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DATA SUMMARY AND ANALYSIS FOR BAT AND WATER QUALITY BASED EFFLUENT LIMITATIONS

This document is a summary of the data evaluations that were performed for the purpose of determining the appropriate effluent limitations for Discharge 001 and Discharge 002 for the renewal of the NPDES permit for the Molycorp mine at Questa New Mexico, NM 0022306. The effluent data from the Discharge Monitoring Reports (DMRs) and recently conducted, but unrelated to the NPDES permit, remedial investigation (RI) studies were evaluated to determine if there was a technical basis for continuing to monitor all of the parameters in the previous permit. The data from the RI studies provided data on a number of additional parameters that were not limited in the previous permit. The data from the RI studies and the existing USGS data were evaluated to characterize the ambient stream concentrations above the discharge. These data allowed the calculation of a projected worst case in stream waste concentration (IWC) for each parameter and direct comparison of the IWC with the most stringent New Mexico stream standard (July 2005). This comparison allows a determination of whether a discharge causes, has a reasonable potential to cause, or contributes to an in stream excursion above the water quality standard.

Reasonable Potential

Arsenic, Copper, Lead, and Zinc

The reasonable potential analysis, using conservative assumptions and the 2.14 multiplier (from the Region 6 IWC procedure) for the mean effluent values indicates that there is a substantial margin between the predicted worst case in stream waste concentration (Cd) and the most stringent water quality standard for these parameters. **Monitoring for these parameters can be removed from the permit or reduced to quarterly.**

Mercury and Cyanide

The monitoring demonstrates that mercury and cyanide were either absent or not present in detectable amounts. In this case, it is appropriate to depend on the certification of the permittee that these substances are not believed to be present. **Monitoring for these parameters should be removed from the permit.**

Additional Trace Metals

The reasonable potential analysis indicates that there is a substantial margin between the predicted worst case in stream waste concentration (Cd) and the most stringent water quality standard for **antimony, barium, beryllium, chromium, cobalt, nickel, selenium, silver, thallium and vanadium. The data confirms that permit monitoring is unnecessary for these metals.**

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Best Available Treatment

The existing concentration limits **for flow, pH, Chemical Oxygen Demand, Total Suspended Solids, fluoride, iron, molybdenum, and manganese** have effluent limitations that are not based on water quality standards. The effluent limitations for the parameters in this section are not water quality based effluent limitations (WQBELs). The effluent limitations are based on Best Available Treatment and are not calculated from stream standards, stream background concentrations, and stream flows and permitted capacities. Monitoring is required and is not dependent on the calculation of Reasonable Potential. There is new data on many of these parameters from both the plant discharge and from the special RI studies that have been performed. This data has been summarized, but has not been used to develop or evaluate effluent limitations.

BAT effluent guidelines are established in the Clean Water Act as the principal national means to control the direct discharge of pollutants where state standards for parameters have not been implemented, or where economically available treatment technologies are available for an industrial subcategory. The uniform application of secondary treatment standards for BOD and TSS for municipal discharges is a good example of effluent guidelines that are applied nationwide.

The mass limits for fluoride, molybdenum, and manganese are BAT limitations. The effluent limitations for these parameters were not evaluated at this time. **The BAT based effluent limitations in the new permit are expected to be the same as the existing permit. (A reevaluation of the basis for the old BAT limits may be appropriate, in some cases.)**

Mass limits for Total Suspended Solids, Chemical Oxygen Demand, and total iron have little meaning since most of the concentration values are "less than" values that are far below the concentration limits and the calculation of a mass loading for these parameters is a function of the "less than" value used in the calculation. **Reporting these mass values has little value and the requirement to calculate and report should be removed from the permit.**

pH (Outfall 002)

- The range of pH values for this discharge was 7.0 to 7.8.
- The median monthly low pH value was 7.28. The median monthly high pH value was 7.48.

Conclusion: The pH is well characterized. The data set has over 200 measurements, shows low variability, and has no outliers that are close to levels of regulatory concern.

TOTAL SUSPENDED SOLIDS (TSS) Concentration (Outfall 002)

- The maximum TSS value for the 50 month period was 7.2 mg/L, and was the only detected measurement.
- The absolute range of TSS values for this discharge could be estimated to be between 2 to 7.2 mg/L.

Conclusion: The TSS concentration is well characterized. The data set has a median of "less than" 4 mg/L and has no outliers that are close to the BAT levels of regulatory concern - 30 mg/L.

CHEMICAL OXYGEN DEMAND (COD) concentration (Outfall 002)

- The range of COD values for this discharge could be estimated to be between 5 to 25 mg/L.

Conclusion: The COD concentration is well characterized. The data set has a median of "less than" 10mg/L and has no outliers that are close to the levels of regulatory concern - 90 mg/L.

FLUORIDE concentrations (Outfall 002)

The existing effluent limitations are based on Best Available Treatment or Best Professional Judgment and are not calculated from stream standards, stream background concentrations, and stream flows and permitted capacities. Monitoring is required and is not used in the calculation of Reasonable Potential.

DMR data

- The range of fluoride values for the 50 month period was 0.94 – 2.0 mg/L.
- The variability is low. The coefficient of variation is 16.0 %.

Conclusion: The fluoride concentration is well characterized. The measured and predicted outliers are below the BPJ regulatory level of concern - 3.0 mg/L.

FLUORIDE Mass (Outfall 002)

- The range of fluoride mass values for this discharge was approximately 3.4 to 9.9 pounds per day.
- The variability is moderate. The coefficient of variation is 18.6%.

Conclusion: The fluoride mass is well characterized. The data set has one value above the level of regulatory concern, 8.75 lb/day, which may be an outlier. There is reasonable potential for fluoride mass to exceed the existing effluent limitation.

MANGANESE Concentration (Outfall 002)

DMR Data

- The range of manganese values for the DMR data set was 0.46 to 1.3 mg/L.
- The variability is moderate. The coefficient of variation is 25.6%.

RI Data Set

The RI data was taken between November 2002 and April 2004 at approximately quarterly intervals. There are twelve samples taken at two sites, Outfall 002 and Outfall 002 Pipe.

- The range of manganese values for the RI data set was 0.46 to 0.73 mg/L.
- The mean manganese concentration for the RI data set is 0.61 mg/L.

Conclusion: The manganese concentration is well characterized. The data shows moderate variability, and has no outliers that are greater than the BAT level of regulatory concern, 1.5 mg/L. The mean was characterized in two separate data sets in the 0.61 to 0.67 range.

MANGANESE Mass (OUTFALL 002)

- The range of manganese mass values for this data set was 1.6 to 4.1 #/day.
- The variability is moderate. The coefficient of variation is 22.6%.

Conclusion: The manganese mass is well characterized. The data set has no values above the level of regulatory concern, 4.38 #/day. There are several values within two standard deviations of the standard, suggesting that the value of 4.1 #/day is not an outlier. Treatment modifications were performed to reduce the manganese mass.

MOLYBDENUM Concentration (Outfall 002)

DMR Data

- The range of molybdenum values for this discharge was approximately 1.1 to 1.8 mg/L.
- The variability is low. The coefficient of variation is 13.1%.

RI Data Set

The RI data was taken between November 2002 and April 2004 at approximately quarterly intervals. There are twelve samples taken at two sites, Outfall 002 and Outfall 002 Pipe.

- The range of molybdenum values for the RI data set was 1.1 to 1.4 mg/L.
- The mean molybdenum concentration for the RI data set is 1.2 mg/L.

Conclusion: The molybdenum concentration is well characterized. The mean was characterized in two separate data sets in the 1.2 to 1.37 range. The data shows low variability, and has no outliers that are close to the levels of regulatory concern - 5.03 mg/L. There is no reasonable potential for molybdenum concentration to exceed the existing BAT/BPJ effluent limitation.

MOLYBDENUM Mass (Outfall 002)

DMR data set

- The range of molybdenum mass values for this discharge was 4.3 to 7.2 #/day.
- The variability is low. The coefficient of variation is 13.5%.

Conclusion: The molybdenum mass is well characterized. The data set has no values close to the level of regulatory concern, - 14.7 # per day. There is no reasonable potential for molybdenum mass to exceed the existing BAT effluent limitation.

IRON TOTAL Concentration (Outfall 002)

DMR data

- The range of iron values for this data set could be estimated to be between 50 and 280 µg/L.

RI Data Set

The RI data was taken between November 2002 and April 2004 at approximately quarterly intervals. There are twelve samples taken at two sites, Outfall 002 and Outfall 002 Pipe. Only two values were measured in this data set.

- The range total iron values for was 25 to 170 µg/L.

Conclusion: The iron (total) concentration is well characterized. The data set has a median of "less than" 100 µg/L and has no outliers that are close to the levels of regulatory concern - 600 µg/L.

IRON, TOTAL, (Iron) Mass (Outfall 002)

- The range of iron mass values for this discharge could be estimated to be 0.2 to 1.38 #/day.

Conclusion: The iron (total) mass is well characterized. The data set has over 50 measurements. The data set has a median of 0.43 #/day based on calculations using 100 µg/L as the concentration and has no outliers that are close to the levels of regulatory concern, 1.75 #/day.

Water Quality Based Effluent Limitations

There is additional data that has been generated on a number of parameters since the last permit for this discharge was issued. The new data includes the plant discharge data on seven metals and cyanide that have been generated monthly as a Discharge Monitoring Report (DMR) requirement, plant discharge data on twenty two metals on grab samples taken from the grab samples of 002, and data from the Red River at numerous sites in three discrete segments of the river (RI data). These data were summarized and discussed in the Data Analysis and Discussion document. Spreadsheets of the raw data and spreadsheets with parameters of interest extracted and summarized are included in the data package.

The data for these parameters were evaluated using the procedures for determining the potential to exceed numeric criteria, given in the *Region VI Implementation Guidance for State of New Mexico Standards for Interstate and Intrastate Streams*. This procedure uses ambient concentrations of the receiving body and the historical effluent data, along with the statistically based low flow and plant permitted capacities to calculate an estimate of the worst case in stream waste concentration (IWC) that is likely to occur. This worst case IWC value is then compared to the most restrictive stream standard that would apply to the receiving stream to determine if there is a reasonable potential for the discharge to cause or contribute to the exceedance of this stream standard. The additional data allows that comparison to be made.

The following tables summarize this analysis.

Table 1
Reasonable Potential Spreadsheet - Discharge 002

F = Fraction of stream allowed for mixing
Ca = Ambient stream concentration (dissolved) above the discharge. Values are arithmetic or geometric means.
Qe = WWTP design flow 4.30 MGD for 001 plus .746 MGD
Cp = Average effluent concentration for WWTP. Values are total metals.
Ce = Estimated 95th percentile effluent concentration
Cd = Cd is a worst case IWC calculation using the 2.14 multiplier for Cp
WQCt = Total water quality standard
C/Ct = Fraction of total metal that is dissolved. Values in table from previous permit calculation.
WQCd = Dissolved water quality standard
Hardness based metals are based on a hardness of 127 mg/L as CaCO3

Existing Permit Parameters that have effluent limitations that are based on Water Quality Standards

Parameter	F	Qa	Ca	Qe	Cp	Ce	Cd	WQCt	C/Ct	WQCd
	MZ adj	4Q3 mgd	Ambient µg/L	Max Flow mgd	mean µg/L	95th%tile µg/L	(IWC) µg/L	Total µg/L		Dissolved µg/L
Arsenic	1	4.58	0.43	0.726	0.5	1.07	**0.47**	**4.4**	0.528	2.3
Cadmium*	1	4.58	0.33	0.726	0.6	1.28	**0.39**	**0.29**	1	0.29
Cadmium	1	4.58	0.33	0.726	0.6	1.28	**0.39**	**2.67**	1	2.67
Copper	1	4.58	2.5	0.726	2.5	5.35	**2.68**	**31.8**	0.346	10.99
Lead	1	4.58	0.35	0.726	0.35	0.75	**0.37**	**17.7**	0.184	3.26
Zinc	1	4.58	15	0.726	15	32.10	**16**	**501.7**	0.286	143.5
Molybdenum**	1	4.58	46	0.726	1400	2996	**230**	**1000.0**	1	1000
Aluminum	1	4.58	166	0.726	100	214	**169**	**750.0**	1	750

*The dissolved water quality standard for cadmium is based on the equations given in State of New Mexico Standards for Interstate and Intrastate Surface Waters as amended July 17, 2005.

**Molybdenum is limited by BAT

***The recommendation is to set the permit limit based on the acute aluminum water quality standard.

Table 2
Additional parameters to evaluate effluent limits based on Water Quality Standards 002

Parameter	F MZ adj	Qa 4Q3 mgd	Ca Ambient µg/L	Qe Max Flow mgd	Cp Median* µg/L	Ce 95th%tile µg/L	Cd (IWC) µg/L	WQCt Total µg/L	C/Ct	WQCd Dissolved µg/L
Antimony	1	4.58	0.5	0.726	1.0	2.14	**0.60**	**5.6**	1	5.6
Barium	1	4.58	37	0.726	29.0	62.06	**38.6**	**2000**	1	2000
Beryllium	1	4.58	0.2	0.726	0.3	0.64	**0.23**	**4.0**	1	4
Boron	1	4.58	12	0.726	31.0	66.34	**15.4**	**750**	1	750
Chromium	1	4.58	1	0.726	1.5	3.21	**1.14**	**90.1**	1	90.1
Cobalt	1	4.58	3	0.726	2.5	5.35	**3.1**	**50.0**	1	50
Nickel	1	4.58	10.3	0.726	3.0	6.42	**10**	**63.7**	1	63.7
Selenium	1	4.58	0.75	0.726	1.5	3.21	**0.9**	**5.0**	1	5
Silver	1	4.58	0.2	0.726	0.2	0.43	**0.21**	**5.0**	1	4.95
Thallium	1	4.58	0.1	0.726	0.2	0.43	**0.12**	**1.7**	1	1.7
Vanadium	1	4.58	0.3	0.726	1.6	3.42	**0.49**	**100**	1	100

* Due to the large number of non detect values, the median value was used instead of the mean values for most parameters.

Table 3

Reasonable Potential Spreadsheet - Discharges 001 and 002 Combined

F = Fraction of stream allowed for mixing
Qa = Critical low flow at discharge point - 4Q3 7.05 cfs – 4.58 MGD
Ca = Ambient stream concentration (dissolved) above the discharge. Values are arithmetic or geometric means.
Qe = WWTP design flow 4.30 MGD for 001 plus .746 MGD for 002
Cp = Average effluent concentration for WWTP. Values are total metals.
Ce = Estimated 95th percentile effluent concentration
Cd = Cd is a worst case IWC calculation using the 2.14 multiplier for Cp
WQCt = Total water quality standard
C/Ct = Fraction of total metal that is dissolved. Values in table from previous permit calculation.
WQCd = Dissolved water quality standard
Hardness based metals are based on a hardness of 127 mg/L as CaCO3

Existing Permit Parameters that have effluent limitations that are based on Water Quality Standards

Parameter	F	Qa	Ca	Qe	Cp	Ce	Cd	WQCt	C/Ct	WQCd	
	MZ adj	4Q3 mgd	Ambient µg/L	Max Flow mgd	mean µg/L	95th%tile µg/L	(IWC) µg/L	Total µg/L		Dissolved µg/L	
Arsenic	1	4.58	0.43	5.05	0.5	1.07	**0.77**	**4.4**	0.528	2.3	
Cadmium*	1	4.58	0.33	5.05	0.6	1.28	**0.83**	**0.29**	1	0.29	New
Cadmium	1	4.58	0.33	5.05	0.6	1.28	**0.83**	**2.67**	1	2.67	Old
Copper	1	4.58	2.5	5.05	2.5	5.35	**3.99**	**31.8**	0.346	10.99	
Lead	1	4.58	0.35	5.05	0.35	0.75	**0.56**	**17.7**	0.184	3.26	
Zinc	1	4.58	15	5.05	15	32.10	**24**	**501.7**	0.286	143.5	
Molybdenum**	1	4.58	46	5.05	1400	2996	**1592**	**1000**	1	1000	Irrigation
Aluminum	1	4.58	166	5.05	100	214	**191**	**750.0**	1	750	Acute

*The dissolved water quality standard for cadmium is based on the equations given in State of New Mexico Standards for Interstate and Intrastate Surface Waters as amended July 17, 2005.

**Molybdenum is limited by BAT

***The recommendation is to set the permit limit based on the acute aluminum water quality standard.

Table 4

Additional parameters to evaluate effluent limits based on Water Quality Standards 001 and 002

Parameter	F MZ adj	Qa 4Q3 mgd	Ca Ambient µg/L	Qe Max Flow Mgd	Cp Median* µg/L	Ce 95th%tile µg/L	Cd (IWC) µg/L	WQCt Total µg/L	C/Ct	WQCd Dissolved µg/L
Antimony	1	4.58	0.5	5.046	1.0	2.14	**1.36**	**5.6**	1	5.6
Barium	1	4.58	37	5.046	29.0	62.06	**50.1**	**2000**	1	2000
Beryllium	1	4.58	0.2	5.046	0.3	0.64	**0.43**	**4.0**	1	4
Boron	1	4.58	12	5.046	31.0	66.34	**40.5**	**750**	1	750
Chromium	1	4.58	1	5.046	1.5	3.21	**2.16**	**90.1**	1	90.1
Cobalt	1	4.58	3	5.046	2.5	5.35	**4.2**	**50.0**	1	50
Nickel	1	4.58	10.3	5.046	3.0	6.42	**8**	**63.7**	1	63.7
Selenium	1	4.58	0.75	5.046	1.5	3.21	**2.0**	**5.0**	1	5
Silver	1	4.58	0.2	5.046	0.2	0.43	**0.32**	**5.0**	1	4.95
Thallium	1	4.58	0.1	5.046	0.2	0.43	**0.27**	**1.7**	1	1.7
Vanadium	1	4.58	0.3	5.046	1.6	3.42	**1.94**	**100**	1	100

* Due to the large number of non detect values, the median value was used instead of the mean values for most parameters.

Effluent Limitations for Discharge 002

The State of New Mexico Standards for Interstate and Intrastate Surface Waters, 20.6.4 NMAC, as amended through July 17, 2005 was used as the source of the water quality standards that were compared with the worst case IWC (Cd in the above tables). These water quality standards may not have been approved by EPA Region VI.

Cadmium was the only parameter that demonstrated a reasonable potential to cause or contribute to an exceedance of a water quality standard. The July 17, 2005 standards used a new equation for calculating the hardness based cadmium standard. Based on this calculation, the ambient upstream concentration exceeds the new cadmium stream standard. If the new cadmium standard is correct, this segment will need to be evaluated for a TMDL or a site specific standard.

The evaluation used the acute standard for dissolved aluminum of 750 µg/L instead of the chronic standard of 87 µg/L. The stream data clearly indicates that the ambient aluminum concentrations upstream of the discharge substantially exceed the chronic dissolved aluminum standard of 87 µg/L. The chronic aluminum standard is currently under evaluation in other states and EPA regions. Our recommendation is to base the effluent limitation on the acute standard of 750 µg/L until the standards can be re-evaluated or a site specific standard can be developed.

Effluent Limitations for 001 and 002 Combined

There was no discharge from Discharge 001 during the permitting period, there was no new data on the quality of the discharge. For the reasonable potential analysis, it was assumed that the effluent concentrations of 001 would be equal to the concentrations of 002.

There was one additional parameter that demonstrated reasonable potential when the combined impact of 001 and 002 was evaluated. The analysis indicated that there was reasonable potential for the combined discharge to cause or contribute to an exceedance of the molybdenum stream standard for irrigation of 1.0 mg/L.

The water quality based effluent limitation was calculated for the combined discharge

Parameter	Qa	F	Ca	Qe	Cs	Cp - Daily Max Concentration	Monthy Average
Molybdenum	4.58	1	46	5.046	1000	1866	1244

Where:

Qa	= Critical low flow at discharge point - 4Q3	4.58 MGD	001	002
F	= Fraction of stream allowed for mixing			
Ca	= Ambient stream concentration			
Qe	= WWTP design flow – 001 plus 002		4.3 MGD	0.746 MGD
Cs	= Water quality standard for irrigation	1000 µg/L		

In previous permits, different limits have been set for the two discharges. The 30 day average effluent limitation for molybdenum for Discharge 002 (flow = 0.746 MGD) was set at 3.3 mg/L. Since the monthly average effluent limitation for the combined flow from 001 and 002 has been calculated, the flow and the effluent limitation for 002 is known the monthly average effluent limitation for Discharge 001 can be calculated using the mixing equation.

$$\text{Monthly Average Limit for 001} = \frac{(1244 \times 5.046) - (3300 \times .746)}{4.3 \text{ MGD}} = 887\ \mu g/L$$

A calculated monthly average effluent limitation for molybdenum for 001 of 0.9 mg/L is required to meet the water quality based standard for irrigation of 1.0 mg/L in the Red River, if a monthly average BAT limit of 3.3 mg/L is allocated to 002. This is consistent with past permitting practice and recognizes that discharge from 001 is infrequent (There was no discharge during the entire term of the previous permit). If discharge 001 is to resume, the permit could be amended to assign a lower molybdenum effluent limit to 002 and calculate a higher limit for molybdenum at 001.

Parameters that could not be evaluated

Cyanide and mercury were included in the DMR monitoring, and mercury was included in the RI monitoring of Discharge 002 and on the Red River sites. The detection limit of the methods used for these analyses was not low enough to determine if the water quality standard had been met. There is no reason to believe that mercury and cyanide is present in the discharge, and the monitoring that was performed verified that mercury and cyanide were not present in detectable concentrations.

Monitoring Recommendations

Best Available Treatment (BAT) Parameters

BAT effluent guidelines are established in the Clean Water Act as the principal national means to control the direct discharge of pollutants where state standards for parameters have not been implemented, or where economically available treatment technologies are available for an industrial subcategory. The uniform application of secondary treatment standards for BOD and TSS for municipal discharges is a good example of effluent guidelines that are applied nationwide.

Monitoring frequency, and concentration limits for flow, pH, Chemical Oxygen Demand, Total Suspended Solids, fluoride, iron, molybdenum, and manganese are BAT limitations. Mass limits for fluoride, molybdenum, and manganese are BAT limitations. The effluent limitations for these parameters were not evaluated at this time (a reevaluation of the basis for the old BAT limits may be appropriate, in some cases).

Mass limits for Total Suspended Solids, Chemical Oxygen Demand, and total iron have little meaning since most of the concentration values are "less than" values that are far below the concentration limits and the calculation of a mass loading for these parameters is a function of the "less than" value used in the calculation.

Reporting these mass values has little value and the requirement to calculate and report should be removed from the permit.

Aluminum

The aluminum issue is not resolved. There is no reasonable potential if the acute standard of 750 µg/L for dissolved aluminum is applied. There is reasonable potential if the chronic standard of 87 µg/L is applied. However, it is not clear whether the aluminum concentrations in 002 could consistently meet a 87 µg/L effluent limitation. The recommended approach is to set the effluent limitation based at the acute dissolved standard of 750 µg/L with re-opener language pending resolution of the chronic aluminum standard issue.

Monthly monitoring should be continued. The permit should specify that a method with a detection limit of at least 25 µg/L be used.

Cadmium

The July 15 amendments to the New Mexico standards lowered the stream standard for cadmium by almost a factor of ten (2.67 µg/L to 0.29 µg/L). This change moves this segment of the Red River from full attainment, with a large margin of safety to a situation where the upstream ambient values may be greater than the water quality standard. Detection limit was not a factor in determining compliance with a stream standard of 2.67 µg/L. Detection limit problems with the existing data set make it difficult to determine if either the ambient cadmium concentrations or the effluent concentrations at 002 are above or below the new stream standard.

Monthly monitoring should be continued. The permit should specify that a method with a detection limit of at least 0.05 µg/L be used. Effluent limitations should not be established until the ambient cadmium concentrations can be determined using more sensitive analytical techniques (if they are available.)

Arsenic, Copper, Lead, and Zinc

The reasonable potential analysis, using conservative assumptions and the 2.14 multiplier (from the Region 6 IWC procedure) for the mean effluent values indicates that there is a substantial margin between the predicted worst case in stream waste concentration (Cd) and the most stringent water quality standard for these parameters. The predicted worst case in stream waste concentrations are between eight and thirty times less than the stream standard. By observation there is no reasonable potential for the discharge to

cause or contribute to an exceedance of the stream standard for these parameters and a more formal Reasonable Potential analysis is unnecessary.

Monitoring for these parameters can be removed from the permit or reduced to quarterly.

Additional Trace Metals

The RI data sets provided a good characterization of ambient conditions for a number of trace metals in the Red River immediately above the discharge and in discharge 002 These data were subjected to the same IWC evaluation and comparison with stream standards procedure that was used for the permitted metals.

The metals analyzed were: Antimony, barium, beryllium, chromium, cobalt, nickel, selenium, silver, thallium and vanadium. Again, the predicted worst case in stream waste concentrations are between eight and thirty times less than the stream standard for either the separate or combined discharges. By observation there is no reasonable potential for the discharge to cause or contribute to an exceedance of the stream standard for these parameters and a more formal Reasonable Potential analysis is unnecessary.

The data confirms that permit monitoring is unnecessary for these metals.

Mercury and Cyanide

No useful information was obtained from monitoring these two parameters. The detection limit limitations made it impossible to determine if these compounds were present or absent. The monitoring demonstrated that they were either absent or not present in detectable amounts. In this case, it is appropriate to depend on the certification of the permittee that these substances are not believed to be present.

Monitoring for these parameters should be removed from the permit.

CRITICAL ANALYSIS of the EXISTING WATER-QUALITY DATABASE

PERMIT RENEWAL APPLICATION FOR NM0022306

There is additional effluent data that has been generated on a number of parameters since the last permit for this discharge was issued. The new effluent data includes the plant discharge data on seven metals and cyanide that have been generated monthly as a Discharge Monitoring Report (DMR) requirement and plant discharge data on 22 (twenty two) metals taken on RI samples from Outfall 002 and Outfall 002 pipe.

Data on the Red River above discharge 002 - The previous permit relied on the USGS gage and limited water quality sampling on the Red River upstream of discharges 001 and 002. The site is USGS 08265000 Red River near Questa, New Mexico, latitude 36° 42'12", longitude 105° 34'04". The site is approximately 3.2 miles above discharge 002, just west of the Questa Ranger station. The USGS site is upstream of the diversion for Eagle Rock Lake, a small off channel reservoir, the confluence with Cabresto Creek, and the discharge from the Town of Questa WWTP. The period of record is 1978 through 1986. The sampling frequency is approximately monthly.

There is additional, more recent data on the Red River in the reach just above discharges 001 and 002 collected as part of remedial investigation (RI) studies unrelated to the NPDES permit. The RI data set includes five discrete sites in Surface Water Area 11. Surface Water Area 11 is downstream of the USGS site and Cabresto Creek confluence, and, as such, closer to Outfall 002. The period of record is September 2002 to September 2003. The reach is described as Red River along Tailings Piles.

These data sets have been analyzed to characterize the effluent concentrations for parameters that were monitored in the existing permit and to characterize the ambient stream concentration upstream of the discharge.

FLOW – Outfall 002

- Flow is measured daily.
- The data is summarized on the DMR. The reported data include the monthly average and the maximum daily flow during the calendar month. Raw flow data was not analyzed
- There is data for fifty months.

Monthly Average Flows

- There are 50 data points for Monthly Average
- The average of the 50 monthly averages reported is .523 MGD. The range of monthly averages was 0.400 MGD to .655 MGD

- The average of monthly averages appears to be normally distributed with the mean and median in close agreement.
- The monthly averages show little variability. Coefficient of variation is 12.6%

Monthly Maximum Flow

- The maximum flow for the 50 month period was 0.726 MGD. This flow is the maximum value recorded over a data set of approximately 1500 days.
- The average of the 50 monthly maximums reported is .646 MGD. The range of monthly maximums was 0.464 MGD to .726 MGD
- The average of monthly maximums appears to be normally distributed with the mean and median in close agreement.
- The monthly maximums show little variability. Coefficient of variation is 12.8%

Conclusion: The flow is well characterized. The data set has over 1500 measurements, and shows low variability. The average monthly flow is about 0.50 MGD, with maximum daily flows of about 0.75 MGD.

River Data

There is a USGS gage and water quality sampling site on the Red River upstream of discharges 001 and 002. The site is USGS 08265000 Red River near Questa, New Mexico. Latitude 36° 42'12", Longitude 105° 34'04". The site is approximately 3.2 miles above discharge 002. The site is just south of SR-38 just west of the Questa Ranger station. It is upstream of the diversion for Eagle Rock Lake, a small off channel reservoir, and the confluence with Cabresto Creek. The site is above the discharge from the Town of Questa WWTP.

The period of record is 1978 through 1986

River Flow

The flow is measured when water quality samples are taken. There are continuous flow records for determining statistical low flows. This analysis is from the period of record and covers a wide range of flows over an eight year period.

- There are 69 flow values in the data set.
- The range is from 5 cfs to 1100 cfs.
- The flow values show strong seasonality, with the majority of high flow values in May and June and the low values from October through March.
- The data is not normally distributed. The arithmetic mean (77 CFS) is significantly different than the median (24 cfs).
- The geometric mean (32 cfs) and the median (24 cfs) are fairly close, which suggests that the data is lognormally distributed.

- The 2nd percentile flow is 5 cfs. The 5th percentile flow is 7.1 cfs. This low flow range is consistent with the receiving stream critical low flow (4Q3) of 7.05 cfs.

Conclusion: The range, seasonality and characteristic low flows are well characterized by this data set.

Qa – River flow for developing WQBELS and RP will continue to be 7.05 CFS.

pH (Outfall 002)

- The frequency of pH measurement is weekly.
- The data set includes 50 months or approximately 200 pH measurements.
- The data is summarized on the DMR. The monthly minimum and the monthly maximum values are reported.
- The minimum pH value for the 50 month period was 7.00 SU. This pH value is the minimum value recorded over a data set of approximately 200 measurements.
- The maximum pH value for the 50 month period was 7.77 SU. This pH value is the maximum value recorded over a data set of approximately 200 measurements.
- The range of pH values for this discharge was 7.0 to 7.8.
- The median monthly low pH value was 7.28. The median monthly high pH value was 7.48.
- A characteristic pH range for this discharge is approximately 7.3 to 7.5.

Conclusion: The pH is well characterized. The data set has over 200 measurements, shows low variability, and has no outliers that are close to levels of regulatory concern.

River pH

- pH is measured when water quality samples are taken
- The data set includes 63 pH measurements.
- The minimum pH value for the data set was 3.8 SU. There were 2 pH values less than 6.0 in the data set.
- The maximum pH value for the data set was 8.2 SU. There were six pH values equal or greater than 8.0 SU.
- The range of pH values for this data set was approximately 3.8 to 8.2.
- The median pH value was 7.5. (Since pH is a logarithmic function, median is a better indication of central tendency than arithmetic average.)
- A characteristic pH range for this stream segment is 7.0 to 7.9

Conclusion: The pH is well characterized. The data set has over 60 measurements. The data contains low pH outliers that are not typical of stream pH data sets and are at levels that are of regulatory concern.

FLUORIDE concentrations (Outfall 002)

The effluent limitations for fluoride are not water quality based effluent limitations (WQBELs). The effluent limitations are based on Best Available Treatment and are not calculated from stream standards, stream background concentrations, and stream flows and permitted capacities. Monitoring is required and is not dependent on the calculation of Reasonable Potential.

DMR data

- The frequency of fluoride measurement is once per month.
- The DMR data set includes 50 months or approximately 50 measurements. (On some occasions more than one sample was analyzed.) A value was measured for each of the 50 samples taken. There were no "non-detects" in this data set. This data set can be subjected to standard statistical analysis.
- The data is summarized on the DMR. The monthly average and the monthly maximum values are reported. However since there is usually only one data point per month, the maximum value can be treated as a discrete data point.
- The minimum fluoride value for the 50 month period was 0.94 mg/L. This fluoride value is the minimum value recorded over a data set of approximately 50 measurements.
- The maximum fluoride value for the 50 month period was 2.0 mg/L. This fluoride value is the maximum value recorded over a data set of approximately 50 measurements.
- The range of fluoride values for this discharge was 0.94 to 2.0 mg/L.
- The data is normally distributed. There is close agreement between the median (1.40 mg/L) and the mean (1.43 mg/L).
- The variability is low. The coefficient of variation is 16.0 %.

Conclusion: The fluoride concentration is well characterized. The data set has over 50 measurements, and shows low variability. The data set has no outliers that are close to levels of regulatory concern. The measured and predicted outliers are below the BAT regulatory level of concern - 3.0 mg/L.

FLUORIDE Mass (Outfall 002)

- The frequency of fluoride measurement is once per month.
- The data set includes 50 months or approximately 50 measurements. The mass values were calculated using the fluoride measurement and the corresponding flow from that day.
- The data is summarized on the DMR. The monthly average and the monthly maximum values are reported. However since there is usually only one data point per month, the maximum value can be treated as a discrete data point.

- The minimum fluoride mass value for the 50 month period was 3.38 pounds per day. This fluoride value is the minimum mass value recorded over a data set of approximately 50 measurements.
- The maximum fluoride mass value for the 50 month period was 9.84 pounds per day. This fluoride value is the maximum mass value recorded over a data set of approximately 50 measurements.
- The range of fluoride mass values for this discharge was approximately 3.4 to 9.9 pounds per day.
- The data are normally distributed. There is close agreement between the median (5.99 mg/L) and the mean (6.16 mg/L).
- The variability is moderate. The coefficient of variation is 18.6%.

Conclusion: The fluoride mass is well characterized. The data set has over 50 measurements. The data shows moderate variability. The data set has one value above the level of regulatory concern, 8.75 lb/day, which may be an outlier. There are five values within one standard deviation of 8.75 lb/day. There is reasonable potential for fluoride mass to exceed the existing effluent limitation.

MANGANESE Concentration (Outfall 002)

The effluent limitations for manganese are not water quality based effluent limitations (WQBELs). The effluent limitations are based on Best Available Treatment and are not calculated from stream standards, stream background concentrations, and stream flows and permitted capacities. Monitoring is required and is not dependent on the calculation of Reasonable Potential.

DMR Data

- The frequency of manganese measurement is once per month.
- The data set includes 50 months or approximately 50 measurements. (On some occasions more than one sample was analyzed.) A value was measured for each of the 50 samples taken. There were no "non-detects" in this data set. This data set can be subjected to standard statistical analysis.
- The data is summarized on the DMR. The monthly average and the monthly maximum values are reported. However since there is usually only one data point per month, the maximum value can be treated as a discrete data point.
- The minimum manganese value for the 50 month period was 0.46 mg/L
- The maximum manganese value for the 50 month period was 1.3 mg/L.
- The range of manganese values for the DMR data set was 0.46 to 1.3 mg/L.
- The data is normally distributed. There is close agreement between the median (0.68 mg/L) and the mean (0.72 mg/L).
- The variability is moderate. The coefficient of variation is 25.6%.

RI Data Set

The RI data was taken between November 2002 and April 2004 at approximately quarterly intervals. There are twelve samples taken at two sites, Outfall 002 and Outfall 002 Pipe.

- The minimum manganese value for 12 samples was 0.46 mg/L.
- The maximum manganese value for 12 samples was 0.74 mg/L.
- The range of manganese values for the RI data set was 0.46 to 0.73 mg/L.
- The mean manganese concentration for the RI data set is 0.61 mg/L.

Conclusion: The manganese concentration is well characterized. The data set has over 60 measurements. The data shows moderate variability, and has no outliers that are greater than the levels of regulatory concern, 1.5 mg/L. The mean was characterized in two separate data sets in the 0.61 to 0.67 range. There are three values within two standard deviations of the effluent limit, suggesting that the value 1.3 mg/L is not an outlier. The New Mexico approach of estimating the 95th percentile by multiplying the mean by 2.14 gives a value of 1.43 mg/L which appears to be reasonable.

MANGANESE Mass (OUTFALL 002)

- The frequency of manganese measurement is once per month.
- The data set includes 50 months or approximately 50 measurements. The mass values were calculated using the manganese measurement and the corresponding flow from that day.
- The data is summarized on the DMR. The monthly average and the monthly maximum values are reported. However since there is usually only one data point per month, the maximum value can be treated as a discrete data point.
- The minimum manganese mass value for the 50 month period was 1.6 #/day.
- The maximum manganese mass value for the 50 month period was 4.12 #/day. .
- The range of manganese mass values for this data set was 1.6 to 4.1 #/day.
- The data appear normally distributed. There is reasonable agreement between the median (3.28 #/day) and the mean (3.20 #/day).
- The variability is moderate. The coefficient of variation is 22.6%.

Conclusion: The manganese mass is well characterized. The data set has over 50 measurements. The data shows moderate variability. The data set has no values above the level of regulatory concern, 4.38 #/day. There are several values within two standard deviations of the standard, suggesting that the value of 4.1 #/day is not an outlier.

MOLYBDENUM Concentration (Outfall 002)

The effluent limitations for molybdenum are not water quality based effluent limitations (WQBELs). The effluent limitations are based on Best Available Treatment and are not

calculated from stream standards, stream background concentrations, and stream flows and permitted capacities. Monitoring is required and is not dependent on the calculation of Reasonable Potential.

DMR Data

- The frequency of molybdenum measurement is once per month.
- The data set includes 50 months or approximately 50 measurements. (On some occasions more than one sample was analyzed.) A value was measured for each of the 50 samples taken. There were no "non-detects" in this data set. This data set can be subjected to standard statistical analysis.
- The data is summarized on the DMR. The monthly average and the monthly maximum values are reported. However since there is usually only one data point per month, the maximum value can be treated as a discrete data point.
- The minimum molybdenum value for the 50 month period was 1.10 mg/L.
- The maximum molybdenum value for the 50 month period was 1.8 mg/L.
- The absolute range of manganese values for this discharge was approximately 1.1 to 1.8 mg/L.
- The data is normally distributed. There is close agreement between the median (1.30 mg/L) and the mean (1.37 mg/L).
- The variability is low. The coefficient of variation is 13.1%.

RI Data Set

The RI data was taken between November 2002 and April 2004 at approximately quarterly intervals. There are twelve samples taken at two sites, Outfall 002 and Outfall 002 Pipe.

- The minimum molybdenum value for 12 samples was 1.1 mg/L.
- The maximum molybdenum value for 12 samples was 1.4 mg/L.
- The range of molybdenum values for the RI data set was 1.1 to 1.4 mg/L.
- The mean molybdenum concentration for the RI data set is 1.2 mg/L.

Conclusion: The molybdenum concentration is well characterized. The combined data sets have over 60 measurements. The mean was characterized in two separate data sets in the 1.2 to 1.37 range. The data shows low variability, and has no outliers that are close to the levels of regulatory concern - 5.03 mg/L. There are no values within three standard deviations of the effluent limit, suggesting that there is no reasonable potential for molybdenum concentration to exceed the existing BAT effluent limitation.

MOLYBDENYM Mass (Outfall 002)

DMR data set

- The frequency of molybdenum measurement is once per month.

- The data set includes 50 months or approximately 50 measurements. The mass values were calculated using the molybdenum measurement and the corresponding flow from that day.
- The data is summarized on the DMR. The monthly average and the monthly maximum values are reported. However since there is usually only one data point per month, the maximum value can be treated as a discrete data point.
- The minimum molybdenum mass value for the 50 month period was 4.32 #/day.
- The maximum molybdenum mass value for the 50 month period was 7.15 #/day. This molybdenum value is the maximum mass value recorded over a data set of approximately 35 measurements.
- The absolute range of molybdenum mass values for this discharge was approximately 4.3 to 7.2 #/day.
- The data is probably normally distributed. There is good agreement between the median (5.93 #/day) and the mean (5.75 #/day).
- The variability is low. The coefficient of variation is 13.5%.

Conclusion: The molybdenum mass is well characterized. The data set has over 50 measurements. The data shows low variability. The data set has no values close to the level of regulatory concern, - 14.7 # per day. There are no measurements within three standard deviations of the standard, suggesting that there is no reasonable potential for molybdenum mass to exceed the existing BAT effluent limitation.

TOTAL SUSPENDED SOLIDS (TSS) Concentration (Outfall 002)

The effluent limitations for total suspended solids are not water quality based effluent limitations (WQBELs). The effluent limitations are based on Best Available Treatment and are not calculated from stream standards, stream background concentrations, and stream flows and permitted capacities. Monitoring is required and is not dependent on the calculation of Reasonable Potential.

- The frequency of TSS measurement is once per month.
- The data set includes 50 months or approximately 50 measurements. (On some occasions more than one sample was analyzed.) Only one value was measured in the 50 samples taken. There were 34 "non-detects" at a reporting limit of 4 mg/L in this data set. This data set cannot be subjected to standard statistical analysis.
- The data is summarized on the DMR. The monthly average and the monthly maximum values are reported. However since there is usually only one data point per month, the maximum value can be treated as a discrete data point.
- The minimum TSS value for the 50 month period was somewhere between zero and 4 mg/L.
- The maximum TSS value for the 50 month period was 7.2 mg/L, and the only detected measurement. This TSS value is the maximum value recorded over a data set of approximately 35 measurements.
- The absolute range of TSS values for this discharge could be estimated to be between 2 to 7.2 mg/L.

- The data distribution cannot be determined.
- The variability cannot be determined.

Conclusion: The TSS concentration is well characterized. The data set has over 50 measurements. The data set has a median of "less than" 4 mg/L and has no outliers that are close to the BAT levels of regulatory concern - 30 mg/L. The factor of 7 between the conservative estimate of the median and the effluent limitation demonstrates that there is no reasonable potential for the TSS concentration to exceed the existing effluent limitation.

TOTAL SUSPENDED SOLIDS (TSS) Mass (Outfall 002)

- The frequency of TSS measurement is once per month.
- The data set includes 50 months or approximately 50 measurements. (On some occasions more than one sample was analyzed.) Only one value was measured in the 50samples taken. There were 34 "non detects" at a reporting limit of 4 mg/L in this data set. This data set cannot be subjected to standard statistical analysis.
- The data is summarized on the DMR. The monthly average and the monthly maximum values are reported. However since there is usually only one data point per month, the maximum value can be treated as a discrete data point. A calculated mass value was reported, using by assuming the TSS concentrations for all "less than" were at the reporting limit of 4 mg/L. This is a conservative assumption.
- The minimum TSS mass value for the 50 month period was somewhere between zero and 13.7 #/day.
- The maximum TSS mass value for the 50 month period was 35.5 #/day.
- The range of TSS mass values for this discharge could be estimated to be between 10 and 36 #/day.
- The data distribution cannot be determined.
- The variability cannot be determined.

Conclusion: The TSS mass is well characterized. The data set has over 50 measurements. The data set has a median of 17 #/day based on calculations substituting 4 mg/L for the less than values in the concentration, and has no outliers that are close to the levels of regulatory concern - 87.6 #/day. The factor of 5 between the conservative estimate of the median and the effluent limitation demonstrates that there is no reasonable potential for the TSS mass to exceed the existing BAT effluent limitation.

CHEMICAL OXYGEN DEMAND (COD) concentration (Outfall 002)

The effluent limitations for chemical oxygen demand are not water quality based effluent limitations (WQBELs). The effluent limitations are based on Best Available Treatment and are not calculated from stream standards, stream background concentrations, and stream flows and permitted capacities. Monitoring is required and is not dependent on the calculation of Reasonable Potential.

- The frequency of COD measurement is once per month.
- The data set includes 50 months or approximately 50 measurements. (On some occasions more than one sample was analyzed.) Only four values were measured in the 50 samples taken. There were 46 "non-detects" at a reporting limit of 10 mg/L in this data set. This data set cannot be subjected to standard statistical analysis.
- The data is summarized on the DMR. The monthly average and the monthly maximum values are reported. However since there is usually only one data point per month, the maximum value can be treated as a discrete data point.
- The minimum COD value for the 50 month period was somewhere between zero and 10 mg/L.
- The maximum COD value for the 50 month period was 25 mg/L.
- The range of COD values for this discharge could be estimated to be between 5 to 25 mg/L.
- The data distribution cannot be determined.
- The variability cannot be determined.

Conclusion: The COD concentration is well characterized. The data set has over 50 measurements. The data set has a median of "less than" 10mg/L and has no outliers that are close to the levels of regulatory concern - 90 mg/L. The factor of almost 4 between the conservative estimate of the median and the effluent limitation demonstrates that there is no reasonable potential for the COD concentration to exceed the existing BAT effluent limitation.

CHEMICAL OXYGEN DEMAND (COD) Mass (Outfall 001)

- The frequency of COD measurement is once per month.
- The data set includes 50 months or approximately 50 measurements. (On some occasions more than one sample was analyzed.) Only three values were measured in the 50 samples taken. There were 46 "non-detects" at a reporting limit of 10 mg/L in this data set. This data set cannot be subjected to standard statistical analysis.
- The data is summarized on the DMR. The monthly average and the monthly maximum values are reported. However since there is usually only one data point per month, the maximum value can be treated as a discrete data point. A calculated mass value was reported, using by assuming the COD concentrations for all "less than" were at the reporting limit of 10 mg/L. This is a conservative assumption.
- The minimum COD mass value for the 50 month period was somewhere between zero and 34 pounds per day.
- The maximum COD mass value for the 50 month period was 113.7 #/day.
- The absolute range of COD mass values for this discharge could be estimated to be 20 to 114 pounds per day.
- The data distribution cannot be determined.

- The variability cannot be determined.

Conclusion: The COD mass is well characterized. The data set has over 50 measurements. The data set has a median of 42 #/day based on calculations substituting 10 mg/L as the concentration and has no outliers that are close to the levels of BAT regulatory concern - 263 #/day. The factor of 6 between the conservative estimate of the median and the effluent limitation demonstrates that there is no reasonable potential for the COD mass to exceed the existing effluent limitation.

IRON TOTAL Concentration (Outfall 002)

The effluent limitations for iron are not water quality based effluent limitations (WQBELs). The effluent limitations are based on Best Available Treatment and are not calculated from stream standards, stream background concentrations, and stream flows and permitted capacities. Monitoring is required and is not dependent on the calculation of Reasonable Potential.

DMR data

- The frequency of iron measurement is once per month.
- The data set includes 50 months or approximately 50 measurements. (On some occasions more than one sample was analyzed.) Only five values were measured in 50 samples taken. There were 45 "non-detects" at a reporting limit of 100 µg/L in this data set. This data set cannot be subjected to standard statistical analysis. The data is summarized on the DMR. The monthly average and the monthly maximum values are reported. However since there is usually only one data point per month, the maximum value can be treated as a discrete data point.
- The minimum iron value for the 50 month period was somewhere between zero and 100 µg/L.
- The maximum iron value for the 50 month period was 280 µg/L.
- The range of iron values for this data set could be estimated to be between 50 and 280 µg/L.
- The data distribution cannot be determined.
- The variability cannot be determined.

RI Data Set

The RI data was taken between November 2002 and April 2004 at approximately quarterly intervals. There are twelve samples taken at two sites, Outfall 002 and Outfall 002 Pipe. Only two values were measured in this data set.

- The minimum total iron value for 12 samples was 25 µg/L.
- The maximum total iron value for 12 samples was 170 µg/L.

Conclusion: The iron (total) concentration is well characterized. The data set has over 50 measurements. The data set has a median of "less than" 100 µg/L and has no outliers that are close to the levels of regulatory concern - 600 µg/L. The factor of almost 6 between the conservative estimate of the median and the effluent limitation demonstrates that there is no reasonable potential for the iron, total concentration to exceed the existing effluent limitation.

IRON, TOTAL, (Iron) Mass (Outfall 002)

- The frequency of iron measurement is once per month.
- The data set includes 50 months or approximately 50 measurements. (On some occasions more than one sample was analyzed.) Only five values were measured in the 50 samples taken. There were 45 "non detects" at a reporting limit of 100 µg/L in this data set. This data set cannot be subjected to standard statistical analysis.
- The data is summarized on the DMR. The monthly average and the monthly maximum values are reported. However since there is usually only one data point per month, the maximum value can be treated as a discrete data point. A calculated mass value was reported, by assuming the iron concentrations for all "less than" were at the reporting limit of 100µg/L. This is a conservative assumption.
- The minimum iron mass value for the 50 month period was somewhere between zero and 0.234 #/day.
- The maximum iron mass value for the 50month period was 1.38 #/day.
- The range of iron mass values for this discharge could be estimated to be 0.2 to 1.38 #/day.
- The data distribution cannot be determined.
- The variability cannot be determined.

Conclusion: The iron (total) mass is well characterized. The data set has over 50 measurements. The data set has a median of 0.43 #/day based on calculations using 100 µg/L as the concentration and has no outliers that are close to the levels of regulatory concern, 1.75 #/day. The factor of 4 between the conservative estimate of the median and the effluent limitation demonstrates that there is no reasonable potential for the iron, total mass to exceed the existing effluent limitation.

ALUMINUM, Total, Concentration (Outfall 002)

Aluminum is a metal that can be regulated as a water quality based effluent limitation. However, in this case, the background aluminum concentrations measured upstream of the discharge are substantially greater than the concentration of the aluminum in the discharge. The background concentration of aluminum definitely exceeds the current stream standard. The concentration of aluminum in discharge 002 may have values that exceed the current stream standard. Aluminum is a candidate for a Total Maximum Daily

Load or a re evaluation of the stream standard. Calculating a WQBEL using normal procedures has no real value.

- The frequency of aluminum measurement is once per month.
- The data set includes 50 months or approximately 50 measurements. (On some occasions more than one sample was analyzed.) Only one value was measured in 50 samples taken. There were 49 "non-detects" at a reporting limit of 50 µg/L to 100 µg/L in this data set. This data set cannot be subjected to standard statistical analysis. The data is summarized on the DMR. The monthly average and the monthly maximum values are reported. However since there is usually only one data point per month, the maximum value can be treated as a discrete data point.
- The minimum aluminum value for the 50 month period was somewhere between zero and 50 µg/L.
- The maximum aluminum value for the 50 month period was 120 µg/L.
- The range of aluminum values for this data set could be estimated to be between 30 to 120 µg/L.
- The data distribution cannot be determined.
- The variability cannot be determined.

The RI data was taken between November 2002 and April 2004 at approximately quarterly intervals. There are twelve samples taken at two sites, Outfall 002 and Outfall 002 Pipe. Only two values were measured in this data set.

- The minimum total aluminum value for 12 samples was 35 µg/L.
- The maximum total aluminum value for 12 samples was 200 µg/L.
- There were 4 total aluminum values in the data set that were less than 35 µg/L.

Conclusion: The characterization of the aluminum, total concentration is further complicated by the change of reporting limits during the reporting period from 100 µg/L to 50 µg/L and the low aluminum permit limit of 87 µg/L. Without a reasonable estimate at the median concentration, it cannot be determined if the measured value of 120 µg/L is an outlier. The data cannot be used to calculate or to estimate if there is a reasonable potential for the aluminum concentrations to exceed the water quality based permit limitation of 87 µg/L.

Effluent RI data

Aluminum, total

- There were 2 measured values out of 25samples in this data set.
- The range of measured values was 35 to 200 µg/L.
- Ten values in the data set were less than 35 µg/L

River Data

RI Data Set

The RI data was taken between November 2002 and April 2004 at approximately quarterly intervals. There are twelve samples taken at two sites, Outfall 002 and Outfall 002 Pipe. The detection limits were lower for this data set than in the DMR data set.

Aluminum, Dissolved

- There were 13 measured values out of 25 samples in this data set.
- The range of measured values was 65 to 150 µg/L.
- The mean of the measured values was 106 µg/L

TRACE METALS and CYANIDE

DMR data

The frequency of measurement for the following seven parameters is once per month. These parameters are candidates for water Quality based effluent limitations (WQBELs)

The data set includes data from 50 months or approximately 50 measurements for each of the seven parameters. (On some occasions more than one sample was analyzed.) No values were measured in 50 samples taken. There were 50 "non-detects" in each data set. These data sets cannot be subjected to standard statistical analysis. However, the reporting limit for each parameter can be compared to the existing permit limit to determine the significance of the 50 "non-detected" values.

The effluent limits are given as a range. Some of these parameters have a maximum daily value and a monthly average value. For months where only one sample is analyzed, the monthly average and the maximum daily value are the same, and in effect, the lower monthly average value becomes the daily maximum limit, by default.

Parameter	Detected/Analyzed	Reporting Limit	Effluent Limits
Cyanide	0/50	10 µg/L	14 – 22 µg/L
Arsenic	0/50	5 µg/L	429 – 644 µg/L
Cadmium	0/50	1.0 µg/L	4.8 – 7.0 µg/L
Copper	0/50	10 µg/L	41 – 62 µg/L
Lead	0/50	3 µg/L	216 – 235 µg/L
Mercury	0/50	0.200 µg/L	0.111 - 0.170 µg/L
Zinc	0/50	20 µg/L	200-200 µg/L

Effluent RI Data

RI Data Set

The RI data was taken between November 2002 and April 2004 at approximately quarterly intervals. There are twelve samples taken at two sites, Outfall 002 and Outfall 002 Pipe. The detection limits were lower for this data set than in the DMR data set.

Arsenic

- There were eight measured values out of 12 samples in this data set.
- The range of measured values was 0.36 to 0.61 µg/L.
- All twelve values in the data set were less than 0.61 µg/L

Cadmium

- There was one measured value out of 12 samples in this data set.
- The measured value was 0.20 µg/L.
- All twelve values in the data set were less than 0.6 µg/L

Copper

- There were three measured values out of 12 samples in this data set.
- The measured values were between 1.0 and 8.3 µg/L.
- Ten values in the data set were less than 2.5 µg/L

Lead

- There were two measured values out of 12 samples in this data set.
- The measured values were between 1.0 and 8.3 µg/L.
- Ten values in the data set were less than 2.5 µg/L.

Zinc

- There were no measured values out of 12 samples in this data set.
- Seven values in the data set were less than 15 µg/L.

Arsenic, Cadmium, Copper, Lead and Zinc Concentrations for 002

The 50 "non-detect" values for arsenic, cadmium, copper, lead and zinc are a factor of four to eighty times below the present effluent limitations. Fifty samples over a 50 month period should adequately characterize the maximum value in a data set. The magnitude of the difference between the maximum concentration, conservatively estimated to be at the Reporting Limit, and the present permit limit demonstrates that there is no reasonable

potential for any of these parameters to cause or contribute to an exceedance of an effluent limitation.

The smaller RI data set allows estimates of the median values for these parameters that may be used in the calculation of Reasonable Potential. The median from the RI data sets was compared with the New Mexico approach of substituting one half the detection limit in the calculation of an average value.

Parameter	One half the DL	Values from RI data	Reason
Arsenic	2.5 µg/L	**0.5 µg/L**	Median value from good data set
Cadmium	0.5 µg/L	**0.6 µg/L**	Max value from good data set
Copper	5 µg/L	**2.5 µg/L**	Median is < 2.5 µg/L
Lead	1.5 µg/L	**0.35 µg/L**	Median is < 0.35 µg/L
Zinc	10 µg/L	**15 µg/L**	Median value is < 15 µg/L

Conclusion: The effluent data indicates that the concentrations of all parameters except cadmium are well below the stream standard. The mean and median concentrations for cadmium cannot be calculated for the effluent because of the large number of non-detects in the RI data set, which has the lower detection limits of the two data sets.

River Arsenic, Cadmium, Copper, Lead and Zinc Concentrations

USGS Data

There is a USGS gauge and water quality sampling site on the Red River just above discharges 001 and 002. The site is USGS 08265000 Red River near Questa, New Mexico. Latitude 36° 42'12", Longitude 105° 34'04". The site is approximately 3.2 miles above discharge 002. The site is just south of SR-38 just west of the Questa Ranger station. The site is upstream of the diversion for Eagle Rock Lake, a small off channel reservoir, and the confluence with Cabresto Creek. The site is also above the discharge from the Town of Questa WWTP. The period of record is 1978 through 1986. The sampling frequency is approximately monthly.

RI Data

The RI data set includes five discrete sites in Surface Water Area 11, which are downstream of the USGS site, and, as such, closer to Outfall 002. The period of record is September 2002 to September 2003. The reach is described as Red River Along Tailings Piles.

ARSENIC

USGS

The data set for arsenic is too small to characterize the ambient concentration of either the dissolved or total forms of the either metal.

RI – SW Area 11

Arsenic

- There was one measured values out of 25 samples in this data set.
- The measured value was 0.41 µg/L.
- All twenty five values in the data set were less than 0.43 µg/L

CADMIUM

USGS

The data set for total cadmium has more than 50 measurements, but a high percentage of the data (over 88%) are "non-detects". The concentration of total cadmium cannot be characterized statistically. The data indicate that the characteristic range for total cadmium is zero to 1.4 µg/L. The median is less than 1.0 µg/L.

RI data - SW area 11

- There were 25 measured values out of 25 samples in this data set.
- The range was 0.2 to 0.56 µg/L
- The mean of this data set was 0.34 µg/L
- The geometric mean of this data set was 0.33 µg/L

COPPER

USGS – Dissolved Copper

The dissolved copper data set is small (9 values) and has a high percentage of non-detects (more than 65%). Dissolved copper levels cannot be characterized by this data set.

RI data - SW area 11 – Dissolved Copper

- There were 22 measured values out of 25 samples in this data set.
- The range was 1.7 to 14 µg/L
- The mean of this data set was 4.9 µg/L
- The geometric mean of this data set was 3.7 µg/L

LEAD

USGS

The data set for dissolved lead is too small to characterize the ambient concentration of either the dissolved or total forms of the either metal.

RI – SW Area 11

Lead

- There were 8 measured values out of 25 samples in this data set.
- The range of measured values was 0.7 to 1.4 µg/L.
- Eighteen values in the data set were less than 0.2 µg/L

ZINC

USGS – Total and Dissolved Zinc

The data set includes data for both dissolved and total zinc. The total data set has few "less than values" and is subject to direct statistical analysis. The dissolved data set has a small percentage of "less than values" and statistical analysis is appropriate with the understanding that analysis of only the numerical values tends to overestimate the actual values for the calculated statistic by an indeterminate extent. The following discussion is based on the measured values in each data set.

Statistic	Total Zinc	Dissolved Zinc
Count	64 values out of 64 analyses	61 values out of 64 analyses
Minimum	50 µg/L	10 µg/L
Maximum	4400 µg/L	2600 µg/L
Absolute Range	50 – 4400 µg/L	10 – 2600 µg/L
Characteristic range	50 – 700 µg/L	10 – 400 µg/L
Mean	236 µg/L	138 µg/L
Median	130 µg/L	60 µg/L
Geometric Mean	146 µg/L	71 µg/L
Substituted Geometric mean	146 µg/L	63 µg/L

RI data - SW area 11 – Dissolved Zinc

- There were 22 measured values out of 25 samples in this data set.
- The range was 13 to 120 µg/L
- The mean of this data set was 52 µg/L
- The geometric mean of this data set was 46 µg/L

Conclusion: The RI data set provides a good characterization of arsenic, lead, cadmium, copper and zinc in river samples. Arsenic and lead had a large number of non-detects, but the median and maximum values are both well below the stream standard.

Cadmium, copper, and zinc had good data sets with few less than values and mean and geometric means can be calculated. Copper and zinc values are well below the stream standards. Cadmium has a mean of 0.34 µg/L and a geometric mean of 0.33 µg/L which is below the new stream standard for cadmium.

Effluent Cyanide and Mercury

The reporting limit for cyanide is only slightly lower than the most restrictive effluent limit of 14 µg/L. The actual cyanide concentration cannot be determined from the measurements performed. No statistical analysis can be performed on this data set. It can be concluded that the maximum value in the data set was somewhere between zero and 10 µg/L. The magnitude of the difference between the maximum concentration, conservatively estimated to be at the Reporting Limit and the present permit limit does not demonstrate that there is no reasonable potential for cyanide to cause or contribute to an exceedance of an effluent limitation.

River Cyanide Concentrations

USGS

The data set for total cyanide has more than 35 measurements but a high percentage of the data (over 94%) are "non-detects". The concentration of total cyanide cannot be characterized statistically. The data indicate that the characteristic range for total cyanide is 0 to 10 µg/L. The median is less than 10 µg/L. The substituted geometric mean is 5.2 µg/L.

The substituted geometric mean can be calculated from the data sets using the New Mexico procedure, but the value will be completely dependent on the value used in the substitution for the non-detect values. The substituted geometric mean for total cyanide is 5.2 µg/L. Even though this geometric mean is statistically uncertain, the geometric mean for total cyanide is substantially lower than the stream standard.

Effluent Mercury Concentrations

The reporting limit for mercury (200 ng/L) is substantially higher than the most restrictive effluent limit of 110 ng/L. The actual mercury concentration cannot be determined from the measurements performed. No statistical analysis can be performed on this data set. All that can be concluded is that the maximum value for mercury in the data set was somewhere between zero and 200 ng/L. Compliance or non compliance

with the existing effluent limitations cannot be determined from the fifty measurements performed.

River Mercury Concentrations

The data sets for mercury are too small to characterize the ambient concentration. The detection limit is much higher than the stream standard. The data does not provide any indication of whether mercury is present or if the stream standard is met.

SUMMARY

Parameters that have Effluent Limitations that are Determined by BAT

Parameter	Representative Plant Concentration Range	Representative Red River Concentration Range
Flow	0.4 – 0.655 MGD	
pH	7.0 – 7.8 SU	7.0 – 7.9 SU
Fluoride	0.94 – 2.0 mg/L	0.1 – 1.8 mg/L
Manganese, Dissolved	0.46 – 1.3 mg/L	.12 - .37 mg/L
Molybdenum	1.1 – 1.8 mg/L	.001 - .053 mg/L
Iron, Dissolved	.025 - .280 mg/L	0.17 - .78 mg/L

Reasonable Potential and WQBEL Parameters

Parameter	Plant Concentration For Determining Reasonable Potential	Ambient Stream Concentration	Basis for Stream Concentration
Arsenic	0.5 µg/L	0.43 µg/L	Maximum RI data
Cadmium	0.6 µg/L	0.33 µg/L	Geo Mean RI data
Copper	2.5 µg/L	3.7 µg/L	Geo Mean RI data
Lead	0.35 µg/L	0.2 µg/L	Maximum RI data
Zinc	15 ug/L	46 µg/L	Geo Mean RI data
Zinc	15 µg/L	71 µg/L	Geo Mean USGS

These values come from RI data sets, DMR data, and the USGS. The DMR data is the best data set with fifty monthly values sampled recently. However, this data set does not include ambient stream data. The RI data sets are recent, have a moderate number of values, and have contemporaneous effluent and stream data. The USGS data is a large data set but the data is not recent.

Reasonable Potential and WQBEL Parameters

Parameter	Plant Concentration For Determining Reasonable Potential	Ambient Stream Concentration Along Tailings	Basis for Stream Concentration
Antimony	<1.0 µg/L	<0.5 µg/L	Median RI data
Barium	29 µg/L	37 µg/L	Median RI data
Beryllium	<0.3 µg/L	<0.2 µg/L	Median RI data
Boron	31 µg/L	0.2 µg/L	Median RI data
Chromium	<1.5ug/L	<1 µg/L	Median RI data
Cobalt	<2.5µg/L	<3 µg/L	Median RI data
Nickel	<3.0 µg/L	<10.3 µg/L	Median RI data
Selenium	<1.5 µg/L	<0.75 µg/L	Median RI data
Silver	<0.2µg/L	<0.2µg/L	Median RI data
Thallium	<0.2 µg/L	<0.1 µg/L	Median RI data
Vanadium	<1.6 µg/L	<0.3 µg/L	Median RI data

All of this data comes from RI data sets. In most cases the majority of data was below the detection limit. However, the median to 80th percentile value could be identified with certainty that 50 to 80 percent of the values were below the value selected. The actual median value is probably lower than the value in these tables. However, these values could be used to demonstrate unequivocally the relationship between the worst case IWC (using the Region 6 procedure) and the stream standard.

Calculations used the following flow values:

001A	-	4.3 MGD	
002	-	0.746 MGD	
Red River	-	4.58 MGD	(7.05 cfs)

The 4Q3 was value not recalculated. Inspection indicated that the statistical low flow was probably in the 5 to 10 cfs range. Since there were few WQBELs there was little reason to revisit the 4Q3.

Hardness

The hardness value of 127 mg/L as $CaCO_3$ was used for calculation of hardness-based metals limits. Inspection of the data set indicated that hardness at low flow was probably in the 140 to 150 mg/L range if hardness values were associated with low flows, as many states and EPA regions allow. Since there were few WQBELs there was little reason to revisit the hardness procedure. The hardness data set is not current.

Dissolved Metals Summaries from Three Red River Data Sets

Parameter	USGS			RI Along Tailings			RI along Mine		
	Range	Mean	Geo mean	Range	Mean	Geo mean	Range	Mean	Geo mean
	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
Aluminum				65 - 150	106	104	49 - 630	184	166
Barium				29 - 60	37	37	13 - 59	34	33
Cadmium				.2 - .56	.34	.33	0.13 - 0.75	.4	.36
Copper				1.7 - 14	4.9	3.7	2.1 - 22	5	4.4
Manganese	60 - 1700	531	404	120 - 370	250	239	58 - 570	222	191
Molybdenum	1 - 53	8.6	5.5	3 - 91	46	32	0.9 – 6.8	2	2.1
Nickel				6.4 - 18	10	9.8	3.2 - 35	13	11.3
Zinc	10 - 360	94	67	13 - 120	52	45	8.6 - 210	74	57

SUPPLEMENTAL INFORMATION

1. *White Paper – Aluminum*
2. *Executive Summary of Data on the Red River in the Vicinity of NPDES Permitted Outfalls 001 and 002*
3. *Manganese Pumpback System Summary*
4. *Best Management Practices Implementation Summary*

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White Paper - Aluminum

Geochemistry of Aluminum

Aluminum is a common element that is present in significant concentrations in most soils and sediments. Aluminum makes up about 8.3 % of the earth's crust by weight. Aluminum is the most common metal in the earth's crust (chemists consider silicon to be a non metal). In order of abundance, the metal composition of the earth's crust is: Aluminum – 8.3 %, Iron – 4.8 %, Calcium – 4.1 %., Sodium – 2.3%, Magnesium – 1.9%.

The most common form of aluminum in soils is the clay component of the soil structure. Chemically, clays like kaolin and bentonite, are a hydrated aluminum silicate, with a formula of $Al_2O_3.2SiO_2.2\ H_20$. Clay has a sheet structure with a silicon dioxide tetrahedral layer alternating with an octahedral aluminum oxide (alumina) layer. Two extremely inert materials, silicon dioxide, and aluminum oxide are chemically bonded into a stable soil component. (The alternate layers are responsible for the lubricating qualities of clays like bentonite which is commonly used as a lubricant in drilling.) A pure clay material, like kaolin (a fine white clay that is the basic raw material for the ceramic industry) is approximately 24% aluminum. Most clays are in the 18 – 25% aluminum range. Clays are formed in nature by chemical weathering of feldspar and aluminum silicate rocks. Another well known clay material, is bentonite, which is a found as a hydrated silica mineral called montmorillanite, usually associated with volcanic ash. Bentonite includes other alkaline earth metals, such as calcium and magnesium in the chemical structure, but chemically it is primarily a hydrated aluminum silicate.

Aluminum is a common component of soils and sediments in the grams per kilogram range, but is not generally found in water above the low micrograms per liter level. This is because the predominant form of aluminum is the compound aluminum oxide, Al_2O_3 and as a component of the clay minerals as aluminum silicates. Aluminum oxide is similar to silicon dioxide (sand), which is a hard, stable, insoluble compound (both are used commercially in sand paper). Neither aluminum nor silicon is found in appreciable concentrations in the dissolved form in water, even though the soils and sediments contain large quantities of both elements. The cation-anion balance, a standard method for checking the correctness of water sample analysis (Standard Methods 1030 F) does not even include aluminum in the enumeration of cations. Dissolved aluminum is just not expected to be present in appreciable amounts in water samples, despite being an extremely common element in the environment.

The abundance of aluminum in soils and sediments and the insolubility of the predominant aluminum compounds, (aluminum silicates), are characteristics that account for the wide variation between the measurements of dissolved aluminum and total aluminum in water samples. The measured values of total aluminum in environmental samples, over time, typically show an extremely large variation in values. The range of total aluminum values in a natural

stream system can range from less than 10 micrograms per liter to over 200,000 micrograms per liter. The range of dissolved aluminum values in the same systems are usually in the 10 to 400 micrograms per liter range. The difference in the variability of measurements of the two forms of the metal indicate that the sediments are the primary source of the aluminum in the aluminum measurements on whole water samples. This is exactly what would be predicted given the geochemistry and abundance of aluminum in the environment. The same pattern holds for total and dissolved iron, where iron oxides are a common component of soils and sediments. Dissolved iron in stream samples commonly is found in the 10 to 100 micrograms per liter range, while total iron values from the same streams vary from to 10 to 50,000 micrograms per liter. **The other conclusion that can be drawn from the difference in variability is that the presence of high concentrations of high aluminum content sediments is not a major factor in predicting the concentration of dissolved aluminum in the same sample.** In fact, some of the variability in the dissolved aluminum measurements may be due to colloidal particles that pass the 0.45 micron pore size during the filtration step that differentiates the dissolved from the total form of the metal being analyzed (the crystal structure of the aluminum silicate results in the formation of small negatively charged particles with large surface area).

There has been a legitimate discussion in the environmental community about the merits of basing environmental evaluations and effluent limitations of the total and dissolved form of the metal. Some of that debate has been resolved with the use of the total/dissolved ratios and translator provisions that have been evolving. These discussions have merit when the metals concentrations in the sediment are low and there is a significant solubility of the metal compounds at equilibrium. These discussions do not apply well to aluminum and iron because both metals naturally are present in large concentrations in the form of compounds which have extremely low solubility.

Data from Red River Sites

Site specific data from sites on the Red River are consistent with the above discussion. **There are significant quantities of aluminum in the Red River sediments.** In 36 samples, taken from sites RR3 – RR6 (above the mine site), representing riffle, depositional, and composite sample types, the range of total aluminum concentrations was 2610 to 20,800 mg/kg, with an arithmetic average of 6626 mg/kg.

The total aluminum concentrations in the Red River whole water samples were variable. In 17 samples, taken from sites RR3 – RR6 and at Zwergle (above the mine site), the range of total aluminum concentrations was less than 11 to 3400 µg/L. The sampling was conducted in the months of March, July, September, and October which are low flow months. The range would probably have been broader with a data set that represented months with higher flows and the associated sediment loads.

The dissolved aluminum concentrations in the Red River water samples were less variable. In 17 samples, taken from sites RR3 – RR6 and at Zwergle (above the mine site), the range of dissolved aluminum concentrations was 3 to 260 µg/l.

Permitting Issues

The data clearly indicates that the total aluminum concentrations in the Red River above the mine area frequently exceed stream standards for total aluminum of 87 µg/l (see

accompanying table). Over 82 percent of the measured values are greater than the stream standard. Over 64 percent of the values exceed the stream standard by a factor of three or more. The geometric mean is estimated to be between 170 and 288 µg/l, depending on the substitution procedure used for handling the below detection limit values.

Reference: Red River above Mine Site						
			Raw Data	Substituted Values		
SITE ID	SAMPLE_DATE	Sample type	Total Aluminum mg/L	Below DL as DL	Below DL as 1/2 DL	Below DL as .001 mg/l
RR-1	04-Oct-02	Surface Water	0.042	0.042	0.042	0.042
RR-1	21-Mar-03	Surface Water	<0.43			
RR-1	16-Jul-03	Surface Water	<0.071	0.071	0.0355	0.001
RR-1	25-Sep-03	Surface Water	<0.051	0.051	0.0255	0.001
RR-3	03-Oct-02	Surface Water	0.45	0.45	0.45	0.45
RR-3	21-Mar-03	Surface Water	3.4	3.4	3.4	3.4
RR-3	16-Jul-03	Surface Water	0.35	0.35	0.35	0.35
RR-3	25-Sep-03	Surface Water	0.31	0.31	0.31	0.31
RR-4	04-Oct-02	Surface Water	0.47	0.47	0.47	0.47
RR-4	21-Mar-03	Surface Water	0.5	0.5	0.5	0.5
RR-4	16-Jul-03	Surface Water	0.36	0.36	0.36	0.36
RR-4	25-Sep-03	Surface Water	0.31	0.31	0.31	0.31
RR-5	03-Oct-02	Surface Water	0.48	0.48	0.48	0.48
RR-5	21-Mar-03	Surface Water	<0.89			
RR-5	16-Jul-03	Surface Water	0.27	0.27	0.27	0.27
RR-5	24-Sep-03	Surface Water	0.27	0.27	0.27	0.27
RR-6	04-Oct-02	Surface Water	0.88	0.88	0.88	0.88
RR-6	21-Mar-03	Surface Water	1.4	1.4	1.4	1.4
RR-6	16-Jul-03	Surface Water	0.62	0.62	0.62	0.62
RR-6	24-Sep-03	Surface Water	0.66	0.66	0.66	0.66
RR-6A	04-Oct-02	Surface Water	0.79	0.79	0.79	0.79
RR-6A	21-Mar-03	Surface Water	1.3	1.3	1.3	1.3
RR-6A	15-Jul-03	Surface Water	0.55	0.55	0.55	0.55
RR-6A	24-Sep-03	Surface Water	0.6	0.6	0.6	0.6
RR-6V	16-Jul-03	Surface Water	0.22	0.22	0.22	0.22
RR-6V	24-Sep-03	Surface Water	0.26	0.26	0.26	0.26
Zwergle	07-Oct-02	Surface Water	<0.011	0.011	0.0055	0.001
Zwergle	23-Mar-03	Surface Water	0.11	0.11	0.11	0.11
Zwergle	16-Jul-03	Surface Water	<0.067	0.067	0.0335	0.001
Zwergle	25-Sep-03	Surface Water	0.038	0.038	0.038	0.038
			Geometric Mean	**0.288**	**0.260**	**0.170**

Red = Data point removed before data analyzed

Blue = Substituted value for less than value

The data clearly indicate that the total aluminum concentration in Discharge 002A is lower than the total aluminum concentrations in the Red River. The absolute range for the total aluminum concentration is 30 to 120 µg/l. Over 98 percent of the values are less than the detection limit of 100 µg/l that was used for the majority of permit monitoring measurements.

The data indicates that there is not a reasonable potential for the discharge from 002A to cause or contribute to an increase in the baseline concentration of the Red River. In most cases, the total aluminum concentration in the river will be decreased as the result of the discharge from 002A.

River Data and Analysis

Two data points were removed from the data set. The values were "less than values" that were far above the expected detection limit for aluminum and have little value in understanding the distribution of data. Including these data points as substituted values would bias the data set high. The "less than" values that are more in the range of expected detection limits for aluminum (50 – 100 µg/l) indicate that the distribution includes a significant number of low values. The "less thans" indicate that as many as 18 percent of the values may be below the stream standard.

Substitution techniques that involve the substitution of a rule based value for a "less than" value can provide an estimate of the central tendency of the data set. If a value of 1 microgram per liter is substituted for each of the "less than" values in the data set, the geometric mean would still be estimated to be 170 micrograms per liter. (A value of 1 microgram per liter was selected to be very near zero, since a zero can't be used in the calculation of a geometric mean). **Even with the most generous substitution, the geometric mean of 170 µg/l is estimated to be almost two times the stream standard of 87 µg/l.** For this data set, the New Mexico procedure of substituting one half the detection limit for values below the detection limit is appropriate and provides a reasonable approximation of the baseline concentration of aluminum.

Outfall 002

The effluent data does not lend itself to the kind of data analysis used on the Red River samples above the mine area since there are not enough measured data points to suggest a data distribution. The data set includes 50 measurements taken at approximately monthly intervals. Only one value was measured in 50 samples taken. There were 49 "non-detects" at a reporting limit of 50 µg/L to 100 µg/L in this data set. There were seven values that were "less than" 50 µg/l.

This data set cannot be subjected to standard statistical analysis. The minimum aluminum value for the 50 month period was between zero and 50 µg/L. The maximum aluminum value for the 50 month period was 120 µg/L. This aluminum value is the maximum value recorded over a data set of approximately 50 measurements.

Conclusion:

The characterization of the aluminum, total concentration is complicated by the change of reporting limits during the reporting period from 100 µg/L to 50 µg/L and the low aluminum permit limit of 87 µg/L. Without a reasonable estimate at the median concentration, it cannot be determined if the measured value of 120 µg/l is an outlier. The

data cannot be used to calculate or to estimate if there is a reasonable potential for the aluminum concentrations to exceed the permit limitation of 87 µg/l.

Aluminum Water Quality Criteria and other States' Approaches

The existing USEPA aluminum criteria (1988) were derived from a limited acute toxicity database of 14 genera (that just meets the "8 family rule" for criteria development) and two chronic toxicity studies that revealed heightened sensitivity of brook trout and striped bass to aluminum. Chadwick Ecologcial Consultants Inc., (CEC) recently conducted a technical review and update of the existing USEPA criteria as part of remedial investigation/risk assessment studies on the Red River unrelated to the NPDES permit (see Technical Memo attached). An evaluation of the existing data revealed multiple undefined acute toxicity values that warrant removal and/or correction. Furthermore, a review of the studies used to lower the chronic criterion were not conducted according to USEPA protocol (Stephan et al. 1985) and therefore not typically used in criteria derivation. More specifically, unusual dilution water with pH<6.5 and hardness <50mg/L were used to generate the no observable effect concentration value of 87ug/L for the striped bass, which is the lowered chronic criterion.

The CEC literature review located eighteen new acute toxicity values, which included toxicity data for four new genera, as well as five new chronic toxicity values. These new data were added to the respective databases. The new acute toxicity data revealed a significant relationship between water hardness and aluminum toxicity that was not apparent in the existing limited database. Recalculating the final acute value (FAV) and final chronic value (FCV) with hardness normalized genus mean acute values (GMCV) and an updated acute-to-chronic ratio results in the following acute and chronic equations:

$$\text{Acute} = e^{[0.7602(\ln \text{hardness})+4.0061]}$$
$$\text{Chronic} = e^{[0.7602(\ln \text{hardness})+2.7279]}$$

The Colorado Water Quality Control Commission (CWQCC) recently recognized the abnormal water quality conditions used to derive the 1988 chronic criterion. To address this matter, the CWQCC will be adding a footnote (similar to the footnote within Utah's water quality standards) to the existing water quality criteria as a result of its 2005 Basic Standards Hearing.

"Where the pH is equal to or greater than 7.0 and the hardness is equal to or greater than 50 mg/L CaCO3 in the receiving water after mixing, the 87 ug/L chronic total recoverable aluminum criterion will not apply, and aluminum will be regulated on compliance with the 750 ug/L acute total recoverable aluminum criterion."

Recommended Permitting Approach

New Mexico uses a statistical approach to examine the historical data on a discharge to determine if there is a reasonable potential for that discharge to cause or contribute to a violation of the stream standard. In this case, there is one data point with a value greater than the stream standard. However there is not enough information to estimate the central tendency of the data or to determine if the one measured value is an outlier. **The data set does not allow a determination that there is a "reasonable potential" for the discharge to cause or contribute to a violation of the stream standard.**

The data clearly demonstrates that the total aluminum concentration of the effluent is consistently less than the background concentration in the Red River. The data indicates that it is not reasonable to expect that the effluent discharge will cause or contribute to an increase in the total aluminum concentration.

The data clearly demonstrates that the total aluminum concentration in the Red River consistently and significantly exceeds the stream standard in samples taken above the mine area. Streams that have background concentrations greater than the stream standard in many states are candidates for either an ambient standard or the development of a Total Maximum Daily Load (TMDL).

Since it has not been clearly demonstrated that there is reasonable potential for discharge 002A to cause or contribute to the violation of the total aluminum stream standard, it would be appropriate to set no effluent limitation for total aluminum on discharge 002A. There is no risk in this approach because it is clear that the background total aluminum concentrations in the stream are significantly higher than the effluent concentrations. Discharge 002A will not cause or contribute to an increase in the total aluminum concentration in the stream.

It would be appropriate to continue to require that both total and dissolved aluminum be monitored and that a method with a detection limit of 10 μg/l or less be used. This would allow a determination of reasonable potential for total aluminum to be developed and the need for an effluent limitation for total aluminum to be determined. This approach would allow time for New Mexico to fully evaluate appropriate aluminum criteria for the protection of aquatic life and if total aluminum is the appropriate metal species for the stream standard.

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TECHNICAL MEMORANDUM

April 2004

POTENTIAL TIER III ACUTE AND CHRONIC SCREENING LEVEL CRITERIA FOR ALUMINUM

INTRODUCTION

At the request of Molycorp, Inc., Chadwick Ecological Consultants, Inc. (CEC) has reviewed the scientific literature with the goal of reviewing the available screening level water quality criteria (SLC) for aluminum for the protection of aquatic life. These criteria would potentially be included as part of a larger effort to interpret ambient water quality in the Red River near Questa, New Mexico, as part of RI/FS activities. Currently, the ecological risk assessment is using existing U.S. Environmental Protection Agency (and State of New Mexico) ambient water quality criteria (AWQC) for aluminum of 750 µg/L acute and 87 µg/L chronic. The purpose of this report is to summarize our technical review of the AWQC and recommend potential Tier III acute and chronic aluminum SLCs, where appropriate.

Preliminary Review of Existing Aluminum Criteria

CEC's evaluation of the existing U.S. Environmental Protection Agency (U.S. EPA) aluminum WQC document (1988) and development of potential Tier III SLCs was conducted in two primary phases. The first phase of this process reviewed the existing criteria document to determine if U.S. EPA methods were followed and whether or not any errors were made in development of the existing AWQC. The conclusions of this first phase were that, in general, U.S. EPA methods were followed in development of the existing AWQC. However, the final development of the chronic criterion did not follow current criteria development methodologies and a significant error was made in calculation of the final acute criterion which, when corrected, results in a higher acute criterion. The correction of a transcription error made in development of the current acute criterion (750 µg/L) results in a corrected criterion of 825 µg/L. With regard to the chronic value, the concentration with no observed effect (NOEC) from two studies of brook trout and striped bass were used to establish a chronic criterion of 87 µg/L. The current approach for determining a chronic value

is to calculate the geometric mean of the LOEC (lowest observed effect concentration, the treatment with the lowest concentration of toxicant determined to have an adverse effect) and the NOEC (U.S. EPA 1998). Using this approach, these two studies would have produced a chronic value of approximately 122 µg/L, rather than 87 µg/L. This finding from our first phase has been noted previously with regard to aluminum exceedences in the Red River as part of technical comments to the TMDL proposed by the New Mexico Environment Department (NMED).

REVISION OF ALUMINUM CRITERIA

Based upon the results of the first phase of this technical review, a second phase was conducted. The goal of this additional effort was to 1) assemble and critically review all available aluminum toxicity literature (especially those studies published since the 1988 criteria document) in order to develop updated acute and chronic toxicity databases; 2) determine if sufficient toxicity data had been generated since July 1986, when the last comprehensive data review was conducted for the current document (U.S. EPA 1988), to justify developing an updated criteria based on new data; and 3) produce preliminary updated aluminum criteria or their equivalent that could be considered as Tier III SLCs for the ecological risk assessment for the Molycorp RI/FS.

To date, approximately 300 scientific papers and documents relating to aluminum toxicity to aquatic life have been critically reviewed for content. Useable toxicity endpoints gleaned from this review have been assembled into acute and chronic toxicity databases (comparable to Tables 1 and 2 of a U.S. EPA AWQC document). Once assembled, these updated toxicity databases can potentially be used to calculate acute and chronic SLCs based upon the most current scientific data.

In order to determine which toxicity data were acceptable for inclusion in these updated databases, it was necessary to develop a set of criteria for review of data from relevant studies. For example, in addition to guidance provided by the U.S. EPA for determining the suitability of data for inclusion in toxicity databases (Stephan *et al.* 1985), only data from tests conducted at a pH between 6.5 and 9.0 were included. A pH range of 6.5 to 9.0 was established as a limit for data used in the update of the aluminum toxicity databases, because the U.S. EPA has established this as an acceptable range for pH in ambient freshwater (U.S. EPA 1999). Further, this is the range over which the current U.S. EPA criteria for aluminum are

applicable (U.S. EPA 1988). Typically, if data were not included in the final updated database, it was for one of the following reasons: 1) test organisms do not have reproducing, wild populations in North America, 2) study did not use an adequate control treatment, 3) data are presented in such a format that their quality cannot be insured, or 4) data were derived using solutions with a pH of less than 6.5.

Updated Toxicity Databases

Of the 300 scientific papers that have been reviewed for aluminum toxicity data, relatively few of these studies contain reliable toxicity endpoints for North American freshwater biota at pH values between 6.5 and 9.0. Much of the research into aluminum toxicity has been concerned with the additive toxicity of aluminum in acidic solutions (especially studies related to "acid rain"). However, due to the chemical activity of aluminum in solution, the vast majority of aluminum in a given solution at a circum-neutral pH is present as less toxic and largely insoluble hydroxides. Further, much of the literature has been concerned with the differing toxicity of aluminum in solutions of varying pH, and not necessarily with the absolute toxicity of aluminum at each pH value. Thus, much of the research into aluminum toxicity in the pH range of 6.5 to 9.0 found no effect (i.e., not tested at high enough concentrations), and simply had to be reported as toxicity values in excess of (i.e., "greater than") the highest tested concentration. Historically, such values have been included in U.S. EPA toxicity databases as an absolute value. Yet, many of these values can be unrealistically low - simply as an artifact of the experimental design. As such, these "greater than" values were evaluated, and a decision whether or not to include them in the database made, on a case-by-case basis.

Typically, if the value was similar to other values for a species or genus, it was included. An example of how a "greater than" value was removed from the database is the case of *Micropterus*. The genus mean acute value (GMAV) for *Micropterus* of >217 µg/L would represent the most sensitive value in the database if left as is. However, a review of this study reveals that while 217 µg/L was the highest concentration tested at a pH of 7.5 (and it had no toxicity), an acute value of >978 µg/L was generated at a pH of 6.1 in the same study (Kane and Rabeni 1987). Because the toxicity of aluminum increases with increasingly acidic solutions, a value determined to be non-toxic at a pH of 6.1 would certainly be expected to be non-toxic at a pH of 7.5. Thus, including a value of 217 µg/L as an acutely toxic endpoint for *Micropterus* is not scientifically defensible or reasonable. Because of this, and the fact that this was the only acute toxicity value

for *Micropterus* generated at a circum-neutral pH, no acute aluminum toxicity data were included for *Micropterus* in our final calculations.

A final consideration in screening data for calculation of both species mean acute values (SMAV) is that data generated using flow-through methods with measured toxicant concentrations are used to the exclusion of all other data (Stephan *et al.* 1985). In the updated database, this rule affected the calculation of the SMAV for *Oncorhynchus mykiss* (rainbow trout). There are eight acute aluminum toxicity values for *O. mykiss* in the database from two different studies. The first of these studies (Call 1984) used static methods and measured the concentration of aluminum in the test chambers. The more recent study (Gundersen *et al.* 1994) used flow-through methods and also measured the concentration of aluminum in the test. Because the Gundersen *et al.* (1994) data were generated using flow-through methods with measured concentrations, the Call (1984) data were excluded from a calculation of the SMAV for *O. mykiss*. Thus, the SMAV for *O. mykiss* was determined to be 6,707 µg/L using only flow-through data, rather than 9,086 µg/L using all available data (Table 1).

The updated acute toxicity database (Table 1), using all data from studies with a pH of 6.5-9.0, contains toxicity data for 18 genera, with new data added for five of the original 14 genera in the 1988 U.S. EPA database. However, when the suspect "greater than" values are removed, the database again becomes based on 14 genera. The most sensitive genus in this database is *Ceriodaphnia*, with a corrected GMAV of 2,759 µg/L.

TABLE 1: Acute toxicity of aluminum to aquatic animals. Only values determined at pH values of 6.5 - 9.0 were included in the data base. SMAV = species mean acute value; GMAV = genus mean acute value. All aluminum values as µg/L.

New Data?	Rank	Species	Method	Hardness (mg/L as $CaCO_3$)	pH	LC50	SMAV	GMAV	Normalized SMAV (hardness = 50 mg/L as $CaCO_3$)	Normalized GMAV (hardness = 50 mg/L as $CaCO_3$)	Reference
N	14	Midge *Tanytarsus dissimilis*	S,U,T	17.43	7.71-6.85	>77,700	>77,700	>77,700	>17,3119	>17,3119	Lamb & Bailey 1981
N	13	Yellow perch *Perca flavescens*	S,M,T	47.4	7.55	49,800	49,800	49,800	51,863	51,863	Call 1984
N	12	Channel catfish *Ictalurus punctatus*	S,M,T	47.4	7.54	47,900	47,900	47,900	49,885	49,885	Call 1984
N		Snail *Physa* sp.	S,M,T	47.4	6.59	>23,400					Call 1984
N		Snail *Physa* sp.	S,M,T	47.4	7 .46	>72,100					Call 1984
N		Snail *Physa* sp.	S,M,T	47.4	7.55	>30,600					Call 1984
N	11	Snail *Physa* sp.	S,M,T	47.4	8.17	>24,700	>33,604	>33,604	>34,996	>34,996	Call 1984
N	10	Stonefly *Acroneuria* sp.	S,M,T	47.4	7.46	>22,600	>22,600	>22,600	>23,536	>23,536	Call 1984
N		Rainbow trout *Oncorhynchus mykiss*	S,M,T	47.4	6.59	7,400					Call 1984
N		Rainbow trout *Oncorhynchus mykiss*	S,M,T	47.4	7.31	14,600					Call 1984

TABLE 1: Continued.

New Data?	Rank	Species	Method	Hardness (mg/L as $CaCO_3$)	pH	LC50	SMAV	GMAV	Normalized SMAV (hardness = 50 mg/L as $CaCO_3$)	Normalized GMAV (hardness = 50 mg/L as $CaCO_3$)	Reference
N		Rainbow trout *Oncorhynchus mykiss*	S,M,T	47.4	7.46	8,600					Call 1984
N		Rainbow trout *Oncorhychus mykiss*	S,M,T	47.4	8.17	>24,700					Call 1984
Y		Rainbow trout *Oncorhychus mykiss*	F,M,T	23.2	8.25	6,170					Gundersen *et al.* 1994
Y		Rainbow trout *Oncorhychus mykiss*	F,M,T	35	8.25	6,170					Gundersen *et al.* 1994
Y		Rainbow trout *Oncorhychus mykiss*	F,M,T	83.6	8.29	7,670					Gundersen *et al.* 1994
Y		Rainbow trout *Oncorhychus mykiss*	F,M,T	115.8	8.29	6,930	6,707		6,697		Gundersen *et al.* 1994
N	9	Chinook Salmon *Oncorhynchus tschawytscha*	S,M,N	28	7	>40,000	>40,000	>16,379	>62,157	20,403	Peterson *et al.* 1974
N		Fathead minnow *Pimephales promelas*	S,M,T	220	7.34	35,000					Kimball, mss.
N		Fathead minnow *Pimephales promelas*	S,U,T	--	7.6	>18,900					Boyd 1979

TABLE 1: Continued.

New Data?	Rank	Species	Method	Hardness	pH	LC50	SMAV	GMAV	Normalized SMAV (hardness = 50 mg/L as $CaCO_3$)	Normalized GMAV (hardness = 50 mg/L as $CaCO_3$)	Reference
N		Fathead minnow *Pimephales promelas*	S,M,T	47.4	7.61	>48,200					Call 1984
N		Fathead minnow *Pimephales promelas*	S,M,T	47.4	8.05	>49,800					Call 1984
Y		Fathead minnow *Pimephales promelas*	S,M,T	26	7.8	1,160					ENSR 1992b
Y		Fathead minnow *Pimephales promelas*	S,M,T	46	7.6	8,180					ENSR 1992b
Y		Fathead minnow *Pimephales promelas*	S,M,T	96	8.1	20,300					ENSR 1992b
Y	8	Fathead minnow *Pimephales promelas*	S,M,T	194	8.1	44,800	18,497	18,497	13,878	13,878	ENSR 1992b
N	7	Flatworm *Dugesia tigrina*	S,M,T	47.4	7.48	>16,600	>16,600	>16,600	>17,288	>17,288	Brooke *et al.* 1985
N		Cladoceran *Daphnia magna*	S,M,T	220	7.05	38,200					Kimball, mss.
N		Cladoceran *Daphnia magna*	S,M,T	45.4	7.61	>25,300					Brooke *et al.* 1985
N	6	Cladoceran *Daphnia magna*	S,U,T	45.3	6.5-7.5	3,900	15,563	15,563	11,234	11,234	Biesinger & Christensen 1972

TABLE 1: Continued.

New Data?	Rank	Species	Method	Hardness (mg/L as $CaCO_3$)	pH	LC50	SMAV	GMAV	Normalized SMAV (hardness = 50 mg/L as $CaCO_3$)	Normalized GMAV (hardness = 50 mg/L as $CaCO_3$)	Reference
Y	5	Amphipod *Crangonyx pseudogracilis*	S,U,T	50	6.75	9,190	9,190	9,190	9,190	9,190	Martin & Holdich 1986
N		Amphipod *Gammarus pseudolimnaeus*	S,M,T	47.4	7.53	22,000	22,000		22,911		Call 1984
Y	4	Amphipod *Gammarus pulex*	S,U,T	--	6.9	>2,698	>2,698	>7,704	>7,704	7,862	Storey *et al.* 1992
N		Green sunfish *Lepomis cyanellus*	S,M,T	47.4	7.55	>50,000	>50,000		>52,072		Call 1984
Y		Bluegill *Lepomis macrochirus*	F,U,T	20-25	6.5	>400					Palmer *et al.* 1988
Y	†	Bluegill *Lepomis macrochirus*	F,U,T	20-25	7.5	>400	>400	>4,472	>734	>6,182	Palmer *et al.* 1988
Y	3	Isopod *Asellus aquaticus*	S,U,T	50	6.75	4,370	4,370	4,370	4,370	4,370	Martin & Holdich 1986
N	2	Brook trout *Salvelinus fontinalis*	F,M,T	--	6.5	3,600	3,600	3,600	3,600	3,600	Decker & Menendez 1974
N		Cladoceran *Ceriodaphnia dubia*	S,M,T	50	7.42	1,900					McCauley *et al.* 1986
N		Cladoceran *Ceriodaphnia dubia*	S,M,T	50	7.86	1,500					McCauley *et al.* 1986

TABLE 1: Continued.

New Data?	Rank	Species	Method	Hardness (mg/L as $CaCO_3$)	pH	LC50	SMAV	GMAV	Normalized SMAV (hardness = 50 mg/L as $CaCO_3$)	Normalized GMAV (hardness = 50 mg/L as $CaCO_3$)	Reference
N		Cladoceran *Ceriodaphnia dubia*	S,M,T	50	8.13	2,560					McCauley *et al.* 1986
Y		Cladoceran *Ceriodaphnia dubia*	S,M,T	26	7.5	720					ENSR 1992a
Y		Cladoceran *Ceriodaphnia dubia*	S,M,T	46	7.6	1,880					ENSR 1992a
Y		Cladoceran *Ceriodaphnia dubia*	S,M,T	96	7.8	2,450					ENSR 1992a
Y		Cladoceran *Ceriodaphnia dubia*	S,M,T	194	8.1	>99,600					ENSR 1992a
Y		Cladoceran *Ceriodaphnia dubia*	S,M,T	98.5	76	2,880	3,021		2,510		Soucek *et al.* 2001
N		Cladoceran *Ceriodaphnia* sp.	S,M,T	47.4	7.36	2,300					Call 1984
N	1	Cladoceran *Ceriodaphnia* sp.	S,M,T	47.4	7.68	3,690	2,913	2,967	3,034	2,760	Call 1984
N		Common carp *Cyprinus carpio*	S,U,T	--	6.5	>4,000					Muramoto 1981
N		Common carp *Cyprinus carpio*	S,U,T	--	6.6	>2,000					Muramoto 1981
N		Common carp *Cyprinus carpio*	S,U,T	--	6.6	>4,000					Muramota 1981

TABLE 1: Continued.

