	ND		
Silver	D	mg/L	5	0	HH DW (HQ=1)	0.18	0	0.0001	0.0001	ND	ND		
Sodium	D	mg/L	5	100	No SLC					4.8	7.1	6.4	6.7
Thallium	D	mg/L	5	0	HH DW (HQ=1)	0.0026	0	0.0001	0.0001	ND	ND		
Vanadium	D	mg/L	5	20	ECO Chronic	0.019	0	0.0001	0.0004	ND	0.00015		
Vanadium	D	mg/L	5	20	HH DW (HQ=1)	0.26	0	0.0001	0.0004	ND	0.00015		
Zinc	D	mg/L	5	100	ECO Chronic	0.12	80			0.1	0.41	0.32	0.39
Zinc	D	mg/L	5	100	HH DW (HQ=1)	11	0			0.1	0.41	0.32	0.39

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-24

Groundwater/Surface Water Interaction - Chamber Water GSI 3

RI/FS Red River

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Inorganics													
Dissolved Organic Carbon	D	mg/L	20	100	No SLC					1	3.3	2.1	1.8
Hardness	D	mg/L	20	100	No SLC					121	447	165	149
Fluoride	T	mg/L	20	100	HH DW (HQ=1)	2.2	0			0.48	1.4	0.71	0.65
Sulfate	T	mg/L	20	100	HH DW (HQ=1)	1500	0			63.9	378	111	93.3
Total Organic Carbon	T	mg/L	20	100	No SLC					1.5	3	2.1	2.2
Metals													
Aluminum	D	mg/L	20	80	HH DW (HQ=1)	37	0	0.034	0.096	ND	0.29	0.097	0.073
Antimony	D	mg/L	20	0	ECO Chronic	0.69	0	0.0003	0.0011	ND	ND		
Antimony	D	mg/L	20	0	HH DW (HQ=1)	0.015	0	0.0003	0.0011	ND	ND		
Arsenic	D	mg/L	20	0	ECO Chronic	0.15	0	0.0001	0.0002	ND	ND		
Arsenic	D	mg/L	20	0	HH DW (HQ=1)	0.01	0	0.0001	0.0002	ND	ND		
Barium	D	mg/L	20	100	ECO Chronic	0.004	100			0.026	0.046	0.036	0.036
Barium	D	mg/L	20	100	HH DW (HQ=1)	2.6	0			0.026	0.046	0.036	0.036
Beryllium	D	mg/L	20	10	HH DW (HQ=1)	0.073	0	0.0003	0.00055	ND	0.00037		
Beryllium	D	mg/L	20	10	ECO Chronic	0.0053	0	0.0003	0.00055	ND	0.00037		
Boron	D	mg/L	20	0	HH DW (HQ=1)	3.3	0	0.0069	0.0069	ND	ND		
Boron	D	mg/L	20	0	ECO Chronic	0.0016	0	0.0069	0.0069	ND	ND		
Cadmium	D	mg/L	20	70	ECO Chronic	0.00025	57.1	0.0001	0.0001	ND	0.0011	0.00028	0.00022
Cadmium	D	mg/L	20	70	HH DW (HQ=1)	0.018	0	0.0001	0.0001	ND	0.0011	0.00028	0.00022
Calcium	D	mg/L	20	100	No SLC					36.3	137	49.9	45
Chromium	D	mg/L	20	15	ECO Chronic	0.074	0	0.0009	0.0011	ND	0.0016		
Chromium	D	mg/L	20	15	HH DW (HQ=1)	0.1	0	0.0009	0.0011	ND	0.0016		
Cobalt	D	mg/L	20	20	HH DW (HQ=1)	0.73	0	0.0031	0.0031	ND	0.0066		
Cobalt	D	mg/L	20	20	ECO Chronic	1.5	0	0.0031	0.0031	ND	0.0066		
Copper	D	mg/L	20	80	ECO Chronic	0.009	0	0.0031	0.0041	ND	0.009	0.0036	0.0034
Copper	D	mg/L	20	80	HH DW (HQ=1)	1.4	0	0.0031	0.0041	ND	0.009	0.0036	0.0034

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-24

Groundwater/Surface Water Interaction - Chamber Water GSI 3

RI/FS Red River

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Iron	D	mg/L	20	20	HH DW (HQ=1)	11	0	0.036	0.13	ND	0.082		
Lead	D	mg/L	20	5	HH DW (HQ=1)	0.015	0	0.0001	0.0001	ND	0.0001		
Lead	D	mg/L	20	5	ECO Chronic	0.0025	0	0.0001	0.0001	ND	0.0001		
Magnesium	D	mg/L	20	100	No SLC					7.4	25.8	9.9	8.9
Manganese	D	mg/L	20	100	HH DW (HQ=1)	1.7	0			0.016	0.58	0.15	0.092
Manganese	D	mg/L	20	100	ECO Chronic	1.7	0			0.016	0.58	0.15	0.092
Molybdenum	D	mg/L	20	40	HH DW (HQ=1)	0.18	0	0.0026	0.0057	ND	0.0054		
Molybdenum	D	mg/L	20	40	ECO Chronic	2.2	0	0.0026	0.0057	ND	0.0054		
Nickel	D	mg/L	20	100	HH DW (HQ=1)	0.73	0			0.0074	0.023	0.012	0.01
Nickel	D	mg/L	20	100	ECO Chronic	0.052	0			0.0074	0.023	0.012	0.01
Potassium	D	mg/L	20	100	No SLC					1	2.4	1.4	1.4
Selenium	D	mg/L	20	15	HH DW (HQ=1)	0.18	0	0.0003	0.0003	ND	0.00083		
Selenium	D	mg/L	20	15	ECO Chronic	0.046	0	0.0003	0.0003	ND	0.00083		
Silver	D	mg/L	20	0	HH DW (HQ=1)	0.18	0	0.0001	0.0001	ND	ND		
Silver	D	mg/L	20	0	ECO Chronic	0.00032	0	0.0001	0.0001	ND	ND		
Sodium	D	mg/L	20	100	No SLC					4.1	9.4	5	4.8
Thallium	D	mg/L	20	0	HH DW (HQ=1)	0.0026	0	0.0001	0.0001	ND	ND		
Vanadium	D	mg/L	20	25	ECO Chronic	0.019	0	0.0001	0.00038	ND	0.0002		
Vanadium	D	mg/L	20	25	HH DW (HQ=1)	0.26	0	0.0001	0.00038	ND	0.0002		
Zinc	D	mg/L	20	100	ECO Chronic	0.12	15			0.031	0.18	0.073	0.061
Zinc	D	mg/L	20	100	HH DW (HQ=1)	11	0			0.031	0.18	0.073	0.061

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-25

Groundwater/Surface Water Interaction - Piezometers GSI 3

RI/FS Reference Upper Red River - Zwergle

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Field													
DO	T	mg/L	15	NA	No SLC					3.1	7.4	5.2	5.3
pH	T	SU	15	NA	No SLC					6.3	7.9	6.9	6.8
Specific Conductance	T	mS/cm	15	NA	No SLC					0.14	0.19	0.16	0.15
Temperature	T	Celsius	15	NA	No SLC					5.3	7.5	6.3	6.5
Inorganics													
Dissolved Organic Carbon	D	mg/L	5	80	No SLC			1	1	ND	2	1.4	1.5
Hardness	D	mg/L	5	100	No SLC					97.7	123	112	111
Bicarbonate (as CaCO3)	T	mg/L	5	100	No SLC					88.4	93.6	90.9	90.4
Carbonate (as CaCO3)	T	mg/L	5	0	No SLC			1	1	ND	ND		
Fluoride	T	mg/L	5	0	HH DW (HQ=1)	2.2	0	0.1	0.1	ND	ND		
Hydroxide (as CaCO3)	T	mg/L	5	0	No SLC			1	1	ND	ND		
Sulfate	T	mg/L	5	80	HH DW (HQ=1)	1500	0	22.4	22.4	ND	27.6	22.7	26.1
Total Alkalinity	T	mg/L	5	100	No SLC					88.4	93.6	90.9	90.4
Total Organic Carbon	T	mg/L	5	80	No SLC			1	1	ND	1.8	1.4	1.7
Metals													
Aluminum	D	mg/L	5	0	HH DW (HQ=1)	37	0	0.034	0.07	ND	ND		
Antimony	D	mg/L	5	0	HH DW (HQ=1)	0.015	0	0.00031	0.0016	ND	ND		
Arsenic	D	mg/L	5	0	HH DW (HQ=1)	0.01	0	0.0001	0.00022	ND	ND		
Barium	D	mg/L	5	100	HH DW (HQ=1)	2.6	0			0.049	0.058	0.053	0.05
Beryllium	D	mg/L	5	20	HH DW (HQ=1)	0.073	0	0.0003	0.0003	ND	0.00041		
Boron	D	mg/L	5	0	HH DW (HQ=1)	3.3	0	0.0069	0.0069	ND	ND		
Cadmium	D	mg/L	5	0	HH DW (HQ=1)	0.018	0	0.0001	0.0001	ND	ND		
Calcium	D	mg/L	5	100	No SLC					31.8	40.2	36.6	36
Chromium	D	mg/L	5	20	HH DW (HQ=1)	0.1	0	0.0009	0.0011	ND	0.0013		
Cobalt	D	mg/L	5	20	HH DW (HQ=1)	0.73	0	0.0031	0.0031	ND	0.0084		
Copper	D	mg/L	5	20	HH DW (HQ=1)	1.4	0	0.0003	0.0016	ND	0.00069		

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-25

Groundwater/Surface Water Interaction - Piezometers GSI 3

RI/FS Reference Upper Red River - Zwergle

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Iron	D	mg/L	5	0	HH DW (HQ=1)	11	0	0.036	0.069	ND	ND		
Lead	D	mg/L	5	20	HH DW (HQ=1)	0.015	0	0.0001	0.0001	ND	0.00011		
Magnesium	D	mg/L	5	100	No SLC					4.4	5.6	5.1	5
Manganese	D	mg/L	5	100	HH DW (HQ=1)	1.7	0			0.1	0.3	0.17	0.16
Molybdenum	D	mg/L	5	20	HH DW (HQ=1)	0.18	0	0.00076	0.002	ND	0.0009		
Nickel	D	mg/L	5	60	HH DW (HQ=1)	0.73	0	0.0003	0.0003	ND	0.0015	0.00065	0.00064
Potassium	D	mg/L	5	100	No SLC					0.83	1.2	0.99	0.95
Selenium	D	mg/L	5	0	HH DW (HQ=1)	0.18	0	0.0003	0.0003	ND	ND		
Silver	D	mg/L	5	0	HH DW (HQ=1)	0.18	0	0.0001	0.0001	ND	ND		
Sodium	D	mg/L	5	100	No SLC					2.3	3.5	2.8	2.7
Thallium	D	mg/L	5	0	HH DW (HQ=1)	0.0026	0	0.0001	0.0001	ND	ND		
Vanadium	D	mg/L	5	60	HH DW (HQ=1)	0.26	0	0.00057	0.00058	ND	0.00076	0.00039	0.00029
Zinc	D	mg/L	5	100	HH DW (HQ=1)	11	0			0.024	0.035	0.028	0.026

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-26

Groundwater/Surface Water Interaction - Piezometers GSI 3

RI/FS Reference Red River Above Mine Site

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Field													
DO	T	mg/L	15	NA	No SLC					6	9.2	6.9	6.6
pH	T	SU	15	NA	No SLC					4	4.7	4.3	4.4
Specific Conductance	T	mS/cm	15	NA	No SLC					0.49	0.7	0.56	0.54
Temperature	T	Celsius	15	NA	No SLC					7	9.2	7.8	7.7
Inorganics													
Dissolved Organic Carbon	D	mg/L	5	60	No SLC			1	1	ND	2.1	1.1	1.1
Hardness	D	mg/L	5	100	No SLC					300	345	326	331
Bicarbonate (as CaCO3)	T	mg/L	4	0	No SLC			1	1	ND	ND		
Carbonate (as CaCO3)	T	mg/L	4	0	No SLC			1	1	ND	ND		
Fluoride	T	mg/L	5	100	HH DW (HQ=1)	2.2	0			0.94	1.7	1.5	1.7
Hydroxide (as CaCO3)	T	mg/L	4	0	No SLC			1	1	ND	ND		
Sulfate	T	mg/L	5	100	HH DW (HQ=1)	1500	0			205	406	354	387
Total Alkalinity	T	mg/L	4	0	No SLC			1	1	ND	ND		
Total Organic Carbon	T	mg/L	5	80	No SLC			1	1	ND	2.1	1.4	1.6
Metals													
Aluminum	D	mg/L	5	100	HH DW (HQ=1)	37	0			11.2	13.4	12.1	11.9
Antimony	D	mg/L	5	0	HH DW (HQ=1)	0.015	0	0.0003	0.0014	ND	ND		
Arsenic	D	mg/L	5	0	HH DW (HQ=1)	0.01	0	0.0001	0.0001	ND	ND		
Barium	D	mg/L	5	20	HH DW (HQ=1)	2.6	0	0.011	0.011	ND	0.011		
Beryllium	D	mg/L	5	100	HH DW (HQ=1)	0.073	0			0.0025	0.0028	0.0026	0.0026
Boron	D	mg/L	5	0	HH DW (HQ=1)	3.3	0	0.0069	0.0069	ND	ND		
Cadmium	D	mg/L	5	100	HH DW (HQ=1)	0.018	0			0.0019	0.0024	0.0021	0.0022
Calcium	D	mg/L	5	100	No SLC					80.6	92.5	87.9	89.1
Chromium	D	mg/L	5	40	HH DW (HQ=1)	0.1	0	0.0009	0.0015	ND	0.0023		
Cobalt	D	mg/L	5	100	HH DW (HQ=1)	0.73	0			0.035	0.04	0.037	0.038
Copper	D	mg/L	5	100	HH DW (HQ=1)	1.4	0			0.054	0.058	0.055	0.055

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-26

Groundwater/Surface Water Interaction - Piezometers GSI 3

RI/FS Reference Red River Above Mine Site

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Iron	D	mg/L	5	40	HH DW (HQ=1)	11	0	0.057	0.12	ND	0.086		
Lead	D	mg/L	5	100	HH DW (HQ=1)	0.015	0			0.00019	0.00033	0.00023	0.00021
Magnesium	D	mg/L	5	100	No SLC					23.9	27.7	25.9	26.3
Manganese	D	mg/L	5	100	HH DW (HQ=1)	1.7	100			1.8	1.9	1.9	1.9
Molybdenum	D	mg/L	5	0	HH DW (HQ=1)	0.18	0	0.0004	0.0025	ND	ND		
Nickel	D	mg/L	5	100	HH DW (HQ=1)	0.73	0			0.095	0.1	0.099	0.099
Potassium	D	mg/L	5	100	No SLC					1.3	1.7	1.4	1.4
Selenium	D	mg/L	5	100	HH DW (HQ=1)	0.18	0			0.00088	0.0016	0.0012	0.0012
Silver	D	mg/L	5	0	HH DW (HQ=1)	0.18	0	0.0001	0.0001	ND	ND		
Sodium	D	mg/L	5	100	No SLC					7.5	8.5	7.8	7.6
Thallium	D	mg/L	5	0	HH DW (HQ=1)	0.0026	0	0.0001	0.0001	ND	ND		
Vanadium	D	mg/L	5	20	HH DW (HQ=1)	0.26	0	0.0001	0.00035	ND	0.0002		
Zinc	D	mg/L	5	100	HH DW (HQ=1)	11	0			0.52	0.56	0.54	0.55

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-27

Groundwater/Surface Water Interaction - Piezometers GSI 3

RI/FS Red River

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Field													
DO	T	mg/L	60	NA	No SLC					3.6	9.5	6.3	5.9
pH	T	SU	62	NA	No SLC					3.8	7.2	5.6	6.1
Specific Conductance	T	mS/cm	62	NA	No SLC					0.3	1.6	0.69	0.58
Temperature	T	Celsius	62	NA	No SLC					7.4	11.7	9.6	9.7
Inorganics													
Dissolved Organic Carbon	D	mg/L	20	85	No SLC			1	1	ND	4.4	1.8	1.7
Hardness	D	mg/L	20	100	No SLC					131	565	346	328
Bicarbonate (as CaCO3)	T	mg/L	20	50	No SLC			1	1	ND	67	24.3	19
Carbonate (as CaCO3)	T	mg/L	20	0	No SLC			1	1	ND	ND		
Fluoride	T	mg/L	20	100	HH DW (HQ=1)	2.2	75			0.55	8.3	4	3.5
Hydroxide (as CaCO3)	T	mg/L	20	0	No SLC			1	1	ND	ND		
Sulfate	T	mg/L	20	100	HH DW (HQ=1)	1500	0			69.6	899	403	366
Total Alkalinity	T	mg/L	20	50	No SLC			1	1	ND	67	24.3	19
Total Organic Carbon	T	mg/L	20	95	No SLC			1	1	ND	3.8	2.2	1.8
Metals													
Aluminum	D	mg/L	20	90	HH DW (HQ=1)	37	22.2	0.034	0.13	ND	66.6	20.5	11.8
Antimony	D	mg/L	20	0	HH DW (HQ=1)	0.015	0	0.0003	0.0014	ND	ND		
Arsenic	D	mg/L	20	0	HH DW (HQ=1)	0.01	0	0.0001	0.00019	ND	ND		
Barium	D	mg/L	20	100	HH DW (HQ=1)	2.6	0			0.013	0.041	0.024	0.024
Beryllium	D	mg/L	20	75	HH DW (HQ=1)	0.073	0	0.0003	0.00061	ND	0.011	0.0039	0.0028
Boron	D	mg/L	20	0	HH DW (HQ=1)	3.3	0	0.0069	0.0069	ND	ND		
Cadmium	D	mg/L	20	100	HH DW (HQ=1)	0.018	0			0.0002	0.0086	0.0032	0.0022
Calcium	D	mg/L	20	100	No SLC					39.8	155	99.1	92.8
Chromium	D	mg/L	20	20	HH DW (HQ=1)	0.1	0	0.0009	0.0018	ND	0.0017		
Cobalt	D	mg/L	20	65	HH DW (HQ=1)	0.73	0	0.0031	0.0031	ND	0.11	0.039	0.026
Copper	D	mg/L	20	70	HH DW (HQ=1)	1.4	0	0.0003	0.0036	ND	0.63	0.2	0.12

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-27

Groundwater/Surface Water Interaction - Piezometers GSI 3

RI/FS Red River

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Iron	D	mg/L	20	60	HH DW (HQ=1)	11	33.3	0.036	0.053	ND	20.3	5.3	2.2
Lead	D	mg/L	20	50	HH DW (HQ=1)	0.015	0	0.0001	0.0001	ND	0.001	0.00045	0.00039
Magnesium	D	mg/L	20	100	No SLC					7.7	43	24	22.1
Manganese	D	mg/L	20	100	HH DW (HQ=1)	1.7	50			0.0015	8.1	2.7	1.8
Molybdenum	D	mg/L	20	30	HH DW (HQ=1)	0.18	0	0.002	0.0061	ND	0.0052		
Nickel	D	mg/L	20	100	HH DW (HQ=1)	0.73	0			0.0093	0.23	0.091	0.066
Potassium	D	mg/L	20	100	No SLC					1.2	2.3	1.6	1.5
Selenium	D	mg/L	20	80	HH DW (HQ=1)	0.18	0	0.0003	0.0003	ND	0.0021	0.00086	0.00085
Silver	D	mg/L	20	0	HH DW (HQ=1)	0.18	0	0.0001	0.0001	ND	ND		
Sodium	D	mg/L	20	100	No SLC					4.2	15.7	9.4	9.7
Thallium	D	mg/L	20	5	HH DW (HQ=1)	0.0026	0	0.0001	0.0001	ND	0.00013		
Vanadium	D	mg/L	20	30	HH DW (HQ=1)	0.26	0	0.0001	0.00048	ND	0.00018		
Zinc	D	mg/L	20	100	HH DW (HQ=1)	11	0			0.036	2.1	0.77	0.56

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-28

Groundwater/Surface Water Interaction - Sediment GSI 3

RI/FS Reference Upper Red River - Zwergle

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Inorganics													
Chloride	T	mg/kg-dry	1	100	No SLC					0.87	0.87	0.87	0.87
Fluoride	T	mg/kg-dry	1	0	HH Soil (HQ=1)	3700	0	0.14	0.14	ND	ND		
pH	T	SU	1	100	No SLC					7.4	7.4	7.4	7.4
Solids, Percent	T	%	1	100	No SLC					71.8	71.8	71.8	71.8
Specific Conductance	T	umhos/cm	1	100	No SLC					99.5	99.5	99.5	99.5
Sulfate	T	mg/kg-dry	1	100	No SLC					14.9	14.9	14.9	14.9
Total Organic Carbon	T	mg/kg-dry	1	100	No SLC					2010	2010	2010	2010
Metals													
Aluminum	T	mg/kg-dry	1	100	ECO Sed	25500	0			9250	9250	9250	9250
Aluminum	T	mg/kg-dry	1	100	HH Soil (HQ=1)	76000	0			9250	9250	9250	9250
Antimony	T	mg/kg-dry	1	0	ECO Sed	2	0	0.64	0.64	ND	ND		
Antimony	T	mg/kg-dry	1	0	HH Soil (HQ=1)	31	0	0.64	0.64	ND	ND		
Arsenic	T	mg/kg-dry	1	100	ECO Sed	5.9	0			2.7	2.7	2.7	2.7
Arsenic	T	mg/kg-dry	1	100	HH Soil (HQ=1)	0.39	100			2.7	2.7	2.7	2.7
Barium	T	mg/kg-dry	1	100	HH Soil (HQ=1)	5500	0			122	122	122	122
Beryllium	T	mg/kg-dry	1	100	HH Soil (HQ=1)	150	0			0.5	0.5	0.5	0.5
Boron	T	mg/kg-dry	1	0	HH Soil (HQ=1)	5500	0	6	6	ND	ND		
Cadmium	T	mg/kg-dry	1	0	ECO Sed	0.6	0	0.81	0.81	ND	ND		
Cadmium	T	mg/kg-dry	1	0	HH Soil (HQ=1)	39	0	0.81	0.81	ND	ND		
Calcium	T	mg/kg-dry	1	100	No SLC					5460	5460	5460	5460
Chromium	T	mg/kg-dry	1	100	ECO Sed	37.3	0			32.6	32.6	32.6	32.6
Chromium	T	mg/kg-dry	1	100	HH Soil (HQ=1)	210	0			32.6	32.6	32.6	32.6
Cobalt	T	mg/kg-dry	1	100	HH Soil (HQ=1)	900	0			13.4	13.4	13.4	13.4
Cobalt	T	mg/kg-dry	1	100	ECO Sed	50	0			13.4	13.4	13.4	13.4
Copper	T	mg/kg-dry	1	100	ECO Sed	35.7	0			17.8	17.8	17.8	17.8
Copper	T	mg/kg-dry	1	100	HH Soil (HQ=1)	2900	0			17.8	17.8	17.8	17.8

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-28

Groundwater/Surface Water Interaction - Sediment GSI 3

RI/FS Reference Upper Red River - Zwergle

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Iron	T	mg/kg-dry	1	100	HH Soil (HQ=1)	23000	0			23000	23000	23000	23000
Iron	T	mg/kg-dry	1	100	ECO Sed	20000	100			23000	23000	23000	23000
Lead	T	mg/kg-dry	1	100	HH Soil (HQ=1)	400	0			9.9	9.9	9.9	9.9
Lead	T	mg/kg-dry	1	100	ECO Sed	35	0			9.9	9.9	9.9	9.9
Magnesium	T	mg/kg-dry	1	100	No SLC					6530	6530	6530	6530
Manganese	T	mg/kg-dry	1	100	HH Soil (HQ=1)	3200	0			837	837	837	837
Manganese	T	mg/kg-dry	1	100	ECO Sed	460	100			837	837	837	837
Mercury	T	mg/kg-dry	1	0	ECO Sed	0.17	0	0.021	0.021	ND	ND		
Mercury	T	mg/kg-dry	1	0	HH Soil (HQ=1)	23	0	0.021	0.021	ND	ND		
Molybdenum	T	mg/kg-dry	1	100	HH Soil (HQ=1)	390	0			4.2	4.2	4.2	4.2
Nickel	T	mg/kg-dry	1	100	ECO Sed	18	100			26.8	26.8	26.8	26.8
Nickel	T	mg/kg-dry	1	100	HH Soil (HQ=1)	1600	0			26.8	26.8	26.8	26.8
Potassium	T	mg/kg-dry	1	100	No SLC					1190	1190	1190	1190
Selenium	T	mg/kg-dry	1	0	HH Soil (HQ=1)	390	0	0.33	0.33	ND	ND		
Selenium	T	mg/kg-dry	1	0	ECO Sed	2	0	0.33	0.33	ND	ND		
Silver	T	mg/kg-dry	1	0	HH Soil (HQ=1)	390	0	0.19	0.19	ND	ND		
Silver	T	mg/kg-dry	1	0	ECO Sed	1	0	0.19	0.19	ND	ND		
Sodium	T	mg/kg-dry	1	0	No SLC			45.7	45.7	ND	ND		
Thallium	T	mg/kg-dry	1	0	HH Soil (HQ=1)	5.5	0	0.11	0.11	ND	ND		
Vanadium	T	mg/kg-dry	1	100	HH Soil (HQ=1)	78	0			43	43	43	43
Zinc	T	mg/kg-dry	1	100	ECO Sed	123	0			59.7	59.7	59.7	59.7
Zinc	T	mg/kg-dry	1	100	HH Soil (HQ=1)	23000	0			59.7	59.7	59.7	59.7

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-29

Groundwater/Surface Water Interaction - Sediment GSI 3

RI/FS Reference Red River Above Mine Site

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Inorganics													
Chloride	T	mg/kg-dry	1	100	No SLC					0.63	0.63	0.63	0.63
Fluoride	T	mg/kg-dry	1	0	HH Soil (HQ=1)	3700	0	0.14	0.14	ND	ND		
pH	T	SU	1	100	No SLC					6	6	6	6
Solids, Percent	T	%	1	100	No SLC					73.9	73.9	73.9	73.9
Specific Conductance	T	umhos/cm	1	100	No SLC					128	128	128	128
Sulfate	T	mg/kg-dry	1	100	No SLC					98.1	98.1	98.1	98.1
Total Organic Carbon	T	mg/kg-dry	1	0	No SLC			900	900	ND	ND		
Metals													
Aluminum	T	mg/kg-dry	1	100	HH Soil (HQ=1)	76000	0			5160	5160	5160	5160
Aluminum	T	mg/kg-dry	1	100	ECO Sed	25500	0			5160	5160	5160	5160
Antimony	T	mg/kg-dry	1	0	HH Soil (HQ=1)	31	0	0.66	0.66	ND	ND		
Antimony	T	mg/kg-dry	1	0	ECO Sed	2	0	0.66	0.66	ND	ND		
Arsenic	T	mg/kg-dry	1	100	ECO Sed	5.9	0			4.8	4.8	4.8	4.8
Arsenic	T	mg/kg-dry	1	100	HH Soil (HQ=1)	0.39	100			4.8	4.8	4.8	4.8
Barium	T	mg/kg-dry	1	100	HH Soil (HQ=1)	5500	0			157	157	157	157
Beryllium	T	mg/kg-dry	1	100	HH Soil (HQ=1)	150	0			0.28	0.28	0.28	0.28
Boron	T	mg/kg-dry	1	0	HH Soil (HQ=1)	5500	0	4	4	ND	ND		
Cadmium	T	mg/kg-dry	1	0	HH Soil (HQ=1)	39	0	0.52	0.52	ND	ND		
Cadmium	T	mg/kg-dry	1	0	ECO Sed	0.6	0	0.52	0.52	ND	ND		
Calcium	T	mg/kg-dry	1	100	No SLC					2560	2560	2560	2560
Chromium	T	mg/kg-dry	1	100	HH Soil (HQ=1)	210	0			13	13	13	13
Chromium	T	mg/kg-dry	1	100	ECO Sed	37.3	0			13	13	13	13
Cobalt	T	mg/kg-dry	1	100	HH Soil (HQ=1)	900	0			3.9	3.9	3.9	3.9
Cobalt	T	mg/kg-dry	1	100	ECO Sed	50	0			3.9	3.9	3.9	3.9
Copper	T	mg/kg-dry	1	100	ECO Sed	35.7	0			17.7	17.7	17.7	17.7
Copper	T	mg/kg-dry	1	100	HH Soil (HQ=1)	2900	0			17.7	17.7	17.7	17.7

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-29

Groundwater/Surface Water Interaction - Sediment GSI 3

RI/FS Reference Red River Above Mine Site

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Iron	T	mg/kg-dry	1	100	HH Soil (HQ=1)	23000	0			15300	15300	15300	15300
Iron	T	mg/kg-dry	1	100	ECO Sed	20000	0			15300	15300	15300	15300
Lead	T	mg/kg-dry	1	100	ECO Sed	35	0			17.2	17.2	17.2	17.2
Lead	T	mg/kg-dry	1	100	HH Soil (HQ=1)	400	0			17.2	17.2	17.2	17.2
Magnesium	T	mg/kg-dry	1	100	No SLC					3520	3520	3520	3520
Manganese	T	mg/kg-dry	1	100	ECO Sed	460	0			277	277	277	277
Manganese	T	mg/kg-dry	1	100	HH Soil (HQ=1)	3200	0			277	277	277	277
Mercury	T	mg/kg-dry	1	0	HH Soil (HQ=1)	23	0	0.02	0.02	ND	ND		
Mercury	T	mg/kg-dry	1	0	ECO Sed	0.17	0	0.02	0.02	ND	ND		
Molybdenum	T	mg/kg-dry	1	100	HH Soil (HQ=1)	390	0			2.2	2.2	2.2	2.2
Nickel	T	mg/kg-dry	1	100	ECO Sed	18	0			14.7	14.7	14.7	14.7
Nickel	T	mg/kg-dry	1	100	HH Soil (HQ=1)	1600	0			14.7	14.7	14.7	14.7
Potassium	T	mg/kg-dry	1	100	No SLC					1260	1260	1260	1260
Selenium	T	mg/kg-dry	1	100	HH Soil (HQ=1)	390	0			0.69	0.69	0.69	0.69
Selenium	T	mg/kg-dry	1	100	ECO Sed	2	0			0.69	0.69	0.69	0.69
Silver	T	mg/kg-dry	1	0	ECO Sed	1	0	0.2	0.2	ND	ND		
Silver	T	mg/kg-dry	1	0	HH Soil (HQ=1)	390	0	0.2	0.2	ND	ND		
Sodium	T	mg/kg-dry	1	100	No SLC					109	109	109	109
Thallium	T	mg/kg-dry	1	0	HH Soil (HQ=1)	5.5	0	0.12	0.12	ND	ND		
Vanadium	T	mg/kg-dry	1	100	HH Soil (HQ=1)	78	0			11.4	11.4	11.4	11.4
Zinc	T	mg/kg-dry	1	100	ECO Sed	123	0			48.9	48.9	48.9	48.9
Zinc	T	mg/kg-dry	1	100	HH Soil (HQ=1)	23000	0			48.9	48.9	48.9	48.9

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-30

Groundwater/Surface Water Interaction - Sediment GSI 3

RI/FS Red River

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Inorganics													
Chloride	T	mg/kg-dry	4	100	No SLC					0.79	0.99	0.93	0.97
Fluoride	T	mg/kg-dry	4	75	HH Soil (HQ=1)	3700	0	0.13	0.13	ND	1.2	0.54	0.44
pH	T	SU	4	100	No SLC					6	6.8	6.5	6.5
Solids, Percent	T	%	4	100	No SLC					75.5	88.8	78.9	75.6
Specific Conductance	T	umhos/cm	4	100	No SLC					43.6	82.1	67.1	71.4
Sulfate	T	mg/kg-dry	4	100	No SLC					36.5	48.5	42.3	42.2
Total Organic Carbon	T	mg/kg-dry	4	0	No SLC			599	1810	ND	ND		
Metals													
Aluminum	T	mg/kg-dry	4	100	HH Soil (HQ=1)	76000	0			4200	7310	5430	5110
Aluminum	T	mg/kg-dry	4	100	ECO Sed	25500	0			4200	7310	5430	5110
Antimony	T	mg/kg-dry	4	0	HH Soil (HQ=1)	31	0	0.55	0.98	ND	ND		
Antimony	T	mg/kg-dry	4	0	ECO Sed	2	0	0.55	0.98	ND	ND		
Arsenic	T	mg/kg-dry	4	100	ECO Sed	5.9	0			2.6	5.2	3.4	3
Arsenic	T	mg/kg-dry	4	100	HH Soil (HQ=1)	0.39	100			2.6	5.2	3.4	3
Barium	T	mg/kg-dry	4	100	HH Soil (HQ=1)	5500	0			61.9	248	120	85.3
Beryllium	T	mg/kg-dry	4	100	HH Soil (HQ=1)	150	0			0.41	0.77	0.55	0.51
Boron	T	mg/kg-dry	4	0	HH Soil (HQ=1)	5500	0	2.5	4.3	ND	ND		
Cadmium	T	mg/kg-dry	4	0	HH Soil (HQ=1)	39	0	0.55	0.78	ND	ND		
Cadmium	T	mg/kg-dry	4	0	ECO Sed	0.6	0	0.55	0.78	ND	ND		
Calcium	T	mg/kg-dry	4	100	No SLC					847	1690	1160	1050
Chromium	T	mg/kg-dry	4	100	ECO Sed	37.3	0			7.3	13.6	10	9.5
Chromium	T	mg/kg-dry	4	100	HH Soil (HQ=1)	210	0			7.3	13.6	10	9.5
Cobalt	T	mg/kg-dry	4	100	HH Soil (HQ=1)	900	0			4.8	6.1	5.3	5.1
Cobalt	T	mg/kg-dry	4	100	ECO Sed	50	0			4.8	6.1	5.3	5.1
Copper	T	mg/kg-dry	4	100	ECO Sed	35.7	25			19.9	57.6	33.7	28.8
Copper	T	mg/kg-dry	4	100	HH Soil (HQ=1)	2900	0			19.9	57.6	33.7	28.8

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-30

Groundwater/Surface Water Interaction - Sediment GSI 3

RI/FS Red River

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Iron	T	mg/kg-dry	4	100	ECO Sed	20000	0			10900	19800	14900	14500
Iron	T	mg/kg-dry	4	100	HH Soil (HQ=1)	23000	0			10900	19800	14900	14500
Lead	T	mg/kg-dry	4	100	ECO Sed	35	25			25	37.7	30.7	30.1
Lead	T	mg/kg-dry	4	100	HH Soil (HQ=1)	400	0			25	37.7	30.7	30.1
Magnesium	T	mg/kg-dry	4	100	No SLC					2180	3640	3030	3150
Manganese	T	mg/kg-dry	4	100	HH Soil (HQ=1)	3200	0			255	416	305	274
Manganese	T	mg/kg-dry	4	100	ECO Sed	460	0			255	416	305	274
Mercury	T	mg/kg-dry	4	0	HH Soil (HQ=1)	23	0	0.017	0.021	ND	ND		
Mercury	T	mg/kg-dry	4	0	ECO Sed	0.17	0	0.017	0.021	ND	ND		
Molybdenum	T	mg/kg-dry	4	100	HH Soil (HQ=1)	390	0			4.1	4.9	4.6	4.8
Nickel	T	mg/kg-dry	4	100	ECO Sed	18	75			16.8	19.9	18.7	19.1
Nickel	T	mg/kg-dry	4	100	HH Soil (HQ=1)	1600	0			16.8	19.9	18.7	19.1
Potassium	T	mg/kg-dry	4	100	No SLC					917	1620	1210	1150
Selenium	T	mg/kg-dry	4	75	ECO Sed	2	0	0.28	0.28	ND	0.53	0.37	0.42
Selenium	T	mg/kg-dry	4	75	HH Soil (HQ=1)	390	0	0.28	0.28	ND	0.53	0.37	0.42
Silver	T	mg/kg-dry	4	0	ECO Sed	1	0	0.16	0.19	ND	ND		
Silver	T	mg/kg-dry	4	0	HH Soil (HQ=1)	390	0	0.16	0.19	ND	ND		
Sodium	T	mg/kg-dry	4	100	No SLC					66.5	119	90.1	87.5
Thallium	T	mg/kg-dry	4	0	HH Soil (HQ=1)	5.5	0	0.094	0.13	ND	ND		
Vanadium	T	mg/kg-dry	4	100	HH Soil (HQ=1)	78	0			7.3	12.5	10	10.2
Zinc	T	mg/kg-dry	4	100	ECO Sed	123	0			98.9	119	107	105
Zinc	T	mg/kg-dry	4	100	HH Soil (HQ=1)	23000	0			98.9	119	107	105

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-31
Focused Sampling - Surface Water Transect
RI/FS Red River
Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Field													
DO	T	mg/l	20	NA	No SLC					8.7	10.8	9.6	9.4
EH	T	millivolts	20	NA	No SLC					13.8	455	173	153
pH	T	SU	20	NA	No SLC					6.2	8.3	7.6	7.6
Specific Conductance	T	us/cm	20	NA	No SLC					173	617	372	338
Temperature	T	Celsius	20	NA	No SLC					5	13.3	8.3	8.2
Turbidity	T	NTU	20	NA	No SLC					0	17.3	4.5	3.9
Inorganics													
Hardness	D	mg/L	14	100	No SLC					117	152	133	133
Bicarbonate (as CaCO3)	T	mg/L	20	100	No SLC					62.3	141	73.9	67.9
Carbonate (as CaCO3)	T	mg/L	20	0	No SLC			1	1	ND	ND		
Chloride	T	mg/L	20	100	HH DW (HQ=1)	250	0			2.1	3	2.6	2.6
Chloride	T	mg/L	20	100	ECO Chronic	230	0			2.1	3	2.6	2.6
Cyanide	T	mg/L	20	0	ECO Chronic	0.0052	0	0.01	0.01	ND	ND		
Cyanide	T	mg/L	20	0	HH DW (HQ=1)	0.73	0	0.01	0.01	ND	ND		
Fluoride	T	mg/L	20	100	HH DW (HQ=1)	2.2	0			0.26	0.57	0.43	0.49
Hydroxide (as CaCO3)	T	mg/L	20	0	No SLC			1	1	ND	ND		
Nitrate+Nitrite as N	T	mg/L	20	100	No SLC					0.25	0.44	0.33	0.31
Nitrite	T	mg/L	20	20	HH DW (HQ=1)	1	0	0.005	0.005	ND	0.0074		
Phosphate, Ortho As P	T	mg/L	20	0	No SLC			0.01	0.01	ND	ND		
Phosphorus	T	mg/L	20	100	No SLC					0.02	0.05	0.031	0.028
Sulfate	T	mg/L	20	100	HH DW (HQ=1)	1500	0			50.3	136	73.6	69.4
Total Alkalinity	T	mg/L	20	100	No SLC					62.3	141	73.9	67.9
Total Dissolved Solids	T	mg/L	20	100	No SLC					168	212	191	192
Total Organic Carbon	T	mg/L	20	50	No SLC			1	1	ND	1.8	0.87	0.75
Total Suspended Solids	T	mg/L	20	100	No SLC					3.9	14.6	6.9	6.3

Metals

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-31
Focused Sampling - Surface Water Transect
RI/FS Red River
Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Aluminum	D	mg/L	20	70	HH DW (HQ=1)	37	0	0.17	0.22	ND	0.28	0.15	0.16
Antimony	D	mg/L	20	0	ECO Chronic	0.69	0	0.00032	0.00083	ND	ND		
Antimony	D	mg/L	20	0	HH DW (HQ=1)	0.015	0	0.00032	0.00083	ND	ND		
Arsenic	D	mg/L	20	0	HH DW (HQ=1)	0.01	0	0.0001	0.0001	ND	ND		
Arsenic	D	mg/L	20	0	ECO Chronic	0.15	0	0.0001	0.0001	ND	ND		
Barium	D	mg/L	20	100	ECO Chronic	0.004	100			0.035	0.039	0.037	0.036
Barium	D	mg/L	20	100	HH DW (HQ=1)	2.6	0			0.035	0.039	0.037	0.036
Beryllium	D	mg/L	20	0	HH DW (HQ=1)	0.073	0	0.0003	0.0003	ND	ND		
Beryllium	D	mg/L	20	0	ECO Chronic	0.0053	0	0.0003	0.0003	ND	ND		
Boron	D	mg/L	20	0	HH DW (HQ=1)	3.3	0	0.0057	0.0095	ND	ND		
Boron	D	mg/L	20	0	ECO Chronic	0.0016	0	0.0057	0.0095	ND	ND		
Cadmium	D	mg/L	20	35	HH DW (HQ=1)	0.018	0	0.0001	0.0001	ND	0.00019		
Cadmium	D	mg/L	20	35	ECO Chronic	0.00025	0	0.0001	0.0001	ND	0.00019		
Calcium	D	mg/L	20	100	No SLC					36.1	46.1	41.2	42
Chromium	D	mg/L	20	5	HH DW (HQ=1)	0.1	0	0.0011	0.0011	ND	0.0026		
Chromium	D	mg/L	20	5	ECO Chronic	0.074	0	0.0011	0.0011	ND	0.0026		
Cobalt	D	mg/L	20	30	ECO Chronic	1.5	0	0.0017	0.0031	ND	0.0054		
Cobalt	D	mg/L	20	30	HH DW (HQ=1)	0.73	0	0.0017	0.0031	ND	0.0054		
Copper	D	mg/L	20	100	HH DW (HQ=1)	1.4	0			0.0012	0.014	0.0028	0.0017
Copper	D	mg/L	20	100	ECO Chronic	0.009	10			0.0012	0.014	0.0028	0.0017
Iron	D	mg/L	20	15	HH DW (HQ=1)	11	0	0.036	0.048	ND	0.082		
Lead	D	mg/L	20	10	HH DW (HQ=1)	0.015	0	0.0001	0.0001	ND	0.0034		
Lead	D	mg/L	20	10	ECO Chronic	0.0025	50	0.0001	0.0001	ND	0.0034		
Magnesium	D	mg/L	20	100	No SLC					6.6	9	7.8	8.1
Manganese	D	mg/L	20	100	HH DW (HQ=1)	1.7	0			0.075	0.18	0.1	0.084
Manganese	D	mg/L	20	100	ECO Chronic	1.7	0			0.075	0.18	0.1	0.084
Mercury	D	mg/L	14	0	ECO Chronic	0.00077	0	0.0001	0.0001	ND	ND		

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-31

Focused Sampling - Surface Water Transect

RI/FS Red River

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Mercury	D	mg/L	14	0	HH DW (HQ=1)	0.011	0	0.0001	0.0001	ND	ND		
Molybdenum	D	mg/L	20	25	ECO Chronic	2.2	0	0.0013	0.003	ND	0.0022		
Molybdenum	D	mg/L	20	25	HH DW (HQ=1)	0.18	0	0.0013	0.003	ND	0.0022		
Nickel	D	mg/L	20	100	ECO Chronic	0.052	0			0.0031	0.011	0.007	0.0079
Nickel	D	mg/L	20	100	HH DW (HQ=1)	0.73	0			0.0031	0.011	0.007	0.0079
Potassium	D	mg/L	20	100	No SLC					0.85	1.6	1.2	1.1
Selenium	D	mg/L	20	0	ECO Chronic	0.046	0	0.0002	0.0003	ND	ND		
Selenium	D	mg/L	20	0	HH DW (HQ=1)	0.18	0	0.0002	0.0003	ND	ND		
Silver	D	mg/L	20	0	ECO Chronic	0.00032	0	0.0001	0.0001	ND	ND		
Silver	D	mg/L	20	0	HH DW (HQ=1)	0.18	0	0.0001	0.0001	ND	ND		
Sodium	D	mg/L	20	100	No SLC					4	5	4.5	4.5
Thallium	D	mg/L	20	0	HH DW (HQ=1)	0.0026	0	0.0001	0.0001	ND	ND		
Vanadium	D	mg/L	20	0	ECO Chronic	0.019	0	0.0001	0.0001	ND	ND		
Vanadium	D	mg/L	20	0	HH DW (HQ=1)	0.26	0	0.0001	0.0001	ND	ND		
Zinc	D	mg/L	20	70	ECO Chronic	0.12	0	0.032	0.053	ND	0.046	0.023	0.019
Zinc	D	mg/L	20	70	HH DW (HQ=1)	11	0	0.032	0.053	ND	0.046	0.023	0.019
Aluminum	T	mg/L	20	100	ECO Chronic	0.087	100			0.43	1.3	0.69	0.53
Aluminum	T	mg/L	20	100	HH DW (HQ=1)	37	0			0.43	1.3	0.69	0.53
Iron	T	mg/L	20	100	ECO Chronic	1	0			0.12	0.77	0.24	0.19
Iron	T	mg/L	20	100	HH DW (HQ=1)	11	0			0.12	0.77	0.24	0.19

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-32

Focused Sampling - Sediment Riffle Transect

RI/FS Red River

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Inorganics													
Chloride	T	mg/kg-dry	20	25	No SLC			0.81	1.1	ND	0.95		
Fluoride	T	mg/kg-dry	20	100	HH Soil (HQ=1)	3700	0			0.15	0.96	0.44	0.37
pH	T	SU	20	100	No SLC					5.1	7.4	6.9	7.1
Solids, Percent	T	%	20	100	No SLC					71.5	81.5	76.4	76.5
Specific Conductance	T	umhos/cm	20	100	No SLC					56.6	110	80.4	80.1
Sulfate	T	mg/kg-dry	20	100	No SLC					18.8	58.2	27.7	25.4
Total Organic Carbon	T	mg/kg-dry	20	0	No SLC			870	1990	ND	ND		
Metals													
Aluminum	T	mg/kg-dry	20	100	ECO Sed	25500	0			4260	9070	5440	5010
Aluminum	T	mg/kg-dry	20	100	HH Soil (HQ=1)	76000	0			4260	9070	5440	5010
Antimony	T	mg/kg-dry	20	0	HH Soil (HQ=1)	31	0	0.34	1.5	ND	ND		
Antimony	T	mg/kg-dry	20	0	ECO Sed	2	0	0.34	1.5	ND	ND		
Arsenic	T	mg/kg-dry	20	100	HH Soil (HQ=1)	0.39	100			3	6.9	4.8	4.9
Arsenic	T	mg/kg-dry	20	100	ECO Sed	5.9	20			3	6.9	4.8	4.9
Barium	T	mg/kg-dry	20	100	HH Soil (HQ=1)	5500	0			73.6	223	143	140
Beryllium	T	mg/kg-dry	20	100	HH Soil (HQ=1)	150	0			0.29	0.85	0.58	0.61
Boron	T	mg/kg-dry	20	5	HH Soil (HQ=1)	5500	0	0.76	4.7	ND	5.2		
Cadmium	T	mg/kg-dry	20	90	ECO Sed	0.6	100	0.63	0.85	ND	1.4	0.84	0.83
Cadmium	T	mg/kg-dry	20	90	HH Soil (HQ=1)	39	0	0.63	0.85	ND	1.4	0.84	0.83
Calcium	T	mg/kg-dry	20	100	No SLC					1130	1960	1510	1450
Chromium	T	mg/kg-dry	20	100	ECO Sed	37.3	0			6.9	15.1	11.2	10.9
Chromium	T	mg/kg-dry	20	100	HH Soil (HQ=1)	210	0			6.9	15.1	11.2	10.9
Cobalt	T	mg/kg-dry	20	100	HH Soil (HQ=1)	900	0			5	12	6.9	6.6
Cobalt	T	mg/kg-dry	20	100	ECO Sed	50	0			5	12	6.9	6.6
Copper	T	mg/kg-dry	20	100	ECO Sed	35.7	45			18.3	128	37.8	34.6
Copper	T	mg/kg-dry	20	100	HH Soil (HQ=1)	2900	0			18.3	128	37.8	34.6

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-32

Focused Sampling - Sediment Riffle Transect

RI/FS Red River

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Iron	T	mg/kg-dry	20	100	ECO Sed	20000	30			11100	23000	17600	18400
Iron	T	mg/kg-dry	20	100	HH Soil (HQ=1)	23000	0			11100	23000	17600	18400
Lead	T	mg/kg-dry	20	100	ECO Sed	35	35			18.5	248	44.4	31.1
Lead	T	mg/kg-dry	20	100	HH Soil (HQ=1)	400	0			18.5	248	44.4	31.1
Magnesium	T	mg/kg-dry	20	100	No SLC					2480	4250	3170	3100
Manganese	T	mg/kg-dry	20	100	ECO Sed	460	20			241	1080	378	319
Manganese	T	mg/kg-dry	20	100	HH Soil (HQ=1)	3200	0			241	1080	378	319
Mercury	T	mg/kg-dry	20	0	ECO Sed	0.17	0	0.017	0.022	ND	ND		
Mercury	T	mg/kg-dry	20	0	HH Soil (HQ=1)	23	0	0.017	0.022	ND	ND		
Molybdenum	T	mg/kg-dry	20	100	HH Soil (HQ=1)	390	0			2.7	9.6	5.6	5.2
Nickel	T	mg/kg-dry	20	100	HH Soil (HQ=1)	1600	0			18.6	34.1	24.1	22.9
Nickel	T	mg/kg-dry	20	100	ECO Sed	18	100			18.6	34.1	24.1	22.9
Potassium	T	mg/kg-dry	20	100	No SLC					936	1710	1340	1350
Selenium	T	mg/kg-dry	20	75	HH Soil (HQ=1)	390	0	0.31	0.39	ND	0.97	0.44	0.45
Selenium	T	mg/kg-dry	20	75	ECO Sed	2	0	0.31	0.39	ND	0.97	0.44	0.45
Silver	T	mg/kg-dry	20	20	HH Soil (HQ=1)	390	0	0.16	0.2	ND	0.32		
Silver	T	mg/kg-dry	20	20	ECO Sed	1	0	0.16	0.2	ND	0.32		
Sodium	T	mg/kg-dry	20	70	No SLC			116	150	ND	254	113	88.3
Thallium	T	mg/kg-dry	20	70	HH Soil (HQ=1)	5.5	0	0.1	0.13	ND	0.16	0.11	0.13
Vanadium	T	mg/kg-dry	20	100	HH Soil (HQ=1)	78	0			8.4	15	10.7	10
Zinc	T	mg/kg-dry	20	100	HH Soil (HQ=1)	23000	0			81.6	218	134	124
Zinc	T	mg/kg-dry	20	100	ECO Sed	123	50			81.6	218	134	124

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-33

Focused Sampling - Surface Water Radon

RI/FS Red River

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Field													
do	T	mg/L	14	NA	No SLC					7	9.5	8.5	8.8
eh	T	millivolts	14	NA	No SLC					114	430	206	149
Flow	T	CFS	11	NA	No SLC					16.7	20.3	19	18.9
ph	T	SU	14	NA	No SLC					7.5	8.2	7.8	7.7
Radon-222	T	Pci/L	14	NA	No SLC					2	89.8	26	16.1
specific conductance	T	uS/cm	14	NA	No SLC					116	295	260	280
temperature	T	Celsius	14	NA	No SLC					4.1	11.5	7	5.5
turbidity	T	NTU	14	NA	No SLC					0	6.8	3.3	4.1
Inorganics													
Hardness	D	mg/L	14	100	No SLC					108	146	131	133
Bicarbonate (as CaCO3)	T	mg/L	14	100	No SLC					62.6	72.3	67.6	67.6
Carbonate (as CaCO3)	T	mg/L	14	0	No SLC			1	1	ND	ND		
Chloride	T	mg/L	14	100	ECO Chronic	230	0			2.3	2.9	2.6	2.6
Chloride	T	mg/L	14	100	HH DW (HQ=1)	250	0			2.3	2.9	2.6	2.6
Cyanide	T	mg/L	14	0	HH DW (HQ=1)	0.73	0	0.01	0.01	ND	ND		
Cyanide	T	mg/L	14	0	ECO Chronic	0.0052	0	0.01	0.01	ND	ND		
Fluoride	T	mg/L	14	100	HH DW (HQ=1)	2.2	0			0.3	0.7	0.53	0.58
Hydroxide (as CaCO3)	T	mg/L	14	0	No SLC			1	1	ND	ND		
Nitrate+Nitrite as N	T	mg/L	14	100	No SLC					0.23	0.27	0.26	0.26
Nitrite	T	mg/L	14	0	HH DW (HQ=1)	1	0	0.005	0.005	ND	ND		
Phosphate, Ortho As P	T	mg/L	14	0	No SLC			0.01	0.01	ND	ND		
Phosphorus	T	mg/L	14	100	No SLC					0.012	0.026	0.018	0.018
Sulfate	T	mg/L	14	100	HH DW (HQ=1)	1500	0			50.3	84.8	68	70.4
Total Alkalinity	T	mg/L	14	100	No SLC					62.6	72.3	67.6	67.6
Total Dissolved Solids	T	mg/L	14	100	No SLC					134	204	169	159
Total Organic Carbon	T	mg/L	14	71.4	No SLC			1	1	ND	2.1	1.2	1.3

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-33
Focused Sampling - Surface Water Radon
RI/FS Red River
Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Total Suspended Solids	T	mg/L	14	100	No SLC					4.9	9.2	7	7.1
Metals													
Aluminum	D	mg/L	14	100	HH DW (HQ=1)	37	0			0.067	0.24	0.14	0.13
Antimony	D	mg/L	14	7.1	ECO Chronic	0.69	0	0.00043	0.0018	ND	0.0014		
Antimony	D	mg/L	14	7.1	HH DW (HQ=1)	0.015	0	0.00043	0.0018	ND	0.0014		
Arsenic	D	mg/L	14	0	ECO Chronic	0.15	0	0.0001	0.0001	ND	ND		
Arsenic	D	mg/L	14	0	HH DW (HQ=1)	0.01	0	0.0001	0.0001	ND	ND		
Barium	D	mg/L	14	100	ECO Chronic	0.004	100			0.03	0.036	0.033	0.034
Barium	D	mg/L	14	100	HH DW (HQ=1)	2.6	0			0.03	0.036	0.033	0.034
Beryllium	D	mg/L	14	21.4	HH DW (HQ=1)	0.073	0	0.0003	0.0003	ND	0.00042		
Beryllium	D	mg/L	14	21.4	ECO Chronic	0.0053	0	0.0003	0.0003	ND	0.00042		
Boron	D	mg/L	14	0	ECO Chronic	0.0016	0	0.0069	0.0069	ND	ND		
Boron	D	mg/L	14	0	HH DW (HQ=1)	3.3	0	0.0069	0.0069	ND	ND		
Cadmium	D	mg/L	14	35.7	ECO Chronic	0.00025	0	0.00019	0.00052	ND	0.00022		
Cadmium	D	mg/L	14	35.7	HH DW (HQ=1)	0.018	0	0.00019	0.00052	ND	0.00022		
Calcium	D	mg/L	14	100	No SLC					32.8	43.5	39.2	39.9
Chromium	D	mg/L	14	0	ECO Chronic	0.074	0	0.0011	0.0013	ND	ND		
Chromium	D	mg/L	14	0	HH DW (HQ=1)	0.1	0	0.0011	0.0013	ND	ND		
Cobalt	D	mg/L	14	21.4	ECO Chronic	1.5	0	0.0031	0.0031	ND	0.0056		
Cobalt	D	mg/L	14	21.4	HH DW (HQ=1)	0.73	0	0.0031	0.0031	ND	0.0056		
Copper	D	mg/L	14	100	HH DW (HQ=1)	1.4	0			0.0015	0.0039	0.0026	0.0023
Copper	D	mg/L	14	100	ECO Chronic	0.009	0			0.0015	0.0039	0.0026	0.0023
Iron	D	mg/L	14	7.1	HH DW (HQ=1)	11	0	0.036	0.08	ND	0.04		
Lead	D	mg/L	14	0	ECO Chronic	0.0025	0	0.0001	0.0001	ND	ND		
Lead	D	mg/L	14	0	HH DW (HQ=1)	0.015	0	0.0001	0.0001	ND	ND		
Magnesium	D	mg/L	14	100	No SLC					6.4	9	7.9	8.2
Manganese	D	mg/L	14	100	ECO Chronic	1.7	0			0.084	0.19	0.12	0.098

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-33

Focused Sampling - Surface Water Radon

RI/FS Red River

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Manganese	D	mg/L	14	100	HH DW (HQ=1)	1.7	0			0.084	0.19	0.12	0.098
Mercury	D	mg/L	14	0	HH DW (HQ=1)	0.011	0	0.0001	0.0001	ND	ND		
Mercury	D	mg/L	14	0	ECO Chronic	0.00077	0	0.0001	0.0001	ND	ND		
Molybdenum	D	mg/L	14	35.7	ECO Chronic	2.2	0	0.0021	0.0032	ND	0.0016		
Molybdenum	D	mg/L	14	35.7	HH DW (HQ=1)	0.18	0	0.0021	0.0032	ND	0.0016		
Nickel	D	mg/L	14	100	ECO Chronic	0.052	0			0.005	0.014	0.0099	0.0098
Nickel	D	mg/L	14	100	HH DW (HQ=1)	0.73	0			0.005	0.014	0.0099	0.0098
Potassium	D	mg/L	14	100	No SLC					0.66	1.4	1.1	1.2
Selenium	D	mg/L	14	7.1	ECO Chronic	0.046	0	0.0003	0.00035	ND	0.00043		
Selenium	D	mg/L	14	7.1	HH DW (HQ=1)	0.18	0	0.0003	0.00035	ND	0.00043		
Silver	D	mg/L	14	0	ECO Chronic	0.00032	0	0.0001	0.0001	ND	ND		
Silver	D	mg/L	14	0	HH DW (HQ=1)	0.18	0	0.0001	0.0001	ND	ND		
Sodium	D	mg/L	14	100	No SLC					3.9	5	4.4	4.3
Thallium	D	mg/L	14	0	HH DW (HQ=1)	0.0026	0	0.0001	0.0001	ND	ND		
Vanadium	D	mg/L	14	0	ECO Chronic	0.019	0	0.0001	0.0003	ND	ND		
Vanadium	D	mg/L	14	0	HH DW (HQ=1)	0.26	0	0.0001	0.0003	ND	ND		
Zinc	D	mg/L	14	92.9	ECO Chronic	0.12	0	0.013	0.013	ND	0.057	0.041	0.046
Zinc	D	mg/L	14	92.9	HH DW (HQ=1)	11	0	0.013	0.013	ND	0.057	0.041	0.046
Aluminum	T	mg/L	14	100	ECO Chronic	0.087	100			0.41	1.1	0.69	0.62
Aluminum	T	mg/L	14	100	HH DW (HQ=1)	37	0			0.41	1.1	0.69	0.62
Iron	T	mg/L	14	64.3	ECO Chronic	1	0	0.18	0.25	ND	0.34	0.21	0.23
Iron	T	mg/L	14	64.3	HH DW (HQ=1)	11	0	0.18	0.25	ND	0.34	0.21	0.23

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-34

Focused Sampling - Seep/Spring Radon

RI/FS Groundwater Area 1 - Area drained by Capulin Canyon

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Field													
Radon-222	T	Pci/L	3	NA	No SLC					637	783	729	766

"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

Table 5-35

Focused Sampling - Seep/Spring Radon

RI/FS Groundwater Area 5 - Admin and ME Area

Summary of Results

Analyte	Sample Fraction	Units	Total Number of Samples	Percent Detects (%)	SLC	SLC Value	Percent Above SLC	Min RL for ND	Max RL for ND	Min Value	Max Value	Mean Value	Median Value
Field													
Radon-222	T	Pci/L	2	NA	No SLC					542	683	613	613

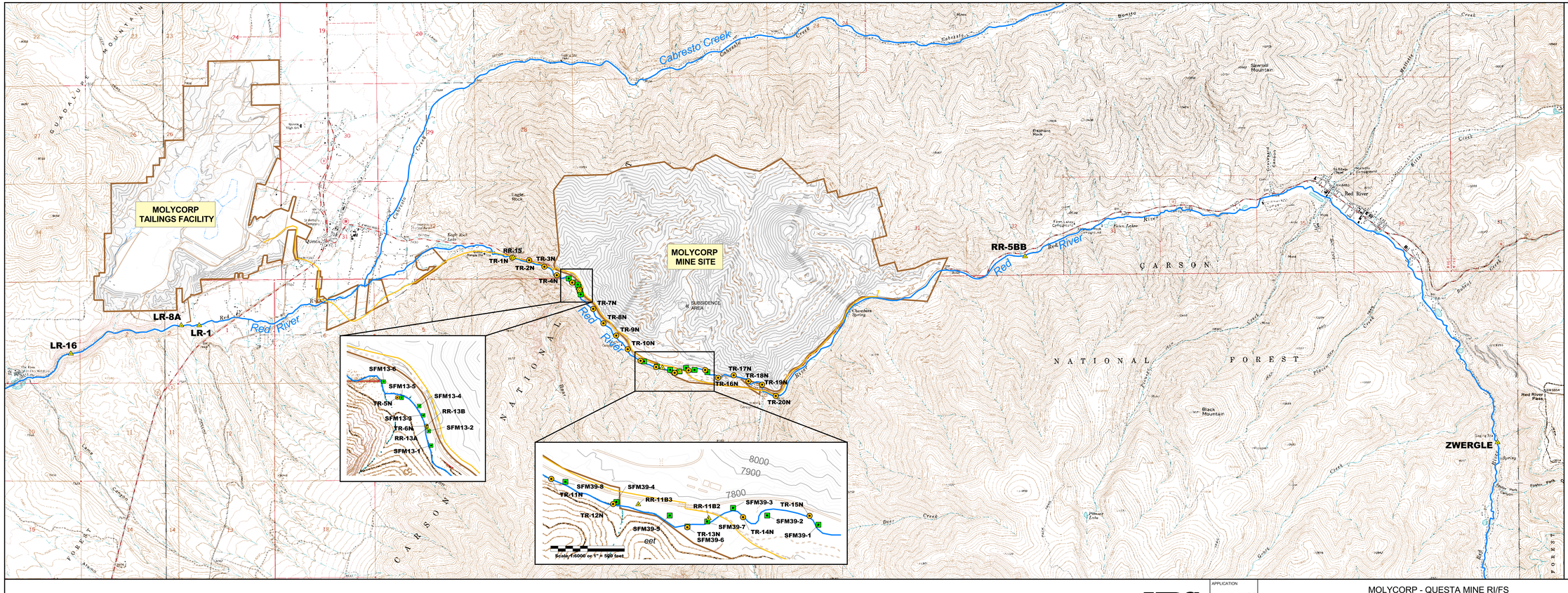
"No SLC" indicates that there is not a Screening Level Criterion for this medium specified for the RI/FS.
"ECO Chronic" EPA Region 6 Tier 1-3 RBSLs Aqueous Ecological Chronic
"HH DW (HQ=1)" EPA Region 6 RBSLs Human Health Tap Water (HQ=1)
"HH Soil (HQ=1)" EPA Region 6 RBSLs Human Health Residential Soil (HQ=1)
"ECO Sed" EPA Region 6 Tier 1-3 RBSLs Ecological Sediment Freshwater
Median Value determined using 1/2 the Reporting Limit value for Non-Detects if 50% or greater than the values were detected.
Mean Value calculated using 1/2 the Reporting Limit for Non-Detects if 50% or greater than the values were detected.

T = Total Fraction
D = Filtered Fraction (0.45 micron filter)
A = Filtered Fraction (0.1 micron filter)
ND = Non-Detected Value

SECTION 5

EPA GROUNDWATER/SURFACE WATER INTERACTION STUDIES AND FOCUSED SAMPLING

FIGURES



GSI Sampling Location (Surface Water, Piezometer Water, Chamber Water, or Sediment Sample)

EPA Focused Sampling:

Physical Habitat Sampling Location (Sediment and Surface Water Sample)

Radon 222 Sampling Location (Surface Water Sample)

Sewage Lagoon
Tailings Pipeline
Paved Road
Unpaved Road
River or Creek
Tailings Pond

Property Lines
Easement
Mine Boundary

NOTES
1. Base topography taken from USGS 7.5-minute quadrangles for Questa, New Mexico (1963) and Red River, New Mexico (1963) and .
2. Mine Site topography provided by Molycorp-Questa Mine (quest_sp.dwg, 2001).

N

2000 0 2000 Feet
Main Map Scale 1:24000 or 1"= 2000 feet

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URS Center
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Denver, CO 80237-2637
(303) 694-2770

APPLICATION	ArcView GIS
FILE NAME	gsi_techmemo.apr
DRAWN BY	DenverGIS
DATE	2/21/2005

MOLYCORP - QUESTA MINE RI/FS

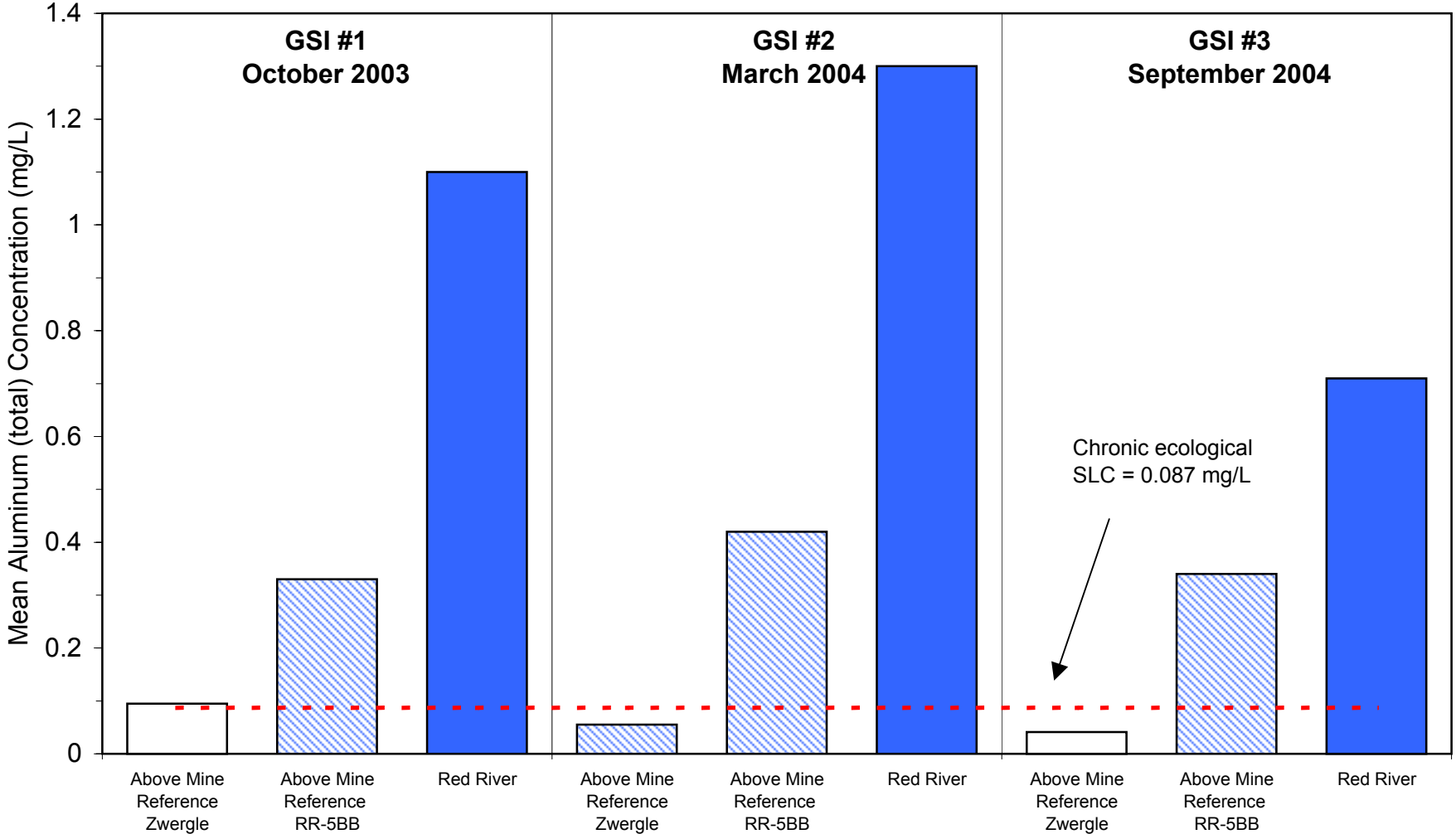
GROUNDWATER - SURFACE WATER INTERACTION AND EPA FOCUSED SAMPLING LOCATIONS

PROJECT 22236244

FIGURE 5-1

Preliminary Site Characterization Report

Figure 5-2
GSI Surface Water - Red River and Upstream Reference Areas
Comparison of Mean Concentrations of Aluminum (total)



Note: A white bar indicates that 50% or more of the values were not detected, and a mean was not calculated. In these cases, the maximum detected value or the maximum reporting limit, whichever was greater, was plotted.

Figure 5-3
GSI Surface Water - Red River and Upstream Reference Areas
Comparison of Mean Concentrations of Barium (dissolved)

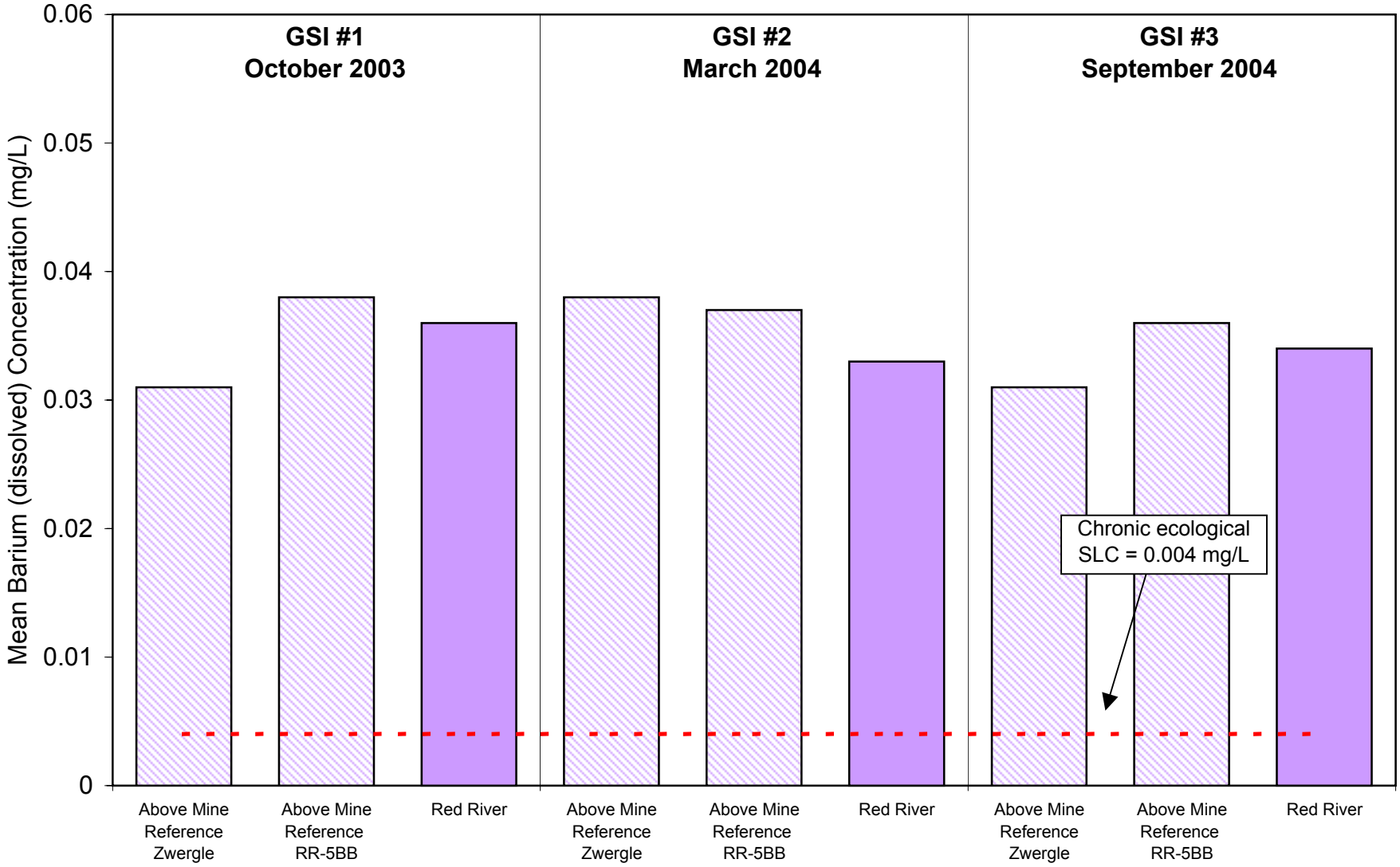


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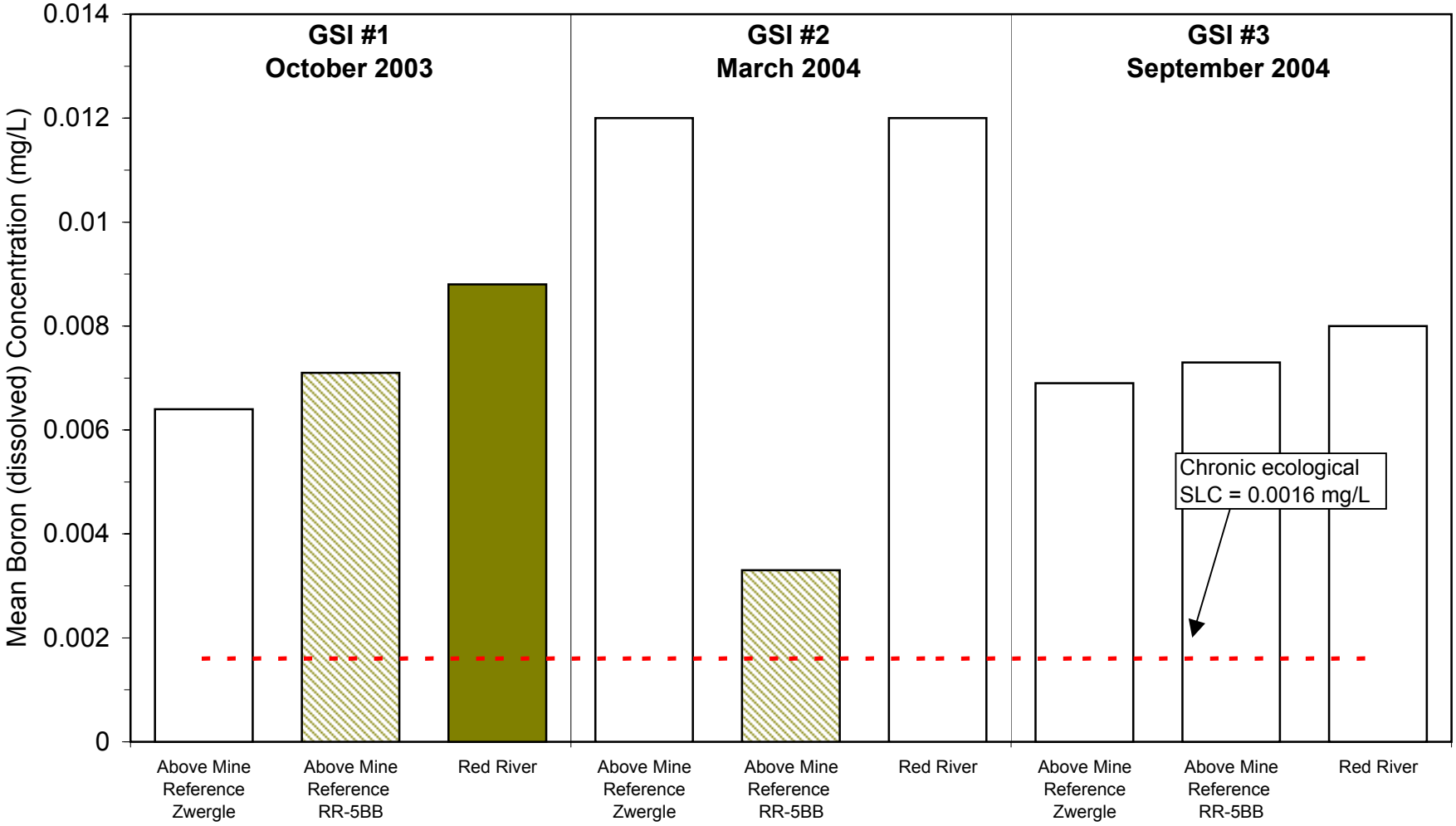
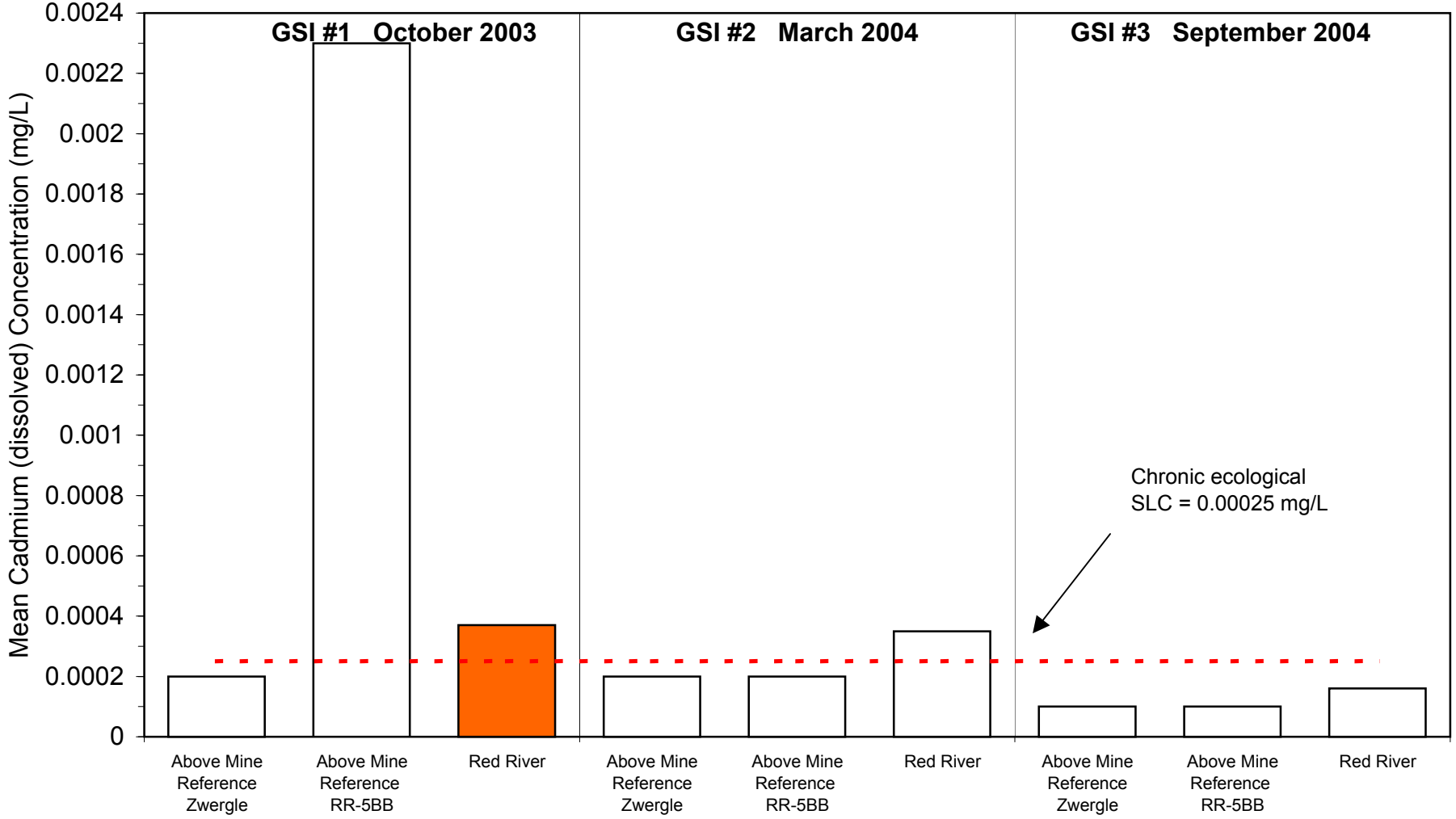
Figure 5-4
GSI Surface Water - Red River and Upstream Reference Areas
Comparison of Mean Concentrations of Boron (dissolved)



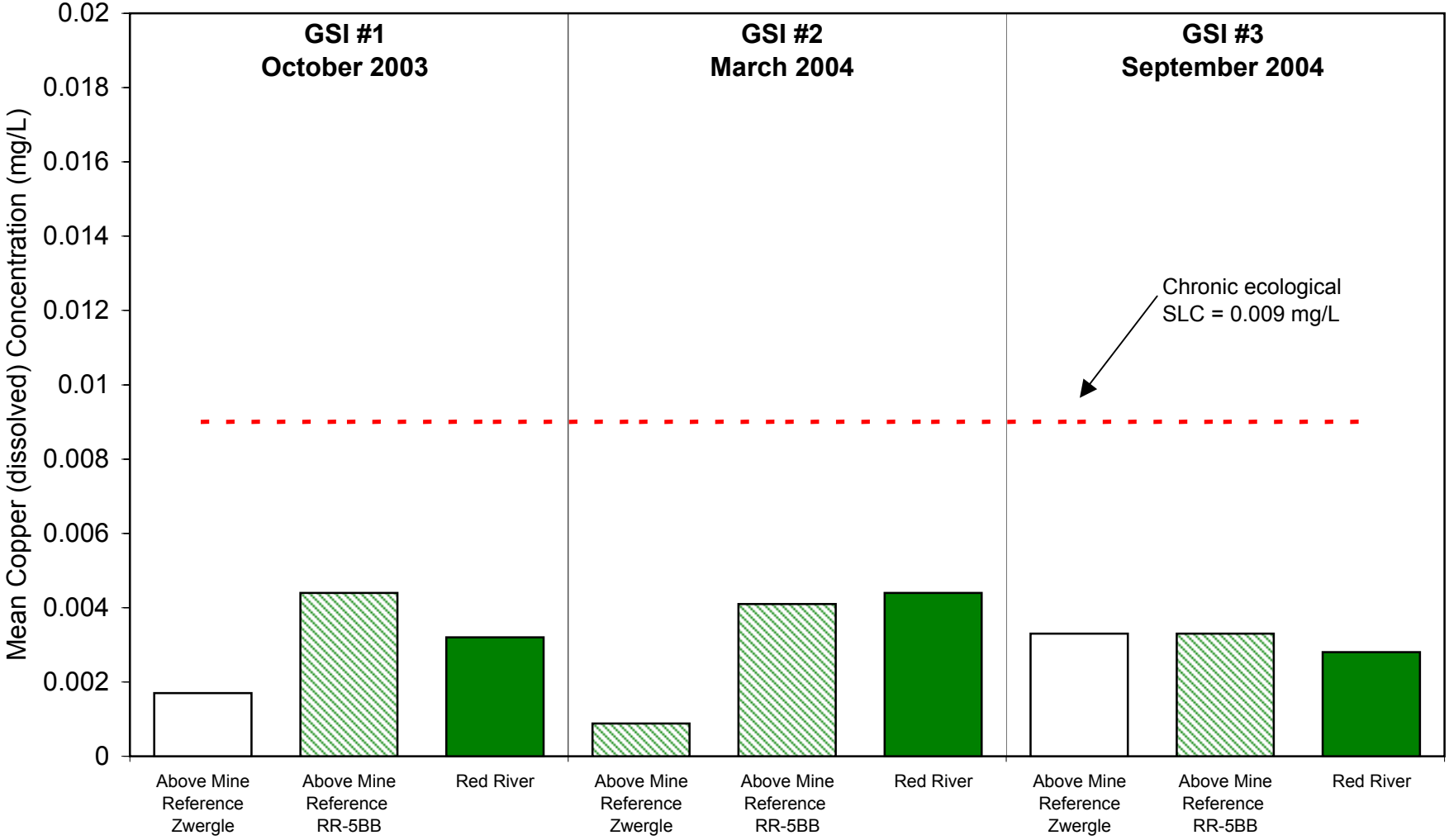
Note: A white bar indicates that 50% or more of the values were not detected, and a mean was not calculated. In these cases, the maximum detected value or the maximum reporting limit, whichever was greater, was plotted.

Figure 5-5
GSI Surface Water - Red River and Upstream Reference Areas
Comparison of Mean Concentrations of Cadmium (dissolved)



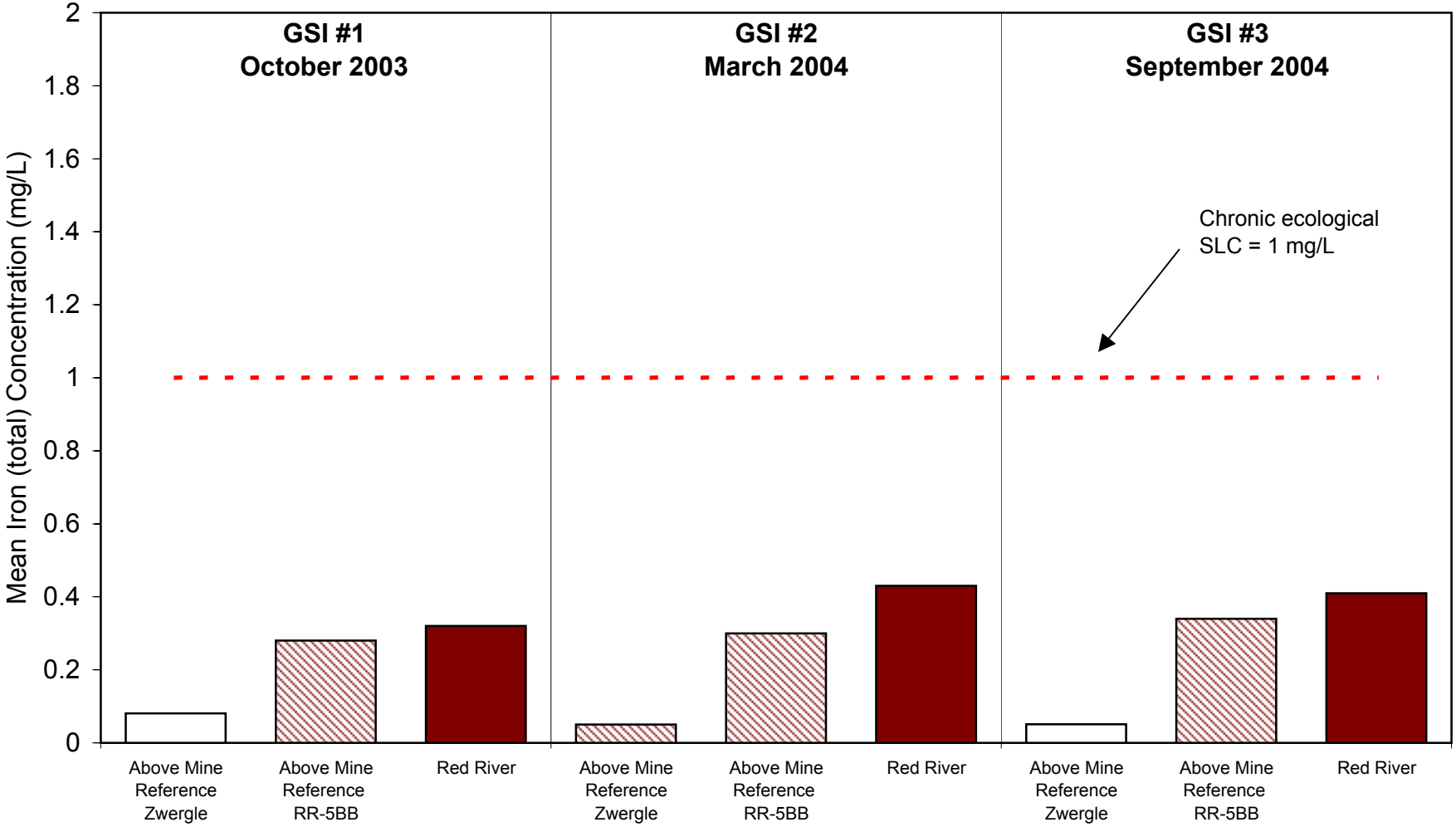
Note: A white bar indicates that 50% or more of the values were not detected, and a mean was not calculated. In these cases, the maximum detected value or the maximum reporting limit, whichever was greater, was plotted.

Figure 5-6
GSI Surface Water - Red River and Upstream Reference Areas
Comparison of Mean Concentrations of Copper (dissolved)



Note: A white bar indicates that 50% or more of the values were not detected, and a mean was not calculated. In these cases, the maximum detected value or the maximum reporting limit, whichever was greater, was plotted.

Figure 5-7
GSI Surface Water - Red River and Upstream Reference Areas
Comparison of Mean Concentrations of Iron (total)



Note: A white bar indicates that 50% or more of the values were not detected, and a mean was not calculated. In these cases, the maximum detected value or the maximum reporting limit, whichever was greater, was plotted.

Figure 5-8
GSI Chamber Water - Red River and Upstream Reference Areas
Comparison of Mean Concentrations of Barium (dissolved)

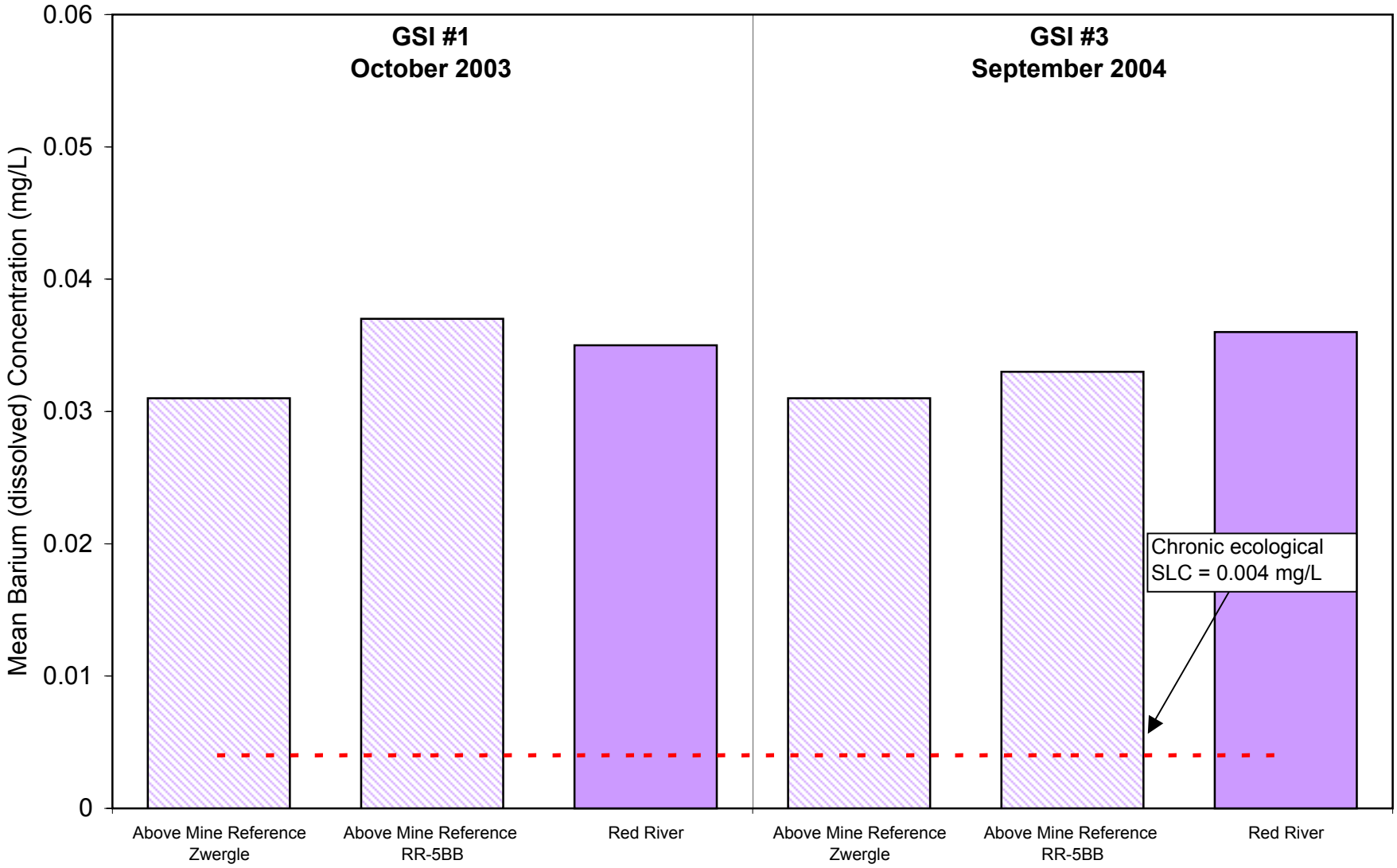


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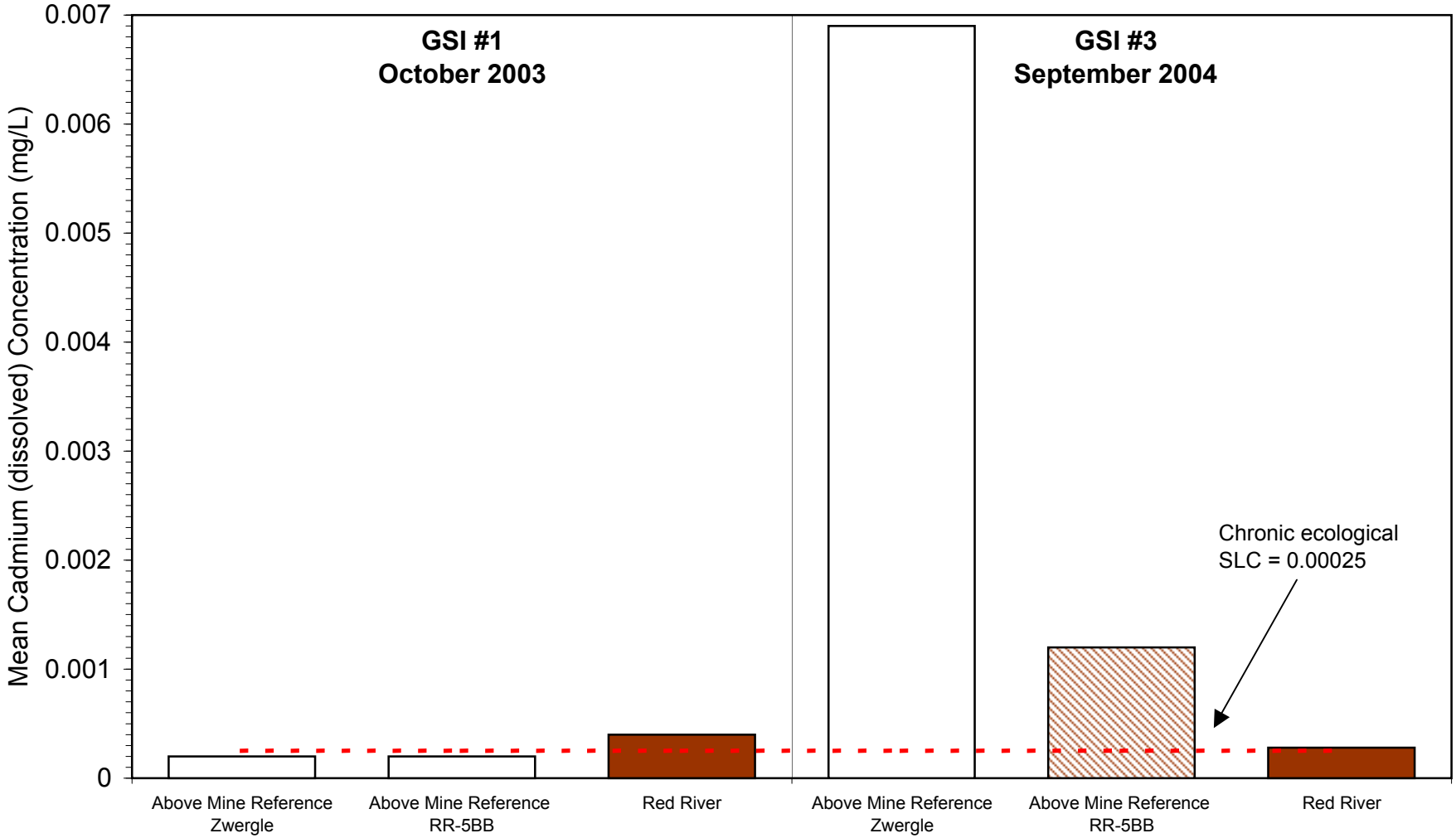
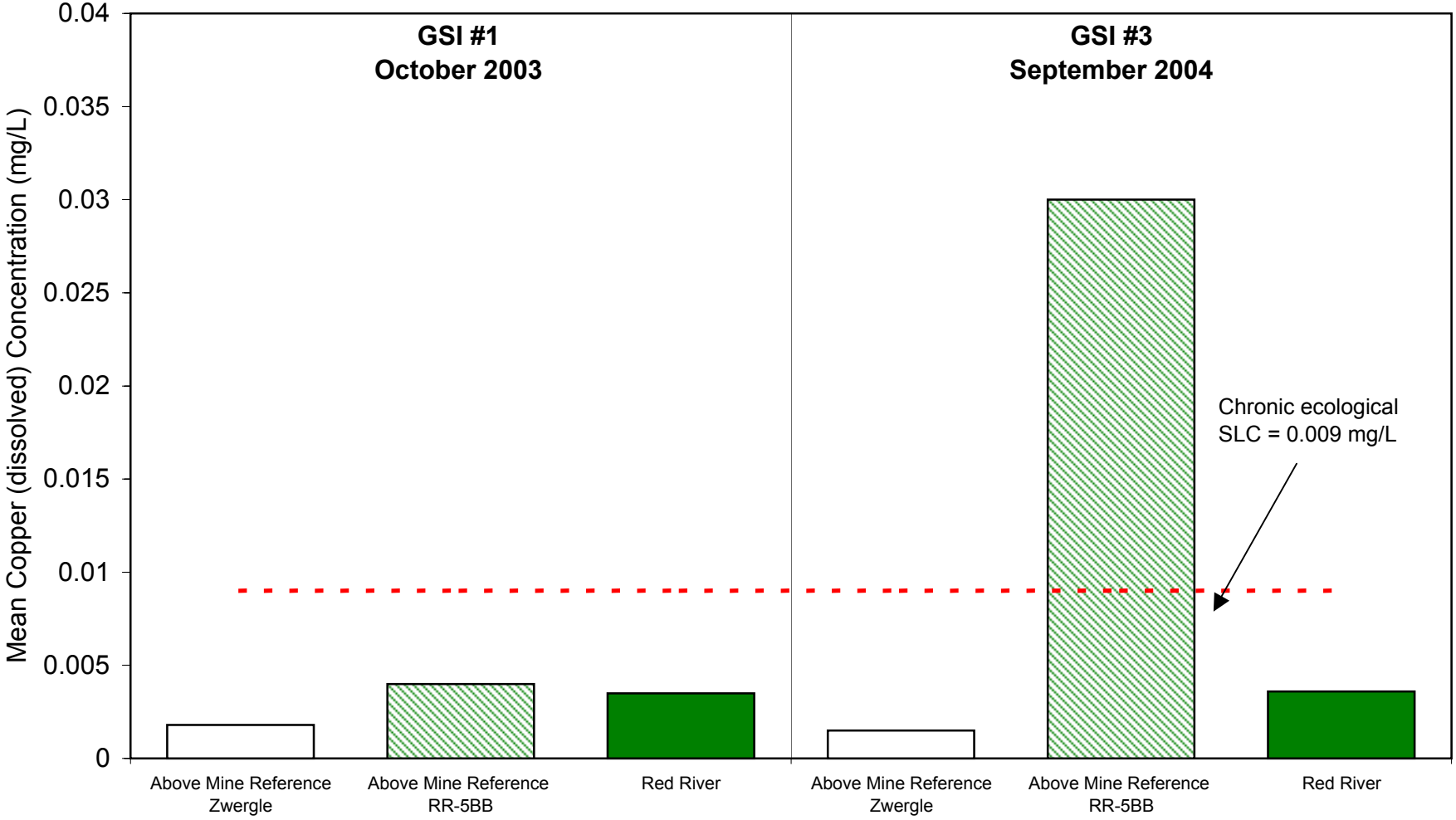
Figure 5-9
GSI Chamber Water - Red River and Upstream Reference Areas
Comparison of Mean Concentrations of Cadmium (dissolved)



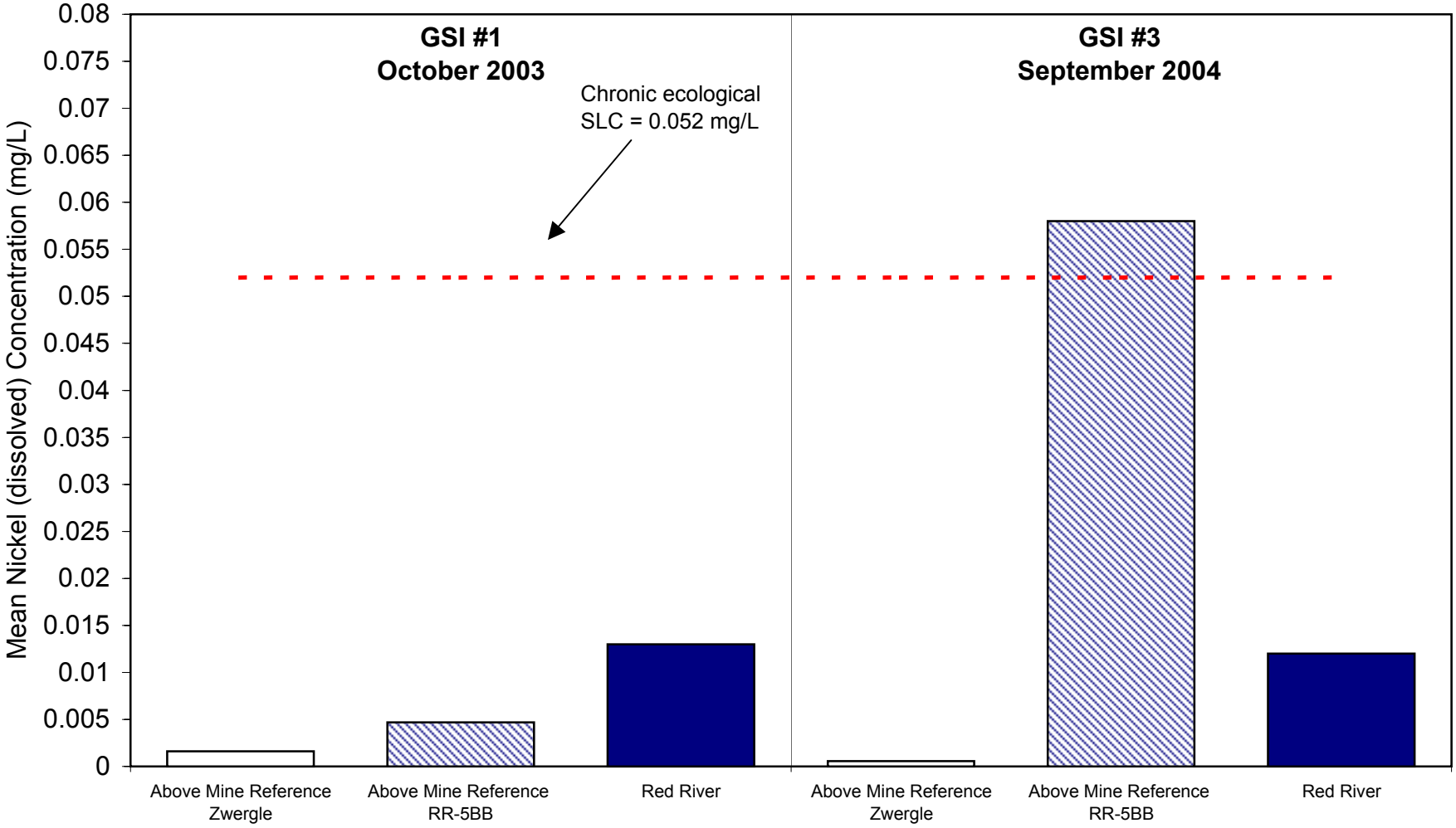
Note: A white bar indicates that 50% or more of the values were not detected, and a mean was not calculated. In these cases, the maximum detected value or the maximum reporting limit, whichever was greater, was plotted.

Figure 5-10
GSI Chamber Water - Red River and Upstream Reference Areas
Comparison of Mean Concentrations of Copper (dissolved)



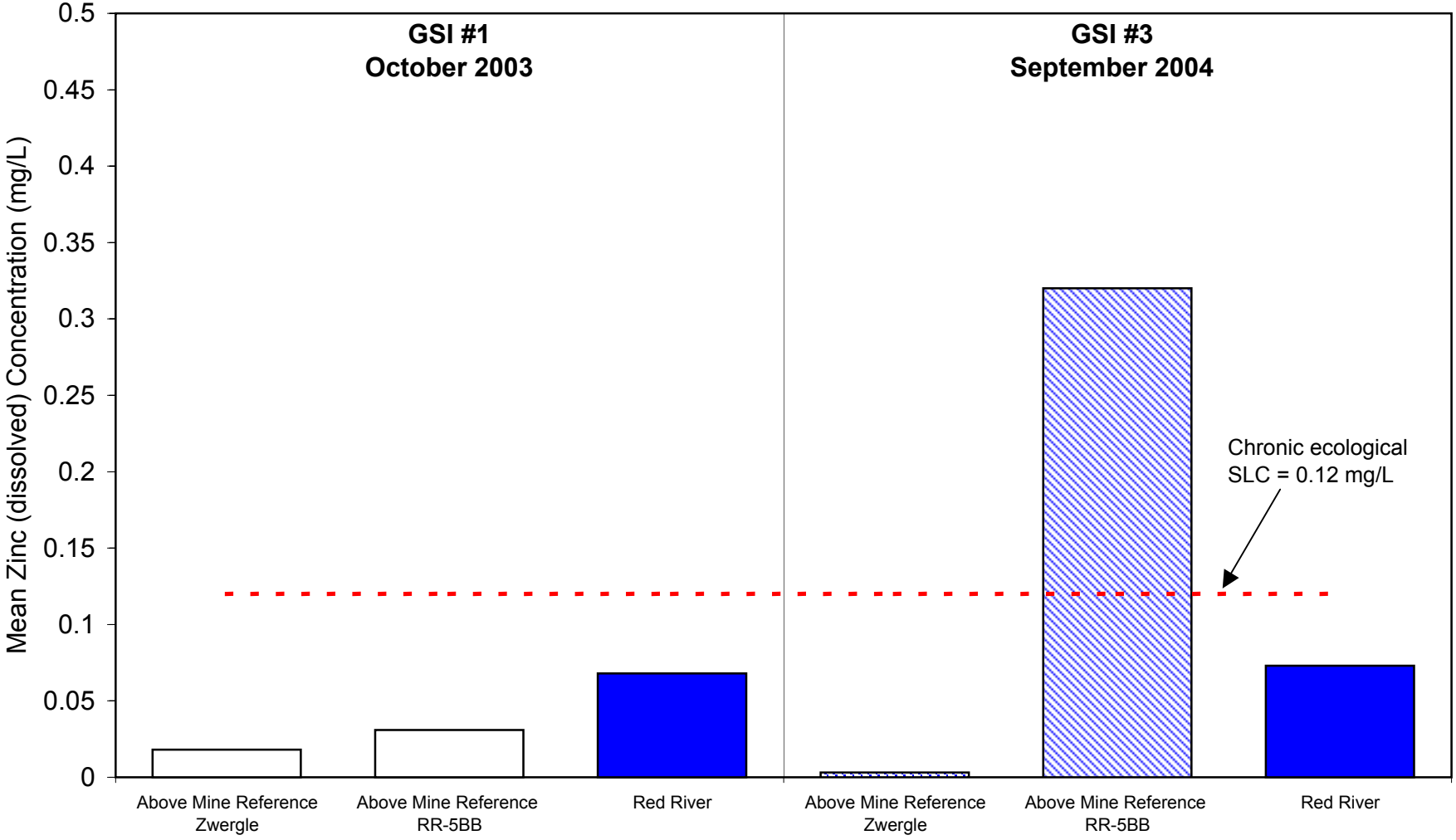
Note: A white bar indicates that 50% or more of the values were not detected, and a mean was not calculated. In these cases, the maximum detected value or the maximum reporting limit, whichever was greater, was plotted.