New Data?	Rank	Species	Method	Hardness (mg/L as $CaCO_3$)	pH	LC50	SMAV	GMAV	Normalized SMAV (hardness = 50 mg/L as $CaCO_3$)	Normalized GMAV (hardness = 50 mg/L as $CaCO_3$)	Reference
N	†	Common carp	S,U,T	--	6.7	>2,000	>2,828	>2,828**	>2,828**	>2,828	Muramota 1981
Y	†	Common carp Copepod *Cyclops viridis*	S,U,T	--	6.9	>2,698	>2,698	>2,698*	>2,698*	>2,698*	Storey *et al.* 1992
Y	†	Smallmouth bass *Micropterus dolomieui*	S,M,T	12.1-12.8	7.5	>217	>217	>217*	>623*	>623*	Kane & Rabeni 1987

* Value not used in final calculations since study found higher NOEC at lower pH.
** Value not used in 1988 document or present re-analysis.
† Value not used in final criteria development.
S Static test.
F Flow-through test.
U Nominal aluminum concentration.
M Measured aluminum concentration.
T Aluminum values presented are as total aluminum.
N Document unavailable for review; value used in 1988 document, assume aluminum value as total.

Based on our literature review, chronic aluminum toxicity data for six genera of freshwater animals generated using test solutions with a pH between 6.5 and 9.0 were compiled (Table 2). Unlike the acute database which contains several potentially suspect "greater than" values, only the genus mean chronic value (GMCV) for *Salvelinus* (>224.5 µg/L) contains "greater than" toxicity values. All but one of the available chronic values for *Salvelinus* were "greater than" values. Although a *Salvelinus* chronic value of 87 µg/L was used to lower the current calculated chronic criterion from 750 µg/L to 87 µg/L, this value was not included in the original development of the chronic toxicity database in the current aluminum criteria (U.S. EPA 1988). The study upon which the 87 µg/L value was based was published in 1989 following publication of the criteria document (Cleveland *et al.* 1989). Re-evaluation of this study resulted in a chronic value of 121.95 µg/L derived from the geometric mean of the NOEC of 88 µg/L and a LOEC of 169 µg/L. This is the only study available that presents chronic toxicity data to *Salvelinus* at a pH between 6.5 and 9.0 (exposure pH ranged from 6.5 to 6.6 in this study).

Because there are too few chronic data to develop a separate chronic criterion, an acute-to-chronic ratio will have to be used to translate the final acute value (FAV) to a final chronic value (FCV) - as was the case with the original criteria document. The updated toxicity databases contained paired acute and chronic data for five genera (Table 3), a sufficient number to calculate a new ACR. However, U.S. EPA guidance dictates that a difference between the smallest and largest ACR should not be greater than a factor of 10. In this case, the largest difference in this data set is 13.5, suggesting that further refinement of this relationship may be warranted and that the calculated ACR of 7.18 (Table 3) should be considered preliminary.

TABLE 2: Chronic toxicity of aluminum to aquatic animals. All values determined at pH values < 6.5 were excluded from database. All aluminum values as total µg/L. SMCV = species mean chronic value; GMCV = genus mean chronic value.

New Data?	Rank	Species	Test	Chemical	Hardness (mg/L as $CaCO_3$)	pH	Limits	Chronic Value	SMCV	GMCV	Reference
Y		Cladoceran *Ceriodaphnia dubia*	LC	aluminum chloride	47.4	7.58	--	12,100	12,100		Call 1984
N	6	Cladoceran *Ceriodaphnia dubia*	LC	aluminum chloride	50	7.15	1,400-2,600	1,908	1,908	4,805	McCauley *et al.* 1986
N	5	Fathead minnow *Pimephales promelas*	ELS	aluminum sulfate	220	7.24-8.15	2,300-4,700	3,288	3,288	3,288	Kimball, mss.
N	4	Cladoceran *Ceriodaphnia dubia*	LC	aluminum chloride	50	7.15	1,400-2,600	1,908	1,908	1,908	McCauley *et al.* 1986
Y		Rainbow trout *Oncorhynchus mykiss*	ELS	aluminum chloride	103	7.94-8.10	--	3,910			Gundersen *et al.* 1994
Y	3	Rainbow trout *Oncorhynchus mykiss*	ELS	aluminum chloride	20.3	7.97-8.14	--	1,940	2,754.2	2,754.2	Gundersen *et al.* 1994
N	2	Cladoceran *Daphnia magna*	LC	aluminum sulfate	220	8.3	540-1,020	742.2	742.2	742.2	Kimball, mss.
Y		Brook trout *Salvelinus fontinalis*	ELS	aluminum sulfate	285	7.2	--	>242			Cleveland *et al.* 1986
Y		Brook trout *Salvelinus fontinalis*	ELS	n/s	--	7.81	--	>283			Hunn *et al.* 1987
N		Brook trout *Salvelinus fontinalis*	ELS	aluminum sulfate	12	6.5-6.6	88-169	121.95			Cleveland *et al.* 1989
Y	1	Brook trout *Salvelinus fontinalis*	ELS	aluminum sulfate	--	7.2	--	>303.9	224.5	224.5	Cleveland *et al.* 1991

LC = Life-cycle test.
ELS = Early life stage used in testing.

TABLE 3: Acute-to-chronic ratio of aluminum toxicity to five genera.

Genus	Acute Value (µg/L)	Chronic Value (µg/L)	Acute to Chronic Ratio
Pimephales	18,497	3,288	5.63
Ceriodaphnia	2,966.5	1,908	1.55
Oncorhynchus	19,064	2,925	6.52
Daphnia	15,563	742.2	20.97
Salvelinus	3,600	224.5	16.03
Geometric Mean			**7.18**

Hardness Relationship

A significant result of our review of the aluminum toxicity literature was the discovery of an apparent inverse relationship between the toxicity of aluminum and the hardness of the solution. Using data presented in the updated acute database (Table 1), a hardness modifier for the aluminum criteria can be developed. This relationship between the acute toxicity of aluminum and hardness was evaluated following guidance from the U.S. EPA (Stephan *et al.* 1985) and using the recently issued cadmium criteria document (U.S. EPA 2001) as a guide.

At a minimum, a range of toxicity values at differing hardness values should be available from two different species in the toxicity database. This range of hardness values for a given species should be such that the highest hardness value is at least three times the lowest and there is a minimum difference of 100 mg/L as $CaCO_3$ between the highest and lowest hardness value. After sorting the data using these criteria, a relationship was developed between aluminum toxicity and hardness using data from *C. dubia*, *D. magna*, and *P. promelas*. A linear regression was performed between log-transformed hardness values normalized to a mean for each species and log-transformed LC_{50} values normalized in the same manner (Fig. 1). The result of this analysis is a significant ($p = 0.0012$), positive (slope = 0.7602) relationship indicating an inverse relationship between hardness and toxicity. The slope of this line can then be used to develop a hardness-based equation to calculate an updated aluminum criteria between a hardness of 25 and 400 mg/L as $CaCO_3$ similar to that used for many other metals.

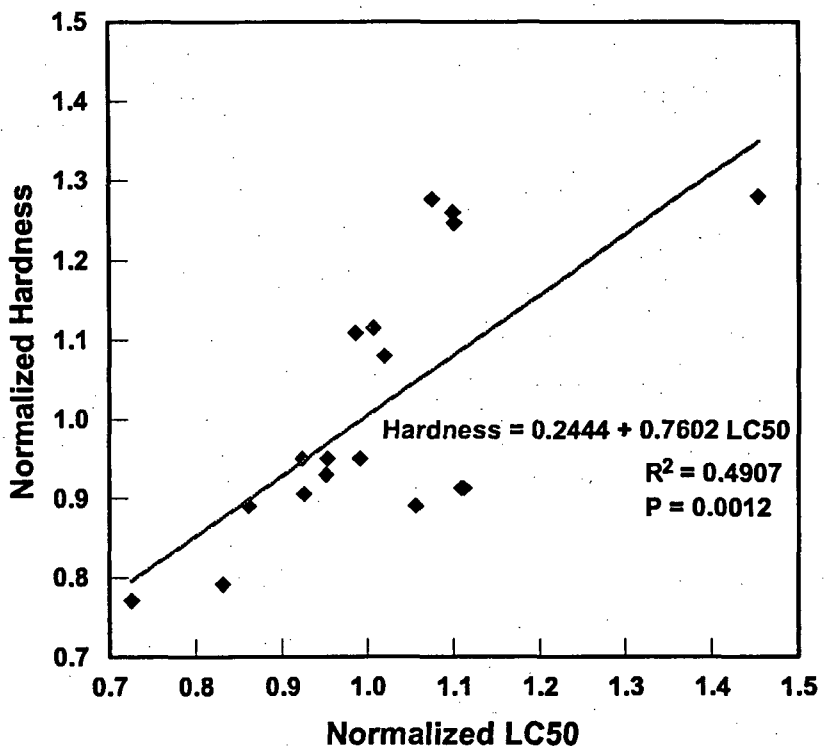

FIGURE 1: Relationship between the acute toxicity of aluminum and the hardness (mg/L as $CaCO_3$) of the test solution. Straight line is the result of a simple linear regression of the data, and is defined by the included equation.

REVISED ACUTE AND CHRONIC CRITERIA FOR ALUMINUM

Using the updated toxicity databases and the relationship between water hardness and aluminum toxicity developed using these databases, an updated, hardness-based acute aluminum screening level criterion can be developed (Table 4). The resulting acute criterion equation is $e^{[0.7602(\ln \text{hardness})+4.0061]}$. At a hardness value of 100 mg/L as $CaCO_3$ the updated acute aluminum criterion based upon this equation is 1,821 µg/L (Table 4). These preliminary calculations indicate that an updated acute SLC for the Molycorp ecorisk analysis would be substantially higher than the existing 1988 criterion. Further, these values are more environmentally realistic in that the criteria increase as the hardness of the solution increases.

TABLE 4: Recalculation of the final acute and chronic values for aluminum using updated toxicity databases (N = 14 genera, R = sensitivity rank in database, P = rank ÷ N+1).

Rank	Genus	GMAV (µg/L)	ln GMAV	$(\ln GMAV)^2$	P = R/(N+1)	√P
4	*Gammarus*	7862	8.9698	80.4572	0.2667	0.5164
3	*Asellus*	4370	8.3825	70.2666	0.2000	0.4472
2	*Salvelinus*	3600	8.1887	67.0546	0.1333	0.3651
1	*Ceriodaphnia*	2759.6	7.9228	62.7714	0.0667	0.2582
		Sum of columns	33.4638	280.5499	0.6667	1.5870

Calculations:

Acute Criterion

$$S^2 = \frac{\Sigma(\ln GMAV)^2 - (\Sigma \ln GMAV)^2/4}{\Sigma P - (\Sigma\sqrt{P})^2/4} = \frac{280.5499 - (33.4638)^2/4}{0.6667 - (1.5870)^2/4} = 16.0136 \qquad S = 4.0017$$

$L = [\Sigma \ln GMAV - S(\Sigma\sqrt{P})]/4 = [33.4638 - 4.0017\,(1.5870)]/4 = 6.7783$

$A = S(\sqrt{0.05}) + L = (4.0017)(0.2236) + 6.7783 = 7.6731$

Final Acute Value = FAV $= e^{A} = 2149.7867$

CMC = ½ FAV = 1074.8934

Pooled Slope = 0.7602

ln (Criteria Maximum Incercept) = 4.0061

Recalculated Acute Aluminum Criterion $= e^{[0.7602\,(\ln \text{hardness})+4.0061]} = 1{,}821$ µg/L at a hardness of 100 mg/L

Assumed Chronic Slope = 0.7602

Final Acute-to-Chronic ratio (FACR) = 7.18

Final Chronic Value (FCV) = FAV ÷ ACR = 2149.7867 ÷ 7.18 = 299.4132

ln (Final Chronic Intercept) = 2.7279

Recalculated Chronic Aluminum Criterion $= e^{[0.7602(\ln \text{hardness})+2.7279]} = 507$ µg/L at a hardness of 100 mg/L

The chronic SLC can also be updated using both the hardness relationship and the ACR of 7.18 calculated during this study. Using this new information, the new chronic criteria equation is $e^{[0.7602(\ln \text{hardness})+2.7279]}$. At a hardness value of 100 mg/L as $CaCO_3$, the updated chronic aluminum criterion based upon this equation is 507 µg/L (Table 4). As with the acute criteria values, the updated chronic value is higher than

the existing 1988 chronic criterion. In addition, the updated chronic criterion presented here is hardness-dependant and increases with increasing hardness of the solution.

RECOMMENDED TIER III SCREENING LEVEL CRITERIA FOR ALUMINUM

Based on this review of the 1988 aluminum criteria document,, a detailed literature review, and subsequent technical updates of criteria, new Tier III aluminum SLCs were developed which could be utilized for the Molycorp ecorisk (Table 5). These would be 1.8 mg/L acute and 0.5 mg/L chronic (at hardness 100 mg/L).

TABLE 5: Summary of updated acute and chronic aluminum criteria values compared to existing and corrected existing U.S. EPA water quality criteria.

Hardness of 100 mg/L (as $CaCO_3$)	1988 Criterion (µg/L)	Corrected Criterion (µg/L)	Updated Tier III Study (µg/L)
Acute	750	825	1,800
Chronic	87	122	500

It is important to note that these updated SLCs are based upon studies that measured aluminum as total aluminum in circum-neutral solutions. The 1988 criteria (U.S. EPA 1988) were also based upon total aluminum data. However, the U.S. EPA suggested in that document that implementing these criteria as dissolved rather than as total may be more appropriate. And, in fact, the existing criteria have often been adopted by States as regulating dissolved and not total aluminum. It is our understanding that for the ecological risk assessment, it has been decided to use these numbers as total aluminum (appropriate for the database).

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TECHNICAL MEMORANDUM

Executive Summary of Data on the Red River in the Vicinity of NPDES Permitted Outfalls 001 and 002

Introduction

This memorandum provides an executive summary of the aquatic biological and chemical data collected on the Red River in the vicinity of Outfalls 001 and 002 permitted through the National Pollution Discharge and Elimination System (NPDES). The information is presented for the Molycorp, Inc. (Molycorp) NPDES renewal process. Data supporting this renewal report come primarily from long-term aquatic biological monitoring reports from Chadwick Ecological Consultants, Inc. (CEC) prepared on behalf of Molycorp (CEC 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2005) and data collected by the Remedial Investigation (RI) Study as presented in the Molycorp Preliminary Site Characterization Report (URS 2005).

Site Descriptions

Sites bracketing each outfall were chosen to characterize the aquatic biota and water and sediment chemistry in the vicinity of each outfall (Fig. 1). Study site names are based on names used during the Molycorp Remedial Investigation/Feasibility Study ([RI/FS] URS 2005). Study sites used for this summary include:

LR-1 - upstream of Outfall 002, biological sampling/water chemistry/sediment chemistry
LR-5 - downstream of Outfall 002, water chemistry/sediment chemistry
LR-8A - downstream of Outfall 002, biological sampling/water chemistry/sediment chemistry
LR-11A - downstream of Outfall 002 and upstream of Outfall 001, water chemistry/sediment chemistry
LR-13 - downstream of Outfall 002 and upstream of Outfall 001, water chemistry/sediment chemistry
LR-16 - downstream of Outfalls 001 and 002, biological sampling/water chemistry/sediment chemistry

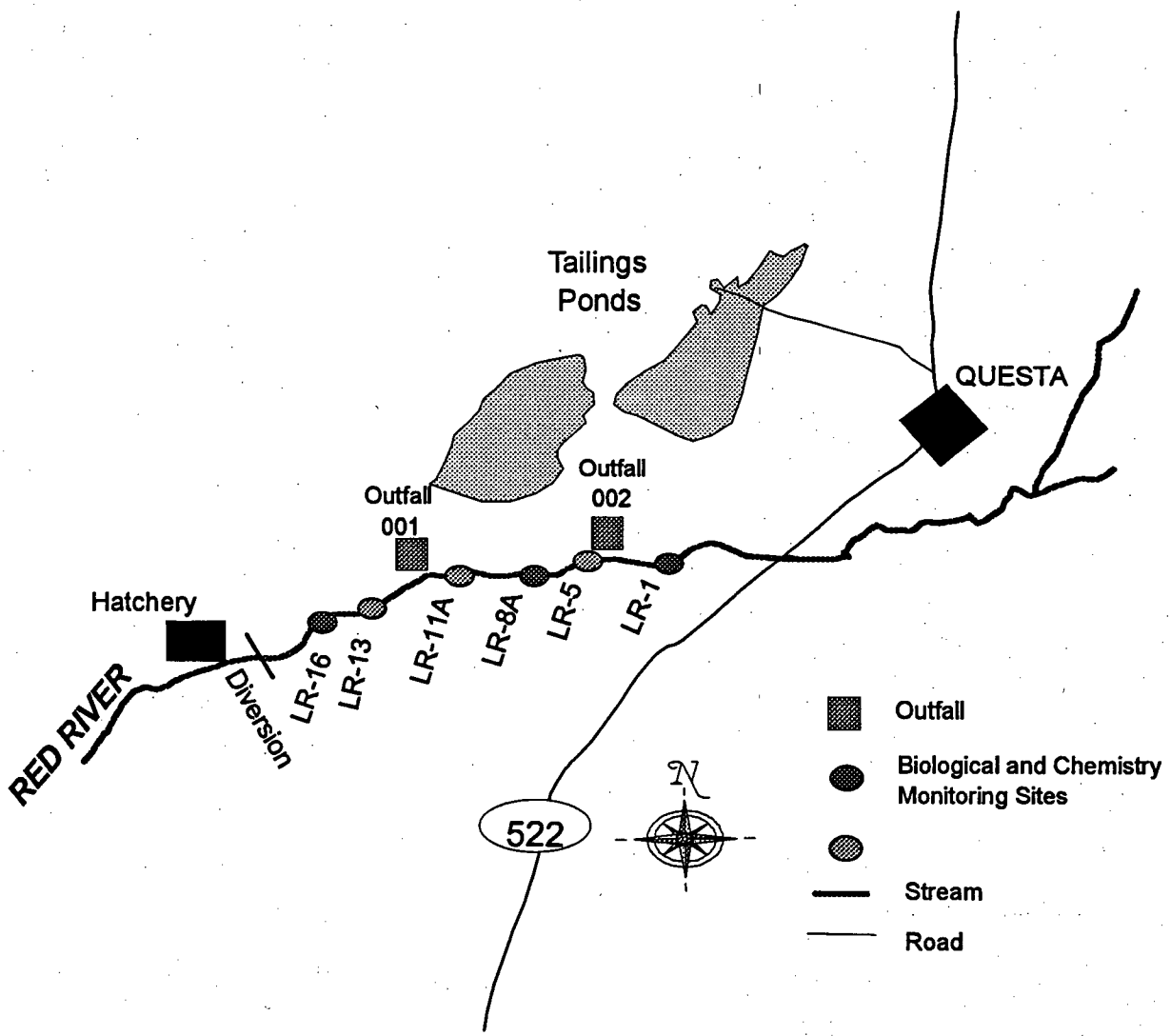

FIGURE 1: Study sites in the vicinity of Outfall 002 and Outfall 001.

Outfall 002 is the only NPDES permitted outfall currently in active use by Molycorp on the Red River. The GPS coordinates for this outfall are N36°41'31.36" W105°37'16.58", and it is at an elevation of 7,226 ft. Biological sampling has been conducted at Sites LR-1 and LR-8A bracketing this outfall (Fig. 1). During the RI, water and sediment samples were collected at those two sites, as well as Site LR-5, downstream of Outfall 002.

Outfall 001 is the outlet from Pope Lake, but has not been used for discharge since the last permit was granted. The GPS coordinates for this outfall are N36°41'40.15" W105°38'3.37", and it is at an elevation of 7,331 ft. Biological sampling has been conducted downstream of this outfall at Site LR-16. During the RI, water and sediment samples were collected at that site, as well as at Site LR-11A, upstream of Outfall 001, and LR-13, downstream of Outfall 001 (Fig. 1).

Media Sampled

Fish, benthic invertebrate, and periphyton populations have been sampled at each biological monitoring site. Fish populations were quantitatively sampled using electrofishing gear and a multiple-pass depletion technique. Fish species include rainbow trout, hybrid rainbow/cutthroat trout, brown trout, and white sucker. Rainbow trout found in the study area represent fish stocked by the New Mexico Game and Fish Department and the Town of Red River. These fish generally exist in the river for a short period of time because they are quickly harvested. Therefore, rainbow trout are not considered resident fish and are not discussed in this data summary. Benthic invertebrate populations were quantitatively sampled by taking five replicate samples using a modified Hess sampler. Periphyton populations were qualitatively sampled by scraping algae from the stream bottom substrates.

Fish and invertebrate tissue samples have also been collected during the RI. Rooted macrophytes were uncommon in the study area, so bryophytes (moss) were used for plant tissue samples.

Water quality samples were collected for the RI as grab samples at each collection date. Sediment samples collected in fall 2002 were a composite of erosional and depositional sediment due to a lack of appropriate riffles in many areas of the stream. Low flows allowed sediment to accumulate, and storms partially dammed the river with sediment in 2002, especially downstream of Hot 'n Tot and Hansen creeks. Sediment samples collected at other times were obtained separately from riffles and depositional zones.

Tissues, water, and sediment samples were analyzed for a suite of 25 elements. These elemental analytes were analyzed in both the total and dissolved fractions of the water samples. At sites generally co-located with biological monitoring sites, water and sediment samples were also analyzed (in total

fractions) for a suite of 138 organic compounds, including 43 volatile organic compounds, 62 semi-volatile organic compounds, 5 explosive organic compounds, and 28 pesticides/PCBs, in fall 2002. Because the concentrations of these organic compounds (except ∃-hexachlorocyclohexane and 2-butanone in sediment) were nearly all below detection limits at all sites, no further analysis was conducted for those analytes. Inorganic ions, pH, alkalinity, specific conductance, % solids, and other similar laboratory and physical parameters were measured on the appropriate media for each sample (URS 2005).

Screening level criteria used for analysis of the water and sediment data were based on U.S. EPA Region 6 Risk-Based Screening Level Criteria for Human Health, promulgated New Mexico Surface Water Quality Standards, or pertinent National Recommended Ambient Water Quality Criteria for ecological receptors, as required in the Data Quality Objectives for the Molycorp RI/FS (URS 2002).

Screening level criteria do not exist for tissue-based samples (i.e., fish, benthic invertebrate, and plant samples); therefore, the measured concentrations were compared between sites (upstream - downstream of an outfall) and between years (2002 and 2003).

Screening level chronic toxicity tests were performed using *Ceriodaphnia dubia* on baseflow water samples in October 2002. Full dilution series chronic toxicity tests were performed using *C. dubia* for snowmelt runoff samples in late April 2003. Full dilution series acute toxicity tests were performed using *C. dubia* for three sets of stormwater samples from July through September 2003. Ten-day chronic sediment toxicity tests using *Hyalella azteca* and *Chironomus tentans* were performed on sediment samples at each site in October 2002. Chronic and acute toxicity test procedures followed methods described in U.S. EPA documentation (Lewis *et al.* 1994, U.S. EPA 2000, U.S. EPA 2002).

Habitat variables were measured in the sites used for fish population monitoring, generally representative of the reach in which it was located. Habitat units were identified by type according to the R1/R4 Habitat Inventory procedures used by the U.S. Forest Service (Overton *et al.* 1997). The length, widths, and depths of each habitat unit were measured, and a subjective score, ranging from 0.0 (degraded) to 5.0 (optimal), was assessed.

Summary of Data

Outfall 002 Sites

Fish Populations

Fish population samples have been collected at sites upstream and downstream of Outfall 002 in fall 2002, 2003, and 2004. At both sites, brown trout have been collected each year, and white suckers were also collected at Site LR-1 upstream of Outfall 002 in fall 2004. Brown trout densities have consistently exceeded 100 fish/acre, ranging up to 520 fish/acre, with higher densities found downstream of Outfall 002 at both Sites LR-8A and LR-16 (Fig. 2).

Brown trout biomass varied between sites and between years; however, biomass has been consistently greater downstream of Outfall 002 than upstream of Outfall 002 (Fig. 2). At the site above Outfall 002, brown trout biomass exceeded 25 lbs/acre. Downstream of Outfall 002, biomass of brown trout exceeded 40 lbs/acre every year except in 2002.

Fish Tissues

Metals were found in fish tissues both upstream and downstream of Outfall 002. In fall 2002, more analytes were below the detection limit at the upstream site than in the downstream site for size classes. In fall 2003, there were more analytes below the detection limits at the upstream site in brown trout >8 inches, but the trend was reversed for young-of-the-year (YOY) brown trout. In brown trout <8 inches, the same number of analytes were below the detection limits at both sites.

Tissue-based screening criteria have not been produced for analysis of these data. For 2002 data, there were lower concentrations of Cd in brown trout >8 inches and higher concentrations of Ba and Fe in brown trout <8 inches in the downstream site as compared to the upstream site. For 2003 data, there were higher concentrations of Al, Cr, Fe, Mn, Ni, and Se in brown trout >8 inches, higher concentrations of Cr, Ni, and Se in brown trout <8 inches, and higher concentrations of Hg and Se in YOY brown trout in the downstream site compared to the upstream site. From fall 2002 to fall 2003, Al and Mn concentrations decreased at the upstream site in brown trout >8 inches. At the downstream site in brown trout >8 inches, Cr and Mn concentrations increased from 2002 to 2003, and in brown trout <8 inches, Cr and Ni

concentrations increased from 2002 to 2003. All other metal concentrations were fairly consistent between years.

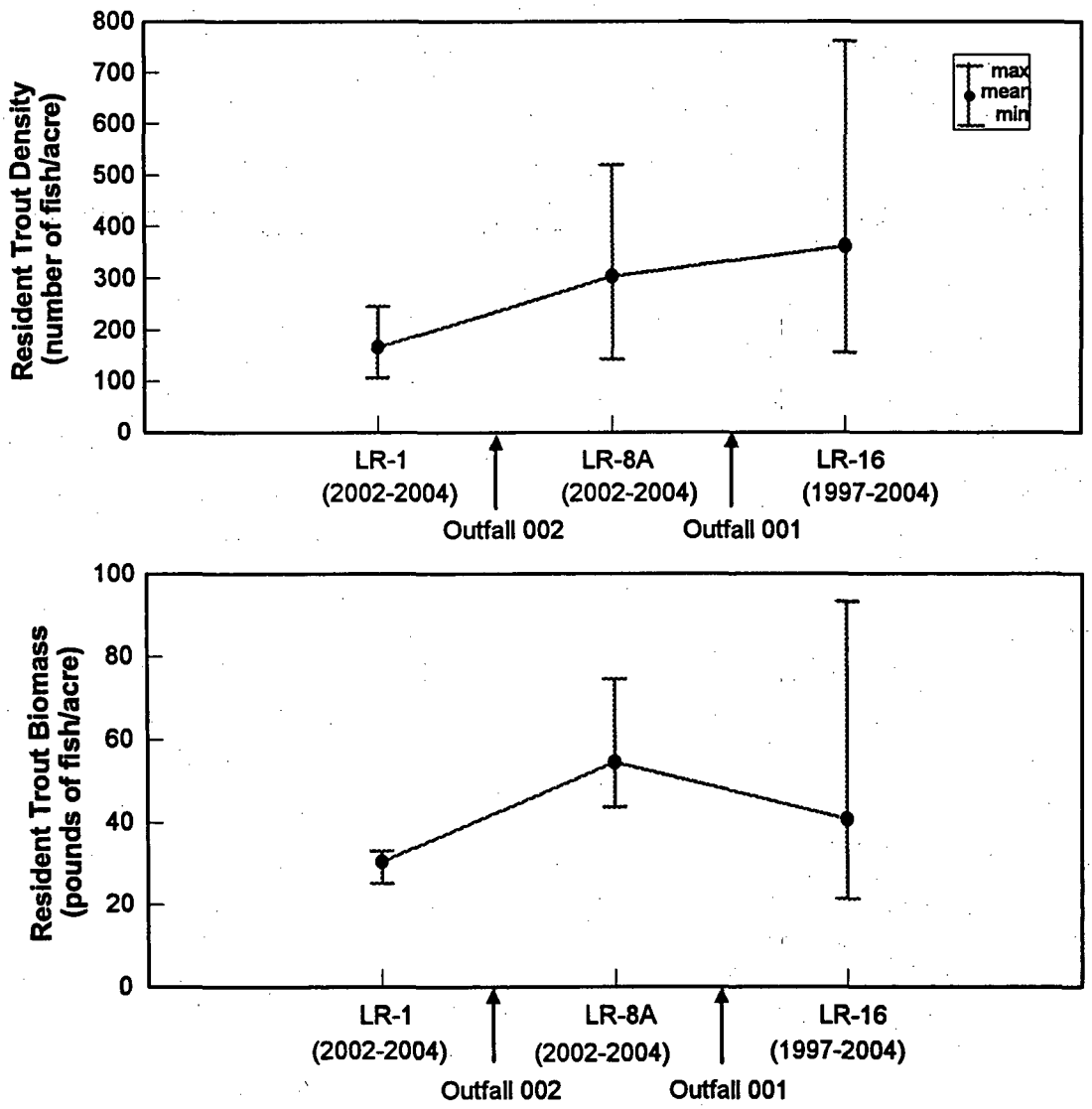

FIGURE 2: Comparison of resident trout density (number of fish/acre) and biomass (pounds of fish/ acre) at sites in the vicinity of NPDES permitted Outfalls 001 and 002 on the Red River, Taos County, New Mexico. Data collected in years indicated in parentheses.

Benthic Invertebrate Populations

Benthic invertebrate populations have been sampled at Site LR-1 upstream of Outfall 002 in spring and fall since spring 2002, and at Site LR-8A downstream of Outfall 002 in spring and fall since fall 2002. Densities have consistently been greater downstream of Outfall 002 (Fig. 3), with some seasonal fluctuations. Number of taxa has ranged from 22 taxa at the site upstream of Outfall 002 in spring 2004 to 45 taxa at the site downstream of Outfall 002 in spring 2003 (Fig. 3). There have been more than eight EPT (Ephemeroptera, Plecoptera, and Trichoptera) taxa collected in every sample. Shannon-Weaver diversity index values have generally been above 3.00, with only one value below 2.50 at the site upstream of Outfall 002 in spring 2002.

Benthic Invertebrate Tissues

Benthic invertebrate tissue samples were collected at both biological monitoring sites in spring 2002, fall 2002, and fall 2003. A reduced number of parameters was analyzed in spring 2002. Similar numbers of analytes were below detection limits at the sites upstream and downstream of Outfall 002. In fall 2002, Cd and Mo concentrations were lower at the downstream site as compared to the upstream site, and Se concentrations were lower at the downstream site in fall 2003. There was high variability between years at both sites.

Periphyton Populations

Periphyton population samples were collected at both sites bracketing Outfall 002 in fall 2002 and fall 2003. At the site upstream of Outfall 002, 18 - 19 taxa were collected, of which 17 were diatom taxa. Diatoms comprised well over half of the density in both years, with the rest of the population being blue-green algae in 2002 and blue-green algae plus green algae in 2003. At the downstream site, the number of algal taxa ranged from 19 - 22 taxa, with 16 - 20 taxa being diatom taxa. Diatoms comprised 91.2% of the density in 2002, with the remainder being blue-green and other algae. In 2003, diatoms comprised less than half of the density, blue-green algal density decreased from 2002 values, and other algae (mostly green algae) comprised just over half of the remaining density.

Plant Tissues

Most analytes (∃80%) were above detection limits in tissue samples from plants collected at the two sites in the vicinity of Outfall 002. In fall 2002, concentrations of Co, Mn, and Mo were higher at the

downstream site as compared to the upstream site; in fall 2003, only concentrations of Mo were higher at the downstream site, and Pb concentrations were lower at the downstream site.

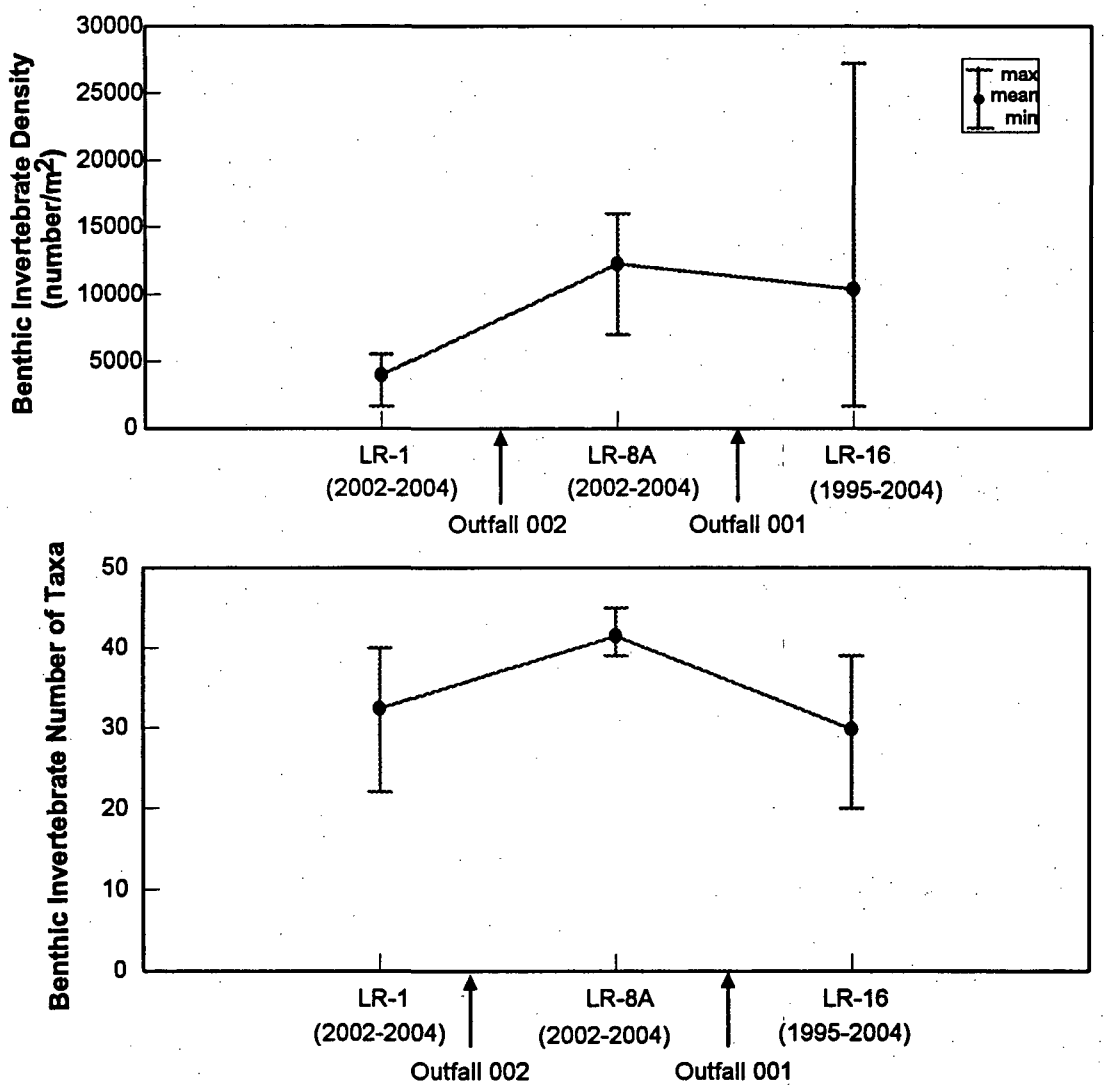

FIGURE 3: Comparison of benthic invertebrate density (number/m^2) and number of taxa at sites in the vicinity of NPDES permitted Outfalls 001 and 002 on the Red River, Taos County, New Mexico. Data collected in years indicated in parentheses.

Water Quality

Dissolved Ba concentrations and total Al concentrations exceeded ecological chronic screening level criteria at all three sites in the vicinity of Outfall 002 during each sample event. Dissolved B concentrations also exceeded the ecological chronic screening level criteria in spring, summer, and fall 2003 at all three sites. Dissolved Cd concentrations exceeded ecological chronic screening level criteria at all three sites in spring, summer, and fall 2003, but only at Site LR-1 upstream of Outfall 002 and Site LR-5 downstream of Outfall 002 in fall 2002. All other analyte concentrations were either below detection limits or below all screening level criteria, or screening level criteria do not exist.

Sediment Chemistry

Human health screening level criteria were exceeded by As concentrations at all sites on each sample date. Iron concentrations also exceeded human health screening level criteria in the composite samples from all three sites in fall 2002 and in depositional samples from all three sites in spring 2003 and fall 2003. ∃-Hexachlorocyclohexane and 2-butanone concentrations exceeded ecological screening level criteria in composite samples from fall 2002 at all sites. Concentrations of Ni exceeded ecological screening level criteria in all samples from spring 2003, and concentrations of Cu, Pb, and Zn exceeded ecological screening level criteria in all samples from depositional zones in spring 2003. Otherwise, concentrations of As, Cd, Cu, Fe, Pb, Mn, Ni, Se, and Zn exceeded ecological screening level criteria in various samples on various dates, with most of these analytes found either upstream only or both upstream and downstream of Outfall 002. Concentrations exceeded ecological screening level criteria in downstream sites only for Cd in riffle and depositional zone samples in spring 2003 and Pb in riffle samples in summer 2003. All other analyte concentrations were either below detection limits or below all screening level criteria, or screening level criteria do not exist.

Habitat Evaluations

Habitat parameters were evaluated at the sites bracketing Outfall 002 in fall of 2002, 2003, and 2004. A reduced number of habitat parameters was evaluated in spring 2004. Upstream of Outfall 002, there have been four habitat units consistently identified, comprised of low gradient riffles and runs. Average depths have been less than one foot, and maximum depths have been less than 1.5 feet. Habitat quality ratings have ranged from 2.5 - 3.3 at this site. At the site downstream of Outfall 002, seven to eight habitat units have been identified, comprised of low gradient riffles, runs, and small pools. The

average depth has been about one foot, with average maximum depths at least 1.5 feet. Habitat quality ratings were consistently 2.5 - 2.6.

Toxicity Tests

Screening level chronic toxicity tests using *C. dubia* were performed on water collected at the biological monitoring sites upstream and downstream of Outfall 002 in October 2002. There were no significant effects on survival in these tests; however, there were significant reproductive effects when compared to control organisms. A subsequent full dilution series chronic toxicity test using *C. dubia* was then performed on water from Outfall 002 and the sites bracketing the outfall in October 2002. The No Observed Effect Concentration (NOEC) for survival and reproduction was 100% in these tests. The IC_{25} values for the test using Outfall 002 water were 93.8% effluent for survival and 95.9% effluent for growth. However, no confidence limits could be calculated for these values and they cannot, therefore, be determined to be significantly different from 100% test waters. For the sites bracketing Outfall 002, the IC_{25} values for survival and reproduction were all >100% river water. Ten-day sediment toxicity tests using *H. azteca* and *C. tentans* were performed on sediment samples collected from the biological monitoring sites in October 2002 and October 2003. No significant effects on survival or growth were detected in any of these tests. Acute toxicity tests were run using stream water collected during three rainfall events (stormwater testing) in summer-fall at Site LR-16 downstream of Outfall 002. No significant acute toxicity (i.e., LC50 >100% streamwater) was detected in any of the storms.

<u>Outfall 001 Sites</u>

Fish Populations

Fish populations were initially sampled in Spring 1997 and subsequently each fall since 1997. Brown trout have had an average density of 380 fish/acre and an average biomass of 42.5 lbs/acre (Fig. 2). Values were consistently higher at the site downstream of Outfall 001 than at Site LR-1 upstream of both Outfalls 002 and 001.

Fish Tissues

In fish tissue samples, the number of analytes below detection limits in both brown trout >8 inches and brown trout <8 inches increased from 2002 to 2003.

Benthic Invertebrate Populations

Benthic invertebrate population sampling was conducted in fall 1997, 1998, and 1999, and in spring and fall since 2000. Densities have varied widely, with a particularly low density of 1,606 organisms/m^2 in fall 1997 to densities over 20,000 organisms/m^2 in fall 2000, fall 2002, and spring 2003 (Fig. 3). Number of taxa has consistently been greater than 20 taxa, with >30 taxa found in four of the 12 sample periods (Fig. 3). Number of EPT taxa has consistently ranged from nine to thirteen taxa. Shannon-Weaver diversity values have been generally good, with only two values below the threshold of 2.50 (fall 1998 and fall 1999). All other values have been greater than 2.50, with half of the values ∃ 3.00. The values for these parameters indicate healthy, generally abundant invertebrate populations downstream of Outfall 001. In addition, densities downstream of Outfall 001 were generally larger than at Site LR-1, upstream of both Outfalls 002 and 001. The number of taxa, number of EPT taxa, and diversity have not demonstrated clear trends among Sites LR-1, LR-8A, and LR-16.

Benthic Invertebrate Tissues

Only 5 - 6 analytes were below detection limits in benthic invertebrate tissue samples in 2002 and 2003. Concentrations of As, Ba, Fe, Pb, and V decreased and concentrations of Cd and Zn increased at this site from 2002 to 2003.

Periphyton Populations

Periphyton populations have been sampled at the site below Outfall 001 in fall 2002 and 2003. In both years, 19 algal taxa were collected, of which 18 - 19 taxa were diatoms. Diatoms comprised 92.1 - 100% of the population on those dates, whereas blue-green algae comprised the remainder of the population.

Plant Tissues

Between 3 - 5 analytes were below the detection limits in tissue samples from plants collected in fall 2002 and fall 2003. Concentrations of B increased in 2003 compared to 2002, but concentrations of Mo and Se decreased.

Water Chemistry

Dissolved Ba concentrations and total Al concentrations exceeded ecological chronic screening level criteria at all three sites in the vicinity of Outfall 001 during each sample event. Dissolved B concentrations also exceeded the ecological chronic screening level criteria in spring, summer, and fall 2003 at all three sites. Dissolved Cd concentrations exceeded ecological chronic screening level criteria at all three sites in spring and fall 2003, but only at Site LR-11A upstream of Outfall 001 and Site LR-13 downstream of Outfall 001 in summer 2003 and at Site LR-16 downstream of Outfall 001 in fall 2002. Total Fe concentrations exceeded screening level criteria at the Site LR-11A upstream of Outfall 001 and Site LR-16 downstream of Outfall 001 in fall 2002. All other analyte concentrations were below detection limits or below all screening level criteria, or screening level criteria do not exist.

Sediment Chemistry

Human health screening level criteria were exceeded by As concentrations at all sites on each sample date. Iron concentrations also exceeded human health screening level criteria in the composite samples from sites upstream and downstream of Outfall 001 in fall 2002 and in depositional samples from at least two sites in the vicinity of Outfall 001 in spring 2003 and summer 2003. ∃-Hexachlorocyclohexane and 2-butanone concentrations exceeded ecological screening level criteria in composite samples from fall 2002 at all sites. Concentrations of Ni exceeded ecological screening level criteria in all samples from spring 2003, and concentrations of Cu, Pb, and Zn exceeded ecological screening level criteria in all samples from depositional zones in spring 2003. Otherwise, concentrations of As, Cd, Cu, Fe, Pb, Mn, Ni, Se, Ag, and Zn exceeded ecological screening level criteria in various samples on various dates, with most of these analytes found either upstream only or both upstream and downstream of Outfall 001. Concentrations exceeded ecological screening level criteria in downstream sites only for Pb in riffle samples in spring 2003, Se in depositional samples in spring 2003, Cu and Mn in riffle samples from summer 2003, Fe in depositional samples in summer 2003, and Mn, Ni, and Zn in depositional samples in fall 2003. All other analyte concentrations were either below detection limits or below all screening level criteria, or screening level criteria do not exist.

Habitat Evaluations

Habitat evaluations at this site were conducted in fall 1999, 2002, 2003, and 2004, with a reduced set of parameters evaluated in spring 2004. Generally, eight habitat units were identified, except in 1999

when six units were identified. Mean depths have ranged from 0.9 - 1.7 feet, and mean maximum depths have ranged from 1.7 - 3.5 feet. Habitat quality ratings have varied from 2.5 - 3.6.

Toxicity Tests

Screening level chronic toxicity tests using *Ceriodaphnia dubia* were performed on water collected at the biological monitoring site downstream of Outfall 001 in October 2002. There were no significant effects on survival or reproduction in these tests. A full dilution series chronic toxicity test using *C. dubia* was conducted on water collected during snowmelt runoff in April 2003. The NOEC for survival was 100% and the NOEC for reproduction was 75% in this test, with corresponding IC_{25} values of >100% and 89.2%, respectively. These values were not significantly different from 100% test water. Full dilution series acute toxicity tests were also performed on water collected during three storm events in summer-fall 2003, each resulting in no significant acute toxicity (i.e., an LC_{50} of >100% test water) at the Site LR-16 downstream of Outfall 001.

Ten-day sediment toxicity tests using *H. azteca* and *C. tentans* were performed on sediment samples collected from the biological monitoring site downstream of Outfall 001 in October 2002 and October 2003. No significant effects on survival or growth were detected in the tests using *C. tentans*; however, there was only 71.3% survival in the October 2002 tests using *H. azteca*, significantly different from the control. Other tests using *H. azteca* showed no significant differences from control values.

Summary

Even though Outfall 002 is the only NPDES permitted outfall currently in active use by Molycorp, chemical concentrations in the water frequently differ upstream and downstream of both Outfalls 001 and 002, reflecting changes in chemistry occurring through this study reach unrelated to surface discharges. Regardless, biota population parameters show no measurable effects when comparing sites upstream and downstream of each outfall and are frequently greater downstream of outfall locations.

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MOLYCORP, INC
QUESTA DIVISION
NPDES PERMIT NM0022306 APPLICATION

SUPPLEMENTAL INFORMATION

MANGANESE PUMP BACK SYSTEM SUMMARY

Background

The U.S. EPA Region 6 issued an Administrative Order Docket No. CWA-6-01-1204, (AO), dated February 2, 2001, advising Molycorp, Inc. that the manganese loadings discharged from Outfall 002 exceeded those authorized by NPDES Permit NM0022306. The AO further directed Molycorp to develop and implement a plan to achieve full compliance with the new Permit limitations by February 1, 2004

Outfall 002 discharges collected seepage water from tailings ponds and intercepted groundwater to the Red River. Analysis by Vail Engineering, Inc. indicated that elevated manganese loadings were primarily due to the manganese in water transported to the tailings ponds rather than from seepage of such water through the deposited tailings. Water discharged to the ponds include combined well waters and surface waters diverted in the mill area, as well as water used to convey waste ore in a slurry and water from the mine de-watering operation. Vail Engineering found a large variation in the manganese concentrations of these various water streams, with the highest concentrations in the well water pumped for tailings transport and mine de-watering. Vail Engineering determined that 90% of the total manganese loading at Outfall 002 derived from the original drain lines developed in the area down gradient of Dam 1A.

Remediation Program

Vail Engineering recommended that all intercepted water from drain system components that had manganese concentrations in excess of 1.0 mg/L be diverted to a new well. This thus captured high manganese water would then be pumped a distance of 6,000 feet to the Dam 5A pond area and discharged to this upper pond.

The investigation, analyses, and recommendation details are documented in the report, which is included herein by reference.

Implementation of the recommendation was completed by Molycorp in January 2004, consistent with the AO, and Outfall 002 discharge has been in compliance with the Permit Manganese loading limitations since the installation of the pump back system was completed. Molycorp, Inc. submitted the required documentation to EPA Region 6 in a letter dated December 30, 2003. EPA officially closed the AO in a letter dated January

27, 2004. Molycorp, Inc, in a letter to U.S. EPA Region 6 dated February 13, 2004, further demonstrated such compliance

Literature Cited

Vail Engineering. 2003. *Report on Analysis of Molycorp's Outfall 002 Drain System and Proposed Seepage Pump Back System.* Report to Molycorp, Inc., Questa NM, May 2002 (Revised May 2003)

MOLYCORP, INC
QUESTA DIVISION
NPDES PERMIT NM0022306 APPLICATION

SUPPLEMENTAL INFORMATION

BEST MANAGEMENT PRACTICES IMPLEMENTATION SUMMARY

Background

NPDES Permit NM0022306, at Part I.B. prohibited the discharge of pollutants traceable to point source mine operations through a hydrologic connection to the Red River, except in trace amounts. The area in question is marked by natural springs and groundwater seeps, and is thought to originate, in part, from the mine rock piles. The exact source and nature of these springs and seeps has not been determined, nor is it expected that they will be in the near term. Therefore, a requirement to implement Best Management Practices (BMPs) to intercept these non-point flows was included in the Permit in lieu of precise source identification. Part I. C. included a Schedule of Compliance which, in part, scheduled the implementation of the BMPs specified in Part II.B. of the Permit. The design of the BMPs was provided in Part II.A. of the Permit. Satisfaction of BMP implementation requirement constituted compliance with the I.B. prohibition.

The BMPs included the design and construction of two French drains at the Spring 13 and Spring 39 seepage zones, and the construction of three groundwater extraction wells below the toe of the Sugar Shack South mine rock pile. More detailed configurations and locations of the improvements are provided in Part II.A. of the Permit.

Field investigations, both before and after implementation of the BMPs, were specified in the Permit to determine any appropriate changes to the design of the BMPs, and to assess the effectiveness of the BMPs at intercepting the potential seepage. Specified reporting requirements were also included in the Permit provision.

Evaluation of Effectiveness

The above required effectiveness evaluation was conducted by Vail Engineering, Inc. of Santa Fe, New Mexico. The evaluation and its results are documented in a report, (Vail Engineering 2003), which is included herein by reference.

In summary, the evaluation found the following:

Spring 13

During the first several weeks after installation, there was no noticeable seepage and no visible milkyness along the river north shore line. Subsequently, even though there was an apparent reduction in inlet flow to the French drain system, there remained a considerable reduction in visible seepage along the shoreline in this reach of the river.

Spring 39

The Spring 39 drainage system appears to be operating satisfactorily, and has eliminated visual seepage flow along the adjacent shore line.

Groundwater Wells

The groundwater withdrawal wells are functioning as expected, and are having the beneficial effect anticipated. However, because of the low permeability of the basin aquifer along the north side in the vicinity of the wells, the effects of such pumpage will accrue over a longer period of time then anticipated. Gradual reduction in conductance in the water pumped during the initial weeks of the system operation indicates and increasing percentage of basin flow water that is being drawn from outside the seepage plume.

Literature Cited

Vail Engineering. 2003. *Evaluation of Effectiveness, Spring 13 & Spring 39 Seepage Collection Systems, Ground Water Withdrawal Wells,* Report to Molycorp, Inc., Questa, NM, April 30, 2003

22304 04

VAIL ENGINEERING, INC.

PHONE: (505)
988-5575

1588 SAN MATEO LANE
SANTA FE, NEW MEXICO
87505

April 7, 2000

Mr. Scott Wilson
NPDES Permit Branch (6WQ-P)
US Environmental Protection Agency
Region 6
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Received
APR 1 8 2000
6WQ-PP

Re: Molycorp, Questa New Mexico - Spring 13

Dear Sir,

At the request of Mr. David Shoemaker, we are submitting herewith the Preliminary Design Analysis and related Drawings relative to the proposed interception of acid rock drainage at Spring 13 and Spring 39.

Both areas are on US Forest Service land and the Spring 13 area is also on the right-of-way of State Highway 38. We regret to advise that at a meeting with the Forest Service District Ranger on April 6, we were advised that regulatory requirements for public notice, clearances from other Federal and State agencies etc. must be met and that at the earliest it probably will be September of this year before a permit for even the field investigations can be approved, and that a much longer time period may be required. The State Highway Department has advised that it cannot issue a permit until the clearance from the Forest Service is received.

Molycorp wishes to advise you that it will do everything possible to expedite the approval of these permits, and that it will proceed with tentative final designs and make every effort to complete the installation of the proposed facilities this fall, before the low river flow period, which generally commences in November.

Respectfully Submitted
Vail Engineering, Inc.

Ralph E. Vail

Chief Engineer

cc: Mr. David Shoemaker
Mr. Geyza Lorinczi

VAIL ENGINEERING, INC.

PHONE: (505)
988-5575

1588 SAN MATEO LANE
SANTA FE, NEW MEXICO
87505

March 14, 2000

District Highway Engineer
P.O. Box 4127
Santa Fe, New Mexico 87502-4127

Attention: Mr. James Sullivan

Dear Sir:

Attached is an application on behalf of Molycorp, Inc., Questa, NM for the making of temporary excavations along a section of State Highway 38 in Taos County, New Mexico.

There is a section along Red River adjacent to State Highway 38 where natural ground water that has a very low pH (3.2 $\pm$) and very high mineral content is seeping into the river. This deteriorates the quality of the water in the river and during very low flow periods adds substantially to the milky appearance of the river water downstream.

A few years ago the State Highway Department cooperated with the New Mexico Environmental Department and Molycorp in excavating a trench in this area along the south shoulder of the highway near the river, the placement of lime stone in the trench and backfilling the trench. It was hoped that the limestone would neutralize the low pH of the ground water and the metals would precipitate out before reaching the river. Unfortunately this anoxic alkaline drain treatment has not significantly reduced the effect of the ground water seepage on the river.

Recently, at the request of the U.S. Environmental Protection Agency, Molycorp agreed to try to intercept this ground water seepage to the river and treat or dispose of this water even though this water appears to be natural and not resulting from or related to Molycorp's mining operations.

In order to design an effective system to intercept such ground water it will be necessary to determine the quantity and direction of flow and the hydrological characteristics of the aquifer.

It appears that the ground water lies at a fairly shallow depth for some distance back away from the river. Molycorp therefore proposes to determine the water table elevation, gradient and other characteristics by open excavation with a back hoe. The excavation pits will generally be not over 36 inches wide and only as long as required to reach to a depth of a few feet below the water table. It is anticipated that the depth of the pits will range from about 6 feet up to a maximum of 12 feet.

It appears that the highway right-of-way extends to near the river on the south side and generally to a steep hillside on the north. It will be necessary therefore to excavate the pits in the right-of-way, however there is sufficient room to make the excavations at a substantial distance

from the paved roadway. At this location the highway has two 12 foot wide traffic lanes and a paved shoulder of about six feet. The proposed location of the pit closest to the highway is at a distance of 32 feet from the highway centerline. At this location the pit will be behind a guard rail. Otherwise the pits will be about 40 or more feet from the highway centerline. It is anticipated that the excavations will be backfilled with suitable compacted material and the areas restored within 48 hours after the excavation is made. At most locations a four inch perforated vertical pipe may be inserted for future monitoring of the water table levels. The pipe will be suitably capped and will be completed flush with the surface in possible traffic or parking areas. All open excavations will be barricaded and the Highway Department's regulations regarding traffic safety will be complied with.

In addition to the individual pits, it may be desirable to excavate a trench parallel to the highway for a distance of about 200 feet and at a distance of not less than 40 feet from the highway centerline. If the ditch is located on the north side it will be behind the guard rail near Station 150+00. If the ditch is on the south side it probably will be down off the roadway embankment. A 4 inch drain line may be installed in this trench. After engineering data is obtained the trench will be filled and the area restored.

We anticipate that approximately 12 small pits will be required in addition to the temporary trench.

This application is for temporary excavations only. After the data is obtained and a final design is complete; Molycorp will submit an application for a permanent facility with detailed drawings for your consideration. It is anticipated that the proposed facility will consist of a french drain type system or several small wells which will be located near your right-of-way limits.

We are aware that there are existing underground telephone and gas lines and possibly an electric cable in this area and Molycorp will work with the utility companies to insure protection of such.

Molycorp has promised to develop an effective ground water catchment system at an early date and therefore requests your favorable consideration and approval of this application at your earliest convenience. We are including herewith a sketch showing the general location and details of the proposed excavations. We have also reviewed, on site, the proposed work with Mr. Steve Sanchez of your Questa office.

Please contact the undersigned Ralph E. Vail at (505)988-5575 if you have any questions or need further information.

Respectfully Submitted
VAIL ENGINEERING, INC.

Ralph E. Vail

Chief Engineer
NM PE & LS 2098

cc: Mr. Geyza Lorinci
Molycorp, Questa

Form No. M-202
Rev. 2-93

Application For Permit To Install Utility Facilities Within Public Right of Way

TO: NEW MEXICO STATE HIGHWAY
AND TRANSPORTATION DEPARTMENT
P.O. Box 1149
Santa Fe, New Mexico 87504-1149

Permit No._____

- [x] New Installation
- [ ] Renewal Permit
- [ ] Relocation
- [ ] Remain in Place

1. Pursuant to New Mexico Statutes Annotated, 1978 Compilation, Sections 67-8-13 and 69-8-14, the undersigned Molycorp, Inc.
Address: P.O. Box 469, Questa, NM 87556-0469

herein makes application to use highway rights of way to install:
Size and Type of Facility: Temporary excavations to determine ground water conditions.
in the following location: N.M. Project No._____ S.R. No._____
Hwy. Station 150+00 to Hwy.Station 155+00.
County, Section 3, Township 28N, Range 13E

2. For the purpose of this application "within" shall be construed as meaning "on, over, under, across or along."
   a. "Engineer" shall be construed as meaning the District Highway Engineer of the New Mexico State Highway and Transportation Department or his representative.
   b. "Applicant" shall be construed as meaning the individual, firm, corporation, association, governmental subdivision, or other organization making application, or the successors of any of the above.
   c. "Facility" shall be construed as meaning, but not limited to, and publicly, privately, cooperatively, municipally or governmentally owned facility used for carriage, distribution or transmission of water, gas or electricity, oil and products derived therefrom, sewage, steam or other projects carried by means of pipelines, conduits, wires, culverts, ditches, conveyors or other methods.
   d. If application is for a parallel installation, justification as to why private right may not be utilized must be furnished.
3. Applicant proposes to relocate, install or leave facility ____feet within the ____right of way line. The proposed installation shall be:
   parallel (Crossing or Parallel) subsurface (Subsurface or Overhead) open excavation out of pavement (Boring, Jacking or Pavement Cut)
   a. If Applicant requests installation by pavement cut, complete justification therefore shall be submitted by attachment.
   b. Where application for pavement cut is justified, the application may be held in abeyance pending receipt of cash bond in an amount to be fixed by the Engineer.
4. There is attached hereto a diagrammatic dimensioned drawing showing the location of existing and/or proposed installation referenced to roadway and right of way, right of way lines, any access control lines, distance of proposed installation above or below grade, highway stationing, identification of materials to be used and any other pertinent data. If application is for parallel installation, nature of adjacent land use shall be shown. Proposed installations on or in bridges or other structures, or for the installation of any structures, will require detailed structural drawings.
5. Applicant desires this permit to be in affect for 1 years. Permit will not be issued for a period longer than 25 years, must be renewed upon expiration and the burden of timely renewal is on the Applicant. The Applicant shall formally notify the engineer of actual commencement and completion of construction of the installation. The Applicant shall also formally notify the Engineer of removal or abandonment of the facility, or relinquishment of the permit.
6. The signing of the application by the Engineer and returning it to the Applicant shall validate this application as a permit. The granting of this permit shall not be construed as granting any easement or property right.
7. Servicing of facilities will not be permitted within the access control lines on any controlled access project. Should an emergency occur, the Applicant shall notify the Engineer and shall provide such flagmen, flashers, warning or other safety devices as required by the Engineer. All routine maintenance shall be performed from outside any access control lines.
8. The relocation or installation of facilities within public right of way shall be in strict conformance with all provisions of this application, drawing and the Instruction for Utility Permits, as they may be modified by the Engineer, and no departure therefrom may be made without the written consent of the Engineer. All facilities shall be so placed that they will not interfere with nor endanger any roadway features nor other existing facilities. All construction of facilities shall be subject to the inspection and approval of the Engineer. All such work shall be performed so that danger, inconvenience and delay to the traveling public will be held to a minimum. Protection and handling of traffic during the installation are the responsibility of the Applicant and must be approved by Engineer.
9. The Applicant will, except as otherwise ordered by the Engineer, restore the public right-of-way, and all bridges or other structures

thereon or adjacent thereto which have been altered or affected by facility installation performed hereunder, in accordance with sound construction practices and the Engineer's specifications, and shall cause the work to be done in a workmanlike manner. If any damage is caused to the highway right of way or to any bridge, structure or improvement thereon or adjacent thereto by reason of the installation, maintenance, alteration or removal of such facilities or other appurtenances, the Applicant will reimburse the Engineer the full amount thereof promptly upon demand by the Engineer; provided, however that the obligation imposed under this paragraph shall not apply in the event the damage resulted from causes beyond the control of the Applicant. All such facilities located within the right of way shall at all times be kept in such repair so as not to damage the highway, inconvenience or endanger the traveling public and shall be kept free from advertisement, posters and the like.

10. The Applicant will at all times indemnify and save harmless the Engineer from any and all claims of every kind of character caused by or incident to the installation, alteration, removal or condition of these facilities in the right of way and will promptly reimburse the engineer for any and all expenses incurred by the Engineer in resisting any such claim or claims. Nothing herein shall be construed to mean that the Applicant hereunder will indemnify and save harmless the Engineer from any claim caused by or incident to any neglect, carelessness or breach of duty on the part of the Engineer.
11. Should the Applicant at any time fail to promptly and fully perform any of the obligations imposed hereby and after thirty (30) days written notice thereof, the Engineer may, at his option, (a) cause the obligations to be fully carried out and performed, and the Applicant will promptly reimburse the Engineer for all costs and expenses incident thereto, (b) may summarily order the removal of such facility and if the applicant fails to comply within a reasonable time, the engineer may direct the removal of the facility with all costs and expenses thereto to be borne by Applicant.
12. If by any reason of any change in the location, construction, grade or by any other matter affecting the highway upon which any facility is located because of changing traffic conditions or otherwise, it shall become advisable in the opinion of the Engineer the said facility be removed, relocated or otherwise modified, the Applicant, upon written notice from the Engineer, shall remove, relocate or modify such facility without undue delay in such manner as the Engineer may direct or approve, at the Applicant's expense and at no cost to the Engineer. All facilities located on public right of way under the dual jurisdiction of the State and a subordinate governmental entity shall comply with all applicable rules and regulations of such entity properly and lawfully in force and including but not limited to provisions of local franchises not in conflict with the rules and regulations of the Engineer. The Engineer makes no warranty either express or implied as to the continued existence of any highway in any particular location and expressly assumes no obligation with regard to the facility upon change, vacation or abandonment of any highway or portions thereof.
13. Neither the making of this application nor anything herein contained shall constitute a waiver on the part of the Applicant of any rights or claims had or made by some with respect to the occupancy of the streets and highways under the Constitution and laws of the State of New Mexico, nor shall anything herein contained in anywise prejudice or impair any rights or claims existing independent of this application with respect to the construction, operation and maintenance of the Applicant's facilities in the State of New Mexico.
14. Each copy of the application must be signed by the Applicant as an individual owner or by any official designated to execute such documents.

This application is hereby granted subject to all provisions herein and to the following special provisions, changes or amendments:

Applicant Molycorp, Inc.

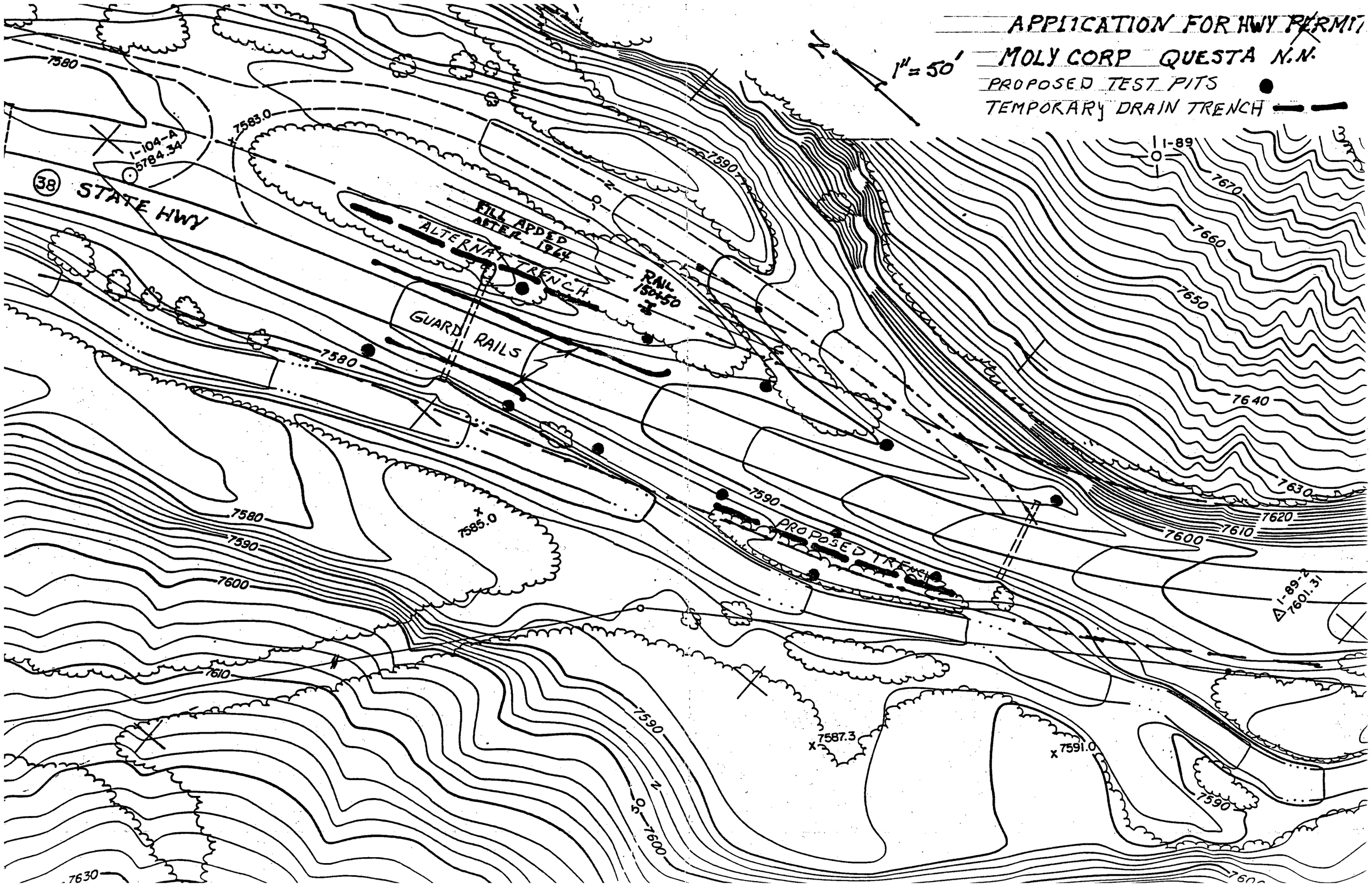
By Ralph E. Vail

Title Consulting Enfineer

Approval of this permit is hereby given this _____ day of _____, 19____

New Mexico State Highway and Transportation Department

By _____


APPLICATION FOR HWY PERMIT
MOLY CORP QUESTA N.M.
1" = 50'
PROPOSED TEST PITS
TEMPORARY DRAIN TRENCH
38 STATE HWY
1-104-A
5784.34
7583.0
FILL ADDED AFTER 1964
ALTERNAT TRENCH
RAIL 150+50
GUARD RAILS
PROPOSED TRENCH
1-89
1-89-2
7601.31
7585.0
7587.3
7591.0
7580
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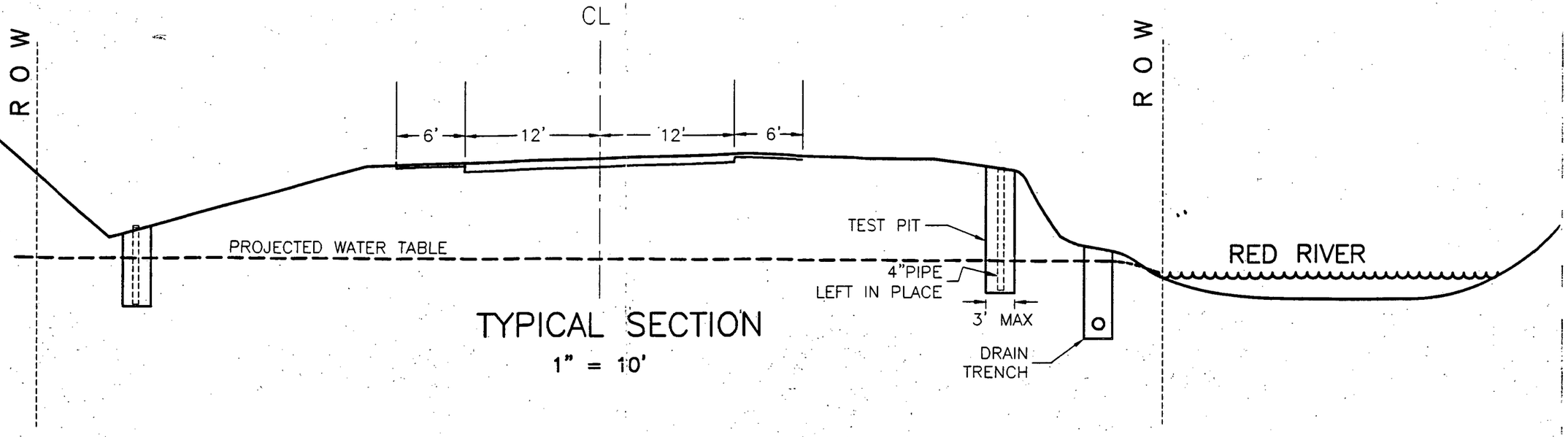
7600
7610
7620
7630
7640
7650
7660
7670

STATION 148=50 TO 153+50

NM HWY 38



TYPICAL SECTION

1" = 10'

APPLICATION FOR PERMIT

MOLYCORP INC.

QUESTA NM

Molycorp, Inc.
P. O. Box 469
3 ½ miles East of Questa on State Road 38
Questa, NM 87556
Telephone (505) 586-0212
Facsimile (505) 586-0811

MOLYCORP, INC.
Questa Division

Fax

To: Scott Wilson **From:** Anne Wagner

Fax: **Pages:** 3 including cover

Phone: **Date:** 10/11/02

Re: **CC:**

☐ **Urgent** ☐ **For Review** ☐ **Please Comment** ☐ **Please Reply** ☐ **Please Recycle**

• **Comments:**

Per our conversation
Hard Copy is in the mail.

This message is intended only for the use of the individual or entity to which it is addressed, and may contain information that is privileged, confidential and exempt from disclosure under applicable law. If the reader of this message is not the intended recipient, or the employee or agent responsible for delivering the message to the intended recipient, you are hereby notified that any dissemination, distribution or copying of this communication is strictly prohibited. If you have received this communication in error, please notify the sender immediately by telephone and return the original message to the sender at the above address via the U. S. Postal Service. Thank you.

Molycorp, Inc.
Molybdenum Group
P.O. Box 469
Questa, NM 87556-0469
Telephone (505) 586-0212
Facsimile (505) 586-0811

Molycorp

VIA FACSIMILE

October 11, 2002

J. Scott Wilson
NPDES Permits Branch (6WQ-P)
U.S. Environmental Protection Agency
1445 Ross Avenue
Dallas, TX 75202-2733

Re: Spring 13 and Spring 39 French Drain Design Modification
NPDES Permit No. NM0022306

Dear Mr. Wilson:

As a followup to our conversation of October 9, 2002 we are providing the following documentation. As indicated in our conversation a recent inspection of the test drain line that was installed in February 2001 at Spring 13 revealed that, based on the current design specifications for cap screen slot and pipe orifice size, the french drain system may be prone to plugging.

Prior to the final installation of the permanent drain lines at Spring 13 and Spring 39, the following modifications to the design are proposed in order to minimize the potential for plugging:

(a) The 2" pipe cap to be slotted with 1/8" saw cuts providing approximately 2" of open area per cap (slot width 12 ½ times that of the original 10 slot screen).

(b) The drain pipe orifice size to be increased to 3/8" diameter holes which will have a flow capacity four times that of the original design of 3/16" holes. It is anticipated that the higher flow rate will result in velocities sufficient to flush out any sediment that may plug the holes.

(c) The spacing between orifices will be increased in an equal amount to compensate for the larger individual orifice flow rate.

(d) Install two or four inch pipe wells extending from the drain line elevation to above the surface at about 50 foot intervals along the drain lines and make periodic water level measurements to verify proper functioning of the drain systems in the future.

Per our telephone conversation on October 9, 2002 it is Molycorp's understanding that the above modifications are acceptable to EPA and that Molycorp is approved to proceed as proposed.

Should you have any questions or require additional information, please contact me at (505) 586-7625.

Sincerely,

Anne Wagner
Environmental Manager, Questa

Cc: Program Manager, SWQB, NMED
W. Strickley, US EPA Region 6

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

RECEIVED
2001 JAN 29 AM 10: 13
EPA-GWO-D
OFFICE OF GENERAL COUNSEL

JAN 19 2001

MEMORANDUM

SUBJECT: Adverse Decision in *Amigos Bravos v. Environmental Protection Agency, et al.*, 10th Cir. No. 99-2346 (January 3, 2001)

FROM: Susan G. Lepow
Associate General Counsel
Water Law Office (2355A)

TO: Steven A. Herman
Assistant Administrator for Enforcement and Compliance Assurance (2201A)

J. Charles Fox
Assistant Administrator for Water (4101)

Gregg A. Cooke
Regional Administrator
Region VI

On January 3, 2001, the U.S. Court of Appeals for the Tenth Circuit reversed and remanded for further proceedings a decision of a Federal district court determining that collateral estoppel barred a citizen enforcement action under section 505 of the Clean Water Act (CWA).

Appellant Amigos Bravos had filed a civil action against the U.S. Environmental Protection Agency and the Regional Administrator for Region VI (EPA), alleging that EPA had violated its duty to take corrective or enforcement action against Molycorp, Inc. (Molycorp) for unlawful point source discharges. Amigos Bravos alleged that a report prepared by an EPA employee constituted a determination by EPA that Molycorp was illegally discharging pollutants from a point source without a permit. In these circumstances, Amigos Bravos asserted that the report triggered section 309(a)(3) of the CWA, and a consequent EPA duty to take some form of corrective action. The district court disagreed, concluding that a prior district court decision barred Amigos Bravos's claim under the judicial doctrine of collateral estoppel. This doctrine bars an action when the issues raised in the action have already been determined in a prior case.

Here, the Court of Appeals concluded that the prior decision did not bar the present action. Moreover, the court also declined to sustain the district court decision on other grounds raised by EPA. These include the contention that, irrespective of whether or not collateral

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estoppel applied, the Court of Appeals must sustain the lower court decision because the citizen complaint alleged violations of discretionary duties which the district court lacked jurisdiction to enforce.

Background

In an earlier district court action, Amigos Bravos filed a section 505 citizen suit action against Molycorp. In that case, Amigos Bravos alleged that Molycorp was violating its NPDES permit because pollutants from waste rock piles at Molycorp's facility leached into ground water that was hydrologically connected to the Red River. The court granted Molycorp's motion for summary judgment concluding that, during the EPA permitting process, EPA had determined that Molycorp did not need a permit for any ground water seepage into the Red River. The court determined that Amigos Bravos's suit essentially attacked EPA's issuance of a permit to Molycorp and any challenge to a permit had to have been brought in a petition for review of the permit in a United States Court of Appeals pursuant to CWA section 309(b)(1)(F). Because Amigos Bravos had failed to challenge the permit pursuant to the statutory review provision, the district court concluded it lacked jurisdiction over the claim under the citizen suit provision. The Tenth Circuit affirmed the decision. *Amigos Bravos v. Molycorp,Inc.*, No. 97-2327, 1998 WL 792159 (10th Cir. Nov. 13, 1998).

Tenth Circuit Decision

In the current case, Amigos Bravos asserted that its citizen suit claim against EPA arose because EPA had changed its position from that taken in the earlier permitting case. Amigos Bravos maintained that EPA had, subsequent to the issuance of the 1993 NPDES permit considered in the previous case, determined that Molycorp was illegally discharging pollutants from the waste rock piles, based on language in a EPA geologist's report to this effect. This determination, in Amigos Bravos's view, required EPA to take action against the unlawful discharge under section 309(a)(3) of the CWA..

The Court of Appeals reviewed the district court's conclusion that the case was barred by collateral estoppel and concluded that it did not meet the four elements necessary for collateral estoppel. Specifically, the court noted that the issue decided in the earlier case was not identical to that raised in the more recent case. The first case involved the issue of whether EPA should have taken the allegations of an illegal point source discharge into account in its permitting decision. The second case concerns whether EPA has a duty to take enforcement action once it discovers an illegal discharge. Though factually related, in the court's view, the two issues were not identical.

Next, the court concluded that Amigos Bravos did not have a full and fair opportunity to litigate the second issue in the first proceeding, a necessary element for collateral estoppel to apply. The court noted that the report which Amigos Bravos asserted gave rise to EPA's duty under section 309 was not issued until two years after the initiation of the earlier action.

Moreover, resolving the issue of whether EPA had a duty to take an enforcement action was not a relevant issue in the first case.

As noted, the court also rejected several alternative bases for sustaining the district court's decision. The court declined to do so on the basis that the court below had not considered these issues. The court went on, however, to include some potentially troublesome language on the issue of whether the Agency has a mandatory enforcement duty under section 309(a)(2). The court stated that:

> "We make no comment on whether the Administrator's enforcement duties are discretionary or mandatory, except to observe that there is no controlling Supreme Court or Tenth Circuit authority." 2001 WL8310, *2 (10th Cir. (N.M.)).

As you are aware, several district courts have recently concluded, contrary to the Agency's view, that, in certain circumstances, the Agency may have a mandatory duty to take an enforcement action.

If you have any further questions about this decision, please call Richard Witt (202-260-7715) of my staff or Renea Ryland, Office of Regional Counsel, Region VI (214-665-2131).

Attachment

cc: Eric Schaeffer (2241A)
Brian Maas (2243A)
Mike Cook (4201)
Renea Ryland, ORC - Region VI
Regional Counsels, Regions I-X
Regional Water Management Directors, Regions I-X
Associate General Counsels
Water Attorneys

Only the Westlaw citation is currently available.

United States Court of Appeals, Tenth Circuit.

Amigos BRAVOS, a nonprofit corporation and New Mexico Citizens for Clean Air and Water, a nonprofit corporation, Plaintiffs-Appellants,
v.
ENVIRONMENTAL PROTECTION AGENCY; Carol Browner, Administrator of the Environmental Protection Agency; Greg Cook, EPA Regional Administrator for Region VI, Defendants-Appellees.

No. 99-2346.

Jan. 3, 2001.

Appeal from the United States District Court for the District of New Mexico, (D.C. No. CIV-99-327-DJS).

Submitted on the briefs: [FN*] Matthew Bishop, Western Environmental Law Center, Taos, NM, for the Plaintiffs-Appellants.

FN* At the parties' request, the case is unanimously ordered submitted without oral argument pursuant to Fed.R.App.P. 34(f) and 10th Cir.R. 34.1(G).

John W. Zavitz, Assistant United States Attorney, Albuquerque, NM, Renea Ryland, United States Environmental Protection Agency Office of Regional Counsel, Dallas, TX, Lois J. Schiffer, Assistant Attorney General, Evelyn Ying, Melaine Williams, Kathryn E. Kovacs, Washington, DC, for the Defendants-Appellees.

Before BRORBY, KELLY and LUCERO, Circuit Judges.

LUCERO, Circuit Judge.

*1 Plaintiffs-appellants Amigos Bravos and New Mexico Citizens for Clean Air and Water bring this civil action for declaratory and injunctive relief against the United States Environmental Protection Agency ("EPA"), the EPA Administrator, and the EPA Regional Administrator under a citizen suit provision of the **Clean Water Act** ("the Act"), 33 U.S.C. § 1365(a)(2). [FN1] Appellants allege that in February 1998 the EPA recognized an illegal point source [FN2] discharge of pollutants entering the Red River from waste rock piles of Molycorp, Inc.'s molybdenum mine site near Questa, New Mexico but has failed to take any corrective or enforcement action. The district court concluded that the suit is barred by the doctrine of collateral estoppel and dismissed the matter with prejudice. [FN3] Exercising jurisdiction under 28 U.S.C. § 1291, we reverse and remand for further proceedings.

FN1. 33 U.S.C. § 1365(a) provides:
(a) Authorization; jurisdiction
Except as provided in subsection (b) of this section and section 1319(g)(6) of this title, any citizen may commence a civil action on his own behalf--
(1) against any person ... who is alleged to be in violation of (A) an effluent standard or limitation under this chapter or (B) an order issued by the Administrator or a State with respect to [**Clean Water Act** standards], or
(2) against the Administrator where there is an alleged failure of the Administrator to perform any act or duty under this chapter which is not discretionary with the Administrator.
The district courts shall have jurisdiction, without regard to the amount in controversy or the citizenship of the parties, to ... order the Administrator to perform such act or duty....

FN2. Under the Act, a point source is "any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, [or] discrete fissure ... from which pollutants are or may be discharged." 33 U.S.C. § 1362(14).

FN3. The district court's judgment was entered upon a memorandum opinion and order issued by the magistrate judge assigned to the case for final disposition pursuant to 28 U.S.C. § 636(c) and Fed.R.Civ.P. 73.

I

The district court's collateral estoppel determination is based on the outcome of a case filed by appellants in 1995 against Molycorp. In that case, brought under 33 U.S.C. § 1365(a)(1), appellants alleged that the discharge of pollutants leached from the

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waste rock piles into the Red River was not authorized by the National Pollution Discharge Elimination System ("NPDES") permit reissued by the EPA in September 1993. See Amigos Bravos v. Molycorp, Inc., No. 97-2327, 1998 WL 792159 (10th Cir. Nov. 13, 1998) (unpublished disposition). The district court granted Molycorp's summary judgment motion on the ground that it lacked subject matter jurisdiction over appellants' claims.

In making its determination, the district court examined the EPA's permitting process and the issues resolved in connection with the Molycorp permit. It "determined that, '[w]ithout question, the EPA made a decision that Molycorp did not need a permit for any ground water seepage into the Red River, regardless of whether Molycorp's operations polluted the ground water and, eventually, the river.' " Id. at * *3 (quoting the district court's order). Because, " '[a]t its core, [appellants'] complaint attack[ed] the EPA's decision to reissue Molycorp's NPDES permit,' " appellants were required to bring their claims to the court of appeals in a petition for review under 33 U.S.C. § 1369(b)(1)(F). Id. Accordingly, the district court lacked subject matter jurisdiction. On appeal, this Court affirmed. See id. at * *4.

In the present case, appellants assert that their claims are premised entirely on the EPA's recognition of the allegedly illegal point source discharge in a February 13, 1998 report entitled "Report on Hydrological Connection Associated with Molycorp Mining Activity, Questa, New Mexico." They contend that the EPA's report constituted a change of position that triggered a duty under § 309(a)(3) of the Act, requiring the EPA to take some form of corrective action against Molycorp. See 33 U.S.C. § 1319(a)(3). [FN4] Additionally, appellants assert that the EPA's failure to take action amounts to an illegal exemption of a known point source discharge from the Act's permit provisions. See id. § 1342(a)(1) (requiring, for "the discharge of any pollutant, or combination of pollutants," a NPDES permit prescribing conditions "necessary to carry out" the Act's provisions); id. § 1311(a) (making illegal any pollutant discharges not specifically allowed by an NPDES permit).

FN4. Section 309(a)(3) provides, in pertinent part: Whenever on the basis of any information available to him the Administrator finds that any person is in violation of [provisions of the Act], or is in violation of any permit condition or limitation implementing any of such sections in a permit ..., he shall issue an order requiring such person to comply with such section or requirement, or he shall bring a civil action....

II

*2 We review de novo a district court's determination that collateral estoppel bars a plaintiff's claims. See Dodge v. Cotter Corp., 203 F.3d 1190, 1197 (10th Cir.2000). Under the doctrine of collateral estoppel, "once a court has decided an issue of fact or law necessary to its judgment, that decision may preclude relitigation of the issue in a suit on a different cause of action involving a party to the first case." Ag Servs. of Am., Inc. v. Nielsen, 231 F.3d 726, 732 (10th Cir.2000) (quotations and citations omitted). As applied in the Tenth Circuit, the elements of collateral estoppel are:

(1) the issue previously decided is identical with the one presented in the action in question, (2) the prior action has been finally adjudicated on the merits, (3) the party against whom the doctrine is invoked was a party, or in privity with a party, to the prior adjudication, and (4) the party against whom the doctrine is raised had a full and fair opportunity to litigate the issue in the prior action. Dodge, 203 F.3d at 1198.

In this case, neither the first nor the fourth element is satisfied. The issue in contention in the prior action concerned appellants' allegations of a point source discharge that should have been taken into consideration in the EPA's decision to reissue Molycorp's 1993 NPDES permit. Here, the issue is whether the EPA has a duty to take action once it discovers an illegal point source discharge. Although factually related, these two issues are not identical. Furthermore, as a matter of timing, appellants did not have a full and fair opportunity to litigate the current issue in the prior action. The EPA report was issued over two years after initiation of the earlier action, during the pendency of appellants' appeal. Resolving the duty issue was not necessary, or even relevant, to the judgment in the earlier action. Accordingly, the district court was incorrect in concluding that the doctrine of collateral estoppel operates to bar the instant action.

We acknowledge the EPA's argument that, even if

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collateral estoppel does not bar litigation of this case, we may affirm the district court's dismissal on an alternative basis. We decline to do so. "As a general rule, we do not consider issues not passed on below, and it is appropriate to remand the case to the district court to address an issue first." N. Texas Prod. Credit Ass'n v. McCurtain County Nat'l Bank, 222 F.3d 800, 812 (10th Cir.2000). [FN5] The judgment of the district court is REVERSED and REMANDED for further proceedings consistent with this opinion.

FN5. The EPA provides several bases for its contention that dismissal was the appropriate disposition of this lawsuit. Two of these arguments require a factual analysis which cannot be performed on the record before us. These factual arguments include: (1) a claim that the 1998 report which triggered this action is of no legal significance, in that the report was authored by a geologist who was not empowered to make findings on behalf of the Administrator and, therefore, does not constitute a "finding" under § 1319(a)(2) or "determination" under § 1342(c)(3) necessary to impose an enforcement duty; and (2) an assertion that the EPA met any such duty on May 27, 2000 by issuing a draft of a new NPDES permit that covers the groundwater discharges at issue in this case.

The EPA's primary argument relies on principles of statutory interpretation. The citizen-suit provision of the Act authorizes suits against the Administrator only when the Administrator's duty is mandatory and nondiscretionary. See 33 U.S.C. § 1365(a)(2). The EPA contends that, although the complaint alleges violations of nondiscretionary duties, the specified duties are actually discretionary, and that the federal courts therefore lack subject matter jurisdiction over appellants' claims. We make no comment on whether the Administrator's enforcement duties are discretionary or mandatory, except to observe that there is no controlling Supreme Court or Tenth Circuit authority. However, we note the EPA's contention that the statutory interpretation issue implicates subject matter jurisdiction is erroneous. This notion appears to be based on case law decided before recent cases explaining "[t]he absence of a valid (as opposed to arguable) cause of action does not implicate subject matter jurisdiction, i.e., the courts' statutory or constitutional power to adjudicate the case." Steel Co. [v. Citizens for a Better Environment, 523 U.S. 83, 87 (1998)]. Jurisdiction is not defeated by the possibility that the averments might fail to state a cause of action on which petitioners could actually recover. Rather, where the complaint is so drawn as to seek recovery directly under the Constitution or the laws of the United States, the federal court, but for two possible exceptions must entertain the suit. The two exceptions come into play where the alleged claim under the Constitution or federal statutes clearly appears to be immaterial and made solely for the purpose of obtaining jurisdiction or where such a claim is wholly insubstantial and frivolous. If the applicability of the federal statute upon which a plaintiff relies is genuinely at issue, the federal courts possess jurisdiction and should reach the merits of the claim. Davoll v. Webb, 194 F.3d 1116, 1129 (10th Cir.1999) (further citations and quotations omitted).

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February 16, 2000

REMEDIAL SYSTEMS FOR THE ACID ROCK DRAINAGE AT THE MOLYCORP MINE, QUESTA, NEW MEXICO

draft

CONTACT: C. David Abshire (USEPA, Region 6, 214-665-7188)

The EPA Region 6 National Pollution Discharge Elimination System (NPDES) program has requested the Ground Water Center (GWC) develop the most appropriate remedy for the low ph and high metals seep discharge to the Red River at the Molycorp mine site. The GWC contends that no thorough remedial investigation has been conducted at the Molycorp mine site, and therefore, any proposed remedy may not be fully effective in reaching the NPDES goals. For optimum effectiveness, water quality samples should be taken at uniform intervals along the Red River to characterize all metals sources to the river. The visible seeps may not be the only sources of contamination to the river; the river is fed by ground water which enters the river from below, as well as from the bank (i.e., seeps). Concentrations and ph levels defined by equally spaced river samples would dictate the most appropriate remedial system for the river. However, although a comprehensive study of Red River water quality is required to define the most appropriate remedial plan for the river, the point of this study is to address issues relevant to the NPDES program, i.e., discharges to surface water.

Disregarding the GWC's concerns for evenly spaced river water samples, the GWC has developed what it believes to be the most appropriate remedy to address the Region 6 NPDES concerns, based on the available data. The proposed remedies are to be cost effective by utilizing the hydraulic head developed by the natural river gradient (in place of pumps) and existing Molycorp facilities (i.e., pipeline, ion-exchange unit, settling ponds). The NPDES proposed permit requires zero seep discharge to the Red River within the Molycorp boundary. The GWC views the zero discharge requirement as either a zero water discharge or a zero contaminant discharge. Therefore, the GWC has developed two (2) remedial approaches: total capture and ex-situ active treatment, and a combination of ex-situ passive treatment (e.g., limestone cells) for low flow seeps and capture and ex-situ active treatment for the high flow seeps. The following is a discussion addressing each remedial approach.

TOTAL CAPTURE AND EX-SITU ACTIVE TREATMENT:

The capture of seep discharge requires 1) trenching approximately 6 separate seep areas, 2) installing drains which maintain a negative head to move groundwater to the drain, and 3) moving the captured water to a treatment facility which can manage the water volumes, and neutralize the ph and remove the metals. Molycorp has constructed a pipeline along the river from the mine site, down-gradient to the ponds at Questa for the transport and disposal of mill slurry. On the assumption that the pipeline pressure at the seep location is minimal, Molycorp may forgo pumps and utilize the natural gradient of the river to pipe captured ground water from the drain to the pipeline. A combination of gravity drainage with backflow systems to prevent pipeline water entering the drain system and dedicated pumps operating only when the gravity

drainage is insufficient can be utilized to minimize costs. The Molycorp Questa facility maintains an ion-exchange treatment facility, which at the moment is idle. The pipeline water would be directed to the ion-exchange unit which would increase the ph and remove the metals prior to the discharge of the decant water to the settling ponds and ultimately to the river. The pipeline and treatment facility already exist, therefore, Molycorp's expenditure would be for the capture trenches, drains and associated piping to connect to the existing pipeline. The only concern for this remedial approach is whether the ion-exchange facility has the capacity to manage the cumulative water volumes from all seeps within the Molycorp boundary.

EX-SITU PASSIVE TREATMENT AND CAPTURE AND EX-SITU ACTIVE TREATMENT:

Waters from high flow seeps will be captured, removed and treated (e.g., ion-exchange facility). In addition to the capture and treatment of high flow seeps, the GWC proposes a series of passive limestone systems of solid catchment cells, inside the Molycorp property boundary, to raise the ph of low flow seep discharge, and in turn, discharge neutral ph waters to the river while precipitating the metals into the solid catchment cells. When the limes ability to raise the ph is depleted, the expended lime and the precipitate will be removed by lifting each catchment cell "cage" and transporting the lime and precipitate to a disposal cell. New limestone will be added to the catchment cage at the site.

Considering that Acid Rock Drainage (ARD) degrades the river water quality and that water moving down through Molycorp's Waste Rock Dump (WRD) material appears to be one of the major causes of ARD, the most appropriate remedy for the mine site would be to cap the WRDs with impermeable material to prevent the infiltration of water. This would require Molycorp cap approximately 500 surface acres of WRDs with a hard surface (e.g., concrete, clay, etc.). However, although the WRDs are capped, the existing contaminated groundwater below the WRDs will require many years to reach the river. Therefore, controlling seep discharge is necessary to improve the Red River water quality.

Considering that this is an NPDES issue, and that apparently the NPDES program has authority over point discharges to surface water only, the GWC suggests that NPDES request Molycorp position ex-situ limestone filled catchments at relatively low discharge seeps; and capture, extract and treat the more active and concentrated seep discharge. The Red River is fed by ground water which enters the river through visible seeps along the bank and from the river bed. Molycorp, National Forest personnel or conservation groups may be willing to address Red River water quality outside of the Molycorp property boundary to utilize a dilution factor for low ph which may enter the river system from the river bed.

The following is a discussion of the negative and positive aspects of remedial systems and river water quality issues outside of the Molycorp boundary.

1) In-situ Versus Ex-situ Treatment:

Seep discharge and metals concentrations are relatively low at most seeps to allow the use of small in-situ anoxic limestone drains or ex-situ catchment cells of limestone. The ph level, volume, concentrations and flow velocity of the water dictate the effectiveness of a drain or catchment to increase ph and precipitate metals within the confines of the system. Most importantly, the acidic waters must be in contact with the limestone for an appropriate length of time for the alkaline material to increase the ph to an acceptable level. Therefore, the discharge (flow) rate, acidity and metals concentrations must be determined to define the size (length and depth) of the system and the volume of limestone needed. A large volume of limestone and large system would be required for high flow seeps, however they would not be appropriate for this area due to the relatively narrow width of the Red River and river bank material.

The negative aspects of an in-situ anoxic system is that it must be placed deep enough below the water table surface (and the predicted water table surface due to decreased head within the system) to maintain anaerobic conditions; if not, iron and aluminum levels are such that they may form hydroxides which will coat the limestone surface and make it ineffective. In addition, decreasing the hydraulic head of the water table increases volumes and velocity of ground water moving through the system. Greater volumes may lower the effectiveness of the drain. At the most active seeps (e.g.., Capulin Canyon), the ph level is considerably lower, and concentrations and the flow rates are greater; and therefore, this seep discharge requires groundwater capture and ex-situ treatment, not the placement of an anoxic drain. The capture of this seep water can be accomplished by placing a standard drain below ground or installing a capture well near the river.

Other seep flow rates, ph level and concentrations are such that the discharge can be treated in a passive system (i.e., ex-situ catchment cell). Although the river area is considered small for capture cells, it appears that the low seep discharge should have sufficient residence time within the limestone filled catchment cell for the alkaline material to increase the ph to an acceptable level. The catchment cells would be in series, the first set of cells would be dedicated to aeration (precipitation of hydroxides) and the remaining cells for limestone water interaction.

2) Addressing River Water Quality:

In combination with the previously discussed "remedy for seep discharge", The National Forest group, which controls the majority of the properties outside of the Molycorp property, may wish to assist the local community in addressing the overall Red River water quality. For example, a passive system may be placed within the Hanson creek tributary (within National Forest control), which is upriver (outside) of the Molycorp property. This tributary supplies approximately 3 ph water and dissolved metals to the Red River due to minor abandoned mines and the Hanson scar material. Considering that seepage occurs from below river level (i.e., the river bed), increasing the ph, and in-turn precipitating metals, within the Red River at Hanson Creek would allow good quality water to move down river to dilute any river bed seepage.

CONCLUSIONS:

The GWC has concerns regarding the effectiveness of any remedy based on the available data. The most appropriate remedial approach(s) must be developed to address the low ph levels and metals concentrations discharged to the Red River by seeps. Prior to the design of the remedial system, water quality samples should be taken at the seeps and at uniform intervals along the Red River to define the site specific acidity and contaminant input to the river. A single remedial approach, in most cases, will not achieve the desired water quality. Metals have different solubilities, and therefore, the metals concentrations in seep and river water must be defined to determine the optimum ph value needed for the limestone drains and catchments to be most effective. Constituents may require aeration to remove them from the water prior to entering the system because some can coat the limestone surface preventing its effectiveness in increasing the ph level.

The most effective remedy for seeps within the Molycorp boundary is 1) passive treatment (i.e., limestone filled catchment cells) at low flow seeps; and 2) capture (i.e., trench), transport (i.e., pipeline) and ex-situ treatment (i.e., ion-exchange) of high flow seep discharge. To address the water quality within the Red River watershed, an additional option would be to address the metals loading to the Red River upgradient of the mine site (i.e., Hanson Creek). The proposed remedies are appropriate; however, as previously discussed, several conditions can hamper the effectiveness of these remedial systems to improve river water quality within the Red River watershed. Therefore, representative water quality data from seep discharge, trenches and the Red River must be collected to define the most effective remedy for the low ph and high metals concentrations being discharged by surface and ground water to the Red River. The remedies suggested by EPA are designed to be cost effective. If the remedies are not completely effective, they will stay actively in place and supplemental remedies will be designed. Molycorp may wish to propose other remedial approaches to address the acidic, high metals seeps within its boundaries. However, although all interested parties agree to a remedy(s) based on adequate site specific data, any remedial plan requires a pilot project to determine its effectiveness in meeting the NPDES goals for zero discharge to the Red River.

Draft

cc: Larry Wright
Scott W.
orig → Brian M.

1) Shown
2) Jack
3) Scott for your info

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Walter West, P.E.
RR2, Box 226K
Zavalla, TX 75980
Feb. 22, 2002

Office of the Chief Clerk - MC 105
Texas Natural Resource Conservation Commission
P.O. Box 13087
Austin, TX 78711-3087

Subject: Comments on Donohue Industries, Inc.
Application for Amendment - Permit No. 00368

Dear Ms. Castanuela;

Please consider these additional comments in your review of the subject permit amendment.

Paper mills are known sources of pollutants that include hazardous and toxic materials. The Lufkin Paper Mill has been in operation since the early forties and it is very likely that hazardous wastes have been disposed of on-site, within an unlined land fill. Monitoring wells are known to exist in or near the paper mill land fill currently operated or owned by the applicant. In order to protect the public from ground water contamination by leachate associated with this land fill it would be appropriate to include in the 00368 permit a requirement to monitor, assay, and report the water chemistry conditions in the ground water affected by the land fill.

Refer to Tech Section, page 14 of the application. The permit application says location of monitoring wells and water supply wells is given in attachment 7 & 8. There were no indications of wells on attachments 7 & 8 in the amendment application on file for public review in the Lufkin Library.

On page 14 of the Tech Section of the permit application available for public review, the applicant was asked to define locations of leak detection and monitoring wells in place or planned. The applicants response to this query was "N/A". Since at least 15 monitoring wells have been assayed by the applicant this does not seem to be an appropriate response?

It would seem appropriate for TNRCC to require the applicant to describe the means of leachate collection if any, and to also describe the means of disposal of leachate collected from this land fill, if any.

In the interest of avoiding human health and nuisance issues the applicant should identify the location of privately owned wells and public water wells in the vicinity of their landfill.

Comments I submitted to Mr. Rocques of TNRCC on the recently advertised 305(b) assessment take issue with the classification of Paper Mill Creek as an intermittent stream. The permit limits associated with this classification do not provide protection of aquatic life and allow effluent causing chronic toxic effects to pass through privately owned property and National Forest property. There is a TNRCC internal memorandum written in 1996 that identifies several metals determined by TNRCC to be present in waste water discharges from outfall 001 which discharges into Paper Mill Creek. Table B-5 of the amendment application requires the applicant to identify constituents known to be present and to quantify the concentration level of the constituents. Mercury, lead, and copper were not identified as constituents by the applicant even though the 1996 TNRCC memorandum indicates the metals are present in the 001 outfall effluent in significant concentrations. The permit regulating discharges from outfall 001 should contain limits that preclude the passage of toxic effluent through private and public property and should protect both the public health and aquatic life from synergistic toxic effects.

I apologize for the late submittal date on these comments but this is due in part to my inability to get answers from TNRCC to questions about the issues raised herein that I submitted last May - 2001. Your consideration of these comments will be appreciated.

Sincerely

Walter West

Walter West, P.E.

CC: Gregg Cooke
J. McReynolds

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New Mexico Ecological Services Field Office
2105 Osuna NE
Albuquerque, New Mexico 87113
Phone: (505) 346-2525 Fax: (505) 346-2542

6SF-L
Wren/Don

Wren/Don,
Please send a copy to GWQ for their NPDES file -
8/17/01

August 13, 2001

Mr. Holland Shepherd
New Mexico Energy, Minerals,
and Natural Resources Department
Mining and Minerals Division
2040 South Pacheco Street
Santa Fe, New Mexico 87505

Dear Mr. Shepherd:

Thank you for the opportunity to participate in the technical review of the Molycorp Mine Closeout/Closure Plan. The following comments are in response to issues raised in the June 19, 2001, Molycorp conference call hosted by the U.S. Environmental Protection Agency regarding fish and benthic invertebrate populations in the Red River. Comments are based primarily on information provided in the report titled "Red River Biological Monitoring 2000" (Chadwick 2001). While Chadwick (2001) discusses some very important points regarding the ecological health of the Red River, there are several additional issues that were not addressed.

Fish Population Surveys

Although trout populations (density) progressively decrease between the town of Red River and Hansen Creek (upstream of Molycorp), trout biomass does not. Chadwick (2001) mentions biomass, but discussions throughout the document focus on total trout populations (rather than biomass and individual species trends). The relative steady biomass concurrent with a decrease in density indicates a shift from smaller fish (e.g., brook trout, other native trout) to larger fish (e.g., stocked rainbow trout). There is a slight decrease in biomass at the June Bug campground, which may be related to a switch in competitive advantage between brown trout (which prefer bigger, slightly warmer waters) versus previously abundant brook trout (which prefer smaller, cooler headwaters). But brook trout and brown trout mean weight (biomass) and condition factor (ratio of fish weight to length) actually increase at the June Bug site (bigger, fatter fish compared to sites further upstream). Thus, adverse effects to the fish community due to natural metal loading above the Molycorp mine appear less severe once biomass and species distributions are considered.

SCOTT

FOR YOUR NPDES FILES.

- QUESTA MINE SITE, NM

MARK PURCELL
x 6807

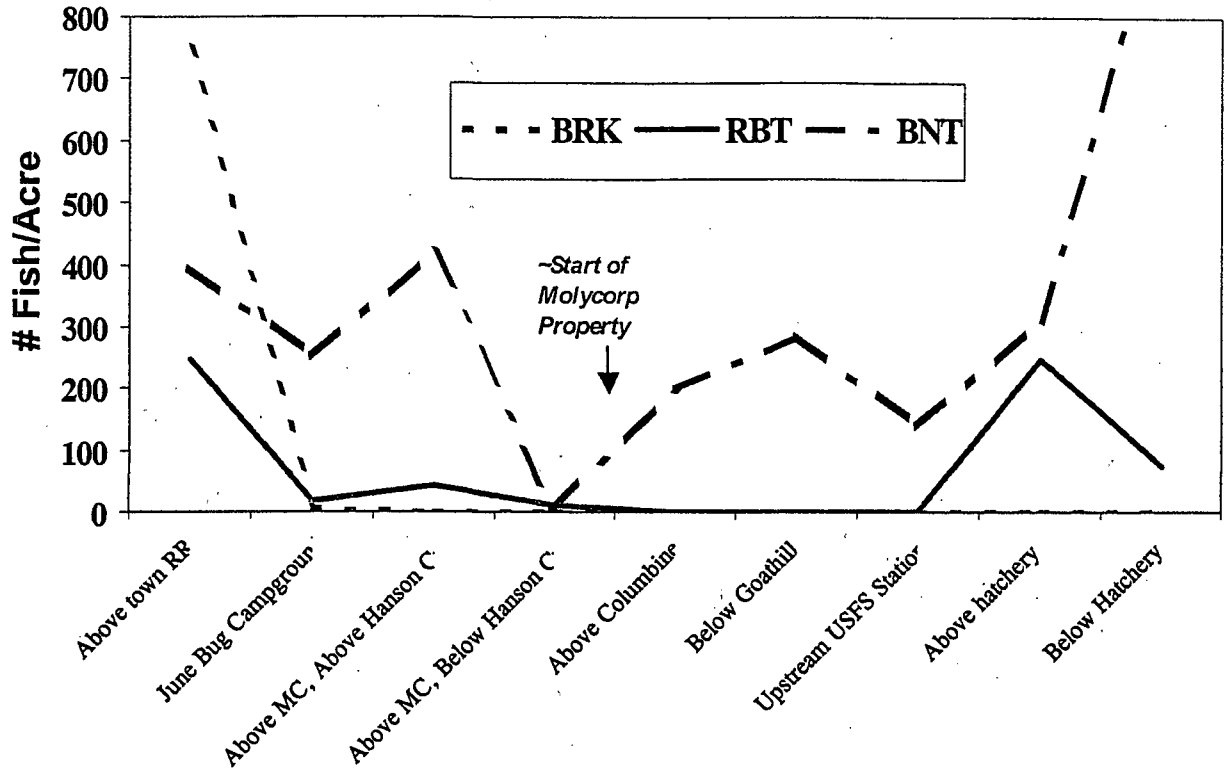

Figure 1. Individual fish species population trends in the Red River during September 2000 (data re-plotted from Chadwick 2001). BRK = brook trout; RBT = rainbow trout; BNT = brown trout; MC = Molycorp.

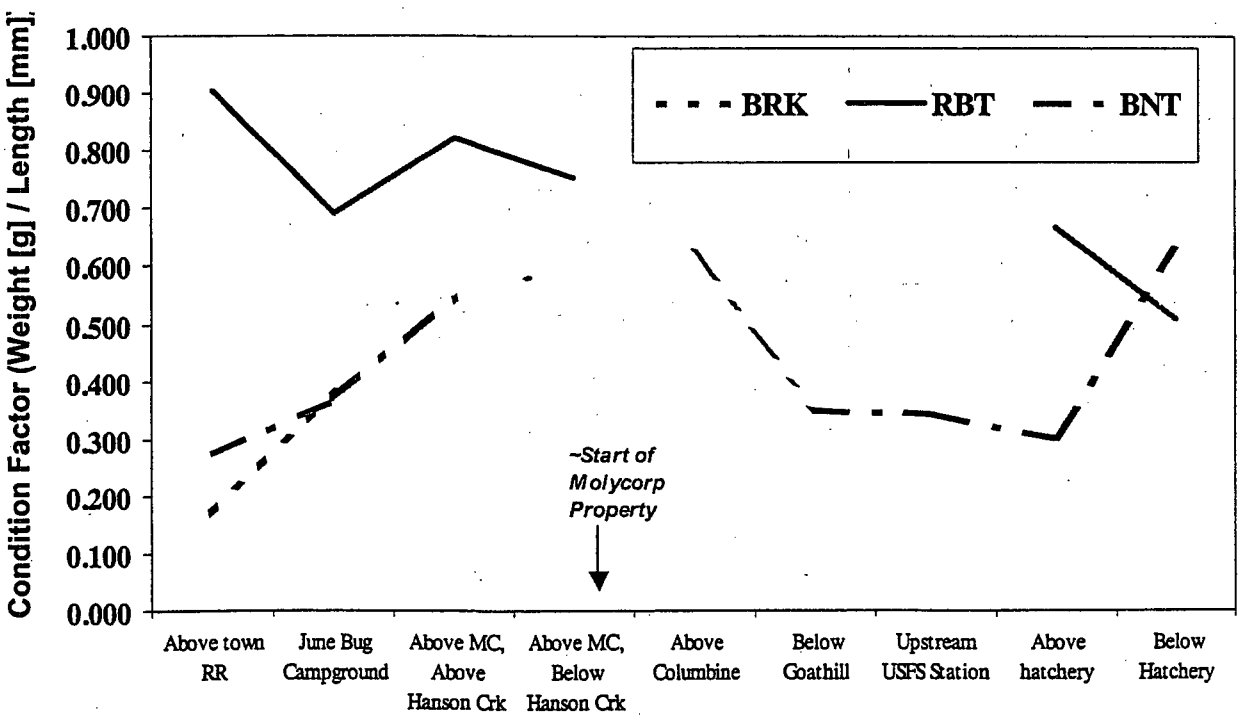

Figure 2. Fish condition factor, which is the ratio of fish weight to length, for three trout species in the Red River sampled in September 2000 (data derived from Chadwick 2001). BRK = brook trout; RBT = rainbow trout; BNT = brown trout; MC = Molycorp.

Moving farther downstream, even though trout populations approach zero below Hansen Creek (above Molycorp operations), some rainbow trout persist. Nonetheless, there is clearly a negative impact on fish populations below Hansen Creek. The cause(s) of this decline may include: natural metals loading from the Hansen Creek hydrothermal scar, increased fishing pressure, decreased habitat quality or quantity, and decreased invertebrate food availability.

Below Molycorp property, rainbow trout are completely absent even though they are stocked upstream. The only trout species present at and below Molycorp operations are brown trout. Studies of fish populations and species distributions in the metal-contaminated Clark Fork River in Montana, noted this same trend. Rainbow trout were absent from many contaminated stretches of the Clark Fork River, whereas brown trout remained. Laboratory studies determined that rainbow trout were more sensitive to metals than brown trout (Phillips and Lipton 1995). Concurrent studies concluded that pulses of metals (i.e., storm events), prior acclimation to metals, behavioral avoidance, and consumption of metals-contaminated invertebrates, could adversely affect fish health, survival, and/or species distributions[1].

Despite gradual increases in brown trout numbers through much of Molycorp's property, mean brown trout weight and condition factor decrease, suggesting impaired health. Impaired health could be related to a parallel decrease in benthic invertebrate density (food) and/or sub-lethal contaminant stressors. Brown trout density also decreases farther downstream at the Questa Ranger Station site. This could be related to the cumulative impacts of several low-pH, metal-rich seeps (such as from Capulin Canyon) on water quality beyond the downstream border of Molycorp's property. More contaminant-sensitive rainbow trout do not return until just upstream of the hatchery.

While other factors, such as poor habitat quality and discharge, could explain the trends in fish and invertebrate density and species diversity, contaminants can not be discounted as a causative factor. Even if surface-water grab-samples do not indicate an exceedance of a water quality criterion, high-concentration pulses of contaminants can be toxic, may cause fish to avoid metal enriched water, and result in the temporary collapse of benthic invertebrate populations. It is possible that the Red River is markedly "biologically impoverished" or "devoid of aquatic life" during these events.

Although aquatic ecosystems will recover from chemical and physical perturbations, this does not mean that the ecosystem is without long-term adverse impacts. The presence of life does not mean an ecosystem is healthy and self-supporting (the Mining Act requires that Molycorp return mine-impacted areas to a "self-sustaining ecosystem").

---

[1] There are numerous peer-reviewed, published papers that discuss sensitivity of various trout species, especially those produced as part of investigations at the Clark Fork River in Montana. These studies are published as a special section in the Canadian Journal of Fisheries and Aquatic Sciences, Volume 52 (1995).

Invertebrate Community Surveys

The invertebrate community data are equivocal. Community metrics vary widely between different sites along the Red River, and between replicate samples collected at individual sites. Because habitat, sediment embededness, sediment and water metal concentrations, invertebrate tissue metal concentrations, flows, seasonal variation, and storm events, will all affect invertebrate community metrics, it is difficult to draw any definitive conclusions from Chadwick (2001) regarding the potential impacts of Molycorp operations on the biological health of the Red River.

There is, however, a steep decline in percent ephemeroptera, plecoptera, and trichoptera (percent EPT) taxa and percent ephemeroptera downstream of Molycorp operations. There is also a decline in overall invertebrate density, number of taxa, and number of EPT taxa below Molycorp operations. But these declines follow an initial sharp increase in percent EPT, and even the lowest percent EPT measured below the mine is not significantly different than upstream reference sites. Nonetheless, decreases in some metrics, a significant negative correlation between copper and zinc concentrations and numbers of total and EPT taxa, and the increase in sediment copper and zinc concentrations below Molycorp operations, suggest that further studies are needed to assess if Molycorp operations are having an adverse effect on invertebrate communities.

Studies by Failing (1993) and Lynch et al. (1988) also noted that invertebrate tissue metal concentrations were greater below Molycorp operations. Concentrations of copper, manganese, and molybdenum were approximately 2 times, 15 times, and 6 times, respectively, greater in invertebrates collected below Molycorp operations. Concentrations of copper and zinc in invertebrates exceed Lowest Observable Adverse Effect Level (LOAEL) based benchmarks for food items of insectivorous birds (Sample et al. 1996).

Sediment Sampling

The "freeze-core" sampling technique, in which an eight-inch core of sediment is extracted, may not be representative of the surface sediments that biota contact. Moreover, the lack of a clear trend in percentage fine sediment along the length of the Red River is not surprising given the sampling technique. Finer sediments will preferentially accumulate near the surface, in pool habitat, and along banks and backwaters. Fine sediment content will also vary greatly according to season, time since the last storm runoff, etc. Future analyses of fines should focus on surface sampling. Also, rather than comparing invertebrate populations to fine sediment content, comparisons should be made to percent sediment embededness.

Freeze-core sediment metal concentrations may not reflect the biota exposure concentration. As is evident in Table 1, sediment metal concentrations determined in Chadwick (2001) are the lowest among four different studies. This may be due to "dilution" of sediment metals by coarser sands from deeper in the sediment core. Comparison of these metal concentrations to

the most recently published sediment effects thresholds (MacDonald et al. 2000) indicates that copper and zinc exceed "probable effects concentrations." The thresholds determined by MacDonald et al. (2000) are "consensus-based" thresholds. They are derived by calculating the geometric mean of the thresholds derived by up to six different research groups, including the Ontario "Severe Effect Level" criteria (Persaud et al. 1993) used by Chadwick (2001).

Table 1. Metals concentrations in sediment at or near Goathill Campground determined in various studies.

Study	Aluminum	Cadmium	Copper	Lead	Zinc
Chadwick 2001	1,890	0.4	31	24	136
Taylor 2000	40,800	BD	390	BD	1,630
Allen *et al.* 1999	103,000	BD	250	BD	330
Kent 1995	10,900	BD	104	91	182
Threshold Effects Concentration	*NA*	***1.0***	***32***	***36***	***121***
Probable Effects Concentration	*NA*	***5.0***	***149***	***128***	***459***

Samples collected by Taylor (2000) focused on depositional areas were biota would likely be exposed. Values are in mg/kg dry weight. BD = Below Detection limit; NA = Not Available.

Nonetheless, even though concentrations are lower as documented in Chadwick (2001), there is a clear trend of increasing zinc concentrations below Molycorp's operations. Other studies (e.g., Table 1) also indicate an increasing trend in aluminum, cobalt, copper, manganese, molybdenum, and nickle concentrations.

Toxicity testing

Results of the water and sediment toxicity tests suggest that there may be adverse effects due to both natural metals sources and Molycorp operations; however, there are no clear trends. Concentrations of metals in water and sediments may vary widely, so a single grab sample is only a snapshot in time and may not reflect "typical" conditions, or complex, changing conditions. More advanced laboratory testing is required to simulate the dynamic conditions of the Red River.

In conclusion, there appears to be an impact to fish populations, species distributions, weight, and health due to Molycorp operations, although upstream contaminant loading and habitat alterations due to various natural and anthropogenic activities will also affect fish and invertebrate populations, density, and species distributions.

Every effort should be made to remediate and restore as much of the Red River as possible to a "self-sustaining ecosystem" with a "Post Mining Land Use" of "Wildlife habitat" as specified in the New Mexico Mining Act, §507.A and §107.MM. Please contact Russ MacRae of my staff at (505) 346-2525, ext. 124 if you have questions or require further information.

Sincerely,

Brian Hanson

for Joy E. Nicholopoulos
Field Supervisor

cc:
Environmental Coordinator, Molycorp, Inc., Questa, New Mexico
Director, New Mexico Department of Game and Fish, Santa Fe, New Mexico
Director, New Mexico Environment Department, Groundwater Quality Bureau, Santa Fe, New Mexico
Director, New Mexico Environment Department, Surface Water Quality Bureau, Santa Fe, New Mexico
Director, Superfund Program, U.S. Environmental Protection Agency, Dallas, Texas

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HORSE FLY
VOLUME 1 NUMBER 3
NOVEMBER 15, 1999

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HORSE FLY

THIS AND THAT

Got a Dirty River?

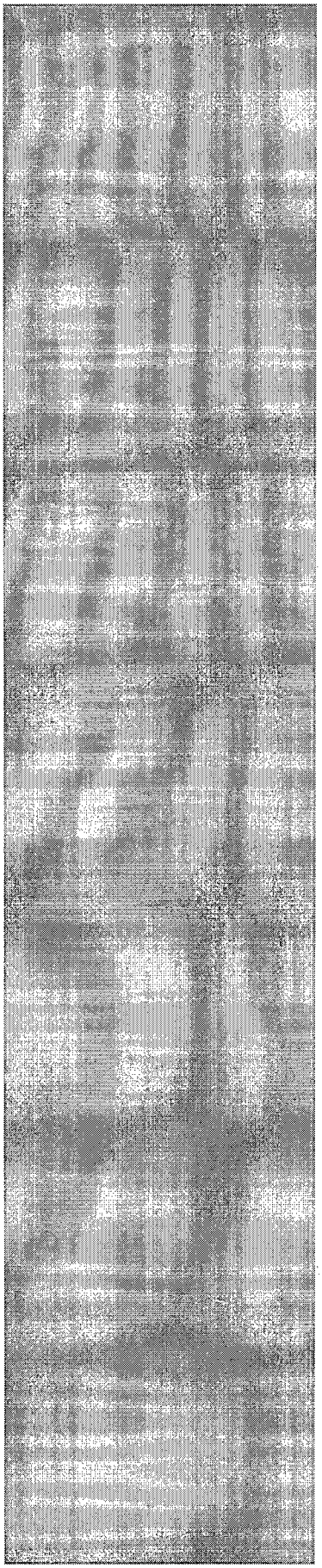
by Linda Fair

A policeman stopped and ticketed Brian Shields on Highway 512 the night of Nov. 4. The officer had just stopped another speeder, an unidentified woman racing back to Santa Fe from the evening meeting in Questa. The parish hall was spewing forth preoccupied drivers with lead feet.

Molycorp, the Environment Department, the Mining and Minerals Department, Amigos Bravos members, and community people from Questa and the surrounding villages were attending this important meeting. The topic being discussed was whether or not to approve Molycorp's application to extend the time limit to present a reclamation plan to the state of New Mexico. Under the 1993 New Mexico Mining Act, Molycorp is required to develop a reclamation plan that will restore the mine area to a "natural" state and ensure that pollution is stopped and controlled. The state will not reissue a mining permit to Molycorp until the mine presents it with a feasible plan for restoration of the environment.

Sounds like a reasonable request. The meeting terminated with the state requesting further information prior to giving Molycorp another two-year extension. A previous two-year extension was given in 1997, and Molycorp has yet to fulfill its part of the deal. Amigos Bravos, the river protection group based in Taos, and many other citizens are concerned about the health of the Red River, which used to be the main breeding ground in the north for the big trout of the Rio Grande. The Environment Department has already determined that the mine is polluting the Red River. Brian Shields, executive director of Amigos Bravos, asked Scott McKittrick of the Environment Department if he thought Molycorp was polluting the river. He replied, "Yes, definitely."

However, Molycorp's David Shoemaker is still in a state



of denial vis-...-vis the relationship of the mine and the river and announced to the crowd that the river had benefited from the mine, that it was in better condition now than before the mine began operations. Makes one wonder if environmentalists should look at mining as a new way to clean up rivers. Got a dirty river? Invite a mine in to pump waste into the water and you've got pristine water again.

David Shoemaker invited Amigos Bravos and other interested parties to join with the mine in preparing a workable reclamation plan. A meeting was set for Dec. 1, 1999. Shoemaker told the assemblage that Molycorp had no secrets and encouraged concerned citizens to work with them. Brian Shields was shocked by this announcement in light of an 11-year history of trying to work with Molycorp and being rebuffed and reviled repeatedly, but he feels this is a window of opportunity. He sees Molycorp as being up against the wall at this point, because the state agencies will not rubberstamp its requests anymore. He hopes that now the mine will have to work with the state and the public to resolve longstanding environmental issues and undo some of the damage that has affected all aspects of life in northern New Mexico.

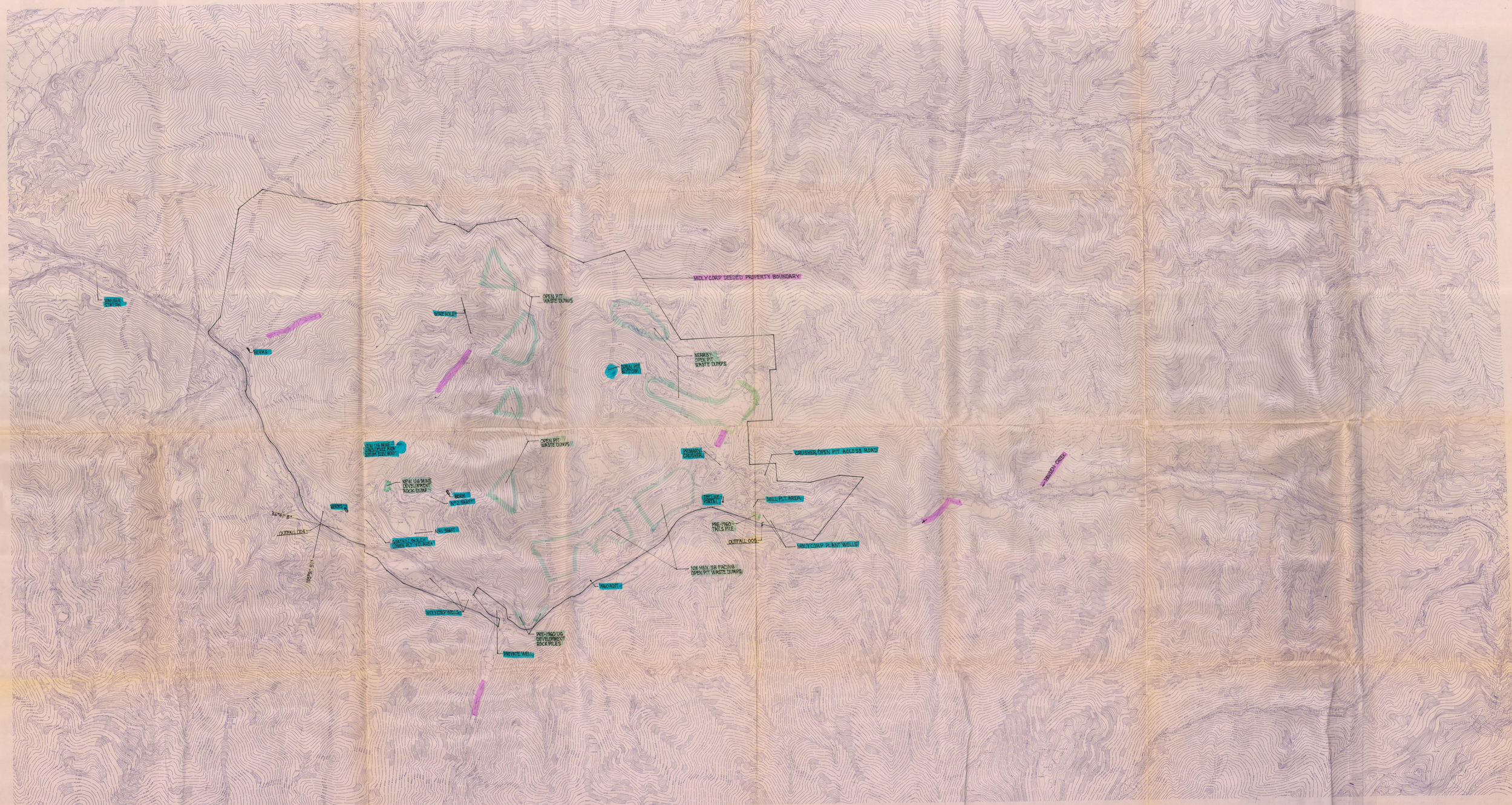
Linda Fair is a local authority on river abuse.

Coming Home to Taos
by Leah Alexander

Last year I sat at the edge of the meadow that borders my land in Taos and looked toward the mountain. The meadow gleamed green. Black cows munched their way across it. It was absolutely quiet. Then the song of one meadowlark pierced the air. I knew then that I wanted to come here -- to come home.

The move was demanding. Eighteen years of stuff in boxes. When my son, a dog, and I left for California, we took whatever we could carry in a Datsun pickup with a camper shell. I returned with enough belongings to fill a good-sized compartment in a moving van, plus the station wagon I drove back.

When the giant semi got to Taos, the driver had to back down my narrow dirt road for a quarter of a mile and park on the road above the house. The path sloped down to the house through a jungle of head-high sagebrush. The two movers carried everything down the



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- STREAM / RIVER
- BUILDING
- POWER POLES
- FENCES
- PIPELINES
- TANKS
- DIRT ROAD
- HARD SURFACED ROAD
- TRAILS
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UNION MOLY CORP.
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EPA FORM 1
ITEM XI : LOCATION MAP
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MPC REPORT
PROTECTING COMMUNITIES AND THE ENVIRONMENT
NO. 1 REGULATORY REFORM

Six Mines, Six Mishaps

Six Case Studies of What's Wrong with Federal and State Hardrock Mining Regulations, and Recommendations for Reform

Mineral Policy Center

September 1999

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FOREWORD

Clean water. Pristine landscapes. Ecosystem integrity. The protection of communities and cultures. This is what is at stake today on public, state, and private land when a mining company comes to town. It is time for stronger environmental safeguards to protect these important resources.

Sometimes mining is done responsibly. There are companies that operate at a profit, meet environmental performance standards, and cleanup and reclaim mine sites. For example, this is what the Homestake Mining Company hopes to accomplish with their reclamation plan at the McLaughlin mine in California. Other companies do not exhibit the same level of responsibility.

Unfortunately, rather than voicing support for stronger environmental safeguards, there are many in the mining industry who have a knee-jerk reaction to the mere mention of the possibility. They claim that federal and state regulation and oversight is adequate. In addition, they often argue that environmental protection should be left up to the industry, on a voluntary basis.

Consider the recent fight over the application of the Toxic Release Inventory (TRI) to the mining industry. Previously, mining had been exempt from reporting its releases despite the fact that the industry produces more waste than all other industries and municipalities combined. The U.S. Environmental Protection Agency considers much of this waste potentially hazardous. Yet, industry trade associations fought the expansion of TRI. Why? Because, in their view, mining waste is different than that produced other waste-producing industries. Rather than allowing an educated public to make its own determination about the potential threat posed by mining waste, the industry fought to withhold this information from the public.

Similarly, some industry representatives have asserted that the Mining Law of 1872 does not need meaningful reform, despite the fact that this antiquated statute has almost no environmental protection provisions. What is worse, some industry representatives have promoted sham reform "initiatives," which contain no environmental protection provisions. These proposals are nothing but a public relations smokescreen intended to confuse the public.

A similar industry-sponsored misstep is unfolding with regard to the tools that the U.S. Bureau of Land Management (BLM) uses to govern mining on our public lands. Long in need of modernization, the current regulations fail to offer adequate environmental protection and have led to what are likely to be multi-million dollar taxpayer funded cleanups of abandoned mines.

Since these BLM regulations were first written in the early 1980's, there has been a proliferation of massive mines that use cyanide and other processing chemicals. These mines have experienced scores of toxic spills and other mine mishaps. In partial response to these problems, many states have updated and improved aspects of their mining regulations. Yet BLM's regulations remain outdated and unchanged.

Despite the fact that the BLM's regulations are in dire need of modernization, many in industry assert that they are already doing an adequate job of protecting the environment. We have evidence to the contrary and it is contained in this report.

Six Mines, Six Mishaps, demonstrates that there are still too many loopholes and gaps in BLM mining regulations. The results are troubling because today's mines are massive operations that use dangerous processing chemicals, and have the potential to become major pollution problems. When something goes wrong at one of these mines, it is the public's land, water, and wildlife resources that are impacted.

We must remember that environmental laws and safeguards should be written to protect against potential irresponsibility, against the potential bad actor. They should be written to prevent disasters and to create an incentive for good behavior. When it comes to protecting public lands, the public should not simply be expected to rely on the good will of a particular mining company.

We believe the industry needs to rethink its opposition to enhanced environmental protection on public lands, especially those companies that have committed their resources and their reputations to environmentally responsible and sustainable mining practices. Failure to strengthen these regulations today will result in more taxpayer-funded cleanups of mines tomorrow. In the public's mind, the reputation of all mining companies will suffer.

Without significant reform of our nation's mining laws and regulations there will be more messes like the Zortman-Landusky mine and the Summitville mine, which is likely to cost taxpayers over $170 million.

Given its irresponsible position on environmental protection, is it any wonder that the mining industry is held in such low regard by the public? Today, the industry is wasting its money on a costly public relations effort, seeking to *greenwash* its reputation. The reputation of the industry will continue to suffer until fundamental change occurs and our nation's mining regulations and laws are modernized. Such reforms will allow responsible companies to get the credit that they deserve while penalizing bad actors. The result will be a healthier mining industry and environment.

Those in Congress interested in promoting and advancing a responsible mining industry in this country should question, rather than acquiesce to, industry efforts to delay reform. By standing up to the industry, they may actually be doing the industry a favor.

Stephen D'Esposito, President
Mineral Policy Center
Washington, D.C.

MPC REPORT

SIX MINES, SIX MISHAPS

Six Case Studies of What's Wrong with Federal and State Hardrock Mining Regulations, and Recommendations for Reform

The following six mines are unfortunate examples of where federal and state regulations have failed to protect the environment from unnecessary degradation. This degradation could have been prevented if adequate environmental safeguards had been in place. These mines are not the *only* examples of where current regulations shortchange the environment and the taxpayer. Yet they illustrate the wide array of environmental problems that mining has created on our public lands.

For most of the mines in this report, problems that could have been prevented in the planning stage are now much more difficult to solve. Substantial reclamation costs and potential long-term environmental problems plague the mine sites. Unfortunately, due to weak federal and state environmental regulations, it is the taxpayer that is likely to get hit with the multi-million dollar cleanup bill at many of these mines.

How did we get here? Mining techniques have outpaced regulations that were written prior to the widespread use of modern technology, such as cyanide heap leach processing and large open pit mines. These new techniques impact the environment in ways that the old regulations, written nearly 20 years ago, did not address. Today's highly mechanized and chemical-intensive mining industry requires a new set of federal environmental regulations. In fact, it was anticipated that the decades-old regulations would need to be updated as the industry and technology changed. However, no such modernization has occurred. While some states have updated their regulations, no state has a comprehensive set of regulations that is adequate to protect federal public lands.

Some argue that there is no need to strengthen federal regulations because state programs are adequate. Given the flaws in most state regulations, this is a questionable assertion. Even where states regulations are strong, they are not a substitute for a comprehensive set of federal regulations to protect public lands.

While some states have improved their regulations, this does not replace the need for stronger federal regulations. A federal baseline regulatory standard is needed on which states can base their own regulations. This standard should explicitly prohibit practices that cause undue

degradation on public lands. As the trustees for public lands, federal and state agencies have a responsibility to protect our lands for future generations, not to leave a legacy of poisoned waterways and fragmented landscapes.

Over the past three years there has been significant debate about the need to modernize the BLM mining regulations. Three times the Senate has sought to use anti-environmental riders to delay the development of these new regulations. The delays have come despite growing evidence that mining waste is polluting our public land and waterways, such as those mines profiled in this report.

The question for those in Congress delaying reform is this: How much longer will you allow our public lands and waterways to be polluted by mines before taking the necessary actions to protect the environment and the taxpayers' pocketbook?

ZORTMAN-LANDUSKY MINES

A Poster Mine For Stronger Environmental Regulations

The now-defunct Zortman-Landusky (Z-L) mine in north central Montana may be the next Summitville, because the cleanup could take years and cost taxpayer millions of dollars. On January 16, 1998, Pegasus Gold Inc. declared bankruptcy. As a result, a substantial portion of the cleanup and reclamation effort needed at this gold mine is likely to be paid by taxpayers.

Approximately $60 million in cleanup bonds were required for these mines – roughly $30 million for reclamation, and another $30 million for water treatment. While this bond may seem large, complete reclamation is expected to cost much more. Already state regulators estimate that the shortfall is likely to be at least $8 million for the reclamation alone. However, local Native American tribes who live near the mine have commissioned an independent assessment that predicts the shortfall for complete reclamation could be as high as $90 million.[1]

Therefore, the Z-L mine, like the Summitville mine, could become another poster child of financial and environmental disaster, illustrating how regulatory agencies and mechanisms failed to protect the environment and local community. Current federal regulations do not require a comprehensive and realistic assessment of the potential impacts of this type of large-scale cyanide heap leach mine, nor the potential reclamation costs. This inadequacy coupled with insufficient bonding requirements leaves the taxpayer at risk. Bonds are and should be used as a tool that allows regulators to guarantee that the mining company pays for reclamation and cleanup, rather than the taxpayer.

As one of the world's first large scale cyanide heap leach gold mines, the Z-L mine was the lowest grade gold mine in the United States and the largest gold mine in Montana when operations began in 1979.[2] However, the Z-L mine has a dubious record of numerous environmental violations, disregard for culturally significant sites, potential health problems related to the mine at the immediately adjacent Fort Belknap Reservation, and poorly reviewed amendments and expansions.

The Z-L mine has experienced a litany of cyanide solution leaks and spills, stability failures, acid mine drainage, surface and groundwater contamination, wildlife fatalities, and other problems. Failure of federal regulations and state laws to mandate testing procedures for acid mine drainage led Bureau of Land Management (BLM) to conduct only cursory tests indicating mining would take place in oxide ore. However, soon it became clear that the company was mining in substantial amounts of acid-generating sulfide ores. Today, half of all streams emanating from the mine area, have been seriously polluted with acid and heavy metals.[3] The BLM regulations have not been changed to address these problems.

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[1] James Kuipers, P.E. for the Ft. Belknap Tribes, based upon the report, *Alternative Final Reclamation and Closure Plan, Zortman and Landusky Mines, Montana*, Center for Science in Public Participation, January 1999
[2] The Denver Post, *Montana mine had nine cyanide leaks*, November 2, 1993
[3] Phone conversation, Montana Water Quality Bureau, September 1999

As the Assiniboine and Gros Ventre Tribes of Fort Belknap have a strong cultural and spiritual connection with the Little Rockies. The mining operation has destroyed or harmed several of the tribes' traditional sacred grounds. Spirit Mountain, for example, which was a mountain peak of cultural significance to the Assiniboine and Gros Ventre people, is essentially gone, replaced by a huge open pit. Current regulations fail to protect such culturally important sites.

Given its environmental, financial and cultural impacts, Zortman-Landusky has become a poster child for regulatory inadequacy, illustrating how existing regulatory agencies and mechanisms failed to protect the environment and local communities from irresponsible mining.

FAILURES OF FEDERAL AND STATE REGULATIONS

NO REQUIREMENT FOR CHARACTERIZING THE RISK OF ACID MINE DRAINAGE - Failure of federal regulations and state laws to mandate testing procedures for acid mine drainage led the Bureau of Land Management (BLM) to conduct only cursory tests that indicated the Z-L mine would be mining in oxide ore. However, it soon became clear that the company was mining in substantial amounts of acid-generating sulfide ores. Today, over 50 per cent of the streams emanating from the mine area have been seriously polluted with acid and heavy metals.[4]

NEED FOR STRONGER REGULATIONS ON CYANIDE MANAGEMENT - Nearby communities are justifiably concerned about health impacts of the mine. Besides acid and heavy metals, Z-L has experienced multiple cyanide leaks into the environment since it operations began. In one incident, a ruptured pipe released 52,000 gallons of cyanide solution, contaminating a drinking water well and forcing the shutdown of a community water system.[5]

LACK OF ENFORCEMENT OF EXISTING REGULATIONS/APPROVAL OF INCOMPLETE MANAGEMENT PLANS - About half of the Z-L mine is located on BLM land, and the other half is located on patented private land. Until the last proposed expansion, which was approved but not implemented because of the bankruptcy of the operator, all of the approximately one dozen permit amendments and expansions that occurred in the mine's 19 year history were approved under the less comprehensive Environmental Analyses (EA) instead of a full Environmental Impact Statement (EIS). Lack of rigorous environmental analysis before each expansion approval most certainly led to worsening of the environmental problems at the mines.

NO WELL-DEFINED OPERATING STANDARDS REFLECTING BEST AVAILABLE TECHNOLOGY - Lack of specific standards on leach pad construction allowed the company to overload its leach pads, undermining their stability and leading to cyanide releases. State regulators actually amended the permit to allow a dangerous overload of the pad in excess of engineered capacity.[6]

Pegasus Gold was also allowed to reclaim waste rock piles at steep slopes that were dangerously unstable and prone to erosion. Soils from these unstable slopes are contaminated with metals, and are easily washed into streams during storm events, impacting aquatic organisms and jeopardizing the long-term success of reclamation.

FAILURE TO CONSIDER PREVIOUS ACTIONS IN GRANTING APPROVAL OF NEW MANAGEMENT PLANS - Almost immediately after the historic settlement, Pegasus was granted approval of its request to double the size of its current operation. This approval was given despite the many unresolved environmental problems at the Z-L mine. The decision was challenged on behalf of the Fort Belknap Community Council and Island Mountain Protectors by the Western Environmental Law Center, Montana Environmental Information Center, National Wildlife Federation, and the Indian Law Resource Center.[7]

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[4] Phone conversation, Montana Water Quality Bureau, September 1999
[5] DeRosa, Carlos, *Righting the Regs,* Mineral Policy Center, June 1997
[6] Ibid
[7] Great Falls Tribune, *$37 millions mine deal draws praise*, July 23, 1996

In an important decision in June 1997, the Interior Board of Land Appeals announced that it would not allow any expansion related activities to proceed at Z-L until the lawsuits challenging the pending expansion were resolved.[8] With its troubled history that has included multiple cyanide discharges, acid mine drainage, and violations of environmental quality standards, Z-L should have first demonstrated it could operate in a safe manner before expansions were approved.

LACK OF ENFORCEMENT OF EXISTING REGULATIONS - Montana Department of Environmental Quality and BLM share regulatory oversight for the Z-L mine. Responsibility for the poor track record at Z-L rests not only with Pegasus, but also with these regulatory agencies. Despite major environmental problems early on in its operations, Pegasus received only one fine - for $15,000 - in the first 16 years of operation. With more stringent oversight and stronger regulations, many of these problems could have been addressed and perhaps prevented.

NO REQUIREMENT FOR GUARANTEE FULL COST BONDING MECHANISMS FOR RECLAMATION - The Montana Department of Environmental Quality estimates[9] that cleanup and permanent water treatment of the abandoned mine site will cost about $70.5 million. After several lawsuits seeking bond money from Pegasus and its creditors, the state of Montana holds approximately $62.5 million in bonds, leaving taxpayers to cover the $8 million shortfall. Unfortunately, it is likely that taxpayers will be liable for much more. The Ft. Belknap Indian tribes, which border the mine site, commissioned an independent assessment of the reclamation needs and costs at Z-L.[10] According to this assessment, the total bill for treatment and cleanup of Z-L could cost an additional $60 million. That is an additional $60 million that the bankrupt Pegasus Gold certainly doesn't have and $60 million that neither the state of Montana nor the Bureau of Land Management have budgeted for Z-L cleanup.

LACK OF DISCRETION BY REGULATORS TO PROHIBIT MINING IN ENVIRONMENTALLY OR CULTURALLY IMPORTANT AND FRAGILE AREAS - Under current law, BLM regulators did not have the authority to prohibit or limit the operations in order to protect the cultural resources of the Assiniboine and Gros Ventre tribes. Already, Z-L's operations have harmed or destroyed several of the tribes' traditional sacred grounds. BLM also does not have the ability to protect other environmental, wildlife, and cultural values that may outweigh those of hardrock mining.

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[8] Great Falls Tribune, *State fails in bid to dismiss Zortman expansion lawsuit*, July 15, 1997

[9] Montana Department of Environmental Quality Permitting and Compliance Division, *Revised Reclamation Estimate for the Record of Decision, Zortman and Landusky Bond Files,* OP #00095.10 and #00096.10. June 16, 1998

[10] James Kuipers, P.E. for the Ft. Belknap Tribes, based upon the report "Alternative Final Reclamation and Closure Plan, Zortman and Landusky Mines, MT," Center for Science in Public Participation, January 1999.

ZORTMAN-LANDUSKY MINE
Mine Profile

NAME: Zortman-Landusky Mines

LOCATION: Little Rocky Mountains
Adjacent to Fort Belknap Reservation, northern central Montana

COMPANY: Pegasus Gold Inc.

MINERALS: Gold and silver

OPERATING STATUS:
1979-1998
Currently in reclamation

PRIMARY REGULATORY OVERSIGHT:
Montana Department of Environmental Quality
Bureau of Land Management

LAND OWNERSHIP:
Approximately fifty percent BLM land
Approximately fifty percent patented private land

TYPE OF OPERATION:
Open pit cyanide heap leach mine

FOR MORE INFORMATION CONTACT:
Island Mountain Protectors: Gus Helgeson 406.673.3385
Marble Law Offices: Don Marble 406.759.5104
Mineral Policy Center: 202.887.1872

GILT EDGE MINE
A Mountain of Burden

The Gilt Edge, or Brohm, mine located in the Black Hills of South Dakota, is proving to be a mountain of burden to citizens of South Dakota. In July 1999, after 11 years of operation, Dakota Mining Company, the parent company of the operating company, Brohm Mining, declared bankruptcy,[11] leaving a cleanup bill currently estimated to be between $12 – 15 million.[12] Since the reclamation bond was for only $6 million, the burden of at least $6 million is likely to fall on taxpayers.

The Gilt Edge mine is notorious for its environmental problems, violations, and lack of compliance with pollution limits. Since opening in 1988, the Gilt Edge mine has been a source of pollution to nearby waters. It has had cyanide spills and acid mine drainage problems since 1992. Despite all these environmental problems, in 1996 the Brohm Mining Company received approval from the state of South Dakota for an expansion.[13] The company also received approval from the U.S. Forest Service, as 37 acres of its Anchor Hill expansion would be in the Black Hills National Forest. The mine's expansion would have been the first onto federal land in South Dakota.[14]

The EIS for the mine expansion onto public land was completed in November 1997 and the U.S. Forest Service subsequently approved it.[15] However, in early 1998, the Spearfish Canyon Preservation Trust and ACTion for the Environment filed an administrative appeal of this expansion. In February 1998, the Forest Service responded to the appeal by rescinding its approval. This decision was based on the misuse of mining claims for dumping mine waste rock. Despite the outcome, state and federal regulators, given the troubled history of this operation should never have approved the mine expansion. It is now clear that both state and federal reclamation and bonding requirements were grossly inadequate.

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[11] PR Newswire, July 12, 1999
[12] Personal Conversation with Gary Heckenlabile, ACTion for the Environment, August 18, 1999
[13] Lawrence County Centennial, August 23, 1997
[14] Ibid
[15] Press Release, Earthlaw, Western Mining Action Project, and Spearfish Canyon Hills, January 5, 1998

FAILURES OF FEDERAL AND STATE REGULATIONS

NO WELL-DEFINED OPERATING STANDARDS REFLECTING BEST AVAILABLE TECHNOLOGY – This critical oversight at the Gilt Edge mine has resulted in torn containment liners, poor mine design, and sloppy management practices. As a result, shortly after mining began, cyanide leaked into the groundwater and nearby Strawberry and Bear Butte Creeks.[16]

NO REQUIREMENT FOR CHARACTERIZING THE RISK OF ACID MINE DRAINAGE – The lack of adequate testing procedures allowed the Gilt Edge mine to become a source of acid mine drainage. In late 1992, the mine began generating acid, reaching an extreme point between October 1994 and May 1995, when it flowed offsite from the mine's waste piles into Ruby Gulch Creek. The waters of the creek were so dangerously acidic that its pH was measured as low as 2.1. The mine's acid drainage has left local streams unable to support a viable fish population and other aquatic life.[17]

NO REQUIREMENT FOR GUARANTEED FULL COST BONDING MECHANISMS FOR RECLAMATION - Since the abandonment of the Gilt Edge mine by the Brohm Mining Company and its parent, Dakota Mining Company, left limited financial resources for the site's cleanup and reclamation, the burden of the reclamation will rest with the taxpayer. The South Dakota Department of Environment and Natural Resources has determined that the Brohm Mining Company left $6 million in cash bonds, less than half the expected cost for reclamation. Thus, the state does not hold enough in cash bonds to fund the cleanup and on-going treatment at the Gilt Edge mine. Will the Gilt Edge mine have the dubious distinction of joining other abandoned mine sites on the Superfund list, leaving a legacy of debt and environmental destruction for future generations?

[16] Lawrence County Centennial, October, 21, 1994; Lawrence County Centennial, May 13, 1995
[17] Lawrence County Centennial, July 16, 1997; Lawrence County Centennial, June 7, 1995

GILT EDGE MINE
Mine Profile

NAME: Gilt Edge Mine, also know as the Brohm Mine

LOCATION: In the Black Hills, near Deadwood, South Dakota

COMPANY: Dakota Mining Company, which announced bankruptcy in July 1999

MINERAL: Gold and Silver

OPERATING STATUS:
Abandoned - No significant mining activity at this time
1988-1999

PRIMARY REGULATORY OVERSIGHT:
Black Hills National Forest
South Dakota Department of Environment and Natural Resources

LAND OWNERSHIP:
Private Holdings
Expansion planned onto public lands

TYPE OF OPERATION:
Open pit cyanide heap-leach mine

FOR MORE INFORMATION CONTACT:
Spearfish Canyon Preservation Trust: Jack Cole 605.584.3778
ACTion for the Environment: Gary Heckenlaible or Richard Fort
605.341.4063
Mineral Policy Center: 202.887.1872

THOMPSON CREEK MINE
Playing with Acid?

There was no provision for controlling or containing dangerous acid rock drainage when the Thompson Creek molybdenum mine's operating plan was drafted in 1980.[18] However, 10 years ago, the mine began to show signs of producing acid rock drainage. Now, almost 20 years since the operating plan was drafted, the mine faces potentially serious future problems with acid drainage.[19] Pit excavation is unearthing pyrite (iron sulfide) which mixes with water and air to create acid rock drainage. Acid drainage can kill fish and other aquatic life.

Currently, pyrite is being placed in the waste rock dumps and tailings impoundment, including the tailings dam. Although submerged, the chances of acid rock drainage reaching ground and surface waters are greatly increased.[20] It is likely that this mine will have to be monitored for potential acid pollution of water in perpetuity.

Acid rock drainage is not the only serious environmental threat from the mine. The tailings dam is one of the largest in the world, already holding over 100 million tons of tailings and expected to hold a total of 200 million tons. The embankment of the dam is 700 feet high, spelling certain disaster should the dam fail at any point in the future. Since the mine is only 30 miles from the epicenter of the 1983 Mt. Borah earthquake (measuring 7.3 on the Richter scale) and since the region is subject to harsh winters and intense summer storms, the threat of dam failure is real.[21]

The Thompson Creek mine provides about 8 per cent (18 million tons per year) of the world's supply of molybdenum, which is used to strengthen steel.[22] However, it is located 2,000 feet above and only 5 miles away from Salmon River, a prime recreational river in central Idaho that supports endangered chinook and sockeye salmon, steelhead trout and bull trout.

The state of Idaho, in anticipation of acid rock drainage problems increased the reclamation bond amount to $2,500 per acre.[23] However, this amount is still insufficient. In case of default by the mining company, it does not protect against the potential cost of restoring water quality in the Salmon River from acid rock drainage. Given that hardrock mining accounts for less than one half of one per cent of Idaho's non-farm employment, some wonder if the risks associated with the mine are justified given the potential environmental impacts.[24]

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[18] Idaho Mountain Express, July 29, 1998
[19] Ibid
[20] Letter to Secretary of Interior, Bruce Babbitt from the Idaho Conservation League, Boulder-White Clouds Council, and other environmental organizations, February 18, 1997
[21] *The Salmon River's Future: It's Our Choice*, Idaho Conservation League, 1997
[22] Post Register, July 21, 1996
[23] Post Register, April 28, 1997
[24] Idaho Economic Forecast, Idaho Division of Financial Management, October 1996

FAILURES OF FEDERAL AND STATE REGULATIONS

APPROVAL OF CONTROVERSIAL AND INCOMPLETE MANAGEMENT PLANS - In 1997, the U.S. Forest Service approved a controversial management plan that allowed the dumping of concentrated pyrite into the tailings dam, despite the environmental risks. The Boulder-White Clouds Council submitted a letter to the U.S. Forest Service stating that the plan was never subject to public review under NEPA.[25] The Thompson Creek mine is at risk of developing acid rock drainage because of the amount of pyrite being buried in the tailings dam and waste rock dump. Despite those risks, a new operating plan was approved in 1999 allowing the continued dumping of pyrite into the tailings facility.

HOLES IN REGULATORY PATCHWORK– The EPA's Region 10 office ranked the draft SEIS for the Thompson Creek mine an EO-2 (Environmental Objections – Insufficient Information). Then EPA reiterated many of its prior concerns in written comments on the final SEIS since it believed the U.S. Forest Service had not adequately addressed the concerns.[26]

Consultation with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service was not completed before the Record of Decisions was issued. The USFWS disagreed with the U.S. Forest Service's Biological Assessment on the effects of the mine on several key species such as the bull trout, the Canada lynx and the bald eagle. The USFWS also requested additional information, indicating a lack of cooperation and communication between the federal agencies.[27]

LACK OF DISCRETION BY REGULATORS TO PROHIBIT MINING IN ENVIRONMENTALLY OR CULTURALLY IMPORTANT AND FRAGILE AREAS - The mining company, Thompson Creek Mining, has a pending patent application to acquire public lands within the project area. An EIS is being prepared to amend the permit to address potential major acid mine drainage problems. However, there is great potential to cause serious damage to the nearby streams and tributaries of the Salmon River, a critical habitat for salmon and other wildlife. The risks of acid mine drainage and the potential for a tailings dam failure, especially given the high earthquake potential, and subsequent devastation downstream, should require regulators to seriously reconsider whether it is prudent to mining in the area at all. Current regulations do not allow a mine to be blocked due to its potential adverse impacts on other natural and cultural resources.

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[25] Letter to the Supervisor of Salmon and Challis National Forests signed by Roger Flynn, Esq., Western Mining Action Project, July 1, 1997

[26] Letter to Michael Dombeck, Chief, U.S. Forest Service, from the Idaho Conservation League, April 29, 1999

[27] Ibid

THOMPSON CREEK MINE
Mine Profile

NAME: Thompson Creek Molybdenum Mine

LOCATION: Central Idaho near Clayton, Idaho
Located on Thompson Creek drainage

COMPANY: Thompson Creek Mining

MINERAL: Molybdenum

OPERATING STATUS:
1983-Present
A new one-year *interim* operating plan approved spring 1999
Permanent operating plan expected after final consultation on Endangered Species Act-listed fish

PRIMARY REGULATORY OVERSIGHT:
Challis National Forest
Idaho Department of Environmental Quality

LAND OWNERSHIP:
Salmon - Challis National Forest
Bureau of Land Management
Private holdings

TYPE OF OPERATION:
Open pit mining

FOR MORE INFORMATION CONTACT:
Idaho Conservation League: Scott Brown 208.345.6933
Boulder-White Clouds Council: Lynne Stone 208.726.1065
Mineral Policy Center: 202.887.1872

GROUSE CREEK MINE

1001 Sins of the Past

In 1994, then-Idaho Governor Cecil Andrus reacted to complaints about the Grouse Creek mine, an open pit gold mine opened one year earlier and described as a state-of-the-art mining operation [28] by proclaiming, *"I can show you a thousand sins of the past that we need to clean up, but modern-day mining is a plus. The salmon problem isn't with mining in Idaho; it's with those eight blocks of concrete [i.e. Hydro-dams] downstream."*[29] Next to the largest wilderness complex in the lower 48 states, the Frank Church-River of No Return Wilderness, the defunct Grouse Creek mine, is now the "one thousandth and one" sin of the past. Cyanide is currently leaking from the mine and contaminating nearby Jordan Creek at levels harmful to fish and other aquatic species.

Grouse Creek mine failed not only to be a state-of-the-art mining operation, but also did not produce the predicted amount of gold. It has turned into a potential environmental nightmare. The mine has been plagued with mishaps in its short operation – from a major landslide in 1994, which buried Jordan Creek, to numerous cyanide leaks and spills. One cyanide spill occurred just as adult salmon were migrating into the area to spawn.

In 1996, the EPA fined Hecla $85,000 for violating the mine's wastewater discharge permit.[30] Cyanide and mercury discharges exceeded the limits by more than five times the allowed levels over a period of 13 months. Other violations were more than twice the permitted levels. The mine also was cited for excessive sediment leaving the project site and impacting Jordan Creek waters. In 1997, Hecla agreed to make $1.5 million in pollution control improvements, including building a water quality treatment plant.[31]

In April 1999, Idaho State environmental officials reported cyanide leaking into a stream, which is habitat for endangered chinook salmon, steelhead and bull trout.[32] As of September 7, 199 the mine is still leaking cyanide into the Jordan Creek despite Hecla's efforts to stem the flow.[33] The cyanide levels are the same as measured in April and are over twelve times the concentration at which chronic exposure negatively affects fish and other aquatic organisms.[34]

At 7,300 feet elevation, the Grouse Creek mine perches in steep terrain above Jordan Creek. The creek is a tributary to the Yankee Fork, which is in turn a major tributary to Idaho's famous Salmon River. The Pinyon Lake Tailings Impoundment now holds 450 million gallons of cyanide-laced water. Additionally, there are 4.3 million tons of heavy metals laying at the

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[28] Times-News, *Closed mine still leaks cyanide*, September 7, 1999
[29] The Idaho Statesman, *Mine is golden for economy, but does it tarnish the land?*, September 4, 1994
[30] Wood River Valley News, *EPA Fines Mining Company*, August 28, 1996
[31] Times-News, June 6, 1999
[32] Ibid
[33] Times-News, *Closed mine still leaks cyanide*, September 7, 1999
[34] Ibid

bottom of the dam, which, if exposed to air, could cause acid mine drainage.[35] Oversight agencies are only now working with Hecla on a reclamation plan.

[35] Conversation with Lynne Stone and Scott Brown, September 1999

FAILURES OF FEDERAL AND STATE REGULATIONS

HOLES IN THE REGULATORY PATCHWORK– Before the project was approved, there was "total opposition to the project because the U.S. Fish and Wildlife Service (USFWS) didn't think [they] were getting resolution through the Forest Service process."[36] The USFWS and the Idaho Fish & Game Department both expressed their opposition to the Grouse Creek mine but felt the U.S. Forest Service had "signed off" on the project.[37]

In addition, the National Marine Fisheries Service (NMFS) voiced several concerns on the Draft Supplemental Environmental Impact Statement including water quality and quantity problems and their impacts on the aquatic life, the high potential for acid generation and run-off, and the naturally high rate of erosion at the mine site. NMFS warned there was a "significantly greater potential for acid run-off impacts for a mine of the magnitude of the proposed [Grouse Creek] project."[38]

Environmental regulations should not allow federal and state agencies to dismiss significant environmental issues, raised by other responsible agencies, such as these.

NEED FOR STRONGER REGULATIONS ON CYANIDE MANAGEMENT - The U.S. Forest Service, in its Final Supplemental Environmental Impact Statement, approved the use of cyanide vat leaching and treating the washed cyanide-laced ore for the Grouse Creek mine. The ore, the U.S. Forest Service stated, could then be disposed of without drainage controls.[39] Regulations should require stronger cyanide management techniques.

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[36] The Idaho Statesman, *Mine is golden for economy, but does it tarnish the land?*, September 4, 1994
[37] Ibid
[38] Letter to Greg Johnson, District Ranger of the Yankee Fork Ranger District from Merritt Tuttle, Division Chief of NMFS, on the Draft Supplemental Environmental Impact Statement
[39] Grouse Creek Project, Final Supplemental Environmental Impact Statement – Volume 2, Appendices, May 1992

GROUSE CREEK MINE
Mine Profile

NAME: Grouse Creek Mine

LOCATION: North central Idaho
15 miles northeast of Stanley

COMPANY: Hecla Mining Company

MINERAL: Gold

OPERATING STATUS:
1994 - 1997
The mine closed 5 years earlier than expected

PRIMARY REGULATORY OVERSIGHT:
Salmon and Challis National Forest
Idaho Department of Environmental Quality

LAND OWNERSHIP:
Salmon and Challis National Forest
Private holdings

TYPE OF OPERATION:
Cyanide vat leaching

FOR MORE INFORMATION CONTACT:
Idaho Conservation League: Scott Brown 208.345.6933
Boulder-White Clouds Council: Lynne Stone 208.726.1065
Mineral Policy Center: 202.887.1872

MOLYCORP MINE

From Blue-Ribbon Fishery to Dead River

At least eight miles of the Red River in northern New Mexico are biologically dead.[40] Over the last 30 years, widespread acid mine drainage and heavy metal contamination has leached out of the waste rock piles at the Molycorp molybdenum mine and contaminated the Red River, located within the Río Grande watershed. In addition, there were over 100 documented slurry spills into the Red River[41] between 1986 and 1991 alone, and numerous fines levied against the mining company, Molycorp, for point source pollution involving broken tailings pipes.[42] Even the U.S. District Judge James Parker noted that the once blue-ribbon trout fishery has now been reduced to a biologically dead waterway.[43]

Since this large-scale operations began, the small town of Questa, New Mexico has seen the Red River, just below the mine, turn milky blue in color from aluminum coating the riverbed. Many other toxic metals including copper, zinc, lead, cadmium and silver, have been detected at chronic and acute levels along the twenty-mile stretch of the Red River below the mine.[44] In addition to water contamination, dust containing lead and other pollutants from enormous molybdenum tailings storage ponds blows over the town of Questa. A state High School baseball championship was cancelled due to a dust storm blowing from the tailings piles.[45] Molycorp eventually paid to have the High School relocated. However, after the Junior High School was condemned, it was moved into the abandoned High School.

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[40] 1994 Report on Water Quality and Water Pollution Control in New Mexico. Report Prepared Pursuant to Section 305b of the Federal Water Pollution Control Act. New Mexico Water Quality Control Commission Report, p. 176-177

[41] 1991 Molycorp Inc. Spills Summary Sheet. New Mexico Environment Department

[42] An April 1986 tailings slurry spill contaminated a Questa Acequia Association irrigation ditch designated a watercourse to the Red River. New Mexico Environmental Improvement Division, Letter to LeRoy Apodaca, Molycorp Inc. - Questa Division, April 24, 1986, p.1.

[43] Written opinion of U.S. District Judge James Parker on Amigos Bravos/NMCCAW lawsuit. "I have concerns about the alleged contamination of the Red River downstream from the defendant's (Molycorp) operations. That stretch of the Red River once was an excellent trout fishery. For whatever reason, it no longer is." September 1997

[44] 1998-2000 State of New Mexico 303d List for Assessed Stream and River Reaches

[45] Taos News, 1981

FAILURES OF FEDERAL AND STATE REGULATIONS

HOLES IN THE REGULATORY PATCHWORK - For over a decade, the New Mexico Environment Department (NMED) and other federal and state agencies have documented water quality violations, which have degraded the Red River. For instance, Molycorp violated its federal Clean Water Act permit 12 times between 1978 and 1981, "admit[ted]" to these dozen violations agreed to pay fines as assessed, and to repair its tailings pipelines.[46]

However, Molycorp has continued to pollute ground waters. In November 1998, the NMED notified Molycorp that it's mine was in violation of the New Mexico Water Quality Act and Water Quality Control Commission Regulations for illegally discharged pollutants.[47] Molycorp, facing fines up to $15,000 per day, challenged the NMED's authority to regulate the mine but lost in an unanimous vote before the New Mexico Water Quality Control Commission the following January.

Due in part to pressure from local activists, the EPA in preparation for renewing Molycorp's National Pollution Discharge Elimination System (NPDES) permit in 1998, began its own investigation. In February 1998 the EPA confirmed that Molycorp has been in violation of the Clean Water Act for over 30 years. The EPA released a report stating the waste rock piles at the Molycorp mine are a "point source" (as defined in NPDES regulations, 40 CFR 122.2) for pollution into seeps that drain into the Red River.[48] Although there are some contributions from natural erosional scars, the waste rock piles are contaminating the groundwater with elevated levels of metals and sulfates. In addition, the tailings ponds were shown to contaminate groundwater supplies as well.

Despite this critical report, Molycorp, in the 1998 NPDES permit application, not only does not acknowledge pollution from the waste rock piles but claims that, "the Questa mine has not harmed, and may have improved the condition of the Red River." Still writing the permit, the EPA is being encouraged by environmental organizations and local citizens to acknowledge the waste rock piles as "point source" pollution, as noted in the EPA's own report in February 1998.

LACK OF ENFORCEMENT OF EXISTING REGULATIONS - In over 30 years of operation, Molycorp has never had an EPA permit for these discharges. Despite their own condemning report in February 1998, the EPA has taken no regulatory action on this issue by either requiring Molycorp to comply with water quality protection permits or prohibiting the illegal discharge pollution. Since Molycorp continues to operate, violating the Clean Water Act, the Western Environmental Law Center, on behalf of Amigos Bravos and the New Mexico Citizens for Clean Air and Water, filed a lawsuit in March 1999 alleging that the EPA is not fulfilling its regulatory duty. Environmental regulations should penalize repeat offender by revoking permits and banning them from operating new mines and expansion until they have cleaned-up their act.

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[46] United States District Court, New Mexico District, *United States v. Molycorp, Inc.*, No. 81-785-M Civil, Memorandum Opinion and Order, Albuquerque, New Mexico, entered March 26, 1984

[47] 1999 New Mexico Environment Department comments on DP-1055, groundwater discharge permit for waste rock area

[48] Report on Hydrological Connection Associated with Molycorp Mining Activity, Questa, New Mexico. USEPA, Region 6, NPDES Permits Branch (6WQ-P). Prepared by David Abshire. February 13, 1998

MOLYCORP MINE
Mine Profile

NAME: Molycorp Molybdenum Mine

LOCATION: Near the Red River
Above Questa, New Mexico

COMPANY: Molycorp
A subsidiary of Unocal (formerly Union Oil of California).

MINERAL: Molybdenum

OPERATING STATUS:
Currently operating underground
Large scale open pit operations began in 1964
Small scale mining since the 1920s

PRIMARY REGULATORY OVERSIGHT:
New Mexico state agencies

LAND OWNERSHIP:
Formerly federal lands
Acquired by Molycorp through federal land patenting

TYPE OF OPERATION:
Underground

FOR MORE INFORMATION CONTACT:
Amigos Bravos/Molycorp Watch Project: Ernie Atencio 505.758.3874
Concerned Citizens for Questa: Roberto Vigil 505.586.0202
Mineral Policy Center: 202.887.1872

MIDNITE MINE
Taken for a Midnite ride?

The Midnite mine, a currently inactive open-pit uranium mine located on the Spokane Indian Reservation in Washington State, has had numerous problems with contamination. In April 1998, the EPA conducted an Expanded Site Inspection (ESI) at the Midnite mine. Elevated levels of metals and radionuclides were detected in numerous on-site sources as well as in ground water seeps that flow into the nearby surface water drainages including nearby Blue Creek. Wetlands at the site have chromium levels above the Ambient Water Quality Criteria.[49]

The operating company, Dawn Mining Company, also owns the nearby uranium millsite facility, which is located on the border of the Spokane Indian Reservation. It is situated next to a tributary of the Columbia River and directly underneath the site is the Walker's Prairie Aquifer. The aquifer has already been polluted by the old uranium mine and is being pumped out to remove radionuclides and sulfates. Expected to last twenty years, this operation uses 100 acres of plastic-lined pools for evaporation.

The Dawn Mining Company has attempted to turn this millsite area into a commercial radioactive waste dump rather than fulfill its cleanup obligations. The company's first plan for the importation of radioactive waste drew fierce opposition from local communities, businesses and the state of Washington itself, which in 1991 denied the company's request for the dump. Pressure from the company to permit the dump was so strong as to be called "blackmail" by the head of the Department of Health's (DOH), Division of Radiation Protection.[50] Then in 1995, a new administration and state Secretary of Health permitted the commercial radioactive waste dump, even though the state's policy limits the amount of imported radioactive waste.[51] The fact that this proposal received approval by regulators is evidence of the shortcoming of the regulatory framework.

In a September 10, 199 Spokesman-Review article, Dawn Mining Company claims to have abandoned its plan to use its old uranium milling pit as a commercial radioactive waste dump, promising instead to use clean fill for reclamation of the site.[52] Despite the apparent abandonment of the unpopular plan, Dawn's true intentions may be revealed in a September 9 letter from the president of Dawn Mining Company to Washington State's DOH, Division of Radiation Protection.[53] The letter indicates that Dawn intends to dispose of radioactive source

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[49] Direct quote from EPA News Release, *EPA Proposes Midnite Mine (Stevens County) For Inclusion on National Priorities List*, February 16, 1999

[50] Letter to Bob Nichols from T.R. Strong, head of Washington State Department of Health, Division of Radiation Protection on Draft Briefing Paper: Dawn/NORM, April 27, 1993

[51] Letter to Eric Slagle and Dan Silver from T. R. Strong, head of Washington State Department of Health, Environmental Health Programs, Division of Radiation Protection, on the history of Washington State's policy on Radioactive Waste, November 17, 1992

[52] The Spokesman-Review, *Dawn Mining dumps plan to haul in waste*, September 10, 1999

[53] Letter to Gary Robertson, Washington State Department of Health, Division of Radiation Protection, from David Delcour, President of Dawn Mining Company, September 9, 1999

material from their Midnite mine in the dump, instead of just using clean fill, as implied in the newspaper article. Contaminated soils, sludge and mill remains would be dumped with clean fill only acting to "fill the remainder" of the pit and cover the dump site.[54]

Dawn's letter also explains how a number of "unnecessary and expensive design elements" for the reclamation cover design of the tailings disposal areas will be "eliminated." These protective measures are discarded by Dawn while simultaneously Dawn states that it wants to continue to look for commercial radioactive waste elsewhere.

[54] Letter to Gary Robertson, Washington State Department of Health, Division of Radiation Protection, from David Delcour, President of Dawn Mining Company, September 9, 1999

FAILURES OF FEDERAL AND STATE REGULATIONS

NO REQUIREMENT FOR GUARANTEED FULL COST BONDING MECHANISMS FOR RECLAMATION - Newmont Mining Company, the wealthy parent of Dawn Mining Company, claims that it is not financially responsible for reclamation of the mine site.[55] The Department of Interior previously notified Dawn that when the lease was terminated, it, and potentially other agencies, would seek to hold Dawn and the Newmont Mining Company (as Dawn's then 51% owner) liable for any costs incurred as a result of Dawn's failure to comply with the lease and applicable regulations.[56] Despite the fact that Dawn was required to post a $9 million bond for the mine, there is speculation that this has never been posted. If this is true, then why was Dawn accepted as a contractor in good standing with the federal government and allowed to bid on Formerly Utilized Sites Remedial Action Program (FUSRAP) contracts for commercial radioactive waste while delinquent in providing the bond?[57]

LACK OF REGULATION TO ENSURE COMPLETE RECLAMATION - The disposal of imported radioactive dirt or source materials from the Midnite mine site could set a dangerous precedent for other mining companies who would promote similar disposal schemes instead of proper and complete reclamation. Full reclamation of the Midnite mine without the use of funds generated by importing and dumping radioactive dump is possible, but so far has not been considered as an option by either the Dawn Mining Company or the Newmont Mining Company.

In February 1999, the EPA proposed that the Midnite mine be included on the National Priorities List (NPL) in order "to prevent further environmental harm from mine waste, contaminated ground water and surface water runoff from the mine."[58] If added to the NPL, the site will be eligible for clean up under the federal Superfund program.

Recent considerations by the U.S. Nuclear Regulatory Commission to expand the Dawn low-level radioactive waste dump into an industrial waste dump have additional concerns. Disposing of wastes other than 11e.(2) byproduct material can only compound the potential for pollution, and complicate necessary monitoring and cleanup from additional toxic pollutants with potentially unknown or poorly understood synergistic effects.[59]

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[55] U.S. Securities and Exchange Commission, Newmont Mining Company, Form 10-Q, CIK Code 71824, August 16, 1999

[56] Ibid

[57] Personal Communication, Owen Berio, September 6, 1999

[58] EPA News Release, *EPA Proposes Midnite Mine (Stevens County) For Inclusion on National Priorities List*, February 16, 1999

[59] Letter to the U.S. Nuclear Regulatory Commission's Commissioners, from W.D. Travers, Director of the USNRC's Office of Nuclear Material Safety & Safeguards. SECY-99-012, April 8, 1999

MIDNITE MINE
Mine Profile

NAME: Midnite Uranium Mine

LOCATION: Spokane Indian Reservation
Approximately eight miles from Wellpinit, northeastern Washington

COMPANY: Dawn Mining Company (DMC), a subsidiary of Midnite Mines
Majority interest in DMC held by Newmont Mining Corporation

MINERAL: Uranium

OPERATING STATUS:
Late 1950s to 1981

PRIMARY REGULATORY OVERSIGHT:
U.S. Department of Interior
Bureau of Indian Affairs
Bureau of Land Management
EPA

LAND OWNERSHIP:
Spokane Indian Reservation

FOR MORE INFORMATION CONTACT:
Dawn Watch: Owen Berio 509.937.2093 www.dawnwatch.org
Mineral Policy Center: 202.887.1872

THE WAY FORWARD

The federal government has a legal obligation to prevent unnecessary and undue degradation of our public lands. Lands of pristine beauty and rugged natural settings. Lands of abundant wildlife and majestic vistas.

Today, rather than being protected, our public lands are threatened by the mining of gold, copper, silver, and other hardrock minerals. Open pits and waste rock piles have scarred the landscape. Toxic waste from active and abandoned mine sites has contaminated our surface and groundwaters - threatening wildlife habitat as well as local drinking water supplies.

How could this happen? The answer is inadequate environmental regulation. From the antiquated Mining Law of 1872 and a weak patchwork of state regulatory programs, to the vague hardrock mining regulations utilized by the Bureau of Land Management, current laws and regulations fail to provide the necessary oversight of hardrock mining on public lands. Consequently, irresponsible mining has devastated the landscape, as exemplified by the mines described in this report. It doesn't have to be this way.

The Department of the Interior's Bureau of Land Management (BLM) is the manager of the largest share of publicly owned land in the United States. The government's authority to regulate mining's environmental impacts on BLM land is found in the Federal Land Policy and Management Act of 1976 (FLPMA). Under FLPMA, the Secretary of the Interior is directed to "take any action necessary, by regulation or otherwise, to prevent unnecessary or undue degradation on the federal lands." In carrying out this mandate, however, the Secretary must adhere to the weak hardrock mining regulations contained in Section 3809 of the Code of Federal Regulations (43 CFR 3809). Published in 1981 when James Watt headed the Department of Interior, these regulations are outdated and ineffective. In fact, when first published, it was expected that these regulations would need to be updated to keep pace with future technology and practices.

Frustrated by this ineffective regulatory instrument, Secretary of the Interior Bruce Babbitt initiated a process in January 1997 to update and revise the "3809" regulations. Despite exhaustive public comment and involvement from all stakeholders, industry advocates in Congress have blocked or delayed the rule making process at every opportunity.

Many critics of the Department of the Interior's proposal to revise the "3809" regulations argue that the states adequately regulate the environmental impacts of hardrock mining on federal land. Thus, these critics argue that the federal government should defer to the states in regulating mining's impacts on these lands.

However, state regulatory programs mirror many of the worst flaws of federal regulations. State laws are riddled with exemptions for small-scale mining, provide inadequate systems of inspection and monitoring, and fail to require mines to do baselines studies or characterize environmental risks before they begin mining. Few states mandate that mining operations on

federal land follow proven "best available technology standards" for operating and reclaiming mined land.

The lack of consistency among state programs is an additional risk to public lands. Most states, including Arizona, Montana, New Mexico, Nevada, and Alaska have inadequate reclamation laws. However some states are more progressive on certain issues. California and Nevada require operators of proposed mining projects to analyze the acid generating potential of their wastes, and Arizona imposes some "best available demonstrated control technology" operating standards at its mines.

In the end though, the inconsistent level of environmental protection provided by state programs is not an adequate substitute for a strong federal regulatory program that sets a clear standard for environmental protection of our federal lands. The level of environmental protection accorded to public land should not depend on state boundaries. Rather, the American public should be assured that regulation of mining activities on any public lands would conform to a consistent set of high standards. Federal authorities, through appropriate regulations, must therefore establish a high level of performance and operating standards that all states must meet. Certainly protection of federal lands must rest squarely with federal authorities, for they alone are entrusted with a duty to all Americans to "prevent unnecessary or undue degradation" on our public lands.

Although many industry actors are indeed well intentioned, regulations are not written for the good actor. They are written for whose who have mishandled the spill, walked away from the cleanup, showed disregard for community impacts, or polluted the streams.

6 Mines, 6 Mishaps is a case-study examination of the costly environmental impacts caused by the current state and federal regulatory patchwork, and the irresponsible actors that slip through its holes. *6 Mines* is by no means an exhaustive study of the problem mines and environmental degradation caused by hardrock mining. Rather, it provides an overview of the types of problems that have occurred at specific mines due to weak laws and regulations. (For Mineral Policy Center's *Essential Elements of Regulatory Reform*, see the chart on page 30-31) In the process, it demonstrates that no matter the good intentions of responsible elements of industry, no matter the commendable elements of various state regulatory regimes, the current system does not work.

ESSENTIAL ELEMENTS OF HARDROCK

HOW TO PREVENT "UNNECESSARY AND UNDUE

PROTECT WATER QUALITY

Baseline hydrological data must be required using sound sampling methods. Pre-mining water quality must be determined prior to the proposed disturbance. Ongoing water monitoring should be required.

Guidelines must be specified for identifying and managing potentially acid-generating materials.

In order to protect water resources, all mine applications that require significant long-term water treatment after mine closure, should be denied. The operator must guarantee that water treatment after closure will have the desired result within a specific period of time. Perpetual treatment of water should not be allowed.

Reclamation bonds should cover the full cost of complying with water quality standards.

FINANCIAL GUARANTEES

Bonding must be adequate, liquid, and independently guaranteed. No corporate guarantees or self-bonding should be allowed as a substitute.

Bonds must cover the full cost of complete reclamation and closure. Bonds should be required for all long-term water treatment and returned only when the need for water treatment ceases.

All NEPA alternatives should include a full and detailed analysis of the form and amount of bonding. Additionally, the public should have the right to comment on the adequacy of financial guarantees and whether bonds should be released.

Bonds should not be released until it can be established that a mine will meet all water quality standards in perpetuity.

CITIZEN INVOLVEMENT

There are a number of steps to mine approval including exploration and data collection, permitting, bond calculation, operation, reclamation and bond release. The public has a genuine interest in each of these stages. Public input should be allowed and encouraged at each step.

Citizens often have information, insights, skills and energy that can assist the Bureau of Land Management (BLM) in carrying out its mandate to prevent unnecessary or undue degradation. Furthermore, by soliciting public input on mining operations on public lands, BLM can avoid and defuse controversies.

MINING REGULATORY REFORM

DEGRADATION" OF PUBLIC LANDS

NOTICE MINES

The ability to avoid submitting plans of operations and participating in the NEPA process via the "Notice Mine" exemption should be eliminated. Small mines under the "Notice Mine" provisions, and mines that do not cause "significant disturbance" under the U.S. Forest Service alternative, escape the NEPA process. However, both types have the potential to create unnecessary or undue degradation, and both are abused today with regulatory acquiescence.

INSPECTION AND ENFORCEMENT

The Secretary of the Interior should take the enforcement authority that he has under the Federal Land Policy and Management Act (FLPMA) and bring it to life under new BLM 3809 regulations. This should include using civil and criminal penalties for those who violate the new regulations. BLM should be required to issue cessation orders and revoke permits when certain infractions or violations occur.

Citizens should have the right to petition for inspection and enforcement in order to spur the BLM into fully implementing its FLPMA obligations.

"Bad actors", and their corporate affiliates, must be blocked from operating on public lands.

TECHNOLOGY AND RECLAMATION STANDARDS

A standard must be established that will drive the industry to use the most efficient and successful technology available to protect the environment. In other regulatory arenas, setting technology standards has driven improvements in environmental performance without causing significant losses of productivity. Mineral Policy Center recommends that BLM use, at a minimum, a Best Technology Standard to improve environmental performance at modern mine sites.

At a minimum, standards for the health of public lands must address: (1) watershed function; (2) nutrient cycling and energy flow; (3) water quality and quantity; (4) habitat for endangered, threatened, or special-status species; and (5) habitat quality for native plant and animal populations and communities.

APPENDIX A: CONTRIBUTORS
(IN ALPHABETICAL ORDER)

Ernie Atencio
Amigos Bravos
Questa, New Mexico
Molycorp Mine

Owen Berio
Dawn Watch
Springdale, Washington
Midnite Mine

Scott Brown
Idaho Conservation League
Boise, Idaho
Thompson Creek Mine, Grouse Creek Mine

David Chambers
Center for Science in Public Participation
Boulder, Montana
Zortman-Landusky Mine

Gary Heckenlaible and Dick Fort
ACTion for the Environment
Rapid City, South Dakota
Gilt Edge Mine

Jim Kuipers
Center for Science in Public Participation
Boulder, Montana
Zortman-Landusky Mine

Lynne Stone
Boulder-White Clouds Council
Ketchum, Idaho
Thompson Creek Mine, Grouse Creek Mine

APPENDIX B: PRESS ARTICLES

1.) Billings, Erin P., *State Bonding: Miners offer assets to pay reclamation*, Billings Gazette, August 31, 1999

2.) Editorial, *Miners offer regulators some hard lessons*, Missoulian, August 29, 1999

Billings Gazette
The Source.
Tuesday, August 31, 1999

▼ STATE BONDING

Miners offer assets to pay reclamation

By ERIN P. BILLINGS
Gazette State Bureau

HELENA — The owners of a closed gold mine near Lewistown have offered the state thousands of acres in mineral claims instead of cash to cover increases in pollution cleanup costs at the site.

CR Kendall Corp. of Golden, Colo., owned by Canyon Resources Corp., has proposed putting up some of its 900,000 acres in surface and mineral rights across the state as collateral to cover increases on the reclamation bond at its Kendall gold mine. The company said it decided to offer up assets because of tight cash flow.

"At this point the gold business is very tight," said Conrad Parrish, environmental manager of the Kendall mine. "We have to look for ways to fulfill obligations that aren't necessarily the traditional ways."

The Montana Department of Environmental Quality now is reviewing the existing $1.9 million bond for reclamation at Kendall and trying to determine how much more will be needed to complete cleanup work. Officials have estimated that as much as $3.7 million more might be needed to reclaim the mine site and cover long-term water treatment.

The Kendall mine was a cyanide heap-leach operation that ceased operating in 1995.

Jan Sensibaugh, administrator of the department's Permitting and Compliance Division, said the state hopes by next month to have determined how much more money will be needed for the reclamation bond. Also, it is reviewing the value of CR Kendall's mineral rights to determine whether they would be a valuable enough asset to replace cash.

Reclamation bonds are held as an assurance mine cleanup gets completed. The bond is rarely tapped unless a company goes belly up or cannot complete the reclamation itself and the state needs the money to do the work.

Sensibaugh said the state has yet to accept a company's mineral rights as collateral for a metal mine reclamation bond, but has some leeway in doing so.

"As far as I understand it, the DEQ has the flexibility to accept anything as a bond," Sensibaugh said. "We have in some cases, not under the Metal Mine Reclamation Act but under the Open Cut Act, accepted vacant property or a house, things like that.

"The problem is assessing the actual value of what is offered as a bond when it isn't cash."

But Bonnie Gestring, community organizer for the Montana Environmental Information Center, said CR Kendall's offer could be the "fleecing of Montana." She said not only should the state stay out of the real estate business, but she questions whether it is even legal to accept the mineral claims in lieu of cash.

"It's is MEIC's position that state law prohibits the DEQ from accepting assets that devalue over time and with good reason — to protect the Montana taxpayer," Gestring said. "Clearly

(More on Mine, Page 10A)

Mine

From Page 1A

mineral rights and surface rights fall under this category with the continuing plummeting price of gold."

The Montana Environmental Information Center has filed a formal intent to sue the state if it doesn't review and increase the Kendall mine reclamation bond in a timely manner.

The state now is analyzing CR Kendall's offer and trying to determine whether the mineral rights could be sold. The mineral rights would only be marketed, however, if Kendall couldn't finish the reclamation work itself.

"We don't want to take something that has a theoretical value and then can't pay the guy on the bulldozer," Sensibaugh said. "We're being careful to ensure this is what it's exactly worth and we aren't going to take anything we don't feel we could sell if we needed to."

Parrish said the idea would be to get the mineral claims back with the rest of the bond after the company completes reclamation at the mine. About two-thirds of the work at the site has been reclaimed, he said.

He said under the deal, the state likely would pick and choose what claims it would hold on to, rather than the entire 900,000 acres worth.

"We're not proposing that the state hold the entire lot as collateral," Parrish said. "We'll settle on a bond amount, settle on the valuation and then settle on which lands from among that package the state would hold for collateral bonding purposes."

Gestring, however, said if the mining company is looking for creative ways to fulfill their pollution cleanup obligations, it should simply sell it's mineral and surface rights and give the state the cash.

Opinion

■ DAVID FUSELIER ..... PUBLISHER
■ MIKE MCINALLY ..... EDITOR
■ STEVE WOODRUFF ..... EDITORIAL PAGE EDITOR
■ SHELLIE NELSON ..... ASSISTANT NEWS EDITOR
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EDITORIAL POLICY

■ The Missoulian strives to present to readers a wide range of ideas from a diverse array of writers. Missoulian Editorials express the views of the newspaper's Editorial Board. Signed commentary, columns, letters and editorial cartoons represent the independent views of the authors. Comments and suggestions always are welcome.

MISSOULIAN EDITORIAL

Miners offer regulators some hard lessons

SUMMARY: Reclamation laws were supposed to usher hard-rock mining into a new, more responsible era. But reclamation isn't exactly assured.

In a matter of months, the contractor appointed to maintain water-treatment facilities at the defunct Zortman-Landusky gold mine south of Malta depleted the annual budget for the work. For now, the state of Montana has taken over, and taxpayers are footing the bill for work needed to control water pollution.

That may be the least of troubles in store at a mine once touted as a model of Montana's new mining industry.

State officials say it may take as much as $38 million to reclaim Zortman-Landusky as required by law. But the mine operator, Pegasus Gold, went bankrupt. While in operation, Pegasus posted bonds to ensure reclamation, but those bonds total $29.6 million. Lawyers for the state got another $1 million for reclamation from the bankruptcy court overseeing reorganization of Pegasus. Optimists at the Department of Environmental Quality hope the money will stretch far enough. You should hope they're right: You and your neighbors will make up any shortfall. All in all, the state is counting on nearly $80 million worth of bonds to ensure cleanup at five Pegasus mines.

Pegasus' bankruptcy has been an eye-opening experience for state regulators. Among the lessons learned:

■ It's a mistake to assume the companies that develop mines will stay around – or even exist – when it comes time to clean the mines up.

■ Reclamation plans that presume miners will reclaim their own mines understate the actual cost when miners go out of business or skip out. Everything becomes more expensive when the state has to hire contractors for the work.

■ Reclamation bonds required to ensure cleanup may not be worth as much as expected. At least some of the insurance companies that issue reclamation bonds would rather fight than pay, forcing the state to rack up legal expenses or accept lesser settlements.

Case in point: Safeco Insurance went to federal court in June to cancel a $500,000 bond for reclamation at the Diamond Hill mine near Townsend. The state went to court to prevent the company from canceling the bond; the company wound up paying the $500,000 – but has since sued the state to get the money back.

Bonds are supposed to guarantee money for reclamation if a mining company fails to honor its commitments. But regulators say they're learning that, with large sums of money at stake, at least some companies that issue bonds will exploit any possible opportunity to avoid paying. As a result, DEQ has adopted a no-nonsense, see-you-in-court approach in dealing with bond companies.

State laws enacted more than 20 years ago to better regulate the mining industry were supposed to usher hard-rock mining into a new, more responsible era. But as the first mines developed under the new laws start to play out, reclamation is turning out to be anything but assured. Look hard around the state, and you won't find a single example of a large-scale hard-rock mine successfully reclaimed.

"Unfortunately, we're not at the point where you can show the citizens of Montana that everything works the way it's supposed to," says DEQ Director Mark Simonich.

Earlier this year, DEQ battled the mining industry and persuaded the Legislature to make a key change in the administration of reclamation bonds. Regulators now will review the adequacy of bonds at least annually; previously, bonds were subject to review once every five years.

Simonich says various state agencies also are trying to do a better job of coordinating different aspects of mine regulation.

"We have learned a great deal," he says. Unfortunately, those lessons have been learned the hard way.

Taxpayers and the environment aren't the only losers when reclamation plans go awry. Miners haven't done their industry any favors, either. Mining is controversial enough, even when people focus on jobs and profits. Leaving citizens of the state with big messes and big bills to pay after the mines play out is a good way to wear out your welcome.

In this regard, hard-rock miners would do well to emulate their coal-mining brethren.

Thirty years ago, coal mining was hugely controversial in Montana. Ranchers, environmentalists and others feared that strip mining on a massive scale would leave areas of eastern Montana looking like West Virginia.

You don't hear a lot of discouraging words about coal mining today, though. That's largely because coal miners have done a splendid job of reclaiming strip mines. Coal miners have established a track record of which they are proud, and the public is satisfied.

The story is completely different when it comes to hard-rock mining. The record of hard-rock mine reclamation in Montana is one of broken commitments and public disappointments. Until this changes, hard-rock miners will find themselves embroiled in constant controversy.

SIX MINES, SIX MISHAPS

Six Case Studies of What's Wrong with Federal and State Hardrock Mining Regulations, and Recommendations for Reform

---

Today's highly mechanized and chemical-intensive mining industry requires a new set of federal environmental regulations. Mining techniques have outpaced regulations that were written prior to the widespread use of modern technology, such as cyanide heap leach processing and large open pit mines. These new techniques have led to environmental impacts that the old regulations, written nearly 20 years ago, were not meant to address. While some states have updated their regulations, no state has a comprehensive set of regulations that is adequate to protect federal public lands.

Over the past three years there has been significant debate about the need to modernize the Bureau of Land Management's mining regulations. What is needed is a federal baseline regulatory standard, on which states can base their own regulations. This standard should explicitly prohibit practices that cause undue degradation on public lands. As the trustees for the public lands, the federal and state agencies have a responsibility to protect our lands for future generations, not leave a legacy of poisoned waterways and fragmented landscapes.

6 Mines, 6 Mishaps, is a case study analysis of six mines from around the United States, anecdotally demonstrating where existing regulations have failed to protect the environment and communities from unnecessary degradation. The report outlines what essential elements are needed for comprehensive hardrock mining regulatory reform.

MINERAL POLICY CENTER

Mineral Policy Center (MPC) is a non-profit environmental organization dedicated to protecting communities and the environment from the impacts of irresponsible mining. The Center programs and activities include mining-related research; public outreach; regulatory and legislative reform of mining laws; initiatives to improve company practice; and technical assistance and community organizing. MPC is supported by membership and foundation grants. Join MPC and help protect the land, water, wildlife, and natural resources for future generations. Donations are tax deductible. Mineral Policy Center, 1612 K Street, NW, Suite 808, Washington, D.C., 20006 Tel: 202.887.1872 Fax: 202.887.1875 E-mail: mpc@mineralpolicy.org Web address: www.mineralpolicy.org. MPC also has two regional offices in Durango, Colorado and Bozeman, Montana.