Figure 5-11
GSI Chamber Water - Red River and Upstream Reference Areas
Comparison of Mean Concentrations of Nickel (dissolved)



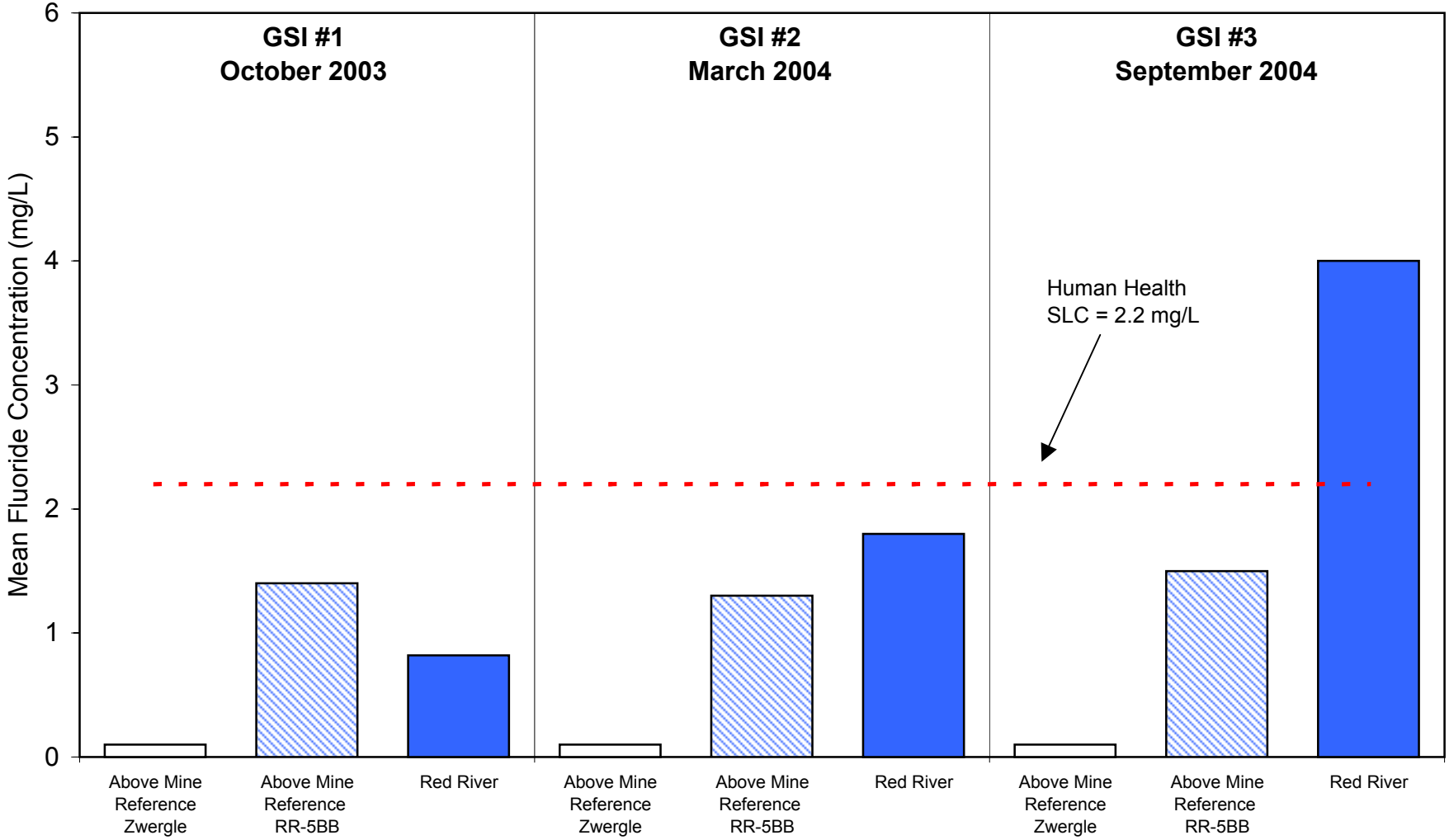
Note: A white bar indicates that 50% or more of the values were not detected, and a mean was not calculated. In these cases, the maximum detected value or the maximum reporting limit, whichever was greater, was plotted.

Figure 5-12
GSI Chamber Water - Red River and Upstream Reference Areas
Comparison of Mean Concentrations of Zinc (dissolved)



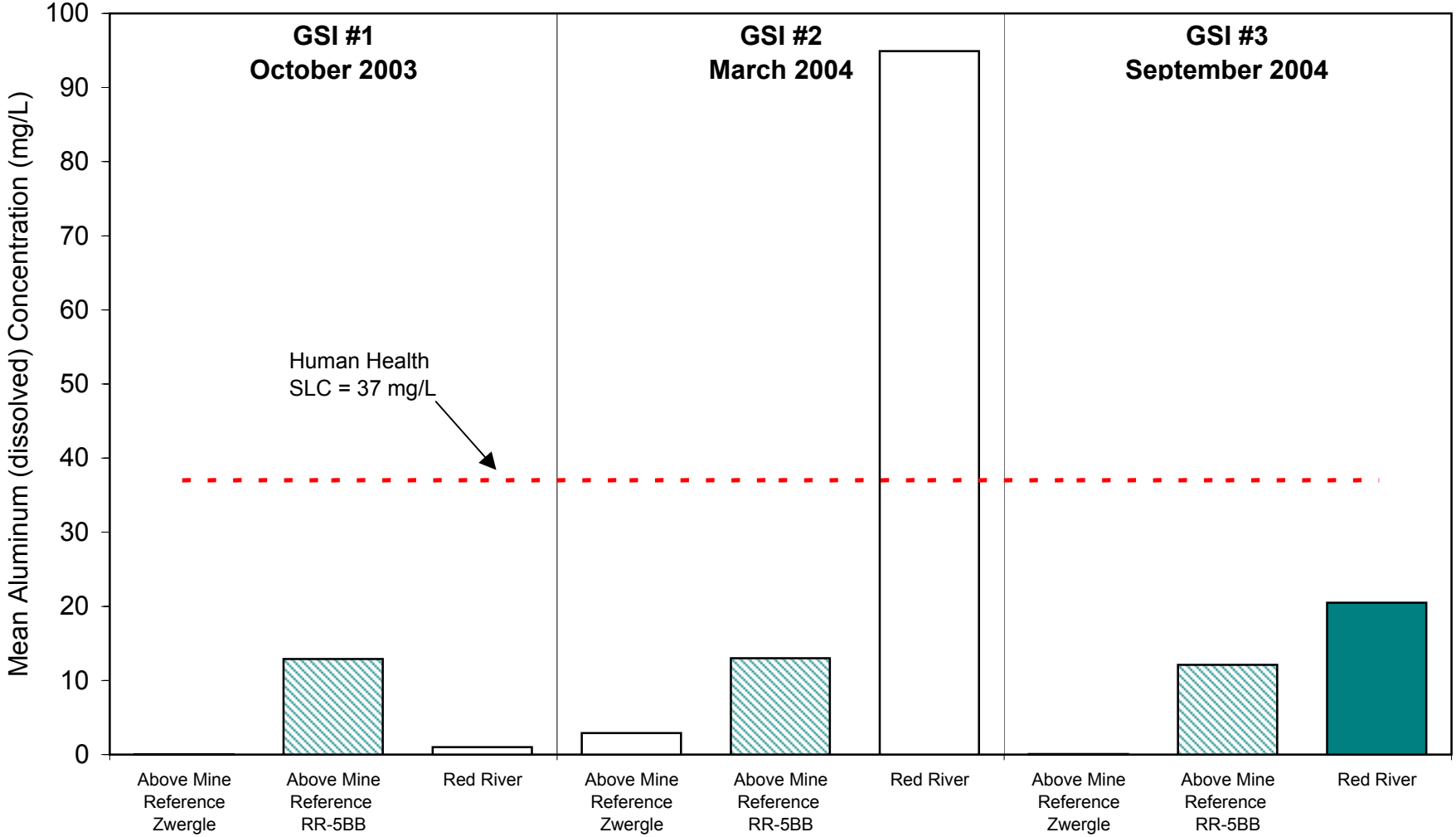
Note: A white bar indicates that 50% or more of the values were not detected, and a mean was not calculated. In these cases, the maximum detected value or the maximum reporting limit, whichever was greater, was plotted.

Figure 5-13
GSI Piezometer Water - Red River and Upstream Reference Areas
Comparison of Mean Concentrations of Fluoride



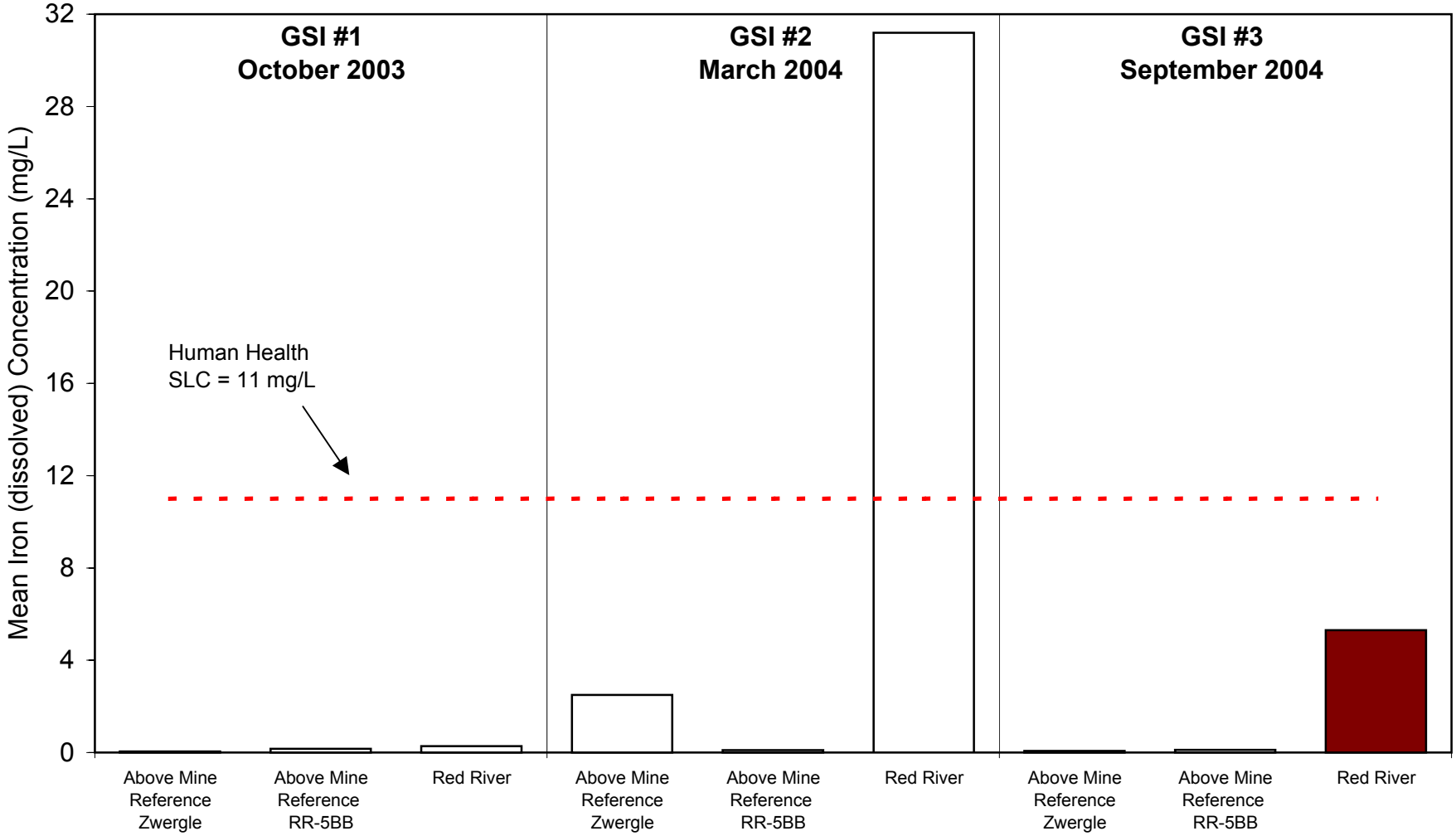
Note: A white bar indicates that 50% or more of the values were not detected, and a mean was not calculated. In these cases, the maximum detected value or the maximum reporting limit, whichever was greater, was plotted.

Figure 5-14
GSI Piezometer Water - Red River and Upstream Reference Areas
Comparison of Mean Concentrations of Aluminum (dissolved)



Note: A white bar indicates that 50% or more of the values were not detected, and a mean was not calculated. In these cases, the maximum detected value or the maximum reporting limit, whichever was greater, was plotted.

Figure 5-15
GSI Piezometer Water - Red River and Upstream Reference Areas
Comparison of Mean Concentrations of Iron (dissolved)



Note: A white bar indicates that 50% or more of the values were not detected, and a mean was not calculated. In these cases, the maximum detected value or the maximum reporting limit, whichever was greater, was plotted.

Figure 5-16
GSI Piezometer Water - Red River and Upstream Reference Areas
Comparison of Mean Concentrations of Manganese (dissolved)

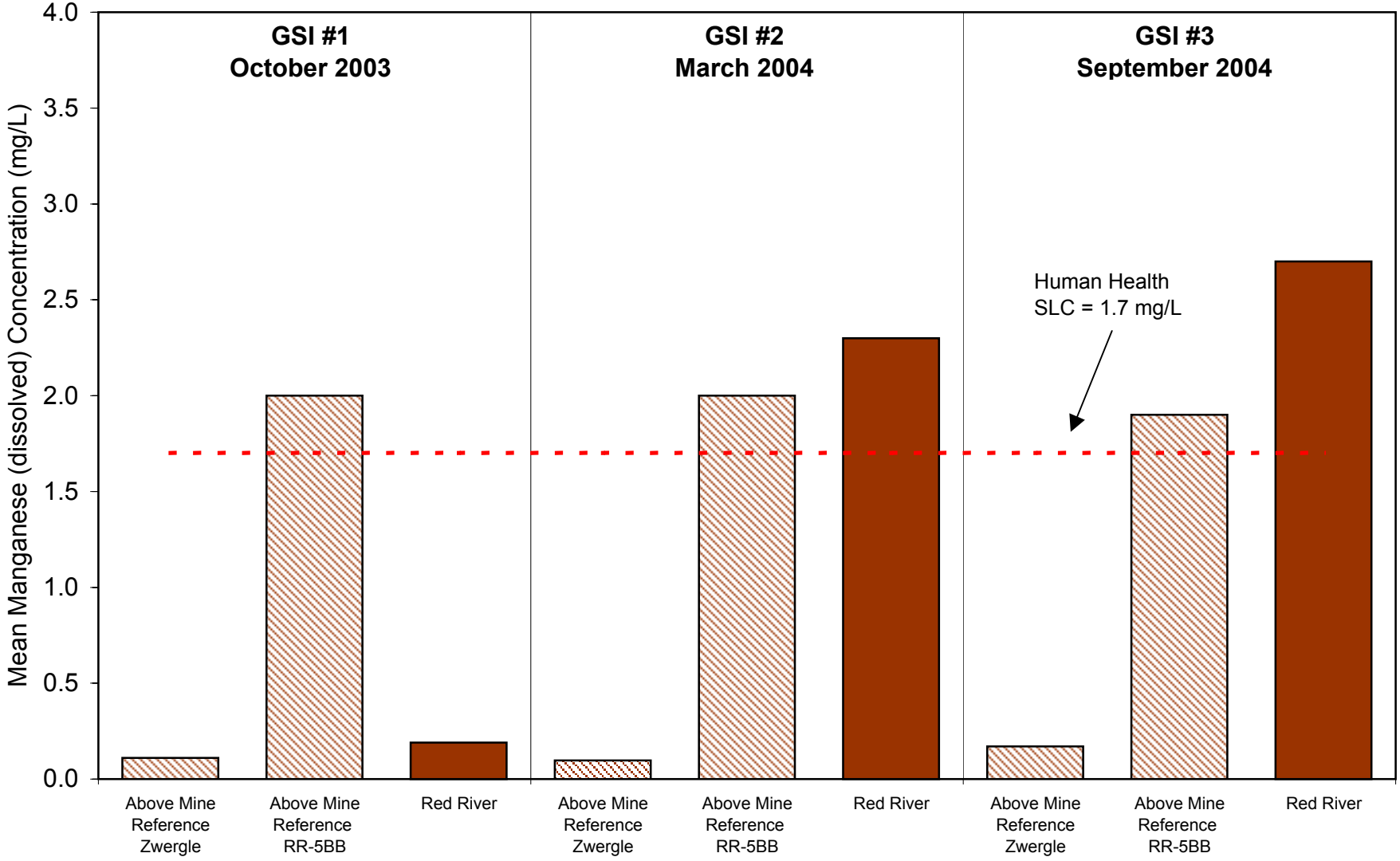


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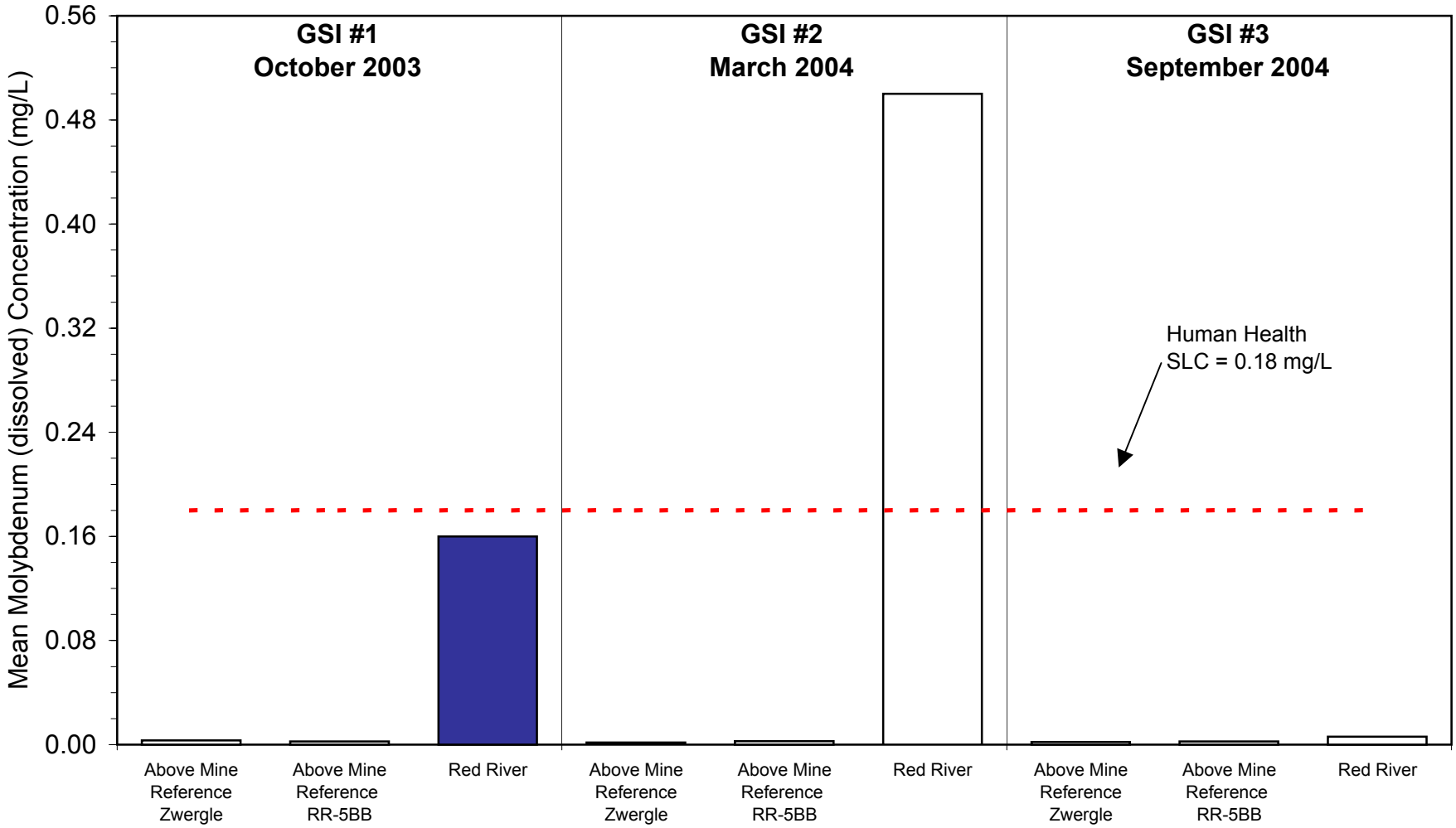
Figure 5-17
GSI Piezometer Water - Red River and Upstream Reference Areas
Comparison of Mean Concentrations of Molybdenum (dissolved)



Note: A white bar indicates that 50% or more of the values were not detected, and a mean was not calculated. In these cases, the maximum detected value or the maximum reporting limit, whichever was greater, was plotted.

Figure 5-18
GSI Sediment - Red River and Upstream Reference Areas
Comparison of Mean Concentrations of Copper (total)

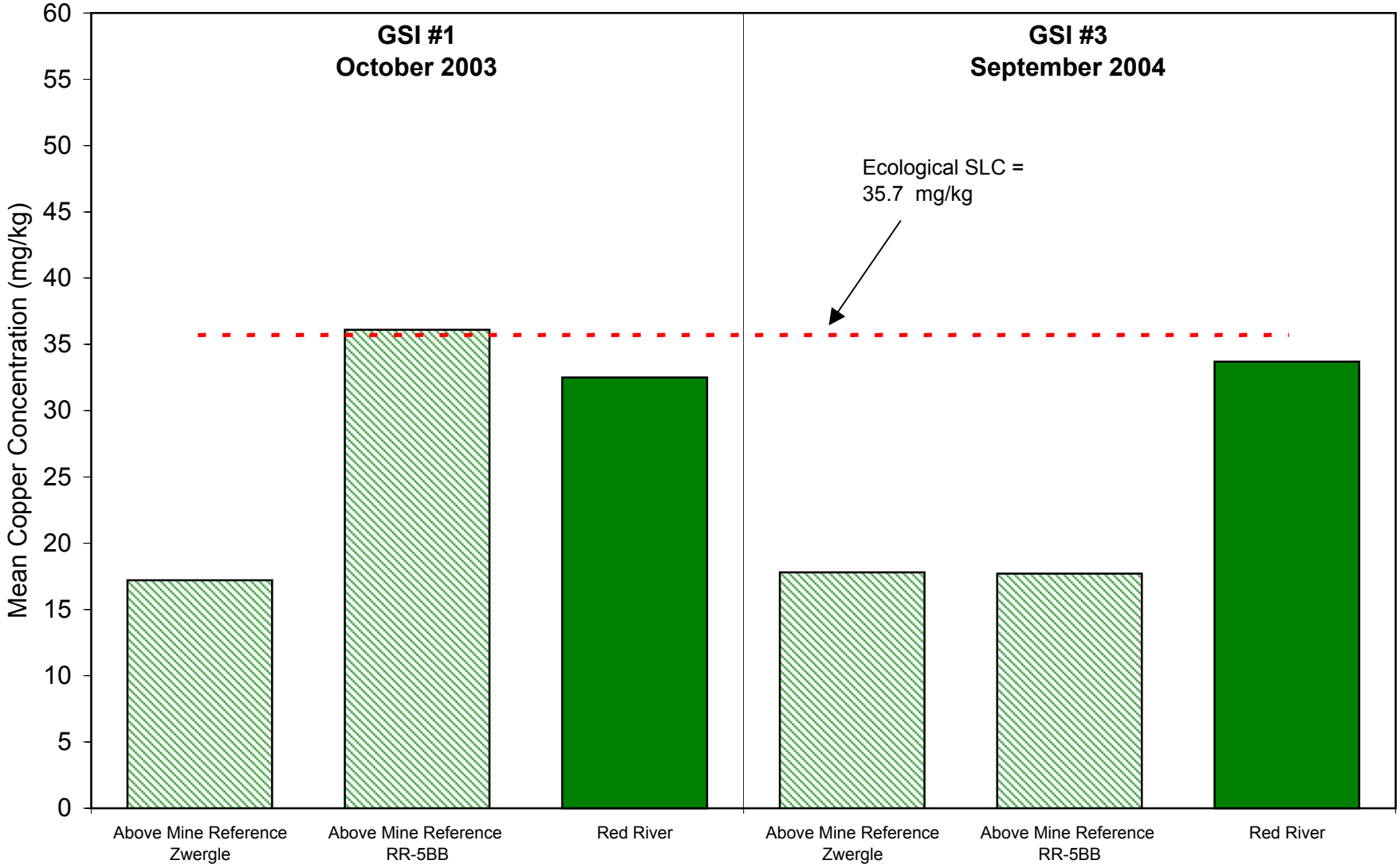


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Figure 5-19
GSI Sediment - Red River and Upstream Reference Areas
Comparison of Mean Concentrations of Iron (total)

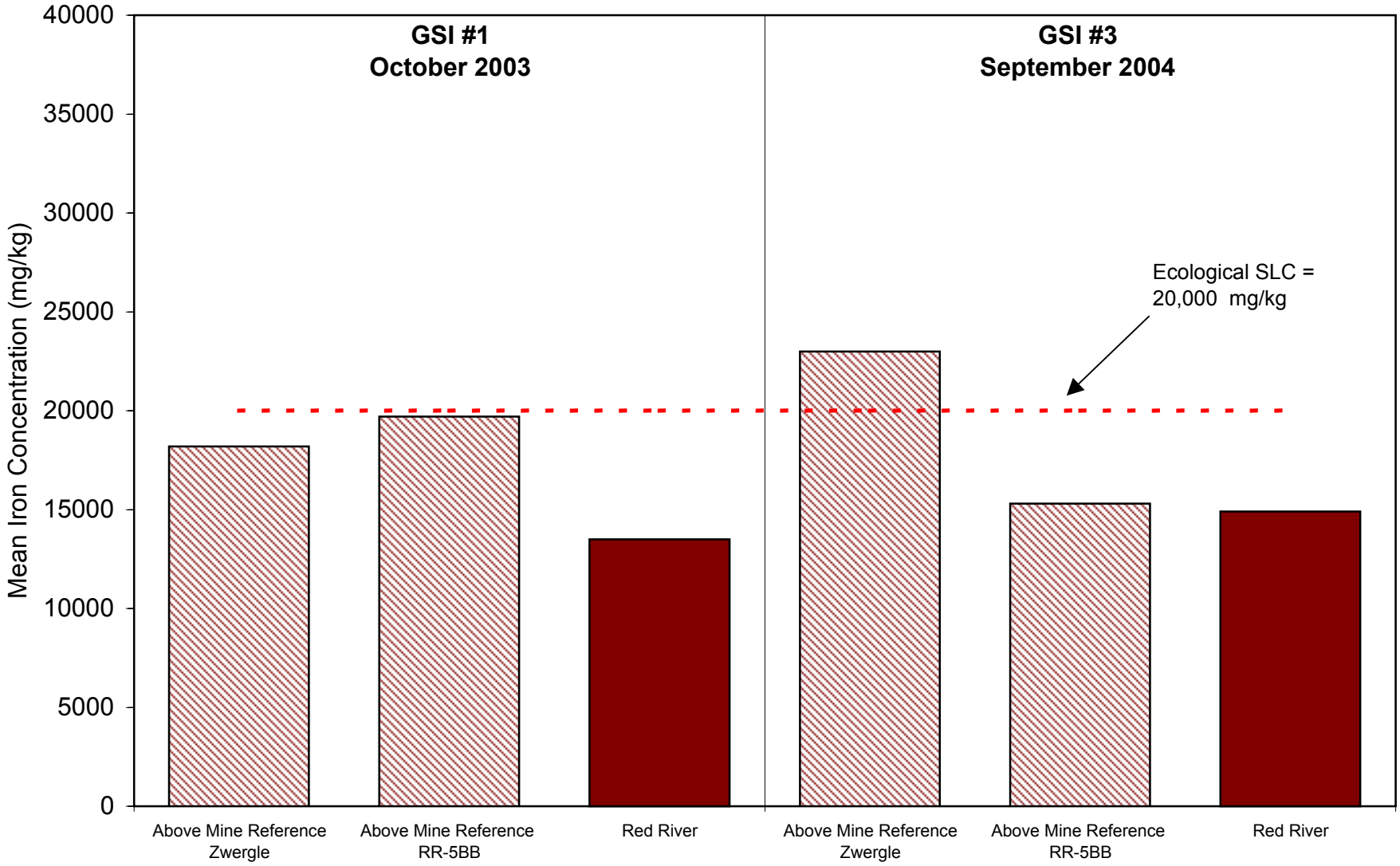

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Figure 5-20
GSI Sediment - Red River and Upstream Reference Areas
Comparison of Mean Concentrations of Lead (total)

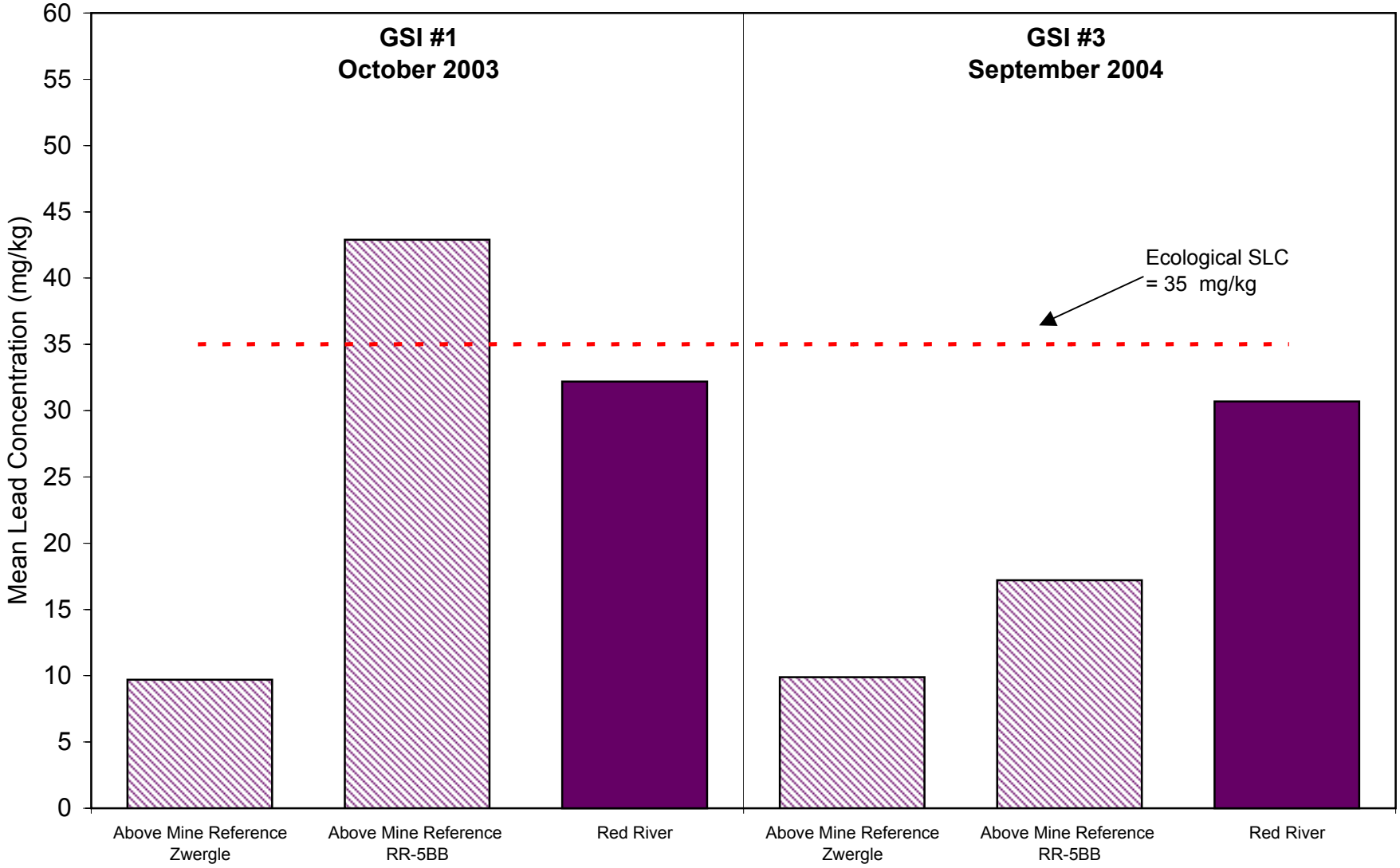

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Figure 5-21
GSI Sediment - Red River and Upstream Reference Areas
Comparison of Mean Concentrations of Manganese (total)

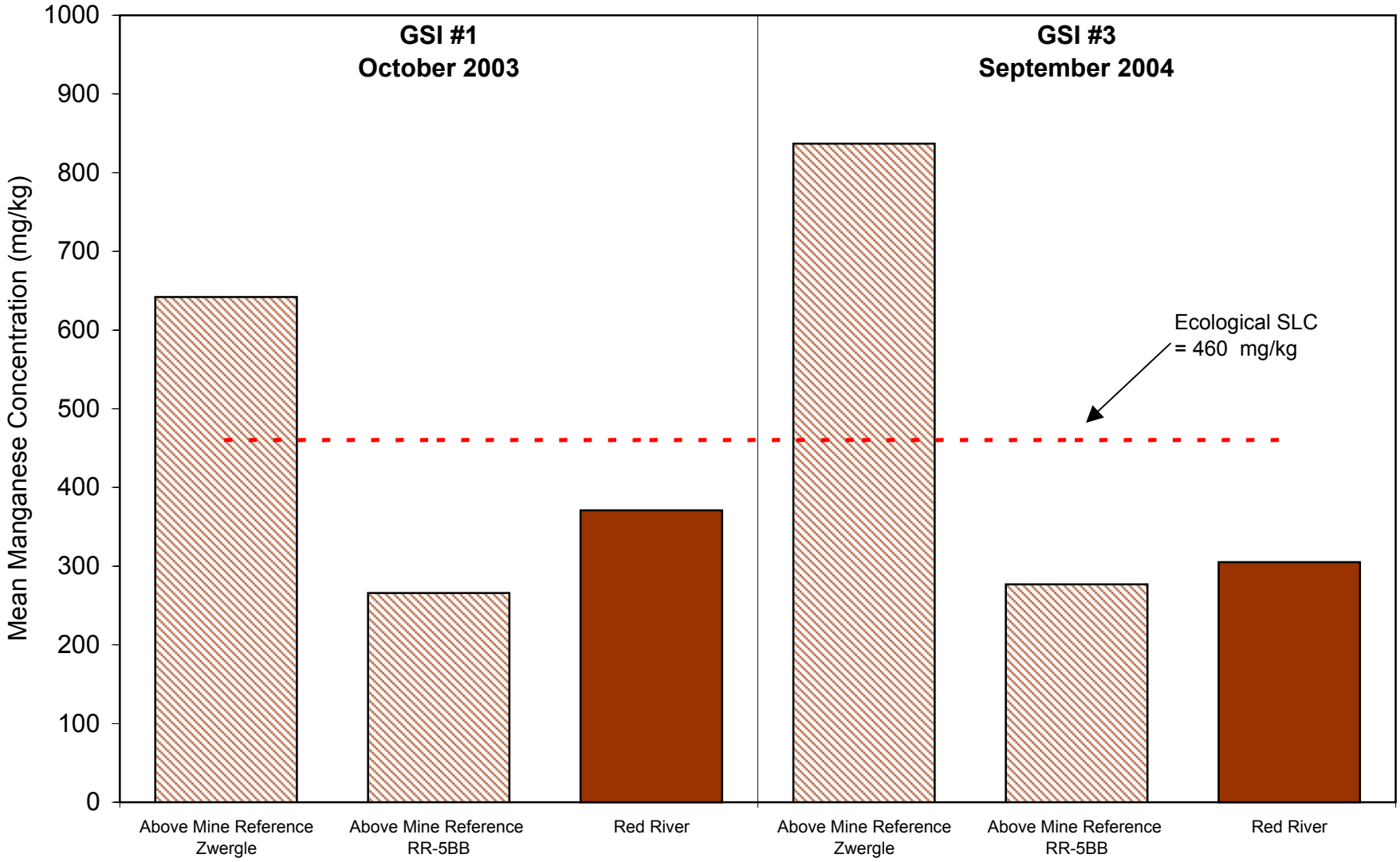

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Figure 5-22
GSI Sediment - Red River and Upstream Reference Areas
Comparison of Mean Concentrations of Nickel (total)

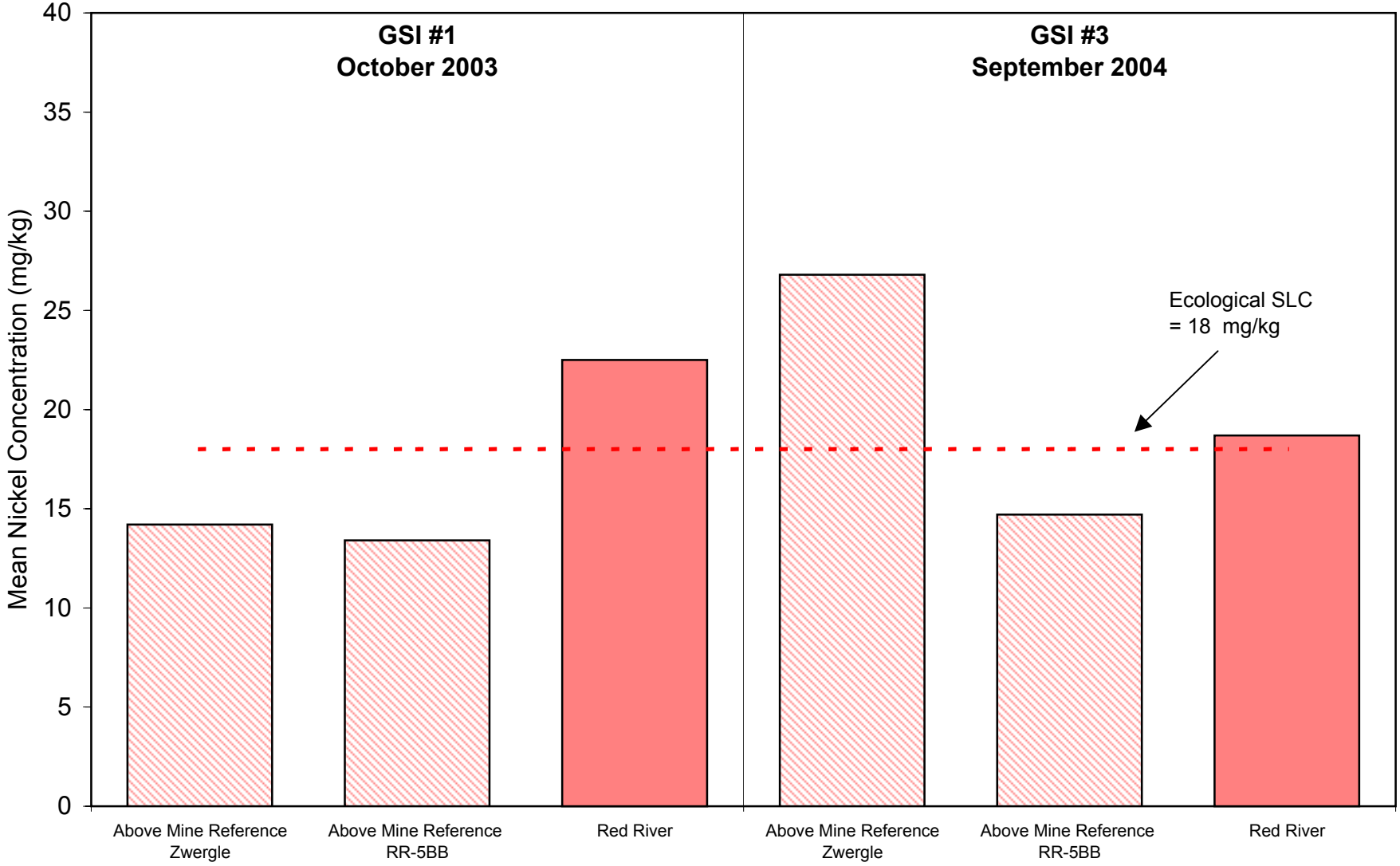

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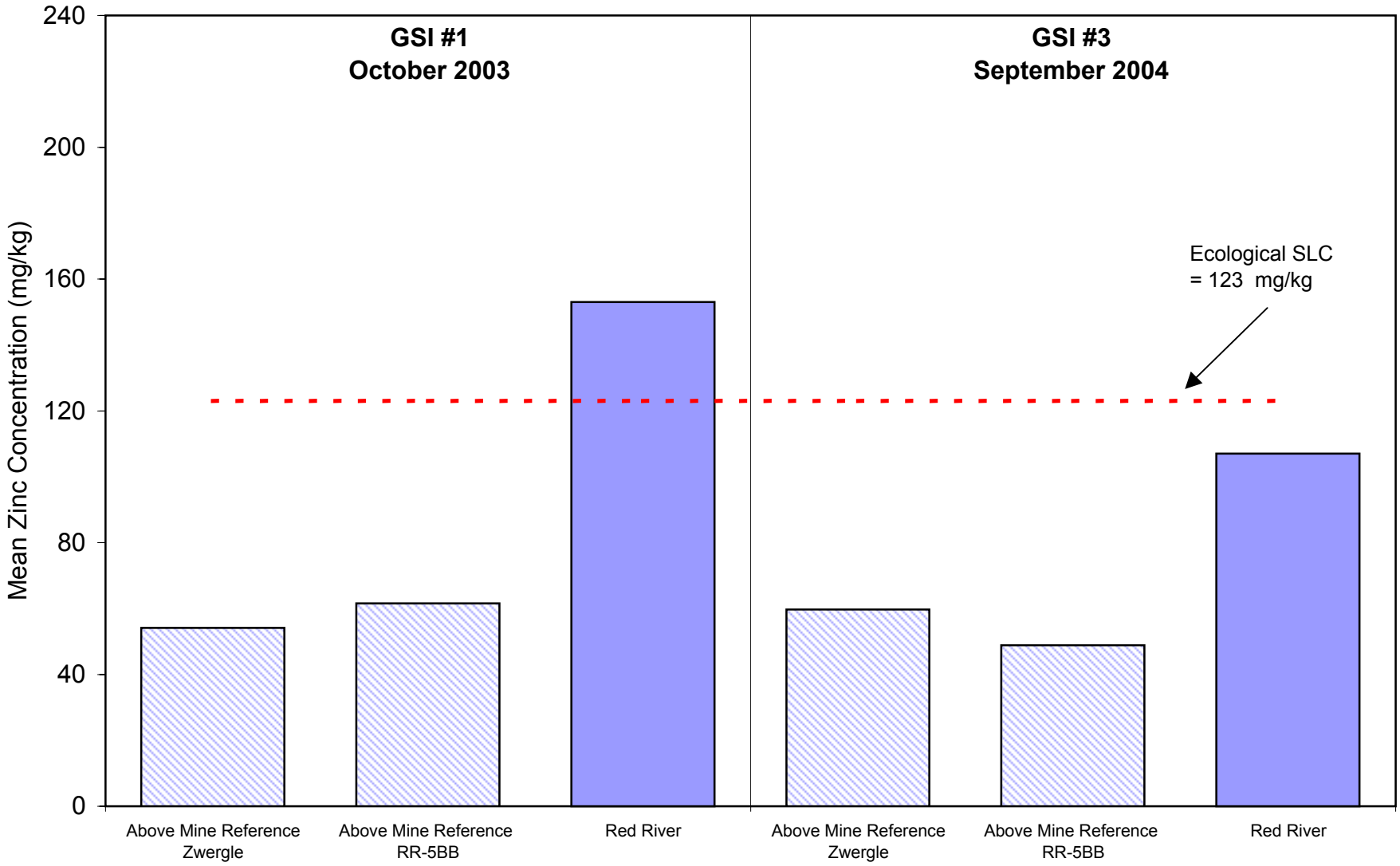
Figure 5-23
GSI Sediment - Red River and Upstream Reference Areas
Comparison of Mean Concentrations of Zinc (total)



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APPENDIX A-5

GROUNDWATER/SURFACE WATER INTERACTION

VALIDATED ANALYTICAL RESULTS

Appendix A-5a
Groundwater/Surface Water Interaction - Chamber Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	LR-1 10/7/2003 LR-1-T01N-WCC SWR		LR-1 10/7/2003 LR-1-T01N-ASC SWR		LR-1 10/7/2003 LR-1-D01N-WCC SWR		LR-1 10/7/2003 LR-1-D01N-ASC SWR		LR-1 10/8/2003 LR-1-T02N-WCC SWR		LR-1 10/8/2003 LR-1-T02N-ASC SWR	
Field Measurements														
Ammonia	mg/L	T	<0.1	:	<0.1	:	-		-		<0.1	:	<0.1	:
General Chemistry														
Fluoride	mg/L	T	0.77	:	0.76	:	-		-		0.76	:	0.76	:
Sulfate	mg/L	T	91.1	:	93.7	:	-		-		92.1	:	110.	:
Total Organic Carbon	mg/L	T	4.2	:	4.7	:	-		-		3.1	:	-	
Physical Properties														
Hardness	mg/L	D	-		-		161.	:	166.	:	-		-	
Metals														
Aluminum	mg/L	D	-		-		0.112	:	0.108	:	-		-	
Antimony	mg/L	D	-		-		<0.0005	:	<0.0005	:	-		-	
Arsenic	mg/L	D	-		-		<0.0002	:	<0.0002	:	-		-	
Barium	mg/L	D	-		-		0.0374	:	0.0338	:	-		-	
Beryllium	mg/L	D	-		-		<0.0002	:	<0.0002	:	-		-	
Boron	mg/L	D	-		-		<0.0078	J	<0.0064	J	-		-	
Cadmium	mg/L	D	-		-		0.00038	:	0.00042	:	-		-	
Calcium	mg/L	D	-		-		48.3	:	49.6	:	-		-	
Chromium	mg/L	D	-		-		<0.0023	:	<0.0023	:	-		-	
Cobalt	mg/L	D	-		-		0.0063	:	0.0048	:	-		-	
Copper	mg/L	D	-		-		0.0028	:	0.0027	:	-		-	
Iron	mg/L	D	-		-		<0.0455	:	<0.0455	:	-		-	
Lead	mg/L	D	-		-		<0.0002	:	<0.0002	:	-		-	
Magnesium	mg/L	D	-		-		9.9	:	10.2	:	-		-	
Manganese	mg/L	D	-		-		0.226	:	0.208	:	-		-	
Molybdenum	mg/L	D	-		-		0.004	:	0.004	:	-		-	
Nickel	mg/L	D	-		-		0.0131	:	0.0137	:	-		-	
Potassium	mg/L	D	-		-		1.32	:	1.36	:	-		-	
Selenium	mg/L	D	-		-		0.00038	:	<0.0003	:	-		-	
Silver	mg/L	D	-		-		<0.0001	:	<0.0001	:	-		-	
Sodium	mg/L	D	-		-		5.67	:	5.93	:	-		-	
Thallium	mg/L	D	-		-		<0.0001	:	<0.0001	:	-		-	
Vanadium	mg/L	D	-		-		<0.0001	:	<0.0001	:	-		-	
Zinc	mg/L	D	-		-		0.0664	:	0.069	:	-		-	

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5a
Groundwater/Surface Water Interaction - Chamber Water
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID											
			LR-1 10/8/2003 LR-1-D02N-WCC		LR-1 10/8/2003 LR-1-D02N-ASC		LR-1 10/9/2003 LR-1-T03N-WCC		LR-1 10/9/2003 LR-1-T03N-ASC		LR-1 10/9/2003 LR-1-D03N-WCC		LR-1 10/9/2003 LR-1-D03N-ASC	
			SWR		SWR		SWR		SWR		SWR		SWR	
Field Measurements														
Ammonia	mg/L	T	-		-		<0.1	:	<0.1	:	-		-	
General Chemistry														
Fluoride	mg/L	T	-		-		0.79	:	0.79	:	-		-	
Sulfate	mg/L	T	-		-		99.2	:	106.	:	-		-	
Total Organic Carbon	mg/L	T	-		-		2.3	:	1.9	:	-		-	
Physical Properties														
Hardness	mg/L	D	170.	:	164.	:	-		-		155.	:	151.	:
Metals														
Aluminum	mg/L	D	0.117	:	0.0869	:	-		-		<0.133	:	<0.133	:
Antimony	mg/L	D	0.00054	:	0.0007	:	-		-		0.00058	:	<0.0005	:
Arsenic	mg/L	D	<0.0002	:	<0.0002	:	-		-		<0.0002	:	<0.0002	:
Barium	mg/L	D	0.036	:	0.0368	:	-		-		0.0338	:	0.0412	:
Beryllium	mg/L	D	<0.0002	:	<0.0002	:	-		-		0.00033	:	0.00046	:
Boron	mg/L	D	<0.013	J	<0.0071	J	-		-		0.0076	:	0.0068	:
Cadmium	mg/L	D	0.00035	:	0.00033	:	-		-		0.00039	:	0.00033	:
Calcium	mg/L	D	50.8	:	49.	:	-		-		46.2	:	45.3	:
Chromium	mg/L	D	<0.0023	:	<0.0023	:	-		-		<0.0013	:	<0.0013	:
Cobalt	mg/L	D	<0.0032	:	<0.0032	:	-		-		<0.0031	:	<0.0031	:
Copper	mg/L	D	0.003	:	0.0032	:	-		-		0.0026	:	0.003	:
Iron	mg/L	D	<0.0455	:	<0.0455	:	-		-		<0.03	:	<0.03	:
Lead	mg/L	D	<0.0002	:	<0.0002	:	-		-		<0.0002	:	<0.0002	:
Magnesium	mg/L	D	10.5	:	10.1	:	-		-		9.52	:	9.31	:
Manganese	mg/L	D	0.204	:	0.202	:	-		-		0.195	:	0.181	:
Molybdenum	mg/L	D	0.0039	:	0.004	:	-		-		0.0042	:	0.0042	:
Nickel	mg/L	D	0.013	:	0.0128	:	-		-		0.0125	:	0.0125	:
Potassium	mg/L	D	1.4	:	1.36	:	-		-		1.32	:	1.3	:
Selenium	mg/L	D	<0.0003	:	<0.0003	:	-		-		<0.0003	:	<0.0003	:
Silver	mg/L	D	<0.0001	:	<0.0001	:	-		-		<0.0001	:	<0.0001	:
Sodium	mg/L	D	6.26	:	5.92	:	-		-		5.36	:	5.29	:
Thallium	mg/L	D	<0.0001	:	<0.0001	:	-		-		<0.0001	:	<0.0001	:
Vanadium	mg/L	D	<0.0001	:	<0.0001	:	-		-		0.0001	:	<0.0001	:
Zinc	mg/L	D	0.072	:	0.0705	:	-		-		0.0704	:	0.0652	:

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5a
Groundwater/Surface Water Interaction - Chamber Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	LR-1 10/10/2003 LR-1-T04N-WCC SWR	LR-1 10/10/2003 LR-1-T04N-ASC SWR	LR-1 10/10/2003 LR-1-D04N-WCC SWR	LR-1 10/10/2003 LR-1-D04N-ASC SWR	LR-16 10/7/2003 LR-16-T01N-WCC SWR	LR-16 10/7/2003 LR-16-T01N-ASC SWR
Field Measurements								
Ammonia	mg/L	T	<0.1 :	<0.1 :	-	-	<0.1 :	<0.1 :
General Chemistry								
Fluoride	mg/L	T	0.86 :	0.86 :	-	-	0.76 :	0.74 :
Sulfate	mg/L	T	103. :	103. :	-	-	103. :	109. :
Total Organic Carbon	mg/L	T	<1. :	1.7 :	-	-	5.4 :	5.8 :
Physical Properties								
Hardness	mg/L	D	-	-	171. :	172. :	-	-
Metals								
Aluminum	mg/L	D	-	-	0.122 :	0.0926 :	-	-
Antimony	mg/L	D	-	-	<0.0005 :	<0.00062 :	-	-
Arsenic	mg/L	D	-	-	<0.0002 :	<0.0002 :	-	-
Barium	mg/L	D	-	-	0.0352 :	0.0354 :	-	-
Beryllium	mg/L	D	-	-	<0.0004 :	<0.0004 :	-	-
Boron	mg/L	D	-	-	<0.0063 :	<0.0063 :	-	-
Cadmium	mg/L	D	-	-	0.00036 :	0.00047 :	-	-
Calcium	mg/L	D	-	-	51.3 :	51.6 :	-	-
Chromium	mg/L	D	-	-	<0.0011 J	<0.0011 J	-	-
Cobalt	mg/L	D	-	-	0.005 :	0.0108 :	-	-
Copper	mg/L	D	-	-	0.0027 :	0.0039 :	-	-
Iron	mg/L	D	-	-	<0.0278 :	<0.0278 :	-	-
Lead	mg/L	D	-	-	<0.0002 :	<0.0002 :	-	-
Magnesium	mg/L	D	-	-	10.5 :	10.6 :	-	-
Manganese	mg/L	D	-	-	0.22 :	0.221 :	-	-
Molybdenum	mg/L	D	-	-	0.0045 :	0.0046 :	-	-
Nickel	mg/L	D	-	-	0.0139 :	0.0138 :	-	-
Potassium	mg/L	D	-	-	1.77 :	1.73 :	-	-
Selenium	mg/L	D	-	-	0.00034 :	0.00053 :	-	-
Silver	mg/L	D	-	-	<0.0001 :	<0.0001 :	-	-
Sodium	mg/L	D	-	-	6.59 :	6.33 :	-	-
Thallium	mg/L	D	-	-	<0.0001 :	<0.0001 :	-	-
Vanadium	mg/L	D	-	-	<0.0001 :	<0.0001 :	-	-
Zinc	mg/L	D	-	-	0.0686 :	0.0692 :	-	-

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5a
Groundwater/Surface Water Interaction - Chamber Water
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID: LR-16	LR-16	LR-16	LR-16	LR-16	LR-16
		Sample Date:	10/7/2003	10/7/2003	10/8/2003	10/8/2003	10/8/2003	10/8/2003
		Sample ID:	LR-16-D01N-WCC	LR-16-D01N-ASC	LR-16-T02N-WCC	LR-16-T02N-ASC	LR-16-D02N-WCC	LR-16-D02N-ASC
		Exposure Area	SWR	SWR	SWR	SWR	SWR	SWR
Field Measurements								
Ammonia	mg/L	T	-	-	<0.1 :	<0.1 :	-	-
General Chemistry								
Fluoride	mg/L	T	-	-	0.81 :	0.79 :	-	-
Sulfate	mg/L	T	-	-	109. :	110. :	-	-
Total Organic Carbon	mg/L	T	-	-	3.4 :	3.4 :	-	-
Physical Properties								
Hardness	mg/L	D	190. :	186. :	-	-	167. :	172. :
Metals								
Aluminum	mg/L	D	0.0862 :	0.0796 :	-	-	<0.111 :	<0.13 :
Antimony	mg/L	D	<0.0005 :	<0.0005 :	-	-	<0.0005 :	0.00065 :
Arsenic	mg/L	D	<0.0002 :	<0.0002 :	-	-	<0.0002 :	<0.0002 :
Barium	mg/L	D	0.0373 :	0.0358 :	-	-	0.0326 :	0.0349 :
Beryllium	mg/L	D	<0.0002 :	<0.0002 :	-	-	0.0009 :	0.00036 :
Boron	mg/L	D	<0.0115 J	<0.0083 J	-	-	0.0126 :	0.0122 :
Cadmium	mg/L	D	0.0003 :	0.00042 :	-	-	0.00026 :	0.00035 :
Calcium	mg/L	D	57.4 :	56. :	-	-	50.4 :	51.8 :
Chromium	mg/L	D	<0.0023 :	<0.0023 :	-	-	<0.0013 :	<0.0013 :
Cobalt	mg/L	D	0.0044 :	0.0048 :	-	-	<0.0031 :	<0.0031 :
Copper	mg/L	D	0.0028 :	0.0047 :	-	-	0.0025 :	0.0031 :
Iron	mg/L	D	<0.0455 :	<0.0455 :	-	-	<0.03 :	<0.03 :
Lead	mg/L	D	<0.0002 :	<0.0002 :	-	-	<0.0002 :	<0.0002 :
Magnesium	mg/L	D	11.4 :	11.2 :	-	-	10.1 :	10.4 :
Manganese	mg/L	D	0.19 :	0.183 :	-	-	0.156 :	0.156 :
Molybdenum	mg/L	D	0.0404 :	0.0407 :	-	-	0.0387 :	0.042 :
Nickel	mg/L	D	0.0104 :	0.0108 :	-	-	0.008 :	0.0095 :
Potassium	mg/L	D	1.58 :	1.56 :	-	-	1.42 :	1.49 :
Selenium	mg/L	D	<0.0003 :	<0.0003 :	-	-	<0.0003 :	<0.0003 :
Silver	mg/L	D	<0.0001 :	<0.0001 :	-	-	<0.0001 :	<0.0001 :
Sodium	mg/L	D	10.4 :	9.94 :	-	-	8.94 :	9.33 :
Thallium	mg/L	D	<0.0001 :	<0.0001 :	-	-	<0.0001 :	<0.0001 :
Vanadium	mg/L	D	0.00025 :	0.00027 :	-	-	0.00023 :	0.0003 :
Zinc	mg/L	D	0.0483 :	0.0463 :	-	-	0.0527 :	0.0479 :

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5a
Groundwater/Surface Water Interaction - Chamber Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area	Fraction	LR-16 10/9/2003 LR-16-T03N-WCC SWR	LR-16 10/9/2003 LR-16-T03N-ASC SWR	LR-16 10/9/2003 LR-16-D03N-WCC SWR	LR-16 10/9/2003 LR-16-D03N-ASC SWR	LR-16 10/10/2003 LR-16-T04N-WCC SWR	LR-16 10/10/2003 LR-16-T04N-ASC SWR
Field Measurements									
Ammonia	mg/L		T	<0.1 :	<0.1 :	-	-	<0.1 :	<0.1 :
General Chemistry									
Fluoride	mg/L		T	0.79 :	0.79 :	-	-	0.84 :	0.83 :
Sulfate	mg/L		T	126. :	120. :	-	-	120. :	120. :
Total Organic Carbon	mg/L		T	1.7 :	2.1 :	-	-	1.4 :	1.6 :
Physical Properties									
Hardness	mg/L		D	-	-	173. :	175. :	-	-
Metals									
Aluminum	mg/L		D	-	-	<0.116 :	<0.114 :	-	-
Antimony	mg/L		D	-	-	<0.0005 :	0.00057 :	-	-
Arsenic	mg/L		D	-	-	<0.0002 :	<0.0002 :	-	-
Barium	mg/L		D	-	-	0.0358 :	0.0352 :	-	-
Beryllium	mg/L		D	-	-	<0.0003 :	<0.0003 :	-	-
Boron	mg/L		D	-	-	0.0108 :	0.0113 :	-	-
Cadmium	mg/L		D	-	-	0.0004 :	0.00047 :	-	-
Calcium	mg/L		D	-	-	52.1 :	52.8 :	-	-
Chromium	mg/L		D	-	-	<0.0013 :	<0.0013 :	-	-
Cobalt	mg/L		D	-	-	<0.0031 :	<0.0031 :	-	-
Copper	mg/L		D	-	-	0.0029 :	0.003 :	-	-
Iron	mg/L		D	-	-	<0.03 :	<0.03 :	-	-
Lead	mg/L		D	-	-	<0.0002 :	<0.0002 :	-	-
Magnesium	mg/L		D	-	-	10.4 :	10.6 :	-	-
Manganese	mg/L		D	-	-	0.158 :	0.155 :	-	-
Molybdenum	mg/L		D	-	-	0.0432 :	0.0436 :	-	-
Nickel	mg/L		D	-	-	0.0104 :	0.0101 :	-	-
Potassium	mg/L		D	-	-	1.5 :	1.52 :	-	-
Selenium	mg/L		D	-	-	<0.0003 :	<0.0003 :	-	-
Silver	mg/L		D	-	-	<0.0001 :	<0.0001 :	-	-
Sodium	mg/L		D	-	-	9.26 :	9.5 :	-	-
Thallium	mg/L		D	-	-	<0.0001 :	<0.0001 :	-	-
Vanadium	mg/L		D	-	-	0.00032 :	0.00032 :	-	-
Zinc	mg/L		D	-	-	0.0662 :	0.0554 :	-	-

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5a
Groundwater/Surface Water Interaction - Chamber Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	LR-16 10/10/2003 LR-16-D04N-WCC SWR	LR-16 10/10/2003 LR-16-D04N-ASC SWR	LR-8A 10/7/2003 LR-8A-T01N-WCC SWR	LR-8A 10/7/2003 LR-8A-T01N-ASC SWR	LR-8A 10/7/2003 LR-8A-D01N-WCC SWR	LR-8A 10/7/2003 LR-8A-D01N-ASC SWR
Field Measurements								
Ammonia	mg/L	T	-	-	<0.1 :	<0.1 :	-	-
General Chemistry								
Fluoride	mg/L	T	-	-	0.74 :	0.76 :	-	-
Sulfate	mg/L	T	-	-	97.1 :	96.4 :	-	-
Total Organic Carbon	mg/L	T	-	-	4.5 :	5.3 :	-	-
Physical Properties								
Hardness	mg/L	D	190. :	191. :	-	-	169. :	163. :
Metals								
Aluminum	mg/L	D	0.104 :	0.0971 :	-	-	0.0935 :	0.0943 :
Antimony	mg/L	D	<0.0022 J	<0.0005 :	-	-	<0.0005 :	<0.0005 :
Arsenic	mg/L	D	<0.0002 :	<0.0002 :	-	-	<0.0002 :	<0.0002 :
Barium	mg/L	D	0.0341 :	0.0356 :	-	-	0.0376 :	0.0385 :
Beryllium	mg/L	D	<0.0004 :	<0.0004 :	-	-	<0.0002 :	<0.0002 :
Boron	mg/L	D	0.0084 :	0.0096 :	-	-	<0.0094 J	<0.0074 J
Cadmium	mg/L	D	0.00029 J	0.00037 :	-	-	0.00036 :	0.00039 :
Calcium	mg/L	D	57.2 :	57.7 :	-	-	51. :	49. :
Chromium	mg/L	D	<0.0011 J	<0.0011 J	-	-	<0.0023 :	<0.0023 :
Cobalt	mg/L	D	<0.0029 :	<0.0029 :	-	-	0.0046 :	0.0064 :
Copper	mg/L	D	0.0027 :	0.0025 :	-	-	0.0026 :	0.0047 :
Iron	mg/L	D	<0.0278 :	<0.0278 :	-	-	<0.0455 :	<0.0455 :
Lead	mg/L	D	<0.0002 :	<0.0002 :	-	-	<0.0002 :	<0.0002 :
Magnesium	mg/L	D	11.4 :	11.4 :	-	-	10.2 :	9.78 :
Manganese	mg/L	D	0.159 :	0.145 :	-	-	0.214 :	0.222 :
Molybdenum	mg/L	D	0.0449 :	0.0466 :	-	-	0.0204 :	0.0185 :
Nickel	mg/L	D	0.0098 :	0.0099 :	-	-	0.012 :	0.0118 :
Potassium	mg/L	D	1.79 :	1.74 :	-	-	1.4 :	1.38 :
Selenium	mg/L	D	0.00039 :	<0.0003 :	-	-	<0.0003 :	<0.0003 :
Silver	mg/L	D	<0.0001 :	<0.0001 :	-	-	<0.0001 :	<0.0001 :
Sodium	mg/L	D	10.6 :	11.1 :	-	-	7.72 :	7.63 :
Thallium	mg/L	D	<0.0001 :	<0.0001 :	-	-	<0.0001 :	<0.0001 :
Vanadium	mg/L	D	0.0003 :	0.00027 :	-	-	<0.0001 :	<0.0001 :
Zinc	mg/L	D	0.0444 :	0.0471 :	-	-	0.0613 :	0.0774 :

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5a
Groundwater/Surface Water Interaction - Chamber Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area	Fraction											
		LR-8A 10/8/2003 LR-8A-T02N-WCC	SWR	LR-8A 10/8/2003 LR-8A-T02N-ASC	SWR	LR-8A 10/8/2003 LR-8A-D02N-WCC	SWR	LR-8A 10/8/2003 LR-8A-D02N-ASC	SWR	LR-8A 10/9/2003 LR-8A-T03N-WCC	SWR	LR-8A 10/9/2003 LR-8A-T03N-ASC	SWR
Field Measurements													
Ammonia	mg/L	<0.1	: T	<0.1	: T	-		-		<0.1	: T	<0.1	: T
General Chemistry													
Fluoride	mg/L	0.73	: T	0.74	: T	-		-		0.81	: T	0.79	: T
Sulfate	mg/L	110.	: T	99.8	: T	-		-		110.	: T	110.	: T
Total Organic Carbon	mg/L	2.6	: T	2.8	: T	-		-		1.1	: T	2.1	: T
Physical Properties													
Hardness	mg/L	-	D	-	D	179.	: D	171.	: D	-	D	-	D
Metals													
Aluminum	mg/L	-	D	-	D	0.13	: D	0.162	: D	-	D	-	D
Antimony	mg/L	-	D	-	D	0.00065	: D	<0.0005	: D	-	D	-	D
Arsenic	mg/L	-	D	-	D	<0.0002	: D	<0.0002	: D	-	D	-	D
Barium	mg/L	-	D	-	D	0.0366	: D	0.038	: D	-	D	-	D
Beryllium	mg/L	-	D	-	D	<0.0002	: D	<0.0002	: D	-	D	-	D
Boron	mg/L	-	D	-	D	<0.0085	: D	<0.01	: D	-	D	-	D
Cadmium	mg/L	-	D	-	D	0.0004	: D	0.00032	: D	-	D	-	D
Calcium	mg/L	-	D	-	D	53.9	: D	51.5	: D	-	D	-	D
Chromium	mg/L	-	D	-	D	<0.0023	: D	<0.0023	: D	-	D	-	D
Cobalt	mg/L	-	D	-	D	<0.0032	: D	<0.0032	: D	-	D	-	D
Copper	mg/L	-	D	-	D	0.003	: D	0.0033	: D	-	D	-	D
Iron	mg/L	-	D	-	D	<0.0455	: D	<0.0455	: D	-	D	-	D
Lead	mg/L	-	D	-	D	<0.0002	: D	<0.0002	: D	-	D	-	D
Magnesium	mg/L	-	D	-	D	10.8	: D	10.3	: D	-	D	-	D
Manganese	mg/L	-	D	-	D	0.19	: D	0.194	: D	-	D	-	D
Molybdenum	mg/L	-	D	-	D	0.0187	: D	0.0165	: D	-	D	-	D
Nickel	mg/L	-	D	-	D	0.0111	: D	0.0112	: D	-	D	-	D
Potassium	mg/L	-	D	-	D	1.47	: D	1.41	: D	-	D	-	D
Selenium	mg/L	-	D	-	D	<0.0003	: D	<0.0003	: D	-	D	-	D
Silver	mg/L	-	D	-	D	<0.0001	: D	<0.0001	: D	-	D	-	D
Sodium	mg/L	-	D	-	D	7.97	: D	7.55	: D	-	D	-	D
Thallium	mg/L	-	D	-	D	<0.0001	: D	<0.0001	: D	-	D	-	D
Vanadium	mg/L	-	D	-	D	<0.0001	: D	<0.0001	: D	-	D	-	D
Zinc	mg/L	-	D	-	D	0.0683	: D	0.11	: D	-	D	-	D

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5a
Groundwater/Surface Water Interaction - Chamber Water
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID					
			LR-8A 10/9/2003 LR-8A-D03N-WCC	LR-8A 10/9/2003 LR-8A-D03N-ASC	LR-8A 10/10/2003 LR-8A-T04N-WCC	LR-8A 10/10/2003 LR-8A-T04N-ASC	LR-8A 10/10/2003 LR-8A-D04N-WCC	LR-8A 10/10/2003 LR-8A-D04N-ASC
			SWR	SWR	SWR	SWR	SWR	SWR
Field Measurements								
Ammonia	mg/L	T	-	-	<0.1 :	<0.1 :	-	-
General Chemistry								
Fluoride	mg/L	T	-	-	0.84 :	0.84 :	-	-
Sulfate	mg/L	T	-	-	104. :	106. :	-	-
Total Organic Carbon	mg/L	T	-	-	3.1 :	1.2 :	-	-
Physical Properties								
Hardness	mg/L	D	166. :	162. :	-	-	177. :	176. :
Metals								
Aluminum	mg/L	D	<0.123 :	<0.104 :	-	-	0.105 :	0.0884 :
Antimony	mg/L	D	0.00062 :	0.00053 :	-	-	<0.0017 :	<0.0005 :
Arsenic	mg/L	D	<0.0002 :	<0.0002 :	-	-	<0.0002 :	<0.0002 :
Barium	mg/L	D	0.0348 :	0.0343 :	-	-	0.035 :	0.0356 :
Beryllium	mg/L	D	0.00033 :	0.00049 :	-	-	<0.0004 :	<0.0004 :
Boron	mg/L	D	0.009 :	0.0089 :	-	-	0.0072 :	0.0071 :
Cadmium	mg/L	D	0.00035 :	0.00041 :	-	-	0.00033 :	0.00041 :
Calcium	mg/L	D	49.8 :	48.6 :	-	-	53.3 :	53.2 :
Chromium	mg/L	D	<0.0013 :	<0.0013 :	-	-	<0.0011 J	<0.0011 J
Cobalt	mg/L	D	<0.0031 :	<0.0031 :	-	-	<0.0029 :	<0.0029 :
Copper	mg/L	D	0.0027 :	0.0027 :	-	-	0.0029 :	0.0055 :
Iron	mg/L	D	<0.03 :	<0.0623 :	-	-	<0.0278 :	<0.0278 :
Lead	mg/L	D	<0.0002 :	<0.0002 :	-	-	<0.0002 :	<0.0002 :
Magnesium	mg/L	D	10. :	9.78 :	-	-	10.6 :	10.6 :
Manganese	mg/L	D	0.189 :	0.177 :	-	-	0.2 :	0.191 :
Molybdenum	mg/L	D	0.0192 :	0.0169 :	-	-	0.0212 :	0.0174 :
Nickel	mg/L	D	0.012 :	0.0121 :	-	-	0.0126 :	0.0121 :
Potassium	mg/L	D	1.4 :	1.34 :	-	-	<1.54 :	<1.52 :
Selenium	mg/L	D	<0.0003 :	<0.0003 :	-	-	<0.0003 :	<0.0003 :
Silver	mg/L	D	<0.0001 :	<0.0001 :	-	-	<0.0001 :	<0.0001 :
Sodium	mg/L	D	7.25 :	6.87 :	-	-	8.12 :	8.37 :
Thallium	mg/L	D	<0.0001 :	<0.0001 :	-	-	<0.0001 :	<0.0001 :
Vanadium	mg/L	D	<0.0001 :	<0.0001 :	-	-	<0.0001 :	<0.0001 :
Zinc	mg/L	D	0.0596 :	0.0612 :	-	-	0.0658 :	0.0649 :

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5a
Groundwater/Surface Water Interaction - Chamber Water
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID											
			RR-11B2 9/27/2004 RR-11B2-T00N-WSC		RR-11B2 9/27/2004 RR-11B2-D00N-WSC		RR-11B2 9/28/2004 RR-11B2-T01N-WSC		RR-11B2 9/28/2004 RR-11B2-D01N-WSC		RR-11B2 9/29/2004 RR-11B2-T02N-WSC		RR-11B2 9/29/2004 RR-11B2-D02N-WSC	
			SWR		SWR		SWR		SWR		SWR		SWR	
General Chemistry														
Dissolved Organic Carbon	mg/L	D	-		2.7	:	-		1.7	:	-		2.1	:
Fluoride	mg/L	T	0.73	:	-		0.63	:	-		1.4	:	-	
Sulfate	mg/L	T	78.	:	-		71.2	:	-		128.	:	-	
Total Organic Carbon	mg/L	T	2.4	:	-		2.6	:	-		1.8	:	-	
Physical Properties														
Hardness	mg/L	D	-		146.	:	-		121.	:	-		171.	:
Metals														
Aluminum	mg/L	D	-		0.131	:	-		0.0649	:	-		0.292	:
Antimony	mg/L	D	-		<0.0011	:	-		<0.0003	:	-		<0.00046	:
Arsenic	mg/L	D	-		<0.0001	:	-		<0.0001	J	-		<0.0001	:
Barium	mg/L	D	-		0.0386	:	-		0.0361	:	-		0.0456	:
Beryllium	mg/L	D	-		<0.0003	:	-		<0.0003	:	-		<0.0003	:
Boron	mg/L	D	-		<0.0069	:	-		<0.0069	:	-		<0.0069	:
Cadmium	mg/L	D	-		<0.0001	:	-		<0.0001	J	-		0.00021	:
Calcium	mg/L	D	-		44.	:	-		36.3	:	-		49.3	:
Chromium	mg/L	D	-		<0.0011	:	-		<0.0009	:	-		0.0016	:
Cobalt	mg/L	D	-		<0.0031	:	-		<0.0031	:	-		<0.0031	:
Copper	mg/L	D	-		0.0033	:	-		0.0039	J	-		0.0018	J
Iron	mg/L	D	-		0.0654	:	-		<0.0355	:	-		<0.0456	:
Lead	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Magnesium	mg/L	D	-		8.86	:	-		7.36	:	-		11.7	:
Manganese	mg/L	D	-		0.0478	:	-		0.0366	:	-		0.0471	:
Molybdenum	mg/L	D	-		<0.0026	:	-		0.0019	:	-		<0.0036	:
Nickel	mg/L	D	-		0.0102	:	-		0.0074	:	-		0.0181	:
Potassium	mg/L	D	-		1.47	:	-		1.09	:	-		1.39	:
Selenium	mg/L	D	-		<0.0003	:	-		<0.0003	:	-		<0.0003	:
Silver	mg/L	D	-		<0.0001	:	-		<0.0001	J	-		<0.0001	J
Sodium	mg/L	D	-		4.77	:	-		4.09	:	-		5.33	:
Thallium	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Vanadium	mg/L	D	-		0.0002	:	-		<0.0001	J	-		<0.0001	:
Zinc	mg/L	D	-		0.0532	:	-		0.0413	:	-		0.132	:

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5a
Groundwater/Surface Water Interaction - Chamber Water
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID											
			RR-11B2 9/30/2004 RR-11B2-T03N-WSC		RR-11B2 9/30/2004 RR-11B2-D03N-WSC		RR-11B2 10/1/2004 RR-11B2-T04N-WSC		RR-11B2 10/1/2004 RR-11B2-D04N-WSC		RR-11B3 9/27/2004 RR-11B3-T00N-WSC		RR-11B3 9/27/2004 RR-11B3-D00N-WSC	
			SWR		SWR		SWR		SWR		SWR		SWR	
General Chemistry														
Dissolved Organic Carbon	mg/L	D	-		2.9	J	-		1.7	J	-		3.3	:
Fluoride	mg/L	T	0.9	J	-		0.83	J	-		0.51	:	-	
Sulfate	mg/L	T	79.6	J	-		63.9	J	-		80.1	:	-	
Total Organic Carbon	mg/L	T	2.9	J	-		2.3	J	-		2.2	:	-	
Physical Properties														
Hardness	mg/L	D	-		139.	J	-		144.	J	-		149.	:
Metals														
Aluminum	mg/L	D	-		0.0729	:	-		<0.0597	:	-		0.0781	:
Antimony	mg/L	D	-		<0.00042	:	-		<0.0004	:	-		<0.0011	:
Arsenic	mg/L	D	-		<0.00014	:	-		<0.00016	:	-		<0.0001	:
Barium	mg/L	D	-		0.0363	:	-		0.0332	:	-		0.0346	:
Beryllium	mg/L	D	-		<0.0003	:	-		<0.0003	:	-		<0.0003	:
Boron	mg/L	D	-		<0.0069	:	-		<0.0069	:	-		<0.0069	:
Cadmium	mg/L	D	-		0.00024	:	-		0.00014	:	-		<0.0001	:
Calcium	mg/L	D	-		41.4	:	-		42.8	:	-		45.1	:
Chromium	mg/L	D	-		<0.0011	:	-		<0.0011	:	-		<0.0011	:
Cobalt	mg/L	D	-		<0.0031	:	-		<0.0031	:	-		<0.0031	:
Copper	mg/L	D	-		<0.0034	:	-		<0.0031	:	-		0.0024	:
Iron	mg/L	D	-		<0.0355	:	-		<0.0355	:	-		<0.0355	:
Lead	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Magnesium	mg/L	D	-		8.77	:	-		9.	:	-		8.7	:
Manganese	mg/L	D	-		0.0356	:	-		0.0226	:	-		0.0416	:
Molybdenum	mg/L	D	-		<0.0038	:	-		<0.0032	:	-		<0.0028	:
Nickel	mg/L	D	-		0.0117	:	-		0.0088	:	-		0.0076	:
Potassium	mg/L	D	-		1.22	:	-		1.52	:	-		1.38	:
Selenium	mg/L	D	-		<0.0003	:	-		<0.0003	:	-		<0.0003	:
Silver	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Sodium	mg/L	D	-		4.28	:	-		4.48	:	-		5.14	:
Thallium	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Vanadium	mg/L	D	-		<0.00038	:	-		<0.00026	:	-		0.00019	:
Zinc	mg/L	D	-		0.0608	:	-		0.0447	:	-		0.0314	:

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5a
Groundwater/Surface Water Interaction - Chamber Water
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID											
			RR-11B3 9/28/2004 RR-11B3-T01N-WSC		RR-11B3 9/28/2004 RR-11B3-D01N-WSC		RR-11B3 9/29/2004 RR-11B3-T02N-WSC		RR-11B3 9/29/2004 RR-11B3-D02N-WSC		RR-11B3 9/30/2004 RR-11B3-T03N-WSC		RR-11B3 9/30/2004 RR-11B3-D03N-WSC	
			SWR		SWR		SWR		SWR		SWR		SWR	
General Chemistry														
Dissolved Organic Carbon	mg/L	D	-		1.6	:	-		2.3	:	-		1.8	J
Fluoride	mg/L	T	0.51	:	-		0.48	:	-		1.1	J	-	
Sulfate	mg/L	T	83.2	:	-		110.	:	-		378.	J	-	
Total Organic Carbon	mg/L	T	1.8	:	-		2.7	:	-		2.7	J	-	
Physical Properties														
Hardness	mg/L	D	-		130.	:	-		155.	:	-		447.	J
Metals														
Aluminum	mg/L	D	-		0.052	:	-		0.0677	:	-		0.127	:
Antimony	mg/L	D	-		<0.0003	:	-		<0.00043	:	-		<0.00049	:
Arsenic	mg/L	D	-		<0.0001	J	-		<0.0001	:	-		<0.00015	:
Barium	mg/L	D	-		0.0357	:	-		0.0402	:	-		0.0259	:
Beryllium	mg/L	D	-		0.00037	:	-		<0.0003	:	-		<0.0003	:
Boron	mg/L	D	-		<0.0069	:	-		<0.0069	:	-		<0.0069	:
Cadmium	mg/L	D	-		<0.0001	J	-		0.00034	:	-		0.00057	:
Calcium	mg/L	D	-		39.2	:	-		47.3	:	-		137.	:
Chromium	mg/L	D	-		<0.0009	:	-		0.0015	:	-		<0.0011	:
Cobalt	mg/L	D	-		<0.0031	:	-		<0.0031	:	-		<0.0031	:
Copper	mg/L	D	-		0.0017	J	-		0.0017	J	-		<0.0033	:
Iron	mg/L	D	-		<0.0355	:	-		<0.057	:	-		<0.0355	:
Lead	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Magnesium	mg/L	D	-		7.77	:	-		9.04	:	-		25.8	:
Manganese	mg/L	D	-		0.0393	:	-		0.116	:	-		0.0269	:
Molybdenum	mg/L	D	-		0.0023	:	-		<0.0038	:	-		<0.0049	:
Nickel	mg/L	D	-		0.0077	:	-		0.0137	:	-		0.0137	:
Potassium	mg/L	D	-		1.28	:	-		1.66	:	-		2.36	:
Selenium	mg/L	D	-		<0.0003	:	-		<0.0003	:	-		0.00083	:
Silver	mg/L	D	-		<0.0001	J	-		<0.0001	J	-		<0.0001	:
Sodium	mg/L	D	-		4.11	:	-		4.8	:	-		9.41	:
Thallium	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Vanadium	mg/L	D	-		<0.0001	J	-		<0.0001	:	-		<0.00037	:
Zinc	mg/L	D	-		0.0322	:	-		0.08	:	-		0.0659	:

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5a
Groundwater/Surface Water Interaction - Chamber Water
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID											
			RR-11B3 10/1/2004 RR-11B3-T04N-WSC		RR-11B3 10/1/2004 RR-11B3-D04N-WSC		RR-13A 9/27/2004 RR-13A-T00N-WSC		RR-13A 9/27/2004 RR-13A-D00N-WSC		RR-13A 9/28/2004 RR-13A-T01N-WSC		RR-13A 9/28/2004 RR-13A-D01N-WSC	
			SWR		SWR		SWR		SWR		SWR		SWR	
General Chemistry														
Dissolved Organic Carbon	mg/L	D	-		1.6	J	-		1.	:	-		1.6	:
Fluoride	mg/L	T	0.59	J	-		0.54	:	-		0.58	:	-	
Sulfate	mg/L	T	152.	J	-		76.9	:	-		87.9	:	-	
Total Organic Carbon	mg/L	T	1.7	J	-		1.7	:	-		1.5	:	-	
Physical Properties														
Hardness	mg/L	D	-		189.	J	-		148.	:	-		135.	:
Metals														
Aluminum	mg/L	D	-		<0.0341	:	-		0.177	:	-		0.177	:
Antimony	mg/L	D	-		<0.0004	:	-		<0.0011	:	-		<0.00046	:
Arsenic	mg/L	D	-		<0.0002	:	-		<0.0001	:	-		<0.0001	J
Barium	mg/L	D	-		0.0337	:	-		0.0353	:	-		0.0358	:
Beryllium	mg/L	D	-		<0.0003	:	-		<0.0003	:	-		<0.0003	:
Boron	mg/L	D	-		<0.0069	:	-		<0.0069	:	-		<0.0069	:
Cadmium	mg/L	D	-		0.00024	:	-		0.00012	:	-		<0.0001	J
Calcium	mg/L	D	-		57.3	:	-		44.9	:	-		40.6	:
Chromium	mg/L	D	-		<0.0011	:	-		<0.0011	:	-		<0.0009	:
Cobalt	mg/L	D	-		<0.0031	:	-		<0.0031	:	-		<0.0031	:
Copper	mg/L	D	-		<0.0041	:	-		0.0035	:	-		0.0034	J
Iron	mg/L	D	-		<0.0355	:	-		0.0385	:	-		<0.0355	:
Lead	mg/L	D	-		0.0001	:	-		<0.0001	:	-		<0.0001	:
Magnesium	mg/L	D	-		11.3	:	-		8.8	:	-		8.19	:
Manganese	mg/L	D	-		0.0161	:	-		0.085	:	-		0.0981	:
Molybdenum	mg/L	D	-		<0.004	:	-		<0.0027	:	-		0.0024	:
Nickel	mg/L	D	-		0.0089	:	-		0.008	:	-		0.0087	:
Potassium	mg/L	D	-		1.48	:	-		1.34	:	-		1.01	:
Selenium	mg/L	D	-		0.0008	:	-		<0.0003	:	-		<0.0003	J
Silver	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	J
Sodium	mg/L	D	-		4.82	:	-		5.01	:	-		4.52	:
Thallium	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Vanadium	mg/L	D	-		<0.00036	:	-		0.00018	:	-		<0.0001	J
Zinc	mg/L	D	-		0.0416	:	-		0.0416	:	-		0.0604	:

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5a
Groundwater/Surface Water Interaction - Chamber Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-13A 9/29/2004 RR-13A-T02N-WSC SWR		RR-13A 9/29/2004 RR-13A-D02N-WSC SWR		RR-13A 9/30/2004 RR-13A-T03N-WSC SWR		RR-13A 9/30/2004 RR-13A-D03N-WSC SWR		RR-13A 10/1/2004 RR-13A-T04N-WSC SWR		RR-13A 10/1/2004 RR-13A-D04N-WSC SWR	
General Chemistry														
Dissolved Organic Carbon	mg/L	D	-		1.9	:	-		3.1	J	-		2.1	:
Fluoride	mg/L	T	0.71	:	-		0.85	J	-		0.69	:	-	
Sulfate	mg/L	T	119.	:	-		127.	J	-		107.	:	-	
Total Organic Carbon	mg/L	T	2.3	:	-		1.6	J	-		1.8	:	-	
Physical Properties														
Hardness	mg/L	D	-		181.	:	-		165.	J	-		146.	:
Metals														
Aluminum	mg/L	D	-		<0.0956	:	-		0.0422	:	-		<0.0341	:
Antimony	mg/L	D	-		<0.00058	:	-		<0.00042	:	-		<0.0005	:
Arsenic	mg/L	D	-		<0.0001	:	-		<0.00018	:	-		<0.0001	J
Barium	mg/L	D	-		0.0401	:	-		0.0383	:	-		0.0328	:
Beryllium	mg/L	D	-		<0.0003	:	-		0.00033	:	-		<0.00055	:
Boron	mg/L	D	-		<0.0069	:	-		<0.0069	:	-		<0.0069	:
Cadmium	mg/L	D	-		0.00059	:	-		0.0011	:	-		0.00036	J
Calcium	mg/L	D	-		55.	:	-		49.5	:	-		43.9	:
Chromium	mg/L	D	-		<0.0011	:	-		<0.0011	:	-		<0.0011	J
Cobalt	mg/L	D	-		0.0061	:	-		0.0066	:	-		<0.0031	:
Copper	mg/L	D	-		0.0033	J	-		0.0077	:	-		0.0048	J
Iron	mg/L	D	-		<0.128	:	-		0.0817	:	-		<0.0473	:
Lead	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Magnesium	mg/L	D	-		10.6	:	-		9.94	:	-		8.91	:
Manganese	mg/L	D	-		0.474	:	-		0.584	:	-		0.321	:
Molybdenum	mg/L	D	-		0.0054	:	-		<0.0057	:	-		0.0038	:
Nickel	mg/L	D	-		0.0214	:	-		0.0228	:	-		0.0129	:
Potassium	mg/L	D	-		1.55	:	-		1.56	:	-		1.24	:
Selenium	mg/L	D	-		<0.0003	:	-		0.00033	:	-		<0.0003	J
Silver	mg/L	D	-		<0.0001	J	-		<0.0001	:	-		<0.0001	J
Sodium	mg/L	D	-		5.48	:	-		4.74	:	-		4.82	:
Thallium	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Vanadium	mg/L	D	-		<0.0001	:	-		<0.0003	:	-		<0.0001	:
Zinc	mg/L	D	-		0.132	:	-		0.179	:	-		0.106	:

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5a
Groundwater/Surface Water Interaction - Chamber Water
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID											
			RR-13B 9/27/2004 RR-13B-T00N-WSC		RR-13B 9/27/2004 RR-13B-D00N-WSC		RR-13B 9/28/2004 RR-13B-T01N-WSC		RR-13B 9/28/2004 RR-13B-D01N-WSC		RR-13B 9/29/2004 RR-13B-T02N-WSC		RR-13B 9/29/2004 RR-13B-D02N-WSC	
			SWR		SWR		SWR		SWR		SWR		SWR	
General Chemistry														
Dissolved Organic Carbon	mg/L	D	-		1.7	:	-		1.6	:	-		2.3	:
Fluoride	mg/L	T	0.57	:	-		0.6	:	-		0.71	:	-	
Sulfate	mg/L	T	81.6	:	-		95.7	:	-		102.	:	-	
Total Organic Carbon	mg/L	T	1.6	:	-		1.6	:	-		3.	:	-	
Physical Properties														
Hardness	mg/L	D	-		149.	:	-		127.	:	-		159.	:
Metals														
Aluminum	mg/L	D	-		0.192	:	-		0.118	:	-		0.0914	:
Antimony	mg/L	D	-		<0.0011	:	-		<0.0003	:	-		<0.00052	:
Arsenic	mg/L	D	-		<0.0001	:	-		<0.0001	J	-		<0.0001	:
Barium	mg/L	D	-		0.0345	:	-		0.034	:	-		0.036	:
Beryllium	mg/L	D	-		<0.0003	:	-		<0.00039	:	-		<0.0003	:
Boron	mg/L	D	-		<0.0069	:	-		<0.0069	:	-		<0.0069	:
Cadmium	mg/L	D	-		0.00014	:	-		<0.0001	J	-		0.00038	:
Calcium	mg/L	D	-		45.	:	-		38.3	:	-		48.2	:
Chromium	mg/L	D	-		<0.0011	:	-		<0.0009	:	-		0.0013	:
Cobalt	mg/L	D	-		<0.0031	:	-		<0.0031	:	-		0.0044	:
Copper	mg/L	D	-		0.004	:	-		0.0047	J	-		0.0056	J
Iron	mg/L	D	-		0.0395	:	-		<0.0355	:	-		<0.0355	:
Lead	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Magnesium	mg/L	D	-		8.81	:	-		7.7	:	-		9.45	:
Manganese	mg/L	D	-		0.113	:	-		0.114	:	-		0.32	:
Molybdenum	mg/L	D	-		<0.0028	:	-		0.0023	:	-		0.0051	:
Nickel	mg/L	D	-		0.0094	:	-		0.0092	:	-		0.0139	:
Potassium	mg/L	D	-		1.45	:	-		1.06	:	-		1.44	:
Selenium	mg/L	D	-		<0.0003	:	-		<0.0003	J	-		<0.0003	:
Silver	mg/L	D	-		<0.0001	:	-		<0.0001	J	-		<0.0001	J
Sodium	mg/L	D	-		4.94	:	-		4.26	:	-		5.56	:
Thallium	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Vanadium	mg/L	D	-		0.00019	:	-		<0.0001	J	-		0.00011	:
Zinc	mg/L	D	-		0.04	:	-		0.048	:	-		0.112	:

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5a
Groundwater/Surface Water Interaction - Chamber Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-13B 9/30/2004 RR-13B-T03N-WSC SWR		RR-13B 9/30/2004 RR-13B-D03N-WSC SWR		RR-13B 10/1/2004 RR-13B-T04N-WSC SWR		RR-13B 10/1/2004 RR-13B-D04N-WSC SWR		RR-15 10/7/2003 RR-15-T01N-WCC SWR		RR-15 10/7/2003 RR-15-T01N-ASC SWR	
Field Measurements														
Ammonia	mg/L	T	-		-		-		-		<0.1	:	<0.1	:
General Chemistry														
Dissolved Organic Carbon	mg/L	D	-		2.4	J	-		1.7	:	-		-	
Fluoride	mg/L	T	0.67	J	-		0.59	:	-		0.7	:	0.69	:
Sulfate	mg/L	T	101.	J	-		91.	:	-		83.5	:	95.8	:
Total Organic Carbon	mg/L	T	2.4	J	-		2.2	:	-		4.	:	5.4	:
Physical Properties														
Hardness	mg/L	D	-		162.	J	-		145.	:	-		-	
Metals														
Aluminum	mg/L	D	-		0.0731	:	-		0.0695	:	-		-	
Antimony	mg/L	D	-		<0.00041	:	-		<0.00049	:	-		-	
Arsenic	mg/L	D	-		<0.0001	:	-		<0.0001	J	-		-	
Barium	mg/L	D	-		0.0354	:	-		0.0325	:	-		-	
Beryllium	mg/L	D	-		<0.0003	:	-		<0.00039	:	-		-	
Boron	mg/L	D	-		<0.0069	:	-		<0.0069	:	-		-	
Cadmium	mg/L	D	-		0.00054	:	-		0.00032	J	-		-	
Calcium	mg/L	D	-		49.2	:	-		43.6	:	-		-	
Chromium	mg/L	D	-		<0.0011	:	-		<0.0011	J	-		-	
Cobalt	mg/L	D	-		0.0031	:	-		<0.0031	:	-		-	
Copper	mg/L	D	-		0.009	:	-		0.0052	J	-		-	
Iron	mg/L	D	-		<0.0355	:	-		<0.0355	:	-		-	
Lead	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		-	
Magnesium	mg/L	D	-		9.6	:	-		8.7	:	-		-	
Manganese	mg/L	D	-		0.268	:	-		0.201	:	-		-	
Molybdenum	mg/L	D	-		<0.005	:	-		0.0032	:	-		-	
Nickel	mg/L	D	-		0.0149	:	-		0.0101	:	-		-	
Potassium	mg/L	D	-		1.76	:	-		1.17	:	-		-	
Selenium	mg/L	D	-		<0.0003	:	-		<0.0003	J	-		-	
Silver	mg/L	D	-		<0.0001	:	-		<0.0001	J	-		-	
Sodium	mg/L	D	-		4.82	:	-		4.7	:	-		-	
Thallium	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		-	
Vanadium	mg/L	D	-		<0.00024	:	-		<0.0001	:	-		-	
Zinc	mg/L	D	-		0.0905	:	-		0.0685	:	-		-	

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5a
Groundwater/Surface Water Interaction - Chamber Water
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID: RR-15 Sample Date: 10/7/2003 Sample ID: RR-15-D01N-WCC SWR	Site ID: RR-15 Sample Date: 10/7/2003 Sample ID: RR-15-D01N-ASC SWR	Site ID: RR-15 Sample Date: 10/8/2003 Sample ID: RR-15-T02N-WCC SWR	Site ID: RR-15 Sample Date: 10/8/2003 Sample ID: RR-15-T02N-ASC SWR	Site ID: RR-15 Sample Date: 10/8/2003 Sample ID: RR-15-D02N-WCC SWR	Site ID: RR-15 Sample Date: 10/8/2003 Sample ID: RR-15-D02N-ASC SWR
Field Measurements								
Ammonia	mg/L	T	-	-	<0.1 :	<0.1 :	-	-
General Chemistry								
Fluoride	mg/L	T	-	-	0.74 :	0.75 :	-	-
Sulfate	mg/L	T	-	-	84.2 :	85.8 :	-	-
Total Organic Carbon	mg/L	T	-	-	2.3 :	2.5 :	-	-
Physical Properties								
Hardness	mg/L	D	156. :	175. :	-	-	146. :	147. :
Metals								
Aluminum	mg/L	D	0.212 :	0.224 :	-	-	<0.281 :	<0.251 :
Antimony	mg/L	D	<0.0005 :	<0.0005 :	-	-	0.0038 :	0.0028 :
Arsenic	mg/L	D	<0.0002 :	<0.0002 :	-	-	<0.0002 :	<0.0002 :
Barium	mg/L	D	0.0358 :	0.035 :	-	-	0.036 :	0.0333 :
Beryllium	mg/L	D	<0.0002 :	<0.0002 :	-	-	0.00039 :	<0.0003 :
Boron	mg/L	D	<0.0064 J	<0.0072 J	-	-	0.0086 :	0.008 :
Cadmium	mg/L	D	0.00046 :	0.00036 :	-	-	0.00043 :	0.00047 :
Calcium	mg/L	D	46.5 :	52.1 :	-	-	43.5 :	43.8 :
Chromium	mg/L	D	<0.0023 :	<0.0023 :	-	-	<0.0013 :	<0.0013 :
Cobalt	mg/L	D	0.0051 :	0.0069 :	-	-	<0.0031 :	<0.0031 :
Copper	mg/L	D	0.004 :	0.0054 :	-	-	0.0049 :	0.0044 :
Iron	mg/L	D	<0.0455 :	<0.0455 :	-	-	<0.0419 :	<0.03 :
Lead	mg/L	D	<0.0002 :	<0.0002 :	-	-	<0.0002 :	<0.0002 :
Magnesium	mg/L	D	9.7 :	10.9 :	-	-	9.13 :	9.2 :
Manganese	mg/L	D	0.228 :	0.225 :	-	-	0.214 :	0.216 :
Molybdenum	mg/L	D	0.0025 :	0.0023 :	-	-	0.0025 :	0.0024 :
Nickel	mg/L	D	0.0153 :	0.0153 :	-	-	0.015 :	0.0147 :
Potassium	mg/L	D	1.26 :	1.38 :	-	-	1.24 :	1.23 :
Selenium	mg/L	D	<0.0003 :	<0.0003 :	-	-	<0.0003 :	<0.0003 :
Silver	mg/L	D	<0.0001 :	<0.0001 :	-	-	<0.0001 :	<0.0001 :
Sodium	mg/L	D	4.88 :	5.63 :	-	-	4.4 :	4.53 :
Thallium	mg/L	D	<0.0001 :	<0.0001 :	-	-	<0.0001 :	<0.0001 :
Vanadium	mg/L	D	<0.0001 :	<0.0001 :	-	-	<0.0001 :	0.00011 :
Zinc	mg/L	D	0.0749 :	0.0846 :	-	-	0.0782 :	0.0756 :

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5a
Groundwater/Surface Water Interaction - Chamber Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area	Fraction	RR-15 10/9/2003 RR-15-T03N-WCC SWR	RR-15 10/9/2003 RR-15-T03N-ASC SWR	RR-15 10/9/2003 RR-15-D03N-WCC SWR	RR-15 10/9/2003 RR-15-D03N-ASC SWR	RR-15 10/10/2003 RR-15-T04N-WCC SWR	RR-15 10/10/2003 RR-15-T04N-ASC SWR
Field Measurements									
Ammonia	mg/L		T	<0.1 :	<0.1 :	-	-	<0.1 :	<0.1 :
General Chemistry									
Fluoride	mg/L		T	0.75 :	0.74 :	-	-	0.79 :	0.78 :
Sulfate	mg/L		T	96.6 :	101. :	-	-	104. :	106. :
Total Organic Carbon	mg/L		T	1.9 :	1.8 :	-	-	1.3 :	1.2 :
Physical Properties									
Hardness	mg/L		D	-	-	146. :	149. :	-	-
Metals									
Aluminum	mg/L		D	-	-	<0.201 :	<0.184 :	-	-
Antimony	mg/L		D	-	-	<0.0005 :	<0.0005 :	-	-
Arsenic	mg/L		D	-	-	<0.0002 :	<0.0002 :	-	-
Barium	mg/L		D	-	-	0.0336 :	0.0316 :	-	-
Beryllium	mg/L		D	-	-	0.00045 :	<0.0003 :	-	-
Boron	mg/L		D	-	-	<0.0064 :	<0.0064 :	-	-
Cadmium	mg/L		D	-	-	0.00045 :	0.00052 :	-	-
Calcium	mg/L		D	-	-	43.5 :	44.4 :	-	-
Chromium	mg/L		D	-	-	<0.0013 :	<0.0013 :	-	-
Cobalt	mg/L		D	-	-	<0.0031 :	<0.0031 :	-	-
Copper	mg/L		D	-	-	0.0044 :	0.0041 :	-	-
Iron	mg/L		D	-	-	<0.0314 :	<0.03 :	-	-
Lead	mg/L		D	-	-	<0.0002 :	<0.0002 :	-	-
Magnesium	mg/L		D	-	-	9.14 :	9.31 :	-	-
Manganese	mg/L		D	-	-	0.216 :	0.22 :	-	-
Molybdenum	mg/L		D	-	-	0.0024 :	0.0025 :	-	-
Nickel	mg/L		D	-	-	0.0154 :	0.0167 :	-	-
Potassium	mg/L		D	-	-	1.2 :	1.26 :	-	-
Selenium	mg/L		D	-	-	<0.0003 :	<0.0003 :	-	-
Silver	mg/L		D	-	-	<0.0001 :	<0.0001 :	-	-
Sodium	mg/L		D	-	-	4.45 :	4.46 :	-	-
Thallium	mg/L		D	-	-	<0.0001 :	<0.0001 :	-	-
Vanadium	mg/L		D	-	-	<0.0001 :	<0.0001 :	-	-
Zinc	mg/L		D	-	-	0.0859 :	0.0811 :	-	-

J = Qualified as estimated during data validation
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T = Total Fraction D= Dissolved Fraction

Appendix A-5a
Groundwater/Surface Water Interaction - Chamber Water
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID											
			RR-15 10/10/2003 RR-15-D04N-WCC		RR-15 10/10/2003 RR-15-D04N-ASC		RR-5BB 10/7/2003 RR-5BB-T01N-WCC		RR-5BB 10/7/2003 RR-5BB-T01N-ASC		RR-5BB 10/7/2003 RR-5BB-D01N-WCC		RR-5BB 10/7/2003 RR-5BB-D01N-ASC	
			SWR		SWR		RURR		RURR		RURR		RURR	
Field Measurements														
Ammonia	mg/L	T	-		-		<0.1	:	<0.1	:	-		-	
General Chemistry														
Fluoride	mg/L	T	-		-		0.24	:	0.24	:	-		-	
Sulfate	mg/L	T	-		-		46.9	:	49.2	:	-		-	
Total Organic Carbon	mg/L	T	-		-		4.5	:	2.8	:	-		-	
Physical Properties														
Hardness	mg/L	D	160.	:	160.	:	-		-		119.	:	117.	:
Metals														
Aluminum	mg/L	D	0.184	:	0.147	:	-		-		0.0958	:	0.0973	:
Antimony	mg/L	D	<0.0031	:	<0.0012	:	-		-		<0.0005	:	<0.0005	:
Arsenic	mg/L	D	<0.0002	:	<0.0002	:	-		-		<0.0002	:	<0.0002	:
Barium	mg/L	D	0.0344	:	0.0348	:	-		-		0.0376	:	0.0365	:
Beryllium	mg/L	D	<0.0004	:	<0.0004	:	-		-		<0.0002	:	<0.0002	:
Boron	mg/L	D	<0.0063	:	<0.0063	:	-		-		<0.0077	J	<0.0064	J
Cadmium	mg/L	D	0.00059	:	0.0005	:	-		-		<0.0002	:	<0.0002	:
Calcium	mg/L	D	47.5	:	47.8	:	-		-		35.8	:	35.2	:
Chromium	mg/L	D	<0.0011	J	<0.0011	J	-		-		<0.0023	:	<0.0023	:
Cobalt	mg/L	D	<0.0029	:	<0.0029	:	-		-		0.005	:	<0.0032	:
Copper	mg/L	D	0.0048	:	0.0039	:	-		-		0.0038	:	0.0038	:
Iron	mg/L	D	<0.0278	:	<0.0278	:	-		-		0.0897	:	<0.0455	:
Lead	mg/L	D	<0.0002	:	<0.0002	:	-		-		<0.0002	:	<0.0002	:
Magnesium	mg/L	D	9.94	:	9.99	:	-		-		7.21	:	7.09	:
Manganese	mg/L	D	0.25	:	0.242	:	-		-		0.0916	:	0.087	:
Molybdenum	mg/L	D	0.0026	:	0.0025	:	-		-		<0.001	:	<0.0011	:
Nickel	mg/L	D	0.0172	:	0.0165	:	-		-		0.0048	:	0.0046	:
Potassium	mg/L	D	<1.53	:	1.67	:	-		-		1.18	:	1.17	:
Selenium	mg/L	D	0.00041	:	0.00049	:	-		-		0.00034	:	<0.0003	:
Silver	mg/L	D	<0.0001	:	<0.0001	:	-		-		<0.0001	:	<0.0001	:
Sodium	mg/L	D	5.36	:	5.46	:	-		-		4.33	:	4.27	:
Thallium	mg/L	D	<0.0001	:	<0.0001	:	-		-		<0.0001	:	<0.0001	:
Vanadium	mg/L	D	<0.0001	:	<0.0001	:	-		-		<0.0001	:	<0.0001	:
Zinc	mg/L	D	0.0939	:	0.0851	:	-		-		0.0275	:	0.029	:

J = Qualified as estimated during data validation
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T = Total Fraction D= Dissolved Fraction

Appendix A-5a
Groundwater/Surface Water Interaction - Chamber Water
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID: RR-5BB Sample Date: 10/8/2003 Sample ID: RR-5BB-T02N-WCC RURR	Site ID: RR-5BB Sample Date: 10/8/2003 Sample ID: RR-5BB-T02N-ASC RURR	Site ID: RR-5BB Sample Date: 10/8/2003 Sample ID: RR-5BB-D02N-WCC RURR	Site ID: RR-5BB Sample Date: 10/8/2003 Sample ID: RR-5BB-D02N-ASC RURR	Site ID: RR-5BB Sample Date: 10/9/2003 Sample ID: RR-5BB-T03N-WCC RURR	Site ID: RR-5BB Sample Date: 10/9/2003 Sample ID: RR-5BB-T03N-ASC RURR
Field Measurements								
Ammonia	mg/L	T	<0.1 :	<0.1 :	-	-	<0.1 :	<0.1 :
General Chemistry								
Fluoride	mg/L	T	0.23 :	0.24 :	-	-	0.28 :	0.27 :
Sulfate	mg/L	T	50.4 :	51.3 :	-	-	51.2 :	26.4 :
Total Organic Carbon	mg/L	T	3.8 :	2.8 :	-	-	1.5 :	1.4 :
Physical Properties								
Hardness	mg/L	D	-	-	123. :	117. :	-	-
Metals								
Aluminum	mg/L	D	-	-	0.113 :	0.101 :	-	-
Antimony	mg/L	D	-	-	0.00083 :	0.00067 :	-	-
Arsenic	mg/L	D	-	-	<0.0002 :	<0.0002 :	-	-
Barium	mg/L	D	-	-	0.0398 :	0.0392 :	-	-
Beryllium	mg/L	D	-	-	<0.0002 :	<0.0002 :	-	-
Boron	mg/L	D	-	-	<0.0064 :	<0.0096 :	-	-
Cadmium	mg/L	D	-	-	<0.0002 :	<0.0002 :	-	-
Calcium	mg/L	D	-	-	36.9 :	35.3 :	-	-
Chromium	mg/L	D	-	-	<0.0023 :	<0.0023 :	-	-
Cobalt	mg/L	D	-	-	<0.0032 :	<0.0032 :	-	-
Copper	mg/L	D	-	-	0.0041 :	0.0047 :	-	-
Iron	mg/L	D	-	-	0.0475 :	<0.0455 :	-	-
Lead	mg/L	D	-	-	<0.0002 :	<0.0002 :	-	-
Magnesium	mg/L	D	-	-	7.43 :	7.1 :	-	-
Manganese	mg/L	D	-	-	0.0888 :	0.0879 :	-	-
Molybdenum	mg/L	D	-	-	0.0011 :	0.001 :	-	-
Nickel	mg/L	D	-	-	0.0041 :	0.0043 :	-	-
Potassium	mg/L	D	-	-	1.23 :	1.19 :	-	-
Selenium	mg/L	D	-	-	<0.0003 :	<0.0003 :	-	-
Silver	mg/L	D	-	-	<0.0001 :	<0.0001 :	-	-
Sodium	mg/L	D	-	-	4.53 :	4.23 :	-	-
Thallium	mg/L	D	-	-	<0.0001 :	<0.0001 :	-	-
Vanadium	mg/L	D	-	-	0.0001 :	<0.0001 :	-	-
Zinc	mg/L	D	-	-	0.0309 :	0.0254 :	-	-

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Appendix A-5a
Groundwater/Surface Water Interaction - Chamber Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-5BB 10/9/2003 RR-5BB-D03N-WCC RURR		RR-5BB 10/9/2003 RR-5BB-D03N-ASC RURR		RR-5BB 10/10/2003 RR-5BB-T04N-WCC RURR		RR-5BB 10/10/2003 RR-5BB-T04N-ASC RURR		RR-5BB 10/10/2003 RR-5BB-D04N-WCC RURR		RR-5BB 10/10/2003 RR-5BB-D04N-ASC RURR	
Field Measurements														
Ammonia	mg/L	T	-		-		<0.1	:	<0.1	:	-		-	
General Chemistry														
Fluoride	mg/L	T	-		-		0.28	:	0.28	:	-		-	
Sulfate	mg/L	T	-		-		71.1	:	54.6	:	-		-	
Total Organic Carbon	mg/L	T	-		-		1.7	:	1.6	:	-		-	
Physical Properties														
Hardness	mg/L	D	113.	:	113.	:	-		-		121.	:	120.	:
Metals														
Aluminum	mg/L	D	<0.11	:	<0.109	:	-		-		0.103	:	<0.102	:
Antimony	mg/L	D	<0.0005	:	0.0028	:	-		-		<0.0005	:	<0.003	:
Arsenic	mg/L	D	<0.0002	:	<0.0002	:	-		-		<0.0002	:	<0.0002	:
Barium	mg/L	D	0.0334	:	0.0369	:	-		-		0.0371	:	0.037	:
Beryllium	mg/L	D	0.00047	:	0.00039	:	-		-		<0.0004	:	<0.0004	:
Boron	mg/L	D	0.0085	:	0.008	:	-		-		<0.0063	:	<0.0063	:
Cadmium	mg/L	D	<0.0002	:	<0.0002	:	-		-		<0.0002	:	<0.0002	:
Calcium	mg/L	D	33.8	:	33.9	:	-		-		36.5	:	36.2	:
Chromium	mg/L	D	<0.0013	:	<0.0013	:	-		-		<0.0011	J	<0.0011	J
Cobalt	mg/L	D	<0.0031	:	<0.0031	:	-		-		0.01	:	<0.0029	:
Copper	mg/L	D	0.0039	:	0.0037	:	-		-		0.0044	:	0.0037	:
Iron	mg/L	D	<0.0417	:	<0.0324	:	-		-		<0.0278	:	<0.0278	:
Lead	mg/L	D	<0.0002	:	<0.0002	:	-		-		<0.0002	:	<0.0002	:
Magnesium	mg/L	D	6.83	:	6.84	:	-		-		7.32	:	7.26	:
Manganese	mg/L	D	0.0891	:	0.0885	:	-		-		0.104	:	0.0873	:
Molybdenum	mg/L	D	0.00096	:	0.00096	:	-		-		<0.0012	:	<0.0011	:
Nickel	mg/L	D	0.0048	:	0.0045	:	-		-		0.0054	:	0.0049	:
Potassium	mg/L	D	1.13	:	1.13	:	-		-		<1.39	:	<1.42	:
Selenium	mg/L	D	<0.0003	:	<0.0003	:	-		-		0.00047	:	0.00035	:
Silver	mg/L	D	<0.0001	:	<0.0001	:	-		-		<0.0001	:	<0.0001	:
Sodium	mg/L	D	4.02	:	3.99	:	-		-		4.8	:	4.5	:
Thallium	mg/L	D	<0.0001	:	<0.0001	:	-		-		<0.0001	:	<0.0001	:
Vanadium	mg/L	D	0.00013	:	<0.0001	:	-		-		<0.0001	:	<0.0001	:
Zinc	mg/L	D	0.0269	:	<0.0248	:	-		-		0.0291	:	0.0272	:

J = Qualified as estimated during data validation
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T = Total Fraction D= Dissolved Fraction