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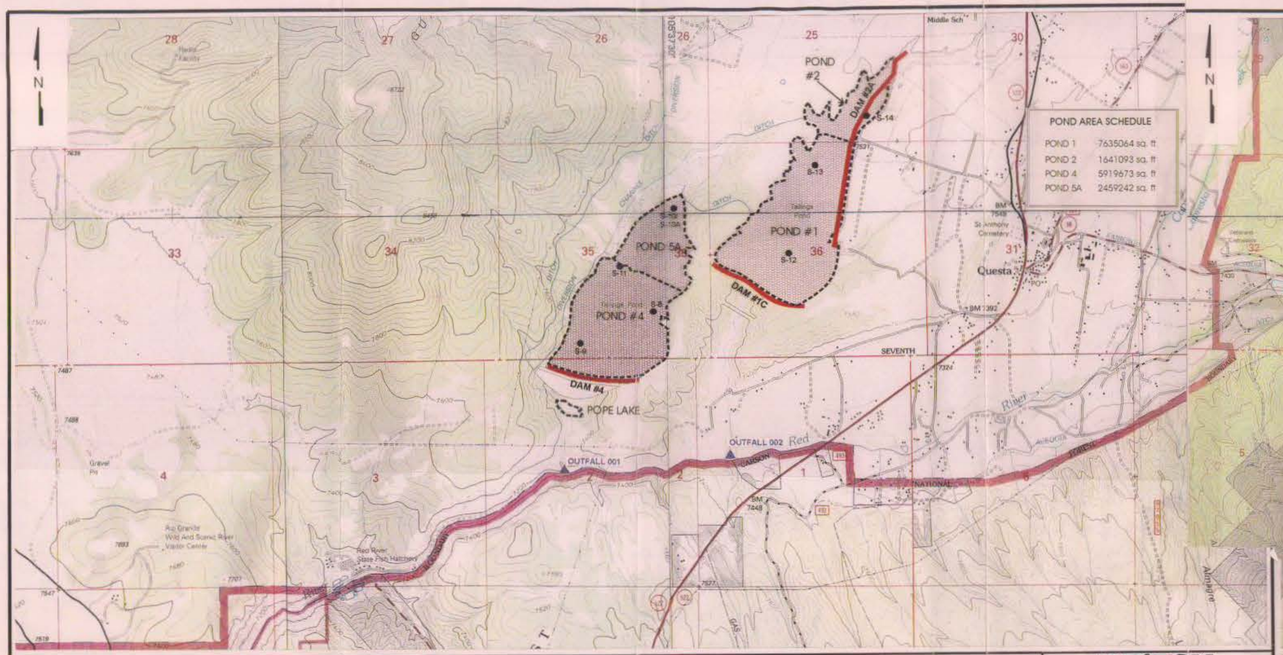

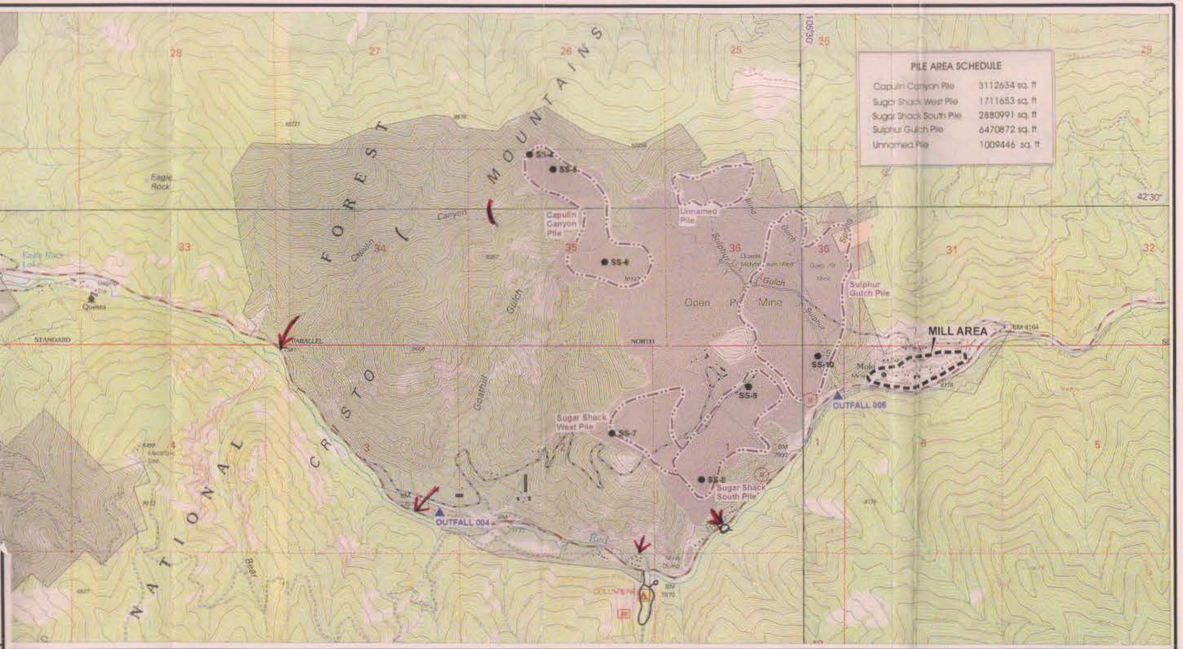

MAP PREPARED FROM:
U.S. DEPT. OF THE INTERIOR GEOGRAPHICAL SURVEY
UNITED STATES DEPARTMENT OF AGRICULTURE FOREST SERVICE
RED RIVER QUADRANGLE
GUADALUPE MOUNTAIN QUADRANGLE
QUESTA QUADRANGLE
NEW MEXICO - TAOS CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
1995 SERIES
SCALE 1: 24,000

0 1000 2000
SCALE IN FEET

LEGEND
- SOURCE SAMPLE (SOIL)
- NPDES OUTFALL

WESTON
MANAGING DESIGNING CONSULTING

FIGURE A-4
SOURCE AREA MAP
- TAILINGS PONDS
MOLYCORP, INC.
QUESTA, TAOS COUNTY, NEW MEXICO
CERCLA ID. NO.: NMD002899094

EPA REGION 6
HRS DOCUMENTATION RECORD

W.O. NO.: 03886-190-008-0100

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MAP PREPARED FROM:
U.S. DEPT. OF THE INTERIOR GEOGRAPHICAL SURVEY
UNITED STATES DEPARTMENT OF AGRICULTURE FOREST SERVICE
RED RIVER QUADRANGLE
GUADALUPE MOUNTAIN QUADRANGLE
QUESTA QUADRANGLE
NEW MEXICO - TAOS CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
1995 SERIES
SCALE 1: 24,000

0 1000 1800
SCALE IN FEET

LEGEND
- SOURCE SAMPLE (SOIL)
- OPEN PIT MINE BOUNDARY
- CAMPGROUND
- NPDES OUTFALL
- APPROXIMATE BOUNDARY OF WASTE ROCK PILE

WESTON
MANAGING DESIGNING CONSULTING

FIGURE A-2
SOURCE AREA MAP - MINE
MOLYCORP, INC.
QUESTA, TAOS COUNTY, NEW MEXICO
CERCLA ID. NO.: NMD002899094

EPA REGION 6
HRS DOCUMENTATION RECORD

W.O. NO.: 03886-190-008-0100

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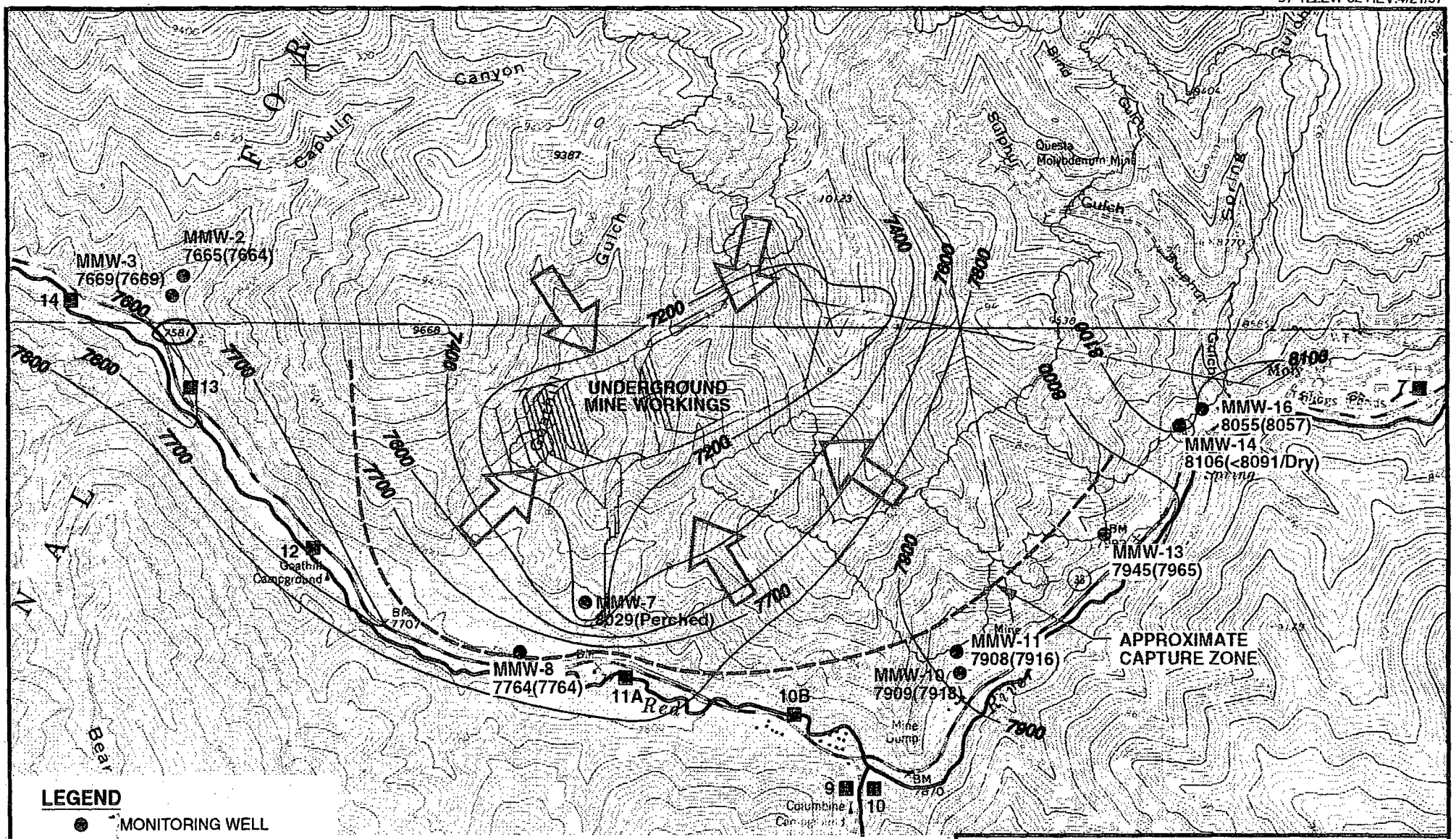


LEGEND

- MONITORING WELL
- 7908 FEBRUARY 1997 ELEVATION
- (7916) JANUARY 1996 ELEVATION
- RED RIVER SAMPLE LOCATION
- GROUND WATER FLOW DIRECTION
- OVERBURDEN DISPOSAL PILES (SRK, 1995)

0 2000 4000 FEET

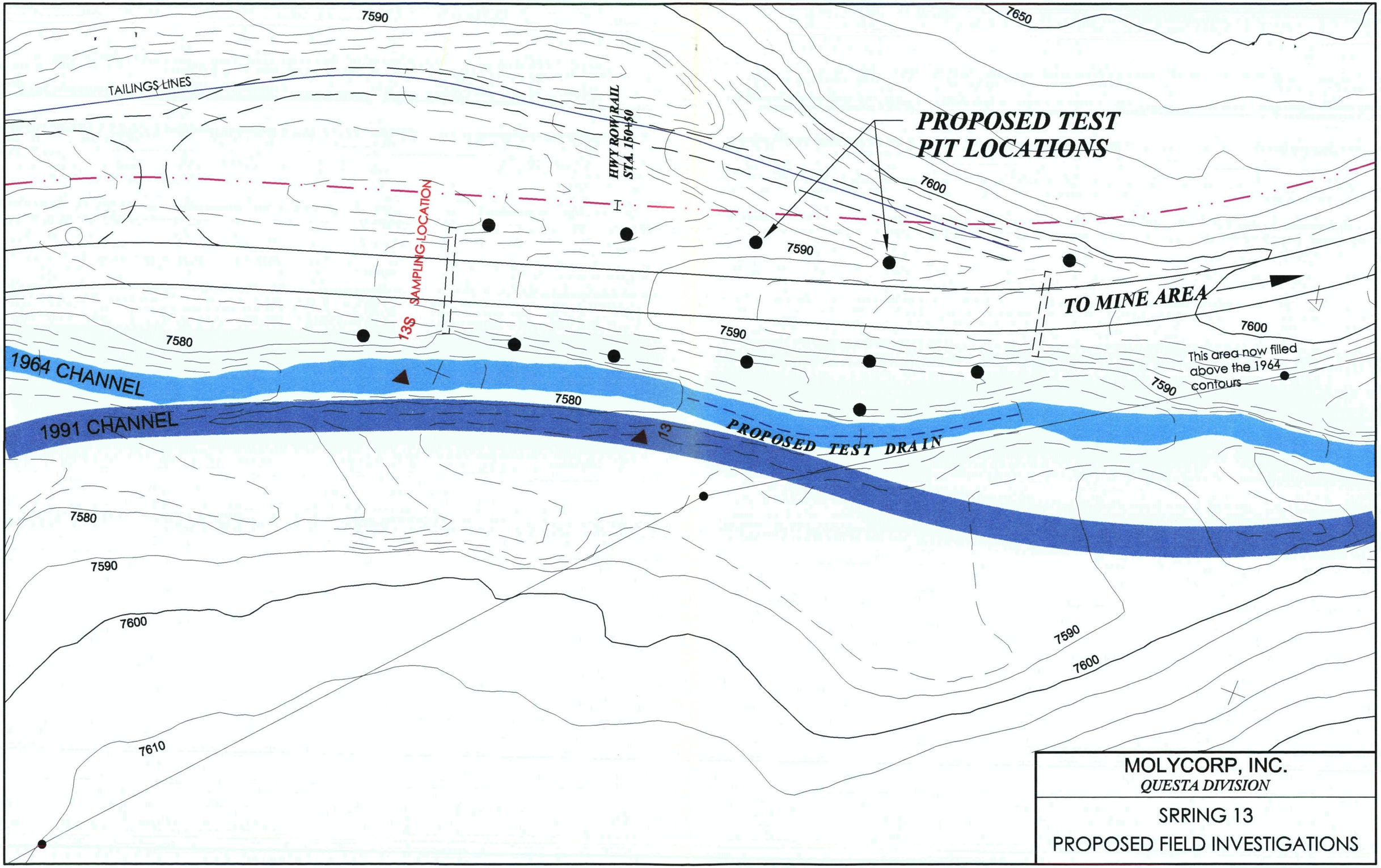
SCALE

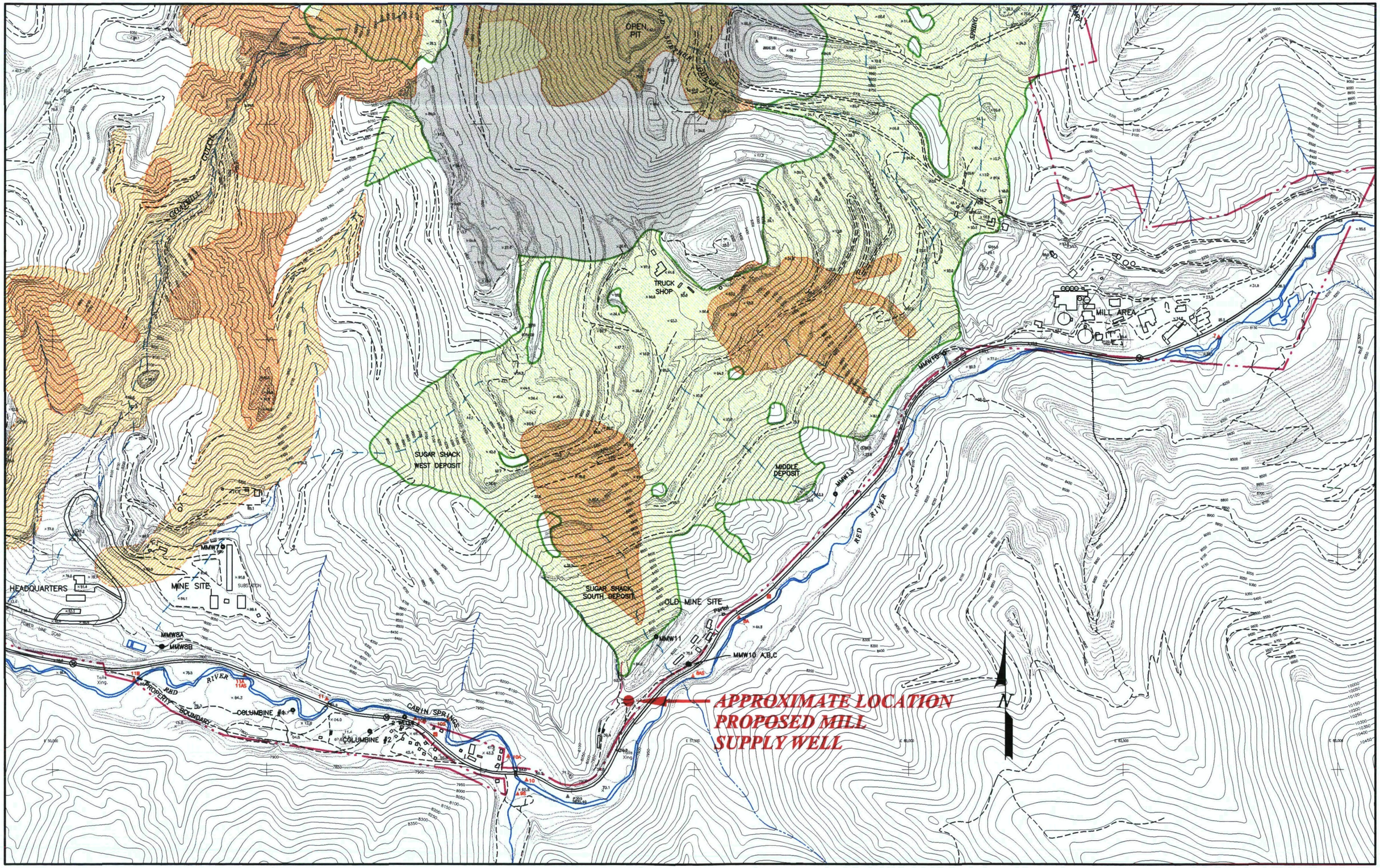
REFERENCE: U.S.G.S. TOPOGRAPHIC MAPS OF QUESTA AND RED RIVER, NEW MEXICO DATED 1963.

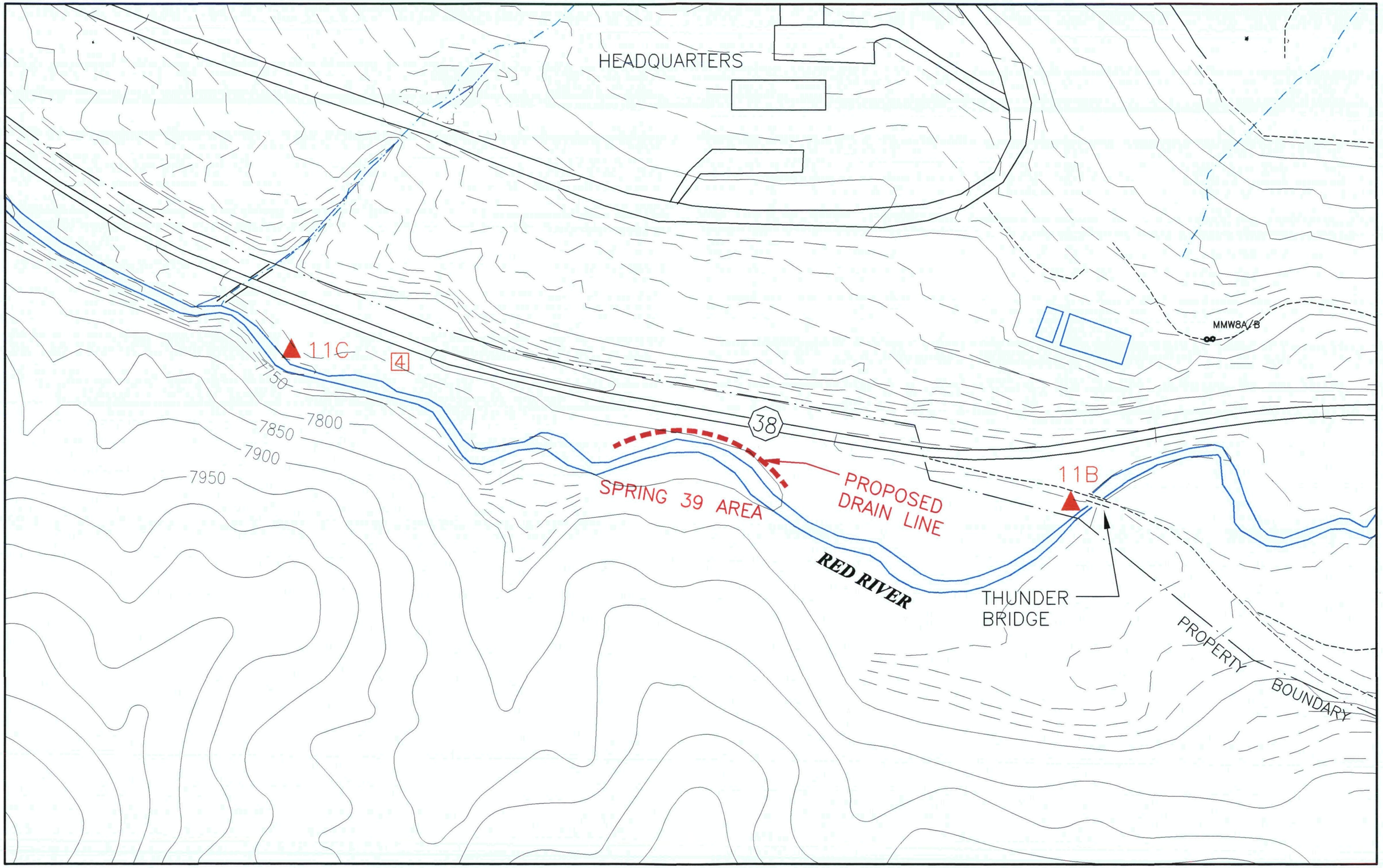
FIGURE 3

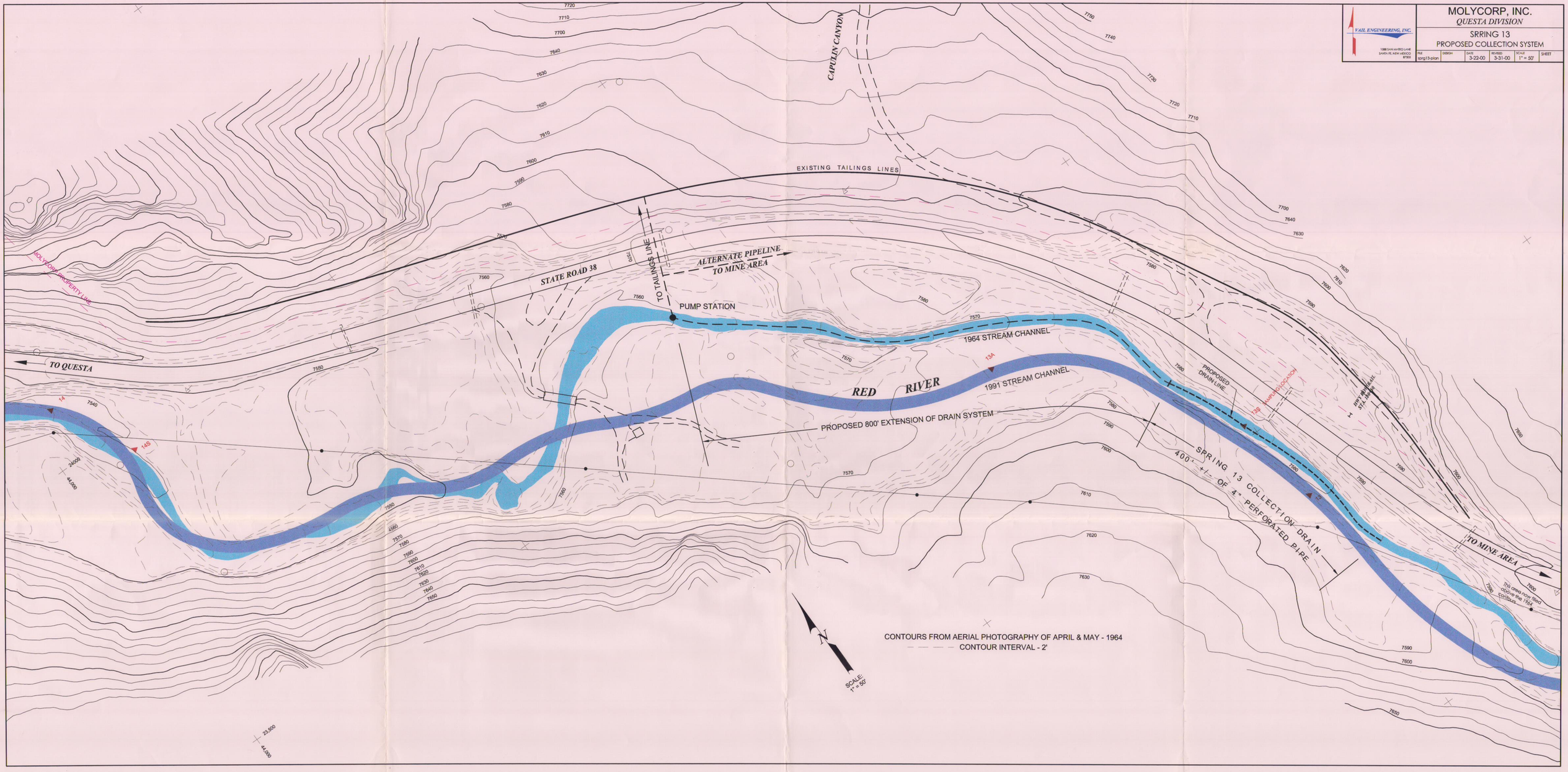
GROUND WATER CONE OF DEPRESSION CREATED BY DEWATERING OF THE UNDERGROUND MINE

TRC ENVIRONMENTAL SOLUTIONS, INC.


7590
7650
TAILINGS LINES
HWY ROW/RAIL
STA. 150+50
PROPOSED TEST
PIT LOCATIONS
7600
7590
SAMPLING LOCATION
13S
TO MINE AREA
7580
7590
7600
This area now filled
above the 1964
contours
1964 CHANNEL
7590
7580
1991 CHANNEL
13
PROPOSED TEST DRAIN
7580
7590
7600
7590
7600
7610
MOLYCORP, INC.
QUESTA DIVISION
SRRING 13
PROPOSED FIELD INVESTIGATIONS


OPEN PIT
OLD SUGAR SHACK
GOLDHILL GULCH
TRUCK SHOP
MILL AREA
MMW13
SUGAR SHACK WEST DEPOSIT
MIDDLE DEPOSIT
SUGAR SHACK SOUTH DEPOSIT
RED RIVER
MMW7
HEADQUARTERS
MINE SITE
SUBSTATION
POWER LINE SCAR
MMW8A
MMW8B
OLD MINE SITE
Portal
MMW11
MMW10 A,B,C
Tails Xing
PROPERTY BOUNDARY
COLUMBINE #1
COLUMBINE #2
CABIN SPRINGS
APPROXIMATE LOCATION
PROPOSED MILL
SUPPLY WELL
N


HEADQUARTERS
MMW8A/B
11C
4
7750
7800
7850
7900
7950
38
11B
PROPOSED
DRAIN LINE
SPRING 39 AREA
RED RIVER
THUNDER
BRIDGE
PROPERTY
BOUNDARY


VAIL ENGINEERING, INC.
1080 SAN MATEO LANE
SANTA FE, NEW MEXICO
87505
MOLYCORP, INC.
QUESTA DIVISION
SRRING 13
PROPOSED COLLECTION SYSTEM
FILE srring13-plan
DESIGN
DATE 3-22-00
REVISED 3-31-00
SCALE 1" = 50'
SHEET
CAPULIN CANYON
EXISTING TAILINGS LINES
STATE ROAD 38
TO TAILINGS LINE
ALTERNATE PIPELINE TO MINE AREA
PUMP STATION
1964 STREAM CHANNEL
1991 STREAM CHANNEL
RED RIVER
TO QUESTA
TO MINE AREA
PROPOSED DRAIN LINE
PROPOSED 800' EXTENSION OF DRAIN SYSTEM
SRRING 13 COLLECTION DRAIN
400' +/- OF 4" PERFORATED PIPE
MOLYCORP PROPERTY LINE
14
14S
13A
13S
SAMPLE LOCATION
This area now flood above the 1964 contours
CONTOURS FROM AERIAL PHOTOGRAPHY OF APRIL & MAY - 1964
CONTOUR INTERVAL - 2'
N
SCALE: 1" = 50'
24,000
44,000
23,500
44,000

VAIL ENGINEERING, INC.

PHONE: (505)
988-5575

1588 SAN MATEO LANE
SANTA FE, NEW MEXICO
87505

SPRING 13 & 39 PRELIMINARY DESIGN ANALYSIS:

Seepage containing high concentrations of acid rock drainage enters Red River at what is known as Spring 13, located several hundred feet upstream from the mouth of Capulin Canyon, and Spring 39 located about 500 feet downstream from Thunder Bridge at the west end of the Columbine Park area. This seepage results in increases in the metal and sulfate loadings in the river. During extreme low river flow periods, the seepage at Spring 13 adds considerably to the milky appearance of the waters downstream in the river to below the Ranger Station.

Ground Water Conditions

Spring 13 and Spring 39 are not isolated streams of water. These are seepage areas to the river of ground water flowing in a basin aquifer that extends at significant width and depth across the Red River Valley. This basin aquifer extends from below the Ranger Station to above the Town of Red River. The water table elevation in this aquifer is below the river elevation along extended reaches. At some locations the ground water table elevation is slightly above the river level and water seeps from the basin aquifer to the surface flow. Significant seepage areas are the river reaches through the Town of Red River and along the lower part of Columbine Park. Spring 39 is located in this latter reach. The ground water table in the vicinity of Spring 13 also is generally slightly above the river elevation which results in some seepage along this reach.

Above the mine area there are extensive areas of altered rock and numerous hydro-thermal scars. These areas and scars are predominantly along the north side of the river valley. These areas produce significant quantities of low pH acid rock drainage (ARD). Most of this drainage is to the basin aquifer below the river level. Most of the ARD appears to be concentrated in a plume flowing along the north side of the basin aquifer.

The Spring 13 area is located at the southwest base of Goat Hill. Goat Hill is composed of highly mineralized altered rock containing high concentration of pyrite. This results in the addition of ARD to the north side plume of the basin flow. This ARD increases the conductivity in the plume in the Spring 13 area to above 2000 μS/cm. Spring 13 includes a significant portion of this plume. Data from numerous river surveys indicate that the seepage from Capulin Canyon is minor and commensurate with the natural drainage that would be expected from the canyon area downstream of the Capulin capture system.

Seepage along the Spring 39 reach ranges up to 1700 μS/cm which is higher than that expected in the plume downstream of Thunder Bridge. If the high conductivities are the result of

accretions; the source has not been determined. There are no hydro-thermal scars, significant altered rock areas or waste piles in the near vicinity of Spring 39.

For the purpose of this report, Spring 13 is considered as the total of the ground water seepage flow along the north side of the river over a reach of about 400 feet in length. The seepage appears to be fairly well spread out over this reach with some localized areas of higher or lower seepage. These probably reflect variations in the elevations and gradients of both the surface and ground water flow and variations of hydraulic conductivity in the ground water aquifer along the river. Seepage is visible along the north river shore line and up the north bank in locations to an elevation of about one foot above the river level.

The quantity of seepage discharged to the river at Spring 13 is estimated based on the results of Molycorp's water quality surveys of Red River. Water samples are collected at least twice a year (from 1992 through 1999) from approximately 24 stations over the reach from above the Town of Red River to below the Ranger Station. Stream flow measurements at up to 16 Stations have been made coincidentally with the sampling. Water samples are collected at Station 13 (a few hundred feet above Spring 13) and at Station 13A (about 300 feet below Spring 13).

On March 14, 2000 the flow at Station 13 was measured at 17.63 CFS and the conductance was 374. The conductivity of the river water as 383 at Station 13A and the conductivity of Spring 13 discharge was 1888.

The flow of Spring 13 was calculated algebraically as follows:

(Flow Upstream x Conductance) + (Spring 13 Flow x Conductance) = (Downstream flow x Conductance)

(17.63 x 374) + (S13 CFS x 1888) = (17.63 +S13 CFS) x 383

Transposing:

(S13 CFS x 1888) = (17.63 x 383) - (17.63 x 374) + (S13 CFS x 383)

(S13 CFS x 1505) = 159

S13 = .1054 CFS = 47.3 GPM

Calculations using both conductance and SO_4 concentrations of other river surveys made during the past few years, indicated Spring 13 flows of similar magnitude.

PRIMARY DESIGN ALTERNATE

At this time the most favorable appearing seepage collection method appears to be the installation of a modified "French Drain" type system. Preliminary analysis indicates that a drain line installed at a depth of about two feet below the adjacent low water flow river level and about ten feet from the north shore line will be effective. The drain line would be perforated with small diameter holes drilled at spacing which will control the inflow to a rate of slightly more than the probable ground water seepage to the river. If the drain line inflow rate was not controlled there would be an excessive amount of inflow during high river flow periods.

Assuming that the Spring 13 seepage amounts to 50 gpm over a 400 foot reach; the average required inflow rate to the drain would be .125 gpm/feet. It appears desirable to maintain a minimum head above the orifice of 0.5 feet. Based on the standard orifice formula: Q cfs = C x Area sq. ft. x $(2\ gh)^{.5}$ and assuming an orifice coefficient of 0.61; 3/16 inch orifices at an average spacing of 2′ 3″ will be required. The river level during nominal high flow periods is approximately one foot above the level at low flow periods. At high flow periods the inflow rate would be approximately 1.5 times higher.

It is proposed to extend the Spring 13 drain line for about 800 feet farther west to collect the shallow seepage flow along the reach of the mouth of Capulin Canyon. It is believed that such seepage can be collected by installation of this section of the drain line along the old river channel. It is anticipated that an additional 50 gpm of seepage will be intercepted by this drain extension.

A similar drain line is proposed for the Spring 39 area. Additional exploratory work is required to determine the reach along the river where such a line would be beneficial. It presently appears that at least 400 feet of drain line will be required in this area.

In this area there is a large general discharge of the basin under flow to river surface flow. This precludes estimating the volume of high ARD seepage from the conductance gain along this river reach. Additional field investigations will therefore be required to determine the volume of the seepage flow that should be collected. It appears that the volume of high ARD seepage is somewhat less than at Spring 13. The collected water at Spring 39 will be pumped to either the tailing line or to the water supply line from Columbine Park to the mill.

ALTERNATE COLLECTION SYSTEM DESIGN

Interception of the seepage flow by several small shallow wells has also been considered. The number, spacing and distance from the river of the required wells is dependent on the hydrological properties of the aquifer. The principal advantage of the well system is that a nearly uniform ground water extraction rate would result. It is also probable that it would be necessary to extract a higher total amount of ground water to achieve the same effectiveness as the French Drain system.

ALTERNATIVES FOR DISPOSAL OF THE CAPTURED GROUND WATER INCLUDE:

(a) pumping the water to the tailings line

(b) installation of a new pipe line and pumpage of the collected water to the mine or mill area.

Tests must be made to determine if pumpage of the collected water to the tailings line will result in a pH in the tailings line that might be low enough to cause corrosion of the line or be in conflict with State regulations relative to discharges of such water to the tailing line or to

the tailings ponds. If low pH appears to be a problem it may be possible to neutralize the collected water with lime before pumpage to the tailings line.

At the Spring 13 area the pressure in the tailings line might vary from 50 psi or less to over 160 psi. A variable speed pump will therefore be required. The pump motor will be approximately 20 horse power.

ESSENTIAL FIELD INVESTIGATIONS

In order to make a final determination of the best and most effective alternative and the specific design details for such; a considerable amount of field investigation, and testing will be required. The proposed data collection work includes the following:

Proposed Ground Water Investigations

(a) Determine the elevations, direction of ground water flow and gradients in the vicinity of the Spring areas. It is probable that the water table elevation is at a fairly shallow depth in the area between the river and the steeply rising ground lying north of the highway. It is therefore proposed at each seepage area, to excavate with a back hoe, about 12 small pits to slightly below the water table. The water level in each pit will be accurately determined by instrument surveys. A vertical perforated pipe will be installed in pits during backfill operations so that the water levels can be monitored over a period of time. Tentative locations for most of the pits are shown on an attached drawing.

(b) Determine the hydrological characteristics of the shallow ground water aquifer. It is proposed to pump water from two or more of the shallow pits or from shallow wells in the vicinity. During the pumpage and water level recovery periods; the water levels at the pumped hole and in several nearly observation wells will be monitored to determine coefficients of hydraulic conductivity, aquifer storage coefficients and the extent and shape of the draw-down cone of depression. Water samples will also be collected and analyzed to determine variations in ARD concentrations.

(c) Determine the feasibility of a "french drain" type collection system and the detailed design factors related to such. It is proposed to excavate in the Spring 13 area, a trench to a depth of approximately 2 feet below the river level for a distance of about 100 feet parallel to and about 10 feet north of the river shoreline. (See attached drawing of proposed field investigations.)

Water inflow rates will be noted along the trench line. A four inch diameter plastic pipe will be laid along the trench bottom. The pipe will be perforated with the diameter and spacing of the perforations to be made as estimated for collection of an adequate and controlled amount of seepage flow into the line. Different hole diameters or spacing may be used along various sections of the trench length as indicated by possible variations in seepage rates into the trench or along the river shore line. The trench will then be back filled with clean gravel to a depth of about 18 inches over the pipe and with excavated soil to the natural ground line. The trench will be extended downstream about 100 feet on a fairly shallow grade to where it day lights out above

the surface so that the perforated collection line will be kept drained. The trench down stream of the perforated drain line will be backfilled to above the ground water level with clayey material.

Flow from the drain line will be measured over a period of time. Several observation wells at various distances out from each side of the drain line will be installed. The water levels in these will be monitored to observe changes of levels and gradients in the vicinity of the drain line. Seepage along the river in the vicinity of the drain line will be carefully noted prior to the excavation of the trench and monitored for some time thereafter. Prior to, during and following the drain trench installation, the conductivity of the river water upstream and downstream of the Spring 13 area will be measured frequently and a record of the river flow at the Ranger Station will be kept during this period. Final drain line location and design depth and size and spacing of perforations will be based on the results of the test drain line section.

PROJECT SCHEDULE

It is anticipated that a permit will be approved by the New Mexico Highway Department within the next few days so that the proposed field investigation can be conducted. Unless early snow melt flood flows occur, the field investigations can probably be completed by the end of April and final designs by the end of June. High river flows are expected from May through August or September. Construction can commence thereafter and should be completed by the end of November and before the usual period of milky river water and elevated ARD concentrations of the winter months.

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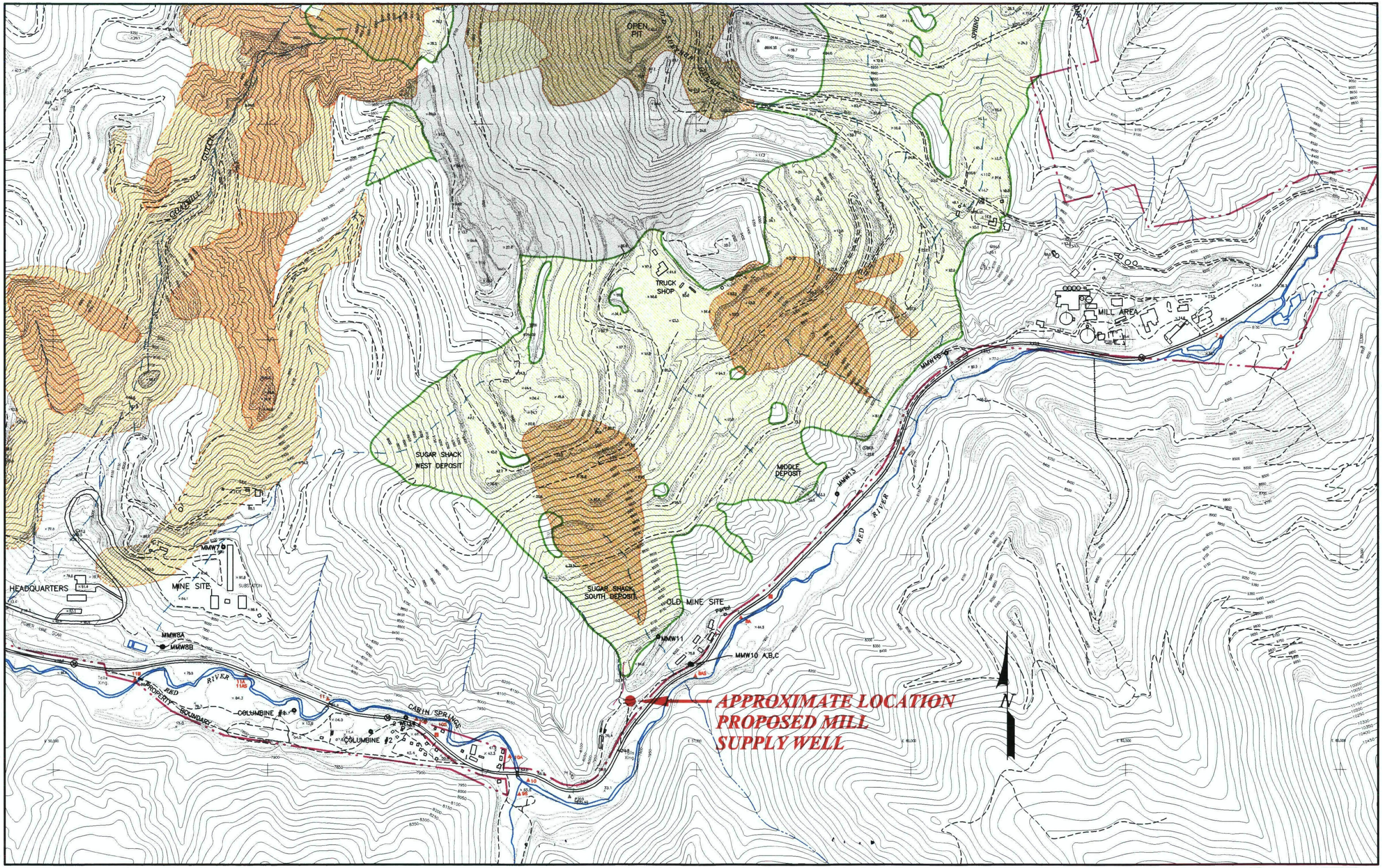
Molycorp is planning on developing a new well to augment the water supply for milling of ore and transportation of tailings. The well will be located at the west end of the area of waste rock piles which extend along the north side of the river basin between the mill area and Columbine Park. The well will be developed near the north edge of the valley underground water basin. It is anticipated that the well will intercept a substantial volume of the flow in the high ARD plume that flows from above the mine area down along the north side of the basin aquifer. This should substantially reduce the amount of ARD that is discharged from the underground basin into the river surface flow in the Columbine Park area. It is also anticipated that the well will result in a reduction in the ARD concentrations of the seepage farther downstream.

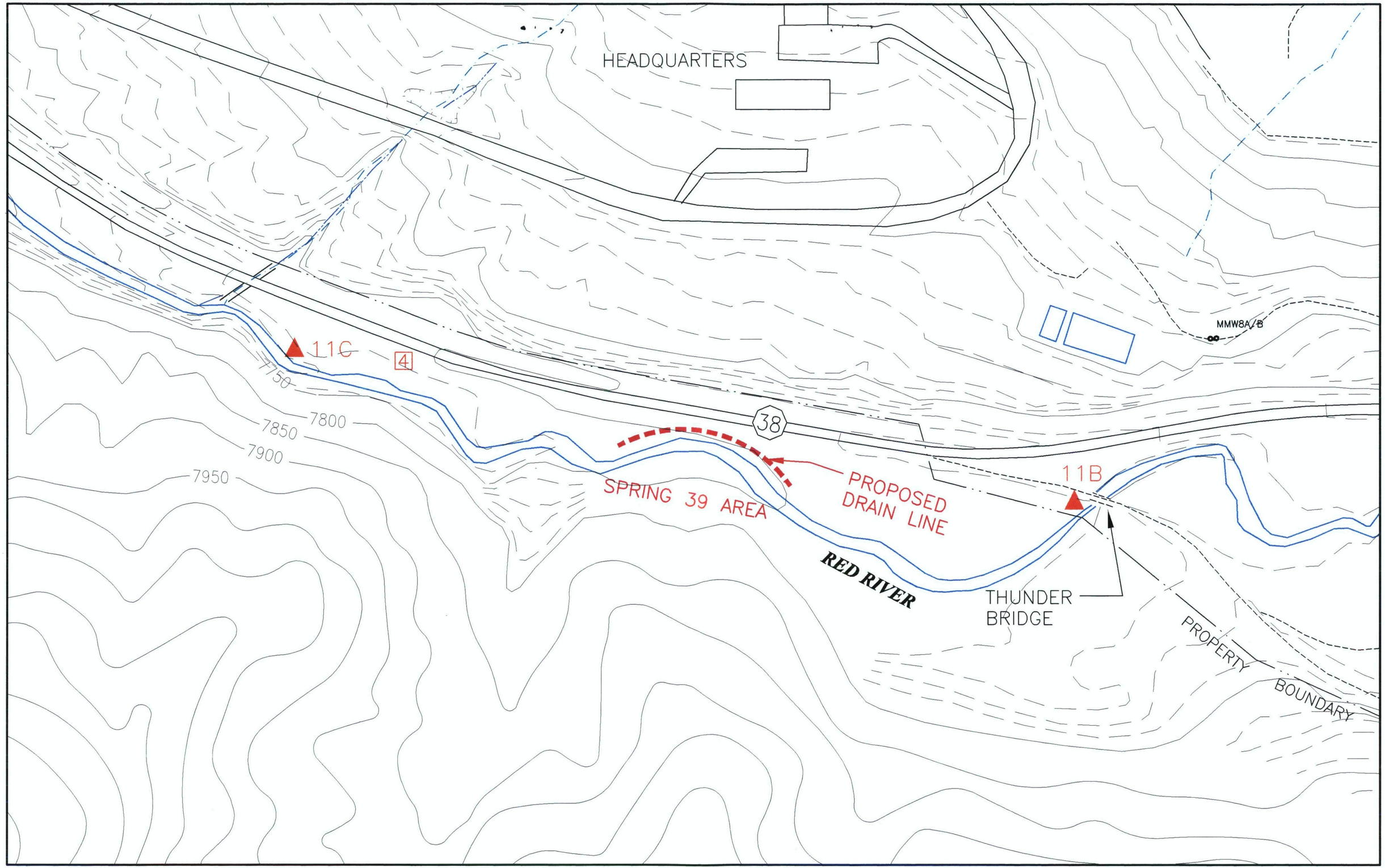
A permit from the State Engineer will be required to divert the ground waters by either well pumpage or a drain collection system and for discharge to either the river or the tailings line.

Respectfully Submitted:
VAIL ENGINEERING, INC.

Ralph E. Vail

Chief Engineer
NM PE & LS 2098


OPEN PIT
TRUCK SHOP
MILL AREA
SUGAR SHACK WEST DEPOSIT
MIDDLE DEPOSIT
SUGAR SHACK SOUTH DEPOSIT
OLD MINE SITE
HEADQUARTERS
MINE SITE
SUBSTATION
MMW7
MMW8A
MMW8B
MMW11
MMW10 A,B,C
MMW13
RED RIVER
PROPERTY BOUNDARY
COLUMBINE #1
COLUMBINE #2
CABIN SPRINGS
APPROXIMATE LOCATION
PROPOSED MILL
SUPPLY WELL
N


HEADQUARTERS
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4
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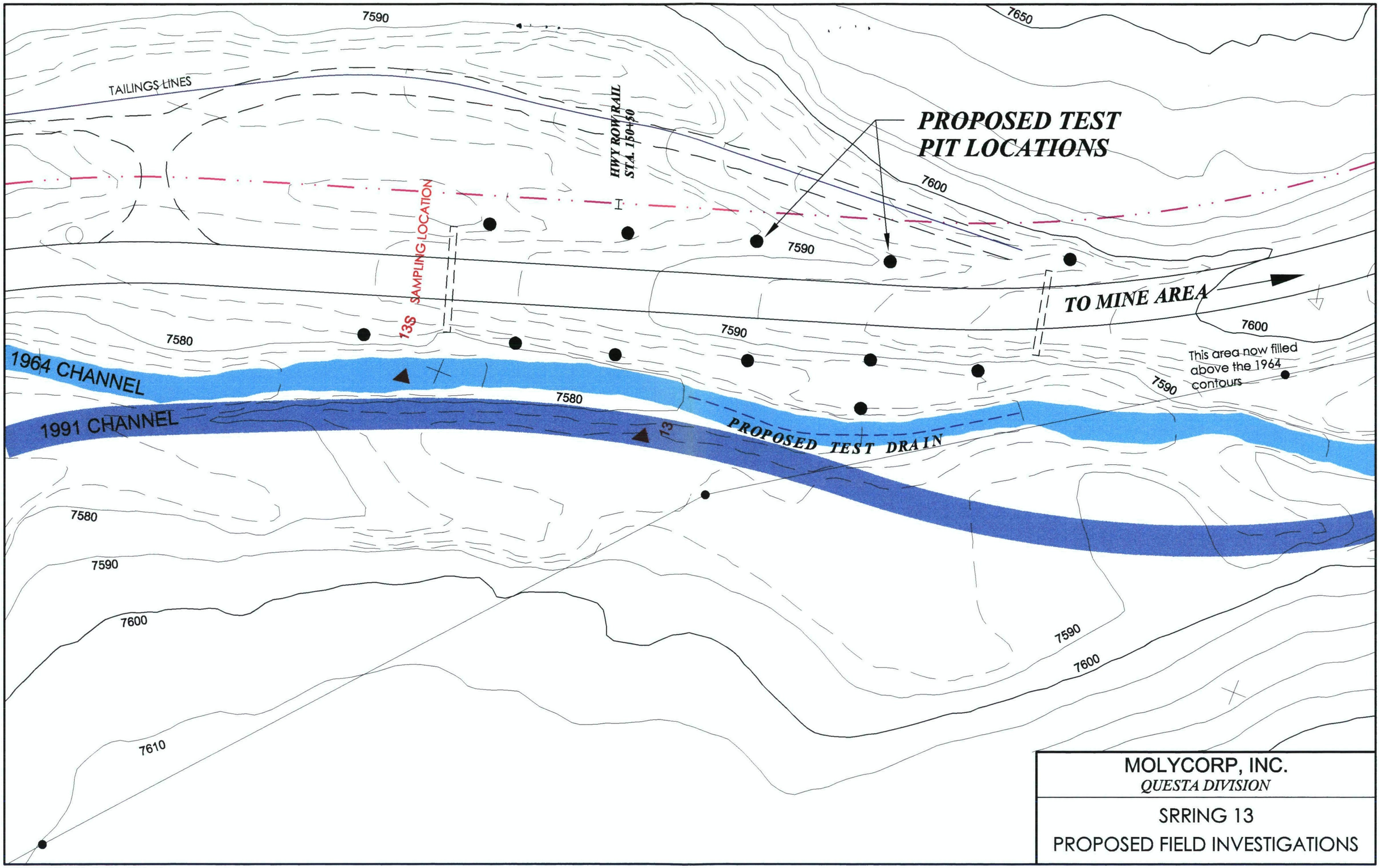
SPRING 39 AREA
PROPOSED
DRAIN LINE
11B
RED RIVER
THUNDER
BRIDGE
PROPERTY
BOUNDARY


7590
7650
TAILINGS LINES
HWY ROW/RAIL
STA. 150+50
PROPOSED TEST
PIT LOCATIONS
7600
7590
SAMPLING LOCATION
13S
TO MINE AREA
7580
7590
7600
This area now filled
above the 1964
contours
7590
1964 CHANNEL
7580
1991 CHANNEL
13
PROPOSED TEST DRAIN
7580
7590
7600
7590
7600
7610
MOLYCORP, INC.
QUESTA DIVISION
SRRING 13
PROPOSED FIELD INVESTIGATIONS

VAIL ENGINEERING, INC.

PHONE: (505)
988-5575

1588 SAN MATEO LANE
SANTA FE, NEW MEXICO
87505

SPRING 13 & 39 PRELIMINARY DESIGN ANALYSIS:

Seepage containing high concentrations of acid rock drainage enters Red River at what is known as Spring 13, located several hundred feet upstream from the mouth of Capulin Canyon, and Spring 39 located about 500 feet downstream from Thunder Bridge at the west end of the Columbine Park area. This seepage results in increases in the metal and sulfate loadings in the river. During extreme low river flow periods, the seepage at Spring 13 adds considerably to the milky appearance of the waters downstream in the river to below the Ranger Station.

Ground Water Conditions

Spring 13 and Spring 39 are not isolated streams of water. These are seepage areas to the river of ground water flowing in a basin aquifer that extends at significant width and depth across the Red River Valley. This basin aquifer extends from below the Ranger Station to above the Town of Red River. The water table elevation in this aquifer is below the river elevation along extended reaches. At some locations the ground water table elevation is slightly above the river level and water seeps from the basin aquifer to the surface flow. Significant seepage areas are the river reaches through the Town of Red River and along the lower part of Columbine Park. Spring 39 is located in this latter reach. The ground water table in the vicinity of Spring 13 also is generally slightly above the river elevation which results in some seepage along this reach.

Above the mine area there are extensive areas of altered rock and numerous hydro-thermal scars. These areas and scars are predominantly along the north side of the river valley. These areas produce significant quantities of low pH acid rock drainage (ARD). Most of this drainage is to the basin aquifer below the river level. Most of the ARD appears to be concentrated in a plume flowing along the north side of the basin aquifer.

The Spring 13 area is located at the southwest base of Goat Hill. Goat Hill is composed of highly mineralized altered rock containing high concentration of pyrite. This results in the addition of ARD to the north side plume of the basin flow. This ARD increases the conductivity in the plume in the Spring 13 area to above 2000 μS/cm. Spring 13 includes a significant portion of this plume. Data from numerous river surveys indicate that the seepage from Capulin Canyon is minor and commensurate with the natural drainage that would be expected from the canyon area downstream of the Capulin capture system.

Seepage along the Spring 39 reach ranges up to 1700 μS/cm which is higher than that expected in the plume downstream of Thunder Bridge. If the high conductivities are the result of

accretions; the source has not been determined. There are no hydro-thermal scars, significant altered rock areas or waste piles in the near vicinity of Spring 39.

For the purpose of this report, Spring 13 is considered as the total of the ground water seepage flow along the north side of the river over a reach of about 400 feet in length. The seepage appears to be fairly well spread out over this reach with some localized areas of higher or lower seepage. These probably reflect variations in the elevations and gradients of both the surface and ground water flow and variations of hydraulic conductivity in the ground water aquifer along the river. Seepage is visible along the north river shore line and up the north bank in locations to an elevation of about one foot above the river level.

The quantity of seepage discharged to the river at Spring 13 is estimated based on the results of Molycorp's water quality surveys of Red River. Water samples are collected at least twice a year (from 1992 through 1999) from approximately 24 stations over the reach from above the Town of Red River to below the Ranger Station. Stream flow measurements at up to 16 Stations have been made coincidentally with the sampling. Water samples are collected at Station 13 (a few hundred feet above Spring 13) and at Station 13A (about 300 feet below Spring 13).

On March 14, 2000 the flow at Station 13 was measured at 17.63 CFS and the conductance was 374. The conductivity of the river water as 383 at Station 13A and the conductivity of Spring 13 discharge was 1888.

The flow of Spring 13 was calculated algebraically as follows:

(Flow Upstream x Conductance) + (Spring 13 Flow x Conductance) = (Downstream flow x Conductance)

(17.63 x 374) + (S13 CFS x 1888) = (17.63 +S13 CFS) x 383

Transposing:

(S13 CFS x 1888) = (17.63 x 383) - (17.63 x 374) + (S13 CFS x 383)

(S13 CFS x 1505) = 159

S13 = .1054 CFS = 47.3 GPM

Calculations using both conductance and SO_4 concentrations of other river surveys made during the past few years, indicated Spring 13 flows of similar magnitude.

PRIMARY DESIGN ALTERNATE

At this time the most favorable appearing seepage collection method appears to be the installation of a modified "French Drain" type system. Preliminary analysis indicates that a drain line installed at a depth of about two feet below the adjacent low water flow river level and about ten feet from the north shore line will be effective. The drain line would be perforated with small diameter holes drilled at spacing which will control the inflow to a rate of slightly more than the probable ground water seepage to the river. If the drain line inflow rate was not controlled there would be an excessive amount of inflow during high river flow periods.

Assuming that the Spring 13 seepage amounts to 50 gpm over a 400 foot reach; the average required inflow rate to the drain would be .125 gpm/feet. It appears desirable to maintain a minimum head above the orifice of 0.5 feet. Based on the standard orifice formula: Q cfs = C x Area sq. ft. x $(2\ gh)^{.5}$ and assuming an orifice coefficient of 0.61; 3/16 inch orifices at an average spacing of 2′ 3″ will be required. The river level during nominal high flow periods is approximately one foot above the level at low flow periods. At high flow periods the inflow rate would be approximately 1.5 times higher.

It is proposed to extend the Spring 13 drain line for about 800 feet farther west to collect the shallow seepage flow along the reach of the mouth of Capulin Canyon. It is believed that such seepage can be collected by installation of this section of the drain line along the old river channel. It is anticipated that an additional 50 gpm of seepage will be intercepted by this drain extension.

A similar drain line is proposed for the Spring 39 area. Additional exploratory work is required to determine the reach along the river where such a line would be beneficial. It presently appears that at least 400 feet of drain line will be required in this area.

In this area there is a large general discharge of the basin under flow to river surface flow. This precludes estimating the volume of high ARD seepage from the conductance gain along this river reach. Additional field investigations will therefore be required to determine the volume of the seepage flow that should be collected. It appears that the volume of high ARD seepage is somewhat less than at Spring 13. The collected water at Spring 39 will be pumped to either the tailing line or to the water supply line from Columbine Park to the mill.

ALTERNATE COLLECTION SYSTEM DESIGN

Interception of the seepage flow by several small shallow wells has also been considered. The number, spacing and distance from the river of the required wells is dependent on the hydrological properties of the aquifer. The principal advantage of the well system is that a nearly uniform ground water extraction rate would result. It is also probable that it would be necessary to extract a higher total amount of ground water to achieve the same effectiveness as the French Drain system.

ALTERNATIVES FOR DISPOSAL OF THE CAPTURED GROUND WATER INCLUDE:

(a) pumping the water to the tailings line

(b) installation of a new pipe line and pumpage of the collected water to the mine or mill area.

Tests must be made to determine if pumpage of the collected water to the tailings line will result in a pH in the tailings line that might be low enough to cause corrosion of the line or be in conflict with State regulations relative to discharges of such water to the tailing line or to

the tailings ponds. If low pH appears to be a problem it may be possible to neutralize the collected water with lime before pumpage to the tailings line.

At the Spring 13 area the pressure in the tailings line might vary from 50 psi or less to over 160 psi. A variable speed pump will therefore be required. The pump motor will be approximately 20 horse power.

ESSENTIAL FIELD INVESTIGATIONS

In order to make a final determination of the best and most effective alternative and the specific design details for such; a considerable amount of field investigation, and testing will be required. The proposed data collection work includes the following:

Proposed Ground Water Investigations

(a) Determine the elevations, direction of ground water flow and gradients in the vicinity of the Spring areas. It is probable that the water table elevation is at a fairly shallow depth in the area between the river and the steeply rising ground lying north of the highway. It is therefore proposed at each seepage area, to excavate with a back hoe, about 12 small pits to slightly below the water table. The water level in each pit will be accurately determined by instrument surveys. A vertical perforated pipe will be installed in pits during backfill operations so that the water levels can be monitored over a period of time. Tentative locations for most of the pits are shown on an attached drawing.

(b) Determine the hydrological characteristics of the shallow ground water aquifer. It is proposed to pump water from two or more of the shallow pits or from shallow wells in the vicinity. During the pumpage and water level recovery periods; the water levels at the pumped hole and in several nearly observation wells will be monitored to determine coefficients of hydraulic conductivity, aquifer storage coefficients and the extent and shape of the draw-down cone of depression. Water samples will also be collected and analyzed to determine variations in ARD concentrations.

(c) Determine the feasibility of a "french drain" type collection system and the detailed design factors related to such. It is proposed to excavate in the Spring 13 area, a trench to a depth of approximately 2 feet below the river level for a distance of about 100 feet parallel to and about 10 feet north of the river shoreline. (See attached drawing of proposed field investigations.)

Water inflow rates will be noted along the trench line. A four inch diameter plastic pipe will be laid along the trench bottom. The pipe will be perforated with the diameter and spacing of the perforations to be made as estimated for collection of an adequate and controlled amount of seepage flow into the line. Different hole diameters or spacing may be used along various sections of the trench length as indicated by possible variations in seepage rates into the trench or along the river shore line. The trench will then be back filled with clean gravel to a depth of about 18 inches over the pipe and with excavated soil to the natural ground line. The trench will be extended downstream about 100 feet on a fairly shallow grade to where it day lights out above

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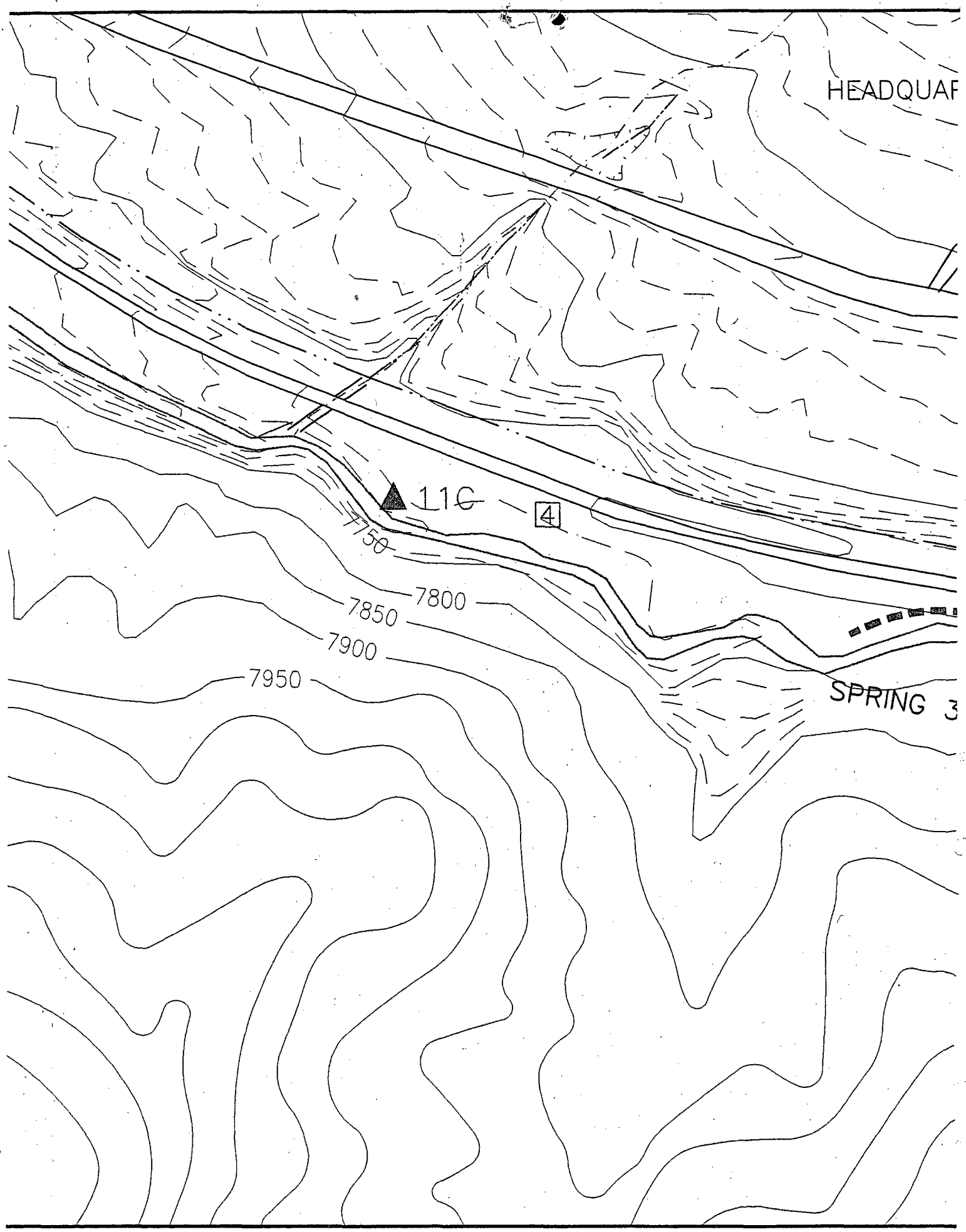
Chief Engineer
NM PE & LS 2098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7800
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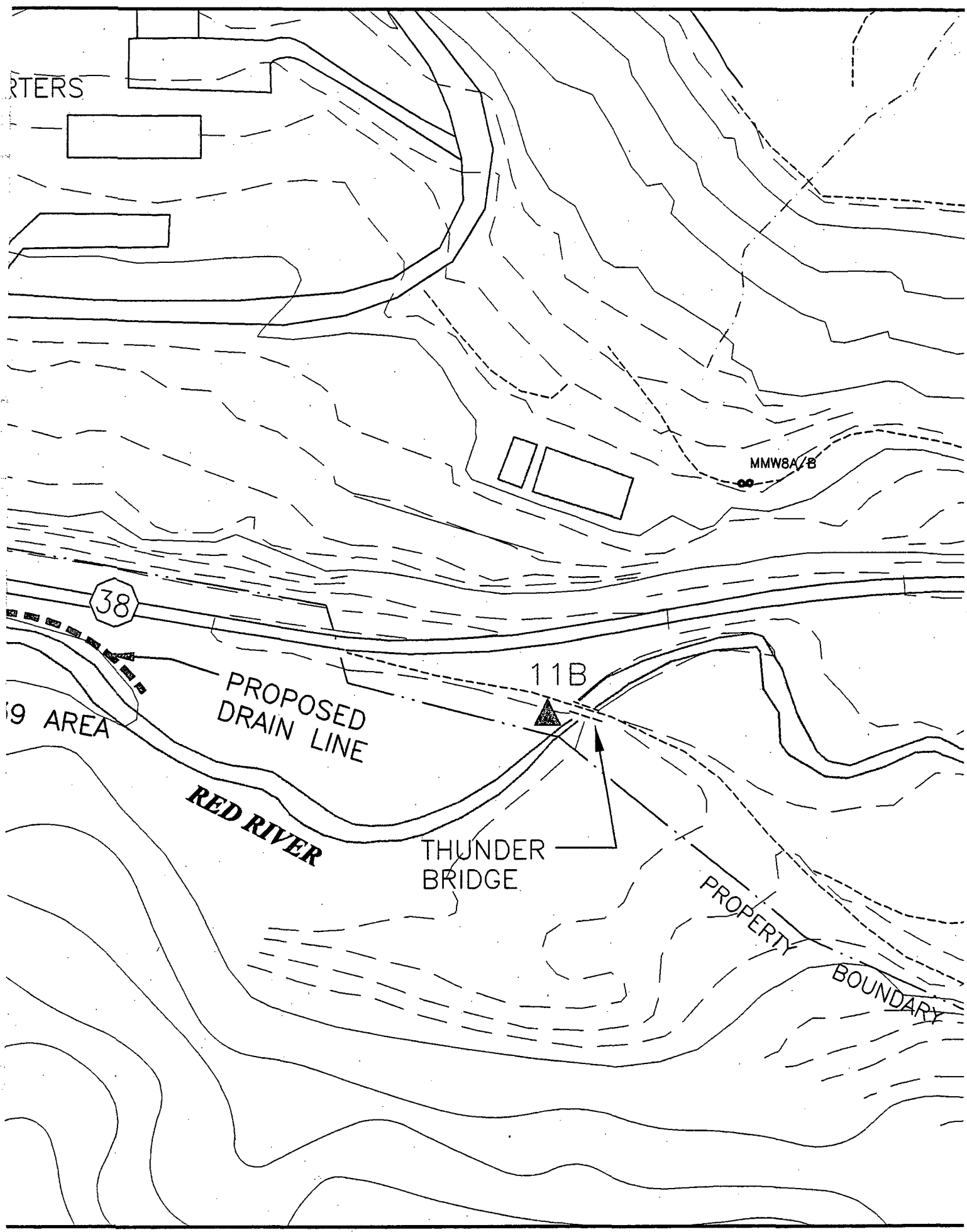
SPRING 3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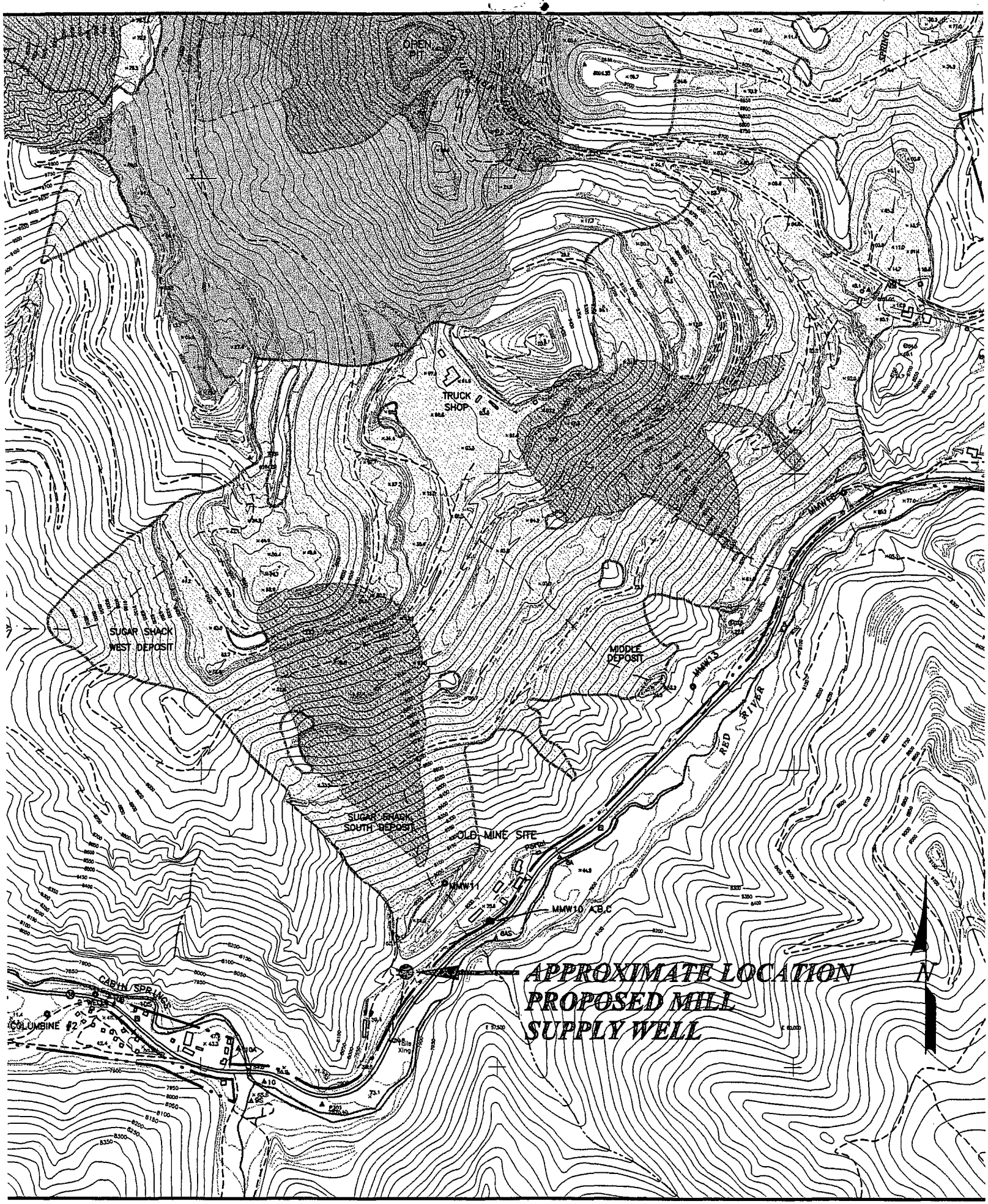
MMW8A/B
38
PROPOSED
DRAIN LINE
11B
9 AREA
RED RIVER
THUNDER
BRIDGE
PROPERTY
BOUNDARY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TRUCK SHOP
SUGAR SHACK WEST DEPOST
MIDDLE DEPOSIT
MMW13
RED RIVER
SUGAR SHACK SOUTH DEPOST
OLD MINE SITE
MMW11
MMW10 A,B,C
APPROXIMATE LOCATION
PROPOSED MILL
SUPPLY WELL
N
CABIN SPRING
COLUMBINE #2
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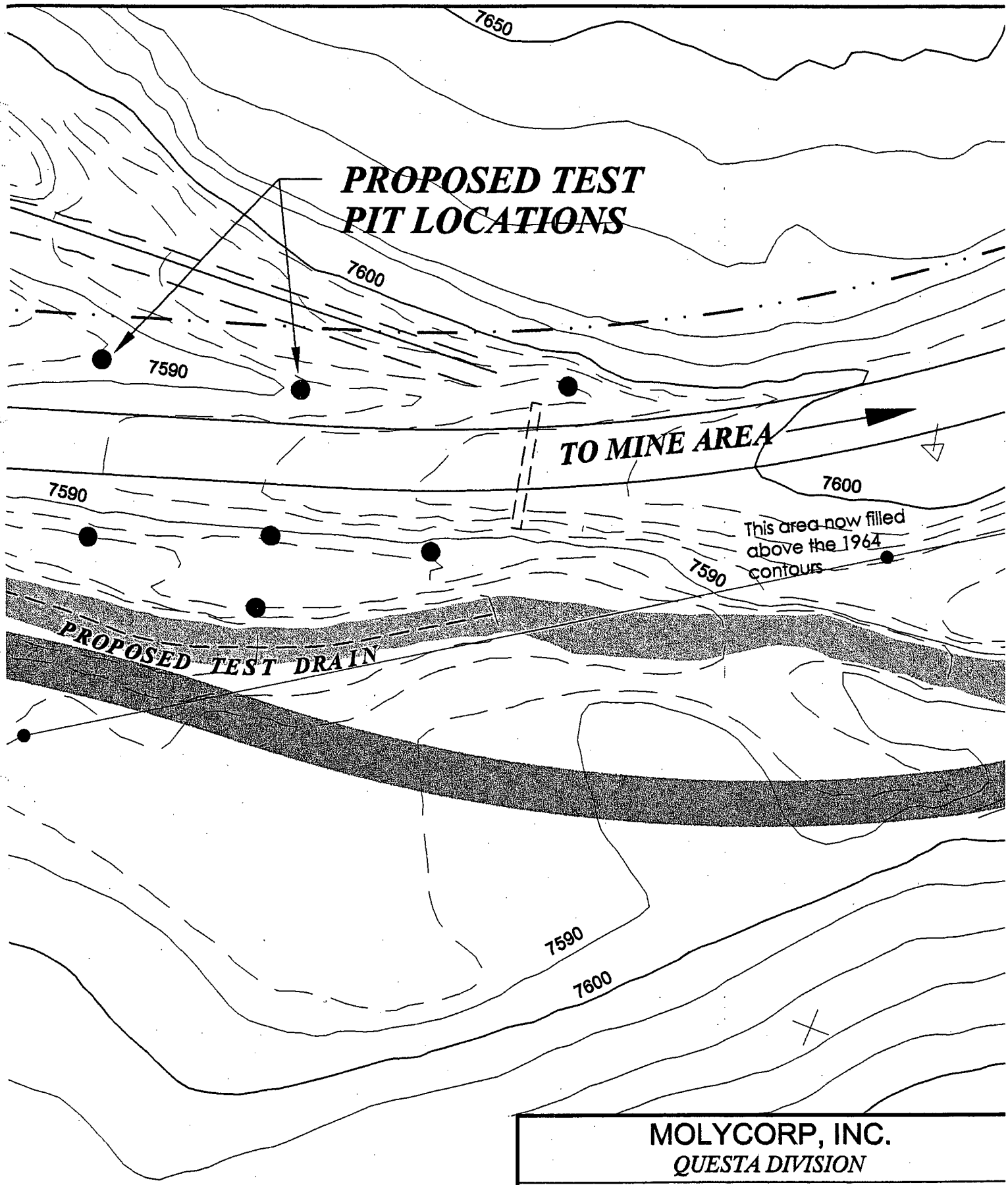
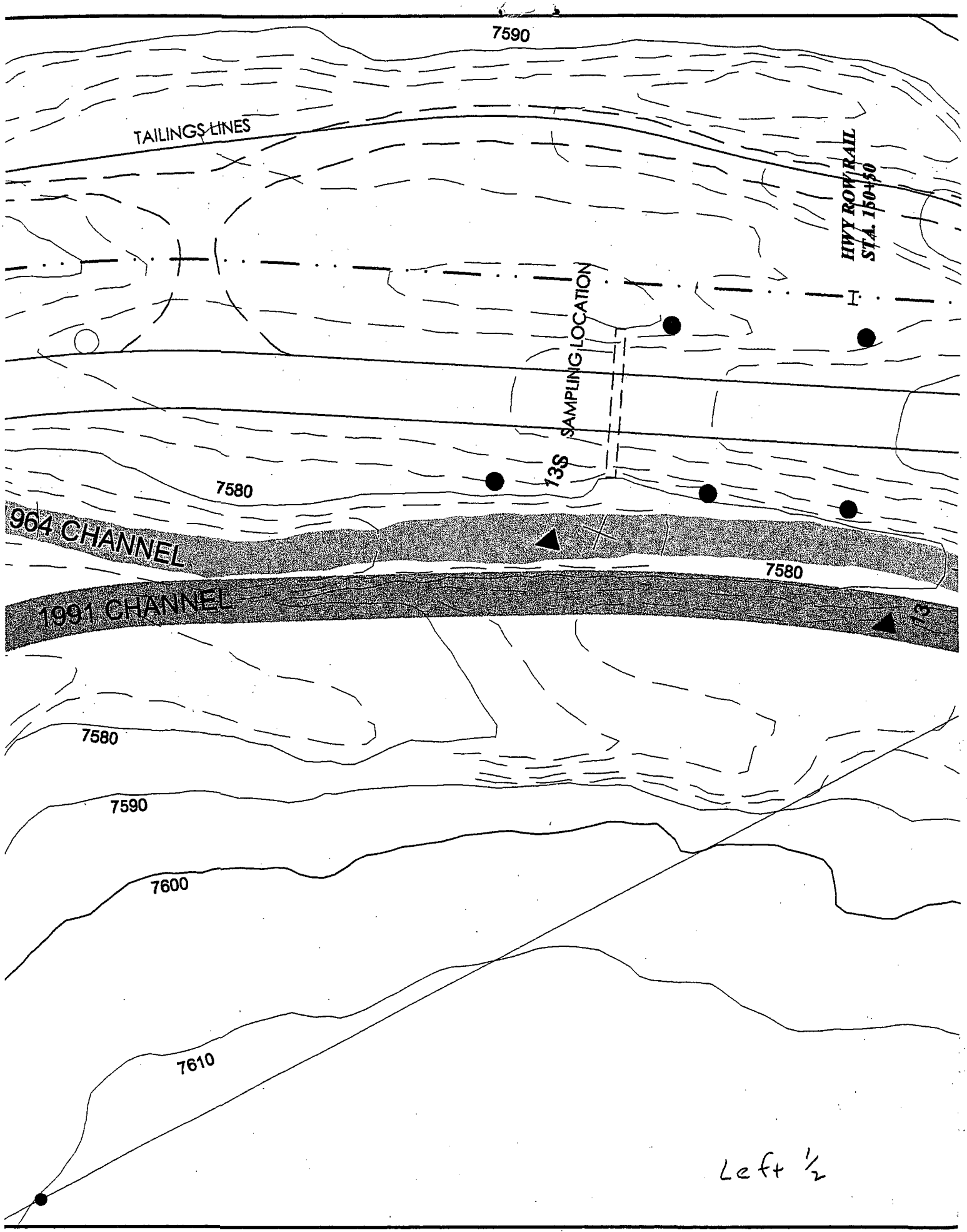


MOLYCORP, INC.
QUESTA DIVISION

SRRING 13

PROPOSED FIELD INVESTIGATIONS

Right ½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HWY ROW/RAIL
STA. 150+50
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964 CHANNEL
7580
1991 CHANNEL
13
7580
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7600
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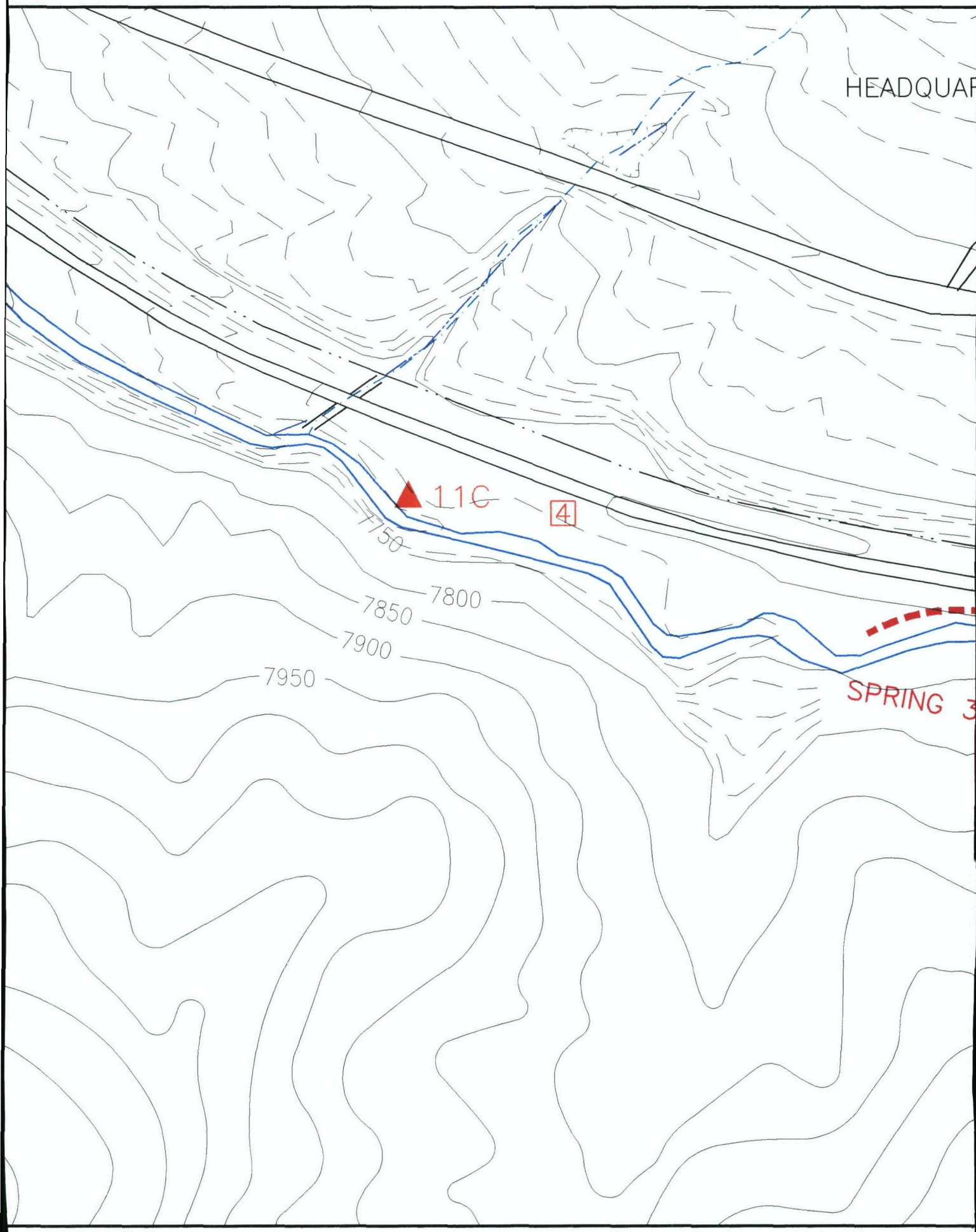
Left ½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7900
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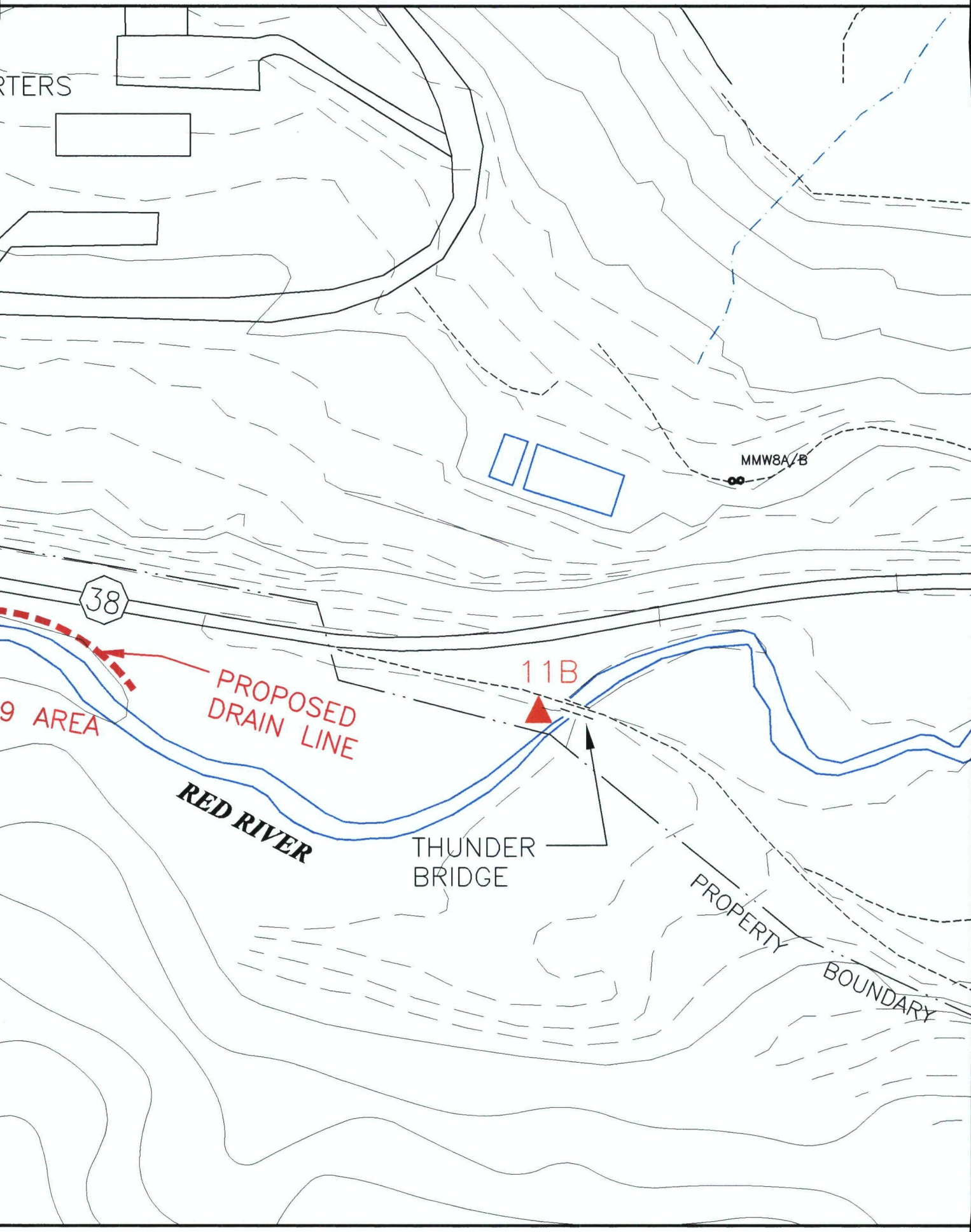
SPRING 3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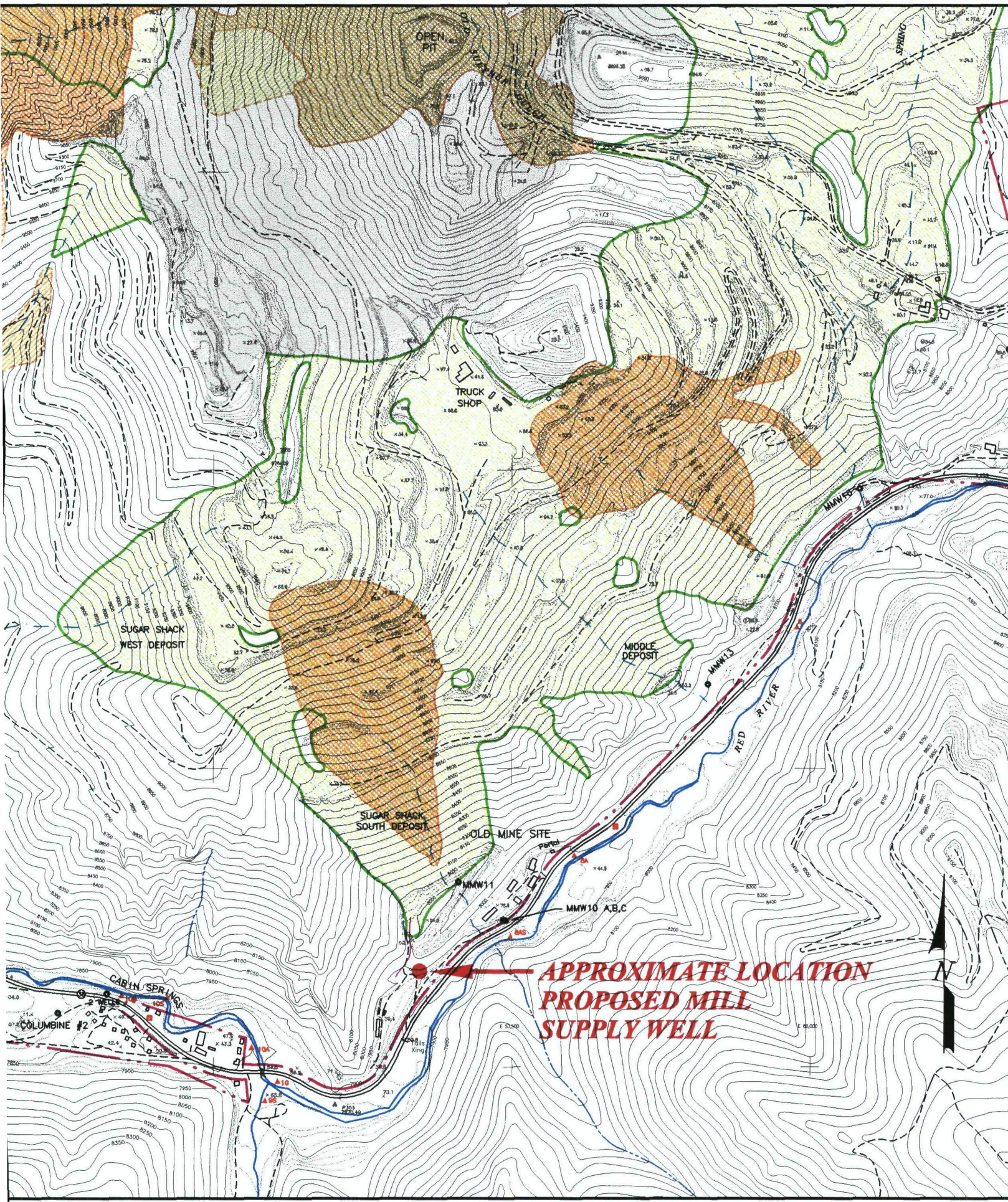
38
PROPOSED
DRAIN LINE
9 AREA
11B
RED RIVER
THUNDER
BRIDGE
PROPERTY
BOUNDARY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TRUCK SHOP
SUGAR SHACK WEST DEPOSIT
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SUGAR SHACK SOUTH DEPOSIT
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MMW11
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CABIN SPRINGS
COLUMBINE #2
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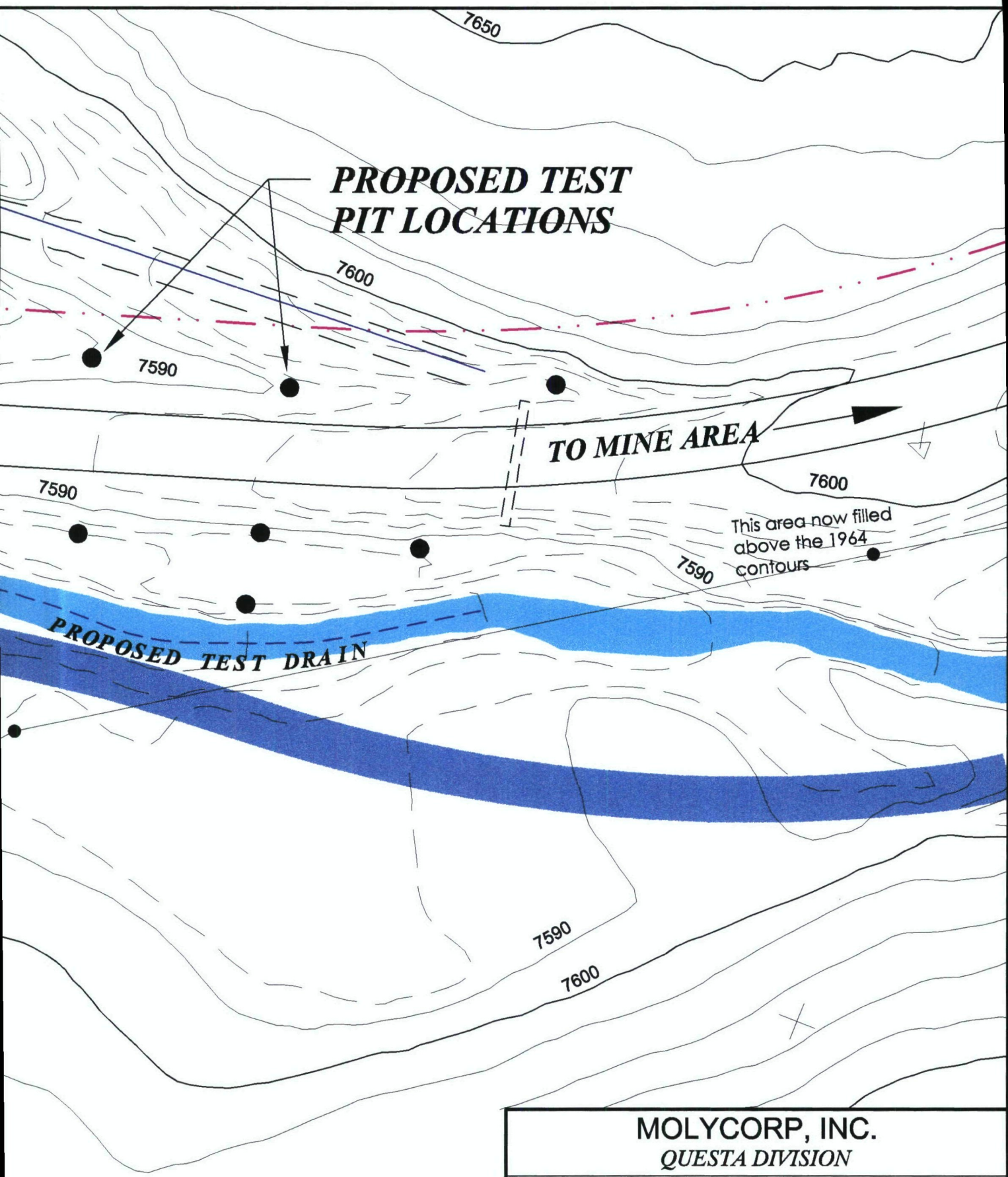
N

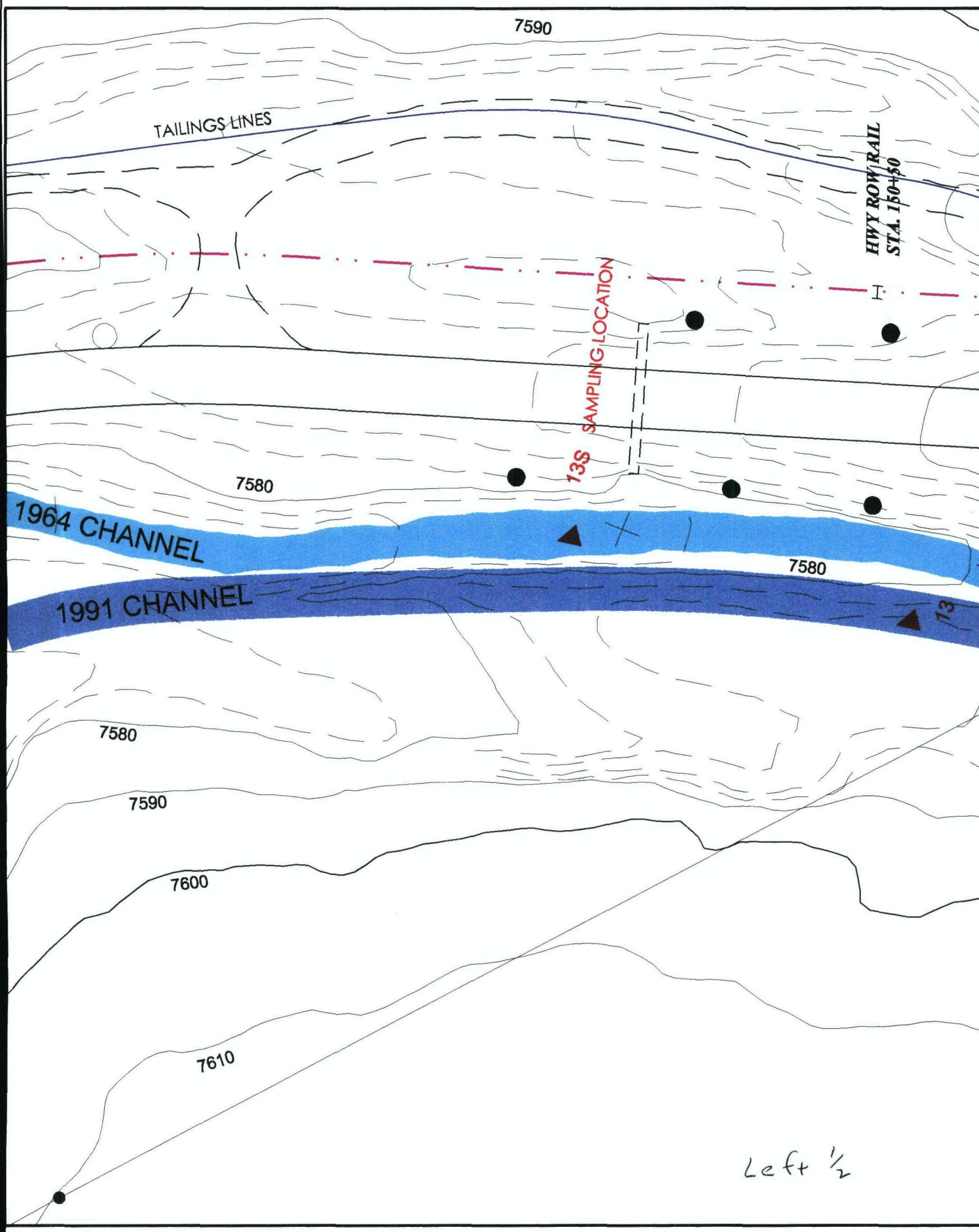


MOLYCORP, INC.
QUESTA DIVISION

SRRING 13

PROPOSED FIELD INVESTIGATIONS

Right ½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TAILINGS LINES
HWY ROW/RAIL
STA. 150+50
SAMPLING LOCATION
13S
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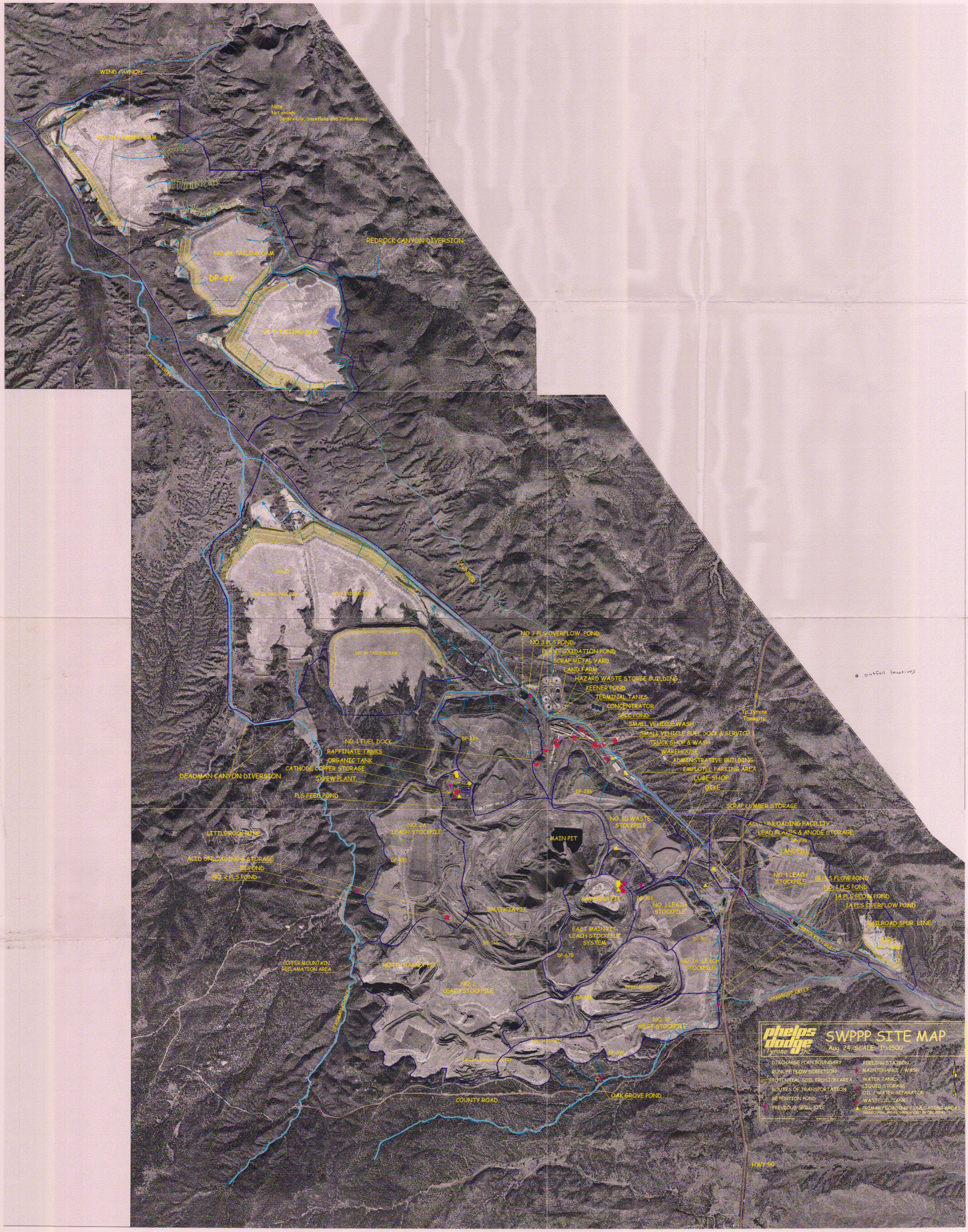
Left ½


WIND CANYON
Note:
Not shown:
Jersey Lily, Snowflake and Virtue Mines
NO. 3X TAILING DAM
REDROCK CANYON DIVERSION
NO. 3X TAILING DAM
DP-27
NO. 2 TAILING DAM
HANSEN CREEK
DP-27
NO. 3X TAILING DAM
NO. 1 TAILING DAM
LAUNDER
NO. 1A TAILING DAM
NO 3 PLS OVERFLOW POND
NO 3 PLS POND
PLANT OXIDATION POND
SCRAP METAL YARD
LAND FARM
HAZARD WASTE STORGE BUILDING
KEENER POND
TERMINAL TANKS
CONCENTRATOR
SPCC POND
SMALL VEHICLE WASH
SMALL VEHICLE FUEL DOCK & SERVICE
TRUCK SHOP & WASH
WAREHOUSE
ADMINSTRATIVE BUILDING
EMPLOYEE PARKING AREA
LUBE SHOP
DIKE
To Tyrone Townsite
outfall locations
NO. 1 FUEL DOCK
RAFFINATE TANKS
ORGANIC TANK
CATHODE COPPER STORAGE
SX/EW PLANT
PLS FEED POND
DEADMAN CANYON DIVERSION
DP-286
DP-286
SCRAP LUMBER STORAGE
NO. 1D WASTE STOCKPILE
ACID UNLOADING FACILITY
LEAD FLAKES & ANODE STORAGE
DP-896
LANDFILL
NO. 2A LEACH STOCKPILE
MAIN PIT
LITTLE ROCK MINE
ACID UNLOADING & STORAGE
PE POND
NO. 2 PLS POND
DP-335
NO. 1 LEACH STOCKPILE
1B PLS FLOW POND
NO. 1 PLS POND
1A PLS FLOW POND
1A PLS OVERFLOW POND
SAVANNA PIT
DP-383
NO. 1 LEACH STOCKPILE
VALENCIA PIT
RAILROAD SPUR LINE
BRICK KILN GULCH
EAST MAIN PIT LEACH STOCKPILE SYSTEM
DP-166
DP-670
DP-302
NO. 1A LEACH STOCKPILE
COPPER MOUNTAIN RECLAMATION AREA
NORTH RACKET PIT
NO. 2 LEACH STOCKPILE
SETTLING PIT
DP-495
OAKGROVE CREEK
NO. 1C WEST STOCKPILE
DEADMAN CANYON
DP-396
OAK GROVE POND
COUNTY ROAD
HWY 90
phelps dodge Tyrone Inc.
SWPPP SITE MAP
Aug. 24 SCALE: 1"=1500
DISCHARGE PLAN BOUNDARY
RUNOFF FLOW DIRECTION
POTENTIAL SOIL EROSION AREA
ROUTES OF TRANSPORTATION
RETENTION POND
PREVIOUS SPILL SITE
FUELING STATION
MAINTENANCE / WASH
WATER TANKS
LIQUID STORAGE
OIL / WATER SEPARATOR
WASTE OIL TANK
PRIMARY LOADING / UNLOADING AREAS

04

VAIL ENGINEERING, INC.

PHONE: (505)
988-5575

1588 SAN MATEO LANE
SANTA FE, NEW MEXICO
87505

April 7, 2000

Mr. Scott Wilson
NPDES Permit Branch (6WQ-P)
US Environmental Protection Agency
Region 6
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Re: Molycorp, Questa New Mexico - Spring 13

Dear Sir,

At the request of Mr. David Shoemaker, we are submitting herewith the Preliminary Design Analysis and related Drawings relative to the proposed interception of acid rock drainage at Spring 13 and Spring 39.

Both areas are on US Forest Service land and the Spring 13 area is also on the right-of-way of State Highway 38. We regret to advise that at a meeting with the Forest Service District Ranger on April 6, we were advised that regulatory requirements for public notice, clearances from other Federal and State agencies etc. must be met and that at the earliest it probably will be September of this year before a permit for even the field investigations can be approved, and that a much longer time period may be required. The State Highway Department has advised that it cannot issue a permit until the clearance from the Forest Service is received.

Molycorp wishes to advise you that it will do everything possible to expedite the approval of these permits, and that it will proceed with tentative final designs and make every effort to complete the installation of the proposed facilities this fall, before the low river flow period, which generally commences in November.

Respectfully Submitted
Vail Engineering, Inc.

Ralph E. Vail

Chief Engineer

cc: Mr. David Shoemaker
Mr. Geyza Lorinczi

VAIL ENGINEERING, INC.

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988-5575

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SANTA FE, NEW MEXICO
87505

SPRING 13 & 39 PRELIMINARY DESIGN ANALYSIS:

Seepage containing high concentrations of acid rock drainage enters Red River at what is known as Spring 13, located several hundred feet upstream from the mouth of Capulin Canyon, and Spring 39 located about 500 feet downstream from Thunder Bridge at the west end of the Columbine Park area. This seepage results in increases in the metal and sulfate loadings in the river. During extreme low river flow periods, the seepage at Spring 13 adds considerably to the milky appearance of the waters downstream in the river to below the Ranger Station.

Ground Water Conditions

Spring 13 and Spring 39 are not isolated streams of water. These are seepage areas to the river of ground water flowing in a basin aquifer that extends at significant width and depth across the Red River Valley. This basin aquifer extends from below the Ranger Station to above the Town of Red River. The water table elevation in this aquifer is below the river elevation along extended reaches. At some locations the ground water table elevation is slightly above the river level and water seeps from the basin aquifer to the surface flow. Significant seepage areas are the river reaches through the Town of Red River and along the lower part of Columbine Park. Spring 39 is located in this latter reach. The ground water table in the vicinity of Spring 13 also is generally slightly above the river elevation which results in some seepage along this reach.

Above the mine area there are extensive areas of altered rock and numerous hydro-thermal scars. These areas and scars are predominantly along the north side of the river valley. These areas produce significant quantities of low pH acid rock drainage (ARD). Most of this drainage is to the basin aquifer below the river level. Most of the ARD appears to be concentrated in a plume flowing along the north side of the basin aquifer.

The Spring 13 area is located at the southwest base of Goat Hill. Goat Hill is composed of highly mineralized altered rock containing high concentration of pyrite. This results in the addition of ARD to the north side plume of the basin flow. This ARD increases the conductivity in the plume in the Spring 13 area to above 2000 μS/cm. Spring 13 includes a significant portion of this plume. Data from numerous river surveys indicate that the seepage from Capulin Canyon is minor and commensurate with the natural drainage that would be expected from the canyon area downstream of the Capulin capture system.

Seepage along the Spring 39 reach ranges up to 1700 μS/cm which is higher than that expected in the plume downstream of Thunder Bridge. If the high conductivities are the result of

accretions; the source has not been determined. There are no hydro-thermal scars, significant altered rock areas or waste piles in the near vicinity of Spring 39.

For the purpose of this report, Spring 13 is considered as the total of the ground water seepage flow along the north side of the river over a reach of about 400 feet in length. The seepage appears to be fairly well spread out over this reach with some localized areas of higher or lower seepage. These probably reflect variations in the elevations and gradients of both the surface and ground water flow and variations of hydraulic conductivity in the ground water aquifer along the river. Seepage is visible along the north river shore line and up the north bank in locations to an elevation of about one foot above the river level.

The quantity of seepage discharged to the river at Spring 13 is estimated based on the results of Molycorp's water quality surveys of Red River. Water samples are collected at least twice a year (from 1992 through 1999) from approximately 24 stations over the reach from above the Town of Red River to below the Ranger Station. Stream flow measurements at up to 16 Stations have been made coincidentally with the sampling. Water samples are collected at Station 13 (a few hundred feet above Spring 13) and at Station 13A (about 300 feet below Spring 13).

On March 14, 2000 the flow at Station 13 was measured at 17.63 CFS and the conductance was 374. The conductivity of the river water as 383 at Station 13A and the conductivity of Spring 13 discharge was 1888.

The flow of Spring 13 was calculated algebraically as follows:

(Flow Upstream x Conductance) + (Spring 13 Flow x Conductance) = (Downstream flow x Conductance)

(17.63 x 374) + (S13 CFS x 1888) = (17.63 +S13 CFS) x 383

Transposing:

(S13 CFS x 1888) = (17.63 x 383) - (17.63 x 374) + (S13 CFS x 383)

(S13 CFS x 1505) = 159

S13 = .1054 CFS = 47.3 GPM

Calculations using both conductance and SO_4 concentrations of other river surveys made during the past few years, indicated Spring 13 flows of similar magnitude.

PRIMARY DESIGN ALTERNATE

At this time the most favorable appearing seepage collection method appears to be the installation of a modified "French Drain" type system. Preliminary analysis indicates that a drain line installed at a depth of about two feet below the adjacent low water flow river level and about ten feet from the north shore line will be effective. The drain line would be perforated with small diameter holes drilled at spacing which will control the inflow to a rate of slightly more than the probable ground water seepage to the river. If the drain line inflow rate was not controlled there would be an excessive amount of inflow during high river flow periods.

Assuming that the Spring 13 seepage amounts to 50 gpm over a 400 foot reach; the average required inflow rate to the drain would be .125 gpm/feet. It appears desirable to maintain a minimum head above the orifice of 0.5 feet. Based on the standard orifice formula: Q cfs = C x Area sq. ft. x $(2\ gh)^{.5}$ and assuming an orifice coefficient of 0.61; 3/16 inch orifices at an average spacing of 2′ 3″ will be required. The river level during nominal high flow periods is approximately one foot above the level at low flow periods. At high flow periods the inflow rate would be approximately 1.5 times higher.

It is proposed to extend the Spring 13 drain line for about 800 feet farther west to collect the shallow seepage flow along the reach of the mouth of Capulin Canyon. It is believed that such seepage can be collected by installation of this section of the drain line along the old river channel. It is anticipated that an additional 50 gpm of seepage will be intercepted by this drain extension.

A similar drain line is proposed for the Spring 39 area. Additional exploratory work is required to determine the reach along the river where such a line would be beneficial. It presently appears that at least 400 feet of drain line will be required in this area.

In this area there is a large general discharge of the basin under flow to river surface flow. This precludes estimating the volume of high ARD seepage from the conductance gain along this river reach. Additional field investigations will therefore be required to determine the volume of the seepage flow that should be collected. It appears that the volume of high ARD seepage is somewhat less than at Spring 13. The collected water at Spring 39 will be pumped to either the tailing line or to the water supply line from Columbine Park to the mill.

ALTERNATE COLLECTION SYSTEM DESIGN

Interception of the seepage flow by several small shallow wells has also been considered. The number, spacing and distance from the river of the required wells is dependent on the hydrological properties of the aquifer. The principal advantage of the well system is that a nearly uniform ground water extraction rate would result. It is also probable that it would be necessary to extract a higher total amount of ground water to achieve the same effectiveness as the French Drain system.

ALTERNATIVES FOR DISPOSAL OF THE CAPTURED GROUND WATER INCLUDE:

(a) pumping the water to the tailings line

(b) installation of a new pipe line and pumpage of the collected water to the mine or mill area.

Tests must be made to determine if pumpage of the collected water to the tailings line will result in a pH in the tailings line that might be low enough to cause corrosion of the line or be in conflict with State regulations relative to discharges of such water to the tailing line or to

the tailings ponds. If low pH appears to be a problem it may be possible to neutralize the collected water with lime before pumpage to the tailings line.

At the Spring 13 area the pressure in the tailings line might vary from 50 psi or less to over 160 psi. A variable speed pump will therefore be required. The pump motor will be approximately 20 horse power.

ESSENTIAL FIELD INVESTIGATIONS

In order to make a final determination of the best and most effective alternative and the specific design details for such; a considerable amount of field investigation, and testing will be required. The proposed data collection work includes the following:

Proposed Ground Water Investigations

(a) Determine the elevations, direction of ground water flow and gradients in the vicinity of the Spring areas. It is probable that the water table elevation is at a fairly shallow depth in the area between the river and the steeply rising ground lying north of the highway. It is therefore proposed at each seepage area, to excavate with a back hoe, about 12 small pits to slightly below the water table. The water level in each pit will be accurately determined by instrument surveys. A vertical perforated pipe will be installed in pits during backfill operations so that the water levels can be monitored over a period of time. Tentative locations for most of the pits are shown on an attached drawing.

(b) Determine the hydrological characteristics of the shallow ground water aquifer. It is proposed to pump water from two or more of the shallow pits or from shallow wells in the vicinity. During the pumpage and water level recovery periods; the water levels at the pumped hole and in several nearly observation wells will be monitored to determine coefficients of hydraulic conductivity, aquifer storage coefficients and the extent and shape of the draw-down cone of depression. Water samples will also be collected and analyzed to determine variations in ARD concentrations.

(c) Determine the feasibility of a "french drain" type collection system and the detailed design factors related to such. It is proposed to excavate in the Spring 13 area, a trench to a depth of approximately 2 feet below the river level for a distance of about 100 feet parallel to and about 10 feet north of the river shoreline. (See attached drawing of proposed field investigations.)

Water inflow rates will be noted along the trench line. A four inch diameter plastic pipe will be laid along the trench bottom. The pipe will be perforated with the diameter and spacing of the perforations to be made as estimated for collection of an adequate and controlled amount of seepage flow into the line. Different hole diameters or spacing may be used along various sections of the trench length as indicated by possible variations in seepage rates into the trench or along the river shore line. The trench will then be back filled with clean gravel to a depth of about 18 inches over the pipe and with excavated soil to the natural ground line. The trench will be extended downstream about 100 feet on a fairly shallow grade to where it day lights out above

the surface so that the perforated collection line will be kept drained. The trench down stream of the perforated drain line will be backfilled to above the ground water level with clayey material.

Flow from the drain line will be measured over a period of time. Several observation wells at various distances out from each side of the drain line will be installed. The water levels in these will be monitored to observe changes of levels and gradients in the vicinity of the drain line. Seepage along the river in the vicinity of the drain line will be carefully noted prior to the excavation of the trench and monitored for some time thereafter. Prior to, during and following the drain trench installation, the conductivity of the river water upstream and downstream of the Spring 13 area will be measured frequently and a record of the river flow at the Ranger Station will be kept during this period. Final drain line location and design depth and size and spacing of perforations will be based on the results of the test drain line section.

PROJECT SCHEDULE

It is anticipated that a permit will be approved by the New Mexico Highway Department within the next few days so that the proposed field investigation can be conducted. Unless early snow melt flood flows occur, the field investigations can probably be completed by the end of April and final designs by the end of June. High river flows are expected from May through August or September. Construction can commence thereafter and should be completed by the end of November and before the usual period of milky river water and elevated ARD concentrations of the winter months.

NEW MILL WATER SUPPLY WELL

Molycorp is planning on developing a new well to augment the water supply for milling of ore and transportation of tailings. The well will be located at the west end of the area of waste rock piles which extend along the north side of the river basin between the mill area and Columbine Park. The well will be developed near the north edge of the valley underground water basin. It is anticipated that the well will intercept a substantial volume of the flow in the high ARD plume that flows from above the mine area down along the north side of the basin aquifer. This should substantially reduce the amount of ARD that is discharged from the underground basin into the river surface flow in the Columbine Park area. It is also anticipated that the well will result in a reduction in the ARD concentrations of the seepage farther downstream.

A permit from the State Engineer will be required to divert the ground waters by either well pumpage or a drain collection system and for discharge to either the river or the tailings line.

Respectfully Submitted:
VAIL ENGINEERING, INC.

Ralph E. Vail

Chief Engineer
NM PE & LS 2098

VAIL ENGINEERING, INC.

PHONE: (505)
988-5575

1588 SAN MATEO LANE
SANTA FE, NEW MEXICO
87505

March 14, 2000

District Highway Engineer
P.O. Box 4127
Santa Fe, New Mexico 87502-4127

Attention: Mr. James Sullivan

Dear Sir:

Attached is an application on behalf of Molycorp, Inc., Questa, NM for the making of temporary excavations along a section of State Highway 38 in Taos County, New Mexico.

There is a section along Red River adjacent to State Highway 38 where natural ground water that has a very low pH (3.2 $\pm$) and very high mineral content is seeping into the river. This deteriorates the quality of the water in the river and during very low flow periods adds substantially to the milky appearance of the river water downstream.

A few years ago the State Highway Department cooperated with the New Mexico Environmental Department and Molycorp in excavating a trench in this area along the south shoulder of the highway near the river, the placement of lime stone in the trench and backfilling the trench. It was hoped that the limestone would neutralize the low pH of the ground water and the metals would precipitate out before reaching the river. Unfortunately this anoxic alkaline drain treatment has not significantly reduced the effect of the ground water seepage on the river.

Recently, at the request of the U.S. Environmental Protection Agency, Molycorp agreed to try to intercept this ground water seepage to the river and treat or dispose of this water even though this water appears to be natural and not resulting from or related to Molycorp's mining operations.

In order to design an effective system to intercept such ground water it will be necessary to determine the quantity and direction of flow and the hydrological characteristics of the aquifer.

It appears that the ground water lies at a fairly shallow depth for some distance back away from the river. Molycorp therefore proposes to determine the water table elevation, gradient and other characteristics by open excavation with a back hoe. The excavation pits will generally be not over 36 inches wide and only as long as required to reach to a depth of a few feet below the water table. It is anticipated that the depth of the pits will range from about 6 feet up to a maximum of 12 feet.

It appears that the highway right-of-way extends to near the river on the south side and generally to a steep hillside on the north. It will be necessary therefore to excavate the pits in the right-of-way, however there is sufficient room to make the excavations at a substantial distance

from the paved roadway. At this location the highway has two 12 foot wide traffic lanes and a paved shoulder of about six feet. The proposed location of the pit closest to the highway is at a distance of 32 feet from the highway centerline. At this location the pit will be behind a guard rail. Otherwise the pits will be about 40 or more feet from the highway centerline. It is anticipated that the excavations will be backfilled with suitable compacted material and the areas restored within 48 hours after the excavation is made. At most locations a four inch perforated vertical pipe may be inserted for future monitoring of the water table levels. The pipe will be suitably capped and will be completed flush with the surface in possible traffic or parking areas. All open excavations will be barricaded and the Highway Department's regulations regarding traffic safety will be complied with.

In addition to the individual pits, it may be desirable to excavate a trench parallel to the highway for a distance of about 200 feet and at a distance of not less than 40 feet from the highway centerline. If the ditch is located on the north side it will be behind the guard rail near Station 150+00. If the ditch is on the south side it probably will be down off the roadway embankment. A 4 inch drain line may be installed in this trench. After engineering data is obtained the trench will be filled and the area restored.

We anticipate that approximately 12 small pits will be required in addition to the temporary trench.

This application is for temporary excavations only. After the data is obtained and a final design is complete; Molycorp will submit an application for a permanent facility with detailed drawings for your consideration. It is anticipated that the proposed facility will consist of a french drain type system or several small wells which will be located near your right-of-way limits.

We are aware that there are existing underground telephone and gas lines and possibly an electric cable in this area and Molycorp will work with the utility companies to insure protection of such.

Molycorp has promised to develop an effective ground water catchment system at an early date and therefore requests your favorable consideration and approval of this application at your earliest convenience. We are including herewith a sketch showing the general location and details of the proposed excavations. We have also reviewed, on site, the proposed work with Mr. Steve Sanchez of your Questa office.

Please contact the undersigned Ralph E. Vail at (505)988-5575 if you have any questions or need further information.

Respectfully Submitted
VAIL ENGINEERING, INC.

Ralph E. Vail

Chief Engineer
NM PE & LS 2098

cc: Mr. Geyza Lorinci
Molycorp, Questa

Form No. M-202
Rev. 2-93

Application For Permit To Install Utility Facilities Within Public Right of Way

TO: NEW MEXICO STATE HIGHWAY
AND TRANSPORTATION DEPARTMENT
P.O. Box 1149
Santa Fe, New Mexico 87504-1149

Permit No._____

- [x] New Installation
- [ ] Renewal Permit
- [ ] Relocation
- [ ] Remain in Place

1. Pursuant to New Mexico Statutes Annotated, 1978 Compilation, Sections 67-8-13 and 69-8-14, the undersigned Molycorp, Inc.
Address: P.O. Box 469, Questa, NM 87556-0469

herein makes application to use highway rights of way to install:
Size and Type of Facility: Temporary excavations to determine ground water conditions.
in the following location: N.M. Project No._____ S.R. No._____
Hwy. Station 150+00 to Hwy.Station 155+00.
County, Section 3, Township 28N, Range 13E

2. For the purpose of this application "within" shall be construed as meaning "on, over, under, across or along."
   a. "Engineer" shall be construed as meaning the District Highway Engineer of the New Mexico State Highway and Transportation Department or his representative.
   b. "Applicant" shall be construed as meaning the individual, firm, corporation, association, governmental subdivision, or other organization making application, or the successors of any of the above.
   c. "Facility" shall be construed as meaning, but not limited to, and publicly, privately, cooperatively, municipally or governmentally owned facility used for carriage, distribution or transmission of water, gas or electricity, oil and products derived therefrom, sewage, steam or other projects carried by means of pipelines, conduits, wires, culverts, ditches, conveyors or other methods.
   d. If application is for a parallel installation, justification as to why private right may not be utilized must be furnished.
3. Applicant proposes to relocate, install or leave facility ____feet within the ____right of way line. The proposed installation shall be:
   parallel (Crossing or Parallel) subsurface (Subsurface or Overhead) open excavation out of pavement (Boring, Jacking or Pavement Cut)
   a. If Applicant requests installation by pavement cut, complete justification therefore shall be submitted by attachment.
   b. Where application for pavement cut is justified, the application may be held in abeyance pending receipt of cash bond in an amount to be fixed by the Engineer.
4. There is attached hereto a diagrammatic dimensioned drawing showing the location of existing and/or proposed installation referenced to roadway and right of way, right of way lines, any access control lines, distance of proposed installation above or below grade, highway stationing, identification of materials to be used and any other pertinent data. If application is for parallel installation, nature of adjacent land use shall be shown. Proposed installations on or in bridges or other structures, or for the installation of any structures, will require detailed structural drawings.
5. Applicant desires this permit to be in affect for 1 years. Permit will not be issued for a period longer than 25 years, must be renewed upon expiration and the burden of timely renewal is on the Applicant. The Applicant shall formally notify the engineer of actual commencement and completion of construction of the installation. The Applicant shall also formally notify the Engineer of removal or abandonment of the facility, or relinquishment of the permit.
6. The signing of the application by the Engineer and returning it to the Applicant shall validate this application as a permit. The granting of this permit shall not be construed as granting any easement or property right.
7. Servicing of facilities will not be permitted within the access control lines on any controlled access project. Should an emergency occur, the Applicant shall notify the Engineer and shall provide such flagmen, flashers, warning or other safety devices as required by the Engineer. All routine maintenance shall be performed from outside any access control lines.
8. The relocation or installation of facilities within public right of way shall be in strict conformance with all provisions of this application, drawing and the Instruction for Utility Permits, as they may be modified by the Engineer, and no departure therefrom may be made without the written consent of the Engineer. All facilities shall be so placed that they will not interfere with nor endanger any roadway features nor other existing facilities. All construction of facilities shall be subject to the inspection and approval of the Engineer. All such work shall be performed so that danger, inconvenience and delay to the traveling public will be held to a minimum. Protection and handling of traffic during the installation are the responsibility of the Applicant and must be approved by Engineer.
9. The Applicant will, except as otherwise ordered by the Engineer, restore the public right-of-way, and all bridges or other structures

thereon or adjacent thereto which have been altered or affected by facility installation performed hereunder, in accordance with sound construction practices and the Engineer's specifications, and shall cause the work to be done in a workmanlike manner. If any damage is caused to the highway right of way or to any bridge, structure or improvement thereon or adjacent thereto by reason of the installation, maintenance, alteration or removal of such facilities or other appurtenances, the Applicant will reimburse the Engineer the full amount thereof promptly upon demand by the Engineer; provided, however that the obligation imposed under this paragraph shall not apply in the event the damage resulted from causes beyond the control of the Applicant. All such facilities located within the right of way shall at all times be kept in such repair so as not to damage the highway, inconvenience or endanger the traveling public and shall be kept free from advertisement, posters and the like.

10. The Applicant will at all times indemnify and save harmless the Engineer from any and all claims of every kind of character caused by or incident to the installation, alteration, removal or condition of these facilities in the right of way and will promptly reimburse the engineer for any and all expenses incurred by the Engineer in resisting any such claim or claims. Nothing herein shall be construed to mean that the Applicant hereunder will indemnify and save harmless the Engineer from any claim caused by or incident to any neglect, carelessness or breach of duty on the part of the Engineer.
11. Should the Applicant at any time fail to promptly and fully perform any of the obligations imposed hereby and after thirty (30) days written notice thereof, the Engineer may, at his option, (a) cause the obligations to be fully carried out and performed, and the Applicant will promptly reimburse the Engineer for all costs and expenses incident thereto, (b) may summarily order the removal of such facility and if the applicant fails to comply within a reasonable time, the engineer may direct the removal of the facility with all costs and expenses thereto to be borne by Applicant.
12. If by any reason of any change in the location, construction, grade or by any other matter affecting the highway upon which any facility is located because of changing traffic conditions or otherwise, it shall become advisable in the opinion of the Engineer the said facility be removed, relocated or otherwise modified, the Applicant, upon written notice from the Engineer, shall remove, relocate or modify such facility without undue delay in such manner as the Engineer may direct or approve, at the Applicant's expense and at no cost to the Engineer. All facilities located on public right of way under the dual jurisdiction of the State and a subordinate governmental entity shall comply with all applicable rules and regulations of such entity properly and lawfully in force and including but not limited to provisions of local franchises not in conflict with the rules and regulations of the Engineer. The Engineer makes no warranty either express or implied as to the continued existence of any highway in any particular location and expressly assumes no obligation with regard to the facility upon change, vacation or abandonment of any highway or portions thereof.
13. Neither the making of this application nor anything herein contained shall constitute a waiver on the part of the Applicant of any rights or claims had or made by some with respect to the occupancy of the streets and highways under the Constitution and laws of the State of New Mexico, nor shall anything herein contained in anywise prejudice or impair any rights or claims existing independent of this application with respect to the construction, operation and maintenance of the Applicant's facilities in the State of New Mexico.
14. Each copy of the application must be signed by the Applicant as an individual owner or by any official designated to execute such documents.

This application is hereby granted subject to all provisions herein and to the following special provisions, changes or amendments:

Applicant Molycorp, Inc.

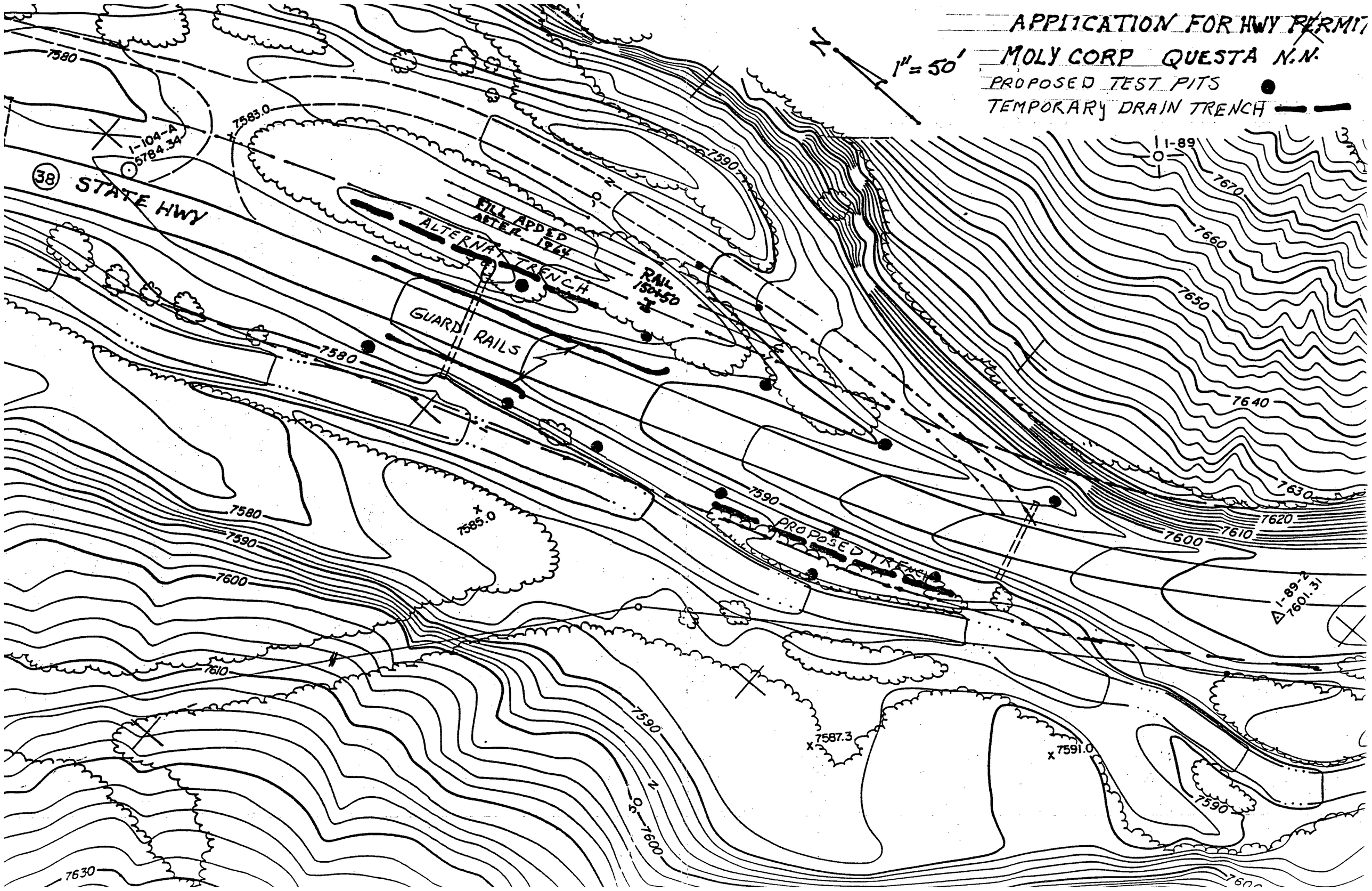
By Ralph E. Vail

Title Consulting Enfineer

Approval of this permit is hereby given this _____ day of _____, 19____

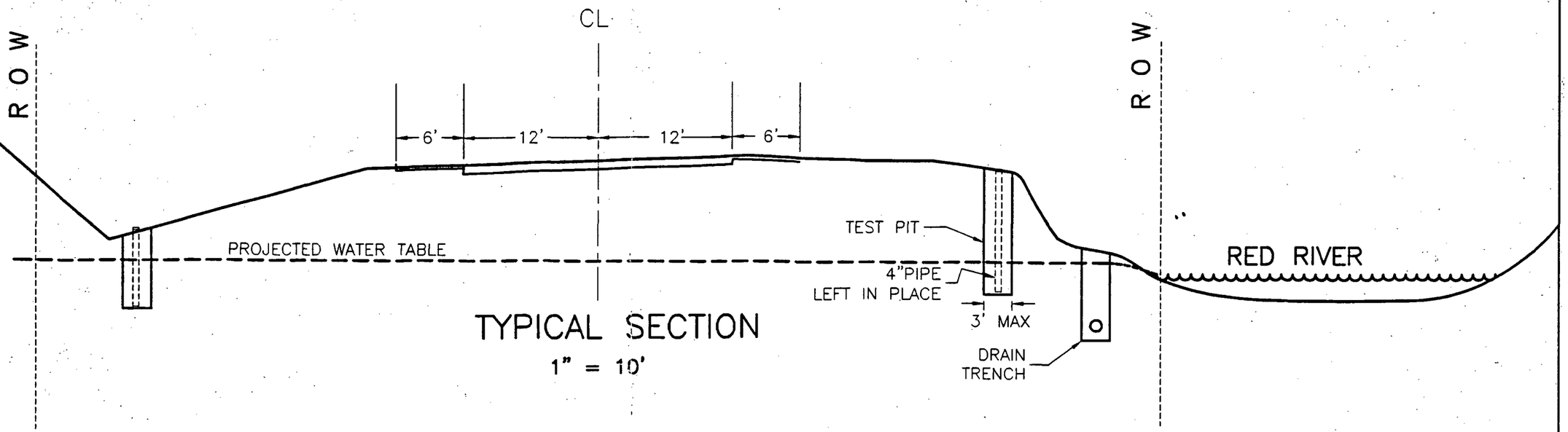
New Mexico State Highway and Transportation Department

By _____


APPLICATION FOR HWY PERMIT
MOLY CORP QUESTA N.M.
1" = 50'
PROPOSED TEST PITS
TEMPORARY DRAIN TRENCH
38 STATE HWY
1-104-A
5784.34
7583.0
FILL ADDED AFTER 1964
ALTERNAT TRENCH
RAIL 150+50
GUARD RAILS
7585.0
PROPOSED TRENCH
1-89
1-89-2
7601.31
7587.3
7591.0
7580
7590
7600
7610
7620
7630
7640
7650
7660
7670

STATION 148=50 TO 153+50

NM HWY 38



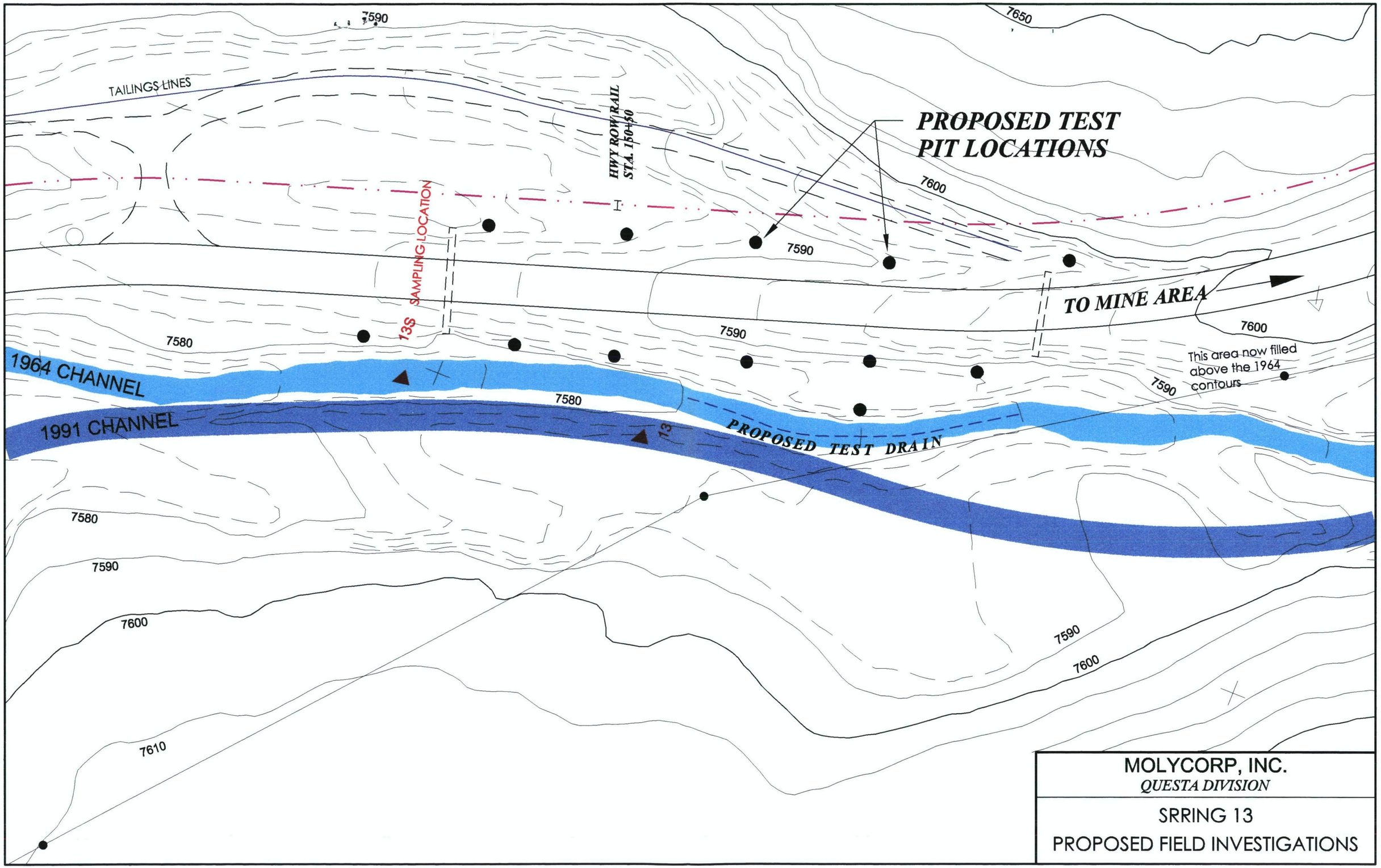
TYPICAL SECTION

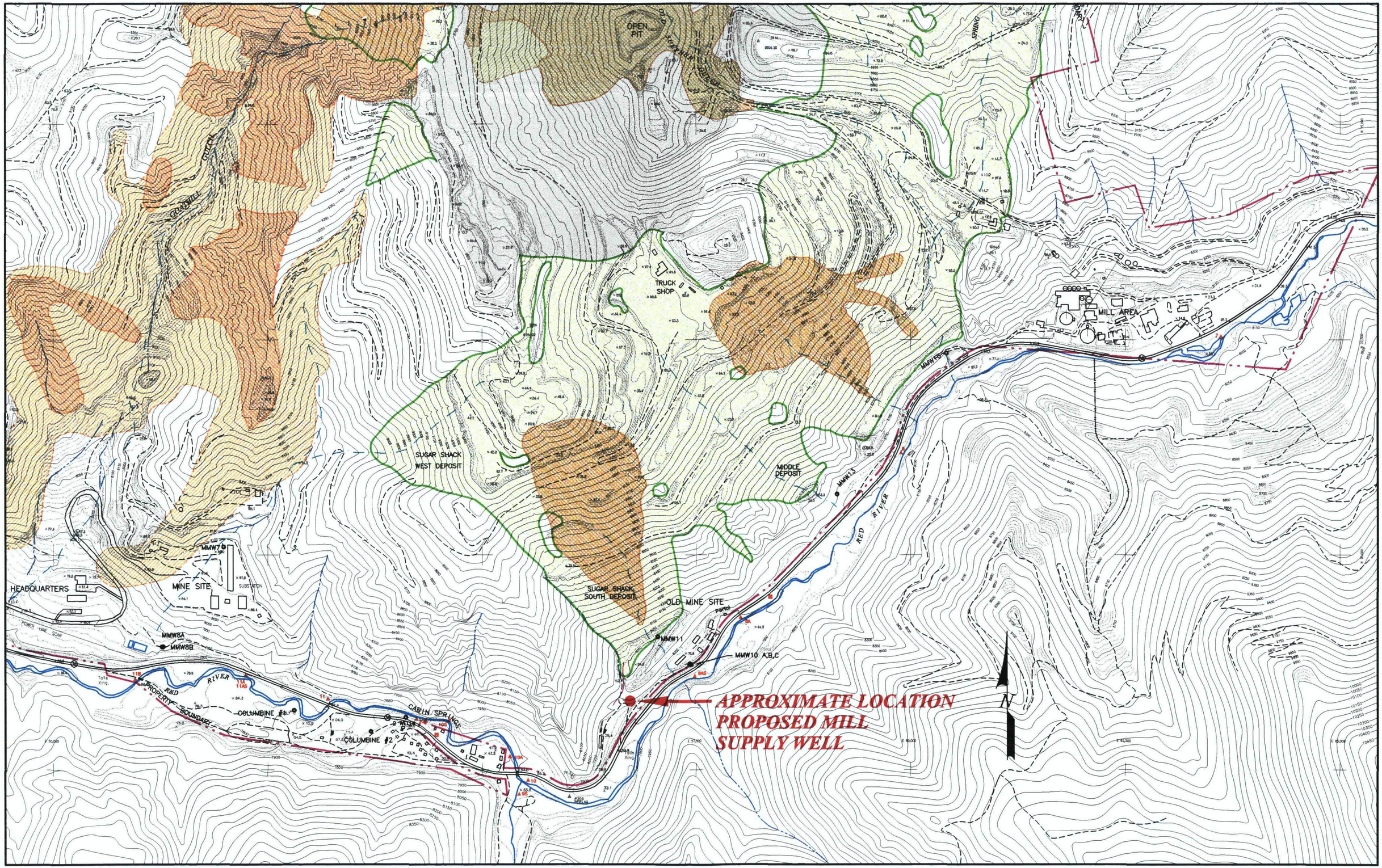
1" = 10'

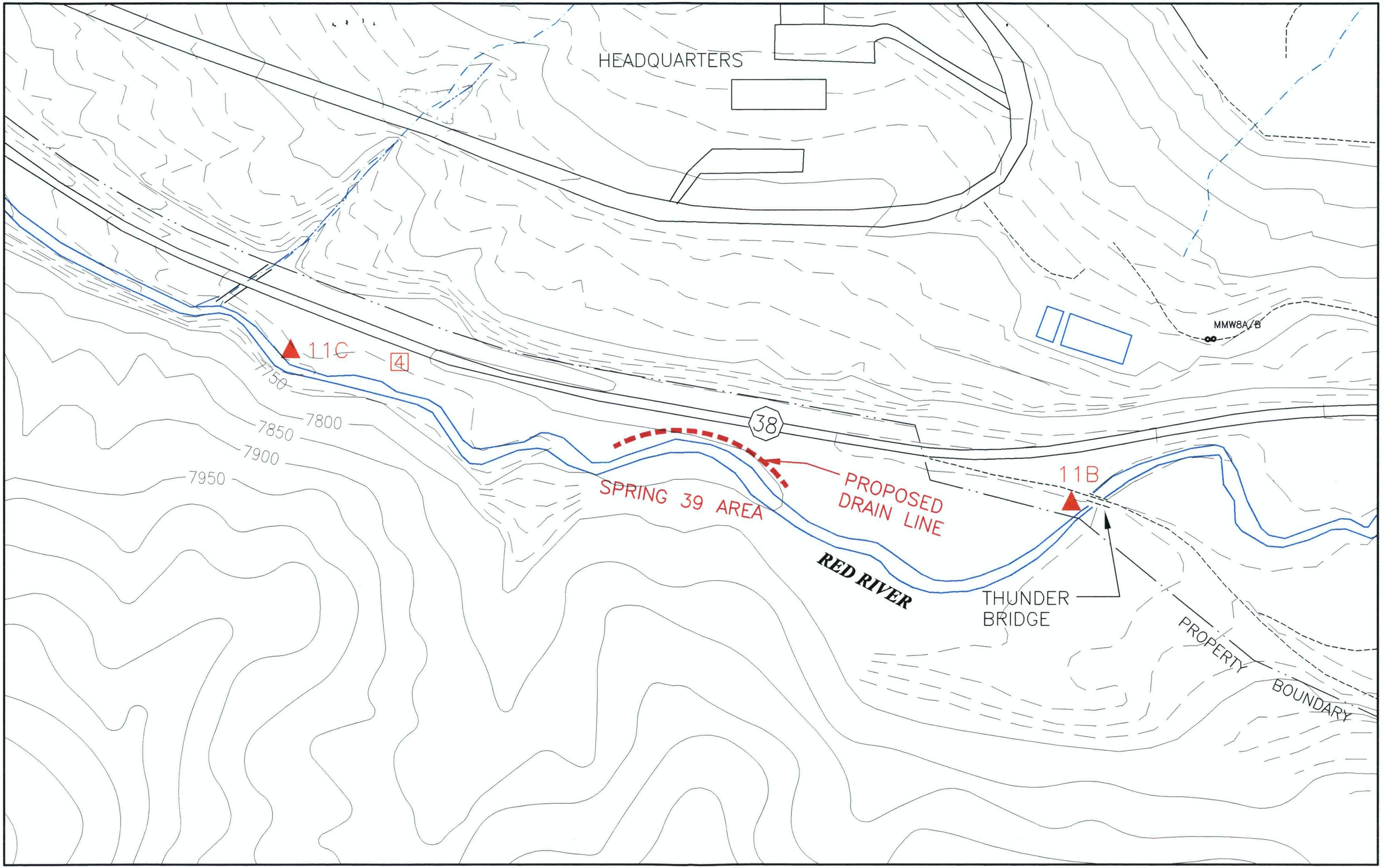
APPLICATION FOR PERMIT

MOLYCORP INC.

QUESTA NM


7590
7650
TAILINGS LINES
HWY ROW/RAIL
STA. 150+50
PROPOSED TEST
PIT LOCATIONS
7600
7590
SAMPLING LOCATION
13S
TO MINE AREA
7580
7590
7600
This area now filled
above the 1964
contours
1964 CHANNEL
7590
7580
1991 CHANNEL
13
PROPOSED TEST DRAIN
7580
7590
7600
7590
7600
7610
MOLYCORP, INC.
QUESTA DIVISION
SRRING 13
PROPOSED FIELD INVESTIGATIONS


OPEN PIT
TRUCK SHOP
MILL AREA
SPRING
GOODWILL GULCH
SUGAR SHACK WEST DEPOSIT
MIDDLE DEPOSIT
SUGAR SHACK SOUTH DEPOSIT
OLD MINE SITE
MMW13
MMW11
MMW10 A,B,C
MMW7
MMW8A
MMW8B
HEADQUARTERS
MINE SITE
SUBSTATION
POWER LINE SCAR
RED RIVER
PROPERTY BOUNDARY
COLUMBINE #1
COLUMBINE #2
CABIN SPRINGS
APPROXIMATE LOCATION
PROPOSED MILL
SUPPLY WELL
N


HEADQUARTERS
MMW8A/B
11C
4
7750
7800
7850
7900
7950
38
PROPOSED
DRAIN LINE
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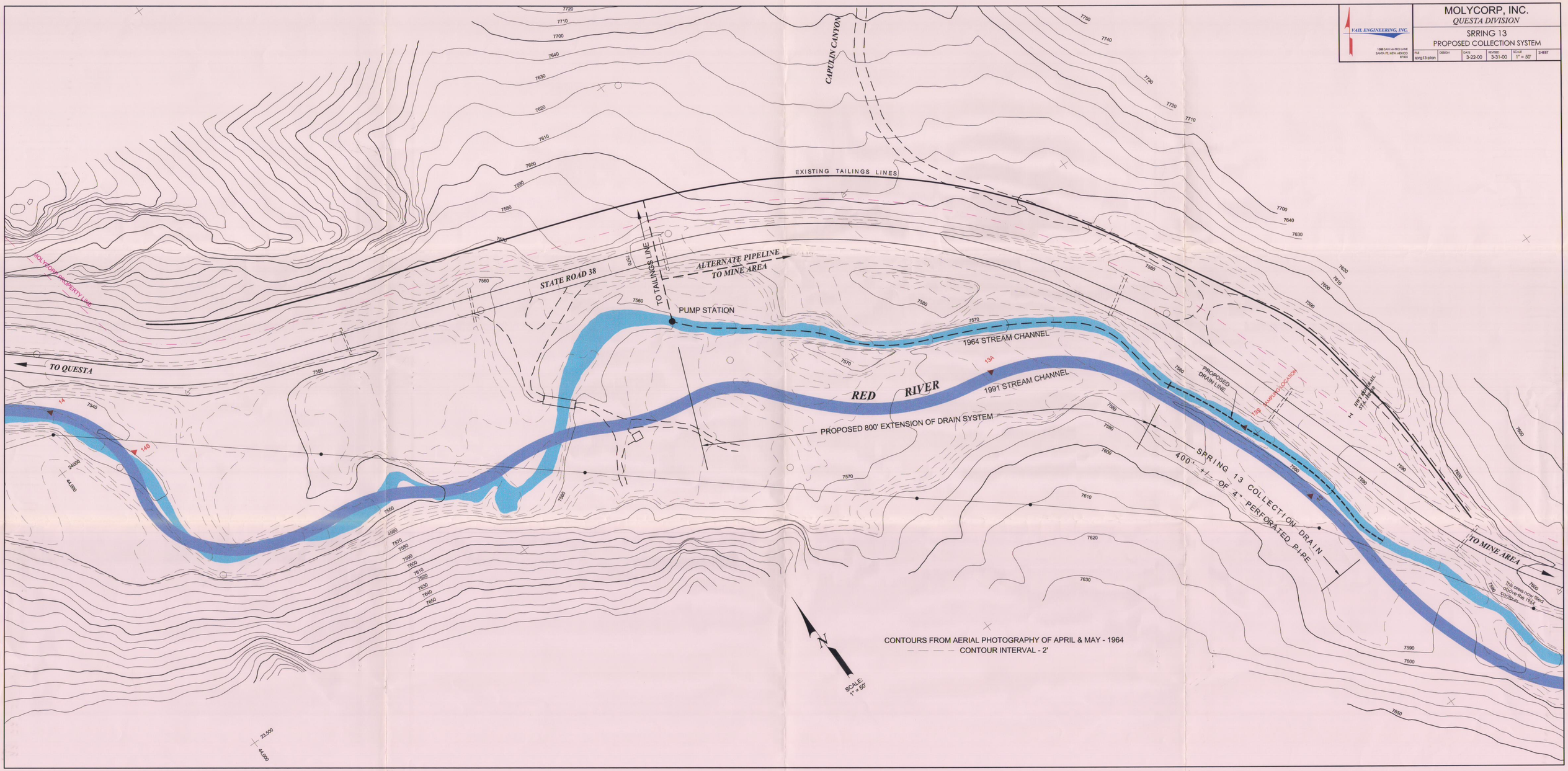
11B
RED RIVER
THUNDER
BRIDGE
PROPERTY
BOUNDARY


VAIL ENGINEERING, INC.
1386 SAN MARCOS LANE
SANTA FE, NEW MEXICO
87503
MOLYCORP, INC.
QUESTA DIVISION
SRRING 13
PROPOSED COLLECTION SYSTEM
FILE spring13-plan
DESIGN
DATE 3-22-00
REVISED 3-31-00
SCALE 1" = 50'
SHEET
CAPULIN CANYON
EXISTING TAILINGS LINES
MOLYCORP PROPERTY LINE
STATE ROAD 38
TO TAILINGS LINE
ALTERNATE PIPELINE TO MINE AREA
PUMP STATION
1964 STREAM CHANNEL
1991 STREAM CHANNEL
RED RIVER
TO QUESTA
PROPOSED DRAIN LINE
PROPOSED 800' EXTENSION OF DRAIN SYSTEM
SPRING 13 COLLECTION DRAIN
400' +/- OF 4" PERFORATED PIPE
TO MINE AREA
14
14S
13A
13S
24,000
44,000
23,500
44,000
N
SCALE: 1" = 50'
CONTOURS FROM AERIAL PHOTOGRAPHY OF APRIL & MAY - 1964
CONTOUR INTERVAL - 2'

Molycorp, Inc.
Molybdenum Group
P.O. Box 469
Questa, NM 87556-0469
Telephone (505) 586-7601
Facsimile (505) 586-0811

NM22306
04

David R. Shoemaker
Vice President

Molycorp

January 15, 2001

Marcy Leavitt, Chief
Ground Water Quality Bureau
New Mexico Environment Department
Harold Runnels Building
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, NM 87502

Scott Wilson
NPDES Permits Branch
U.S. EPA Region 6
1445 Ross Avenue
Dallas, TX 75202-2733

RE: Stormwater and seepage interception system design (DP-1055 and NPDES Permit No. NM0022306)

Dear Ms. Leavitt and Mr. Wilson:

Enclosed please find our proposal for stormwater system design and seepage interception. These proposals are pursuant to the requirements in DP-1055 and NPDES Permit No. NM0002306.

Detailed survey and geophysical work has been completed for the Capulin Canyon, Goathill and Sugar Shack West systems. The pipeline route and pumping station have been approximately located. Preliminary design has been completed and is included in the attached package from URS.

We would like to meet with you in the near future to obtain approval for this portion of the program so that we can move forward with the detailed engineering, begin the procurement process and contractor selection. We would like to complete this portion of the program during the upcoming summer construction season.

Site assessment work for the seep collection system (Springs 13 and 39) has not yet commenced because we are awaiting clearance from the U.S. Forest Service. We anticipate receiving clearance shortly. When we receive the clearance for field work, we will have until March 1, 2001 to complete any field activities. Field work is prohibited in those areas because of Threatened and

Endangered Species regulations from March 1 to August 15 or October 15 depending upon the site. A conceptual collection system design is included in this package and we would be happy to discuss this at the meeting.

Site investigation is currently underway for a groundwater collection system below Sugar Shack South, Middle and Sulphur Gulch rock piles. A description of this site investigation is included in the package and we would be glad to discuss the current results and ideas for groundwater collection at the meeting.

If you have any questions you can contact me at (505) 586-7601, Geyza Lorinczi at (505) 586-7626 or Anne Wagner at (505) 586-7625.

Sincerely,

David R. Shoemaker
Vice-President

cc: S. McKitrick, NMED
K. Aisling, EPA Superfund

NM0022306
4

Molycorp Issue Paper

DATE: November 16, 2000

TOPIC: Final NPDES Permit Issuance for Molycorp

BACKGROUND: An NPDES permit for the Molycorp mine was proposed May 27, 2000. Existing discharges from the ground water capture system and treatment plant at the tailings ponds and storm water at the mine were proposed to be continued. The proposed permit included requirements to capture seeps in the area of the mine. This will eliminate a significant pollutant loading to the Red River.

CURRENT STATUS: All issues raised by commentors have been addressed and a final permit is ready to issue. The Public Notice of the final permit is expected to be December 9th.

TECHNICAL CONCERNS:

- The is the first NPDES permit to require specific actions to eliminate discharges of acid mine drainage made through a ground water hydrological connection.
- The stream segment is listed for violating standards for Aluminum.
- The permit's requirement to capture acidic metal laden discharges to the Red River will result in decreased loading of aluminum and other metals to the river.
- This action is consistent with, and has been closely coordinated with, ongoing Superfund actions.

COMMUNITY CONCERNS: Citizens living near the mine want EPA to take a reasonable approach. There are concerns that EPA actions may close the mine and harm the economy in the community. A citizens group located in Taos, the Amigos Bravos, has filed suit against EPA for failing to take enforcement action or regulate the seeps under an NPDES permit. There are no direct Tribal issues. No Pueblos are adjacent to or directly downstream. The Taos Pueblo does not wish to be involve in this issue. There are also no endangered species issues.

FUTURE/RECOMMENDED ACTIONS: We plan to meet with Amigos Bravos on November 29th to present the final permit. We also plan to inform NMED, politicals, and Molycorp of the final decision.

CONTACT: Scott Wilson, 214-665-7511

Per [redacted] 5-01 Telephone c[redacted] w/ Geyza Lorinczi

ACTIVITY	COMPLETION DATE
Complete engineering assessments needed to develop the design criteria and system design of the selected technology(ies)	January 1, 2002 ~~November 1, 2001~~
Complete the capital appropriations request and obtain management approval to implement the technology	August 1, 2002
Start construction and installation of the necessary facilities	May 1, 2003
Complete the installation of the necessary facilities	December 1, 2003
Complete the startup and attain compliance with the final effluent limitations	February 1, 2004

505 586 0811

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

RECEIVED
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EPA-GWO-D
OFFICE OF GENERAL COUNSEL

JAN 19 2001

MEMORANDUM

SUBJECT: Adverse Decision in *Amigos Bravos v. Environmental Protection Agency, et al.*, 10th Cir. No. 99-2346 (January 3, 2001)

FROM: Susan G. Lepow
Associate General Counsel
Water Law Office (2355A)

TO: Steven A. Herman
Assistant Administrator for Enforcement and Compliance Assurance (2201A)

J. Charles Fox
Assistant Administrator for Water (4101)

Gregg A. Cooke
Regional Administrator
Region VI

On January 3, 2001, the U.S. Court of Appeals for the Tenth Circuit reversed and remanded for further proceedings a decision of a Federal district court determining that collateral estoppel barred a citizen enforcement action under section 505 of the Clean Water Act (CWA).

Appellant Amigos Bravos had filed a civil action against the U.S. Environmental Protection Agency and the Regional Administrator for Region VI (EPA), alleging that EPA had violated its duty to take corrective or enforcement action against Molycorp, Inc. (Molycorp) for unlawful point source discharges. Amigos Bravos alleged that a report prepared by an EPA employee constituted a determination by EPA that Molycorp was illegally discharging pollutants from a point source without a permit. In these circumstances, Amigos Bravos asserted that the report triggered section 309(a)(3) of the CWA, and a consequent EPA duty to take some form of corrective action. The district court disagreed, concluding that a prior district court decision barred Amigos Bravos's claim under the judicial doctrine of collateral estoppel. This doctrine bars an action when the issues raised in the action have already been determined in a prior case.

Here, the Court of Appeals concluded that the prior decision did not bar the present action. Moreover, the court also declined to sustain the district court decision on other grounds raised by EPA. These include the contention that, irrespective of whether or not collateral

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estoppel applied, the Court of Appeals must sustain the lower court decision because the citizen complaint alleged violations of discretionary duties which the district court lacked jurisdiction to enforce.

Background

In an earlier district court action, Amigos Bravos filed a section 505 citizen suit action against Molycorp. In that case, Amigos Bravos alleged that Molycorp was violating its NPDES permit because pollutants from waste rock piles at Molycorp's facility leached into ground water that was hydrologically connected to the Red River. The court granted Molycorp's motion for summary judgment concluding that, during the EPA permitting process, EPA had determined that Molycorp did not need a permit for any ground water seepage into the Red River. The court determined that Amigos Bravos's suit essentially attacked EPA's issuance of a permit to Molycorp and any challenge to a permit had to have been brought in a petition for review of the permit in a United States Court of Appeals pursuant to CWA section 309(b)(1)(F). Because Amigos Bravos had failed to challenge the permit pursuant to the statutory review provision, the district court concluded it lacked jurisdiction over the claim under the citizen suit provision. The Tenth Circuit affirmed the decision. *Amigos Bravos v. Molycorp,Inc.*, No. 97-2327, 1998 WL 792159 (10th Cir. Nov. 13, 1998).

Tenth Circuit Decision

In the current case, Amigos Bravos asserted that its citizen suit claim against EPA arose because EPA had changed its position from that taken in the earlier permitting case. Amigos Bravos maintained that EPA had, subsequent to the issuance of the 1993 NPDES permit considered in the previous case, determined that Molycorp was illegally discharging pollutants from the waste rock piles, based on language in a EPA geologist's report to this effect. This determination, in Amigos Bravos's view, required EPA to take action against the unlawful discharge under section 309(a)(3) of the CWA..

The Court of Appeals reviewed the district court's conclusion that the case was barred by collateral estoppel and concluded that it did not meet the four elements necessary for collateral estoppel. Specifically, the court noted that the issue decided in the earlier case was not identical to that raised in the more recent case. The first case involved the issue of whether EPA should have taken the allegations of an illegal point source discharge into account in its permitting decision. The second case concerns whether EPA has a duty to take enforcement action once it discovers an illegal discharge. Though factually related, in the court's view, the two issues were not identical.

Next, the court concluded that Amigos Bravos did not have a full and fair opportunity to litigate the second issue in the first proceeding, a necessary element for collateral estoppel to apply. The court noted that the report which Amigos Bravos asserted gave rise to EPA's duty under section 309 was not issued until two years after the initiation of the earlier action.

Moreover, resolving the issue of whether EPA had a duty to take an enforcement action was not a relevant issue in the first case.

As noted, the court also rejected several alternative bases for sustaining the district court's decision. The court declined to do so on the basis that the court below had not considered these issues. The court went on, however, to include some potentially troublesome language on the issue of whether the Agency has a mandatory enforcement duty under section 309(a)(2). The court stated that:

> "We make no comment on whether the Administrator's enforcement duties are discretionary or mandatory, except to observe that there is no controlling Supreme Court or Tenth Circuit authority." 2001 WL8310, *2 (10th Cir. (N.M.)).

As you are aware, several district courts have recently concluded, contrary to the Agency's view, that, in certain circumstances, the Agency may have a mandatory duty to take an enforcement action.

If you have any further questions about this decision, please call Richard Witt (202-260-7715) of my staff or Renea Ryland, Office of Regional Counsel, Region VI (214-665-2131).

Attachment

cc: Eric Schaeffer (2241A)
Brian Maas (2243A)
Mike Cook (4201)
Renea Ryland, ORC - Region VI
Regional Counsels, Regions I-X
Regional Water Management Directors, Regions I-X
Associate General Counsels
Water Attorneys

Only the Westlaw citation is currently available.

United States Court of Appeals, Tenth Circuit.

Amigos BRAVOS, a nonprofit corporation and New Mexico Citizens for Clean Air and Water, a nonprofit corporation, Plaintiffs-Appellants,
v.
ENVIRONMENTAL PROTECTION AGENCY; Carol Browner, Administrator of the Environmental Protection Agency; Greg Cook, EPA Regional Administrator for Region VI, Defendants-Appellees.

No. 99-2346.

Jan. 3, 2001.

Appeal from the United States District Court for the District of New Mexico, (D.C. No. CIV-99-327-DJS).

Submitted on the briefs: [FN*] Matthew Bishop, Western Environmental Law Center, Taos, NM, for the Plaintiffs-Appellants.

FN* At the parties' request, the case is unanimously ordered submitted without oral argument pursuant to Fed.R.App.P. 34(f) and 10th Cir.R. 34.1(G).

John W. Zavitz, Assistant United States Attorney, Albuquerque, NM, Renea Ryland, United States Environmental Protection Agency Office of Regional Counsel, Dallas, TX, Lois J. Schiffer, Assistant Attorney General, Evelyn Ying, Melaine Williams, Kathryn E. Kovacs, Washington, DC, for the Defendants-Appellees.

Before BRORBY, KELLY and LUCERO, Circuit Judges.

LUCERO, Circuit Judge.

*1 Plaintiffs-appellants Amigos Bravos and New Mexico Citizens for Clean Air and Water bring this civil action for declaratory and injunctive relief against the United States Environmental Protection Agency ("EPA"), the EPA Administrator, and the EPA Regional Administrator under a citizen suit provision of the **Clean Water Act** ("the Act"), 33 U.S.C. § 1365(a)(2). [FN1] Appellants allege that in February 1998 the EPA recognized an illegal point source [FN2] discharge of pollutants entering the Red River from waste rock piles of Molycorp, Inc.'s molybdenum mine site near Questa, New Mexico but has failed to take any corrective or enforcement action. The district court concluded that the suit is barred by the doctrine of collateral estoppel and dismissed the matter with prejudice. [FN3] Exercising jurisdiction under 28 U.S.C. § 1291, we reverse and remand for further proceedings.

FN1. 33 U.S.C. § 1365(a) provides:
(a) Authorization; jurisdiction
Except as provided in subsection (b) of this section and section 1319(g)(6) of this title, any citizen may commence a civil action on his own behalf--
(1) against any person ... who is alleged to be in violation of (A) an effluent standard or limitation under this chapter or (B) an order issued by the Administrator or a State with respect to [**Clean Water Act** standards], or
(2) against the Administrator where there is an alleged failure of the Administrator to perform any act or duty under this chapter which is not discretionary with the Administrator.
The district courts shall have jurisdiction, without regard to the amount in controversy or the citizenship of the parties, to ... order the Administrator to perform such act or duty....

FN2. Under the Act, a point source is "any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, [or] discrete fissure ... from which pollutants are or may be discharged." 33 U.S.C. § 1362(14).

FN3. The district court's judgment was entered upon a memorandum opinion and order issued by the magistrate judge assigned to the case for final disposition pursuant to 28 U.S.C. § 636(c) and Fed.R.Civ.P. 73.

I

The district court's collateral estoppel determination is based on the outcome of a case filed by appellants in 1995 against Molycorp. In that case, brought under 33 U.S.C. § 1365(a)(1), appellants alleged that the discharge of pollutants leached from the

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waste rock piles into the Red River was not authorized by the National Pollution Discharge Elimination System ("NPDES") permit reissued by the EPA in September 1993. See Amigos Bravos v. Molycorp, Inc., No. 97-2327, 1998 WL 792159 (10th Cir. Nov. 13, 1998) (unpublished disposition). The district court granted Molycorp's summary judgment motion on the ground that it lacked subject matter jurisdiction over appellants' claims.

In making its determination, the district court examined the EPA's permitting process and the issues resolved in connection with the Molycorp permit. It "determined that, '[w]ithout question, the EPA made a decision that Molycorp did not need a permit for any ground water seepage into the Red River, regardless of whether Molycorp's operations polluted the ground water and, eventually, the river.' " Id. at * *3 (quoting the district court's order). Because, " '[a]t its core, [appellants'] complaint attack[ed] the EPA's decision to reissue Molycorp's NPDES permit,' " appellants were required to bring their claims to the court of appeals in a petition for review under 33 U.S.C. § 1369(b)(1)(F). Id. Accordingly, the district court lacked subject matter jurisdiction. On appeal, this Court affirmed. See id. at * *4.

In the present case, appellants assert that their claims are premised entirely on the EPA's recognition of the allegedly illegal point source discharge in a February 13, 1998 report entitled "Report on Hydrological Connection Associated with Molycorp Mining Activity, Questa, New Mexico." They contend that the EPA's report constituted a change of position that triggered a duty under § 309(a)(3) of the Act, requiring the EPA to take some form of corrective action against Molycorp. See 33 U.S.C. § 1319(a)(3). [FN4] Additionally, appellants assert that the EPA's failure to take action amounts to an illegal exemption of a known point source discharge from the Act's permit provisions. See id. § 1342(a)(1) (requiring, for "the discharge of any pollutant, or combination of pollutants," a NPDES permit prescribing conditions "necessary to carry out" the Act's provisions); id. § 1311(a) (making illegal any pollutant discharges not specifically allowed by an NPDES permit).

FN4. Section 309(a)(3) provides, in pertinent part: Whenever on the basis of any information available to him the Administrator finds that any person is in violation of [provisions of the Act], or is in violation of any permit condition or limitation implementing any of such sections in a permit ...., he shall issue an order requiring such person to comply with such section or requirement, or he shall bring a civil action....

II

*2 We review de novo a district court's determination that collateral estoppel bars a plaintiff's claims. See Dodge v. Cotter Corp., 203 F.3d 1190, 1197 (10th Cir.2000). Under the doctrine of collateral estoppel, "once a court has decided an issue of fact or law necessary to its judgment, that decision may preclude relitigation of the issue in a suit on a different cause of action involving a party to the first case." Ag Servs. of Am., Inc. v. Nielsen, 231 F.3d 726, 732 (10th Cir.2000) (quotations and citations omitted). As applied in the Tenth Circuit, the elements of collateral estoppel are:

> (1) the issue previously decided is identical with the one presented in the action in question, (2) the prior action has been finally adjudicated on the merits, (3) the party against whom the doctrine is invoked was a party, or in privity with a party, to the prior adjudication, and (4) the party against whom the doctrine is raised had a full and fair opportunity to litigate the issue in the prior action. Dodge, 203 F.3d at 1198.

In this case, neither the first nor the fourth element is satisfied. The issue in contention in the prior action concerned appellants' allegations of a point source discharge that should have been taken into consideration in the EPA's decision to reissue Molycorp's 1993 NPDES permit. Here, the issue is whether the EPA has a duty to take action once it discovers an illegal point source discharge. Although factually related, these two issues are not identical. Furthermore, as a matter of timing, appellants did not have a full and fair opportunity to litigate the current issue in the prior action. The EPA report was issued over two years after initiation of the earlier action, during the pendency of appellants' appeal. Resolving the duty issue was not necessary, or even relevant, to the judgment in the earlier action. Accordingly, the district court was incorrect in concluding that the doctrine of collateral estoppel operates to bar the instant action.

We acknowledge the EPA's argument that, even if

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collateral estoppel does not bar litigation of this case, we may affirm the district court's dismissal on an alternative basis. We decline to do so. "As a general rule, we do not consider issues not passed on below, and it is appropriate to remand the case to the district court to address an issue first." N. Texas Prod. Credit Ass'n v. McCurtain County Nat'l Bank, 222 F.3d 800, 812 (10th Cir.2000). [FN5] The judgment of the district court is REVERSED and REMANDED for further proceedings consistent with this opinion.

FN5. The EPA provides several bases for its contention that dismissal was the appropriate disposition of this lawsuit. Two of these arguments require a factual analysis which cannot be performed on the record before us. These factual arguments include: (1) a claim that the 1998 report which triggered this action is of no legal significance, in that the report was authored by a geologist who was not empowered to make findings on behalf of the Administrator and, therefore, does not constitute a "finding" under § 1319(a)(2) or "determination" under § 1342(c)(3) necessary to impose an enforcement duty; and (2) an assertion that the EPA met any such duty on May 27, 2000 by issuing a draft of a new NPDES permit that covers the groundwater discharges at issue in this case.

The EPA's primary argument relies on principles of statutory interpretation. The citizen-suit provision of the Act authorizes suits against the Administrator only when the Administrator's duty is mandatory and nondiscretionary. See 33 U.S.C. § 1365(a)(2). The EPA contends that, although the complaint alleges violations of nondiscretionary duties, the specified duties are actually discretionary, and that the federal courts therefore lack subject matter jurisdiction over appellants' claims. We make no comment on whether the Administrator's enforcement duties are discretionary or mandatory, except to observe that there is no controlling Supreme Court or Tenth Circuit authority. However, we note the EPA's contention that the statutory interpretation issue implicates subject matter jurisdiction is erroneous. This notion appears to be based on case law decided before recent cases explaining "[t]he absence of a valid (as opposed to arguable) cause of action does not implicate subject matter jurisdiction, i.e., the courts' statutory or constitutional power to adjudicate the case." Steel Co. [v. Citizens for a Better Environment, 523 U.S. 83, 87 (1998)]. Jurisdiction is not defeated by the possibility that the averments might fail to state a cause of action on which petitioners could actually recover. Rather, where the complaint is so drawn as to seek recovery directly under the Constitution or the laws of the United States, the federal court, but for two possible exceptions must entertain the suit. The two exceptions come into play where the alleged claim under the Constitution or federal statutes clearly appears to be immaterial and made solely for the purpose of obtaining jurisdiction or where such a claim is wholly insubstantial and frivolous. If the applicability of the federal statute upon which a plaintiff relies is genuinely at issue, the federal courts possess jurisdiction and should reach the merits of the claim. Davoll v. Webb, 194 F.3d 1116, 1129 (10th Cir.1999) (further citations and quotations omitted).

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Molycorp, Inc.
P. O. Box 469
3 ½ miles East of Questa on State Road 38
Questa, NM 87556
Telephone (505) 586-0212
Facsimile (505) 586-0811

MOLYCORP, INC.
Questa Division

Fax

(505) 586-7625

To: Scott Wilson **From:** Anne Wagner

Fax: (214) 665-2191 **Pages:** 3 Including cover

Phone: **Date:** 4/5/02

Re: **CC:**

☐ **Urgent** ☐ **For Review** ☐ **Please Comment** ☐ **Please Reply** ☐ **Please Recycle**

• **Comments:**

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Molybdenum Group
P.O. Box 469
Questa, NM 87556-0469
Telephone (505) 586-0212
Facsimile (505) 586-0811

Certified Mail Return Receipt Requested

April 5, 2002

J. Scott Wilson
U.S. EPA - Region 6
Permits Section (6WQ-PP)
NPDES Permits Branch
1445 Ross Avenue
Dallas, TX 75202-2733

RE: Molycorp Inc. NPDES Permit No. NM0022306 Request for Written Approval for Additional Ground Water Withdrawal Wells – Additional Information

Dear Mr. Wilson:

I am writing in response to your request for additional information about the locations and specifications for the two additional ground water withdrawal wells to be constructed to enhance Molycorp's seepage interception system under Part II.A of the above-referenced NPDES permit.

The locations were selected for the reasons described in greater detail in our previous submittal. Briefly, the physical location of the rock piles, highway, river and springs restricts the placement of wells to a relatively narrow area. The specific locations were selected based upon information from the adjacent monitor wells (including water quality, depth to water, direction of flow, etc.), locations of known springs and accessibility. Additional details on the selection of the well locations are provided in the field investigation report of February 14, 2002.

Well specifications are based upon available information and knowledge of the local system. We expect that as wells are drilled, more information will be available to refine the specifications. The proposed wells are currently specified to reach the following depths: MEW 1 to 125 feet, MEW 2 to 100 feet, and MEW 3 to 100 feet. The wells will be screened from approximately 10 feet below the water table which is anticipated to be about 75-to-85 feet below ground surface. They will be screened to the bedrock-alluvium contact, allowing for a well sump.

Pumping rates are expected to be 112 gpm each for MEW 1 and 2, and 224 gpm for MEW 3 for at total of 448 gpm (or 1cfs total).

The anticipated zone of influence for each well is approximately 200 to 300 feet from the wells to the northern boundary of the Red River alluvial aquifer. The goal is to draw water for the wells only up to the northern boundary of this aquifer.

Please contact Anne Wagner at (505) 586-7625 if you need additional information or have further questions.

Sincerely yours,

Allen Randle
Vice President
Molycorp Inc.

cc: Program Manager, SWQB
W. Strickley, EPA
A. Wagner

CALCULATIONS OF NEW MEXICO WATER QUALITY-BASED EFFLUENT LIMITATIONS

Calculations Specifications: Lotus Smartsuite 97 1-2-3 Revised as 8/28/2000

Prepared By: Isaac Chen

STEP 1: REFERENCE IMPLEMENTATION PROCEDURES
INPUT FACILITY AND RECEIVING STREAM DATA
INPUT RECEIVING STREAM POLLUTANT BACKGROUND CONCENTRATION DATA
LIST SOURCE OF DATA INPUT
INPUT EFFLUENT DATA

IMPLEMENTATION PROCEDURES

The water quality standards for Interstate and Intrastate streams of the State of New Mexico are implemented in this fact sheet using procedures established in the "Implementation Guidance for State of New Mexico Standards for Interstate and Intrastate streams", February 23, 2000.

FACILTY		DATA INPUT	
Permittee		Permittee	
NPDES Permit No.		NM0000000	
Outfall No.(s)		1	
Plant Effluent Flow (MGD)		4.64	For industrial and federal facility, use the highest monthly average flow
Plant Effluent Flow (cfs)		7.192	for the past 24 months. For POTWs, use the design flow.

RECEIVING STREAM		DATA INPUT	
Receiving Stream Name		River	
Basin Name		Basin	
Waterbody Segment Code No.		Segment	
Is a publicly owned lake or reservoir (enter "1" if yes, "0" if no)		0	
Are acute aquatic life criteria considered (1= yes, 0=no)		0	
Are chronic aquatic life criteria considered (1= yes, 0=no)		0	
Are domestic water supply criteria considered (1= yes, 0=no)		0	
Are irrigation water supply criteria considered (1= yes, 0=no)		0	
Livestock watering and wildlife habitat criteria applied to all streams			
USGS Flow Station		USGS Stat.	
WQ Monitoring Station No.		NA	
Receiving Stream TSS (mg/l)		1	For intermittent stream, enter effluent TSS
Receiving Stream Hardness (mg/l as CaCOs)	RANGE: 0 - 400	50	For intermittent stream, enter effluent Hardness
Receiving Stream Critical Low Flow (4Q3) (cfs)		0	Enter "0" for intermittent stream and lake.
Avg. Water Temperature (C)		5	

pH (Avg)	7.72		
Fraction of stream allowed for mixing (F)	1	FQa=	0
(= 1, if stream morphology data is not available, or for intermittent stream, or pollutants have EPA human health criteria)			

SITE-SPECIFIC CRITERIA		
	Flow Limit (cfs)	100.000
	Chlorides (mg/l)	1.00E+100
	Sulfate (SO4) (mg/l)	1.00E+100
	Total Dissolved Solids	1.00E+100

DATA INPUT

Input pollutant geometric mean concentration as micro-gram per liter (ug/l or ppb) unless other unit is specified for the parameter. (Metals in "total" form)

Value below detection level which is smaller than the minimum quantification level will be counted as "0".
Value reported as "less than" but greater than MQL, the reported value is used.
Value below detection level and reported as "ND" will be counted as "0".

The following formular is used to calculate the Instream Waste Concentration (Cd)

Cd = [(F*Qa*Ca) + (Qe*2.13*Ce)] / (F*Qa + Qe)
Where:
Cd = Instream Waste Concentration
F = Fraction of stream allowed for mixing (see NM Implementation Guidance)
Ce = Reported concentration in effluent
Ca = Ambient stream concentration upstream of discharge
Qe = Plant effluent flow
Qa = Critical low flow of stream at discharge point expressed as the 4Q3

DATA SOURCES:

NPDES Application Form 2C dated 2/7/90.
Memo from Brian McGill to NPDES file dated 7/11/96
Letter from Brian McGill (Permittee) to Isaac Chen (EPA) dated 1/5/99, 1/6/99, and 1/19/99, respectively.
May enter "<" in column D or G if data was report as "less Than".

POLLUTANTS	<" Ambient Stream Conc. Ca (ug/l)	Ca > MQL?	<" Effluent Concentration Ce (ug/l)	Ce > MQL?	Instream Waste Concentration, Cd (ug/l) 2.13* Ce	100% 4Q3	F= 1 or less	MQL
Total Phenols (4AAP)	0	0	0	0	0	0	0	5
Aluminum (T)	3822	3822	70	70	149.1	149.1	149.1	100
Barium (T)	0	0	26	26	55.38	55.38	55.38	100

Boron (T)	0	0	0	0	0	0	0	100
Chlorine Residual (T)	0	0	0	0	0	0	0	100
Chlordane (T)	0	0	0	0	0	0	0	0.2
Cobalt (T)	2.6	2.6	0	0	0	0	0	50
Molybdenum (T)	0	0	2229	2229	4747.77	4747.77	4747.77	10
Nitrate (as N) (T) (mg/l)	0	0	140	140	298.2	298.2	298.2	0.1
Uranium (T)	0	0	0	0	0	0	0	
Radium-226+Radium 228 (pCi/l)	0	0	0.7	0.7	1.491	1.491	1.491	
Strontium-90 (pCi/l)	0	0	0	0	0	0	0	
Tritium (pCi/l)	0	0	0	0	0	0	0	
Gross Alpha (pCi/l)	0	0	31.7	31.7	67.521	67.521	67.521	
Vanadium	0	0	0	0	0	0	0	50
Antimony	0	0	2	2	4.26	4.26	4.26	60
Arsenic	0	0	1000	1000	2130	2130	2130	10
Beryllium	0	0	5	5	10.65	10.65	10.65	5
Cadmium	2	2	100	100	213	213	213	1
Chromium	0	0	10	10	21.3	21.3	21.3	10
Copper	3.5	3.5	300	300	639	639	639	10
Lead	0	0	600	600	1278	1278	1278	5
Mercury	0	0	0.23	0.23	0.4899	0.4899	0.4899	0.2
Nickel	12	12	10	10	21.3	21.3	21.3	5
Selenium	0	0	5	5	10.65	10.65	10.65	5
Selenium (SO4 >500 mg/l)	0	0	5	5	10.65	10.65	10.65	5
Silver	0	0	2	2	4.26	4.26	4.26	2
Thalllium	0	0	2	2	4.26	4.26	4.26	10
Zinc	146	146	200	200	426	426	426	20
Cyanide (Amenable to chlorination)	0	0	40	40	85.2	85.2	85.2	20
Cyanide (T)	0	0	40	40	85.2	85.2	85.2	20
Arsenic, dissolved	NO DATA	NO DATA	NO DATA	NO DATA	0	0	0	10
Chromium, dissolved	NO DATA	NO DATA	NO DATA	NO DATA	0	0	0	10
Copper, dissolved	NO DATA	NO DATA	NO DATA	NO DATA	0	0	0	10
Lead, dissolved	NO DATA	NO DATA	NO DATA	NO DATA	0	0	0	5
Nickel, dissolved	NO DATA	NO DATA	NO DATA	NO DATA	0	0	0	5
Zinc, dissolved	NO DATA	NO DATA	NO DATA	NO DATA	0	0	0	20
Total DDT and metabolites	NO DATA	NO DATA	NO DATA	NO DATA	0	0	0	
Total PCBs	NO DATA	NO DATA	NO DATA	NO DATA	0	0	0	
Chlorides (mg/l)	NO DATA	NO DATA	NO DATA	NO DATA	0	0	0	
Sulfate (mg/l)	NO DATA	NO DATA	NO DATA	NO DATA	0	0	0	
Total Dissolved Solids (mg/l)	NO DATA	NO DATA	NO DATA	NO DATA	0	0	0	

STEP 2: CALCULATE HARDNESS DEPENDENT CRITERIA

CONVERT DISSOLVED METALS TO TOTAL FORM

This step calculate hardness dependent criteria, then convert these criteria from dissolved form to total form

The following formular is used to convert dissolved metals criteria to total form

Kp = Kpo * (TSS**a) — Kp = Linear partition coefficient; Kpo and a can be found in table below
C/Ct = 1/ (1 + Kp*TSS* 1.0E-6) — TSS = Total suspended solids concentration found in receiving stream (or in effluent for intermittent stream)
Total Metal Criteria (Ct) = Cr / (C/Ct) — C/Ct = Fraction of metal dissolved; and Cr = Dissolved criteria value

	Stream Linear Partition Coefficient				Lake Linear Partition Coefficient			
Metals	Kpo	alpha (a)	Kp	C/Ct	Kpo	alpha (a)	Kp	C/Ct
Arsenic	480000	-0.73	480000	0.6756757	480000	-0.73	480000	0.6756757
Chromium	3360000	-0.93	3360000	0.2293578	2170000	-0.27	2170000	0.3154574
Copper	1040000	-0.74	1040000	0.4901961	2850000	-0.9	2850000	0.2597403
Lead	2800000	-0.8	2800000	0.2631579	2040000	-0.53	2040000	0.3289474
Nickel	490000	-0.57	490000	0.6711409	2210000	-0.76	2210000	0.3115265
Zinc	1250000	-0.7	1250000	0.4444444	3340000	-0.68	3340000	0.2304147
Silver	2400000	-1.03	2400000	0.2941176	2400000	-1.03	2400000	0.2941176

The following formular is used to calculate hardness dependent criteria

			Dissolved WQC (ug/l)	Total Stream WQC (ug/l)	Total Lake WQC (ug/l)
Cadmium (D)	Acute	e(1.128[ln(hardness)]-3.6867)*CF	2.0111195		
	Chronic	e(0.7852[ln(hardness)]-2.715)*CF	1.3400621		
Chromium (D)	Acute	e(0.819[ln(hardness)]+2.5736)	322.96593	1408.1315	1023.802
	Chronic	e(0.819[ln(hardness)]+0.534)	42.011645	183.17077	133.17691
Copper (D)	Acute	e(0.9422[ln(hardness)]-1.7408)	6.9943877	14.268551	26.928393
	Chronic	e(0.8545[ln(hardness)]-1.7428)	4.9531496	10.104425	19.069626
Lead (D)	Acute	e(1.273[ln(hardness)]-1.46)*CF	30.135914	114.51647	91.613177
	Chronic	e(1.273[ln(hardness)]-4.705)*CF	1.1743533	4.4625425	3.570034
Nickel (D)	Acute	e(0.846[ln(hardness)]+2.253)	260.49182	388.13281	836.17874
	Chronic	e(0.846[ln(hardness)]+0.0554)	28.932672	43.109681	92.873876
Zinc (D)	Acute	e(0.8473[ln(hardness)]+0.8618)	65.134678	146.55303	282.6845
	Chronic	e(0.8473[ln(hardness)]+0.8699)	65.664411	147.74493	284.98354
Silver (D)	Acute	e(1.72[ln(hardness)]-6.6825)	1.0472625	3.5606923	3.5606923

STEP 3: SCAN POTENTIAL INSTREAM WASTE CONCENTRATIONS AGAINST WATER QUALITY CRITERIA AND ESTABLISH EFFLUENT LIMITATIONS FOR ALL APPLICABLE PARAMETERS

No limits are established if the receiving stream is not designated for the particular uses.
No limits are established if the potential instream waste concentrations are less than the chronic water quality criteria.
The most applicable stringent criteria are used to establish effluent limitations for a given parameter.
Water quality criteria apply at the end-of-pipe for acute aquatic life criteria and discharges to public lakes.
If background concentration exceeds the water quality criteria, water quality criteria apply. And "Need TMDL" shown to the next column of Avg. Mass
Monthly avg concentration = daily max. / 1.5.

TABLE OF NM WATER QUALITY STANDARDS
* For selenium and mercury, standards for wildlife habitat replace standards for livestock watering. Refer NMWQS for chlorine residual standards for wildlife habitat.

STREAM CRITERIA PARAMETERS	Potential Conc. ug/l (2.13*Ce)	IWC, (ug/l) 100% 4Q3 (Cd)	IWC (ug/l) F=1 or less	Livestock/ Wildlife Cr. ug/l	Irrigation Criteria ug/l	Domestic Criteria ug/l	Acute Fish Criteria ug/l	Chronic Fish Criteria ug/l
Aluminum (T)	149.1	149.1	149.1	5000	5000	1.00E+100	750	87
Barium (T)	55.38	55.38	55.38	1.00E+100	1.00E+100	2000	1.00E+100	1.00E+100
Boron (T)	0	0	0	5000	750	1.00E+100	1.00E+100	1.00E+100
Chlorine Residual (T)	0	0	0	11	1.00E+100	1.00E+100	19	11
Chlordane (T)	0	0	0	1.00E+100	1.00E+100	1.00E+100	2.4	0.0043
Cobalt (T)	0	0	0	1000	50	1.00E+100	1.00E+100	1.00E+100
Molydenum (T)	4747.77	4747.77	4747.77	1.00E+100	1000	1.00E+100	1.00E+100	1.00E+100
Nitrate (as N) (T) (mg/l)	298.2	298.2	298.2	1.00E+100	1.00E+100	10	1.00E+100	1.00E+100
Uranium (T)	0	0	0	1.00E+100	1.00E+100	5000	1.00E+100	1.00E+100
Radium-226+Radium 228 (pCi/l)	1.491	1.491	1.491	30	1.00E+100	5	1.00E+100	1.00E+100
Strontium-90 (pCi/l)	0	0	0	1.00E+100	1.00E+100	8	1.00E+100	1.00E+100
Tritium (pCi/l)	0	0	0	20000	1.00E+100	20000	1.00E+100	1.00E+100
Gross Alpha (pCi/l)	67.521	67.521	67.521	15	1.00E+100	15	1.00E+100	1.00E+100
Vanadium	0	0	0	100	100	1.00E+100	1.00E+100	1.00E+100
Antimony	4.26	4.26	4.26	1.00E+100	1.00E+100	6	1.00E+100	1.00E+100
Arsenic (T)	2130	2130	2130	296	148	74	503.2	222
Beryllium	10.65	10.65	10.65	1.00E+100	1.00E+100	4	130	5.3
Cadmium	213	213	213	50	10	5	2.0111195	1.3400621
Chromium (T)	21.3	21.3	21.3	4360	436	436	1408.1315	183.17077
Copper (T)	639	639	639	1020	408	1.00E+100	14.268551	10.104425
Lead (T)	1278	1278	1278	380	19000	190	114.51647	4.4625425
Mercury	0.4899	0.4899	0.4899	0.77	1.00E+100	2	2.4	0.012
Nickel (T)	21.3	21.3	21.3	1.00E+100	1.00E+100	149	388.13281	43.109681
Selenium	10.65	10.65	10.65	5	130	50	20	5
Selenium (pres. of >500 mg/l SO4	10.65	10.65	10.65	1.00E+100	250	50	20	5

Silver	4.26	4.26	4.26	1.00E+100	1.00E+100	1.00E+100	3.5606923	1.00E+100
Thalllium	4.26	4.26	4.26	1.00E+100	1.00E+100	2	1.00E+100	1.00E+100
Zinc	426	426	426	56250	4500	1.00E+100	146.55303	147.74493
Cyanide (Amenable to chlorination)	85.2	85.2	85.2	5.2	1.00E+100	200	22	5.2
Cyanide (T)	85.2	85.2	85.2	5.2	1.00E+100	200	22	5.2
Arsenic, dissolved	0	0	0	200	100	50	340	150
Chromium, dissolved	0	0	0	1000	100	100	322.96593	42.011645
Copper, dissolved	0	0	0	500	200	1.00E+100	6.9943877	4.9531496
Lead, dissolved	0	0	0	100	5000	50	30.135914	1.1743533
Nickel, dissolved	0	0	0	1.00E+100	1.00E+100	100	260.49182	28.932672
Zinc, dissolved	0	0	0	25000	2000	1.00E+100	65.134678	65.664411
Silver, dissolved	4.26	4.26	4.26	1.00E+100	1.00E+100	1.00E+100	1.0472625	1.00E+100
Total DDT and metabolites	0	0	0	0.001	1.00E+100	1.00E+100	1.00E+100	1.00E+100
Total PCBs	0	0	0	0.014	1.00E+100	1.00E+100	1.00E+100	1.00E+100
Chlorides (mg/l)	0	0	0	1.00E+100	1.00E+100	1.00E+100	1.00E+100	1.00E+100
Sulfate (mg/l)	0	0	0	1.00E+100	1.00E+100	1.00E+100	1.00E+100	1.00E+100
Total Dissolved Solids (mg/l)	0	0	0	1.00E+100	1.00E+100	1.00E+100	1.00E+100	1.00E+100

APPLICABLE WATER QUALITY-BASED LIMITS

The following formular is used to calculate the allowable daily maximum effluent cincentration

Daily Max. Conc. = Cs + (Cs - Ca)(F*Qa/Qe)
Monthly Avg. Conc. = Daily Max. Conc. / 1.5

Where:
Cs = Applicable water quality standard
Ca = Ambient stream concentration
F = Fraction of stream allowed for mixing
Qe = Plant effluent flow
Qa = Criteria low flow (4Q3)

STREAM PARAMETERS	Livestock/ Wildlife Lim ug/l	Irrigation Limits ug/l	Domestic Limits ug/l	Acute Fish Limits ug/l	Chronic Fis Limits ug/l	Daily Max. ug/l	Daily Avg. ug/l	Max. Mass LBS/Day	Avg. Mass LBS/Day	Background Greater Than WQS
Aluminum (T)	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	
Barium (T)	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	
Boron (T)	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	
Chlorine Residual (T)	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	
Chlordane (T)	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	
Cobalt (T)	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	

Molydenum (T)	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Nitrate (as N) (T) (mg/l)	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Uranium (T)	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Radium-226+Radium 228 (pCi/l)	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Strontium-90 (pCi/l)	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Tritium (pCi/l)	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Gross Alpha (pCi/l)	15	No Limit	No Limit	No Limit	No Limit	15	10	0.580464	0.386976
Vanadium	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Antimony	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Arsenic	296	No Limit	No Limit	No Limit	No Limit	296	197.33333	11.45449	7.6363264
Beryllium	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Cadmium	50	No Limit	No Limit	No Limit	No Limit	50	33.333333	1.93488	1.28992
Chromium	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Copper	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Lead	380	No Limit	No Limit	No Limit	No Limit	380	253.33333	14.705088	9.803392
Mercury	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Nickel	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Selenium	5	No Limit	No Limit	No Limit	No Limit	5	3.3333333	0.193488	0.128992
Selenium (pres. of >500 mg/l SO4	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Silver	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Thalllium	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Zinc	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Cyanide (Amenable to chlorination)	5.2	No Limit	No Limit	No Limit	No Limit	5.2	3.4666667	0.2012275	0.1341517
Cyanide (T)	5.2	No Limit	No Limit	No Limit	No Limit	5.2	3.4666667	0.2012275	0.1341517
Arsenic, dissolved	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Chromium, dissolved	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Copper, dissolved	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Lead, dissolved	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Nickel, dissolved	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Zinc, dissolved	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Total DDT and metabolites	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Total PCBs	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Chlorides (mg/l)	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Sulfate (mg/l)	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Total Dissolved Solids (mg/l)	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit

CALCULATIONS OF NEW MEXICO WATER QUALITY-BASED EFFLUENT LIMITATIONS

Calculations Specifications: Lotus Smartsuite 97 1-2-3 Revised as 8/28/2000

Prepared By: Isaac Chen

STEP 1: REFERENCE IMPLEMENTATION PROCEDURES
INPUT FACILITY AND RECEIVING STREAM DATA
INPUT RECEIVING STREAM POLLUTANT BACKGROUND CONCENTRATION DATA
LIST SOURCE OF DATA INPUT
INPUT EFFLUENT DATA

IMPLEMENTATION PROCEDURES

The water quality standards for Interstate and Intrastate streams of the State of New Mexico are implemented in this fact sheet using procedures established in the "Implementation Guidance for State of New Mexico Standards for Interstate and Intrastate streams", February 23, 2000.