Appendix A-5a
Groundwater/Surface Water Interaction - Chamber Water
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID	
			RR-5BB 9/27/2004 RR-5BB-T00N-WSC		RR-5BB 9/27/2004 RR-5BB-D00N-WSC		RR-5BB 9/28/2004 RR-5BB-T01N-WSC		RR-5BB 9/28/2004 RR-5BB-D01N-WSC		RR-5BB 9/29/2004 RR-5BB-T02N-WSC		RR-5BB 9/29/2004 RR-5BB-D02N-WSC	
			RURR		RURR		RURR		RURR		RURR		RURR	
General Chemistry														
Dissolved Organic Carbon	mg/L	D	-		2.3	:	-		1.5	:	-		2.4	:
Fluoride	mg/L	T	0.7	:	-		0.4	:	-		1.2	:	-	
Sulfate	mg/L	T	251.	:	-		119.	:	-		293.	:	-	
Total Organic Carbon	mg/L	T	1.1	:	-		1.6	:	-		1.2	:	-	
Physical Properties														
Hardness	mg/L	D	-		263.	:	-		151.	:	-		289.	:
Metals														
Aluminum	mg/L	D	-		0.992	:	-		0.0847	:	-		6.07	:
Antimony	mg/L	D	-		<0.0012	:	-		<0.0003	:	-		<0.00046	:
Arsenic	mg/L	D	-		<0.0001	:	-		<0.0001	J	-		<0.0001	:
Barium	mg/L	D	-		0.0399	:	-		0.0399	:	-		0.036	:
Beryllium	mg/L	D	-		0.00077	:	-		<0.0003	:	-		0.0014	:
Boron	mg/L	D	-		<0.0069	:	-		<0.0069	:	-		<0.0069	:
Cadmium	mg/L	D	-		0.0011	:	-		0.00025	J	-		0.0014	:
Calcium	mg/L	D	-		74.2	:	-		44.1	:	-		80.9	:
Chromium	mg/L	D	-		<0.0011	:	-		<0.0009	:	-		0.0021	:
Cobalt	mg/L	D	-		0.0202	:	-		0.0048	:	-		0.0268	:
Copper	mg/L	D	-		0.0229	:	-		0.005	J	-		0.0359	:
Iron	mg/L	D	-		<0.0427	:	-		<0.0355	:	-		<0.0776	:
Lead	mg/L	D	-		0.00015	:	-		<0.0001	:	-		0.00012	:
Magnesium	mg/L	D	-		18.8	:	-		9.86	:	-		21.1	:
Manganese	mg/L	D	-		1.06	:	-		0.35	:	-		1.32	:
Molybdenum	mg/L	D	-		<0.0015	:	-		0.00099	:	-		<0.0004	:
Nickel	mg/L	D	-		0.0536	:	-		0.0174	:	-		0.0658	:
Potassium	mg/L	D	-		1.6	:	-		1.18	:	-		1.38	:
Selenium	mg/L	D	-		0.00052	:	-		<0.0003	J	-		0.00055	:
Silver	mg/L	D	-		<0.0001	:	-		<0.0001	J	-		<0.0001	J
Sodium	mg/L	D	-		6.7	:	-		4.75	:	-		7.13	:
Thallium	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Vanadium	mg/L	D	-		0.00015	:	-		<0.0001	J	-		<0.0001	:
Zinc	mg/L	D	-		0.311	:	-		0.101	:	-		0.393	:

J = Qualified as estimated during data validation
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T = Total Fraction D= Dissolved Fraction

Appendix A-5a
Groundwater/Surface Water Interaction - Chamber Water
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID	
			RR-5BB 9/30/2004 RR-5BB-T03N-WSC		RR-5BB 9/30/2004 RR-5BB-D03N-WSC		RR-5BB 10/1/2004 RR-5BB-T04N-WSC		RR-5BB 10/1/2004 RR-5BB-D04N-WSC		Zwergle 10/7/2003 Zwergle-T01N-WCC	Zwergle 10/7/2003 Zwergle-T01N-ASC
			RURR		RURR		RURR		RURR		RURR-Z	RURR-Z
Field Measurements												
Ammonia	mg/L	T	-		-		-		-		<0.1 :	<0.1 :
General Chemistry												
Dissolved Organic Carbon	mg/L	D	-		2.5	J	-		1.3	J	-	-
Fluoride	mg/L	T	1.2	J	-		1.2	J	-		<0.1 :	<0.1 :
Sulfate	mg/L	T	306.	J	-		293.	J	-		18.9 :	19.4 :
Total Organic Carbon	mg/L	T	1.2	J	-		1.9	J	-		2.6 :	3.8 :
Physical Properties												
Hardness	mg/L	D	-		279.	J	-		277.	J	-	-
Metals												
Aluminum	mg/L	D	-		7.31	:	-		6.85	:	-	-
Antimony	mg/L	D	-		<0.00039	:	-		<0.00043	:	-	-
Arsenic	mg/L	D	-		<0.0001	:	-		<0.0001	:	-	-
Barium	mg/L	D	-		0.0236	:	-		0.0248	:	-	-
Beryllium	mg/L	D	-		0.0018	:	-		0.0018	:	-	-
Boron	mg/L	D	-		<0.0069	:	-		<0.0069	:	-	-
Cadmium	mg/L	D	-		0.0018	:	-		0.0014	:	-	-
Calcium	mg/L	D	-		76.6	:	-		76.2	:	-	-
Chromium	mg/L	D	-		<0.0011	:	-		<0.0011	:	-	-
Cobalt	mg/L	D	-		0.0274	:	-		0.0267	:	-	-
Copper	mg/L	D	-		0.0458	:	-		0.0413	:	-	-
Iron	mg/L	D	-		<0.0355	:	-		<0.0355	:	-	-
Lead	mg/L	D	-		0.00023	:	-		0.00021	:	-	-
Magnesium	mg/L	D	-		21.2	:	-		21.2	:	-	-
Manganese	mg/L	D	-		1.43	:	-		1.4	:	-	-
Molybdenum	mg/L	D	-		<0.002	:	-		<0.002	:	-	-
Nickel	mg/L	D	-		0.0794	:	-		0.0734	:	-	-
Potassium	mg/L	D	-		1.58	:	-		1.54	:	-	-
Selenium	mg/L	D	-		0.00093	:	-		0.00094	:	-	-
Silver	mg/L	D	-		<0.0001	:	-		<0.0001	:	-	-
Sodium	mg/L	D	-		6.65	:	-		6.73	:	-	-
Thallium	mg/L	D	-		<0.0001	:	-		<0.0001	:	-	-
Vanadium	mg/L	D	-		<0.0004	:	-		<0.00033	:	-	-
Zinc	mg/L	D	-		0.413	:	-		0.404	:	-	-

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5a
Groundwater/Surface Water Interaction - Chamber Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	Zwergle 10/7/2003 ZWERGLE-D01N-WC C RURR-Z	Zwergle 10/7/2003 ZWERGLE-D01N-AS C RURR-Z	Zwergle 10/8/2003 ZWERGLE-T02N-WC C RURR-Z	Zwergle 10/8/2003 ZWERGLE-T02N-AS C RURR-Z	Zwergle 10/8/2003 ZWERGLE-D02N-WC C RURR-Z	Zwergle 10/8/2003 ZWERGLE-D02N-AS C RURR-Z
Field Measurements								
Ammonia	mg/L	T	-	-	<0.1 :	<0.1 :	-	-
General Chemistry								
Fluoride	mg/L	T	-	-	<0.1 :	<0.1 :	-	-
Sulfate	mg/L	T	-	-	21.4 :	19.2 :	-	-
Total Organic Carbon	mg/L	T	-	-	-	2.8 :	-	-
Physical Properties								
Hardness	mg/L	D	92.7 :	91.4 :	-	-	99. :	92.1 :
Metals								
Aluminum	mg/L	D	<0.0217 :	<0.0217 :	-	-	<0.0217 :	<0.0217 :
Antimony	mg/L	D	<0.0005 :	0.00072 :	-	-	0.00066 :	<0.0005 :
Arsenic	mg/L	D	<0.0002 :	<0.0002 :	-	-	<0.0002 :	<0.0002 :
Barium	mg/L	D	0.0313 :	0.0284 :	-	-	0.0336 :	0.0314 :
Beryllium	mg/L	D	<0.0002 :	<0.0002 :	-	-	<0.0002 :	<0.0002 :
Boron	mg/L	D	<0.0064 J	<0.0064 J	-	-	<0.0064 J	<0.0064 J
Cadmium	mg/L	D	<0.0002 :	<0.0002 :	-	-	<0.0002 :	<0.0002 :
Calcium	mg/L	D	30.2 :	29.8 :	-	-	32.4 :	30.1 :
Chromium	mg/L	D	<0.0023 :	<0.0023 :	-	-	<0.0023 :	<0.0023 :
Cobalt	mg/L	D	0.0042 :	<0.0032 :	-	-	<0.0032 :	<0.0032 :
Copper	mg/L	D	<0.0017 :	<0.0017 :	-	-	<0.0017 :	<0.0017 :
Iron	mg/L	D	<0.0455 :	<0.0455 :	-	-	<0.0455 :	<0.0455 :
Lead	mg/L	D	<0.0002 :	<0.0002 :	-	-	<0.0002 :	<0.0002 :
Magnesium	mg/L	D	4.18 :	4.13 :	-	-	4.43 :	4.12 :
Manganese	mg/L	D	0.0097 :	0.0066 :	-	-	0.0018 :	0.003 :
Molybdenum	mg/L	D	<0.00084 :	<0.001 :	-	-	0.00082 :	0.00076 :
Nickel	mg/L	D	<0.0016 :	<0.0016 :	-	-	<0.0016 :	<0.0016 :
Potassium	mg/L	D	0.8 :	0.796 :	-	-	0.834 :	0.814 :
Selenium	mg/L	D	<0.0003 :	<0.0003 :	-	-	<0.0003 :	<0.0003 :
Silver	mg/L	D	<0.0001 :	<0.0001 :	-	-	<0.0001 :	<0.0001 :
Sodium	mg/L	D	2.52 :	2.26 :	-	-	2.54 :	2.44 :
Thallium	mg/L	D	<0.0001 :	<0.0001 :	-	-	<0.0001 :	<0.0001 :
Vanadium	mg/L	D	0.00027 :	0.00023 :	-	-	0.00027 :	0.00024 :
Zinc	mg/L	D	0.0184 :	<0.0115 :	-	-	<0.0076 :	0.017 :

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5a
Groundwater/Surface Water Interaction - Chamber Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	Zwergle 10/9/2003 Zwergle-T03N-WCC RURR-Z	Zwergle 10/9/2003 Zwergle-T03N-ASC RURR-Z	Zwergle 10/9/2003 ZWERGLE-D03N-WCC RURR-Z	Zwergle 10/9/2003 ZWERGLE-D03N-ASC RURR-Z	Zwergle 10/10/2003 Zwergle-T04N-WCC RURR-Z	Zwergle 10/10/2003 Zwergle-T04N-ASC RURR-Z
Field Measurements								
Ammonia	mg/L	T	<0.1 :	<0.1 :	-	-	<0.1 :	<0.1 :
General Chemistry								
Fluoride	mg/L	T	<0.1 :	<0.1 :	-	-	<0.1 :	<0.1 :
Sulfate	mg/L	T	26.1 :	30.7 :	-	-	20.3 :	20.7 :
Total Organic Carbon	mg/L	T	2. :	2.1 :	-	-	1.7 :	1.9 :
Physical Properties								
Hardness	mg/L	D	-	-	91.8 :	90.5 :	-	-
Metals								
Aluminum	mg/L	D	-	-	<0.0307 :	<0.0307 :	-	-
Antimony	mg/L	D	-	-	0.0021 :	0.00054 :	-	-
Arsenic	mg/L	D	-	-	<0.0002 :	<0.0002 :	-	-
Barium	mg/L	D	-	-	0.029 :	0.0292 :	-	-
Beryllium	mg/L	D	-	-	<0.0003 :	0.00051 :	-	-
Boron	mg/L	D	-	-	<0.0064 :	<0.0064 :	-	-
Cadmium	mg/L	D	-	-	<0.0002 :	<0.0002 :	-	-
Calcium	mg/L	D	-	-	30. :	29.6 :	-	-
Chromium	mg/L	D	-	-	<0.0013 :	<0.0013 :	-	-
Cobalt	mg/L	D	-	-	<0.0031 :	<0.0031 :	-	-
Copper	mg/L	D	-	-	<0.0017 :	<0.0017 :	-	-
Iron	mg/L	D	-	-	<0.03 :	<0.0322 :	-	-
Lead	mg/L	D	-	-	<0.0002 :	<0.0002 :	-	-
Magnesium	mg/L	D	-	-	4.12 :	4.06 :	-	-
Manganese	mg/L	D	-	-	<0.0017 :	<0.0013 :	-	-
Molybdenum	mg/L	D	-	-	0.00078 :	0.00088 :	-	-
Nickel	mg/L	D	-	-	<0.0016 :	<0.0016 :	-	-
Potassium	mg/L	D	-	-	0.735 :	0.675 :	-	-
Selenium	mg/L	D	-	-	<0.0003 :	<0.0003 :	-	-
Silver	mg/L	D	-	-	<0.0001 :	<0.0001 :	-	-
Sodium	mg/L	D	-	-	2.17 :	2.17 :	-	-
Thallium	mg/L	D	-	-	<0.0001 :	<0.0001 :	-	-
Vanadium	mg/L	D	-	-	0.00017 :	0.00017 :	-	-
Zinc	mg/L	D	-	-	<0.0092 :	<0.0058 :	-	-

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5a
Groundwater/Surface Water Interaction - Chamber Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	Zwergle 10/10/2003 ZWERGLE-D04N-WC C RURR-Z	Zwergle 10/10/2003 ZWERGLE-D04N-AS C RURR-Z	Zwergle 9/27/2004 ZWERGLE-T00N-WS C RURR-Z	Zwergle 9/27/2004 ZWERGLE-D00N-WS C RURR-Z	Zwergle 9/28/2004 ZWERGLE-T01N-WS C RURR-Z	Zwergle 9/28/2004 ZWERGLE-D01N-WS C RURR-Z
General Chemistry								
Dissolved Organic Carbon	mg/L	D	-	-	-	2.4 :	-	1.6 :
Fluoride	mg/L	T	-	-	-	-	<0.1 :	-
Sulfate	mg/L	T	-	-	27.9 :	-	28.9 :	-
Total Organic Carbon	mg/L	T	-	-	2.6 :	-	1.3 :	-
Physical Properties								
Hardness	mg/L	D	102. :	97.3 :	-	105. :	-	96. :
Metals								
Aluminum	mg/L	D	<0.0221 :	<0.0221 :	-	<0.0341 :	-	<0.0341 :
Antimony	mg/L	D	<0.00053 :	<0.0037 :	-	<0.0011 :	-	<0.0003 J
Arsenic	mg/L	D	<0.0002 :	<0.0002 :	-	<0.0001 :	-	<0.0001 :
Barium	mg/L	D	0.0315 :	0.0307 :	-	0.0297 :	-	0.0309 :
Beryllium	mg/L	D	<0.0004 :	<0.0004 :	-	<0.0003 :	-	<0.0003 :
Boron	mg/L	D	<0.0063 :	<0.0063 :	-	<0.0069 :	-	<0.0069 :
Cadmium	mg/L	D	<0.0002 :	<0.0002 :	-	<0.0001 :	-	<0.0001 J
Calcium	mg/L	D	33.3 :	31.8 :	-	34.7 :	-	31.6 :
Chromium	mg/L	D	<0.0011 J	<0.0011 J	-	<0.0011 :	-	<0.0009 :
Cobalt	mg/L	D	0.0089 :	<0.0029 :	-	<0.0031 :	-	<0.0031 :
Copper	mg/L	D	<0.0017 :	0.0018 :	-	0.00061 :	-	<0.0003 J
Iron	mg/L	D	<0.0278 :	<0.0278 :	-	<0.0355 :	-	<0.0355 :
Lead	mg/L	D	<0.0002 :	<0.0002 :	-	<0.0001 :	-	<0.0001 :
Magnesium	mg/L	D	4.59 :	4.35 :	-	4.45 :	-	4.14 :
Manganese	mg/L	D	0.0139 :	<0.0012 :	-	<0.001 :	-	<0.001 :
Molybdenum	mg/L	D	<0.00092 :	<0.001 :	-	<0.0015 :	-	0.0011 :
Nickel	mg/L	D	<0.0016 :	<0.0016 :	-	<0.0003 J	-	<0.0003 J
Potassium	mg/L	D	<0.979 :	<0.842 :	-	0.711 :	-	0.759 :
Selenium	mg/L	D	0.00033 :	<0.0003 :	-	<0.0003 :	-	<0.0003 :
Silver	mg/L	D	<0.0001 :	<0.0001 :	-	<0.0001 :	-	<0.0001 J
Sodium	mg/L	D	2.59 :	2.54 :	-	2.7 :	-	2.26 :
Thallium	mg/L	D	<0.0001 :	<0.0001 :	-	<0.0001 :	-	<0.0001 :
Vanadium	mg/L	D	0.00014 :	0.00016 :	-	0.00026 :	-	<0.0001 J
Zinc	mg/L	D	<0.0087 :	<0.0112 :	-	<0.0029 :	-	0.0061 :

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5a
Groundwater/Surface Water Interaction - Chamber Water
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID											
			Zwergle 9/29/2004 ZWERGLE-T02N-WSC RURR-Z		Zwergle 9/29/2004 ZWERGLE-D02N-WSC RURR-Z		Zwergle 9/30/2004 ZWERGLE-T03N-WSC RURR-Z		Zwergle 9/30/2004 ZWERGLE-D03N-WSC RURR-Z		Zwergle 10/1/2004 ZWERGLE-T04N-WSC RURR-Z		Zwergle 10/1/2004 ZWERGLE-D04N-WSC RURR-Z	
General Chemistry														
Dissolved Organic Carbon	mg/L	D	-		2.7	:	-		1.5	J	-		2.2	J
Fluoride	mg/L	T	<0.1	:	-		<0.1	J	-		<0.1	J	-	
Sulfate	mg/L	T	24.8	:	-		23.3	J	-		23.2	J	-	
Total Organic Carbon	mg/L	T	1.9	:	-		1.6	J	-		1.9	J	-	
Physical Properties														
Hardness	mg/L	D	-		109.	:	-		103.	J	-		104.	J
Metals														
Aluminum	mg/L	D	-		<0.0465	:	-		<0.0341	:	-		<0.0341	:
Antimony	mg/L	D	-		<0.00053	:	-		<0.0004	:	-		<0.00047	:
Arsenic	mg/L	D	-		<0.0001	:	-		<0.00017	:	-		<0.00022	:
Barium	mg/L	D	-		0.0339	:	-		0.0309	:	-		0.0311	:
Beryllium	mg/L	D	-		<0.0003	:	-		<0.0003	:	-		<0.0003	:
Boron	mg/L	D	-		<0.0069	:	-		<0.0069	:	-		<0.0069	:
Cadmium	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Calcium	mg/L	D	-		36.	:	-		33.9	:	-		34.1	:
Chromium	mg/L	D	-		0.0016	:	-		<0.0011	:	-		<0.0028	:
Cobalt	mg/L	D	-		<0.0031	:	-		<0.0031	:	-		<0.0031	:
Copper	mg/L	D	-		<0.0003	J	-		<0.0015	:	-		<0.0015	:
Iron	mg/L	D	-		<0.0426	:	-		<0.0355	:	-		<0.0355	:
Lead	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Magnesium	mg/L	D	-		4.74	:	-		4.46	:	-		4.52	:
Manganese	mg/L	D	-		0.0014	:	-		<0.001	:	-		0.001	:
Molybdenum	mg/L	D	-		<0.00053	:	-		<0.002	:	-		<0.0022	:
Nickel	mg/L	D	-		<0.0003	J	-		0.00057	:	-		0.00057	:
Potassium	mg/L	D	-		0.882	:	-		0.941	:	-		0.924	:
Selenium	mg/L	D	-		<0.0003	:	-		<0.0003	:	-		<0.0003	:
Silver	mg/L	D	-		<0.0001	J	-		<0.0001	:	-		<0.0001	:
Sodium	mg/L	D	-		2.51	:	-		2.23	:	-		2.35	:
Thallium	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Vanadium	mg/L	D	-		0.0002	:	-		<0.00039	:	-		<0.00028	:
Zinc	mg/L	D	-		0.0047	:	-		<0.0019	:	-		0.0026	:

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5b
Groundwater/Surface Water Interaction - Sediment
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID		LR-1 10/10/2003 LR-1-T04N-SED SWR		LR-16 10/10/2003 LR-16-T04N-SED SWR		LR-8A 10/10/2003 LR-8A-T04N-SED SWR		RR-11B2 10/1/2004 RR-11B2-T04N-SED SWR		RR-11B3 10/1/2004 RR-11B3-T04N-SED SWR		RR-13A 10/1/2004 RR-13A-T04N-SED SWR	
General Chemistry																
Ammonia	mg/kg-dry	T		13.	:	19.2	:	24.4	:	-		-		-	
Chloride	mg/kg-dry	T		3.9	:	5.	:	4.5	:	0.96	:	0.99	:	0.79	:
Fluoride	mg/kg-dry	T		0.71	:	0.36	:	0.36	:	1.2	:	0.6	:	0.28	:
Nitrate	mg/kg-dry	T		<2.5	:	<2.6	:	<2.5	:	-		-		-	
Phosphorus	mg/kg-dry	T		438.	:	429.	:	445.	:	-		-		-	
Sulfate	mg/kg-dry	T		26.1	:	121.	:	25.9	:	42.6	:	48.5	:	41.8	:
Total Kjeldahl Nitrogen	mg/kg-dry	T		52.9	:	45.6	:	30.7	:	-		-		-	
Total Organic Carbon	mg/kg-dry	T		783.	J	856.	J	506.	J	<599.	:	<679.	:	<1810.	:
Laboratory Parameters															
pH	SU	T		6.9	:	7.2	:	7.	:	6.5	J	6.6	J	6.8	J
Solids, Percent	%	T		81.4	:	78.	:	82.1	:	75.7	:	75.5	:	88.8	:
Specific Conductance	umhos/cm	T		117.	:	217.	:	104.	:	82.1	J	80.1	J	62.8	J
Geotechnical															
Organic Soils	%	T		1.9	:	1.9	:	1.8	:	-		-		-	
Physical Properties															
Cation-Exchange Capacity	meq/100g	T		<6.	:	6.1	:	<6.	:	-		-		-	
Sodium Absorption Ratio	ratio	T		0.29	:	0.53	:	0.47	:	-		-		-	
Metals															
Aluminum	mg/kg-dry	T		5660.	:	4640.	:	4710.	:	4590.	:	4200.	:	5630.	:
Antimony	mg/kg-dry	T		<0.5	J	<0.57	J	<0.46	J	<0.98	:	<0.72	:	<0.55	:
Arsenic	mg/kg-dry	T		4.2	:	2.1	:	3.8	:	5.2	:	3.3	:	2.7	:
Barium	mg/kg-dry	T		205.	:	87.3	:	117.	:	248.	:	83.6	:	61.9	:
Beryllium	mg/kg-dry	T		0.72	:	0.55	:	0.57	:	0.41	:	0.42	:	0.6	:
Boron	mg/kg-dry	T		<0.81	:	<0.65	:	<0.74	:	<4.	:	<3.	:	<2.5	:
Cadmium	mg/kg-dry	T		0.35	:	0.34	:	0.5	:	<0.72	:	<0.66	:	<0.55	:
Calcium	mg/kg-dry	T		1480.	:	1490.	:	1250.	:	1690.	:	1210.	:	883.	:
Chromium	mg/kg-dry	T		11.	:	7.9	:	9.4	:	13.6	:	8.1	:	7.3	:
Cobalt	mg/kg-dry	T		7.5	:	6.2	:	7.	:	5.1	:	4.8	:	5.1	:
Copper	mg/kg-dry	T		40.1	:	27.7	:	27.4	:	19.9	:	23.3	:	34.2	:
Iron	mg/kg-dry	T		14200.	:	12000.	:	11900.	:	15800.	:	13100.	:	10900.	:
Lead	mg/kg-dry	T		29.5	:	40.3	:	24.8	:	31.9	:	25.	:	28.2	:
Magnesium	mg/kg-dry	T		2990.	:	2460.	:	2750.	:	3640.	:	2720.	:	2180.	:
Manganese	mg/kg-dry	T		436.	:	359.	:	423.	:	292.	:	255.	:	255.	:

J = Qualified as estimated during data validation

R = Qualified as rejected value from data validation and results are considered unusable for any purpose

T = Total Fraction D= Dissolved Fraction

Appendix A-5b
Groundwater/Surface Water Interaction - Sediment
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID / Exposure Area													
			LR-1 10/10/2003 LR-1-T04N-SED SWR		LR-16 10/10/2003 LR-16-T04N-SED SWR		LR-8A 10/10/2003 LR-8A-T04N-SED SWR		RR-11B2 10/1/2004 RR-11B2-T04N-SED SWR		RR-11B3 10/1/2004 RR-11B3-T04N-SED SWR		RR-13A 10/1/2004 RR-13A-T04N-SED SWR	
Mercury	mg/kg-dry	T	<0.017	:	<0.019	:	<0.017	:	<0.021	:	<0.019	:	<0.017	:
Molybdenum	mg/kg-dry	T	4.9	:	8.8	:	5.1	:	4.9	:	4.1	:	4.8	:
Nickel	mg/kg-dry	T	23.7	:	20.5	:	25.4	:	19.6	:	16.8	:	18.6	:
Potassium	mg/kg-dry	T	1430.	:	1220.	:	1270.	:	1240.	:	1050.	:	917.	:
Selenium	mg/kg-dry	T	0.41	J	<0.34	J	0.85	J	0.43	:	0.53	:	<0.28	:
Silver	mg/kg-dry	T	<0.18	:	<0.15	:	<0.17	:	<0.19	:	<0.17	:	<0.16	:
Sodium	mg/kg-dry	T	90.6	:	89.2	:	93.	:	119.	:	93.6	:	66.5	:
Thallium	mg/kg-dry	T	<0.099	:	<0.11	:	<0.092	:	<0.13	:	<0.13	:	<0.094	:
Vanadium	mg/kg-dry	T	11.4	:	9.5	:	9.9	:	11.3	:	9.	:	7.3	:
Zinc	mg/kg-dry	T	161.	:	136.	:	175.	:	98.9	:	105.	:	105.	:

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5b
Groundwater/Surface Water Interaction - Sediment
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID	
			RR-13B 10/1/2004 RR-13B-T04N-SED		RR-15 10/10/2003 RR-15-T04N-SED		RR-5BB 10/10/2003 RR-5BB-T04N-SED		RR-5BB 10/1/2004 RR-5BB-T04N-SED		Zwergle 10/10/2003 ZWERGLE-T04N-SED		Zwergle 10/1/2004 ZWERGLE-T04N-SED
			SWR		SWR		RURR		RURR		RURR-Z		RURR-Z
General Chemistry													
Ammonia	mg/kg-dry	T	-		15.	:	19.8	:	-		12.6	:	-
Chloride	mg/kg-dry	T	0.99	:	3.2	:	6.7	:	0.63	:	4.2	:	0.87 :
Fluoride	mg/kg-dry	T	<0.13	:	0.65	:	1.1	:	<0.14	:	<0.25	:	<0.14 :
Nitrate	mg/kg-dry	T	-		<2.5	:	<2.7	:	-		<2.5	:	-
Phosphorus	mg/kg-dry	T	-		479.	:	846.	:	-		810.	:	-
Sulfate	mg/kg-dry	T	36.5	:	78.5	:	247.	:	98.1	:	24.1	:	14.9 :
Total Kjeldahl Nitrogen	mg/kg-dry	T	-		33.2	:	40.9	:	-		103.	:	-
Total Organic Carbon	mg/kg-dry	T	<1180.	:	<125.	J	233.	J	<900.	J	280.	J	2010. :
Laboratory Parameters													
pH	SU	T	6.	J	6.4	:	4.8	:	6.	J	7.1	:	7.4 J
Solids, Percent	%	T	75.6	:	80.5	:	76.	:	73.9	:	82.7	:	71.8 :
Specific Conductance	umhos/cm	T	43.6	J	130.	:	276.	:	128.	J	133.	:	99.5 J
Geotechnical													
Organic Soils	%	T	-		2.1	:	2.4	:	-		1.9	:	-
Physical Properties													
Cation-Exchange Capacity	meq/100g	T	-		<6.	:	6.6	:	-		10.	:	-
Sodium Absorption Ratio	ratio	T	-		0.08	:	0.07	:	-		<0.06	:	-
Metals													
Aluminum	mg/kg-dry	T	7310.	:	5210.	:	6520.	:	5160.	:	8230.	:	9250. :
Antimony	mg/kg-dry	T	<0.61	:	<0.58	J	<0.6	J	<0.66	J	<0.5	J	<0.64 :
Arsenic	mg/kg-dry	T	2.6	:	4.9	:	5.8	:	4.8	:	0.94	:	2.7 :
Barium	mg/kg-dry	T	86.9	:	224.	:	409.	:	157.	:	98.2	:	122. :
Beryllium	mg/kg-dry	T	0.77	:	0.7	:	0.47	:	0.28	:	0.44	:	0.5 :
Boron	mg/kg-dry	T	<4.3	:	<0.63	:	<0.84	:	<4.	:	<0.89	:	<6. :
Cadmium	mg/kg-dry	T	<0.78	:	0.28	:	<0.17	:	<0.52	:	0.16	:	<0.81 :
Calcium	mg/kg-dry	T	847.	:	1240.	:	796.	:	2560.	:	5720.	:	5460. :
Chromium	mg/kg-dry	T	10.9	:	9.3	:	11.7	:	13.	:	16.7	:	32.6 :
Cobalt	mg/kg-dry	T	6.1	:	5.3	:	6.9	:	3.9	:	8.6	:	13.4 :
Copper	mg/kg-dry	T	57.6	:	34.8	:	36.1	:	17.7	:	17.2	:	17.8 :
Iron	mg/kg-dry	T	19800.	:	16000.	:	19700.	:	15300.	:	18200.	:	23000. :
Lead	mg/kg-dry	T	37.7	:	34.2	:	42.9	:	17.2	:	9.7	:	9.9 :
Magnesium	mg/kg-dry	T	3580.	:	2620.	:	3650.	:	3520.	:	5280.	:	6530. :
Manganese	mg/kg-dry	T	416.	:	265.	:	266.	J	277.	:	642.	:	837. :

J = Qualified as estimated during data validation

R = Qualified as rejected value from data validation and results are considered unusable for any purpose

T = Total Fraction D= Dissolved Fraction

Appendix A-5b
Groundwater/Surface Water Interaction - Sediment
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction											
		RR-13B / 10/1/2004 / RR-13B-T04N-SED / SWR / T		RR-15 / 10/10/2003 / RR-15-T04N-SED / SWR / T		RR-5BB / 10/10/2003 / RR-5BB-T04N-SED / RURR / T		RR-5BB / 10/1/2004 / RR-5BB-T04N-SED / RURR / T		Zwergle / 10/10/2003 / ZWERGLE-T04N-SED / RURR-Z / T		Zwergle / 10/1/2004 / ZWERGLE-T04N-SED / RURR-Z / T	
Mercury	mg/kg-dry	<0.018	:	<0.018	:	<0.02	:	<0.02	:	<0.016	:	<0.021	:
Molybdenum	mg/kg-dry	4.7	:	4.9	J	5.3	:	2.2	:	0.49	:	4.2	:
Nickel	mg/kg-dry	19.9	:	20.4	:	13.4	:	14.7	:	14.2	:	26.8	:
Potassium	mg/kg-dry	1620.	:	1360.	:	1950.	:	1260.	:	1260.	:	1190.	:
Selenium	mg/kg-dry	0.4	:	0.93	J	1.6	J	0.69	:	0.36	J	<0.33	:
Silver	mg/kg-dry	<0.19	:	<0.15	:	<0.2	:	<0.2	:	<0.15	:	<0.19	:
Sodium	mg/kg-dry	81.3	:	90.3	:	152.	:	109.	:	287.	:	<45.7	:
Thallium	mg/kg-dry	<0.11	:	<0.12	:	0.13	:	<0.12	:	<0.1	:	<0.11	:
Vanadium	mg/kg-dry	12.5	:	10.1	:	13.2	:	11.4	:	31.7	:	43.	:
Zinc	mg/kg-dry	119.	:	141.	:	61.6	:	48.9	:	54.1	:	59.7	:

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	LR-1 10/6/2003 LR-1-T00N-PS SWR	LR-1 10/6/2003 LR-1-T00N-PD SWR	LR-1 10/6/2003 LR-1-T00N-P3S SWR	LR-1 10/6/2003 LR-1-T00N-P3D SWR	LR-1 10/6/2003 LR-1-T00N-P2S SWR	LR-1 10/6/2003 LR-1-T00N-P2D SWR
Field Measurements								
DO	mg/L	T	-	-	4.3 :	5.7 :	8.6 :	4.5 :
EH	millivolts	T	-	-	243. :	247. :	228. :	241. :
pH	SU	T	-	-	7.1 :	7.1 :	7.1 :	7.1 :
Specific Conductance	uS/cm	T	-	-	499. :	512. :	564. :	563. :
Temperature	Celsius	T	-	-	12.3 :	12.4 :	12.7 :	12.4 :
General Chemistry								
Fluoride	mg/L	T	0.54 :	0.43 :	-	-	-	-
Sulfate	mg/L	T	73.4 J	69.3 J	-	-	-	-
Total Organic Carbon	mg/L	T	5.4 :	4.9 :	-	-	-	-

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID / Exposure Area													
			LR-1 10/6/2003 LR-1-T00N-P1S SWR		LR-1 10/6/2003 LR-1-T00N-P1D SWR		LR-1 10/6/2003 LR-1-D00N-PS SWR		LR-1 10/6/2003 LR-1-D00N-PD SWR		LR-1 10/7/2003 LR-1-T01N-PS SWR		LR-1 10/7/2003 LR-1-T01N-PD SWR	
Field Measurements														
DO	mg/L	T	7.5	:	5.46	:	-		-		-		-	
EH	millivolts	T	212.9	:	238.2	:	-		-		-		-	
pH	SU	T	7.2	:	7.09	:	-		-		-		-	
Specific Conductance	uS/cm	T	409.	:	486.	:	-		-		-		-	
Temperature	Celsius	T	13.	:	12.25	:	-		-		-		-	
General Chemistry														
Fluoride	mg/L	T	-		-		-		-		0.61	:	0.53	:
Sulfate	mg/L	T	-		-		-		-		72.1	J	73.1	J
Total Organic Carbon	mg/L	T	-		-		-		-		2.8	:	4.7	:
Physical Properties														
Hardness	mg/L	D	-		-		230.	:	258.	:	-		-	
Metals														
Aluminum	mg/L	D	-		-		<0.0217	J	<0.0217	J	-		-	
Antimony	mg/L	D	-		-		<0.0005	J	<0.00072	J	-		-	
Arsenic	mg/L	D	-		-		<0.0002	J	0.00022	J	-		-	
Barium	mg/L	D	-		-		0.0852	:	0.114	:	-		-	
Beryllium	mg/L	D	-		-		<0.0004	:	<0.0004	:	-		-	
Boron	mg/L	D	-		-		0.0958	:	0.134	:	-		-	
Cadmium	mg/L	D	-		-		<0.0002	J	<0.0002	J	-		-	
Calcium	mg/L	D	-		-		70.4	:	79.6	:	-		-	
Chromium	mg/L	D	-		-		<0.0011	:	0.0019	:	-		-	
Cobalt	mg/L	D	-		-		0.0031	:	<0.0029	:	-		-	
Copper	mg/L	D	-		-		0.0033	:	0.0058	:	-		-	
Iron	mg/L	D	-		-		<0.034	:	<0.0616	:	-		-	
Lead	mg/L	D	-		-		<0.0002	:	<0.0002	:	-		-	
Magnesium	mg/L	D	-		-		13.	:	14.5	:	-		-	
Manganese	mg/L	D	-		-		0.0056	:	0.0055	:	-		-	
Molybdenum	mg/L	D	-		-		0.0078	:	0.0095	:	-		-	
Nickel	mg/L	D	-		-		0.0022	:	0.0035	:	-		-	
Potassium	mg/L	D	-		-		1.79	J	1.92	J	-		-	
Selenium	mg/L	D	-		-		<0.0003	J	<0.0003	J	-		-	
Silver	mg/L	D	-		-		<0.0001	:	<0.0001	:	-		-	
Sodium	mg/L	D	-		-		27.8	:	36.9	:	-		-	

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction						
		Site ID	LR-1	LR-1	LR-1	LR-1	LR-1	LR-1
		Sample Date	10/6/2003	10/6/2003	10/6/2003	10/6/2003	10/7/2003	10/7/2003
		Sample ID	LR-1-T00N-P1S	LR-1-T00N-P1D	LR-1-D00N-PS	LR-1-D00N-PD	LR-1-T01N-PS	LR-1-T01N-PD
		Exposure Area	SWR	SWR	SWR	SWR	SWR	SWR
Thallium	mg/L	D	-	-	<0.0001 :	<0.0001 :	-	-
Vanadium	mg/L	D	-	-	0.00035 :	0.00055 :	-	-
Zinc	mg/L	D	-	-	0.0368 :	0.142 :	-	-

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID					
			LR-1 10/7/2003 LR-1-T01N-P3S	LR-1 10/7/2003 LR-1-T01N-P3D	LR-1 10/7/2003 LR-1-T01N-P2S	LR-1 10/7/2003 LR-1-T01N-P2D	LR-1 10/7/2003 LR-1-T01N-P1S	LR-1 10/7/2003 LR-1-T01N-P1D
			SWR	SWR	SWR	SWR	SWR	SWR
Field Measurements								
DO	mg/L	T	11. :	8.3 :	8.3 :	9.7 :	11.5 :	11.5 :
EH	millivolts	T	125. :	127. :	126. :	126. :	118. :	116. :
pH	SU	T	7.1 :	7. :	7.1 :	7.1 :	7.4 :	7.4 :
Specific Conductance	uS/cm	T	471. :	500. :	537. :	544. :	366. :	434. :
Temperature	Celsius	T	12.5 :	12.7 :	12.2 :	12.6 :	11.7 :	12.1 :

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID: LR-1 Sample Date: 10/7/2003 Sample ID: LR-1-D01N-PS SWR	Site ID: LR-1 Sample Date: 10/7/2003 Sample ID: LR-1-D01N-PD SWR	Site ID: LR-1 Sample Date: 10/8/2003 Sample ID: LR-1-T02N-PS SWR	Site ID: LR-1 Sample Date: 10/8/2003 Sample ID: LR-1-T02N-PD SWR	Site ID: LR-1 Sample Date: 10/8/2003 Sample ID: LR-1-T02N-P3S SWR	Site ID: LR-1 Sample Date: 10/8/2003 Sample ID: LR-1-T02N-P3D SWR
Field Measurements								
DO	mg/L	T	-	-	-	-	6.6 :	7.5 :
EH	millivolts	T	-	-	-	-	220. :	221. :
pH	SU	T	-	-	-	-	6.9 :	6.9 :
Specific Conductance	uS/cm	T	-	-	-	-	468. :	496. :
Temperature	Celsius	T	-	-	-	-	12.1 :	12.4 :
General Chemistry								
Fluoride	mg/L	T	-	-	0.67 :	0.52 :	-	-
Sulfate	mg/L	T	-	-	206. J	72. J	-	-
Total Organic Carbon	mg/L	T	-	-	2.2 :	2.7 :	-	-
Physical Properties								
Hardness	mg/L	D	216. :	222. :	-	-	-	-
Metals								
Aluminum	mg/L	D	<0.0217 J	<0.0217 J	-	-	-	-
Antimony	mg/L	D	<0.00074 :	<0.0005 :	-	-	-	-
Arsenic	mg/L	D	<0.0002 J	0.0002 J	-	-	-	-
Barium	mg/L	D	0.0838 :	0.0892 :	-	-	-	-
Beryllium	mg/L	D	<0.0004 :	<0.0004 :	-	-	-	-
Boron	mg/L	D	0.0917 :	0.109 :	-	-	-	-
Cadmium	mg/L	D	<0.0002 J	<0.0002 J	-	-	-	-
Calcium	mg/L	D	66.1 :	68.4 :	-	-	-	-
Chromium	mg/L	D	<0.0011 :	<0.0011 :	-	-	-	-
Cobalt	mg/L	D	<0.0029 :	0.0033 :	-	-	-	-
Copper	mg/L	D	0.0031 :	0.0034 :	-	-	-	-
Iron	mg/L	D	<0.0278 :	<0.0278 :	-	-	-	-
Lead	mg/L	D	<0.0002 :	<0.0002 :	-	-	-	-
Magnesium	mg/L	D	12.3 :	12.5 :	-	-	-	-
Manganese	mg/L	D	0.0048 :	0.0063 :	-	-	-	-
Molybdenum	mg/L	D	0.0074 :	0.008 :	-	-	-	-
Nickel	mg/L	D	0.0022 :	0.0025 :	-	-	-	-
Potassium	mg/L	D	1.2 J	1.45 J	-	-	-	-
Selenium	mg/L	D	0.00048 J	<0.0003 J	-	-	-	-
Silver	mg/L	D	<0.0001 :	<0.0001 :	-	-	-	-
Sodium	mg/L	D	26.5 :	30.6 :	-	-	-	-

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction											
		LR-1 10/7/2003 LR-1-D01N-PS SWR		LR-1 10/7/2003 LR-1-D01N-PD SWR		LR-1 10/8/2003 LR-1-T02N-PS SWR	LR-1 10/8/2003 LR-1-T02N-PD SWR	LR-1 10/8/2003 LR-1-T02N-P3S SWR	LR-1 10/8/2003 LR-1-T02N-P3D SWR
Thallium	mg/L	D	<0.0001	:	<0.0001	:	-	-	-	-
Vanadium	mg/L	D	0.00041	:	0.00041	:	-	-	-	-
Zinc	mg/L	D	0.035	:	0.0918	:	-	-	-	-

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID											
			LR-1 10/8/2003 LR-1-T02N-P2S		LR-1 10/8/2003 LR-1-T02N-P2D		LR-1 10/8/2003 LR-1-T02N-P1S		LR-1 10/8/2003 LR-1-T02N-P1D		LR-1 10/8/2003 LR-1-D02N-PS		LR-1 10/8/2003 LR-1-D02N-PD	
			SWR		SWR		SWR		SWR		SWR		SWR	
Field Measurements														
DO	mg/L	T	4.	:	6.4	:	7.2	:	4.8	:	-		-	
EH	millivolts	T	226.	:	229.	:	226.	:	230.	:	-		-	
pH	SU	T	6.9	:	6.9	:	7.	:	6.9	:	-		-	
Specific Conductance	uS/cm	T	536.	:	535.	:	394.	:	488.	:	-		-	
Temperature	Celsius	T	11.7	:	11.7	:	10.	:	11.2	:	-		-	
Physical Properties														
Hardness	mg/L	D	-		-		-		-		344.	:	218.	:
Metals														
Aluminum	mg/L	D	-		-		-		-		<0.0221	:	<0.0307	:
Antimony	mg/L	D	-		-		-		-		<0.0005	:	<0.0005	:
Arsenic	mg/L	D	-		-		-		-		0.00027	J	<0.0002	J
Barium	mg/L	D	-		-		-		-		0.0571	:	0.0904	:
Beryllium	mg/L	D	-		-		-		-		<0.0004	:	<0.0003	:
Boron	mg/L	D	-		-		-		-		0.0706	:	0.118	:
Cadmium	mg/L	D	-		-		-		-		<0.0002	J	<0.0002	J
Calcium	mg/L	D	-		-		-		-		106.	:	66.8	:
Chromium	mg/L	D	-		-		-		-		<0.0011	:	<0.0013	:
Cobalt	mg/L	D	-		-		-		-		<0.0029	:	0.0032	:
Copper	mg/L	D	-		-		-		-		<0.0121	:	0.0036	:
Iron	mg/L	D	-		-		-		-		<0.0278	:	<0.03	:
Lead	mg/L	D	-		-		-		-		<0.0002	:	<0.0002	:
Magnesium	mg/L	D	-		-		-		-		19.1	:	12.4	:
Manganese	mg/L	D	-		-		-		-		0.0039	:	0.004	:
Molybdenum	mg/L	D	-		-		-		-		0.171	:	<0.0108	:
Nickel	mg/L	D	-		-		-		-		0.0018	:	0.0035	:
Potassium	mg/L	D	-		-		-		-		2.11	:	<2.01	:
Selenium	mg/L	D	-		-		-		-		0.00074	J	<0.0003	J
Silver	mg/L	D	-		-		-		-		<0.0001	:	<0.0001	:
Sodium	mg/L	D	-		-		-		-		35.1	:	31.8	:
Thallium	mg/L	D	-		-		-		-		<0.0001	:	<0.0001	:
Vanadium	mg/L	D	-		-		-		-		0.00054	:	0.00045	:
Zinc	mg/L	D	-		-		-		-		0.0558	:	0.0819	:

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID											
			LR-1 10/9/2003 LR-1-T03N-PS		LR-1 10/9/2003 LR-1-T03N-PD		LR-1 10/9/2003 LR-1-T03N-P3S		LR-1 10/9/2003 LR-1-T03N-P3D		LR-1 10/9/2003 LR-1-T03N-P2S		LR-1 10/9/2003 LR-1-T03N-P2D	
			SWR		SWR		SWR		SWR		SWR		SWR	
Field Measurements														
DO	mg/L	T	-		-		4.96	:	3.71	:	4.62	:	3.46	:
EH	millivolts	T	-		-		158.	:	166.	:	178.	:	181.	:
pH	SU	T	-		-		6.9	:	6.9	:	6.9	:	6.9	:
Specific Conductance	uS/cm	T	-		-		418.	:	441.	:	469.	:	473.	:
Temperature	Celsius	T	-		-		12.18	:	12.23	:	11.33	:	11.51	:
General Chemistry														
Fluoride	mg/L	T	0.59	:	0.52	:	-		-		-		-	
Sulfate	mg/L	T	78.1	J	61.	J	-		-		-		-	
Total Organic Carbon	mg/L	T	2.	:	2.1	:	-		-		-		-	

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	LR-1 10/9/2003 LR-1-T03N-P1S SWR		LR-1 10/9/2003 LR-1-T03N-P1D SWR		LR-1 10/9/2003 LR-1-D03N-PS SWR		LR-1 10/9/2003 LR-1-D03N-PD SWR		LR-1 10/10/2003 LR-1-T04N-PS SWR		LR-1 10/10/2003 LR-1-T04N-PD SWR	
Field Measurements														
DO	mg/L	T	5.36	:	3.86	:	-		-		-		-	
EH	millivolts	T	180.	:	183.	:	-		-		-		-	
pH	SU	T	7.	:	6.9	:	-		-		-		-	
Specific Conductance	uS/cm	T	352.	:	429.	:	-		-		-		-	
Temperature	Celsius	T	9.88	:	10.2	:	-		-		-		-	
General Chemistry														
Fluoride	mg/L	T	-		-		-		-		0.58	:	0.44	:
Sulfate	mg/L	T	-		-		-		-		80.4	J	75.7	J
Total Organic Carbon	mg/L	T	-		-		-		-		2.2	:	2.2	:
Physical Properties														
Hardness	mg/L	D	-		-		205.	:	219.	:	-		-	
Metals														
Aluminum	mg/L	D	-		-		<0.0307	:	<0.0307	:	-		-	
Antimony	mg/L	D	-		-		<0.0005	:	<0.0005	:	-		-	
Arsenic	mg/L	D	-		-		<0.0002	J	<0.0002	J	-		-	
Barium	mg/L	D	-		-		0.0772	:	0.0934	:	-		-	
Beryllium	mg/L	D	-		-		<0.0003	:	<0.0003	:	-		-	
Boron	mg/L	D	-		-		0.0884	:	0.12	:	-		-	
Cadmium	mg/L	D	-		-		<0.0002	J	<0.0002	J	-		-	
Calcium	mg/L	D	-		-		62.8	:	67.3	:	-		-	
Chromium	mg/L	D	-		-		<0.0013	:	<0.0013	:	-		-	
Cobalt	mg/L	D	-		-		0.0119	:	0.0102	:	-		-	
Copper	mg/L	D	-		-		0.0034	:	0.004	:	-		-	
Iron	mg/L	D	-		-		<0.03	:	<0.03	:	-		-	
Lead	mg/L	D	-		-		<0.0002	:	<0.0002	:	-		-	
Magnesium	mg/L	D	-		-		11.7	:	12.4	:	-		-	
Manganese	mg/L	D	-		-		0.0168	:	0.0155	:	-		-	
Molybdenum	mg/L	D	-		-		<0.0106	:	<0.0104	:	-		-	
Nickel	mg/L	D	-		-		0.0051	:	0.0053	:	-		-	
Potassium	mg/L	D	-		-		<1.77	:	<1.48	:	-		-	
Selenium	mg/L	D	-		-		0.00041	J	<0.0003	J	-		-	
Silver	mg/L	D	-		-		<0.0001	:	<0.0001	:	-		-	
Sodium	mg/L	D	-		-		25.5	:	32.8	:	-		-	

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction						
		Site ID	LR-1	LR-1	LR-1	LR-1	LR-1	LR-1
		Sample Date	10/9/2003	10/9/2003	10/9/2003	10/9/2003	10/10/2003	10/10/2003
		Sample ID	LR-1-T03N-P1S	LR-1-T03N-P1D	LR-1-D03N-PS	LR-1-D03N-PD	LR-1-T04N-PS	LR-1-T04N-PD
		Exposure Area	SWR	SWR	SWR	SWR	SWR	SWR
Thallium	mg/L	D	-	-	<0.0001 :	<0.0001 :	-	-
Vanadium	mg/L	D	-	-	0.00037 :	0.00063 :	-	-
Zinc	mg/L	D	-	-	0.0381 :	0.0864 :	-	-

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID / Exposure Area					
			LR-1 10/10/2003 LR-1-T04N-P3S SWR	LR-1 10/10/2003 LR-1-T04N-P3D SWR	LR-1 10/10/2003 LR-1-T04N-P2S SWR	LR-1 10/10/2003 LR-1-T04N-P2D SWR	LR-1 10/10/2003 LR-1-T04N-P1S SWR	LR-1 10/10/2003 LR-1-T04N-P1D SWR
Field Measurements								
DO	mg/L	T	2.69 :	3.28 :	1.8 :	3.9 :	3.83 :	5.53 :
EH	millivolts	T	159.7 :	161.7 :	164.3 :	165.9 :	166.1 :	161.2 :
pH	SU	T	6.9 :	6.9 :	6.9 :	6.9 :	7. :	7. :
Specific Conductance	uS/cm	T	409. :	428. :	464. :	464. :	362. :	449. :
Temperature	Celsius	T	12.8 :	12.6 :	12.4 :	12.2 :	11.6 :	12.4 :

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID													
			LR-1 10/10/2003 LR-1-D04N-PS		LR-1 10/10/2003 LR-1-D04N-PD		LR-1 3/23/2004 LR-1-T01N-P3S		LR-1 3/23/2004 LR-1-T01N-P2S		LR-1 3/23/2004 LR-1-T01N-P1S		LR-1 3/24/2004 LR-1-T02N-P3S	
			SWR		SWR		SWR		SWR		SWR		SWR	
Field Measurements														
DO	mg/L	T	-		-		5.2	:	5.2	:	6.	:	-	
EH	millivolts	T	-		-		262.	:	265.	:	258.	:	207.	:
pH	SU	T	-		-		7.2	:	7.2	:	7.5	:	7.1	:
Specific Conductance	mS/cm	T	-		-		0.448	:	0.485	:	0.35	:	0.462	:
Temperature	Celsius	T	-		-		10.1	:	10.4	:	9.1	:	10.4	:
Physical Properties														
Hardness	mg/L	D	228.	:	232.	:	-		-		-		-	
Metals														
Aluminum	mg/L	D	<0.0307	:	<0.0307	:	-		-		-		-	
Antimony	mg/L	D	<0.0013	:	<0.00063	:	-		-		-		-	
Arsenic	mg/L	D	<0.0002	J	<0.0002	J	-		-		-		-	
Barium	mg/L	D	0.0875	:	0.0997	:	-		-		-		-	
Beryllium	mg/L	D	<0.0003	:	<0.00052	:	-		-		-		-	
Boron	mg/L	D	0.0832	:	0.109	:	-		-		-		-	
Cadmium	mg/L	D	<0.0002	J	<0.0002	J	-		-		-		-	
Calcium	mg/L	D	69.2	:	70.7	:	-		-		-		-	
Chromium	mg/L	D	<0.0013	J	<0.0013	J	-		-		-		-	
Cobalt	mg/L	D	<0.0031	:	0.0061	:	-		-		-		-	
Copper	mg/L	D	0.0036	:	0.0039	:	-		-		-		-	
Iron	mg/L	D	<0.03	:	<0.03	:	-		-		-		-	
Lead	mg/L	D	<0.0002	:	<0.0002	:	-		-		-		-	
Magnesium	mg/L	D	13.4	:	13.4	:	-		-		-		-	
Manganese	mg/L	D	0.0064	:	0.0075	:	-		-		-		-	
Molybdenum	mg/L	D	0.0074	J	0.0068	J	-		-		-		-	
Nickel	mg/L	D	0.0029	:	0.0034	:	-		-		-		-	
Potassium	mg/L	D	1.56	:	1.6	:	-		-		-		-	
Selenium	mg/L	D	<0.0003	J	<0.0003	J	-		-		-		-	
Silver	mg/L	D	<0.0001	:	<0.0001	:	-		-		-		-	
Sodium	mg/L	D	29.4	:	36.	:	-		-		-		-	
Thallium	mg/L	D	<0.0001	:	<0.0001	:	-		-		-		-	
Vanadium	mg/L	D	0.00032	:	0.00053	:	-		-		-		-	
Zinc	mg/L	D	0.0424	:	0.0803	:	-		-		-		-	

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID / Exposure Area					
			LR-1 3/24/2004 LR-1-T02N-P2S SWR	LR-1 3/24/2004 LR-1-T02N-P1S SWR	LR-1 3/25/2004 LR-1-T03N-PS SWR	LR-1 3/25/2004 LR-1-T03N-P3S SWR	LR-1 3/25/2004 LR-1-T03N-P2S SWR	LR-1 3/25/2004 LR-1-T03N-P1S SWR
Field Measurements								
DO	mg/L	T	-	-	-	4.81 :	5.95 :	8.44 :
EH	millivolts	T	206. :	205. :	-	226. :	227. :	217. :
pH	SU	T	7.3 :	7.3 :	-	7.13 :	7.18 :	7.52 :
Specific Conductance	mS/cm	T	0.507 :	0.336 :	-	0.494 :	0.531 :	0.353 :
Temperature	Celsius	T	10.6 :	9.1 :	-	10.25 :	10.4 :	8.3 :
General Chemistry								
Fluoride	mg/L	T	-	-	0.65 :	-	-	-
Sulfate	mg/L	T	-	-	68.6 :	-	-	-
Total Organic Carbon	mg/L	T	-	-	3.1 :	-	-	-

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID	
			LR-1 3/25/2004 LR-1-T02N-PS		LR-1 3/25/2004 LR-1-T01N-PS		LR-1 3/25/2004 LR-1-D03N-PS		LR-1 3/25/2004 LR-1-D02N-PS		LR-1 3/25/2004 LR-1-D01N-PS		LR-16 10/6/2003 LR-16-T00N-PS	
			SWR		SWR		SWR		SWR		SWR		SWR	
General Chemistry														
Fluoride	mg/L	T	0.62	:	0.65	:	-		-		-		0.87	:
Sulfate	mg/L	T	67.6	:	66.5	:	-		-		-		80.6	J
Total Organic Carbon	mg/L	T	4.3	:	10.	:	-		-		-		2.5	:
Physical Properties														
Hardness	mg/L	D	-		-		197.	:	186.	:	200.	:	-	
Metals														
Aluminum	mg/L	D	-		-		<0.0306	:	<0.0496	:	<0.112	:	-	
Antimony	mg/L	D	-		-		<0.0004	J	<0.0004	J	<0.0004	J	-	
Arsenic	mg/L	D	-		-		<0.0002	:	<0.0002	:	<0.0002	:	-	
Barium	mg/L	D	-		-		0.079	:	0.0811	:	0.0782	:	-	
Beryllium	mg/L	D	-		-		<0.0002	J	<0.0002	J	<0.0002	J	-	
Boron	mg/L	D	-		-		0.0793	:	0.0767	:	<0.0829	:	-	
Cadmium	mg/L	D	-		-		<0.0002	:	<0.0002	:	<0.0002	:	-	
Calcium	mg/L	D	-		-		60.7	:	57.2	:	61.3	:	-	
Chromium	mg/L	D	-		-		<0.0012	J	<0.00097	J	<0.0008	J	-	
Cobalt	mg/L	D	-		-		0.0165	:	0.0125	:	0.0154	:	-	
Copper	mg/L	D	-		-		0.0077	:	0.0038	:	<0.0053	:	-	
Iron	mg/L	D	-		-		<0.0192	J	<0.0192	J	<0.0809	:	-	
Lead	mg/L	D	-		-		<0.0004	:	<0.0004	:	<0.0004	:	-	
Magnesium	mg/L	D	-		-		11.1	:	10.6	:	11.4	:	-	
Manganese	mg/L	D	-		-		0.023	:	0.0175	:	0.0209	:	-	
Molybdenum	mg/L	D	-		-		0.0085	:	0.0078	:	<0.0106	:	-	
Nickel	mg/L	D	-		-		0.0038	J	0.0035	J	0.0051	:	-	
Potassium	mg/L	D	-		-		1.84	:	1.52	:	1.94	:	-	
Selenium	mg/L	D	-		-		<0.0007	:	<0.0007	:	<0.0007	:	-	
Silver	mg/L	D	-		-		<0.0001	J	<0.0001	J	<0.0001	:	-	
Sodium	mg/L	D	-		-		26.5	:	27.1	:	27.4	:	-	
Thallium	mg/L	D	-		-		<0.0001	:	<0.0001	:	<0.0001	:	-	
Vanadium	mg/L	D	-		-		<0.00088	:	<0.00086	:	0.00061	:	-	
Zinc	mg/L	D	-		-		0.015	:	<0.0129	:	0.0125	:	-	

J = Qualified as estimated during data validation
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T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID / Exposure Area											
			LR-16 10/6/2003 LR-16-T00N-PD SWR		LR-16 10/6/2003 LR-16-T00N-P3S SWR		LR-16 10/6/2003 LR-16-T00N-P3D SWR		LR-16 10/6/2003 LR-16-T00N-P2S SWR		LR-16 10/6/2003 LR-16-T00N-P2D SWR		LR-16 10/6/2003 LR-16-T00N-P1S SWR	
Field Measurements														
DO	mg/L	T	-		7.6	:	8.5	:	9.1	:	9.1	:	8.7	:
EH	millivolts	T	-		101.	:	98.	:	90.	:	93.	:	104.	:
pH	SU	T	-		7.9	:	7.9	:	8.	:	7.9	:	7.9	:
Specific Conductance	uS/cm	T	-		372.	:	383.	:	387.	:	399.	:	391.	:
Temperature	Celsius	T	-		16.	:	16.	:	15.	:	16.	:	14.3	:
General Chemistry														
Fluoride	mg/L	T	0.87	:	-		-		-		-		-	
Sulfate	mg/L	T	87.1	J	-		-		-		-		-	
Total Organic Carbon	mg/L	T	<1.	:	-		-		-		-		-	

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R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID: LR-16	LR-16	LR-16	LR-16	LR-16	LR-16
		Sample Date:	10/6/2003	10/6/2003	10/6/2003	10/7/2003	10/7/2003	10/7/2003
		Sample ID:	LR-16-T00N-P1D	LR-16-D00N-PS	LR-16-D00N-PD	LR-16-T01N-PS	LR-16-T01N-PD	LR-16-T01N-P3S
			SWR	SWR	SWR	SWR	SWR	SWR
Field Measurements								
DO	mg/L	T	8.7 :	-	-	-	-	13.3 :
EH	millivolts	T	107. :	-	-	-	-	158. :
pH	SU	T	7.9 :	-	-	-	-	7.8 :
Specific Conductance	uS/cm	T	398. :	-	-	-	-	356. :
Temperature	Celsius	T	15. :	-	-	-	-	14.7 :
General Chemistry								
Fluoride	mg/L	T	-	-	-	0.92 :	0.92 :	-
Sulfate	mg/L	T	-	-	-	87.4 J	93.1 J	-
Total Organic Carbon	mg/L	T	-	-	-	1.8 :	1.4 :	-
Physical Properties								
Hardness	mg/L	D	-	127. :	125. :	-	-	-
Metals								
Aluminum	mg/L	D	-	<0.0217 J	<0.0217 J	-	-	-
Antimony	mg/L	D	-	<0.0005 :	<0.0005 :	-	-	-
Arsenic	mg/L	D	-	0.0016 J	0.0018 J	-	-	-
Barium	mg/L	D	-	0.0382 :	0.0396 :	-	-	-
Beryllium	mg/L	D	-	<0.0004 :	<0.0004 :	-	-	-
Boron	mg/L	D	-	0.0488 :	0.048 :	-	-	-
Cadmium	mg/L	D	-	<0.0002 J	<0.0002 J	-	-	-
Calcium	mg/L	D	-	34. :	33.2 :	-	-	-
Chromium	mg/L	D	-	0.0022 :	0.0024 :	-	-	-
Cobalt	mg/L	D	-	<0.0029 :	<0.0029 :	-	-	-
Copper	mg/L	D	-	<0.0017 :	<0.0017 :	-	-	-
Iron	mg/L	D	-	<0.0354 :	<0.0318 :	-	-	-
Lead	mg/L	D	-	<0.0002 :	<0.0002 :	-	-	-
Magnesium	mg/L	D	-	10.3 :	10.2 :	-	-	-
Manganese	mg/L	D	-	<0.0012 :	0.0061 :	-	-	-
Molybdenum	mg/L	D	-	0.0924 :	0.103 :	-	-	-
Nickel	mg/L	D	-	<0.0016 :	<0.0016 :	-	-	-
Potassium	mg/L	D	-	3.46 J	3.46 J	-	-	-
Selenium	mg/L	D	-	0.00055 J	0.00075 J	-	-	-
Silver	mg/L	D	-	<0.0001 :	<0.0001 :	-	-	-
Sodium	mg/L	D	-	31.7 :	31.7 :	-	-	-

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T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction						
		LR-16 / 10/6/2003 / LR-16-T00N-P1D / SWR / D	LR-16 / 10/6/2003 / LR-16-D00N-PS / SWR / D		LR-16 / 10/6/2003 / LR-16-D00N-PD / SWR / D		LR-16 / 10/7/2003 / LR-16-T01N-PS / SWR / D	LR-16 / 10/7/2003 / LR-16-T01N-PD / SWR / D	LR-16 / 10/7/2003 / LR-16-T01N-P3S / SWR / D
Thallium	mg/L	-	<0.0001	:	<0.0001	:	-	-	-
Vanadium	mg/L	-	0.0056	:	0.0065	:	-	-	-
Zinc	mg/L	-	0.0266	:	0.0386	:	-	-	-

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID / SWR													
			LR-16 10/7/2003 LR-16-T01N-P3D SWR		LR-16 10/7/2003 LR-16-T01N-P2S SWR		LR-16 10/7/2003 LR-16-T01N-P2D SWR		LR-16 10/7/2003 LR-16-T01N-P1S SWR		LR-16 10/7/2003 LR-16-T01N-P1D SWR		LR-16 10/7/2003 LR-16-D01N-PS SWR	
Field Measurements														
DO	mg/L	T	9.5	:	7.7	:	9.	:	9.3	:	8.5	:	-	
EH	millivolts	T	156.	:	155.	:	166.	:	169.	:	179.	:	-	
pH	SU	T	7.9	:	7.7	:	7.9	:	7.8	:	7.7	:	-	
Specific Conductance	uS/cm	T	368.	:	374.	:	375.	:	372.	:	383.	:	-	
Temperature	Celsius	T	15.4	:	14.8	:	13.7	:	13.2	:	14.6	:	-	
Physical Properties														
Hardness	mg/L	D	-		-		-		-		-		123.	:
Metals														
Aluminum	mg/L	D	-		-		-		-		-		<0.0221	:
Antimony	mg/L	D	-		-		-		-		-		<0.0005	:
Arsenic	mg/L	D	-		-		-		-		-		0.0015	J
Barium	mg/L	D	-		-		-		-		-		0.0328	:
Beryllium	mg/L	D	-		-		-		-		-		<0.0004	:
Boron	mg/L	D	-		-		-		-		-		0.0466	:
Cadmium	mg/L	D	-		-		-		-		-		<0.0002	J
Calcium	mg/L	D	-		-		-		-		-		32.9	:
Chromium	mg/L	D	-		-		-		-		-		<0.0011	:
Cobalt	mg/L	D	-		-		-		-		-		<0.0029	:
Copper	mg/L	D	-		-		-		-		-		<0.0115	:
Iron	mg/L	D	-		-		-		-		-		<0.0278	:
Lead	mg/L	D	-		-		-		-		-		<0.0002	:
Magnesium	mg/L	D	-		-		-		-		-		9.91	:
Manganese	mg/L	D	-		-		-		-		-		0.003	:
Molybdenum	mg/L	D	-		-		-		-		-		0.093	:
Nickel	mg/L	D	-		-		-		-		-		<0.0016	:
Potassium	mg/L	D	-		-		-		-		-		3.36	:
Selenium	mg/L	D	-		-		-		-		-		0.00049	J
Silver	mg/L	D	-		-		-		-		-		<0.0001	:
Sodium	mg/L	D	-		-		-		-		-		30.8	:
Thallium	mg/L	D	-		-		-		-		-		<0.0001	:
Vanadium	mg/L	D	-		-		-		-		-		0.0056	:
Zinc	mg/L	D	-		-		-		-		-		<0.0247	:

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID	
			LR-16 10/7/2003 LR-16-D01N-PD		LR-16 10/8/2003 LR-16-T02N-PS		LR-16 10/8/2003 LR-16-T02N-PD		LR-16 10/8/2003 LR-16-T02N-P3S		LR-16 10/8/2003 LR-16-T02N-P3D		LR-16 10/8/2003 LR-16-T02N-P2S	
			SWR		SWR		SWR		SWR		SWR		SWR	
Field Measurements														
DO	mg/L	T	-		-		-		7.5	:	7.8	:	7.7	:
EH	millivolts	T	-		-		-		164.	:	165.	:	165.	:
pH	SU	T	-		-		-		7.7	:	7.7	:	7.7	:
Specific Conductance	uS/cm	T	-		-		-		362.	:	374.	:	376.	:
Temperature	Celsius	T	-		-		-		15.1	:	15.6	:	14.6	:
General Chemistry														
Fluoride	mg/L	T	-		0.92	:	0.92	:	-		-		-	
Sulfate	mg/L	T	-		83.2	J	96.8	J	-		-		-	
Total Organic Carbon	mg/L	T	-		1.7	:	1.1	:	-		-		-	
Physical Properties														
Hardness	mg/L	D	129.	:	-		-		-		-		-	
Metals														
Aluminum	mg/L	D	<0.0221	:	-		-		-		-		-	
Antimony	mg/L	D	<0.0005	:	-		-		-		-		-	
Arsenic	mg/L	D	0.0016	J	-		-		-		-		-	
Barium	mg/L	D	0.0335	:	-		-		-		-		-	
Beryllium	mg/L	D	<0.0004	:	-		-		-		-		-	
Boron	mg/L	D	0.05	:	-		-		-		-		-	
Cadmium	mg/L	D	<0.0002	J	-		-		-		-		-	
Calcium	mg/L	D	34.3	:	-		-		-		-		-	
Chromium	mg/L	D	<0.0011	:	-		-		-		-		-	
Cobalt	mg/L	D	<0.0029	:	-		-		-		-		-	
Copper	mg/L	D	<0.0108	:	-		-		-		-		-	
Iron	mg/L	D	<0.0278	:	-		-		-		-		-	
Lead	mg/L	D	<0.0002	:	-		-		-		-		-	
Magnesium	mg/L	D	10.5	:	-		-		-		-		-	
Manganese	mg/L	D	0.0046	:	-		-		-		-		-	
Molybdenum	mg/L	D	0.0982	:	-		-		-		-		-	
Nickel	mg/L	D	<0.0016	:	-		-		-		-		-	
Potassium	mg/L	D	3.7	:	-		-		-		-		-	
Selenium	mg/L	D	0.00038	J	-		-		-		-		-	
Silver	mg/L	D	<0.0001	:	-		-		-		-		-	
Sodium	mg/L	D	32.6	:	-		-		-		-		-	

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID						
			LR-16 10/7/2003 LR-16-D01N-PD	LR-16 10/8/2003 LR-16-T02N-PS	LR-16 10/8/2003 LR-16-T02N-PD	LR-16 10/8/2003 LR-16-T02N-P3S	LR-16 10/8/2003 LR-16-T02N-P3D	LR-16 10/8/2003 LR-16-T02N-P2S
			SWR	SWR	SWR	SWR	SWR	SWR
Thallium	mg/L	D	<0.0001 :	-	-	-	-	-
Vanadium	mg/L	D	0.0062 :	-	-	-	-	-
Zinc	mg/L	D	0.034 :	-	-	-	-	-

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID	
			LR-16 10/8/2003 LR-16-T02N-P2D		LR-16 10/8/2003 LR-16-T02N-P1S		LR-16 10/8/2003 LR-16-T02N-P1D		LR-16 10/8/2003 LR-16-D02N-PS		LR-16 10/8/2003 LR-16-D02N-PD		LR-16 10/9/2003 LR-16-T03N-PS	
			SWR		SWR		SWR		SWR		SWR		SWR	
Field Measurements														
DO	mg/L	T	8.8	:	8.	:	7.2	:	-		-		-	
EH	millivolts	T	170.	:	189.	:	197.	:	-		-		-	
pH	SU	T	7.6	:	7.4	:	7.2	:	-		-		-	
Specific Conductance	uS/cm	T	389.	:	373.	:	386.	:	-		-		-	
Temperature	Celsius	T	15.6	:	13.1	:	14.4	:	-		-		-	
General Chemistry														
Fluoride	mg/L	T	-		-		-		-		-		0.8	:
Sulfate	mg/L	T	-		-		-		-		-		72.6	J
Total Organic Carbon	mg/L	T	-		-		-		-		-		1.6	:
Physical Properties														
Hardness	mg/L	D	-		-		-		114.	:	119.	:	-	
Metals														
Aluminum	mg/L	D	-		-		-		<0.0307	:	<0.0307	:	-	
Antimony	mg/L	D	-		-		-		<0.0005	:	<0.0005	:	-	
Arsenic	mg/L	D	-		-		-		0.0015	J	0.0019	J	-	
Barium	mg/L	D	-		-		-		0.031	:	0.0326	:	-	
Beryllium	mg/L	D	-		-		-		<0.0003	:	<0.0003	:	-	
Boron	mg/L	D	-		-		-		0.0444	:	0.0458	:	-	
Cadmium	mg/L	D	-		-		-		<0.0002	J	<0.0002	J	-	
Calcium	mg/L	D	-		-		-		30.2	:	31.5	:	-	
Chromium	mg/L	D	-		-		-		0.0019	:	0.0023	:	-	
Cobalt	mg/L	D	-		-		-		<0.0031	:	<0.0031	:	-	
Copper	mg/L	D	-		-		-		<0.0017	:	<0.0017	:	-	
Iron	mg/L	D	-		-		-		<0.03	:	<0.03	:	-	
Lead	mg/L	D	-		-		-		<0.0002	:	<0.0002	:	-	
Magnesium	mg/L	D	-		-		-		9.33	:	9.81	:	-	
Manganese	mg/L	D	-		-		-		0.0033	:	0.0081	:	-	
Molybdenum	mg/L	D	-		-		-		0.0905	:	0.0996	:	-	
Nickel	mg/L	D	-		-		-		<0.0016	:	<0.0016	:	-	
Potassium	mg/L	D	-		-		-		<3.08	:	<3.12	:	-	
Selenium	mg/L	D	-		-		-		0.00053	J	0.00072	J	-	
Silver	mg/L	D	-		-		-		<0.0001	:	<0.0001	:	-	
Sodium	mg/L	D	-		-		-		28.6	:	30.4	:	-	

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction						
		LR-16 / 10/8/2003 / LR-16-T02N-P2D / SWR /	LR-16 / 10/8/2003 / LR-16-T02N-P1S / SWR /	LR-16 / 10/8/2003 / LR-16-T02N-P1D / SWR /	LR-16 / 10/8/2003 / LR-16-D02N-PS / SWR /	LR-16 / 10/8/2003 / LR-16-D02N-PD / SWR /	LR-16 / 10/9/2003 / LR-16-T03N-PS / SWR /
Thallium	mg/L	D	-	-	-	<0.0001 :	<0.0001 :	-
Vanadium	mg/L	D	-	-	-	0.0055 :	0.0063 :	-
Zinc	mg/L	D	-	-	-	0.0201 :	0.03 :	-

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID / Exposure Area											
			LR-16 10/9/2003 LR-16-T03N-PD SWR		LR-16 10/9/2003 LR-16-T03N-P3S SWR		LR-16 10/9/2003 LR-16-T03N-P3D SWR		LR-16 10/9/2003 LR-16-T03N-P2S SWR		LR-16 10/9/2003 LR-16-T03N-P2D SWR		LR-16 10/9/2003 LR-16-T03N-P1S SWR	
Field Measurements														
DO	mg/L	T	-		6.91	:	7.93	:	7.62	:	7.79	:	6.73	:
EH	millivolts	T	-		137.	:	135.	:	137.	:	140.	:	147.	:
pH	SU	T	-		7.7	:	7.7	:	7.7	:	7.6	:	7.4	:
Specific Conductance	uS/cm	T	-		316.	:	328.	:	329.	:	340.	:	326.	:
Temperature	Celsius	T	-		14.46	:	15.21	:	14.11	:	14.99	:	12.3	:
General Chemistry														
Fluoride	mg/L	T	1.	:	-		-		-		-		-	
Sulfate	mg/L	T	79.6	J	-		-		-		-		-	
Total Organic Carbon	mg/L	T	1.2	:	-		-		-		-		-	

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T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID: LR-16 Sample Date: 10/9/2003 Sample ID: LR-16-T03N-P1D SWR	Site ID: LR-16 Sample Date: 10/9/2003 Sample ID: LR-16-D03N-PS SWR	Site ID: LR-16 Sample Date: 10/9/2003 Sample ID: LR-16-D03N-PD SWR	Site ID: LR-16 Sample Date: 10/10/2003 Sample ID: LR-16-T04N-PS SWR	Site ID: LR-16 Sample Date: 10/10/2003 Sample ID: LR-16-T04N-PD SWR	Site ID: LR-16 Sample Date: 10/10/2003 Sample ID: LR-16-T04N-P3S SWR
Field Measurements								
DO	mg/L	T	6.35 :	-	-	-	-	5.12 :
EH	millivolts	T	150. :	-	-	-	-	117.9 :
pH	SU	T	7.2 :	-	-	-	-	7.6 :
Specific Conductance	uS/cm	T	336. :	-	-	-	-	309. :
Temperature	Celsius	T	14.08 :	-	-	-	-	15.1 :
General Chemistry								
Fluoride	mg/L	T	-	-	-	0.98 :	0.92 :	-
Sulfate	mg/L	T	-	-	-	93.6 J	91. J	-
Total Organic Carbon	mg/L	T	-	-	-	1.4 :	1.4 :	-
Physical Properties								
Hardness	mg/L	D	-	122. :	121. :	-	-	-
Metals								
Aluminum	mg/L	D	-	<0.0621 :	<0.0409 :	-	-	-
Antimony	mg/L	D	-	0.00072 :	<0.0005 :	-	-	-
Arsenic	mg/L	D	-	0.0015 J	0.0018 J	-	-	-
Barium	mg/L	D	-	0.0314 :	0.0363 :	-	-	-
Beryllium	mg/L	D	-	<0.001 :	<0.0003 :	-	-	-
Boron	mg/L	D	-	0.0442 :	0.0515 :	-	-	-
Cadmium	mg/L	D	-	<0.0001 J	<0.0002 J	-	-	-
Calcium	mg/L	D	-	32.5 :	32.4 :	-	-	-
Chromium	mg/L	D	-	<0.0057 :	0.0029 :	-	-	-
Cobalt	mg/L	D	-	0.0112 :	0.0129 :	-	-	-
Copper	mg/L	D	-	<0.0003 J	<0.0017 :	-	-	-
Iron	mg/L	D	-	<0.0423 :	<0.03 :	-	-	-
Lead	mg/L	D	-	<0.0001 :	0.0035 J	-	-	-
Magnesium	mg/L	D	-	9.84 :	9.82 :	-	-	-
Manganese	mg/L	D	-	0.0176 :	0.0237 :	-	-	-
Mercury	mg/L	D	-	<0.0001 J	-	-	-	-
Molybdenum	mg/L	D	-	0.0886 :	0.105 :	-	-	-
Nickel	mg/L	D	-	0.00053 J	<0.0028 :	-	-	-
Potassium	mg/L	D	-	3.29 :	3.73 :	-	-	-
Selenium	mg/L	D	-	0.00042 J	0.00041 J	-	-	-
Silver	mg/L	D	-	<0.0001 J	<0.0001 :	-	-	-

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction											
		LR-16 10/9/2003 LR-16-T03N-P1D SWR		LR-16 10/9/2003 LR-16-D03N-PS SWR		LR-16 10/9/2003 LR-16-D03N-PD SWR		LR-16 10/10/2003 LR-16-T04N-PS SWR		LR-16 10/10/2003 LR-16-T04N-PD SWR		LR-16 10/10/2003 LR-16-T04N-P3S SWR	
Sodium	mg/L	D	-	29.4	:	31.5	:	-		-		-	
Thallium	mg/L	D	-	<0.0001	:	<0.0001	:	-		-		-	
Vanadium	mg/L	D	-	0.0057	J	0.0061	:	-		-		-	
Zinc	mg/L	D	-	0.0191	:	0.0328	:	-		-		-	

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Fraction	LR-16		LR-16		LR-16		LR-16		LR-16		LR-16	
Sample Date			10/10/2003		10/10/2003		10/10/2003		10/10/2003		10/10/2003		10/10/2003	
Sample ID			LR-16-T04N-P3D		LR-16-T04N-P2S		LR-16-T04N-P2D		LR-16-T04N-P1S		LR-16-T04N-P1D		LR-16-D04N-PS	
Exposure Area			SWR		SWR		SWR		SWR		SWR		SWR	
Field Measurements														
DO	mg/L	T	6.1	:	5.82	:	6.4	:	6.43	:	6.58	:	-	
EH	millivolts	T	113.4	:	113.4	:	115.3	:	125.6	:	135.4	:	-	
pH	SU	T	7.7	:	7.7	:	7.6	:	7.5	:	5.56	:	-	
Specific Conductance	uS/cm	T	318.	:	330.	:	340.	:	334.	:	338.	:	-	
Temperature	Celsius	T	15.7	:	15.8	:	16.6	:	15.1	:	15.3	:	-	
Physical Properties														
Hardness	mg/L	D	-		-		-		-		-		118.	:
Metals														
Aluminum	mg/L	D	-		-		-		-		-		0.0321	:
Antimony	mg/L	D	-		-		-		-		-		<0.0014	:
Arsenic	mg/L	D	-		-		-		-		-		0.0014	J
Barium	mg/L	D	-		-		-		-		-		0.0332	:
Beryllium	mg/L	D	-		-		-		-		-		<0.0003	:
Boron	mg/L	D	-		-		-		-		-		0.0471	:
Cadmium	mg/L	D	-		-		-		-		-		<0.0002	J
Calcium	mg/L	D	-		-		-		-		-		30.9	:
Chromium	mg/L	D	-		-		-		-		-		0.0035	J
Cobalt	mg/L	D	-		-		-		-		-		0.0065	:
Copper	mg/L	D	-		-		-		-		-		<0.0017	:
Iron	mg/L	D	-		-		-		-		-		<0.03	:
Lead	mg/L	D	-		-		-		-		-		<0.0002	:
Magnesium	mg/L	D	-		-		-		-		-		9.84	:
Manganese	mg/L	D	-		-		-		-		-		0.0083	:
Molybdenum	mg/L	D	-		-		-		-		-		0.094	:
Nickel	mg/L	D	-		-		-		-		-		<0.0016	:
Potassium	mg/L	D	-		-		-		-		-		3.21	:
Selenium	mg/L	D	-		-		-		-		-		0.00054	J
Silver	mg/L	D	-		-		-		-		-		<0.0001	:
Sodium	mg/L	D	-		-		-		-		-		32.4	:
Thallium	mg/L	D	-		-		-		-		-		<0.0001	:
Vanadium	mg/L	D	-		-		-		-		-		0.0055	:
Zinc	mg/L	D	-		-		-		-		-		0.0228	:

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Fraction	LR-16 10/10/2003 LR-16-D04N-PD SWR	LR-16 3/23/2004 LR-16-T01N-P3S SWR	LR-16 3/23/2004 LR-16-T01N-P2S SWR	LR-16 3/23/2004 LR-16-T01N-P1S SWR	LR-16 3/24/2004 LR-16-T02N-P3S SWR	LR-16 3/24/2004 LR-16-T02N-P2S SWR
Field Measurements								
DO	mg/L	T	-	8. :	8.3 :	9.4 :	-	-
EH	millivolts	T	-	284. :	284. :	288. :	167. :	167. :
pH	SU	T	-	8. :	8. :	8. :	8.03 :	8.1 :
Specific Conductance	mS/cm	T	-	0.34 :	0.351 :	0.335 :	0.356 :	0.371 :
Temperature	Celsius	T	-	13. :	12.3 :	10.2 :	13. :	12.5 :
Physical Properties								
Hardness	mg/L	D	120. :	-	-	-	-	-
Metals								
Aluminum	mg/L	D	<0.0307 :	-	-	-	-	-
Antimony	mg/L	D	<0.00062 :	-	-	-	-	-
Arsenic	mg/L	D	0.0016 J	-	-	-	-	-
Barium	mg/L	D	0.0313 :	-	-	-	-	-
Beryllium	mg/L	D	<0.00045 :	-	-	-	-	-
Boron	mg/L	D	0.0484 :	-	-	-	-	-
Cadmium	mg/L	D	<0.0002 J	-	-	-	-	-
Calcium	mg/L	D	31.5 :	-	-	-	-	-
Chromium	mg/L	D	0.002 J	-	-	-	-	-
Cobalt	mg/L	D	0.0042 :	-	-	-	-	-
Copper	mg/L	D	<0.0017 :	-	-	-	-	-
Iron	mg/L	D	<0.03 :	-	-	-	-	-
Lead	mg/L	D	<0.0002 :	-	-	-	-	-
Magnesium	mg/L	D	10.2 :	-	-	-	-	-
Manganese	mg/L	D	0.0087 :	-	-	-	-	-
Molybdenum	mg/L	D	0.0976 :	-	-	-	-	-
Nickel	mg/L	D	<0.0016 :	-	-	-	-	-
Potassium	mg/L	D	3.11 :	-	-	-	-	-
Selenium	mg/L	D	0.00037 J	-	-	-	-	-
Silver	mg/L	D	<0.0001 :	-	-	-	-	-
Sodium	mg/L	D	33. :	-	-	-	-	-
Thallium	mg/L	D	<0.0001 :	-	-	-	-	-
Vanadium	mg/L	D	0.0061 :	-	-	-	-	-
Zinc	mg/L	D	0.029 :	-	-	-	-	-

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID					
			LR-16 3/24/2004 LR-16-T02N-P1S	LR-16 3/25/2004 LR-16-T03N-PS	LR-16 3/25/2004 LR-16-T03N-P3S	LR-16 3/25/2004 LR-16-T03N-P2S	LR-16 3/25/2004 LR-16-T03N-P1S	LR-16 3/25/2004 LR-16-T02N-PS
Field Measurements								
DO	mg/L	T	-	-	7.4 :	7.13 :	7.36 :	-
EH	millivolts	T	182. :	-	219. :	215. :	213. :	-
pH	SU	T	8.18 :	-	7.9 :	7.95 :	8.06 :	-
Specific Conductance	mS/cm	T	0.345 :	-	0.36 :	0.38 :	0.355 :	-
Temperature	Celsius	T	10.87 :	-	12.1 :	12.2 :	9.71 :	-
General Chemistry								
Fluoride	mg/L	T	-	0.92 :	-	-	-	0.92 :
Sulfate	mg/L	T	-	93.6 :	-	-	-	95.4 :
Total Organic Carbon	mg/L	T	-	1.4 :	-	-	-	1.7 :

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID	
			LR-16 3/25/2004 LR-16-T01N-PS		LR-16 3/25/2004 LR-16-D03N-PS		LR-16 3/25/2004 LR-16-D02N-PS		LR-16 3/25/2004 LR-16-D01N-PS		LR-8A 10/6/2003 LR-8A-T00N-PS	LR-8A 10/6/2003 LR-8A-T00N-PD
			SWR		SWR		SWR		SWR		SWR	SWR
General Chemistry												
Fluoride	mg/L	T	0.89	:	-		-		-		0.77 :	0.71 :
Sulfate	mg/L	T	84.5	:	-		-		-		449. J	467. J
Total Organic Carbon	mg/L	T	1.9	:	-		-		-		5.3 :	7.4 :
Physical Properties												
Hardness	mg/L	D	-		125.	:	111.	:	116.	:	-	-
Metals												
Aluminum	mg/L	D	-		<0.0267	:	<0.0603	:	<0.0948	:	-	-
Antimony	mg/L	D	-		<0.0004	J	<0.0004	J	<0.0004	J	-	-
Arsenic	mg/L	D	-		0.0017	:	0.0018	:	0.0017	:	-	-
Barium	mg/L	D	-		0.0274	:	0.0298	:	0.0267	:	-	-
Beryllium	mg/L	D	-		<0.0002	:	<0.0002	J	<0.0002	J	-	-
Boron	mg/L	D	-		0.0479	:	0.0456	:	<0.0469	:	-	-
Cadmium	mg/L	D	-		<0.0002	:	<0.0002	:	<0.0002	:	-	-
Calcium	mg/L	D	-		33.4	:	29.6	:	30.8	:	-	-
Chromium	mg/L	D	-		<0.0032	J	<0.0027	J	<0.0008	J	-	-
Cobalt	mg/L	D	-		0.0191	:	0.0097	:	0.0154	:	-	-
Copper	mg/L	D	-		<0.0008	J	<0.0008	J	<0.0011	:	-	-
Iron	mg/L	D	-		<0.0407	J	<0.0222	J	<0.0418	:	-	-
Lead	mg/L	D	-		<0.0004	:	<0.0004	:	<0.0004	:	-	-
Magnesium	mg/L	D	-		10.	:	9.08	:	9.56	:	-	-
Manganese	mg/L	D	-		0.027	:	0.0147	:	0.0219	:	-	-
Molybdenum	mg/L	D	-		0.0972	:	0.0931	:	0.0928	:	-	-
Nickel	mg/L	D	-		0.0015	J	<0.0009	J	0.0025	:	-	-
Potassium	mg/L	D	-		3.46	:	3.18	:	3.3	:	-	-
Selenium	mg/L	D	-		<0.0007	:	<0.0007	:	<0.0007	:	-	-
Silver	mg/L	D	-		<0.0001	J	<0.0001	J	<0.0001	:	-	-
Sodium	mg/L	D	-		30.8	:	31.7	:	30.1	:	-	-
Thallium	mg/L	D	-		<0.0001	:	<0.0001	:	<0.0001	:	-	-
Vanadium	mg/L	D	-		0.0063	:	0.0064	:	0.0062	:	-	-
Zinc	mg/L	D	-		0.0288	:	<0.0109	:	0.0078	J	-	-

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID / Exposure Area					
			LR-8A 10/6/2003 LR-8A-T00N-P3S SWR	LR-8A 10/6/2003 LR-8A-T00N-P3D SWR	LR-8A 10/6/2003 LR-8A-T00N-P2S SWR	LR-8A 10/6/2003 LR-8A-T00N-P2D SWR	LR-8A 10/6/2003 LR-8A-T00N-P1S SWR	LR-8A 10/6/2003 LR-8A-T00N-P1D SWR
Field Measurements								
DO	mg/L	T	8.3 :	8.5 :	-	5.6 :	5.5 :	5.4 :
EH	millivolts	T	130. :	134. :	-	143. :	146. :	140. :
pH	SU	T	7.3 :	7.2 :	7.1 :	7.1 :	7.2 :	7.4 :
Specific Conductance	uS/cm	T	1125. :	1124. :	1137. :	1133. :	1147. :	1165. :
Temperature	Celsius	T	12. :	12.3 :	12.4 :	12. :	12.2 :	12.8 :

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID											
			LR-8A 10/6/2003 LR-8A-D00N-PS		LR-8A 10/6/2003 LR-8A-D00N-PD		LR-8A 10/7/2003 LR-8A-T01N-PS		LR-8A 10/7/2003 LR-8A-T01N-PD		LR-8A 10/7/2003 LR-8A-T01N-P3S		LR-8A 10/7/2003 LR-8A-T01N-P3D	
			SWR		SWR		SWR		SWR		SWR		SWR	
Field Measurements														
DO	mg/L	T	-		-		-		-		10.	:	10.6	:
EH	millivolts	T	-		-		-		-		162.	:	161.	:
pH	SU	T	-		-		-		-		7.1	:	7.1	:
Specific Conductance	uS/cm	T	-		-		-		-		1100.	:	1093.	:
Temperature	Celsius	T	-		-		-		-		12.1	:	12.3	:
General Chemistry														
Fluoride	mg/L	T	-		-		0.74	:	0.73	:	-		-	
Sulfate	mg/L	T	-		-		474.	J	460.	J	-		-	
Total Organic Carbon	mg/L	T	-		-		3.9	:	2.5	:	-		-	
Physical Properties														
Hardness	mg/L	D	615.	:	555.	:	-		-		-		-	
Metals														
Aluminum	mg/L	D	<0.0217	J	<0.0217	J	-		-		-		-	
Antimony	mg/L	D	<0.0005	J	<0.0005	:	-		-		-		-	
Arsenic	mg/L	D	0.00033	J	0.00028	J	-		-		-		-	
Barium	mg/L	D	0.0396	:	0.0361	:	-		-		-		-	
Beryllium	mg/L	D	<0.0004	:	<0.0004	:	-		-		-		-	
Boron	mg/L	D	0.0363	:	0.0318	:	-		-		-		-	
Cadmium	mg/L	D	<0.0002	J	<0.0002	J	-		-		-		-	
Calcium	mg/L	D	190.	:	172.	:	-		-		-		-	
Chromium	mg/L	D	<0.0011	:	<0.0011	:	-		-		-		-	
Cobalt	mg/L	D	<0.0029	:	<0.0029	:	-		-		-		-	
Copper	mg/L	D	<0.0017	:	<0.0017	:	-		-		-		-	
Iron	mg/L	D	<0.0349	:	<0.0278	:	-		-		-		-	
Lead	mg/L	D	<0.0002	:	<0.0002	:	-		-		-		-	
Magnesium	mg/L	D	34.1	:	30.1	:	-		-		-		-	
Manganese	mg/L	D	0.0046	:	0.0105	:	-		-		-		-	
Molybdenum	mg/L	D	0.569	:	0.491	:	-		-		-		-	
Nickel	mg/L	D	<0.0016	:	<0.0016	:	-		-		-		-	
Potassium	mg/L	D	2.69	J	2.31	J	-		-		-		-	
Selenium	mg/L	D	0.00048	J	0.00051	J	-		-		-		-	
Silver	mg/L	D	<0.0001	:	<0.0001	:	-		-		-		-	
Sodium	mg/L	D	61.5	:	54.3	:	-		-		-		-	

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction						
		LR-8A 10/6/2003 LR-8A-D00N-PS SWR		LR-8A 10/6/2003 LR-8A-D00N-PD SWR		LR-8A 10/7/2003 LR-8A-T01N-PS SWR	LR-8A 10/7/2003 LR-8A-T01N-PD SWR	LR-8A 10/7/2003 LR-8A-T01N-P3S SWR	LR-8A 10/7/2003 LR-8A-T01N-P3D SWR
Thallium	mg/L	D	<0.0001 :		<0.0001 :	-	-	-	-
Vanadium	mg/L	D	0.00088 :		0.00088 :	-	-	-	-
Zinc	mg/L	D	0.0518 :		0.113 :	-	-	-	-

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID	
			LR-8A 10/7/2003 LR-8A-T01N-P2S		LR-8A 10/7/2003 LR-8A-T01N-P2D		LR-8A 10/7/2003 LR-8A-T01N-P1S		LR-8A 10/7/2003 LR-8A-T01N-P1D		LR-8A 10/7/2003 LR-8A-D01N-PS		LR-8A 10/7/2003 LR-8A-D01N-PD	
			SWR		SWR		SWR		SWR		SWR		SWR	
Field Measurements														
DO	mg/L	T	11.8	:	8.8	:	9.2	:	7.9	:	-		-	
EH	millivolts	T	160.	:	156.	:	160.	:	161.	:	-		-	
pH	SU	T	7.1	:	7.1	:	7.2	:	7.2	:	-		-	
Specific Conductance	uS/cm	T	1082.	:	1100.	:	1100.	:	1110.	:	-		-	
Temperature	Celsius	T	11.8	:	12.1	:	12.	:	12.2	:	-		-	
Physical Properties														
Hardness	mg/L	D	-		-		-		-		599.	:	599.	:
Metals														
Aluminum	mg/L	D	-		-		-		-		<0.15	:	<0.0221	:
Antimony	mg/L	D	-		-		-		-		<0.0013	:	<0.00053	:
Arsenic	mg/L	D	-		-		-		-		0.00031	J	0.00043	J
Barium	mg/L	D	-		-		-		-		0.0383	:	0.0373	:
Beryllium	mg/L	D	-		-		-		-		0.00078	:	<0.0004	:
Boron	mg/L	D	-		-		-		-		0.0382	:	0.0353	:
Cadmium	mg/L	D	-		-		-		-		<0.0002	J	<0.0002	J
Calcium	mg/L	D	-		-		-		-		186.	:	186.	:
Chromium	mg/L	D	-		-		-		-		<0.0011	:	<0.0011	:
Cobalt	mg/L	D	-		-		-		-		<0.0029	:	<0.0029	:
Copper	mg/L	D	-		-		-		-		<0.0117	:	<0.0118	:
Iron	mg/L	D	-		-		-		-		<0.116	:	<0.0278	:
Lead	mg/L	D	-		-		-		-		<0.0002	:	<0.0002	:
Magnesium	mg/L	D	-		-		-		-		32.7	:	32.6	:
Manganese	mg/L	D	-		-		-		-		0.0057	:	0.0091	:
Molybdenum	mg/L	D	-		-		-		-		0.545	:	0.527	:
Nickel	mg/L	D	-		-		-		-		<0.0016	:	<0.0016	:
Potassium	mg/L	D	-		-		-		-		2.96	:	2.76	:
Selenium	mg/L	D	-		-		-		-		0.0006	J	0.00099	J
Silver	mg/L	D	-		-		-		-		<0.0001	:	<0.0001	:
Sodium	mg/L	D	-		-		-		-		59.7	:	59.2	:
Thallium	mg/L	D	-		-		-		-		<0.0001	:	<0.0001	:
Vanadium	mg/L	D	-		-		-		-		0.00081	:	0.00087	:
Zinc	mg/L	D	-		-		-		-		0.0432	:	0.0762	:

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	LR-8A 10/8/2003 LR-8A-T02N-PS SWR	LR-8A 10/8/2003 LR-8A-T02N-PD SWR	LR-8A 10/8/2003 LR-8A-T02N-P3S SWR	LR-8A 10/8/2003 LR-8A-T02N-P3D SWR	LR-8A 10/8/2003 LR-8A-T02N-P2S SWR	LR-8A 10/8/2003 LR-8A-T02N-P2D SWR
Field Measurements								
DO	mg/L	T	-	-	8.2 :	5.5 :	6.9 :	6.8 :
EH	millivolts	T	-	-	243. :	244. :	245. :	246. :
pH	SU	T	-	-	6.9 :	6.8 :	6.9 :	6.9 :
Specific Conductance	uS/cm	T	-	-	1081. :	1072. :	1070. :	1080. :
Temperature	Celsius	T	-	-	11.4 :	11.5 :	11.1 :	11.4 :
General Chemistry								
Fluoride	mg/L	T	0.67 :	0.71 :	-	-	-	-
Sulfate	mg/L	T	373. J	547. J	-	-	-	-
Total Organic Carbon	mg/L	T	2.1 :	1.7 :	-	-	-	-

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID											
			LR-8A 10/8/2003 LR-8A-T02N-P1S		LR-8A 10/8/2003 LR-8A-T02N-P1D		LR-8A 10/8/2003 LR-8A-D02N-PS		LR-8A 10/8/2003 LR-8A-D02N-PD		LR-8A 10/9/2003 LR-8A-T03N-PS		LR-8A 10/9/2003 LR-8A-T03N-PD	
			SWR		SWR		SWR		SWR		SWR		SWR	
Field Measurements														
DO	mg/L	T	6.5	:	6.6	:	-		-		-		-	
EH	millivolts	T	251.	:	253.	:	-		-		-		-	
pH	SU	T	6.9	:	6.9	:	-		-		-		-	
Specific Conductance	uS/cm	T	1080.	:	1100.	:	-		-		-		-	
Temperature	Celsius	T	1.3	:	11.8	:	-		-		-		-	
General Chemistry														
Fluoride	mg/L	T	-		-		-		-		0.72	:	0.72	:
Sulfate	mg/L	T	-		-		-		-		517.	J	467.	J
Total Organic Carbon	mg/L	T	-		-		-		-		2.3	:	2.4	:
Physical Properties														
Hardness	mg/L	D	-		-		427.	:	568.	:	-		-	
Metals														
Aluminum	mg/L	D	-		-		<0.0307	:	<0.0307	:	-		-	
Antimony	mg/L	D	-		-		<0.0005	:	<0.0005	:	-		-	
Arsenic	mg/L	D	-		-		0.00028	J	0.00031	J	-		-	
Barium	mg/L	D	-		-		0.0449	:	0.0358	:	-		-	
Beryllium	mg/L	D	-		-		<0.0003	:	<0.0003	:	-		-	
Boron	mg/L	D	-		-		0.0573	:	0.036	:	-		-	
Cadmium	mg/L	D	-		-		<0.0002	J	<0.0002	J	-		-	
Calcium	mg/L	D	-		-		132.	:	176.	:	-		-	
Chromium	mg/L	D	-		-		0.0013	:	<0.0013	:	-		-	
Cobalt	mg/L	D	-		-		<0.0031	:	<0.0031	:	-		-	
Copper	mg/L	D	-		-		0.002	:	<0.0017	:	-		-	
Iron	mg/L	D	-		-		<0.03	:	<0.03	:	-		-	
Lead	mg/L	D	-		-		<0.0002	:	<0.0002	:	-		-	
Magnesium	mg/L	D	-		-		23.5	:	31.2	:	-		-	
Manganese	mg/L	D	-		-		0.0031	:	0.0064	:	-		-	
Molybdenum	mg/L	D	-		-		0.37	:	0.534	:	-		-	
Nickel	mg/L	D	-		-		0.0019	:	0.0016	:	-		-	
Potassium	mg/L	D	-		-		<3.13	:	<2.92	:	-		-	
Selenium	mg/L	D	-		-		0.00056	J	0.00058	J	-		-	
Silver	mg/L	D	-		-		<0.0001	:	<0.0001	:	-		-	
Sodium	mg/L	D	-		-		46.2	:	57.4	:	-		-	

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction						
		Site ID	LR-8A	LR-8A	LR-8A	LR-8A	LR-8A	LR-8A
		Sample Date	10/8/2003	10/8/2003	10/8/2003	10/8/2003	10/9/2003	10/9/2003
		Sample ID	LR-8A-T02N-P1S	LR-8A-T02N-P1D	LR-8A-D02N-PS	LR-8A-D02N-PD	LR-8A-T03N-PS	LR-8A-T03N-PD
		Exposure Area	SWR	SWR	SWR	SWR	SWR	SWR
Thallium	mg/L	D	-	-	<0.0001 :	<0.0001 :	-	-
Vanadium	mg/L	D	-	-	0.00067 :	0.0009 :	-	-
Zinc	mg/L	D	-	-	0.0274 :	0.067 :	-	-

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R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID					
			LR-8A 10/9/2003 LR-8A-T03N-P3S	LR-8A 10/9/2003 LR-8A-T03N-P3D	LR-8A 10/9/2003 LR-8A-T03N-P2S	LR-8A 10/9/2003 LR-8A-T03N-P2D	LR-8A 10/9/2003 LR-8A-T03N-P1S	LR-8A 10/9/2003 LR-8A-T03N-P1D
			SWR	SWR	SWR	SWR	SWR	SWR
Field Measurements								
DO	mg/L	T	5.21 :	5.28 :	4.3 :	4.52 :	4.53 :	3.8 :
EH	millivolts	T	209. :	212. :	213. :	218. :	227. :	233. :
pH	SU	T	6.8 :	6.7 :	6.7 :	6.6 :	6.4 :	6.3 :
Specific Conductance	uS/cm	T	935. :	933. :	923. :	938. :	934. :	952. :
Temperature	Celsius	T	10.6 :	11. :	10.25 :	10.9 :	10.26 :	11.28 :

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID: LR-8A Sample Date: 10/9/2003 Sample ID: LR-8A-D03N-PS SWR	Site ID: LR-8A Sample Date: 10/9/2003 Sample ID: LR-8A-D03N-PD SWR	Site ID: LR-8A Sample Date: 10/10/2003 Sample ID: LR-8A-T04N-PS SWR	Site ID: LR-8A Sample Date: 10/10/2003 Sample ID: LR-8A-T04N-PD SWR	Site ID: LR-8A Sample Date: 10/10/2003 Sample ID: LR-8A-T04N-P3S SWR	Site ID: LR-8A Sample Date: 10/10/2003 Sample ID: LR-8A-T04N-P3D SWR
Field Measurements								
DO	mg/L	T	-	-	-	-	3.16 :	3.32 :
EH	millivolts	T	-	-	-	-	196.9 :	199.7 :
pH	SU	T	-	-	-	-	6.8 :	6.8 :
Specific Conductance	uS/cm	T	-	-	-	-	935. :	926. :
Temperature	Celsius	T	-	-	-	-	12.3 :	12.4 :
General Chemistry								
Fluoride	mg/L	T	-	-	0.72 :	0.75 :	-	-
Sulfate	mg/L	T	-	-	477. J	457. J	-	-
Total Organic Carbon	mg/L	T	-	-	2. :	1.9 J	-	-
Physical Properties								
Hardness	mg/L	D	561. :	550. :	-	-	-	-
Metals								
Aluminum	mg/L	D	<0.0307 :	<0.0307 :	-	-	-	-
Antimony	mg/L	D	<0.0005 :	<0.0005 :	-	-	-	-
Arsenic	mg/L	D	0.00038 J	0.00033 J	-	-	-	-
Barium	mg/L	D	0.0356 :	0.037 :	-	-	-	-
Beryllium	mg/L	D	<0.0003 :	<0.0003 :	-	-	-	-
Boron	mg/L	D	<0.0332 :	0.035 :	-	-	-	-
Cadmium	mg/L	D	<0.0002 J	<0.0002 J	-	-	-	-
Calcium	mg/L	D	174. :	172. :	-	-	-	-
Chromium	mg/L	D	<0.0013 :	<0.0013 :	-	-	-	-
Cobalt	mg/L	D	0.0086 :	0.0073 :	-	-	-	-
Copper	mg/L	D	0.0019 :	0.0018 :	-	-	-	-
Iron	mg/L	D	<0.03 :	<0.03 :	-	-	-	-
Lead	mg/L	D	<0.0002 :	<0.0002 :	-	-	-	-
Magnesium	mg/L	D	30.4 :	29.6 :	-	-	-	-
Manganese	mg/L	D	0.0118 :	0.0124 :	-	-	-	-
Molybdenum	mg/L	D	0.548 :	0.531 :	-	-	-	-
Nickel	mg/L	D	0.0022 :	0.0026 :	-	-	-	-
Potassium	mg/L	D	<2.08 :	<0.749 :	-	-	-	-
Selenium	mg/L	D	0.00089 J	0.00064 J	-	-	-	-
Silver	mg/L	D	<0.0001 :	<0.0001 :	-	-	-	-
Sodium	mg/L	D	56.2 :	54.6 :	-	-	-	-

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction											
		LR-8A 10/9/2003 LR-8A-D03N-PS SWR		LR-8A 10/9/2003 LR-8A-D03N-PD SWR		LR-8A 10/10/2003 LR-8A-T04N-PS SWR		LR-8A 10/10/2003 LR-8A-T04N-PD SWR		LR-8A 10/10/2003 LR-8A-T04N-P3S SWR		LR-8A 10/10/2003 LR-8A-T04N-P3D SWR	
Thallium	mg/L	D	<0.0001 :		<0.0001 :		-		-		-		-
Vanadium	mg/L	D	0.00092 :		0.00087 :		-		-		-		-
Zinc	mg/L	D	0.0404 :		0.0673 :		-		-		-		-

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID	
			LR-8A 10/10/2003 LR-8A-T04N-P2S		LR-8A 10/10/2003 LR-8A-T04N-P2D		LR-8A 10/10/2003 LR-8A-T04N-P1S		LR-8A 10/10/2003 LR-8A-T04N-P1D		LR-8A 10/10/2003 LR-8A-D04N-PS	LR-8A 10/10/2003 LR-8A-D04N-PD
			SWR		SWR		SWR		SWR		SWR	SWR
Field Measurements												
DO	mg/L	T	3.19	:	3.94	:	3.42	:	3.45	:	-	-
EH	millivolts	T	202.5	:	202.	:	200.3	:	225.	:	-	-
pH	SU	T	6.8	:	6.83	:	6.81	:	6.76	:	-	-
Specific Conductance	uS/cm	T	927.	:	931.	:	945.	:	944.	:	-	-
Temperature	Celsius	T	12.2	:	12.2	:	12.8	:	12.7	:	-	-
Physical Properties												
Hardness	mg/L	D	-		-		-		-		552. :	597. :
Metals												
Aluminum	mg/L	D	-		-		-		-		<0.0307 :	<0.0307 :
Antimony	mg/L	D	-		-		-		-		<0.0005 :	<0.0005 :
Arsenic	mg/L	D	-		-		-		-		0.0003 J	0.00027 J
Barium	mg/L	D	-		-		-		-		0.0366 :	0.0382 :
Beryllium	mg/L	D	-		-		-		-		<0.00065 :	<0.00046 :
Boron	mg/L	D	-		-		-		-		0.0285 :	0.0306 J
Cadmium	mg/L	D	-		-		-		-		<0.0002 J	<0.0002 J
Calcium	mg/L	D	-		-		-		-		170. :	184. :
Chromium	mg/L	D	-		-		-		-		0.0014 J	<0.0013 J
Cobalt	mg/L	D	-		-		-		-		0.0046 :	<0.0031 :
Copper	mg/L	D	-		-		-		-		0.0052 :	<0.0017 :
Iron	mg/L	D	-		-		-		-		<0.03 :	<0.03 J
Lead	mg/L	D	-		-		-		-		0.00027 :	<0.0002 :
Magnesium	mg/L	D	-		-		-		-		31. :	33.4 :
Manganese	mg/L	D	-		-		-		-		0.0065 :	0.0088 :
Molybdenum	mg/L	D	-		-		-		-		0.542 :	0.568 :
Nickel	mg/L	D	-		-		-		-		<0.0016 :	0.0017 :
Potassium	mg/L	D	-		-		-		-		2.36 :	2.52 :
Selenium	mg/L	D	-		-		-		-		0.00055 J	0.00065 J
Silver	mg/L	D	-		-		-		-		<0.0001 :	<0.0001 :
Sodium	mg/L	D	-		-		-		-		57.8 :	62.6 :
Thallium	mg/L	D	-		-		-		-		<0.0001 :	<0.0001 :
Vanadium	mg/L	D	-		-		-		-		0.00077 :	0.00082 :
Zinc	mg/L	D	-		-		-		-		0.0464 :	0.0666 :

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID / Exposure Area					
			LR-8A 3/23/2004 LR-8A-T01N-P3S SWR	LR-8A 3/23/2004 LR-8A-T01N-P2S SWR	LR-8A 3/23/2004 LR-8A-T01N-P1S SWR	LR-8A 3/24/2004 LR-8A-T02N-P3S SWR	LR-8A 3/24/2004 LR-8A-T02N-P2S SWR	LR-8A 3/24/2004 LR-8A-T02N-P1S SWR
Field Measurements								
DO	mg/L	T	5.4 :	5.3 :	5.7 :	-	-	-
EH	millivolts	T	284. :	287. :	283. :	207. :	205. :	209. :
pH	SU	T	7. :	7.1 :	7.3 :	7.04 :	7.33 :	7.4 :
Specific Conductance	mS/cm	T	1.21 :	1.19 :	1.14 :	1.23 :	1.23 :	1.21 :
Temperature	Celsius	T	8.1 :	7.3 :	7.5 :	8.26 :	7.86 :	8.4 :

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID / Exposure Area					
			LR-8A 3/25/2004 LR-8A-T03N-PS SWR	LR-8A 3/25/2004 LR-8A-T03N-P3S SWR	LR-8A 3/25/2004 LR-8A-T03N-P2S SWR	LR-8A 3/25/2004 LR-8A-T03N-P1S SWR	LR-8A 3/25/2004 LR-8A-T02N-PS SWR	LR-8A 3/25/2004 LR-8A-T01N-PS SWR
Field Measurements								
DO	mg/L	T	-	7.34 :	7.49 :	7.1 :	-	-
EH	millivolts	T	-	240. :	241. :	238. :	-	-
pH	SU	T	-	7.03 :	7.08 :	7.33 :	-	-
Specific Conductance	mS/cm	T	-	1.308 :	1.286 :	1.26 :	-	-
Temperature	Celsius	T	-	7.8 :	7.2 :	7.6 :	-	-
General Chemistry								
Fluoride	mg/L	T	0.66 :	-	-	-	0.7 :	0.71 :
Sulfate	mg/L	T	672. :	-	-	-	632. :	663. :
Total Organic Carbon	mg/L	T	2.8 :	-	-	-	2. :	3.4 :