FACILTY	DATA INPUT	
Permittee	Permittee	
NPDES Permit No.	NM0000000	
Outfall No.(s)	1	
Plant Effluent Flow (MGD)	4.64	For industrial and federal facility, use the highest monthly average flow
Plant Effluent Flow (cfs)	7.192	for the past 24 months. For POTWs, use the design flow.

RECEIVING STREAM		DATA INPUT	
Receiving Stream Name		River	
Basin Name		Basin	
Waterbody Segment Code No.		Segment	
Is a publicly owned lake or reservoir (enter "1" if yes, "0" if no)		0	
Are acute aquatic life criteria considered (1= yes, 0=no)		0	
Are chronic aquatic life criteria considered (1= yes, 0=no)		0	
Are domestic water supply criteria considered (1= yes, 0=no)		0	
Are irrigation water supply criteria considered (1= yes, 0=no)		0	
Livestock watering and wildlife habitat criteria applied to all streams			
USGS Flow Station		USGS Stat.	
WQ Monitoring Station No.		NA	
Receiving Stream TSS (mg/l)		2	For intermittent stream, enter effluent TSS
Receiving Stream Hardness (mg/l as CaCOs)	RANGE: 0 - 400	50	For intermittent stream, enter effluent Hardness
Receiving Stream Critical Low Flow (4Q3) (cfs)		0	Enter "0" for intermittent stream and lake.
Avg. Water Temperature (C)		5	

pH (Avg)	7.72		
Fraction of stream allowed for mixing (F) (= 1, if stream morphology data is not available, or for intermittent stream, or pollutants have EPA human health criteria)	1	FQa=	0

SITE-SPECIFIC CRITERIA		
	Flow Limit (cfs)	100.000
	Chlorides (mg/l)	1.00E+100
	Sulfate (SO4) (mg/l)	1.00E+100
	Total Dissolved Solids	1.00E+100

DATA INPUT

Input pollutant geometric mean concentration as micro-gram per liter (ug/l or ppb) unless other unit is specified for the parameter. (Metals in "total" form)

Value below detection level which is smaller than the minimum quantification level will be counted as "0".
Value reported as "less than" but greater than MQL, the reported value is used.
Value below detection level and reported as "ND" will be counted as "0".

The following formular is used to calculate the Instream Waste Concentration (Cd)

Cd = [(F*Qa*Ca) + (Qe*2.13*Ce)] / (F*Qa + Qe)
Where:
Cd = Instream Waste Concentration
F = Fraction of stream allowed for mixing (see NM Implementation Guidance)
Ce = Reported concentration in effluent
Ca = Ambient stream concentration upstream of discharge
Qe = Plant effluent flow
Qa = Critical low flow of stream at discharge point expressed as the 4Q3

DATA SOURCES:

NPDES Application Form 2C dated 2/7/90.
Memo from Brian McGill to NPDES file dated 7/11/96
Letter from Brian McGill (Permittee) to Isaac Chen (EPA) dated 1/5/99, 1/6/99, and 1/19/99, respectively.
May enter "<" in column D or G if data was report as "less Than".

POLLUTANTS	<" Ambient Stream Conc. Ca (ug/l)	Ca > MQL?	<" Effluent Concentration Ce (ug/l)	Ce > MQL?	Instream Waste Concentration, Cd (ug/l) 2.13* Ce	100% 4Q3	F= 1 or less	MQL
Total Phenols (4AAP)	0	0	0	0	0	0	0	5
Aluminum (T)	3822	3822	70	70	149.1	149.1	149.1	100
Barium (T)	0	0	26	26	55.38	55.38	55.38	100

Boron (T)	0	0	0	0	0	0	0	100
Chlorine Residual (T)	0	0	0	0	0	0	0	100
Chlordane (T)	0	0	0	0	0	0	0	0.2
Cobalt (T)	2.6	2.6	0	0	0	0	0	50
Molybdenum (T)	0	0	2229	2229	4747.77	4747.77	4747.77	10
Nitrate (as N) (T) (mg/l)	0	0	140	140	298.2	298.2	298.2	0.1
Uranium (T)	0	0	0	0	0	0	0	
Radium-226+Radium 228 (pCi/l)	0	0	0.7	0.7	1.491	1.491	1.491	
Strontium-90 (pCi/l)	0	0	0	0	0	0	0	
Tritium (pCi/l)	0	0	0	0	0	0	0	
Gross Alpha (pCi/l)	0	0	31.7	31.7	67.521	67.521	67.521	
Vanadium	0	0	0	0	0	0	0	50
Antimony	0	0	2	2	4.26	4.26	4.26	60
Arsenic	0	0	1000	1000	2130	2130	2130	10
Beryllium	0	0	5	5	10.65	10.65	10.65	5
Cadmium	2	2	100	100	213	213	213	1
Chromium	0	0	10	10	21.3	21.3	21.3	10
Copper	3.5	3.5	300	300	639	639	639	10
Lead	0	0	600	600	1278	1278	1278	5
Mercury	0	0	0.23	0.23	0.4899	0.4899	0.4899	0.2
Nickel	12	12	10	10	21.3	21.3	21.3	5
Selenium	0	0	5	5	10.65	10.65	10.65	5
Selenium (SO4 >500 mg/l)	0	0	5	5	10.65	10.65	10.65	5
Silver	0	0	2	2	4.26	4.26	4.26	2
Thalllium	0	0	2	2	4.26	4.26	4.26	10
Zinc	146	146	200	200	426	426	426	20
Cyanide (Amenable to chlorination)	0	0	40	40	85.2	85.2	85.2	20
Cyanide (T)	0	0	40	40	85.2	85.2	85.2	20
Arsenic, dissolved	NO DATA	NO DATA	NO DATA	NO DATA	0	0	0	10
Chromium, dissolved	NO DATA	NO DATA	NO DATA	NO DATA	0	0	0	10
Copper, dissolved	NO DATA	NO DATA	NO DATA	NO DATA	0	0	0	10
Lead, dissolved	NO DATA	NO DATA	NO DATA	NO DATA	0	0	0	5
Nickel, dissolved	NO DATA	NO DATA	NO DATA	NO DATA	0	0	0	5
Zinc, dissolved	NO DATA	NO DATA	NO DATA	NO DATA	0	0	0	20
Total DDT and metabolites	NO DATA	NO DATA	NO DATA	NO DATA	0	0	0	
Total PCBs	NO DATA	NO DATA	NO DATA	NO DATA	0	0	0	
Chlorides (mg/l)	NO DATA	NO DATA	NO DATA	NO DATA	0	0	0	
Sulfate (mg/l)	NO DATA	NO DATA	NO DATA	NO DATA	0	0	0	
Total Dissolved Solids (mg/l)	NO DATA	NO DATA	NO DATA	NO DATA	0	0	0	

STEP 2: CALCULATE HARDNESS DEPENDENT CRITERIA

CONVERT DISSOLVED METALS TO TOTAL FORM

This step calculate hardness dependent criteria, then convert these criteria from dissolved form to total form

The following formular is used to convert dissolved metals criteria to total form

Kp = Kpo * (TSS**a) — Kp = Linear partition coefficient; Kpo and a can be found in table below
C/Ct = 1/ (1 + Kp*TSS* 1.0E-6) — TSS = Total suspended solids concentration found in receiving stream (or in effluent for intermittent stream)
Total Metal Criteria (Ct) = Cr / (C/Ct) — C/Ct = Fraction of metal dissolved; and Cr = Dissolved criteria value

	Stream Linear Partition Coefficient				Lake Linear Partition Coefficient			
Metals	Kpo	alpha (a)	Kp	C/Ct	Kpo	alpha (a)	Kp	C/Ct
Arsenic	480000	-0.73	289393.88	0.6333974	480000	-0.73	289393.88	0.6333974
Chromium	3360000	-0.93	1763524	0.2208945	2170000	-0.27	1799623.4	0.2174269
Copper	1040000	-0.74	622688.93	0.4453593	2850000	-0.9	1527277.2	0.2466362
Lead	2800000	-0.8	1608177.7	0.2371717	2040000	-0.53	1412811.7	0.2613953
Nickel	490000	-0.57	330072.23	0.6023572	2210000	-0.76	1304996.9	0.2770088
Zinc	1250000	-0.7	769465.26	0.3938666	3340000	-0.68	2084712	0.1934451
Silver	2400000	-1.03	1175304.4	0.2984532	2400000	-1.03	1175304.4	0.2984532

The following formular is used to calculate hardness dependent criteria

			Dissolved WQC (ug/l)	Total Stream WQC (ug/l)	Total Lake WQC (ug/l)
Cadmium (D)	Acute	e(1.128[ln(hardness)]-3.6867)*CF	2.0111195		
	Chronic	e(0.7852[ln(hardness)]-2.715)*CF	1.3400621		
Chromium (D)	Acute	e(0.819[ln(hardness)]+2.5736)	322.96593	1462.0823	1485.4
	Chronic	e(0.819[ln(hardness)]+0.534)	42.011645	190.18874	193.22192
Copper (D)	Acute	e(0.9422[ln(hardness)]-1.7408)	6.9943877	15.705043	28.359125
	Chronic	e(0.8545[ln(hardness)]-1.7428)	4.9531496	11.121692	20.082814
Lead (D)	Acute	e(1.273[ln(hardness)]-1.46)*CF	30.135914	127.06372	115.28865
	Chronic	e(1.273[ln(hardness)]-4.705)*CF	1.1743533	4.9514908	4.4926333
Nickel (D)	Acute	e(0.846[ln(hardness)]+2.253)	260.49182	432.45405	940.37385
	Chronic	e(0.846[ln(hardness)]+0.0554)	28.932672	48.032414	104.44676
Zinc (D)	Acute	e(0.8473[ln(hardness)]+0.8618)	65.134678	165.37242	336.70877
	Chronic	e(0.8473[ln(hardness)]+0.8699)	65.664411	166.71738	339.44719
Silver (D)	Acute	e(1.72[ln(hardness)]-6.6825)	1.0472625	3.5089667	3.5089667

STEP 3: SCAN POTENTIAL INSTREAM WASTE CONCENTRATIONS AGAINST WATER QUALITY CRITERIA AND ESTABLISH EFFLUENT LIMITATIONS FOR ALL APPLICABLE PARAMETERS

No limits are established if the receiving stream is not designated for the particular uses.
No limits are established if the potential instream waste concentrations are less than the chronic water quality criteria.
The most applicable stringent criteria are used to establish effluent limitations for a given parameter.
Water quality criteria apply at the end-of-pipe for acute aquatic life criteria and discharges to public lakes.
If background concentration exceeds the water quality criteria, water quality criteria apply. And "Need TMDL" shown to the next column of Avg. Mass
Monthly avg concentration = daily max. / 1.5.

TABLE OF NM WATER QUALITY STANDARDS
* For selenium and mercury, standards for wildlife habitat replace standards for livestock watering. Refer NMWQS for chlorine residual standards for wildlife habitat.

STREAM CRITERIA PARAMETERS	Potential Conc. ug/l (2.13*Ce)	IWC, (ug/l) 100% 4Q3 (Cd)	IWC (ug/l) F=1 or less	Livestock/ Wildlife Cr. ug/l	Irrigation Criteria ug/l	Domestic Criteria ug/l	Acute Fish Criteria ug/l	Chronic Fish Criteria ug/l
Aluminum (T)	149.1	149.1	149.1	5000	5000	1.00E+100	750	87
Barium (T)	55.38	55.38	55.38	1.00E+100	1.00E+100	2000	1.00E+100	1.00E+100
Boron (T)	0	0	0	5000	750	1.00E+100	1.00E+100	1.00E+100
Chlorine Residual (T)	0	0	0	11	1.00E+100	1.00E+100	19	11
Chlordane (T)	0	0	0	1.00E+100	1.00E+100	1.00E+100	2.4	0.0043
Cobalt (T)	0	0	0	1000	50	1.00E+100	1.00E+100	1.00E+100
Molydenum (T)	4747.77	4747.77	4747.77	1.00E+100	1000	1.00E+100	1.00E+100	1.00E+100
Nitrate (as N) (T) (mg/l)	298.2	298.2	298.2	1.00E+100	1.00E+100	10	1.00E+100	1.00E+100
Uranium (T)	0	0	0	1.00E+100	1.00E+100	5000	1.00E+100	1.00E+100
Radium-226+Radium 228 (pCi/l)	1.491	1.491	1.491	30	1.00E+100	5	1.00E+100	1.00E+100
Strontium-90 (pCi/l)	0	0	0	1.00E+100	1.00E+100	8	1.00E+100	1.00E+100
Tritium (pCi/l)	0	0	0	20000	1.00E+100	20000	1.00E+100	1.00E+100
Gross Alpha (pCi/l)	67.521	67.521	67.521	15	1.00E+100	15	1.00E+100	1.00E+100
Vanadium	0	0	0	100	100	1.00E+100	1.00E+100	1.00E+100
Antimony	4.26	4.26	4.26	1.00E+100	1.00E+100	6	1.00E+100	1.00E+100
Arsenic (T)	2130	2130	2130	315.75755	157.87878	78.939388	536.78784	236.81816
Beryllium	10.65	10.65	10.65	1.00E+100	1.00E+100	4	130	5.3
Cadmium	213	213	213	50	10	5	2.0111195	1.3400621
Chromium (T)	21.3	21.3	21.3	4527.0481	452.70481	452.70481	1462.0823	190.18874
Copper (T)	639	639	639	1122.6889	449.07557	1.00E+100	15.705043	11.121692
Lead (T)	1278	1278	1278	421.63554	21081.777	210.81777	127.06372	4.9514908
Mercury	0.4899	0.4899	0.4899	0.77	1.00E+100	2	2.4	0.012
Nickel (T)	21.3	21.3	21.3	1.00E+100	1.00E+100	166.01445	432.45405	48.032414
Selenium	10.65	10.65	10.65	5	130	50	20	5
Selenium (pres. of >500 mg/l SO4	10.65	10.65	10.65	1.00E+100	250	50	20	5

Silver	4.26	4.26	4.26	1.00E+100	1.00E+100	1.00E+100	3.5089667	1.00E+100
Thalllium	4.26	4.26	4.26	1.00E+100	1.00E+100	2	1.00E+100	1.00E+100
Zinc	426	426	426	63473.263	5077.861	1.00E+100	165.37242	166.71738
Cyanide (Amenable to chlorination)	85.2	85.2	85.2	5.2	1.00E+100	200	22	5.2
Cyanide (T)	85.2	85.2	85.2	5.2	1.00E+100	200	22	5.2
Arsenic, dissolved	0	0	0	200	100	50	340	150
Chromium, dissolved	0	0	0	1000	100	100	322.96593	42.011645
Copper, dissolved	0	0	0	500	200	1.00E+100	6.9943877	4.9531496
Lead, dissolved	0	0	0	100	5000	50	30.135914	1.1743533
Nickel, dissolved	0	0	0	1.00E+100	1.00E+100	100	260.49182	28.932672
Zinc, dissolved	0	0	0	25000	2000	1.00E+100	65.134678	65.664411
Silver, dissolved	4.26	4.26	4.26	1.00E+100	1.00E+100	1.00E+100	1.0472625	1.00E+100
Total DDT and metabolites	0	0	0	0.001	1.00E+100	1.00E+100	1.00E+100	1.00E+100
Total PCBs	0	0	0	0.014	1.00E+100	1.00E+100	1.00E+100	1.00E+100
Chlorides (mg/l)	0	0	0	1.00E+100	1.00E+100	1.00E+100	1.00E+100	1.00E+100
Sulfate (mg/l)	0	0	0	1.00E+100	1.00E+100	1.00E+100	1.00E+100	1.00E+100
Total Dissolved Solids (mg/l)	0	0	0	1.00E+100	1.00E+100	1.00E+100	1.00E+100	1.00E+100

APPLICABLE WATER QUALITY-BASED LIMITS

The following formular is used to calculate the allowable daily maximum effluent cincentration

Daily Max. Conc. = Cs + (Cs - Ca)(F*Qa/Qe)
Monthly Avg. Conc. = Daily Max. Conc. / 1.5

Where:
Cs = Applicable water quality standard
Ca = Ambient stream concentration
F = Fraction of stream allowed for mixing
Qe = Plant effluent flow
Qa = Criteria low flow (4Q3)

STREAM PARAMETERS	Livestock/ Wildlife Lim ug/l	Irrigation Limits ug/l	Domestic Limits ug/l	Acute Fish Limits ug/l	Chronic Fis Limits ug/l	Daily Max. ug/l	Daily Avg. ug/l	Max. Mass LBS/Day	Avg. Mass LBS/Day	Background Greater Than WQS
Aluminum (T)	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	
Barium (T)	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	
Boron (T)	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	
Chlorine Residual (T)	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	
Chlordane (T)	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	
Cobalt (T)	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	

Molydenum (T)	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Nitrate (as N) (T) (mg/l)	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Uranium (T)	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Radium-226+Radium 228 (pCi/l)	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Strontium-90 (pCi/l)	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Tritium (pCi/l)	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Gross Alpha (pCi/l)	15	No Limit	No Limit	No Limit	No Limit	15	10	0.580464	0.386976
Vanadium	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Antimony	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Arsenic	315.75755	No Limit	No Limit	No Limit	No Limit	315.75755	210.50503	12.219059	8.1460396
Beryllium	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Cadmium	50	No Limit	No Limit	No Limit	No Limit	50	33.333333	1.93488	1.28992
Chromium	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Copper	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Lead	421.63554	No Limit	No Limit	No Limit	No Limit	421.63554	281.09036	16.316283	10.877522
Mercury	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Nickel	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Selenium	5	No Limit	No Limit	No Limit	No Limit	5	3.3333333	0.193488	0.128992
Selenium (pres. of >500 mg/l SO4	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Silver	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Thalllium	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Zinc	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Cyanide (Amenable to chlorination)	5.2	No Limit	No Limit	No Limit	No Limit	5.2	3.4666667	0.2012275	0.1341517
Cyanide (T)	5.2	No Limit	No Limit	No Limit	No Limit	5.2	3.4666667	0.2012275	0.1341517
Arsenic, dissolved	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Chromium, dissolved	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Copper, dissolved	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Lead, dissolved	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Nickel, dissolved	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Zinc, dissolved	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Total DDT and metabolites	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Total PCBs	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Chlorides (mg/l)	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Sulfate (mg/l)	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit
Total Dissolved Solids (mg/l)	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit

Economic analysis of a treatment technology consists of two parts, a comparison of the quantity of pollutants removed by the technology versus the cost of the treatment system and its operation (cost effectiveness), and a comparison of the cost of treatment versus long-run and short-run financial measures.

Cost Effectiveness Analysis

The cost effectiveness of the Best Available Treatment technology of zero discharge from the five seeps located at the mine site was calculated using the following ratio:

Cost Effectiveness = Total Annualized Treatment Cost / Pound Equivalents Removed

The calculated cost effectiveness is then compared with the cost effectiveness for treatment technologies for other industries to determine if it is within the range of costs which have generally been applied. The cost effectiveness for the BAT of zero discharge from the seeps at the mine was calculated as follows:

Calculation of Seep Discharge Loadings

Pollutant	Conc. (mg/l) *	Total Annual ** Pounds Removed	TWF ***	Total Annual Pound Equivalents Removed	SRK Table 1.6 kg/l
pH (S.U.)	3.09				
Sulfate	4395	7,706,595			5885 from mine area
Aluminum	471	611,560	0.064	39,140	38.55 + 42.05
Cadmium	0.14	182	2.6	473	
Cobalt	1.238	1,607	0.11	177	
Chromium	0.162	210	0.076	16	
Copper	3.89	5,051	0.63	3,182	4.8
Iron	230	298,639	0.0056	1,672	440.28
Molybdenum	0.099	129	0.2	26	
Manganese	210	272,670	0.07	19,087	40.83
Nickel	2.54	330	0.11	36	
Lead	0.184	239	2.2	526	
Zinc	36	46,743	0.047	2,197	9.13
Flows in one single TDS					45.58
	Total	8,943,955		66,532	7685

* SRK 1995

** Annual pounds discharged = Conc. (mg/l) * 8.34 * 0.4265 MGD

*** Toxic Weighting Factors

Treatment Technology Cost

Methods proposed to be implemented to capture Molycorp's seeps and prevent their

Cynthia Fanning

12/12/00 01:08 PM

To: Brenda Cook/R6/USEPA/US@EPA, Charles Gazda/R6/USEPA/US@EPA, Clovis Steib/R6/USEPA/US@EPA, Jane Watson/R6/USEPA/US@EPA, Jerry Clifford/R6/USEPA/US@EPA, Js Wilson/R6/USEPA/US@EPA, Kathleen Aisling/R6/USEPA/US@EPA, Michael Boydston/R6/USEPA/US@EPA, Myron Knudson/R6/USEPA/US@EPA, Susan Webster/R6/USEPA/US@EPA, David Bary/R6/USEPA/US@EPA

cc:

Subject: Cooperation, at last, for cleaning Red River

OPINION

Cooperation, at last, for cleaning Red River

12/09/2000
The Santa Fe New Mexican
Page A-9
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For years, Molycorp has denied that its Questa mine pollutes the Red River; it's just a coincidence, insisted the bosses, that the river below the mountaintop molybdenum mine went all murky, its bottom so crusty that insects couldn't breed there and serve as fish food.

Northern New Mexico environmentalists, however, insisted that the mine was poisoning the river. They've been in court for years, trying to stop Molycorp from allowing its chemicals to seep into the river - - and trying to force the federal Environmental Protection Agency to act on behalf of the stream.

Amigos Bravos, the Taos environmental group leading the charge, won a major victory earlier this year: Molycorp, facing the strong possibility that the EPA would declare the mine a Superfund cleanup site -- one facing a cleanup under federal supervision, with the mine company footing the bill -- agreed to post a $129 million cleanup bond with the New Mexico Environment Department.

Now the EPA has acted: It has ordered Molycorp to cease discharging 7,000 tons of tailings contaminants into the river every year.

That's just what Amigos Bravos have been trying to accomplish on behalf of their fellow New Mexicans -- and they deserve vast amounts of applause for their tenacity.

Molycorp, too, comes in for some credit. The company has new leadership, including executives who recognize that the old days of digging up minerals without regard for the Earth are fast fading.

The company has agreed to dig a water-collecting and treatment system; a project which, says vice president David Shoemaker, will improve water quality "very definitely."

This, from a company so long in denial, is a refreshing assumption of responsibility, albeit under duress. And from the feds, it's fresh evidence of commitment to environmental laws. From both, it's an encouraging sign of cooperation.

MANGANESE

- View Chemical Information
- View Environmental Data
- View Freundlich Isotherm Data
- View Aqueous Technology Data
- View Solid Technology Data

MANGANESE

CAS Number : 7439-96-5
Formula: MN
Alternate Name:
MN

Compound Group: INORGANIC ELEMENT

CHEMICAL AND PHYSICAL PROPERTIES		Reference
Molecular Weight:	54.94	333A
Melting Point (C):	1244	333A
Boiling Point (C):	1962	333A
Vapor Pressure @ T(C), Torr:	1 @ 1292	333A
Solubility in Water @ T(C), mg/L:	HYDROLYZES	2028A
Log octanol/Water Partition Coefficient:		
Henry's Law Constant, atm x m3 mole-2:		

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Enviromental Data for MANGANESE

Chronic Noncarcinogenic Systemic Toxicity:	
Risk Estimates for Carcinogens:	
Drinking Water Health Advisories/Standards:	
Water Quality Criteria:	345B
Quatic Toxicity Database:	

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Freundlich Isotherm Data for MANGANESE

* No Frundlich Isotherm data on file *

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Aqueous Technology Data for MANGANESE

Technology	Influent Concentration	Source Matrix	Scale	Effluent Concentration	Percent Removal	Reference
AS	0-100 ug/L	D --- NA	F37	28 (6) ug/L	39	1B-S-
TF	0-100 ug/L	D --- NA	F10	90 (6) ug/L	8	1B-S-

AS	0-100 ug/	D --- NA	F10	95 (6) ug/L	3	1B-S-
RBC	0-100 ug/L	D --- NA	F33	39 (6) ug/L	11	1B-S-
AS	0-100 ug/L	D --- NA	F37	28 (6) ug/L	39	1B-S-
TF	0-100 ug/L	D --- NA	F3	70 (3) ug/L	12	35E-S-
AS	0-100 ug/L	D --- NA	F4	90 (3) ug/L	10	35E-S-
AS	0-100 ug/L	D --- NA	F9	30 (1) ug/L	0	35E-S-
AS	0-100 ug/L	D --- NA	F7	20 (2) ug/L	0	35E-S-
RO	0-100 ug/L	I --- 28	P11	10 (1) ug/L	80	20B---
RO	0-100 ug/L	D --- NA	P1	4.5 (35) ug/L	89	18B---
GAC	0-100 ug/L	SF --- NA	F5	83 (5) ug/L	1	245B---
ChPt	0-100 ug/L	D --- NA	F1	1.5 (33) ug/L	95.5	1682B---
Fil	0-100 ug/L	SF --- NA	F5	84 (5) ug/L	1	245B---
RO	0-100 ug/L	I --- 20	P7	20 (5) ug/L	60	20B---
RO	0-100 ug/L	I --- 20	P6	<10 (3) ug/L	>83	20B---
Fil	0-100 ug/L	SF --- NA	F6	42 (5) ug/L	7	245B---
AS	0-100 ug/L	D --- NA	F1	40 (30) ug/L	0	35E-S-
AS	0-100 ug/L	I --- 31	F6	<6 (1) ug/L	>67	31B---
Fil	0-100 ug/L	D --- NA	F	41 ug/L	18	59E---
AS	0-100 ug/L	D --- NA	F8	100 (2) ug/L	0	35E-S-
AS	0-100 ug/L	D --- NA	F4	35 (1) ug/L	20	31B---
AS	0-100 ug/L	D --- NA	F	50 ug/L	25	59E---
SS	0-100 ug/L	I --- 28	F33	75 (3) ug/L	4	87B---
SS	0-100 ug/L	I --- 28	F22	44 (2) ug/L	0	87B---
AL	0-100 ug/L	D --- NA	F	17 (36) ug/L	18	54E---
Sed	0-100 ug/L	D --- NA	F9	30 (1) ug/L	0	35E-S-
Sed	0-100 ug/L	D --- NA	F7	20 (2) ug/L	33	35E-S-
ChPt	0-100 ug/L	D --- NA	F2	2.6 (9) ug/L	91.0	1682B---
AS	0-100 ug/L	D --- NA	F10	30 (1) ug/L	25	255B-S-
Sed	0-100 ug/L	D --- NA	F8	100 (1) ug/L	0	255B-S-
Sed	0-100 ug/L	D --- NA	F7	10 (1) ug/L	88	255B-S-
RO	0-100 ug/L	GW --- NA	F	12 ug/L	87	185A--$
AS	0-100 ug/L	I --- 28	F21	41 (3) ug/L	36	87B---
AS	0-100 ug/L	I --- 28	F23	70 (3) ug/L	24	87B---
SS	0-100 ug/L	I --- 28	F7	32 (3) ug/L	24	87B---
GAC	0-100 ug/L	I --- 28	F9	65 (2) ug/L	0	87B---
CAC	0-100 ug/L	W --- NA	P	1.6 (10) ug/L	87	38D---
GAC	0-100 ug/L	I --- 28	F15	66 (3) ug/L	29	87B---
SExt (B)	0-100 ug/L	I --- 28	F32	100 (2) ug/L	0	87B---
RA	0-100 ug/L	I --- 28	F3	46 (1) ug/L	36	87B---
SS	0-100 ug/L	I --- 28	F12	57 (3) ug/L	0	87B---
ChOx(Cl)	0-100 ug/L	I --- 28	F26	61 (3) ug/L	0	87B---
SS+GAC	0-100 ug/L	I --- 28	F27	68 (3) ug/L	0	87B---

ChOx(Cl)	0-100 ug/	I --- 28	F34	63 (3) ug/L	16	87B---
AS	0-100 ug/L	D --- NA	F16	50 (1) ug/L	0	255B-S-
AL	0-100 ug/L	D --- NA	F2	<10 (1) ug/L	>67	255B-S-
Sed	0-100 ug/L	D --- NA	F1	40 (30) ug/L	33	35E-S-
RO	0-100 ug/L	I --- 28	P9	<10 (2) ug/L	>90.0	20B---
ChPt	0-100 ug/L	D --- NA	F	2.4 (107) ug/L	93.1	1830B---
Sed	0-100 ug/L	D --- NA	F3	80 (3) ug/L	20	35E-S-
IE	>100-1000 ug/L	GW --- NA	P	<30 ug/L	>94.0	812E---
AS	>100-1000 ug/L	D --- NA	F4	180 (6) ug/L	71	1B-S-
TF	>100-1000 ug/L	D --- NA	F17	110 (6) ug/L	15	1B-S-
RO	>100-1000 ug/L	I --- 47	F5	40 ug/L	88	250B---
AS	>100-1000 ug/L	D --- NA	F6	120 (2) ug/L	25	35E-S-
Sed	>100-1000 ug/L	I --- 31	F8	140 (1) ug/L	75	31B---
AL+AS	>100-1000 ug/L	I --- 31	F8	30 (1) ug/L	78	31B---
Sed	>100-1000 ug/L	D --- NA	F6	160 (2) ug/L	68	35E-S-
AS	>100-1000 ug/L	I --- 31	F2	190 (1) ug/L	0	31B---
Sed	>100-1000 ug/L	D --- NA	F2	150 (4) ug/L	42	35E-S-
AS	>100-1000 ug/L	D --- NA	F2	110 (4) ug/L	27	35E-S-
PACT	>100-1000 ug/L	I --- 31	F1	32 (1) ug/L	72	31B---
API	>100-1000 ug/L	SF --- NA	F3	700 (1) ug/L	0	245B---
Fil	>100-1000 ug/L	SF --- NA	F3	810 (1) ug/L	4	245B---
AirS	>100-1000 ug/L	SF --- NA	F6	220 (5) ug/L	0	245B---
AS	>100-1000 ug/L	I --- 28	F25	33 (3) ug/L	75	87B---
ChPtwChOx(Cl)	>100-1000 ug/L	I --- 10	P2	100 ug/L	90.0	139E---
AS	>100-1000 ug/L	I --- 28	F31	74 (3) ug/L	37	87B---
SExt	>100-1000 ug/L	I --- 28	F8	100 (3) ug/L	3	87B---
GAC	>100-1000 ug/L	I --- 28	F10	610 (3) ug/L	0	87B---
GAC	>100-1000 ug/L	I --- 28	F4	280 (2) ug/L	0	87B---
RA	>100-1000 ug/L	I --- 28	F4	190 (2) ug/L	13	87B---
AS	>100-1000 ug/L	I --- 28	F5	620 (3) ug/L	0	87B---
GAC	>100-1000 ug/L	I --- 28	F5	690 (3) ug/L	0	87B---
GAC	>100-1000 ug/L	I --- 28	F14	<12 (3) ug/L	>89	87B---
AS	>100-1000 ug/L	I --- 28	F13	150 (2) ug/L	57	87B---
ChPt	>100-1000 ug/L	SF --- NA	B	5 (1) ug/L	97.4	91E---
GAC	>100-1000 ug/L	SF --- NA	B6	240 (2) ug/L	15	1927B---
AS	>100-1000 ug/L	D --- NA	F19	20 (1) ug/L	93.3	255B-S-
AS	>100-1000 ug/L	D --- NA	F18	80 (1) ug/L	47	255B-S-
AS	>100-1000 ug/L	D --- NA	F15	50 (1) ug/L	76	255B-S-
AS	>100-1000 ug/L	D --- NA	F12	40 (1) ug/L	73	255B-S-
ChPt (B)	>100-1000 ug/L	SF --- NA	B5	310 (1) ug/L	45	1927B---
DAF (B)	>100-1000 ug/L	SF --- NA	B4	420 (2) ug/L	60	1927B---
CAC (B)	>100-1000 ug/L	SF --- NA	B2	400 (1) ug/L	56	1927B---

Sed (B)	>100-100[illegible]	SF --- NA	B1	730 (1) ug/[illegible]	20	1927B---
Sed	>100-1000 ug/L	D --- NA	F6	130 (1) ug/L	0	255B-S-
ChPtwCAC (B)	>100-1000 ug/L	ML --- NA	P	10 (1) ug/L	98.4	175A---
AL	>100-1000 ug/L	D --- NA	F	270 (12) ug/L	0	132D-S-
AlkHyd	>100-1000 ug/L	I --- 28	F24	140 (3) ug/L	0	87B---
AL+Fil	>100-1000 ug/L	I --- 28	F29	180 (3) ug/L	17	87B---
Sed+AS	>100-1000 ug/L	I --- 28	F28	220 (3) ug/L	4	87B---
AL	>100-1000 ug/L	I --- 28	F11	160 (3) ug/L	72	87B---
Fil	>100-1000 ug/L	I --- 28	F16	93 (3) ug/L	22	87B---
AS	>100-1000 ug/L	D --- NA	F20	100 (1) ug/L	90	255B-S-
AS	>100-1000 ug/L	I --- 28	F30	200 (3) ug/L	0	87B---
SS	>100-1000 ug/L	I --- 28	F6	130 (3) ug/L	0	87B---
GAC	>100-1000 ug/L	I --- 28	F3	72 (1) ug/L	49	87B---
AS	>100-1000 ug/L	I --- 28	F17	360 (3) ug/L	19	87B---
ChOx(Cl) (B)	>100-1000 ug/L	I --- 28	F18	110 (3) ug/L	0	87B---
CAC	>100-1000 ug/L	I --- 31	F6	18 (1) ug/L	88	31B---
RBC	>100-1000 ug/L	I --- 31	F7	610 (1) ug/L	9	31B---
CAC	>100-1000 ug/L	D --- NA	F4	44 (1) ug/L	63	31B---
AS	>100-1000 ug/L	I --- 31	F5	60 (1) ug/L	82	31B---
ChPt	>100-1000 ug/L	D --- NA	P	20 ug/L	87	47B---
GAC	>100-1000 ug/L	I --- 28	F1	160 (1) ug/L	44	87B---
PACT	>100-1000 ug/L	I --- 28	F8	500 (1) ug/L	14	32B---
AS	>100-1000 ug/L	D --- NA	P	400 (14) ug/L	38	16A-S-
AirS	>100-1000 ug/L	SF --- NA	F4	110 (5) ug/L	13	245B---
CAC (B)	>100-1000 ug/L	I --- 49	B2	60 (1) ug/L	84	638B---
CAC	>100-1000 ug/L	I --- 28	F	320 ug/L	38	393A---
AS	>100-1000 ug/L	D --- NA	F17	100 (6) ug/L	23	1B-S-
AS	>100-1000 ug/L	D --- NA	F57	180 (6) ug/L	42	1B-S-
AL	>100-1000 ug/L	D --- NA	F55	420 (6) ug/L	31	1B-S-
GAC	>100-1000 ug/L	SF --- NA	F3	670 (1) ug/L	16	245B---
RO	>100-1000 ug/L	I --- 26	P3	<10 (2) ug/L	>94.4	20B---
GAC	>100-1000 ug/L	HL --- NA	F1	860 (1) ug/L	0	245B---
CAC	>100-1000 ug/L	I --- 28	F8	580 (1) ug/L	20	32B---
RO	>100-1000 ug/L	I --- 26	P2	<10 (3) ug/L	>93.3	20B---
CAC	>100-1000 ug/L	I --- 31	F2	150 (1) ug/L	22	31B---
GAC	>100-1000 ug/L	SF --- NA	F4	160 (5) ug/L	0	245B---
CAC	>100-1000 ug/L	I --- 31	F1	110 (1) ug/L	39	31B---
DAF	>100-1000 ug/L	SF --- NA	F3	850 (1) ug/L	0	245B---
AS	>100-1000 ug/L	D --- NA	F10	70 (3) ug/L	58	35E-S-
ED	>100-1000 ug/L	I --- 26	P4	20 (5) ug/L	88	20B---
Sed	>100-1000 ug/L	D --- NA	F8	100 (2) ug/L	9	35E-S-
AS	>100-1000 ug/L	SF --- NA	F6	30 (5) ug/L	86	245B---
AS	>100-1000 ug/L	D --- NA	F	200 (35) ug/L	31	201B-S-

AS	>1-10 mg	D --- NA	F60	100 (6) mg	91.7	1B-S-
GAC	>1-10 mg/L	SF --- NA	F2	1,500 (1) mg/L	40	245B---
RA (B) + Fil	>1-10 mg/L	I --- 28	F20	740 (1) mg/L	78	87B---
ChPtwPAC+Fil	>1-10 mg/L	ML --- NA	P6	270 (1) mg/L	89.6	265D---
ChPtwPAC+Fil	>1-10 mg/L	ML --- NA	P5	270 (1) mg/L	94.5	265D---
ChPtwPAC+Fil	>1-10 mg/L	ML --- NA	B1	20 (1) mg/L	99.64	265D---
ChPtwPAC+Fil	>1-10 mg/L	RCRA --- NA	P4	220 (1) mg/L	88	265D---
ChPtwPAC+Fil	>1-10 mg/L	RCRA --- NA	P3	230 (1) mg/L	87	265D---
ChPtwPAC+Fil	>1-10 mg/L	RCRA --- NA	P2	<100 (1) mg/L	>94.7	265D---
ChPtwPAC+Fil	>1-10 mg/L	RCRA --- NA	P1	<100 (1) mg/L	>95.4	265D---
AS	>1-10 mg/L	I --- 99	B	690 (4) mg/L	76	268A-S-
Sed	>1-10 mg/L	I --- 49	F1	80 mg/L	96.8	638B---
GAC	>1-10 mg/L	GW --- NA	F2	3500 (1) mg/L	10	87B---
AL	>1-10 mg/L	GW --- NA	F2	6800 (3) mg/L	12	87B---
AnFFwGAC	>1-10 mg/L	HL --- NA	P1	1,700 mg/L	15	154B---
ChPtwChOx(Cl)	>1-10 mg/L	I --- 10	P2	1000 mg/L	84	139E---
IE	>1-10 mg/L	I --- 10	P2	6200 mg/L	3	139E---
AnFFwGAC	>1-10 mg/L	HL --- NA	P2	600 mg/L	80	154B---
ChPt (B) + Fil	>1-10 mg/L	I --- 28	F19	3400 (1) mg/L	23	87B---
AnFF	>1-10 mg/L	I --- 10	B	1,400 (5) mg/L	52	45E---
CAC	>1-10 mg/L	I --- 31	F7	1,400 (1) mg/L	0	31B---
Sed	>1-10 mg/L	D --- NA	F5	2,000 (2) mg/L	46	35E-S-
AS	>1-10 mg/L	D --- NA	F5	220 (2) mg/L	89	35E-S-
AS	>1-10 mg/L	D --- NA	F3	5,000 (1) mg/L	18	31B---
AL	>1-10 mg/L	I --- 31	F7	670 (1) mg/L	52	31B---
RO	>1-10 mg/L	D --- NA	P3	690 (7) mg/L	85	18B---
ChPt	>1-10 mg/L	SF --- NA	F6	45 (5) mg/L	99.17	245B---
RO	>1-10 mg/L	D --- NA	P4	1,800 (8) mg/L	80	18B---
RO	>1-10 mg/L	D --- NA	P2	140 (4) mg/L	86	18B---
GAC	>1-10 mg/L	SF --- NA	F8	1,900 (5) mg/L	0	245B---
Fil	>1-10 mg/L	SF --- NA	F8	2,300 (5) mg/L	2	245B---
Fil	>1-10 mg/L	SF --- NA	F2	4,700 (1) mg/L	2	245B---
ChPt (B)	>10-100 mg/L	GW --- NA	B	<50 mg/L	>99.81	1313E---
CAC (B)	>10-100 mg/L	I --- 49	B1	1,600 (1) mg/L	92.4	638B---
ChPt+Fil (B)	>10-100 mg/L	I --- 10	B2	7,400 (1) mg/L	85	66B---
ChPt (B)	>10-100 mg/L	SF --- NA	B	<100 (1) mg/L	>99.89	182A---
ChPtwPAC+Fil	>10-100 mg/L	HL --- NA	P7	4200 (1) mg/L	95.1	265D---
ChPt (B)	>10-100 mg/L	ML --- NA	B2	200 (1) mg/L	99.66	258D---
ChPt+Fil	>10-100 mg/L	I --- 49	F	100 mg/L	99.50	194E---

ChPt (B)	>10-100 m	ML --- NA	B1	54000 (1) m	26	258D---
ChPt+Fil (B)	>10-100 mg/L	I --- 10	B	100 (1) mg/L	99.67	176E---
AnFF	>10-100 mg/L	S --- NA	P1	1,900 (1) mg/L	91.1	149B-S-
Sed	>10-100 mg/L	D --- NA	F3	6,100 (1) mg/L	90.0	31B---
ChPt	>100-1000 mg/L	SF --- NA	F2	4.8 (1) mg/L	97.6	245B---
ChPt+Fil (B)	>100-1000 mg/L	I --- 10	B1	97 (1) mg/L	39	66B---
ChPt	>100-1000 mg/L	SF --- NA	F8	2.4 (5) mg/L	99.11	245B---

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Solid Technology Data for MANGANESE

Matrix	Technology	Concentration Before	Concentration After	% improvement	Scale	Reference	Analytical Method	Operation Paramete
SED	SE	240 mg/kg	220 (1) mg/kg	8	B1(B)	1976D$	TCA	TEA, 3 s
SED	SE	240 mg/kg	210 (1) mg/kg	12	B2(B)	1976D$	TCA	TEA, 3 s
SLUDGE	SE	20 mg/L	500 (1) ug/L	97.5	B1(B)	1922E$	TCA	10% MD
SLUDGE	SE	24 mg/L	3.6 (1) mg/L	85	B5(B)	1922E$	TCA	10% DE
SLUDGE	SE	2.4 mg/L	1.3 (1) mg/L	46	B4(B)	1922E$	TCA	10% DE
SLUDGE	SE	5.9 mg/L	3.1 (1) mg/L	47	B6(B)	1922E$	TCA	10% DE
SLUDGE	Sol	4.2 mg/L	350 (1) ug/L	91.7	B1(B)	1925E$	TCLP	Fly ash/
SLUDGE	Sol	4.2 mg/L	3.1 (1) mg/L	26	B2(B)	1925E$	TCLP	Cement
SLUDGE	Sol	570 ug/L	48 (3) ug/L	91.6	B8(B)	266B-	TCLP	Port. Ce
SLUDGE	Sol	530 ug/L	260 (3) ug/L	51	B11(B)	266B-	TCLP	Port. Ce
SLUDGE	Sol	1.9 mg/L	>1 (3) ug/L	>99.947	B2(B)	266B-	TCLP	Port. Ce
SLUDGE	Sol	1.9 mg/L	<2 (3) ug/L	>99.89	B4(B)	266B-	TCLP	Kiln Dus
SLUDGE	Sol	570 ug/L	330 (3) ug/L	42	B10(B)	266B-	TCLP	Kiln Dus
SLUDGE	Sol	530 ug/L	170 (3) ug/L	68	B13(B)	266B-	TCLP	Kiln Dus
SLUDGE	Sol	530 ug/L	<8 (3) ug/L	>98.5	B12(B)	266B-	TCLP	Lime/Fly
SLUDGE	Sol	1.9 mg/L	<2 (3) ug/L	>99.89	B3(B)	266B-	TCLP	Lime/Fly
SLUDGE	Sol	570 ug/L	260 (3) ug/L	54	B9(B)	266B-	TCLP	Lime/Fly

SLUDGE	Sol	4.2	<13 (1) ug/L	>99.69	B	1925E$	TCLP	Cement
SLUDGE	Sol	4.2 mg/L	1.6 (1) mg/L	62	B4(B)	1925E$	TCLP	Fly ash/
SLUDGE	Sol	4.2 mg/L	130 (1) ug/L	96.9	B5(B)	1925E$	TCLP	Fly ash/
SLUDGE	Sol	4.6 mg/L	<2 (3) ug/L	>99.956	B7(B)	266B-	TCLP	Lime/Fly
SLUDGE	Sol	4.6 mg/L	<2 (3) ug/L	99.956	B6(B)	266B-	TCLP	Port. Ce
SLUDGE	Sol	4.6 mg/L	950 (3) ug/L	79	B5(B)	266B-	TCLP	Kiln Dus
SLUDGE	Sol-in	4.2 mg/L	460 (1) ug/L	89	F1(B)	1925E$	TCLP	Fly ash/
SLUDGE	Sol-in	4.2 mg/L	220 (1) ug/L	94.8	F2(B)	1925E$	TCLP	Cement
SOIL	HTMR	600 mg/kg	1.2 (2) gm/kg	0	F	1900B-	TCA	FLASH-S
SOIL	HTMR	3.7 mg/L	1.3 (2) mg/L	65	F	1900B-	TCLP	FLASH-S
SOIL	Sol	3.6 mg/L	<1.0 (1) ug/L	>99.972	P2(B)	1981B-	TCLP	Cement/
SOIL	Sol	3.6 mg/L	2.8 (1) ug/L	99.922	P1(B)	1981B-	TCLP	Cement/
SOIL	Sol	3.6 mg/L	<1.0 (1) ug/L	>99.972	P3(B)	1981B-	TCLP	Cement/
SOIL	Sol	680 mg/kg	560 (1) mg/kg	18	P1(B)	1981B-	TCA	Cement/
SOIL	Sol	680 mg/kg	680 (1) mg/kg	0	P2(B)	1981B-	TCA	Cement/
SOIL	Sol	680 mg/kg	480 (1) mg/kg	29	P3(B)	1981B-	TCA	Cement/

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Search by Technology(s)
(List chemicals for selected Technology(s))

Choose Technology(s) to include in data subset:

☐ AAS	Activated Alumina Sorption
☐ AFF	Aerobic Fixed Film
☐ AFF+AnFF	Aerobic Fixed Film and Anaerobic Fixed Film
☐ AFFwGAC	Aerobic Fixed Film with Activated Carbon (Granular)
☐ AL	Aerobic Lagoons
☐ AL+AS	Aerobic Lagoons and Activated Sludge
☐ AL+Fil	Aerobic Lagoons and Filtration
☐ API	API Oil/Water Separator
☐ API+DAF+AS	API Oil/Water Separator and DAF and AS
☐ AS	Activated Sludge
☐ AS+AS	Activated Sludge and Activated Sludge
☐ AS+Fil	Activated Sludge and Filtration
☐ AirS	Air Stripping
☐ AirS+GAC	Air Stripping and Activated carbon(Granular)
☐ AlgIE	Algal Ion Exchange
☐ AlkHyd	Alkaline Hydrolysis
☐ AnFF	Anaerobic Fixed Film
☐ AnFFwGAC	Anaerobic Fixed Film with Activated Carbon (Granular)
☐ BD,AS	Biological Destruction, Aerobic, Slurry
☐ BD,AnS	Biological Destruction, Anaerobic, Slurry
☐ BD,asp	Biological Destruction, aerobic, solid phase
☐ BDA-in	Biological Destruction, Aerobic, (in-situ)
☐ BDN-in	Biological Destruction, aNaerobic, (in-situ)
☐ BGAC	Biological Granular Activated Carbon
☐ CAC	Chemically Assisted Clarification
☐ CAC (B)	Chemically Assisted Clarification (Batch)

☐ [illegible]C+AirS	Chemically Assis[illegible]Clarification and Air Stripping
☐ CAC+ChPt (B)	CAC and Chemical Precipitation
☐ CAC+Fil	Chemically Assisted Clarification and Filtration
☐ CACwFil	Chemically Assisted Clarification with Filtration
☐ CACwPAC (B)	Chemically Assisted Clarification with Pow. Act. Carbon
☐ CD	Chemical Destruction
☐ CD,S	Chemical Destruction, Slurry
☐ CD-in	Chemical Destruction, (in-situ)
☐ CW	Classification/Washing
☐ ChOx	Chemical Oxidation
☐ ChOx (Cl)	Chemical Oxidation chlorine
☐ ChOx (Cl) (B)	Chemical Oxidation chlorine (Batch)
☐ ChOx (ClO2) (B)	Chemical Oxidation chlorine dioxide (Batch)
☐ ChOx (H2O2) (B)	Chemical Oxidation Peroxide (Batch)
☐ ChOx (H2O2wOz)	Chemical Oxidation Peroxide with ozone
☐ ChOx (Oz)	Chemical Oxidation ozone
☐ ChOx (Oz) (B)	Chemical Oxidation ozone (Batch)
☐ ChOx (Sur) (B)	Chemical Oxidation surfactant (Batch)
☐ ChOx (UV)	Chemical Oxidation ultraviolet light
☐ ChOx (UV) (B)	Chemical Oxidation ultraviolet light (Batch)
☐ ChOx (UVwH2O2)	Chemical Oxidation ultraviolet with peroxide
☐ ChOx (UVwH2O2) (B)	Chemical Oxidation ultraviolet with peroxide (Batch)
☐ ChOx (UVwH2O2wOz)	Chemical Oxidation ultraviolet with peroxide and ozone
☐ ChOx (UVwOz)	Chemical Oxidation ultraviolet with ozone
☐ ChOx (UVwOz) (B)	Chemical Oxidation ultraviolet with ozone (Batch)
☐ ChOx/Pt	Chemical Oxidation percipitation
☐ ChOx/Pt (B)	Chemical Oxidation percipitation (Batch)
☐ ChOxwCAC (B)	Chemical Oxidation with Chemically Assisted Clarification
☐ ChPt	Chemical Precipitation

☐ [illegible]Pt (B)	Chemical Precip[illegible]n
☐ ChPt (B) + Fil	Chemical Precipitation (Batch) and Filtration
☐ ChPt+Fil (B)	Chemical Precipitation and Filtration (Batch)
☐ ChPt+Fil	Chemical Precipitation and Filtration
☐ ChPtwCAC (B)	Chemical Precipitation with CAC
☐ ChPtwChOx(Cl)	Chemical Precipitation with Chemical Oxidation
☐ ChPtwFil	Chemical Precipitation with Filtration
☐ ChPtwPAC+Fil	Chemical Precipitation with PAC and Filtration
☐ ChRed	Chemical Reduction
☐ ChRed (B)	Chemical Reduction (Batch)
☐ Comp	Composting
☐ DAF	Dissolved Air Flotation
☐ DAF (B)	Dissolved Air Flotation (Batch)
☐ ED	Electrodialysis
☐ ElOx (B)	Electrical Oxidation (Batch)
☐ Fil	Filtration
☐ Fil+GAC	Filtration and Activated Carbon (Granular)
☐ GAC	Activated Carbon (Granular)
☐ GAC+ChOx(Cl)	Activated Carbon (Granular) and Chemical Oxidation Chlorine
☐ HTMR	High Temperature Metal Recovery
☐ IE	Ion Exchange
☐ IE (A)	Ion Exchange - anionic
☐ IE (C)	Ion Exchange - cationic
☐ IE (M)	Ion Exchange - mixed
☐ KEPG (B)	Dechlorination of Toxics using an Alkoxide (Batch)
☐ LTD	Low Temperature Desorption
☐ PACT	Powdered Activated Carbon Addition to Activated Sludge
☐ PACT+Fil	PACT and Filtration
☐ PAP	Plasma Arc Pyrolysis
☐ PD-in	Physical Destruction, (in-situ)
☐ RA	Resin Adsorption
☐ RA (B) + Fil	Resin Adsorption (Batch) and filtration

☐ [illegible]+GAC	Resin Adsoption [illegible] Activated Carbon (Granular)
☐ RBC	Rotating Biological Contactor
☐ RO	Reverse Osmosis
☐ SBR	Sequential Batch Reactor
☐ SBRwPAC	Sequential Batch Reactor with Powdered Activated Carbon
☐ SCOx	Super Critical Oxidation
☐ SE	Solvent Extraction
☐ SE-in	Solvent Extraction, (in-situ)
☐ SExt	Solvent Extraction
☐ SExt (B)	Solvent Extraction (Batch)
☐ SS	Steam Stripping
☐ SS+GAC	Steam Stripping and Activated Carbon (Granular)
☐ SS-in	Steam Stripping, (in-situ)
☐ Sed	Sedimentation
☐ Sed (B)	Sedimentation (Batch)
☐ Sed+AS	Sedimentation and Activated Sludge
☐ Soft	Water Softening
☐ Sol	Solidification
☐ Sol-in	Solidification, (in-situ)
☐ Stab	Stabilization
☐ TD	Thermal Destruction
☐ TF	Trickling Filter
☐ TF+AS	Trickling Filter and Activated Sludge
☐ UF	Ultrafiltration
☐ UV	UV Rad./Light/Solar
☐ VE-in	Vacuum Extraction, (in-situ)
☐ Vi-in	Vitrification, (in-situ)
☐ WOx	Wet Air Oxidation
☐ WOx (B)	Wet Air Oxidation (Batch)
☐ WOx+Fil (B)	Wet Air Oxidation and Filtration (Batch)
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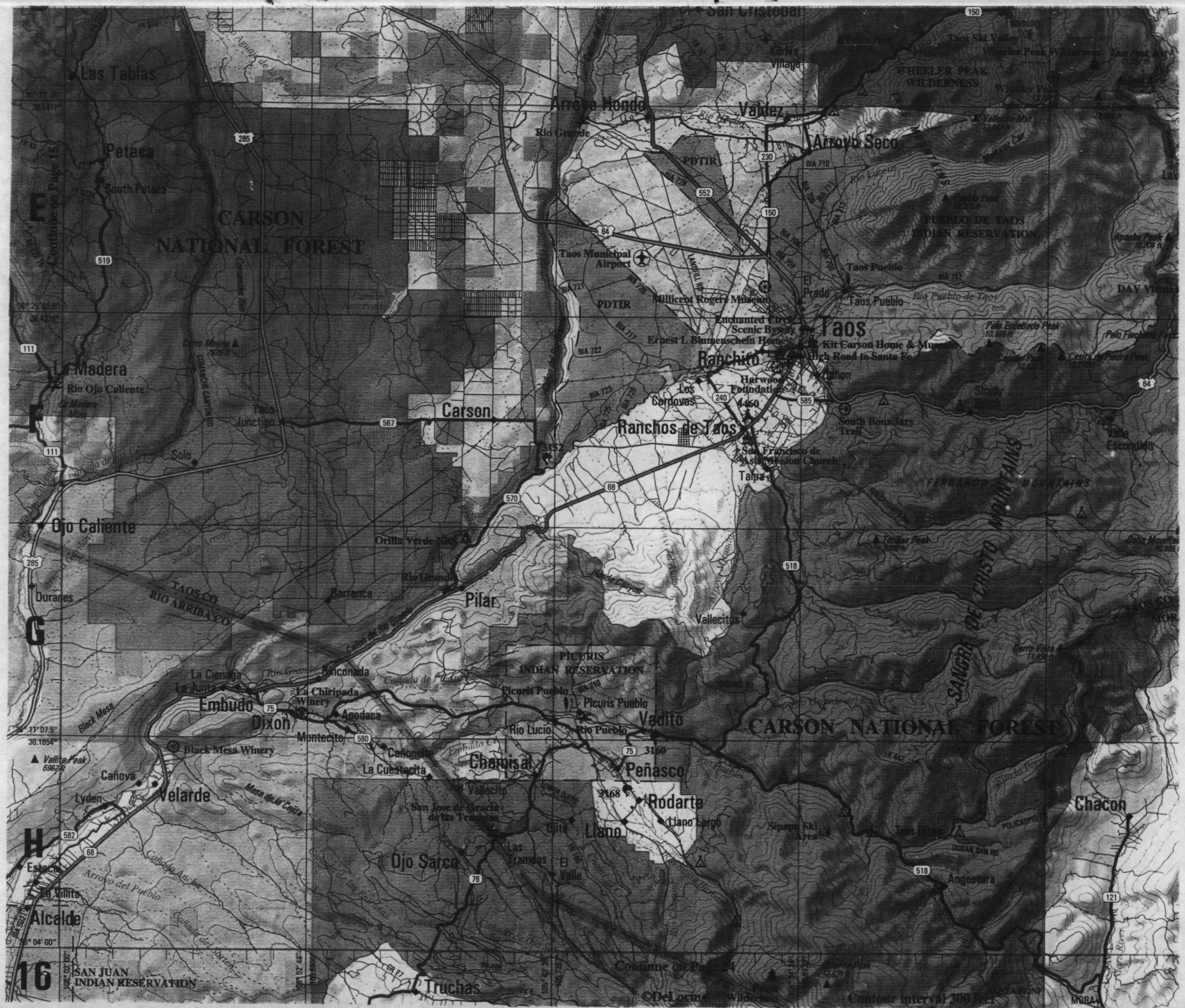
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Sipapu Ski Area
Tres Ritos
Valle Escondido
Shady Brook
Tenorio Peak
Cerro Vista
Continue on Page 14
©DeLorme
Contour Interval 300 feet
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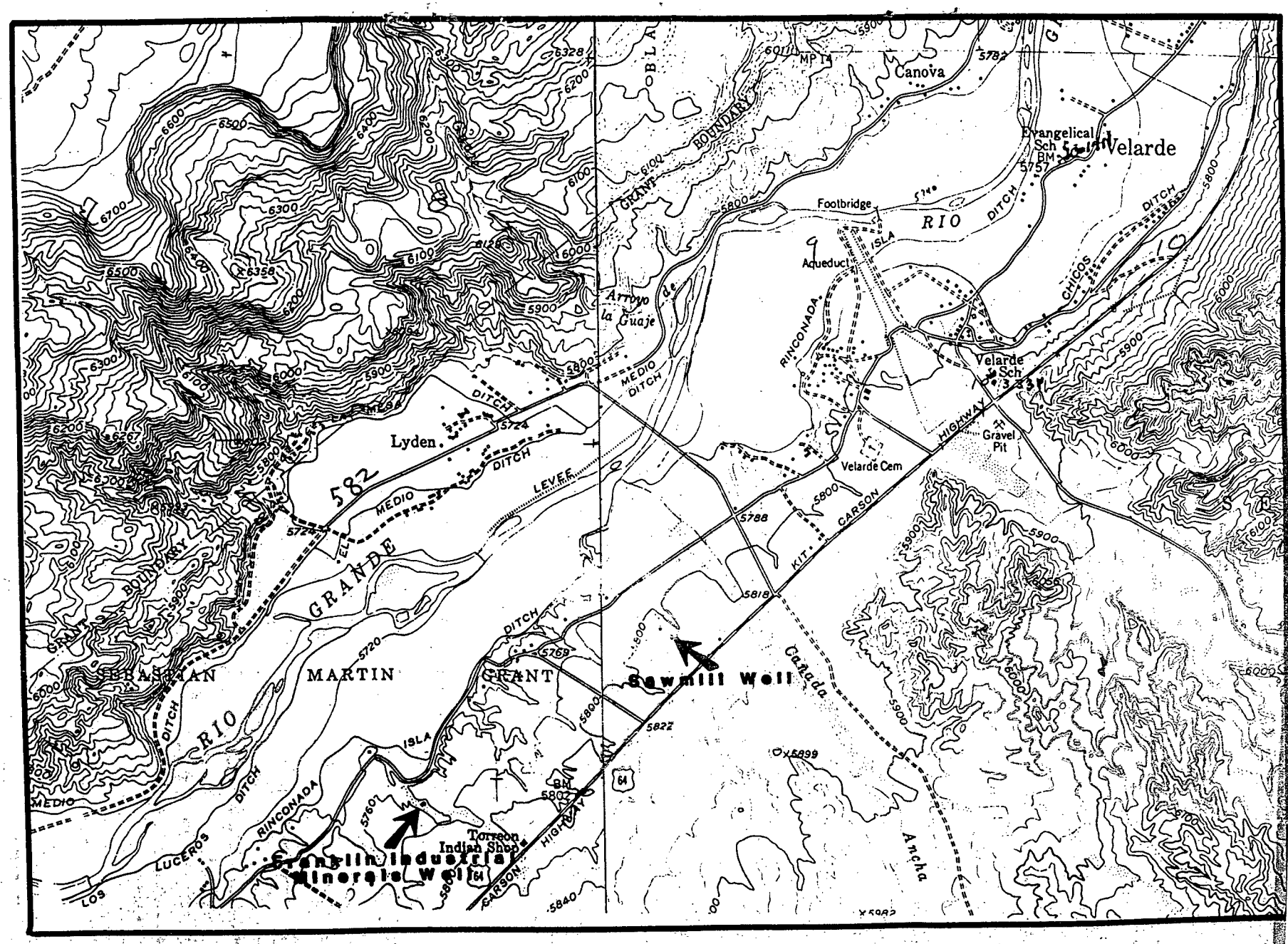
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DITCH
ISLA
Aqueduct
Arroyo de la Guaje
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Gravel Pit
HIGHWAY
Velarde Cem
CARSON
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Lyden
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MEDIO
LEVEE
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GRANT
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Ancha
Torreon Indian Shop
Franklin Industrial Minerals Well
LUCEROS
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Continue in DeLorme's Colorado Atlas & Gazetteer
Punche Valley
Twin Lakes
Jaroso
Garcia
COLORADO
NEW MEXICO
COSTILLA CO
TAOS CO
State Line Peak
Costilla
Ventero
San Pedro Mesa
Amalia
Rio Grande National Wild & Scenic River
Ute Mountain
SANGRE DE CRISTO MOUNTAINS
TAOS MOUNTAINS
Big Costilla Peak
Urraca WMA
Ski Rio
Vermejo Peak
Adams Lake
BEAR CAMP RD
Costilla Peak
SUNSHINE RD
Sunshine
Questa Municipal Airport
El Rito
Buena Vista
Latir Peak
LATIR PEAK WILDERNESS
Baldy Mountain
Carson National Forest Valle Vidal Unit
Cerro de la Olla
Cerro Chiflo
Rio Grande
Cerro
Guadalupe Mtn
CARSON NATIONAL FOREST
Memphis
Red River
Questa
Wild Rivers NRS
Red River Ski Area
Red River State Fish Hatchery
Enchanted Forest Ski Area
Black Mountain
Gold Hill
Llano
Elizabethtown
Baldy Mountain
Barker WMA
Lobo Peak
San Cristobal
Scully Mountain
Twining
Taos Ski Valley
Wheeler Peak Wilderness
WHEELER PEAK WILDERNESS
Kiowa Village
Touch-Me-Not Mountain
Eagle Nest
Idlewild
Arroyo Hondo
Valdez
Rio Grande
Cimarron Canyon
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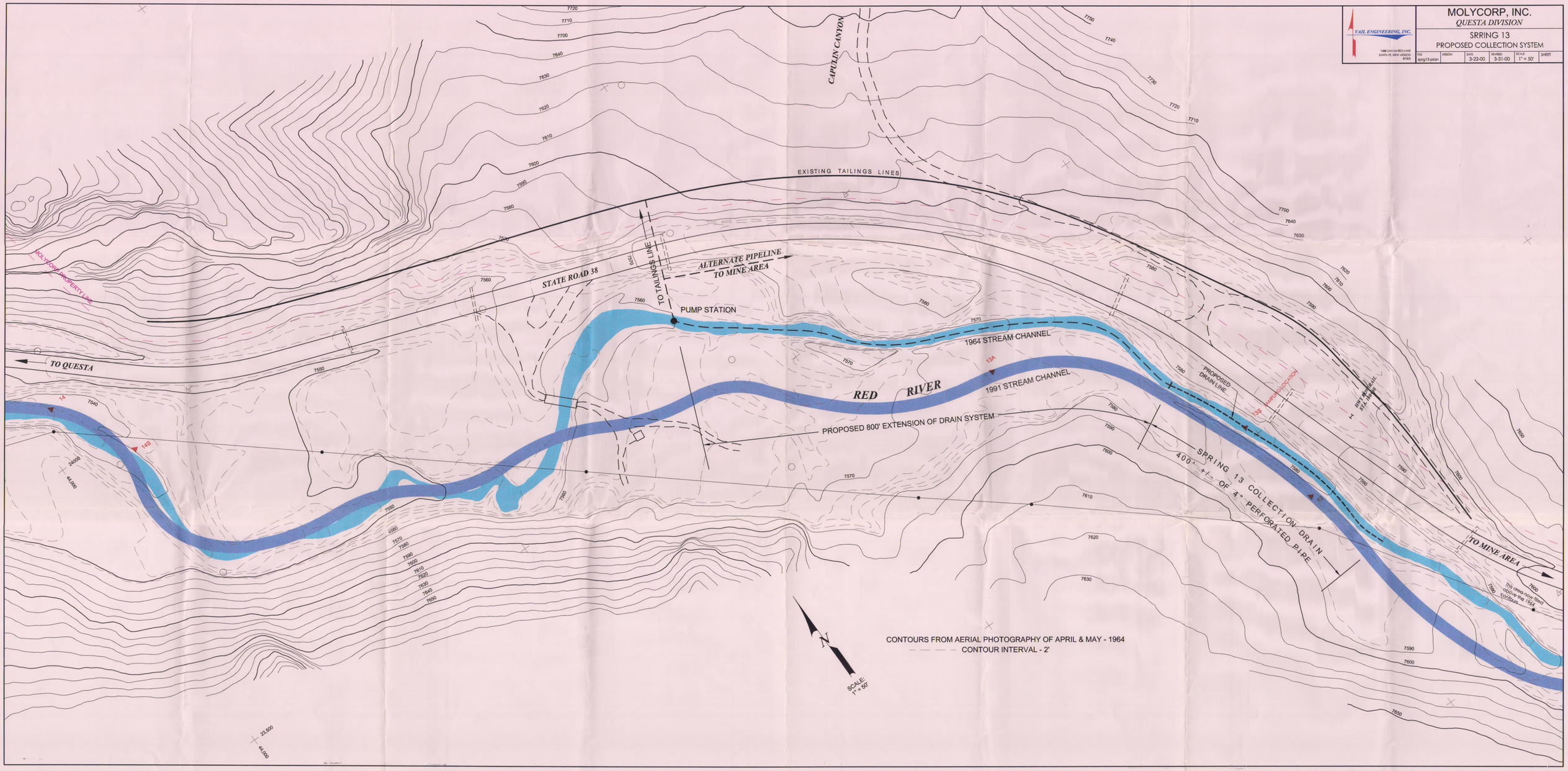
VAIL ENGINEERING, INC.
1088 SAN MATEO LANE
SANTA FE, NEW MEXICO
87505
MOLYCORP, INC.
QUESTA DIVISION
SRRING 13
PROPOSED COLLECTION SYSTEM
FILE spring13-plan
DESIGN
DATE 3-22-00
REVISED 3-31-00
SCALE 1" = 50'
SHEET
CAPULIN CANYON
EXISTING TAILINGS LINES
MOLYCORP PROPERTY LINE
STATE ROAD 38
TO TAILINGS LINE
ALTERNATE PIPELINE TO MINE AREA
PUMP STATION
1964 STREAM CHANNEL
1991 STREAM CHANNEL
RED RIVER
TO QUESTA
PROPOSED DRAIN LINE
PROPOSED 800' EXTENSION OF DRAIN SYSTEM
SPRING 13 COLLECTION DRAIN
400' +/- OF 4" PERFORATED PIPE
TO MINE AREA
This area not filled above the 1964 contours
CONTOURS FROM AERIAL PHOTOGRAPHY OF APRIL & MAY - 1964
CONTOUR INTERVAL - 2'
SCALE: 1" = 50'
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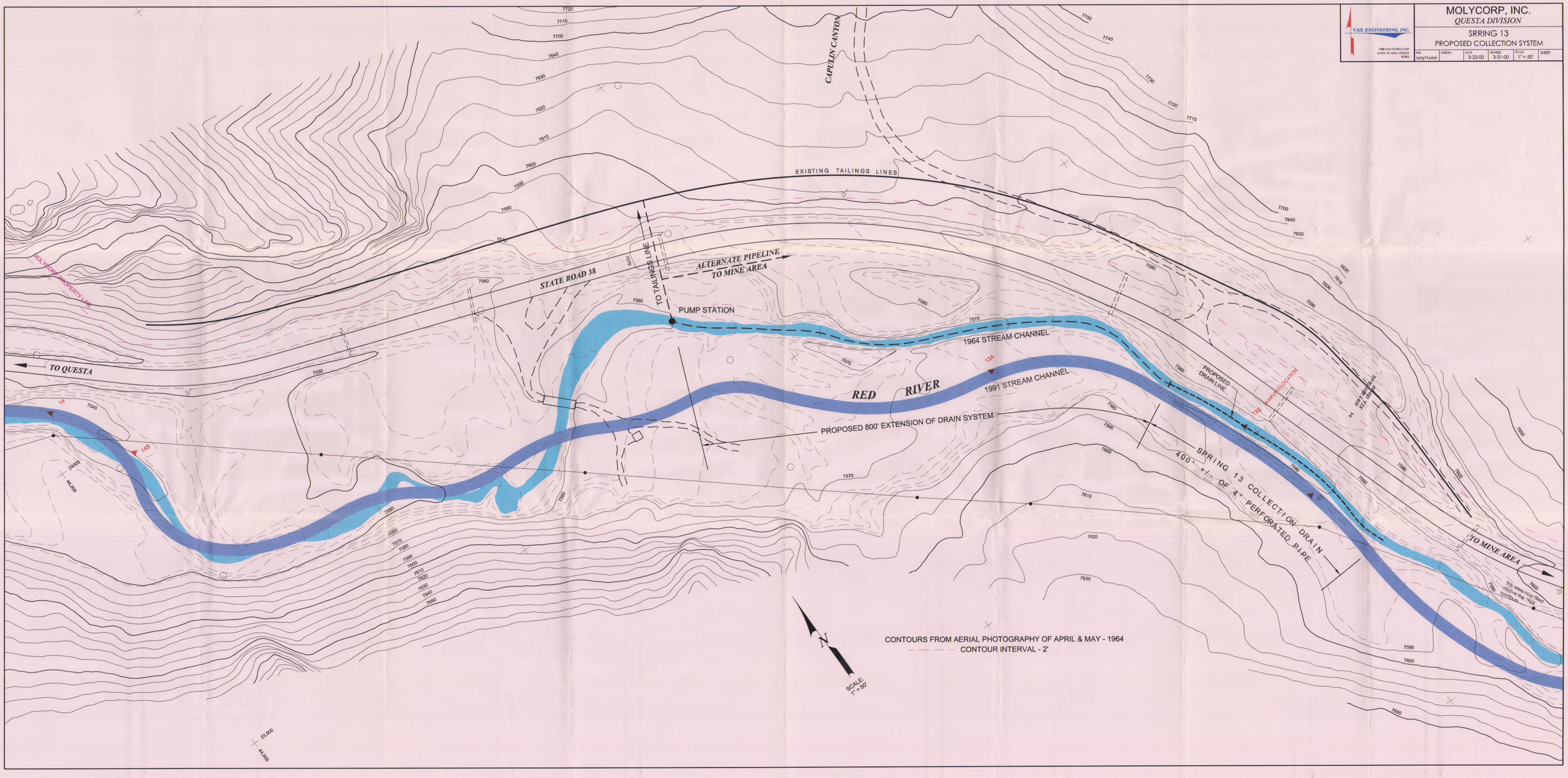
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SANTA FE, NEW MEXICO
87505
MOLYCORP, INC.
QUESTA DIVISION
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FILE srrg13-plan
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REVISED 3-31-00
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EXISTING TAILINGS LINES
STATE ROAD 38
TO TAILINGS LINE
ALTERNATE PIPELINE TO MINE AREA
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TO QUESTA
1964 STREAM CHANNEL
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PROPOSED 800' EXTENSION OF DRAIN SYSTEM
SPRING 13 COLLECTION DRAIN
400' +/- OF 4" PERFORATED PIPE
TO MINE AREA
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CONTOURS FROM AERIAL PHOTOGRAPHY OF APRIL & MAY - 1964
CONTOUR INTERVAL - 2'
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SCALE 1" = 50'

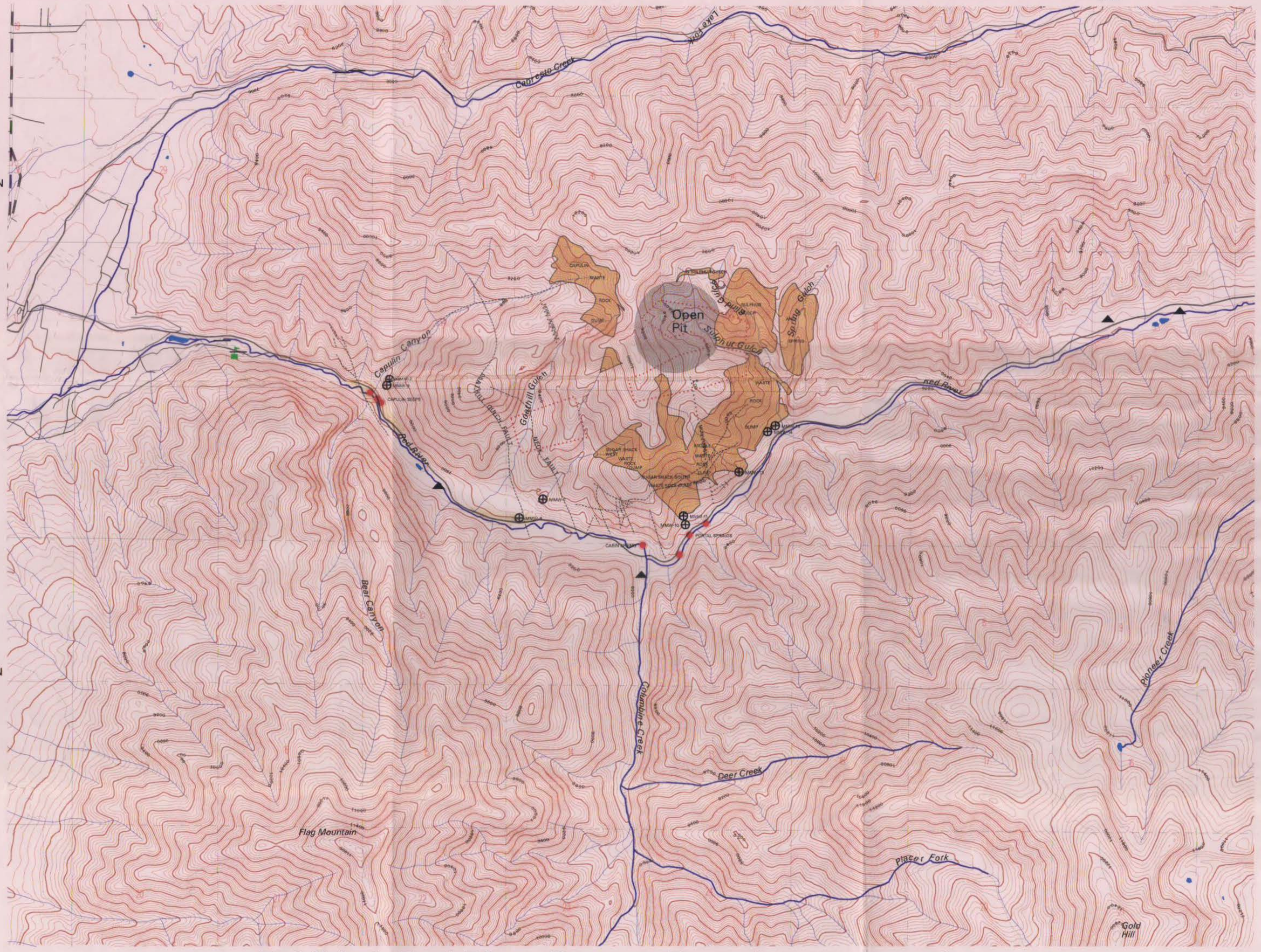


Exhibit 1: Red River Canyon Pre-mine topography

Road Network

- Primary Road
- Secondary Road
- Improved Road
- Unimproved Road
- Trail

Surface Water Features

- Perennial Stream
- Intermittent Stream / Canal
- Ponds

Mine Features

- Fault Line
- Limits of Underground Mine Workings
- Open Pit Mine
- Waste Rock Dump

Symbols

- Spring
- Monitoring Well
- Gaging Station
- Campground
- Questa Ranger Station

Scale: 1 inch = 2000 feet
Contour Interval 40 feet

Map produced by Spatial Dynamics, Inc. March 1997.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

QUESTA QUADRANGLE
NEW MEXICO-TAOS CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)

Mapped, edited, and published by the Geological Survey

Control by USGS and USC&GS

Topography by photogrammetric methods from aerial photographs taken 1962. Field checked 1963

Polyconic projection. 1927 North American datum
10,000 foot grid based on New Mexico coordinate system, central zone
1000-meter Universal Transverse Mercator grid ticks, zone 13, shown in blue

Where omitted, land lines have not been established

Fine red dashed lines indicate selected fence lines

UTM GRID AND 1963 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000

CONTOUR INTERVAL 40 FEET
DOTTED LINES REPRESENT 20-FOOT CONTOURS
DATUM IS MEAN SEA LEVEL

ROAD CLASSIFICATION

Medium-duty — Light-duty

Unimproved dirt

State Route

NEW MEXICO
QUADRANGLE LOCATION

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR WASHINGTON, D. C. 20242
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

QUESTA, N. MEX.
N3637.5-W10530/7.5
1963
AMS 4857 II NE SERIES V881

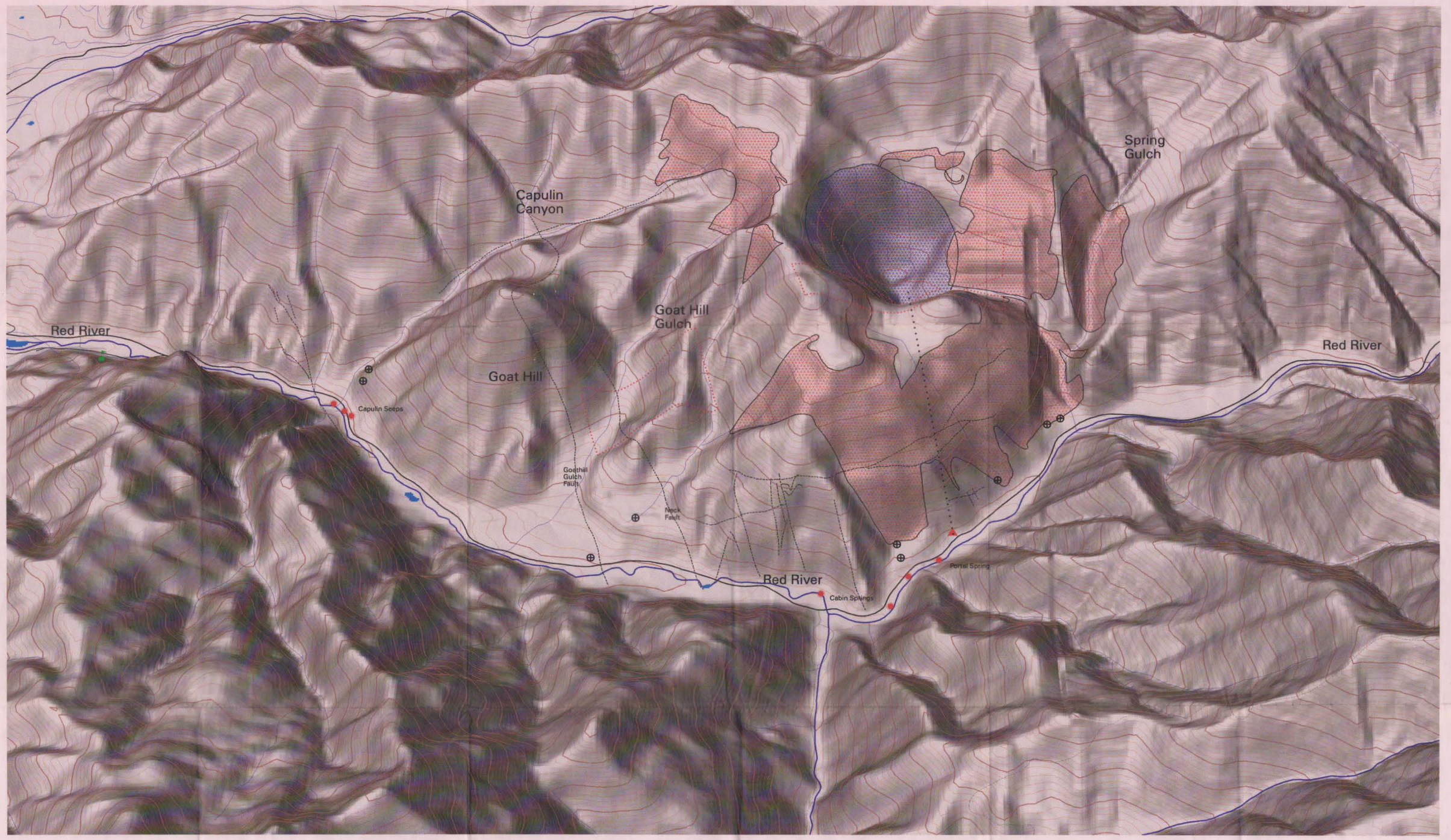


Exhibit 2: Red River Canyon Post - Mine Topography

Road Network
- Primary Road
- Secondary Road
- Improved Road
- Unimproved Road
- Trail

Surface Water Features
- Perennial Stream
- Intermittent Stream / Canal
- Ponds

Mine Features
- Moly Tunnel
- Fault Line
- Limits of Underground Mine Workings
- Open Pit Mine
- Waste Rock Dump

Symbols
- Spring
- Monitoring Well
- Moly Tunnel Outlet
- Questa Ranger Station

N

Map produced by Spatial Dynamics, Inc. March 1997.

REFERENCES DWG. NO.	DESCRIPTION	REFERENCES DWG. NO.	DESCRIPTION	REVISIONS NO.	MADE BY	DATE	DESCRIPTION	REVISIONS NO.	MADE BY	DATE	DESCRIPTION
				1							
				2							
				3							

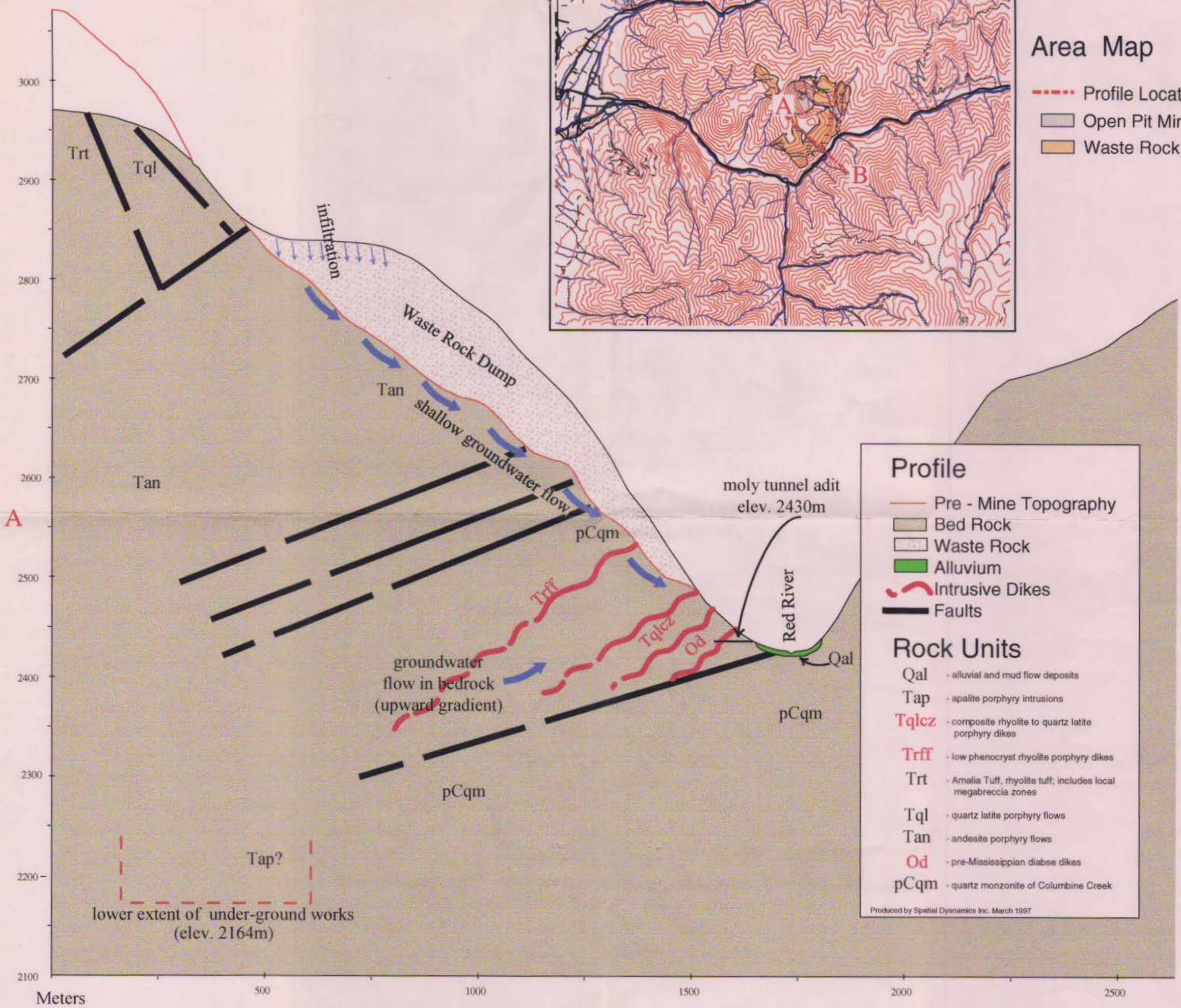
		DATE
DRAWN BY:	P. LaCOME	5-30-97
CHECKED BY:		
APPROVED:		

UNOCAL 76
MOLYCORP
QUESTA, NEW MEXICO

MOLYCORP QUESTA MINE
TAILINGS DISPOSAL AREA

MONITORING AND EXTRACTION WELL LOCATIONS

SCALE: 1"=500'
Dwg No.: 144-229
Cad File: TAIL_ALL



Red River Canyon Profile

(Modified From Meyer and Leonardson, undated; Molycorp Mine Plan; USGS Questa Quadrangle.)

MOLYCORP, INC. SUPERFUND SITE Informational Bulletin Winter 2003

On November 12, 2002, the U.S. Environmental Protection Agency (EPA) held a Community Meeting in Questa, New Mexico, regarding the Molycorp, Inc., Superfund Site. At the meeting, EPA informed the community that a Fact Sheet would be prepared which addresses the questions asked at the meeting so that people who were unable to attend would still be as informed as possible. The following are the questions asked at the meeting and the EPA's responses:

1. *Is EPA going to include the Rio Grande in its sampling plan? If not, why?*

The EPA does not currently plan to include the Rio Grande in its sampling program. Sampling will be performed on portions of the Red River downstream of the Tailings Facility almost as far as the State Fish Hatchery. However, if contamination is present there, the EPA would then test further downstream. The EPA will expand its investigation as necessary to determine the full extent of contamination. This could possibly be as far downstream as the Rio Grande.

2. *Will EPA perform any human health assessment?*

The EPA will be performing a human health risk assessment for the Molycorp Site (hereinafter the "Site") as part of the Superfund Remedial Investigation/Feasibility Study (RI/FS) process. The human health risk assessment will be a scientific estimate of the chances that someone will be harmed from exposure to hazardous substances at the Site. The EPA will use the environmental data collected during the RI/FS to complete the risk assessment. Based on the findings, EPA will determine if areas at the Molycorp Site need to be cleaned up to prevent further exposure to those hazardous substances.

The Agency for Toxic Substances and Disease Registry (ATSDR) has performed a Public Health Assessment (PHA) for the Molycorp Site. In conducting the PHA, the ATSDR reviewed existing environmental data for the Molycorp Site. The PHA report was released for public comment on November 13, 2002. The PHA was performed to determine if there has been exposure to contamination and the possible health effects from the exposure. A copy of the PHA can be reviewed at the Village of Questa Buildings, 2500 Old State Road 3, Questa, New Mexico; at the New Mexico Environment Department, 1190 St. Francis Drive, Santa Fe, New Mexico; and at the EPA Region 6 office, 1445 Ross Avenue, Suite 1200, Dallas, Texas. A copy may also be obtained by contacting the ATSDR representatives, Lovyst L. Luker or Shan Ching Tsai, at (888) 422-8737.

The EPA will work closely with the ATSDR during the RI/FS to ensure that all relevant environmental data collected as part of our investigation are provided to the ATSDR for inclusion into the PHA document. As new environmental data become available, the

ATSDR's PHA may be modified to reflect the new information.

3. *What is the EPA testing for during the RI/FS? How will the EPA verify what has been tested?*

The EPA is collecting soil, sediment, surface water and ground water samples from the Site and analyzing them for hazardous substances, including heavy metals, volatile organic compounds, semi-volatile organic compounds, polychlorinated bi-phenyls (PCBs), pesticides, dioxins, and explosives. The EPA is also collecting biota data (fish, mammals, aquatic and terrestrial plants, macro invertebrates) and analyzing them for some of the same substances. At this time, based on historic site data, the hazardous substances of concern at the site are heavy metals (for example, aluminum, molybdenum and copper).

The EPA uses quality assurance/quality control (QA/QC) requirements during the collection of environmental data to ensure those data will be of the type, quality and quantity needed to support legally-defensible decision making. These QA/QC requirements are defined in the Quality Assurance Project Plan (QAPP) prepared for this site (Volume 3 of the RI/FS Work Plan).

4. *What were the pH levels of the seeps above Seep 13?*

The last pH level measurement EPA took at Seep 13 was during EPA's August 2002 field survey. The pH level was slightly less than 4.0. That was the lowest level recorded during the survey. The pH levels of the other seeps upstream of Seep 13 were generally higher, in the 6.0 to 7.0 range. Please note that on a scale from 0 to 14.0, a pH level of approximately 7.0 is considered neutral. The lower the pH of the water, the more acidic it will be.

5. *What is the difference between a TAG and a CAG?*

A TAG is a Technical Assistance Grant. It is a $50,000 grant awarded to a non-profit, incorporated community group for the purpose of hiring a technical advisor who will help the community interpret and understand technical components of the Site activities. The EPA advertised the grant availability in The Taos News on June 15, 2000 and in an EPA Fact Sheet distributed on June 22, 2000. The Rio Colorado Reclamation Committee applied for the grant, which it received on October 1, 2002. A CAG is a Community Advisory Group. It is a group that must be initiated by the community. A CAG is made up of representatives of diverse community interests and it provides a public forum for community members to present and discuss their needs and concerns about the decision-making process. CAGs are by the community and for the community. The EPA offers training for CAGs but does not participate in them (if asked, EPA staff will try to attend CAG meetings whenever possible), nor does the EPA provide funding for CAGs.

6. *How can we become a member of the TAG group?*

Contact the TAG group for information on how to participate in the TAG group. There are no membership dues and membership is open to everyone. Contact:

Rio Colorado Reclamation Committee
P.O. Box 637
Questa, NM 87556
719-672-0401

7. *What causes the chemical reaction that results in the acidic leaching?*

Acidic leaching or drainage (often referred to as Acid Rock Drainage or ARD) is caused primarily by the weathering of sulfide minerals such as pyrite, an iron sulfide. The sulfide minerals undergo a chemical reaction, called oxidation, when they come into contact with air and water. The oxidation process results in the release of sulfate and sulfuric acid, thereby forming acid-sulfate soils and developing acidity in the water. The acidic water then leaches or dissolves metals such as iron, copper and aluminum when it comes into contact with the rocks. This often results in an orange or red "rust" color to the soils and water. If ARD is left uncontrolled, the resulting acidic metal-laden water may drain into and contaminate streams and stream sediments or migrate into the underlying ground water. These weathering processes occur naturally. However, mining and mining-related activities have the overall effect of dramatically increasing the rates of oxidation by providing greater accessibility of air and water through mine workings, waste rock and tailings.

8. *What about EPA's investigation at the mine site? Will monitoring wells be used in Blind Gulch? Is the EPA testing there, or in Capulin Canyon, or at the lube shop or the pit shop? What has the EPA found in those areas?*

The EPA is testing the ground water from monitoring well MW-41A in Blind Gulch and from monitoring wells MMW-2, MMW-3, MMW-28A, and MMW-28B in Capulin Canyon. Additionally, one or two new wells, MMW-45A and 45B will be installed along the Red River, downstream of the mouth of Capulin Canyon. Further, soils in several areas at the mine site, including the Blind Gulch and Capulin Canyon waste rock piles, and near several man-made structures and historic storage or disposal areas will be tested. The historic storage and disposal areas being tested include the salvage equipment storage area (known as the "Bone Yard"), the underground debris stockpile, the historic Spring Gulch landfill and Goathill landfill, the explosives storage area, the former drum storage area, and the former truck shop. It is the EPA's understanding that the former truck shop is where the lube shop used to be located and is also referred to as the pit shop.

The sampling locations for these and all other areas are shown on figures contained in the Field Sampling Plan (Volume 4 of the RI/FS Work Plan) for the Site. The Field Sampling Plan is available for review at the community information repository, which is located at the Village of Questa Buildings, 2500 Old State Road 3, Questa, New Mexico. The EPA will have the analytical results from these tests in the spring 2004 and plans to provide a summary of its findings to the community at that time.

The EPA is interested in any additional information which you may have regarding Molycorp's past disposal operations at the mine site (or any other areas) and encourages you to contact us directly at the numbers provided at the end of this Fact Sheet.

9. *Is there a sense of urgency or concern about cleaning up the Site?*

The EPA is concerned about threats to human health and the environment at Superfund sites. At this time the EPA is not aware of any immediate life-threatening condition at the Molycorp site. If EPA becomes aware of such a condition, we would promptly respond. This type of a response is referred to as a "removal action." A removal action is a short-term

response intended to stabilize or clean up an incident or immediate threat to public health. For example, it may include constructing a fence or posting warning signs to restrict access to people or animals. It may also provide alternate water supplies to local residents when drinking water has become contaminated. Removals generally do not deal with area-wide contamination, such as ground-water contamination, which requires a long-term cleanup. A long-term cleanup action is usually undertaken by the Superfund Remedial Program to stop or substantially reduce actual or potential releases of contaminants that are serious, but not immediately life threatening.

The EPA is currently conducting the RI/FS as the first phase of the Superfund remedial response. It typically takes more than two years to complete an RI/FS. Because the Site is a very massive and complex site, the EPA anticipates that the RI/FS will take approximately four to five years to finish. The scoping (planning) and data-collection stages alone will take more than two years to complete. For example, the EPA plans to collect samples seasonally (fall 2002, spring 2003, and summer 2003 storm events) to assess the variations in water chemistry associated with varying levels of surface-water flow of the Red River. EPA will also evaluate site data on an annual basis, and plans to collect samples in the fall of 2003 for comparison to the fall 2002 samples. Water samples collected from the Red River in an extremely dry year, with drought conditions (like 2002) may have significantly different chemistry when compared to samples collected in a wet year.

10. *Is there a moratorium on the amount of time the investigations will take?*

Under the Superfund laws, there is no time limitation associated with the RI/FS. Please see the EPA's response to Question No. 9, above, regarding anticipated time frames for completion of the RI/FS at the Site.

11. *When will the sample results be ready and when will EPA hold its next community meeting?*

The analytical results from samples collected in the fall of 2002 will be ready in the spring of 2003. The EPA plans to hold a meeting at that time to discuss the results and the status of the investigation with the community.

12. *Who is collecting the samples?*

Under the EPA's Administrative Order on Consent (AOC) for the RI/FS, Molycorp is required to collect the data for the EPA. Molycorp and its contractors have been in the field this Fall collecting the environmental samples. Representatives for EPA have also been in the field overseeing the sampling program and collecting additional samples which we refer to as "split samples." The EPA is conducting the field oversight to ensure that Molycorp performs all of the sampling requirements defined in the work plans and sampling plans approved by EPA. The EPA collects the split samples and sends them to an independent laboratory for analysis as a way to verify the accuracy of the analytical results reported by the laboratories used by Molycorp. A split sample is actually one sample that is split into two parts, one for Molycorp to send to its contracted laboratory, and the other for the EPA's independent analysis. The EPA typically collects a number of split samples which represent anywhere from 5-20 percent of the total samples collected by Molycorp. The EPA also reviews the qualifications of all contractors and laboratories selected by Molycorp to ensure that they are qualified to do the work. The EPA may perform independent audits or inspections of the

laboratories to ensure that they meet all of the EPA's QA/QC requirements, which are defined in the Site Quality Assurance Project Plan (Volume 3 of the RI/FS Work Plan). The EPA may also, at any time, disapprove of any contractor or laboratory used by Molycorp if the EPA deems it to be unacceptable for performing the work.

13. *Is the EPA willing to use the community's documentation of environmental impacts, such as evidence of dust from tailings blowing off the tailings ponds? Why is the EPA depending on Molycorp for its information?*

While the EPA is willing to gather and evaluate other information documented by the community, especially when assessing its data needs, the EPA is required by the Superfund laws and regulations to collect the right type, quality and quantity of data for use in selecting the appropriate cleanup method. Also, the data must be of sufficient quality to support EPA's defense of those decisions in a court of law.

In addition, although Molycorp is collecting the field data, it is still the EPA's investigation, not Molycorp's, and the EPA determines what information is needed to complete the investigation. In preparing the work plans and sampling plans, the EPA has directed Molycorp where and how to sample, and what chemical analyses to perform for each of those samples. The EPA has also established the quantity of samples and the frequency of the sampling events it needs to complete the investigation. Furthermore, if at any time during the RI/FS the EPA believes additional data are needed, it will direct Molycorp to collect those data. Finally, in the event that Molycorp does not meet the requirements for data collection or any other work defined in the AOC, the EPA has the right to seek stipulated penalties from Molycorp. The EPA also retains the right to collect its own samples, complete the RI/FS (or any portion thereof) and seek reimbursement from Molycorp for EPA's costs.

14. *How can the EPA be sure that it is contacted by those in the community who know where spills happened?*

The EPA has already begun to contact members of the community regarding spills and other information about the Site. On November 12 and 13, 2002, representatives from the EPA conducted door-to door community interviews in the Village of Questa and will continue to follow up with subsequent interviews. The EPA will provide contact information in each community mailing, and it encourages people who want to share any information regarding the Molycorp Site to call ~~us,~~ or write to us. Your name can be kept confidential with regard to any information that you may share. Your input is essential to the EPA being able to have as complete a history of Site activities as soon as possible.

15. *What was Molycorp's Hazard Ranking System (HRS) score?*

The HRS score for the Molycorp Site is 50. Sites are scored for a total of 0 to 100 points. To be placed on the NPL, a site must have an HRS score of at least 28.50. The EPA originally selected 28.50 as the cutoff HRS score because it produced an NPL list of at least 400 sites, the minimum set by the law that established Superfund. To be consistent, the EPA continues to add sites with scores of 28.50 or above.

The scoring is based on three factors: (1) whether the site has released (or may release) contamination into the environment; (2) the concentrations, toxicity, and quantity of waste on

site; and (3) the people or sensitive environments affected by any release of hazardous waste.

16. *Why would a Potentially Responsible Party (PRP) not want a site to be listed on the National Priorities List (NPL) of Superfund sites?*

The EPA has no comment on why companies do not want sites listed on the NPL.

17. *How do the EPA's RI/FS and remedy selection processes relate to Molycorp's ongoing work for surface-water protection, reclamation, and closure under other state and federal laws and regulations?*

The EPA Superfund Program recognizes that Molycorp is currently conducting activities at the Site that are subject to other laws, including the New Mexico Mining Act and the New Mexico Water Quality Act. Therefore, and as stated in the AOC, the EPA intends, to the extent practicable and consistent with the Superfund law and regulations defined in the National Contingency Plan (NCP), to work with the New Mexico Environment Department (NMED), the Mining and Minerals Division (MMD) of the New Mexico Energy, Minerals and Natural Resources Department, as well as the State of New Mexico and Federal Natural Resource Trustees to coordinate activities in connection with the Site and avoid any duplication of efforts.

Under those other laws, regulations, and associated permits, Molycorp is conducting certain investigations and studies within specific schedules. Those investigations and studies, or portions thereof, may become part of the RI/FS work required under the AOC. An example of an investigation being conducted by Molycorp as a requirement of NMED's ground-water discharge permit (Permit No. 933) is the study of historic tailings spills. That study is being incorporated into the RI/FS and is currently under review by the EPA to ensure that it meets all the requirements of the AOC. An example of an ongoing study is the vegetation study (test plots) for the waste rock piles at the mine site. This study, which is referred to as a treatability study, may provide the EPA important information in its evaluation of revegetation as a candidate technology during the development and screening of cleanup alternatives for the Site. The process for identifying candidate technologies and developing cleanup alternatives is ongoing.

In the event that the technologies being studied by Molycorp under those other laws, regulations and permits are selected by the EPA as cleanup alternatives during the RI/FS, the performance or test data generated from those related treatability studies will be further evaluated by the EPA for meeting the NCP regulations and the EPA's RI/FS guidance.

Molycorp may also conduct abatement or remedial actions under the terms of its other permits. At Molycorp's written request, the EPA Superfund Program will review the proposed action, and coordinate its efforts with the State of New Mexico or Federal authorities directing the work. For example, the NMED recently directed Molycorp to remove spilled tailings found at one of its tailings staging areas (known as the Upper Dump Sump). Molycorp sought and received EPA's concurrence to remove the tailings prior to starting the work. Another example is the new storm water and seepage interception system which Molycorp is currently installing at the mine site to address NMED's permit requirements and the EPA's National Pollutant Discharge Elimination System (NPDES) permit. If the Superfund investigation shows that storm-

water runoff or seepage has impacted, or continues to impact, surface water, the EPA Superfund Program will assess whether that system meets the Superfund criteria as a feasible cleanup alternative.

18. *Do Molycorp mining tunnels go under the highway and under the Red River?*

Based on the site information provided to the EPA, it is our understanding that the mining tunnels do not go under the highway or the Red River.

19. *Is the village of Questa's municipal drinking water supply contaminated? And if so, what is the contamination and how does it get into the water supply?*

It is our understanding that biological agents were detected in the Questa drinking water supply a few years ago. The municipal water supply wells (Well Nos. 1 and 2) were sampled by the Public Works Department on December 12, 2000, to determine the susceptibility of the water supply to surface water intrusion. The samples were tested using the EPA's "Consensus Method for Determining Groundwaters Under the Direct Influence of Surface Water Using Microscopic Particulate Analysis" (MPA). The samples were also tested for the parasites, giardia and cyptosporidum. The ingestion of these parasites may cause diarrhea. The ingestion of Cyptosporidum can also cause cryptosporidiosis, an abdominal infection.

The analytical results showed the presence of diatoms and algae in the water, suggesting that the ground water is under the direct influence of surface water. However, giardia and cyptosporidum were not found in the samples.

The Village of Questa periodically monitors the quality of its municipal water supply from homes or businesses in its distribution area. In its 2001 Water Quality Report, it stated that total coliform bacteria was elevated in the water supply in early 2000. It also stated that subsequent monthly sampling for total coliform during that year was negative.

The EPA does not know how these microorganisms entered into the water supply. It may have been inadequate well head protection or some type of structural deficiency in the construction of the two municipal water wells. Wellhead protection is a process where the land areas that contribute water to the two municipal water wells through surface-water runoff and infiltration are delineated for protection from sources of contamination. Those sources may include septic systems, agricultural runoff, fertilizers, and underground fuel storage tanks. It is our understanding that the Village of Questa has hired Gannet Fleming West, an engineering firm, to evaluate the nature and extent of this problem.

At this time, the EPA is not aware of any adverse impacts to the Questa municipal water supply by Site-related contaminants (heavy metals) and the EPA does not plan to test resident's drinking water at the tap. It is the responsibility of the Village of Questa, in accordance with State and Federal drinking water regulations, to monitor the quality of the drinking water it provides to the Questa community. The NMED Drinking Water Bureau also provides support and assistance to the Village of Questa in the operation, maintenance and monitoring of its drinking water program. However, the EPA has discussed the water quality concerns of the community with the Village of Questa and the NMED Drinking Water Bureau. It is the EPA's understanding that the Village of Questa is considering the collection of additional water samples for

analysis. The EPA is also gathering available water chemistry data for review. If information is provided to the EPA that shows the water supply to be adversely impacted, the EPA's Superfund Program will work with the Village of Questa, the NMED Drinking Water Bureau, and other appropriate State and Federal regulatory authorities, to address this issue.

20. *Are the Village of Questa's water lines going under tailings piles?*

Currently, the EPA does not have a map of the municipal drinking water distribution system for the Village of Questa that includes the location of the underground water lines. Therefore, the EPA does not know whether any of those lines traverse through soils where tailings spills may have occurred. The EPA has recently asked the Village of Questa for such a map. Also, the EPA, in working with NMED, will be conducting an investigation of the historic tailings spills at the Site to determine where tailings deposits are located and whether those spills impact the underlying soils and ground water.

21. *Will our property values decrease if Molycorp becomes a Superfund Site?*

Property values can be affected by a number of environmental factors: perceived health risks; impacts on safe drinking water; air pollution; odor; construction activity; and noise. Factors that may reduce the impact on property values include distance from the Site and the presence of a geographic buffer, such as a hill, railroad, river, forest, or divided highway. We suggest that you consult a professional in your community who can give you more accurate and current advise regarding you property situation. Real estate agents, banks and other lenders, appraisers, and public and private assessors should be able to give you information regarding your property value. Local government agencies – such as your taxing authority or planning commission – may also be able to give you helpful information on property values. Please refer to an EPA publication titled "Superfund Today: Focus on Property Values" that is available at the Site Information Repository for more information and answers to frequently asked questions about property values.

22. *Will the clean-up process raise more pollutants, either in the air or into the ground or through the water?*

When a cleanup is performed, the EPA takes precautions to ensure that the workers and the community are protected. First, a health and safety plan is prepared prior to the start of the work. This plan defines the level of protection the remedial workers must have to perform the work, such as the type of protective clothing and respiratory equipment to be used. It also includes an air monitoring plan for monitoring airborne particulates and vapors in the work zone and along the perimeter of the site. The perimeter air monitoring is performed to ensure that the particulates and vapors are not released into the community during any earth moving work. If particulates or vapors are detected at the perimeter of the site, work would be shut down until vapor-suppressant measures could be implemented.

The EPA also takes measures to ensure that contamination is not spread to clean areas during the work. Plastic sheeting may be placed on the ground where contaminated soil may be stockpiled prior to transport. Also, truck beds may be lined with plastic for containment during transport. Further, all workers and equipment exiting the work zone would go through some type of decontamination process to prevent the further spreading of contaminants. The equipment would be thoroughly cleaned and the

protective clothing used by the workers would be properly discarded.

23. *Is the Alta Vista Elementary school on it's own well?*

No. The school is connected to the Village of Questa's municipal water distribution system.

FOR MORE INFORMATION

If you have questions about the activities at Molycorp site, please contact:

Mark Purcell
Remedial Project Manager
U.S. EPA Region 6 (6SF-LP)
1445 Ross Avenue
Dallas, TX 75202-2733
(214) 665-6707 or 1 800 533-3508

Beverly Negri
Community Relations Coordinator
U.S. EPA Region 6 (6SF-PO)
1445 Ross Avenue
Dallas, TX 75202-2733
(214) 665-8157 or 1 800 533-3508

Mike Reed
New Mexico Environmental Department
1190 St. Francis Drive
Santa Fe, New Mexico 87502-6110
(505) 827-2340

Inquiries from the news media should be directed to Mr. Dave Bary, EPA Press Officer at (214) 665-2208.

Information about the site is available at the following location:

Village of Questa
2500 Old State Road 3
P.O. Box 260
Questa, New Mexico 87556
(505) 586-0694

Information can also be accessed via the U.S. EPA Internet Homepage at:
U.S. EPA Headquarters: http://www.epa.gov
U.S. EPA Region 6: http://www.epa.gov/earth1r6
U.S. EPA region 6 Superfund Division:
http://epa.gov/earth1r6/6sf/6sf.htm

If you would like to have your name and address added to the site mailing list please call 1-800-533-3508 (toll-free).

Molycorp, Inc. Superfund
Site
Informational Bulletin

EPA

U. S. Environmental Protection Agency
Region 6 (6SF-P)
1445 Ross Avenue
Dallas, Texas 75202

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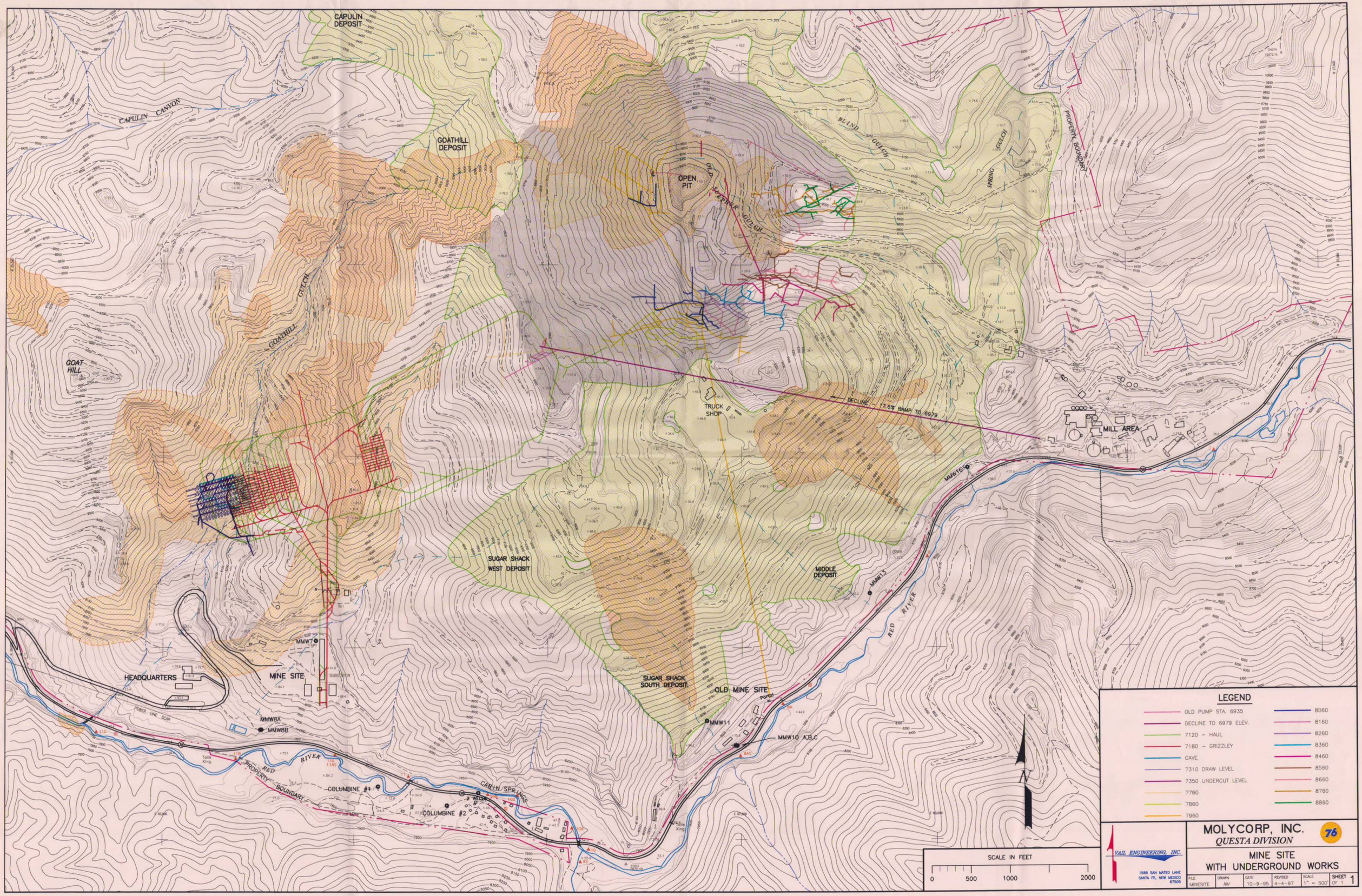
CAPULIN DEPOSIT
CAPULIN CANYON
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OPEN PIT
OLD SUPERPIT GULCH
BLIND GULCH
SPRING GULCH
PROPERTY BOUNDARY
GOATHILL GULCH
GOAT HILL
TRUCK SHOP
DECLINE - 17.6% RAMP TO 6979
MILL AREA
MMW15
MMW13
SUGAR SHACK WEST DEPOSIT
MIDDLE DEPOSIT
SUGAR SHACK SOUTH DEPOSIT
OLD MINE SITE
Pond
MMW11
MMW10 A,B,C
RED RIVER
HEADQUARTERS
MINE SITE
SUBSTATION
MMW7
POWER LINE SCAR
MMW8A
MMW8B
Tailing Xing
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COLUMBINE #2
CABIN SPRINGS
2 WELLS
LEGEND
OLD PUMP STA. 6935
DECLINE TO 6979 ELEV.
7120 - HAUL
7180 - GRIZZLEY
CAVE
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VAIL ENGINEERING, INC.
1588 SAN MATEO LANE
SANTA FE, NEW MEXICO
87505
MOLYCORP, INC.
QUESTA DIVISION
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MINE SITE
WITH UNDERGROUND WORKS
FILE MINESITE
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REVISED 4-4-97
SCALE 1" = 500'
SHEET 1 OF 1

Molycorp, Inc.
A Unocal Company
Questa Division
P.O. Box 469
Questa, New Mexico 87556
Telephone: (505) 586-0212

UNOCAL 76
MOLYCORP

Certified Mail – Return Receipt Requested

September 15, 1998

Mr. Scott Wilson
NPDES Permits Branch (6WQ-P)
U.S. Environmental Protection Agency
Region 6
1445 Ross Avenue
Dallas, TX 75202-2733

RECEIVED
SEP 18 1998
6WQ-P

Re: Molycorp, Inc. Renewal Application for NPDES Permit No. NM0022306; Comments on Report by Mr. David Abshire

Dear Mr. Wilson:

Molycorp, Inc. ("Molycorp") and its consultants have completed their review of Mr. David Abshire's report prepared for the NPDES Permits Branch: "Report on Hydrological Connection Associated with Molycorp Mining Activity, Questa, NM" by David Abshire, Geologist, USEPA, Region 6 (February 13, 1998) (hereinafter, "Abshire Report"). Mr. Abshire has done an admirable job under difficult circumstances of reviewing a large amount of data from technical reports in a very short time. He could spend only a portion of one day at the mine site, where he was accompanied by mine personnel and several persons representing the New Mexico Environment Department.

The report is intended to be a scientific analysis, but at one point it repeats the legal views of unknown persons. In the Executive Summary of the report, Mr. Abshire wrote that "A documented ground water hydrological connection between a source and surface water discharge *may be viewed* as a conduit; or a discernible, confined, and discrete conveyance." (Abshire Report at iii, emphasis added) When we asked Mr. Abshire about that statement, he told us that he carefully chose the words "may be viewed," and told us that those views were not his, but

had been urged upon him by others – apparently persons outside the Agency. We disagree with these views.

We have prepared the following comments on the Abshire Report. We have separated our comments into two categories: (1) substantive issues and (2) correcting specific errors.

Substantive Issues

The impact of underground mine de-watering on surface water and ground water flows at the mine site has been largely omitted from the Abshire Report. De-watering of the underground mine has created a substential cone of depression, with its southern capture zone extending close to the Red River. Molycorp has submitted to EPA supporting documentation and ground water monitoring data demonstrating this effect.[1]

The caved area is one part of the system that forms a single, large cone of depression in the mine area. Compare Abshire Report at 14. The caved area's interception of ground water and run off is due to changes in potentiometric surface trends created by underground mining. Once captured, the water in the caved area will not reach the river because of water flow reversal, combined with the fact that the caved area has a lower elevation than the river. Compare Abshire Report at 14.

The water balance studies and observations provide further proof of the existence of a large cone of depression. The underground mine collects runoff and seepage waters from Capulin Canyon, runoff and seepage waters from Goathill Gulch, runoff and seepage waters from the Open Pit and runoff water from the waste rock piles. The total estimated area from which runoff, infiltration and seepage waters report to the underground mine is 2,300 acres.[2] According to water balance calculations conducted by TRC Environmental Solutions, Inc. for the 2,300 acre area, approximately 313 gallons per minute ("gpm") of water will end up in the underground mine's surface capture area.[3] The mine collects and pumps to the mill to be used as process water an average of 270 gpm of water. This collection rate indicates that virtually all of the water in the mine capture area is pumped to the surface and does not migrate to the Red River. Compare Abshire Report at 21.

---

1 Ian P. G. Hutchison: "Questa Mine Site Expert Report" (TRC Environmental Solutions Inc.; April 23, 1997), at 8 (see Figure 3).

2 *Id.*, at 9 (see Attachment C).

3 *Id.*, at 9.

The speculation that the cone of depression may not affect water in the upper valley fill ignores the likelihood of natural discontinuities in the clay beneath the valley fill, as well as the impact of fracturing and subsided original surface created by underground mining. See Abshire Report at 18-19. These features disrupt the semi-confining layers underlying the upper valley fill, so dissolved constituent transport to the Red River through that fill layer is an unlikely scenario. Such transport would be unlikely whether or not the cone of depression underlay the valley fill. In fact, the upper valley fill layer does not contain an independent aquifer, even outside of the cone of depression.

The report discusses the relative contributions of naturally occurring constituents to the Red River from pulse loading from stormwater runoff versus ground water seepage. See Abshire Report at 13. Although Molycorp has controlled stormwater runoff at the mine site, elsewhere along the river, especially at Hansen Creek and Hot 'n Tot Creek, hydrothermal scars contribute large loadings to the river. After a storm subsides, the materials remaining in the river channel will continue to move downstream and enter the water, due to chemical interchange or physical remobilization of precipitates, from the river channel itself. Similarly, the mudflows from heavy precipitation will carry, as part of the slurry, pyrites and other sulfides to the river. They will continue to be acid sources until they have been entirely oxidized. Compare Abshire Report at 13.

In fact, as the Abshire Report points out (at pages 19-20), flow in the fan delta deposits will conform to the river gradient – it will move in the fan delta deposits and enter the river downriver from where the flows originated. We believe that this phenomenon is not localized. Acid drainage from hydrothermal scars such as those at Hanson Creek and Hot 'n Tot will flow through the gravel alluvial deposits into the river far downstream from the source. Thus acid drainage from these upriver scars may appear in the river (or leave it) at the Molycorp property as they enter and leave the alluvial gravel deposits in the stream bed.

The seeps at the Molycorp property have markedly diminished. This flow reduction is probably due to a combination of mine de-watering and the pumping of the Columbine supply wells located on the Molycorp mine site property south of the Red River.

To our knowledge, no one has ever done a mass balance comparing stormwater and ground water (seepage) contributions of contituents to the river. The relative contributions of these sources is unknown.

If seeps are
diminished due
to mine dewatering
and pumping at
the Columbine well,
then there must
be a Hydrologic
connection

In general, the report does not give sufficient recognition to the process of natural attenuation at the Questa mine area. Rocks in the immediate area of the mine and the surrounding altered zones have anomalous high percentages of calcite and various clay minerals. These minerals have excellent attenuative properties and capacity. It is evident from the mineralogical composition of both the alluvium and the bedrock that the attenuative capacity in the general area of the mine site has not been exhausted.

The Moly Tunnel is not a source of contaminated waters. The tunnel has been plugged with concrete plugs. A check last winter for water behind the concrete plug revealed no significant buildup, so there is no pressure that would force water out of the tunnel. The underground workings that would drain to the tunnel are dewatered via the new underground development. See Abshire Report at 12 (list of possible sources).

The Sugar Shack waste rock pile catchment basins are also unlikely sources of dissolved constituents to the Red River. Water rarely accumulates in them. When it does, the rate of infiltration is slow due to the accumulation of fines at the basin bottoms; consequently most of the accumulated water evaporates. Compare Abshire Report at 15.

The report assumes that both sides of the river have similar topography, so the existence of seeps only on the north side of the river must be due to manmade factors which increase recharge to ground water. See Abshire Report at 23. In fact: (1) natural seeps occur on both the north and south sides of the river; and (2) storage of water within the waste rock piles, and subsequent evaporation of that water, may decrease ground water recharge relative to natural conditions. Compare Abshire Report at 17. In addition, water is released at a different rate on the south side of the river; spring snowmelt is slower because the slope receives less-direct sunlight.

The report also concludes (at page 17) that the upper valley fill layer should be saturated below and downgradient of the WRDs due to recharge. In fact, whether the valley fill is saturated depends simply on whether its holding capacity is filled with water. Most evidence indicates that the upper valley fill is unsaturated.

The report (at page 3) cites numerous studies of the condition of the Red River since 1966, but omits any mention of the 1997 report by Chadwick

Ecological Consultants, Inc. ("Chadwick").[4] To our knowledge the Chadwick study is the only biological assessment of the Red River based on an analysis of the biological data for the river over time. Chadwick did its own sampling of fish and benthic invertebrates in the Red River (between a site upstream of the Town of Red River and a site about one third of a mile upstream of the fish hatchery diversion) in the spring of 1997. Chadwick also carefully reviewed all available biological data of the stream's condition, which went back to 1960.

Chadwick found that mining had not harmed fish in the Red River compared with pre-mining conditions, and that in fact there are more fish in the river now than there were in 1960:

> The similarity in the longitudinal trend in fish density between the three data collection periods (1960, 1774-1988, 1997) indicates that the relative suitabilities of the distinct reaches of the Red River to sustain fish populations has not changed substantially over this period. This trend is apparently independent of open pit mining activities, including the creation of the waste rock piles at the Questa Molybdenum Mine.
>
> Comparisons between baseline fish densities and present conditions indicate that, at all corresponding sampling sites between 1960 and 1997, there are higher densities of resident trout (excluding stocked rainbow trout) at present than during baseline conditions. Although sampling methods between the two periods were different, this indicates that the suitability of the Red River to sustain trout likely has improved over this period.

Chadwick Report at 64-65. After summarizing the river data for benthic invertebrates, Chadwick concluded that "the open pit mine and waste rock piles do not appear to have measurably impacted the suitability of the Red River to support aquatic biota." Chadwick Report at 66.

Specific Corrections

In addition to the foregoing substantive issues, we have the following comments on certain specific details in the Abshire Report..

---

[4] Chadwick Ecological Consultants, Inc.:"Aquatic Biological Assessment of the Red River, New Mexico, in the Vicinity of the Questa Molybdenum Mine" (April 1997) (Chadwick Report). Chadwick later prepared a supplemental report based on additional biological sampling of the River: "Fall 1997 Data Addendum, Red River Aquatic Biological Assessment" (February 1998). Both reports were submitted to EPA as part of Molycorp's permit renewal application.

- The tailings pond fluids do not have low pH and high metals concentrations and can not be classified as ARD; the pH ranges between 7.5 and 7.8. The only metal in slightly elevated concentrations – molybdenum – will be mostly removed in an ion exchange plant prior to discharge of the water.
- Chimney drains are a standard construction element of the type of dam that we have at Questa. They have no designed environmental mitigation function. The Abshire Report relied on a mistaken statement by SPRI, which misunderstood the purpose of a chimney drain. (See Abshire Report at 2, 8)
- The mine area does not primarily consist of the mineral pyrite. (See Abshire Report at 15) In fact, on an average, it carries only about 1.0% to 1.5% pyrite. In the area of the erosional scars, the pyrite content may reach 5%. All other volcanic rocks of the mine area and the altered trend contain pyrite. Pyrite is one of the minerals produced during the hydrothermal alteration process, and it occurs throughout the southern margin of the Questa Caldera.
- Only some of the hydrothermal scars contain or are rhyolite; others are andesite. The rhyolite in the mine area is likely to have varying amounts of minerals, including sulfides. Other volcanic rock types, including andesites, contain sulfides. (See Abshire Report at 15-16)
- The results from spring drainage sample CCS-2 cannot be utilized as background water quality because it was taken from outside of the zone of alteration. (See Abshire Report at 23)
- It does not necessarily follow that a greater ground water residence time causes greater constituent concentrations. There is no connection between residence time and concentrations unless (a) the residence location is a source of the constituents; and (b) concentrations are not solubility limited and are dissolution rate dependent (severely limiting conditions). (See Abshire Report at 26)
- Mr. Abshire assumes that the rhyolitic erosional scar is a brecciated rock, which is easily eroded due to lack of cementation and its highly fractured nature. (See Abshire Report at 17). Many scars are not brecciated or highly fractured rhyolite and the erodibilty occurs as a result of the rapid chemical weathering of the highly sulfidic material reducing it to a soil-like material. Erodibility, sulfide content and <u>both</u> chemical (heavy metals) and silt yields to Red River contamination are therefore closely related and natural processes.

We appreciate the opportunity to provide these comments and would be happy to discuss this report with you further at your convenience.
I may be reached at (505) 586-7601.

They told me
the plant is not
used any more
and was not
very effective
anyway

Sincerely,

David R. Shoemaker
Mine Manager

cc: Mr. David C. Abshire
Ms. Jane B. Watson, Ph.D.

Molycorp, Inc.
Molybdenum Group
P.O. Box 469
Questa, NM 87556-0469
Telephone (505) 586-0212
Facsimile (505) 586-0811

Permit File-A
NM 00 22306

Molycorp

CERTIFIED MAIL RETURN RECEIPT

November 2, 2005

Mr. Scott Wilson (6WQ-PP)
U.S. EPA Region 6
Permits Section – NPDES Permits Branch
1445 Ross Avenue
Dallas, TX 75202-2733

RE: NPDES Permit Renewal Application Addendum – Analytical Testing Testing Results Report

Dear Mr. Wilson:

Enclosed, please find a report containing analytical testing results for the NPDES permit renewal application. The report has been prepared in accordance with USEPA's request for data dated August 5, 2005. The data is being submitted as an addendum to the application to renew NPDES permit NM0022306, dated August 2, 2005.

Should you have any questions or require additional information, please contact me at (505) 586-7639 or Scott Honan at (760) 856-7656.

Sincerely,

Armando Martinez
Environmental Compliance Specialist

Enclosure

cc: R. Powell – NMED-SWQB
R. Torres – Molycorp, Inc.
S. Honan – Molycorp, Inc.

RECEIVED
2005 NOV -8 PM 8:12
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REPORT

OUTFALL 002 SAMPLING EVENT

Prepared for
Molycorp, Inc.
Questa, New Mexico

November 1, 2005

URS

URS Corporation
8181 E. Tufts Avenue
Denver, CO 80237

Project No. 22236239.00600

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Appendix B Laboratory Results

Appendix C Data Review Summary

1.0 INTRODUCTION

URS has undertaken environmental sampling at the Molycorp, Inc. (Molycorp) mine located 3.5 miles east of Questa in Taos County, New Mexico. Groundwater from Outfall 002 was obtained for laboratory analysis related to National Pollution Discharge Elimination System (NPDES) Permit Application. Results of the sampling and analysis are reported herein.

2.0 SAMPLE COLLECTION

On August 23, 2005, an aqueous sample was collected from Outfall 002 for chemical analysis to obtain result to be presented with the Permit Application. The aqueous sample from Outfall 002 was sampled by securely placing the end of a Teflon-lined tubing into the water stream flowing over the weir structure, which is located in the concrete cistern (e.g. well) of Outfall 002. The tubing was attached to a mobile peristaltic pump, which was located outside the cistern. The water flow over the weir, which is continuously monitored by Molycorp with a flow logger, was recorded before sample collection began. Physical parameters including pH, specific conductivity, dissolved oxygen, oxidation-reduction potential, and temperature were recorded with a calibrated and properly functioning QED MP20 multi-sensor field instrument. Both the flow and physical parameters are presented on Table 1, Field Measurements.

All sample bottles were directly filled from the end of the Teflon-lined tubing. Dissolved sample fractions were obtained by attaching a 0.45-micrometer filter to the end of the tubing and filling the sample bottles. Sample bottles for volatile organic compound (VOC) analysis were filled at a flow rate of less than 0.1 liter per minute (L/min). The balance of the sample bottles was filled at a flow rate of less than 1.0 L/min. All sampling activities followed Standard Operating Procedures (SOPs) as adopted by Molycorp for ongoing compliance water sampling activities. The sample containers were stored in an ice-filled cooler while awaiting transport to the laboratory. Samples were shipped under chain-of-custody procedures to the STL St. Louis laboratory in Earth City, Missouri for chemical analysis.

Chain-of-custody information is included as Appendix A. The sample was analyzed for the constituents specified by EPA for the NPDES permit application. Analyses included the following analyte groups: inorganics, metals, cyanide, 2,3,7,8-TCDD, volatile organic compounds (VOC), semi-volatile organic compounds (SVOC), pesticides, polychlorinated biphenyls (PCB), and radionuclides.

3.0 RESULTS

Laboratory analytical results for the sample collected from Outfall 002 are summarized in Table 2, Summary of Analytical Results, and the qualified results sheets are attached as Appendix B. Laboratory data review was conducted in accordance with SOP 12.0, Data Validation of Permit Data. The data review summary is included as Appendix C. The assigned data qualifiers are included in Table 2. All data were found to be usable as qualified with the exception of the weak-acid dissociable (WAD) cyanide result, which was rejected due to a matrix spike recovery below 30%. However, the data user should note that the maximum amount of WAD cyanide that could potentially be present is ≤0.0086 mg/L, which is the result reported for total cyanide.

Although a positive result of 0.0086 mg/L was obtained for total cyanide, this result is not in disagreement with historic results. The reporting limit (RL) for the total cyanide analysis conducted on this sample is 0.005 mg/L. The RL obtained for all historic results is 0.010 mg/L and 0.0086 mg/L is <0.010 mg/L. The total cyanide results obtained for 25 historic measurements were all <0.010. Although a positive result of 0.0086 mg/L was obtained for total cyanide, the result obtained for the laboratory duplicate sample was <0.005 mg/L. Because the two results, 0.0086 mg/L and <0.005 mg/L do not differ by more than one times the RL, data qualification was not assigned during data validation.

As part of the data review process, it was verified that the laboratory's Minimum Detection Levels (MDL) or RLs met Minimum Quantification Level (MQL) requirements as requested by EPA for the NPDES permit application, with one exception. The RL reported for technical chlordane is 0.5 μg/L and the MQL is 0.2 μg/L. Technical chlordane is a mixture whose principle components are alpha-chlordane and gamma-chlordane. The laboratory indicated that the analyst looks for the pattern for both components when reviewing chromatograms. The laboratory indicated that the MDL for alpha-chlordane and gamma-chlordane is 0.05 μg/L for each component. Although the RL for chlordane is 0.5 μg/L, the data indicate that neither of the primary constituents is present above the MDL of 0.05 μg/L as the laboratory reported any constituents detected at concentrations greater than the MDL.

Table 2 includes the laboratory RLs. For metals, pesticides, PCBs, WAD cyanide, and benzidine) the MDL was used as the RL. Please note that to meet MQLs, the laboratory reported constituents detected at concentrations greater than the MDL. Any detected values between the MDL and routine RLs were qualified as estimated values.

Review of the laboratory results show that there are no detectable VOCs, SVOCs, PCBs, pesticides, or 2,3,7,8-TCDD. Metals and inorganic constituents were reported at concentrations in the general range of historic results of these analytes of Outfall 002. The only radionuclide constituent detected was dissolved uranium at 31.4 ± 0.31 μg/L. Gross alpha particle activity was measured at 28.9 ± 7.8 pCi/L, approximately 21.0 pCi/l of which is attributable to total uranium (assuming that U^{238} and U^{234} are in equilibrium).

Table 1
FIELD MEASUREMENTS

Location	Date/Time	Flow (gpm)	pH (SU)	Specific Conductivity (mS/cm)	Temperature (deg C)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)
Outfall 002	8/23/05; 1440	354	7.05	1.590	13.97	6.10	132

Table 2
OUTFALL 002 ANALYTICAL RESULTS FOR AUGUST 23, 2005 SAMPLING

Chemical Class	Analyte	Analysis Method	Laboratory RL [1]	EPA MQL	Laboratory Result	Units	Data Qualifiers
PCDDs	2,3,7,8-TCDD	1613B	9.5	10	<9.5	pg/L	
Inorganics	T. Residual Chlorine	330.3	0.1	NS	<0.1	mg/L	J
Inorganics	Nitrate as N (mg/l)	300.0	0.02	NS	0.17	mg/L	
Inorganics	Nitrite + Nitrate (mg/l)	353.1	0.05	NS	0.112	mg/L	J
Inorganics	Total Cyanide (filtered sample)	335.4	0.005	0.01	0.0086	mg/L	J
Inorganics	Cyanide, wk acid dis (WAD)	4500-CN 1	0.010	NS		mg/L	R
Metals	Aluminum, dis	200.8	8.5	100*	<8.5	µg/L	
Metals	Antimony, dis.	200.8	0.61	60*	<0.61	µg/L	
Metals	Arsenic, dis.	200.8	1.8	10*	<1.8	µg/L	
Metals	Barium, dis.	200.8	0.6	10*	31.4	µg/L	
Metals	Beryllium, dis.	200.8	0.13	5*	<0.13	µg/L	
Metals	Boron, dis.	200.8	5.5	NS	45.5	µg/L	J
Metals	Cadmium, dis.	200.8	0.067	1*	2.7	µg/L	J
Metals	Chromium, dis.	200.8	3.7	10*	<3.7	µg/L	
Metals	Cobalt, dis.	200.8	0.52	NS	1.0	µg/L	J
Metals	Copper, dis.	200.8	0.72	10*	2.9	µg/L	J
Metals	Lead, dis.	200.8	0.132	0.2*	<0.132	µg/L	
Metals	Mercury, dis.	245.1	0.046	30*	<0.046	µg/L	
Metals	Mercury, total	245.1	0.046	30*	<0.046	µg/L	J
Metals	Molybdenum, dis.	200.8	0.63	30*	1,330	µg/L	
Metals	Nickel, dis.	200.8	1.2	40*	8.5	µg/L	J
Metals	Selenium, dis (SO4 >500 mg/l)	200.8	0.57	5*	NA	µg/L	
Metals	Selenium, dis.	200.8	0.57	5*	<0.84	µg/L	U
Metals	Selenium, total rec.	200.8	0.57	5*	<2.6	µg/L	U
Metals	Silver, dis.	200.8	1.5	2*	<1.5	µg/L	
Metals	Thalllium, dis.	200.8	0.22	10*	<0.44	µg/L	U
Metals	Vanadium, dis.	200.8	1.6	NS	<6.4	µg/L	U
Metals	Zinc, dis.	200.8	20	20*	<20	µg/L	
PCBs	Aroclor 1016	608	1	1	<1	µg/L	

Table 2
OUTFALL 002 ANALYTICAL RESULTS FOR AUGUST 23, 2005 SAMPLING

Chemical Class	Analyte	Analysis Method	Laboratory RL [1]	EPA MQL	Laboratory Result	Units	Data Qualifiers
PCBs	Aroclor 1016	608	1	1	<1	µg/L	
PCBs	Aroclor 1016	608	1	1	<1	µg/L	
PCBs	Aroclor 1016	608	1	1	<1	µg/L	
PCBs	Aroclor 1016	608	1	1	<1	µg/L	
PCBs	Aroclor 1016	608	1	1	<1	µg/L	
PCBs	Aroclor 1016	608	1	1	<1	µg/L	
Pesticides	Aldrin	608	0.05	0.05	<0.05	µg/L	
Pesticides	Alpha-BHC	608	0.05	0.05	<0.05	µg/L	
Pesticides	Beta-BHC	608	0.05	0.05	<0.05	µg/L	
Pesticides	Gamma-BHC	608	0.05	0.05	<0.05	µg/L	
Pesticides	Chlordane	608	0.5	0.2	<0.5	µg/L	
Pesticides	4,4'-DDT and derivatives	608	0.05	0.1	<0.05	µg/L	
Pesticides	4,4'-DDE	608	0.05	0.1	<0.05	µg/L	
Pesticides	4,4'-DDD	608	0.05	0.1	<0.05	µg/L	
Pesticides	Dieldrin	608	0.05	0.1	<0.05	µg/L	
Pesticides	Alpha-Endosulfan	608	0.05	0.1	<0.05	µg/L	
Pesticides	Beta-Endosulfan	608	0.05	0.1	<0.05	µg/L	
Pesticides	Endosulfan sulfate	608	0.05	0.1	<0.05	µg/L	
Pesticides	Endrin	608	0.05	0.1	<0.05	µg/L	
Pesticides	Endrin Aldehyde	608	0.1	0.1	<0.1	µg/L	
Pesticides	Heptachlor	608	0.05	0.05	<0.05	µg/L	
Pesticides	Heptachlor Epoxide	608	0.05	0.05	<0.05	µg/L	
Pesticides	Toxaphene	608	2	5	<2	µg/L	
Radionuclides	Total Uranium (filtered sample)	ASTM D5174	0.0 (MDC)	NS	31.4 +/- 0.31	µg/L	
Radionuclides	Ra-226	903.0/904.0	0.4 (MDC)	NS	<0.22 +/- 0.25	pCi/L	
Radionuclides	Ra-228	903.0/904.0	1.2 (MDC)	NS	<1.06 +/- 0.75	pCi/L	J
Radionuclides	Strontium	905.0	0.58 (MDC)	NS	<0.12 +/- 0.35	pCi/L	J
Radionuclides	Tritium (pCi/l) (total)	906.0	430 (MDC)	NS	<160 +/- 280	pCi/L	
Radionuclides	Tritium (pCi/l) (dissolved)	906.0	430 (MDC)	NS	<160 +/- 280	pCi/L	
Radionuclides	Gross Alpha	900.0	5.9 (MDC)	NS	28.9 +/- 7.8	pCi/L	

Table 2
OUTFALL 002 ANALYTICAL RESULTS FOR AUGUST 23, 2005 SAMPLING

Chemical Class	Analyte	Analysis Method	Laboratory RL [1]	EPA MQL	Laboratory Result	Units	Data Qualifiers
SVOC	2-Chlorophenol	625	10	10	<10	µg/L	
SVOC	2,4-Dichlorophenol	625	10	10	<10	µg/L	
SVOC	2,4-Dimethylphenol	625	10	10	<10	µg/L	
SVOC	4,6-Dinitro-o-Cresol (=4,6-Dinitro-2-methyl phenol)	625	50	50	<50	µg/L	
SVOC	2,4-Dinitrophenol	625	50	50	<50	µg/L	
SVOC	Pentachlorophenol	625	50	50	<50	µg/L	
SVOC	Phenol	625	10	10	<10	µg/L	
SVOC	2,4,6-Trichlorophenol	625	10	10	<10	µg/L	
SVOC	Acenaphthene	625	10	10	<10	µg/L	
SVOC	Anthracene	625	10	10	<10	µg/L	
SVOC	Benzidine	625	100 (MDL = 3.62)	50	<3.62	µg/L	
SVOC	Benzo(a)anthracene	625	10	10	<10	µg/L	
SVOC	Benzo(a)pyrene	625	10	10	<10	µg/L	
SVOC	3,4-Benzofluoranthene (= Benzo(b)fluoranthene)	625	10	10	<10	µg/L	
SVOC	Benzo(k)fluoranthene	625	10	10	<10	µg/L	
SVOC	Bis(2-chloroethyl)Ether	625	10	10	<10	µg/L	
SVOC	Bis(2-chloroisopropyl)Ether	625	10	10	<10	µg/L	
SVOC	Bis(2-ethylhexyl)Phthalate	625	10	10	<10	µg/L	
SVOC	Butyl Benzyl Phthalate	625	10	10	<10	µg/L	
SVOC	2-Chloronapthalene	625	10	10	<10	µg/L	
SVOC	Chrysene	625	10	10	<10	µg/L	
SVOC	Dibenzo(a,h)anthracene	625	10	20	<10	µg/L	
SVOC	1,2-Dichlorobenzene	625	10	10	<10	µg/L	
SVOC	1,3-Dichlorobenzene	625	10	10	<10	µg/L	
SVOC	1,4-Dichlorobenzene	625	10	10	<10	µg/L	
SVOC	3,3'-Dichlorobenzidine	625	50	50	<50	µg/L	
SVOC	Diethyl Phthalate	625	10	10	<10	µg/L	
SVOC	Dimethyl Phthalate	625	10	10	<10	µg/L	

Table 2
OUTFALL 002 ANALYTICAL RESULTS FOR AUGUST 23, 2005 SAMPLING

Chemical Class	Analyte	Analysis Method	Laboratory RL [1]	EPA MQL	Laboratory Result	Units	Data Qualifiers
SVOC	Di-n-Butyl Phthalate	625	10	10	<10	µg/L	
SVOC	2,4-Dinitrotoluene	625	10	10	<10	µg/L	
SVOC	1,2-Diphenylhydrazine	625	10	20	<10	µg/L	
SVOC	Fluoranthene	625	10	10	<10	µg/L	
SVOC	Fluorene	625	10	10	<10	µg/L	
SVOC	Hexachlorobenzene	625	10	10	<10	µg/L	
SVOC	Hexachlorobutadiene	625	10	10	<10	µg/L	
SVOC	Hexachlorocyclopentadiene	625	10	10	<10	µg/L	
SVOC	Hexachloroethane	625	10	10	<10	µg/L	
SVOC	Indeno(1,2,3-cd)Pyrene	625	10	20	<10	µg/L	
SVOC	Isophorone	625	10	10	<10	µg/L	
SVOC	Nitrobenzene	625	10	10	<10	µg/L	
SVOC	n-Nitrosodimethylamine	625	10	50	<10	µg/L	
SVOC	n-Nitrosodi-n-Propylamine	625	10	20	<10	µg/L	
SVOC	n-Nitrosodiphenylamine	625	10	20	<10	µg/L	
SVOC	Pyrene	625	10	10	<10	µg/L	
SVOC	1,2,4-Trichlorobenzene	625	10	10	<10	µg/L	
VOC	Acrolein	624	50	50	<50	µg/L	
VOC	Acrylonitrile	624	50	50	<50	µg/L	
VOC	Benzene	624	5	10	<5	µg/L	
VOC	Bromoform	624	5	10	<5	µg/L	
VOC	Carbon Tetrachloride	624	5	10	<5	µg/L	
VOC	Chlorobenzene	624	5	10	<5	µg/L	
VOC	Chlorodibromomethane	624	5	10	<5	µg/L	
VOC	Chloroform	624	5	10	<5	µg/L	
VOC	Dichlorobromomethane	624	5	NS	<5	µg/L	
VOC	1,2-Dichloroethane	624	5	10	<5	µg/L	
VOC	1,1-Dichloroethylene	624	5	10	<5	µg/L	
VOC	1,2-Dichloropropane	624	5	10	<5	µg/L	J
VOC	cis-1,3-Dichloropropene	624	5	10	<5	µg/L	

Table 2
OUTFALL 002 ANALYTICAL RESULTS FOR AUGUST 23, 2005 SAMPLING

Chemical Class	Analyte	Analysis Method	Laboratory RL [1]	EPA MQL	Laboratory Result	Units	Data Qualifiers
VOC	trans-1,3-Dichloropropene	624	5	10	<5	µg/L	
VOC	Ethylbenzene	624	5	10	<5	µg/L	
VOC	Methyl Bromide	624	5	50	<5	µg/L	
VOC	Methylene Chloride	624	5	20	<5	µg/L	
VOC	1,1,2,2-Tetrachloroethane	624	5	10	<5	µg/L	
VOC	Tetrachloroethylene	624	5	10	<5	µg/L	
VOC	Toluene	624	5	10	<5	µg/L	
VOC	1,2-trans-Dichloroethylene	624	5	10	<5	µg/L	
VOC	1,1,2-Trichloroethane	624	5	10	<5	µg/L	
VOC	Trichloroethylene	624	5	10	<5	µg/L	
VOC	Vinyl Chloride	624	5	10	<5	µg/L	

[1] For the metals and pesticide and PCB analyses, the MDLs were used as the RLs.

Qualifier Definitions
EPA = United States Environmental Protection Agency
U = Nondetect
RL = Reporting Limit
J = Reported value is considered an estimate
MDL = Method Detection Limit
R = Result is unusable
MQL = Minimum Quantification Limit
NS = None Specified
PCDD = Polychlorinated dibenzo-p-dioxin
TCDD = Tetrachlorodibenzo-p-dioxin
NA = Not Applicable
SVOC = Semivolatile Organic Compound
MDC = Value determined by instrument performance only
VOC = Volatile Organic Compound

Note: If analytes are present at detectable levels between the RL and the MDL, the laboratory reports the measured value as a detect at an estimated quantity.
* indicates that EPA's MQL requirement for metals is expressed as "total metals" whereas EPA required dissolved analyses for the permit application.

Appendix A

Chain-of-Custody Information

LOT # F5H250304

STL ST. LOUIS

URS

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

URS Corporation ● 8181 E. Tufts Avenue, Denver, CO 80237 ● 303-694-2770 ● Fax 303-694-3946

PAGE 1 OF 1

Work Order #

Project Name: Outfall 002 Sampling

Project Number: 22236229.00600

Project Manager: Stacy Malerba

Report CC: Bill Eaton

Company/Address: URS CORPORATION, 8181 EAST TUFTS AVENUE, DENVER, CO 80237

Phone #: 303.740.2648

FAX #: (303) 694-3946 (URS)

Sampler's Signature:

Sampler's Printed Name: MARC JOELLNER

ANALYSIS REQUESTED (Include Method Number and Container Preservative)

FIELD SAMPLE ID	FOR LAB USE ONLY	SAMPLING DATE	SAMPLING TIME	MATRIX	Total Number of Containers	Total Metals	Dissolved Metals	Inorganic Suite (see notes)	VOCs	~~BTEX~~	~~TPH-G~~	~~TPH-D~~	~~SVOCs~~	~~Pesticides~~	~~PCBs~~	~~Explosives~~	~~PCDD/PCDFs~~	~~Herbicide~~	Cyanide	Cyanide WAD	Uranium, 8/35	Sr, Ra, gross-α	PRESERVATIVE	REMARKS / LAB CONTAINER
						2	2	8	1										4	4	2	2		
Outfall002-TOIN-GRW		8/23/05	1545	W	15	✓		✓	✓	3 rinse (metals) 9×LP, 350p, 500g, 2×250p,									✓	✓		✓		
Outfall002-DOIN-GRW		"	"	W	2		✓		(Rad) LP, 500p (metals)										8×vial		✓			
TB04T-GRW		"	1500	W	1				✓	Vial HO														
																								MTS

Preservative Key: 0. NONE; 1. HCl; 2. HNO_3; 3. H_2SO_4; 4. NaOH; 5. Zn. Acetate; 6. MeOH; 7. $NaHSO_3$; 8. Other 4°C; 9. Other

SPECIAL INSTRUCTIONS/COMMENTS

Inorganic suite includes:

Quote # TL081505-3

URS Contact: * per "Outfall002 Parameters 2B"

See SOW ☐

See QAPP ☐

Matrix Key: W = Water; S = Soil/Sediment; B = Biota; O = Other

Container Key: P = Plastic; G = Glass; C = Clear; A = Amber; V = Vial; Z = Ziploc bag; M = Multiple types

TURNAROUND REQUIREMENTS: ____ RUSH (surcharges apply); ____ 24 hr ____ 48 hr ____ 5 day; ____ STANDARD; REQUESTED FAX DATE ____; REQUESTED REPORT DATE ____

REPORT REQUIREMENTS: ____ I. Results Only; ____ II. Results + QC Summaries (LCS, DUP, MS/MSD as required); ____ III. Results + QC and Calibration Summaries; ____ IV. Data Validation Report with Raw Data; ____ Specialized Forms/Custom Report; Edata ____ Yes ____ No

INVOICE INFORMATION: PO#; BILL TO:; SUBMISSION #:

SAMPLE RECEIPT: CONDITION/COOLER TEMP: ____ CUSTODY SEALS: Y N

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
Signature	Signature	Signature	Signature	Signature	Signature
Printed Name: MARC SOELLNER	Printed Name: VALERIO P. HAYES	Printed Name	Printed Name	Printed Name	Printed Name
Firm: URS	Firm	Firm	Firm	Firm	Firm
Date/Time: 8/24/05 0945	Date/Time: 08/25/05 0840	Date/Time	Date/Time	Date/Time	Date/Time

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White and Yellow to lab

Pink – sample management

Cooler 1 of 1

LOT # F5H250304

STL ST. LOUIS

CUR 1295

URS

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

URS Corporation ● 8181 E. Tufts Avenue, Denver, CO 80237 ● 303-694-2770 ● Fax 303-694-3946

PAGE 1 OF 1

Work Order #

Project Name: Buffalo 002 Sampling
Project Number: 22236229.00600
Project Manager: Stacey Malerba
Report CC: Bill Eaton
Company/Address: URS Corporation, 8181 East Tufts Avenue, Denver, CO 80237
Phone #: 303 740 2148
FAX #: (303) 694-3946 (URS)
Sampler's Signature:
Sampler's Printed Name: MARC SOELLNER

ANALYSIS REQUESTED (Include Method Number and Container Preservative)

FIELD SAMPLE ID	FOR LAB USE ONLY	SAMPLING DATE	SAMPLING TIME	MATRIX	Total Number of Containers	~~Total Metals~~	Dissolved Metals	~~Inorganic Suite (see notes)~~	~~VOCs~~	~~BTEX~~	~~TPH-G~~	~~TPH-D~~	SVOCs	Pesticides	PCBs	~~Explosives~~	PCDD/~~PCDFs~~	~~Herbicide~~					PRESERVATIVE	REMARKS
													∞	∞	∞		∞							
Buffalo002-T01N-GRW		8/23/05	1545	W	6			5x5 (sub)					✓	✓	✓		✓			1	CG		LAB CONTAINER RCV. broken	
24Gallon002-T01D-GRW		8/23/05	1545	W	3			3x5 (sub)					✓	✓	✓		✓						HOLD.	
						3x40, 250p, 500p(mets) 5xCG																		

Preservative Key: 0. NONE; 1. HCl; 2. HNO_3; 3. H_2SO_4; 4. NaOH; 5. Zn. Acetate; 6. MeOH; 7. $NaHSO_4$; 8. Other 4°C; 9. Other

MTS

SPECIAL INSTRUCTIONS/COMMENTS
Inorganic suite includes:

Quote # TL 081505-3

URS Contact:

See SOW ☐

See QAPP ☐

Matrix Key: W = Water; S = Soil/Sediment; B = Biota; O = Other

Container Key: P = Plastic; G = Glass; C = Clear; A = Amber; V = Vial; Z = Ziploc bag; M = Multiple types

TURNAROUND REQUIREMENTS: ____ RUSH (surcharges apply); ____ 24 hr ____ 48 hr ____ 5 day; ____ STANDARD; REQUESTED FAX DATE ____; REQUESTED REPORT DATE ____

REPORT REQUIREMENTS: ____ I. Results Only; ____ II. Results + QC Summaries (LCS, DUP, MS/MSD as required); ____ III. Results + QC and Calibration Summaries; ____ IV. Data Validation Report with Raw Data; ____ Specialized Forms/Custom Report; Edata ____ Yes ____ No

INVOICE INFORMATION: PO#; BILL TO:; SUBMISSION #:

SAMPLE RECEIPT CONDITION/COOLER TEMP: ____ CUSTODY SEALS: Y N

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
Signature	Signature Valerio P. Hayes	Signature	Signature	Signature	Signature
Printed Name MARC SOELLNER	Printed Name VALERIO P. HAYES	Printed Name	Printed Name	Printed Name	Printed Name
Firm URS	Firm	Firm	Firm	Firm	Firm
Date/Time 8/24/05 0945	Date/Time 092505 0840	Date/Time	Date/Time	Date/Time	Date/Time

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White and Yellow to lab — Pink – sample management

Cooler 1 of 1

LOT # FSH250304

STL ST. LOUIS

CUK 1295

URS

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

URS Corporation • 8181 E. Tufts Avenue, Denver, CO 80237 • 303-694-2770 • Fax 303-694-3946

PAGE 1 OF 1

Work Order #

Project Name: Outfall 002 Sampling

Project Number: 22236229.00600

Project Manager: Stacy Malerba

Report CC: Bill Eaton

Company/Address: URS Corporation, 8181 East Tufts Avenue, Denver, CO 80237

Phone #: 303.740.7648

FAX #: (303) 694-3946 (URS)

Sampler's Signature:

Sampler's Printed Name: MARC SOELLNER

ANALYSIS REQUESTED (Include Method Number and Container Preservative)

FIELD SAMPLE ID	FOR LAB USE ONLY	SAMPLING DATE	SAMPLING TIME	MATRIX	Total Number of Containers	Total Metals	Dissolved Metals	Inorganic Suite (see notes)	VOCs	~~BTEX~~	~~TPH-G~~	~~TPH-D~~	SVOCs	Pesticides	PCBs	~~Explosives~~	~~PCDD/PCDFs~~	~~Herbicides~~	Cyanide	Cyanide WAD	Tritium	PRESERVATIVE	REMARKS / LAB CONTAINER
						2	1	8	—				8	8	8		8		4	4	1		
Outfall002-T01D-GRW		8/23/05	1545	W	1		✓	(IrM)(ISO6)	2x1P												1P		HOLD
Outfall002-D01D-GRW		"	"	W	13			✓	✓				✓	✓	✓		✓		✓	✓	✓		HOLD
FB03T-GRW		"	1500	W	1	✓			✓				vial										HOLD
	500P(Mets)																						

Preservative Key: 0. NONE; 1. HCl; 2. HNO_3; 3. H_2SO_4; 4. NaOH; 5. Zn. Acetate; 6. MeOH; 7. $NaHSO_4$; 8. Other 4°C; 9. Other

HTS

SPECIAL INSTRUCTIONS/COMMENTS

Inorganic suite includes:

Quote # TL 081505-3

URS Contact:

See SOW ☐

See QAPP ☐

* per "Outfall 002 Parameters 2B"

Matrix Key: W = Water; S = Soil/Sediment; B = Biota; O = Other

Container Key: P = Plastic; G = Glass; C = Clear; A = Amber; V = Vial; Z = Ziploc bag; M = Multiple types

TURNAROUND REQUIREMENTS: ____ RUSH (surcharges apply); ____ 24 hr ____ 48 hr ____ 5 day; ____ STANDARD; REQUESTED FAX DATE; REQUESTED REPORT DATE

REPORT REQUIREMENTS: ____ I. Results Only; ____ II. Results + QC Summaries (LCS, DUP, MS/MSD as required); ____ III. Results + QC and Calibration Summaries; ____ IV. Data Validation Report with Raw Data; ____ Specialized Forms/Custom Report; Edata ____ Yes ____ No

INVOICE INFORMATION: PO#; BILL TO; SUBMISSION #

SAMPLE RECEIPT: CONDITION/COOLER TEMP: ____ CUSTODY SEALS: Y N

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
Signature:	Signature: Valerie P. Hayes	Signature	Signature	Signature	Signature
Printed Name: MARC SOELLNER	Printed Name: VALERIE P. HAYES	Printed Name	Printed Name	Printed Name	Printed Name
Firm: URS	Firm	Firm	Firm	Firm	Firm
Date/Time: 8/24/05 0945	Date/Time: 082505 0840	Date/Time	Date/Time	Date/Time	Date/Time

White and Yellow to lab — Pink – sample management

Cooler 1 of 1

LOT # F5H250304

STL ST. LOUIS

CUR 1295

URS

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

URS Corporation ● 8181 E. Tufts Avenue, Denver, CO 80237 ● 303-694-2770 ● Fax 303-694-3946

PAGE 1 OF 1

Work Order #

Project/Name: Outfall 002 Sampling

Project Number: 22236229.00600

Project Manager: Stacey Malerba

Report CC: Bill Eaton

Company/Address: URS Corporation, 8181 East Tufts Avenue, Denver, CO 80237

Phone #: 303.740.2648

FAX #: (303) 694-3946 (URS)

Sampler's Signature:

Sampler's Printed Name: MARC SOELLNER

ANALYSIS REQUESTED (Include Method Number and Container Preservative)

FIELD SAMPLE ID	FOR LAB USE ONLY	SAMPLING DATE	SAMPLING TIME	MATRIX	Total Number of Containers	~~Total Metals~~	~~Dissolved Metals~~	~~Inorganic Suite (see notes)~~	~~VOCs~~	~~BTEX~~	~~TPH-G~~	~~TPH-D~~	SVOCs	Pesticides	PCBs	~~Explosives~~	PCDD/~~PCDFs~~	~~Herbicide~~	Tritium				PRESERVATIVE
													30	30	30		30		30				
													*	*	*								
Outfall002-TOIN-GRW		8/23/05	1545	W	8		8x	LG			VPH		✓	✓	✓		✓		✓				

Preservative Key: 0. NONE; 1. HCl; 2. HNO_3; 3. H_2SO_4; 4. NaOH; 5. Zn. Acetate; 6. MeOH; 7. $NaHSO_4$; 8. Other 4°C; 9. Other

REMARKS: LAB CONTAINER

(2x red X 250b)

MTS

SPECIAL INSTRUCTIONS/COMMENTS

Inorganic suite includes:

Quote # TL 081505-3

URS Contact: * per "Outfall 002 Parameters 2B"

See SOW ☐

See QAPP ☐

Matrix Key: W = Water; S = Soil/Sediment; B = Biota; O = Other

Container Key: P = Plastic; G = Glass; C = Clear; A = Amber; V = Vial; Z = Ziploc bag; M = Multiple types

TURNAROUND REQUIREMENTS: ____ RUSH (surcharges apply); ____ 24 hr ____ 48 hr ____ 5 day; ____ STANDARD; REQUESTED FAX DATE ____; REQUESTED REPORT DATE ____

REPORT REQUIREMENTS: ____ I. Results Only; ____ II. Results + QC Summaries (LCS, DUP, MS/MSD as required); ____ III. Results + QC and Calibration Summaries; ____ IV. Data Validation Report with Raw Data; ____ Specialized Forms/Custom Report; Edata ____ Yes ____ No

INVOICE INFORMATION: PO#; BILL TO:; SUBMISSION #:

SAMPLE RECEIPT CONDITION/COOLER TEMP: ____ CUSTODY SEALS: Y N

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
Signature	Signature: Valerie P. Hayes	Signature	Signature	Signature	Signature
Printed Name: MARC SOELLNER	Printed Name: VALERIE P. HAYES	Printed Name	Printed Name	Printed Name	Printed Name
Firm: URS	Firm	Firm	Firm	Firm	Firm
Date/Time: 8/24/05 0945	Date/Time: 082505 0840	Date/Time	Date/Time	Date/Time	Date/Time

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White and Yellow to lab

Pink – sample management

Cooler 1 of 1

LOT # F5H250304

STL ST. LOUIS

URS

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

URS Corporation ● 8181 E. Tufts Avenue, Denver, CO 80237 ● 303-694-2770 ● Fax 303-694-3946

PAGE 1 OF 1

Work Order #

Project Name: Outfall 002 Sampling

Project Number: 22236229.06600

Project Manager: Stacy Maleiba

Report CC: Bill Eaton

Company/Address: URS Corporation, 8181 East Tufts Avenue, Denver, CO 80237

Phone #: 303.740.2648

FAX #: (303) 694-3946 (URS)

Sampler's Signature:

Sampler's Printed Name: MARC SOELLNER

ANALYSIS REQUESTED (Include Method Number and Container Preservative)

FIELD SAMPLE ID	FOR LAB USE ONLY	SAMPLING DATE	SAMPLING TIME	MATRIX	Total Number of Containers	Total Metals	Dissolved Metals	Inorganic Suite (see notes)	VOCs	BTEX	TPH-G	TPH-D	SVOCs	Pesticides	PCBs	Explosives	PCDD/PCDFs	Herbicide	Cyanide	Cyanide WAD	Uranium, diss	Sr, Ra, gross α	PRESERVATIVE	REMARKS	LAB CONTAINER
						2	2	8											4	4	1	2			
Outfall002-TOIN-GRW		8/23/05	1545	W	9	✓		✓	(3rad) 5xLP, 250p, 250p, 2x120p				2x 1450(E) Ex 8260B 8/25/05						✓	✓		✓			
Outfall002-DOIN-GRW		"	"	W	2		✓		LP, 500p (Met), pH												✓				

Preservative Key: 0. NONE; 1. HCl; 2. HNO_3; 3. H_2SO_4; 4. NaOH; 5. Zn. Acetate; 6. MeOH; 7. $NaHSO_4$; 8. Other 4°C; 9. Other

MTS

SPECIAL INSTRUCTIONS/COMMENTS

Inorganic suite includes:

Quote # TL 081505-3

URS Contact:

See SOW ☐

See QAPP ☐

Matrix Key: W = Water; S = Soil/Sediment; B = Biota; O = Other

Container Key: P = Plastic; G = Glass; C = Clear; A = Amber; V = Vial; Z = Ziploc bag; M = Multiple types

TURNAROUND REQUIREMENTS: ____ RUSH (surcharges apply); ____ 24 hr ____ 48 hr ____ 5 day; ____ STANDARD; REQUESTED FAX DATE; REQUESTED REPORT DATE

REPORT REQUIREMENTS: ____ I. Results Only; ____ II. Results + QC Summaries (LCS, DUP, MS/MSD as required); ____ III. Results + QC and Calibration Summaries; ____ IV. Data Validation Report with Raw Data; ____ Specialized Forms/Custom Report; Edata ____ Yes ____ No

INVOICE INFORMATION: PO#; BILL TO:; SUBMISSION #:

SAMPLE RECEIPT/CONDITION/COOLER TEMP: ____ CUSTODY SEALS: Y N

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
Signature	Signature: Valerie P. Hayes	Signature	Signature	Signature	Signature
Printed Name: MARC SOELLNER	Printed Name: Valerie P. Hayes	Printed Name	Printed Name	Printed Name	Printed Name
Firm: URS	Firm	Firm	Firm	Firm	Firm
Date/Time: 8/27/05 0945	Date/Time: 082505 0840	Date/Time	Date/Time	Date/Time	Date/Time

E:\Desktop\1.15\URS General.doc 1/15/04 3:53 PM

White and Yellow to lab

Pink – sample management

Cooler 1 of 1

Appendix B

Laboratory Results

URS Corporation

Client Sample ID: OUTFALL002-T01N-GRW

GC/MS Volatiles

Lot-Sample #...: F5H250304-001 **Work Order #...:** HH9H61AR **Matrix.....:** WATER
Date Sampled...: 08/23/05 15:45 **Date Received..:** 08/25/05
Prep Date.....: 08/29/05 **Analysis Date..:** 08/29/05
Prep Batch #...: 5241494 **Analysis Time..:** 15:28
Dilution Factor: 1
Method.....: CFR136A 624

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Trichloroethylene	ND	5.0	ug/L
Acrolein	ND	50	ug/L
Acrylonitrile	ND	50	ug/L
Chlorodibromomethane	ND	5.0	ug/L
Dichlorobromomethane	ND	5.0	ug/L
Methyl bromide	ND	5.0	ug/L
1,1-Dichloroethylene	ND	5.0	ug/L
trans-1,2-Dichloroethylene	ND	5.0	ug/L
Tetrachloroethylene	ND	5.0	ug/L
cis-1,3-Dichloropropene	ND	5.0	ug/L
trans-1,3-Dichloropropene	ND	5.0	ug/L
Vinyl chloride	ND	5.0	ug/L
Methylene chloride	ND	5.0	ug/L
Chloroform	ND	5.0	ug/L
Carbon tetrachloride	ND	5.0	ug/L
1,2-Dichloroethane	ND	5.0	ug/L
Benzene	ND	5.0	ug/L
1,2-Dichloropropane	ND	5.0	ug/L
Toluene	ND	5.0	ug/L
1,1,2-Trichloroethane	ND	5.0	ug/L
Chlorobenzene	ND	5.0	ug/L
Ethylbenzene	ND	5.0	ug/L
Bromoform	ND	5.0	ug/L
1,1,2,2-Tetrachloroethane	ND	5.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1,2-Dichloroethane-d4	102	(68 - 142)
Toluene-d8	114	(75 - 127)
4-Bromofluorobenzene	107	(82 - 116)

URS Corporation

Client Sample ID: TB04T-GRN

GC/MS Volatiles

Lot-Sample #...: F5H250304-003 **Work Order #...:** HH9RD1AA **Matrix.....:** WATER
Date Sampled...: 08/23/05 15:00 **Date Received..:** 08/25/05
Prep Date.....: 08/29/05 **Analysis Date..:** 08/29/05
Prep Batch #...: 5241494 **Analysis Time..:** 16:49
Dilution Factor: 1

Method.....: CFR136A 624

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Trichloroethylene	ND	5.0	ug/L
Acrolein	ND	50	ug/L
Acrylonitrile	ND	50	ug/L
Chlorodibromomethane	ND	5.0	ug/L
Dichlorobromomethane	ND	5.0	ug/L
Methyl bromide	ND	5.0	ug/L
1,1-Dichloroethylene	ND	5.0	ug/L
trans-1,2-Dichloroethylene	ND	5.0	ug/L
Tetrachloroethylene	ND	5.0	ug/L
cis-1,3-Dichloropropene	ND	5.0	ug/L
trans-1,3-Dichloropropene	ND	5.0	ug/L
Vinyl chloride	ND	5.0	ug/L
Methylene chloride	ND	5.0	ug/L
Chloroform	ND	5.0	ug/L
Carbon tetrachloride	ND	5.0	ug/L
1,2-Dichloroethane	ND	5.0	ug/L
Benzene	ND	5.0	ug/L
1,2-Dichloropropane	ND	5.0	ug/L
Toluene	ND	5.0	ug/L
1,1,2-Trichloroethane	ND	5.0	ug/L
Chlorobenzene	ND	5.0	ug/L
Ethylbenzene	ND	5.0	ug/L
Bromoform	ND	5.0	ug/L
1,1,2,2-Tetrachloroethane	ND	5.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1,2-Dichloroethane-d4	101	(68 - 142)
Toluene-d8	113	(75 - 127)
4-Bromofluorobenzene	107	(82 - 116)

URS Corporation

Client Sample ID: OUTFALL002-T01N-GRW

GC/MS Semivolatiles

Lot-Sample #...: F5H250304-001 **Work Order #...:** HH9H61AC **Matrix.....:** WATER
Date Sampled...: 08/23/05 15:45 **Date Received..:** 08/25/05
Prep Date.....: 08/29/05 **Analysis Date..:** 08/31/05
Prep Batch #...: 5241402 **Analysis Time..:** 13:20
Dilution Factor: 1

Method.....: CFR136A 625

PARAMETER	RESULT	REPORTING LIMIT	UNITS
N-Nitrosodimethylamine	ND	10	ug/L
bis(2-Chloroisopropyl) ether	ND	10	ug/L
1,2-Dichlorobenzene	ND	10	ug/L
1,3-Dichlorobenzene	ND	10	ug/L
1,4-Dichlorobenzene	ND	10	ug/L
Phenol	ND	10	ug/L
bis(2-Chloroethyl)-ether	ND	10	ug/L
2-Chlorophenol	ND	10	ug/L
N-Nitrosodi-n-propyl-amine	ND	10	ug/L
Hexachloroethane	ND	10	ug/L
Nitrobenzene	ND	10	ug/L
Isophorone	ND	10	ug/L
2,4-Dimethylphenol	ND	10	ug/L
2,4-Dichlorophenol	ND	10	ug/L
1,2,4-Trichloro-benzene	ND	10	ug/L
Hexachlorobutadiene	ND	10	ug/L
Hexachlorocyclopenta-diene	ND	10	ug/L
2,4,6-Trichloro-phenol	ND	10	ug/L
2-Chloronaphthalene	ND	10	ug/L
Dimethyl phthalate	ND	10	ug/L
Acenaphthene	ND	10	ug/L
2,4-Dinitrophenol	ND	50	ug/L
2,4-Dinitrotoluene	ND	10	ug/L
Diethyl phthalate	ND	10	ug/L
Fluorene	ND	10	ug/L
4,6-Dinitro-2-methylphenol	ND	50	ug/L
Hexachlorobenzene	ND	10	ug/L
Pentachlorophenol	ND	50	ug/L
Anthracene	ND	10	ug/L
Di-n-butyl phthalate	ND	10	ug/L
Fluoranthene	ND	10	ug/L

(Continued on next page)

URS Corporation

Client Sample ID: OUTFALL002-T01N-GRW

GC/MS Semivolatiles

Lot-Sample #...: F5H250304-001 **Work Order #...:** HH9H61AC **Matrix.....:** WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzidine	ND	100	ug/L
Pyrene	ND	10	ug/L
Benzo(a)anthracene	ND	10	ug/L
3,3'-Dichlorobenzidine	ND	50	ug/L
Butyl benzyl phthalate	ND	10	ug/L
Chrysene	ND	10	ug/L
bis(2-Ethylhexyl) phthalate	ND	10	ug/L
Benzo(b)fluoranthene	ND	10	ug/L
Benzo(k)fluoranthene	ND	10	ug/L
Benzo(a)pyrene	ND	10	ug/L
Indeno(1,2,3-cd)pyrene	ND	10	ug/L
Dibenzo(a,h)anthracene	ND	10	ug/L
N-Nitrosodiphenylamine	ND	10	ug/L
1,2-Diphenylhydrazine (as Azobenzene)	ND	10	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
2-Fluorobiphenyl	65	(51 - 109)
2-Fluorophenol	34	(21 - 55)
2,4,6-Tribromophenol	77	(53 - 106)
Nitrobenzene-d5	70	(37 - 111)
Phenol-d5	23	(15 - 38)
Terphenyl-d14	72	(50 - 102)

URS Corporation

Client Sample ID: OUTFALL002-T01N-GRW

GC Semivolatiles

Lot-Sample #...: F5H250304-001 **Work Order #...:** HH9H61AA **Matrix.....:** WATER
Date Sampled...: 08/23/05 15:45 **Date Received..:** 08/25/05
Prep Date.....: 08/30/05 **Analysis Date..:** 09/08/05
Prep Batch #...: 5242580 **Analysis Time..:** 12:09
Dilution Factor: 1

Method.....: CFR136A 608

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Endrin aldehyde	ND	0.10	ug/L
Chlordane (technical)	ND	0.50	ug/L
Aroclor 1016	ND	1.0	ug/L
Aroclor 1221	ND	1.0	ug/L
Aroclor 1232	ND	1.0	ug/L
Aroclor 1242	ND	1.0	ug/L
Aroclor 1248	ND	1.0	ug/L
Aroclor 1254	ND	1.0	ug/L
Aroclor 1260	ND	1.0	ug/L
Heptachlor	ND	0.050	ug/L
Heptachlor epoxide	ND	0.050	ug/L
Toxaphene	ND	2.0	ug/L
Aldrin	ND	0.050	ug/L
alpha-BHC	ND	0.050	ug/L
beta-BHC	ND	0.050	ug/L
gamma-BHC (Lindane)	ND	0.050	ug/L
4,4'-DDD	ND	0.050	ug/L
4,4'-DDE	ND	0.050	ug/L
4,4'-DDT	ND Kuk	0.050	ug/L
Dieldrin	ND	0.050	ug/L
Endosulfan I	ND	0.050	ug/L
Endosulfan II	ND	0.050	ug/L
Endosulfan sulfate	ND	0.050	ug/L
Endrin	ND	0.050	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	100	(13 - 150)
Decachlorobiphenyl	62	(10 - 150)

URS Corporation

Client Sample ID: OUTFALL002-T01N-GRW

GC Semivolatiles

Lot-Sample #...: F5H250304-001 **Work Order #...:** HH9H62AA **Matrix.....:** WATER
Date Sampled...: 08/23/05 15:45 **Date Received..:** 08/25/05
Prep Date.....: 09/07/05 **Analysis Date..:** 09/08/05
Prep Batch #...: 5250442 **Analysis Time..:** 19:45
Dilution Factor: 1

Method.....: CFR136A 608

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Endrin aldehyde	ND	0.10	ug/L
Chlordane (technical)	ND	0.50	ug/L
Heptachlor	ND	0.050	ug/L
Heptachlor epoxide	ND	0.050	ug/L
Toxaphene	ND	2.0	ug/L
Aldrin	ND	0.050	ug/L
alpha-BHC	ND	0.050	ug/L
beta-BHC	ND	0.050	ug/L
gamma-BHC (Lindane)	ND	0.050	ug/L
4,4'-DDD	ND	0.050	ug/L
4,4'-DDE	ND	0.050	ug/L
4,4'-DDT	ND	0.050	ug/L
Dieldrin	ND	0.050	ug/L
Endosulfan I	ND	0.050	ug/L
Endosulfan II	ND	0.050	ug/L
Endosulfan sulfate	ND	0.050	ug/L
Endrin	ND	0.050	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	72	(65 - 125)
Decachlorobiphenyl	86	(54 - 112)

URS Corporation

Client Sample ID: OUTFALL002-T01N-GRW

Trace Level Organic Compounds

Lot-Sample #...: F5H250304-001 **Work Order #...:** HH9H61AD **Matrix.....:** WATER
Date Sampled...: 08/23/05 15:45 **Date Received..:** 08/25/05
Prep Date.....: 09/06/05 **Analysis Date..:** 09/15/05
Prep Batch #...: 5249153 **Analysis Time..:** 04:55
Dilution Factor: 1

PARAMETER	RESULT	DETECTION LIMIT	UNITS	METHOD
2,3,7,8-TCDD	ND	9.5	pg/L	EPA-5 1613B

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	98	(20 - 175)
13C-1,2,3,7,8-PeCDD	95	(21 - 227)
13C-1,2,3,4,7,8-HxCDD	91	(21 - 193)
13C-1,2,3,6,7,8-HxCDD	88	(25 - 163)
13C-1,2,3,4,6,7,8-HpCDD	94	(26 - 166)
13C-OCDD	97	(13 - 199)
13C-2,3,7,8-TCDF	101	(22 - 152)
13C-1,2,3,7,8-PeCDF	111	(21 - 192)
13C-2,3,4,7,8-PeCDF	100	(13 - 328)
13C-1,2,3,4,7,8-HxCDF	87	(19 - 202)
13C-1,2,3,6,7,8-HxCDF	81	(21 - 159)
13C-2,3,4,6,7,8-HxCDF	93	(22 - 176)
13C-1,2,3,7,8,9-HxCDF	94	(17 - 205)
13C-1,2,3,4,6,7,8-HpCDF	91	(21 - 158)
13C-1,2,3,4,7,8,9-HpCDF	96	(20 - 186)

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
37Cl4-2,3,7,8-TCDD	100	(31 - 191)

URS Corporation

Client Sample ID: OUTFALL002-T01N-GRW

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F5H250304-001
Work Order: HH9H6
Matrix: WATER

Date Collected: 08/23/05 1545
Date Received: 08/25/05 0840

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
SR-90 BY GFPC EPA-905 MOD				pCi/L	905 MOD			
Strontium 90	0.12	U	0.35	0.58	08/29/05	09/06/05	5241086	80
RA-226 BY EPA-903.0 MOD				pCi/L	903.0 MOD			
Radium (226)	0.22	U	0.25	0.40	08/29/05	09/12/05	5241081	67
RA-228 BY GFPC EPA 904 MOD				pCi/L	904 MOD			
Radium 228	1.06	U	0.75	1.2	08/29/05	09/12/05	5241082	47
TRITIUM (Distill) by EPA 906.0 MOD				pCi/L	906.0 MOD			
Tritium	160	U	280	430	10/21/05	10/25/05	5291327	
GROSS A/B BY GFPC EPA 900.0 MOD				pCi/L	900.0 MOD			
Gross Alpha	28.9		7.8	5.9	09/07/05	09/10/05	5250079	

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

U Result is less than the sample detection limit.

URS Corporation

Client Sample ID: OUTFALL002-T01N-GRW DUP

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F5H250304-001X
Work Order: HH9H6
Matrix: WATER

Date Collected: 08/23/05 1545
Date Received: 08/25/05 0840

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
TRITIUM (Distill) by EPA 906.0 MOD				pCi/L	906.0 MOD			
Tritium	190	U	280	430	10/21/05	10/25/05	5291327	

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

U Result is less than the sample detection limit.

URS Corporation

Client Sample ID: OUTFALL002-D01N-GRW

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F5H250304-002
Work Order: HH9M7
Matrix: WATER

Date Collected: 08/23/05 1545
Date Received: 08/25/05 0840

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
TRITIUM (Distill) by EPA 906.0 MOD				pCi/L	906.0 MOD			
Tritium	280	U	260	430	10/21/05	10/24/05	5291327	
Total Uranium by KPA ASTM 5174-91				ug/L	5174-91			
Total Uranium	31.4		0.31	0.0	09/01/05	09/01/05	5243336	

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

U Result is less than the sample detection limit.

URS Corporation

Client Sample ID: OUTFALL002-T01N-GRW

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F5H250304-001
Work Order: HH9H6
Matrix: WATER

Date Collected: 08/23/05 1545
Date Received: 08/25/05 0840

Parameter	Result	Qual	Total Uncert. (2 σ+/-)		MDC	Prep Date	Analysis Date	Batch #	Yld %
SR-90 BY GFPC EPA-905 MOD				pCi/L		905 MOD			
Strontium 90	0.12	U	0.35		0.58	08/29/05	09/06/05	5241086	80
RA-226 BY EPA-903.0 MOD				pCi/L		903.0 MOD			
Radium (226)	0.22	U	0.25		0.40	08/29/05	09/12/05	5241081	67
RA-228 BY GFPC EPA 904 MOD				pCi/L		904 MOD			
Radium 228	1.06	U	0.75		1.2	08/29/05	09/12/05	5241082	47
GROSS A/B BY GFPC EPA 900.0 MOD				pCi/L		900.0 MOD			
Gross Alpha	28.9		7.8		5.9	09/07/05	09/10/05	5250079	

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

U Result is less than the sample detection limit.

URS Corporation

Client Sample ID: OUTFALL002-D01N-GRW

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F5H250304-002
Work Order: HH9M7
Matrix: WATER

Date Collected: 08/23/05 1545
Date Received: 08/25/05 0840

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
Total Uranium by KPA ASTM 5174-91				ug/L	5174-91			
Total Uranium	31.4		0.31	0.0	09/01/05	08/25/05	5243336	

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

URS Corporation

Client Sample ID: OUTFALL002-D01N-GRW

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F5H250304-002
Work Order: HH9M7
Matrix: WATER

Date Collected: 08/23/05 1545
Date Received: 08/25/05 0840

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
Total Uranium by KPA ASTM 5174-91				ug/L	5174-91			
Total Uranium	31.4		0.31	0.0	09/01/05	09/01/05	5243336	

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

SEVERN TRENT **STL**

Analysis Report for Total Uranium by KPA

Batch: 5243336 **Operator:** 402350

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

SampID	WRKNO	Aliquot	Digest Vol	InstrResult	Dilution	Instr	RunDateTime	Result	UncTotal	UncCount	MDC	CRDL
F5H250304-002	HH9M71AX	5.0000 mL	5.0000 mL	3.138E+001 ug/L	1.00	KPA11	9/1/05 15:05	3.139E+001 ug/L	3.731E+000	2.016E+000	3.090E-001	1.000E+000

Laboratory Control Sample Information

SampID	WRKNO	ComponentName	Result	StdAdded	Recovery
					%

Sample Duplicate Information

Sample ID	Sample WRKN	Sample Result	Dup ID	Dup WRKNO	Dup Result	RPD	RER
						%	

Matrix Spike Information

MSSampID	MSWRKNO	SampID	SampWRKNO	ComponentName	MSResult	SampResult	StdAdded	Recovery
								%

SW
2RUN
9/12/05

Wet Chemistry Analysis

8/61

Client Sample No.

EB0IT-GRW

Lab Name: STL Buffalo Contract: _____

Lab Code: RECNY Case No.: _____ SAS No.: _____ SDG No.: 250304

Matrix (soil/water): WATER Lab Sample ID: A5932802

% Solids: 0.0 Date Samp/Recv: 08/23/2005 08/27/2005

Parameter Name	Units of Measure	Result	C	Q	M	Method Number	Analyzed Date
Weak Acid Dissociable Cyanide	MG/L	0.010	U			4500 CN I	08/31/2005

Comments:

Wet Chemistry Analysis

Client Sample No.

OUTFALL 002-T01N-GRW

Lab Name: STL Buffalo Contract: _____

Lab Code: REXNY Case No.: _____ SAS No.: _____ SDG No.: 250304

Matrix (soil/water): WATER Lab Sample ID: A5932801

% Solids: 0.0 Date Samp/Recv: 08/23/2005 08/27/2005

Parameter Name	Units of Measure	Result	C	Q	M	Method Number	Analyzed Date
Weak Acid Dissociable Cyanide	MG/L	0.010	U			4500 CN I	08/31/2005

Comments:

Wet Chemistry Analysis

Client Sample No.

OUTFALL 002-T01N-GRW

Lab Name: STL Buffalo Contract: _____

Lab Code: RECNY Case No.: _____ SAS No.: _____ SDG No.: 250304

Matrix (soil/water): WATER Lab Sample ID: A5932801FD

% Solids: 0.0 Date Samp/Recv: 08/23/2005 08/30/2005

Parameter Name	Units of Measure	Result	C	Q	M	Method Number	Analyzed Date
Weak Acid Dissociable Cyanide	MG/L	4.4				4500 CN I	09/01/2005

Comments:

Multi-Channel Table
Type: Unknowns
Channel Range: 1 to 1 — Cup Range: 39 to 74

Cup	Sample ID	Sampling Date	Sampling Time	# of Reps	CYANIDE (mg/L)	Auto Dil Factor	
39	a5941301	01 Sep 2005	09:51:44	1	2.6330	1.00	
40	a5942501	01 Sep 2005	09:52:27	1	0.0145	1.00	
41	a5942502	01 Sep 2005	09:53:09	1	0.0128	1.00	
42	a5942601	01 Sep 2005	09:53:52	1	0.0096	1.00	
43	a5942602	01 Sep 2005	09:54:35	1	0.0080	1.00	
44	a5942603	01 Sep 2005	09:55:17	1	0.0075	1.00	
45	a5932801FD FW/D	01 Sep 2005	09:55:59	1	0.0044	1.00	
46	a5932702	01 Sep 2005	09:56:43	1	-0.0000	1.00	
47	a5938701	01 Sep 2005	09:57:27	1	0.0287	1.00	
48	a5942604	01 Sep 2005	09:58:10	1	0.0045	1.00	
49	ccv#41@.25ppm	01 Sep 2005	09:58:54	1	0.2463	1.00	98.5%
50	ccb#42	01 Sep 2005	09:59:38	1	-0.0000	1.00	<.01
51	a5942606	01 Sep 2005	10:00:22	1	0.0036	1.00	
52	a5942701	01 Sep 2005	10:01:05	1	-0.0000	1.00	
53	a5942605	01 Sep 2005	10:01:48	1	-0.0000	1.00	
54	~~a5942605MS@0.1~~	~~01 Sep 2005~~	~~10:02:31~~	~~1~~	~~0.0616~~	~~1.00~~	
55	a5932801FD FW/D	01 Sep 2005	10:03:13	1	0.0055	1.00	Karen QC
56	a5942605SD@0.1	01 Sep 2005	10:03:56	1	0.0918	1.00	
57	a5942608	01 Sep 2005	10:04:39	1	0.0037	1.00	
58	a5943201	01 Sep 2005	10:05:21	1	0.0037	1.00	
59	a5943202	01 Sep 2005	10:06:04	1	-0.0000	1.00	
60	a5943203	01 Sep 2005	10:06:47	1	-0.0000	1.00	
61	ccv#61@.25ppm	01 Sep 2005	10:07:31	1	0.2145	1.00	86%
62	ccb#62	01 Sep 2005	10:08:14	1	-0.0000	1.00	<.01
63	a5943203FD	01 Sep 2005	10:08:59	1	-0.0000	1.00	
64	a5943204	01 Sep 2005	10:09:43	1	-0.0000	1.00	
65	a5943205	01 Sep 2005	10:10:27	1	-0.0000	1.00	
66	a5943206	01 Sep 2005	10:11:10	1	-0.0000	1.00	
67	a5943207	01 Sep 2005	10:11:54	1	-0.0000	1.00	Karen QC
68	a5943208	01 Sep 2005	10:12:38	1	-0.0000	1.00	
69	a5943209	01 Sep 2005	10:13:22	1	-0.0000	1.00	
70	a5943210	01 Sep 2005	10:14:04	1	-0.0000	1.00	
71	a5943211	01 Sep 2005	10:14:47	1	0.0003	1.00	
72	a5943211dup	01 Sep 2005	10:15:30	1	0.0048	1.00	
73	ccv#61@.25ppm	01 Sep 2005	10:16:12	1	0.2470	1.00	98.8%
74	ccb#62	01 Sep 2005	10:16:55	1	-0.0000	1.00	<.01

SEVERN TRENT STL

LABORATORY TEST RESULTS

Job Number: 509801

Date:09/09/2005

CUSTOMER: STL St. Louis, MO. PROJECT: DRINKING WATER ATTN: TERRY LOLLING

Customer Sample ID: OUTFALL 02-DOIN-GRW
Date Sampled.....: 08/23/2005
Time Sampled.....: 15:45
Sample Matrix.....: Water

Laboratory Sample ID: 509801-1
Date Received.....: 08/30/2005
Time Received.....: 13:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
EPA 200.8	Lead (Pb), Dissolved	0.132	U		0.132	0.500	1	ug/L	152257		09/02/05 1209	bjh

* In Description = Dry Wgt.