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R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	LR-8A 3/25/2004 LR-8A-D03N-PS SWR		LR-8A 3/25/2004 LR-8A-D02N-PS SWR		LR-8A 3/25/2004 LR-8A-D01N-PS SWR		RR-11B2 3/23/2004 RR-11B2-T01N-P3S SWR		RR-11B2 3/23/2004 RR-11B2-T01N-P2S SWR		RR-11B2 3/23/2004 RR-11B2-T01N-P1S SWR	
Field Measurements														
DO	mg/L	T	-		-		-		10.7	:	10.6	:	11.4	:
EH	millivolts	T	-		-		-		162.	:	162.	:	146.	:
pH	SU	T	-		-		-		6.85	:	6.92	:	7.16	:
Specific Conductance	mS/cm	T	-		-		-		0.335	:	0.354	:	0.337	:
Temperature	Celsius	T	-		-		-		5.72	:	5.54	:	5.98	:
Physical Properties														
Hardness	mg/L	D	744.	:	701.	:	791.	:	-		-		-	
Metals														
Aluminum	mg/L	D	<0.0182	:	<0.06	:	<0.0528	:	-		-		-	
Antimony	mg/L	D	<0.0004	J	<0.0004	J	<0.0004	J	-		-		-	
Arsenic	mg/L	D	0.00022	:	0.00025	:	0.00039	:	-		-		-	
Barium	mg/L	D	0.0439	:	0.0496	:	0.0469	:	-		-		-	
Beryllium	mg/L	D	<0.0002	:	<0.0002	J	<0.0002	J	-		-		-	
Boron	mg/L	D	0.0287	:	0.0272	:	<0.0288	:	-		-		-	
Cadmium	mg/L	D	<0.0002	:	<0.0002	:	<0.0002	:	-		-		-	
Calcium	mg/L	D	231.	:	217.	:	245.	:	-		-		-	
Chromium	mg/L	D	<0.0016	J	<0.0019	:	<0.0008	J	-		-		-	
Cobalt	mg/L	D	0.0182	:	0.0151	:	0.0147	:	-		-		-	
Copper	mg/L	D	0.001	J	0.0017	J	<0.0021	:	-		-		-	
Iron	mg/L	D	<0.0443	J	<0.0402	:	<0.0562	:	-		-		-	
Lead	mg/L	D	<0.0004	:	<0.0004	:	<0.0004	:	-		-		-	
Magnesium	mg/L	D	40.6	:	38.6	:	43.8	:	-		-		-	
Manganese	mg/L	D	0.026	:	0.0245	:	0.0207	:	-		-		-	
Molybdenum	mg/L	D	0.484	:	0.47	:	0.499	:	-		-		-	
Nickel	mg/L	D	0.0043	:	0.0042	:	0.005	:	-		-		-	
Potassium	mg/L	D	2.48	:	2.3	:	2.66	:	-		-		-	
Selenium	mg/L	D	0.00092	:	0.00093	:	0.00099	:	-		-		-	
Silver	mg/L	D	<0.0001	J	<0.0001	J	<0.0001	:	-		-		-	
Sodium	mg/L	D	62.8	:	65.8	:	65.2	:	-		-		-	
Thallium	mg/L	D	<0.0001	:	<0.0001	:	<0.0001	:	-		-		-	
Vanadium	mg/L	D	<0.0013	:	<0.0012	:	0.00093	:	-		-		-	
Zinc	mg/L	D	0.0239	:	0.0219	:	0.0215	:	-		-		-	

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID					
			RR-11B2 3/24/2004 RR-11B2-T02N-P3S	RR-11B2 3/24/2004 RR-11B2-T02N-P2S	RR-11B2 3/24/2004 RR-11B2-T02N-P1S	RR-11B2 3/25/2004 RR-11B2-T03N-PS	RR-11B2 3/25/2004 RR-11B2-T03N-P3S	RR-11B2 3/25/2004 RR-11B2-T03N-P2S
			SWR	SWR	SWR	SWR	SWR	SWR
Field Measurements								
EH	millivolts	T	175. :	167. :	158. :	-	189. :	187. :
pH	SU	T	6.55 :	6.71 :	7.2 :	-	6.6 :	6.65 :
Specific Conductance	mS/cm	T	0.36 :	0.362 :	0.355 :	-	0.376 :	0.384 :
Temperature	Celsius	T	5.48 :	5.3 :	5.5 :	-	5.4 :	5.73 :
General Chemistry								
Fluoride	mg/L	T	-	-	-	2.8 :	-	-
Sulfate	mg/L	T	-	-	-	171. :	-	-
Total Organic Carbon	mg/L	T	-	-	-	3.7 :	-	-

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T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID					
			RR-11B2 3/25/2004 RR-11B2-T03N-P1S	RR-11B2 3/25/2004 RR-11B2-T02N-PS	RR-11B2 3/25/2004 RR-11B2-T01N-PS	RR-11B2 3/25/2004 RR-11B2-D03N-PS	RR-11B2 3/25/2004 RR-11B2-D02N-PS	RR-11B2 3/25/2004 RR-11B2-D01N-PS
			SWR	SWR	SWR	SWR	SWR	SWR
Field Measurements								
EH	millivolts	T	178. :	-	-	-	-	-
pH	SU	T	6.9 :	-	-	-	-	-
Specific Conductance	mS/cm	T	0.378 :	-	-	-	-	-
Temperature	Celsius	T	6.23 :	-	-	-	-	-
General Chemistry								
Fluoride	mg/L	T	-	2.6 :	2.3 :	-	-	-
Sulfate	mg/L	T	-	176. :	164. :	-	-	-
Total Organic Carbon	mg/L	T	-	3. :	3.5 :	-	-	-
Physical Properties								
Hardness	mg/L	D	-	-	-	196. :	208. :	212. :
Metals								
Aluminum	mg/L	D	-	-	-	0.521 :	0.477 :	<0.482 :
Antimony	mg/L	D	-	-	-	<0.0004 J	<0.0004 J	<0.0004 J
Arsenic	mg/L	D	-	-	-	<0.0002 :	<0.0002 :	<0.0002 :
Barium	mg/L	D	-	-	-	0.0386 :	0.0371 :	0.0361 :
Beryllium	mg/L	D	-	-	-	<0.0002 J	0.00045 J	<0.0002 J
Boron	mg/L	D	-	-	-	<0.007 :	<0.0073 :	<0.0107 :
Cadmium	mg/L	D	-	-	-	0.00027 :	0.00029 :	0.0003 :
Calcium	mg/L	D	-	-	-	53.1 :	56.5 :	57.5 :
Chromium	mg/L	D	-	-	-	<0.0014 J	<0.00088 :	<0.0008 J
Cobalt	mg/L	D	-	-	-	0.0132 :	0.0107 :	0.016 :
Copper	mg/L	D	-	-	-	0.0064 :	0.0023 J	<0.0035 :
Iron	mg/L	D	-	-	-	<0.0312 J	<0.0375 :	<0.205 :
Lead	mg/L	D	-	-	-	0.0011 :	<0.0004 :	<0.0004 :
Magnesium	mg/L	D	-	-	-	15.4 :	16.2 :	16.6 :
Manganese	mg/L	D	-	-	-	0.021 :	0.0196 :	0.034 :
Molybdenum	mg/L	D	-	-	-	0.0047 :	<0.0053 :	<0.008 :
Nickel	mg/L	D	-	-	-	0.0405 :	0.0399 :	0.0385 :
Potassium	mg/L	D	-	-	-	0.859 J	1.23 :	1.35 :
Selenium	mg/L	D	-	-	-	<0.0007 :	<0.0007 :	<0.0007 :
Silver	mg/L	D	-	-	-	<0.0001 J	<0.0001 J	<0.0001 :
Sodium	mg/L	D	-	-	-	7.07 :	6.99 :	6.94 :
Thallium	mg/L	D	-	-	-	<0.0001 :	<0.0001 :	<0.0001 :

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction						
		Site ID	RR-11B2	RR-11B2	RR-11B2	RR-11B2	RR-11B2	RR-11B2
		Sample Date	3/25/2004	3/25/2004	3/25/2004	3/25/2004	3/25/2004	3/25/2004
		Sample ID	RR-11B2-T03N-P1S	RR-11B2-T02N-PS	RR-11B2-T01N-PS	RR-11B2-D03N-PS	RR-11B2-D02N-PS	RR-11B2-D01N-PS
		Exposure Area	SWR	SWR	SWR	SWR	SWR	SWR
Vanadium	mg/L	D	-	-	-	<0.00053 :	<0.00061 :	0.00022 :
Zinc	mg/L	D	-	-	-	0.239 :	0.253 :	0.234 :

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID: RR-11B2 Sample Date: 9/27/2004 Sample ID: RR-11B2-T00N-PS SWR		Site ID: RR-11B2 Sample Date: 9/27/2004 Sample ID: RR-11B2-T00N-P3S SWR		Site ID: RR-11B2 Sample Date: 9/27/2004 Sample ID: RR-11B2-T00N-P2S SWR		Site ID: RR-11B2 Sample Date: 9/27/2004 Sample ID: RR-11B2-T00N-P1S SWR		Site ID: RR-11B2 Sample Date: 9/27/2004 Sample ID: RR-11B2-D00N-PS SWR		Site ID: RR-11B2 Sample Date: 9/28/2004 Sample ID: RR-11B2-T01N-PS SWR	
Field Measurements														
DO	mg/L	T	-		8.2	:	8.6	:	8.3	:	-		-	
pH	SU	T	-		6.3	:	6.5	:	7.2	:	-		-	
Specific Conductance	mS/cm	T	-		0.434	:	0.31	:	0.418	:	-		-	
Temperature	Celsius	T	-		10.2	:	10.1	:	9.2	:	-		-	
General Chemistry														
Bicarbonate (as CaCO3)	mg/L	T	37.6	:	-		-		-		-		38.9	:
Carbonate (as CaCO3)	mg/L	T	<1.	:	-		-		-		-		<1.	:
Dissolved Organic Carbon	mg/L	D	-		-		-		-		1.6	:	-	
Fluoride	mg/L	T	2.5	:	-		-		-		-		2.5	:
Hydroxide (as CaCO3)	mg/L	T	<1.	:	-		-		-		-		<1.	:
Sulfate	mg/L	T	193.	:	-		-		-		-		181.	:
Total Alkalinity	mg/L	T	37.6	:	-		-		-		-		38.9	:
Total Organic Carbon	mg/L	T	1.1	:	-		-		-		-		1.4	:
Physical Properties														
Hardness	mg/L	D	-		-		-		-		239.	:	-	
Metals														
Aluminum	mg/L	D	-		-		-		-		0.425	:	-	
Antimony	mg/L	D	-		-		-		-		<0.0014	:	-	
Arsenic	mg/L	D	-		-		-		-		<0.0001	:	-	
Barium	mg/L	D	-		-		-		-		0.0397	:	-	
Beryllium	mg/L	D	-		-		-		-		0.00066	:	-	
Boron	mg/L	D	-		-		-		-		<0.0069	:	-	
Cadmium	mg/L	D	-		-		-		-		0.0003	:	-	
Calcium	mg/L	D	-		-		-		-		66.	:	-	
Chromium	mg/L	D	-		-		-		-		<0.0011	:	-	
Cobalt	mg/L	D	-		-		-		-		0.0078	:	-	
Copper	mg/L	D	-		-		-		-		0.0014	:	-	
Iron	mg/L	D	-		-		-		-		0.0432	:	-	
Lead	mg/L	D	-		-		-		-		<0.0001	:	-	
Magnesium	mg/L	D	-		-		-		-		17.9	:	-	
Manganese	mg/L	D	-		-		-		-		0.0118	:	-	
Molybdenum	mg/L	D	-		-		-		-		0.0052	:	-	
Nickel	mg/L	D	-		-		-		-		0.0319	:	-	

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T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-11B2 9/27/2004 RR-11B2-T00N-PS SWR	RR-11B2 9/27/2004 RR-11B2-T00N-P3S SWR	RR-11B2 9/27/2004 RR-11B2-T00N-P2S SWR	RR-11B2 9/27/2004 RR-11B2-T00N-P1S SWR	RR-11B2 9/27/2004 RR-11B2-D00N-PS SWR	RR-11B2 9/28/2004 RR-11B2-T01N-PS SWR
Potassium	mg/L	D	-	-	-	-	1.55 :	-
Selenium	mg/L	D	-	-	-	-	<0.0003 :	-
Silver	mg/L	D	-	-	-	-	<0.0001 :	-
Sodium	mg/L	D	-	-	-	-	6.67 :	-
Thallium	mg/L	D	-	-	-	-	<0.0001 :	-
Vanadium	mg/L	D	-	-	-	-	<0.0001 :	-
Zinc	mg/L	D	-	-	-	-	0.218 :	-

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID					
			RR-11B2 9/28/2004 RR-11B2-T01N-P3S	RR-11B2 9/28/2004 RR-11B2-T01N-P2S	RR-11B2 9/28/2004 RR-11B2-T01N-P1S	RR-11B2 9/28/2004 RR-11B2-D01N-PS	RR-11B2 9/29/2004 RR-11B2-T02N-PS	RR-11B2 9/29/2004 RR-11B2-T02N-P3S
			SWR	SWR	SWR	SWR	SWR	SWR
Field Measurements								
DO	mg/L	T	7. :	6.7 :	9.5 :	-	-	6.2 :
pH	SU	T	6.5 :	6.9 :	7. :	-	-	6.5 :
Specific Conductance	mS/cm	T	0.355 :	0.351 :	0.352 :	-	-	0.327 :
Temperature	Celsius	T	11.1 :	11.1 :	11. :	-	-	8.5 :
General Chemistry								
Bicarbonate (as CaCO3)	mg/L	T	-	-	-	-	38.7 :	-
Carbonate (as CaCO3)	mg/L	T	-	-	-	-	<1. :	-
Dissolved Organic Carbon	mg/L	D	-	-	-	2.2 :	-	-
Fluoride	mg/L	T	-	-	-	-	2.5 :	-
Hydroxide (as CaCO3)	mg/L	T	-	-	-	-	<1. :	-
Sulfate	mg/L	T	-	-	-	-	160. :	-
Total Alkalinity	mg/L	T	-	-	-	-	38.7 :	-
Total Organic Carbon	mg/L	T	-	-	-	-	1.2 :	-
Physical Properties								
Hardness	mg/L	D	-	-	-	204. :	-	-
Metals								
Aluminum	mg/L	D	-	-	-	0.395 :	-	-
Antimony	mg/L	D	-	-	-	<0.0011 :	-	-
Arsenic	mg/L	D	-	-	-	<0.0001 J	-	-
Barium	mg/L	D	-	-	-	0.0385 :	-	-
Beryllium	mg/L	D	-	-	-	0.00084 :	-	-
Boron	mg/L	D	-	-	-	<0.0069 :	-	-
Cadmium	mg/L	D	-	-	-	0.0002 J	-	-
Calcium	mg/L	D	-	-	-	56.3 :	-	-
Chromium	mg/L	D	-	-	-	<0.0009 :	-	-
Cobalt	mg/L	D	-	-	-	0.0094 :	-	-
Copper	mg/L	D	-	-	-	0.00054 J	-	-
Iron	mg/L	D	-	-	-	<0.0355 :	-	-
Lead	mg/L	D	-	-	-	<0.0001 :	-	-
Magnesium	mg/L	D	-	-	-	15.5 :	-	-
Manganese	mg/L	D	-	-	-	0.0192 :	-	-
Molybdenum	mg/L	D	-	-	-	0.005 :	-	-
Nickel	mg/L	D	-	-	-	0.0329 :	-	-

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-11B2 9/28/2004 RR-11B2-T01N-P3S SWR	RR-11B2 9/28/2004 RR-11B2-T01N-P2S SWR	RR-11B2 9/28/2004 RR-11B2-T01N-P1S SWR	RR-11B2 9/28/2004 RR-11B2-D01N-PS SWR	RR-11B2 9/29/2004 RR-11B2-T02N-PS SWR	RR-11B2 9/29/2004 RR-11B2-T02N-P3S SWR
Potassium	mg/L	D	-	-	-	1.15 :	-	-
Selenium	mg/L	D	-	-	-	<0.0003 :	-	-
Silver	mg/L	D	-	-	-	<0.0001 J	-	-
Sodium	mg/L	D	-	-	-	5.55 :	-	-
Thallium	mg/L	D	-	-	-	<0.0001 :	-	-
Vanadium	mg/L	D	-	-	-	<0.0001 J	-	-
Zinc	mg/L	D	-	-	-	0.207 :	-	-

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-11B2 9/29/2004 RR-11B2-T02N-P2S SWR	RR-11B2 9/29/2004 RR-11B2-T02N-P1S SWR	RR-11B2 9/29/2004 RR-11B2-D02N-PS SWR	RR-11B2 9/30/2004 RR-11B2-T03N-PS SWR	RR-11B2 9/30/2004 RR-11B2-T03N-P3S SWR	RR-11B2 9/30/2004 RR-11B2-T03N-P2S SWR
Field Measurements								
DO	mg/L	T	6.5 :	6.4 :	-	-	6.3 :	6.4 :
pH	SU	T	6.7 :	6.9 :	-	-	6.7 :	6.8 :
Specific Conductance	mS/cm	T	0.326 :	0.325 :	-	-	0.342 :	0.338 :
Temperature	Celsius	T	8.4 :	8.5 :	-	-	9.9 :	9.5 :
General Chemistry								
Bicarbonate (as CaCO3)	mg/L	T	-	-	-	39.1 J	-	-
Carbonate (as CaCO3)	mg/L	T	-	-	-	<1. J	-	-
Dissolved Organic Carbon	mg/L	D	-	-	1.2 :	-	-	-
Fluoride	mg/L	T	-	-	-	2.5 J	-	-
Hydroxide (as CaCO3)	mg/L	T	-	-	-	<1. J	-	-
Sulfate	mg/L	T	-	-	-	167. J	-	-
Total Alkalinity	mg/L	T	-	-	-	39.1 J	-	-
Total Organic Carbon	mg/L	T	-	-	-	3.8 J	-	-
Physical Properties								
Hardness	mg/L	D	-	-	218. :	-	-	-
Metals								
Aluminum	mg/L	D	-	-	0.46 :	-	-	-
Antimony	mg/L	D	-	-	<0.00057 :	-	-	-
Arsenic	mg/L	D	-	-	<0.0001 :	-	-	-
Barium	mg/L	D	-	-	0.0413 :	-	-	-
Beryllium	mg/L	D	-	-	<0.00061 :	-	-	-
Boron	mg/L	D	-	-	<0.0069 :	-	-	-
Cadmium	mg/L	D	-	-	0.00022 :	-	-	-
Calcium	mg/L	D	-	-	60.3 :	-	-	-
Chromium	mg/L	D	-	-	<0.0011 :	-	-	-
Cobalt	mg/L	D	-	-	<0.0031 :	-	-	-
Copper	mg/L	D	-	-	<0.0003 J	-	-	-
Iron	mg/L	D	-	-	<0.0525 :	-	-	-
Lead	mg/L	D	-	-	<0.0001 :	-	-	-
Magnesium	mg/L	D	-	-	16.5 :	-	-	-
Manganese	mg/L	D	-	-	0.0088 :	-	-	-
Molybdenum	mg/L	D	-	-	0.0045 :	-	-	-
Nickel	mg/L	D	-	-	0.0277 :	-	-	-

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-11B2 9/29/2004 RR-11B2-T02N-P2S SWR	RR-11B2 9/29/2004 RR-11B2-T02N-P1S SWR	RR-11B2 9/29/2004 RR-11B2-D02N-PS SWR	RR-11B2 9/30/2004 RR-11B2-T03N-PS SWR	RR-11B2 9/30/2004 RR-11B2-T03N-P3S SWR	RR-11B2 9/30/2004 RR-11B2-T03N-P2S SWR
Potassium	mg/L	D	-	-	1.37 :	-	-	-
Selenium	mg/L	D	-	-	<0.0003 :	-	-	-
Silver	mg/L	D	-	-	<0.0001 J	-	-	-
Sodium	mg/L	D	-	-	6.41 :	-	-	-
Thallium	mg/L	D	-	-	<0.0001 :	-	-	-
Vanadium	mg/L	D	-	-	<0.0001 :	-	-	-
Zinc	mg/L	D	-	-	0.202 :	-	-	-

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID: RR-11B2 Sample Date: 9/30/2004 Sample ID: RR-11B2-T03N-P1S SWR		Site ID: RR-11B2 Sample Date: 9/30/2004 Sample ID: RR-11B2-D03N-PS SWR		Site ID: RR-11B2 Sample Date: 10/1/2004 Sample ID: RR-11B2-T04N-PS SWR		Site ID: RR-11B2 Sample Date: 10/1/2004 Sample ID: RR-11B2-T04N-P3S SWR		Site ID: RR-11B2 Sample Date: 10/1/2004 Sample ID: RR-11B2-T04N-P2S SWR		Site ID: RR-11B2 Sample Date: 10/1/2004 Sample ID: RR-11B2-T04N-P1S SWR	
Field Measurements														
DO	mg/L	T	5.8	:	-		-		6.3	:	6.2	:	6.6	:
pH	SU	T	7.	:	-		-		6.8	:	7.	:	7.2	:
Specific Conductance	mS/cm	T	0.344	:	-		-		0.301	:	0.301	:	0.295	:
Temperature	Celsius	T	10.5	:	-		-		7.8	:	8.	:	7.4	:
General Chemistry														
Bicarbonate (as CaCO3)	mg/L	T	-		-		39.	J	-		-		-	
Carbonate (as CaCO3)	mg/L	T	-		-		<1.	J	-		-		-	
Dissolved Organic Carbon	mg/L	D	-		2.1	J	-		-		-		-	
Fluoride	mg/L	T	-		-		2.5	J	-		-		-	
Hydroxide (as CaCO3)	mg/L	T	-		-		<1.	J	-		-		-	
Sulfate	mg/L	T	-		-		162.	J	-		-		-	
Total Alkalinity	mg/L	T	-		-		39.	J	-		-		-	
Total Organic Carbon	mg/L	T	-		-		1.8	J	-		-		-	
Physical Properties														
Hardness	mg/L	D	-		221.	J	-		-		-		-	
Metals														
Aluminum	mg/L	D	-		0.429	:	-		-		-		-	
Antimony	mg/L	D	-		<0.00052	:	-		-		-		-	
Arsenic	mg/L	D	-		<0.00013	:	-		-		-		-	
Barium	mg/L	D	-		0.0388	:	-		-		-		-	
Beryllium	mg/L	D	-		0.00067	:	-		-		-		-	
Boron	mg/L	D	-		<0.0069	:	-		-		-		-	
Cadmium	mg/L	D	-		0.00043	:	-		-		-		-	
Calcium	mg/L	D	-		60.9	:	-		-		-		-	
Chromium	mg/L	D	-		<0.0011	:	-		-		-		-	
Cobalt	mg/L	D	-		<0.0031	:	-		-		-		-	
Copper	mg/L	D	-		<0.003	:	-		-		-		-	
Iron	mg/L	D	-		<0.0355	:	-		-		-		-	
Lead	mg/L	D	-		<0.0001	:	-		-		-		-	
Magnesium	mg/L	D	-		16.6	:	-		-		-		-	
Manganese	mg/L	D	-		0.0033	:	-		-		-		-	
Molybdenum	mg/L	D	-		<0.006	:	-		-		-		-	
Nickel	mg/L	D	-		0.0335	:	-		-		-		-	

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-11B2 9/30/2004 RR-11B2-T03N-P1S SWR	RR-11B2 9/30/2004 RR-11B2-D03N-PS SWR	RR-11B2 10/1/2004 RR-11B2-T04N-PS SWR	RR-11B2 10/1/2004 RR-11B2-T04N-P3S SWR	RR-11B2 10/1/2004 RR-11B2-T04N-P2S SWR	RR-11B2 10/1/2004 RR-11B2-T04N-P1S SWR
Potassium	mg/L	D	-	1.53 :	-	-	-	-
Selenium	mg/L	D	-	0.00043 :	-	-	-	-
Silver	mg/L	D	-	<0.0001 :	-	-	-	-
Sodium	mg/L	D	-	5.8 :	-	-	-	-
Thallium	mg/L	D	-	<0.0001 :	-	-	-	-
Vanadium	mg/L	D	-	<0.00025 :	-	-	-	-
Zinc	mg/L	D	-	0.215 :	-	-	-	-

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

		Site ID	RR-11B2	RR-11B3	RR-11B3	RR-11B3	RR-11B3	RR-11B3
		Sample Date	10/1/2004	3/23/2004	3/23/2004	3/23/2004	3/24/2004	3/24/2004
		Sample ID	RR-11B2-D04N-PS	RR-11B3-T01N-P3S	RR-11B3-T01N-P2S	RR-11B3-T01N-P1S	RR-11B3-T02N-P3S	RR-11B3-T02N-P2S
		Exposure Area	SWR	SWR	SWR	SWR	SWR	SWR
Parameter	**Units**	**Fraction**						
Field Measurements								
DO	mg/L	T	-	7.7 :	7.9 :	8.2 :	-	-
EH	millivolts	T	-	168. :	169. :	169. :	136. :	150. :
pH	SU	T	-	6.8 :	6.8 :	6.9 :	6.7 :	6.71 :
Specific Conductance	mS/cm	T	-	0.466 :	0.613 :	0.646 :	0.493 :	0.647 :
Temperature	Celsius	T	-	7.7 :	7.4 :	8. :	6.73 :	7.08 :
General Chemistry								
Dissolved Organic Carbon	mg/L	D	4.4 J	-	-	-	-	-
Physical Properties								
Hardness	mg/L	D	212. J	-	-	-	-	-
Metals								
Aluminum	mg/L	D	0.414 :	-	-	-	-	-
Antimony	mg/L	D	<0.00043 :	-	-	-	-	-
Arsenic	mg/L	D	<0.00017 :	-	-	-	-	-
Barium	mg/L	D	0.037 :	-	-	-	-	-
Beryllium	mg/L	D	0.0007 :	-	-	-	-	-
Boron	mg/L	D	<0.0069 :	-	-	-	-	-
Cadmium	mg/L	D	0.00036 :	-	-	-	-	-
Calcium	mg/L	D	58.4 :	-	-	-	-	-
Chromium	mg/L	D	<0.0011 :	-	-	-	-	-
Cobalt	mg/L	D	<0.0031 :	-	-	-	-	-
Copper	mg/L	D	<0.0027 :	-	-	-	-	-
Iron	mg/L	D	<0.0355 :	-	-	-	-	-
Lead	mg/L	D	<0.0001 :	-	-	-	-	-
Magnesium	mg/L	D	16. :	-	-	-	-	-
Manganese	mg/L	D	0.0015 :	-	-	-	-	-
Molybdenum	mg/L	D	<0.0061 :	-	-	-	-	-
Nickel	mg/L	D	0.0334 :	-	-	-	-	-
Potassium	mg/L	D	1.44 :	-	-	-	-	-
Selenium	mg/L	D	<0.0003 :	-	-	-	-	-
Silver	mg/L	D	<0.0001 :	-	-	-	-	-
Sodium	mg/L	D	5.65 :	-	-	-	-	-
Thallium	mg/L	D	<0.0001 :	-	-	-	-	-
Vanadium	mg/L	D	<0.00026 :	-	-	-	-	-

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID					
			RR-11B2 10/1/2004 RR-11B2-D04N-PS	RR-11B3 3/23/2004 RR-11B3-T01N-P3S	RR-11B3 3/23/2004 RR-11B3-T01N-P2S	RR-11B3 3/23/2004 RR-11B3-T01N-P1S	RR-11B3 3/24/2004 RR-11B3-T02N-P3S	RR-11B3 3/24/2004 RR-11B3-T02N-P2S
			SWR	SWR	SWR	SWR	SWR	SWR
Zinc	mg/L	D	0.208 :	-	-	-	-	-

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T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID / Exposure Area					
			RR-11B3 3/24/2004 RR-11B3-T02N-P1S SWR	RR-11B3 3/25/2004 RR-11B3-T03N-PS SWR	RR-11B3 3/25/2004 RR-11B3-T03N-P3S SWR	RR-11B3 3/25/2004 RR-11B3-T03N-P2S SWR	RR-11B3 3/25/2004 RR-11B3-T03N-P1S SWR	RR-11B3 3/25/2004 RR-11B3-T02N-PS SWR
Field Measurements								
DO	mg/L	T	-	-	6.8 :	6.8 :	7.61 :	-
EH	millivolts	T	149. :	-	161. :	170. :	172. :	-
pH	SU	T	6.87 :	-	6.7 :	6.68 :	6.43 :	-
Specific Conductance	mS/cm	T	0.661 :	-	0.544 :	0.645 :	0.675 :	-
Temperature	Celsius	T	7.58 :	-	6.7 :	6.95 :	7.59 :	-
General Chemistry								
Fluoride	mg/L	T	-	1.3 :	-	-	-	1.2 :
Sulfate	mg/L	T	-	308. :	-	-	-	296. :
Total Organic Carbon	mg/L	T	-	4.4 :	-	-	-	4.3 :

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area	Fraction	RR-11B3 3/25/2004 RR-11B3-T01N-PS SWR	RR-11B3 3/25/2004 RR-11B3-D03N-PS SWR	RR-11B3 3/25/2004 RR-11B3-D02N-PS SWR	RR-11B3 3/25/2004 RR-11B3-D01N-PS SWR	RR-11B3 9/27/2004 RR-11B3-T02N-P3S SWR	RR-11B3 9/27/2004 RR-11B3-T00N-PS SWR
Field Measurements									
pH	SU		T	-	-	-	-	6.6 :	-
Specific Conductance	mS/cm		T	-	-	-	-	0.712 :	-
Temperature	Celsius		T	-	-	-	-	8.7 :	-
General Chemistry									
Bicarbonate (as CaCO3)	mg/L		T	-	-	-	-	-	53.8 :
Carbonate (as CaCO3)	mg/L		T	-	-	-	-	-	<1. :
Fluoride	mg/L		T	1.4 :	-	-	-	-	1.1 :
Hydroxide (as CaCO3)	mg/L		T	-	-	-	-	-	<1. :
Sulfate	mg/L		T	283. :	-	-	-	-	353. :
Total Alkalinity	mg/L		T	-	-	-	-	-	53.8 :
Total Organic Carbon	mg/L		T	3. :	-	-	-	-	1.8 :
Physical Properties									
Hardness	mg/L		D	-	346. :	342. :	363. :	-	-
Metals									
Aluminum	mg/L		D	-	<0.115 :	<0.2 :	<0.105 :	-	-
Antimony	mg/L		D	-	<0.0004 J	<0.0004 J	<0.0004 J	-	-
Arsenic	mg/L		D	-	<0.0002 :	<0.0002 :	<0.0002 :	-	-
Barium	mg/L		D	-	0.0246 :	0.0248 :	0.0232 :	-	-
Beryllium	mg/L		D	-	<0.0002 J	<0.0002 J	<0.0002 J	-	-
Boron	mg/L		D	-	<0.0077 :	<0.0059 :	<0.0107 :	-	-
Cadmium	mg/L		D	-	0.00032 :	0.00041 :	0.00045 :	-	-
Calcium	mg/L		D	-	107. :	105. :	112. :	-	-
Chromium	mg/L		D	-	<0.0008 J	<0.0015 :	<0.0008 J	-	-
Cobalt	mg/L		D	-	0.016 :	0.0117 :	0.0218 :	-	-
Copper	mg/L		D	-	0.00081 J	0.0013 J	<0.002 :	-	-
Iron	mg/L		D	-	<0.0247 J	<0.134 :	<0.0796 :	-	-
Lead	mg/L		D	-	<0.0004 :	<0.0004 :	<0.0004 :	-	-
Magnesium	mg/L		D	-	19.3 :	19.1 :	20.3 :	-	-
Manganese	mg/L		D	-	0.0385 :	0.0433 :	0.0712 :	-	-
Molybdenum	mg/L		D	-	0.0042 :	<0.0057 :	<0.0066 :	-	-
Nickel	mg/L		D	-	0.0135 :	0.0145 :	0.0147 :	-	-
Potassium	mg/L		D	-	1.47 :	1.45 :	1.86 :	-	-
Selenium	mg/L		D	-	0.00084 :	0.00094 :	<0.0007 :	-	-

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction						
		RR-11B3 3/25/2004 RR-11B3-T01N-PS SWR	RR-11B3 3/25/2004 RR-11B3-D03N-PS SWR	RR-11B3 3/25/2004 RR-11B3-D02N-PS SWR	RR-11B3 3/25/2004 RR-11B3-D01N-PS SWR	RR-11B3 9/27/2004 RR-11B3-T02N-P3S SWR	RR-11B3 9/27/2004 RR-11B3-T00N-PS SWR
Silver	mg/L	D -	<0.0001 J	<0.0001 J	<0.0001 :	-	-
Sodium	mg/L	D -	8.65 :	8.69 :	8.42 :	-	-
Thallium	mg/L	D -	<0.0001 :	<0.0001 :	0.0001 :	-	-
Vanadium	mg/L	D -	<0.00058 :	<0.00064 :	0.00027 :	-	-
Zinc	mg/L	D -	0.061 :	0.0613 :	0.058 :	-	-

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T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-11B3 9/27/2004 RR-11B3-T00N-P3S SWR	RR-11B3 9/27/2004 RR-11B3-T00N-P2S SWR	RR-11B3 9/27/2004 RR-11B3-T00N-P1S SWR	RR-11B3 9/27/2004 RR-11B3-D00N-PS SWR	RR-11B3 9/28/2004 RR-11B3-T01N-PS SWR	RR-11B3 9/28/2004 RR-11B3-T01N-P3S SWR
Field Measurements								
DO	mg/L	T	8.5 :	8.7 :	7. :	-	-	6.4 :
pH	SU	T	6.6 :	6.4 :	6.2 :	-	-	6.4 :
Specific Conductance	mS/cm	T	0.712 :	0.794 :	0.781 :	-	-	0.584 :
Temperature	Celsius	T	8.7 :	9. :	9.8 :	-	-	9.2 :
General Chemistry								
Bicarbonate (as CaCO3)	mg/L	T	-	-	-	-	60.4 :	-
Carbonate (as CaCO3)	mg/L	T	-	-	-	-	<1. :	-
Dissolved Organic Carbon	mg/L	D	-	-	-	2.2 :	-	-
Fluoride	mg/L	T	-	-	-	-	1.1 :	-
Hydroxide (as CaCO3)	mg/L	T	-	-	-	-	<1. :	-
Sulfate	mg/L	T	-	-	-	-	173. :	-
Total Alkalinity	mg/L	T	-	-	-	-	60.4 :	-
Total Organic Carbon	mg/L	T	-	-	-	-	1.7 :	-
Physical Properties								
Hardness	mg/L	D	-	-	-	473. :	-	-
Metals								
Aluminum	mg/L	D	-	-	-	0.076 :	-	-
Antimony	mg/L	D	-	-	-	<0.0014 :	-	-
Arsenic	mg/L	D	-	-	-	<0.0001 :	-	-
Barium	mg/L	D	-	-	-	0.0251 :	-	-
Beryllium	mg/L	D	-	-	-	<0.0003 :	-	-
Boron	mg/L	D	-	-	-	<0.0069 :	-	-
Cadmium	mg/L	D	-	-	-	0.00053 :	-	-
Calcium	mg/L	D	-	-	-	145. :	-	-
Chromium	mg/L	D	-	-	-	<0.0011 :	-	-
Cobalt	mg/L	D	-	-	-	0.0081 :	-	-
Copper	mg/L	D	-	-	-	0.0013 :	-	-
Iron	mg/L	D	-	-	-	0.0603 :	-	-
Lead	mg/L	D	-	-	-	<0.0001 :	-	-
Magnesium	mg/L	D	-	-	-	26.8 :	-	-
Manganese	mg/L	D	-	-	-	0.0495 :	-	-
Molybdenum	mg/L	D	-	-	-	0.0046 :	-	-
Nickel	mg/L	D	-	-	-	0.0139 :	-	-

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T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-11B3 9/27/2004 RR-11B3-T00N-P3S SWR	RR-11B3 9/27/2004 RR-11B3-T00N-P2S SWR	RR-11B3 9/27/2004 RR-11B3-T00N-P1S SWR	RR-11B3 9/27/2004 RR-11B3-D00N-PS SWR	RR-11B3 9/28/2004 RR-11B3-T01N-PS SWR	RR-11B3 9/28/2004 RR-11B3-T01N-P3S SWR
Potassium	mg/L	D	-	-	-	2.2 :	-	-
Selenium	mg/L	D	-	-	-	0.00086 :	-	-
Silver	mg/L	D	-	-	-	<0.0001 :	-	-
Sodium	mg/L	D	-	-	-	10.5 :	-	-
Thallium	mg/L	D	-	-	-	<0.0001 :	-	-
Vanadium	mg/L	D	-	-	-	0.00015 :	-	-
Zinc	mg/L	D	-	-	-	0.0637 :	-	-

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID	
			RR-11B3 9/28/2004 RR-11B3-T01N-P2S		RR-11B3 9/28/2004 RR-11B3-T01N-P1S		RR-11B3 9/28/2004 RR-11B3-D01N-PS		RR-11B3 9/29/2004 RR-11B3-T02N-PS		RR-11B3 9/29/2004 RR-11B3-T02N-P3S		RR-11B3 9/29/2004 RR-11B3-T02N-P2S	
			SWR		SWR		SWR		SWR		SWR		SWR	
Field Measurements														
DO	mg/L	T	5.4	:	5.5	:	-		-		5.6	:	5.	:
pH	SU	T	6.4	:	6.5	:	-		-		6.6	:	6.6	:
Specific Conductance	mS/cm	T	0.648	:	0.635	:	-		-		0.577	:	0.634	:
Temperature	Celsius	T	10.3	:	10.9	:	-		-		8.3	:	8.6	:
General Chemistry														
Bicarbonate (as CaCO3)	mg/L	T	-		-		-		53.6	:	-		-	
Carbonate (as CaCO3)	mg/L	T	-		-		-		<1.	:	-		-	
Dissolved Organic Carbon	mg/L	D	-		-		1.5	:	-		-		-	
Fluoride	mg/L	T	-		-		-		1.1	:	-		-	
Hydroxide (as CaCO3)	mg/L	T	-		-		-		<1.	:	-		-	
Sulfate	mg/L	T	-		-		-		379.	:	-		-	
Total Alkalinity	mg/L	T	-		-		-		53.6	:	-		-	
Total Organic Carbon	mg/L	T	-		-		-		1.5	:	-		-	
Physical Properties														
Hardness	mg/L	D	-		-		365.	:	-		-		-	
Metals														
Aluminum	mg/L	D	-		-		0.0475	:	-		-		-	
Antimony	mg/L	D	-		-		<0.0003	:	-		-		-	
Arsenic	mg/L	D	-		-		<0.0001	J	-		-		-	
Barium	mg/L	D	-		-		0.0237	:	-		-		-	
Beryllium	mg/L	D	-		-		0.00042	:	-		-		-	
Boron	mg/L	D	-		-		<0.0069	:	-		-		-	
Cadmium	mg/L	D	-		-		0.00039	J	-		-		-	
Calcium	mg/L	D	-		-		112.	:	-		-		-	
Chromium	mg/L	D	-		-		<0.0009	:	-		-		-	
Cobalt	mg/L	D	-		-		<0.0031	:	-		-		-	
Copper	mg/L	D	-		-		0.00071	J	-		-		-	
Iron	mg/L	D	-		-		<0.0355	:	-		-		-	
Lead	mg/L	D	-		-		<0.0001	:	-		-		-	
Magnesium	mg/L	D	-		-		21.	:	-		-		-	
Manganese	mg/L	D	-		-		0.0262	:	-		-		-	
Molybdenum	mg/L	D	-		-		0.004	:	-		-		-	
Nickel	mg/L	D	-		-		0.0112	:	-		-		-	

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T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-11B3 9/28/2004 RR-11B3-T01N-P2S SWR	RR-11B3 9/28/2004 RR-11B3-T01N-P1S SWR	RR-11B3 9/28/2004 RR-11B3-D01N-PS SWR	RR-11B3 9/29/2004 RR-11B3-T02N-PS SWR	RR-11B3 9/29/2004 RR-11B3-T02N-P3S SWR	RR-11B3 9/29/2004 RR-11B3-T02N-P2S SWR
Potassium	mg/L	D	-	-	1.8 :	-	-	-
Selenium	mg/L	D	-	-	0.00051 :	-	-	-
Silver	mg/L	D	-	-	<0.0001 J	-	-	-
Sodium	mg/L	D	-	-	8.23 :	-	-	-
Thallium	mg/L	D	-	-	<0.0001 :	-	-	-
Vanadium	mg/L	D	-	-	<0.0001 J	-	-	-
Zinc	mg/L	D	-	-	0.0556 :	-	-	-

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID											
			RR-11B3 9/29/2004 RR-11B3-T02N-P1S		RR-11B3 9/29/2004 RR-11B3-D02N-PS		RR-11B3 9/30/2004 RR-11B3-T03N-PS		RR-11B3 9/30/2004 RR-11B3-T03N-P3S		RR-11B3 9/30/2004 RR-11B3-T03N-P2S		RR-11B3 9/30/2004 RR-11B3-T03N-P1S	
			SWR		SWR		SWR		SWR		SWR		SWR	
Field Measurements														
DO	mg/L	T	5.2	:	-		-		5.8	:	5.1	:	6.	:
pH	SU	T	6.7	:	-		-		6.7	:	6.7	:	6.7	:
Specific Conductance	mS/cm	T	0.604	:	-		-		0.589	:	0.65	:	0.621	:
Temperature	Celsius	T	8.9	:	-		-		8.9	:	9.3	:	9.7	:
General Chemistry														
Bicarbonate (as CaCO3)	mg/L	T	-		-		67.	J	-		-		-	
Carbonate (as CaCO3)	mg/L	T	-		-		<1.	J	-		-		-	
Dissolved Organic Carbon	mg/L	D	-		2.	:	-		-		-		-	
Fluoride	mg/L	T	-		-		0.55	J	-		-		-	
Hydroxide (as CaCO3)	mg/L	T	-		-		<1.	J	-		-		-	
Sulfate	mg/L	T	-		-		69.6	J	-		-		-	
Total Alkalinity	mg/L	T	-		-		67.	J	-		-		-	
Total Organic Carbon	mg/L	T	-		-		1.3	J	-		-		-	
Physical Properties														
Hardness	mg/L	D	-		457.	:	-		-		-		-	
Metals														
Aluminum	mg/L	D	-		0.146	:	-		-		-		-	
Antimony	mg/L	D	-		<0.00051	:	-		-		-		-	
Arsenic	mg/L	D	-		<0.0001	:	-		-		-		-	
Barium	mg/L	D	-		0.0279	:	-		-		-		-	
Beryllium	mg/L	D	-		<0.0003	:	-		-		-		-	
Boron	mg/L	D	-		<0.0069	:	-		-		-		-	
Cadmium	mg/L	D	-		0.00041	:	-		-		-		-	
Calcium	mg/L	D	-		139.	:	-		-		-		-	
Chromium	mg/L	D	-		<0.0011	:	-		-		-		-	
Cobalt	mg/L	D	-		<0.0031	:	-		-		-		-	
Copper	mg/L	D	-		<0.0003	J	-		-		-		-	
Iron	mg/L	D	-		<0.0482	:	-		-		-		-	
Lead	mg/L	D	-		<0.0001	:	-		-		-		-	
Magnesium	mg/L	D	-		26.7	:	-		-		-		-	
Manganese	mg/L	D	-		0.0231	:	-		-		-		-	
Molybdenum	mg/L	D	-		<0.0036	:	-		-		-		-	
Nickel	mg/L	D	-		0.012	:	-		-		-		-	

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T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-11B3 9/29/2004 RR-11B3-T02N-P1S SWR	RR-11B3 9/29/2004 RR-11B3-D02N-PS SWR	RR-11B3 9/30/2004 RR-11B3-T03N-PS SWR	RR-11B3 9/30/2004 RR-11B3-T03N-P3S SWR	RR-11B3 9/30/2004 RR-11B3-T03N-P2S SWR	RR-11B3 9/30/2004 RR-11B3-T03N-P1S SWR
Potassium	mg/L	D	-	1.96 :	-	-	-	-
Selenium	mg/L	D	-	0.00031 :	-	-	-	-
Silver	mg/L	D	-	<0.0001 J	-	-	-	-
Sodium	mg/L	D	-	10.4 :	-	-	-	-
Thallium	mg/L	D	-	<0.0001 :	-	-	-	-
Vanadium	mg/L	D	-	0.00013 :	-	-	-	-
Zinc	mg/L	D	-	0.0643 :	-	-	-	-

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID: RR-11B3 Sample Date: 9/30/2004 Sample ID: RR-11B3-D03N-PS SWR	Site ID: RR-11B3 Sample Date: 10/1/2004 Sample ID: RR-11B3-T04N-PS SWR	Site ID: RR-11B3 Sample Date: 10/1/2004 Sample ID: RR-11B3-T04N-P3S SWR	Site ID: RR-11B3 Sample Date: 10/1/2004 Sample ID: RR-11B3-T04N-P2S SWR	Site ID: RR-11B3 Sample Date: 10/1/2004 Sample ID: RR-11B3-T04N-P1S SWR	Site ID: RR-11B3 Sample Date: 10/1/2004 Sample ID: RR-11B3-D04N-PS SWR
Field Measurements								
DO	mg/L	T	-	-	5.2 :	4.8 :	6. :	-
pH	SU	T	-	-	6.8 :	6.9 :	7.1 :	-
Specific Conductance	mS/cm	T	-	-	0.545 :	0.598 :	0.571 :	-
Temperature	Celsius	T	-	-	8.3 :	8.1 :	8.3 :	-
General Chemistry								
Bicarbonate (as CaCO3)	mg/L	T	-	53.2 J	-	-	-	-
Carbonate (as CaCO3)	mg/L	T	-	<1. J	-	-	-	-
Dissolved Organic Carbon	mg/L	D	<1. J	-	-	-	-	<1. J
Fluoride	mg/L	T	-	1.1 J	-	-	-	-
Hydroxide (as CaCO3)	mg/L	T	-	<1. J	-	-	-	-
Sulfate	mg/L	T	-	317. J	-	-	-	-
Total Alkalinity	mg/L	T	-	53.2 J	-	-	-	-
Total Organic Carbon	mg/L	T	-	<1. J	-	-	-	-
Physical Properties								
Hardness	mg/L	D	131. J	-	-	-	-	447. J
Metals								
Aluminum	mg/L	D	<0.0341 :	-	-	-	-	<0.128 :
Antimony	mg/L	D	<0.00042 :	-	-	-	-	<0.00051 :
Arsenic	mg/L	D	<0.00019 :	-	-	-	-	<0.0001 :
Barium	mg/L	D	0.0318 :	-	-	-	-	0.0254 :
Beryllium	mg/L	D	<0.0003 :	-	-	-	-	<0.0003 :
Boron	mg/L	D	<0.0069 :	-	-	-	-	<0.0069 :
Cadmium	mg/L	D	0.0002 :	-	-	-	-	0.00053 :
Calcium	mg/L	D	39.8 :	-	-	-	-	136. :
Chromium	mg/L	D	<0.0011 :	-	-	-	-	<0.0011 :
Cobalt	mg/L	D	<0.0031 :	-	-	-	-	<0.0031 :
Copper	mg/L	D	<0.0036 :	-	-	-	-	<0.0024 :
Iron	mg/L	D	<0.0355 :	-	-	-	-	<0.0355 :
Lead	mg/L	D	<0.0001 :	-	-	-	-	<0.0001 :
Magnesium	mg/L	D	7.72 :	-	-	-	-	25.9 :
Manganese	mg/L	D	0.0334 :	-	-	-	-	0.025 :
Molybdenum	mg/L	D	<0.0041 :	-	-	-	-	<0.0049 :
Nickel	mg/L	D	0.0093 :	-	-	-	-	0.0143 :

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-11B3 9/30/2004 RR-11B3-D03N-PS SWR		RR-11B3 10/1/2004 RR-11B3-T04N-PS SWR		RR-11B3 10/1/2004 RR-11B3-T04N-P3S SWR		RR-11B3 10/1/2004 RR-11B3-T04N-P2S SWR		RR-11B3 10/1/2004 RR-11B3-T04N-P1S SWR		RR-11B3 10/1/2004 RR-11B3-D04N-PS SWR	
Potassium	mg/L	D	1.26	:	-		-		-		-		2.25	:
Selenium	mg/L	D	0.00038	:	-		-		-		-		0.001	:
Silver	mg/L	D	<0.0001	:	-		-		-		-		<0.0001	:
Sodium	mg/L	D	4.2	:	-		-		-		-		9.21	:
Thallium	mg/L	D	<0.0001	:	-		-		-		-		<0.0001	:
Vanadium	mg/L	D	<0.00026	:	-		-		-		-		<0.00033	:
Zinc	mg/L	D	0.0362	:	-		-		-		-		0.0669	:

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID					
			RR-13A 3/23/2004 RR-13A-T01N-P3S	RR-13A 3/23/2004 RR-13A-T01N-P2S	RR-13A 3/23/2004 RR-13A-T01N-P1S	RR-13A 3/24/2004 RR-13A-T02N-P3S	RR-13A 3/24/2004 RR-13A-T02N-P2S	RR-13A 3/24/2004 RR-13A-T02N-P1S
			SWR	SWR	SWR	SWR	SWR	SWR
Field Measurements								
DO	mg/L	T	10.36 :	7.66 :	9.79 :	-	-	-
EH	millivolts	T	169. :	196. :	240. :	187. :	196. :	150. :
pH	SU	T	4.78 :	4.75 :	4.81 :	4.62 :	4.44 :	5.51 :
Specific Conductance	mS/cm	T	0.76 :	0.762 :	0.589 :	0.826 :	1.044 :	0.436 :
Temperature	Celsius	T	7.53 :	7.51 :	7.73 :	7.91 :	7.8 :	8.51 :

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID											
			RR-13A 3/25/2004 RR-13A-T03N-PS		RR-13A 3/25/2004 RR-13A-T03N-P3S		RR-13A 3/25/2004 RR-13A-T03N-P2S		RR-13A 3/25/2004 RR-13A-T03N-P1S		RR-13A 3/25/2004 RR-13A-T02N-PS		RR-13A 3/25/2004 RR-13A-T01N-PS	
			SWR		SWR		SWR		SWR		SWR		SWR	
Field Measurements														
DO	mg/L	T	-		7.54	:	6.94	:	8.27	:	-		-	
EH	millivolts	T	-		205.	:	233.	:	230.	:	-		-	
pH	SU	T	-		4.63	:	4.48	:	5.08	:	-		-	
Specific Conductance	mS/cm	T	-		0.952	:	1.088	:	5.08	:	-		-	
Temperature	Celsius	T	-		7.45	:	7.43	:	7.55	:	-		-	
General Chemistry														
Fluoride	mg/L	T	3.3	J	-		-		-		3.3	J	3.4	J
Sulfate	mg/L	T	519.	:	-		-		-		527.	:	435.	:
Total Organic Carbon	mg/L	T	9.4	:	-		-		-		6.9	:	41.4	:

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-13A 3/25/2004 RR-13A-D03N-PS SWR	RR-13A 3/25/2004 RR-13A-D02N-PS SWR	RR-13A 3/25/2004 RR-13A-D01N-PS SWR	RR-13A 9/27/2004 RR-13A-T02N-P3S SWR	RR-13A 9/27/2004 RR-13A-T00N-PS SWR	RR-13A 9/27/2004 RR-13A-T00N-P3S SWR
Field Measurements								
DO	mg/L	T	-	-	-	-	-	5.4 :
pH	SU	T	-	-	-	4. :	-	4. :
Specific Conductance	mS/cm	T	-	-	-	1.63 :	-	1.63 :
Temperature	Celsius	T	-	-	-	10.4 :	-	10.4 :
General Chemistry								
Bicarbonate (as CaCO3)	mg/L	T	-	-	-	-	<1. :	-
Carbonate (as CaCO3)	mg/L	T	-	-	-	-	<1. :	-
Fluoride	mg/L	T	-	-	-	-	8.1 :	-
Hydroxide (as CaCO3)	mg/L	T	-	-	-	-	<1. :	-
Sulfate	mg/L	T	-	-	-	-	899. :	-
Total Alkalinity	mg/L	T	-	-	-	-	<1. :	-
Total Organic Carbon	mg/L	T	-	-	-	-	2. :	-
Physical Properties								
Hardness	mg/L	D	372. :	342. :	332. :	-	-	-
Metals								
Aluminum	mg/L	D	33.8 :	32.4 :	24.4 :	-	-	-
Antimony	mg/L	D	<0.0004 J	<0.0004 J	<0.0004 J	-	-	-
Arsenic	mg/L	D	<0.0002 :	<0.0002 :	<0.0002 :	-	-	-
Barium	mg/L	D	0.0283 :	0.0266 :	0.0302 :	-	-	-
Beryllium	mg/L	D	0.0057 :	0.0051 :	0.0041 :	-	-	-
Boron	mg/L	D	<0.0085 :	<0.0075 :	<0.0048 :	-	-	-
Cadmium	mg/L	D	0.0056 :	0.0053 :	0.0051 :	-	-	-
Calcium	mg/L	D	104. :	95.8 :	93.3 :	-	-	-
Chromium	mg/L	D	<0.0021 J	<0.0016 :	<0.0008 J	-	-	-
Cobalt	mg/L	D	0.0814 :	0.0766 :	0.0712 :	-	-	-
Copper	mg/L	D	0.338 :	0.319 :	0.275 :	-	-	-
Iron	mg/L	D	11.7 :	10.7 :	9.59 :	-	-	-
Lead	mg/L	D	0.00057 :	0.00042 :	0.0012 :	-	-	-
Magnesium	mg/L	D	27.2 :	25. :	24. :	-	-	-
Manganese	mg/L	D	5.09 :	4.66 :	4.04 :	-	-	-
Molybdenum	mg/L	D	<0.001 :	<0.0015 :	<0.0037 :	-	-	-
Nickel	mg/L	D	0.145 :	0.14 :	0.12 :	-	-	-
Potassium	mg/L	D	1.63 :	1.36 :	1.78 :	-	-	-

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Fraction	RR-13A 3/25/2004 RR-13A-D03N-PS SWR		RR-13A 3/25/2004 RR-13A-D02N-PS SWR		RR-13A 3/25/2004 RR-13A-D01N-PS SWR		RR-13A 9/27/2004 RR-13A-T02N-P3S SWR	RR-13A 9/27/2004 RR-13A-T00N-PS SWR	RR-13A 9/27/2004 RR-13A-T00N-P3S SWR
Selenium	mg/L	D	0.0013	:	0.0013	:	0.0011	:	-	-	-
Silver	mg/L	D	<0.0001	J	<0.0001	J	<0.0001	:	-	-	-
Sodium	mg/L	D	10.9	:	10.6	:	9.75	:	-	-	-
Thallium	mg/L	D	<0.0001	:	<0.0001	:	0.00013	:	-	-	-
Vanadium	mg/L	D	<0.00059	:	<0.00059	:	0.00026	:	-	-	-
Zinc	mg/L	D	1.3	:	1.18	:	1.06	:	-	-	-

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID											
			RR-13A 9/27/2004 RR-13A-T00N-P2S		RR-13A 9/27/2004 RR-13A-T00N-P1S		RR-13A 9/27/2004 RR-13A-D00N-PS		RR-13A 9/28/2004 RR-13A-T01N-PS		RR-13A 9/28/2004 RR-13A-T01N-P3S		RR-13A 9/28/2004 RR-13A-T01N-P2S	
			SWR		SWR		SWR		SWR		SWR		SWR	
Field Measurements														
DO	mg/L	T	7.2	:	9.4	:	-		-		5.6	:	4.9	:
pH	SU	T	4.1	:	5.1	:	-		-		3.8	:	3.9	:
Specific Conductance	mS/cm	T	1.43	:	0.956	:	-		-		1.341	:	1.174	:
Temperature	Celsius	T	9.1	:	9.9	:	-		-		11.3	:	10.8	:
General Chemistry														
Bicarbonate (as CaCO3)	mg/L	T	-		-		-		<1.	:	-		-	
Carbonate (as CaCO3)	mg/L	T	-		-		-		<1.	:	-		-	
Dissolved Organic Carbon	mg/L	D	-		-		1.5	:	-		-		-	
Fluoride	mg/L	T	-		-		-		7.1	:	-		-	
Hydroxide (as CaCO3)	mg/L	T	-		-		-		<1.	:	-		-	
Sulfate	mg/L	T	-		-		-		393.	:	-		-	
Total Alkalinity	mg/L	T	-		-		-		<1.	:	-		-	
Total Organic Carbon	mg/L	T	-		-		-		3.4	:	-		-	
Physical Properties														
Hardness	mg/L	D	-		-		500.	:	-		-		-	
Metals														
Aluminum	mg/L	D	-		-		56.2	:	-		-		-	
Antimony	mg/L	D	-		-		<0.0012	:	-		-		-	
Arsenic	mg/L	D	-		-		<0.0001	:	-		-		-	
Barium	mg/L	D	-		-		0.0151	:	-		-		-	
Beryllium	mg/L	D	-		-		0.0095	:	-		-		-	
Boron	mg/L	D	-		-		<0.0069	:	-		-		-	
Cadmium	mg/L	D	-		-		0.0082	J	-		-		-	
Calcium	mg/L	D	-		-		139.	:	-		-		-	
Chromium	mg/L	D	-		-		0.0014	:	-		-		-	
Cobalt	mg/L	D	-		-		0.0987	:	-		-		-	
Copper	mg/L	D	-		-		0.543	:	-		-		-	
Iron	mg/L	D	-		-		17.5	:	-		-		-	
Lead	mg/L	D	-		-		0.00086	:	-		-		-	
Magnesium	mg/L	D	-		-		37.5	:	-		-		-	
Manganese	mg/L	D	-		-		7.19	:	-		-		-	
Molybdenum	mg/L	D	-		-		0.0051	:	-		-		-	
Nickel	mg/L	D	-		-		0.209	:	-		-		-	

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-13A 9/27/2004 RR-13A-T00N-P2S SWR	RR-13A 9/27/2004 RR-13A-T00N-P1S SWR	RR-13A 9/27/2004 RR-13A-D00N-PS SWR	RR-13A 9/28/2004 RR-13A-T01N-PS SWR	RR-13A 9/28/2004 RR-13A-T01N-P3S SWR	RR-13A 9/28/2004 RR-13A-T01N-P2S SWR
Potassium	mg/L	D	-	-	1.87 :	-	-	-
Selenium	mg/L	D	-	-	0.0019 :	-	-	-
Silver	mg/L	D	-	-	<0.0001 :	-	-	-
Sodium	mg/L	D	-	-	13.9 :	-	-	-
Thallium	mg/L	D	-	-	0.00013 :	-	-	-
Vanadium	mg/L	D	-	-	0.00018 :	-	-	-
Zinc	mg/L	D	-	-	1.9 :	-	-	-

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Fraction	RR-13A 9/28/2004 RR-13A-T01N-P1S SWR	RR-13A 9/28/2004 RR-13A-D01N-PS SWR	RR-13A 9/29/2004 RR-13A-T02N-PS SWR	RR-13A 9/29/2004 RR-13A-T02N-P3S SWR	RR-13A 9/29/2004 RR-13A-T02N-P2S SWR	RR-13A 9/29/2004 RR-13A-T02N-P1S SWR
Field Measurements								
DO	mg/L	T	9.3 :	-	-	4.3 :	4.4 :	6.8 :
pH	SU	T	6.1 :	-	-	4.1 :	4.2 :	4.9 :
Specific Conductance	mS/cm	T	0.296 :	-	-	1.3 :	1.186 :	0.597 :
Temperature	Celsius	T	11.7 :	-	-	9.6 :	9.6 :	9.7 :
General Chemistry								
Bicarbonate (as CaCO3)	mg/L	T	-	-	<1. :	-	-	-
Carbonate (as CaCO3)	mg/L	T	-	-	<1. :	-	-	-
Dissolved Organic Carbon	mg/L	D	-	1.7 :	-	-	-	-
Fluoride	mg/L	T	-	-	8.3 :	-	-	-
Hydroxide (as CaCO3)	mg/L	T	-	-	<1. :	-	-	-
Sulfate	mg/L	T	-	-	827. :	-	-	-
Total Alkalinity	mg/L	T	-	-	<1. :	-	-	-
Total Organic Carbon	mg/L	T	-	-	1.9 :	-	-	-
Physical Properties								
Hardness	mg/L	D	-	337. :	-	-	-	-
Metals								
Aluminum	mg/L	D	-	33.9 :	-	-	-	-
Antimony	mg/L	D	-	<0.0013 :	-	-	-	-
Arsenic	mg/L	D	-	<0.0001 J	-	-	-	-
Barium	mg/L	D	-	0.014 :	-	-	-	-
Beryllium	mg/L	D	-	0.007 :	-	-	-	-
Boron	mg/L	D	-	<0.0069 :	-	-	-	-
Cadmium	mg/L	D	-	0.0073 :	-	-	-	-
Calcium	mg/L	D	-	95. :	-	-	-	-
Chromium	mg/L	D	-	<0.0009 :	-	-	-	-
Cobalt	mg/L	D	-	0.0617 :	-	-	-	-
Copper	mg/L	D	-	0.487 :	-	-	-	-
Iron	mg/L	D	-	8.01 :	-	-	-	-
Lead	mg/L	D	-	0.00079 :	-	-	-	-
Magnesium	mg/L	D	-	24.2 :	-	-	-	-
Manganese	mg/L	D	-	4.7 :	-	-	-	-
Molybdenum	mg/L	D	-	<0.002 :	-	-	-	-
Nickel	mg/L	D	-	0.191 :	-	-	-	-

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction											
		RR-13A 9/28/2004 RR-13A-T01N-P1S SWR		RR-13A 9/28/2004 RR-13A-D01N-PS SWR		RR-13A 9/29/2004 RR-13A-T02N-PS SWR		RR-13A 9/29/2004 RR-13A-T02N-P3S SWR		RR-13A 9/29/2004 RR-13A-T02N-P2S SWR		RR-13A 9/29/2004 RR-13A-T02N-P1S SWR	
Potassium	mg/L	D	-	1.51	:	-		-		-		-	
Selenium	mg/L	D	-	0.00091	:	-		-		-		-	
Silver	mg/L	D	-	<0.0001	J	-		-		-		-	
Sodium	mg/L	D	-	10.2	:	-		-		-		-	
Thallium	mg/L	D	-	<0.0001	:	-		-		-		-	
Vanadium	mg/L	D	-	<0.0001	J	-		-		-		-	
Zinc	mg/L	D	-	1.19	:	-		-		-		-	

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-13A 9/29/2004 RR-13A-D02N-PS SWR	RR-13A 9/30/2004 RR-13A-T03N-PS SWR	RR-13A 9/30/2004 RR-13A-T03N-P3S SWR	RR-13A 9/30/2004 RR-13A-T03N-P2S SWR	RR-13A 9/30/2004 RR-13A-T03N-P1S SWR	RR-13A 9/30/2004 RR-13A-D03N-PS SWR
Field Measurements								
DO	mg/L	T	-	-	4.6 :	5.1 :	8.6 :	-
pH	SU	T	-	-	4.1 :	4.3 :	5.1 :	-
Specific Conductance	mS/cm	T	-	-	1.325 :	1.232 :	0.449 :	-
Temperature	Celsius	T	-	-	9.9 :	9.9 :	9.9 :	-
General Chemistry								
Bicarbonate (as CaCO3)	mg/L	T	-	<1. J	-	-	-	-
Carbonate (as CaCO3)	mg/L	T	-	<1. J	-	-	-	-
Dissolved Organic Carbon	mg/L	D	3.8 :	-	-	-	-	1.7 J
Fluoride	mg/L	T	-	7.8 J	-	-	-	-
Hydroxide (as CaCO3)	mg/L	T	-	<1. J	-	-	-	-
Sulfate	mg/L	T	-	875. J	-	-	-	-
Total Alkalinity	mg/L	T	-	<1. J	-	-	-	-
Total Organic Carbon	mg/L	T	-	1.6 J	-	-	-	-
Physical Properties								
Hardness	mg/L	D	565. :	-	-	-	-	511. J
Metals								
Aluminum	mg/L	D	66.6 :	-	-	-	-	57.8 :
Antimony	mg/L	D	<0.00049 :	-	-	-	-	<0.00065 :
Arsenic	mg/L	D	<0.0001 :	-	-	-	-	<0.0001 :
Barium	mg/L	D	0.0167 :	-	-	-	-	0.0142 :
Beryllium	mg/L	D	0.0106 :	-	-	-	-	0.0101 :
Boron	mg/L	D	<0.0069 :	-	-	-	-	<0.0069 :
Cadmium	mg/L	D	0.0086 :	-	-	-	-	0.0085 :
Calcium	mg/L	D	155. :	-	-	-	-	141. :
Chromium	mg/L	D	0.0013 :	-	-	-	-	<0.0018 :
Cobalt	mg/L	D	0.112 :	-	-	-	-	0.105 :
Copper	mg/L	D	0.627 :	-	-	-	-	0.567 :
Iron	mg/L	D	20.3 :	-	-	-	-	18.3 :
Lead	mg/L	D	0.00085 :	-	-	-	-	0.00084 :
Magnesium	mg/L	D	43. :	-	-	-	-	38.4 :
Manganese	mg/L	D	8.11 :	-	-	-	-	7.59 :
Molybdenum	mg/L	D	<0.002 :	-	-	-	-	<0.002 :
Nickel	mg/L	D	0.228 :	-	-	-	-	0.228 :

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction											
		RR-13A 9/29/2004 RR-13A-D02N-PS SWR		RR-13A 9/30/2004 RR-13A-T03N-PS SWR		RR-13A 9/30/2004 RR-13A-T03N-P3S SWR		RR-13A 9/30/2004 RR-13A-T03N-P2S SWR		RR-13A 9/30/2004 RR-13A-T03N-P1S SWR		RR-13A 9/30/2004 RR-13A-D03N-PS SWR	
Potassium	mg/L	D	1.89 :		-		-		-		-		1.89 :
Selenium	mg/L	D	0.0014 :		-		-		-		-		0.0021 :
Silver	mg/L	D	<0.0001 J		-		-		-		-		<0.0001 :
Sodium	mg/L	D	15.7 :		-		-		-		-		13.8 :
Thallium	mg/L	D	<0.0001 :		-		-		-		-		<0.0001 :
Vanadium	mg/L	D	0.00018 :		-		-		-		-		<0.00048 :
Zinc	mg/L	D	2.1 :		-		-		-		-		1.95 J

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID	RR-13A 10/1/2004 RR-13A-T04N-PS SWR	RR-13A 10/1/2004 RR-13A-T04N-P3S SWR	RR-13A 10/1/2004 RR-13A-T04N-P2S SWR	RR-13A 10/1/2004 RR-13A-T04N-P1S SWR	RR-13A 10/1/2004 RR-13A-D04N-PS SWR	RR-13B 3/23/2004 RR-13B-T01N-P3S SWR
Field Measurements									
DO	mg/L	T		-	5.5 :	5.2 :	9.1 :	-	5.64 :
EH	millivolts	T		-	-	-	-	-	278. :
pH	SU	T		-	3.8 :	4. :	5.5 :	-	3.92 :
Specific Conductance	mS/cm	T		-	1.238 :	1.137 :	0.35 :	-	1.682 :
Temperature	Celsius	T		-	9.7 :	9.2 :	8.7 :	-	8.15 :
General Chemistry									
Bicarbonate (as CaCO3)	mg/L	T		<1. :	-	-	-	-	-
Carbonate (as CaCO3)	mg/L	T		<1. :	-	-	-	-	-
Dissolved Organic Carbon	mg/L	D		-	-	-	-	2. :	-
Fluoride	mg/L	T		7.6 :	-	-	-	-	-
Hydroxide (as CaCO3)	mg/L	T		<1. :	-	-	-	-	-
Sulfate	mg/L	T		820. :	-	-	-	-	-
Total Alkalinity	mg/L	T		<1. :	-	-	-	-	-
Total Organic Carbon	mg/L	T		2.2 :	-	-	-	-	-
Physical Properties									
Hardness	mg/L	D		-	-	-	-	483. :	-
Metals									
Aluminum	mg/L	D		-	-	-	-	54.5 :	-
Antimony	mg/L	D		-	-	-	-	<0.00084 :	-
Arsenic	mg/L	D		-	-	-	-	<0.0001 J	-
Barium	mg/L	D		-	-	-	-	0.0134 :	-
Beryllium	mg/L	D		-	-	-	-	0.0097 :	-
Boron	mg/L	D		-	-	-	-	<0.0069 :	-
Cadmium	mg/L	D		-	-	-	-	0.0074 :	-
Calcium	mg/L	D		-	-	-	-	134. :	-
Chromium	mg/L	D		-	-	-	-	0.0016 J	-
Cobalt	mg/L	D		-	-	-	-	0.108 :	-
Copper	mg/L	D		-	-	-	-	0.496 :	-
Iron	mg/L	D		-	-	-	-	17.3 :	-
Lead	mg/L	D		-	-	-	-	0.00073 :	-
Magnesium	mg/L	D		-	-	-	-	36.3 :	-
Manganese	mg/L	D		-	-	-	-	7.35 :	-
Molybdenum	mg/L	D		-	-	-	-	<0.002 :	-

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction						
			RR-13A 10/1/2004 RR-13A-T04N-PS SWR	RR-13A 10/1/2004 RR-13A-T04N-P3S SWR	RR-13A 10/1/2004 RR-13A-T04N-P2S SWR	RR-13A 10/1/2004 RR-13A-T04N-P1S SWR	RR-13A 10/1/2004 RR-13A-D04N-PS SWR	RR-13B 3/23/2004 RR-13B-T01N-P3S SWR
Nickel	mg/L	D	-	-	-	-	0.201 :	-
Potassium	mg/L	D	-	-	-	-	1.52 :	-
Selenium	mg/L	D	-	-	-	-	0.0012 J	-
Silver	mg/L	D	-	-	-	-	<0.0001 J	-
Sodium	mg/L	D	-	-	-	-	13.4 :	-
Thallium	mg/L	D	-	-	-	-	<0.0001 :	-
Vanadium	mg/L	D	-	-	-	-	0.00012 :	-
Zinc	mg/L	D	-	-	-	-	1.88 :	-

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID											
			RR-13B 3/23/2004 RR-13B-T01N-P2S		RR-13B 3/23/2004 RR-13B-T01N-P1S		RR-13B 3/24/2004 RR-13B-T02N-P3S		RR-13B 3/24/2004 RR-13B-T02N-P2S		RR-13B 3/24/2004 RR-13B-T02N-P1S		RR-13B 3/25/2004 RR-13B-T03N-PS	
			SWR		SWR		SWR		SWR		SWR		SWR	
Field Measurements														
DO	mg/L	T	8.8	:	7.14	:	-		-		-		-	
EH	millivolts	T	244.	:	247.	:	279.	:	257.	:	245.	:	-	
pH	SU	T	4.17	:	4.5	:	3.77	:	3.94	:	4.26	:	-	
Specific Conductance	mS/cm	T	1.335	:	1.16	:	1.782	:	1.488	:	1.243	:	-	
Temperature	Celsius	T	7.94	:	7.6	:	8.63	:	8.46	:	8.4	:	-	
General Chemistry														
Fluoride	mg/L	T	-		-		-		-		-		3.5	J
Sulfate	mg/L	T	-		-		-		-		-		1310.	:
Total Organic Carbon	mg/L	T	-		-		-		-		-		3.9	J

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID	
			RR-13B 3/25/2004 RR-13B-T03N-P3S		RR-13B 3/25/2004 RR-13B-T03N-P2S		RR-13B 3/25/2004 RR-13B-T03N-P1S		RR-13B 3/25/2004 RR-13B-T02N-PS		RR-13B 3/25/2004 RR-13B-T01N-PS		RR-13B 3/25/2004 RR-13B-D03N-PS	
			SWR		SWR		SWR		SWR		SWR		SWR	
Field Measurements														
DO	mg/L	T	5.28	:	5.58	:	5.38	:	-		-		-	
EH	millivolts	T	281.	:	266.	:	256.	:	-		-		-	
pH	SU	T	3.88	:	4.06	:	4.27	:	-		-		-	
Specific Conductance	mS/cm	T	1.776	:	1.57	:	1.42	:	-		-		-	
Temperature	Celsius	T	8.48	:	8.38	:	8.	:	-		-		-	
General Chemistry														
Fluoride	mg/L	T	-		-		-		3.6	J	3.6	J	-	
Sulfate	mg/L	T	-		-		-		1230.	:	1220.	:	-	
Total Organic Carbon	mg/L	T	-		-		-		10.9	:	14.6	:	-	
Physical Properties														
Hardness	mg/L	D	-		-		-		-		-		729.	:
Metals														
Aluminum	mg/L	D	-		-		-		-		-		94.9	:
Antimony	mg/L	D	-		-		-		-		-		<0.0004	J
Arsenic	mg/L	D	-		-		-		-		-		<0.0002	:
Barium	mg/L	D	-		-		-		-		-		0.0127	:
Beryllium	mg/L	D	-		-		-		-		-		0.0154	:
Boron	mg/L	D	-		-		-		-		-		<0.0108	:
Cadmium	mg/L	D	-		-		-		-		-		0.0133	J
Calcium	mg/L	D	-		-		-		-		-		199.	:
Chromium	mg/L	D	-		-		-		-		-		<0.0043	J
Cobalt	mg/L	D	-		-		-		-		-		0.183	J
Copper	mg/L	D	-		-		-		-		-		0.91	:
Iron	mg/L	D	-		-		-		-		-		31.2	:
Lead	mg/L	D	-		-		-		-		-		0.00067	:
Magnesium	mg/L	D	-		-		-		-		-		56.6	:
Manganese	mg/L	D	-		-		-		-		-		14.1	:
Molybdenum	mg/L	D	-		-		-		-		-		<0.001	:
Nickel	mg/L	D	-		-		-		-		-		0.335	J
Potassium	mg/L	D	-		-		-		-		-		2.12	:
Selenium	mg/L	D	-		-		-		-		-		0.0022	:
Silver	mg/L	D	-		-		-		-		-		<0.0001	J
Sodium	mg/L	D	-		-		-		-		-		19.	:

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-13B 3/25/2004 RR-13B-T03N-P3S SWR	RR-13B 3/25/2004 RR-13B-T03N-P2S SWR	RR-13B 3/25/2004 RR-13B-T03N-P1S SWR	RR-13B 3/25/2004 RR-13B-T02N-PS SWR	RR-13B 3/25/2004 RR-13B-T01N-PS SWR	RR-13B 3/25/2004 RR-13B-D03N-PS SWR
Thallium	mg/L	D	-	-	-	-	-	0.0001 :
Vanadium	mg/L	D	-	-	-	-	-	<0.00076 :
Zinc	mg/L	D	-	-	-	-	-	3.1 J

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID											
			RR-13B 3/25/2004 RR-13B-D02N-PS		RR-13B 3/25/2004 RR-13B-D01N-PS		RR-13B 9/27/2004 RR-13B-T00N-PS		RR-13B 9/27/2004 RR-13B-T00N-P3S		RR-13B 9/27/2004 RR-13B-T00N-P2S		RR-13B 9/27/2004 RR-13B-T00N-P1S	
			SWR		SWR		SWR		SWR		SWR		SWR	
Field Measurements														
DO	mg/L	T	-		-		-		8.	:	6.6	:	5.6	:
pH	SU	T	-		-		-		4.8	:	4.5	:	4.1	:
Specific Conductance	mS/cm	T	-		-		-		0.458	:	0.522	:	1.47	:
Temperature	Celsius	T	-		-		-		9.8	:	9.	:	9.4	:
General Chemistry														
Bicarbonate (as CaCO3)	mg/L	T	-		-		<1.	:	-		-		-	
Carbonate (as CaCO3)	mg/L	T	-		-		<1.	:	-		-		-	
Fluoride	mg/L	T	-		-		4.4	:	-		-		-	
Hydroxide (as CaCO3)	mg/L	T	-		-		<1.	:	-		-		-	
Sulfate	mg/L	T	-		-		471.	:	-		-		-	
Total Alkalinity	mg/L	T	-		-		<1.	:	-		-		-	
Total Organic Carbon	mg/L	T	-		-		3.6	:	-		-		-	
Physical Properties														
Hardness	mg/L	D	677.	:	694.	:	-		-		-		-	
Metals														
Aluminum	mg/L	D	94.3	:	88.	:	-		-		-		-	
Antimony	mg/L	D	<0.0004	J	<0.0004	J	-		-		-		-	
Arsenic	mg/L	D	<0.0002	:	<0.0002	:	-		-		-		-	
Barium	mg/L	D	0.0122	:	0.0106	:	-		-		-		-	
Beryllium	mg/L	D	0.0141	:	0.014	:	-		-		-		-	
Boron	mg/L	D	<0.0095	:	<0.0018	:	-		-		-		-	
Cadmium	mg/L	D	0.0125	:	0.013	:	-		-		-		-	
Calcium	mg/L	D	184.	:	188.	:	-		-		-		-	
Chromium	mg/L	D	<0.0042	:	<0.0008	J	-		-		-		-	
Cobalt	mg/L	D	0.168	:	0.171	:	-		-		-		-	
Copper	mg/L	D	0.92	:	0.878	:	-		-		-		-	
Iron	mg/L	D	29.2	:	30.5	:	-		-		-		-	
Lead	mg/L	D	0.00072	:	0.00099	:	-		-		-		-	
Magnesium	mg/L	D	52.7	:	54.4	:	-		-		-		-	
Manganese	mg/L	D	14.	:	12.9	:	-		-		-		-	
Molybdenum	mg/L	D	<0.001	:	<0.003	:	-		-		-		-	
Nickel	mg/L	D	0.336	:	0.328	:	-		-		-		-	
Potassium	mg/L	D	2.06	:	2.26	:	-		-		-		-	

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T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction											
		RR-13B 3/25/2004 RR-13B-D02N-PS SWR		RR-13B 3/25/2004 RR-13B-D01N-PS SWR		RR-13B 9/27/2004 RR-13B-T00N-PS SWR	RR-13B 9/27/2004 RR-13B-T00N-P3S SWR	RR-13B 9/27/2004 RR-13B-T00N-P2S SWR	RR-13B 9/27/2004 RR-13B-T00N-P1S SWR
Selenium	mg/L	D	0.0023	:	0.0019	:	-	-	-	-
Silver	mg/L	D	<0.0001	J	<0.0001	:	-	-	-	-
Sodium	mg/L	D	19.3	:	18.3	:	-	-	-	-
Thallium	mg/L	D	<0.0001	:	0.00021	:	-	-	-	-
Vanadium	mg/L	D	<0.00071	:	0.00034	:	-	-	-	-
Zinc	mg/L	D	2.94	:	2.9	:	-	-	-	-

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID	RR-13B 9/27/2004 RR-13B-D00N-PS SWR	RR-13B 9/28/2004 RR-13B-T01N-PS SWR	RR-13B 9/28/2004 RR-13B-T01N-P3S SWR	RR-13B 9/28/2004 RR-13B-T01N-P2S SWR	RR-13B 9/28/2004 RR-13B-T01N-P1S SWR	RR-13B 9/28/2004 RR-13B-D01N-PS SWR
Field Measurements									
DO	mg/L	T		-	-	5.5 :	5.8 :	3.6 :	-
pH	SU	T		-	-	4.4 :	4.3 :	3.9 :	-
Specific Conductance	mS/cm	T		-	-	0.382 :	0.454 :	1.193 :	-
Temperature	Celsius	T		-	-	10.7 :	10. :	11.2 :	-
General Chemistry									
Bicarbonate (as CaCO3)	mg/L	T		-	<1. :	-	-	-	-
Carbonate (as CaCO3)	mg/L	T		-	<1. :	-	-	-	-
Dissolved Organic Carbon	mg/L	D		1.1 :	-	-	-	-	1.3 :
Fluoride	mg/L	T		-	4.7 :	-	-	-	-
Hydroxide (as CaCO3)	mg/L	T		-	<1. :	-	-	-	-
Sulfate	mg/L	T		-	250. :	-	-	-	-
Total Alkalinity	mg/L	T		-	<1. :	-	-	-	-
Total Organic Carbon	mg/L	T		-	2. :	-	-	-	-
Physical Properties									
Hardness	mg/L	D		315. :	-	-	-	-	305. :
Metals									
Aluminum	mg/L	D		23.2 :	-	-	-	-	29.2 :
Antimony	mg/L	D		<0.0012 :	-	-	-	-	<0.0014 :
Arsenic	mg/L	D		<0.0001 :	-	-	-	-	<0.0001 J
Barium	mg/L	D		0.0235 :	-	-	-	-	0.0149 :
Beryllium	mg/L	D		0.0048 :	-	-	-	-	0.0059 :
Boron	mg/L	D		<0.0069 :	-	-	-	-	<0.0069 :
Cadmium	mg/L	D		0.0041 :	-	-	-	-	0.0044 :
Calcium	mg/L	D		90.2 :	-	-	-	-	86.8 :
Chromium	mg/L	D		<0.0011 :	-	-	-	-	<0.0009 :
Cobalt	mg/L	D		0.0538 :	-	-	-	-	0.0537 :
Copper	mg/L	D		0.242 :	-	-	-	-	0.284 :
Iron	mg/L	D		4.43 :	-	-	-	-	5.32 :
Lead	mg/L	D		0.00096 :	-	-	-	-	0.001 :
Magnesium	mg/L	D		21.7 :	-	-	-	-	21.6 :
Manganese	mg/L	D		4.08 :	-	-	-	-	4.15 :
Molybdenum	mg/L	D		<0.0033 :	-	-	-	-	<0.002 :
Nickel	mg/L	D		0.101 :	-	-	-	-	0.114 :

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Fraction											
Site ID			RR-13B		RR-13B		RR-13B		RR-13B		RR-13B		RR-13B	
Sample Date			9/27/2004		9/28/2004		9/28/2004		9/28/2004		9/28/2004		9/28/2004	
Sample ID			RR-13B-D00N-PS		RR-13B-T01N-PS		RR-13B-T01N-P3S		RR-13B-T01N-P2S		RR-13B-T01N-P1S		RR-13B-D01N-PS	
Exposure Area			SWR		SWR		SWR		SWR		SWR		SWR	
Potassium	mg/L	D	1.54	:	-		-		-		-		1.19	:
Selenium	mg/L	D	0.0013	:	-		-		-		-		0.00082	J
Silver	mg/L	D	<0.0001	:	-		-		-		-		<0.0001	J
Sodium	mg/L	D	9.79	:	-		-		-		-		9.74	:
Thallium	mg/L	D	<0.0001	:	-		-		-		-		<0.0001	:
Vanadium	mg/L	D	0.00011	:	-		-		-		-		<0.0001	J
Zinc	mg/L	D	0.945	:	-		-		-		-		1.03	:

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

		Site ID	RR-13B	RR-13B	RR-13B	RR-13B	RR-13B	RR-13B
		Sample Date	9/29/2004	9/29/2004	9/29/2004	9/29/2004	9/29/2004	9/30/2004
		Sample ID	RR-13B-T02N-PS	RR-13B-T02N-P3S	RR-13B-T02N-P2S	RR-13B-T02N-P1S	RR-13B-D02N-PS	RR-13B-T03N-PS
		Exposure Area	SWR	SWR	SWR	SWR	SWR	SWR
Parameter	**Units**	**Fraction**						
Field Measurements								
DO	mg/L	T	-	5.5 :	5.3 :	4.5 :	-	-
pH	SU	T	-	4.5 :	4.4 :	4.2 :	-	-
Specific Conductance	mS/cm	T	-	0.382 :	0.467 :	1.16 :	-	-
Temperature	Celsius	T	-	9.8 :	9.9 :	10.6 :	-	-
General Chemistry								
Bicarbonate (as CaCO3)	mg/L	T	<1. :	-	-	-	-	<1. J
Carbonate (as CaCO3)	mg/L	T	<1. :	-	-	-	-	<1. J
Dissolved Organic Carbon	mg/L	D	-	-	-	-	1.1 :	-
Fluoride	mg/L	T	5.3 :	-	-	-	-	4.7 J
Hydroxide (as CaCO3)	mg/L	T	<1. :	-	-	-	-	<1. J
Sulfate	mg/L	T	486. :	-	-	-	-	460. J
Total Alkalinity	mg/L	T	<1. :	-	-	-	-	<1. J
Total Organic Carbon	mg/L	T	3.6 :	-	-	-	-	3.6 J
Physical Properties								
Hardness	mg/L	D	-	-	-	-	339. :	-
Metals								
Aluminum	mg/L	D	-	-	-	-	32.3 :	-
Antimony	mg/L	D	-	-	-	-	<0.00097 :	-
Arsenic	mg/L	D	-	-	-	-	<0.0001 :	-
Barium	mg/L	D	-	-	-	-	0.0171 :	-
Beryllium	mg/L	D	-	-	-	-	0.0058 :	-
Boron	mg/L	D	-	-	-	-	<0.0069 :	-
Cadmium	mg/L	D	-	-	-	-	0.0044 :	-
Calcium	mg/L	D	-	-	-	-	96.2 :	-
Chromium	mg/L	D	-	-	-	-	0.0017 :	-
Cobalt	mg/L	D	-	-	-	-	0.0546 :	-
Copper	mg/L	D	-	-	-	-	0.283 :	-
Iron	mg/L	D	-	-	-	-	5.76 :	-
Lead	mg/L	D	-	-	-	-	0.00076 :	-
Magnesium	mg/L	D	-	-	-	-	23.9 :	-
Manganese	mg/L	D	-	-	-	-	4.08 :	-
Molybdenum	mg/L	D	-	-	-	-	<0.002 :	-
Nickel	mg/L	D	-	-	-	-	0.115 :	-

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-13B 9/29/2004 RR-13B-T02N-PS SWR	RR-13B 9/29/2004 RR-13B-T02N-P3S SWR	RR-13B 9/29/2004 RR-13B-T02N-P2S SWR	RR-13B 9/29/2004 RR-13B-T02N-P1S SWR	RR-13B 9/29/2004 RR-13B-D02N-PS SWR	RR-13B 9/30/2004 RR-13B-T03N-PS SWR
Potassium	mg/L	D	-	-	-	-	1.28 :	-
Selenium	mg/L	D	-	-	-	-	0.00099 :	-
Silver	mg/L	D	-	-	-	-	<0.0001 J	-
Sodium	mg/L	D	-	-	-	-	10.6 :	-
Thallium	mg/L	D	-	-	-	-	<0.0001 :	-
Vanadium	mg/L	D	-	-	-	-	<0.0001 :	-
Zinc	mg/L	D	-	-	-	-	1.07 :	-

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-13B 9/30/2004 RR-13B-T03N-P3S SWR	RR-13B 9/30/2004 RR-13B-T03N-P2S SWR	RR-13B 9/30/2004 RR-13B-T03N-P1S SWR	RR-13B 9/30/2004 RR-13B-D03N-PS SWR	RR-13B 10/1/2004 RR-13B-T04N-PS SWR	RR-13B 10/1/2004 RR-13B-T04N-P3S SWR
Field Measurements								
DO	mg/L	T	5.5 :	5.5 :	4.7 :	-	-	5.5 :
pH	SU	T	4.6 :	4.6 :	4.4 :	-	-	4.3 :
Specific Conductance	mS/cm	T	0.375 :	0.433 :	1.187 :	-	-	0.346 :
Temperature	Celsius	T	9. :	9.4 :	10.7 :	-	-	8.3 :
General Chemistry								
Bicarbonate (as CaCO3)	mg/L	T	-	-	-	-	<1. :	-
Carbonate (as CaCO3)	mg/L	T	-	-	-	-	<1. :	-
Dissolved Organic Carbon	mg/L	D	-	-	-	2.2 J	-	-
Fluoride	mg/L	T	-	-	-	-	4.4 :	-
Hydroxide (as CaCO3)	mg/L	T	-	-	-	-	<1. :	-
Sulfate	mg/L	T	-	-	-	-	420. :	-
Total Alkalinity	mg/L	T	-	-	-	-	<1. :	-
Total Organic Carbon	mg/L	T	-	-	-	-	3.6 :	-
Physical Properties								
Hardness	mg/L	D	-	-	-	319. J	-	-
Metals								
Aluminum	mg/L	D	-	-	-	29.3 :	-	-
Antimony	mg/L	D	-	-	-	<0.00045 :	-	-
Arsenic	mg/L	D	-	-	-	<0.0001 :	-	-
Barium	mg/L	D	-	-	-	0.0135 :	-	-
Beryllium	mg/L	D	-	-	-	0.0057 :	-	-
Boron	mg/L	D	-	-	-	<0.0069 :	-	-
Cadmium	mg/L	D	-	-	-	0.0047 :	-	-
Calcium	mg/L	D	-	-	-	90.7 :	-	-
Chromium	mg/L	D	-	-	-	<0.0011 :	-	-
Cobalt	mg/L	D	-	-	-	0.0525 :	-	-
Copper	mg/L	D	-	-	-	0.282 :	-	-
Iron	mg/L	D	-	-	-	5.3 :	-	-
Lead	mg/L	D	-	-	-	0.00094 :	-	-
Magnesium	mg/L	D	-	-	-	22.4 :	-	-
Manganese	mg/L	D	-	-	-	4.01 :	-	-
Molybdenum	mg/L	D	-	-	-	<0.002 :	-	-
Nickel	mg/L	D	-	-	-	0.113 :	-	-

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID					
			RR-13B 9/30/2004 RR-13B-T03N-P3S	RR-13B 9/30/2004 RR-13B-T03N-P2S	RR-13B 9/30/2004 RR-13B-T03N-P1S	RR-13B 9/30/2004 RR-13B-D03N-PS	RR-13B 10/1/2004 RR-13B-T04N-PS	RR-13B 10/1/2004 RR-13B-T04N-P3S
			SWR	SWR	SWR	SWR	SWR	SWR
Potassium	mg/L	D	-	-	-	1.5 :	-	-
Selenium	mg/L	D	-	-	-	0.0017 :	-	-
Silver	mg/L	D	-	-	-	<0.0001 :	-	-
Sodium	mg/L	D	-	-	-	9.64 :	-	-
Thallium	mg/L	D	-	-	-	<0.0001 :	-	-
Vanadium	mg/L	D	-	-	-	<0.00034 :	-	-
Zinc	mg/L	D	-	-	-	1.03 :	-	-

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID					
			RR-13B 10/1/2004 RR-13B-T04N-P2S	RR-13B 10/1/2004 RR-13B-T04N-P1S	RR-13B 10/1/2004 RR-13B-D04N-PS	RR-15 10/6/2003 RR-15-T00N-PS	RR-15 10/6/2003 RR-15-T00N-PD	RR-15 10/6/2003 RR-15-T00N-P3S
			SWR	SWR	SWR	SWR	SWR	SWR
Field Measurements								
DO	mg/L	T	6.2 :	6.8 :	-	-	-	9. :
EH	millivolts	T	-	-	-	-	-	99. :
pH	SU	T	4.4 :	4. :	-	-	-	6.4 :
Specific Conductance	uS/cm	T	-	-	-	-	-	316. :
Specific Conductance	mS/cm	T	0.383 :	1.054 :	-	-	-	-
Temperature	Celsius	T	8.7 :	9.9 :	-	-	-	11. :
General Chemistry								
Dissolved Organic Carbon	mg/L	D	-	-	<1. :	-	-	-
Fluoride	mg/L	T	-	-	-	1.1 :	1. :	-
Sulfate	mg/L	T	-	-	-	168. J	176. J	-
Total Organic Carbon	mg/L	T	-	-	-	4.1 :	1.7 :	-
Physical Properties								
Hardness	mg/L	D	-	-	283. :	-	-	-
Metals								
Aluminum	mg/L	D	-	-	25.4 :	-	-	-
Antimony	mg/L	D	-	-	<0.00057 :	-	-	-
Arsenic	mg/L	D	-	-	<0.0001 J	-	-	-
Barium	mg/L	D	-	-	0.0133 :	-	-	-
Beryllium	mg/L	D	-	-	0.0054 :	-	-	-
Boron	mg/L	D	-	-	<0.0069 :	-	-	-
Cadmium	mg/L	D	-	-	0.0038 :	-	-	-
Calcium	mg/L	D	-	-	80.6 :	-	-	-
Chromium	mg/L	D	-	-	<0.0011 J	-	-	-
Cobalt	mg/L	D	-	-	0.0435 :	-	-	-
Copper	mg/L	D	-	-	0.242 :	-	-	-
Iron	mg/L	D	-	-	4.43 :	-	-	-
Lead	mg/L	D	-	-	0.00073 :	-	-	-
Magnesium	mg/L	D	-	-	19.8 :	-	-	-
Manganese	mg/L	D	-	-	3.48 :	-	-	-
Molybdenum	mg/L	D	-	-	<0.002 :	-	-	-
Nickel	mg/L	D	-	-	0.0985 :	-	-	-
Potassium	mg/L	D	-	-	1.16 :	-	-	-
Selenium	mg/L	D	-	-	0.00084 J	-	-	-

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction							
		Site ID	RR-13B	RR-13B	RR-13B	RR-15	RR-15	RR-15
		Sample Date	10/1/2004	10/1/2004	10/1/2004	10/6/2003	10/6/2003	10/6/2003
		Sample ID	RR-13B-T04N-P2S	RR-13B-T04N-P1S	RR-13B-D04N-PS	RR-15-T00N-PS	RR-15-T00N-PD	RR-15-T00N-P3S
		Exposure Area	SWR	SWR	SWR	SWR	SWR	SWR
Silver	mg/L	D	-	-	<0.0001 J	-	-	-
Sodium	mg/L	D	-	-	8.67 :	-	-	-
Thallium	mg/L	D	-	-	<0.0001 :	-	-	-
Vanadium	mg/L	D	-	-	<0.0001 :	-	-	-
Zinc	mg/L	D	-	-	0.909 :	-	-	-

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID: RR-15 Sample Date: 10/6/2003 Sample ID: RR-15-T00N-P3D SWR		Site ID: RR-15 Sample Date: 10/6/2003 Sample ID: RR-15-T00N-P2S SWR		Site ID: RR-15 Sample Date: 10/6/2003 Sample ID: RR-15-T00N-P2D SWR		Site ID: RR-15 Sample Date: 10/6/2003 Sample ID: RR-15-T00N-P1S SWR		Site ID: RR-15 Sample Date: 10/6/2003 Sample ID: RR-15-T00N-P1D SWR		Site ID: RR-15 Sample Date: 10/6/2003 Sample ID: RR-15-D00N-PS SWR	
Field Measurements														
DO	mg/L	T	6.7	:	5.6	:	5.7	:	7.2	:	-		-	
EH	millivolts	T	107.	:	112.	:	152.	:	179.	:	135.	:	-	
pH	SU	T	6.4	:	6.3	:	6.	:	6.	:	6.6	:	-	
Specific Conductance	uS/cm	T	335.	:	326.	:	360.	:	506.	:	450.	:	-	
Temperature	Celsius	T	10.7	:	10.3	:	10.7	:	10.5	:	11.2	:	-	
Physical Properties														
Hardness	mg/L	D	-		-		-		-		-		204.	:
Metals														
Aluminum	mg/L	D	-		-		-		-		-		0.756	:
Antimony	mg/L	D	-		-		-		-		-		<0.0005	J
Arsenic	mg/L	D	-		-		-		-		-		<0.0002	J
Barium	mg/L	D	-		-		-		-		-		0.0327	:
Beryllium	mg/L	D	-		-		-		-		-		<0.00081	:
Boron	mg/L	D	-		-		-		-		-		0.0063	:
Cadmium	mg/L	D	-		-		-		-		-		0.0014	J
Calcium	mg/L	D	-		-		-		-		-		58.8	:
Chromium	mg/L	D	-		-		-		-		-		<0.0011	:
Cobalt	mg/L	D	-		-		-		-		-		0.0041	:
Copper	mg/L	D	-		-		-		-		-		0.0053	:
Iron	mg/L	D	-		-		-		-		-		<0.0278	:
Lead	mg/L	D	-		-		-		-		-		<0.0002	:
Magnesium	mg/L	D	-		-		-		-		-		13.8	:
Manganese	mg/L	D	-		-		-		-		-		0.67	:
Molybdenum	mg/L	D	-		-		-		-		-		<0.0012	:
Nickel	mg/L	D	-		-		-		-		-		0.0247	:
Potassium	mg/L	D	-		-		-		-		-		1.46	J
Selenium	mg/L	D	-		-		-		-		-		0.00034	J
Silver	mg/L	D	-		-		-		-		-		<0.0001	:
Sodium	mg/L	D	-		-		-		-		-		7.08	:
Thallium	mg/L	D	-		-		-		-		-		<0.0001	:
Vanadium	mg/L	D	-		-		-		-		-		<0.0001	:
Zinc	mg/L	D	-		-		-		-		-		0.347	:

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID					
			RR-15 10/6/2003 RR-15-D00N-PD	RR-15 10/7/2003 RR-15-T01N-PS	RR-15 10/7/2003 RR-15-T01N-PD	RR-15 10/7/2003 RR-15-T01N-P3S	RR-15 10/7/2003 RR-15-T01N-P3D	RR-15 10/7/2003 RR-15-T01N-P2S
			SWR	SWR	SWR	SWR	SWR	SWR
Field Measurements								
EH	millivolts	T	-	-	-	149. :	145. :	227. :
pH	SU	T	-	-	-	6.5 :	6.3 :	6.5 :
Specific Conductance	uS/cm	T	-	-	-	290. :	313. :	300. :
Temperature	Celsius	T	-	-	-	10. :	10. :	10. :
Turbidity	NTU	T	-	-	-	710. :	67. :	169. :
General Chemistry								
Fluoride	mg/L	T	-	1.1 :	0.96 :	-	-	-
Sulfate	mg/L	T	-	143. J	142. J	-	-	-
Total Organic Carbon	mg/L	T	-	1.6 :	1.2 :	-	-	-
Physical Properties								
Hardness	mg/L	D	197. :	-	-	-	-	-
Metals								
Aluminum	mg/L	D	0.198 J	-	-	-	-	-
Antimony	mg/L	D	<0.0005 J	-	-	-	-	-
Arsenic	mg/L	D	<0.0002 J	-	-	-	-	-
Barium	mg/L	D	0.0308 :	-	-	-	-	-
Beryllium	mg/L	D	<0.0004 :	-	-	-	-	-
Boron	mg/L	D	<0.0063 :	-	-	-	-	-
Cadmium	mg/L	D	0.00079 J	-	-	-	-	-
Calcium	mg/L	D	56.9 :	-	-	-	-	-
Chromium	mg/L	D	<0.0011 :	-	-	-	-	-
Cobalt	mg/L	D	0.0059 :	-	-	-	-	-
Copper	mg/L	D	<0.0017 :	-	-	-	-	-
Iron	mg/L	D	<0.276 :	-	-	-	-	-
Lead	mg/L	D	<0.0002 :	-	-	-	-	-
Magnesium	mg/L	D	13.3 :	-	-	-	-	-
Manganese	mg/L	D	1.12 :	-	-	-	-	-
Molybdenum	mg/L	D	0.0023 :	-	-	-	-	-
Nickel	mg/L	D	0.0173 :	-	-	-	-	-
Potassium	mg/L	D	1.43 J	-	-	-	-	-
Selenium	mg/L	D	0.00046 J	-	-	-	-	-
Silver	mg/L	D	<0.0001 :	-	-	-	-	-
Sodium	mg/L	D	6.89 :	-	-	-	-	-

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID						
			RR-15 10/6/2003 RR-15-D00N-PD	RR-15 10/7/2003 RR-15-T01N-PS	RR-15 10/7/2003 RR-15-T01N-PD	RR-15 10/7/2003 RR-15-T01N-P3S	RR-15 10/7/2003 RR-15-T01N-P3D	RR-15 10/7/2003 RR-15-T01N-P2S
			SWR	SWR	SWR	SWR	SWR	SWR
Thallium	mg/L	D	<0.0001 :	-	-	-	-	-
Vanadium	mg/L	D	<0.0001 :	-	-	-	-	-
Zinc	mg/L	D	1.03 :	-	-	-	-	-

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID	
			RR-15 10/7/2003 RR-15-T01N-P2D		RR-15 10/7/2003 RR-15-T01N-P1S		RR-15 10/7/2003 RR-15-T01N-P1D		RR-15 10/7/2003 RR-15-D01N-PS		RR-15 10/7/2003 RR-15-D01N-PD		RR-15 10/8/2003 RR-15-T02N-PS	
			SWR		SWR		SWR		SWR		SWR		SWR	
Field Measurements														
EH	millivolts	T	129.	:	287.	:	255.	:	-		-		-	
pH	SU	T	6.4	:	5.5	:	5.7	:	-		-		-	
Specific Conductance	uS/cm	T	338.	:	483.	:	425.	:	-		-		-	
Temperature	Celsius	T	10.	:	11.	:	10.5	:	-		-		-	
Turbidity	NTU	T	67.	:	121.	:	253.	:	-		-		-	
General Chemistry														
Fluoride	mg/L	T	-		-		-		-		-		1.2	:
Sulfate	mg/L	T	-		-		-		-		-		156.	J
Total Organic Carbon	mg/L	T	-		-		-		-		-		2.4	:
Physical Properties														
Hardness	mg/L	D	-		-		-		186.	:	192.	:	-	
Metals														
Aluminum	mg/L	D	-		-		-		0.756	:	0.297	J	-	
Antimony	mg/L	D	-		-		-		<0.0005	:	<0.0005	:	-	
Arsenic	mg/L	D	-		-		-		<0.0002	J	<0.0002	J	-	
Barium	mg/L	D	-		-		-		0.0324	:	0.0299	:	-	
Beryllium	mg/L	D	-		-		-		<0.00079	:	<0.00046	:	-	
Boron	mg/L	D	-		-		-		<0.0063	:	<0.0063	:	-	
Cadmium	mg/L	D	-		-		-		0.0012	J	0.00074	J	-	
Calcium	mg/L	D	-		-		-		53.7	:	55.5	:	-	
Chromium	mg/L	D	-		-		-		<0.0011	:	<0.0011	:	-	
Cobalt	mg/L	D	-		-		-		0.0085	:	0.0069	:	-	
Copper	mg/L	D	-		-		-		0.0047	:	0.0018	:	-	
Iron	mg/L	D	-		-		-		<0.0394	:	0.2	:	-	
Lead	mg/L	D	-		-		-		0.00021	:	<0.0002	:	-	
Magnesium	mg/L	D	-		-		-		12.5	:	13.	:	-	
Manganese	mg/L	D	-		-		-		0.564	:	0.779	:	-	
Molybdenum	mg/L	D	-		-		-		<0.0012	:	0.0018	:	-	
Nickel	mg/L	D	-		-		-		0.0216	:	0.0157	:	-	
Potassium	mg/L	D	-		-		-		1.13	J	0.981	J	-	
Selenium	mg/L	D	-		-		-		0.00034	J	0.00049	J	-	
Silver	mg/L	D	-		-		-		<0.0001	:	<0.0001	:	-	
Sodium	mg/L	D	-		-		-		6.63	:	6.91	:	-	

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T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-15 10/7/2003 RR-15-T01N-P2D SWR	RR-15 10/7/2003 RR-15-T01N-P1S SWR	RR-15 10/7/2003 RR-15-T01N-P1D SWR	RR-15 10/7/2003 RR-15-D01N-PS SWR	RR-15 10/7/2003 RR-15-D01N-PD SWR	RR-15 10/8/2003 RR-15-T02N-PS SWR
Thallium	mg/L	D	-	-	-	<0.0001 :	<0.0001 :	-
Vanadium	mg/L	D	-	-	-	<0.0001 :	0.0001 :	-
Zinc	mg/L	D	-	-	-	0.285 :	0.839 :	-

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID	
			RR-15 10/8/2003 RR-15-T02N-PD		RR-15 10/8/2003 RR-15-T02N-P3S		RR-15 10/8/2003 RR-15-T02N-P3D		RR-15 10/8/2003 RR-15-T02N-P2S		RR-15 10/8/2003 RR-15-T02N-P2D		RR-15 10/8/2003 RR-15-T02N-P1S	
			SWR		SWR		SWR		SWR		SWR		SWR	
Field Measurements														
DO	mg/L	T	-		6.7	:	6.7	:	5.8	:	4.6	:	4.9	:
EH	millivolts	T	-		126.	:	127.	:	136.	:	180.	:	251.	:
pH	SU	T	-		6.1	:	6.1	:	6.	:	5.5	:	5.	:
Specific Conductance	uS/cm	T	-		303.	:	324.	:	310.	:	348.	:	498.	:
Temperature	Celsius	T	-		10.6	:	11.3	:	10.9	:	11.1	:	11.1	:
General Chemistry														
Fluoride	mg/L	T	0.98	:	-		-		-		-		-	
Sulfate	mg/L	T	143.	J	-		-		-		-		-	
Total Organic Carbon	mg/L	T	1.6	:	-		-		-		-		-	

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID					
			RR-15 10/8/2003 RR-15-T02N-P1D	RR-15 10/8/2003 RR-15-D02N-PS	RR-15 10/8/2003 RR-15-D02N-PD	RR-15 10/9/2003 RR-15-T03N-PS	RR-15 10/9/2003 RR-15-T03N-PD	RR-15 10/9/2003 RR-15-T03N-P3S
			SWR	SWR	SWR	SWR	SWR	SWR
Field Measurements								
DO	mg/L	T	4. :	-	-	-	-	6.71 :
EH	millivolts	T	235. :	-	-	-	-	118. :
pH	SU	T	5.7 :	-	-	-	-	6.34 :
Specific Conductance	uS/cm	T	438. :	-	-	-	-	268. :
Temperature	Celsius	T	11.5 :	-	-	-	-	9.91 :
General Chemistry								
Fluoride	mg/L	T	-	-	-	1.3 :	0.98 :	-
Sulfate	mg/L	T	-	-	-	152. J	144. J	-
Total Organic Carbon	mg/L	T	-	-	-	2.4 :	1.6 :	-
Physical Properties								
Hardness	mg/L	D	-	186. :	182. :	-	-	-
Metals								
Aluminum	mg/L	D	-	0.865 :	0.326 :	-	-	-
Antimony	mg/L	D	-	<0.0005 :	<0.0005 :	-	-	-
Arsenic	mg/L	D	-	<0.0002 J	<0.0002 J	-	-	-
Barium	mg/L	D	-	0.0299 :	0.0272 :	-	-	-
Beryllium	mg/L	D	-	0.00089 :	<0.0004 :	-	-	-
Boron	mg/L	D	-	0.0067 :	0.0065 :	-	-	-
Cadmium	mg/L	D	-	0.0014 J	0.00081 J	-	-	-
Calcium	mg/L	D	-	53.9 :	52.5 :	-	-	-
Chromium	mg/L	D	-	<0.0011 :	<0.0011 :	-	-	-
Cobalt	mg/L	D	-	<0.0029 :	0.0039 :	-	-	-
Copper	mg/L	D	-	<0.015 :	<0.0116 :	-	-	-
Iron	mg/L	D	-	<0.0278 :	<0.137 :	-	-	-
Lead	mg/L	D	-	<0.0002 :	<0.0002 :	-	-	-
Magnesium	mg/L	D	-	12.5 :	12.2 :	-	-	-
Manganese	mg/L	D	-	0.598 :	0.794 :	-	-	-
Molybdenum	mg/L	D	-	<0.0014 :	<0.002 :	-	-	-
Nickel	mg/L	D	-	0.0226 :	0.0151 :	-	-	-
Potassium	mg/L	D	-	1.21 :	1.27 :	-	-	-
Selenium	mg/L	D	-	0.00062 J	0.00031 J	-	-	-
Silver	mg/L	D	-	<0.0001 :	<0.0001 :	-	-	-
Sodium	mg/L	D	-	6.39 :	6.55 :	-	-	-

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T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-15 10/8/2003 RR-15-T02N-P1D SWR D		RR-15 10/8/2003 RR-15-D02N-PS SWR D		RR-15 10/8/2003 RR-15-D02N-PD SWR D		RR-15 10/9/2003 RR-15-T03N-PS SWR D	RR-15 10/9/2003 RR-15-T03N-PD SWR D	RR-15 10/9/2003 RR-15-T03N-P3S SWR D
Thallium	mg/L	D	-		<0.0001	:	<0.0001	:	-	-	-
Vanadium	mg/L	D	-		<0.0001	:	<0.0001	:	-	-	-
Zinc	mg/L	D	-		0.303	:	0.831	:	-	-	-

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID	
			RR-15 10/9/2003 RR-15-T03N-P3D		RR-15 10/9/2003 RR-15-T03N-P2S		RR-15 10/9/2003 RR-15-T03N-P2D		RR-15 10/9/2003 RR-15-T03N-P1S		RR-15 10/9/2003 RR-15-T03N-P1D		RR-15 10/9/2003 RR-15-D03N-PS	
			SWR		SWR		SWR		SWR		SWR		SWR	
Field Measurements														
DO	mg/L	T	5.67	:	4.54	:	2.59	:	2.01	:	2.29	:	-	
EH	millivolts	T	129.	:	133.	:	164.	:	239.2	:	176.	:	-	
pH	SU	T	6.28	:	6.34	:	5.87	:	5.6	:	6.4	:	-	
Specific Conductance	uS/cm	T	286.	:	271.	:	305.	:	438.	:	383.	:	-	
Temperature	Celsius	T	11.1	:	10.31	:	10.95	:	10.38	:	11.33	:	-	
Physical Properties														
Hardness	mg/L	D	-		-		-		-		-		197.	:
Metals														
Aluminum	mg/L	D	-		-		-		-		-		0.99	:
Antimony	mg/L	D	-		-		-		-		-		<0.00054	:
Arsenic	mg/L	D	-		-		-		-		-		<0.0002	J
Barium	mg/L	D	-		-		-		-		-		0.0328	:
Beryllium	mg/L	D	-		-		-		-		-		0.00085	:
Boron	mg/L	D	-		-		-		-		-		0.0105	:
Cadmium	mg/L	D	-		-		-		-		-		0.0012	J
Calcium	mg/L	D	-		-		-		-		-		57.1	:
Chromium	mg/L	D	-		-		-		-		-		<0.0011	:
Cobalt	mg/L	D	-		-		-		-		-		0.0115	:
Copper	mg/L	D	-		-		-		-		-		<0.0152	:
Iron	mg/L	D	-		-		-		-		-		<0.0278	:
Lead	mg/L	D	-		-		-		-		-		<0.0002	:
Magnesium	mg/L	D	-		-		-		-		-		13.3	:
Manganese	mg/L	D	-		-		-		-		-		0.654	:
Molybdenum	mg/L	D	-		-		-		-		-		<0.0015	:
Nickel	mg/L	D	-		-		-		-		-		0.0221	:
Potassium	mg/L	D	-		-		-		-		-		1.43	:
Selenium	mg/L	D	-		-		-		-		-		0.00075	J
Silver	mg/L	D	-		-		-		-		-		<0.0001	:
Sodium	mg/L	D	-		-		-		-		-		6.62	:
Thallium	mg/L	D	-		-		-		-		-		<0.0001	:
Vanadium	mg/L	D	-		-		-		-		-		<0.0001	:
Zinc	mg/L	D	-		-		-		-		-		0.32	:

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T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID					
			RR-15 10/9/2003 RR-15-D03N-PD	RR-15 10/10/2003 RR-15-T04N-PS	RR-15 10/10/2003 RR-15-T04N-PD	RR-15 10/10/2003 RR-15-T04N-P3S	RR-15 10/10/2003 RR-15-T04N-P3D	RR-15 10/10/2003 RR-15-T04N-P2S
			SWR	SWR	SWR	SWR	SWR	SWR
Field Measurements								
DO	mg/L	T	-	-	-	6.52 :	4.94 :	5.36 :
EH	millivolts	T	-	-	-	126.7 :	133. :	141. :
pH	SU	T	-	-	-	6.2 :	6.3 :	6.2 :
Specific Conductance	uS/cm	T	-	-	-	254. :	266. :	253. :
Temperature	Celsius	T	-	-	-	9.2 :	9.9 :	9.3 :
General Chemistry								
Fluoride	mg/L	T	-	1.3 :	1. :	-	-	-
Sulfate	mg/L	T	-	143. J	148. J	-	-	-
Total Organic Carbon	mg/L	T	-	1.5 :	1.6 :	-	-	-
Physical Properties								
Hardness	mg/L	D	199. :	-	-	-	-	-
Metals								
Aluminum	mg/L	D	0.428 :	-	-	-	-	-
Antimony	mg/L	D	<0.0005 :	-	-	-	-	-
Arsenic	mg/L	D	<0.0002 J	-	-	-	-	-
Barium	mg/L	D	0.0276 :	-	-	-	-	-
Beryllium	mg/L	D	<0.0004 :	-	-	-	-	-
Boron	mg/L	D	0.0074 :	-	-	-	-	-
Cadmium	mg/L	D	0.00076 J	-	-	-	-	-
Calcium	mg/L	D	57.6 :	-	-	-	-	-
Chromium	mg/L	D	<0.0011 :	-	-	-	-	-
Cobalt	mg/L	D	0.0096 :	-	-	-	-	-
Copper	mg/L	D	<0.0117 :	-	-	-	-	-
Iron	mg/L	D	<0.143 :	-	-	-	-	-
Lead	mg/L	D	<0.0002 :	-	-	-	-	-
Magnesium	mg/L	D	13.4 :	-	-	-	-	-
Manganese	mg/L	D	0.74 :	-	-	-	-	-
Molybdenum	mg/L	D	<0.0017 :	-	-	-	-	-
Nickel	mg/L	D	0.0145 :	-	-	-	-	-
Potassium	mg/L	D	1.66 :	-	-	-	-	-
Selenium	mg/L	D	<0.0003 J	-	-	-	-	-
Silver	mg/L	D	<0.0001 :	-	-	-	-	-
Sodium	mg/L	D	6.75 :	-	-	-	-	-

J = Qualified as estimated during data validation
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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction						
		RR-15 10/9/2003 RR-15-D03N-PD SWR		RR-15 10/10/2003 RR-15-T04N-PS SWR	RR-15 10/10/2003 RR-15-T04N-PD SWR	RR-15 10/10/2003 RR-15-T04N-P3S SWR	RR-15 10/10/2003 RR-15-T04N-P3D SWR	RR-15 10/10/2003 RR-15-T04N-P2S SWR
Thallium	mg/L	D	<0.0001 :	-	-	-	-	-
Vanadium	mg/L	D	<0.0001 :	-	-	-	-	-
Zinc	mg/L	D	0.826 :	-	-	-	-	-

J = Qualified as estimated during data validation
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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID	
			RR-15 10/10/2003 RR-15-T04N-P2D		RR-15 10/10/2003 RR-15-T04N-P1S		RR-15 10/10/2003 RR-15-T04N-P1D		RR-15 10/10/2003 RR-15-D04N-PS		RR-15 10/10/2003 RR-15-D04N-PD		RR-15 3/23/2004 RR-15-T01N-P3S	
			SWR		SWR		SWR		SWR		SWR		SWR	
Field Measurements														
DO	mg/L	T	4.32	:	4.02	:	3.84	:	-		-		12.2	:
EH	millivolts	T	178.9	:	231.3	:	174.6	:	-		-		183.	:
pH	SU	T	5.9	:	5.9	:	7.1	:	-		-		7.1	:
Specific Conductance	uS/cm	T	282.	:	407.	:	344.	:	-		-		-	
Specific Conductance	mS/cm	T	-		-		-		-		-		0.252	:
Temperature	Celsius	T	10.	:	9.8	:	10.	:	-		-		7.1	:
Physical Properties														
Hardness	mg/L	D	-		-		-		188.	:	179.	:	-	
Metals														
Aluminum	mg/L	D	-		-		-		1.	:	0.388	:	-	
Antimony	mg/L	D	-		-		-		<0.0005	:	<0.0005	:	-	
Arsenic	mg/L	D	-		-		-		<0.0002	J	<0.0002	J	-	
Barium	mg/L	D	-		-		-		0.0326	:	0.03	:	-	
Beryllium	mg/L	D	-		-		-		0.00067	:	0.00037	:	-	
Boron	mg/L	D	-		-		-		0.0074	:	<0.0064	:	-	
Cadmium	mg/L	D	-		-		-		0.0012	J	0.00076	J	-	
Calcium	mg/L	D	-		-		-		54.6	:	51.8	:	-	
Chromium	mg/L	D	-		-		-		<0.0013	:	<0.0013	:	-	
Cobalt	mg/L	D	-		-		-		0.0049	:	0.0077	:	-	
Copper	mg/L	D	-		-		-		0.0056	:	0.0021	:	-	
Iron	mg/L	D	-		-		-		<0.03	:	<0.109	:	-	
Lead	mg/L	D	-		-		-		0.0002	:	<0.0002	:	-	
Magnesium	mg/L	D	-		-		-		12.6	:	12.	:	-	
Manganese	mg/L	D	-		-		-		0.646	:	0.663	:	-	
Molybdenum	mg/L	D	-		-		-		<0.0022	:	<0.0051	:	-	
Nickel	mg/L	D	-		-		-		0.0255	:	0.0178	:	-	
Potassium	mg/L	D	-		-		-		<1.18	J	<0.522	J	-	
Selenium	mg/L	D	-		-		-		0.00035	J	0.00039	J	-	
Silver	mg/L	D	-		-		-		<0.0001	:	<0.0001	:	-	
Sodium	mg/L	D	-		-		-		6.06	:	5.32	:	-	
Thallium	mg/L	D	-		-		-		<0.0001	:	<0.0001	:	-	
Vanadium	mg/L	D	-		-		-		<0.0001	:	0.00014	:	-	
Zinc	mg/L	D	-		-		-		0.317	:	0.755	:	-	

J = Qualified as estimated during data validation
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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID / Exposure Area					
			RR-15 3/23/2004 RR-15-T01N-P2S SWR	RR-15 3/23/2004 RR-15-T01N-P1S SWR	RR-15 3/24/2004 RR-15-T02N-P3S SWR	RR-15 3/24/2004 RR-15-T02N-P2S SWR	RR-15 3/24/2004 RR-15-T02N-P1S SWR	RR-15 3/25/2004 RR-15-T03N-PS SWR
Field Measurements								
DO	mg/L	T	11.6 :	6.82 :	-	-	-	-
EH	millivolts	T	202. :	242. :	164. :	188. :	213. :	-
pH	SU	T	6.62 :	6.59 :	6.9 :	6.5 :	7. :	-
Specific Conductance	mS/cm	T	0.262 :	0.344 :	0.261 :	0.275 :	0.379 :	-
Temperature	Celsius	T	6.3 :	5.58 :	6.9 :	6.8 :	6.7 :	-
General Chemistry								
Fluoride	mg/L	T	-	-	-	-	-	0.98 :
Sulfate	mg/L	T	-	-	-	-	-	140. :
Total Organic Carbon	mg/L	T	-	-	-	-	-	4.2 :

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID	
			RR-15 3/25/2004 RR-15-T03N-P3S		RR-15 3/25/2004 RR-15-T03N-P2S		RR-15 3/25/2004 RR-15-T03N-P1S		RR-15 3/25/2004 RR-15-T02N-PS		RR-15 3/25/2004 RR-15-T01N-PS		RR-15 3/25/2004 RR-15-D03N-PS	
			SWR		SWR		SWR		SWR		SWR		SWR	
Field Measurements														
DO	mg/L	T	8.8	:	7.97	:	7.8	:	-		-		-	
EH	millivolts	T	192.	:	207.	:	232.	:	-		-		-	
pH	SU	T	6.73	:	6.4	:	6.4	:	-		-		-	
Specific Conductance	mS/cm	T	0.271	:	0.294	:	0.407	:	-		-		-	
Temperature	Celsius	T	6.44	:	6.2	:	6.1	:	-		-		-	
General Chemistry														
Fluoride	mg/L	T	-		-		-		1.1	:	0.91	:	-	
Sulfate	mg/L	T	-		-		-		133.	:	128.	:	-	
Total Organic Carbon	mg/L	T	-		-		-		8.	:	7.7	:	-	
Physical Properties														
Hardness	mg/L	D	-		-		-		-		-		161.	:
Metals														
Aluminum	mg/L	D	-		-		-		-		-		0.432	:
Antimony	mg/L	D	-		-		-		-		-		<0.0004	J
Arsenic	mg/L	D	-		-		-		-		-		<0.0002	:
Barium	mg/L	D	-		-		-		-		-		0.027	:
Beryllium	mg/L	D	-		-		-		-		-		<0.0002	J
Boron	mg/L	D	-		-		-		-		-		<0.0055	:
Cadmium	mg/L	D	-		-		-		-		-		0.0003	:
Calcium	mg/L	D	-		-		-		-		-		47.	:
Chromium	mg/L	D	-		-		-		-		-		<0.0012	J
Cobalt	mg/L	D	-		-		-		-		-		0.012	:
Copper	mg/L	D	-		-		-		-		-		0.0088	:
Iron	mg/L	D	-		-		-		-		-		<0.0192	J
Lead	mg/L	D	-		-		-		-		-		<0.0004	:
Magnesium	mg/L	D	-		-		-		-		-		10.5	:
Manganese	mg/L	D	-		-		-		-		-		0.103	:
Molybdenum	mg/L	D	-		-		-		-		-		0.0023	:
Nickel	mg/L	D	-		-		-		-		-		0.0119	:
Potassium	mg/L	D	-		-		-		-		-		0.962	J
Selenium	mg/L	D	-		-		-		-		-		<0.0007	:
Silver	mg/L	D	-		-		-		-		-		<0.0001	J
Sodium	mg/L	D	-		-		-		-		-		6.7	:

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T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-15 3/25/2004 RR-15-T03N-P3S SWR	RR-15 3/25/2004 RR-15-T03N-P2S SWR	RR-15 3/25/2004 RR-15-T03N-P1S SWR	RR-15 3/25/2004 RR-15-T02N-PS SWR	RR-15 3/25/2004 RR-15-T01N-PS SWR	RR-15 3/25/2004 RR-15-D03N-PS SWR
Thallium	mg/L	D	-	-	-	-	-	<0.0001 :
Vanadium	mg/L	D	-	-	-	-	-	<0.00053 :
Zinc	mg/L	D	-	-	-	-	-	0.0961 :

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID	
			RR-15 3/25/2004 RR-15-D02N-PS		RR-15 3/25/2004 RR-15-D01N-PS		RR-5BB 10/6/2003 RR-5BB-T00N-PS		RR-5BB 10/6/2003 RR-5BB-T00N-PD		RR-5BB 10/6/2003 RR-5BB-T00N-P3S		RR-5BB 10/6/2003 RR-5BB-T00N-P3D	
			SWR		SWR		RURR		RURR		RURR		RURR	
Field Measurements														
EH	millivolts	T	-		-		-		-		401.	:	390.	:
pH	SU	T	-		-		-		-		4.3	:	4.4	:
Specific Conductance	uS/cm	T	-		-		-		-		680.	:	678.	:
Temperature	Celsius	T	-		-		-		-		8.6	:	8.6	:
General Chemistry														
Fluoride	mg/L	T	-		-		1.4	:	1.4	:	-		-	
Sulfate	mg/L	T	-		-		360.	J	400.	J	-		-	
Total Organic Carbon	mg/L	T	-		-		4.7	:	3.7	:	-		-	
Physical Properties														
Hardness	mg/L	D	161.	:	176.	:	-		-		-		-	
Metals														
Aluminum	mg/L	D	<0.37	:	<0.323	:	-		-		-		-	
Antimony	mg/L	D	<0.0004	J	<0.0004	J	-		-		-		-	
Arsenic	mg/L	D	<0.0002	:	<0.0002	:	-		-		-		-	
Barium	mg/L	D	0.026	:	0.0254	:	-		-		-		-	
Beryllium	mg/L	D	<0.0002	J	<0.0002	J	-		-		-		-	
Boron	mg/L	D	<0.0067	:	<0.0061	:	-		-		-		-	
Cadmium	mg/L	D	0.00027	:	0.00028	:	-		-		-		-	
Calcium	mg/L	D	47.1	:	51.6	:	-		-		-		-	
Chromium	mg/L	D	<0.0014	:	<0.0008	J	-		-		-		-	
Cobalt	mg/L	D	0.0187	:	0.0131	:	-		-		-		-	
Copper	mg/L	D	0.002	J	<0.003	:	-		-		-		-	
Iron	mg/L	D	<0.0299	:	<0.049	:	-		-		-		-	
Lead	mg/L	D	<0.0004	:	<0.0004	:	-		-		-		-	
Magnesium	mg/L	D	10.5	:	11.4	:	-		-		-		-	
Manganese	mg/L	D	0.127	:	0.136	:	-		-		-		-	
Molybdenum	mg/L	D	<0.0027	:	<0.0056	:	-		-		-		-	
Nickel	mg/L	D	0.0116	:	0.0125	:	-		-		-		-	
Potassium	mg/L	D	1.1	:	1.6	:	-		-		-		-	
Selenium	mg/L	D	<0.0007	:	<0.0007	:	-		-		-		-	
Silver	mg/L	D	<0.0001	J	<0.0001	:	-		-		-		-	
Sodium	mg/L	D	6.93	:	7.37	:	-		-		-		-	
Thallium	mg/L	D	<0.0001	:	<0.0001	:	-		-		-		-	

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction													
		RR-15 3/25/2004 RR-15-D02N-PS SWR		RR-15 3/25/2004 RR-15-D01N-PS SWR		RR-5BB 10/6/2003 RR-5BB-T00N-PS RURR		RR-5BB 10/6/2003 RR-5BB-T00N-PD RURR		RR-5BB 10/6/2003 RR-5BB-T00N-P3S RURR		RR-5BB 10/6/2003 RR-5BB-T00N-P3D RURR	
Vanadium	mg/L	D	<0.00053 :		0.00026 :		-		-		-		-		
Zinc	mg/L	D	0.0892 :		0.0765 :		-		-		-		-		

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T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID	
			RR-5BB 10/6/2003 RR-5BB-T00N-P2S		RR-5BB 10/6/2003 RR-5BB-T00N-P2D		RR-5BB 10/6/2003 RR-5BB-T00N-P1S		RR-5BB 10/6/2003 RR-5BB-T00N-P1D		RR-5BB 10/6/2003 RR-5BB-D00N-PS		RR-5BB 10/6/2003 RR-5BB-D00N-PD	
			RURR		RURR		RURR		RURR		RURR		RURR	
Field Measurements														
EH	millivolts	T	384.	:	373.	:	382.	:	326.	:	-		-	
pH	SU	T	4.6	:	4.4	:	4.3	:	4.6	:	-		-	
Specific Conductance	uS/cm	T	561.	:	671.	:	365.	:	673.	:	-		-	
Temperature	Celsius	T	8.7	:	8.7	:	8.9	:	8.2	:	-		-	
Physical Properties														
Hardness	mg/L	D	-		-		-		-		336.	:	362.	:
Metals														
Aluminum	mg/L	D	-		-		-		-		12.5	:	12.6	:
Antimony	mg/L	D	-		-		-		-		<0.0005	J	<0.0005	J
Arsenic	mg/L	D	-		-		-		-		<0.0002	J	<0.0002	J
Barium	mg/L	D	-		-		-		-		0.0154	:	0.0188	:
Beryllium	mg/L	D	-		-		-		-		<0.0026	:	<0.0028	:
Boron	mg/L	D	-		-		-		-		<0.0063	:	<0.0063	:
Cadmium	mg/L	D	-		-		-		-		0.0023	J	0.0024	J
Calcium	mg/L	D	-		-		-		-		90.3	:	97.2	:
Chromium	mg/L	D	-		-		-		-		0.0016	:	0.002	:
Cobalt	mg/L	D	-		-		-		-		0.0394	:	0.0425	:
Copper	mg/L	D	-		-		-		-		0.0559	:	0.0591	:
Iron	mg/L	D	-		-		-		-		<0.131	:	<0.156	:
Lead	mg/L	D	-		-		-		-		0.00021	:	<0.0002	:
Magnesium	mg/L	D	-		-		-		-		26.8	:	28.9	:
Manganese	mg/L	D	-		-		-		-		1.92	:	2.08	:
Molybdenum	mg/L	D	-		-		-		-		<0.0002	:	<0.0002	:
Nickel	mg/L	D	-		-		-		-		0.105	:	0.11	:
Potassium	mg/L	D	-		-		-		-		1.22	J	1.32	J
Selenium	mg/L	D	-		-		-		-		0.0013	J	0.0011	J
Silver	mg/L	D	-		-		-		-		<0.0001	:	<0.0001	:
Sodium	mg/L	D	-		-		-		-		7.8	:	8.48	:
Thallium	mg/L	D	-		-		-		-		<0.0001	:	<0.0001	:
Vanadium	mg/L	D	-		-		-		-		<0.0001	:	<0.0001	:
Zinc	mg/L	D	-		-		-		-		0.637	:	0.787	:

J = Qualified as estimated during data validation
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T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID											
			RR-5BB 10/7/2003 RR-5BB-T01N-PS		RR-5BB 10/7/2003 RR-5BB-T01N-PD		RR-5BB 10/7/2003 RR-5BB-T01N-P3S		RR-5BB 10/7/2003 RR-5BB-T01N-P3D		RR-5BB 10/7/2003 RR-5BB-T01N-P2S		RR-5BB 10/7/2003 RR-5BB-T01N-P2D	
			RURR		RURR		RURR		RURR		RURR		RURR	
Field Measurements														
DO	mg/L	T	-		-		10.	:	9.5	:	11.	:	8.	:
EH	millivolts	T	-		-		387.	:	380.	:	364.	:	368.	:
pH	SU	T	-		-		4.3	:	4.3	:	4.5	:	4.4	:
Specific Conductance	uS/cm	T	-		-		655.	:	653.	:	589.	:	640.	:
Temperature	Celsius	T	-		-		8.2	:	8.1	:	8.5	:	8.1	:
General Chemistry														
Fluoride	mg/L	T	1.3	:	1.3	:	-		-		-		-	
Sulfate	mg/L	T	390.	J	406.	J	-		-		-		-	
Total Organic Carbon	mg/L	T	3.9	:	3.7	:	-		-		-		-	

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID	
			RR-5BB 10/7/2003 RR-5BB-T01N-P1S		RR-5BB 10/7/2003 RR-5BB-T01N-P1D		RR-5BB 10/7/2003 RR-5BB-D01N-PS		RR-5BB 10/7/2003 RR-5BB-D01N-PD		RR-5BB 10/8/2003 RR-5BB-T02N-PS		RR-5BB 10/8/2003 RR-5BB-T02N-PD	
			RURR		RURR		RURR		RURR		RURR		RURR	
Field Measurements														
DO	mg/L	T	10.	:	7.6	:	-		-		-		-	
EH	millivolts	T	331.	:	276.	:	-		-		-		-	
pH	SU	T	4.5	:	5.	:	-		-		-		-	
Specific Conductance	uS/cm	T	655.	:	657.	:	-		-		-		-	
Temperature	Celsius	T	8.1	:	8.3	:	-		-		-		-	
General Chemistry														
Fluoride	mg/L	T	-		-		-		-		1.3	:	1.4	:
Sulfate	mg/L	T	-		-		-		-		357.	J	367.	J
Total Organic Carbon	mg/L	T	-		-		-		-		1.6	:	1.5	:
Physical Properties														
Hardness	mg/L	D	-		-		352.	:	355.	:	-		-	
Metals														
Aluminum	mg/L	D	-		-		12.2	:	12.8	:	-		-	
Antimony	mg/L	D	-		-		<0.0005	:	<0.0005	:	-		-	
Arsenic	mg/L	D	-		-		<0.0002	J	<0.0002	J	-		-	
Barium	mg/L	D	-		-		0.0164	:	0.0157	:	-		-	
Beryllium	mg/L	D	-		-		<0.0027	:	<0.003	:	-		-	
Boron	mg/L	D	-		-		<0.0063	:	<0.0063	:	-		-	
Cadmium	mg/L	D	-		-		0.0023	J	0.0023	J	-		-	
Calcium	mg/L	D	-		-		94.5	:	95.3	:	-		-	
Chromium	mg/L	D	-		-		0.0016	:	0.0017	:	-		-	
Cobalt	mg/L	D	-		-		0.0424	:	0.0425	:	-		-	
Copper	mg/L	D	-		-		0.0574	:	0.0775	:	-		-	
Iron	mg/L	D	-		-		<0.0671	:	<0.0659	:	-		-	
Lead	mg/L	D	-		-		0.00021	:	<0.0002	:	-		-	
Magnesium	mg/L	D	-		-		28.2	:	28.4	:	-		-	
Manganese	mg/L	D	-		-		2.02	:	2.04	:	-		-	
Molybdenum	mg/L	D	-		-		<0.0002	:	<0.0002	:	-		-	
Nickel	mg/L	D	-		-		0.106	:	0.107	:	-		-	
Potassium	mg/L	D	-		-		1.23	J	1.2	J	-		-	
Selenium	mg/L	D	-		-		0.00086	J	0.0013	J	-		-	
Silver	mg/L	D	-		-		<0.0001	:	<0.0001	:	-		-	
Sodium	mg/L	D	-		-		8.2	:	8.51	:	-		-	

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R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-5BB 10/7/2003 RR-5BB-T01N-P1S RURR	RR-5BB 10/7/2003 RR-5BB-T01N-P1D RURR	RR-5BB 10/7/2003 RR-5BB-D01N-PS RURR	RR-5BB 10/7/2003 RR-5BB-D01N-PD RURR	RR-5BB 10/8/2003 RR-5BB-T02N-PS RURR	RR-5BB 10/8/2003 RR-5BB-T02N-PD RURR
Thallium	mg/L	D	-	-	<0.0001 :	<0.0001 :	-	-
Vanadium	mg/L	D	-	-	<0.0001 :	<0.0001 :	-	-
Zinc	mg/L	D	-	-	0.65 :	0.77 :	-	-

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID					
			RR-5BB 10/8/2003 RR-5BB-T02N-P3S	RR-5BB 10/8/2003 RR-5BB-T02N-P3D	RR-5BB 10/8/2003 RR-5BB-T02N-P2S	RR-5BB 10/8/2003 RR-5BB-T02N-P2D	RR-5BB 10/8/2003 RR-5BB-T02N-P1S	RR-5BB 10/8/2003 RR-5BB-T02N-P1D
			RURR	RURR	RURR	RURR	RURR	RURR
Field Measurements								
DO	mg/L	T	6.7 :	5.8 :	7. :	6.2 :	6. :	5.7 :
EH	millivolts	T	371. :	365. :	332. :	338. :	310. :	260. :
pH	SU	T	3.8 :	3.8 :	4.1 :	4. :	4. :	4.8 :
Specific Conductance	uS/cm	T	673. :	678. :	559. :	665. :	677. :	699. :
Temperature	Celsius	T	8.8 :	8.9 :	9. :	8.9 :	8.9 :	9.3 :

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area / Fraction	Site ID / Sample Date / Sample ID											
			RR-5BB 10/8/2003 RR-5BB-D02N-PS		RR-5BB 10/8/2003 RR-5BB-D02N-PD		RR-5BB 10/9/2003 RR-5BB-T03N-PS		RR-5BB 10/9/2003 RR-5BB-T03N-PD		RR-5BB 10/9/2003 RR-5BB-T03N-P3S		RR-5BB 10/9/2003 RR-5BB-T03N-P3D	
			RURR		RURR		RURR		RURR		RURR		RURR	
Field Measurements														
DO	mg/L	T	-		-		-		-		5.02	:	4.42	:
EH	millivolts	T	-		-		-		-		401.5	:	391.8	:
pH	SU	T	-		-		-		-		4.13	:	4.26	:
Specific Conductance	uS/cm	T	-		-		-		-		602.	:	598.	:
Temperature	Celsius	T	-		-		-		-		9.1	:	8.8	:
General Chemistry														
Fluoride	mg/L	T	-		-		1.4	:	1.4	:	-		-	
Sulfate	mg/L	T	-		-		406.	J	358.	J	-		-	
Total Organic Carbon	mg/L	T	-		-		1.9	:	1.9	:	-		-	
Physical Properties														
Hardness	mg/L	D	337.	:	346.	:	-		-		-		-	
Metals														
Aluminum	mg/L	D	12.8	:	13.1	:	-		-		-		-	
Antimony	mg/L	D	<0.0005	:	<0.0013	:	-		-		-		-	
Arsenic	mg/L	D	<0.0002	J	<0.0002	J	-		-		-		-	
Barium	mg/L	D	0.014	:	0.0164	:	-		-		-		-	
Beryllium	mg/L	D	0.0029	J	0.0027	J	-		-		-		-	
Boron	mg/L	D	0.0065	:	0.008	:	-		-		-		-	
Cadmium	mg/L	D	0.0021	J	0.0021	J	-		-		-		-	
Calcium	mg/L	D	90.2	:	93.1	:	-		-		-		-	
Chromium	mg/L	D	0.0013	:	<0.0011	:	-		-		-		-	
Cobalt	mg/L	D	0.042	:	0.0404	:	-		-		-		-	
Copper	mg/L	D	0.0654	:	0.0681	:	-		-		-		-	
Iron	mg/L	D	0.119	:	<0.0966	:	-		-		-		-	
Lead	mg/L	D	0.00027	:	0.00027	:	-		-		-		-	
Magnesium	mg/L	D	27.2	:	27.5	:	-		-		-		-	
Manganese	mg/L	D	1.97	:	1.98	:	-		-		-		-	
Molybdenum	mg/L	D	<0.0002	J	<0.0002	J	-		-		-		-	
Nickel	mg/L	D	0.101	:	0.104	:	-		-		-		-	
Potassium	mg/L	D	1.16	:	1.24	:	-		-		-		-	
Selenium	mg/L	D	0.0015	J	0.0016	J	-		-		-		-	
Silver	mg/L	D	<0.0001	:	<0.0001	:	-		-		-		-	
Sodium	mg/L	D	7.41	:	8.38	:	-		-		-		-	

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID											
			RR-5BB 10/8/2003 RR-5BB-D02N-PS		RR-5BB 10/8/2003 RR-5BB-D02N-PD		RR-5BB 10/9/2003 RR-5BB-T03N-PS		RR-5BB 10/9/2003 RR-5BB-T03N-PD		RR-5BB 10/9/2003 RR-5BB-T03N-P3S		RR-5BB 10/9/2003 RR-5BB-T03N-P3D	
			RURR		RURR		RURR		RURR		RURR		RURR	
Thallium	mg/L	D	<0.0001	:	<0.0001	:	-		-		-		-	
Vanadium	mg/L	D	<0.0001	:	<0.0001	:	-		-		-		-	
Zinc	mg/L	D	0.597	:	0.74	:	-		-		-		-	

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R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID	
			RR-5BB 10/9/2003 RR-5BB-T03N-P2S		RR-5BB 10/9/2003 RR-5BB-T03N-P2D		RR-5BB 10/9/2003 RR-5BB-T03N-P1S		RR-5BB 10/9/2003 RR-5BB-T03N-P1D		RR-5BB 10/9/2003 RR-5BB-D03N-PS		RR-5BB 10/9/2003 RR-5BB-D03N-PD	
			RURR		RURR		RURR		RURR		RURR		RURR	
Field Measurements														
DO	mg/L	T	4.56	:	3.68	:	3.71	:	3.58	:	-		-	
EH	millivolts	T	382.9	:	381.4	:	371.3	:	121.	:	-		-	
pH	SU	T	4.	:	4.23	:	4.06	:	4.43	:	-		-	
Specific Conductance	uS/cm	T	577.	:	576.	:	596.	:	605.	:	-		-	
Temperature	Celsius	T	9.11	:	8.39	:	8.64	:	8.98	:	-		-	
Physical Properties														
Hardness	mg/L	D	-		-		-		-		348.	:	345.	:
Metals														
Aluminum	mg/L	D	-		-		-		-		13.2	:	12.9	:
Antimony	mg/L	D	-		-		-		-		<0.0015	:	<0.0005	:
Arsenic	mg/L	D	-		-		-		-		<0.0002	J	<0.0002	J
Barium	mg/L	D	-		-		-		-		0.0159	:	0.0157	:
Beryllium	mg/L	D	-		-		-		-		0.0027	J	0.0028	J
Boron	mg/L	D	-		-		-		-		0.0083	:	<0.0064	:
Cadmium	mg/L	D	-		-		-		-		0.0023	J	0.0022	J
Calcium	mg/L	D	-		-		-		-		93.5	:	93.5	:
Chromium	mg/L	D	-		-		-		-		<0.0011	:	<0.0013	:
Cobalt	mg/L	D	-		-		-		-		0.0456	:	0.0468	:
Copper	mg/L	D	-		-		-		-		0.0664	:	0.0666	:
Iron	mg/L	D	-		-		-		-		<0.117	:	0.102	J
Lead	mg/L	D	-		-		-		-		0.00036	:	0.00031	:
Magnesium	mg/L	D	-		-		-		-		27.8	:	27.1	:
Manganese	mg/L	D	-		-		-		-		1.99	:	2.09	:
Molybdenum	mg/L	D	-		-		-		-		<0.0002	J	<0.0002	J
Nickel	mg/L	D	-		-		-		-		0.105	:	0.103	:
Potassium	mg/L	D	-		-		-		-		1.28	:	0.797	:
Selenium	mg/L	D	-		-		-		-		0.0016	J	0.0014	J
Silver	mg/L	D	-		-		-		-		<0.0001	:	<0.0001	:
Sodium	mg/L	D	-		-		-		-		8.13	:	7.19	:
Thallium	mg/L	D	-		-		-		-		<0.0001	:	<0.0001	:
Vanadium	mg/L	D	-		-		-		-		<0.0001	:	0.00013	:
Zinc	mg/L	D	-		-		-		-		0.626	:	0.751	:

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID											
			RR-5BB 10/10/2003 RR-5BB-T04N-PS		RR-5BB 10/10/2003 RR-5BB-T04N-PD		RR-5BB 10/10/2003 RR-5BB-T04N-P3S		RR-5BB 10/10/2003 RR-5BB-T04N-P3D		RR-5BB 10/10/2003 RR-5BB-T04N-P2S		RR-5BB 10/10/2003 RR-5BB-T04N-P2D	
			RURR		RURR		RURR		RURR		RURR		RURR	
Field Measurements														
DO	mg/L	T	-		-		5.61	:	6.3	:	6.16	:	5.72	:
EH	millivolts	T	-		-		404.6	:	399.3	:	391.9	:	383.1	:
pH	SU	T	-		-		4.1	:	4.1	:	4.2	:	4.2	:
Specific Conductance	uS/cm	T	-		-		592.	:	558.	:	533.	:	549.	:
Temperature	Celsius	T	-		-		8.3	:	8.	:	8.2	:	8.1	:
General Chemistry														
Fluoride	mg/L	T	1.3	:	1.4	:	-		-		-		-	
Sulfate	mg/L	T	434.	J	376.	J	-		-		-		-	
Total Organic Carbon	mg/L	T	2.1	:	2.	:	-		-		-		-	

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-5BB 10/10/2003 RR-5BB-T04N-P1S RURR		RR-5BB 10/10/2003 RR-5BB-T04N-P1D RURR		RR-5BB 10/10/2003 RR-5BB-D04N-PS RURR		RR-5BB 10/10/2003 RR-5BB-D04N-PD RURR		RR-5BB 3/23/2004 RR-5BB-T01N-P3S RURR		RR-5BB 3/23/2004 RR-5BB-T01N-P2S RURR	
Field Measurements														
DO	mg/L	T	5.82	:	6.16	:	-		-		4.34	:	4.47	:
EH	millivolts	T	369.8	:	308.6	:	-		-		298.	:	288.	:
pH	SU	T	4.2	:	4.5	:	-		-		4.5	:	4.55	:
Specific Conductance	mS/cm	T	-		-		-		-		0.619	:	0.6	:
Specific Conductance	uS/cm	T	561.	:	566.	:	-		-		-		-	
Temperature	Celsius	T	8.1	:	8.3	:	-		-		7.56	:	7.53	:
Physical Properties														
Hardness	mg/L	D	-		-		354.	:	352.	:	-		-	
Metals														
Aluminum	mg/L	D	-		-		13.6	:	13.3	:	-		-	
Antimony	mg/L	D	-		-		<0.0005	:	<0.0005	:	-		-	
Arsenic	mg/L	D	-		-		<0.0002	J	<0.0002	J	-		-	
Barium	mg/L	D	-		-		0.0175	:	0.0175	:	-		-	
Beryllium	mg/L	D	-		-		0.0026	J	0.0027	J	-		-	
Boron	mg/L	D	-		-		<0.0064	:	0.0067	:	-		-	
Cadmium	mg/L	D	-		-		0.0021	J	0.0022	J	-		-	
Calcium	mg/L	D	-		-		95.6	:	95.	:	-		-	
Chromium	mg/L	D	-		-		0.0019	:	0.0024	:	-		-	
Cobalt	mg/L	D	-		-		0.0482	:	0.0479	:	-		-	
Copper	mg/L	D	-		-		0.0612	:	0.0635	:	-		-	
Iron	mg/L	D	-		-		0.0707	:	<0.0777	:	-		-	
Lead	mg/L	D	-		-		0.0004	:	0.00029	:	-		-	
Magnesium	mg/L	D	-		-		28.	:	27.8	:	-		-	
Manganese	mg/L	D	-		-		2.14	:	2.12	:	-		-	
Molybdenum	mg/L	D	-		-		<0.0012	J	<0.0024	:	-		-	
Nickel	mg/L	D	-		-		0.113	:	0.12	:	-		-	
Potassium	mg/L	D	-		-		<0.942	:	<1.26	J	-		-	
Selenium	mg/L	D	-		-		0.0012	J	0.0012	J	-		-	
Silver	mg/L	D	-		-		<0.0001	:	<0.0001	:	-		-	
Sodium	mg/L	D	-		-		7.99	:	7.66	:	-		-	
Thallium	mg/L	D	-		-		<0.0001	:	<0.0001	:	-		-	
Vanadium	mg/L	D	-		-		<0.0001	:	<0.0001	:	-		-	
Zinc	mg/L	D	-		-		0.638	:	0.739	:	-		-	

J = Qualified as estimated during data validation
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T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID	
			RR-5BB 3/23/2004 RR-5BB-T01N-P1S		RR-5BB 3/24/2004 RR-5BB-T02N-P3S		RR-5BB 3/24/2004 RR-5BB-T02N-P2S		RR-5BB 3/24/2004 RR-5BB-T02N-P1S		RR-5BB 3/25/2004 RR-5BB-T03N-PS		RR-5BB 3/25/2004 RR-5BB-T03N-P3S	
			RURR		RURR		RURR		RURR		RURR		RURR	
Field Measurements														
DO	mg/L	T	4.11	:	-		-		-		-		6.5	:
EH	millivolts	T	277.	:	321.	:	302.	:	269.	:	-		321.	:
pH	SU	T	4.65	:	4.24	:	4.25	:	4.72	:	-		4.32	:
Specific Conductance	mS/cm	T	0.625	:	0.644	:	0.629	:	0.639	:	-		0.681	:
Temperature	Celsius	T	7.97	:	7.44	:	7.7	:	7.78	:	-		7.85	:
General Chemistry														
Fluoride	mg/L	T	-		-		-		-		1.3	J	-	
Sulfate	mg/L	T	-		-		-		-		391.	:	-	
Total Organic Carbon	mg/L	T	-		-		-		-		2.7	:	-	

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID	
			RR-5BB 3/25/2004 RR-5BB-T03N-P2S		RR-5BB 3/25/2004 RR-5BB-T03N-P1S		RR-5BB 3/25/2004 RR-5BB-T02N-PS		RR-5BB 3/25/2004 RR-5BB-T01N-PS		RR-5BB 3/25/2004 RR-5BB-D03N-PS		RR-5BB 3/25/2004 RR-5BB-D02N-PS	
			RURR		RURR		RURR		RURR		RURR		RURR	
Field Measurements														
DO	mg/L	T	6.71	:	6.63	:	-		-		-		-	
EH	millivolts	T	314.	:	289.	:	-		-		-		-	
pH	SU	T	4.34	:	4.61	:	-		-		-		-	
Specific Conductance	mS/cm	T	0.663	:	0.68	:	-		-		-		-	
Temperature	Celsius	T	7.87	:	8.27	:	-		-		-		-	
General Chemistry														
Fluoride	mg/L	T	-		-		1.3	J	1.3	J	-		-	
Sulfate	mg/L	T	-		-		377.	:	393.	:	-		-	
Total Organic Carbon	mg/L	T	-		-		3.2	:	3.5	:	-		-	
Physical Properties														
Hardness	mg/L	D	-		-		-		-		343.	:	312.	:
Metals														
Aluminum	mg/L	D	-		-		-		-		13.	:	13.3	:
Antimony	mg/L	D	-		-		-		-		<0.0004	J	<0.0004	J
Arsenic	mg/L	D	-		-		-		-		<0.0002	:	<0.0002	:
Barium	mg/L	D	-		-		-		-		0.013	:	0.0097	:
Beryllium	mg/L	D	-		-		-		-		0.0026	:	0.0023	:
Boron	mg/L	D	-		-		-		-		<0.0062	:	<0.0045	:
Cadmium	mg/L	D	-		-		-		-		0.0022	:	0.0022	:
Calcium	mg/L	D	-		-		-		-		92.4	:	84.	:
Chromium	mg/L	D	-		-		-		-		<0.002	J	<0.0021	J
Cobalt	mg/L	D	-		-		-		-		0.0554	:	0.051	:
Copper	mg/L	D	-		-		-		-		0.0566	:	0.0569	:
Iron	mg/L	D	-		-		-		-		<0.0825	J	<0.0741	J
Lead	mg/L	D	-		-		-		-		<0.0004	:	<0.0004	:
Magnesium	mg/L	D	-		-		-		-		27.2	:	24.9	:
Manganese	mg/L	D	-		-		-		-		2.04	:	1.94	:
Molybdenum	mg/L	D	-		-		-		-		0.0011	:	<0.001	:
Nickel	mg/L	D	-		-		-		-		0.106	:	0.105	:
Potassium	mg/L	D	-		-		-		-		1.34	:	1.01	J
Selenium	mg/L	D	-		-		-		-		0.0014	:	0.0013	:
Silver	mg/L	D	-		-		-		-		<0.0001	J	<0.0001	J
Sodium	mg/L	D	-		-		-		-		8.	:	8.08	:

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T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-5BB 3/25/2004 RR-5BB-T03N-P2S RURR	RR-5BB 3/25/2004 RR-5BB-T03N-P1S RURR	RR-5BB 3/25/2004 RR-5BB-T02N-PS RURR	RR-5BB 3/25/2004 RR-5BB-T01N-PS RURR	RR-5BB 3/25/2004 RR-5BB-D03N-PS RURR	RR-5BB 3/25/2004 RR-5BB-D02N-PS RURR
Thallium	mg/L	D	-	-	-	-	<0.0001 :	<0.0001 :
Vanadium	mg/L	D	-	-	-	-	<0.00058 :	<0.00056 :
Zinc	mg/L	D	-	-	-	-	0.585 :	0.55 :

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area	Fraction	RR-5BB 3/25/2004 RR-5BB-D01N-PS RURR	RR-5BB 9/27/2004 RR-5BB-T00N-PS RURR	RR-5BB 9/27/2004 RR-5BB-T00N-P3S RURR	RR-5BB 9/27/2004 RR-5BB-T00N-P2S RURR	RR-5BB 9/27/2004 RR-5BB-T00N-P1S RURR	RR-5BB 9/27/2004 RR-5BB-D00N-PS RURR
Field Measurements									
DO	mg/L		T	-	-	8.2 :	8.3 :	9.2 :	-
pH	SU		T	-	-	4.2 :	4.1 :	4.7 :	-
Specific Conductance	mS/cm		T	-	-	0.696 :	0.694 :	0.695 :	-
Temperature	Celsius		T	-	-	8.8 :	8.6 :	9.2 :	-
General Chemistry									
Bicarbonate (as CaCO3)	mg/L		T	-	<1. :	-	-	-	-
Carbonate (as CaCO3)	mg/L		T	-	<1. :	-	-	-	-
Dissolved Organic Carbon	mg/L		D	-	-	-	-	-	1.1 :
Fluoride	mg/L		T	-	1.4 :	-	-	-	-
Hydroxide (as CaCO3)	mg/L		T	-	<1. :	-	-	-	-
Sulfate	mg/L		T	-	398. :	-	-	-	-
Total Alkalinity	mg/L		T	-	<1. :	-	-	-	-
Total Organic Carbon	mg/L		T	-	2.1 :	-	-	-	-
Physical Properties									
Hardness	mg/L		D	335. :	-	-	-	-	324. :
Metals									
Aluminum	mg/L		D	12.6 :	-	-	-	-	11.2 :
Antimony	mg/L		D	<0.0004 J	-	-	-	-	<0.0014 :
Arsenic	mg/L		D	<0.0002 :	-	-	-	-	<0.0001 :
Barium	mg/L		D	0.0116 :	-	-	-	-	0.0111 :
Beryllium	mg/L		D	0.0024 :	-	-	-	-	0.0026 :
Boron	mg/L		D	<0.0048 :	-	-	-	-	<0.0069 :
Cadmium	mg/L		D	0.0024 :	-	-	-	-	0.002 :
Calcium	mg/L		D	90.2 :	-	-	-	-	87.8 :
Chromium	mg/L		D	<0.0008 J	-	-	-	-	0.0019 :
Cobalt	mg/L		D	0.0494 :	-	-	-	-	0.0362 :
Copper	mg/L		D	0.0566 :	-	-	-	-	0.0543 :
Iron	mg/L		D	<0.0979 :	-	-	-	-	<0.123 :
Lead	mg/L		D	0.00061 :	-	-	-	-	0.00033 :
Magnesium	mg/L		D	26.8 :	-	-	-	-	25.4 :
Manganese	mg/L		D	1.91 :	-	-	-	-	1.77 :
Molybdenum	mg/L		D	<0.0026 :	-	-	-	-	<0.0025 :
Nickel	mg/L		D	0.0988 :	-	-	-	-	0.0947 :

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction						
		RR-5BB 3/25/2004 RR-5BB-D01N-PS RURR	RR-5BB 9/27/2004 RR-5BB-T00N-PS RURR	RR-5BB 9/27/2004 RR-5BB-T00N-P3S RURR	RR-5BB 9/27/2004 RR-5BB-T00N-P2S RURR	RR-5BB 9/27/2004 RR-5BB-T00N-P1S RURR	RR-5BB 9/27/2004 RR-5BB-D00N-PS RURR
Potassium	mg/L	D	1.35 :	-	-	-	-	1.42 :
Selenium	mg/L	D	0.0013 :	-	-	-	-	0.0012 :
Silver	mg/L	D	<0.0001 :	-	-	-	-	<0.0001 :
Sodium	mg/L	D	7.87 :	-	-	-	-	7.75 :
Thallium	mg/L	D	0.00011 :	-	-	-	-	<0.0001 :
Vanadium	mg/L	D	0.00024 :	-	-	-	-	0.0002 :
Zinc	mg/L	D	0.559 :	-	-	-	-	0.523 :

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T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area	Fraction	RR-5BB 9/28/2004 RR-5BB-T01N-PS RURR	RR-5BB 9/28/2004 RR-5BB-T01N-P3S RURR	RR-5BB 9/28/2004 RR-5BB-T01N-P2S RURR	RR-5BB 9/28/2004 RR-5BB-T01N-P1S RURR	RR-5BB 9/28/2004 RR-5BB-D01N-PS RURR	RR-5BB 9/29/2004 RR-5BB-T02N-PS RURR
Field Measurements									
DO	mg/L		T	-	6.9 :	6.4 :	7.3 :	-	-
pH	SU		T	-	4.4 :	4. :	4. :	-	-
Specific Conductance	mS/cm		T	-	0.544 :	0.485 :	0.543 :	-	-
Temperature	Celsius		T	-	7.6 :	7.8 :	7.8 :	-	-
General Chemistry									
Bicarbonate (as CaCO3)	mg/L		T	-	-	-	-	-	<1. :
Carbonate (as CaCO3)	mg/L		T	-	-	-	-	-	<1. :
Dissolved Organic Carbon	mg/L		D	-	-	-	-	<1. :	-
Fluoride	mg/L		T	0.94 :	-	-	-	-	1.7 :
Hydroxide (as CaCO3)	mg/L		T	-	-	-	-	-	<1. :
Sulfate	mg/L		T	205. :	-	-	-	-	406. :
Total Alkalinity	mg/L		T	-	-	-	-	-	<1. :
Total Organic Carbon	mg/L		T	<1. :	-	-	-	-	1. :
Physical Properties									
Hardness	mg/L		D	-	-	-	-	300. :	-
Metals									
Aluminum	mg/L		D	-	-	-	-	11.8 :	-
Antimony	mg/L		D	-	-	-	-	<0.0003 :	-
Arsenic	mg/L		D	-	-	-	-	<0.0001 J	-
Barium	mg/L		D	-	-	-	-	<0.011 :	-
Beryllium	mg/L		D	-	-	-	-	0.0028 :	-
Boron	mg/L		D	-	-	-	-	<0.0069 :	-
Cadmium	mg/L		D	-	-	-	-	0.0019 :	-
Calcium	mg/L		D	-	-	-	-	80.6 :	-
Chromium	mg/L		D	-	-	-	-	<0.0009 :	-
Cobalt	mg/L		D	-	-	-	-	0.0349 :	-
Copper	mg/L		D	-	-	-	-	0.0538 :	-
Iron	mg/L		D	-	-	-	-	<0.0568 :	-
Lead	mg/L		D	-	-	-	-	0.00019 :	-
Magnesium	mg/L		D	-	-	-	-	23.9 :	-
Manganese	mg/L		D	-	-	-	-	1.81 :	-
Molybdenum	mg/L		D	-	-	-	-	<0.0004 :	-
Nickel	mg/L		D	-	-	-	-	0.0986 :	-

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-5BB 9/28/2004 RR-5BB-T01N-PS RURR	RR-5BB 9/28/2004 RR-5BB-T01N-P3S RURR	RR-5BB 9/28/2004 RR-5BB-T01N-P2S RURR	RR-5BB 9/28/2004 RR-5BB-T01N-P1S RURR	RR-5BB 9/28/2004 RR-5BB-D01N-PS RURR	RR-5BB 9/29/2004 RR-5BB-T02N-PS RURR
Potassium	mg/L	D	-	-	-	-	1.25 :	-
Selenium	mg/L	D	-	-	-	-	0.00088 J	-
Silver	mg/L	D	-	-	-	-	<0.0001 J	-
Sodium	mg/L	D	-	-	-	-	7.64 :	-
Thallium	mg/L	D	-	-	-	-	<0.0001 :	-
Vanadium	mg/L	D	-	-	-	-	<0.0001 J	-
Zinc	mg/L	D	-	-	-	-	0.531 :	-

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T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID					
			RR-5BB 9/29/2004 RR-5BB-T02N-P3S	RR-5BB 9/29/2004 RR-5BB-T02N-P2S	RR-5BB 9/29/2004 RR-5BB-T02N-P1S	RR-5BB 9/29/2004 RR-5BB-D02N-PS	RR-5BB 9/30/2004 RR-5BB-T03N-PS	RR-5BB 9/30/2004 RR-5BB-T03N-P3S
			RURR	RURR	RURR	RURR	RURR	RURR
Field Measurements								
DO	mg/L	T	6.6 :	6.2 :	6.3 :	-	-	6.5 :
pH	SU	T	4.3 :	4.4 :	4.6 :	-	-	4.4 :
Specific Conductance	mS/cm	T	0.546 :	0.532 :	0.54 :	-	-	0.545 :
Temperature	Celsius	T	7.7 :	7.7 :	7.7 :	-	-	7.2 :
General Chemistry								
Bicarbonate (as CaCO3)	mg/L	T	-	-	-	-	<1. J	-
Carbonate (as CaCO3)	mg/L	T	-	-	-	-	<1. J	-
Dissolved Organic Carbon	mg/L	D	-	-	-	2.1 :	-	-
Fluoride	mg/L	T	-	-	-	-	1.7 J	-
Hydroxide (as CaCO3)	mg/L	T	-	-	-	-	<1. J	-
Sulfate	mg/L	T	-	-	-	-	387. J	-
Total Alkalinity	mg/L	T	-	-	-	-	<1. J	-
Total Organic Carbon	mg/L	T	-	-	-	-	1.7 J	-
Physical Properties								
Hardness	mg/L	D	-	-	-	345. :	-	-
Metals								
Aluminum	mg/L	D	-	-	-	13.4 :	-	-
Antimony	mg/L	D	-	-	-	<0.00061 :	-	-
Arsenic	mg/L	D	-	-	-	<0.0001 :	-	-
Barium	mg/L	D	-	-	-	<0.011 :	-	-
Beryllium	mg/L	D	-	-	-	0.0026 :	-	-
Boron	mg/L	D	-	-	-	<0.0069 :	-	-
Cadmium	mg/L	D	-	-	-	0.0022 :	-	-
Calcium	mg/L	D	-	-	-	92.5 :	-	-
Chromium	mg/L	D	-	-	-	0.0023 :	-	-
Cobalt	mg/L	D	-	-	-	0.0396 :	-	-
Copper	mg/L	D	-	-	-	0.0553 :	-	-
Iron	mg/L	D	-	-	-	<0.0844 :	-	-
Lead	mg/L	D	-	-	-	0.00021 :	-	-
Magnesium	mg/L	D	-	-	-	27.7 :	-	-
Manganese	mg/L	D	-	-	-	1.92 :	-	-
Molybdenum	mg/L	D	-	-	-	<0.002 :	-	-
Nickel	mg/L	D	-	-	-	0.101 :	-	-

J = Qualified as estimated during data validation
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T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID					
			RR-5BB 9/29/2004 RR-5BB-T02N-P3S	RR-5BB 9/29/2004 RR-5BB-T02N-P2S	RR-5BB 9/29/2004 RR-5BB-T02N-P1S	RR-5BB 9/29/2004 RR-5BB-D02N-PS	RR-5BB 9/30/2004 RR-5BB-T03N-PS	RR-5BB 9/30/2004 RR-5BB-T03N-P3S
			RURR	RURR	RURR	RURR	RURR	RURR
Potassium	mg/L	D	-	-	-	1.32 :	-	-
Selenium	mg/L	D	-	-	-	0.0011 :	-	-
Silver	mg/L	D	-	-	-	<0.0001 J	-	-
Sodium	mg/L	D	-	-	-	8.46 :	-	-
Thallium	mg/L	D	-	-	-	<0.0001 :	-	-
Vanadium	mg/L	D	-	-	-	<0.0001 :	-	-
Zinc	mg/L	D	-	-	-	0.555 :	-	-

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area	Fraction	RR-5BB 9/30/2004 RR-5BB-T03N-P2S RURR		RR-5BB 9/30/2004 RR-5BB-T03N-P1S RURR		RR-5BB 9/30/2004 RR-5BB-D03N-PS RURR		RR-5BB 10/1/2004 RR-5BB-T04N-PS RURR		RR-5BB 10/1/2004 RR-5BB-T04N-P3S RURR		RR-5BB 10/1/2004 RR-5BB-T04N-P2S RURR	
Field Measurements															
DO	mg/L		T	6.7	:	6.	:	-		-		6.6	:	6.6	:
pH	SU		T	4.4	:	4.7	:	-		-		4.	:	4.1	:
Specific Conductance	mS/cm		T	0.53	:	0.536	:	-		-		0.519	:	0.506	:
Temperature	Celsius		T	7.3	:	7.	:	-		-		7.6	:	7.8	:
General Chemistry															
Bicarbonate (as CaCO3)	mg/L		T	-		-		-		<1.	J	-		-	
Carbonate (as CaCO3)	mg/L		T	-		-		-		<1.	J	-		-	
Dissolved Organic Carbon	mg/L		D	-		-		<1.	J	-		-		-	
Fluoride	mg/L		T	-		-		-		1.7	J	-		-	
Hydroxide (as CaCO3)	mg/L		T	-		-		-		<1.	J	-		-	
Sulfate	mg/L		T	-		-		-		372.	J	-		-	
Total Alkalinity	mg/L		T	-		-		-		<1.	J	-		-	
Total Organic Carbon	mg/L		T	-		-		-		1.6	J	-		-	
Physical Properties															
Hardness	mg/L		D	-		-		332.	J	-		-		-	
Metals															
Aluminum	mg/L		D	-		-		12.	:	-		-		-	
Antimony	mg/L		D	-		-		<0.00049	:	-		-		-	
Arsenic	mg/L		D	-		-		<0.0001	:	-		-		-	
Barium	mg/L		D	-		-		<0.011	:	-		-		-	
Beryllium	mg/L		D	-		-		0.0025	:	-		-		-	
Boron	mg/L		D	-		-		<0.0069	:	-		-		-	
Cadmium	mg/L		D	-		-		0.0024	:	-		-		-	
Calcium	mg/L		D	-		-		89.4	:	-		-		-	
Chromium	mg/L		D	-		-		<0.0015	:	-		-		-	
Cobalt	mg/L		D	-		-		0.0383	:	-		-		-	
Copper	mg/L		D	-		-		0.0578	:	-		-		-	
Iron	mg/L		D	-		-		0.0861	:	-		-		-	
Lead	mg/L		D	-		-		0.00023	:	-		-		-	
Magnesium	mg/L		D	-		-		26.4	:	-		-		-	
Manganese	mg/L		D	-		-		1.89	:	-		-		-	
Molybdenum	mg/L		D	-		-		<0.002	:	-		-		-	
Nickel	mg/L		D	-		-		0.104	:	-		-		-	

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-5BB 9/30/2004 RR-5BB-T03N-P2S RURR	RR-5BB 9/30/2004 RR-5BB-T03N-P1S RURR	RR-5BB 9/30/2004 RR-5BB-D03N-PS RURR	RR-5BB 10/1/2004 RR-5BB-T04N-PS RURR	RR-5BB 10/1/2004 RR-5BB-T04N-P3S RURR	RR-5BB 10/1/2004 RR-5BB-T04N-P2S RURR
Potassium	mg/L	D	-	-	1.6 :	-	-	-
Selenium	mg/L	D	-	-	0.0016 :	-	-	-
Silver	mg/L	D	-	-	<0.0001 :	-	-	-
Sodium	mg/L	D	-	-	7.5 :	-	-	-
Thallium	mg/L	D	-	-	<0.0001 :	-	-	-
Vanadium	mg/L	D	-	-	<0.00034 :	-	-	-
Zinc	mg/L	D	-	-	0.55 :	-	-	-

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID											
			RR-5BB 10/1/2004 RR-5BB-T04N-P1S		RR-5BB 10/1/2004 RR-5BB-D04N-PS		Zwergle 10/6/2003 ZWERGLE-T00N-PS		Zwergle 10/6/2003 ZWERGLE-T00N-PD		Zwergle 10/6/2003 Zwergle-T00N-P3S		Zwergle 10/6/2003 Zwergle-T00N-P3D	
			RURR		RURR		RURR-Z		RURR-Z		RURR-Z		RURR-Z	
Field Measurements														
DO	mg/L	T	6.2	:	-		-		-		8.	:	6.7	:
EH	millivolts	T	-		-		-		-		109.	:	96.	:
pH	SU	T	4.5	:	-		-		-		7.4	:	7.5	:
Specific Conductance	uS/cm	T	-		-		-		-		179.	:	186.	:
Specific Conductance	mS/cm	T	0.518	:	-		-		-		-		-	
Temperature	Celsius	T	7.9	:	-		-		-		9.5	:	10.3	:
General Chemistry														
Dissolved Organic Carbon	mg/L	D	-		1.2	J	-		-		-		-	
Fluoride	mg/L	T	-		-		<0.1	:	<0.1	:	-		-	
Sulfate	mg/L	T	-		-		18.7	J	18.3	J	-		-	
Total Organic Carbon	mg/L	T	-		-		1.9	:	3.1	:	-		-	
Physical Properties														
Hardness	mg/L	D	-		331.	J	-		-		-		-	
Metals														
Aluminum	mg/L	D	-		11.9	:	-		-		-		-	
Antimony	mg/L	D	-		<0.00047	:	-		-		-		-	
Arsenic	mg/L	D	-		<0.0001	:	-		-		-		-	
Barium	mg/L	D	-		<0.011	:	-		-		-		-	
Beryllium	mg/L	D	-		0.0025	:	-		-		-		-	
Boron	mg/L	D	-		<0.0069	:	-		-		-		-	
Cadmium	mg/L	D	-		0.0022	:	-		-		-		-	
Calcium	mg/L	D	-		89.1	:	-		-		-		-	
Chromium	mg/L	D	-		<0.0015	:	-		-		-		-	
Cobalt	mg/L	D	-		0.038	:	-		-		-		-	
Copper	mg/L	D	-		0.0557	:	-		-		-		-	
Iron	mg/L	D	-		0.0476	:	-		-		-		-	
Lead	mg/L	D	-		0.00019	:	-		-		-		-	
Magnesium	mg/L	D	-		26.3	:	-		-		-		-	
Manganese	mg/L	D	-		1.88	:	-		-		-		-	
Molybdenum	mg/L	D	-		<0.002	:	-		-		-		-	
Nickel	mg/L	D	-		0.0983	:	-		-		-		-	
Potassium	mg/L	D	-		1.65	:	-		-		-		-	
Selenium	mg/L	D	-		0.0014	:	-		-		-		-	

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-5BB 10/1/2004 RR-5BB-T04N-P1S RURR		RR-5BB 10/1/2004 RR-5BB-D04N-PS RURR		Zwergle 10/6/2003 ZWERGLE-T00N-PS RURR-Z	Zwergle 10/6/2003 ZWERGLE-T00N-PD RURR-Z	Zwergle 10/6/2003 Zwergle-T00N-P3S RURR-Z	Zwergle 10/6/2003 Zwergle-T00N-P3D RURR-Z
Silver	mg/L	D	-		<0.0001	:	-	-	-	-
Sodium	mg/L	D	-		7.48	:	-	-	-	-
Thallium	mg/L	D	-		<0.0001	:	-	-	-	-
Vanadium	mg/L	D	-		<0.00035	:	-	-	-	-
Zinc	mg/L	D	-		0.55	:	-	-	-	-

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID	
			Zwergle 10/6/2003 Zwergle-T00N-P2S		Zwergle 10/6/2003 Zwergle-T00N-P2D		Zwergle 10/6/2003 Zwergle-T00N-P1S		Zwergle 10/6/2003 Zwergle-T00N-P1D		Zwergle 10/6/2003 ZWERGLE-D00N-PS		Zwergle 10/6/2003 ZWERGLE-D00N-PD	
			RURR-Z		RURR-Z		RURR-Z		RURR-Z		RURR-Z		RURR-Z	
Field Measurements														
DO	mg/L	T	8.1	:	7.4	:	7.7	:	5.6	:	-		-	
EH	millivolts	T	98.	:	95.	:	89.	:	171.	:	-		-	
pH	SU	T	7.5	:	7.5	:	7.6	:	7.7	:	-		-	
Specific Conductance	uS/cm	T	176.	:	178.	:	185.	:	179.	:	-		-	
Temperature	Celsius	T	8.9	:	8.6	:	9.2	:	8.1	:	-		-	
Physical Properties														
Hardness	mg/L	D	-		-		-		-		101.	:	111.	:
Metals														
Aluminum	mg/L	D	-		-		-		-		<0.0217	J	<0.0217	J
Antimony	mg/L	D	-		-		-		-		<0.0014	J	<0.0005	J
Arsenic	mg/L	D	-		-		-		-		0.00021	J	<0.0002	J
Barium	mg/L	D	-		-		-		-		0.0579	:	0.0614	:
Beryllium	mg/L	D	-		-		-		-		<0.0004	:	<0.0004	:
Boron	mg/L	D	-		-		-		-		<0.0063	:	<0.0063	:
Cadmium	mg/L	D	-		-		-		-		<0.0002	J	<0.0002	J
Calcium	mg/L	D	-		-		-		-		32.8	:	36.	:
Chromium	mg/L	D	-		-		-		-		<0.0011	:	<0.0011	:
Cobalt	mg/L	D	-		-		-		-		<0.0029	:	<0.0029	:
Copper	mg/L	D	-		-		-		-		<0.0017	:	<0.0017	:
Iron	mg/L	D	-		-		-		-		<0.0379	:	<0.0486	:
Lead	mg/L	D	-		-		-		-		<0.0002	:	<0.0002	:
Magnesium	mg/L	D	-		-		-		-		4.61	:	5.07	:
Manganese	mg/L	D	-		-		-		-		0.262	:	0.0469	:
Molybdenum	mg/L	D	-		-		-		-		0.0014	:	0.00084	:
Nickel	mg/L	D	-		-		-		-		<0.0016	:	<0.0016	:
Potassium	mg/L	D	-		-		-		-		0.856	J	1.01	J
Selenium	mg/L	D	-		-		-		-		<0.0003	J	<0.0003	J
Silver	mg/L	D	-		-		-		-		<0.0001	:	<0.0001	:
Sodium	mg/L	D	-		-		-		-		<2.89	:	<3.33	:
Thallium	mg/L	D	-		-		-		-		<0.0001	:	<0.0001	:
Vanadium	mg/L	D	-		-		-		-		0.0012	:	0.00055	:
Zinc	mg/L	D	-		-		-		-		0.0594	:	0.0631	:

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID											
			Zwergle 10/7/2003 ZWERGLE-T01N-PS		Zwergle 10/7/2003 ZWERGLE-T01N-PD		Zwergle 10/7/2003 Zwergle-T01N-P3S		Zwergle 10/7/2003 Zwergle-T01N-P3D		Zwergle 10/7/2003 Zwergle-T01N-P2S		Zwergle 10/7/2003 Zwergle-T01N-P2D	
			RURR-Z		RURR-Z		RURR-Z		RURR-Z		RURR-Z		RURR-Z	
Field Measurements														
DO	mg/L	T	-		-		12.5	:	12.5	:	11.	:	10.5	:
EH	millivolts	T	-		-		142.	:	143.	:	139.	:	140.	:
pH	SU	T	-		-		7.5	:	7.5	:	7.5	:	7.5	:
Specific Conductance	uS/cm	T	-		-		174.	:	171.	:	165.	:	168.	:
Temperature	Celsius	T	-		-		9.9	:	9.1	:	8.	:	7.6	:
General Chemistry														
Fluoride	mg/L	T	<0.1	:	<0.1	:	-		-		-		-	
Sulfate	mg/L	T	19.8	J	20.	J	-		-		-		-	
Total Organic Carbon	mg/L	T	1.6	:	3.2	:	-		-		-		-	

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	Zwergle 10/7/2003 Zwergle-T01N-P1S RURR-Z	Zwergle 10/7/2003 Zwergle-T01N-P1D RURR-Z	Zwergle 10/7/2003 ZWERGLE-D01N-PS RURR-Z	Zwergle 10/7/2003 ZWERGLE-D01N-PD RURR-Z	Zwergle 10/8/2003 ZWERGLE-T02N-PS RURR-Z	Zwergle 10/8/2003 ZWERGLE-T02N-PD RURR-Z
Field Measurements								
DO	mg/L	T	11.8 :	8.7 :	-	-	-	-
EH	millivolts	T	148. :	153. :	-	-	-	-
pH	SU	T	7.4 :	7.4 :	-	-	-	-
Specific Conductance	uS/cm	T	173. :	172. :	-	-	-	-
Temperature	Celsius	T	8. :	8. :	-	-	-	-
General Chemistry								
Fluoride	mg/L	T	-	-	-	-	<0.1 :	<0.1 :
Sulfate	mg/L	T	-	-	-	-	21.5 J	21.8 J
Total Organic Carbon	mg/L	T	-	-	-	-	2.3 :	3.2 :
Physical Properties								
Hardness	mg/L	D	-	-	99.6 :	106. :	-	-
Metals								
Aluminum	mg/L	D	-	-	<0.0217 J	<0.0217 J	-	-
Antimony	mg/L	D	-	-	<0.0005 :	<0.00083 :	-	-
Arsenic	mg/L	D	-	-	0.00022 J	<0.0002 J	-	-
Barium	mg/L	D	-	-	0.0542 :	0.0567 :	-	-
Beryllium	mg/L	D	-	-	<0.0004 :	<0.0004 :	-	-
Boron	mg/L	D	-	-	<0.0063 :	<0.0063 :	-	-
Cadmium	mg/L	D	-	-	<0.0002 J	<0.0002 J	-	-
Calcium	mg/L	D	-	-	32.4 :	34.4 :	-	-
Chromium	mg/L	D	-	-	<0.0011 :	<0.0011 :	-	-
Cobalt	mg/L	D	-	-	<0.0029 :	<0.0029 :	-	-
Copper	mg/L	D	-	-	<0.0017 :	<0.0017 :	-	-
Iron	mg/L	D	-	-	<0.0278 :	<0.035 :	-	-
Lead	mg/L	D	-	-	<0.0002 :	<0.0002 :	-	-
Magnesium	mg/L	D	-	-	4.54 :	4.85 :	-	-
Manganese	mg/L	D	-	-	0.24 :	0.029 :	-	-
Molybdenum	mg/L	D	-	-	<0.0013 :	<0.00081 :	-	-
Nickel	mg/L	D	-	-	<0.0016 :	<0.0016 :	-	-
Potassium	mg/L	D	-	-	0.719 J	0.944 J	-	-
Selenium	mg/L	D	-	-	<0.0003 J	<0.0003 J	-	-
Silver	mg/L	D	-	-	<0.0001 :	<0.0001 :	-	-
Sodium	mg/L	D	-	-	<2.99 :	<3.09 :	-	-

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	Zwergle 10/7/2003 Zwergle-T01N-P1S RURR-Z	Zwergle 10/7/2003 Zwergle-T01N-P1D RURR-Z	Zwergle 10/7/2003 ZWERGLE-D01N-PS RURR-Z	Zwergle 10/7/2003 ZWERGLE-D01N-PD RURR-Z	Zwergle 10/8/2003 ZWERGLE-T02N-PS RURR-Z	Zwergle 10/8/2003 ZWERGLE-T02N-PD RURR-Z
Thallium	mg/L	D	-	-	<0.0001 :	<0.0001 :	-	-
Vanadium	mg/L	D	-	-	0.00067 :	0.00039 :	-	-
Zinc	mg/L	D	-	-	0.0588 :	0.064 :	-	-

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	Zwergle 10/8/2003 Zwergle-T02N-P3S RURR-Z	Zwergle 10/8/2003 Zwergle-T02N-P3D RURR-Z	Zwergle 10/8/2003 Zwergle-T02N-P2S RURR-Z	Zwergle 10/8/2003 Zwergle-T02N-P2D RURR-Z	Zwergle 10/8/2003 Zwergle-T02N-P1S RURR-Z	Zwergle 10/8/2003 Zwergle-T02N-P1D RURR-Z
Field Measurements								
DO	mg/L	T	6.9 :	6.5 :	7.8 :	7.5 :	5.5 :	5. :
EH	millivolts	T	146. :	154. :	153. :	157. :	159. :	159. :
pH	SU	T	7.4 :	7.5 :	7.5 :	7.5 :	7.5 :	7.6 :
Specific Conductance	uS/cm	T	207. :	184. :	170. :	171. :	177. :	182. :
Temperature	Celsius	T	15.7 :	11.3 :	8.6 :	8.3 :	8.5 :	9.1 :

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID: Zwergle	Zwergle	Zwergle	Zwergle	Zwergle	Zwergle
		Sample Date:	10/8/2003	10/8/2003	10/9/2003	10/9/2003	10/9/2003	10/9/2003
		Sample ID:	ZWERGLE-D02N-PS	ZWERGLE-D02N-PD	ZWERGLE-T03N-PS	ZWERGLE-T03N-PD	Zwergle-T03N-P3S	Zwergle-T03N-P3D
		Exposure Area	RURR-Z	RURR-Z	RURR-Z	RURR-Z	RURR-Z	RURR-Z
Field Measurements								
DO	mg/L	T	-	-	-	-	20.9 :	23.16 :
EH	millivolts	T	-	-	-	-	164.9 :	198.5 :
pH	SU	T	-	-	-	-	6.9 :	6.77 :
Specific Conductance	uS/cm	T	-	-	-	-	167. :	151. :
Temperature	Celsius	T	-	-	-	-	12. :	9.32 :
General Chemistry								
Fluoride	mg/L	T	-	-	<0.1 :	<0.1 :	-	-
Sulfate	mg/L	T	-	-	20.4 J	19.4 J	-	-
Total Organic Carbon	mg/L	T	-	-	2. :	1.6 :	-	-
Physical Properties								
Hardness	mg/L	D	103. :	103. :	-	-	-	-
Metals								
Aluminum	mg/L	D	<0.0221 :	<0.0221 :	-	-	-	-
Antimony	mg/L	D	<0.0005 :	<0.0005 :	-	-	-	-
Arsenic	mg/L	D	0.00024 J	<0.0002 J	-	-	-	-
Barium	mg/L	D	0.0519 :	0.0542 :	-	-	-	-
Beryllium	mg/L	D	<0.0004 :	<0.0004 :	-	-	-	-
Boron	mg/L	D	<0.0063 :	<0.0063 :	-	-	-	-
Cadmium	mg/L	D	<0.0002 J	<0.0002 J	-	-	-	-
Calcium	mg/L	D	33.6 :	33.5 :	-	-	-	-
Chromium	mg/L	D	<0.0011 :	<0.0011 :	-	-	-	-
Cobalt	mg/L	D	<0.0029 :	<0.0029 :	-	-	-	-
Copper	mg/L	D	<0.0119 :	<0.0113 :	-	-	-	-
Iron	mg/L	D	<0.0278 :	<0.0278 :	-	-	-	-
Lead	mg/L	D	<0.0002 :	<0.0002 :	-	-	-	-
Magnesium	mg/L	D	4.69 :	4.72 :	-	-	-	-
Manganese	mg/L	D	0.18 :	0.021 :	-	-	-	-
Molybdenum	mg/L	D	<0.0016 :	<0.001 :	-	-	-	-
Nickel	mg/L	D	<0.0016 :	<0.0016 :	-	-	-	-
Potassium	mg/L	D	0.759 :	0.962 :	-	-	-	-
Selenium	mg/L	D	0.00045 J	<0.0003 J	-	-	-	-
Silver	mg/L	D	<0.0001 :	<0.0001 :	-	-	-	-
Sodium	mg/L	D	2.98 :	2.95 :	-	-	-	-

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T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction											
		Zwergle / 10/8/2003 / ZWERGLE-D02N-PS / RURR-Z		Zwergle / 10/8/2003 / ZWERGLE-D02N-PD / RURR-Z		Zwergle / 10/9/2003 / ZWERGLE-T03N-PS / RURR-Z		Zwergle / 10/9/2003 / ZWERGLE-T03N-PD / RURR-Z		Zwergle / 10/9/2003 / Zwergle-T03N-P3S / RURR-Z		Zwergle / 10/9/2003 / Zwergle-T03N-P3D / RURR-Z	
Thallium	mg/L	D	<0.0001	:	<0.0001	:	-		-		-		-	
Vanadium	mg/L	D	0.00062	:	0.00041	:	-		-		-		-	
Zinc	mg/L	D	0.0541	:	0.0553	:	-		-		-		-	

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R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID: Zwergle	Zwergle	Zwergle	Zwergle	Zwergle	Zwergle
		Sample Date:	10/9/2003	10/9/2003	10/9/2003	10/9/2003	10/9/2003	10/9/2003
		Sample ID:	Zwergle-T03N-P2S	Zwergle-T03N-P2D	Zwergle-T03N-P1S	Zwergle-T03N-P1D	ZWERGLE-D03N-PS	ZWERGLE-D03N-PD
		Exposure Area:	RURR-Z	RURR-Z	RURR-Z	RURR-Z	RURR-Z	RURR-Z
Field Measurements								
DO	mg/L	T	25.08 :	19.17 :	15.9 :	13.75 :	-	-
EH	millivolts	T	227.5 :	239.6 :	290.4 :	335.9 :	-	-
pH	SU	T	6.65 :	6.55 :	6.26 :	5.58 :	-	-
Specific Conductance	uS/cm	T	156. :	159. :	160. :	158. :	-	-
Temperature	Celsius	T	9.8 :	9.79 :	9.48 :	9.04 :	-	-
Physical Properties								
Hardness	mg/L	D	-	-	-	-	103. :	107. :
Metals								
Aluminum	mg/L	D	-	-	-	-	<0.0221 :	<0.0251 :
Antimony	mg/L	D	-	-	-	-	<0.00061 :	<0.00066 :
Arsenic	mg/L	D	-	-	-	-	0.00022 J	<0.0002 J
Barium	mg/L	D	-	-	-	-	0.0516 :	0.0558 :
Beryllium	mg/L	D	-	-	-	-	<0.0004 :	<0.0004 :
Boron	mg/L	D	-	-	-	-	<0.0063 :	<0.0063 :
Cadmium	mg/L	D	-	-	-	-	<0.0002 J	<0.0002 J
Calcium	mg/L	D	-	-	-	-	33.6 :	34.6 :
Chromium	mg/L	D	-	-	-	-	<0.0011 :	<0.0011 :
Cobalt	mg/L	D	-	-	-	-	0.011 :	0.0082 :
Copper	mg/L	D	-	-	-	-	<0.0112 :	<0.0111 :
Iron	mg/L	D	-	-	-	-	<0.0278 :	<0.0278 :
Lead	mg/L	D	-	-	-	-	<0.0002 :	<0.0002 :
Magnesium	mg/L	D	-	-	-	-	4.7 :	4.86 :
Manganese	mg/L	D	-	-	-	-	0.148 :	0.0246 :
Molybdenum	mg/L	D	-	-	-	-	<0.001 :	<0.00083 :
Nickel	mg/L	D	-	-	-	-	<0.0016 :	0.0019 :
Potassium	mg/L	D	-	-	-	-	1.03 :	1.12 :
Selenium	mg/L	D	-	-	-	-	0.00044 J	<0.0003 J
Silver	mg/L	D	-	-	-	-	<0.0001 :	<0.0001 :
Sodium	mg/L	D	-	-	-	-	3.02 :	3.1 :
Thallium	mg/L	D	-	-	-	-	<0.0001 :	<0.0001 :
Vanadium	mg/L	D	-	-	-	-	0.00054 :	0.00043 :
Zinc	mg/L	D	-	-	-	-	0.0474 :	0.0492 :

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID											
			Zwergle 10/10/2003 ZWERGLE-T04N-PS		Zwergle 10/10/2003 ZWERGLE-T04N-PD		Zwergle 10/10/2003 Zwergle-T04N-P3S		Zwergle 10/10/2003 Zwergle-T04N-P3D		Zwergle 10/10/2003 Zwergle-T04N-P2S		Zwergle 10/10/2003 Zwergle-T04N-P2D	
			RURR-Z		RURR-Z		RURR-Z		RURR-Z		RURR-Z		RURR-Z	
Field Measurements														
DO	mg/L	T	-		-		6.65	:	6.22	:	6.62	:	7.32	:
EH	millivolts	T	-		-		165.2	:	163.	:	168.	:	165.5	:
pH	SU	T	-		-		7.1	:	7.1	:	7.	:	6.9	:
Specific Conductance	uS/cm	T	-		-		143.	:	138.	:	137.	:	140.	:
Temperature	Celsius	T	-		-		8.8	:	7.4	:	6.3	:	6.3	:
General Chemistry														
Fluoride	mg/L	T	<0.1	:	<0.1	:	-		-		-		-	
Sulfate	mg/L	T	22.3	J	21.6	J	-		-		-		-	
Total Organic Carbon	mg/L	T	1.3	:	1.7	:	-		-		-		-	

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID	
			Zwergle 10/10/2003 Zwergle-T04N-P1S		Zwergle 10/10/2003 Zwergle-T04N-P1D		Zwergle 10/10/2003 ZWERGLE-D04N-PS		Zwergle 10/10/2003 ZWERGLE-D04N-PD		Zwergle 3/23/2004 Zwergle-T01N-P3S		Zwergle 3/23/2004 Zwergle-T01N-P2S	
			RURR-Z		RURR-Z		RURR-Z		RURR-Z		RURR-Z		RURR-Z	
Field Measurements														
DO	mg/L	T	4.27	:	4.97	:	-		-		8.4	:	9.1	:
EH	millivolts	T	172.	:	189.8	:	-		-		372.	:	381.	:
pH	SU	T	6.83	:	6.7	:	-		-		7.6	:	7.7	:
Specific Conductance	uS/cm	T	143.	:	142.	:	-		-		-		-	
Specific Conductance	mS/cm	T	-		-		-		-		0.15	:	0.15	:
Temperature	Celsius	T	6.9	:	6.9	:	-		-		3.1	:	4.1	:
Physical Properties														
Hardness	mg/L	D	-		-		91.8	:	100.	:	-		-	
Metals														
Aluminum	mg/L	D	-		-		<0.0307	:	<0.0307	:	-		-	
Antimony	mg/L	D	-		-		<0.0005	:	<0.0005	:	-		-	
Arsenic	mg/L	D	-		-		<0.0002	J	<0.0002	J	-		-	
Barium	mg/L	D	-		-		0.0526	:	0.0565	:	-		-	
Beryllium	mg/L	D	-		-		<0.0003	:	<0.0003	:	-		-	
Boron	mg/L	D	-		-		<0.0064	:	0.0088	:	-		-	
Cadmium	mg/L	D	-		-		<0.0002	J	<0.0002	J	-		-	
Calcium	mg/L	D	-		-		29.9	:	32.6	:	-		-	
Chromium	mg/L	D	-		-		<0.0013	:	<0.0013	:	-		-	
Cobalt	mg/L	D	-		-		0.0066	:	0.005	:	-		-	
Copper	mg/L	D	-		-		<0.0017	:	<0.0017	:	-		-	
Iron	mg/L	D	-		-		<0.03	:	<0.03	J	-		-	
Lead	mg/L	D	-		-		0.00031	:	<0.0002	:	-		-	
Magnesium	mg/L	D	-		-		4.14	:	4.53	:	-		-	
Manganese	mg/L	D	-		-		0.162	:	0.0167	:	-		-	
Molybdenum	mg/L	D	-		-		<0.0032	:	<0.0029	:	-		-	
Nickel	mg/L	D	-		-		<0.0016	:	<0.0016	:	-		-	
Potassium	mg/L	D	-		-		<0.522	J	<0.522	J	-		-	
Selenium	mg/L	D	-		-		<0.0003	J	<0.0003	J	-		-	
Silver	mg/L	D	-		-		<0.0001	:	<0.0001	:	-		-	
Sodium	mg/L	D	-		-		2.4	:	2.54	:	-		-	
Thallium	mg/L	D	-		-		<0.0001	:	<0.0001	:	-		-	
Vanadium	mg/L	D	-		-		0.00048	J	0.00039	J	-		-	
Zinc	mg/L	D	-		-		0.0506	:	0.0413	:	-		-	

J = Qualified as estimated during data validation
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T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID					
			Zwergle 3/23/2004 Zwergle-T01N-P1S	Zwergle 3/24/2004 Zwergle-T02N-P3S	Zwergle 3/24/2004 Zwergle-T02N-P2S	Zwergle 3/24/2004 Zwergle-T02N-P1S	Zwergle 3/25/2004 ZWERGLE-T03N-PS	Zwergle 3/25/2004 Zwergle-T03N-P3S
			RURR-Z	RURR-Z	RURR-Z	RURR-Z	RURR-Z	RURR-Z
Field Measurements								
DO	mg/L	T	7.6 :	-	-	-	-	8.51 :
EH	millivolts	T	382. :	168. :	161. :	153. :	-	215. :
pH	SU	T	8. :	7.78 :	8.12 :	7.92 :	-	7.67 :
Specific Conductance	mS/cm	T	0.149 :	0.153 :	0.153 :	0.16 :	-	0.162 :
Temperature	Celsius	T	3.3 :	2.97 :	3.97 :	4.43 :	-	3.37 :
General Chemistry								
Fluoride	mg/L	T	-	-	-	-	<0.1 :	-
Sulfate	mg/L	T	-	-	-	-	15.5 :	-
Total Organic Carbon	mg/L	T	-	-	-	-	2.2 :	-

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID	
			Zwergle 3/25/2004 Zwergle-T03N-P2S		Zwergle 3/25/2004 Zwergle-T03N-P1S		Zwergle 3/25/2004 ZWERGLE-T02N-PS		Zwergle 3/25/2004 ZWERGLE-T01N-PS		Zwergle 3/25/2004 ZWERGLE-D03N-PS		Zwergle 3/25/2004 ZWERGLE-D02N-PS	
			RURR-Z		RURR-Z		RURR-Z		RURR-Z		RURR-Z		RURR-Z	
Field Measurements														
DO	mg/L	T	8.58	:	8.71	:	-		-		-		-	
EH	millivolts	T	213.	:	210.	:	-		-		-		-	
pH	SU	T	7.68	:	7.86	:	-		-		-		-	
Specific Conductance	mS/cm	T	0.157	:	0.163	:	-		-		-		-	
Temperature	Celsius	T	3.5	:	3.76	:	-		-		-		-	
General Chemistry														
Fluoride	mg/L	T	-		-		<0.1	:	<0.1	:	-		-	
Sulfate	mg/L	T	-		-		18.3	:	15.5	:	-		-	
Total Organic Carbon	mg/L	T	-		-		1.9	:	2.6	:	-		-	
Physical Properties														
Hardness	mg/L	D	-		-		-		-		101.	:	96.1	:
Metals														
Aluminum	mg/L	D	-		-		-		-		<0.0608	:	<0.0498	:
Antimony	mg/L	D	-		-		-		-		<0.0004	J	<0.0004	J
Arsenic	mg/L	D	-		-		-		-		<0.0002	:	<0.0002	:
Barium	mg/L	D	-		-		-		-		0.0473	:	0.048	:
Beryllium	mg/L	D	-		-		-		-		<0.0002	J	<0.0002	J
Boron	mg/L	D	-		-		-		-		<0.0045	:	<0.0039	:
Cadmium	mg/L	D	-		-		-		-		<0.0002	:	<0.0002	:
Calcium	mg/L	D	-		-		-		-		32.8	:	31.1	:
Chromium	mg/L	D	-		-		-		-		<0.0008	J	<0.0015	J
Cobalt	mg/L	D	-		-		-		-		0.0123	:	0.0106	:
Copper	mg/L	D	-		-		-		-		<0.0008	J	0.0011	J
Iron	mg/L	D	-		-		-		-		<0.0718	J	<0.0317	J
Lead	mg/L	D	-		-		-		-		<0.0004	:	<0.0004	:
Magnesium	mg/L	D	-		-		-		-		4.69	:	4.49	:
Manganese	mg/L	D	-		-		-		-		0.021	:	0.0182	:
Molybdenum	mg/L	D	-		-		-		-		0.0017	:	0.0014	:
Nickel	mg/L	D	-		-		-		-		0.0014	J	0.0013	J
Potassium	mg/L	D	-		-		-		-		0.839	J	0.299	J
Selenium	mg/L	D	-		-		-		-		<0.0007	:	<0.0007	:
Silver	mg/L	D	-		-		-		-		<0.0001	J	<0.0001	J
Sodium	mg/L	D	-		-		-		-		3.35	:	3.58	:

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID: Zwergle Sample Date: 3/25/2004 Sample ID: Zwergle-T03N-P2S RURR-Z	Zwergle 3/25/2004 Zwergle-T03N-P1S RURR-Z	Zwergle 3/25/2004 ZWERGLE-T02N-PS RURR-Z	Zwergle 3/25/2004 ZWERGLE-T01N-PS RURR-Z	Zwergle 3/25/2004 ZWERGLE-D03N-PS RURR-Z	Zwergle 3/25/2004 ZWERGLE-D02N-PS RURR-Z
Thallium	mg/L	D	-	-	-	-	<0.0001 :	<0.0001 :
Vanadium	mg/L	D	-	-	-	-	<0.00072 :	<0.00073 :
Zinc	mg/L	D	-	-	-	-	0.0512 :	0.05 :

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	Zwergle 3/25/2004 ZWERGLE-D01N-PS RURR-Z	Zwergle 9/27/2004 ZWERGLE-T00N-PS RURR-Z	Zwergle 9/27/2004 Zwergle-T00N-P3S RURR-Z	Zwergle 9/27/2004 Zwergle-T00N-P2S RURR-Z	Zwergle 9/27/2004 Zwergle-T00N-P1S RURR-Z	Zwergle 9/27/2004 ZWERGLE-D00N-PS RURR-Z
Field Measurements								
DO	mg/L	T	-	-	6.2 :	3.1 :	5.1 :	-
pH	SU	T	-	-	7.1 :	7. :	7.2 :	-
Specific Conductance	mS/cm	T	-	-	0.181 :	0.189 :	0.185 :	-
Temperature	Celsius	T	-	-	5.5 :	6.1 :	6.5 :	-
General Chemistry								
Bicarbonate (as CaCO3)	mg/L	T	-	88.4 :	-	-	-	-
Carbonate (as CaCO3)	mg/L	T	-	<1. :	-	-	-	-
Dissolved Organic Carbon	mg/L	D	-	-	-	-	-	2. :
Fluoride	mg/L	T	-	<0.1 :	-	-	-	-
Hydroxide (as CaCO3)	mg/L	T	-	<1. :	-	-	-	-
Sulfate	mg/L	T	-	26.8 :	-	-	-	-
Total Alkalinity	mg/L	T	-	88.4 :	-	-	-	-
Total Organic Carbon	mg/L	T	-	1.7 :	-	-	-	-
Physical Properties								
Hardness	mg/L	D	115. :	-	-	-	-	121. :
Metals								
Aluminum	mg/L	D	2.9 :	-	-	-	-	<0.0341 :
Antimony	mg/L	D	<0.0004 J	-	-	-	-	<0.0015 :
Arsenic	mg/L	D	0.00046 :	-	-	-	-	<0.0001 :
Barium	mg/L	D	0.085 :	-	-	-	-	0.0553 :
Beryllium	mg/L	D	<0.0002 J	-	-	-	-	<0.0003 :
Boron	mg/L	D	<0.0039 :	-	-	-	-	<0.0069 :
Cadmium	mg/L	D	<0.0002 :	-	-	-	-	<0.0001 :
Calcium	mg/L	D	36.3 :	-	-	-	-	39.5 :
Chromium	mg/L	D	0.0017 J	-	-	-	-	<0.0011 :
Cobalt	mg/L	D	0.0088 :	-	-	-	-	0.0084 :
Copper	mg/L	D	<0.0089 :	-	-	-	-	0.00069 :
Iron	mg/L	D	2.46 :	-	-	-	-	<0.0506 :
Lead	mg/L	D	0.0061 :	-	-	-	-	0.00011 :
Magnesium	mg/L	D	5.95 :	-	-	-	-	5.39 :
Manganese	mg/L	D	0.252 :	-	-	-	-	0.301 :
Molybdenum	mg/L	D	<0.0039 :	-	-	-	-	<0.0013 :
Nickel	mg/L	D	0.0055 :	-	-	-	-	0.00081 J

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID: Zwergle	Zwergle	Zwergle	Zwergle	Zwergle	Zwergle
		Sample Date:	3/25/2004	9/27/2004	9/27/2004	9/27/2004	9/27/2004	9/27/2004
		Sample ID:	ZWERGLE-D01N-PS	ZWERGLE-T00N-PS	Zwergle-T00N-P3S	Zwergle-T00N-P2S	Zwergle-T00N-P1S	ZWERGLE-D00N-PS
		Exposure Area:	RURR-Z	RURR-Z	RURR-Z	RURR-Z	RURR-Z	RURR-Z
Potassium	mg/L	D	1.88 :	-	-	-	-	1.13 :
Selenium	mg/L	D	<0.0007 :	-	-	-	-	<0.0003 :
Silver	mg/L	D	<0.0001 :	-	-	-	-	<0.0001 :
Sodium	mg/L	D	<3.68 :	-	-	-	-	3.5 :
Thallium	mg/L	D	0.00014 :	-	-	-	-	<0.0001 :
Vanadium	mg/L	D	0.0068 :	-	-	-	-	0.00076 :
Zinc	mg/L	D	0.215 :	-	-	-	-	0.026 :

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T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	Zwergle 9/28/2004 ZWERGLE-T01N-PS RURR-Z	Zwergle 9/28/2004 Zwergle-T01N-P3S RURR-Z	Zwergle 9/28/2004 Zwergle-T01N-P2S RURR-Z	Zwergle 9/28/2004 Zwergle-T01N-P1S RURR-Z	Zwergle 9/28/2004 ZWERGLE-D01N-PS RURR-Z	Zwergle 9/29/2004 ZWERGLE-T02N-PS RURR-Z
Field Measurements								
DO	mg/L	T	-	5.7 :	6.1 :	3.6 :	-	-
pH	SU	T	-	7.6 :	7.9 :	6.5 :	-	-
Specific Conductance	mS/cm	T	-	0.156 :	0.151 :	0.155 :	-	-
Temperature	Celsius	T	-	7.5 :	6.7 :	6.9 :	-	-
General Chemistry								
Bicarbonate (as CaCO3)	mg/L	T	90.4 :	-	-	-	-	92.4 :
Carbonate (as CaCO3)	mg/L	T	<1. :	-	-	-	-	<1. :
Dissolved Organic Carbon	mg/L	D	-	-	-	-	1.5 :	-
Fluoride	mg/L	T	<0.1 :	-	-	-	-	<0.1 :
Hydroxide (as CaCO3)	mg/L	T	<1. :	-	-	-	-	<1. :
Sulfate	mg/L	T	26.1 :	-	-	-	-	27.6 :
Total Alkalinity	mg/L	T	90.4 :	-	-	-	-	92.4 :
Total Organic Carbon	mg/L	T	1.8 :	-	-	-	-	1.3 :
Physical Properties								
Hardness	mg/L	D	-	-	-	-	97.7 :	-
Metals								
Aluminum	mg/L	D	-	-	-	-	<0.0341 :	-
Antimony	mg/L	D	-	-	-	-	<0.00031 :	-
Arsenic	mg/L	D	-	-	-	-	<0.0001 J	-
Barium	mg/L	D	-	-	-	-	0.0494 :	-
Beryllium	mg/L	D	-	-	-	-	0.00041 :	-
Boron	mg/L	D	-	-	-	-	<0.0069 :	-
Cadmium	mg/L	D	-	-	-	-	<0.0001 J	-
Calcium	mg/L	D	-	-	-	-	31.8 :	-
Chromium	mg/L	D	-	-	-	-	<0.0009 :	-
Cobalt	mg/L	D	-	-	-	-	<0.0031 :	-
Copper	mg/L	D	-	-	-	-	<0.0003 J	-
Iron	mg/L	D	-	-	-	-	<0.0355 :	-
Lead	mg/L	D	-	-	-	-	<0.0001 :	-
Magnesium	mg/L	D	-	-	-	-	4.41 :	-
Manganese	mg/L	D	-	-	-	-	0.161 :	-
Molybdenum	mg/L	D	-	-	-	-	0.0009 :	-
Nickel	mg/L	D	-	-	-	-	<0.0003 J	-

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T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	Zwergle 9/28/2004 ZWERGLE-T01N-PS RURR-Z	Zwergle 9/28/2004 Zwergle-T01N-P3S RURR-Z	Zwergle 9/28/2004 Zwergle-T01N-P2S RURR-Z	Zwergle 9/28/2004 Zwergle-T01N-P1S RURR-Z	Zwergle 9/28/2004 ZWERGLE-D01N-PS RURR-Z	Zwergle 9/29/2004 ZWERGLE-T02N-PS RURR-Z
Potassium	mg/L	D	-	-	-	-	0.843 :	-
Selenium	mg/L	D	-	-	-	-	<0.0003 :	-
Silver	mg/L	D	-	-	-	-	<0.0001 J	-
Sodium	mg/L	D	-	-	-	-	2.33 :	-
Thallium	mg/L	D	-	-	-	-	<0.0001 :	-
Vanadium	mg/L	D	-	-	-	-	0.00023 J	-
Zinc	mg/L	D	-	-	-	-	0.0238 :	-

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID: Zwergle	Zwergle	Zwergle	Zwergle	Zwergle	Zwergle
		Sample Date:	9/29/2004	9/29/2004	9/29/2004	9/29/2004	9/30/2004	9/30/2004
		Sample ID:	Zwergle-T02N-P3S	Zwergle-T02N-P2S	Zwergle-T02N-P1S	ZWERGLE-D02N-PS	ZWERGLE-T03N-PS	Zwergle-T03N-P3S
		Exposure Area:	RURR-Z	RURR-Z	RURR-Z	RURR-Z	RURR-Z	RURR-Z
Field Measurements								
DO	mg/L	T	6. :	5.5 :	4.9 :	-	-	6.7 :
pH	SU	T	7. :	6.3 :	6.5 :	-	-	6.8 :
Specific Conductance	mS/cm	T	0.154 :	0.148 :	0.159 :	-	-	0.156 :
Temperature	Celsius	T	6.8 :	6.7 :	6.5 :	-	-	6.9 :
General Chemistry								
Bicarbonate (as CaCO3)	mg/L	T	-	-	-	-	93.6 J	-
Carbonate (as CaCO3)	mg/L	T	-	-	-	-	<1. J	-
Dissolved Organic Carbon	mg/L	D	-	-	-	1.5 :	-	-
Fluoride	mg/L	T	-	-	-	-	<0.1 J	-
Hydroxide (as CaCO3)	mg/L	T	-	-	-	-	<1. J	-
Sulfate	mg/L	T	-	-	-	-	<22.4 J	-
Total Alkalinity	mg/L	T	-	-	-	-	93.6 J	-
Total Organic Carbon	mg/L	T	-	-	-	-	1.7 J	-
Physical Properties								
Hardness	mg/L	D	-	-	-	123. :	-	-
Metals								
Aluminum	mg/L	D	-	-	-	<0.0695 :	-	-
Antimony	mg/L	D	-	-	-	<0.0016 :	-	-
Arsenic	mg/L	D	-	-	-	<0.0001 :	-	-
Barium	mg/L	D	-	-	-	0.0582 :	-	-
Beryllium	mg/L	D	-	-	-	<0.0003 :	-	-
Boron	mg/L	D	-	-	-	<0.0069 :	-	-
Cadmium	mg/L	D	-	-	-	<0.0001 :	-	-
Calcium	mg/L	D	-	-	-	40.2 :	-	-
Chromium	mg/L	D	-	-	-	0.0013 :	-	-
Cobalt	mg/L	D	-	-	-	<0.0031 :	-	-
Copper	mg/L	D	-	-	-	<0.0003 J	-	-
Iron	mg/L	D	-	-	-	<0.0691 :	-	-
Lead	mg/L	D	-	-	-	<0.0001 :	-	-
Magnesium	mg/L	D	-	-	-	5.59 :	-	-
Manganese	mg/L	D	-	-	-	0.176 :	-	-
Molybdenum	mg/L	D	-	-	-	<0.00076 :	-	-
Nickel	mg/L	D	-	-	-	<0.0003 J	-	-

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T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction						
		Site ID	Zwergle	Zwergle	Zwergle	Zwergle	Zwergle	Zwergle
		Sample Date	9/29/2004	9/29/2004	9/29/2004	9/29/2004	9/30/2004	9/30/2004
		Sample ID	Zwergle-T02N-P3S	Zwergle-T02N-P2S	Zwergle-T02N-P1S	ZWERGLE-D02N-PS	ZWERGLE-T03N-PS	Zwergle-T03N-P3S
		Exposure Area	RURR-Z	RURR-Z	RURR-Z	RURR-Z	RURR-Z	RURR-Z
Potassium	mg/L	D	-	-	-	0.828 :	-	-
Selenium	mg/L	D	-	-	-	<0.0003 :	-	-
Silver	mg/L	D	-	-	-	<0.0001 J	-	-
Sodium	mg/L	D	-	-	-	3.17 :	-	-
Thallium	mg/L	D	-	-	-	<0.0001 :	-	-
Vanadium	mg/L	D	-	-	-	0.00038 :	-	-
Zinc	mg/L	D	-	-	-	0.0268 :	-	-

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID	
			Zwergle 9/30/2004 Zwergle-T03N-P2S		Zwergle 9/30/2004 Zwergle-T03N-P1S		Zwergle 9/30/2004 ZWERGLE-D03N-PS		Zwergle 10/1/2004 ZWERGLE-T04N-PS		Zwergle 10/1/2004 Zwergle-T04N-P3S		Zwergle 10/1/2004 Zwergle-T04N-P2S	
			RURR-Z		RURR-Z		RURR-Z		RURR-Z		RURR-Z		RURR-Z	
Field Measurements														
DO	mg/L	T	5.2	:	3.3	:	-		-		7.4	:	5.3	:
pH	SU	T	6.6	:	6.4	:	-		-		7.	:	6.8	:
Specific Conductance	mS/cm	T	0.148	:	0.154	:	-		-		0.143	:	0.136	:
Temperature	Celsius	T	5.9	:	6.3	:	-		-		6.2	:	5.3	:
General Chemistry														
Bicarbonate (as CaCO3)	mg/L	T	-		-		-		89.9	J	-		-	
Carbonate (as CaCO3)	mg/L	T	-		-		-		<1.	J	-		-	
Dissolved Organic Carbon	mg/L	D	-		-		<1.	J	-		-		-	
Fluoride	mg/L	T	-		-		-		<0.1	J	-		-	
Hydroxide (as CaCO3)	mg/L	T	-		-		-		<1.	J	-		-	
Sulfate	mg/L	T	-		-		-		21.9	J	-		-	
Total Alkalinity	mg/L	T	-		-		-		89.9	J	-		-	
Total Organic Carbon	mg/L	T	-		-		-		<1.	J	-		-	
Physical Properties														
Hardness	mg/L	D	-		-		109.	J	-		-		-	
Metals														
Aluminum	mg/L	D	-		-		<0.0341	:	-		-		-	
Antimony	mg/L	D	-		-		<0.00042	:	-		-		-	
Arsenic	mg/L	D	-		-		<0.00015	:	-		-		-	
Barium	mg/L	D	-		-		0.0503	:	-		-		-	
Beryllium	mg/L	D	-		-		<0.0003	:	-		-		-	
Boron	mg/L	D	-		-		<0.0069	:	-		-		-	
Cadmium	mg/L	D	-		-		<0.0001	:	-		-		-	
Calcium	mg/L	D	-		-		35.6	:	-		-		-	
Chromium	mg/L	D	-		-		<0.0011	:	-		-		-	
Cobalt	mg/L	D	-		-		<0.0031	:	-		-		-	
Copper	mg/L	D	-		-		<0.0015	:	-		-		-	
Iron	mg/L	D	-		-		<0.0355	:	-		-		-	
Lead	mg/L	D	-		-		<0.0001	:	-		-		-	
Magnesium	mg/L	D	-		-		4.97	:	-		-		-	
Manganese	mg/L	D	-		-		0.104	:	-		-		-	
Molybdenum	mg/L	D	-		-		<0.0019	:	-		-		-	
Nickel	mg/L	D	-		-		0.00064	:	-		-		-	

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Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	Zwergle 9/30/2004 Zwergle-T03N-P2S RURR-Z	Zwergle 9/30/2004 Zwergle-T03N-P1S RURR-Z	Zwergle 9/30/2004 ZWERGLE-D03N-PS RURR-Z	Zwergle 10/1/2004 ZWERGLE-T04N-PS RURR-Z	Zwergle 10/1/2004 Zwergle-T04N-P3S RURR-Z	Zwergle 10/1/2004 Zwergle-T04N-P2S RURR-Z
Potassium	mg/L	D	-	-	0.954 :	-	-	-
Selenium	mg/L	D	-	-	<0.0003 :	-	-	-
Silver	mg/L	D	-	-	<0.0001 :	-	-	-
Sodium	mg/L	D	-	-	2.38 :	-	-	-
Thallium	mg/L	D	-	-	<0.0001 :	-	-	-
Vanadium	mg/L	D	-	-	<0.00058 :	-	-	-
Zinc	mg/L	D	-	-	0.035 :	-	-	-

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T = Total Fraction D= Dissolved Fraction

Appendix A-5c
Groundwater/Surface Water Interaction - Piezometers
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID Sample Date Sample ID									
			Zwergle 10/1/2004 Zwergle-T04N-P1S		Zwergle 10/1/2004 ZWERGLE-D04N-PS		----	----	----	----
			RURR-Z		RURR-Z					
Field Measurements										
DO	mg/L	T	3.9	:	-		-	-	-	-
pH	SU	T	6.7	:	-		-	-	-	-
Specific Conductance	mS/cm	T	0.144	:	-		-	-	-	-
Temperature	Celsius	T	5.4	:	-		-	-	-	-
General Chemistry										
Dissolved Organic Carbon	mg/L	D	-		1.5	J	-	-	-	-
Physical Properties										
Hardness	mg/L	D	-		111.	J	-	-	-	-
Metals										
Aluminum	mg/L	D	-		<0.0341	:	-	-	-	-
Antimony	mg/L	D	-		<0.0005	:	-	-	-	-
Arsenic	mg/L	D	-		<0.00022	:	-	-	-	-
Barium	mg/L	D	-		0.0503	:	-	-	-	-
Beryllium	mg/L	D	-		<0.0003	:	-	-	-	-
Boron	mg/L	D	-		<0.0069	:	-	-	-	-
Cadmium	mg/L	D	-		<0.0001	:	-	-	-	-
Calcium	mg/L	D	-		36.	:	-	-	-	-
Chromium	mg/L	D	-		<0.0011	:	-	-	-	-
Cobalt	mg/L	D	-		<0.0031	:	-	-	-	-
Copper	mg/L	D	-		<0.0016	:	-	-	-	-
Iron	mg/L	D	-		<0.0355	:	-	-	-	-
Lead	mg/L	D	-		<0.0001	:	-	-	-	-
Magnesium	mg/L	D	-		5.	:	-	-	-	-
Manganese	mg/L	D	-		0.116	:	-	-	-	-
Molybdenum	mg/L	D	-		<0.002	:	-	-	-	-
Nickel	mg/L	D	-		0.0015	:	-	-	-	-
Potassium	mg/L	D	-		1.18	:	-	-	-	-
Selenium	mg/L	D	-		<0.0003	:	-	-	-	-
Silver	mg/L	D	-		<0.0001	:	-	-	-	-
Sodium	mg/L	D	-		2.69	:	-	-	-	-
Thallium	mg/L	D	-		<0.0001	:	-	-	-	-
Vanadium	mg/L	D	-		<0.00057	:	-	-	-	-
Zinc	mg/L	D	-		0.0264	:	-	-	-	-

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	LR-1 10/6/2003 LR-1-T00N-SFW SWR		LR-1 10/6/2003 LR-1-D00N-SFW SWR		LR-1 10/7/2003 LR-1-T01N-SFW SWR		LR-1 10/7/2003 LR-1-D01N-SFW SWR		LR-1 10/8/2003 LR-1-T02N-SFW SWR		LR-1 10/8/2003 LR-1-D02N-SFW SWR	
Field Measurements														
Ammonia	mg/L	T	<0.04	:	-		<0.04	:	-		0.062	:	-	
DO	mg/l	T	8.35	:	-		9.21	:	-		9.15	:	-	
EH	millivolts	T	299.	:	-		267.6	:	-		130.5	:	-	
pH	SU	T	7.08	:	-		7.12	:	-		7.1	J	-	
Specific Conductance	uS/cm	T	353.	:	-		361.	:	-		361.	:	-	
Temperature	Celsius	T	12.24	:	-		10.6	:	-		9.01	:	-	
Turbidity	NTU	T	7.6	:	-		-		-		12.	:	-	
General Chemistry														
Ammonia	mg/L	T	<0.04	:	-		<0.04	:	-		0.062	:	-	
Bicarbonate (as CaCO3)	mg/L	T	69.2	:	-		60.8	:	-		62.9	:	-	
Biochemical Oxygen Demand	mg/L	T	<1.3	:	-		<1.4	J	-		<1.5	J	-	
Carbonate (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Chemical Oxygen Demand	mg/L	T	<20.	:	-		<20.	:	-		<20.	:	-	
Chloride	mg/L	T	3.9	:	-		3.5	:	-		3.4	:	-	
Fluoride	mg/L	T	0.79	:	-		0.77	:	-		1.6	:	-	
Hydroxide (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Nitrate	mg/L	T	<0.26	:	-		<0.26	J	-		<0.29	J	-	
Nitrite	mg/L	T	<0.005	:	-		<0.005	J	-		<0.005	J	-	
Phosphate, Ortho As P	mg/L	T	<0.01	:	-		<0.01	J	-		<0.01	J	-	
Phosphorus	mg/L	T	0.029	:	-		0.028	:	-		0.02	:	-	
Sulfate	mg/L	T	117.	:	-		104.	:	-		104.	:	-	
Total Alkalinity	mg/L	T	69.2	:	-		60.8	:	-		62.9	:	-	
Total Dissolved Solids	mg/L	T	272.	:	-		264.	:	-		248.	:	-	
Total Kjeldahl Nitrogen	mg/L	T	<0.24	:	-		<0.24	:	-		0.35	:	-	
Total Organic Carbon	mg/L	T	1.6	:	-		1.3	:	-		1.3	:	-	
Total Suspended Solids	mg/L	T	9.3	:	-		15.2	:	-		11.9	:	-	
Laboratory Parameters														
pH	SU	T	7.08	:	-		7.12	:	-		7.1	J	-	
Specific Conductance	umhos/cm	T	367.	J	-		325.	J	-		338.	J	-	
Inorganics														
Cyanide	mg/L	T	<0.01	:	-		<0.01	:	-		<0.01	:	-	
Physical Properties														
Hardness	mg/L	T	191.	:	-		183.	:	-		177.	:	-	

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T = Total Fraction D= Dissolved Fraction

Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	LR-1 10/6/2003 LR-1-T00N-SFW SWR		LR-1 10/6/2003 LR-1-D00N-SFW SWR		LR-1 10/7/2003 LR-1-T01N-SFW SWR		LR-1 10/7/2003 LR-1-D01N-SFW SWR		LR-1 10/8/2003 LR-1-T02N-SFW SWR		LR-1 10/8/2003 LR-1-D02N-SFW SWR	
Hardness	mg/L	D	-		182.	:	-		180.	:	-		169.	:
Metals														
Aluminum	mg/L	T	1.04	:	-		1.48	:	-		1.12	:	-	
Aluminum	mg/L	D	-		0.15	:	-		<0.176	:	-		<0.14	:
Antimony	mg/L	T	<0.0013	:	-		<0.0013	:	-		<0.0005	:	-	
Antimony	mg/L	D	-		<0.0005	:	-		<0.0005	:	-		<0.0005	:
Arsenic	mg/L	T	<0.0002	:	-		<0.0002	:	-		<0.0002	:	-	
Arsenic	mg/L	D	-		<0.0002	:	-		<0.0002	:	-		<0.0002	:
Barium	mg/L	T	0.0419	:	-		0.0455	:	-		0.041	:	-	
Barium	mg/L	D	-		0.0347	:	-		0.0388	:	-		0.0355	:
Beryllium	mg/L	T	<0.0004	:	-		<0.0003	J	-		<0.0003	:	-	
Beryllium	mg/L	D	-		<0.0004	:	-		<0.0003	J	-		<0.0003	:
Boron	mg/L	T	0.0135	:	-		0.0091	:	-		0.0076	:	-	
Boron	mg/L	D	-		0.0113	:	-		0.0102	:	-		0.0066	:
Cadmium	mg/L	T	0.00042	:	-		0.00041	:	-		0.00043	:	-	
Cadmium	mg/L	D	-		0.0003	:	-		0.00037	:	-		0.00033	:
Calcium	mg/L	T	57.6	:	-		54.6	:	-		52.9	:	-	
Calcium	mg/L	D	-		55.1	:	-		53.7	:	-		50.3	:
Chromium	mg/L	T	<0.0011	:	-		0.0015	J	-		0.0016	:	-	
Chromium	mg/L	D	-		<0.0011	:	-		0.0069	J	-		<0.0013	:
Cobalt	mg/L	T	<0.0029	:	-		0.0033	:	-		<0.0031	:	-	
Cobalt	mg/L	D	-		<0.0029	:	-		0.0045	:	-		<0.0031	:
Copper	mg/L	T	0.0087	:	-		0.0124	:	-		0.0115	:	-	
Copper	mg/L	D	-		0.0018	:	-		0.0019	:	-		0.0027	:
Iron	mg/L	T	0.448	:	-		0.495	:	-		0.42	:	-	
Iron	mg/L	D	-		<0.0278	:	-		<0.0501	:	-		<0.03	:
Lead	mg/L	T	0.0012	:	-		0.001	:	-		0.00066	:	-	
Lead	mg/L	D	-		<0.0002	:	-		<0.0002	:	-		<0.0002	:
Magnesium	mg/L	T	11.4	:	-		11.3	:	-		11.	:	-	
Magnesium	mg/L	D	-		10.9	:	-		11.1	:	-		10.4	:
Manganese	mg/L	T	0.187	:	-		0.248	:	-		0.225	:	-	
Manganese	mg/L	D	-		0.164	:	-		0.228	:	-		0.204	:
Mercury	mg/L	T	<0.0001	:	-		<0.0001	:	-		<0.0001	:	-	
Mercury	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction											
		LR-1 10/6/2003 LR-1-T00N-SFW SWR		LR-1 10/6/2003 LR-1-D00N-SFW SWR		LR-1 10/7/2003 LR-1-T01N-SFW SWR		LR-1 10/7/2003 LR-1-D01N-SFW SWR		LR-1 10/8/2003 LR-1-T02N-SFW SWR		LR-1 10/8/2003 LR-1-D02N-SFW SWR	
Molybdenum	mg/L	T	0.0459 :		-		0.0039 :		-		0.004 :		-	
Molybdenum	mg/L	D	-		0.0481 :		-		0.0044 :		-		0.0044 :	
Nickel	mg/L	T	0.0112 :		-		0.0149 :		-		0.0148 :		-	
Nickel	mg/L	D	-		0.0099 :		-		0.0139 :		-		0.0143 :	
Potassium	mg/L	T	1.71 :		-		1.87 :		-		1.55 :		-	
Potassium	mg/L	D	-		1.55 :		-		1.76 :		-		1.5 :	
Selenium	mg/L	T	<0.0003	J	-		<0.0003	J	-		0.0003	J	-	
Selenium	mg/L	D	-		<0.0003	J	-		<0.0003	J	-		0.00031	J
Silver	mg/L	T	<0.0001 :		-		<0.0001 :		-		<0.0001 :		-	
Silver	mg/L	D	-		<0.0001 :		-		<0.0001 :		-		<0.0001 :	
Sodium	mg/L	T	10.6 :		-		6.35 :		-		6.09 :		-	
Sodium	mg/L	D	-		9.94 :		-		6.18 :		-		5.56 :	
Thallium	mg/L	T	<0.0001 :		-		<0.0001 :		-		<0.0001 :		-	
Thallium	mg/L	D	-		<0.0001 :		-		<0.0001 :		-		<0.0001 :	
Vanadium	mg/L	T	0.00063 :		-		0.00032 :		-		0.00028 :		-	
Vanadium	mg/L	D	-		0.00032 :		-		<0.0001 :		-		<0.0001 :	
Zinc	mg/L	T	0.0681 :		-		0.115	J	-		0.116 :		-	
Zinc	mg/L	D	-		0.0307 :		-		0.0712 :		-		0.0641 :	

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	LR-1 10/9/2003 LR-1-T03N-SFW SWR		LR-1 10/9/2003 LR-1-D03N-SFW SWR		LR-1 10/10/2003 LR-1-T04N-SFW SWR		LR-1 10/10/2003 LR-1-D04N-SFW SWR		LR-1 3/23/2004 LR-1-T01N-SFW SWR		LR-1 3/23/2004 LR-1-D01N-SFW SWR	
Field Measurements														
Ammonia	mg/L	T	<0.1	:	-		<0.1	:	-		<0.048	:	-	
DO	mg/l	T	9.25	:	-		9.39	:	-		6.4	:	-	
EH	millivolts	T	245.	:	-		191.2	:	-		243.	:	-	
pH	SU	T	7.5	J	-		7.3	J	-		7.8	:	-	
Specific Conductance	uS/cm	T	371.	:	-		373.	:	-		238.	:	-	
Temperature	Celsius	T	7.47	:	-		9.76	:	-		8.3	:	-	
Turbidity	NTU	T	14.7	:	-		7.9	:	-		15.	:	-	
General Chemistry														
Ammonia	mg/L	T	<0.1	:	-		<0.1	:	-		<0.048	:	-	
Bicarbonate (as CaCO3)	mg/L	T	59.9	:	-		61.7	:	-		52.7	:	-	
Biochemical Oxygen Demand	mg/L	T	<1.5	:	-		<1.5	:	-		<1.4	J	-	
Carbonate (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Chemical Oxygen Demand	mg/L	T	<20.	:	-		<20.	:	-		<20.	:	-	
Chloride	mg/L	T	3.3	:	-		3.7	:	-		2.2	:	-	
Fluoride	mg/L	T	0.79	:	-		0.84	:	-		0.58	:	-	
Hydroxide (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Nitrate	mg/L	T	<0.28	:	-		<0.43	:	-		0.48	J	-	
Nitrite	mg/L	T	<0.005	:	-		<0.005	:	-		<0.005	J	-	
Phosphate, Ortho As P	mg/L	T	<0.01	:	-		<0.01	:	-		<0.01	J	-	
Phosphorus	mg/L	T	0.025	:	-		0.023	:	-		0.066	:	-	
Sulfate	mg/L	T	93.1	:	-		114.	:	-		79.7	:	-	
Total Alkalinity	mg/L	T	59.9	:	-		61.7	:	-		52.7	:	-	
Total Dissolved Solids	mg/L	T	230.	:	-		254.	:	-		232.	:	-	
Total Kjeldahl Nitrogen	mg/L	T	<0.24	:	-		<0.24	:	-		<0.24	:	-	
Total Organic Carbon	mg/L	T	1.2	:	-		1.6	:	-		<1.8	:	-	
Total Suspended Solids	mg/L	T	9.8	:	-		8.2	:	-		20.9	:	-	
Laboratory Parameters														
pH	SU	T	7.5	J	-		7.3	J	-		7.8	:	-	
Specific Conductance	umhos/cm	T	323.	J	-		329.	J	-		227.	J	-	
Inorganics														
Cyanide	mg/L	T	<0.01	:	-		<0.01	:	-		<0.01	:	-	
Physical Properties														
Hardness	mg/L	T	165.	:	-		169.	:	-		138.	:	-	

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	LR-1 10/9/2003 LR-1-T03N-SFW SWR		LR-1 10/9/2003 LR-1-D03N-SFW SWR		LR-1 10/10/2003 LR-1-T04N-SFW SWR		LR-1 10/10/2003 LR-1-D04N-SFW SWR		LR-1 3/23/2004 LR-1-T01N-SFW SWR		LR-1 3/23/2004 LR-1-D01N-SFW SWR	
Hardness	mg/L	D	-		170.	:	-		169.	:	-		137.	:
Metals														
Aluminum	mg/L	T	0.964	:	-		1.02	:	-		1.54	:	-	
Aluminum	mg/L	D	-		0.0997	:	-		0.0705	J	-		0.124	:
Antimony	mg/L	T	<0.0013	:	-		<0.0005	:	-		<0.0004	J	-	
Antimony	mg/L	D	-		<0.0005	:	-		<0.0005	:	-		<0.0004	J
Arsenic	mg/L	T	<0.0002	:	-		<0.0002	:	-		<0.0002	:	-	
Arsenic	mg/L	D	-		<0.0002	:	-		<0.0002	:	-		<0.0002	:
Barium	mg/L	T	0.0373	:	-		0.0374	:	-		0.0355	:	-	
Barium	mg/L	D	-		0.0348	:	-		0.0345	:	-		0.0304	:
Beryllium	mg/L	T	0.00041	:	-		0.00041	:	-		<0.001	:	-	
Beryllium	mg/L	D	-		<0.0004	:	-		<0.0004	:	-		<0.001	:
Boron	mg/L	T	<0.0085	:	-		<0.0063	:	-		<0.0117	:	-	
Boron	mg/L	D	-		<0.008	:	-		0.0065	:	-		<0.0117	:
Cadmium	mg/L	T	0.00046	:	-		0.00043	:	-		0.0003	:	-	
Cadmium	mg/L	D	-		0.00032	:	-		0.0005	:	-		0.00023	:
Calcium	mg/L	T	49.2	:	-		50.5	:	-		41.7	:	-	
Calcium	mg/L	D	-		50.9	:	-		50.5	:	-		41.3	:
Chromium	mg/L	T	<0.0011	:	-		<0.0011	:	-		<0.00075	:	-	
Chromium	mg/L	D	-		<0.0011	:	-		<0.0011	:	-		<0.0007	:
Cobalt	mg/L	T	<0.0029	:	-		<0.0029	:	-		<0.0037	:	-	
Cobalt	mg/L	D	-		<0.0029	:	-		0.004	:	-		0.0039	:
Copper	mg/L	T	0.0114	:	-		0.0114	:	-		0.0168	:	-	
Copper	mg/L	D	-		0.0034	:	-		0.003	:	-		0.004	:
Iron	mg/L	T	0.31	:	-		0.243	:	-		0.455	:	-	
Iron	mg/L	D	-		<0.0278	:	-		<0.0278	:	-		<0.0423	:
Lead	mg/L	T	0.0006	:	-		0.00049	:	-		0.00078	:	-	
Lead	mg/L	D	-		<0.0002	:	-		<0.0002	:	-		<0.0004	:
Magnesium	mg/L	T	10.1	:	-		10.3	:	-		8.33	:	-	
Magnesium	mg/L	D	-		10.4	:	-		10.3	:	-		8.26	:
Manganese	mg/L	T	0.206	:	-		0.22	:	-		0.216	:	-	
Manganese	mg/L	D	-		0.204	:	-		0.214	:	-		0.186	:
Mercury	mg/L	T	<0.0001	:	-		<0.0001	J	-		<0.0001	J	-	
Mercury	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	J

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T = Total Fraction D= Dissolved Fraction

Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	LR-1 10/9/2003 LR-1-T03N-SFW SWR		LR-1 10/9/2003 LR-1-D03N-SFW SWR		LR-1 10/10/2003 LR-1-T04N-SFW SWR		LR-1 10/10/2003 LR-1-D04N-SFW SWR		LR-1 3/23/2004 LR-1-T01N-SFW SWR		LR-1 3/23/2004 LR-1-D01N-SFW SWR	
Molybdenum	mg/L	T	0.0043	:	-		0.0041	:	-		0.0032	:	-	
Molybdenum	mg/L	D	-		0.0048	:	-		0.0045	:	-		0.0034	:
Nickel	mg/L	T	0.0147	:	-		0.0142	:	-		0.0106	:	-	
Nickel	mg/L	D	-		0.014	:	-		0.0136	:	-		0.0095	:
Potassium	mg/L	T	1.21	:	-		1.12	:	-		1.21	:	-	
Potassium	mg/L	D	-		1.24	:	-		1.15	:	-		1.17	:
Selenium	mg/L	T	0.00033	J	-		<0.00048	J	-		<0.0007	:	-	
Selenium	mg/L	D	-		<0.0003	J	-		<0.00055	J	-		<0.0007	:
Silver	mg/L	T	<0.0001	:	-		<0.0001	:	-		<0.0001	:	-	
Silver	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Sodium	mg/L	T	6.19	:	-		6.36	:	-		5.64	:	-	
Sodium	mg/L	D	-		6.25	:	-		6.45	:	-		5.45	:
Thallium	mg/L	T	<0.0001	:	-		<0.0001	:	-		<0.00012	:	-	
Thallium	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.00012	:
Vanadium	mg/L	T	0.00025	:	-		0.00023	:	-		<0.00053	:	-	
Vanadium	mg/L	D	-		0.00015	:	-		0.0001	:	-		<0.00036	:
Zinc	mg/L	T	0.0948	:	-		0.102	:	-		0.0868	:	-	
Zinc	mg/L	D	-		0.067	:	-		0.071	:	-		0.0396	:

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	LR-1 3/24/2004 LR-1-T02N-SFW SWR		LR-1 3/24/2004 LR-1-D02N-SFW SWR		LR-1 3/25/2004 LR-1-T03N-SFW SWR		LR-1 3/25/2004 LR-1-D03N-SFW SWR		LR-16 10/6/2003 LR-16-T00N-SFW SWR		LR-16 10/6/2003 LR-16-D00N-SFW SWR	
Field Measurements														
Ammonia	mg/L	T	<0.096	:	-		0.048	:	-		<0.04	:	-	
DO	mg/l	T	-		-		9.6	:	-		8.57	:	-	
EH	millivolts	T	193.	:	-		214.	:	-		388.	:	-	
pH	SU	T	7.6	J	-		7.3	J	-		7.5	J	-	
Specific Conductance	uS/cm	T	256.	:	-		254.	:	-		410.	:	-	
Temperature	Celsius	T	9.	:	-		7.5	:	-		13.5	:	-	
Turbidity	NTU	T	11.	:	-		14.	:	-		14.1	:	-	
General Chemistry														
Ammonia	mg/L	T	<0.096	:	-		0.048	:	-		<0.04	:	-	
Bicarbonate (as CaCO3)	mg/L	T	61.7	:	-		57.1	:	-		61.4	:	-	
Biochemical Oxygen Demand	mg/L	T	<1.4	:	-		<1.4	J	-		<1.3	:	-	
Carbonate (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Chemical Oxygen Demand	mg/L	T	<20.	:	-		<20.	:	-		<20.	:	-	
Chloride	mg/L	T	4.4	:	-		3.8	:	-		3.9	:	-	
Fluoride	mg/L	T	0.63	:	-		0.6	:	-		0.79	:	-	
Hydroxide (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Nitrate	mg/L	T	0.5	J	-		<0.2	J	-		<0.28	J	-	
Nitrite	mg/L	T	<0.005	:	-		<0.005	J	-		<0.005	:	-	
Phosphate, Ortho As P	mg/L	T	<0.01	J	-		<0.01	J	-		<0.01	:	-	
Phosphorus	mg/L	T	0.039	:	-		0.079	:	-		0.019	:	-	
Sulfate	mg/L	T	79.1	:	-		77.1	:	-		94.5	:	-	
Total Alkalinity	mg/L	T	61.7	:	-		57.1	:	-		61.4	:	-	
Total Dissolved Solids	mg/L	T	210.	:	-		194.	:	-		242.	:	-	
Total Kjeldahl Nitrogen	mg/L	T	<0.24	:	-		<0.24	:	-		<0.24	:	-	
Total Organic Carbon	mg/L	T	<2.3	:	-		<2.7	:	-		1.3	:	-	
Total Suspended Solids	mg/L	T	16.5	:	-		20.2	:	-		7.4	:	-	
Laboratory Parameters														
pH	SU	T	7.6	J	-		7.3	J	-		7.5	J	-	
Specific Conductance	umhos/cm	T	235.	J	-		254.	J	-		321.	J	-	
Inorganics														
Cyanide	mg/L	T	<0.01	:	-		<0.01	:	-		<0.01	:	-	
Physical Properties														
Hardness	mg/L	T	137.	:	-		143.	:	-		163.	:	-	

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	LR-1 3/24/2004 LR-1-T02N-SFW SWR		LR-1 3/24/2004 LR-1-D02N-SFW SWR		LR-1 3/25/2004 LR-1-T03N-SFW SWR		LR-1 3/25/2004 LR-1-D03N-SFW SWR		LR-16 10/6/2003 LR-16-T00N-SFW SWR		LR-16 10/6/2003 LR-16-D00N-SFW SWR	
Hardness	mg/L	D	-		143.	:	-		145.	:	-		161.	:
Metals														
Aluminum	mg/L	T	1.51	:	-		1.46	:	-		0.151	J	-	
Aluminum	mg/L	D	-		0.0992	:	-		<0.0946	J	-		1.02	J
Antimony	mg/L	T	<0.0004	J	-		<0.0004	J	-		<0.0005	:	-	
Antimony	mg/L	D	-		<0.0004	J	-		<0.0004	J	-		<0.0005	:
Arsenic	mg/L	T	<0.0002	:	-		<0.0002	:	-		<0.0002	:	-	
Arsenic	mg/L	D	-		<0.0002	:	-		<0.0002	:	-		<0.0002	:
Barium	mg/L	T	0.0362	:	-		0.0349	:	-		0.0352	:	-	
Barium	mg/L	D	-		0.0319	:	-		0.0288	:	-		0.038	:
Beryllium	mg/L	T	0.00032	J	-		<0.00075	:	-		<0.0004	:	-	
Beryllium	mg/L	D	-		<0.0002	J	-		<0.00038	:	-		<0.0004	:
Boron	mg/L	T	<0.0044	:	-		0.0051	:	-		0.0073	:	-	
Boron	mg/L	D	-		<0.0049	:	-		0.0052	:	-		0.007	:
Cadmium	mg/L	T	0.00026	:	-		0.00025	:	-		0.00037	:	-	
Cadmium	mg/L	D	-		<0.0002	:	-		<0.0002	:	-		0.00043	:
Calcium	mg/L	T	40.9	:	-		43.4	:	-		49.	:	-	
Calcium	mg/L	D	-		42.9	:	-		43.9	:	-		48.3	:
Chromium	mg/L	T	<0.0008	J	-		0.0008	:	-		<0.0011	:	-	
Chromium	mg/L	D	-		<0.0008	J	-		0.00049	:	-		0.0012	:
Cobalt	mg/L	T	<0.0011	J	-		0.0019	J	-		<0.0029	:	-	
Cobalt	mg/L	D	-		<0.0011	J	-		0.0053	J	-		<0.0029	:
Copper	mg/L	T	0.0173	:	-		0.0177	:	-		0.0031	J	-	
Copper	mg/L	D	-		0.0045	:	-		0.0039	:	-		0.0097	J
Iron	mg/L	T	0.362	:	-		0.494	:	-		<0.0278	J	-	
Iron	mg/L	D	-		<0.0192	J	-		<0.0192	J	-		0.316	J
Lead	mg/L	T	0.00065	:	-		0.00075	:	-		<0.0002	J	-	
Lead	mg/L	D	-		<0.0004	:	-		<0.0004	:	-		0.00062	J
Magnesium	mg/L	T	8.45	:	-		8.47	:	-		9.9	:	-	
Magnesium	mg/L	D	-		8.74	:	-		8.54	:	-		9.78	:
Manganese	mg/L	T	0.227	:	-		0.23	:	-		0.196	:	-	
Manganese	mg/L	D	-		0.202	:	-		0.195	:	-		0.201	:
Mercury	mg/L	T	<0.0001	J	-		<0.0001	:	-		<0.0001	:	-	
Mercury	mg/L	D	-		<0.0001	J	-		<0.0001	:	-		<0.0001	:

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction											
		LR-1 3/24/2004 LR-1-T02N-SFW SWR		LR-1 3/24/2004 LR-1-D02N-SFW SWR		LR-1 3/25/2004 LR-1-T03N-SFW SWR		LR-1 3/25/2004 LR-1-D03N-SFW SWR		LR-16 10/6/2003 LR-16-T00N-SFW SWR		LR-16 10/6/2003 LR-16-D00N-SFW SWR	
Molybdenum	mg/L	T	<0.0038 :		-		0.0028 :		-		0.0045 :		-	
Molybdenum	mg/L	D	-		<0.0044 :		-		0.0032 :		-		0.0042 :	
Nickel	mg/L	T	0.0117 :		-		0.0107 :		-		0.0129 :		-	
Nickel	mg/L	D	-		0.0106 :		-		0.0089 :		-		0.0139 :	
Potassium	mg/L	T	0.727	J	-		1.36 :		-		1.37 :		-	
Potassium	mg/L	D	-		0.911	J	-		1.44 :		-		1.43 :	
Selenium	mg/L	T	<0.0007 :		-		<0.0007 :		-		<0.0003	J	-	
Selenium	mg/L	D	-		<0.0007 :		-		<0.0007 :		-		<0.0003	J
Silver	mg/L	T	<0.0001 :		-		<0.0001	J	-		<0.0001 :		-	
Silver	mg/L	D	-		<0.0001 :		-		<0.0001	J	-		<0.0001 :	
Sodium	mg/L	T	6.29 :		-		5.48 :		-		6.23 :		-	
Sodium	mg/L	D	-		6.41 :		-		5.26 :		-		5.89 :	
Thallium	mg/L	T	0.0001 :		-		<0.0001 :		-		<0.0001 :		-	
Thallium	mg/L	D	-		<0.0001 :		-		<0.0001 :		-		<0.0001 :	
Vanadium	mg/L	T	<0.00042 :		-		0.00032 :		-		0.0003 :		-	
Vanadium	mg/L	D	-		<0.00038 :		-		<0.0002 :		-		0.0003 :	
Zinc	mg/L	T	0.0868 :		-		0.0925 :		-		0.0534	J	-	
Zinc	mg/L	D	-		0.041 :		-		0.0409 :		-		0.106	J

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	LR-16 10/7/2003 LR-16-T01N-SFW SWR		LR-16 10/7/2003 LR-16-D01N-SFW SWR		LR-16 10/8/2003 LR-16-T02N-SFW SWR		LR-16 10/8/2003 LR-16-D02N-SFW SWR		LR-16 10/9/2003 LR-16-T03N-SFW SWR		LR-16 10/9/2003 LR-16-D03N-SFW SWR	
Field Measurements														
Ammonia	mg/L	T	<0.04	:	-		0.042	:	-		<0.1	:	-	
DO	mg/l	T	9.89	:	-		8.44	:	-		9.83	:	-	
EH	millivolts	T	246.8	:	-		198.6	:	-		239.2	:	-	
pH	SU	T	7.4	:	-		7.5	J	-		7.76	:	-	
Specific Conductance	uS/cm	T	412.	:	-		346.	:	-		426.	:	-	
Temperature	Celsius	T	9.29	:	-		10.	:	-		7.77	:	-	
Turbidity	NTU	T	0.	:	-		11.5	:	-		10.5	:	-	
General Chemistry														
Ammonia	mg/L	T	<0.04	:	-		0.042	:	-		<0.1	:	-	
Bicarbonate (as CaCO3)	mg/L	T	70.1	:	-		68.5	:	-		70.7	:	-	
Biochemical Oxygen Demand	mg/L	T	<1.4	J	-		<1.5	J	-		<1.5	:	-	
Carbonate (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Chemical Oxygen Demand	mg/L	T	<20.	:	-		<20.	:	-		<20.	:	-	
Chloride	mg/L	T	3.8	:	-		3.9	:	-		4.	:	-	
Fluoride	mg/L	T	0.74	:	-		0.79	:	-		0.81	:	-	
Hydroxide (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Nitrate	mg/L	T	<0.26	J	-		<0.27	J	-		<0.27	:	-	
Nitrite	mg/L	T	<0.005	J	-		<0.005	J	-		<0.005	:	-	
Phosphate, Ortho As P	mg/L	T	<0.01	J	-		0.052	J	-		<0.01	:	-	
Phosphorus	mg/L	T	0.016	:	-		0.021	J	-		0.021	:	-	
Sulfate	mg/L	T	122.	:	-		111.	:	-		112.	:	-	
Total Alkalinity	mg/L	T	70.1	:	-		68.5	:	-		70.7	:	-	
Total Dissolved Solids	mg/L	T	292.	:	-		256.	:	-		268.	:	-	
Total Kjeldahl Nitrogen	mg/L	T	<0.24	:	-		<0.24	:	-		<0.24	:	-	
Total Organic Carbon	mg/L	T	<1.	:	-		2.3	:	-		1.8	:	-	
Total Suspended Solids	mg/L	T	5.9	:	-		8.5	:	-		8.	:	-	
Laboratory Parameters														
pH	SU	T	7.4	:	-		7.5	J	-		7.76	:	-	
Specific Conductance	umhos/cm	T	377.	J	-		391.	J	-		385.	J	-	
Inorganics														
Cyanide	mg/L	T	<0.01	:	-		<0.01	:	-		<0.01	:	-	
Physical Properties														
Hardness	mg/L	T	199.	:	-		185.	:	-		181.	:	-	

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	LR-16 10/7/2003 LR-16-T01N-SFW SWR		LR-16 10/7/2003 LR-16-D01N-SFW SWR		LR-16 10/8/2003 LR-16-T02N-SFW SWR		LR-16 10/8/2003 LR-16-D02N-SFW SWR		LR-16 10/9/2003 LR-16-T03N-SFW SWR		LR-16 10/9/2003 LR-16-D03N-SFW SWR	
Hardness	mg/L	D	-		196.	:	-		193.	:	-		191.	:
Metals														
Aluminum	mg/L	T	0.876	:	-		0.802	:	-		0.744	:	-	
Aluminum	mg/L	D	-		<0.148	:	-		0.12	:	-		0.0669	:
Antimony	mg/L	T	<0.0005	:	-		<0.00089	:	-		<0.0005	:	-	
Antimony	mg/L	D	-		<0.0005	:	-		<0.0005	:	-		<0.0005	:
Arsenic	mg/L	T	<0.0002	:	-		<0.0002	:	-		0.00021	:	-	
Arsenic	mg/L	D	-		<0.0002	:	-		<0.0002	:	-		<0.0002	:
Barium	mg/L	T	0.0405	:	-		0.0372	:	-		0.0372	:	-	
Barium	mg/L	D	-		0.0371	:	-		0.0357	:	-		0.0349	:
Beryllium	mg/L	T	<0.0003	J	-		<0.0003	:	-		<0.0004	:	-	
Beryllium	mg/L	D	-		<0.0003	J	-		<0.0003	:	-		<0.0004	:
Boron	mg/L	T	0.0132	:	-		0.013	:	-		0.0114	:	-	
Boron	mg/L	D	-		0.0139	:	-		0.0143	:	-		0.011	:
Cadmium	mg/L	T	0.00035	:	-		0.0003	:	-		0.00025	:	-	
Cadmium	mg/L	D	-		0.00033	:	-		0.0003	:	-		0.0004	:
Calcium	mg/L	T	59.8	:	-		55.4	:	-		56.7	:	-	
Calcium	mg/L	D	-		58.8	:	-		57.9	:	-		57.7	:
Chromium	mg/L	T	<0.0013	:	-		0.002	:	-		<0.0011	:	-	
Chromium	mg/L	D	-		0.0015	:	-		<0.0013	:	-		<0.0011	:
Cobalt	mg/L	T	<0.0031	:	-		<0.0031	:	-		<0.0029	:	-	
Cobalt	mg/L	D	-		<0.0031	:	-		<0.0031	:	-		<0.0029	:
Copper	mg/L	T	0.0075	:	-		0.0087	:	-		0.0119	:	-	
Copper	mg/L	D	-		<0.0017	:	-		0.002	:	-		0.0024	:
Iron	mg/L	T	0.272	:	-		0.295	:	-		0.27	:	-	
Iron	mg/L	D	-		<0.03	:	-		<0.03	:	-		<0.0278	:
Lead	mg/L	T	0.00047	:	-		0.00065	:	-		0.00056	:	-	
Lead	mg/L	D	-		<0.0002	:	-		<0.0002	:	-		<0.0002	:
Magnesium	mg/L	T	12.1	:	-		11.2	:	-		11.3	:	-	
Magnesium	mg/L	D	-		11.8	:	-		11.7	:	-		11.5	:
Manganese	mg/L	T	0.196	:	-		0.178	:	-		0.184	:	-	
Manganese	mg/L	D	-		0.185	:	-		0.175	:	-		0.178	:
Mercury	mg/L	T	<0.0001	:	-		<0.0001	:	-		<0.0001	J	-	
Mercury	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	J

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction											
		LR-16 10/7/2003 LR-16-T01N-SFW SWR		LR-16 10/7/2003 LR-16-D01N-SFW SWR		LR-16 10/8/2003 LR-16-T02N-SFW SWR		LR-16 10/8/2003 LR-16-D02N-SFW SWR		LR-16 10/9/2003 LR-16-T03N-SFW SWR		LR-16 10/9/2003 LR-16-D03N-SFW SWR	
Molybdenum	mg/L	T	0.0413 :	-		0.04 :		-		0.0434 :		-	
Molybdenum	mg/L	D	-	0.0458 :		-		0.0425 :		-		0.0438 :	
Nickel	mg/L	T	0.0115 :	-		0.0114 :		-		0.0118 :		-	
Nickel	mg/L	D	-	0.0115 :		-		0.0103 :		-		0.0115 :	
Potassium	mg/L	T	1.93 :	-		1.68 :		-		1.39 :		-	
Potassium	mg/L	D	-	2.19 :		-		1.87 :		-		1.38 :	
Selenium	mg/L	T	<0.0003 J	-		<0.0003 J		-		0.00044 J		-	
Selenium	mg/L	D	-	<0.0003 J		-		<0.0003 J		-		<0.0003 J	
Silver	mg/L	T	<0.0001 :	-		<0.0001 :		-		<0.0001 :		-	
Silver	mg/L	D	-	<0.0001 :		-		<0.0001 :		-		<0.0001 :	
Sodium	mg/L	T	10.7 :	-		10.1 :		-		10.1 :		-	
Sodium	mg/L	D	-	10.1 :		-		9.92 :		-		10.8 :	
Thallium	mg/L	T	<0.0001 :	-		<0.0001 :		-		<0.0001 :		-	
Thallium	mg/L	D	-	<0.0001 :		-		<0.0001 :		-		<0.0001 :	
Vanadium	mg/L	T	0.00045 :	-		0.00051 :		-		0.00038 :		-	
Vanadium	mg/L	D	-	0.00026 :		-		0.00032 :		-		0.00032 :	
Zinc	mg/L	T	0.0754 J	-		0.0705 :		-		0.0748 :		-	
Zinc	mg/L	D	-	0.0548 :		-		0.043 :		-		0.0489 :	

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	LR-16 10/10/2003 LR-16-T04N-SFW SWR		LR-16 10/10/2003 LR-16-D04N-SFW SWR		LR-16 3/23/2004 LR-16-T01N-SFW SWR		LR-16 3/23/2004 LR-16-D01N-SFW SWR		LR-16 3/24/2004 LR-16-T02N-SFW SWR		LR-16 3/24/2004 LR-16-T01N-SFW SWR	
Field Measurements														
Ammonia	mg/L	T	0.11	:	-		<0.059	:	-		<0.18	:	-	
DO	mg/l	T	9.54	:	-		10.6	:	-		-		-	
EH	millivolts	T	172.5	:	-		332.1	:	-		-		180.5	:
pH	SU	T	7.6	J	-		7.9	:	-		7.5	J	8.15	:
Specific Conductance	uS/cm	T	433.	:	-		126.	:	-		-		284.	:
Temperature	Celsius	T	10.69	:	-		6.4	:	-		-		7.08	:
Turbidity	NTU	T	7.	:	-		13.7	:	-		-		11.	:
General Chemistry														
Ammonia	mg/L	T	0.11	:	-		<0.059	:	-		<0.18	:	-	
Bicarbonate (as CaCO3)	mg/L	T	69.2	:	-		62.6	:	-		62.5	:	-	
Biochemical Oxygen Demand	mg/L	T	<1.5	:	-		<1.4	J	-		<1.4	:	-	
Carbonate (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Chemical Oxygen Demand	mg/L	T	<20.	:	-		<20.	:	-		<20.	:	-	
Chloride	mg/L	T	4.1	:	-		4.1	:	-		5.	:	-	
Fluoride	mg/L	T	0.84	:	-		0.66	:	-		0.64	:	-	
Hydroxide (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Nitrate	mg/L	T	<0.29	:	-		0.49	J	-		0.49	J	-	
Nitrite	mg/L	T	<0.005	:	-		<0.005	J	-		<0.005	J	-	
Phosphate, Ortho As P	mg/L	T	<0.01	:	-		<0.01	J	-		<0.01	J	-	
Phosphorus	mg/L	T	0.017	:	-		0.053	:	-		0.05	:	-	
Sulfate	mg/L	T	129.	:	-		98.1	:	-		95.9	:	-	
Total Alkalinity	mg/L	T	69.2	:	-		62.6	:	-		62.5	:	-	
Total Dissolved Solids	mg/L	T	290.	:	-		284.	:	-		234.	:	-	
Total Kjeldahl Nitrogen	mg/L	T	<0.24	:	-		<0.25	:	-		<0.24	:	-	
Total Organic Carbon	mg/L	T	<1.	:	-		<1.5	:	-		<2.7	:	-	
Total Suspended Solids	mg/L	T	6.6	:	-		28.2	:	-		14.6	:	-	
Laboratory Parameters														
pH	SU	T	7.6	J	-		7.9	:	-		7.5	J	8.15	:
Specific Conductance	umhos/cm	T	385.	J	-		260.	J	-		273.	J	-	
Inorganics														
Cyanide	mg/L	T	<0.01	:	-		<0.01	:	-		<0.01	:	-	
Physical Properties														
Hardness	mg/L	T	196.	:	-		159.	:	-		157.	:	-	

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T = Total Fraction D= Dissolved Fraction

Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	LR-16 10/10/2003 LR-16-T04N-SFW SWR		LR-16 10/10/2003 LR-16-D04N-SFW SWR		LR-16 3/23/2004 LR-16-T01N-SFW SWR		LR-16 3/23/2004 LR-16-D01N-SFW SWR		LR-16 3/24/2004 LR-16-T02N-SFW SWR		LR-16 3/24/2004 LR-16-T01N-SFW SWR	
Hardness	mg/L	D	-		191.	:	-		156.	:	-		-	
Metals														
Aluminum	mg/L	T	0.799	:	-		1.66	:	-		1.37	:	-	
Aluminum	mg/L	D	-		<0.0572	J	-		0.108	:	-		-	
Antimony	mg/L	T	<0.0005	:	-		<0.0004	J	-		<0.0004	J	-	
Antimony	mg/L	D	-		<0.0005	:	-		<0.0004	J	-		-	
Arsenic	mg/L	T	0.00028	:	-		0.00029	:	-		0.00027	:	-	
Arsenic	mg/L	D	-		<0.0002	:	-		<0.0002	:	-		-	
Barium	mg/L	T	0.0376	:	-		0.0379	:	-		0.0349	:	-	
Barium	mg/L	D	-		0.0346	:	-		0.0299	:	-		-	
Beryllium	mg/L	T	<0.0004	:	-		<0.001	:	-		0.00024	J	-	
Beryllium	mg/L	D	-		<0.0004	:	-		<0.001	:	-		-	
Boron	mg/L	T	0.0118	:	-		<0.0117	:	-		<0.0101	:	-	
Boron	mg/L	D	-		0.0112	:	-		<0.0117	:	-		-	
Cadmium	mg/L	T	0.00039	:	-		0.00032	:	-		0.00025	:	-	
Cadmium	mg/L	D	-		0.0003	:	-		<0.0002	:	-		-	
Calcium	mg/L	T	59.	:	-		48.	:	-		47.2	:	-	
Calcium	mg/L	D	-		57.7	:	-		47.1	:	-		-	
Chromium	mg/L	T	<0.0011	:	-		<0.0011	:	-		<0.0008	J	-	
Chromium	mg/L	D	-		<0.0011	:	-		<0.00068	:	-		-	
Cobalt	mg/L	T	<0.0029	:	-		<0.0037	:	-		<0.0011	J	-	
Cobalt	mg/L	D	-		0.0035	:	-		0.0059	:	-		-	
Copper	mg/L	T	0.0085	:	-		0.0168	:	-		0.0159	:	-	
Copper	mg/L	D	-		0.0024	:	-		0.0039	:	-		-	
Iron	mg/L	T	0.25	:	-		0.607	:	-		0.42	:	-	
Iron	mg/L	D	-		<0.0278	:	-		<0.0423	:	-		-	
Lead	mg/L	T	0.00058	:	-		0.0015	:	-		0.00083	:	-	
Lead	mg/L	D	-		<0.0002	:	-		<0.0004	:	-		-	
Magnesium	mg/L	T	11.8	:	-		9.57	:	-		9.5	:	-	
Magnesium	mg/L	D	-		11.5	:	-		9.37	:	-		-	
Manganese	mg/L	T	0.189	:	-		0.201	:	-		0.201	:	-	
Manganese	mg/L	D	-		0.18	:	-		0.16	:	-		-	
Mercury	mg/L	T	<0.0001	:	-		<0.0001	J	-		<0.0001	J	-	
Mercury	mg/L	D	-		<0.0001	:	-		<0.0001	J	-		-	

J = Qualified as estimated during data validation
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T = Total Fraction D= Dissolved Fraction

Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	LR-16 10/10/2003 LR-16-T04N-SFW SWR		LR-16 10/10/2003 LR-16-D04N-SFW SWR		LR-16 3/23/2004 LR-16-T01N-SFW SWR		LR-16 3/23/2004 LR-16-D01N-SFW SWR		LR-16 3/24/2004 LR-16-T02N-SFW SWR		LR-16 3/24/2004 LR-16-T01N-SFW SWR	
Molybdenum	mg/L	T	0.0442	:	-		0.0303	:	-		0.0297	:	-	
Molybdenum	mg/L	D	-		0.0456	:	-		0.0314	:	-		-	
Nickel	mg/L	T	0.0108	:	-		0.0101	:	-		0.0106	:	-	
Nickel	mg/L	D	-		0.0105	:	-		0.0083	:	-		-	
Potassium	mg/L	T	1.46	:	-		1.48	:	-		1.24	J	-	
Potassium	mg/L	D	-		1.36	:	-		1.35	:	-		-	
Selenium	mg/L	T	<0.00071	J	-		<0.0007	:	-		<0.0007	:	-	
Selenium	mg/L	D	-		<0.00042	J	-		<0.0007	:	-		-	
Silver	mg/L	T	<0.0001	:	-		<0.0001	:	-		<0.0001	:	-	
Silver	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		-	
Sodium	mg/L	T	10.8	:	-		8.78	:	-		9.32	:	-	
Sodium	mg/L	D	-		11.	:	-		8.88	:	-		-	
Thallium	mg/L	T	<0.0001	:	-		<0.00013	:	-		0.00011	:	-	
Thallium	mg/L	D	-		<0.0001	:	-		<0.00012	:	-		-	
Vanadium	mg/L	T	0.00046	:	-		<0.00089	:	-		<0.00068	:	-	
Vanadium	mg/L	D	-		0.00023	:	-		<0.0005	:	-		-	
Zinc	mg/L	T	0.0741	:	-		0.0796	:	-		0.0745	:	-	
Zinc	mg/L	D	-		0.041	:	-		0.0275	:	-		-	

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID											
			LR-16 3/24/2004 LR-16-D02N-SFW		LR-16 3/25/2004 LR-16-T03N-SFW		LR-16 3/25/2004 LR-16-D03N-SFW		LR-8A 10/6/2003 RR-8A-T00N-SFW		LR-8A 10/6/2003 RR-8A-D00N-SFW		LR-8A 10/6/2003 LR-8A-T00N-SFW	
			SWR		SWR		SWR		SWR		SWR		SWR	
Field Measurements														
Ammonia	mg/L	T	-		0.043	:	-		<0.04	:	-		<0.1	:
DO	mg/l	T	-		10.1	:	-		-		-		8.03	:
EH	millivolts	T	-		209.	:	-		-		-		235.	:
pH	SU	T	-		7.2	J	-		7.1	J	-		7.01	:
Specific Conductance	uS/cm	T	-		284.	:	-		-		-		518.	:
Temperature	Celsius	T	-		6.	:	-		-		-		13.2	:
Turbidity	NTU	T	-		14.	:	-		-		-		12.5	:
General Chemistry														
Ammonia	mg/L	T	-		0.043	:	-		<0.04	:	-		<0.1	:
Bicarbonate (as CaCO3)	mg/L	T	-		66.	:	-		68.6	:	-		-	
Biochemical Oxygen Demand	mg/L	T	-		<1.4	J	-		<1.3	J	-		-	
Carbonate (as CaCO3)	mg/L	T	-		<1.	:	-		<1.	:	-		-	
Chemical Oxygen Demand	mg/L	T	-		<20.	:	-		<20.	:	-		-	
Chloride	mg/L	T	-		4.3	:	-		3.5	:	-		-	
Fluoride	mg/L	T	-		0.63	:	-		0.74	:	-		-	
Hydroxide (as CaCO3)	mg/L	T	-		<1.	:	-		<1.	:	-		-	
Nitrate	mg/L	T	-		<0.2	J	-		<0.29	J	-		-	
Nitrite	mg/L	T	-		<0.005	J	-		<0.005	:	-		-	
Phosphate, Ortho As P	mg/L	T	-		<0.01	J	-		<0.01	:	-		-	
Phosphorus	mg/L	T	-		0.065	:	-		0.025	:	-		-	
Sulfate	mg/L	T	-		88.8	:	-		115.	:	-		-	
Total Alkalinity	mg/L	T	-		66.	:	-		68.6	:	-		-	
Total Dissolved Solids	mg/L	T	-		232.	:	-		268.	:	-		-	
Total Kjeldahl Nitrogen	mg/L	T	-		<0.24	:	-		<0.24	:	-		-	
Total Organic Carbon	mg/L	T	-		<3.1	:	-		1.6	:	-		-	
Total Suspended Solids	mg/L	T	-		25.6	:	-		10.7	:	-		-	
Laboratory Parameters														
pH	SU	T	-		7.2	J	-		7.1	J	-		7.01	:
Specific Conductance	umhos/cm	T	-		287.	J	-		339.	J	-		-	
Inorganics														
Cyanide	mg/L	T	-		<0.01	:	-		<0.01	:	-		-	
Physical Properties														
Hardness	mg/L	T	-		153.	:	-		182.	:	-		-	

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	LR-16 3/24/2004 LR-16-D02N-SFW SWR		LR-16 3/25/2004 LR-16-T03N-SFW SWR		LR-16 3/25/2004 LR-16-D03N-SFW SWR		LR-8A 10/6/2003 RR-8A-T00N-SFW SWR		LR-8A 10/6/2003 RR-8A-D00N-SFW SWR		LR-8A 10/6/2003 LR-8A-T00N-SFW SWR	
Hardness	mg/L	D	163.	:	-		154.	:	-		180.	:	-	
Metals														
Aluminum	mg/L	T	-		1.48	:	-		1.13	:	-		-	
Aluminum	mg/L	D	0.139	:	-		0.126	:	-		0.125	:	-	
Antimony	mg/L	T	-		<0.0004	J	-		<0.0005	:	-		-	
Antimony	mg/L	D	<0.0004	J	-		<0.0004	J	-		<0.0005	:	-	
Arsenic	mg/L	T	-		0.00023	:	-		<0.0002	:	-		-	
Arsenic	mg/L	D	<0.0002	:	-		<0.0002	:	-		<0.0002	:	-	
Barium	mg/L	T	-		0.0353	:	-		0.0424	:	-		-	
Barium	mg/L	D	0.031	:	-		0.0307	:	-		0.0357	:	-	
Beryllium	mg/L	T	-		0.00042	J	-		0.00049	:	-		-	
Beryllium	mg/L	D	<0.0002	J	-		<0.0002	J	-		<0.0004	:	-	
Boron	mg/L	T	-		0.0081	:	-		0.0089	:	-		-	
Boron	mg/L	D	<0.0097	:	-		0.0086	:	-		0.0089	:	-	
Cadmium	mg/L	T	-		0.00026	:	-		0.00034	:	-		-	
Cadmium	mg/L	D	<0.0002	:	-		<0.0002	:	-		0.00033	:	-	
Calcium	mg/L	T	-		46.2	:	-		55.1	:	-		-	
Calcium	mg/L	D	48.9	:	-		46.5	:	-		54.4	:	-	
Chromium	mg/L	T	-		<0.00095	:	-		0.0011	:	-		-	
Chromium	mg/L	D	<0.0008	J	-		<0.0006	:	-		<0.0011	:	-	
Cobalt	mg/L	T	-		0.0019	J	-		<0.0029	:	-		-	
Cobalt	mg/L	D	0.0048	J	-		0.005	J	-		<0.0029	:	-	
Copper	mg/L	T	-		0.0167	:	-		0.0104	:	-		-	
Copper	mg/L	D	0.0041	:	-		0.0029	:	-		0.002	:	-	
Iron	mg/L	T	-		0.488	:	-		0.44	:	-		-	
Iron	mg/L	D	<0.0192	J	-		<0.0192	J	-		<0.0278	:	-	
Lead	mg/L	T	-		0.001	:	-		0.0012	:	-		-	
Lead	mg/L	D	<0.0004	:	-		<0.0004	:	-		<0.0002	:	-	
Magnesium	mg/L	T	-		9.13	:	-		10.8	:	-		-	
Magnesium	mg/L	D	9.84	:	-		9.28	:	-		10.7	:	-	
Manganese	mg/L	T	-		0.2	:	-		0.209	:	-		-	
Manganese	mg/L	D	0.172	:	-		0.16	:	-		0.193	:	-	
Mercury	mg/L	T	-		<0.0001	:	-		<0.0001	:	-		-	
Mercury	mg/L	D	<0.0001	J	-		<0.0001	:	-		<0.0001	:	-	

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T = Total Fraction D= Dissolved Fraction

Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	LR-16 3/24/2004 LR-16-D02N-SFW SWR		LR-16 3/25/2004 LR-16-T03N-SFW SWR		LR-16 3/25/2004 LR-16-D03N-SFW SWR		LR-8A 10/6/2003 RR-8A-T00N-SFW SWR		LR-8A 10/6/2003 RR-8A-D00N-SFW SWR		LR-8A 10/6/2003 LR-8A-T00N-SFW SWR	
Molybdenum	mg/L	T	-		0.0267	:	-		0.0333	:	-		-	
Molybdenum	mg/L	D	0.0319	:	-		0.0289	:	-		0.0335	:	-	
Nickel	mg/L	T	-		0.0092	:	-		0.013	:	-		-	
Nickel	mg/L	D	0.0093	:	-		0.0075	:	-		0.0114	:	-	
Potassium	mg/L	T	-		1.38	:	-		1.56	:	-		-	
Potassium	mg/L	D	1.41	J	-		1.33	:	-		1.48	:	-	
Selenium	mg/L	T	-		<0.0007	:	-		<0.0003	J	-		-	
Selenium	mg/L	D	<0.0007	:	-		<0.0007	:	-		<0.0003	J	-	
Silver	mg/L	T	-		<0.0001	J	-		<0.0001	:	-		-	
Silver	mg/L	D	<0.0001	:	-		<0.0001	J	-		<0.0001	:	-	
Sodium	mg/L	T	-		8.52	:	-		8.58	:	-		-	
Sodium	mg/L	D	9.68	:	-		8.99	:	-		8.69	:	-	
Thallium	mg/L	T	-		<0.0001	:	-		<0.0001	:	-		-	
Thallium	mg/L	D	<0.0001	:	-		<0.0001	:	-		<0.0001	:	-	
Vanadium	mg/L	T	-		0.00064	:	-		0.0004	:	-		-	
Vanadium	mg/L	D	<0.00044	:	-		0.0003	:	-		0.00013	:	-	
Zinc	mg/L	T	-		0.078	:	-		0.0807	:	-		-	
Zinc	mg/L	D	0.0312	:	-		<0.0272	:	-		0.044	:	-	

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	LR-8A 10/7/2003 LR-8A-T01N-SFW SWR		LR-8A 10/7/2003 LR-8A-D01N-SFW SWR		LR-8A 10/8/2003 LR-8A-T02N-SFW SWR		LR-8A 10/8/2003 LR-8A-D02N-SFW SWR		LR-8A 10/9/2003 LR-8A-T03N-SFW SWR		LR-8A 10/9/2003 LR-8A-D03N-SFW SWR	
Field Measurements														
Ammonia	mg/L	T	<0.1	:	-		<0.1	:	-		0.068	:	-	
DO	mg/l	T	9.7	:	-		8.4	:	-		9.49	:	-	
EH	millivolts	T	258.3	:	-		165.5	:	-		207.1	:	-	
pH	SU	T	7.4	J	-		7.52	:	-		7.57	:	-	
Specific Conductance	uS/cm	T	494.	:	-		368.	:	-		376.	:	-	
Temperature	Celsius	T	10.63	:	-		10.38	:	-		8.02	:	-	
Turbidity	NTU	T	-		-		10.4	:	-		16.3	:	-	
General Chemistry														
Ammonia	mg/L	T	<0.1	:	-		<0.1	:	-		0.068	:	-	
Bicarbonate (as CaCO3)	mg/L	T	65.7	:	-		70.8	:	-		69.3	:	-	
Biochemical Oxygen Demand	mg/L	T	<1.4	J	-		<1.5	J	-		<1.5	:	-	
Carbonate (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Chemical Oxygen Demand	mg/L	T	<20.	:	-		<20.	:	-		<20.	:	-	
Chloride	mg/L	T	3.5	:	-		3.7	:	-		3.8	:	-	
Fluoride	mg/L	T	0.74	:	-		0.79	:	-		0.81	:	-	
Hydroxide (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Nitrate	mg/L	T	<0.26	J	-		<0.27	J	-		<0.28	:	-	
Nitrite	mg/L	T	<0.005	J	-		<0.005	J	-		<0.005	:	-	
Phosphate, Ortho As P	mg/L	T	<0.01	J	-		<0.01	J	-		<0.065	:	-	
Phosphorus	mg/L	T	0.026	:	-		0.023	:	-		0.018	:	-	
Sulfate	mg/L	T	106.	:	-		121.	:	-		109.	:	-	
Total Alkalinity	mg/L	T	65.7	:	-		70.8	:	-		69.3	:	-	
Total Dissolved Solids	mg/L	T	294.	:	-		266.	:	-		296.	:	-	
Total Kjeldahl Nitrogen	mg/L	T	<0.24	:	-		<0.24	:	-		<0.24	:	-	
Total Organic Carbon	mg/L	T	1.5	:	-		2.1	:	-		1.3	:	-	
Total Suspended Solids	mg/L	T	9.2	:	-		6.1	:	-		8.5	:	-	
Laboratory Parameters														
pH	SU	T	7.4	J	-		7.52	:	-		7.57	:	-	
Specific Conductance	umhos/cm	T	351.	J	-		387.	J	-		390.	J	-	
Inorganics														
Cyanide	mg/L	T	<0.01	:	-		<0.01	:	-		<0.01	:	-	
Physical Properties														
Hardness	mg/L	T	172.	:	-		198.	:	-		188.	:	-	

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T = Total Fraction D= Dissolved Fraction

Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	LR-8A 10/7/2003 LR-8A-T01N-SFW SWR		LR-8A 10/7/2003 LR-8A-D01N-SFW SWR		LR-8A 10/8/2003 LR-8A-T02N-SFW SWR		LR-8A 10/8/2003 LR-8A-D02N-SFW SWR		LR-8A 10/9/2003 LR-8A-T03N-SFW SWR		LR-8A 10/9/2003 LR-8A-D03N-SFW SWR	
Hardness	mg/L	D	-		194.	:	-		200.	:	-		185.	:
Metals														
Aluminum	mg/L	T	1.25	:	-		0.88	:	-		0.844	:	-	
Aluminum	mg/L	D	-		<0.173	:	-		0.139	:	-		0.0754	:
Antimony	mg/L	T	<0.0005	:	-		<0.0005	:	-		<0.0005	:	-	
Antimony	mg/L	D	-		<0.0005	:	-		<0.0005	:	-		<0.0005	:
Arsenic	mg/L	T	<0.0002	:	-		<0.0002	:	-		<0.0002	:	-	
Arsenic	mg/L	D	-		<0.0002	:	-		<0.0002	:	-		<0.0002	:
Barium	mg/L	T	0.0419	:	-		0.0396	:	-		0.0377	:	-	
Barium	mg/L	D	-		0.0408	:	-		0.0372	:	-		0.0342	:
Beryllium	mg/L	T	<0.0003	J	-		<0.0003	:	-		<0.0004	:	-	
Beryllium	mg/L	D	-		<0.0003	J	-		<0.0003	:	-		<0.0004	:
Boron	mg/L	T	0.0108	:	-		0.0104	:	-		0.0096	:	-	
Boron	mg/L	D	-		0.0121	:	-		0.0121	:	-		0.0096	:
Cadmium	mg/L	T	0.00035	:	-		0.00036	:	-		0.00034	:	-	
Cadmium	mg/L	D	-		0.00032	:	-		0.00033	:	-		0.00033	:
Calcium	mg/L	T	51.6	:	-		59.9	:	-		56.8	:	-	
Calcium	mg/L	D	-		58.3	:	-		60.2	:	-		55.9	:
Chromium	mg/L	T	<0.0013	:	-		0.0015	:	-		<0.0011	:	-	
Chromium	mg/L	D	-		0.0024	:	-		0.0015	:	-		<0.0011	:
Cobalt	mg/L	T	<0.0031	:	-		<0.0031	:	-		<0.0029	:	-	
Cobalt	mg/L	D	-		0.0037	:	-		<0.0031	:	-		<0.0029	:
Copper	mg/L	T	0.0102	:	-		0.0084	:	-		0.0101	:	-	
Copper	mg/L	D	-		0.0021	:	-		0.0025	:	-		0.0029	:
Iron	mg/L	T	0.506	:	-		0.275	:	-		0.282	:	-	
Iron	mg/L	D	-		<0.0326	:	-		<0.03	:	-		<0.0278	:
Lead	mg/L	T	0.00091	:	-		0.00041	:	-		0.00046	:	-	
Lead	mg/L	D	-		<0.0002	:	-		<0.0002	:	-		<0.0002	:
Magnesium	mg/L	T	10.5	:	-		11.9	:	-		11.2	:	-	
Magnesium	mg/L	D	-		11.8	:	-		12.	:	-		11.	:
Manganese	mg/L	T	0.21	:	-		0.202	:	-		0.201	:	-	
Manganese	mg/L	D	-		0.221	:	-		0.197	:	-		0.191	:
Mercury	mg/L	T	<0.0001	:	-		<0.0001	:	-		<0.0001	J	-	
Mercury	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.00016	J

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction											
		LR-8A 10/7/2003 LR-8A-T01N-SFW SWR		LR-8A 10/7/2003 LR-8A-D01N-SFW SWR		LR-8A 10/8/2003 LR-8A-T02N-SFW SWR		LR-8A 10/8/2003 LR-8A-D02N-SFW SWR		LR-8A 10/9/2003 LR-8A-T03N-SFW SWR		LR-8A 10/9/2003 LR-8A-D03N-SFW SWR	
Molybdenum	mg/L	T	0.0156 :	-		0.0473 :		-		0.0409 :		-	
Molybdenum	mg/L	D	-	0.0196 :		-		0.0433 :		-		0.0412 :	
Nickel	mg/L	T	0.013 :	-		0.0121 :		-		0.0136 :		-	
Nickel	mg/L	D	-	0.0141 :		-		0.0108 :		-		0.0126 :	
Potassium	mg/L	T	1.59 :	-		1.7 :		-		1.39 :		-	
Potassium	mg/L	D	-	2.05 :		-		1.88 :		-		1.28 :	
Selenium	mg/L	T	0.00032	J -		0.00049	J -			0.00037	J -		
Selenium	mg/L	D	-	<0.0003	J	-		<0.0003	J	-		0.00044	J
Silver	mg/L	T	<0.0001 :	-		<0.0001 :		-		<0.0001 :		-	
Silver	mg/L	D	-	<0.0001 :		-		<0.0001 :		-		<0.0001 :	
Sodium	mg/L	T	7.34 :	-		9.84 :		-		9.48 :		-	
Sodium	mg/L	D	-	8.11 :		-		10. :		-		9.53 :	
Thallium	mg/L	T	<0.0001 :	-		<0.0001 :		-		<0.0001 :		-	
Thallium	mg/L	D	-	<0.0001 :		-		<0.0001 :		-		<0.0001 :	
Vanadium	mg/L	T	0.00035 :	-		0.00022 :		-		0.00024 :		-	
Vanadium	mg/L	D	-	<0.0001 :		-		0.00016 :		-		<0.0001 :	
Zinc	mg/L	T	0.0908	J -		0.0758 :		-		0.0827 :		-	
Zinc	mg/L	D	-	0.0641 :		-		0.0524 :		-		0.0556 :	

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	LR-8A 10/10/2003 LR-8A-T04N-SFW SWR		LR-8A 10/10/2003 LR-8A-D04N-SFW SWR		LR-8A 3/23/2004 LR-8A-T01N-SFW SWR		LR-8A 3/23/2004 LR-8A-D01N-SFW SWR		LR-8A 3/24/2004 LR-8A-T02N-SFW SWR		LR-8A 3/24/2004 LR-8A-D02N-SFW SWR	
Field Measurements														
Ammonia	mg/L	T	0.041	:	-		<0.062	:	-		<0.084	J	-	
DO	mg/l	T	9.29	:	-		10.	:	-		-		-	
EH	millivolts	T	142.5	:	-		210.	:	-		174.	:	-	
pH	SU	T	7.4	J	-		7.6	J	-		7.4	J	-	
Specific Conductance	uS/cm	T	381.	:	-		242.	:	-		273.	:	-	
Temperature	Celsius	T	9.57	:	-		7.9	:	-		8.8	:	-	
Turbidity	NTU	T	7.6	:	-		24.	:	-		12.	:	-	
General Chemistry														
Ammonia	mg/L	T	0.041	:	-		<0.062	:	-		<0.084	J	-	
Bicarbonate (as CaCO3)	mg/L	T	70.1	:	-		62.5	:	-		63.2	:	-	
Biochemical Oxygen Demand	mg/L	T	<1.5	:	-		<1.4	J	-		<1.4	:	-	
Carbonate (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Chemical Oxygen Demand	mg/L	T	<20.	:	-		<20.	:	-		<20.	:	-	
Chloride	mg/L	T	3.9	:	-		4.6	:	-		4.8	:	-	
Fluoride	mg/L	T	0.84	:	-		0.62	:	-		0.64	:	-	
Hydroxide (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Nitrate	mg/L	T	<0.29	:	-		0.49	J	-		0.49	J	-	
Nitrite	mg/L	T	<0.005	:	-		<0.005	J	-		<0.005	:	-	
Phosphate, Ortho As P	mg/L	T	<0.01	:	-		<0.01	J	-		<0.01	J	-	
Phosphorus	mg/L	T	0.018	:	-		0.073	:	-		0.048	:	-	
Sulfate	mg/L	T	130.	:	-		104.	:	-		102.	:	-	
Total Alkalinity	mg/L	T	70.1	:	-		62.5	:	-		63.2	:	-	
Total Dissolved Solids	mg/L	T	314.	:	-		334.	:	-		256.	:	-	
Total Kjeldahl Nitrogen	mg/L	T	<0.24	:	-		<0.24	:	-		<0.24	:	-	
Total Organic Carbon	mg/L	T	1.3	:	-		<2.2	:	-		2.6	J	-	
Total Suspended Solids	mg/L	T	7.1	:	-		60.	:	-		25.	:	-	
Laboratory Parameters														
pH	SU	T	7.4	J	-		7.6	J	-		7.4	J	-	
Specific Conductance	umhos/cm	T	386.	J	-		277.	J	-		291.	J	-	
Inorganics														
Cyanide	mg/L	T	<0.01	:	-		<0.01	:	-		<0.01	:	-	
Physical Properties														
Hardness	mg/L	T	195.	:	-		164.	:	-		167.	:	-	

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	LR-8A 10/10/2003 LR-8A-T04N-SFW SWR		LR-8A 10/10/2003 LR-8A-D04N-SFW SWR		LR-8A 3/23/2004 LR-8A-T01N-SFW SWR		LR-8A 3/23/2004 LR-8A-D01N-SFW SWR		LR-8A 3/24/2004 LR-8A-T02N-SFW SWR		LR-8A 3/24/2004 LR-8A-D02N-SFW SWR	
Hardness	mg/L	D	-		199.	:	-		171.	:	-		158.	:
Metals														
Aluminum	mg/L	T	0.808	:	-		1.9	:	-		2.02	:	-	
Aluminum	mg/L	D	-		<0.0543	J	-		0.11	:	-		0.139	:
Antimony	mg/L	T	<0.0005	:	-		<0.0004	J	-		<0.0004	J	-	
Antimony	mg/L	D	-		<0.0005	:	-		<0.0004	J	-		<0.0004	J
Arsenic	mg/L	T	<0.0002	:	-		0.00028	:	-		0.00035	:	-	
Arsenic	mg/L	D	-		<0.0002	:	-		<0.0002	:	-		<0.0002	:
Barium	mg/L	T	0.0364	:	-		0.0392	:	-		0.0484	:	-	
Barium	mg/L	D	-		0.0357	:	-		0.0312	:	-		0.0315	:
Beryllium	mg/L	T	0.0004	:	-		<0.001	:	-		<0.0002	J	-	
Beryllium	mg/L	D	-		<0.0004	:	-		<0.001	:	-		<0.0002	J
Boron	mg/L	T	0.0096	:	-		<0.0117	:	-		<0.0085	:	-	
Boron	mg/L	D	-		0.0112	:	-		<0.0117	:	-		<0.0088	:
Cadmium	mg/L	T	0.00039	:	-		0.00034	:	-		0.00021	:	-	
Cadmium	mg/L	D	-		0.00027	:	-		0.00025	:	-		<0.0002	:
Calcium	mg/L	T	58.9	:	-		49.9	:	-		50.4	:	-	
Calcium	mg/L	D	-		60.1	:	-		52.	:	-		47.6	:
Chromium	mg/L	T	<0.0011	:	-		<0.00094	:	-		<0.0008	J	-	
Chromium	mg/L	D	-		<0.0011	:	-		<0.00063	:	-		<0.0008	J
Cobalt	mg/L	T	<0.0029	:	-		<0.0037	:	-		<0.0011	J	-	
Cobalt	mg/L	D	-		0.0041	:	-		0.0044	:	-		<0.0011	J
Copper	mg/L	T	0.0093	:	-		0.0208	:	-		0.0189	:	-	
Copper	mg/L	D	-		0.0044	:	-		0.0042	:	-		0.0048	:
Iron	mg/L	T	0.202	:	-		0.692	:	-		1.1	:	-	
Iron	mg/L	D	-		<0.0278	:	-		<0.0423	:	-		<0.0192	J
Lead	mg/L	T	0.00042	:	-		0.0014	:	-		0.0031	:	-	
Lead	mg/L	D	-		0.00022	:	-		<0.0004	:	-		<0.0004	:
Magnesium	mg/L	T	11.6	:	-		9.64	:	-		10.	:	-	
Magnesium	mg/L	D	-		11.8	:	-		10.	:	-		9.48	:
Manganese	mg/L	T	0.211	:	-		0.242	:	-		0.245	:	-	
Manganese	mg/L	D	-		0.213	:	-		0.189	:	-		0.188	:
Mercury	mg/L	T	<0.0001	:	-		<0.0001	J	-		<0.0001	J	-	
Mercury	mg/L	D	-		<0.00015	:	-		<0.0001	J	-		<0.0001	J

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	LR-8A 10/10/2003 LR-8A-T04N-SFW SWR		LR-8A 10/10/2003 LR-8A-D04N-SFW SWR		LR-8A 3/23/2004 LR-8A-T01N-SFW SWR		LR-8A 3/23/2004 LR-8A-D01N-SFW SWR		LR-8A 3/24/2004 LR-8A-T02N-SFW SWR		LR-8A 3/24/2004 LR-8A-D02N-SFW SWR	
Molybdenum	mg/L	T	0.0478	:	-		0.04	:	-		0.0488	:	-	
Molybdenum	mg/L	D	-		0.0508	:	-		0.0509	:	-		0.0341	:
Nickel	mg/L	T	0.0121	:	-		0.0113	:	-		0.0121	:	-	
Nickel	mg/L	D	-		0.0117	:	-		0.0087	:	-		0.0099	:
Potassium	mg/L	T	1.29	:	-		1.41	:	-		1.38	J	-	
Potassium	mg/L	D	-		1.24	:	-		1.38	:	-		1.13	J
Selenium	mg/L	T	<0.00047	J	-		<0.0007	:	-		<0.0007	:	-	
Selenium	mg/L	D	-		<0.00066	J	-		<0.0007	:	-		<0.0007	:
Silver	mg/L	T	<0.0001	:	-		<0.0001	:	-		<0.0001	:	-	
Silver	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Sodium	mg/L	T	10.2	:	-		8.75	:	-		9.69	J	-	
Sodium	mg/L	D	-		10.7	:	-		9.32	:	-		8.57	:
Thallium	mg/L	T	<0.0001	:	-		<0.00012	:	-		0.00011	:	-	
Thallium	mg/L	D	-		<0.0001	:	-		<0.00012	:	-		0.00011	:
Vanadium	mg/L	T	0.0002	:	-		<0.00074	:	-		0.0011	:	-	
Vanadium	mg/L	D	-		<0.0001	:	-		<0.00041	:	-		<0.00034	:
Zinc	mg/L	T	0.0861	:	-		0.104	:	-		0.089	:	-	
Zinc	mg/L	D	-		0.0639	:	-		0.0376	:	-		0.0397	:

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction											
		LR-8A 3/25/2004 LR-8A-T03N-SFW SWR		LR-8A 3/25/2004 LR-8A-D03N-SFW SWR		RR-11B2 3/23/2004 RR-11B2-T01N-SFW SWR		RR-11B2 3/23/2004 RR-11B2-D01N-SFW SWR		RR-11B2 3/24/2004 RR-11B2-T02N-SFW SWR		RR-11B2 3/24/2004 RR-11B2-D02N-SFW SWR	
Field Measurements													
Ammonia	mg/L	T	0.048 :		-		<0.1 :		-		<0.11 :		-
DO	mg/l	T	9.86 :		-		10.68 :		-		-		-
EH	millivolts	T	207. :		-		108. :		-		125. :		-
pH	SU	T	7.2	J	-		7.76 :		-		7.8 :		-
Specific Conductance	uS/cm	T	271. :		-		211. :		-		219. :		-
Temperature	Celsius	T	7.3 :		-		8.63 :		-		9.2 :		-
Turbidity	NTU	T	13. :		-		11.4 :		-		9.3 :		-
General Chemistry													
Ammonia	mg/L	T	0.048 :		-		<0.1 :		-		<0.11 :		-
Bicarbonate (as CaCO3)	mg/L	T	65.7 :		-		64.6 :		-		64. :		-
Biochemical Oxygen Demand	mg/L	T	<1.4	J	-		<1.4	J	-		<1.4 :		-
Carbonate (as CaCO3)	mg/L	T	<1. :		-		<1. :		-		<1. :		-
Chemical Oxygen Demand	mg/L	T	44.7 :		-		<20. :		-		<20. :		-
Chloride	mg/L	T	4.5 :		-		4.5 :		-		4.5 :		-
Fluoride	mg/L	T	0.63 :		-		0.36 :		-		0.34 :		-
Hydroxide (as CaCO3)	mg/L	T	<1. :		-		<1. :		-		<1. :		-
Nitrate	mg/L	T	<0.2	J	-		0.45	J	-		0.48	J	-
Nitrite	mg/L	T	<0.005	J	-		<0.005 :		-		<0.005 :		-
Phosphate, Ortho As P	mg/L	T	<0.01	J	-		<0.01	J	-		<0.01 :		-
Phosphorus	mg/L	T	0.048 :		-		0.011 :		-		0.053 :		-
Sulfate	mg/L	T	108. :		-		59.8 :		-		54.9 :		-
Total Alkalinity	mg/L	T	65.7 :		-		64.6 :		-		64. :		-
Total Dissolved Solids	mg/L	T	256. :		-		186. :		-		184. :		-
Total Kjeldahl Nitrogen	mg/L	T	<0.24 :		-		<0.26 :		-		0.26 :		-
Total Organic Carbon	mg/L	T	<3.4 :		-		<1.7 :		-		<2.9 :		-
Total Suspended Solids	mg/L	T	18.5 :		-		12.7 :		-		15. :		-
Laboratory Parameters													
pH	SU	T	7.2	J	-		7.76 :		-		7.8 :		-
Specific Conductance	umhos/cm	T	321.	J	-		205.	J	-		207.	J	-
Inorganics													
Cyanide	mg/L	T	<0.01 :		-		<0.01 :		-		<0.01 :		-
Physical Properties													
Hardness	mg/L	T	163. :		-		118. :		-		116. :		-

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	LR-8A 3/25/2004 LR-8A-T03N-SFW SWR		LR-8A 3/25/2004 LR-8A-D03N-SFW SWR		RR-11B2 3/23/2004 RR-11B2-T01N-SFW SWR		RR-11B2 3/23/2004 RR-11B2-D01N-SFW SWR		RR-11B2 3/24/2004 RR-11B2-T02N-SFW SWR		RR-11B2 3/24/2004 RR-11B2-D02N-SFW SWR	
Hardness	mg/L	D	-		171.	:	-		121.	:	-		127.	:
Metals														
Aluminum	mg/L	T	1.42	:	-		0.926	:	-		0.785	:	-	
Aluminum	mg/L	D	-		0.118	:	-		0.212	:	-		0.108	J
Antimony	mg/L	T	<0.0004	J	-		<0.0004	J	-		<0.0004	J	-	
Antimony	mg/L	D	-		<0.0004	J	-		<0.0004	J	-		<0.0004	J
Arsenic	mg/L	T	<0.0002	:	-		<0.0002	:	-		<0.0002	:	-	
Arsenic	mg/L	D	-		<0.0002	:	-		<0.0002	:	-		<0.0002	:
Barium	mg/L	T	0.0362	:	-		0.0444	:	-		0.0419	:	-	
Barium	mg/L	D	-		0.0303	:	-		0.0387	:	-		0.0358	:
Beryllium	mg/L	T	0.00024	J	-		<0.001	:	-		<0.00037	:	-	
Beryllium	mg/L	D	-		<0.0002	J	-		<0.001	:	-		<0.00034	:
Boron	mg/L	T	0.0076	:	-		<0.0117	:	-		0.0036	:	-	
Boron	mg/L	D	-		0.0081	:	-		<0.0117	:	-		0.004	:
Cadmium	mg/L	T	<0.0002	:	-		0.00027	:	-		<0.0002	:	-	
Cadmium	mg/L	D	-		<0.0002	:	-		0.0002	:	-		<0.0002	:
Calcium	mg/L	T	49.5	:	-		35.4	:	-		34.8	:	-	
Calcium	mg/L	D	-		52.1	:	-		36.3	:	-		38.	:
Chromium	mg/L	T	<0.00083	:	-		<0.00079	:	-		<0.0008	J	-	
Chromium	mg/L	D	-		<0.00064	:	-		<0.00085	:	-		<0.0008	J
Cobalt	mg/L	T	0.002	J	-		<0.0037	:	-		<0.0011	J	-	
Cobalt	mg/L	D	-		0.0061	J	-		0.0055	:	-		0.0031	J
Copper	mg/L	T	0.0155	:	-		0.0132	:	-		0.0121	:	-	
Copper	mg/L	D	-		0.0032	:	-		0.0045	:	-		0.003	:
Iron	mg/L	T	0.446	:	-		0.416	:	-		0.31	J	-	
Iron	mg/L	D	-		<0.0192	J	-		<0.0423	:	-		<0.0192	J
Lead	mg/L	T	0.0007	:	-		0.00077	:	-		0.00052	:	-	
Lead	mg/L	D	-		<0.0004	:	-		<0.0004	:	-		<0.0004	:
Magnesium	mg/L	T	9.6	:	-		7.16	:	-		7.16	:	-	
Magnesium	mg/L	D	-		9.94	:	-		7.34	:	-		7.68	:
Manganese	mg/L	T	0.214	:	-		0.123	:	-		0.118	:	-	
Manganese	mg/L	D	-		0.184	:	-		0.0888	:	-		0.0825	:
Mercury	mg/L	T	<0.0001	:	-		<0.0001	J	-		<0.0001	J	-	
Mercury	mg/L	D	-		<0.0001	:	-		<0.0001	J	-		<0.0001	J

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T = Total Fraction D= Dissolved Fraction

Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	LR-8A 3/25/2004 LR-8A-T03N-SFW SWR		LR-8A 3/25/2004 LR-8A-D03N-SFW SWR		RR-11B2 3/23/2004 RR-11B2-T01N-SFW SWR		RR-11B2 3/23/2004 RR-11B2-D01N-SFW SWR		RR-11B2 3/24/2004 RR-11B2-T02N-SFW SWR		RR-11B2 3/24/2004 RR-11B2-D02N-SFW SWR	
Molybdenum	mg/L	T	0.0402	J	-		<0.003	:	-		<0.0019	:	-	
Molybdenum	mg/L	D	-		0.0619	J	-		<0.003	:	-		<0.0018	:
Nickel	mg/L	T	0.0092	:	-		0.0081	:	-		0.0069	:	-	
Nickel	mg/L	D	-		0.0079	:	-		0.0069	:	-		0.0054	:
Potassium	mg/L	T	1.38	:	-		<1.1	:	-		0.49	J	-	
Potassium	mg/L	D	-		1.43	:	-		<1.1	:	-		0.765	J
Selenium	mg/L	T	<0.0007	:	-		<0.0007	:	-		<0.0007	:	-	
Selenium	mg/L	D	-		<0.0007	:	-		<0.0007	:	-		<0.0007	:
Silver	mg/L	T	<0.0001	J	-		<0.0001	:	-		<0.0001	:	-	
Silver	mg/L	D	-		<0.0001	J	-		<0.0001	:	-		<0.0001	:
Sodium	mg/L	T	8.9	:	-		4.59	:	-		5.25	:	-	
Sodium	mg/L	D	-		9.86	:	-		4.86	:	-		5.29	:
Thallium	mg/L	T	<0.0001	:	-		<0.00012	:	-		<0.0001	:	-	
Thallium	mg/L	D	-		<0.0001	:	-		<0.00012	:	-		<0.0001	:
Vanadium	mg/L	T	0.00036	:	-		<0.00056	:	-		<0.0002	:	-	
Vanadium	mg/L	D	-		<0.0002	:	-		<0.00039	:	-		<0.0002	:
Zinc	mg/L	T	0.0795	:	-		0.0558	:	-		0.0522	:	-	
Zinc	mg/L	D	-		0.0361	:	-		0.0225	:	-		0.023	:

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T = Total Fraction D= Dissolved Fraction

Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-11B2 3/25/2004 RR-11B2-T03N-SFW SWR		RR-11B2 3/25/2004 RR-11B2-D03N-SFW SWR		RR-11B2 9/27/2004 RR-11B2-T00N-SFW SWR		RR-11B2 9/27/2004 RR-11B2-D00N-SFW SWR		RR-11B2 9/28/2004 RR-11B2-T01N-SFW SWR		RR-11B2 9/28/2004 RR-11B2-D01N-SFW SWR	
Field Measurements														
Ammonia	mg/L	T	0.042	:	-		-		-		-		-	
DO	mg/l	T	9.88	:	-		10.04	:	-		9.5	:	-	
EH	millivolts	T	153.	:	-		191.3	:	-		147.6	:	-	
pH	SU	T	7.2	J	-		7.73	:	-		7.91	:	-	
Specific Conductance	uS/cm	T	215.	:	-		261.	:	-		250.	:	-	
Temperature	Celsius	T	7.9	:	-		7.13	:	-		7.77	:	-	
Turbidity	NTU	T	9.	:	-		11.1	:	-		0.	:	-	
General Chemistry														
Ammonia	mg/L	T	0.042	:	-		-		-		-		-	
Bicarbonate (as CaCO3)	mg/L	T	68.	:	-		68.4	:	-		69.4	:	-	
Biochemical Oxygen Demand	mg/L	T	<1.4	J	-		-		-		-		-	
Carbonate (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Chemical Oxygen Demand	mg/L	T	<20.	:	-		-		-		-		-	
Chloride	mg/L	T	3.6	:	-		2.8	J	-		2.3	J	-	
Dissolved Organic Carbon	mg/L	D	-		-		-		<1.8	:	-		<2.5	:
Fluoride	mg/L	T	0.35	:	-		0.4	:	-		0.42	:	-	
Hydroxide (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Nitrate	mg/L	T	<0.2	:	-		-		-		-		-	
Nitrate+Nitrite as N	mg/L	T	-		-		0.27	:	-		0.38	:	-	
Nitrite	mg/L	T	<0.005	J	-		<0.005	:	-		<0.005	:	-	
Phosphate, Ortho As P	mg/L	T	<0.01	J	-		<0.01	:	-		<0.01	J	-	
Phosphorus	mg/L	T	0.054	:	-		0.02	:	-		0.039	:	-	
Sulfate	mg/L	T	47.	:	-		57.6	:	-		61.3	:	-	
Total Alkalinity	mg/L	T	68.	:	-		68.4	:	-		69.4	:	-	
Total Dissolved Solids	mg/L	T	176.	:	-		156.	:	-		156.	:	-	
Total Kjeldahl Nitrogen	mg/L	T	<0.24	:	-		-		-		-		-	
Total Organic Carbon	mg/L	T	<3.2	:	-		<1.	:	-		<1.	:	-	
Total Suspended Solids	mg/L	T	13.3	:	-		4.7	:	-		6.1	:	-	
Laboratory Parameters														
pH	SU	T	7.2	J	-		7.73	:	-		7.91	:	-	
Specific Conductance	umhos/cm	T	204.	J	-		-		-		-		-	
Inorganics														
Cyanide	mg/L	T	<0.01	:	-		<0.01	:	-		<0.01	:	-	

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T = Total Fraction D= Dissolved Fraction

Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-11B2 3/25/2004 RR-11B2-T03N-SFW SWR	RR-11B2 3/25/2004 RR-11B2-D03N-SFW SWR	RR-11B2 9/27/2004 RR-11B2-T00N-SFW SWR	RR-11B2 9/27/2004 RR-11B2-D00N-SFW SWR	RR-11B2 9/28/2004 RR-11B2-T01N-SFW SWR	RR-11B2 9/28/2004 RR-11B2-D01N-SFW SWR
Physical Properties								
Hardness	mg/L	T	117. :	-	-	-	-	-
Hardness	mg/L	D	-	117. :	-	124. :	-	138. :
Metals								
Aluminum	mg/L	T	0.751 :	-	0.455 :	-	0.538 :	-
Aluminum	mg/L	D	-	0.144 :	-	0.149 :	-	0.175 :
Antimony	mg/L	T	<0.0004 J	-	-	-	-	-
Antimony	mg/L	D	-	<0.0004 J	-	<0.0003 :	-	<0.0015 :
Arsenic	mg/L	T	<0.0002 :	-	-	-	-	-
Arsenic	mg/L	D	-	<0.0002 :	-	<0.0001 J	-	<0.0001 :
Barium	mg/L	T	0.0413 :	-	-	-	-	-
Barium	mg/L	D	-	0.0353 :	-	0.0362 :	-	0.0405 :
Beryllium	mg/L	T	0.00025 J	-	-	-	-	-
Beryllium	mg/L	D	-	<0.0002 J	-	<0.0003 :	-	<0.0003 :
Boron	mg/L	T	<0.004 :	-	-	-	-	-
Boron	mg/L	D	-	<0.0035 :	-	<0.0069 :	-	<0.0069 :
Cadmium	mg/L	T	<0.0002 :	-	-	-	-	-
Cadmium	mg/L	D	-	<0.0002 :	-	<0.0001 J	-	<0.0001 J
Calcium	mg/L	T	35.2 :	-	-	-	-	-
Calcium	mg/L	D	-	35.4 :	-	37.7 :	-	41.6 :
Chromium	mg/L	T	<0.00068 :	-	-	-	-	-
Chromium	mg/L	D	-	<0.00074 :	-	<0.0011 :	-	<0.0011 J
Cobalt	mg/L	T	0.0013 J	-	-	-	-	-
Cobalt	mg/L	D	-	0.0059 J	-	0.0032 :	-	<0.0031 :
Copper	mg/L	T	0.0115 :	-	-	-	-	-
Copper	mg/L	D	-	0.0032 :	-	0.0019 J	-	0.0046 :
Iron	mg/L	T	0.357 :	-	0.18 :	-	0.149 :	-
Iron	mg/L	D	-	0.0305 J	-	<0.0355 :	-	<0.0355 J
Lead	mg/L	T	0.00064 :	-	-	-	-	-
Lead	mg/L	D	-	<0.0004 :	-	<0.0001 :	-	<0.0001 :
Magnesium	mg/L	T	6.97 :	-	-	-	-	-
Magnesium	mg/L	D	-	6.96 :	-	7.27 :	-	8.22 :
Manganese	mg/L	T	0.11 :	-	-	-	-	-
Manganese	mg/L	D	-	0.0792 :	-	0.0812 :	-	0.087 :

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-11B2 3/25/2004 RR-11B2-T03N-SFW SWR		RR-11B2 3/25/2004 RR-11B2-D03N-SFW SWR		RR-11B2 9/27/2004 RR-11B2-T00N-SFW SWR		RR-11B2 9/27/2004 RR-11B2-D00N-SFW SWR		RR-11B2 9/28/2004 RR-11B2-T01N-SFW SWR		RR-11B2 9/28/2004 RR-11B2-D01N-SFW SWR	
Mercury	mg/L	T	<0.0001	:	-		-		-		-		-	
Mercury	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Molybdenum	mg/L	T	<0.0055	:	-		-		-		-		-	
Molybdenum	mg/L	D	-		<0.0027	:	-		0.0013	:	-		<0.0021	:
Nickel	mg/L	T	0.0069	:	-		-		-		-		-	
Nickel	mg/L	D	-		0.0059	:	-		0.0076	:	-		0.0099	:
Potassium	mg/L	T	1.16	:	-		-		-		-		-	
Potassium	mg/L	D	-		1.22	:	-		1.14	:	-		<1.55	:
Selenium	mg/L	T	<0.0007	:	-		-		-		-		-	
Selenium	mg/L	D	-		<0.0007	:	-		<0.0003	J	-		<0.0003	J
Silver	mg/L	T	<0.0001	J	-		-		-		-		-	
Silver	mg/L	D	-		<0.0001	J	-		<0.0001	J	-		<0.0001	:
Sodium	mg/L	T	4.54	:	-		-		-		-		-	
Sodium	mg/L	D	-		4.41	:	-		4.15	:	-		4.45	:
Thallium	mg/L	T	<0.0001	:	-		-		-		-		-	
Thallium	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Vanadium	mg/L	T	0.00034	:	-		-		-		-		-	
Vanadium	mg/L	D	-		<0.0002	:	-		<0.0001	J	-		0.00019	:
Zinc	mg/L	T	0.0492	:	-		-		-		-		-	
Zinc	mg/L	D	-		0.0213	:	-		0.036	:	-		0.0402	:

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID											
			RR-11B2 9/29/2004 RR-11B2-T02N-SFW		RR-11B2 9/29/2004 RR-11B2-D02N-SFW		RR-11B2 9/30/2004 RR-11B2-T03N-SFW		RR-11B2 9/30/2004 RR-11B2-D03N-SFW		RR-11B2 10/1/2004 RR-11B2-T04N-SFW		RR-11B2 10/1/2004 RR-11B2-D04N-SFW	
			SWR		SWR		SWR		SWR		SWR		SWR	
Field Measurements														
DO	mg/l	T	9.74	:	-		9.69	:	-		10.18	:	-	
EH	millivolts	T	148.9	:	-		212.8	:	-		203.5	:	-	
pH	SU	T	8.48	:	-		8.34	:	-		8.05	:	-	
Specific Conductance	uS/cm	T	242.	:	-		253.	:	-		248.	:	-	
Temperature	Celsius	T	7.35	:	-		6.74	:	-		4.8	:	-	
Turbidity	NTU	T	43.3	:	-		15.8	:	-		7.5	:	-	
General Chemistry														
Bicarbonate (as CaCO3)	mg/L	T	64.6	:	-		70.7	:	-		75.5	:	-	
Carbonate (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Chloride	mg/L	T	2.7	J	-		2.4	J	-		2.4	J	-	
Dissolved Organic Carbon	mg/L	D	-		8.9	J	-		<1.3	:	-		<1.3	:
Fluoride	mg/L	T	0.37	:	-		0.41	:	-		0.41	:	-	
Hydroxide (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Nitrate+Nitrite as N	mg/L	T	0.3	:	-		0.36	:	-		0.3	:	-	
Nitrite	mg/L	T	<0.005	:	-		<0.005	J	-		<0.005	J	-	
Phosphate, Ortho As P	mg/L	T	<0.01	:	-		<0.01	J	-		<0.01	J	-	
Phosphorus	mg/L	T	0.071	:	-		0.041	:	-		0.037	:	-	
Sulfate	mg/L	T	57.6	:	-		53.5	:	-		58.2	:	-	
Total Alkalinity	mg/L	T	64.6	:	-		70.7	:	-		75.5	:	-	
Total Dissolved Solids	mg/L	T	128.	:	-		260.	:	-		226.	:	-	
Total Organic Carbon	mg/L	T	<1.9	J	-		<1.1	:	-		<1.4	:	-	
Total Suspended Solids	mg/L	T	54.4	:	-		17.6	:	-		10.3	:	-	
Laboratory Parameters														
pH	SU	T	8.48	:	-		8.34	:	-		8.05	:	-	
Inorganics														
Cyanide	mg/L	T	<0.01	:	-		<0.01	:	-		<0.01	:	-	
Physical Properties														
Hardness	mg/L	D	-		124.	:	-		126.	:	-		129.	:
Metals														
Aluminum	mg/L	T	0.778	:	-		0.514	:	-		0.494	:	-	
Aluminum	mg/L	D	-		<0.182	:	-		0.123	:	-		0.132	:
Antimony	mg/L	D	-		<0.00066	:	-		<0.00081	:	-		<0.00082	:

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-11B2 9/29/2004 RR-11B2-T02N-SFW SWR	RR-11B2 9/29/2004 RR-11B2-D02N-SFW SWR	RR-11B2 9/30/2004 RR-11B2-T03N-SFW SWR	RR-11B2 9/30/2004 RR-11B2-D03N-SFW SWR	RR-11B2 10/1/2004 RR-11B2-T04N-SFW SWR	RR-11B2 10/1/2004 RR-11B2-D04N-SFW SWR
Arsenic	mg/L	D	-	<0.0001 :	-	<0.0001 :	-	<0.0001 :
Barium	mg/L	D	-	0.0311 :	-	0.0336 :	-	0.0332 :
Beryllium	mg/L	D	-	<0.0003 :	-	0.00033 :	-	<0.0003 :
Boron	mg/L	D	-	<0.0069 :	-	<0.0069 :	-	<0.0069 :
Cadmium	mg/L	D	-	<0.0001 :	-	<0.0001 J	-	<0.0001 J
Calcium	mg/L	D	-	38.1 :	-	38.3 :	-	39.2 :
Chromium	mg/L	D	-	<0.0011 :	-	<0.0011 J	-	<0.0011 J
Cobalt	mg/L	D	-	<0.0031 :	-	<0.0031 :	-	0.0041 :
Copper	mg/L	D	-	0.004 J	-	0.0025 J	-	0.0017 J
Iron	mg/L	T	1.01 :	-	0.289 :	-	0.217 :	-
Iron	mg/L	D	-	0.0577 :	-	<0.0355 J	-	<0.0355 J
Lead	mg/L	D	-	<0.0001 :	-	<0.0001 :	-	<0.0001 :
Magnesium	mg/L	D	-	7.11 :	-	7.42 :	-	7.63 :
Manganese	mg/L	D	-	0.093 :	-	0.0926 :	-	0.0974 :
Mercury	mg/L	D	-	<0.0001 :	-	<0.0001 J	-	<0.0001 J
Molybdenum	mg/L	D	-	0.0081 :	-	0.0015 :	-	0.0014 :
Nickel	mg/L	D	-	0.0064 :	-	0.0073 :	-	0.0083 :
Potassium	mg/L	D	-	1.18 :	-	1.01 :	-	1.22 :
Selenium	mg/L	D	-	<0.0003 J	-	<0.0003 J	-	<0.0003 J
Silver	mg/L	D	-	<0.0001 J	-	<0.0001 J	-	<0.0001 J
Sodium	mg/L	D	-	3.71 :	-	4.36 :	-	4.21 :
Thallium	mg/L	D	-	<0.0001 :	-	<0.0001 :	-	<0.0001 :
Vanadium	mg/L	D	-	<0.0001 :	-	<0.0001 :	-	<0.0001 :
Zinc	mg/L	D	-	0.0232 :	-	0.0312 :	-	0.0402 :

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T = Total Fraction D= Dissolved Fraction

Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-11B3 3/23/2004 RR-11B3-T01N-SFW SWR		RR-11B3 3/23/2004 RR-11B3-D01N-SFW SWR		RR-11B3 3/24/2004 RR-11B3-T02N-SFW SWR		RR-11B3 3/24/2004 RR-11B3-D02N-SFW SWR		RR-11B3 3/25/2004 RR-11B3-T03N-SFW SWR		RR-11B3 3/25/2004 RR-11B3-D03N-SFW SWR	
Field Measurements														
Ammonia	mg/L	T	<0.098	:	-		<0.088	:	-		0.049	:	-	
DO	mg/l	T	12.99	:	-		-		-		9.83	:	-	
EH	millivolts	T	135.9	:	-		126.	:	-		157.	:	-	
pH	SU	T	7.44	:	-		7.3	J	-		7.2	J	-	
Specific Conductance	uS/cm	T	232.	:	-		239.	:	-		236.	:	-	
Temperature	Celsius	T	7.7	:	-		8.3	:	-		7.37	:	-	
Turbidity	NTU	T	9.8	:	-		8.4	:	-		11.6	:	-	
General Chemistry														
Ammonia	mg/L	T	<0.098	:	-		<0.088	:	-		0.049	:	-	
Bicarbonate (as CaCO3)	mg/L	T	64.6	:	-		61.4	:	-		66.	:	-	
Biochemical Oxygen Demand	mg/L	T	<1.4	J	-		<1.4	:	-		<1.4	J	-	
Carbonate (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Chemical Oxygen Demand	mg/L	T	<20.	:	-		<20.	:	-		<20.	:	-	
Chloride	mg/L	T	4.6	:	-		4.5	:	-		3.6	:	-	
Fluoride	mg/L	T	0.45	:	-		0.45	:	-		0.44	:	-	
Hydroxide (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Nitrate	mg/L	T	0.46	J	-		0.51	J	-		<0.2	:	-	
Nitrite	mg/L	T	<0.005	:	-		<0.005	:	-		<0.005	J	-	
Phosphate, Ortho As P	mg/L	T	<0.01	J	-		<0.01	:	-		<0.01	J	-	
Phosphorus	mg/L	T	0.052	:	-		0.045	:	-		0.04	:	-	
Sulfate	mg/L	T	68.9	:	-		68.7	:	-		64.9	:	-	
Total Alkalinity	mg/L	T	64.6	:	-		61.4	:	-		66.	:	-	
Total Dissolved Solids	mg/L	T	212.	:	-		202.	:	-		186.	:	-	
Total Kjeldahl Nitrogen	mg/L	T	<0.5	:	-		<0.24	:	-		<0.24	:	-	
Total Organic Carbon	mg/L	T	<1.9	:	-		<2.3	:	-		<2.4	:	-	
Total Suspended Solids	mg/L	T	10.6	:	-		9.7	:	-		9.9	:	-	
Laboratory Parameters														
pH	SU	T	7.44	:	-		7.3	J	-		7.2	J	-	
Specific Conductance	umhos/cm	T	225.	J	-		226.	J	-		228.	J	-	
Inorganics														
Cyanide	mg/L	T	<0.01	:	-		<0.01	:	-		<0.01	:	-	
Physical Properties														
Hardness	mg/L	T	129.	:	-		140.	:	-		130.	:	-	

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area	Fraction	RR-11B3 3/23/2004 RR-11B3-T01N-SFW SWR		RR-11B3 3/23/2004 RR-11B3-D01N-SFW SWR		RR-11B3 3/24/2004 RR-11B3-T02N-SFW SWR		RR-11B3 3/24/2004 RR-11B3-D02N-SFW SWR		RR-11B3 3/25/2004 RR-11B3-T03N-SFW SWR		RR-11B3 3/25/2004 RR-11B3-D03N-SFW SWR	
Hardness	mg/L		D	-		127.	:	-		140.	:	-		134.	:
Metals															
Aluminum	mg/L		T	0.645	:	-		0.606	:	-		0.67	:	-	
Aluminum	mg/L		D	-		0.13	:	-		0.0578	J	-		0.145	:
Antimony	mg/L		T	<0.0004	J	-		<0.0004	J	-		<0.0004	J	-	
Antimony	mg/L		D	-		<0.0004	J	-		<0.0004	J	-		<0.0004	J
Arsenic	mg/L		T	<0.0002	:	-		<0.0002	:	-		<0.0002	:	-	
Arsenic	mg/L		D	-		<0.0002	:	-		<0.0002	:	-		<0.0002	:
Barium	mg/L		T	0.0402	:	-		0.0389	:	-		0.04	:	-	
Barium	mg/L		D	-		0.036	:	-		0.0338	:	-		0.0349	:
Beryllium	mg/L		T	<0.001	:	-		<0.00057	:	-		<0.0002	J	-	
Beryllium	mg/L		D	-		<0.001	:	-		<0.00044	:	-		<0.0002	J
Boron	mg/L		T	<0.0117	:	-		0.0034	:	-		0.0037	:	-	
Boron	mg/L		D	-		<0.0117	:	-		0.0034	:	-		0.0034	:
Cadmium	mg/L		T	0.00026	:	-		<0.0002	:	-		<0.0002	:	-	
Cadmium	mg/L		D	-		<0.0002	:	-		<0.0002	:	-		<0.0002	:
Calcium	mg/L		T	38.8	:	-		41.9	:	-		39.	:	-	
Calcium	mg/L		D	-		38.2	:	-		42.1	:	-		40.3	:
Chromium	mg/L		T	<0.0014	:	-		<0.0008	J	-		<0.00074	:	-	
Chromium	mg/L		D	-		<0.00066	:	-		<0.0008	J	-		<0.00055	:
Cobalt	mg/L		T	<0.0037	:	-		<0.0011	J	-		<0.0011	J	-	
Cobalt	mg/L		D	-		0.0049	:	-		0.0026	J	-		0.005	J
Copper	mg/L		T	0.0094	:	-		0.0086	:	-		0.0087	:	-	
Copper	mg/L		D	-		0.0041	:	-		0.0025	:	-		0.0028	:
Iron	mg/L		T	0.264	:	-		0.326	J	-		0.308	:	-	
Iron	mg/L		D	-		<0.0423	:	-		<0.0192	J	-		<0.0192	J
Lead	mg/L		T	0.0007	:	-		0.00061	:	-		0.00058	:	-	
Lead	mg/L		D	-		<0.0004	:	-		<0.0004	:	-		<0.0004	:
Magnesium	mg/L		T	7.86	:	-		8.5	:	-		7.88	:	-	
Magnesium	mg/L		D	-		7.75	:	-		8.51	:	-		8.06	:
Manganese	mg/L		T	0.0878	:	-		0.0965	:	-		0.0884	:	-	
Manganese	mg/L		D	-		0.0737	:	-		0.0744	:	-		0.0727	:
Mercury	mg/L		T	<0.0001	J	-		<0.0001	J	-		<0.0001	:	-	
Mercury	mg/L		D	-		<0.0001	J	-		<0.0001	J	-		<0.0001	:

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T = Total Fraction D= Dissolved Fraction

Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area	Fraction	RR-11B3 3/23/2004 RR-11B3-T01N-SFW SWR		RR-11B3 3/23/2004 RR-11B3-D01N-SFW SWR		RR-11B3 3/24/2004 RR-11B3-T02N-SFW SWR		RR-11B3 3/24/2004 RR-11B3-D02N-SFW SWR		RR-11B3 3/25/2004 RR-11B3-T03N-SFW SWR		RR-11B3 3/25/2004 RR-11B3-D03N-SFW SWR	
Molybdenum	mg/L	T		<0.003	:	-		<0.0021	:	-		<0.0023	:	-	
Molybdenum	mg/L	D		-		<0.003	:	-		<0.0023	:	-		<0.0025	:
Nickel	mg/L	T		0.0085	:	-		0.0076	:	-		0.0076	:	-	
Nickel	mg/L	D		-		0.0079	:	-		0.0068	:	-		0.0069	:
Potassium	mg/L	T		<1.1	:	-		0.784	J	-		1.16	:	-	
Potassium	mg/L	D		-		<1.1	:	-		0.77	J	-		1.29	:
Selenium	mg/L	T		<0.0007	:	-		<0.0007	:	-		<0.0007	:	-	
Selenium	mg/L	D		-		<0.0007	:	-		<0.0007	:	-		<0.0007	:
Silver	mg/L	T		<0.0001	:	-		<0.0001	:	-		<0.0001	J	-	
Silver	mg/L	D		-		<0.0001	:	-		<0.0001	:	-		<0.0001	J
Sodium	mg/L	T		4.89	:	-		5.52	:	-		4.92	:	-	
Sodium	mg/L	D		-		4.94	:	-		5.58	:	-		4.74	:
Thallium	mg/L	T		<0.00012	:	-		<0.0001	:	-		<0.0001	:	-	
Thallium	mg/L	D		-		<0.00012	:	-		<0.0001	:	-		<0.0001	:
Vanadium	mg/L	T		<0.00066	:	-		<0.0002	:	-		0.00032	:	-	
Vanadium	mg/L	D		-		<0.00034	:	-		<0.0002	:	-		<0.0002	:
Zinc	mg/L	T		0.0488	:	-		0.0545	:	-		0.0506	:	-	
Zinc	mg/L	D		-		0.0318	:	-		0.0336	:	-		0.0336	:

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID											
			RR-11B3 9/27/2004 RR-11B3-T00N-SFW		RR-11B3 9/27/2004 RR-11B3-D00N-SFW		RR-11B3 9/28/2004 RR-11B3-T01N-SFW		RR-11B3 9/28/2004 RR-11B3-D01N-SFW		RR-11B3 9/29/2004 RR-11B3-T02N-SFW		RR-11B3 9/29/2004 RR-11B3-D02N-SFW	
			SWR		SWR		SWR		SWR		SWR		SWR	
Field Measurements														
DO	mg/l	T	9.48	:	-		9.25	:	-		9.22	:	-	
EH	millivolts	T	182.2	:	-		343.2	:	-		145.	:	-	
pH	SU	T	7.44	:	-		7.02	:	-		8.27	:	-	
Specific Conductance	uS/cm	T	282.	:	-		270.	:	-		258.	:	-	
Temperature	Celsius	T	7.78	:	-		8.59	:	-		7.72	:	-	
Turbidity	NTU	T	44.3	:	-		0.	:	-		36.1	:	-	
General Chemistry														
Bicarbonate (as CaCO3)	mg/L	T	67.3	:	-		65.7	:	-		64.3	:	-	
Carbonate (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Chloride	mg/L	T	2.8	J	-		1.4	J	-		2.6	J	-	
Dissolved Organic Carbon	mg/L	D	-		<2.8	:	-		6.3	J	-		<1.7	:
Fluoride	mg/L	T	0.48	:	-		0.5	:	-		0.44	:	-	
Hydroxide (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Nitrate+Nitrite as N	mg/L	T	0.26	:	-		0.37	:	-		0.3	:	-	
Nitrite	mg/L	T	<0.005	:	-		<0.005	:	-		<0.005	:	-	
Phosphate, Ortho As P	mg/L	T	<0.01	:	-		<0.01	:	-		<0.01	J	-	
Phosphorus	mg/L	T	0.016	:	-		0.016	:	-		0.059	:	-	
Sulfate	mg/L	T	69.6	:	-		69.3	:	-		68.1	:	-	
Total Alkalinity	mg/L	T	67.3	:	-		65.7	:	-		64.3	:	-	
Total Dissolved Solids	mg/L	T	168.	:	-		172.	:	-		154.	:	-	
Total Organic Carbon	mg/L	T	<1.3	:	-		<2.5	J	-		<2.	:	-	
Total Suspended Solids	mg/L	T	4.9	:	-		4.5	:	-		46.6	:	-	
Laboratory Parameters														
pH	SU	T	7.44	:	-		7.02	:	-		8.27	:	-	
Inorganics														
Cyanide	mg/L	T	<0.01	:	-		<0.01	:	-		<0.01	:	-	
Physical Properties														
Hardness	mg/L	D	-		136.	:	-		152.	:	-		132.	:
Metals														
Aluminum	mg/L	T	0.38	:	-		0.456	:	-		0.772	:	-	
Aluminum	mg/L	D	-		0.13	:	-		0.164	:	-		<0.154	:
Antimony	mg/L	D	-		<0.0003	:	-		<0.0013	:	-		<0.00065	:

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area	Fraction	RR-11B3 9/27/2004 RR-11B3-T00N-SFW SWR		RR-11B3 9/27/2004 RR-11B3-D00N-SFW SWR		RR-11B3 9/28/2004 RR-11B3-T01N-SFW SWR		RR-11B3 9/28/2004 RR-11B3-D01N-SFW SWR		RR-11B3 9/29/2004 RR-11B3-T02N-SFW SWR		RR-11B3 9/29/2004 RR-11B3-D02N-SFW SWR	
Arsenic	mg/L		D	-		<0.0001	J	-		<0.0001	:	-		<0.0001	:
Barium	mg/L		D	-		0.0359	:	-		0.0395	:	-		0.031	:
Beryllium	mg/L		D	-		<0.0003	:	-		<0.00035	:	-		<0.0003	:
Boron	mg/L		D	-		<0.0069	:	-		<0.0069	:	-		<0.0069	:
Cadmium	mg/L		D	-		<0.0001	J	-		0.00016	J	-		<0.0001	:
Calcium	mg/L		D	-		41.2	:	-		46.1	:	-		40.3	:
Chromium	mg/L		D	-		<0.0011	:	-		<0.0011	J	-		<0.0011	:
Cobalt	mg/L		D	-		<0.0031	:	-		<0.0031	:	-		0.0036	:
Copper	mg/L		D	-		0.0014	J	-		0.0038	:	-		0.0014	J
Iron	mg/L		T	0.184	:	-		0.102	:	-		1.09	:	-	
Iron	mg/L		D	-		<0.0355	:	-		<0.0355	J	-		0.0584	:
Lead	mg/L		D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Magnesium	mg/L		D	-		8.02	:	-		9.06	:	-		7.71	:
Manganese	mg/L		D	-		0.0746	:	-		0.0789	:	-		0.0907	:
Mercury	mg/L		D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Molybdenum	mg/L		D	-		0.0019	:	-		<0.0028	:	-		<0.0035	:
Nickel	mg/L		D	-		0.0081	:	-		0.0095	:	-		0.0072	:
Potassium	mg/L		D	-		1.2	:	-		<1.52	:	-		1.13	:
Selenium	mg/L		D	-		<0.0003	J	-		<0.0003	J	-		<0.0003	J
Silver	mg/L		D	-		<0.0001	J	-		<0.0001	:	-		<0.0001	J
Sodium	mg/L		D	-		4.33	:	-		4.71	:	-		3.72	:
Thallium	mg/L		D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Vanadium	mg/L		D	-		<0.0001	J	-		0.00016	:	-		0.00014	:
Zinc	mg/L		D	-		0.0417	:	-		0.0471	:	-		0.031	:

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-11B3 9/30/2004 RR-11B3-T03N-SFW SWR		RR-11B3 9/30/2004 RR-11B3-D03N-SFW SWR		RR-11B3 10/1/2004 RR-11B3-T04N-SFW SWR		RR-11B3 10/1/2004 RR-11B3-D04N-SFW SWR		RR-13A 3/23/2004 RR-13A-T01N-SFW SWR		RR-13A 3/23/2004 RR-13A-D01N-SFW SWR	
Field Measurements														
Ammonia	mg/L	T	-		-		-		-		<0.095	:	-	
DO	mg/l	T	9.27	:	-		9.48	:	-		10.06	:	-	
EH	millivolts	T	221.6	:	-		186.7	:	-		171.8	:	-	
pH	SU	T	7.97	:	-		7.73	:	-		7.2	J	-	
Specific Conductance	uS/cm	T	270.	:	-		265.	:	-		242.	:	-	
Temperature	Celsius	T	7.45	:	-		5.73	:	-		7.77	:	-	
Turbidity	NTU	T	8.6	:	-		7.2	:	-		12.4	:	-	
General Chemistry														
Ammonia	mg/L	T	-		-		-		-		<0.095	:	-	
Bicarbonate (as CaCO3)	mg/L	T	69.2	:	-		66.4	:	-		59.7	:	-	
Biochemical Oxygen Demand	mg/L	T	-		-		-		-		<1.4	J	-	
Carbonate (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Chemical Oxygen Demand	mg/L	T	-		-		-		-		<20.	:	-	
Chloride	mg/L	T	2.4	J	-		2.4	J	-		4.8	:	-	
Dissolved Organic Carbon	mg/L	D	-		<4.8	:	-		9.2	J	-		-	
Fluoride	mg/L	T	0.5	:	-		0.49	:	-		0.51	:	-	
Hydroxide (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Nitrate	mg/L	T	-		-		-		-		0.44	J	-	
Nitrate+Nitrite as N	mg/L	T	0.35	:	-		0.3	:	-		-		-	
Nitrite	mg/L	T	<0.005	J	-		<0.005	J	-		<0.005	J	-	
Phosphate, Ortho As P	mg/L	T	<0.01	J	-		<0.01	J	-		<0.01	J	-	
Phosphorus	mg/L	T	0.021	:	-		0.038	:	-		<0.01	:	-	
Sulfate	mg/L	T	62.9	:	-		71.3	:	-		79.7	:	-	
Total Alkalinity	mg/L	T	69.2	:	-		66.4	:	-		59.7	:	-	
Total Dissolved Solids	mg/L	T	266.	:	-		250.	:	-		222.	:	-	
Total Kjeldahl Nitrogen	mg/L	T	-		-		-		-		<0.26	:	-	
Total Organic Carbon	mg/L	T	<1.7	:	-		<1.2	J	-		<2.1	:	-	
Total Suspended Solids	mg/L	T	12.7	:	-		6.3	:	-		15.9	:	-	
Laboratory Parameters														
pH	SU	T	7.97	:	-		7.73	:	-		7.2	J	-	
Specific Conductance	umhos/cm	T	-		-		-		-		233.	J	-	
Inorganics														
Cyanide	mg/L	T	<0.01	:	-		<0.01	:	-		<0.01	:	-	

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-11B3 9/30/2004 RR-11B3-T03N-SFW SWR	RR-11B3 9/30/2004 RR-11B3-D03N-SFW SWR	RR-11B3 10/1/2004 RR-11B3-T04N-SFW SWR	RR-11B3 10/1/2004 RR-11B3-D04N-SFW SWR	RR-13A 3/23/2004 RR-13A-T01N-SFW SWR	RR-13A 3/23/2004 RR-13A-D01N-SFW SWR
Physical Properties								
Hardness	mg/L	T	-	-	-	-	135. :	-
Hardness	mg/L	D	-	135. :	-	142. :	-	132. :
Metals								
Aluminum	mg/L	T	0.489 :	-	0.449 :	-	1.01 :	-
Aluminum	mg/L	D	-	0.131 :	-	0.122 :	-	0.263 :
Antimony	mg/L	T	-	-	-	-	<0.0004 J	-
Antimony	mg/L	D	-	<0.00073 :	-	<0.002 :	-	<0.0004 J
Arsenic	mg/L	T	-	-	-	-	<0.0002 :	-
Arsenic	mg/L	D	-	<0.0001 :	-	<0.0001 :	-	<0.0002 :
Barium	mg/L	T	-	-	-	-	0.0379 :	-
Barium	mg/L	D	-	0.0326 :	-	0.0334 :	-	0.0332 :
Beryllium	mg/L	T	-	-	-	-	<0.001 :	-
Beryllium	mg/L	D	-	<0.0003 :	-	<0.0003 :	-	<0.001 :
Boron	mg/L	T	-	-	-	-	<0.0117 :	-
Boron	mg/L	D	-	<0.0069 :	-	<0.0069 :	-	<0.0117 :
Cadmium	mg/L	T	-	-	-	-	0.00028 :	-
Cadmium	mg/L	D	-	<0.0001 J	-	<0.0001 J	-	0.0002 :
Calcium	mg/L	T	-	-	-	-	40.5 :	-
Calcium	mg/L	D	-	41. :	-	43. :	-	39.5 :
Chromium	mg/L	T	-	-	-	-	<0.00082 J	-
Chromium	mg/L	D	-	<0.0011 J	-	<0.0011 J	-	<0.0014 J
Cobalt	mg/L	T	-	-	-	-	<0.0037 :	-
Cobalt	mg/L	D	-	<0.0031 :	-	<0.0031 :	-	0.006 :
Copper	mg/L	T	-	-	-	-	0.0143 :	-
Copper	mg/L	D	-	<0.0017 :	-	0.0016 J	-	0.0059 :
Iron	mg/L	T	0.286 :	-	0.237 :	-	0.307 :	-
Iron	mg/L	D	-	<0.0355 J	-	<0.0355 J	-	<0.0423 :
Lead	mg/L	T	-	-	-	-	0.00068 :	-
Lead	mg/L	D	-	<0.0001 :	-	<0.0001 :	-	<0.0004 :
Magnesium	mg/L	T	-	-	-	-	8.28 :	-
Magnesium	mg/L	D	-	8.03 :	-	8.4 :	-	8.09 :
Manganese	mg/L	T	-	-	-	-	0.133 :	-
Manganese	mg/L	D	-	0.083 :	-	0.0864 :	-	0.117 :

J = Qualified as estimated during data validation

R = Qualified as rejected value from data validation and results are considered unusable for any purpose

T = Total Fraction D= Dissolved Fraction

Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-11B3 9/30/2004 RR-11B3-T03N-SFW SWR	RR-11B3 9/30/2004 RR-11B3-D03N-SFW SWR	RR-11B3 10/1/2004 RR-11B3-T04N-SFW SWR	RR-11B3 10/1/2004 RR-11B3-D04N-SFW SWR	RR-13A 3/23/2004 RR-13A-T01N-SFW SWR	RR-13A 3/23/2004 RR-13A-D01N-SFW SWR
Mercury	mg/L	T	-	-	-	-	<0.0001 J	-
Mercury	mg/L	D	-	<0.0001 J	-	<0.0001 J	-	<0.0001 J
Molybdenum	mg/L	T	-	-	-	-	<0.003 :	-
Molybdenum	mg/L	D	-	0.0021 :	-	0.0022 :	-	0.0031 :
Nickel	mg/L	T	-	-	-	-	0.0103 :	-
Nickel	mg/L	D	-	0.0081 :	-	0.0084 :	-	0.0097 :
Potassium	mg/L	T	-	-	-	-	<1.1 :	-
Potassium	mg/L	D	-	1.11 :	-	1.32 :	-	<1.1 :
Selenium	mg/L	T	-	-	-	-	<0.0007 :	-
Selenium	mg/L	D	-	<0.0003 J	-	<0.0003 J	-	<0.0007 :
Silver	mg/L	T	-	-	-	-	<0.0001 :	-
Silver	mg/L	D	-	<0.0001 J	-	<0.0001 J	-	<0.0001 :
Sodium	mg/L	T	-	-	-	-	5.09 :	-
Sodium	mg/L	D	-	4.37 :	-	4.52 :	-	5.07 :
Thallium	mg/L	T	-	-	-	-	<0.00012 :	-
Thallium	mg/L	D	-	<0.0001 :	-	<0.0001 :	-	<0.00012 :
Vanadium	mg/L	T	-	-	-	-	<0.00046 :	-
Vanadium	mg/L	D	-	<0.0001 :	-	<0.0001 :	-	<0.00043 :
Zinc	mg/L	T	-	-	-	-	0.0598 :	-
Zinc	mg/L	D	-	0.0376 :	-	0.0417 :	-	0.0332 :

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-13A 3/24/2004 RR-13A-T02N-SFW SWR		RR-13A 3/24/2004 RR-13A-D02N-SFW SWR		RR-13A 3/25/2004 RR-13A-T03N-SFW SWR		RR-13A 3/25/2004 RR-13A-D03N-SFW SWR		RR-13A 9/27/2004 RR-13A-T00N-SFW SWR		RR-13A 9/27/2004 RR-13A-D00N-SFW SWR	
Field Measurements														
Ammonia	mg/L	T	<0.11	:	-		0.13	:	-		-		-	
DO	mg/l	T	-		-		9.1	:	-		9.41	:	-	
EH	millivolts	T	124.	:	-		160.	:	-		140.4	:	-	
pH	SU	T	7.5	J	-		7.3	J	-		6.95	:	-	
Specific Conductance	uS/cm	T	255.	:	-		254.	:	-		295.	:	-	
Temperature	Celsius	T	9.	:	-		7.9	:	-		9.75	:	-	
Turbidity	NTU	T	8.9	:	-		12.	:	-		0.	:	-	
General Chemistry														
Ammonia	mg/L	T	<0.11	:	-		0.13	:	-		-		-	
Bicarbonate (as CaCO3)	mg/L	T	65.6	:	-		62.8	:	-		65.4	:	-	
Biochemical Oxygen Demand	mg/L	T	<1.4	:	-		<1.4	J	-		-		-	
Carbonate (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Chemical Oxygen Demand	mg/L	T	<20.	:	-		<20.	:	-		-		-	
Chloride	mg/L	T	4.7	:	-		3.7	:	-		2.9	J	-	
Dissolved Organic Carbon	mg/L	D	-		-		-		-		-		<1.1	:
Fluoride	mg/L	T	0.51	:	-		0.5	:	-		0.54	:	-	
Hydroxide (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Nitrate	mg/L	T	0.47	J	-		<0.2	:	-		-		-	
Nitrate+Nitrite as N	mg/L	T	-		-		-		-		0.26	:	-	
Nitrite	mg/L	T	<0.005	:	-		<0.005	J	-		<0.005	:	-	
Phosphate, Ortho As P	mg/L	T	<0.01	J	-		<0.01	J	-		<0.01	:	-	
Phosphorus	mg/L	T	0.04	:	-		0.055	:	-		0.014	:	-	
Sulfate	mg/L	T	76.2	:	-		51.5	:	-		80.1	:	-	
Total Alkalinity	mg/L	T	65.6	:	-		62.8	:	-		65.4	:	-	
Total Dissolved Solids	mg/L	T	226.	:	-		184.	:	-		178.	:	-	
Total Kjeldahl Nitrogen	mg/L	T	<0.24	:	-		<0.24	:	-		-		-	
Total Organic Carbon	mg/L	T	<2.8	:	-		<2.8	:	-		<1.	:	-	
Total Suspended Solids	mg/L	T	15.8	:	-		15.3	:	-		4.8	:	-	
Laboratory Parameters														
pH	SU	T	7.5	J	-		7.3	J	-		6.95	:	-	
Specific Conductance	umhos/cm	T	237.	J	-		255.	J	-		-		-	
Inorganics														
Cyanide	mg/L	T	<0.01	:	-		<0.01	:	-		<0.01	:	-	

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-13A 3/24/2004 RR-13A-T02N-SFW SWR	RR-13A 3/24/2004 RR-13A-D02N-SFW SWR	RR-13A 3/25/2004 RR-13A-T03N-SFW SWR	RR-13A 3/25/2004 RR-13A-D03N-SFW SWR	RR-13A 9/27/2004 RR-13A-T00N-SFW SWR	RR-13A 9/27/2004 RR-13A-D00N-SFW SWR
Physical Properties								
Hardness	mg/L	T	134. :	-	143. :	-	-	-
Hardness	mg/L	D	-	136. :	-	135. :	-	145. :
Metals								
Aluminum	mg/L	T	0.978 :	-	0.894 :	-	0.745 :	-
Aluminum	mg/L	D	-	0.265 :	-	0.287 J	-	0.275 :
Antimony	mg/L	T	<0.0004 J	-	<0.0004 J	-	-	-
Antimony	mg/L	D	-	<0.0004 J	-	<0.0004 J	-	<0.0003 :
Arsenic	mg/L	T	<0.0002 :	-	<0.0002 :	-	-	-
Arsenic	mg/L	D	-	<0.0002 :	-	<0.0002 :	-	<0.0001 J
Barium	mg/L	T	0.0384 :	-	0.0354 :	-	-	-
Barium	mg/L	D	-	0.0348 :	-	0.033 :	-	0.0355 :
Beryllium	mg/L	T	<0.00035 J	-	<0.00053 :	-	-	-
Beryllium	mg/L	D	-	<0.0002 J	-	<0.0002 :	-	<0.0003 :
Boron	mg/L	T	<0.0037 :	-	0.0041 :	-	-	-
Boron	mg/L	D	-	<0.0035 :	-	0.0046 :	-	<0.0069 :
Cadmium	mg/L	T	<0.0002 :	-	<0.0002 :	-	-	-
Cadmium	mg/L	D	-	<0.0002 :	-	<0.0002 :	-	<0.0001 J
Calcium	mg/L	T	39.9 :	-	43.4 :	-	-	-
Calcium	mg/L	D	-	40.6 :	-	40.7 :	-	43.7 :
Chromium	mg/L	T	<0.0008 J	-	0.00069 :	-	-	-
Chromium	mg/L	D	-	<0.0008 J	-	0.00087 :	-	<0.0011 :
Cobalt	mg/L	T	<0.0011 J	-	0.0018 J	-	-	-
Cobalt	mg/L	D	-	0.0042 J	-	0.0041 J	-	0.0068 :
Copper	mg/L	T	0.0146 :	-	0.0168 :	-	-	-
Copper	mg/L	D	-	0.0058 :	-	0.0047 :	-	0.0028 J
Iron	mg/L	T	0.261 J	-	<0.381 :	-	0.224 :	-
Iron	mg/L	D	-	<0.0192 J	-	<0.0192 J	-	0.0424 :
Lead	mg/L	T	0.00062 :	-	0.00071 :	-	-	-
Lead	mg/L	D	-	<0.0004 :	-	<0.0004 :	-	<0.0001 :
Magnesium	mg/L	T	8.38 :	-	8.54 :	-	-	-
Magnesium	mg/L	D	-	8.5 :	-	8.2 :	-	8.65 :
Manganese	mg/L	T	0.134 :	-	0.133 :	-	-	-
Manganese	mg/L	D	-	0.121 :	-	0.112 :	-	0.112 :

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-13A 3/24/2004 RR-13A-T02N-SFW SWR		RR-13A 3/24/2004 RR-13A-D02N-SFW SWR		RR-13A 3/25/2004 RR-13A-T03N-SFW SWR		RR-13A 3/25/2004 RR-13A-D03N-SFW SWR		RR-13A 9/27/2004 RR-13A-T00N-SFW SWR		RR-13A 9/27/2004 RR-13A-D00N-SFW SWR	
Mercury	mg/L	T	<0.0001	J	-		<0.0001	:	-		-		-	
Mercury	mg/L	D	-		<0.0001	J	-		<0.0001	:	-		<0.0001	:
Molybdenum	mg/L	T	<0.0033	:	-		<0.0022	:	-		-		-	
Molybdenum	mg/L	D	-		<0.0036	:	-		<0.0025	:	-		0.002	:
Nickel	mg/L	T	0.0104	:	-		0.0087	:	-		-		-	
Nickel	mg/L	D	-		0.0093	:	-		0.0078	:	-		0.0087	:
Potassium	mg/L	T	0.53	J	-		1.4	:	-		-		-	
Potassium	mg/L	D	-		0.547	J	-		1.17	:	-		1.28	:
Selenium	mg/L	T	<0.0007	:	-		<0.0007	:	-		-		-	
Selenium	mg/L	D	-		<0.0007	:	-		<0.0007	:	-		<0.0003	J
Silver	mg/L	T	<0.0001	:	-		<0.0001	J	-		-		-	
Silver	mg/L	D	-		<0.0001	:	-		<0.0001	J	-		<0.0001	J
Sodium	mg/L	T	5.83	:	-		4.94	:	-		-		-	
Sodium	mg/L	D	-		5.82	:	-		5.01	:	-		4.68	:
Thallium	mg/L	T	0.0001	:	-		<0.0001	:	-		-		-	
Thallium	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Vanadium	mg/L	T	<0.00049	:	-		0.00034	:	-		-		-	
Vanadium	mg/L	D	-		<0.00027	:	-		<0.0002	:	-		<0.0001	J
Zinc	mg/L	T	0.0571	:	-		0.0594	:	-		-		-	
Zinc	mg/L	D	-		0.0332	:	-		0.0332	:	-		0.0536	:

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-13A 9/28/2004 RR-13A-T01N-SFW SWR	RR-13A 9/28/2004 RR-13A-D01N-SFW SWR	RR-13A 9/29/2004 RR-13A-T02N-SFW SWR	RR-13A 9/29/2004 RR-13A-D02N-SFW SWR	RR-13A 9/30/2004 RR-13A-T03N-SFW SWR	RR-13A 9/30/2004 RR-13A-D03N-SFW SWR
Field Measurements								
DO	mg/l	T	9.05 :	-	9.22 :	-	9.24 :	-
EH	millivolts	T	275.2 :	-	110. :	-	161.6 :	-
pH	SU	T	7.28 :	-	8.19 :	-	7.98 :	-
Specific Conductance	uS/cm	T	285. :	-	276. :	-	286. :	-
Temperature	Celsius	T	10.18 :	-	8.64 :	-	8.84 :	-
Turbidity	NTU	T	0. :	-	41.2 :	-	11.4 :	-
General Chemistry								
Bicarbonate (as CaCO3)	mg/L	T	68.4 :	-	67.7 :	-	70.9 :	-
Carbonate (as CaCO3)	mg/L	T	<1. :	-	<1. :	-	<1. :	-
Chloride	mg/L	T	2.6 J	-	2.9 J	-	2.6 J	-
Dissolved Organic Carbon	mg/L	D	-	6.9 J	-	7.5 J	-	<1.8 :
Fluoride	mg/L	T	0.58 :	-	0.5 :	-	0.57 :	-
Hydroxide (as CaCO3)	mg/L	T	<1. :	-	<1. :	-	<1. :	-
Nitrate+Nitrite as N	mg/L	T	0.34 :	-	0.27 :	-	0.34 :	-
Nitrite	mg/L	T	<0.005 :	-	<0.005 :	-	<0.005 J	-
Phosphate, Ortho As P	mg/L	T	<0.01 :	-	<0.01 :	-	<0.01 J	-
Phosphorus	mg/L	T	0.015 :	-	0.17 :	-	0.024 :	-
Sulfate	mg/L	T	80.1 :	-	74.3 :	-	71.7 :	-
Total Alkalinity	mg/L	T	68.4 :	-	64.7 :	-	70.9 :	-
Total Dissolved Solids	mg/L	T	172. :	-	180. :	-	244. :	-
Total Organic Carbon	mg/L	T	<1. J	-	<1.5 J	-	<1.3 :	-
Total Suspended Solids	mg/L	T	6.9 :	-	55.6 :	-	17.1 :	-
Laboratory Parameters								
pH	SU	T	7.28 :	-	8.19 :	-	7.98 :	-
Inorganics								
Cyanide	mg/L	T	<0.01 :	-	<0.01 :	-	<0.01 :	-
Physical Properties								
Hardness	mg/L	D	-	158. :	-	144. :	-	144. :
Metals								
Aluminum	mg/L	T	0.77 :	-	1.01 :	-	0.936 :	-
Aluminum	mg/L	D	-	0.295 :	-	0.27 :	-	0.24 :
Antimony	mg/L	D	-	<0.0014 :	-	<0.00081 :	-	<0.0022 :

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-13A 9/28/2004 RR-13A-T01N-SFW SWR		RR-13A 9/28/2004 RR-13A-D01N-SFW SWR		RR-13A 9/29/2004 RR-13A-T02N-SFW SWR		RR-13A 9/29/2004 RR-13A-D02N-SFW SWR		RR-13A 9/30/2004 RR-13A-T03N-SFW SWR		RR-13A 9/30/2004 RR-13A-D03N-SFW SWR	
Arsenic	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Barium	mg/L	D	-		0.0377	:	-		0.0291	:	-		0.0313	:
Beryllium	mg/L	D	-		<0.0003	:	-		<0.0003	:	-		<0.0003	:
Boron	mg/L	D	-		<0.0069	:	-		<0.0069	:	-		<0.008	:
Cadmium	mg/L	D	-		0.00012	J	-		<0.0001	:	-		0.00011	J
Calcium	mg/L	D	-		47.6	:	-		43.8	:	-		43.4	:
Chromium	mg/L	D	-		<0.0011	J	-		<0.0011	:	-		<0.0011	J
Cobalt	mg/L	D	-		<0.0031	:	-		<0.0031	:	-		0.0057	:
Copper	mg/L	D	-		0.0046	:	-		0.0026	J	-		0.0029	J
Iron	mg/L	T	0.123	:	-		0.975	:	-		0.478	:	-	
Iron	mg/L	D	-		<0.0355	J	-		0.0522	:	-		<0.0355	J
Lead	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Magnesium	mg/L	D	-		9.55	:	-		8.49	:	-		8.6	:
Manganese	mg/L	D	-		0.12	:	-		0.132	:	-		0.125	:
Mercury	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	J
Molybdenum	mg/L	D	-		<0.0028	:	-		0.0052	:	-		0.0022	:
Nickel	mg/L	D	-		0.0101	:	-		0.0078	:	-		0.0088	:
Potassium	mg/L	D	-		<1.31	:	-		1.54	:	-		1.17	:
Selenium	mg/L	D	-		<0.0003	J	-		<0.0003	J	-		<0.0003	J
Silver	mg/L	D	-		<0.0001	:	-		<0.0001	J	-		<0.0001	J
Sodium	mg/L	D	-		4.84	:	-		4.13	:	-		4.82	:
Thallium	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Vanadium	mg/L	D	-		0.00018	:	-		0.0001	:	-		<0.0001	:
Zinc	mg/L	D	-		0.0422	:	-		0.0275	:	-		0.0347	:

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-13A 10/1/2004 RR-13A-T04N-SFW SWR		RR-13A 10/1/2004 RR-13A-D04N-SFW SWR		RR-13B 3/23/2004 RR-13B-T01N-SFW SWR		RR-13B 3/23/2004 RR-13B-D01N-SFW SWR		RR-13B 3/24/2004 RR-13B-T02N-SFW SWR		RR-13B 3/24/2004 RR-13B-D02N-SFW SWR	
Field Measurements														
Ammonia	mg/L	T	-		-		<0.1	:	-		<0.095	:	-	
DO	mg/l	T	9.18	:	-		11.	:	-		-		-	
EH	millivolts	T	110.4	:	-		16.6	:	-		178.	:	-	
pH	SU	T	7.83	:	-		7.2	J	-		7.6	:	-	
Specific Conductance	uS/cm	T	280.	:	-		244.	:	-		255.	:	-	
Temperature	Celsius	T	8.41	:	-		7.7	:	-		8.9	:	-	
Turbidity	NTU	T	7.9	:	-		13.	:	-		8.6	:	-	
General Chemistry														
Ammonia	mg/L	T	-		-		<0.1	:	-		<0.095	:	-	
Bicarbonate (as CaCO3)	mg/L	T	66.6	:	-		61.4	:	-		61.4	:	-	
Biochemical Oxygen Demand	mg/L	T	-		-		<1.4	J	-		<1.4	:	-	
Carbonate (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Chemical Oxygen Demand	mg/L	T	-		-		<20.	:	-		<20.	:	-	
Chloride	mg/L	T	2.9	J	-		4.9	:	-		4.7	:	-	
Dissolved Organic Carbon	mg/L	D	-		<1.6	:	-		-		-		-	
Fluoride	mg/L	T	0.56	:	-		0.54	:	-		0.52	:	-	
Hydroxide (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Nitrate	mg/L	T	-		-		0.46	J	-		0.51	J	-	
Nitrate+Nitrite as N	mg/L	T	0.3	:	-		-		-		-		-	
Nitrite	mg/L	T	<0.005	:	-		<0.005	J	-		<0.005	:	-	
Phosphate, Ortho As P	mg/L	T	0.011	:	-		<0.01	J	-		<0.01	J	-	
Phosphorus	mg/L	T	0.031	:	-		0.012	:	-		0.053	:	-	
Sulfate	mg/L	T	77.5	:	-		80.5	:	-		76.8	:	-	
Total Alkalinity	mg/L	T	66.6	:	-		61.4	:	-		61.4	:	-	
Total Dissolved Solids	mg/L	T	180.	:	-		232.	:	-		206.	:	-	
Total Kjeldahl Nitrogen	mg/L	T	-		-		<0.24	:	-		<0.24	:	-	
Total Organic Carbon	mg/L	T	<1.1	:	-		<1.8	:	-		<2.3	:	-	
Total Suspended Solids	mg/L	T	6.8	:	-		18.1	:	-		15.5	:	-	
Laboratory Parameters														
pH	SU	T	7.83	:	-		7.2	J	-		7.6	:	-	
Specific Conductance	umhos/cm	T	-		-		235.	J	-		241.	J	-	
Inorganics														
Cyanide	mg/L	T	<0.01	:	-		<0.01	:	-		<0.01	:	-	

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-13A 10/1/2004 RR-13A-T04N-SFW SWR	RR-13A 10/1/2004 RR-13A-D04N-SFW SWR	RR-13B 3/23/2004 RR-13B-T01N-SFW SWR	RR-13B 3/23/2004 RR-13B-D01N-SFW SWR	RR-13B 3/24/2004 RR-13B-T02N-SFW SWR	RR-13B 3/24/2004 RR-13B-D02N-SFW SWR
Physical Properties								
Hardness	mg/L	T	-	-	138. :	-	149. :	-
Hardness	mg/L	D	-	145. :	-	134. :	-	146. :
Metals								
Aluminum	mg/L	T	0.768 :	-	1.36 :	-	1.17 :	-
Aluminum	mg/L	D	-	0.278 :	-	0.368 :	-	0.186 J
Antimony	mg/L	T	-	-	<0.0004 J	-	<0.0004 J	-
Antimony	mg/L	D	-	<0.0003 J	-	<0.0004 J	-	<0.0004 J
Arsenic	mg/L	T	-	-	<0.0002 :	-	<0.0002 :	-
Arsenic	mg/L	D	-	<0.0001 J	-	<0.0002 :	-	<0.0002 :
Barium	mg/L	T	-	-	0.0384 :	-	0.0369 :	-
Barium	mg/L	D	-	0.0356 :	-	0.0331 :	-	0.0327 :
Beryllium	mg/L	T	-	-	<0.001 :	-	<0.00071 :	-
Beryllium	mg/L	D	-	<0.0005 :	-	<0.001 :	-	<0.00044 :
Boron	mg/L	T	-	-	<0.0117 :	-	0.0023 :	-
Boron	mg/L	D	-	<0.0067 :	-	<0.0117 :	-	0.0028 :
Cadmium	mg/L	T	-	-	0.00038 :	-	<0.0002 :	-
Cadmium	mg/L	D	-	<0.0001 J	-	0.00035 :	-	<0.0002 :
Calcium	mg/L	T	-	-	41.4 :	-	44.6 :	-
Calcium	mg/L	D	-	43.9 :	-	39.9 :	-	43.5 :
Chromium	mg/L	T	-	-	<0.00079 :	-	<0.0008 J	-
Chromium	mg/L	D	-	<0.0009 :	-	<0.00073 :	-	<0.0008 J
Cobalt	mg/L	T	-	-	<0.0037 :	-	<0.0011 J	-
Cobalt	mg/L	D	-	0.0065 :	-	0.0061 :	-	0.0037 J
Copper	mg/L	T	-	-	0.0183 :	-	0.0143 :	-
Copper	mg/L	D	-	0.003 J	-	0.0065 :	-	0.0046 :
Iron	mg/L	T	0.272 :	-	0.397 :	-	0.378 :	-
Iron	mg/L	D	-	0.0393 :	-	0.0545 :	-	<0.0192 J
Lead	mg/L	T	-	-	0.00072 :	-	0.00049 :	-
Lead	mg/L	D	-	<0.0001 :	-	<0.0004 :	-	<0.0004 :
Magnesium	mg/L	T	-	-	8.5 :	-	9.16 :	-
Magnesium	mg/L	D	-	8.73 :	-	8.24 :	-	8.96 :
Manganese	mg/L	T	-	-	0.176 :	-	0.176 :	-
Manganese	mg/L	D	-	0.132 :	-	0.169 :	-	0.16 :

J = Qualified as estimated during data validation

R = Qualified as rejected value from data validation and results are considered unusable for any purpose

T = Total Fraction D= Dissolved Fraction

Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-13A 10/1/2004 RR-13A-T04N-SFW SWR	RR-13A 10/1/2004 RR-13A-D04N-SFW SWR	RR-13B 3/23/2004 RR-13B-T01N-SFW SWR	RR-13B 3/23/2004 RR-13B-D01N-SFW SWR	RR-13B 3/24/2004 RR-13B-T02N-SFW SWR	RR-13B 3/24/2004 RR-13B-D02N-SFW SWR
Mercury	mg/L	T	-	-	<0.0001 J	-	<0.0001 :	-
Mercury	mg/L	D	-	<0.0001 :	-	<0.0001 J	-	<0.0001 :
Molybdenum	mg/L	T	-	-	<0.003 :	-	<0.0021 :	-
Molybdenum	mg/L	D	-	0.0022 :	-	<0.003 :	-	<0.0023 :
Nickel	mg/L	T	-	-	0.0114 :	-	0.0094 :	-
Nickel	mg/L	D	-	0.009 :	-	0.011 :	-	0.0085 :
Potassium	mg/L	T	-	-	<1.1 :	-	0.757 J	-
Potassium	mg/L	D	-	1.25 :	-	<1.1 :	-	0.636 J
Selenium	mg/L	T	-	-	<0.0007 :	-	<0.0007 :	-
Selenium	mg/L	D	-	0.00037 J	-	<0.0007 :	-	<0.0007 :
Silver	mg/L	T	-	-	<0.0001 :	-	<0.0001 J	-
Silver	mg/L	D	-	<0.0001 J	-	<0.0001 :	-	<0.0001 J
Sodium	mg/L	T	-	-	5.03 :	-	5.26 :	-
Sodium	mg/L	D	-	4.15 :	-	5.02 :	-	5.52 :
Thallium	mg/L	T	-	-	<0.00012 :	-	<0.0001 :	-
Thallium	mg/L	D	-	<0.0001 :	-	<0.00012 :	-	<0.0001 :
Vanadium	mg/L	T	-	-	<0.00051 :	-	<0.0002 :	-
Vanadium	mg/L	D	-	<0.0001 J	-	<0.00028 :	-	<0.0002 :
Zinc	mg/L	T	-	-	0.0718 :	-	0.072 :	-
Zinc	mg/L	D	-	0.0569 :	-	0.047 :	-	0.041 :

J = Qualified as estimated during data validation
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T = Total Fraction D= Dissolved Fraction

Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-13B 3/25/2004 RR-13B-T03N-SFW SWR	RR-13B 3/25/2004 RR-13B-D03N-SFW SWR	RR-13B 9/27/2004 RR-13B-T00N-SFW SWR	RR-13B 9/27/2004 RR-13B-D00N-SFW SWR	RR-13B 9/28/2004 RR-13B-T01N-SFW SWR	RR-13B 9/28/2004 RR-13B-D01N-SFW SWR
Field Measurements								
Ammonia	mg/L	T	0.044 :	-	-	-	-	-
DO	mg/l	T	10.19 :	-	9.41 :	-	9.01 :	-
EH	millivolts	T	186. :	-	155.6 :	-	100. :	-
pH	SU	T	7.32 :	-	7.03 :	-	7.3 :	-
Specific Conductance	uS/cm	T	256. :	-	295. :	-	292. :	-
Temperature	Celsius	T	7.85 :	-	9.85 :	-	10.56 :	-
Turbidity	NTU	T	10. :	-	1.5 :	-	0. :	-
General Chemistry								
Ammonia	mg/L	T	0.044 :	-	-	-	-	-
Bicarbonate (as CaCO3)	mg/L	T	63.6 :	-	65.1 :	-	68.3 :	-
Biochemical Oxygen Demand	mg/L	T	<1.4 J	-	-	-	-	-
Carbonate (as CaCO3)	mg/L	T	<1. :	-	<1. :	-	<1. :	-
Chemical Oxygen Demand	mg/L	T	25.6 :	-	-	-	-	-
Chloride	mg/L	T	3.8 :	-	2.9 J	-	2.6 J	-
Dissolved Organic Carbon	mg/L	D	-	-	-	<1.2 :	-	10.1 J
Fluoride	mg/L	T	0.51 :	-	0.55 :	-	0.58 :	-
Hydroxide (as CaCO3)	mg/L	T	<1. :	-	<1. :	-	<1. :	-
Nitrate	mg/L	T	<0.2 :	-	-	-	-	-
Nitrate+Nitrite as N	mg/L	T	-	-	0.27 :	-	0.33 :	-
Nitrite	mg/L	T	<0.005 J	-	<0.005 :	-	<0.005 :	-
Phosphate, Ortho As P	mg/L	T	<0.01 J	-	<0.01 :	-	<0.01 J	-
Phosphorus	mg/L	T	0.04 :	-	0.015 :	-	0.015 :	-
Sulfate	mg/L	T	70.6 :	-	80.6 :	-	83.2 :	-
Total Alkalinity	mg/L	T	63.6 :	-	65.1 :	-	68.3 :	-
Total Dissolved Solids	mg/L	T	204. :	-	160. :	-	172. :	-
Total Kjeldahl Nitrogen	mg/L	T	<0.24 :	-	-	-	-	-
Total Organic Carbon	mg/L	T	<8.5 :	-	<1. :	-	<1.1 J	-
Total Suspended Solids	mg/L	T	19.9 :	-	4.3 :	-	6.7 :	-
Laboratory Parameters								
pH	SU	T	7.32 :	-	7.03 :	-	7.3 :	-
Specific Conductance	umhos/cm	T	245. J	-	-	-	-	-
Inorganics								
Cyanide	mg/L	T	<0.01 :	-	<0.01 :	-	<0.01 :	-

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-13B 3/25/2004 RR-13B-T03N-SFW SWR	RR-13B 3/25/2004 RR-13B-D03N-SFW SWR	RR-13B 9/27/2004 RR-13B-T00N-SFW SWR	RR-13B 9/27/2004 RR-13B-D00N-SFW SWR	RR-13B 9/28/2004 RR-13B-T01N-SFW SWR	RR-13B 9/28/2004 RR-13B-D01N-SFW SWR
Physical Properties								
Hardness	mg/L	T	138. :	-	-	-	-	-
Hardness	mg/L	D	-	139. :	-	142. :	-	159. :
Metals								
Aluminum	mg/L	T	1.22 :	-	0.81 :	-	0.811 :	-
Aluminum	mg/L	D	-	0.277 :	-	0.262 :	-	0.298 :
Antimony	mg/L	T	<0.0004 J	-	-	-	-	-
Antimony	mg/L	D	-	<0.0004 J	-	<0.0003 :	-	<0.0014 :
Arsenic	mg/L	T	<0.0002 :	-	-	-	-	-
Arsenic	mg/L	D	-	<0.0002 :	-	<0.0001 J	-	<0.0001 :
Barium	mg/L	T	0.0384 :	-	-	-	-	-
Barium	mg/L	D	-	0.0341 :	-	0.0344 :	-	0.038 :
Beryllium	mg/L	T	0.00033 :	-	-	-	-	-
Beryllium	mg/L	D	-	<0.0002 J	-	<0.0003 :	-	<0.0003 :
Boron	mg/L	T	0.0046 :	-	-	-	-	-
Boron	mg/L	D	-	0.0038 :	-	<0.0069 :	-	<0.0069 :
Cadmium	mg/L	T	0.00023 :	-	-	-	-	-
Cadmium	mg/L	D	-	<0.0002 :	-	<0.0001 J	-	0.00012 J
Calcium	mg/L	T	41.3 :	-	-	-	-	-
Calcium	mg/L	D	-	41.6 :	-	42.7 :	-	47.9 :
Chromium	mg/L	T	<0.00072 :	-	-	-	-	-
Chromium	mg/L	D	-	<0.00065 :	-	<0.0011 :	-	<0.0011 J
Cobalt	mg/L	T	0.0015 J	-	-	-	-	-
Cobalt	mg/L	D	-	0.0086 J	-	0.0067 :	-	<0.0031 :
Copper	mg/L	T	0.0156 :	-	-	-	-	-
Copper	mg/L	D	-	0.0051 :	-	0.0029 J	-	0.0044 :
Iron	mg/L	T	0.435 :	-	0.203 :	-	0.191 :	-
Iron	mg/L	D	-	0.0564 J	-	0.042 :	-	<0.0355 J
Lead	mg/L	T	0.0007 :	-	-	-	-	-
Lead	mg/L	D	-	<0.0004 :	-	<0.0001 :	-	<0.0001 :
Magnesium	mg/L	T	8.37 :	-	-	-	-	-
Magnesium	mg/L	D	-	8.5 :	-	8.46 :	-	9.61 :
Manganese	mg/L	T	0.163 :	-	-	-	-	-
Manganese	mg/L	D	-	0.159 :	-	0.116 :	-	0.118 :

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction											
		RR-13B 3/25/2004 RR-13B-T03N-SFW SWR		RR-13B 3/25/2004 RR-13B-D03N-SFW SWR		RR-13B 9/27/2004 RR-13B-T00N-SFW SWR		RR-13B 9/27/2004 RR-13B-D00N-SFW SWR		RR-13B 9/28/2004 RR-13B-T01N-SFW SWR		RR-13B 9/28/2004 RR-13B-D01N-SFW SWR	
Mercury	mg/L	T	<0.0001 :		-		-		-		-		-
Mercury	mg/L	D	-		<0.0001 :		-		<0.0001 :		-		<0.0001 :
Molybdenum	mg/L	T	<0.0024 :		-		-		-		-		-
Molybdenum	mg/L	D	-		<0.0026 :		-		0.002 :		-		<0.0028 :
Nickel	mg/L	T	0.0097 :		-		-		-		-		-
Nickel	mg/L	D	-		0.0091 :		-		0.0092 :		-		0.0103 :
Potassium	mg/L	T	1.32 :		-		-		-		-		-
Potassium	mg/L	D	-		1.23 :		-		1.28 :		-		<1.43 :
Selenium	mg/L	T	<0.0007 :		-		-		-		-		-
Selenium	mg/L	D	-		<0.0007 :		-		<0.0003 J		-		<0.0003 J
Silver	mg/L	T	<0.0001 J		-		-		-		-		-
Silver	mg/L	D	-		<0.0001 J		-		<0.0001 J		-		<0.0001 :
Sodium	mg/L	T	5.2 :		-		-		-		-		-
Sodium	mg/L	D	-		5.04 :		-		4.59 :		-		4.74 :
Thallium	mg/L	T	<0.0001 :		-		-		-		-		-
Thallium	mg/L	D	-		<0.0001 :		-		<0.0001 :		-		<0.0001 :
Vanadium	mg/L	T	0.00032 :		-		-		-		-		-
Vanadium	mg/L	D	-		<0.0002 :		-		<0.0001 J		-		0.00018 :
Zinc	mg/L	T	0.0699 :		-		-		-		-		-
Zinc	mg/L	D	-		0.0419 :		-		0.0399 :		-		0.0433 :

J = Qualified as estimated during data validation
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T = Total Fraction D= Dissolved Fraction

Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-13B 9/29/2004 RR-13B-T02N-SFW SWR		RR-13B 9/29/2004 RR-13B-D02N-SFW SWR		RR-13B 9/30/2004 RR-13B-T03N-SFW SWR		RR-13B 9/30/2004 RR-13B-D03N-SFW SWR		RR-13B 10/1/2004 RR-13B-T04N-SFW SWR		RR-13B 10/1/2004 RR-13B-D04N-SFW SWR	
Field Measurements														
DO	mg/l	T	9.33	:	-		9.12	:	-		9.09	:	-	
EH	millivolts	T	50.7	:	-		64.8	:	-		108.8	:	-	
pH	SU	T	7.95	:	-		7.81	:	-		7.36	:	-	
Specific Conductance	uS/cm	T	282.	:	-		293.	:	-		288.	:	-	
Temperature	Celsius	T	9.06	:	-		9.33	:	-		8.07	:	-	
Turbidity	NTU	T	66.6	:	-		16.4	:	-		9.2	:	-	
General Chemistry														
Bicarbonate (as CaCO3)	mg/L	T	64.5	:	-		71.3	:	-		70.5	:	-	
Carbonate (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Chloride	mg/L	T	2.9	J	-		2.6	J	-		3.1	J	-	
Dissolved Organic Carbon	mg/L	D	-		10.	J	-		10.1	J	-		5.7	J
Fluoride	mg/L	T	0.51	:	-		0.58	:	-		0.56	:	-	
Hydroxide (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Nitrate+Nitrite as N	mg/L	T	0.29	:	-		0.32	:	-		0.29	J	-	
Nitrite	mg/L	T	<0.005	:	-		<0.005	J	-		<0.005	:	-	
Phosphate, Ortho As P	mg/L	T	0.47	J	-		<0.01	J	-		<0.01	:	-	
Phosphorus	mg/L	T	0.076	J	-		0.036	:	-		0.026	:	-	
Sulfate	mg/L	T	77.5	:	-		80.6	:	-		66.	:	-	
Total Alkalinity	mg/L	T	64.5	:	-		71.3	:	-		70.5	:	-	
Total Dissolved Solids	mg/L	T	160.	:	-		262.	:	-		182.	:	-	
Total Organic Carbon	mg/L	T	<1.7	J	-		<1.4	J	-		<1.4	J	-	
Total Suspended Solids	mg/L	T	33.	:	-		10.4	:	-		7.1	:	-	
Laboratory Parameters														
pH	SU	T	7.95	:	-		7.81	:	-		7.36	:	-	
Inorganics														
Cyanide	mg/L	T	<0.01	:	-		<0.01	:	-		<0.01	:	-	
Physical Properties														
Hardness	mg/L	D	-		140.	:	-		146.	:	-		146.	:
Metals														
Aluminum	mg/L	T	1.57	:	-		0.751	:	-		0.784	:	-	
Aluminum	mg/L	D	-		0.255	:	-		0.26	:	-		0.279	:
Antimony	mg/L	D	-		<0.00067	:	-		<0.00084	:	-		<0.0016	:

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-13B 9/29/2004 RR-13B-T02N-SFW SWR		RR-13B 9/29/2004 RR-13B-D02N-SFW SWR		RR-13B 9/30/2004 RR-13B-T03N-SFW SWR		RR-13B 9/30/2004 RR-13B-D03N-SFW SWR		RR-13B 10/1/2004 RR-13B-T04N-SFW SWR		RR-13B 10/1/2004 RR-13B-D04N-SFW SWR	
Arsenic	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	J
Barium	mg/L	D	-		0.0285	:	-		0.0317	:	-		0.0356	:
Beryllium	mg/L	D	-		<0.0003	:	-		<0.0003	:	-		<0.0003	:
Boron	mg/L	D	-		<0.0069	:	-		<0.0069	:	-		<0.0069	:
Cadmium	mg/L	D	-		0.00014	:	-		<0.0001	J	-		0.00016	J
Calcium	mg/L	D	-		42.3	:	-		44.2	:	-		43.8	:
Chromium	mg/L	D	-		<0.0011	:	-		<0.0011	J	-		<0.0011	J
Cobalt	mg/L	D	-		<0.0031	:	-		<0.0031	:	-		0.0031	:
Copper	mg/L	D	-		0.0026	J	-		0.003	J	-		0.0025	J
Iron	mg/L	T	1.52	:	-		0.279	:	-		0.284	:	-	
Iron	mg/L	D	-		<0.0355	:	-		<0.0355	J	-		<0.0608	:
Lead	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Magnesium	mg/L	D	-		8.23	:	-		8.74	:	-		8.81	:
Manganese	mg/L	D	-		0.133	:	-		0.123	:	-		0.136	:
Mercury	mg/L	D	-		<0.0001	:	-		<0.0001	J	-		<0.0001	:
Molybdenum	mg/L	D	-		<0.0031	:	-		0.0021	:	-		0.002	:
Nickel	mg/L	D	-		0.0074	:	-		0.0085	:	-		0.0085	:
Potassium	mg/L	D	-		1.31	:	-		1.2	:	-		1.08	:
Selenium	mg/L	D	-		<0.0003	J	-		<0.0003	J	-		<0.0003	J
Silver	mg/L	D	-		<0.0001	J	-		<0.0001	J	-		<0.0001	J
Sodium	mg/L	D	-		3.76	:	-		4.66	:	-		4.6	:
Thallium	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Vanadium	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Zinc	mg/L	D	-		0.0277	:	-		0.0358	:	-		0.0431	:

J = Qualified as estimated during data validation
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T = Total Fraction D= Dissolved Fraction

Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-15 10/6/2003 RR-15-T00N-SFW SWR		RR-15 10/6/2003 RR-15-D00N-SFW SWR		RR-15 10/7/2003 RR-15-T01N-SFW SWR		RR-15 10/7/2003 RR-15-D01N-SFW SWR		RR-15 10/8/2003 RR-15-T02N-SFW SWR		RR-15 10/8/2003 RR-15-D02N-SFW SWR	
Field Measurements														
Ammonia	mg/L	T	<0.04	:	-		<0.1	:	-		<0.1	:	-	
DO	mg/l	T	9.04	:	-		9.71	:	-		8.61	:	-	
EH	millivolts	T	218.	:	-		192.7	:	-		136.3	:	-	
pH	SU	T	7.34	:	-		7.2	J	-		7.4	J	-	
Specific Conductance	uS/cm	T	342.	:	-		346.	:	-		344.	:	-	
Temperature	Celsius	T	10.71	:	-		9.61	:	-		9.96	:	-	
Turbidity	NTU	T	7.6	:	-		-		-		13.	:	-	
General Chemistry														
Ammonia	mg/L	T	<0.04	:	-		<0.1	:	-		<0.1	:	-	
Bicarbonate (as CaCO3)	mg/L	T	62.7	:	-		59.6	:	-		60.9	:	-	
Biochemical Oxygen Demand	mg/L	T	<1.3	:	-		<1.4	J	-		<1.5	J	-	
Carbonate (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Chemical Oxygen Demand	mg/L	T	<20.	:	-		<20.	:	-		<20.	:	-	
Chloride	mg/L	T	3.1	:	-		3.1	:	-		3.	:	-	
Fluoride	mg/L	T	0.72	:	-		0.69	:	-		1.7	:	-	
Hydroxide (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Nitrate	mg/L	T	<0.29	:	-		<0.27	J	-		<0.29	J	-	
Nitrite	mg/L	T	<0.005	:	-		<0.005	J	-		<0.005	J	-	
Phosphate, Ortho As P	mg/L	T	<0.01	:	-		<0.01	:	-		<0.01	J	-	
Phosphorus	mg/L	T	0.016	:	-		0.015	:	-		0.024	:	-	
Sulfate	mg/L	T	91.7	:	-		99.	J	-		93.1	:	-	
Total Alkalinity	mg/L	T	62.7	:	-		59.6	:	-		60.9	:	-	
Total Dissolved Solids	mg/L	T	250.	:	-		272.	:	-		244.	:	-	
Total Kjeldahl Nitrogen	mg/L	T	<0.24	:	-		<0.24	:	-		<0.24	:	-	
Total Organic Carbon	mg/L	T	1.3	:	-		1.4	:	-		1.3	:	-	
Total Suspended Solids	mg/L	T	9.	:	-		10.3	:	-		8.7	:	-	
Laboratory Parameters														
pH	SU	T	7.34	:	-		7.2	J	-		7.4	J	-	
Specific Conductance	umhos/cm	T	307.	J	-		304.	J	-		329.	J	-	
Inorganics														
Cyanide	mg/L	T	<0.01	:	-		<0.01	:	-		<0.01	:	-	
Physical Properties														
Hardness	mg/L	T	159.	:	-		176.	:	-		184.	:	-	

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-15 10/6/2003 RR-15-T00N-SFW SWR		RR-15 10/6/2003 RR-15-D00N-SFW SWR		RR-15 10/7/2003 RR-15-T01N-SFW SWR		RR-15 10/7/2003 RR-15-D01N-SFW SWR		RR-15 10/8/2003 RR-15-T02N-SFW SWR		RR-15 10/8/2003 RR-15-D02N-SFW SWR	
Hardness	mg/L	D	-		160.	:	-		167.	:	-		159.	:
Metals														
Aluminum	mg/L	T	1.41	:	-		1.61	:	-		1.61	:	-	
Aluminum	mg/L	D	-		0.232	:	-		0.286	:	-		0.278	:
Antimony	mg/L	T	<0.0005	:	-		<0.0005	:	-		<0.0005	:	-	
Antimony	mg/L	D	-		<0.0005	:	-		<0.0013	:	-		<0.0005	:
Arsenic	mg/L	T	<0.0002	:	-		<0.0002	:	-		<0.0002	:	-	
Arsenic	mg/L	D	-		<0.0002	:	-		<0.0002	:	-		<0.0002	:
Barium	mg/L	T	0.0396	:	-		0.0434	:	-		0.0438	:	-	
Barium	mg/L	D	-		0.0362	:	-		0.0377	:	-		0.0353	:
Beryllium	mg/L	T	<0.0004	:	-		<0.0003	J	-		<0.0003	:	-	
Beryllium	mg/L	D	-		<0.0004	:	-		<0.0003	J	-		<0.0003	:
Boron	mg/L	T	<0.0063	:	-		0.0074	:	-		0.0093	:	-	
Boron	mg/L	D	-		<0.0063	:	-		0.0094	:	-		0.0066	:
Cadmium	mg/L	T	0.00047	:	-		0.00052	:	-		0.00049	:	-	
Cadmium	mg/L	D	-		0.00035	:	-		0.00043	:	-		0.00049	:
Calcium	mg/L	T	47.4	:	-		52.3	:	-		54.6	:	-	
Calcium	mg/L	D	-		47.8	:	-		49.6	:	-		47.3	:
Chromium	mg/L	T	<0.0011	:	-		0.0017	:	-		0.0032	:	-	
Chromium	mg/L	D	-		<0.0011	:	-		<0.0013	:	-		0.0018	:
Cobalt	mg/L	T	<0.0029	:	-		0.0031	:	-		<0.0031	:	-	
Cobalt	mg/L	D	-		<0.0029	:	-		0.0032	:	-		<0.0031	:
Copper	mg/L	T	0.0147	:	-		0.0145	:	-		0.0154	:	-	
Copper	mg/L	D	-		0.0032	:	-		0.0037	:	-		0.0043	:
Iron	mg/L	T	0.313	:	-		0.348	:	-		0.38	:	-	
Iron	mg/L	D	-		<0.0278	:	-		<0.03	:	-		0.0378	:
Lead	mg/L	T	0.00055	:	-		0.00082	:	-		0.00057	:	-	
Lead	mg/L	D	-		<0.0002	:	-		<0.0002	:	-		<0.0002	:
Magnesium	mg/L	T	9.8	:	-		11.	:	-		11.6	:	-	
Magnesium	mg/L	D	-		9.87	:	-		10.4	:	-		10.	:
Manganese	mg/L	T	0.228	:	-		0.258	:	-		0.263	:	-	
Manganese	mg/L	D	-		0.223	:	-		0.236	:	-		0.222	:
Mercury	mg/L	T	<0.0001	:	-		<0.0001	:	-		<0.0001	:	-	
Mercury	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-15 10/6/2003 RR-15-T00N-SFW SWR		RR-15 10/6/2003 RR-15-D00N-SFW SWR		RR-15 10/7/2003 RR-15-T01N-SFW SWR		RR-15 10/7/2003 RR-15-D01N-SFW SWR		RR-15 10/8/2003 RR-15-T02N-SFW SWR		RR-15 10/8/2003 RR-15-D02N-SFW SWR	
Molybdenum	mg/L	T	<0.0025	:	-		0.0026	:	-		0.0026	:	-	
Molybdenum	mg/L	D	-		<0.0025	:	-		0.0027	:	-		0.0027	:
Nickel	mg/L	T	0.0165	:	-		0.0166	:	-		0.0208	:	-	
Nickel	mg/L	D	-		0.0152	:	-		0.0157	:	-		0.0162	:
Potassium	mg/L	T	1.36	:	-		<1.96	:	-		2.02	:	-	
Potassium	mg/L	D	-		1.36	:	-		1.49	:	-		1.56	:
Selenium	mg/L	T	<0.0003	J	-		<0.0003	J	-		0.00035	J	-	
Selenium	mg/L	D	-		<0.0003	J	-		<0.0003	J	-		<0.0003	J
Silver	mg/L	T	<0.0001	:	-		<0.0001	:	-		<0.0001	:	-	
Silver	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Sodium	mg/L	T	5.2	:	-		5.39	:	-		6.17	:	-	
Sodium	mg/L	D	-		5.33	:	-		5.16	:	-		4.64	:
Thallium	mg/L	T	<0.0001	:	-		<0.0001	:	-		<0.0001	:	-	
Thallium	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Vanadium	mg/L	T	0.00024	:	-		0.00032	:	-		0.00011	:	-	
Vanadium	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		0.00013	:
Zinc	mg/L	T	0.107	:	-		0.126	J	-		0.122	:	-	
Zinc	mg/L	D	-		0.0681	:	-		0.0779	:	-		0.0705	:

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-15 10/9/2003 RR-15-T03N-SFW SWR		RR-15 10/9/2003 RR-15-D03N-SFW SWR		RR-15 10/10/2003 RR-15-T04N-SFW SWR		RR-15 10/10/2003 RR-15-D04N-SFW SWR		RR-15 3/23/2004 RR-15-T01N-SFW SWR		RR-15 3/23/2004 RR-15-D01N-SFW SWR	
Field Measurements														
Ammonia	mg/L	T	0.048	:	-		0.086	:	-		<0.071	:	-	
DO	mg/l	T	10.54	:	-		10.02	:	-		7.2	:	-	
EH	millivolts	T	145.5	:	-		32.	:	-		207.	:	-	
pH	SU	T	7.4	J	-		7.2	J	-		7.6	J	-	
Specific Conductance	uS/cm	T	269.	:	-		362.	:	-		259.	:	-	
Temperature	Celsius	T	6.28	:	-		7.01	:	-		8.8	:	-	
Turbidity	NTU	T	6.28	:	-		10.2	:	-		11.	:	-	
General Chemistry														
Ammonia	mg/L	T	0.048	:	-		0.086	:	-		<0.071	:	-	
Bicarbonate (as CaCO3)	mg/L	T	58.	:	-		57.7	:	-		61.3	:	-	
Biochemical Oxygen Demand	mg/L	T	<1.5	:	-		<1.5	:	-		<1.4	J	-	
Carbonate (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Chemical Oxygen Demand	mg/L	T	<20.	:	-		<20.	:	-		<20.	:	-	
Chloride	mg/L	T	3.1	:	-		3.2	:	-		4.9	:	-	
Fluoride	mg/L	T	0.75	:	-		0.78	:	-		0.62	:	-	
Hydroxide (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Nitrate	mg/L	T	<0.29	:	-		<0.33	:	-		0.45	J	-	
Nitrite	mg/L	T	<0.005	:	-		<0.005	:	-		<0.005	J	-	
Phosphate, Ortho As P	mg/L	T	<0.01	:	-		<0.01	:	-		<0.01	J	-	
Phosphorus	mg/L	T	0.019	:	-		0.019	:	-		0.039	:	-	
Sulfate	mg/L	T	93.1	:	-		99.3	:	-		90.3	:	-	
Total Alkalinity	mg/L	T	58.	:	-		57.7	:	-		61.3	:	-	
Total Dissolved Solids	mg/L	T	210.	:	-		234.	:	-		272.	:	-	
Total Kjeldahl Nitrogen	mg/L	T	<0.24	:	-		<0.24	:	-		<0.24	:	-	
Total Organic Carbon	mg/L	T	<1.	:	-		1.4	:	-		<2.	:	-	
Total Suspended Solids	mg/L	T	8.4	:	-		10.8	:	-		19.1	:	-	
Laboratory Parameters														
pH	SU	T	7.4	J	-		7.2	J	-		7.6	J	-	
Specific Conductance	umhos/cm	T	307.	J	-		321.	J	-		245.	J	-	
Inorganics														
Cyanide	mg/L	T	<0.01	:	-		<0.01	:	-		<0.01	:	-	
Physical Properties														
Hardness	mg/L	T	170.	:	-		163.	:	-		148.	:	-	

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-15 10/9/2003 RR-15-T03N-SFW SWR		RR-15 10/9/2003 RR-15-D03N-SFW SWR		RR-15 10/10/2003 RR-15-T04N-SFW SWR		RR-15 10/10/2003 RR-15-D04N-SFW SWR		RR-15 3/23/2004 RR-15-T01N-SFW SWR		RR-15 3/23/2004 RR-15-D01N-SFW SWR	
Hardness	mg/L	D	-		162.	:	-		162.	:	-		144.	:
Metals														
Aluminum	mg/L	T	1.37	:	-		1.54	:	-		1.86	:	-	
Aluminum	mg/L	D	-		0.192	:	-		0.149	:	-		0.221	:
Antimony	mg/L	T	<0.0005	:	-		<0.0005	:	-		<0.0004	J	-	
Antimony	mg/L	D	-		<0.0005	:	-		<0.0005	:	-		<0.0004	J
Arsenic	mg/L	T	<0.0002	:	-		<0.0002	:	-		<0.0002	:	-	
Arsenic	mg/L	D	-		<0.0002	:	-		<0.0002	:	-		<0.0002	:
Barium	mg/L	T	0.0398	:	-		0.0384	:	-		0.0398	:	-	
Barium	mg/L	D	-		0.0351	:	-		0.0348	:	-		0.0362	:
Beryllium	mg/L	T	0.00047	:	-		0.00053	:	-		<0.001	:	-	
Beryllium	mg/L	D	-		<0.0004	:	-		<0.0004	:	-		<0.001	:
Boron	mg/L	T	<0.0063	:	-		<0.0063	:	-		<0.0117	:	-	
Boron	mg/L	D	-		<0.0063	:	-		<0.0063	:	-		<0.0117	:
Cadmium	mg/L	T	0.00047	:	-		0.00062	:	-		0.00038	:	-	
Cadmium	mg/L	D	-		0.00044	:	-		0.00051	:	-		0.00028	:
Calcium	mg/L	T	50.7	:	-		48.5	:	-		44.2	:	-	
Calcium	mg/L	D	-		48.3	:	-		48.3	:	-		43.1	:
Chromium	mg/L	T	<0.0011	:	-		<0.0011	:	-		<0.00078	:	-	
Chromium	mg/L	D	-		<0.0011	:	-		<0.0011	:	-		<0.00061	:
Cobalt	mg/L	T	<0.0029	:	-		0.003	:	-		<0.0037	:	-	
Cobalt	mg/L	D	-		0.0032	:	-		0.0044	:	-		0.0074	:
Copper	mg/L	T	0.0153	:	-		0.0167	:	-		0.0211	:	-	
Copper	mg/L	D	-		0.0044	:	-		0.0042	:	-		0.0061	:
Iron	mg/L	T	0.274	:	-		0.361	:	-		0.392	:	-	
Iron	mg/L	D	-		<0.0278	:	-		<0.0418	:	-		<0.0423	:
Lead	mg/L	T	0.00038	:	-		0.00077	:	-		0.00057	:	-	
Lead	mg/L	D	-		<0.0002	:	-		<0.0002	:	-		<0.0004	:
Magnesium	mg/L	T	10.6	:	-		10.2	:	-		9.15	:	-	
Magnesium	mg/L	D	-		10.1	:	-		10.1	:	-		8.88	:
Manganese	mg/L	T	0.247	:	-		0.266	:	-		0.266	:	-	
Manganese	mg/L	D	-		0.231	:	-		0.259	:	-		0.243	:
Mercury	mg/L	T	<0.0001	:	-		0.0001	J	-		<0.0001	J	-	
Mercury	mg/L	D	-		<0.0001	:	-		0.0001	J	-		<0.0001	J

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-15 10/9/2003 RR-15-T03N-SFW SWR		RR-15 10/9/2003 RR-15-D03N-SFW SWR		RR-15 10/10/2003 RR-15-T04N-SFW SWR		RR-15 10/10/2003 RR-15-D04N-SFW SWR		RR-15 3/23/2004 RR-15-T01N-SFW SWR		RR-15 3/23/2004 RR-15-D01N-SFW SWR	
Molybdenum	mg/L	T	0.0026	:	-		0.0024	:	-		<0.003	:	-	
Molybdenum	mg/L	D	-		0.0026	:	-		0.0026	:	-		<0.003	:
Nickel	mg/L	T	0.0177	:	-		0.0182	:	-		0.0127	:	-	
Nickel	mg/L	D	-		0.0173	:	-		0.018	:	-		0.0123	:
Potassium	mg/L	T	1.19	:	-		1.16	:	-		<1.1	:	-	
Potassium	mg/L	D	-		1.12	:	-		1.07	:	-		<1.1	:
Selenium	mg/L	T	0.00037	J	-		<0.00051	J	-		<0.0007	:	-	
Selenium	mg/L	D	-		0.00034	J	-		<0.00034	J	-		<0.0007	:
Silver	mg/L	T	<0.0001	:	-		<0.0001	:	-		<0.0001	:	-	
Silver	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Sodium	mg/L	T	5.53	:	-		5.38	:	-		5.5	:	-	
Sodium	mg/L	D	-		5.56	:	-		5.36	:	-		5.38	:
Thallium	mg/L	T	<0.0001	:	-		<0.0001	:	-		<0.00012	:	-	
Thallium	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.00012	:
Vanadium	mg/L	T	0.00025	:	-		0.00023	:	-		<0.00049	:	-	
Vanadium	mg/L	D	-		0.00011	:	-		0.00011	:	-		<0.00029	:
Zinc	mg/L	T	0.121	:	-		0.134	:	-		0.0926	:	-	
Zinc	mg/L	D	-		0.086	:	-		0.105	:	-		0.0546	:

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-15 3/24/2004 RR-15-T02N-SFW SWR		RR-15 3/24/2004 RR-15-D02N-SFW SWR		RR-15 3/25/2004 RR-15-T03N-SFW SWR		RR-15 3/25/2004 RR-15-D03N-SFW SWR		RR-5BB 10/6/2003 RR-5BB-T00N-SFW RURR		RR-5BB 10/6/2003 RR-5BB-D00N-SFW RURR	
Field Measurements														
Ammonia	mg/L	T	<0.067	:	-		0.054	:	-		0.062	:	-	
DO	mg/l	T	-		-		9.4	:	-		9.32	:	-	
EH	millivolts	T	183.	:	-		198.	:	-		285.4	:	-	
pH	SU	T	7.5	:	-		7.63	:	-		7.6	J	-	
Specific Conductance	uS/cm	T	264.	:	-		262.	:	-		255.	:	-	
Temperature	Celsius	T	9.	:	-		7.9	:	-		6.73	:	-	
Turbidity	NTU	T	11.	:	-		12.	:	-		12.4	:	-	
General Chemistry														
Ammonia	mg/L	T	<0.067	:	-		0.054	:	-		0.062	:	-	
Bicarbonate (as CaCO3)	mg/L	T	61.7	:	-		61.4	:	-		73.2	:	-	
Biochemical Oxygen Demand	mg/L	T	<1.4	:	-		<1.4	J	-		<1.3	J	-	
Carbonate (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Chemical Oxygen Demand	mg/L	T	23.5	:	-		36.2	:	-		<20.	:	-	
Chloride	mg/L	T	2.3	:	-		4.5	:	-		2.8	:	-	
Fluoride	mg/L	T	0.63	:	-		0.6	:	-		0.25	:	-	
Hydroxide (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Nitrate	mg/L	T	0.5	J	-		<0.2	J	-		<0.4	J	-	
Nitrite	mg/L	T	<0.005	:	-		<0.005	J	-		<0.005	J	-	
Phosphate, Ortho As P	mg/L	T	<0.01	J	-		<0.01	J	-		<0.01	J	-	
Phosphorus	mg/L	T	0.053	:	-		0.052	:	-		0.022	:	-	
Sulfate	mg/L	T	79.4	:	-		77.4	:	-		50.1	:	-	
Total Alkalinity	mg/L	T	61.7	:	-		61.4	:	-		73.2	:	-	
Total Dissolved Solids	mg/L	T	204.	:	-		196.	:	-		200.	:	-	
Total Kjeldahl Nitrogen	mg/L	T	0.25	:	-		<0.24	:	-		<0.24	:	-	
Total Organic Carbon	mg/L	T	<2.6	:	-		<2.1	:	-		1.	:	-	
Total Suspended Solids	mg/L	T	22.6	:	-		23.	:	-		2.9	:	-	
Laboratory Parameters														
pH	SU	T	7.5	:	-		7.63	:	-		7.6	J	-	
Specific Conductance	umhos/cm	T	249.	J	-		248.	J	-		230.	J	-	
Inorganics														
Cyanide	mg/L	T	<0.01	:	-		<0.01	:	-		<0.01	:	-	
Physical Properties														
Hardness	mg/L	T	147.	:	-		142.	:	-		121.	:	-	

J = Qualified as estimated during data validation

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T = Total Fraction D= Dissolved Fraction

Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-15 3/24/2004 RR-15-T02N-SFW SWR		RR-15 3/24/2004 RR-15-D02N-SFW SWR		RR-15 3/25/2004 RR-15-T03N-SFW SWR		RR-15 3/25/2004 RR-15-D03N-SFW SWR		RR-5BB 10/6/2003 RR-5BB-T00N-SFW RURR		RR-5BB 10/6/2003 RR-5BB-D00N-SFW RURR	
Hardness	mg/L	D	-		147.	:	-		134.	:	-		125.	:
Metals														
Aluminum	mg/L	T	1.96	:	-		1.79	:	-		0.362	:	-	
Aluminum	mg/L	D	-		0.214	:	-		0.203	:	-		0.0992	J
Antimony	mg/L	T	<0.0004	J	-		<0.0004	J	-		<0.0005	:	-	
Antimony	mg/L	D	-		<0.0004	J	-		<0.0004	J	-		<0.0013	:
Arsenic	mg/L	T	0.0002	:	-		<0.0002	:	-		<0.0002	:	-	
Arsenic	mg/L	D	-		<0.0002	:	-		<0.0002	:	-		<0.0002	:
Barium	mg/L	T	0.041	:	-		0.039	:	-		0.0429	:	-	
Barium	mg/L	D	-		0.0353	:	-		0.0317	:	-		0.0383	:
Beryllium	mg/L	T	0.00028	J	-		0.00049	J	-		<0.0004	:	-	
Beryllium	mg/L	D	-		<0.0002	J	-		<0.0002	J	-		<0.0004	:
Boron	mg/L	T	<0.0056	:	-		0.0038	:	-		<0.0063	:	-	
Boron	mg/L	D	-		<0.0046	:	-		0.0034	:	-		0.0076	:
Cadmium	mg/L	T	0.00037	:	-		0.00029	:	-		0.00024	:	-	
Cadmium	mg/L	D	-		<0.0002	:	-		<0.0002	:	-		0.00023	:
Calcium	mg/L	T	43.6	:	-		42.7	:	-		36.5	:	-	
Calcium	mg/L	D	-		43.7	:	-		40.1	:	-		37.8	:
Chromium	mg/L	T	<0.0008	J	-		<0.00072	:	-		0.0012	:	-	
Chromium	mg/L	D	-		<0.0008	J	-		<0.0006	:	-		<0.0011	:
Cobalt	mg/L	T	<0.0011	J	-		0.0028	J	-		<0.0029	:	-	
Cobalt	mg/L	D	-		0.0064	J	-		0.0074	J	-		<0.0029	:
Copper	mg/L	T	0.023	:	-		0.0206	:	-		0.0088	:	-	
Copper	mg/L	D	-		0.0061	:	-		0.0049	:	-		0.003	:
Iron	mg/L	T	0.413	:	-		0.567	:	-		0.381	:	-	
Iron	mg/L	D	-		<0.0192	J	-		<0.0192	J	-		0.0399	:
Lead	mg/L	T	0.00076	:	-		0.00081	:	-		0.0011	J	-	
Lead	mg/L	D	-		<0.0004	:	-		<0.0004	:	-		<0.0002	:
Magnesium	mg/L	T	9.22	:	-		8.64	:	-		7.24	:	-	
Magnesium	mg/L	D	-		9.16	:	-		8.15	:	-		7.45	:
Manganese	mg/L	T	0.277	:	-		0.256	:	-		0.101	:	-	
Manganese	mg/L	D	-		0.251	:	-		0.216	:	-		0.092	:
Mercury	mg/L	T	<0.0001	J	-		<0.0001	:	-		<0.0001	:	-	
Mercury	mg/L	D	-		<0.0001	J	-		<0.0001	:	-		<0.0001	:

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-15 3/24/2004 RR-15-T02N-SFW SWR		RR-15 3/24/2004 RR-15-D02N-SFW SWR		RR-15 3/25/2004 RR-15-T03N-SFW SWR		RR-15 3/25/2004 RR-15-D03N-SFW SWR		RR-5BB 10/6/2003 RR-5BB-T00N-SFW RURR		RR-5BB 10/6/2003 RR-5BB-D00N-SFW RURR	
Molybdenum	mg/L	T	<0.0038	:	-		<0.0025	:	-		<0.0012	:	-	
Molybdenum	mg/L	D	-		<0.0039	:	-		<0.0028	:	-		<0.0013	:
Nickel	mg/L	T	0.0137	:	-		0.0113	:	-		0.0053	:	-	
Nickel	mg/L	D	-		0.0121	:	-		0.0107	:	-		0.0046	:
Potassium	mg/L	T	0.788	J	-		1.35	:	-		1.28	:	-	
Potassium	mg/L	D	-		0.796	J	-		1.16	:	-		1.32	:
Selenium	mg/L	T	<0.0007	:	-		<0.0007	:	-		<0.0003	J	-	
Selenium	mg/L	D	-		<0.0007	:	-		<0.0007	:	-		<0.0003	J
Silver	mg/L	T	<0.0001	:	-		<0.0001	J	-		<0.0001	:	-	
Silver	mg/L	D	-		<0.0001	:	-		<0.0001	J	-		<0.0001	:
Sodium	mg/L	T	6.29	:	-		5.05	:	-		4.57	:	-	
Sodium	mg/L	D	-		6.21	:	-		4.74	:	-		4.86	:
Thallium	mg/L	T	0.00011	:	-		<0.0001	:	-		<0.0001	:	-	
Thallium	mg/L	D	-		0.0001	:	-		<0.0001	:	-		<0.0001	:
Vanadium	mg/L	T	<0.00051	:	-		0.00033	:	-		0.0005	:	-	
Vanadium	mg/L	D	-		<0.00026	:	-		<0.0002	:	-		0.00011	:
Zinc	mg/L	T	0.1	:	-		0.0954	:	-		0.0292	:	-	
Zinc	mg/L	D	-		0.0646	:	-		0.0505	:	-		0.0217	:

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-5BB 10/7/2003 RR-5BB-T01N-SFW RURR T		RR-5BB 10/7/2003 RR-5BB-D01N-SFW RURR T		RR-5BB 10/8/2003 RR-5BB-T02N-SFW RURR T		RR-5BB 10/8/2003 RR-5BB-D02N-SFW RURR T		RR-5BB 10/9/2003 RR-5BB-T03N-SFW RURR T		RR-5BB 10/9/2003 RR-5BB-D03N-SFW RURR T	
Field Measurements														
Ammonia	mg/L	T	<0.04	:	-		<0.04	:	-		0.063	:	-	
DO	mg/l	T	9.5	:	-		8.68	:	-		10.14	:	-	
EH	millivolts	T	132.6	:	-		209.2	:	-		191.9	:	-	
pH	SU	T	7.93	:	-		7.6	J	-		7.84	:	-	
Specific Conductance	uS/cm	T	264.	:	-		261.	:	-		269.	:	-	
Temperature	Celsius	T	10.04	:	-		9.72	:	-		6.28	:	-	
Turbidity	NTU	T	-		-		9.	:	-		9.2	:	-	
General Chemistry														
Ammonia	mg/L	T	<0.04	:	-		<0.04	:	-		0.063	:	-	
Bicarbonate (as CaCO3)	mg/L	T	71.1	:	-		73.7	:	-		74.8	:	-	
Biochemical Oxygen Demand	mg/L	T	<1.4	J	-		<1.5	J	-		<1.5	:	-	
Carbonate (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Chemical Oxygen Demand	mg/L	T	<20.	:	-		<20.	:	-		<20.	:	-	
Chloride	mg/L	T	2.6	:	-		2.7	:	-		2.5	:	-	
Fluoride	mg/L	T	0.24	:	-		0.28	:	-		0.27	:	-	
Hydroxide (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Nitrate	mg/L	T	<0.31	J	-		<0.32	J	-		<0.32	:	-	
Nitrite	mg/L	T	<0.005	:	-		<0.005	J	-		<0.005	:	-	
Phosphate, Ortho As P	mg/L	T	<0.013	:	-		<0.01	J	-		<0.01	:	-	
Phosphorus	mg/L	T	0.025	:	-		0.036	:	-		0.032	:	-	
Sulfate	mg/L	T	54.5	:	-		52.2	:	-		65.1	:	-	
Total Alkalinity	mg/L	T	71.1	:	-		73.7	:	-		74.8	:	-	
Total Dissolved Solids	mg/L	T	192.	:	-		168.	:	-		174.	:	-	
Total Kjeldahl Nitrogen	mg/L	T	<0.24	:	-		<0.24	:	-		<0.24	:	-	
Total Organic Carbon	mg/L	T	1.3	:	-		1.8	:	-		1.1	:	-	
Total Suspended Solids	mg/L	T	2.8	:	-		3.2	:	-		4.5	:	-	
Laboratory Parameters														
pH	SU	T	7.93	:	-		7.6	J	-		7.84	:	-	
Specific Conductance	umhos/cm	T	238.	J	-		243.	J	-		238.	J	-	
Inorganics														
Cyanide	mg/L	T	<0.01	:	-		<0.01	:	-		<0.01	:	-	
Physical Properties														
Hardness	mg/L	T	132.	:	-		124.	:	-		126.	:	-	

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-5BB 10/7/2003 RR-5BB-T01N-SFW RURR		RR-5BB 10/7/2003 RR-5BB-D01N-SFW RURR		RR-5BB 10/8/2003 RR-5BB-T02N-SFW RURR		RR-5BB 10/8/2003 RR-5BB-D02N-SFW RURR		RR-5BB 10/9/2003 RR-5BB-T03N-SFW RURR		RR-5BB 10/9/2003 RR-5BB-D03N-SFW RURR	
Hardness	mg/L	D	-		126.	:	-		126.	:	-		122.	:
Metals														
Aluminum	mg/L	T	0.371	:	-		0.322	:	-		0.27	:	-	
Aluminum	mg/L	D	-		<0.158	:	-		0.15	:	-		0.0977	:
Antimony	mg/L	T	<0.0012	:	-		<0.0005	:	-		<0.0005	:	-	
Antimony	mg/L	D	-		<0.0005	:	-		<0.0005	:	-		<0.0005	:
Arsenic	mg/L	T	<0.0002	:	-		<0.0002	:	-		<0.0002	:	-	
Arsenic	mg/L	D	-		<0.0002	:	-		<0.0002	:	-		<0.0002	:
Barium	mg/L	T	0.0426	:	-		0.0402	:	-		0.0404	:	-	
Barium	mg/L	D	-		0.0384	:	-		0.0388	:	-		0.0384	:
Beryllium	mg/L	T	<0.0003	J	-		<0.0003	:	-		<0.0004	:	-	
Beryllium	mg/L	D	-		<0.0003	J	-		<0.0003	:	-		<0.0004	:
Boron	mg/L	T	0.0108	:	-		0.0081	:	-		0.0065	:	-	
Boron	mg/L	D	-		0.009	:	-		0.0094	:	-		<0.0063	:
Cadmium	mg/L	T	0.00023	:	-		<0.0002	:	-		0.00027	:	-	
Cadmium	mg/L	D	-		<0.0002	:	-		<0.0002	:	-		0.0002	:
Calcium	mg/L	T	39.5	:	-		37.2	:	-		37.8	:	-	
Calcium	mg/L	D	-		37.7	:	-		37.8	:	-		36.6	:
Chromium	mg/L	T	0.0016	:	-		0.0022	J	-		<0.0011	:	-	
Chromium	mg/L	D	-		<0.0013	:	-		0.005	J	-		<0.0011	:
Cobalt	mg/L	T	<0.0031	:	-		<0.0031	:	-		<0.0029	:	-	
Cobalt	mg/L	D	-		<0.0031	:	-		<0.0031	:	-		<0.0029	:
Copper	mg/L	T	0.0076	:	-		0.009	:	-		0.0101	:	-	
Copper	mg/L	D	-		0.0027	:	-		0.0045	:	-		0.0041	:
Iron	mg/L	T	0.275	:	-		0.269	J	-		0.242	:	-	
Iron	mg/L	D	-		<0.0379	:	-		0.699	J	-		<0.0278	:
Lead	mg/L	T	0.00044	:	-		0.00052	:	-		0.00057	:	-	
Lead	mg/L	D	-		<0.0002	:	-		<0.0002	:	-		<0.0002	:
Magnesium	mg/L	T	8.07	:	-		7.58	:	-		7.62	:	-	
Magnesium	mg/L	D	-		7.69	:	-		7.69	:	-		7.36	:
Manganese	mg/L	T	0.0992	:	-		0.0934	:	-		0.0998	:	-	
Manganese	mg/L	D	-		0.0904	:	-		0.0903	:	-		0.0929	:
Mercury	mg/L	T	<0.0001	:	-		<0.0001	:	-		<0.0001	J	-	
Mercury	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	J

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-5BB 10/7/2003 RR-5BB-T01N-SFW RURR		RR-5BB 10/7/2003 RR-5BB-D01N-SFW RURR		RR-5BB 10/8/2003 RR-5BB-T02N-SFW RURR		RR-5BB 10/8/2003 RR-5BB-D02N-SFW RURR		RR-5BB 10/9/2003 RR-5BB-T03N-SFW RURR		RR-5BB 10/9/2003 RR-5BB-D03N-SFW RURR	
Molybdenum	mg/L	T	0.0014	:	-		0.0011	:	-		0.0012	:	-	
Molybdenum	mg/L	D	-		0.0013	:	-		0.0011	:	-		0.0012	:
Nickel	mg/L	T	0.0047	:	-		0.005	:	-		0.0055	:	-	
Nickel	mg/L	D	-		0.0043	:	-		0.0044	:	-		0.0053	:
Potassium	mg/L	T	<1.8	:	-		1.29	:	-		1.1	:	-	
Potassium	mg/L	D	-		<1.5	:	-		1.45	:	-		1.06	:
Selenium	mg/L	T	<0.0003	J	-		<0.0003	J	-		<0.0003	J	-	
Selenium	mg/L	D	-		<0.0003	J	-		<0.0003	J	-		<0.0003	J
Silver	mg/L	T	<0.0001	:	-		<0.0001	:	-		<0.0001	:	-	
Silver	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Sodium	mg/L	T	4.7	:	-		4.53	:	-		4.78	:	-	
Sodium	mg/L	D	-		4.6	:	-		4.63	:	-		4.57	:
Thallium	mg/L	T	<0.0001	:	-		<0.0001	:	-		<0.0001	:	-	
Thallium	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Vanadium	mg/L	T	0.00027	:	-		0.00038	:	-		0.00025	:	-	
Vanadium	mg/L	D	-		0.0001	:	-		0.00015	:	-		0.00013	:
Zinc	mg/L	T	0.0276	J	-		0.0265	:	-		0.0301	:	-	
Zinc	mg/L	D	-		0.0178	:	-		0.0197	:	-		0.024	:

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-5BB 10/10/2003 RR-5BB-T04N-SFW RURR T		RR-5BB 10/10/2003 RR-5BB-D04N-SFW RURR T		RR-5BB 3/23/2004 RR-5BB-T01N-SFW RURR T		RR-5BB 3/23/2004 RR-5BB-D01N-SFW RURR T		RR-5BB 3/24/2004 RR-5BB-T02N-SFW RURR T		RR-5BB 3/24/2004 RR-5BB-D02N-SFW RURR T	
Field Measurements														
Ammonia	mg/L	T	<0.1	:	-		<0.067	:	-		<0.09	:	-	
DO	mg/l	T	10.06	:	-		8.3	:	-		-		-	
EH	millivolts	T	138.2	:	-		147.	:	-		142.1	:	-	
pH	SU	T	7.5	J	-		6.9	J	-		7.4	J	-	
Specific Conductance	uS/cm	T	278.	:	-		210.	:	-		221.	:	-	
Temperature	Celsius	T	6.69	:	-		7.9	:	-		8.48	:	-	
Turbidity	NTU	T	6.	:	-		9.1	:	-		8.2	:	-	
General Chemistry														
Ammonia	mg/L	T	<0.1	:	-		<0.067	:	-		<0.09	:	-	
Bicarbonate (as CaCO3)	mg/L	T	73.3	:	-		69.1	:	-		72.3	:	-	
Biochemical Oxygen Demand	mg/L	T	<1.5	:	-		<1.4	J	-		<1.4	:	-	
Carbonate (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Chemical Oxygen Demand	mg/L	T	<20.	:	-		<20.	:	-		<20.	:	-	
Chloride	mg/L	T	2.6	:	-		5.3	:	-		5.5	:	-	
Fluoride	mg/L	T	0.28	:	-		0.26	:	-		0.27	:	-	
Hydroxide (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Nitrate	mg/L	T	<0.33	:	-		0.44	J	-		0.49	J	-	
Nitrite	mg/L	T	<0.005	:	-		<0.005	:	-		<0.005	:	-	
Phosphate, Ortho As P	mg/L	T	<0.01	:	-		<0.01	J	-		<0.01	:	-	
Phosphorus	mg/L	T	0.026	:	-		0.054	:	-		0.06	:	-	
Sulfate	mg/L	T	52.1	:	-		54.1	:	-		54.6	:	-	
Total Alkalinity	mg/L	T	73.3	:	-		69.1	:	-		72.3	:	-	
Total Dissolved Solids	mg/L	T	170.	:	-		188.	:	-		188.	:	-	
Total Kjeldahl Nitrogen	mg/L	T	<0.24	:	-		<0.25	:	-		0.26	:	-	
Total Organic Carbon	mg/L	T	1.2	:	-		<1.6	:	-		<2.5	:	-	
Total Suspended Solids	mg/L	T	3.	:	-		14.1	:	-		8.5	:	-	
Laboratory Parameters														
pH	SU	T	7.5	J	-		6.9	J	-		7.4	J	-	
Specific Conductance	umhos/cm	T	237.	J	-		208.	J	-		206.	J	-	
Inorganics														
Cyanide	mg/L	T	<0.01	:	-		<0.01	J	-		<0.01	:	-	
Physical Properties														
Hardness	mg/L	T	125.	:	-		123.	:	-		130.	:	-	

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-5BB 10/10/2003 RR-5BB-T04N-SFW RURR		RR-5BB 10/10/2003 RR-5BB-D04N-SFW RURR		RR-5BB 3/23/2004 RR-5BB-T01N-SFW RURR		RR-5BB 3/23/2004 RR-5BB-D01N-SFW RURR		RR-5BB 3/24/2004 RR-5BB-T02N-SFW RURR		RR-5BB 3/24/2004 RR-5BB-D02N-SFW RURR	
Hardness	mg/L	D	-		121.	:	-		121.	:	-		129.	:
Metals														
Aluminum	mg/L	T	0.3	:	-		0.505	:	-		0.335	:	-	
Aluminum	mg/L	D	-		0.0888	J	-		0.112	J	-		0.045	J
Antimony	mg/L	T	<0.0005	:	-		<0.0004	J	-		<0.0004	J	-	
Antimony	mg/L	D	-		<0.0005	:	-		<0.0004	J	-		<0.0004	J
Arsenic	mg/L	T	<0.0002	:	-		<0.0002	:	-		<0.0002	:	-	
Arsenic	mg/L	D	-		<0.0002	:	-		<0.0002	:	-		<0.0002	:
Barium	mg/L	T	0.0405	:	-		0.0428	:	-		0.0406	:	-	
Barium	mg/L	D	-		0.0368	:	-		0.0391	:	-		0.0361	:
Beryllium	mg/L	T	<0.0004	:	-		<0.00024	:	-		<0.00053	:	-	
Beryllium	mg/L	D	-		<0.0004	:	-		<0.0003	:	-		<0.00056	:
Boron	mg/L	T	0.0065	:	-		<0.0068	:	-		0.0037	:	-	
Boron	mg/L	D	-		0.0065	:	-		<0.0061	:	-		0.0032	:
Cadmium	mg/L	T	<0.0002	:	-		<0.0002	J	-		<0.0002	:	-	
Cadmium	mg/L	D	-		<0.0002	:	-		<0.0002	J	-		<0.0002	:
Calcium	mg/L	T	37.5	:	-		36.9	:	-		38.8	:	-	
Calcium	mg/L	D	-		36.3	:	-		36.1	:	-		38.5	:
Chromium	mg/L	T	<0.0011	:	-		<0.00086	:	-		<0.0008	J	-	
Chromium	mg/L	D	-		<0.0011	:	-		<0.00069	:	-		<0.0008	J
Cobalt	mg/L	T	<0.0029	:	-		0.0012	J	-		<0.0011	J	-	
Cobalt	mg/L	D	-		0.0038	:	-		0.0047	J	-		0.0035	J
Copper	mg/L	T	0.0092	:	-		0.0127	:	-		0.0113	:	-	
Copper	mg/L	D	-		0.0076	:	-		0.0043	:	-		0.004	J
Iron	mg/L	T	0.253	:	-		0.377	:	-		0.3	J	-	
Iron	mg/L	D	-		<0.0386	:	-		<0.0192	J	-		<0.0192	J
Lead	mg/L	T	0.00043	:	-		0.00051	:	-		0.00041	:	-	
Lead	mg/L	D	-		0.00059	:	-		<0.0004	:	-		<0.0004	:
Magnesium	mg/L	T	7.56	:	-		7.57	:	-		8.12	:	-	
Magnesium	mg/L	D	-		7.31	:	-		7.4	:	-		8.01	:
Manganese	mg/L	T	0.0987	:	-		0.0958	:	-		0.096	:	-	
Manganese	mg/L	D	-		0.0954	:	-		0.0838	:	-		0.0842	:
Mercury	mg/L	T	<0.0001	J	-		<0.0001	J	-		<0.0001	:	-	
Mercury	mg/L	D	-		<0.0001	J	-		<0.0001	J	-		<0.0001	:

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-5BB 10/10/2003 RR-5BB-T04N-SFW RURR		RR-5BB 10/10/2003 RR-5BB-D04N-SFW RURR		RR-5BB 3/23/2004 RR-5BB-T01N-SFW RURR		RR-5BB 3/23/2004 RR-5BB-D01N-SFW RURR		RR-5BB 3/24/2004 RR-5BB-T02N-SFW RURR		RR-5BB 3/24/2004 RR-5BB-D02N-SFW RURR	
Molybdenum	mg/L	T	0.00097	:	-		0.0017	:	-		<0.0011	:	-	
Molybdenum	mg/L	D	-		0.0012	:	-		0.0021	:	-		<0.0012	:
Nickel	mg/L	T	0.0051	:	-		0.0052	:	-		0.0038	:	-	
Nickel	mg/L	D	-		0.0053	:	-		0.0051	:	-		0.0036	J
Potassium	mg/L	T	1.15	:	-		1.33	:	-		0.712	J	-	
Potassium	mg/L	D	-		1.09	:	-		1.18	:	-		0.794	J
Selenium	mg/L	T	<0.0003	J	-		<0.0007	:	-		<0.0007	:	-	
Selenium	mg/L	D	-		<0.00036	J	-		<0.0007	:	-		<0.0007	:
Silver	mg/L	T	<0.0001	:	-		<0.0001	:	-		<0.0001	J	-	
Silver	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	J
Sodium	mg/L	T	5.01	:	-		5.03	:	-		5.9	:	-	
Sodium	mg/L	D	-		4.85	:	-		5.1	:	-		5.81	:
Thallium	mg/L	T	<0.0001	:	-		<0.00015	:	-		<0.0001	:	-	
Thallium	mg/L	D	-		<0.0001	:	-		<0.00014	:	-		<0.0001	:
Vanadium	mg/L	T	0.00027	:	-		<0.00045	:	-		<0.0002	:	-	
Vanadium	mg/L	D	-		0.00012	:	-		<0.00023	:	-		<0.0002	:
Zinc	mg/L	T	<0.0351	:	-		0.027	:	-		0.0284	:	-	
Zinc	mg/L	D	-		<0.0287	:	-		0.0124	:	-		0.0127	:

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-5BB 3/25/2004 RR-5BB-T03N-SFW RURR		RR-5BB 3/25/2004 RR-5BB-D03N-SFW RURR		RR-5BB 9/27/2004 RR-5BB-T00N-SFW RURR		RR-5BB 9/27/2004 RR-5BB-D00N-SFW RURR		RR-5BB 9/28/2004 RR-5BB-T01N-SFW RURR		RR-5BB 9/28/2004 RR-5BB-D01N-SFW RURR	
Field Measurements														
Ammonia	mg/L	T	0.051	:	-		-		-		-		-	
DO	mg/l	T	10.59	:	-		9.13	:	-		9.67	:	-	
EH	millivolts	T	172.	:	-		330.	:	-		196.3	:	-	
pH	SU	T	7.4	J	-		6.81	:	-		7.94	:	-	
Specific Conductance	uS/cm	T	223.	:	-		269.	:	-		247.	:	-	
Temperature	Celsius	T	8.05	:	-		9.5	:	-		6.91	:	-	
Turbidity	NTU	T	7.8	:	-		0.	:	-		0.	:	-	
General Chemistry														
Ammonia	mg/L	T	0.051	:	-		-		-		-		-	
Bicarbonate (as CaCO3)	mg/L	T	71.8	:	-		72.7	:	-		78.	:	-	
Biochemical Oxygen Demand	mg/L	T	<1.4	J	-		-		-		-		-	
Carbonate (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Chemical Oxygen Demand	mg/L	T	<20.	:	-		-		-		-		-	
Chloride	mg/L	T	4.2	:	-		2.9	J	-		2.8	J	-	
Dissolved Organic Carbon	mg/L	D	-		-		-		<1.5	:	-		<1.3	:
Fluoride	mg/L	T	0.26	:	-		0.25	:	-		0.26	:	-	
Hydroxide (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Nitrate	mg/L	T	<0.2	:	-		-		-		-		-	
Nitrate+Nitrite as N	mg/L	T	-		-		0.4	J	-		0.5	:	-	
Nitrite	mg/L	T	<0.005	J	-		0.0055	:	-		<0.005	:	-	
Phosphate, Ortho As P	mg/L	T	<0.01	J	-		<0.01	:	-		<0.01	J	-	
Phosphorus	mg/L	T	0.044	:	-		0.028	:	-		0.033	:	-	
Sulfate	mg/L	T	48.3	:	-		53.5	:	-		53.5	:	-	
Total Alkalinity	mg/L	T	71.8	:	-		72.7	:	-		78.	:	-	
Total Dissolved Solids	mg/L	T	168.	:	-		140.	:	-		142.	:	-	
Total Kjeldahl Nitrogen	mg/L	T	<0.24	:	-		-		-		-		-	
Total Organic Carbon	mg/L	T	<2.7	:	-		<1.	:	-		<1.	:	-	
Total Suspended Solids	mg/L	T	8.5	:	-		2.2	:	-		6.3	J	-	
Laboratory Parameters														
pH	SU	T	7.4	J	-		6.81	:	-		7.94	:	-	
Specific Conductance	umhos/cm	T	226.	J	-		-		-		-		-	
Inorganics														
Cyanide	mg/L	T	<0.01	:	-		<0.01	:	-		<0.01	:	-	

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-5BB 3/25/2004 RR-5BB-T03N-SFW RURR	RR-5BB 3/25/2004 RR-5BB-D03N-SFW RURR	RR-5BB 9/27/2004 RR-5BB-T00N-SFW RURR	RR-5BB 9/27/2004 RR-5BB-D00N-SFW RURR	RR-5BB 9/28/2004 RR-5BB-T01N-SFW RURR	RR-5BB 9/28/2004 RR-5BB-D01N-SFW RURR
Physical Properties								
Hardness	mg/L	T	122. :	-	-	-	-	-
Hardness	mg/L	D	-	124. :	-	118. :	-	134. :
Metals								
Aluminum	mg/L	T	0.428 :	-	0.2 :	-	0.236 :	-
Aluminum	mg/L	D	-	<0.123 J	-	0.063 :	-	0.104 :
Antimony	mg/L	T	<0.0004 J	-	-	-	-	-
Antimony	mg/L	D	-	<0.0004 J	-	<0.0003 :	-	<0.0015 :
Arsenic	mg/L	T	<0.0002 :	-	-	-	-	-
Arsenic	mg/L	D	-	<0.0002 :	-	<0.0001 J	-	<0.0001 :
Barium	mg/L	T	0.0422 :	-	-	-	-	-
Barium	mg/L	D	-	0.0358 :	-	0.0356 :	-	0.0391 :
Beryllium	mg/L	T	<0.00033 :	-	-	-	-	-
Beryllium	mg/L	D	-	<0.00022 :	-	0.00032 :	-	<0.0003 :
Boron	mg/L	T	<0.0041 :	-	-	-	-	-
Boron	mg/L	D	-	0.0037 :	-	0.0073 :	-	<0.0069 :
Cadmium	mg/L	T	<0.0002 :	-	-	-	-	-
Cadmium	mg/L	D	-	<0.0002 :	-	<0.0001 J	-	<0.0001 J
Calcium	mg/L	T	36.9 :	-	-	-	-	-
Calcium	mg/L	D	-	37.3 :	-	35.7 :	-	40.6 :
Chromium	mg/L	T	0.00068 :	-	-	-	-	-
Chromium	mg/L	D	-	0.00048 :	-	0.002 :	-	<0.0011 J
Cobalt	mg/L	T	0.0023 J	-	-	-	-	-
Cobalt	mg/L	D	-	0.006 J	-	<0.0031 :	-	0.0075 :
Copper	mg/L	T	0.0134 :	-	-	-	-	-
Copper	mg/L	D	-	0.004 :	-	0.003 J	-	0.0039 :
Iron	mg/L	T	<0.418 :	-	0.199 :	-	0.119 :	-
Iron	mg/L	D	-	<0.0275 J	-	0.0517 :	-	<0.0355 J
Lead	mg/L	T	0.00072 :	-	-	-	-	-
Lead	mg/L	D	-	<0.0004 :	-	<0.0001 :	-	<0.0001 :
Magnesium	mg/L	T	7.39 :	-	-	-	-	-
Magnesium	mg/L	D	-	7.46 :	-	6.94 :	-	8.02 :
Manganese	mg/L	T	0.104 :	-	-	-	-	-
Manganese	mg/L	D	-	0.0839 :	-	0.0658 :	-	0.0909 :

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	RR-5BB 3/25/2004 RR-5BB-T03N-SFW RURR		RR-5BB 3/25/2004 RR-5BB-D03N-SFW RURR		RR-5BB 9/27/2004 RR-5BB-T00N-SFW RURR		RR-5BB 9/27/2004 RR-5BB-D00N-SFW RURR		RR-5BB 9/28/2004 RR-5BB-T01N-SFW RURR		RR-5BB 9/28/2004 RR-5BB-D01N-SFW RURR	
Mercury	mg/L	T	<0.0001	:	-		-		-		-		-	
Mercury	mg/L	D	-		<0.0001	:	-		<0.0001	J	-		<0.0001	:
Molybdenum	mg/L	T	<0.0012	:	-		-		-		-		-	
Molybdenum	mg/L	D	-		<0.0013	:	-		0.0012	:	-		<0.0017	:
Nickel	mg/L	T	0.0045	:	-		-		-		-		-	
Nickel	mg/L	D	-		0.004	:	-		0.0048	J	-		0.0049	:
Potassium	mg/L	T	1.23	:	-		-		-		-		-	
Potassium	mg/L	D	-		1.26	:	-		0.995	:	-		<1.36	:
Selenium	mg/L	T	<0.0007	:	-		-		-		-		-	
Selenium	mg/L	D	-		<0.0007	:	-		<0.0003	J	-		<0.0003	J
Silver	mg/L	T	<0.0001	J	-		-		-		-		-	
Silver	mg/L	D	-		<0.0001	J	-		<0.0001	J	-		<0.0001	:
Sodium	mg/L	T	4.84	:	-		-		-		-		-	
Sodium	mg/L	D	-		4.86	:	-		4.22	:	-		4.61	:
Thallium	mg/L	T	<0.0001	:	-		-		-		-		-	
Thallium	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Vanadium	mg/L	T	0.0004	:	-		-		-		-		-	
Vanadium	mg/L	D	-		<0.0002	:	-		<0.0001	J	-		0.00018	:
Zinc	mg/L	T	0.0317	:	-		-		-		-		-	
Zinc	mg/L	D	-		<0.0137	:	-		<0.0157	:	-		0.0212	:

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID	
			RR-5BB 9/29/2004 RR-5BB-T02N-SFW		RR-5BB 9/29/2004 RR-5BB-D02N-SFW		RR-5BB 9/30/2004 RR-5BB-T03N-SFW		RR-5BB 9/30/2004 RR-5BB-D03N-SFW		RR-5BB 10/1/2004 RR-5BB-T04N-SFW		RR-5BB 10/1/2004 RR-5BB-D04N-SFW	
			RURR		RURR		RURR		RURR		RURR		RURR	
Field Measurements														
DO	mg/l	T	9.41	:	-		9.62	:	-		9.3	:	-	
EH	millivolts	T	148.4	:	-		221.4	:	-		320.7	:	-	
pH	SU	T	8.43	:	-		8.33	:	-		7.85	:	-	
Specific Conductance	uS/cm	T	241.	:	-		249.	:	-		245.	:	-	
Temperature	Celsius	T	6.87	:	-		6.09	:	-		6.08	:	-	
Turbidity	NTU	T	13.7	:	-		4.7	:	-		3.7	:	-	
General Chemistry														
Bicarbonate (as CaCO3)	mg/L	T	72.3	:	-		74.1	:	-		74.7	:	-	
Carbonate (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Chloride	mg/L	T	2.7	J	-		2.7	J	-		2.6	J	-	
Dissolved Organic Carbon	mg/L	D	-		<1.8	:	-		<1.5	:	-		<1.3	:
Fluoride	mg/L	T	0.22	:	-		0.26	:	-		0.26	:	-	
Hydroxide (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Nitrate+Nitrite as N	mg/L	T	0.34	:	-		0.43	:	-		0.38	:	-	
Nitrite	mg/L	T	<0.005	:	-		<0.005	J	-		<0.005	J	-	
Phosphate, Ortho As P	mg/L	T	<0.01	:	-		<0.01	J	-		<0.01	J	-	
Phosphorus	mg/L	T	0.039	:	-		0.022	:	-		0.024	:	-	
Sulfate	mg/L	T	53.9	:	-		57.3	:	-		58.3	:	-	
Total Alkalinity	mg/L	T	72.3	:	-		74.1	:	-		74.7	:	-	
Total Dissolved Solids	mg/L	T	138.	:	-		236.	:	-		214.	:	-	
Total Organic Carbon	mg/L	T	<1.4	:	-		<1.5	:	-		<1.7	:	-	
Total Suspended Solids	mg/L	T	10.5	:	-		8.2	:	-		5.3	:	-	
Laboratory Parameters														
pH	SU	T	8.43	:	-		8.33	:	-		7.85	:	-	
Inorganics														
Cyanide	mg/L	T	<0.01	:	-		<0.01	:	-		<0.01	:	-	
Physical Properties														
Hardness	mg/L	D	-		126.	:	-		135.	:	-		130.	:
Metals														
Aluminum	mg/L	T	0.616	:	-		0.333	:	-		0.337	:	-	
Aluminum	mg/L	D	-		<0.151	:	-		0.0922	:	-		0.0794	:
Antimony	mg/L	D	-		<0.0012	:	-		<0.00083	:	-		<0.0013	:

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T = Total Fraction D= Dissolved Fraction

Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area	Fraction	RR-5BB 9/29/2004 RR-5BB-T02N-SFW RURR		RR-5BB 9/29/2004 RR-5BB-D02N-SFW RURR		RR-5BB 9/30/2004 RR-5BB-T03N-SFW RURR		RR-5BB 9/30/2004 RR-5BB-D03N-SFW RURR		RR-5BB 10/1/2004 RR-5BB-T04N-SFW RURR		RR-5BB 10/1/2004 RR-5BB-D04N-SFW RURR	
Arsenic	mg/L	D		-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Barium	mg/L	D		-		0.0354	:	-		0.035	:	-		0.0344	:
Beryllium	mg/L	D		-		<0.0003	:	-		<0.0003	:	-		<0.0003	:
Boron	mg/L	D		-		<0.0069	:	-		<0.0069	:	-		<0.0069	:
Cadmium	mg/L	D		-		<0.0001	:	-		<0.0001	J	-		<0.0001	J
Calcium	mg/L	D		-		38.3	:	-		41.	:	-		39.4	:
Chromium	mg/L	D		-		<0.0011	J	-		<0.0011	J	-		<0.0011	J
Cobalt	mg/L	D		-		0.0065	:	-		0.0054	:	-		0.0051	:
Copper	mg/L	D		-		0.0038	J	-		0.0028	J	-		0.0031	J
Iron	mg/L	T		0.839	:	-		0.281	:	-		0.263	:	-	
Iron	mg/L	D		-		0.0714	:	-		<0.0355	J	-		<0.0355	J
Lead	mg/L	D		-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Magnesium	mg/L	D		-		7.29	:	-		7.9	:	-		7.68	:
Manganese	mg/L	D		-		0.101	:	-		0.104	:	-		0.0969	:
Mercury	mg/L	D		-		<0.0001	:	-		<0.0001	J	-		<0.0001	J
Molybdenum	mg/L	D		-		0.00084	:	-		0.0011	:	-		0.0012	:
Nickel	mg/L	D		-		<0.0036	J	-		0.0042	J	-		0.0042	J
Potassium	mg/L	D		-		1.3	:	-		1.49	:	-		1.35	:
Selenium	mg/L	D		-		<0.0003	J	-		<0.0003	J	-		<0.0003	J
Silver	mg/L	D		-		<0.0001	:	-		<0.0001	J	-		<0.0001	J
Sodium	mg/L	D		-		3.81	:	-		4.82	:	-		4.69	:
Thallium	mg/L	D		-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Vanadium	mg/L	D		-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Zinc	mg/L	D		-		0.0166	:	-		0.0322	:	-		0.02	:

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction											
		Zwergle 10/6/2003 Zwergle-T00N-SFW RURR-Z		Zwergle 10/6/2003 ZWERGLE-D00N-SFW RURR-Z		ZWERGLE 10/7/2003 ZWERGLE-T01N-SFW RURR-Z		ZWERGLE 10/7/2003 ZWERGLE-D01N-SFW RURR-Z		Zwergle 10/8/2003 ZWERGLE-T02N-SFW RURR-Z		Zwergle 10/8/2003 ZWERGLE-D02N-SFW RURR-Z	
Field Measurements													
Ammonia	mg/L T	<0.1	:	-		<0.04	:	-		<0.04	:	-	
DO	mg/l T	9.07	:	-		9.41	:	-		7.96	:	-	
EH	millivolts T	324.5	:	-		195.2	:	-		279.6	:	-	
pH	SU T	7.6	J	-		8.27	:	-		7.5	J	-	
Specific Conductance	uS/cm T	195.	:	-		202.	:	-		201.	:	-	
Temperature	Celsius T	7.36	:	-		8.39	:	-		10.61	:	-	
Turbidity	NTU T	7.	:	-		-		-		11.6	:	-	
General Chemistry													
Ammonia	mg/L T	<0.1	:	-		<0.04	:	-		<0.04	:	-	
Bicarbonate (as CaCO3)	mg/L T	83.7	:	-		83.6	:	-		85.9	:	-	
Biochemical Oxygen Demand	mg/L T	<1.3	J	-		<1.4	:	-		<1.5	J	-	
Carbonate (as CaCO3)	mg/L T	<1.	:	-		<1.	:	-		<1.	:	-	
Chemical Oxygen Demand	mg/L T	<20.	:	-		<20.	:	-		<20.	:	-	
Chloride	mg/L T	<1.2	:	-		<1.3	:	-		<1.5	:	-	
Fluoride	mg/L T	<0.1	:	-		<0.1	:	-		<0.1	:	-	
Hydroxide (as CaCO3)	mg/L T	<1.	:	-		<1.	:	-		<1.	:	-	
Nitrate	mg/L T	<0.24	J	-		<0.2	J	-		<0.2	J	-	
Nitrite	mg/L T	<0.005	J	-		<0.005	:	-		<0.005	J	-	
Phosphate, Ortho As P	mg/L T	<0.01	J	-		<0.01	:	-		<0.01	:	-	
Phosphorus	mg/L T	<0.01	:	-		<0.01	:	-		<0.01	:	-	
Sulfate	mg/L T	25.8	:	-		<18.5	:	-		<18.5	:	-	
Total Alkalinity	mg/L T	83.7	:	-		83.6	:	-		85.9	:	-	
Total Dissolved Solids	mg/L T	118.	:	-		152.	:	-		114.	:	-	
Total Kjeldahl Nitrogen	mg/L T	<0.24	:	-		<0.24	:	-		<0.24	:	-	
Total Organic Carbon	mg/L T	1.3	:	-		1.3	:	-		1.6	:	-	
Total Suspended Solids	mg/L T	0.84	:	-		<0.5	:	-		0.8	:	-	
Laboratory Parameters													
pH	SU T	7.6	J	-		8.27	:	-		7.5	J	-	
Specific Conductance	umhos/cm T	172.	J	-		179.	J	-		185.	J	-	
Inorganics													
Cyanide	mg/L T	<0.01	:	-		<0.01	:	-		<0.01	:	-	
Physical Properties													
Hardness	mg/L T	104.	:	-		111.	:	-		98.8	:	-	

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	Zwergle 10/6/2003 ZWERGLE-T00N-SF W RURR-Z		Zwergle 10/6/2003 ZWERGLE-D00N-SF W RURR-Z		ZWERGLE 10/7/2003 ZWERGLE-T01N-SF W RURR-Z		ZWERGLE 10/7/2003 ZWERGLE-D01N-SF W RURR-Z		Zwergle 10/8/2003 ZWERGLE-T02N-SF W RURR-Z		Zwergle 10/8/2003 ZWERGLE-D02N-SF W RURR-Z	
Hardness	mg/L	D	-		95.9	:	-		106.	:	-		107.	:
Metals														
Aluminum	mg/L	T	<0.0221	J	-		<0.0954	:	-		<0.0307	:	-	
Aluminum	mg/L	D	-		<0.0221	J	-		<0.0307	:	-		<0.0307	:
Antimony	mg/L	T	<0.0005	:	-		<0.0005	:	-		<0.0005	:	-	
Antimony	mg/L	D	-		<0.0005	:	-		<0.0005	:	-		<0.00059	:
Arsenic	mg/L	T	<0.0002	:	-		<0.0002	:	-		<0.0002	:	-	
Arsenic	mg/L	D	-		<0.0002	:	-		<0.0002	:	-		<0.0002	:
Barium	mg/L	T	0.0318	:	-		0.0354	:	-		0.0303	:	-	
Barium	mg/L	D	-		0.0291	:	-		0.0331	:	-		0.0324	:
Beryllium	mg/L	T	<0.0004	:	-		<0.0003	J	-		<0.0003	:	-	
Beryllium	mg/L	D	-		<0.0004	:	-		<0.0003	J	-		<0.0003	:
Boron	mg/L	T	<0.0063	:	-		<0.0064	:	-		<0.0064	:	-	
Boron	mg/L	D	-		<0.0063	:	-		<0.0064	:	-		<0.0064	:
Cadmium	mg/L	T	<0.0002	:	-		<0.0002	:	-		<0.0002	:	-	
Cadmium	mg/L	D	-		<0.0002	:	-		<0.0002	:	-		<0.0002	:
Calcium	mg/L	T	33.9	:	-		36.2	:	-		32.2	:	-	
Calcium	mg/L	D	-		31.4	:	-		34.5	:	-		34.8	:
Chromium	mg/L	T	<0.0011	:	-		0.0024	:	-		<0.0013	:	-	
Chromium	mg/L	D	-		<0.0011	:	-		0.0014	:	-		0.0013	:
Cobalt	mg/L	T	<0.0029	:	-		<0.0031	:	-		<0.0031	:	-	
Cobalt	mg/L	D	-		<0.0029	:	-		<0.0031	:	-		<0.0031	:
Copper	mg/L	T	<0.0017	:	-		<0.0017	:	-		<0.0017	:	-	
Copper	mg/L	D	-		<0.0017	:	-		<0.0017	:	-		<0.0017	:
Iron	mg/L	T	0.051	:	-		<0.081	:	-		<0.03	:	-	
Iron	mg/L	D	-		<0.0278	:	-		<0.03	:	-		<0.03	:
Lead	mg/L	T	<0.0002	:	-		<0.0002	:	-		<0.0002	:	-	
Lead	mg/L	D	-		<0.0002	:	-		<0.0002	:	-		<0.0002	:
Magnesium	mg/L	T	4.62	:	-		5.03	:	-		4.45	:	-	
Magnesium	mg/L	D	-		4.28	:	-		4.79	:	-		4.8	:
Manganese	mg/L	T	0.0024	:	-		0.0044	:	-		0.0027	:	-	
Manganese	mg/L	D	-		0.0012	:	-		0.0046	:	-		0.0012	:
Mercury	mg/L	T	<0.0001	:	-		<0.0001	:	-		<0.0001	:	-	
Mercury	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction											
		Zwergle 10/6/2003 ZWERGLE-T00N-SFW RURR-Z		Zwergle 10/6/2003 ZWERGLE-D00N-SFW RURR-Z		ZWERGLE 10/7/2003 ZWERGLE-T01N-SFW RURR-Z		ZWERGLE 10/7/2003 ZWERGLE-D01N-SFW RURR-Z		Zwergle 10/8/2003 ZWERGLE-T02N-SFW RURR-Z		Zwergle 10/8/2003 ZWERGLE-D02N-SFW RURR-Z	
Molybdenum	mg/L	T	<0.001 :	-		0.00097 :		-		0.001 :		-	
Molybdenum	mg/L	D	-	<0.00098 :		-		0.00093 :		-		0.00097 :	
Nickel	mg/L	T	<0.0016 :	-		<0.0016 :		-		<0.0016 :		-	
Nickel	mg/L	D	-	<0.0016 :		-		<0.0016 :		-		<0.0016 :	
Potassium	mg/L	T	0.94 :	-		1.5 :		-		0.995 :		-	
Potassium	mg/L	D	-	0.813 :		-		1.2 :		-		1.29 :	
Selenium	mg/L	T	<0.0003 J	-		<0.0003 J		-		<0.0003 J		-	
Selenium	mg/L	D	-	<0.0003 J		-		<0.0003 J		-		<0.0003 J	
Silver	mg/L	T	<0.0001 :	-		<0.0001 :		-		<0.0001 :		-	
Silver	mg/L	D	-	<0.0001 :		-		<0.0001 :		-		<0.0001 :	
Sodium	mg/L	T	2.75 :	-		2.87 :		-		2.42 :		-	
Sodium	mg/L	D	-	2.64 :		-		2.52 :		-		2.84 :	
Thallium	mg/L	T	<0.0001 :	-		<0.0001 :		-		<0.0001 :		-	
Thallium	mg/L	D	-	<0.0001 :		-		<0.0001 :		-		<0.0001 :	
Vanadium	mg/L	T	0.00033 :	-		0.00033 :		-		0.00037 :		-	
Vanadium	mg/L	D	-	0.00024 :		-		0.00022 :		-		0.00024 :	
Zinc	mg/L	T	<0.0023 :	-		<0.0104 J		-		<0.002 :		-	
Zinc	mg/L	D	-	<0.0023 :		-		<0.0064 :		-		<0.002 :	

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	Zwergle 10/9/2003 Zwergle-T03N-SFW RURR-Z		Zwergle 10/9/2003 ZWERGLE-D03N-SFW RURR-Z	Zwergle 10/10/2003 Zwergle-T04N-SFW RURR-Z		Zwergle 10/10/2003 ZWERGLE-D04N-SFW RURR-Z	ZWERGLE 3/23/2004 ZWERGLE-T01N-SFW RURR-Z		ZWERGLE 3/23/2004 ZWERGLE-D01N-SFW RURR-Z
Field Measurements											
Ammonia	mg/L	T	<0.1	:	-	<0.1	:	-	<0.044	:	-
DO	mg/l	T	9.89	:	-	10.28	:	-	9.5	:	-
EH	millivolts	T	243.1	:	-	265.6	:	-	381.7	:	-
pH	SU	T	7.8	J	-	7.9	J	-	8.2	:	-
Specific Conductance	uS/cm	T	208.	:	-	214.	:	-	129.	:	-
Temperature	Celsius	T	6.37	:	-	4.49	:	-	1.	:	-
Turbidity	NTU	T	1.7	:	-	0.8	:	-	-		-
General Chemistry											
Ammonia	mg/L	T	<0.1	:	-	<0.1	:	-	<0.044	:	-
Bicarbonate (as CaCO3)	mg/L	T	86.2	:	-	87.5	:	-	87.5	:	-
Biochemical Oxygen Demand	mg/L	T	<1.5	:	-	<1.5	:	-	<1.4	J	-
Carbonate (as CaCO3)	mg/L	T	<1.	:	-	<1.	:	-	<1.	:	-
Chemical Oxygen Demand	mg/L	T	<20.	:	-	<20.	:	-	<20.	:	-
Chloride	mg/L	T	<1.4	:	-	<1.3	:	-	2.4	J	-
Fluoride	mg/L	T	<0.1	:	-	<0.1	:	-	<0.1	:	-
Hydroxide (as CaCO3)	mg/L	T	<1.	:	-	<1.	:	-	<1.	:	-
Nitrate	mg/L	T	<0.2	:	-	<0.24	:	-	0.48	J	-
Nitrite	mg/L	T	<0.005	:	-	<0.005	:	-	<0.005	J	-
Phosphate, Ortho As P	mg/L	T	<0.01	:	-	<0.01	:	-	<0.01	J	-
Phosphorus	mg/L	T	<0.01	:	-	<0.01	:	-	0.016	:	-
Sulfate	mg/L	T	<18.1	:	-	27.4	:	-	15.3	:	-
Total Alkalinity	mg/L	T	86.2	:	-	87.5	:	-	87.5	:	-
Total Dissolved Solids	mg/L	T	124.	:	-	126.	:	-	162.	:	-
Total Kjeldahl Nitrogen	mg/L	T	<0.24	:	-	<0.24	:	-	<0.24	:	-
Total Organic Carbon	mg/L	T	2.3	:	-	2.3	:	-	<1.5	:	-
Total Suspended Solids	mg/L	T	<0.5	:	-	0.6	:	-	3.	:	-
Laboratory Parameters											
pH	SU	T	7.8	J	-	7.9	J	-	8.2	:	-
Specific Conductance	umhos/cm	T	182.	J	-	183.	J	-	151.	J	-
Inorganics											
Cyanide	mg/L	T	<0.01	:	-	<0.01	:	-	<0.01	:	-
Physical Properties											
Hardness	mg/L	T	99.9	:	-	103.	:	-	98.7	:	-

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	Zwergle 10/9/2003 ZWERGLE-T03N-SF W RURR-Z		Zwergle 10/9/2003 ZWERGLE-D03N-SF W RURR-Z		Zwergle 10/10/2003 ZWERGLE-T04N-SF W RURR-Z		Zwergle 10/10/2003 ZWERGLE-D04N-SF W RURR-Z		ZWERGLE 3/23/2004 ZWERGLE-T01N-SF W RURR-Z		ZWERGLE 3/23/2004 ZWERGLE-D01N-SF W RURR-Z	
Hardness	mg/L	D	-		94.7	:	-		101.	:	-		99.7	:
Metals														
Aluminum	mg/L	T	<0.0221	:	-		<0.0221	J	-		0.0805	:	-	
Aluminum	mg/L	D	-		<0.0221	:	-		<0.0221	J	-		<0.0621	:
Antimony	mg/L	T	<0.0005	:	-		<0.00084	:	-		<0.0004	J	-	
Antimony	mg/L	D	-		<0.0005	:	-		<0.0005	:	-		<0.0004	J
Arsenic	mg/L	T	<0.0002	:	-		<0.0002	:	-		<0.0002	:	-	
Arsenic	mg/L	D	-		<0.0002	:	-		0.00026	:	-		<0.0002	:
Barium	mg/L	T	0.0306	:	-		0.0322	:	-		0.0396	:	-	
Barium	mg/L	D	-		0.029	:	-		0.0313	:	-		0.0387	:
Beryllium	mg/L	T	<0.0004	:	-		<0.0004	:	-		<0.001	:	-	
Beryllium	mg/L	D	-		<0.0004	:	-		<0.0004	:	-		<0.001	:
Boron	mg/L	T	<0.0063	:	-		<0.0063	:	-		<0.0117	:	-	
Boron	mg/L	D	-		<0.0063	:	-		<0.0063	:	-		<0.0117	:
Cadmium	mg/L	T	<0.0002	:	-		<0.0002	:	-		<0.0002	:	-	
Cadmium	mg/L	D	-		<0.0002	:	-		<0.0002	:	-		<0.0002	:
Calcium	mg/L	T	32.6	:	-		33.5	:	-		31.3	:	-	
Calcium	mg/L	D	-		30.9	:	-		32.8	:	-		31.7	:
Chromium	mg/L	T	<0.0011	:	-		<0.0011	:	-		<0.00075	:	-	
Chromium	mg/L	D	-		<0.0011	:	-		<0.0011	:	-		<0.00069	:
Cobalt	mg/L	T	<0.0029	:	-		<0.0029	:	-		<0.0037	:	-	
Cobalt	mg/L	D	-		<0.0029	:	-		<0.0029	:	-		<0.0037	:
Copper	mg/L	T	<0.0017	:	-		<0.0017	:	-		0.0016	:	-	
Copper	mg/L	D	-		<0.0017	:	-		0.0017	:	-		0.0013	:
Iron	mg/L	T	<0.0278	:	-		<0.0278	:	-		0.0727	:	-	
Iron	mg/L	D	-		<0.0278	:	-		<0.0278	:	-		<0.0423	:
Lead	mg/L	T	<0.0002	:	-		0.0022	:	-		<0.0004	:	-	
Lead	mg/L	D	-		<0.0002	:	-		<0.0002	:	-		<0.0004	:
Magnesium	mg/L	T	4.48	:	-		4.63	:	-		4.96	:	-	
Magnesium	mg/L	D	-		4.25	:	-		4.53	:	-		5.	:
Manganese	mg/L	T	0.0025	:	-		0.0026	:	-		0.0077	:	-	
Manganese	mg/L	D	-		0.0029	:	-		0.005	:	-		0.0083	J
Mercury	mg/L	T	<0.0001	J	-		<0.0001	J	-		<0.0001	J	-	
Mercury	mg/L	D	-		<0.0001	J	-		<0.0001	J	-		<0.0001	J

J = Qualified as estimated during data validation

R = Qualified as rejected value from data validation and results are considered unusable for any purpose

T = Total Fraction D= Dissolved Fraction

Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	Zwergle 10/9/2003 ZWERGLE-T03N-SF W RURR-Z		Zwergle 10/9/2003 ZWERGLE-D03N-SF W RURR-Z		Zwergle 10/10/2003 ZWERGLE-T04N-SF W RURR-Z		Zwergle 10/10/2003 ZWERGLE-D04N-SF W RURR-Z		ZWERGLE 3/23/2004 ZWERGLE-T01N-SF W RURR-Z		ZWERGLE 3/23/2004 ZWERGLE-D01N-SF W RURR-Z	
Molybdenum	mg/L	T	<0.00091	:	-		0.00093	:	-		<0.003	:	-	
Molybdenum	mg/L	D	-		<0.00095	:	-		0.0008	:	-		<0.003	:
Nickel	mg/L	T	<0.0016	:	-		<0.0016	:	-		<0.0009	:	-	
Nickel	mg/L	D	-		<0.0016	:	-		<0.0016	:	-		0.0011	:
Potassium	mg/L	T	0.742	:	-		0.623	:	-		<1.1	:	-	
Potassium	mg/L	D	-		0.468	:	-		0.626	:	-		<1.1	:
Selenium	mg/L	T	<0.0003	J	-		<0.0003	J	-		<0.0007	:	-	
Selenium	mg/L	D	-		<0.0003	J	-		<0.00079	J	-		<0.0007	:
Silver	mg/L	T	<0.0001	:	-		<0.0001	:	-		<0.0001	:	-	
Silver	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Sodium	mg/L	T	<3.03	:	-		<3.18	:	-		3.17	:	-	
Sodium	mg/L	D	-		<2.6	:	-		<3.06	:	-		3.17	:
Thallium	mg/L	T	<0.0001	:	-		<0.0001	:	-		<0.00011	:	-	
Thallium	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.00011	:
Vanadium	mg/L	T	0.00032	:	-		0.00026	:	-		<0.00056	:	-	
Vanadium	mg/L	D	-		0.00016	:	-		0.00023	:	-		<0.00046	:
Zinc	mg/L	T	<0.0023	:	-		<0.0053	:	-		<0.0091	:	-	
Zinc	mg/L	D	-		<0.0027	:	-		<0.0079	:	-		<0.0091	:

J = Qualified as estimated during data validation
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T = Total Fraction D= Dissolved Fraction

Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	Zwergle 3/24/2004 ZWERGLE-T02N-SF W RURR-Z		Zwergle 3/24/2004 ZWERGLE-D02N-SF W RURR-Z		Zwergle 3/25/2004 ZWERGLE-T03N-SF W RURR-Z		Zwergle 3/25/2004 ZWERGLE-D03N-SF W RURR-Z		Zwergle 9/27/2004 ZWERGLE-T00N-SF W RURR-Z		Zwergle 9/27/2004 ZWERGLE-D00N-SF W RURR-Z	
Field Measurements														
Ammonia	mg/L	T	<0.058	:	-		0.047	:	-		-		-	
DO	mg/l	T	11.9	:	-		10.	:	-		10.49	:	-	
EH	millivolts	T	145.	:	-		211.	:	-		220.1	:	-	
pH	SU	T	7.6	J	-		7.95	:	-		7.35	:	-	
Specific Conductance	uS/cm	T	138.	:	-		142.	:	-		210.	:	-	
Temperature	Celsius	T	2.	:	-		1.7	:	-		3.42	:	-	
Turbidity	NTU	T	4.1	:	-		8.7	:	-		0.	:	-	
General Chemistry														
Ammonia	mg/L	T	<0.058	:	-		0.047	:	-		-		-	
Bicarbonate (as CaCO3)	mg/L	T	90.8	:	-		87.	:	-		86.4	:	-	
Biochemical Oxygen Demand	mg/L	T	<1.4	:	-		<1.4	J	-		-		-	
Carbonate (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Chemical Oxygen Demand	mg/L	T	<20.	:	-		<20.	:	-		-		-	
Chloride	mg/L	T	11.9	:	-		2.1	:	-		1.5	J	-	
Dissolved Organic Carbon	mg/L	D	-		-		-		-		-		<1.	:
Fluoride	mg/L	T	<0.1	:	-		<0.1	:	-		<0.1	:	-	
Hydroxide (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Nitrate	mg/L	T	0.47	J	-		<0.2	J	-		-		-	
Nitrate+Nitrite as N	mg/L	T	-		-		-		-		0.18	:	-	
Nitrite	mg/L	T	<0.005	J	-		<0.005	J	-		<0.005	:	-	
Phosphate, Ortho As P	mg/L	T	<0.01	J	-		0.021	J	-		<0.01	:	-	
Phosphorus	mg/L	T	0.013	:	-		0.016	:	-		<0.01	:	-	
Sulfate	mg/L	T	14.6	:	-		15.4	:	-		26.7	:	-	
Total Alkalinity	mg/L	T	90.8	:	-		87.	:	-		86.4	:	-	
Total Dissolved Solids	mg/L	T	150.	:	-		122.	:	-		108.	J	-	
Total Kjeldahl Nitrogen	mg/L	T	<0.24	:	-		<0.24	:	-		-		-	
Total Organic Carbon	mg/L	T	<2.4	:	-		<2.6	:	-		<1.	:	-	
Total Suspended Solids	mg/L	T	4.3	:	-		3.9	:	-		0.6	J	-	
Laboratory Parameters														
pH	SU	T	7.6	J	-		7.95	:	-		7.35	:	-	
Specific Conductance	umhos/cm	T	155.	J	-		165.	J	-		-		-	
Inorganics														
Cyanide	mg/L	T	<0.01	:	-		<0.01	:	-		<0.01	:	-	

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	Zwergle 3/24/2004 ZWERGLE-T02N-SF W RURR-Z	Zwergle 3/24/2004 ZWERGLE-D02N-SF W RURR-Z	Zwergle 3/25/2004 ZWERGLE-T03N-SF W RURR-Z	Zwergle 3/25/2004 ZWERGLE-D03N-SF W RURR-Z	Zwergle 9/27/2004 ZWERGLE-T00N-SF W RURR-Z	Zwergle 9/27/2004 ZWERGLE-D00N-SF W RURR-Z
Physical Properties								
Hardness	mg/L	T	98.2 :	-	106. :	-	-	-
Hardness	mg/L	D	-	95.9 :	-	107. :	-	105. :
Metals								
Aluminum	mg/L	T	0.0551 :	-	<0.0585 J	-	<0.0341 :	-
Aluminum	mg/L	D	-	<0.0176 :	-	<0.0176 J	-	<0.0341 :
Antimony	mg/L	T	<0.0004 J	-	<0.0004 J	-	-	-
Antimony	mg/L	D	-	<0.0004 J	-	<0.0004 J	-	<0.00049 :
Arsenic	mg/L	T	<0.0002 :	-	<0.0002 :	-	-	-
Arsenic	mg/L	D	-	<0.0002 :	-	<0.0002 :	-	<0.0001 J
Barium	mg/L	T	0.0396 :	-	0.038 :	-	-	-
Barium	mg/L	D	-	0.0381 :	-	0.0367 :	-	0.0303 :
Beryllium	mg/L	T	<0.0002 J	-	<0.00033 :	-	-	-
Beryllium	mg/L	D	-	<0.0002 J	-	<0.0003 :	-	<0.0003 :
Boron	mg/L	T	<0.0029 :	-	0.004 :	-	-	-
Boron	mg/L	D	-	<0.0025 :	-	0.0031 :	-	<0.0069 :
Cadmium	mg/L	T	<0.0002 :	-	<0.0002 :	-	-	-
Cadmium	mg/L	D	-	<0.0002 :	-	<0.0002 :	-	<0.0001 J
Calcium	mg/L	T	31.1 :	-	34. :	-	-	-
Calcium	mg/L	D	-	30.3 :	-	34.2 :	-	34.7 :
Chromium	mg/L	T	<0.0008 J	-	0.00064 J	-	-	-
Chromium	mg/L	D	-	<0.0008 J	-	0.00089 J	-	0.0027 :
Cobalt	mg/L	T	<0.0011 J	-	<0.0011 J	-	-	-
Cobalt	mg/L	D	-	0.0029 J	-	0.0051 J	-	<0.0031 :
Copper	mg/L	T	0.0013 :	-	<0.0008 :	-	-	-
Copper	mg/L	D	-	0.00095 :	-	<0.0008 :	-	<0.0003 J
Iron	mg/L	T	0.0351 J	-	<0.082 J	-	<0.0355 :	-
Iron	mg/L	D	-	<0.0192 J	-	<0.0192 J	-	<0.0355 :
Lead	mg/L	T	<0.0004 :	-	<0.0004 :	-	-	-
Lead	mg/L	D	-	<0.0004 :	-	<0.0004 :	-	<0.0001 :
Magnesium	mg/L	T	5. :	-	5.18 :	-	-	-
Magnesium	mg/L	D	-	4.92 :	-	5.21 :	-	4.54 :
Manganese	mg/L	T	0.0075 :	-	0.0108 :	-	-	-
Manganese	mg/L	D	-	0.0081 :	-	0.0088 :	-	0.0055 :

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	Zwergle 3/24/2004 ZWERGLE-T02N-SF W RURR-Z	Zwergle 3/24/2004 ZWERGLE-D02N-SF W RURR-Z	Zwergle 3/25/2004 ZWERGLE-T03N-SF W RURR-Z	Zwergle 3/25/2004 ZWERGLE-D03N-SF W RURR-Z	Zwergle 9/27/2004 ZWERGLE-T00N-SF W RURR-Z	Zwergle 9/27/2004 ZWERGLE-D00N-SF W RURR-Z
Mercury	mg/L	T	<0.0001 J	-	<0.0001 :	-	-	-
Mercury	mg/L	D	-	<0.0001 J	-	<0.0001 :	-	<0.0001 J
Molybdenum	mg/L	T	<0.002 :	-	<0.0015 :	-	-	-
Molybdenum	mg/L	D	-	<0.0021 :	-	<0.0013 :	-	0.00081 :
Nickel	mg/L	T	0.0011 :	-	<0.0009 :	-	-	-
Nickel	mg/L	D	-	0.0015 :	-	<0.0009 :	-	<0.0003 J
Potassium	mg/L	T	0.422 J	-	0.95 :	-	-	-
Potassium	mg/L	D	-	0.228 J	-	0.901 :	-	0.602 :
Selenium	mg/L	T	<0.0007 :	-	<0.0007 :	-	-	-
Selenium	mg/L	D	-	<0.0007 :	-	<0.0007 :	-	<0.0003 J
Silver	mg/L	T	<0.0001 :	-	<0.0001 J	-	-	-
Silver	mg/L	D	-	<0.0001 :	-	<0.0001 J	-	<0.0001 J
Sodium	mg/L	T	<3.77 :	-	3.18 J	-	-	-
Sodium	mg/L	D	-	<3.7 :	-	3.25 :	-	2.56 :
Thallium	mg/L	T	<0.0001 :	-	<0.0001 :	-	-	-
Thallium	mg/L	D	-	<0.0001 :	-	<0.0001 :	-	<0.0001 :
Vanadium	mg/L	T	<0.00051 :	-	0.00034 :	-	-	-
Vanadium	mg/L	D	-	<0.00045 :	-	0.00026 :	-	<0.0001 J
Zinc	mg/L	T	<0.0015 :	-	<0.0022 :	-	-	-
Zinc	mg/L	D	-	<0.0015 :	-	<0.002 :	-	<0.003 :

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	Zwergle 9/28/2004 Zwergle-T01N-SFW RURR-Z		ZWERGLE 9/28/2004 ZWERGLE-D01N-SFW RURR-Z		Zwergle 9/29/2004 Zwergle-T02N-SFW RURR-Z		Zwergle 9/29/2004 ZWERGLE-D02N-SFW RURR-Z		Zwergle 9/30/2004 Zwergle-T03N-SFW RURR-Z		Zwergle 9/30/2004 ZWERGLE-D03N-SFW RURR-Z	
Field Measurements														
DO	mg/l	T	10.28	:	-		9.98	:	-		10.24	:	-	
EH	millivolts	T	244.9	:	-		162.8	:	-		207.8	:	-	
pH	SU	T	7.77	:	-		7.95	:	-		7.74	:	-	
Specific Conductance	uS/cm	T	198.	:	-		196.	:	-		200.	:	-	
Temperature	Celsius	T	5.15	:	-		4.17	:	-		3.8	:	-	
Turbidity	NTU	T	0.	:	-		1.5	:	-		0.5	:	-	
General Chemistry														
Bicarbonate (as CaCO3)	mg/L	T	86.8	:	-		84.7	:	-		86.7	:	-	
Carbonate (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Chloride	mg/L	T	1.4	J	-		1.5	J	-		1.2	J	-	
Dissolved Organic Carbon	mg/L	D	-		<1.6	:	-		<1.7	:	-		<1.6	:
Fluoride	mg/L	T	<0.1	:	-		<0.1	:	-		<0.1	:	-	
Hydroxide (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Nitrate+Nitrite as N	mg/L	T	0.18	:	-		0.18	:	-		0.21	:	-	
Nitrite	mg/L	T	<0.005	:	-		<0.005	:	-		<0.005	J	-	
Phosphate, Ortho As P	mg/L	T	<0.01	:	-		<0.01	J	-		<0.01	J	-	
Phosphorus	mg/L	T	<0.01	:	-		<0.01	:	-		<0.01	:	-	
Sulfate	mg/L	T	25.6	:	-		25.9	:	-		24.4	:	-	
Total Alkalinity	mg/L	T	86.8	:	-		84.7	:	-		86.7	:	-	
Total Dissolved Solids	mg/L	T	100.	J	-		106.	:	-		194.	:	-	
Total Organic Carbon	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Total Suspended Solids	mg/L	T	1.	:	-		2.4	:	-		2.5	:	-	
Laboratory Parameters														
pH	SU	T	7.77	:	-		7.95	:	-		7.74	:	-	
Inorganics														
Cyanide	mg/L	T	<0.01	:	-		<0.01	:	-		<0.01	:	-	
Physical Properties														
Hardness	mg/L	D	-		116.	:	-		106.	:	-		102.	:
Metals														
Aluminum	mg/L	T	<0.0341	:	-		<0.0354	:	-		0.0397	:	-	
Aluminum	mg/L	D	-		<0.0341	:	-		<0.0341	:	-		<0.0341	:
Antimony	mg/L	D	-		<0.002	:	-		<0.00072	:	-		<0.00087	:

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction											
		Site ID	ZWERGLE		ZWERGLE		Zwergle		Zwergle		Zwergle		Zwergle	
		Sample Date	9/28/2004		9/28/2004		9/29/2004		9/29/2004		9/30/2004		9/30/2004	
		Sample ID	ZWERGLE-T01N-SF		ZWERGLE-D01N-SF		ZWERGLE-T02N-SF		ZWERGLE-D02N-SF		ZWERGLE-T03N-SF		ZWERGLE-D03N-SF	
		Exposure Area	W		W		W		W		W		W	
		Fraction	RURR-Z		RURR-Z		RURR-Z		RURR-Z		RURR-Z		RURR-Z	
Arsenic	mg/L	D	-		0.00012	:	-		<0.0001	:	-		<0.0001	:
Barium	mg/L	D	-		0.0334	:	-		0.0327	:	-		0.029	:
Beryllium	mg/L	D	-		<0.0003	:	-		<0.0003	:	-		<0.0003	:
Boron	mg/L	D	-		<0.0069	:	-		<0.0069	:	-		<0.0069	:
Cadmium	mg/L	D	-		<0.0001	J	-		<0.0001	:	-		<0.0001	J
Calcium	mg/L	D	-		38.3	:	-		34.9	:	-		33.4	:
Chromium	mg/L	D	-		<0.0011	J	-		<0.0011	J	-		<0.0011	J
Cobalt	mg/L	D	-		0.0043	:	-		0.0032	:	-		0.0046	:
Copper	mg/L	D	-		0.00056	:	-		<0.0003	J	-		0.00083	J
Iron	mg/L	T	<0.0355	:	-		0.0508	:	-		<0.0355	:	-	
Iron	mg/L	D	-		<0.0355	J	-		<0.0355	:	-		<0.0355	J
Lead	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Magnesium	mg/L	D	-		4.98	:	-		4.62	:	-		4.4	:
Manganese	mg/L	D	-		0.0087	:	-		0.0082	:	-		0.0101	:
Mercury	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	J
Molybdenum	mg/L	D	-		<0.0016	:	-		0.00053	:	-		0.00084	:
Nickel	mg/L	D	-		0.00032	J	-		<0.0003	J	-		<0.0003	J
Potassium	mg/L	D	-		<1.24	:	-		0.836	:	-		0.617	:
Selenium	mg/L	D	-		<0.0003	J	-		<0.0003	J	-		<0.0003	J
Silver	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	J
Sodium	mg/L	D	-		2.58	:	-		2.12	J	-		2.37	:
Thallium	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Vanadium	mg/L	D	-		0.00022	:	-		0.00021	:	-		<0.0001	:
Zinc	mg/L	D	-		0.0022	:	-		0.0053	:	-		0.0032	:

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Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID									
			Zwergle 10/1/2004 Zwergle-T04N-SFW		Zwergle 10/1/2004 ZWERGLE-D04N-SFW		----	----	----	----
			RURR-Z		RURR-Z					
Field Measurements										
DO	mg/l	T	10.09	:	-		-	-	-	-
EH	millivolts	T	220.	:	-		-	-	-	-
pH	SU	T	8.05	:	-		-	-	-	-
Specific Conductance	uS/cm	T	197.	:	-		-	-	-	-
Temperature	Celsius	T	3.02	:	-		-	-	-	-
Turbidity	NTU	T	0.1	:	-		-	-	-	-
General Chemistry										
Bicarbonate (as CaCO3)	mg/L	T	87.9	:	-		-	-	-	-
Carbonate (as CaCO3)	mg/L	T	<1.	:	-		-	-	-	-
Chloride	mg/L	T	1.3	J	-		-	-	-	-
Dissolved Organic Carbon	mg/L	D	-		<1.5	:	-	-	-	-
Fluoride	mg/L	T	<0.1	:	-		-	-	-	-
Hydroxide (as CaCO3)	mg/L	T	<1.	:	-		-	-	-	-
Nitrate+Nitrite as N	mg/L	T	0.19	:	-		-	-	-	-
Nitrite	mg/L	T	<0.005	J	-		-	-	-	-
Phosphate, Ortho As P	mg/L	T	<0.01	J	-		-	-	-	-
Phosphorus	mg/L	T	<0.01	:	-		-	-	-	-
Sulfate	mg/L	T	24.1	:	-		-	-	-	-
Total Alkalinity	mg/L	T	87.9	:	-		-	-	-	-
Total Dissolved Solids	mg/L	T	204.	:	-		-	-	-	-
Total Organic Carbon	mg/L	T	<1.	:	-		-	-	-	-
Total Suspended Solids	mg/L	T	1.7	:	-		-	-	-	-
Laboratory Parameters										
pH	SU	T	8.05	:	-		-	-	-	-
Inorganics										
Cyanide	mg/L	T	<0.01	:	-		-	-	-	-
Physical Properties										
Hardness	mg/L	D	-		115.	:	-	-	-	-
Metals										
Aluminum	mg/L	T	0.0408	:	-		-	-	-	-
Aluminum	mg/L	D	-		<0.0341	:	-	-	-	-
Antimony	mg/L	D	-		<0.00072	:	-	-	-	-

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5d
Groundwater/Surface Water Interaction - Surface Water
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction							
		Site ID	Zwergle	Zwergle	----	----	----	----	
		Sample Date	10/1/2004	10/1/2004					
		Sample ID	ZWERGLE-T04N-SFW	ZWERGLE-D04N-SFW					
		Exposure Area	RURR-Z	RURR-Z					
Arsenic	mg/L	D	-	<0.0001 :	-	-	-	-	
Barium	mg/L	D	-	0.0305 :	-	-	-	-	
Beryllium	mg/L	D	-	<0.0003 :	-	-	-	-	
Boron	mg/L	D	-	<0.0069 :	-	-	-	-	
Cadmium	mg/L	D	-	<0.0001 J	-	-	-	-	
Calcium	mg/L	D	-	37.7 :	-	-	-	-	
Chromium	mg/L	D	-	<0.0011 J	-	-	-	-	
Cobalt	mg/L	D	-	0.0046 :	-	-	-	-	
Copper	mg/L	D	-	<0.0003 J	-	-	-	-	
Iron	mg/L	T	<0.0355 :	-	-	-	-	-	
Iron	mg/L	D	-	<0.0355 J	-	-	-	-	
Lead	mg/L	D	-	<0.0001 :	-	-	-	-	
Magnesium	mg/L	D	-	4.97 :	-	-	-	-	
Manganese	mg/L	D	-	0.0091 :	-	-	-	-	
Mercury	mg/L	D	-	<0.0001 J	-	-	-	-	
Molybdenum	mg/L	D	-	0.00089 :	-	-	-	-	
Nickel	mg/L	D	-	<0.0003 J	-	-	-	-	
Potassium	mg/L	D	-	1.08 :	-	-	-	-	
Selenium	mg/L	D	-	<0.0003 J	-	-	-	-	
Silver	mg/L	D	-	<0.0001 J	-	-	-	-	
Sodium	mg/L	D	-	2.69 :	-	-	-	-	
Thallium	mg/L	D	-	<0.0001 :	-	-	-	-	
Vanadium	mg/L	D	-	<0.0001 :	-	-	-	-	
Zinc	mg/L	D	-	0.0023 :	-	-	-	-	

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5e
Focused Sampling - Seep/Spring Radon
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID					
			Lower Spring 13 10/14/2004 Lower Spring 13-T01N-SFW GW1	Lower Spring 39 10/14/2004 Lower Spring 39-T01N-SFW GW5	Spring 13 10/14/2004 Spring 13-T01N-SFW GW1	Spring 13-Pump 10/14/2004 Spring 13 Pump-T01N-SFW GW1	Spring 39-Pump 10/14/2004 Spring 39 Pump-T01N-SFW GW5	----
Field Measurements								
Radon-222	Pci/L	T	637. :	542. :	783. :	766. :	683. :	-

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction

Appendix A-5f
Focused Sampling - Sediment Riffle Transect
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID / Exposure Area	TR-10N 9/23/2004 TR-10N-T01N-SED SWR		TR-11N 9/23/2004 TR-11N-T01N-SED SWR		TR-12N 9/23/2004 TR-12N-T01N-SED SWR		TR-13N 9/24/2004 TR-13N-T01N-SED SWR		TR-14N 9/25/2004 TR-14N-T01N-SED SWR		TR-15N 9/24/2004 TR-15N-T01N-SED SWR	
General Chemistry															
Chloride	mg/kg-dry	T		0.69	:	0.58	:	<0.9	:	<0.81	:	<0.89	:	<0.94	:
Fluoride	mg/kg-dry	T		0.59	:	0.37	:	0.6	:	0.4	:	0.29	:	0.18	:
Sulfate	mg/kg-dry	T		21.5	:	32.4	:	29.3	:	19.5	J	20.1	:	21.4	:
Total Organic Carbon	mg/kg-dry	T		<1150.	:	<1110.	:	<1130.	:	<1240.	:	<1390.	:	<1290.	:
Laboratory Parameters															
pH	SU	T		7.4	J	7.3	J	7.1	J	6.7	J	7.	J	7.2	J
Solids, Percent	%	T		76.1	:	79.1	:	81.5	:	74.7	:	76.2	:	72.4	:
Specific Conductance	umhos/cm	T		80.3	J	82.2	J	73.1	J	63.7	J	78.5	J	56.6	J
Metals															
Aluminum	mg/kg-dry	T		4660.	:	4690.	:	4890.	:	4970.	:	4590.	:	5050.	:
Antimony	mg/kg-dry	T		<0.34	J	<0.38	J	<0.35	J	<1.4	J	<1.5	J	<1.3	J
Arsenic	mg/kg-dry	T		3.2	J	3.	J	5.2	J	4.	J	4.4	J	5.3	J
Barium	mg/kg-dry	T		112.	:	100.	:	163.	J	166.	:	95.3	:	132.	:
Beryllium	mg/kg-dry	T		0.67	:	0.65	:	0.77	:	0.46	:	0.33	:	0.38	:
Boron	mg/kg-dry	T		<0.9	:	<0.82	:	<0.76	:	<3.4	:	<4.4	:	<4.6	:
Cadmium	mg/kg-dry	T		<0.85	:	0.78	:	0.92	:	0.76	:	0.84	:	0.94	:
Calcium	mg/kg-dry	T		1420.	:	1450.	:	1450.	:	1590.	:	1580.	:	1760.	:
Chromium	mg/kg-dry	T		9.1	:	8.8	:	10.6	:	9.7	:	10.9	:	12.9	:
Cobalt	mg/kg-dry	T		6.9	:	6.2	:	6.8	:	5.6	:	5.4	:	6.3	:
Copper	mg/kg-dry	T		30.5	:	38.5	:	39.7	:	25.5	J	19.9	:	25.8	:
Iron	mg/kg-dry	T		14700.	:	14300.	:	18400.	:	15000.	:	19700.	:	20700.	:
Lead	mg/kg-dry	T		25.7	:	74.8	:	32.5	:	25.6	J	18.5	:	30.6	:
Magnesium	mg/kg-dry	T		2540.	:	2770.	:	2570.	:	3250.	:	3340.	:	3630.	:
Manganese	mg/kg-dry	T		348.	:	337.	:	313.	:	290.	:	241.	:	312.	:
Mercury	mg/kg-dry	T		<0.019	:	<0.017	:	<0.02	:	<0.02	:	<0.021	:	<0.019	:
Molybdenum	mg/kg-dry	T		3.6	:	4.3	:	9.6	J	3.3	:	2.7	:	2.7	:
Nickel	mg/kg-dry	T		28.2	:	20.1	:	23.7	:	21.1	:	18.6	:	21.5	:
Potassium	mg/kg-dry	T		1220.	:	1020.	:	1320.	:	1260.	:	1640.	:	1460.	:
Selenium	mg/kg-dry	T		0.45	:	0.49	:	0.58	:	0.67	:	0.97	:	<0.36	:
Silver	mg/kg-dry	T		<0.2	:	<0.18	:	<0.16	:	<0.19	:	<0.18	:	<0.19	:
Sodium	mg/kg-dry	T		<117.	:	<116.	:	<140.	:	82.5	:	183.	:	159.	:
Thallium	mg/kg-dry	T		0.13	:	0.13	:	0.13	:	0.12	:	<0.12	:	0.12	:
Vanadium	mg/kg-dry	T		8.4	:	9.	:	11.7	:	10.4	:	8.9	:	10.1	:

J = Qualified as estimated during data validation

R = Qualified as rejected value from data validation and results are considered unusable for any purpose

T = Total Fraction

Appendix A-5f
Focused Sampling - Sediment Riffle Transect
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	TR-10N 9/23/2004 TR-10N-T01N-SED SWR	TR-11N 9/23/2004 TR-11N-T01N-SED SWR	TR-12N 9/23/2004 TR-12N-T01N-SED SWR	TR-13N 9/24/2004 TR-13N-T01N-SED SWR	TR-14N 9/25/2004 TR-14N-T01N-SED SWR	TR-15N 9/24/2004 TR-15N-T01N-SED SWR
Zinc	mg/kg-dry	T	183. J	154. J	164. J	114. J	83.2 J	102. J

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction

Appendix A-5f
Focused Sampling - Sediment Riffle Transect
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID / Exposure Area	TR-16N 9/24/2004 TR-16N-T01N-SED SWR		TR-17N 9/25/2004 TR-17N-T01N-SED SWR		TR-18N 9/25/2004 TR-18N-T01N-SED SWR		TR-19N 9/25/2004 TR-19N-T01N-SED SWR		TR-1N 9/23/2004 TR-1N-T01N-SED SWR		TR-20N 9/25/2004 TR-20N-T01N-SED SWR	
General Chemistry															
Chloride	mg/kg-dry	T		<0.88	:	<0.86	:	<0.95	:	<1.	:	0.55	:	<1.	:
Fluoride	mg/kg-dry	T		0.25	:	0.26	:	0.36	:	0.3	:	0.76	:	0.29	:
Sulfate	mg/kg-dry	T		21.2	:	18.8	:	24.9	:	25.9	:	20.5	:	30.7	:
Total Organic Carbon	mg/kg-dry	T		<1430.	:	<870.	:	<1520.	:	<977.	:	<982.	:	<1070.	:
Laboratory Parameters															
pH	SU	T		7.2	J	7.1	J	7.3	J	7.3	J	7.	J	7.3	J
Solids, Percent	%	T		77.2	:	74.9	:	71.5	:	73.7	:	81.2	:	73.8	:
Specific Conductance	umhos/cm	T		77.6	J	79.9	J	73.1	J	85.1	J	74.9	J	87.3	J
Metals															
Aluminum	mg/kg-dry	T		4260.	:	4580.	:	6050.	:	6050.	:	4550.	:	5420.	:
Antimony	mg/kg-dry	T		<1.3	J	<1.4	J	<1.4	J	<1.4	J	<0.34	J	<1.5	J
Arsenic	mg/kg-dry	T		4.8	J	6.9	J	6.2	J	6.2	J	3.7	J	5.	J
Barium	mg/kg-dry	T		152.	:	134.	:	168.	:	203.	:	95.5	:	196.	:
Beryllium	mg/kg-dry	T		0.29	:	0.51	:	0.46	:	0.45	:	0.68	:	0.34	:
Boron	mg/kg-dry	T		<3.8	:	<4.6	:	<4.7	:	<4.4	:	<0.85	:	<3.8	:
Cadmium	mg/kg-dry	T		0.75	:	0.91	:	1.	:	0.92	:	0.74	:	0.79	:
Calcium	mg/kg-dry	T		1540.	:	1410.	:	1920.	:	1920.	:	1270.	:	1790.	:
Chromium	mg/kg-dry	T		10.3	:	10.7	:	14.3	:	15.1	:	8.7	:	13.2	:
Cobalt	mg/kg-dry	T		6.4	:	5.9	:	7.2	:	7.5	:	6.9	:	6.1	:
Copper	mg/kg-dry	T		21.	:	33.9	:	23.6	:	24.5	:	35.3	:	18.3	:
Iron	mg/kg-dry	T		16700.	:	20600.	:	21000.	:	20000.	:	14200.	:	16700.	:
Lead	mg/kg-dry	T		21.5	:	29.7	:	31.6	:	37.8	:	22.3	:	34.1	:
Magnesium	mg/kg-dry	T		3070.	:	3130.	:	4000.	:	4250.	:	2710.	:	4090.	:
Manganese	mg/kg-dry	T		277.	:	278.	:	364.	:	349.	:	293.	:	302.	:
Mercury	mg/kg-dry	T		<0.02	:	<0.022	:	<0.021	:	<0.018	:	<0.019	:	<0.019	:
Molybdenum	mg/kg-dry	T		4.2	:	7.7	:	3.9	:	2.9	:	8.9	:	2.9	:
Nickel	mg/kg-dry	T		18.9	:	21.2	:	24.9	:	25.8	:	23.	:	22.7	:
Potassium	mg/kg-dry	T		1220.	:	1400.	:	1710.	:	1710.	:	936.	:	1390.	:
Selenium	mg/kg-dry	T		0.37	:	<0.35	:	0.46	:	0.41	:	0.41	:	0.52	:
Silver	mg/kg-dry	T		<0.16	:	0.32	:	<0.16	:	0.19	:	<0.18	:	<0.16	:
Sodium	mg/kg-dry	T		115.	:	254.	:	155.	:	172.	:	<119.	:	157.	:
Thallium	mg/kg-dry	T		<0.12	:	<0.12	:	<0.13	:	0.13	:	0.13	:	<0.12	:
Vanadium	mg/kg-dry	T		9.7	:	9.8	:	12.3	:	14.1	:	8.5	:	11.	:

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction

Appendix A-5f
Focused Sampling - Sediment Riffle Transect
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	TR-16N 9/24/2004 TR-16N-T01N-SED SWR	TR-17N 9/25/2004 TR-17N-T01N-SED SWR	TR-18N 9/25/2004 TR-18N-T01N-SED SWR	TR-19N 9/25/2004 TR-19N-T01N-SED SWR	TR-1N 9/23/2004 TR-1N-T01N-SED SWR	TR-20N 9/25/2004 TR-20N-T01N-SED SWR
Zinc	mg/kg-dry	T	81.6 J	92. J	117. J	116. J	141. J	98.9 J

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction

Appendix A-5f
Focused Sampling - Sediment Riffle Transect
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID		TR-2N 9/23/2004 TR-2N-T01N-SED		TR-3N 9/23/2004 TR-3N-T01N-SED		TR-4N 9/24/2004 TR-4N-T01N-SED		TR-5N 9/24/2004 TR-5N-T01N-SED		TR-6N 9/24/2004 TR-6N-T01N-SED		TR-7N 9/24/2004 TR-7N-T01N-SED	
			Exposure Area		SWR		SWR		SWR		SWR		SWR		SWR	
General Chemistry																
Chloride	mg/kg-dry	T			0.93	:	0.95	:	<0.92	:	<1.1	:	<1.	:	<1.1	:
Fluoride	mg/kg-dry	T			0.16	:	0.66	:	0.69	:	0.96	:	0.15	:	0.33	:
Sulfate	mg/kg-dry	T			55.6	:	19.9	:	26.2	:	29.4	:	27.3	:	58.2	:
Total Organic Carbon	mg/kg-dry	T			<1180.	:	<1210.	:	<1930.	:	<1990.	:	<1250.	:	<1410.	:
Laboratory Parameters																
pH	SU	T			5.8	J	6.9	J	7.3	J	7.1	J	6.1	J	5.1	J
Solids, Percent	%	T			76.5	:	77.4	:	76.7	:	78.5	:	76.1	:	76.6	:
Specific Conductance	umhos/cm	T			104.	J	72.8	J	83.2	J	81.	J	74.9	J	110.	J
Metals																
Aluminum	mg/kg-dry	T			6630.	:	4640.	:	4260.	:	6080.	:	6770.	:	9070.	:
Antimony	mg/kg-dry	T			<0.39	J	<0.36	J	<1.1	J	<1.3	J	<1.3	J	<1.3	J
Arsenic	mg/kg-dry	T			3.2	J	6.3	J	3.7	J	3.9	J	5.8	J	4.6	J
Barium	mg/kg-dry	T			97.5	:	105.	:	73.6	:	106.	:	145.	:	223.	:
Beryllium	mg/kg-dry	T			0.77	:	0.57	J	0.45	:	0.68	:	0.69	:	0.85	:
Boron	mg/kg-dry	T			<0.9	:	<0.86	:	<2.6	:	<3.1	:	<4.5	:	<4.6	:
Cadmium	mg/kg-dry	T			<0.63	:	0.87	:	0.67	:	0.64	:	0.83	:	1.1	:
Calcium	mg/kg-dry	T			1130.	:	1390.	:	1130.	:	1310.	:	1260.	:	1170.	:
Chromium	mg/kg-dry	T			9.3	:	13.3	:	6.9	:	11.	:	11.3	:	13.2	:
Cobalt	mg/kg-dry	T			9.4	:	6.	J	5.3	:	5.	:	7.7	:	12.	:
Copper	mg/kg-dry	T			55.3	:	42.6	:	27.5	:	38.2	:	47.2	:	128.	:
Iron	mg/kg-dry	T			14700.	:	19900.	:	11100.	:	13000.	:	20100.	:	20700.	:
Lead	mg/kg-dry	T			28.9	:	25.2	:	52.9	:	26.2	:	37.8	:	248.	:
Magnesium	mg/kg-dry	T			2670.	:	2770.	:	2480.	:	2990.	:	3050.	:	3160.	:
Manganese	mg/kg-dry	T			512.	:	325.	:	301.	:	242.	:	501.	:	1080.	:
Mercury	mg/kg-dry	T			<0.019	:	<0.02	:	<0.018	:	<0.018	:	<0.02	:	<0.021	:
Molybdenum	mg/kg-dry	T			9.5	:	5.3	:	5.7	:	5.1	:	8.1	:	9.1	:
Nickel	mg/kg-dry	T			24.	:	22.3	:	18.7	:	20.7	:	30.	:	29.1	:
Potassium	mg/kg-dry	T			1040.	:	1120.	:	1120.	:	1090.	:	1650.	:	1480.	:
Selenium	mg/kg-dry	T			<0.39	:	0.54	:	<0.31	:	0.34	:	0.55	:	0.75	:
Silver	mg/kg-dry	T			<0.2	:	<0.19	:	<0.18	:	0.2	:	0.18	:	<0.19	:
Sodium	mg/kg-dry	T			<134.	:	<150.	:	67.8	:	72.2	:	167.	:	94.2	:
Thallium	mg/kg-dry	T			0.16	:	0.13	:	<0.1	:	0.14	:	0.13	:	0.15	:
Vanadium	mg/kg-dry	T			9.5	:	9.8	:	8.5	:	9.4	:	12.3	:	14.4	:

J = Qualified as estimated during data validation

R = Qualified as rejected value from data validation and results are considered unusable for any purpose

T = Total Fraction

Appendix A-5f
Focused Sampling - Sediment Riffle Transect
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	TR-2N 9/23/2004 TR-2N-T01N-SED SWR	TR-3N 9/23/2004 TR-3N-T01N-SED SWR	TR-4N 9/24/2004 TR-4N-T01N-SED SWR	TR-5N 9/24/2004 TR-5N-T01N-SED SWR	TR-6N 9/24/2004 TR-6N-T01N-SED SWR	TR-7N 9/24/2004 TR-7N-T01N-SED SWR
Zinc	mg/kg-dry	T	155. J	132. J	115. J	117. J	130. J	159. J

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction

Appendix A-5f
Focused Sampling - Sediment Riffle Transect
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID							
			TR-8N 9/25/2004 TR-8N-T01N-SED		TR-9N 9/25/2004 TR-9N-T01N-SED		----	----	----	----
			SWR		SWR					
General Chemistry										
Chloride	mg/kg-dry	T	<0.87	:	<0.92	:	-	-	-	-
Fluoride	mg/kg-dry	T	0.6	:	0.62	:	-	-	-	-
Sulfate	mg/kg-dry	T	23.2	:	28.9	:	-	-	-	-
Total Organic Carbon	mg/kg-dry	T	<1020.	:	<1120.	:	-	-	-	-
Laboratory Parameters										
pH	SU	T	7.2	J	7.3	J	-	-	-	-
Solids, Percent	%	T	76.5	:	77.	:	-	-	-	-
Specific Conductance	umhos/cm	T	84.4	J	85.8	J	-	-	-	-
Metals										
Aluminum	mg/kg-dry	T	6070.	:	5570.	:	-	-	-	-
Antimony	mg/kg-dry	T	<1.3	J	<1.4	J	-	-	-	-
Arsenic	mg/kg-dry	T	5.2	J	5.1	J	-	-	-	-
Barium	mg/kg-dry	T	187.	:	211.	:	-	-	-	-
Beryllium	mg/kg-dry	T	0.74	:	0.77	:	-	-	-	-
Boron	mg/kg-dry	T	5.2	:	<4.	:	-	-	-	-
Cadmium	mg/kg-dry	T	1.4	:	1.2	:	-	-	-	-
Calcium	mg/kg-dry	T	1680.	:	1960.	:	-	-	-	-
Chromium	mg/kg-dry	T	13.	:	11.8	:	-	-	-	-
Cobalt	mg/kg-dry	T	8.4	:	8.	:	-	-	-	-
Copper	mg/kg-dry	T	40.9	:	40.6	:	-	-	-	-
Iron	mg/kg-dry	T	23000.	:	18400.	:	-	-	-	-
Lead	mg/kg-dry	T	39.7	:	44.8	:	-	-	-	-
Magnesium	mg/kg-dry	T	3750.	:	3140.	:	-	-	-	-
Manganese	mg/kg-dry	T	482.	:	409.	:	-	-	-	-
Mercury	mg/kg-dry	T	<0.019	:	<0.02	:	-	-	-	-
Molybdenum	mg/kg-dry	T	6.5	:	6.2	:	-	-	-	-
Nickel	mg/kg-dry	T	34.1	:	32.5	:	-	-	-	-
Potassium	mg/kg-dry	T	1370.	:	1550.	:	-	-	-	-
Selenium	mg/kg-dry	T	0.49	:	<0.37	:	-	-	-	-
Silver	mg/kg-dry	T	<0.18	:	<0.17	:	-	-	-	-
Sodium	mg/kg-dry	T	76.3	:	107.	:	-	-	-	-
Thallium	mg/kg-dry	T	0.14	:	0.13	:	-	-	-	-
Vanadium	mg/kg-dry	T	15.	:	10.9	:	-	-	-	-

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction

Appendix A-5f
Focused Sampling - Sediment Riffle Transect
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction						
		Site ID	TR-8N	TR-9N	----	----	----	----
		Sample Date	9/25/2004	9/25/2004				
		Sample ID	TR-8N-T01N-SED	TR-9N-T01N-SED				
		Exposure Area	SWR	SWR				
Zinc	mg/kg-dry	T	218. J	204. J	-	-	-	-

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction

Appendix A-5g
Focused Sampling - Surface Water - Radon and Transect
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID											
			SFM13-1 10/12/2004 SFM13-1-T01N-SFW		SFM13-1 10/12/2004 SFM13-1-D01N-SFW		SFM13-2 10/12/2004 SFM13-2-T01N-SFW		SFM13-2 10/12/2004 SFM13-2-D01N-SFW		SFM13-3 10/12/2004 SFM13-3-T01N-SFW		SFM13-3 10/12/2004 SFM13-3-D01N-SFW	
			SWR		SWR		SWR		SWR		SWR		SWR	
Field Measurements														
DO	mg/l	T	9.04	:	-		9.12	:	-		8.84	:	-	
EH	millivolts	T	430.2	:	-		409.4	:	-		255.3	:	-	
Flow	CFS	T	20.2	:	-		18.9	:	-		17.4	:	-	
pH	SU	T	7.7	:	-		8.21	:	-		8.12	:	-	
Radon-222	Pci/L	T	7.8	:	-		7.8	:	-		16.6	:	-	
Specific Conductance	uS/cm	T	280.	:	-		279.	:	-		283.	:	-	
Temperature	Celsius	T	8.87	:	-		8.7	:	-		10.56	:	-	
Turbidity	NTU	T	3.47	:	-		3.65	:	-		4.09	:	-	
General Chemistry														
Bicarbonate (as CaCO3)	mg/L	T	64.6	:	-		67.8	:	-		63.4	:	-	
Carbonate (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Chloride	mg/L	T	2.7	:	-		2.8	:	-		2.8	:	-	
Fluoride	mg/L	T	0.61	:	-		0.62	:	-		0.66	:	-	
Hydroxide (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Nitrate+Nitrite as N	mg/L	T	0.26	:	-		0.27	:	-		0.27	:	-	
Nitrite	mg/L	T	<0.005	J	-		<0.005	J	-		<0.005	J	-	
Phosphate, Ortho As P	mg/L	T	<0.01	J	-		<0.01	J	-		<0.01	J	-	
Phosphorus	mg/L	T	0.012	:	-		0.015	:	-		0.015	:	-	
Sulfate	mg/L	T	76.4	:	-		78.5	:	-		81.1	:	-	
Total Alkalinity	mg/L	T	64.6	:	-		67.8	:	-		63.4	:	-	
Total Dissolved Solids	mg/L	T	198.	:	-		188.	:	-		204.	:	-	
Total Organic Carbon	mg/L	T	1.6	:	-		1.1	:	-		1.5	:	-	
Total Suspended Solids	mg/L	T	5.	:	-		5.5	:	-		6.3	:	-	
Inorganics														
Cyanide	mg/L	T	<0.01	:	-		<0.01	:	-		<0.01	:	-	
Physical Properties														
Hardness	mg/L	D	-		144.	:	-		135.	:	-		138.	:
Metals														
Aluminum	mg/L	T	0.716	:	-		0.733	:	-		0.822	:	-	
Aluminum	mg/L	D	-		0.236	:	-		0.21	:	-		0.189	:
Antimony	mg/L	D	-		<0.00097	:	-		<0.00052	:	-		<0.00043	:
Arsenic	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Barium	mg/L	D	-		0.0339	:	-		0.0317	:	-		0.0317	:

J = Qualified as estimated during data validation

R = Qualified as rejected value from data validation and results are considered unusable for any purpose

T = Total Fraction D= Dissolved Fraction

Appendix A-5g
Focused Sampling - Surface Water - Radon and Transect
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	SFM13-1 10/12/2004 SFM13-1-T01N-SFW SWR		SFM13-1 10/12/2004 SFM13-1-D01N-SFW SWR		SFM13-2 10/12/2004 SFM13-2-T01N-SFW SWR		SFM13-2 10/12/2004 SFM13-2-D01N-SFW SWR		SFM13-3 10/12/2004 SFM13-3-T01N-SFW SWR		SFM13-3 10/12/2004 SFM13-3-D01N-SFW SWR	
Beryllium	mg/L	D	-		<0.0003	:	-		<0.0003	:	-		<0.0003	:
Boron	mg/L	D	-		<0.0069	:	-		<0.0069	:	-		<0.0069	:
Cadmium	mg/L	D	-		<0.00051	:	-		<0.00044	:	-		<0.00042	:
Calcium	mg/L	D	-		43.2	:	-		40.4	:	-		41.2	:
Chromium	mg/L	D	-		<0.0011	J	-		<0.0011	J	-		<0.0011	J
Cobalt	mg/L	D	-		0.0037	:	-		<0.0031	:	-		<0.0031	:
Copper	mg/L	D	-		0.0032	J	-		0.0033	J	-		0.0033	J
Iron	mg/L	T	<0.231	:	-		<0.181	:	-		<0.192	:	-	
Iron	mg/L	D	-		<0.0548	:	-		<0.0394	:	-		<0.0358	:
Lead	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Magnesium	mg/L	D	-		8.83	:	-		8.26	:	-		8.46	:
Manganese	mg/L	D	-		0.135	:	-		0.129	:	-		0.14	:
Mercury	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Molybdenum	mg/L	D	-		<0.0031	:	-		<0.0029	:	-		<0.003	:
Nickel	mg/L	D	-		0.0118	:	-		0.0114	:	-		0.0125	:
Potassium	mg/L	D	-		1.18	:	-		1.03	:	-		1.14	:
Selenium	mg/L	D	-		<0.0003	:	-		<0.0003	:	-		<0.0003	:
Silver	mg/L	D	-		<0.0001	J	-		<0.0001	J	-		<0.0001	J
Sodium	mg/L	D	-		4.96	:	-		4.77	:	-		4.51	:
Thallium	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Vanadium	mg/L	D	-		<0.0003	:	-		<0.00021	:	-		<0.00021	:
Zinc	mg/L	D	-		0.0452	:	-		0.0439	:	-		0.0456	:

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5g
Focused Sampling - Surface Water - Radon and Transect
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	SFM13-4 10/12/2004 SFM13-4-T01N-SFW SWR		SFM13-4 10/12/2004 SFM13-4-D01N-SFW SWR		SFM13-5 10/12/2004 SFM13-5-T01N-SFW SWR		SFM13-5 10/12/2004 SFM13-5-D01N-SFW SWR		SFM13-6 10/12/2004 SFM13-6-T01N-SFW SWR		SFM13-6 10/12/2004 SFM13-6-D01N-SFW SWR	
Field Measurements														
DO	mg/l	T	8.48	:	-		8.72	:	-		9.18	:	-	
EH	millivolts	T	243.9	:	-		225.6	:	-		245.5	:	-	
Flow	CFS	T	19.7	:	-		18.6	:	-		20.	:	-	
pH	SU	T	8.1	:	-		7.95	:	-		7.89	:	-	
Radon-222	Pci/L	T	14.7	:	-		20.5	:	-		32.3	:	-	
Specific Conductance	uS/cm	T	285.	:	-		288.	:	-		283.	:	-	
Temperature	Celsius	T	9.95	:	-		11.48	:	-		9.34	:	-	
Turbidity	NTU	T	4.4	:	-		4.54	:	-		4.66	:	-	
General Chemistry														
Bicarbonate (as CaCO3)	mg/L	T	68.4	:	-		62.9	:	-		62.6	:	-	
Carbonate (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Chloride	mg/L	T	2.9	:	-		2.8	:	-		2.7	:	-	
Fluoride	mg/L	T	0.66	:	-		0.69	:	-		0.7	:	-	
Hydroxide (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Nitrate+Nitrite as N	mg/L	T	0.25	:	-		0.23	:	-		0.25	:	-	
Nitrite	mg/L	T	<0.005	J	-		<0.005	J	-		<0.005	J	-	
Phosphate, Ortho As P	mg/L	T	<0.01	J	-		<0.01	J	-		<0.01	J	-	
Phosphorus	mg/L	T	0.017	:	-		0.013	:	-		0.015	:	-	
Sulfate	mg/L	T	83.2	:	-		80.1	:	-		84.8	:	-	
Total Alkalinity	mg/L	T	68.4	:	-		62.9	:	-		62.6	:	-	
Total Dissolved Solids	mg/L	T	192.	:	-		192.	:	-		198.	:	-	
Total Organic Carbon	mg/L	T	<1.	:	-		<1.	:	-		1.9	:	-	
Total Suspended Solids	mg/L	T	7.3	:	-		7.9	:	-		8.	:	-	
Inorganics														
Cyanide	mg/L	T	<0.01	:	-		<0.01	:	-		<0.01	:	-	
Physical Properties														
Hardness	mg/L	D	-		131.	:	-		146.	:	-		144.	:
Metals														
Aluminum	mg/L	T	1.12	:	-		1.02	:	-		1.09	:	-	
Aluminum	mg/L	D	-		0.112	:	-		0.169	:	-		0.13	:
Antimony	mg/L	D	-		<0.00053	:	-		<0.0006	:	-		<0.00048	:
Arsenic	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Barium	mg/L	D	-		0.0302	:	-		0.0333	:	-		0.0329	:

J = Qualified as estimated during data validation

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T = Total Fraction D= Dissolved Fraction

Appendix A-5g
Focused Sampling - Surface Water - Radon and Transect
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	SFM13-4 10/12/2004 SFM13-4-T01N-SFW SWR	SFM13-4 10/12/2004 SFM13-4-D01N-SFW SWR	SFM13-5 10/12/2004 SFM13-5-T01N-SFW SWR	SFM13-5 10/12/2004 SFM13-5-D01N-SFW SWR	SFM13-6 10/12/2004 SFM13-6-T01N-SFW SWR	SFM13-6 10/12/2004 SFM13-6-D01N-SFW SWR
Beryllium	mg/L	D	-	0.00039 :	-	<0.0003 :	-	<0.0003 :
Boron	mg/L	D	-	<0.0069 :	-	<0.0069 :	-	<0.0069 :
Cadmium	mg/L	D	-	<0.00047 :	-	<0.00052 :	-	<0.00047 :
Calcium	mg/L	D	-	39.3 :	-	43.5 :	-	43. :
Chromium	mg/L	D	-	<0.0011 J	-	<0.0011 J	-	<0.0011 J
Cobalt	mg/L	D	-	0.0056 :	-	<0.0031 :	-	<0.0031 :
Copper	mg/L	D	-	0.0034 J	-	0.0039 J	-	0.0034 J
Iron	mg/L	T	<0.247 :	-	<0.238 :	-	0.267 :	-
Iron	mg/L	D	-	<0.0804 :	-	<0.0644 :	-	<0.0657 :
Lead	mg/L	D	-	<0.0001 :	-	<0.0001 :	-	<0.0001 :
Magnesium	mg/L	D	-	8.08 :	-	8.95 :	-	8.84 :
Manganese	mg/L	D	-	0.185 :	-	0.172 :	-	0.178 :
Mercury	mg/L	D	-	<0.0001 :	-	<0.0001 :	-	<0.0001 :
Molybdenum	mg/L	D	-	<0.0029 :	-	<0.0032 :	-	<0.0031 :
Nickel	mg/L	D	-	0.0138 :	-	0.0137 :	-	0.0136 :
Potassium	mg/L	D	-	0.914 :	-	1.22 :	-	1.13 :
Selenium	mg/L	D	-	<0.00031 :	-	<0.0003 :	-	<0.00035 :
Silver	mg/L	D	-	<0.0001 J	-	<0.0001 :	-	<0.0001 :
Sodium	mg/L	D	-	4.63 :	-	4.78 :	-	4.68 :
Thallium	mg/L	D	-	<0.0001 :	-	<0.0001 :	-	<0.0001 :
Vanadium	mg/L	D	-	<0.00026 :	-	<0.00016 :	-	<0.00017 :
Zinc	mg/L	D	-	0.0555 :	-	0.0544 :	-	0.0565 :

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5g
Focused Sampling - Surface Water - Radon and Transect
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID / Exposure Area											
			SFM39-1 10/13/2004 SFM39-1-T01N-SFW SWR		SFM39-1 10/13/2004 SFM39-1-D01N-SFW SWR		SFM39-2 10/13/2004 SFM39-2-T01N-SFW SWR		SFM39-2 10/13/2004 SFM39-2-D01N-SFW SWR		SFM39-3 10/13/2004 SFM39-3-T01N-SFW SWR		SFM39-3 10/13/2004 SFM39-3-D01N-SFW SWR	
Field Measurements														
DO	mg/l	T	9.29	:	-		9.5	:	-		8.9	:	-	
EH	millivolts	T	144.	:	-		153.	:	-		145.	:	-	
Flow	CFS	T	16.7	:	-		-		-		18.2	:	-	
pH	SU	T	7.72	:	-		7.75	:	-		7.7	:	-	
Radon-222	Pci/L	T	2.	:	-		2.	:	-		2.9	:	-	
Specific Conductance	uS/cm	T	256.	:	-		254.	:	-		254.	:	-	
Temperature	Celsius	T	5.44	:	-		4.08	:	-		4.38	:	-	
Turbidity	NTU	T	4.13	:	-		0.	:	-		0.	:	-	
General Chemistry														
Bicarbonate (as CaCO3)	mg/L	T	71.5	:	-		70.9	:	-		72.3	:	-	
Carbonate (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Chloride	mg/L	T	2.3	:	-		2.3	:	-		2.6	:	-	
Fluoride	mg/L	T	0.3	:	-		0.3	:	-		0.3	:	-	
Hydroxide (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Nitrate+Nitrite as N	mg/L	T	0.26	:	-		0.27	:	-		0.26	:	-	
Nitrite	mg/L	T	<0.005	:	-		<0.005	:	-		<0.005	:	-	
Phosphate, Ortho As P	mg/L	T	<0.01	:	-		<0.01	:	-		<0.01	:	-	
Phosphorus	mg/L	T	0.018	:	-		0.02	:	-		0.022	:	-	
Sulfate	mg/L	T	56.9	:	-		58.1	:	-		50.3	:	-	
Total Alkalinity	mg/L	T	71.5	:	-		70.9	:	-		72.3	:	-	
Total Dissolved Solids	mg/L	T	142.	:	-		156.	:	-		154.	:	-	
Total Organic Carbon	mg/L	T	<1.	:	-		1.3	:	-		1.	:	-	
Total Suspended Solids	mg/L	T	4.9	:	-		7.1	:	-		6.7	:	-	
Inorganics														
Cyanide	mg/L	T	<0.01	:	-		<0.01	:	-		<0.01	:	-	
Physical Properties														
Hardness	mg/L	D	-		113.	:	-		108.	:	-		110.	:
Metals														
Aluminum	mg/L	T	0.409	:	-		0.462	:	-		0.455	:	-	
Aluminum	mg/L	D	-		0.0818	:	-		0.0666	:	-		0.0802	:
Antimony	mg/L	D	-		<0.00076	:	-		<0.00051	:	-		<0.00043	:
Arsenic	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Barium	mg/L	D	-		0.0341	:	-		0.0329	:	-		0.0331	:

J = Qualified as estimated during data validation

R = Qualified as rejected value from data validation and results are considered unusable for any purpose

T = Total Fraction D= Dissolved Fraction

Appendix A-5g
Focused Sampling - Surface Water - Radon and Transect
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	SFM39-1 10/13/2004 SFM39-1-T01N-SFW SWR		SFM39-1 10/13/2004 SFM39-1-D01N-SFW SWR		SFM39-2 10/13/2004 SFM39-2-T01N-SFW SWR		SFM39-2 10/13/2004 SFM39-2-D01N-SFW SWR		SFM39-3 10/13/2004 SFM39-3-T01N-SFW SWR		SFM39-3 10/13/2004 SFM39-3-D01N-SFW SWR	
Beryllium	mg/L	D	-		0.00032	:	-		0.00042	:	-		<0.0003	:
Boron	mg/L	D	-		<0.0069	:	-		<0.0069	:	-		<0.0069	:
Cadmium	mg/L	D	-		<0.00028	:	-		<0.00025	:	-		<0.00019	:
Calcium	mg/L	D	-		34.4	:	-		32.8	:	-		33.3	:
Chromium	mg/L	D	-		<0.0011	J	-		<0.0011	J	-		<0.0011	J
Cobalt	mg/L	D	-		<0.0031	:	-		<0.0031	:	-		<0.0031	:
Copper	mg/L	D	-		0.0018	J	-		0.0017	J	-		0.0015	J
Iron	mg/L	T	0.202	:	-		0.241	:	-		0.269	:	-	
Iron	mg/L	D	-		<0.0355	:	-		<0.0355	:	-		<0.0355	:
Lead	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Magnesium	mg/L	D	-		6.66	:	-		6.36	:	-		6.46	:
Manganese	mg/L	D	-		0.0978	:	-		0.0979	:	-		0.0943	:
Mercury	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Molybdenum	mg/L	D	-		<0.0023	:	-		<0.0021	:	-		<0.0021	:
Nickel	mg/L	D	-		0.0055	:	-		0.0055	:	-		0.005	:
Potassium	mg/L	D	-		0.857	:	-		0.663	:	-		0.765	:
Selenium	mg/L	D	-		<0.0003	:	-		0.00043	:	-		<0.0003	:
Silver	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Sodium	mg/L	D	-		4.01	:	-		4.1	:	-		3.92	:
Thallium	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Vanadium	mg/L	D	-		<0.0001	:	-		<0.00019	:	-		<0.00023	:
Zinc	mg/L	D	-		0.0156	:	-		<0.0132	:	-		0.015	:

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5g
Focused Sampling - Surface Water - Radon and Transect
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID											
			SFM39-4 10/13/2004 SFM39-4-T01N-SFW		SFM39-4 10/13/2004 SFM39-4-D01N-SFW		SFM39-5 10/13/2004 SFM39-5-T01N-SFW		SFM39-5 10/13/2004 SFM39-5-D01N-SFW		SFM39-6 10/13/2004 SFM39-6-T01N-SFW		SFM39-6 10/13/2004 SFM39-6-D01N-SFW	
			SWR		SWR		SWR		SWR		SWR		SWR	
Field Measurements														
DO	mg/l	T	7.2	:	-		8.25	:	-		7.02	:	-	
EH	millivolts	T	115.	:	-		114.	:	-		138.	:	-	
Flow	CFS	T	20.1	:	-		-		-		18.6	:	-	
pH	SU	T	7.49	:	-		7.56	:	-		7.62	:	-	
Radon-222	Pci/L	T	89.8	:	-		50.8	:	-		41.	:	-	
Specific Conductance	uS/cm	T	290.	:	-		266.	:	-		116.	:	-	
Temperature	Celsius	T	4.95	:	-		4.89	:	-		4.92	:	-	
Turbidity	NTU	T	0.	:	-		0.	:	-		6.75	:	-	
General Chemistry														
Bicarbonate (as CaCO3)	mg/L	T	71.6	:	-		67.2	:	-		67.	:	-	
Carbonate (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Chloride	mg/L	T	2.4	:	-		2.3	:	-		2.5	:	-	
Fluoride	mg/L	T	0.57	:	-		0.5	:	-		0.48	:	-	
Hydroxide (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Nitrate+Nitrite as N	mg/L	T	0.26	:	-		0.26	:	-		0.25	:	-	
Nitrite	mg/L	T	<0.005	:	-		<0.005	:	-		<0.005	:	-	
Phosphate, Ortho As P	mg/L	T	<0.01	:	-		<0.01	:	-		<0.01	:	-	
Phosphorus	mg/L	T	0.026	:	-		0.022	:	-		0.025	:	-	
Sulfate	mg/L	T	67.	:	-		55.	:	-		53.5	:	-	
Total Alkalinity	mg/L	T	71.6	:	-		67.2	:	-		67.	:	-	
Total Dissolved Solids	mg/L	T	160.	:	-		134.	:	-		152.	:	-	
Total Organic Carbon	mg/L	T	1.5	:	-		1.2	:	-		2.1	:	-	
Total Suspended Solids	mg/L	T	7.1	:	-		5.9	:	-		9.2	:	-	
Inorganics														
Cyanide	mg/L	T	<0.01	:	-		<0.01	:	-		<0.01	:	-	
Physical Properties														
Hardness	mg/L	D	-		136.	:	-		127.	:	-		122.	:
Metals														
Aluminum	mg/L	T	0.553	:	-		0.537	:	-		0.575	:	-	
Aluminum	mg/L	D	-		0.132	:	-		0.127	:	-		0.126	:
Antimony	mg/L	D	-		<0.0018	:	-		<0.0015	:	-		<0.0014	:
Arsenic	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Barium	mg/L	D	-		0.0344	:	-		0.0352	:	-		0.0345	:

J = Qualified as estimated during data validation

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T = Total Fraction D= Dissolved Fraction

Appendix A-5g
Focused Sampling - Surface Water - Radon and Transect
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	SFM39-4 10/13/2004 SFM39-4-T01N-SFW SWR		SFM39-4 10/13/2004 SFM39-4-D01N-SFW SWR		SFM39-5 10/13/2004 SFM39-5-T01N-SFW SWR		SFM39-5 10/13/2004 SFM39-5-D01N-SFW SWR		SFM39-6 10/13/2004 SFM39-6-T01N-SFW SWR		SFM39-6 10/13/2004 SFM39-6-D01N-SFW SWR	
Beryllium	mg/L	D	-	:	<0.0003	:	-	:	<0.0003	:	-	:	<0.0003	:
Boron	mg/L	D	-	:	<0.0069	:	-	:	<0.0069	:	-	:	<0.0069	:
Cadmium	mg/L	D	-	:	0.0002	:	-	:	0.00012	:	-	:	0.00013	:
Calcium	mg/L	D	-	:	40.9	:	-	:	38.3	:	-	:	36.8	:
Chromium	mg/L	D	-	:	<0.0013	:	-	:	<0.0012	:	-	:	<0.0011	:
Cobalt	mg/L	D	-	:	<0.0031	:	-	:	0.0031	:	-	:	<0.0031	:
Copper	mg/L	D	-	:	0.0019	J	-	:	0.0025	J	-	:	0.002	J
Iron	mg/L	T	0.226	:	-		0.246	:	-		0.304	:	-	
Iron	mg/L	D	-	:	<0.0355	:	-	:	<0.0385	:	-	:	<0.0355	:
Lead	mg/L	D	-	:	<0.0001	:	-	:	<0.0001	:	-	:	<0.0001	:
Magnesium	mg/L	D	-	:	8.23	:	-	:	7.66	:	-	:	7.32	:
Manganese	mg/L	D	-	:	0.0869	:	-	:	0.0875	:	-	:	0.0836	:
Mercury	mg/L	D	-	:	<0.0001	:	-	:	<0.0001	:	-	:	<0.0001	:
Molybdenum	mg/L	D	-	:	0.0016	J	-	:	0.0012	J	-	:	0.0011	J
Nickel	mg/L	D	-	:	0.01	:	-	:	0.0091	:	-	:	0.0089	:
Potassium	mg/L	D	-	:	1.29	:	-	:	1.26	:	-	:	1.22	:
Selenium	mg/L	D	-	:	<0.0003	J	-	:	<0.0003	J	-	:	<0.0003	J
Silver	mg/L	D	-	:	<0.0001	:	-	:	<0.0001	:	-	:	<0.0001	:
Sodium	mg/L	D	-	:	4.26	:	-	:	4.06	:	-	:	3.87	:
Thallium	mg/L	D	-	:	<0.0001	:	-	:	<0.0001	:	-	:	<0.0001	:
Vanadium	mg/L	D	-	:	<0.0001	:	-	:	<0.0001	:	-	:	<0.0001	:
Zinc	mg/L	D	-	:	0.0518	:	-	:	0.046	:	-	:	0.0431	:

J = Qualified as estimated during data validation
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T = Total Fraction D= Dissolved Fraction

Appendix A-5g
Focused Sampling - Surface Water - Radon and Transect
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID	SFM39-7 10/13/2004 SFM39-7-T01N-SFW SWR	SFM39-7 10/13/2004 SFM39-7-D01N-SFW SWR	SFM39-8 10/13/2004 SFM39-8-T01N-SFW SWR	SFM39-8 10/13/2004 SFM39-8-D01N-SFW SWR	TR-10N 9/23/2004 TR-10-T01N-SFW SWR	TR-10N 9/23/2004 TR-10-D01N-SFW SWR
Field Measurements									
DO	mg/l	T		7.23 :	-	7.76 :	-	10.82 :	-
EH	millivolts	T		140. :	-	122. :	-	193.6 :	-
Flow	CFS	T		-	-	20.3 :	-	-	-
pH	SU	T		7.6 :	-	7.55 :	-	7.22 :	-
Radon-222	Pci/L	T		15.6 :	-	59.6 :	-	-	-
Specific Conductance	uS/cm	T		212. :	-	295. :	-	297. :	-
Temperature	Celsius	T		5.51 :	-	5.24 :	-	6.76 :	-
Turbidity	NTU	T		5.15 :	-	5.48 :	-	4.3 :	-
General Chemistry									
Bicarbonate (as CaCO3)	mg/L	T		67.3 :	-	68.9 :	-	67.9 :	-
Carbonate (as CaCO3)	mg/L	T		<1. :	-	<1. :	-	<1. :	-
Chloride	mg/L	T		2.3 :	-	2.6 :	-	2.8 :	-
Fluoride	mg/L	T		0.49 :	-	0.59 :	-	0.47 :	-
Hydroxide (as CaCO3)	mg/L	T		<1. :	-	<1. :	-	<1. :	-
Nitrate+Nitrite as N	mg/L	T		0.25 :	-	0.25 :	-	0.26 :	-
Nitrite	mg/L	T		<0.005 :	-	<0.005 :	-	<0.005 :	-
Phosphate, Ortho As P	mg/L	T		<0.01 :	-	<0.01 :	-	<0.01 :	-
Phosphorus	mg/L	T		0.015 :	-	0.023 :	-	0.05 :	-
Sulfate	mg/L	T		53.5 :	-	73.8 :	-	60.3 :	-
Total Alkalinity	mg/L	T		67.3 :	-	68.9 :	-	67.9 :	-
Total Dissolved Solids	mg/L	T		134. :	-	158. :	-	182. :	-
Total Organic Carbon	mg/L	T		1.4 :	-	<1. :	-	1.6 :	-
Total Suspended Solids	mg/L	T		8.3 :	-	8.4 :	-	6.9 :	-
Inorganics									
Cyanide	mg/L	T		<0.01 :	-	<0.01 :	-	<0.01 :	-
Physical Properties									
Hardness	mg/L	D		-	130. :	-	143. :	-	-
Metals									
Aluminum	mg/L	T		0.646 :	-	0.589 :	-	0.55 :	-
Aluminum	mg/L	D		-	0.169 :	-	0.15 :	-	<0.166 :
Antimony	mg/L	D		-	<0.0014 :	-	0.0014 :	-	<0.00051 :
Arsenic	mg/L	D		-	<0.0001 :	-	<0.0001 :	-	<0.0001 :
Barium	mg/L	D		-	0.036 :	-	0.0348 :	-	0.0364 :

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Appendix A-5g
Focused Sampling - Surface Water - Radon and Transect
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	SFM39-7 10/13/2004 SFM39-7-T01N-SFW SWR		SFM39-7 10/13/2004 SFM39-7-D01N-SFW SWR		SFM39-8 10/13/2004 SFM39-8-T01N-SFW SWR		SFM39-8 10/13/2004 SFM39-8-D01N-SFW SWR		TR-10N 9/23/2004 TR-10-T01N-SFW SWR		TR-10N 9/23/2004 TR-10-D01N-SFW SWR	
Beryllium	mg/L	D	-		<0.0003	:	-		<0.0003	:	-		<0.0003	:
Boron	mg/L	D	-		<0.0069	:	-		<0.0069	:	-		<0.0093	:
Cadmium	mg/L	D	-		0.00015	:	-		0.00022	:	-		<0.0001	J
Calcium	mg/L	D	-		39.	:	-		42.9	:	-		42.4	:
Chromium	mg/L	D	-		<0.0011	:	-		<0.0011	:	-		<0.0011	:
Cobalt	mg/L	D	-		<0.0031	:	-		<0.0031	:	-		<0.0017	:
Copper	mg/L	D	-		0.0018	J	-		0.0021	J	-		0.0022	J
Iron	mg/L	T	0.337	:	-		0.264	:	-		0.198	J	-	
Iron	mg/L	D	-		0.0399	:	-		<0.0355	:	-		<0.0478	:
Lead	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		0.0002	:
Magnesium	mg/L	D	-		7.87	:	-		8.67	:	-		8.04	:
Manganese	mg/L	D	-		0.0881	:	-		0.0933	:	-		0.0788	:
Mercury	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		-	
Molybdenum	mg/L	D	-		0.001	J	-		0.0014	J	-		<0.0024	:
Nickel	mg/L	D	-		0.0088	:	-		0.0097	:	-		0.0087	:
Potassium	mg/L	D	-		1.36	:	-		1.4	:	-		1.11	:
Selenium	mg/L	D	-		<0.0003	J	-		<0.0003	J	-		<0.0002	J
Silver	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Sodium	mg/L	D	-		4.13	:	-		4.39	:	-		4.38	:
Thallium	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Vanadium	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Zinc	mg/L	D	-		0.0495	:	-		0.0522	:	-		<0.0409	:

J = Qualified as estimated during data validation
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Appendix A-5g
Focused Sampling - Surface Water - Radon and Transect
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	TR-11N 9/23/2004 TR-11-T01N-SFW SWR		TR-11N 9/23/2004 TR-11-D01N-SFW SWR		TR-12N 9/23/2004 TR-12-T01N-SFW SWR		TR-12N 9/23/2004 TR-12-D01N-SFW SWR		TR-13N 9/24/2004 TR-13-T01N-SFW SWR		TR-13N 9/24/2004 TR-13-D01N-SFW SWR	
Field Measurements														
DO	mg/l	T	9.16	:	-		9.1	:	-		10.16	:	-	
EH	millivolts	T	154.7	:	-		126.	:	-		157.	:	-	
pH	SU	T	7.81	:	-		7.74	:	-		7.4	:	-	
Specific Conductance	uS/cm	T	298.	:	-		292.	:	-		279.	:	-	
Temperature	Celsius	T	9.35	:	-		10.44	:	-		7.78	:	-	
Turbidity	NTU	T	4.1	:	-		5.3	:	-		4.6	:	-	
General Chemistry														
Bicarbonate (as CaCO3)	mg/L	T	67.7	:	-		68.2	:	-		69.2	:	-	
Carbonate (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Chloride	mg/L	T	2.8	:	-		2.8	:	-		2.4	:	-	
Fluoride	mg/L	T	0.49	:	-		0.49	:	-		0.38	:	-	
Hydroxide (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Nitrate+Nitrite as N	mg/L	T	0.26	:	-		0.27	:	-		0.37	:	-	
Nitrite	mg/L	T	<0.005	:	-		<0.005	:	-		0.0071	J	-	
Phosphate, Ortho As P	mg/L	T	<0.01	:	-		<0.01	:	-		<0.01	J	-	
Phosphorus	mg/L	T	0.044	:	-		0.021	:	-		0.037	:	-	
Sulfate	mg/L	T	57.6	:	-		113.	:	-		62.3	:	-	
Total Alkalinity	mg/L	T	67.7	:	-		68.2	:	-		69.2	:	-	
Total Dissolved Solids	mg/L	T	190.	:	-		198.	:	-		176.	:	-	
Total Organic Carbon	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Total Suspended Solids	mg/L	T	8.8	:	-		8.8	:	-		7.1	:	-	
Inorganics														
Cyanide	mg/L	T	<0.01	:	-		<0.01	:	-		<0.01	:	-	
Physical Properties														
Hardness	mg/L	D	-		-		-		-		-		122.	:
Metals														
Aluminum	mg/L	T	0.494	:	-		0.478	:	-		0.876	:	-	
Aluminum	mg/L	D	-		<0.173	:	-		<0.18	:	-		0.157	:
Antimony	mg/L	D	-		<0.00052	:	-		<0.00032	:	-		<0.00036	:
Arsenic	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	J
Barium	mg/L	D	-		0.0364	:	-		0.0383	:	-		0.0393	:
Beryllium	mg/L	D	-		<0.0003	:	-		<0.0003	:	-		<0.0003	:
Boron	mg/L	D	-		<0.0078	:	-		<0.0059	:	-		<0.0069	:

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T = Total Fraction D= Dissolved Fraction

Appendix A-5g
Focused Sampling - Surface Water - Radon and Transect
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	TR-11N 9/23/2004 TR-11-T01N-SFW SWR		TR-11N 9/23/2004 TR-11-D01N-SFW SWR		TR-12N 9/23/2004 TR-12-T01N-SFW SWR		TR-12N 9/23/2004 TR-12-D01N-SFW SWR		TR-13N 9/24/2004 TR-13-T01N-SFW SWR		TR-13N 9/24/2004 TR-13-D01N-SFW SWR	
Cadmium	mg/L	D	-		<0.0001	J	-		<0.0001	J	-		0.00012	:
Calcium	mg/L	D	-		41.9	:	-		42.7	:	-		37.5	:
Chromium	mg/L	D	-		<0.0011	:	-		<0.0011	:	-		<0.0011	:
Cobalt	mg/L	D	-		0.0017	:	-		<0.0017	:	-		<0.0031	:
Copper	mg/L	D	-		0.0019	J	-		0.002	J	-		0.0015	J
Iron	mg/L	T	0.15	J	-		0.122	J	-		0.77	J	-	
Iron	mg/L	D	-		<0.0478	:	-		<0.0478	:	-		0.0367	:
Lead	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Magnesium	mg/L	D	-		7.97	:	-		8.12	:	-		6.94	:
Manganese	mg/L	D	-		0.0782	:	-		0.0752	:	-		0.077	:
Mercury	mg/L	D	-		-		-		-		-		<0.0001	J
Molybdenum	mg/L	D	-		<0.0024	:	-		<0.0023	:	-		<0.0019	:
Nickel	mg/L	D	-		0.0088	:	-		0.0083	:	-		0.0068	J
Potassium	mg/L	D	-		1.08	:	-		1.19	:	-		0.845	:
Selenium	mg/L	D	-		<0.0002	J	-		<0.0002	J	-		<0.0003	J
Silver	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Sodium	mg/L	D	-		4.26	:	-		4.46	:	-		4.04	:
Thallium	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Vanadium	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	J
Zinc	mg/L	D	-		<0.0353	:	-		<0.0362	:	-		0.0284	:

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5g
Focused Sampling - Surface Water - Radon and Transect
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID											
			TR-14N 9/25/2004 TR-14-T01N-SFW		TR-14N 9/25/2004 TR-14-D01N-SFW		TR-15N 9/24/2004 TR-15-T01N-SFW		TR-15N 9/24/2004 TR-15-D01N-SFW		TR-16N 9/24/2004 TR-16-T01N-SFW		TR-16N 9/24/2004 TR-16-D01N-SFW	
			SWR		SWR		SWR		SWR		SWR		SWR	
Field Measurements														
DO	mg/l	T	9.08	:	-		9.75	:	-		9.27	:	-	
EH	millivolts	T	220.6	:	-		126.8	:	-		115.5	:	-	
pH	SU	T	8.26	:	-		8.09	:	-		8.21	:	-	
Specific Conductance	uS/cm	T	399.	:	-		278.	:	-		211.	:	-	
Temperature	Celsius	T	7.66	:	-		9.03	:	-		13.31	:	-	
Turbidity	NTU	T	2.1	:	-		3.8	:	-		4.6	:	-	
General Chemistry														
Bicarbonate (as CaCO3)	mg/L	T	68.4	:	-		69.9	J	-		141.	J	-	
Carbonate (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Chloride	mg/L	T	2.5	:	-		2.2	:	-		2.3	:	-	
Fluoride	mg/L	T	0.27	:	-		0.26	:	-		0.27	:	-	
Hydroxide (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Nitrate+Nitrite as N	mg/L	T	0.3	:	-		0.44	:	-		0.41	:	-	
Nitrite	mg/L	T	<0.005	J	-		0.0051	J	-		<0.005	J	-	
Phosphate, Ortho As P	mg/L	T	<0.01	J	-		<0.01	J	-		<0.01	J	-	
Phosphorus	mg/L	T	0.03	:	-		0.026	:	-		0.031	:	-	
Sulfate	mg/L	T	50.3	:	-		56.6	J	-		52.9	J	-	
Total Alkalinity	mg/L	T	68.4	:	-		69.9	J	-		141.	:	-	
Total Dissolved Solids	mg/L	T	180.	:	-		172.	:	-		168.	:	-	
Total Organic Carbon	mg/L	T	1.1	J	-		<1.	:	-		1.2	J	-	
Total Suspended Solids	mg/L	T	5.2	:	-		3.9	:	-		6.	:	-	
Inorganics														
Cyanide	mg/L	T	<0.01	:	-		<0.01	:	-		<0.01	:	-	
Physical Properties														
Hardness	mg/L	D	-		126.	:	-		118.	:	-		129.	:
Metals														
Aluminum	mg/L	T	0.474	:	-		0.425	:	-		0.518	:	-	
Aluminum	mg/L	D	-		0.134	:	-		0.168	:	-		0.168	:
Antimony	mg/L	D	-		<0.00032	:	-		<0.00083	:	-		<0.00078	:
Arsenic	mg/L	D	-		<0.0001	J	-		<0.0001	J	-		<0.0001	J
Barium	mg/L	D	-		0.0378	:	-		0.0389	:	-		0.0385	:
Beryllium	mg/L	D	-		<0.0003	:	-		<0.0003	:	-		<0.0003	:
Boron	mg/L	D	-		<0.0069	:	-		<0.0069	:	-		<0.0069	:

J = Qualified as estimated during data validation

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T = Total Fraction D= Dissolved Fraction

Appendix A-5g
Focused Sampling - Surface Water - Radon and Transect
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	TR-14N 9/25/2004 TR-14-T01N-SFW SWR		TR-14N 9/25/2004 TR-14-D01N-SFW SWR		TR-15N 9/24/2004 TR-15-T01N-SFW SWR		TR-15N 9/24/2004 TR-15-D01N-SFW SWR		TR-16N 9/24/2004 TR-16-T01N-SFW SWR		TR-16N 9/24/2004 TR-16-D01N-SFW SWR	
Cadmium	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Calcium	mg/L	D	-		38.6	:	-		36.4	:	-		39.7	J
Chromium	mg/L	D	-		<0.0011	:	-		<0.0011	:	-		<0.0011	:
Cobalt	mg/L	D	-		<0.0031	:	-		<0.0031	:	-		<0.0031	:
Copper	mg/L	D	-		0.0012	J	-		0.0015	J	-		0.0015	J
Iron	mg/L	T	0.173	J	-		0.163	J	-		0.272	J	-	
Iron	mg/L	D	-		<0.0355	:	-		<0.0355	:	-		<0.0426	:
Lead	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Magnesium	mg/L	D	-		7.15	:	-		6.58	:	-		7.28	J
Manganese	mg/L	D	-		0.0802	:	-		0.0786	:	-		0.0807	:
Mercury	mg/L	D	-		<0.0001	:	-		<0.0001	J	-		<0.0001	:
Molybdenum	mg/L	D	-		0.0015	:	-		<0.0016	:	-		0.0018	:
Nickel	mg/L	D	-		0.0035	J	-		0.0032	J	-		0.0031	J
Potassium	mg/L	D	-		1.31	:	-		0.887	:	-		1.41	:
Selenium	mg/L	D	-		<0.0003	:	-		<0.0003	:	-		<0.0003	:
Silver	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Sodium	mg/L	D	-		4.32	:	-		4.02	:	-		4.45	:
Thallium	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Vanadium	mg/L	D	-		<0.0001	J	-		<0.0001	J	-		<0.0001	J
Zinc	mg/L	D	-		0.0146	:	-		0.0078	:	-		0.0104	:

J = Qualified as estimated during data validation
R = Qualified as rejected value from data validation and results are considered unusable for any purpose
T = Total Fraction D= Dissolved Fraction

Appendix A-5g
Focused Sampling - Surface Water - Radon and Transect
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID											
			TR-17N 9/25/2004 TR-17-T01N-SFW		TR-17N 9/25/2004 TR-17-D01N-SFW		TR-18N 9/25/2004 TR-18-T01N-SFW		TR-18N 9/25/2004 TR-18-D01N-SFW		TR-19N 9/25/2004 TR-19-T01N-SFW		TR-19N 9/25/2004 TR-19-D01N-SFW	
			SWR		SWR		SWR		SWR		SWR		SWR	
Field Measurements														
DO	mg/l	T	8.9	:	-		9.88	:	-		9.3	:	-	
EH	millivolts	T	233.2	:	-		123.6	:	-		134.6	:	-	
pH	SU	T	8.28	:	-		7.91	:	-		8.14	:	-	
Specific Conductance	uS/cm	T	395.	:	-		173.	:	-		275.	:	-	
Temperature	Celsius	T	8.14	:	-		5.92	:	-		6.54	:	-	
Turbidity	NTU	T	0.	:	-		17.3	:	-		13.4	:	-	
General Chemistry														
Bicarbonate (as CaCO3)	mg/L	T	67.	:	-		70.2	:	-		70.7	:	-	
Carbonate (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Chloride	mg/L	T	2.3	:	-		2.7	:	-		2.1	:	-	
Fluoride	mg/L	T	0.27	:	-		0.27	:	-		0.27	:	-	
Hydroxide (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Nitrate+Nitrite as N	mg/L	T	0.35	:	-		0.29	:	-		0.28	:	-	
Nitrite	mg/L	T	<0.005	J	-		<0.005	J	-		<0.005	J	-	
Phosphate, Ortho As P	mg/L	T	<0.01	J	-		<0.01	J	-		<0.01	J	-	
Phosphorus	mg/L	T	0.022	:	-		0.03	:	-		0.024	:	-	
Sulfate	mg/L	T	59.7	:	-		54.	:	-		55.6	:	-	
Total Alkalinity	mg/L	T	67.	:	-		70.2	:	-		70.7	:	-	
Total Dissolved Solids	mg/L	T	186.	:	-		184.	:	-		176.	:	-	
Total Organic Carbon	mg/L	T	1.8	J	-		<1.	:	-		1.	:	-	
Total Suspended Solids	mg/L	T	4.2	:	-		4.5	:	-		4.1	:	-	
Inorganics														
Cyanide	mg/L	T	<0.01	:	-		<0.01	:	-		<0.01	:	-	
Physical Properties														
Hardness	mg/L	D	-		128.	:	-		117.	:	-		121.	:
Metals														
Aluminum	mg/L	T	0.506	:	-		0.458	:	-		0.471	:	-	
Aluminum	mg/L	D	-		0.144	:	-		0.144	:	-		0.156	:
Antimony	mg/L	D	-		<0.00036	:	-		<0.00034	:	-		<0.0004	:
Arsenic	mg/L	D	-		<0.0001	J	-		<0.0001	J	-		<0.0001	J
Barium	mg/L	D	-		0.0386	:	-		0.0382	:	-		0.0394	:
Beryllium	mg/L	D	-		<0.0003	:	-		<0.0003	:	-		<0.0003	:
Boron	mg/L	D	-		<0.0069	:	-		<0.0069	:	-		<0.0069	:

J = Qualified as estimated during data validation

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T = Total Fraction D= Dissolved Fraction

Appendix A-5g
Focused Sampling - Surface Water - Radon and Transect
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	TR-17N 9/25/2004 TR-17-T01N-SFW SWR		TR-17N 9/25/2004 TR-17-D01N-SFW SWR		TR-18N 9/25/2004 TR-18-T01N-SFW SWR		TR-18N 9/25/2004 TR-18-D01N-SFW SWR		TR-19N 9/25/2004 TR-19-T01N-SFW SWR		TR-19N 9/25/2004 TR-19-D01N-SFW SWR	
Cadmium	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Calcium	mg/L	D	-		39.3	:	-		36.1	:	-		37.2	:
Chromium	mg/L	D	-		<0.0011	:	-		<0.0011	:	-		0.0026	:
Cobalt	mg/L	D	-		<0.0031	:	-		<0.0031	:	-		0.0054	:
Copper	mg/L	D	-		0.0013	J	-		0.0014	J	-		0.0016	J
Iron	mg/L	T	0.239	J	-		0.181	J	-		0.167	J	-	
Iron	mg/L	D	-		<0.0371	:	-		<0.0355	:	-		0.0817	:
Lead	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Magnesium	mg/L	D	-		7.33	:	-		6.61	:	-		6.84	:
Manganese	mg/L	D	-		0.0842	:	-		0.0849	:	-		0.0894	:
Mercury	mg/L	D	-		<0.0001	:	-		<0.0001	J	-		<0.0001	J
Molybdenum	mg/L	D	-		0.0014	:	-		<0.0015	:	-		<0.0013	:
Nickel	mg/L	D	-		0.0032	J	-		0.0039	J	-		0.004	J
Potassium	mg/L	D	-		1.4	:	-		0.907	:	-		0.938	:
Selenium	mg/L	D	-		<0.0003	:	-		<0.0003	:	-		<0.0003	:
Silver	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Sodium	mg/L	D	-		4.57	:	-		4.26	:	-		4.18	:
Thallium	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Vanadium	mg/L	D	-		<0.0001	J	-		<0.0001	J	-		<0.0001	J
Zinc	mg/L	D	-		0.0117	:	-		0.0124	:	-		0.0153	:

J = Qualified as estimated during data validation
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T = Total Fraction D= Dissolved Fraction

Appendix A-5g
Focused Sampling - Surface Water - Radon and Transect
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID											
			TR-1N 9/23/2004 TR-1-T01N-SFW		TR-1N 9/23/2004 TR-1-D01N-SFW		TR-20N 9/25/2004 TR-20-T01N-SFW		TR-20N 9/25/2004 TR-20-D01N-SFW		TR-2N 9/23/2004 TR-2-T01N-SFW		TR-2N 9/23/2004 TR-2-D01N-SFW	
			SWR		SWR		SWR		SWR		SWR		SWR	
Field Measurements														
DO	mg/l	T	10.8	:	-		8.69	:	-		9.67	:	-	
EH	millivolts	T	181.4	:	-		152.2	:	-		51.5	:	-	
pH	SU	T	7.31	:	-		8.24	:	-		7.54	:	-	
Specific Conductance	uS/cm	T	310.	:	-		200.	:	-		366.	:	-	
Temperature	Celsius	T	5.04	:	-		8.33	:	-		8.18	:	-	
Turbidity	NTU	T	1.4	:	-		14.1	:	-		1.9	:	-	
General Chemistry														
Bicarbonate (as CaCO3)	mg/L	T	62.7	:	-		67.8	:	-		62.3	:	-	
Carbonate (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Chloride	mg/L	T	3.	:	-		2.8	:	-		3.	:	-	
Fluoride	mg/L	T	0.57	:	-		0.28	:	-		0.56	:	-	
Hydroxide (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Nitrate+Nitrite as N	mg/L	T	0.3	:	-		0.36	:	-		0.28	:	-	
Nitrite	mg/L	T	<0.005	:	-		<0.005	J	-		<0.005	:	-	
Phosphate, Ortho As P	mg/L	T	<0.01	:	-		<0.01	J	-		<0.01	:	-	
Phosphorus	mg/L	T	0.045	:	-		0.028	:	-		0.024	:	-	
Sulfate	mg/L	T	68.6	:	-		70.2	:	-		82.2	:	-	
Total Alkalinity	mg/L	T	62.7	:	-		67.8	:	-		62.3	:	-	
Total Dissolved Solids	mg/L	T	196.	:	-		186.	:	-		200.	:	-	
Total Organic Carbon	mg/L	T	1.4	:	-		1.	J	-		<1.	:	-	
Total Suspended Solids	mg/L	T	14.6	:	-		5.1	:	-		7.1	:	-	
Inorganics														
Cyanide	mg/L	T	<0.01	:	-		<0.01	:	-		<0.01	:	-	
Physical Properties														
Hardness	mg/L	D	-		-		-		139.	:	-		-	
Metals														
Aluminum	mg/L	T	1.25	:	-		0.607	:	-		1.18	:	-	
Aluminum	mg/L	D	-		<0.192	:	-		0.171	:	-		<0.224	:
Antimony	mg/L	D	-		<0.00047	:	-		<0.00035	:	-		<0.00036	:
Arsenic	mg/L	D	-		<0.0001	:	-		<0.0001	J	-		<0.0001	:
Barium	mg/L	D	-		0.0346	:	-		0.0363	:	-		0.0351	:
Beryllium	mg/L	D	-		<0.0003	:	-		<0.0003	:	-		<0.0003	:
Boron	mg/L	D	-		<0.0095	:	-		<0.0069	:	-		<0.0057	:

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Appendix A-5g
Focused Sampling - Surface Water - Radon and Transect
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	TR-1N 9/23/2004 TR-1-T01N-SFW SWR		TR-1N 9/23/2004 TR-1-D01N-SFW SWR		TR-20N 9/25/2004 TR-20-T01N-SFW SWR		TR-20N 9/25/2004 TR-20-D01N-SFW SWR		TR-2N 9/23/2004 TR-2-T01N-SFW SWR		TR-2N 9/23/2004 TR-2-D01N-SFW SWR	
Cadmium	mg/L	D	-		0.00019	J	-		<0.0001	:	-		0.00016	J
Calcium	mg/L	D	-		43.3	:	-		42.	:	-		43.	:
Chromium	mg/L	D	-		<0.0011	:	-		<0.0011	:	-		<0.0011	J
Cobalt	mg/L	D	-		0.004	:	-		<0.0031	:	-		0.0032	:
Copper	mg/L	D	-		0.0092	:	-		0.0017	J	-		0.0029	J
Iron	mg/L	T	0.281	J	-		0.284	J	-		0.374	J	-	
Iron	mg/L	D	-		<0.0478	:	-		<0.039	:	-		<0.0478	:
Lead	mg/L	D	-		0.0034	:	-		<0.0001	:	-		<0.0001	:
Magnesium	mg/L	D	-		8.36	:	-		8.32	:	-		8.25	:
Manganese	mg/L	D	-		0.184	:	-		0.109	:	-		0.162	:
Mercury	mg/L	D	-		-		-		<0.0001	:	-		-	
Molybdenum	mg/L	D	-		<0.0026	:	-		0.0012	:	-		<0.0025	:
Nickel	mg/L	D	-		0.0112	:	-		0.0044	J	-		0.0104	:
Potassium	mg/L	D	-		1.16	:	-		1.45	:	-		1.05	:
Selenium	mg/L	D	-		<0.0002	J	-		<0.0003	:	-		<0.0002	J
Silver	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Sodium	mg/L	D	-		4.7	:	-		4.99	:	-		4.54	:
Thallium	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Vanadium	mg/L	D	-		<0.0001	:	-		<0.0001	J	-		<0.0001	:
Zinc	mg/L	D	-		<0.0525	:	-		0.0148	:	-		<0.0418	:

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Appendix A-5g
Focused Sampling - Surface Water - Radon and Transect
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID / SWR		Site ID / Sample Date / Sample ID / SWR		Site ID / Sample Date / Sample ID / SWR		Site ID / Sample Date / Sample ID / SWR		Site ID / Sample Date / Sample ID / SWR	
			TR-3N 9/23/2004 TR-3-T01N-SFW SWR		TR-3N 9/23/2004 TR-3-D01N-SFW SWR		TR-4N 9/24/2004 TR-4-T01N-SFW SWR		TR-4N 9/24/2004 TR-4-D01N-SFW SWR		TR-5N 9/24/2004 TR-5-T01N-SFW SWR		TR-5N 9/24/2004 TR-5-D01N-SFW SWR	
Field Measurements														
DO	mg/l	T	9.19	:	-		10.28	:	-		9.63	:	-	
EH	millivolts	T	59.2	:	-		13.8	:	-		75.3	:	-	
pH	SU	T	7.55	:	-		6.89	:	-		7.19	:	-	
Specific Conductance	uS/cm	T	540.	:	-		386.	:	-		617.	:	-	
Temperature	Celsius	T	10.04	:	-		5.69	:	-		8.77	:	-	
Turbidity	NTU	T	5.5	:	-		1.3	:	-		6.8	:	-	
General Chemistry														
Bicarbonate (as CaCO3)	mg/L	T	63.9	J	-		62.5	:	-		63.	:	-	
Carbonate (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Chloride	mg/L	T	3.	:	-		2.5	:	-		2.4	:	-	
Fluoride	mg/L	T	0.56	:	-		0.56	:	-		0.55	:	-	
Hydroxide (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Nitrate+Nitrite as N	mg/L	T	0.25	:	-		0.38	:	-		0.37	:	-	
Nitrite	mg/L	T	<0.005	:	-		0.0074	J	-		0.0054	J	-	
Phosphate, Ortho As P	mg/L	T	<0.01	:	-		<0.01	J	-		<0.01	J	-	
Phosphorus	mg/L	T	0.044	:	-		0.027	:	-		0.02	:	-	
Sulfate	mg/L	T	136.	J	-		87.9	:	-		88.9	:	-	
Total Alkalinity	mg/L	T	63.9	:	-		62.5	:	-		63.	:	-	
Total Dissolved Solids	mg/L	T	194.	:	-		206.	:	-		210.	:	-	
Total Organic Carbon	mg/L	T	<1.	:	-		<1.	:	-		1.1	:	-	
Total Suspended Solids	mg/L	T	14.	:	-		7.6	:	-		11.3	:	-	
Inorganics														
Cyanide	mg/L	T	<0.01	:	-		<0.01	:	-		<0.01	:	-	
Physical Properties														
Hardness	mg/L	D	-		-		-		138.	:	-		139.	:
Metals														
Aluminum	mg/L	T	1.06	:	-		1.1	:	-		1.08	:	-	
Aluminum	mg/L	D	-		<0.21	:	-		0.183	:	-		0.178	:
Antimony	mg/L	D	-		<0.00033	:	-		<0.00044	:	-		<0.00038	:
Arsenic	mg/L	D	-		<0.0001	:	-		<0.0001	J	-		<0.0001	J
Barium	mg/L	D	-		0.0347	:	-		0.0353	:	-		0.0362	:
Beryllium	mg/L	D	-		<0.0003	:	-		<0.0003	:	-		<0.0003	:
Boron	mg/L	D	-		<0.0061	:	-		<0.0069	:	-		<0.0069	:

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T = Total Fraction D= Dissolved Fraction

Appendix A-5g
Focused Sampling - Surface Water - Radon and Transect
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	TR-3N 9/23/2004 TR-3-T01N-SFW SWR		TR-3N 9/23/2004 TR-3-D01N-SFW SWR		TR-4N 9/24/2004 TR-4-T01N-SFW SWR		TR-4N 9/24/2004 TR-4-D01N-SFW SWR		TR-5N 9/24/2004 TR-5-T01N-SFW SWR		TR-5N 9/24/2004 TR-5-D01N-SFW SWR	
Cadmium	mg/L	D	-		<0.0001	J	-		0.00018	:	-		0.00016	:
Calcium	mg/L	D	-		42.2	J	-		41.8	:	-		42.3	:
Chromium	mg/L	D	-		<0.0011	:	-		<0.0011	:	-		<0.0011	:
Cobalt	mg/L	D	-		0.0019	:	-		0.0037	:	-		<0.0031	:
Copper	mg/L	D	-		0.0027	J	-		0.0026	J	-		0.0135	:
Iron	mg/L	T	0.299	J	-		0.249	J	-		0.235	J	-	
Iron	mg/L	D	-		<0.0478	:	-		0.0576	:	-		<0.0355	:
Lead	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Magnesium	mg/L	D	-		8.1	J	-		8.1	:	-		8.19	:
Manganese	mg/L	D	-		0.141	:	-		0.156	:	-		0.16	:
Mercury	mg/L	D	-		-		-		<0.0001	J	-		<0.0001	J
Molybdenum	mg/L	D	-		<0.0026	:	-		<0.0024	:	-		<0.0023	:
Nickel	mg/L	D	-		0.0095	:	-		0.0093	:	-		0.0095	:
Potassium	mg/L	D	-		1.11	:	-		1.	:	-		1.	:
Selenium	mg/L	D	-		<0.0002	J	-		<0.0003	:	-		<0.0003	:
Silver	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Sodium	mg/L	D	-		4.5	:	-		4.85	:	-		4.65	:
Thallium	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Vanadium	mg/L	D	-		<0.0001	:	-		<0.0001	J	-		<0.0001	J
Zinc	mg/L	D	-		<0.0315	:	-		0.0462	:	-		0.0432	:

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Appendix A-5g
Focused Sampling - Surface Water - Radon and Transect
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID	
			TR-6N 9/24/2004 TR-6-T01N-SFW		TR-6N 9/24/2004 TR-6-D01N-SFW		TR-7N 9/24/2004 TR-7-T01N-SFW		TR-7N 9/24/2004 TR-7-D01N-SFW		TR-8N 9/25/2004 TR-8-T01N-SFW		TR-8N 9/25/2004 TR-8-D01N-SFW	
			SWR		SWR		SWR		SWR		SWR		SWR	
Field Measurements														
DO	mg/l	T	9.15	:	-		8.87	:	-		10.21	:	-	
EH	millivolts	T	430.1	:	-		454.9	:	-		216.2	:	-	
pH	SU	T	6.17	:	-		7.4	:	-		7.43	:	-	
Specific Conductance	uS/cm	T	600.	:	-		597.	:	-		461.	:	-	
Temperature	Celsius	T	9.88	:	-		10.24	:	-		6.43	:	-	
Turbidity	NTU	T	0.2	:	-		0.	:	-		0.	:	-	
General Chemistry														
Bicarbonate (as CaCO3)	mg/L	T	63.9	:	-		68.	:	-		136.	J	-	
Carbonate (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Chloride	mg/L	T	2.3	:	-		2.3	:	-		2.8	:	-	
Fluoride	mg/L	T	0.53	:	-		0.51	:	-		0.51	:	-	
Hydroxide (as CaCO3)	mg/L	T	<1.	:	-		<1.	:	-		<1.	:	-	
Nitrate+Nitrite as N	mg/L	T	0.37	:	-		0.39	:	-		0.31	:	-	
Nitrite	mg/L	T	<0.005	J	-		<0.005	J	-		<0.005	J	-	
Phosphate, Ortho As P	mg/L	T	<0.01	J	-		<0.01	J	-		<0.01	J	-	
Phosphorus	mg/L	T	0.027	:	-		0.036	:	-		0.022	:	-	
Sulfate	mg/L	T	80.1	:	-		79.6	:	-		77.5	J	-	
Total Alkalinity	mg/L	T	63.9	:	-		68.	:	-		136.	:	-	
Total Dissolved Solids	mg/L	T	198.	:	-		212.	:	-		196.	:	-	
Total Organic Carbon	mg/L	T	1.2	:	-		1.	:	-		<1.	:	-	
Total Suspended Solids	mg/L	T	4.8	:	-		6.5	:	-		4.1	:	-	
Inorganics														
Cyanide	mg/L	T	<0.01	:	-		<0.01	:	-		<0.01	:	-	
Physical Properties														
Hardness	mg/L	D	-		149.	:	-		152.	:	-		136.	:
Metals														
Aluminum	mg/L	T	0.731	:	-		0.519	:	-		0.534	:	-	
Aluminum	mg/L	D	-		0.28	:	-		0.178	:	-		0.16	:
Antimony	mg/L	D	-		<0.0008	:	-		<0.00054	:	-		<0.00038	:
Arsenic	mg/L	D	-		<0.0001	J	-		<0.0001	J	-		<0.0001	J
Barium	mg/L	D	-		0.0361	:	-		0.0357	:	-		0.0363	:
Beryllium	mg/L	D	-		<0.0003	:	-		<0.0003	:	-		<0.0003	:
Boron	mg/L	D	-		<0.0069	:	-		<0.0069	:	-		<0.0069	:

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Appendix A-5g
Focused Sampling - Surface Water - Radon and Transect
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction	TR-6N 9/24/2004 TR-6-T01N-SFW SWR		TR-6N 9/24/2004 TR-6-D01N-SFW SWR		TR-7N 9/24/2004 TR-7-T01N-SFW SWR		TR-7N 9/24/2004 TR-7-D01N-SFW SWR		TR-8N 9/25/2004 TR-8-T01N-SFW SWR		TR-8N 9/25/2004 TR-8-D01N-SFW SWR	
Cadmium	mg/L	D	-		0.00016	:	-		<0.0001	:	-		0.00011	:
Calcium	mg/L	D	-		45.1	:	-		46.1	:	-		41.2	:
Chromium	mg/L	D	-		<0.0011	:	-		<0.0011	:	-		<0.0011	:
Cobalt	mg/L	D	-		<0.0031	:	-		<0.0031	:	-		<0.0031	:
Copper	mg/L	D	-		0.0025	J	-		0.0018	J	-		0.0014	J
Iron	mg/L	T	0.179	J	-		0.176	J	-		0.172	J	-	
Iron	mg/L	D	-		<0.0355	:	-		<0.0355	:	-		<0.0355	:
Lead	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Magnesium	mg/L	D	-		8.72	:	-		8.96	:	-		7.99	:
Manganese	mg/L	D	-		0.108	:	-		0.0838	:	-		0.0811	:
Mercury	mg/L	D	-		<0.0001	J	-		<0.0001	J	-		<0.0001	J
Molybdenum	mg/L	D	-		<0.003	:	-		<0.0025	:	-		<0.0023	:
Nickel	mg/L	D	-		0.0079	:	-		0.0074	:	-		0.0082	:
Potassium	mg/L	D	-		1.46	:	-		1.6	:	-		1.	:
Selenium	mg/L	D	-		<0.0003	:	-		<0.0003	:	-		<0.0003	:
Silver	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Sodium	mg/L	D	-		4.67	:	-		4.57	:	-		4.76	:
Thallium	mg/L	D	-		<0.0001	:	-		<0.0001	:	-		<0.0001	:
Vanadium	mg/L	D	-		<0.0001	J	-		<0.0001	J	-		<0.0001	J
Zinc	mg/L	D	-		0.0408	:	-		0.0317	:	-		0.0351	:

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Appendix A-5g
Focused Sampling - Surface Water - Radon and Transect
Validated Analytical Results

Parameter	Units	Exposure Area Fraction	Site ID / Sample Date / Sample ID		Site ID / Sample Date / Sample ID					
			TR-9N 9/25/2004 TR-9-T01N-SFW		TR-9N 9/25/2004 TR-9-D01N-SFW		----	----	----	----
			SWR		SWR					
Field Measurements										
DO	mg/l	T	9.55	:	-		-	-	-	-
EH	millivolts	T	244.7	:	-		-	-	-	-
pH	SU	T	7.91	:	-		-	-	-	-
Specific Conductance	uS/cm	T	459.	:	-		-	-	-	-
Temperature	Celsius	T	7.8	:	-		-	-	-	-
Turbidity	NTU	T	0.	:	-		-	-	-	-
General Chemistry										
Bicarbonate (as CaCO3)	mg/L	T	67.1	:	-		-	-	-	-
Carbonate (as CaCO3)	mg/L	T	<1.	:	-		-	-	-	-
Chloride	mg/L	T	2.7	:	-		-	-	-	-
Fluoride	mg/L	T	0.5	:	-		-	-	-	-
Hydroxide (as CaCO3)	mg/L	T	<1.	:	-		-	-	-	-
Nitrate+Nitrite as N	mg/L	T	0.29	:	-		-	-	-	-
Nitrite	mg/L	T	<0.005	J	-		-	-	-	-
Phosphate, Ortho As P	mg/L	T	<0.01	J	-		-	-	-	-
Phosphorus	mg/L	T	0.022	:	-		-	-	-	-
Sulfate	mg/L	T	79.	:	-		-	-	-	-
Total Alkalinity	mg/L	T	67.1	:	-		-	-	-	-
Total Dissolved Solids	mg/L	T	206.	:	-		-	-	-	-
Total Organic Carbon	mg/L	T	<1.	:	-		-	-	-	-
Total Suspended Solids	mg/L	T	4.2	:	-		-	-	-	-
Inorganics										
Cyanide	mg/L	T	<0.01	:	-		-	-	-	-
Physical Properties										
Hardness	mg/L	D	-		147.	:	-	-	-	-
Metals										
Aluminum	mg/L	T	0.507	:	-		-	-	-	-
Aluminum	mg/L	D	-		0.164	:	-	-	-	-
Antimony	mg/L	D	-		<0.00049	:	-	-	-	-
Arsenic	mg/L	D	-		<0.0001	J	-	-	-	-
Barium	mg/L	D	-		0.0369	:	-	-	-	-
Beryllium	mg/L	D	-		<0.0003	:	-	-	-	-
Boron	mg/L	D	-		<0.0069	:	-	-	-	-

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Appendix A-5g
Focused Sampling - Surface Water - Radon and Transect
Validated Analytical Results

Parameter	Units	Site ID / Sample Date / Sample ID / Exposure Area / Fraction											
		Site ID	TR-9N		TR-9N		----		----		----		----
		Sample Date	9/25/2004		9/25/2004								
		Sample ID	TR-9-T01N-SFW		TR-9-D01N-SFW								
		Exposure Area	SWR		SWR								
Cadmium	mg/L	D	-		<0.0001	:	-		-		-		-
Calcium	mg/L	D	-		44.6	:	-		-		-		-
Chromium	mg/L	D	-		<0.0011	:	-		-		-		-
Cobalt	mg/L	D	-		<0.0031	:	-		-		-		-
Copper	mg/L	D	-		0.0015	J	-		-		-		-
Iron	mg/L	T	0.174	J	-		-		-		-		-
Iron	mg/L	D	-		<0.0355	:	-		-		-		-
Lead	mg/L	D	-		<0.0001	:	-		-		-		-
Magnesium	mg/L	D	-		8.72	:	-		-		-		-
Manganese	mg/L	D	-		0.0836	:	-		-		-		-
Mercury	mg/L	D	-		<0.0001	:	-		-		-		-
Molybdenum	mg/L	D	-		0.0022	:	-		-		-		-
Nickel	mg/L	D	-		0.0079	:	-		-		-		-
Potassium	mg/L	D	-		1.45	:	-		-		-		-
Selenium	mg/L	D	-		<0.0003	:	-		-		-		-
Silver	mg/L	D	-		<0.0001	:	-		-		-		-
Sodium	mg/L	D	-		4.88	:	-		-		-		-
Thallium	mg/L	D	-		<0.0001	:	-		-		-		-
Vanadium	mg/L	D	-		<0.0001	J	-		-		-		-
Zinc	mg/L	D	-		0.037	:	-		-		-		-

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