URS Corporation

Client Sample ID: OUTFALL002-T01N-GRW

TOTAL Metals

Lot-Sample #...: F5H250304-001 **Matrix.....:** WATER
Date Sampled...: 08/23/05 15:45 **Date Received..:** 08/25/05

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 5241401						
Selenium	**2.6 B,J**	**5.0**	**ug/L**	**MCAWW 200.8**	**08/29-08/30/05**	**HH9H61AH**
		Dilution Factor: 1		Analysis Time..: 17:32		
Prep Batch #...: 5242119						
Mercury	ND	0.20	ug/L	MCAWW 245.1	08/30-08/31/05	HH9H61AJ
		Dilution Factor: 1		Analysis Time..: 11:04		

NOTE(S):

B Estimated result. Result is less than RL.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

STL-ST. LOUIS

Metals Data Reporting Form

Sample Results

Lab Sample ID: HH9H6 **Client ID:** OUTFALL002-T01N-GRW

Matrix: Water **Units:** ug/L **Prep Date:** 8/29/05 **Prep Batch:** 5241401

Weight: 50 **Volume:** 100 **Percent Moisture:** NA

Element	WL/ Mass	MDL	Report Limit	Conc	Q	DF	Instr	Anal Date	Anal Time
Selenium	82	0.57	5.0	2.6	B	1	ICPMS	8/30/05	17:32

Comments: Lot #: F5H250304 Sample #: 1

Version 4.75.1

U Result is less than the IDL
B Result is between IDL and RL

Form I Equivalent

STL-ST. LOUIS

Metals Data Reporting Form

Sample Results

Lab Sample ID: HH9H6 **Client ID:** OUTFALL002-T01N-GRW

Matrix: Water **Units:** ug/L **Prep Date:** 8/30/05 **Prep Batch:** 5242119

Weight: 30 **Volume:** 30 **Percent Moisture:** NA

Element	WL/ Mass	MDL	Report Limit	Conc	Q	DF	Instr	Anal Date	Anal Time
Mercury	253.7	0.046	0.20	0.046	U	1	CVAA	8/31/05	11:04

Comments: Lot #: F5H250304 Sample #: 1

Version 4.75.1

U Result is less than the IDL
B Result is between IDL and RL

Form I Equivalent

URS Corporation

Client Sample ID: OUTFALL002-T01N-GRW

General Chemistry

Lot-Sample #...: F5H250304-001 **Work Order #...:** HH9H6 **Matrix.....:** WATER
Date Sampled...: 08/23/05 15:45 **Date Received..:** 08/25/05

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Nitrate	**0.17**	**0.020**	**mg/L**	**MCAWW 300.0A**	**08/25/05**	**5255434**
		Dilution Factor: 1		Analysis Time..: 05:21		
Nitrate/Nitrite as N	**112**	**50.0**	**ug/L**	**MCAWW 353.1**	**08/29/05**	**5241370**
		Dilution Factor: 1		Analysis Time..: 00:00		
Total Cyanide	**8.6**	**5.0**	**ug/L**	**MCAWW 335.4**	**08/30-09/01/05**	**5244177**
		Dilution Factor: 1		Analysis Time..: 00:00		
Total Residual Chlorine	ND	0.10	mg/L	MCAWW 330.3	08/26-09/08/05	5243209
		Dilution Factor: 1		Analysis Time..: 00:00		

URS Corporation

Client Sample ID: OUTFALL002-D01N-GRW

DISSOLVED Metals

Lot-Sample #...: F5H250304-002 **Matrix.....:** WATER
Date Sampled...: 08/23/05 15:45 **Date Received..:** 08/25/05

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 5241401						
Silver	ND	10.0	ug/L	MCAWW 200.8	08/29-08/30/05	HH9M71AA
		Dilution Factor: 1		Analysis Time..: 17:51		
Aluminum	ND	30.0	ug/L	MCAWW 200.8	08/29-08/30/05	HH9M71AC
		Dilution Factor: 1		Analysis Time..: 17:51		
Arsenic	ND	10.0	ug/L	MCAWW 200.8	08/29-08/30/05	HH9M71AD
		Dilution Factor: 1		Analysis Time..: 17:51		
Barium	**31.4**	**20.0**	**ug/L**	**MCAWW 200.8**	**08/29-08/30/05**	**HH9M71AE**
		Dilution Factor: 1		Analysis Time..: 17:51		
Beryllium	ND	5.0	ug/L	MCAWW 200.8	08/29-08/31/05	HH9M71AF
		Dilution Factor: 1		Analysis Time..: 13:18		
Boron	**45.5 B,J**	**50.0**	**ug/L**	**MCAWW 200.8**	**08/29-08/30/05**	**HH9M71AG**
		Dilution Factor: 1		Analysis Time..: 17:51		
Cadmium	**2.7 B**	**5.0**	**ug/L**	**MCAWW 200.8**	**08/29-08/30/05**	**HH9M71AH**
		Dilution Factor: 1		Analysis Time..: 17:51		
Cobalt	**1.0 B**	**10.0**	**ug/L**	**MCAWW 200.8**	**08/29-08/30/05**	**HH9M71AJ**
		Dilution Factor: 1		Analysis Time..: 17:51		
Chromium	ND	10.0	ug/L	MCAWW 200.8	08/29-08/30/05	HH9M71AK
		Dilution Factor: 1		Analysis Time..: 17:51		
Copper	**2.9 B**	**10.0**	**ug/L**	**MCAWW 200.8**	**08/29-08/30/05**	**HH9M71AL**
		Dilution Factor: 1		Analysis Time..: 17:51		
Molybdenum	**1330**	**10.0**	**ug/L**	**MCAWW 200.8**	**08/29-08/30/05**	**HH9M71AM**
		Dilution Factor: 1		Analysis Time..: 17:51		
Nickel	**8.5 B**	**10.0**	**ug/L**	**MCAWW 200.8**	**08/29-08/30/05**	**HH9M71AN**
		Dilution Factor: 1		Analysis Time..: 17:51		
Antimony	ND	10.0	ug/L	MCAWW 200.8	08/29-08/30/05	HH9M71AQ
		Dilution Factor: 1		Analysis Time..: 17:51		

(Continued on next page)

URS Corporation

Client Sample ID: OUTFALL002-D01N-GRW

DISSOLVED Metals

Lot-Sample #...: F5H250304-002 **Matrix.....:** WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Selenium	**0.84 B,J**	**5.0**	**ug/L**	**MCAWW 200.8**	**08/29-08/30/05**	**HH9M71AR**
		Dilution Factor: 1		Analysis Time..: 17:51		
Thallium	**0.44 B,J**	**10.0**	**ug/L**	**MCAWW 200.8**	**08/29-08/30/05**	**HH9M71AT**
		Dilution Factor: 1		Analysis Time..: 17:51		
Vanadium	**6.4 B,J**	**10.0**	**ug/L**	**MCAWW 200.8**	**08/29-08/30/05**	**HH9M71AU**
		Dilution Factor: 1		Analysis Time..: 17:51		
Zinc	ND	20.0	ug/L	MCAWW 200.8	08/29-08/30/05	HH9M71AV
		Dilution Factor: 1		Analysis Time..: 17:51		
Prep Batch #...: 5242119						
Mercury	ND	0.20	ug/L	MCAWW 245.1	08/30-08/31/05	HH9M71AW
		Dilution Factor: 1		Analysis Time..: 11:47		

NOTE(S):

B Estimated result. Result is less than RL.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

STL-ST. LOUIS

Metals Data Reporting Form

Sample Results

Lab Sample ID: HH9M7 **Client ID:** OUTFALL002-D01N-GRW

Matrix: Water **Units:** ug/L **Prep Date:** 8/29/05 **Prep Batch:** 5241401

Weight: 50 **Volume:** 100 **Percent Moisture:** NA

Element	WL/ Mass	MDL	Report Limit	Conc	Q	DF	Instr	Anal Date	Anal Time
Aluminum	27	8.5	30.0	8.5	U	1	ICPMS	8/30/05	17:51
Antimony	123	0.61	10.0	0.61	U	1	ICPMS	8/30/05	17:51
Arsenic	75	1.8	10.0	1.8	U	1	ICPMS	8/30/05	17:51
Barium	**135**	**0.60**	**20.0**	**31.4**		**1**	**ICPMS**	**8/30/05**	**17:51**
Beryllium	9	0.13	5.0	0.13	U	1	ICPMS	8/31/05	13:18
Boron	**10**	**5.5**	**50.0**	**45.5**	**B**	**1**	**ICPMS**	**8/30/05**	**17:51**
Cadmium	**111**	**0.067**	**5.0**	**2.7**	**B**	**1**	**ICPMS**	**8/30/05**	**17:51**
Chromium	52	3.7	10.0	3.7	U	1	ICPMS	8/30/05	17:51
Cobalt	**59**	**0.52**	**10.0**	**1.0**	**B**	**1**	**ICPMS**	**8/30/05**	**17:51**
Copper	**65**	**0.72**	**10.0**	**2.9**	**B**	**1**	**ICPMS**	**8/30/05**	**17:51**
Molybdenum	**97**	**0.63**	**10.0**	**1330**		**1**	**ICPMS**	**8/30/05**	**17:51**
Nickel	**60**	**1.2**	**10.0**	**8.5**	**B**	**1**	**ICPMS**	**8/30/05**	**17:51**
Selenium	**82**	**0.57**	**5.0**	**0.84**	**B**	**1**	**ICPMS**	**8/30/05**	**17:51**
Silver	107	1.5	10.0	1.5	U	1	ICPMS	8/30/05	17:51
Thallium	**205**	**0.22**	**10.0**	**0.44**	**B**	**1**	**ICPMS**	**8/30/05**	**17:51**
Vanadium	**51**	**1.6**	**10.0**	**6.4**	**B**	**1**	**ICPMS**	**8/30/05**	**17:51**

Comments: Lot #: F5H250304 Sample #: 2

Version 4.75.1

U Result is less than the IDL
B Result is between IDL and RL

Form I Equivalent

STL-ST. LOUIS

Metals Data Reporting Form

Sample Results

Lab Sample ID: HH9M7 **Client ID:** OUTFALL002-D01N-GRW

Matrix: Water **Units:** ug/L **Prep Date:** 8/30/05 **Prep Batch:** 5242119

Weight: 30 **Volume:** 30 **Percent Moisture:** NA

Element	WL/ Mass	MDL	Report Limit	Conc	Q	DF	Instr	Anal Date	Anal Time
Mercury	253.7	0.046	0.20	0.046	U	1	CVAA	8/31/05	11:14

Comments: Lot #: F5H250304 Sample #: 2

Version 4.75.1

U Result is less than the IDL
B Result is between IDL and RL

Form I Equivalent

SEVERN TRENT **STL**

Analysis Report for Strontium 90

Batch: 5241086 **Operator:** 401627

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

SampID / WRKNO	Aliquot / Mass	Sigma / Eff	InstrID / CountDateTime	Y Ingrowth Time / Y Precip Time	SampCntID / BkgCntDur	SampCnt / BkgCnt	Activity	UncTotal / UncCount	MDA / DLC
F5H250304-001	1000.4000 mL	2.00	RedB3	8/29/05 13:15	200.00	273	1.179E-001 pCi/L	3.485E-001	5.845E-001
HH9H61AM	0.0137 g	0.4672	9/6/05 15:11	9/6/05 9:00	1000.00	1287		3.483E-001	2.822E-001
F5H250304-001D	999.5400 mL	2.00	RedC2	8/29/05 13:15	200.00	1074	7.478E+000 pCi/L	1.002E+000	7.050E-001
HH9H61CC	0.0122 g	0.4648	9/6/05 15:12	9/6/05 9:00	1000.00	1280		6.668E-001	3.403E-001
F5H250304-001S	989.0700 mL	2.00	RedC3	8/29/05 13:15	200.00	1196	7.321E+000 pCi/L	9.465E-001	6.137E-001
HH9H61CA	0.0141 g	0.4643	9/6/05 15:12	9/6/05 9:00	1000.00	1317		5.998E-001	2.964E-001
F5H260281-001	986.4700 mL	2.00	RedC4	8/29/05 13:15	200.00	293	4.449E-001 pCi/L	5.915E-001	9.721E-001
HJC211AH	0.0131 g	0.4734	9/6/05 15:12	9/6/05 9:00	1000.00	1288		5.899E-001	4.693E-001
F5H260281-002	1010.3700 mL	2.00	RedD1	8/29/05 13:15	200.00	303	4.849E-001 pCi/L	6.487E-001	1.066E+000
HJC231AH	0.0142 g	0.4717	9/6/05 15:11	9/6/05 9:00	1000.00	1336		6.468E-001	5.151E-001
F5H260281-003	1005.3900 mL	2.00	YellowA1	8/29/05 13:15	200.00	210	-3.180E-001 pCi/L	4.237E-001	7.457E-001
HJC241AH	0.0129 g	0.4579	9/6/05 15:20	9/6/05 9:00	1000.00	1210		4.225E-001	3.596E-001
F5H260281-004	951.2700 mL	2.00	YellowB1	8/29/05 13:15	200.00	257	1.233E-001 pCi/L	3.676E-001	6.171E-001
HJC251AH	0.0136 g	0.4621	9/6/05 15:20	9/6/05 9:00	1000.00	1210		3.674E-001	2.976E-001
F5H270137-002	1222.8900 mL	2.00	YellowB2	8/29/05 13:15	200.00	318	-7.844E-002 pCi/L	4.977E-001	8.498E-001
HJERE1AD	0.0124 g	0.4432	9/6/05 15:20	9/6/05 9:00	1000.00	1630		4.976E-001	4.118E-001
F5H270137-003	1264.4100 mL	2.00	YellowD1	8/29/05 13:15	200.00	171	-1.729E-001 pCi/L	3.858E-001	6.761E-001
HJERX1AD	0.0150 g	0.3963	9/6/05 15:20	9/6/05 9:00	1000.00	940		3.854E-001	3.244E-001
F5H270137-004	1235.3900 mL	2.00	YellowD2	8/29/05 13:15	200.00	198	-2.266E-001 pCi/L	4.218E-001	7.383E-001
HJETW1AD	0.0128 g	0.3812	9/6/05 15:20	9/6/05 9:00	1000.00	1100		4.212E-001	3.554E-001
F5H270137-005	1214.0900 mL	2.00	YellowD3	8/29/05 13:15	200.00	164	-9.866E-002 pCi/L	3.629E-001	6.319E-001
HJETX1AD	0.0129 g	0.3798	9/6/05 15:20	9/6/05 9:00	1000.00	870		3.628E-001	3.028E-001
F5H270137-006	1228.7200 mL	2.00	YellowD4	8/29/05 13:15	200.00	182	0.000E+000 pCi/L	0.000E+000	5.987E-001
HJET21AD	0.0147 g	0.3999	9/6/05 15:20	9/6/05 9:00	1000.00	910		0.000E+000	2.871E-001
F5H270137-007	1204.3700 mL	2.00	RedC3	8/29/05 13:15	200.00	283	1.803E-001 pCi/L	4.303E-001	7.190E-001
HJET61AD	0.0134 g	0.4646	9/6/05 19:16	9/6/05 9:00	1000.00	1317		4.300E-001	3.473E-001
F5H270137-008	1209.7200 mL	2.00	RedC4	8/29/05 13:15	200.00	266	8.382E-002 pCi/L	4.567E-001	7.718E-001
HJET71AD	0.0129 g	0.4735	9/6/05 19:16	9/6/05 9:00	1000.00	1288		4.567E-001	3.726E-001
F5H270137-009	1206.3300 mL	2.00	RedD1	8/29/05 13:15	200.00	296	2.172E-001 pCi/L	3.587E-001	5.938E-001
HJET91AD	0.0137 g	0.4719	9/6/05 19:15	9/6/05 9:00	1000.00	1336		3.580E-001	2.868E-001
F5H270137-010	1258.8200 mL	2.00	YellowA1	8/29/05 13:15	200.00	247	4.987E-002 pCi/L	4.412E-001	7.485E-001
HJEVD1AD	0.0139 g	0.4575	9/6/05 19:22	9/6/05 9:00	1000.00	1210		4.411E-001	3.610E-001
F5H270137-011	1250.3300 mL	2.00	YellowB1	8/29/05 13:15	200.00	232	-7.824E-002 pCi/L	3.408E-001	5.872E-001
HJEVF1AD	0.0136 g	0.4621	9/6/05 19:22	9/6/05 9:00	1000.00	1210		3.407E-001	2.832E-001
F5H270137-012	1236.9700 mL	2.00	YellowB2	8/29/05 13:15	200.00	277	-5.524E-001 pCi/L	5.564E-001	9.770E-001
HJEVJ1AD	0.0119 g	0.4433	9/6/05 19:22	9/6/05 9:00	1000.00	1630		5.537E-001	4.735E-001
F5H270137-015	1230.3800 mL	2.00	YellowD1	8/29/05 13:15	200.00	177	-1.199E-001 pCi/L	4.167E-001	7.245E-001
HJEVQ1AD	0.0133 g	0.3968	9/6/05 19:22	9/6/05 9:00	1000.00	940		4.165E-001	3.477E-001

SampID / WRKNO	Aliquot / Mass	Sigma / Eff	InstrID / CountDateTime	Y Ingrowth Time / Y Precip Time	SampCntD / BkgCntDur	SampCnt / BkgCnt	Activity	UncTotal / UncCount	MDA / DLC
F5H270137-017	1233.9900 mL	2.00	YellowD2	8/29/05 13:15	200.00	200	-2.016E-001 pCi/L	4.136E-001	7.225E-001
HJEV41AD	0.0133 g	0.3810	9/6/05 19:22	9/6/05 9:00	1000.00	1100		4.131E-001	3.478E-001
F5H290000-086B	1000.0000 mL	2.00	YellowD3	8/29/05 13:15	200.00	161	-1.326E-001 pCi/L	3.736E-001	6.533E-001
HJFHV1AA	0.0148 g	0.3792	9/6/05 19:22	9/6/05 9:00	1000.00	870		3.734E-001	3.130E-001
F5H290000-086C	1000.0000 mL	2.00	YellowD4	8/29/05 13:15	200.00	923	7.651E+000 pCi/L	1.028E+000	6.757E-001
HJFHV1AC	0.0135 g	0.4004	9/6/05 19:22	9/6/05 9:00	1000.00	910		6.865E-001	3.241E-001

Laboratory Control Sample Information

SampID	WRKNO	ComponentName	Activity	StdAdded	Recovery
F5H290000-086C	HJFHV1AC	SR-90	7.651E+000	9.455E+000 pCi/L	80.92%

Sample Duplicate Information

SampID	SampDupID	Activity	DupActivity	RPD	RER
F5H250304-001S	F5H250304-001D	7.321E+000	7.478E+000	2.12%	8.059E-002

Matrix Spike Information

SampID	SampMSID	Sample Activity	MS Activity	StdAdded	MSRecovery
F5H250304-001	F5H250304-001D	1.179E-001 pCi/L	7.478E+000 pCi/L	9.460E+000	79.06% %
F5H250304-001	F5H250304-001S	1.179E-001 pCi/L	7.321E+000 pCi/L	9.560E+000	76.58% %

SEVERN TRENT **STL**

Analysis Report for Radium 228

Batch: 5241082 **Operator:** 400697

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

SampID / WRKNO	Aliquot / Mass	Eff	BaYield / YYield	Truncate Yields	CountDateTime / InstrID	Y Ingrowth Time / Y Precip Time	SampCntID / BkgCntDur	SampCnt / BkgCnt	Cal Type / Sigma	Activity	UncTotal / UncCount	MDA / DLC
F5H250304-001	982.3900 mL	0.4623	67.26	False	9/12/05 10:43	8/29/05 15:10	200	309	1	1.062E+000	7.514E-001	1.189E+000
HH9H61AP	0.0228 g		70.33		YellowB1	9/12/05 8:40	1000	1210	2.00	pCi/L	7.438E-001	5.734E-001
F5H250304-001D	994.4600 mL	0.4430	74.63	False	9/12/05 10:43	8/29/05 15:10	200	805	1	6.997E+000	1.206E+000	1.266E+000
HH9H61CG	0.0253 g		70.88		YellowB2	9/12/05 8:40	1000	1630	2.00	pCi/L	9.825E-001	6.135E-001
F5H250304-001S	1004.9900 mL	0.4451	88.20	False	9/12/05 10:43	8/29/05 15:10	200	875	1	7.307E+000	1.098E+000	9.556E-001
HH9H61CF	0.0299 g		71.43		YellowB3	9/12/05 8:40	1000	1350	2.00	pCi/L	8.174E-001	4.617E-001
F5H260410-001	803.4700 mL	0.4387	100.00	False	9/12/05 10:43	8/29/05 15:10	200	486	1	2.938E+000	7.754E-001	1.023E+000
HJD2V1AD	0.0339 g		73.63		YellowB4	9/12/05 8:40	1000	1310	2.00	pCi/L	7.175E-001	4.940E-001
F5H260410-001S	817.9700 mL	0.3968	100.29	False	9/12/05 10:43	8/29/05 15:10	200	895	1	1.012E+001	1.382E+000	9.511E-001
HJD2V1AH	0.0340 g		73.08		YellowD1	9/12/05 8:40	1000	940	2.00	pCi/L	9.418E-001	4.564E-001
F5H260410-001X	958.4000 mL	0.3809	100.59	False	9/12/05 10:43	8/29/05 15:10	200	354	1	1.638E+000	6.083E-001	8.764E-001
HJD2V1AR	0.0341 g		75.82		YellowD2	9/12/05 8:40	1000	1100	2.00	pCi/L	5.859E-001	4.219E-001
F5H290000-082B	1000.0000 mL	0.3798	96.46	False	9/12/05 10:43	8/29/05 15:10	200	193	1	2.472E-001	4.991E-001	8.332E-001
HJFHQ1AA	0.0327 g		71.43		YellowD3	9/12/05 8:40	1000	870	2.00	pCi/L	4.984E-001	3.992E-001
F5H290000-082C	1000.0000 mL	0.4003	97.94	False	9/12/05 10:43	8/29/05 15:10	200	763	1	6.654E+000	9.687E-001	7.494E-001
HJFHQ1AC	0.0332 g		75.82		YellowD4	9/12/05 8:40	1000	910	2.00	pCi/L	7.041E-001	3.594E-001

Laboratory Control Sample Information

SampID	WRKNO	ComponentName	Activity	StdAdded	Recovery
F5H290000-082C	HJFHQ1AC	RA-228	6.654E+000 pCi/L	5.287E+000 pCi/L	125.86 %

Sample Duplicate Information

SampID	SampDupID	Activity	DupActivity	RPD	RER
F5H250304-001S	F5H250304-001D	7.307E+000	6.997E+000	4.34%	1.349E-001
F5H260410-001	F5H260410-001X	2.938E+000	1.638E+000	56.81%	9.395E-001

Matrix Spike Information

SampID	SampMSID	Sample Activity	MS Activity	StdAdded	MSRecovery
F5H250304-001	F5H250304-001D	1.06 pCi/L	7.00 pCi/L	5.32	131.61 %
F5H250304-001	F5H250304-001S	1.06 pCi/L	7.31 pCi/L	5.26	138.91 %
F5H260410-001	F5H260410-001S	2.94 pCi/L	10.12 pCi/L	6.46	111.06 %

SEVERN TRENT **STL**

Analysis Report for Radium 226

Batch: 5241081 **Operator:** 400697

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

SampID / WRKNO	Aliquot / Sigma	Truncate Yields	Ba Mass / BaYield	Ingrowth / Eff	Cnt Date Time / InstrID	Ba Precip Time / Cal Type	SampCntDur / BkgCntDur	SampCnt / BkgCnt	Activity	UncTotal / UncCount	MDA / DLC
F5H250304-001	982.3900mL	False	0.0228	1.0894	9/12/05 12:30	9/12/05 10:10	200	40	2.173E-001	2.454E-001	3.959E-001
HH9H61AN	2.00		67.26%	0.2074	Protean0	2	1000	128	pCi/L	2.444E-001	1.776E-001
F5H250304-001D	994.4600mL	False	0.0253	1.0895	9/12/05 12:30	9/12/05 10:10	200	823	1.112E+001	1.373E+000	3.331E-001
HH9H61CE	2.00		74.63%	0.2009	Protean2	2	1000	105	pCi/L	8.057E-001	1.478E-001
F5H250304-001S	1004.9900mL	False	0.0299	1.0895	9/12/05 12:30	9/12/05 10:10	200	915	1.078E+001	1.309E+000	3.061E-001
HH9H61CD	2.00		88.20%	0.1928	Protean3	2	1000	118	pCi/L	7.413E-001	1.367E-001
F5H260410-001	803.4700mL	False	0.0339	1.0896	9/12/05 12:30	9/12/05 10:10	200	480	6.228E+000	8.751E-001	3.539E-001
HJD2V1AC	2.00		100.00%	0.1880	Protean4	2	1000	124	pCi/L	6.148E-001	1.585E-001
F5H260410-001S	817.9700mL	False	0.0340	1.0897	9/12/05 12:31	9/12/05 10:10	200	1440	1.933E+001	2.193E+000	2.908E-001
HJD2V1AG	2.00		100.29%	0.1856	Protean5	2	1000	81	pCi/L	1.036E+000	1.271E-001
F5H260410-001X	582.4000mL	False	0.0341	1.0898	9/12/05 12:31	9/12/05 10:10	200	328	6.108E+000	9.269E-001	2.892E-001
HJD2V1AT	2.00		100.59%	0.1853	Protean6	2	1000	36	pCi/L	6.972E-001	1.189E-001
F5H290000-081B	1000.0000mL	False	0.0327	1.0898	9/12/05 12:31	9/12/05 10:10	200	31	1.247E-001	1.657E-001	2.725E-001
HJFHR1AA	2.00		96.48%	0.1856	Protean7	2	1000	101	pCi/L	1.652E-001	1.207E-001
F5H290000-081C	1000.0000mL	False	0.0332	1.0899	9/12/05 12:31	9/12/05 10:10	200	938	1.059E+001	1.280E+000	2.988E-001
HJFHR1AC	2.00		97.94%	0.1820	Protean8	2	1000	123	pCi/L	7.194E-001	1.338E-001

Laboratory Control Sample Information

SampID	WRKNO	Analyte	Activity	StdAdded	Recovery
F5H290000-081C	HJFHR1AC	Ra-226	1.059E+001 pCi/L	1.119E+001	94.60 %

Sample Duplicate Information

SampID	SampDupID	Activity	DupActivity	RPD	RER
F5H250304-001S	F5H250304-001D	1.078E+001	1.112E+001	3.08%	1.259E-001
F5H260410-001	F5H260410-001X	6.228E+000	6.108E+000	1.94%	6.650E-002

Matrix Spike Information

SampID	SampMSID	WRKNO	Analyte	Activity	MSActivity	StdAdded	Recovery
F5H250304-001	F5H250304-001D	HH9H61CE	Ra-226	2.173E-001 pCi/L	1.112E+001	1.126E+001	98.82%
F5H250304-001	F5H250304-001S	HH9H61CD	Ra-226	2.173E-001 pCi/L	1.079E+001	1.114E+001	96.84%
F5H260410-001	F5H260410-001S	HJD2V1AG	Ra-226	6.228E+000 pCi/L	1.933E+001	1.368E+001	95.73%

Appendix C

Data Review Summary

MOLYCORP
DATA REVIEW SUMMARY

Data Package Number: F5H250304/250304[4]/509801[5]

Sampling Event: Outfall 002 Sampling 2005 LOT: F5H250304 presented by STL-St.Louis

Matrix: Solid ☐ Water ☒ Biota ☐

Sample-specific Parameter Review? Yes Laboratory Performance Parameters? No

Data Reviewer: Karen Kronoveter Date Completed: 10/04/05

Peer Reviewer: Stacey Malerba Date Completed: 10/31/05

The table below summarizes the results presented in this data package.

Field ID	QC Type	Lab ID[2]	Matrix	Requested Analyses																
				Strontium 90	Radium-226	Radium-228	Gross Alpah/Beta	Tritrium	Uranium (dissolved)	Metals[5]	Mercury	Nitrate as N	Nitrate-Nitrite	Total Cyanide	WAD Cyanide[4]	Residual Chlorine	2,3,7,8-TCDD	VOCs	SVOCs	Pesticides and PCBs
OUTFALL002-T01N-GRW[1]	SA	F5H250304-001/ A5932801[3]	W	X	X	X	X	X	-	X	X	X	X	X	X	X	X	X	X	X
OUTFALL002-D01N-GRW[1]	SA	F5H250304-002/ 509801-1	W						X	X	X									
TB04T-GRW	TB	F5H250304-003	W															X		
EB01T-GRW	EB	A5932802	W															X		

Matrix: S – Soil W – Water
QC Type: SA – Sample TB – Trip Blank EB = Equipment Blank

(1) Additional sample volume provided and used for matrix QC
(2) Multiple lab IDs are presented for Lot # F5H250304
(3) Field Duplicate (Outfall 001-T01D-GRW) presented with this sample ID (A5932801FD)
(4) WAD cyanide analyses performed by STL Buffalo.
In addition, it is noted that an analysis was performed on the field duplicate sample OUTFALL002-T01D-GRW, despite the following issues:
- The laboratory data sheet for the field duplicate sample incorrectly lists the sample ID as OUTFALL002-T01N-GRW, with a laboratory ID of A5932801**FD.** The proper field ID is OUTFALL002-T01D-GRW.
- The requested analysis for the field duplicate was on **HOLD.**

(5) Lead (dissolved) and metal analyses performed by STL Valparaiso.
TCDD = tetrachlorodibenzo-p-dioxin
PCBs= polychlorinated biphenyls
WAD Cyanide = weak acid dissociable cyanide

The data review was conducted in accordance with SOP 12.0, Data Validation of Permit Data. The table following the case narrative summary presents the results of the review and any qualified data. Results are only detailed in the comment section if they fell outside review criteria.

Case Narrative Summary: Except as noted below, any of the issues noted in the laboratory case narrative potentially affecting data quality are addressed in the appropriate sections in the table below.

The laboratory case narrative noted all chemical analysis results are based upon sample as received, wet weight, unless otherwise noted. All radiochemistry results are based upon sample as dried and ground with the exception of tritium, unless requested by the client for wet weight. This comment was not relevant to the data analyzed, as all samples submitted were aqueous.

The laboratory case narrative notes that pursuant to 40CFR Part 136.6, pH, Total Residual Chlorine, Dissolved Oxygen, Sulfite, and Temperature analyses are to be performed immediately after aqueous sample collection. The comment further describes that upon laboratory receipt, these parameters were analyzed as soon as possible. It is noted, however, only one of these parameters was requested and reported as a target analyte. Of the analytes commented upon, only the analysis for total residual chloride was requested and reported.

Sample EB01T-GRW was accidentally sent to the subcontracting laboratory instead of the MS aliquot for WAD cyanide. As such, WAD cyanide was reported for both the primary field sample (Outfall002-T01N-GRW) and the equipment blank (EB01T-GRW) and a MS for WAD Cyanide was not performed. The client (URS) was informed of this error. In addition, the field duplicate aliquot (Outfall002-T01D-GRW), collected as a back-up sample and designated as "on-hold" pending results of the primary sample, was submitted to the sub-contract laboratory and analyzed.

Review Parameter	Criteria Met?	Comments
Sample-specific Parameters	Complete with "Yes," "No," or "Not Applicable."	For each "No" response, list what was out, associated acceptance limits, all qualified data, and bias direction or reference associated table with pertinent details.
COC & Sample Receipt	Yes	A total of five coolers were received containing sample bottles for three groundwater samples collected for the Outfall 002 sampling event under chain of custody (COC) by Severn Trent Laboratories (STL) in St. Louis, MO on August 25th, 2005, with temperatures ranging from 2 to 3°C. It is noted on the Condition Upon Receipt Form that one OUTFALL002-T01N-GRW sample container sampled 08/23/05 at 1545 arrived broken. In addition, it is noted that sample FB01T-GRW only had bottles for the following analyses: Ra-226, Ra-228, Gross Alpha, nitrate as N, and residual chlorine. Sample containers for OUTFALL002-D01N-GRW were received for uranium and dissolved metals. Lastly, sample FB01D-GRW was received for uranium analysis only. Sample containers for a field duplicate sample, equipment blank, and field blank were submitted for the following analyses, but were marked with as status of "ON HOLD". The specified analyses were not to be performed until further instruction by the client. Results for the analysis of Tritium on sample OUTFALL002-T01N-GRW were not received with the initial package, but were supplied in a follow-up submittal. As noted in the Non-Conformance Summary for SDG 250304, for the analysis of WAD cyanide, the sample cooler was received with a temperature of 20.0°C. Based on EPA data validation guidelines, the field duplicate to OUTFALL002-T01N-GRW was qualified as estimated (J) with a qualifier code of "P". Upon further review of the COC and data sheets, the following issues were noted: • The data sheet for OUTFALL002-T01D-GRW lists the sample ID as OUTFALL002-T01N-GRW, with a laboratory ID of A5932801**FD**, designating it as a FD sample.

Review Parameter	Criteria Met?	Comments
		• The above-mentioned requested analysis was specified as on **HOLD.** As noted in the Job Sample Receipt Checklist for SDG 509801, utilized by STL-Valparaiso, the cooler containing sample containers for the analysis of dissolved lead was received with a temperature of 26.8°C. It is suspected that an insufficient amount of time between sample packing and receiving (8 hours) may have contributed to the sample bottles' temperature. It was not considered necessary to qualify the dissolved lead OUTFALL-002-T01N-GRW sample result.
Holding Times	No	The prescribed analytical holding time for the analysis of residual chlorine stipulates immediate analysis. As samples were received beyond collection time and considered outside of holding time, the residual chlorine result for sample OUTFALL002-T01N-GRW was qualified as estimated (UJ), as summarized in Table 1.1.
Laboratory Blank Results	No	Only those instances, in which laboratory blank results did not meet the acceptance criteria, are commented upon here. It can be assumed that for all other analyses, target analytes were not detected in any laboratory blanks in excess of the reporting limits (RL) or in low quantity detections resulting in data qualification. Multiple total and dissolved metal analytes were detected in associated initial calibration blanks (ICB), method blanks (MB), or continuing calibration blanks (CCB), resulting in qualification, as summarized in Table 1.2. Sample results were qualified as nondetect (U) at the RL if the reported analyte concentration was less than 5 times the equivalent blank concentration. Negative blank concentrations (as in the case of mercury) were evaluated for potential effects constituting a low bias in the reporting of these results; thereby resulting in the qualification of nondetect results as well as estimated (UJ).
Matrix QC • MS/MSD OUTFALL002-T01N-GRW OUTFALL002-D01N-GRW • LD OUTFALL002-T01N-GRW OUTFALL002-D01N-GRW	No	1,2-Dichloropropane was recovered in the MS performed on sample OUTFALL002-T01N-GRW slightly below the acceptance range of 80-118% for this compound, with a recovery of 77%. Due to the increased potential for uncertainty in the reporting of this result suggested by the low matrix spike recovery, this analytical result for this compound was qualified as estimated (UJ) with a qualifier code of "MS" assigned. All pesticide analytes were recovered well within the acceptance range in the MS analysis performed on OUTFALL002-T01N-GRW. However, all of the same pesticide analytes were recovered poorly in the MSD performed on the same sample. Due to the systematic presentation of the low recoveries in the MSD, it is likely that the sample was mis-spiked (a reduced aliquot was spiked into this sample). The laboratory case narrative noted that the sample was re-prepared and re-analyzed outside of holding time, confirming the nondetect results obtained for the initial analysis. The initial set of pesticide results were selected for reporting for the following reasons: 1) both analyses resulted in the same analytical results (nondetect for all parameters), 2) only an MS is required per drinking water methods (series 600) so there is adequate matrix QC results to support the initial data set, and 3) that all pesticide results for the re-extracted sample are considered estimated values on the

Review Parameter	Criteria Met?	Comments
		basis of holding time (extracted 7 days beyond the prescribed holding time of 7 days from collection to extraction). The MS analysis performed on sample OUTFALL002-T01N-GRW recovered nitrate/nitrite as N and total cyanide below the acceptance range of 75-125%, with recoveries of 64% and 62%, respectively. Due to the potential low bias in the reporting of these results as suggested by the low matrix spike recoveries, both detected results for nitrate/nitrite as N and total cyanide were qualified as estimated (J). Free WAD cyanide was recovered in the MS analysis on sample OUTFALL002-T01N-GRW, with a recovery of 20%; well below the acceptance range of 85-115%. Consistent with SOP 12.0 protocol, qualification for inorganic analytes exhibiting matrix spike recoveries less than 30% were assigned as follows: nondetect results were qualified as unusable (R), and positive results were qualified as estimated (J). Accordingly, the WAD cyanide results for sample OUTFALL002-T01N-GRW was qualified as unusable (R). The WAD cyanide result reported for the field duplicate sample was also rejected. See the field duplicate sections for details. It is noted that the LCS/LCSD recoveries for this anlayte were acceptable, with recoveries of 93% and 96%, respectively, demonstrating a matrix interference with the detection of this analyte. Table 1.3 summarizes all data qualification issued on the basis of MS/MSD recoveries potentially affecting the quality of data. The laboratory duplicate analysis results for Radium-228 did not meet criteria acceptance. Table 1.4 summarizes the resultant qualifications.
Method QC • Surrogates • PDS • Serial Dilution	Yes	All surrogate recoveries were within acceptance ranges. Post digestion spike and serial dilution summaries were not provided with the data package submittal, and therefore could not be reviewed beyond any comments in the case narrative.

Review Parameter	Criteria Met?	Comments
Field QC • Field Duplicate (FD) OUTFALL002-T01N-GRWFD • Equipment Blank (EB) • Field Blank (FB) • Trip Blank (TB) TB04T-GRW	No	WAD cyanide was nondetect in sample OUTFALL002-T01N-GRW with a RL of 0.010 mg/L. The FD for this sample reported a WAD cyanide concentration of 4.4 mg/L. The WAD cyanide result for the field duplicate was checked back to the raw data because there was a huge disagreement between the field sample and field duplicate as well as the total cyanide results. Page 120 of 824 included the raw data for the pertinent sample run. According to the raw data, a result of 0.0044 mg/l was obtained for this sample. This value is below the reporting limit of 0.010 mg/l. As such, the WAD cyanide result for the field duplicate sample should have been reported as a nondetect result. As such, the WAD cyanide result for the field duplicate was also rejected on the basis of the low matrix spike recoveries. As mentioned previously, the analysis for the EB, FB, and remaining three TB samples were assigned with an "ON HOLD" status, and were appropriately not analyzed at this time. As all results for TB04T-GRW were nondetect for VOCs, no qualification was necessary on the basis of trip blank contamination.
Nondetect Results w/ Elevated RLs?	No	The minimum quantification limit (MQL) for benzidine is 50 µgl, however the laboratory RL is 100 µg/L. Benzidine was reported as nondetect at 100 µg/L. The method detection limit (MDL) for benzidine is 3.62 ug/l. Due to the fact that the laboratory reported detected concentrations down to the MDL, the result obtained is considered usable to demonstrate that benzidine is not present above the MQL.
Package Completeness	Yes	It is noted that an MS/MSD analysis was not performed for the re-extracted pesticide prepped sample. The original run was selected for reporting. Detected analyte results with concentrations between the Instrument Detection Limit (IDL) and the Reporting Limit (RL) were qualified as estimated (J). A qualifier code of "SQL-I" (Sample Quantitation Limit) was assigned to reflect the greater uncertainty in quantitative values below the RL. A discrepancy in analytical times recorded for the analysis of mercury on sample OUTFALL002-D01N-GRW has been noted. The data sheet presented by St. Louis lists an analytical run time of 11:47 on 08/31/05; whereas a second data sheet lists an analytical run time of 11:14 on 08/31/05.

Review Parameter	Criteria Met?	Comments
Other parameters	Yes	The following laboratory performance parameters were evaluated from the summary forms: **Laboratory Control Sample** (LCS) and Laboratory Control Sample Duplicate (LCSD) results were reviewed for all parameters. Only those instances in which LCS/LCSD recoveries did not meet criteria, resulting in data qualification, are noted below. Despite the fact that the laboratory has established an acceptance criterion for the relative percent difference (RPD) of 20%, data qualification was not issued for these instances. • Total Uranium: Two LCS spikes were analyzed for total uranium and were recovered within the acceptance range, however the RPD between the two percent recoveries (131%) did not meet the QC control limit, as established by the laboratory of 90-112%. It was not considered necessary to qualify total uranium results due to the fact that each LCS recovery for two different spike amounts (40.0 µg/L and 8.0 µg/L) were well recovered within the acceptance range (103% and 107%, respectively). • Total Mercury: The mercury recovery in the LCS was 118%, slightly above the accepted criteria range of 85-115%, indicating a potential high bias in the reporting of results. As the total mercury result for OUTFALL002-T01N-GRW was nondetect, data qualification was not necessary.

Table 1.1
Holding Time Qualification for
Sample OUTFALL002-T01N-GRW

Analytes	Resultant Qualification
Residual Chlorine	UJ HT-I

Table 1.2
Metal Blank Detections Resulting in Qualification for
Sample OUTFALL002-T01N-GRW

Analyte	ICB (µg/l)	CCB* (µg/l)	MB (µg/L)	MDL (µg/L)	RL (µg/L)	Resultant Qualification
Selenium (T)	---	---	0.76	0.29	5.0	U MB-I
Selenium (D)	---	0.6	0.76	0.29	5.0	U MB, CCB-I
Thallium (D)	0.4	0.7	0.39	0.11	10.0	U ICB, CCB, MB-I
Vanadium (D)	---	---	4.5	0.81	10.0	U MB-I
Mercury (T)	-0.1	-0.1	---	0.046	0.2	UJ ICB, CCB-L

ICB = Initial Calibration Blank CCB = Continuing Calibration Blank
MB = Method Blank MDL= Method Detection Limit RL = Reporting Limit
Note: Table limited to blank detections resulting in qualification. As such, all blank detections may not be listed.
CCB*: *the precise sequentially CCB number is not recorded here, only the highest CCB detected value resulting in data* qualification.

Table 1.3
Matrix QC Summary Resulting in Data Qualification for Sample OUTFALL002-T01N-GRW

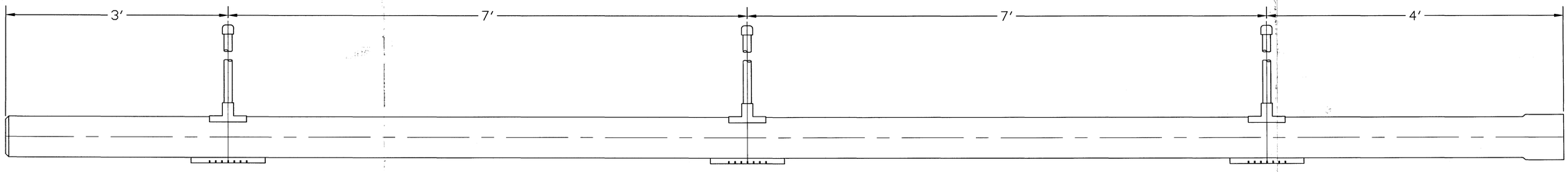
Analyte	MS % R/ MSD%R	Acceptance Range	Resultant Qualification
1,2-Dichloropropane	77	80-118	UJ MS-L
Nitrate/nitrite as N	64	75-125	J MS-L
Total cyanide	62	75-125	J MS-L
WAD cyanide	20	85-115	R MS-L*

*In addition EB01T-GRW qualified R MS-L for WAD cyanide and FD qualified J MS-L

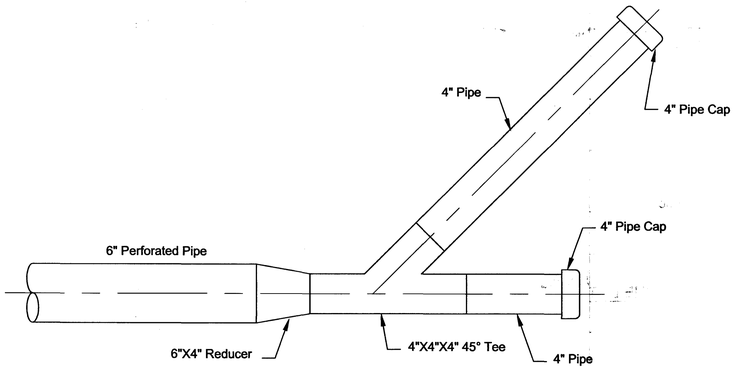
Table 1.4
Laboratory Duplicate Resulting in Data Qualification For OUTFALL002-T01N-GRW

Analyte	MDC* (pCi/L)	Original (pCi/L)	Duplicate (pCi/L))	Precision Exceedance (RPD 20% or >1 x MDC)	Resultant Qualification
Radium-228	0.83	2.94	1.64	> 20% RPD	UJ D-I

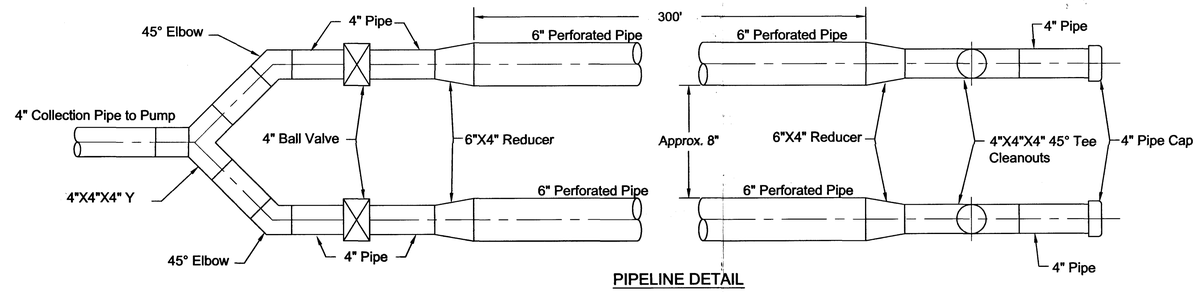
MDC = Minimum Detectable Concentration *Reported from Method Blank Report
RPD = Relative Percent Difference



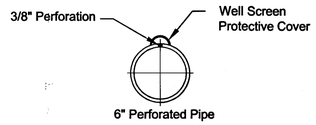
Spacing for Perforations per 21' Joint of Pipe
for both Top and Bottom Perforations



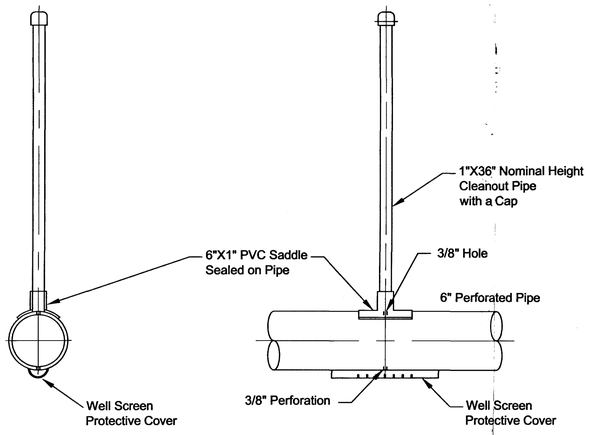
CLEANOUT DETAIL



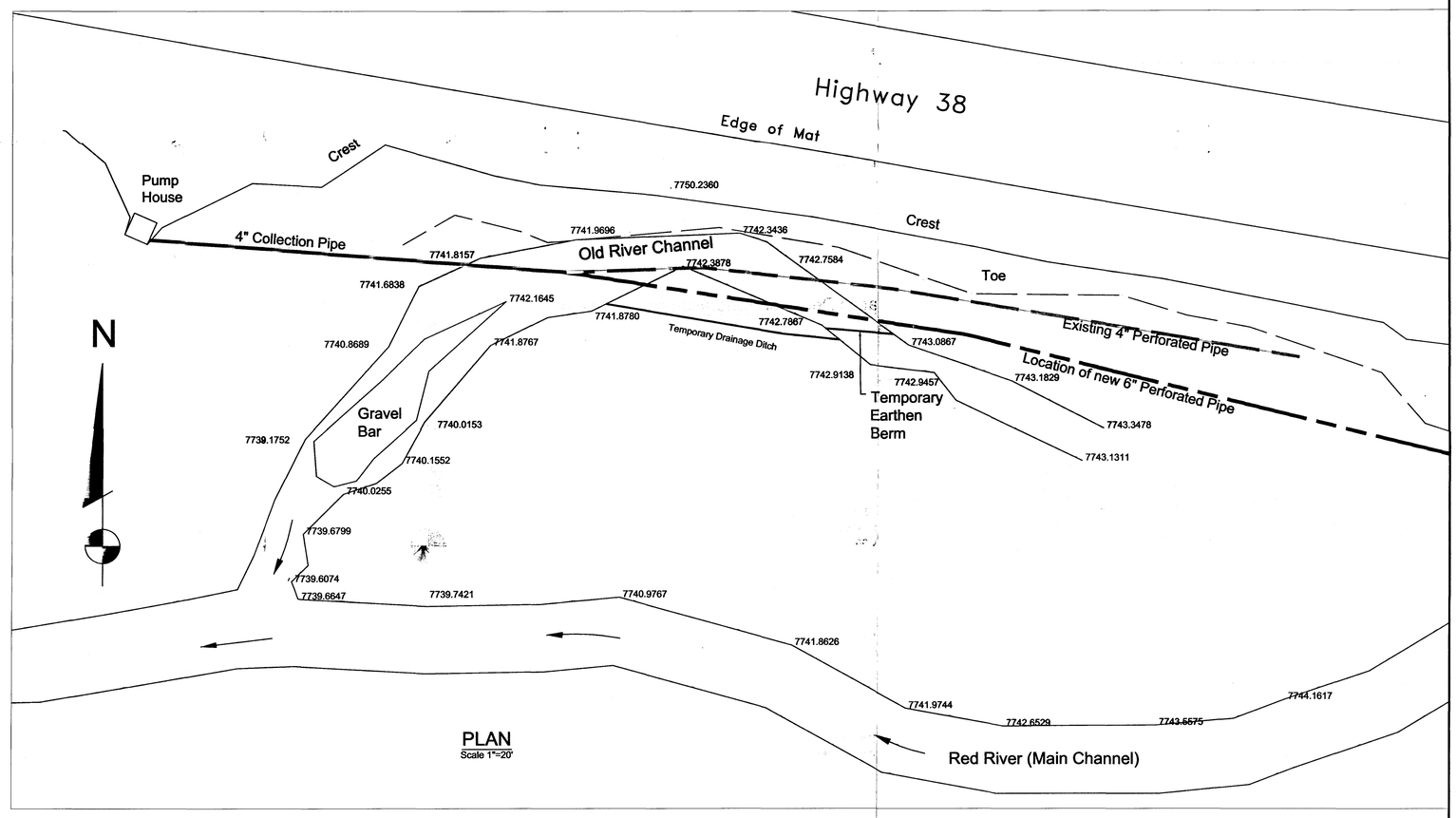
PIPELINE DETAIL



Perforation Detail for Perforation on Top of Pipe



Perforation Detail for Perforation on Bottom of Pipe



PLAN
Scale 1"=20'

REFERENCES	DWG. NO.	DESCRIPTION	REFERENCES	DWG. NO.	DESCRIPTION	REVISIONS	NO.	MADE BY	DATE	DESCRIPTION	REVISIONS	NO.	MADE BY	DATE	DESCRIPTION

DRAWN BY: Paul LaCome 11/2/05
CHECKED BY:
APPROVED:

MOLYCORP
QUESTA DIVISION
Questa, New Mexico

Spring 39 Collection System Repair 2005

SCALE: Noted
Dwg No.: 100-84
Cad File: Engineering/Paul/Surface/Spring 39

Permit File - A
NM 0022306
4

Molycorp

QUESTA DIVISION

NPDES PERMIT NO. NM0022306
RENEWAL APPLICATION

August 4, 2005

Molycorp Contact:
Scott Honan, M. Sc.
Supervisor, Environmental Compliance
(760) 856-7656

Molycorp, Inc.
Questa Division
P.O. Box 469
Questa, NM 87556
Telephone (505) 586-7642
Facsimile (281) 276-9216

Molycorp

Scott Honan
Supervisor, Environmental Compliance

August 2, 2005

Mr. Scott Wilson
USEPA Region 6
1445 Ross Avenue
Suite 1200
Mail Code: 6WQ-PP
Dallas, TX 75202-2733

RE: Molycorp, Inc. Questa Division
NPDES Permit NM0022306 Renewal Application

Dear Mr. Wilson:

Please find attached a completed renewal application for NPDES permit NM0022306. Note that during the term of both the current permit and the previous permit, there was no discharge from Outfalls 001, 004, 005, and during the same period there has been continuous discharge from Outfall 002. Molycorp is requesting that the permit continue to regulate Outfalls 001 and 002. Outfalls 004 and 005 are not included in the renewal application, as there has been no discharge from these outfalls. As both of these outfalls would consist solely of stormwater from the Questa mine site if they were to discharge, they will be incorporated into the Stormwater Pollution Prevention Plan for the facility, and thus regulated under the Multi-Sector General Stormwater Permit.

The permit application addresses several other issues that should be noted:

- The New Mexico water quality standard for cadmium was revised on July 17, 2005 and this new standard has been analyzed in the attached application. The new standard is substantially lower than the previous standard, and it appears that the receiving water cadmium concentration above Outfalls 001 and 002 may be higher than the new standard. In addition, the existing NPDES monitoring data for cadmium is based on a detection limit that is higher than the new standard. Molycorp requests that no cadmium limit be established until additional monitoring is completed using more sensitive analytical methods, in order to determine what the actual ambient and effluent cadmium concentrations are.

- The existing permits describes Best Management Practices (BMPs) consisting of two French drains and three recovery wells designed to intercept and collect seepage prior to its entry into the Red River. Molycorp requests that these BMPs continue to be included in the renewed permit.

- The manganese pumpback system at the tailings facility was successfully commissioned during the term of the current permit. This pumpback system will continue to operate during the renewed permit as necessary to meet Outfall 002 manganese limits.

- The application includes a Reasonable Potential Analysis for the parameters regulated under the current permit. Molycorp requests your consideration of this analysis in setting monitoring frequencies in the renewed permit.

Molycorp believes that this application is administratively complete, and addresses all of the issues that were discussed during the pre-application meeting that was held earlier this year. Should you have any questions regarding this application package, please contact me at 760.856.7656.

Sincerely,

Scott Honan

Scott Honan

C: Rich Powell, NMED-SWQB
Roy Torres, Molycorp
Anne Wagner, Molycorp
William L. Sharrer, Molycorp

MOLYCORP
QUESTA DIVISION

NPDES PERMIT NM0022306
RENEWAL APPLICATION
August 4, 2005

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Critical Analysis of the Existing Water Quality Database

Supplemental Information

- White Paper – Aluminum
- Executive Summary of Data on the Red River in the Vicinity of NPDES Permitted Outfalls 001 and 002
- Manganese Pump Back System Summary
- Best Management Practices Implementation Summary

Compact Discs (CDs) – Data and RPA Spreadsheets

Executive Summary

NPDES PERMIT NO. NM0022306: RENEWAL APPLICATION

The application from Molycorp, Inc. includes the standard application forms, EPA Form 1 General and EPA Form 2C NPDES, as well as analyses of effluent quality, reasonable potential, and calculations of effluent limitations based on best available technology (BAT) and for water quality-based effluent limits (WQBEL). Also included in the package is a cd-rom disk with the data and reasonable potential worksheets in *Microsoft Excel*. These spreadsheets not only support the analyses and recommendations, but will also assist the Permit Writer and NMED with data analysis. The analyses use the latest NMED Water Quality Standards, as revised and corrected, effective July 17, 2005, and the EPA Region 6 *Implementation Guidance for State of New Mexico Standards for Interstate and Intrastate Streams,* provided by Mr. Wilson in February.

The analyses herein considered both BAT standards and WQBEL, and considered Outfall 002 alone and Outfall 002 when Outfall 001 was discharging. Under federal regulations, the most stringent standard applies.

Analyses presented in the *Data Summary and Rationale for BAT and WQBEL Calculations* and the *Critical Analysis of the Existing Database* summaries indicate no reasonable potential to cause or contribute to an exceedence of the water quality standard for many parameters, where limitations are based upon WQS. Based upon these analyses, recommendations are also made to reduce the monitoring frequency for certain parameters. During a meeting with NMED in June, there was general consensus that the chronic aluminum WQS was inappropriate, and that compliance should be based upon the acute aluminum standard until NMED had time to complete a TMDL or evaluate a site specific standard. A White Paper on aluminum toxicity is included as part of a "supplemental information" section in the package to assist in this effort. (Please note, the accompanying re-analysis of applicable aluminum criteria is from separate studies that are still in progress, and is not a final document nor are the findings used as recommendations in this application).

Of the parameters analyzed, only cadmium may have a potential to cause compliance problems. This is because the revised July 17, 2005 New Mexico WQS has a substantially lowered cadmium standard as a result of use of new EPA guidance. Also, it appears that the receiving water cadmium concentration above the Outfalls may be higher than the new standard. Analysis in this case is complicated because the detection level used in past NPDES monitoring is higher than the new standard. Therefore, it is recommended that no cadmium limit be established until additional monitoring with more sensitive analytical methods is conducted to determine what the ambient and effluent concentrations are.

Provided as "supplemental information" in the package are summaries of relevant activities conducted by Molycorp, with respect to biological and chemical data for the Red River, the manganese pumpback system, and the effectiveness of BMPs to intercept groundwater.

Outfalls 004 and 005 are not included in this renewal application, as Molycorp is in the process of incorporating them into the Stormwater Pollution Prevention Plan for inclusion under the Multi-Sector General Stormwater Permit.

Please print or type in the unshaded areas only
(fill-in areas are spaced for elite type, i.e., 12 characters/inch).

Form Approved. OMB No. 2040-0086.

FORM 1 GENERAL

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERAL INFORMATION

Consolidated Permits Program

(Read the "General Instructions" before starting.)

I. EPA I.D. NUMBER

F NM0022306 D

LABEL ITEMS

I. EPA I.D. NUMBER

III. FACILITY NAME

V. FACILITY MAILING ADDRESS

VI. FACILITY LOCATION

PLEASE PLACE LABEL IN THIS SPACE

GENERAL INSTRUCTIONS

If a preprinted label has been provided, affix it in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill-in area below. Also, if any of the preprinted data is absent *(the area to the left of the label space lists the information that should appear)*, please provide it in the proper fill-in area(s) below. If the label is complete and correct, you need not complete Items I, III, V, and VI *(except VI-B which must be completed regardless)*. Complete all items if no label has been provided. Refer to the instructions for detailed item descriptions and for the legal authorizations under which this data is collected.

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of bold-faced terms.

SPECIFIC QUESTIONS	MARK 'X' YES	NO	FORM ATTACHED
A. Is this facility a publicly owned treatment works which results in a discharge to waters of the U.S.? (FORM 2A)		X	
B. Does or will this facility *(either existing or proposed)* include a concentrated animal feeding operation or aquatic animal production facility which results in a discharge to waters of the U.S.? (FORM 2B)		X	
C. Is this a facility which currently results in discharges to waters of the U.S. other than those described in A or B above? (FORM 2C)	X		
D. Is this a proposed facility *(other than those described in A or B above)* which will result in a discharge to waters of the U.S.? (FORM 2D)		X	
E. Does or will this facility treat, store, or dispose of hazardous wastes? (FORM 3)	X*		
F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)		X	
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		X	
H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)		X	
I. Is this facility a proposed stationary source which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X	
J. Is this facility a proposed stationary source which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X	

III. NAME OF FACILITY

1 SKIP QUESTA MINE

IV. FACILITY CONTACT

A. NAME & TITLE *(last, first, & title)*	B. PHONE *(area code & no.)*
2 TORRES, ROY OPERATIONS MANAGER	505 586 7637

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX

3 P. O BOX 469

B. CITY OR TOWN	C. STATE	D. ZIP CODE
4 QUESTA	NM	87556

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER

5 3.5 mi. east of Questa on S.R. 38

B. COUNTY NAME

TAOS

C. CITY OR TOWN	D. STATE	E. ZIP CODE	F. COUNTY CODE *(if known)*
6 N/A	NM	87556	

* Conditionally Exempt Small Quantity Generator

CONTINUE ON REVERSE

CONTINUED FROM THE FRONT

VII. SIC CODES *(4-digit, in order of priority)*

A. FIRST	B. SECOND
7 1061 (specify) METAL MINING FERRO ALLOY ORE	7 (specify)
C. THIRD	**D. FOURTH**
7 (specify)	7 (specify)

VIII. OPERATOR INFORMATION

A. NAME: 8 MOLYCORP, INC.

B. Is the name listed in Item VIII-A also the owner? ☒ YES ☐ NO

C. STATUS OF OPERATOR *(Enter the appropriate letter into the answer box; if "Other", specify.)*
F = FEDERAL
S = STATE
P = PRIVATE
M = PUBLIC *(other than federal or state)*
O = OTHER *(specify)*

P (specify)

D. PHONE *(area code & no.)*: A 505 586 7637

E. STREET OR P.O. BOX: P.O. BOX 469

F. CITY OR TOWN: B QUESTA

G. STATE: NM

H. ZIP CODE: 87556

IX. INDIAN LAND
Is the facility located on Indian lands? ☐ YES ☒ NO

X. EXISTING ENVIRONMENTAL PERMITS

A. NPDES *(Discharges to Surface Water)*: 9 N NM0022306	D. PSD *(Air Emissions from Proposed Sources)*: 9 P
B. UIC *(Underground Injection of Fluids)*: 9 U	E. OTHER *(specify)*: 9 (specify)
C. RCRA *(Hazardous Wastes)*: 9 R NMD002899094	E. OTHER *(specify)*: 9 (specify)

XI. MAP

Attach to this application a topographic map of the area extending to at least one mile beyond property bounderies. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for precise requirements.

XII. NATURE OF BUSINESS *(provide a brief description)*

Mining and milling operations producing Molybdenum Disulfide concentrate

XIII. CERTIFICATION *(see instructions)*

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE *(type or print)*	B. SIGNATURE	C. DATE SIGNED
ROY TORRES, OPERATIONS MGR.	Roy Torres	8-2-05

COMMENTS FOR OFFICIAL USE ONLY

C

Please type or print in the unshaded areas only	EPA ID Number *(Copy from Item 1 of Form 1)* NM0022306	*Form Approved OMB No. 2040-0086 Approval expires 7-31-88*

Form **2C** NPDES

U.S. ENVIRONMENTAL PROTECTION AGENCY

APPLICATION FOR PERMIT TO DISCHARGE WASTEWATER
EXISTING MANUFACTURING, COMMERCIAL, MINING AND SILVICUTLRAL OPERATIONS
Consolidated Permits Program

I. Outfall Location

For each outfall, list the latitude and longitude of its location to the nearest 15 seconds and name of the receiving water.

A. Outfall	B. Latitude			C. Longitude			D. Receiving Water *(name)*
Number *(list)*	Deg	Min	Sec	Deg	Min	Sec	
001	36	41	40	105	38	3	Red River
002	36	41	31	105	37	17	Red River

II. Flows, Sources of Pollution, and Treatment Technologies

A. Attach a line drawing showing the water flow through the facility. Indicate sources of intake water, operations contributing wastewater to the effluent and treatment units labeled to correspond to the more detailed descriptions in Item B. Construct a water balance on the line drawing by showing average flows between intake, operations, treatment units, and outfalls. If a water balance cannot be determined (e.g., for certain mining activities), provide a pictorial description of the nature and amount of all sources of water and any collection or treatment measures.

B. For each outfall, provide a description of (1) all operations contributing wastewater to the effluent, including process wastewater, sanitary wastewater, cooling cooling water, and stormwater runoff; (2) the average flow contributed by each operation; and (3) the treatment received by the wastewater. Continue on additional sheets if necessary.

1. Outfall Number	2. Operations Contributing Flow		3. Treatment		
	a. OPERATION *(list)*	b. AVERAGE FLOW	a. DESCRIPTION	b. LIST CODES FROM TABLE 2C-1	
001	Wastewater from milling	No discharge	PRIMARY: pH adjustment w/ lime	2-K	1-U
	operations & tailings disposal,	during permit term	settling in tailings impoundments to		
	including mine de-watering,		remove suspended solids &		
	runoff from waste rock piles, &		metals precipitates		
	Interceptor well collection				
			SECONDARY: Ion exchange	2-J	
			process to convert MoO_4 ions in		
			tailings water to $CaMoO_4$		
			precipitate returned to mill circuit		
002	Tailings impound., seepage &	0.655 MGD	N/A	N/A	
	BMP intercepted groundwater	(30-day ave.)			

OFFICIAL USE ONLY (effluent guidelines sub-categories

CONTINUED FROM THE FRONT

C. Except for storm runoff, leaks, or spills, are any of the discharges described in Items II-A or B intermittent or seasonal?

X YES (complete the following table) ☐ NO (go to Section III)

1. OUTFALL NUMBER (list)	2. OPERATION(s) CONTRIBUTING FLOW (list)	3. FREQUENCY a. DAYS PER WEEK (specify average)	3. FREQUENCY b. MONTHS PER YEAR (specify average)	4. FLOW a. FLOW RATE (in mgd) 1. LONG TERM AVERAGE	4. FLOW a. FLOW RATE (in mgd) 2. MAXIMUM DAILY	4. FLOW b. TOTAL VOLUME (specify with units) 1. LONG TERM AVERAGE	4. FLOW b. TOTAL VOLUME (specify with units) 2. MAXIMUM DAILY	4. FLOW c. DURATION (in days)
001	No discharge this current permit cycle							

III. PRODUCTION

A. Does an effluent guideline limitation promulgated by EPA under Section 304 of the Clean Water Act apply to your facility?

X YES (complete Item III-B) ☐ NO (go to Section IV)

B. Are the limitations in the applicable effluent guideline expressed in terms of production (or other measure of operation)?

☐ YES (complete Item III-C) X NO (go to Section IV)

If you answered "yes" to Item III-B, list the quantity which represents an actual measurement of your level of production, expressed in the terms and units used in the applicable effluent guideline, and indicate the affected outfalls.

1. AVERAGE DAILY PRODUCTION a. QUANTITY PER DAY	b. UNITS OF MEASURE	c. OPERATION, PRODUCT, MATERIAL, ETC. (specify)	2. AFFECTED OUTFALLS (list outfall numbers)

IV. IMPROVEMENTS

A. Are you now required by any Federal, State, or local authority to meet any implementation schedule for the construction, upgrading, or operation of wastewater treatment equipment or practices or any other environmental programs which may affect the discharges described in this application? This includes, but is not limited to, permit conditions, administrative or enforcement orders, enforcement compliance schedule letters, stipulations, court orders, and grant or loan conditions.

X YES (complete the following table) ☐ NO (go to Item IV-B)

1. IDENTIFICATION OF CONDITION, AGREEMENT, ETC.	2. AFFECTED OUTFALLS a. No.	2. AFFECTED OUTFALLS b. SOURCE OF DISCHARGE	3. BRIEF DESCRIPTION OF PROJECT	4. FINAL COMPLIANCE DATE a. REQUIRED	4. FINAL COMPLIANCE DATE b. PROJECTED
NM0022306	002	Tailings impoundment	Construction of French drain and well	2/2003	2/3/2003
Part I.C.		seepage & intercepted	system to intercept & extract seepage &		completed
Constr. of seepage		groundwater	Mn groundwater & pump back to impnd..		
Interception system			Ref. "Evaluation of Effectiveness, Spring		
			13 & Spring 39 Seepage Collection		
			Systems, Vail Engineering, Inc.		
			April 30, 2003		

OPTIONAL: You may attach additional sheets describing any additional water pollution control programs (or other environmental projects which may affect your discharges) you now have underway or which you plan. Indicate whether each program is now underway or planned, and indicate your actual or planned schedules for construction. ☐ MARK "X" IF DESCRIPTION OF ADDITIONAL CONTROL PROGRAM IS ATTACHED

 CONTINUED ON PAGE 3

CONTINUED FROM PAGE 2	EPA ID Number *(Copy from Item 1 of Form 1)* NM0022306	

V. INTAKE AND EFFLUENT CHARACTERISTICS

A, B, & C: See instructions before proceeding - Complete one set of tables or each outfall - Annotate the outfall number in the space provided. NOTE: Tables V-A, V-B, and V-C are included on separate sheets number V-1 through V-9.

D: Use the space below to list any of the pollutants listed in Tables 2c-3 of the instructions, which you know or have reason to believe is discharged or may be discharged from any outfall. For every pollutant you list, briefly describe the reasons you believe it to be present and report any analytical data in your possession.

1. POLLUTANT	2. SOURCE	1. POLLUTANT	2. SOURCE
NONE			

VI. POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS

Is any pollutant listed in Item V-C a substance or a component of a substance which you currently use or manufacture as an intermediate or final product or byproduct?

☐ YES *(list all such pollutants below)* X NO *(go to Item VI-B)*

 CONTINUED ON REVERSE

CONTINUED FROM THE FRONT

VII. BIOLOGICAL TOXICITY TESTING DATA

Do you have any knowledge or reason to believe that any biological test for acute or chronic toxicity has been made on any of your discharges or on a receiving water in relation to your discharge within the last 3 years?

X **YES** *(identify the test(s) and describe their purpose below)* ☐ **NO** *(go to Section VIII)*

		Survival			Reproduction/Growth		
Date	Species	NOEC	IC25	95% C.I.	NOEC	IC25	95% C.I,
4/16/02	*C. dubia*	67	>67	n/a	67	>67	n/a
4/29/03	*C. dubia*	67	>67	n/a	67	>67	n/a
10/28/03	*C. dubia*	67	>67	n/a	67	>67	n/a
10/28/03	*P. prolelas*	67	>67	n/a	67	>67	n/a
3/23/04	*C. dubia*	67	>67	n/a	67	>67	n/a
9/21/04	*C. dubia*	67	>67	n/a	67	>67	n/a
9/21/04	*P. prolmelas*	50	17.1	10.0-54.7	50	19.1	12.2-68.5
3/22/05	*C. dubia*	67	>67	n/a	67	>67	n/a
3/22/05	*P. promelas*	67	>67	n/a	67	>67	n/a

Conducted on discharge 002 per NPDES Permit NM0022306, and reported to EPA-6. Outfall 001 had no discharge during current permit term.

VIII. CONTRACT ANALYSIS INFORMATION

Were any of the analyses reported in Item V performed by a contract laboratory or consulting firm? N/A

X **YES** *(list the name, address, and telephone number of, and pollutants analyzed by, each such laboratory or firm below)* ☐ **NO** *(go to Section IX)*

A. NAME	B. ADDRESS	C. TELEPHONE *(area code & no.)*	D. POLLUTANTS ANALYZED *(list)*
ENSR	4303 W. LaPorte Ave. Ft. Collins, CO 80521	(970) 416-0916	Toxicity
Stewart Environ. Consultants	3801 Automation Way, Ft. Collins, CO 80525	(970) 226-5000	COD
Paragon Analytics	225 Commerce Drive, Ft. Collins, CO 80524	(970) 443-1511	Metals & Wet Chemistry
		( )	

IX. CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

A. NAME & OFFICIAL TITLE *(type or print)*	B. PHONE NO. *(area code & no.)*
Roy Torres, Operations Manager	(505) 586-7637
C. SIGNATURE Roy Torres	D. DATE SIGNED 8-2-05

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY. You may report some or all of this information on separate sheets (use the same format) instead of completing these pages. SEE INSTRUCTIONS.

EPA I.D. NUMBER *(copy from Item 1 of Form 1)* NM0022306

V. INTAKE AND EFFLUENT CHARACTERISTICS *(continued from page 3 of Form 2-C)*

Outfall 002

PART A - You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

1. POLLUTANT	2. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	(2) MASS	b. MAXIMUM 30 DAY VALUE *(if available)* (1) CONCENTRATION	(2) MASS	c. LONG TERM AVRG. VALUE *(if available)* (1) CONCENTRATION	(2) MASS	d. NO. OF ANALYSES	3. UNITS *(specify if blank)* a. CONCENTRATION	b. MASS	4. INTAKE *(optional)* a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
a. Biochemical Oxygen Demand *(BOD)*	N/A		N/A									
b. Chemical Oxygen Demand *(COD)*	25	113	25	113	<10	46.6	50	mg/L	lbs/da	N/A		
c. Total Organic Carbon *(TOC)*	N/A		N/A									
d. Total Suspended Solids *(TSS)*	7.2	35.5	7.2	35.5	<4	17.7	50	mg/L	lbs/da	N/A		
e. Ammonia *(as N)*												
f. Flow	Value 0.726		Value 0.655		Value 0.523		50	MGD		Value		
g. Temperature *(winter)*	Value N/A		Value		Value			C		Value		
h. Temperature *(summer)*	Value N/A		Value		Value			C		Value		
i. pH	Minimum 7	Maximum 7.77	Minimum 7	Maximum 7.77				STANDARD UNITS				

PART B - Mark _X_ in column 2-a for each pollutant you know or have reason to believe is present. Mark "X" in column 2-b for each pollutant you believe to be absent. If you mark column 2-a for any pollutant which is limited either directly, or indirectly but expressly, in an effluent limitation guideline, you must provide the results of at least one analysis for that pollutant. For other pollutants for which you mark column 2a, you must provide quantitative data or an explanation of their presence in your discharge. Complete one table for each outfall. See the instructions for additional details and requirements.

1. POLLUTANT AND CAS NO. *(if available)*	2. MARK 'X' a. BELIEVED PRESENT	b. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	(2) MASS	b. MAXIMUM 30 DAY VALUE *(if available)* (1) CONCENTRATION	(2) MASS	c. LONG TERM AVRG.VALUE *(if available)* (1) CONCENTRATION	(2) MASS	d. NO. OF ANALYSIS	4. UNITS *(specify if blank)* a. CONCENTRATION	b. MASS	5. INTAKE *(optional)* a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
a. Bromide (24959-67-9)	☐	X												
b. Chlorine, Total Residual	☐	X												
c. Color	☐	X												
d. Fecal Coliform	☐	X												
e. Fluoride (16984-48-8)	X	☐	2.0	9.84	2.0	9.84	1.43	6.16	50	mg/L	lbs/da			
f. Nitrate- Nitrite *(as N)*	X													

ITEM V-B CONTINUED FROM FRONT

1. POLLUTANT AND CAS NO. (If available)	2. MARK 'X' a. BELIEVED PRESENT	2. MARK 'X' b. BELIEVED ABSENT	2. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. (2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	b. (2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	c. (2) MASS	d. NO. OF ANALYSES	3. UNITS a. CONCENTRATION	3. UNITS b. MASS	4. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	a. (2) MASS	b. NO. OF ANALYSES
g. Nitrogen, Total Organic (as N)	☐	X												
h. Oil and Grease	☐	X												
i. Phosphorus (as P), Total (7723-14-0)	X	☐												
Radioactivity														
(1) Alpha, Total	X	☐												
(2) Beta, Total	X	☐												
(3) Radium, Total	X	☐												
(4) Radium 226, Total	X	☐												
k. Sulfate (as SO_4) (14808-79-8)	X	☐												
l. Sulfide (as S)	X	☐												
m. Sulfite (as SO_3)(14265-45-3)	X	☐												
n. Surfactants	☐	X												
o. Aluminum, Total (7429-90-5)	X	☐	0.12	.591	0.12	0.591	<.1	N/A	50	mg/L	lbs/da			
p. Barium, Total (7440-39-3)	X	☐												
q. Boron, Total (7440-42-8)	☐	X												
r. Cobalt, Total (7440-48-4)	X	☐												
s. Iron, Total (7439-89-4)	X	☐	0.28	1.38	0.28	1.38	0.11	0.44	50	"	"			
t. Magnesium, Total (7439-95-4)	X	☐												
u. Molybdenum, Total(7439-98-7)	X	☐	1.8	7.15	1.8	7.15	1.35	5.8	50	"	"			
v. Manganese, Total (7439-96-5)	X	☐	1.3	4.12	1.3	4.12	0.72	3.01	50	"	"			
w. Tin, Total (7440-31-5)	☐	X												
x. Titanium, Total (7440-32-6)	☐	X												

CONTINUED FROM PAGE 3 OF FORM 2-C		EPA I.D. NUMBER (copy from Item 1 of Form 1) NM0022306	OUTFALL NUMBER 002			

PART C - If you are a primary industry and this outfall contains process wastewater, refer to Table 2c-2 in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2-a for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. If you are not required to mark column 2-a *(secondary industries, nonprocess wastewater outfalls, and non-required GC/MS fractions)*, mark "X" in column 2-b for each pollutant you know or have reason to believe is present. Mark "X" in column 2-c for each pollutant you believe is absent. If you mark column 2a for any pollutant, you must provide the results of at least one analysis for that pollutant. If you mark column 2b for any pollutant, you must provide the results of at least one analysis for that pollutant. If you know or have reason to believe it will be discharged in concentrations of 10 ppb or greater. If you mark column 2b for acrolein, acrylonitrile, 2,4 dinitrophenol, or 2-methyl-4, 6 dinitrophenol, you must provide the results of at least one analysis for each of these pollutants which you know or have reason to believe that you discharge in concentrations of 100 ppb or greater. Otherwise, for pollutants for which you mark column 2b, you must either submit at least one analysis or briefly describe the reasons the pollutant is expected to be discharged. Note that there are 7 pages to this part; please review each carefully. Complete one table *(all 7 pages)* for each outfall. See instructions for additional details and requirements.

1. POLLUTANT AND CAS NO. *(if available)*	2. MARK 'X'			3. EFFLUENT							4. UNITS	5. INTAKE *(optional)*			
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE *(if available)*		c. LONG TERM AVRG. VALUE *(if available)*		d. NO. OF ANALYSIS		a. LONG TERM AVERAGE VALUE			b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS		a. CONCENTRATION	b. MASS	(1) CONCENTRATION	(2) MASS	
METALS, CYANIDE, AND TOTAL PHENOLS															
1m. Antimony, Total (7440-36-0)	☐	☐	X												
2M. Arsenic, Total (7440-38-2)	X	☐	X	<5		<5		<5		50	µg/L				
3M. Beryllium, Total (7440-41-7)	☐	☐	X												
4M. Cadmium, Total (7440-43-9)	X	☐	X	<1		<1		<1		50	"				
5M Chromium, Total (7440-47-3)	☐	☐	X												
6M Copper, Total (7440-50-8)	X	☐	X	<10		<10		<10		50	"				
7M lead, Total (7439-92-1)	X	☐	X	<3		<3		<3		50	"				
8M Mercury, Total (7439-97-6)	X	☐	X	<0.2		<0.2		<0.2		50	"				
9M Nickel, Total (7440-02-0)	☐	☐	X												
10M Selenium, Total (7782-49-2)	☐	☐	X												
11M Silver, Total (7440-22-4)	☐	☐	X												
12M Thallium, Total (7440-28-0)	☐	☐	X												
13M Zinc, Total (7440-66-6)	X	☐	X	<20		<20		<20		50	"				
14M Cyanide, Total (57-12-5)	X	☐	X	<10		<10		<10		50	"				
15M Phenols, Total	☐	☐	X												
DIOXIN															
2,3,7,8-Tetra-chlorodibenzo-P-Dioxin (1764-01-6)	☐	☐	X	DESCRIBE RESULTS											

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NO. (if available)	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSES			a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS		a. CONCENTRATION	b. MASS	(1) CONCENTRATION	(2) MASS	
GC/MS - VOLATILE COMPOUNDS															
1V. Acrolein (107-02-8)	☐	☐	X								µg/L	#/da			
2V Acrylonitrile (107-13-1)	☐	☐	X								µg/L	#/da			
3V Benzene (71-43-2)	☐	☐	X								µg/L	#/da			
4V Bis (Chloro-methyl) Ether (542-88-1)	☐	☐	X								µg/L	#/da			
5V Bromoform (75-25-2)	☐	☐	X								µg/L	#/da			
6V Carbon Tetrachloride (56-23-5)	☐	☐	X								µg/L	#/da			
7V Chlorobenzene (108-90-7)	☐	☐	X								µg/L	#/da			
8V Chlorodi-bromomethane (124-48-1)	☐	☐	X								µg/L	#/da			
9V Chloroethane (75-00-3)	☐	☐	X								µg/L	#/da			
10V 2-Chloro-ethylVinyl Ether (110-75-8)	☐	☐	X								µg/L	#/da			
11V Chloroform (67-66-3)	☐	☐	X								µg/L	#/da			
12V Dichloro-bromoethane (75-71-8)	☐	☐	X								µg/L	#/da			
13V Dichloro-difluoromethane (75-71-8)	☐	☐	X								µg/L	#/da			
14V 1,1-Dichloro-ethane (75-34-3)	☐	☐	X								µg/L	#/da			
15V 1,2-Dichloro-ethane (107-06-2)	☐	☐	X								µg/L	#/da			
16V 1,1-Dichloro-ethylene (75335-4)	☐	☐	X								µg/L	#/da			
17V 1,2-Dichloro-propane (78-87-5)	☐	☐	X								µg/L	#/da			
18V 1,3-Dichloro-propylene (542-76-5)	☐	☐	X								µg/L	#/da			
19V Ethylbenzene (100-41-4)	☐	☐	X								µg/L	#/da			
20V Methyl Bromide (74-83-9)	☐	☐	X								µg/L	#/da			
21V Methyl Chloride (74-87-3)	☐	☐	X								µg/L	#/da			

 CONTINUE ON PAGE V-5

CONTINUED FROM PAGE V-4	EPA I.D. NUMBER (copy from Item 1 of Form 1) NM0022306	OUTFALL NUMBER	002

1. POLLUTANT AND CAS NO. (if available)	2. MARK 'X'			2. EFFLUENT							4. UNITS (specify if blank)		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSES			a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS		a. CONCENTRATION	b. MASS	(1) CONCENTRATION	(2) MASS	
GC/MS - VOLATILE COMPOUNDS (continued)															
22V Methylene Chloride (75-09-2)	☐	☐	X								µg/L	#/da			
23V 1,1,2,2-Tetra-Chloroethane (79-34-5)	☐	☐	X								µg/L	#/da			
24V Tetrachloro-ethylene (127-18-4)	☐	☐	X								µg/L	#/da			
25V Toluene (108-88-3)	☐	☐	X								µg/L	#/da			
26V 1,2-Trans-Dichloroethylene(156-60-5)	☐	☐	X								µg/L	#/da			
27V 1,1,1-Tri-chloroethane (71-55-6)	☐	☐	X								µg/L	#/da			
28V 1,1,2-Tri-chloroethane (79-00-5)	☐	☐	X								µg/L	#/da			
29V Trichloro-ethylene (79-01-6)	☐	☐	X								µg/L	#/da			
30V Trichloro-fluoromethane (75-69-4)	☐	☐	X								µg/L	#/da			
31V Vinyl Chloride (75-01-4)	☐	☐	X								µg/L	#/da			
GC/MS FRACTION - ACID COMPOUNDS															
1A 2-Chlorophenol (95-57-8)	☐	☐	X								µg/L	#/da			
2A 2,4-Dichloro-phenol (120-83-2)	☐	☐	X								µg/L	#/da			
3A 2,4-Dimethyl-phenol (105-67-9)	☐	☐	X								µg/L	#/da			
4A 4,6-Dinitro-O-cresol (534-52-1)	☐	☐	X								µg/L	#/da			
5A 2,4-Dinitro-phenol (51-28-5)	☐	☐	X								µg/L	#/da			
6A 2-Nitro-phenol (88-75-5)	☐	☐	X								µg/L	#/da			
7A 4-Nitro-phenol (100-02-7)	☐	☐	X								µg/L	#/da			
8A P-Chloro-M-Cresol (59-50-7)	☐	☐	X								µg/L	#/da			
9A Penta-chlorophenol (87-86-5)	☐	☐	X								µg/L	#/da			
10A Phenol (108-95-2)	☐	☐	X								µg/L	#/da			
11A 2,4,6-Tri-chlorophenol (88-06-2)	☐	☐	X								µg/L	#/da			

CONTINUE ON REVERSE

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NO. (If available)	2. MARK 'X' a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	(2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	(2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	(2) MASS	d. NO. OF ANALYSES	4. UNITS (specify if blank) a. CONCENTRATION	b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS															
1B Acenphthene (83-32-9)	☐	☐	X								µg/L	#/da			
2B Acenaphthylene (208-96-8)	☐	☐	X								µg/L	#/da			
3B Anthracene (120-12-7)	☐	☐	X								µg/L	#/da			
4B Benzidine (92-87-5)	☐	☐	X								µg/L	#/da			
5B Benzo (a) Anthracene (56-55-3)	☐	☐	X								µg/L	#/da			
6B Benzo (a) Pyrene (50-32-8)	☐	☐	X								µg/L	#/da			
7B 3,4-Benzo-fluoranthene (205-99-2)	☐	☐	X								µg/L	#/da			
8B Benzo *(ghi)* Perylene (191-24-2)	☐	☐	X								µg/L	#/da			
9B Benzo *(k)* Fluoranthene (207-08-9)	☐	☐	X								µg/L	#/da			
10B Bis *(2-Chloroethoxy)* Methane (111-91-1)	☐	☐	X								µg/L	#/da			
11B Bis *(2-Chloro-ethyl)* Ether (111-44-4)	☐	☐	X								µg/L	#/da			
12B Bis *(2-Chloroisopropyl)* Ether (102-80-1	☐	☐	X								µg/L	#/da			
13B Bis*(2-Ethyl-hexyl)* Phthalate (117-81-7)	☐	☐	X								µg/L	#/da			
14 B 4-Bromo-phenyl Phenyl Ether (101-55-3)	☐	☐	X								µg/L	#/da			
15B Butyl Benzyl Phthalate (85-68-7)	☐	☐	X								µg/L	#/da			
16B 2-Chloro-naphthalene (91-58-7)	☐	☐	X								µg/L	#/da			
17B 4-Chloro-phenyl Phenyl Ether (7005-72-3)	☐	☐	X								µg/L	#/da			
18B Chrysene (218-01-9)	☐	☐	X								µg/L	#/da			
19B Dibenzo *(a,h)* Anthracene (53-70-3)	☐	☐	X								µg/L	#/da			
20B 1,2-Dichloro-benzene (95-50-1)	☐	☐	X								µg/L	#/da			
21B 1,3-Dichloro-benzene (541-73-1)	☐	☐	X								µg/L	#/da			

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CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NO. (if available)	2. MARK 'X'			3. EFFLUENT							4. UNITS (specify if blank)		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSES			a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS		a. CONCENTRATION	b. MASS	(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS															
22b 1-4 Dichlorobenzene (106-46-7)	☐	☐	X								µg/L	#/da			
23B 3-3' Dichlorobenzidine (91-94-1)	☐	☐	X								µg/L	#/da			
24B Diethyl Phthalate (84-66-2)	☐	☐	X								µg/L	#/da			
25B Dimethyl Phthalate (131-11-3)	☐	☐	X								µg/L	#/da			
26B Di-N-Butyl Phthalate (131-11-3)	☐	☐	X								µg/L	#/da			
27B 2,4-Dinitro-toluene (121-14-2)	☐	☐	X								µg/L	#/da			
28B 2,6-Dinitro-toluene (606-20-2)	☐	☐	X								µg/L	#/da			
29B Di-N-Octyl Phthalate (117-84-0)	☐	☐	X								µg/L	#/da			
30B 1,2-Diphenyl-hydrazine (as Azo-benzene) (122-66-7)	☐	☐	X								µg/L	#/da			
31B Fluoranthene (206-44-0)	☐	☐	X								µg/L	#/da			
32B Fluorene (86-73-7)	☐	☐	X								µg/L	#/da			
33B Hexa-chlorobenzene (118-74-1)	☐	☐	X								µg/L	#/da			
34B Hexa-chlorobutadiene (87-68-3)	☐	☐	X								µg/L	#/da			
35B Hexachloro-cyclopentadiene (77-47-4)	☐	☐	X								µg/L	#/da			
36B Hexa-chloroethane (67-72-1)	☐	☐	X								µg/L	#/da			
37B Indeno (1,2,3-cd) Pyrene (193-39-5)	☐	☐	X								µg/L	#/da			
38B Isophorone (78-59-1)	☐	☐	X								µg/L	#/da			
39B Naphthalene (91-20-3)	☐	☐	X								µg/L	#/da			
40B Nitrobenzene (98-95-3)	☐	☐	X								µg/L	#/da			
41B N-Nitro-sodimethylamine (62-75-9)	☐	☐	X								µg/L	#/da			
42B N-Nitrosd-N-Propylamine (621-64-7)	☐	☐	X								µg/L	#/da			

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CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NO. (if available)	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSIS			a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS		a. CONCENTRATION	b. MASS	(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS (continued)															
43B N-Nitro-sodiphenylamine (86-30-6)	☐	☐	X								µg/L	#/da			
44B Phenanthrene (85-01-8)	☐	☐	X								µg/L	#/da			
45B Pyrene (129-00-0)	☐	☐	X								µg/L	#/da			
46B 1,2,4-Tri-chlorobenzene (120-82-1)	☐	☐	X								µg/L	#/da			
GC/MS FRACTION - PESTICIDES															
1P Aldrin (309-00-2)	☐	☐	X								µg/L	#/da			
2P α-BHC(319-85-7)	☐	☐	X								µg/L	#/da			
4P β-BHC (58-89-9)	☐	☐	X								µg/L	#/da			
5P γ-BHC (319-86-8)	☐	☐	X								µg/L	#/da			
6P Chlordane (57-74-9)	☐	☐	X								µg/L	#/da			
7P 4,4'-DDT (50-29-3)	☐	☐	X								µg/L	#/da			
8P 4,4'-DDE (72-55-9)	☐	☐	X								µg/L	#/da			
9P 4,4'-DDD (72-54-8)	☐	☐	X								µg/L	#/da			
10P Dieldrin (60-57-1)	☐	☐	X								µg/L	#/da			
11P Endo-sulfan (115-29-7)	☐	☐	X								µg/L	#/da			
12P Endo-sulfan (115-29-7	☐	☐	X								µg/L	#/da			
13P Endosulfan Sulfate (1031-07-8)	☐	☐	X								µg/L	#/da			
14P Endrin(72-20-8)	☐	☐	X								µg/L	#/da			
15P Endrin Aldehyde (7421-93-4)	☐	☐	X								µg/L	#/da			
16P Hepta-chlor (76-44-8)	☐	☐	X								µg/L	#/da			

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LUTANT AND CAS O. (if available)	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
achlor Epoxide 3)	☐	☐	X								µg/L	#/da			
-1242 (53469-21-9)	☐	☐	X								µg/L	#/da			
-1254 (11097-69-1)	☐	☐	X								µg/L	#/da			
-1221 (11104-28-2)	☐	☐	X								µg/L	#/da			
-1232 (11141-16-5)	☐	☐	X								µg/L	#/da			
-1248 (12672-29-6)	☐	☐	X								µg/L	#/da			
-1260 (11096-82-5)	☐	☐	X								µg/L	#/da			
-1016 (12674-11-2)	☐	☐	X								µg/L	#/da			
phene (8001-35-2)	☐	☐	X								µg/L	#/da			
achlor Epoxide (1024-	☐	☐	X								µg/L	#/da			
-1242 (53469-21-9)	☐	☐	X								µg/L	#/da			
-1254 (11097-69-1)	☐	☐	X								µg/L	#/da			
-1221 (11104-28-2)	☐	☐	X								µg/L	#/da			
-1232 (11141-16-5)	☐	☐	X								µg/L	#/da			
-1248 (12672-29-6)	☐	☐	X								µg/L	#/da			

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CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NO. (if available)	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSIS			a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS		a. CONCENTRATION	b. MASS	(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION - PESTICIDES															
17P Heptachlor Epoxide (1024-57-3)	☐	☐	X					µg/L	#/da						
18P PCB-1242 (53469-21-9)	☐	☐	X					µg/L	#/da						
19P PCB-1254 (11097-69-1)	☐	☐	X					µg/L	#/da						
20P PCB-1221 (11104-28-2)	☐	☐	X					µg/L	#/da						
21P PCB-1232 (11141-16-5)	☐	☐	X					µg/L	#/da						
22P PCB-1248 (12672-29-6)	☐	☐	X					µg/L	#/da						
23P PCB-1260 (11096-82-5)	☐	☐	X					µg/L	#/da						
24P PCB-1016 (12674-11-2)	☐	☐	X					µg/L	#/da						
25P Toxaphene (8001-35-2)	☐	☐	X					µg/L	#/da						

 CONTINUE ON PAGE V-9

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY. You may report some or all of this information on separate sheets (use the same format) instead of completing these pages. SEE INSTRUCTIONS.	EPA I.D. NUMBER (copy from Item 1 of Form 1) NM0022306			

V. INTAKE AND EFFLUENT CHARACTERISTICS *(continued from page 3 of Form 2-C)* Outfall 001

PART A - You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

1. POLLUTANT	2. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	(2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	(2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	(2) MASS	d. NO. OF ANALYSES	3. UNITS (specify if blank) a. CONCENTRATION	b. MASS	4. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
a. Biochemical Oxygen Demand (BOD)												
b. Chemical Oxygen Demand (COD)	NO	DISCHARGE	DURING	LIFE OF	PERMIT							
c. Total Organic Carbon (TOC)												
d. Total Suspended Solids (TSS)												
e. Ammonia (as N)												
f. Flow	Value		Value		Value					Value		
g. Temperature (winter)	Value		Value		Value			C		Value		
h. Temperature (summer)	Value		Value		Value			C		Value		
i. pH	Minimum	Maximum	Minimum	Maximum				STANDARD UNITS				

PART B - Mark _X_ in column 2-a for each pollutant you know or have reason to believe is present. Mark "X" in column 2-b for each pollutant you believe to be absent. If you mark column 2-a for any pollutant which is limited either directly, or indirectly but expressly, in an effluent limitation guideline, you must provide the results of at least one analysis for that pollutant. For other pollutants for which you mark column 2a, you must provide quantitative data or an explanation of their presence in your discharge. Complete one table for each outfall. See the instructions for additional details and requirements.

1. POLLUTANT AND CAS NO. (if available)	2. MARK 'X' a. BELIEVED PRESENT	b. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	(2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	(2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	(2) MASS	d. NO. OF ANALYSIS	4. UNITS (specify if blank) a. CONCENTRATION	b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
a. Bromide (24959-67-9)	☐	☐												
b. Chlorine, Total Residual	☐	☐												
c. Color	☐	☐												
d. Fecal Coliform	☐	☐												
e. Fluoride (16984-48-8)	☐	☐												
f. Nitrate- Nitrite (as N)	☐	☐												

ITEM V-B CONTINUED FROM FRONT

1. POLLUTANT AND CAS NO. (If available)	2. MARK 'X'		2. EFFLUENT							3. UNITS)		4. INTAKE (optional)		
	a. BELIEVED PRESENT	b. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
g. Nitrogen, Total Organic (as N)	☐	☐												
h. Oil and Grease	☐	☐												
i. Phosphorus (as P), Total (7723-14-0)	☐	☐												
Radioactivity														
(1) Alpha, Total	☐	☐												
(2) Beta, Total	☐	☐												
(3) Radium, Total	☐	☐												
(4) Radium 226, Total	☐	☐												
k. Sulfate (as SO_4) (14808-79-8)	☐	☐				NO				DICHARGE				
l. Sulfide (as S)	☐	☐												
m. Sulfite (as SO_3)(14265-45-3)	☐	☐												
n. Surfactants	☐	☐												
o. Aluminum, Total (7429-90-5)	☐	☐												
p. Barium, Total (7440-39-3)	☐	☐												
q. Boron, Total (7440-42-8)	☐	☐												
r. Cobalt, Total (7440-48-4)	☐	☐												
s. Iron, Total (7439-89-4)	☐	☐												
t. Magnesium, Total (7439-95-4)	☐	☐												
u. Molybdenum, Total(7439-98-7)	☐	☐												
v. Manganese, Total (7439-96-5)	☐	☐												
w. Tin, Total (7440-31-5)	☐	☐												
x. Titanium, Total (7440-32-6)	☐	☐												

 CONTINUE ON REVERSE

CONTINUED FROM PAGE 3 OF FORM 2-C	EPA I.D. NUMBER (copy from Item 1 of Form 1) NM0022306	OUTFALL NUMBER 001

PART C - If you are a primary industry and this outfall contains process wastewater, refer to Table 2c-2 in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2-a for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. If you are not required to mark column 2-a *(secondary industries, nonprocess wastewater outfalls, and non-required GC/MS fractions)*, mark "X" in column 2-b for each pollutant you know or have reason to believe is present. Mark "X" in column 2-c for each pollutant you believe is absent. If you mark column 2a for any pollutant, you must provide the results of at least one analysis for that pollutant. If you mark column 2b for any pollutant, you must provide the results of at least one analysis for that pollutant. If you know or have reason to believe it will be discharged in concentrations of 10 ppb or greater. If you mark column 2b for acrolein, acrylonitrile, 2,4 dinitrophenol, or 2-methyl-4, 6 dinitrophenol, you must provide the results of at least one analysis for each of these pollutants which you know or have reason to believe that you discharge in concentrations of 100 ppb or greater. Otherwise, for pollutants for which you mark column 2b, you must either submit at least one analysis or briefly describe the reasons the pollutant is expected to be discharged. Note that there are 7 pages to this part; please review each carefully. Complete one table *(all 7 pages)* for each outfall. See instructions for additional details and requirements.

1. POLLUTANT AND CAS NO. *(if available)*	2. MARK 'X'			3. EFFLUENT							4. UNITS	5. INTAKE *(optional)*			
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE *(if available)*		c. LONG TERM AVRG. VALUE *(if available)*		d. NO. OF ANALYSIS		a. LONG TERM AVERAGE VALUE			b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS		a. CONCENTRATION	b. MASS	(1) CONCENTRATION	(2) MASS	
METALS, CYANIDE, AND TOTAL PHENOLS															
1m. Antimony, Total (7440-36-0)	☐	☐	☐												
2M. Arsenic, Total (7440-38-2)	☐	☐	☐												
3M. Beryllium, Total (7440-41-7)	☐	☐	☐												
4M. Cadmium, Total (7440-43-9)	☐	☐	☐			NO				DISCHARGE					
5M Chromium, Total (7440-47-3)	☐	☐	☐												
6M Copper, Total (7440-50-8)	☐	☐	☐												
7M lead, Total (7439-92-1)	☐	☐	☐												
8M Mercury, Total (7439-97-6)	☐	☐	☐												
9M Nickel, Total (7440-02-0)	☐	☐	☐												
10M Selenium, Total (7782-49-2)	☐	☐	☐												
11M Silver, Total (7440-22-4)	☐	☐	☐												
12M Thallium, Total (7440-28-0)	☐	☐	☐												
13M Zinc, Total (7440-66-6)	☐	☐	☐												
14M Cyanide, Total (57-12-5)	☐	☐	☐												
15M Phenols, Total	☐	☐	☐												
DIOXIN															
2,3,7,8-Tetrachlorodibenzo-P-Dioxin (1764-01-6)	☐	☐	☐	DESCRIBE RESULTS											

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NO. (if available)	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSES			a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS		a. CONCENTRATION	b. MASS	(1) CONCENTRATION	(2) MASS	
GC/MS - VOLATILE COMPOUNDS															
1V. Acrolein (107-02-8)	☐	☐	☐												
2V Acrylonitrile (107-13-1)	☐	☐	☐												
3V Benzene (71-43-2)	☐	☐	☐												
4V Bis (Chloro-methyl) Ether (542-88-1)	☐	☐	☐												
5V Bromoform (75-25-2)	☐	☐	☐												
6V Carbon Tetrachloride (56-23-5)	☐	☐	☐												
7V Chlorobenzene (108-90-7)	☐	☐	☐												
8V Chlorodi-bromomethane (124-48-1)	☐	☐	☐												
9V Chloroethane (75-00-3)	☐	☐	☐			N0		DIS	CHARGE						
10V 2-Chloro-ethylVinyl Ether (110-75-8)	☐	☐	☐												
11V Chloroform (67-66-3)	☐	☐	☐												
12V Dichloro-bromoethane (75-71-8)	☐	☐	☐												
13V Dichloro-difluoromethane (75-71-8)	☐	☐	☐												
14V 1,1-Dichloro-ethane (75-34-3)	☐	☐	☐												
15V 1,2-Dichloro-ethane (107-06-2)	☐	☐	☐												
16V 1,1-Dichloro-ethylene (75335-4)	☐	☐	☐												
17V 1,2-Dichloro-propane (78-87-5)	☐	☐	☐												
18V 1,3-Dichloro-propylene (542-76-6)	☐	☐	☐												
19V Ethylbenzene (100-41-4)	☐	☐	☐												
20V Methyl Bromide (74-83-9)	☐	☐	☐												
21V Methyl Chloride (74-87-3)	☐	☐	☐												

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CONTINUED FROM PAGE V-4	EPA I.D. NUMBER (copy from Item 1 of Form 1) NM0022306	OUTFALL NUMBER 001		

1. POLLUTANT AND CAS NO. (if available)	2. MARK 'X'			2. EFFLUENT							4. UNITS (specify if blank)		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSES			a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS		a. CONCENTRATION	b. MASS	(1) CONCENTRATION	(2) MASS	
GC/MS - VOLATILE COMPOUNDS (continued)															
22V Methylene Chloride (75-09-2)	☐	☐	☐												
23V 1,1,2,2-Tetra-Chloroethane (79-34-5)	☐	☐	☐												
24V Tetrachloro-ethylene (127-18-4)	☐	☐	☐												
25V Toluene (108-88-3)	☐	☐	☐												
26V 1,2-Trans-Dichloroethylene(156-60-5)	☐	☐	☐												
27V 1,1,1-Tri-chloroethane (71-55-6)	☐	☐	☐												
28V 1,1,2-Tri-chloroethane (79-00-5)	☐	☐	☐												
29V Trichloro-ethylene (79-01-6)	☐	☐	☐												
30V Trichloro-fluoromethane (75-69-4)	☐	☐	☐				NO		DIS	CHARGE					
31V Vinyl Chloride (75-01-4)	☐	☐	☐												
GC/MS FRACTION - ACID COMPOUNDS															
1A 2-Chlorophenol (95-57-8)	☐	☐	☐												
2A 2,4-Dichloro-phenol (120-83-2)	☐	☐	☐												
3A 2,4-Dimethyl-phenol (105-67-9)	☐	☐	☐												
4A 4,6-Dinitro-O-cresol (534-52-1)	☐	☐	☐												
5A 2,4-Dinitro-phenol (51-28-5)	☐	☐	☐												
6A 2-Nitro-phenol (88-75-5)	☐	☐	☐												
7A 4-Nitro-phenol (100-02-7)	☐	☐	☐												
8A P-Chloro-M-Cresol (59-50-7)	☐	☐	☐												
9A Penta-chlorophenol (87-86-5)	☐	☐	☐												
10A Phenol (108-95-2)	☐	☐	☐												
11A 2,4,6-Tri-chlorophenol (88-06-2)	☐	☐	☐												

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NO. (If available)	2. MARK 'X'			3. EFFLUENT							4. UNITS (specify if blank)		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSES			a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS		a. CONCENTRATION	b. MASS	(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS															
1B Acenphthene (83-32-9)	☐	☐	☐												
2B Acenaphthylene (208-96-8)	☐	☐	☐												
3B Anthracene (120-12-7)	☐	☐	☐												
4B Benzidine (92-87-5)	☐	☐	☐												
5B Benzo (a) Anthracene (56-55-3)	☐	☐	☐												
6B Benzo (a) Pyrene (50-32-8)	☐	☐	☐												
7B 3,4-Benzo-fluoranthene (205-99-2)	☐	☐	☐			NO	DIS	CHARGE							
8B Benzo *(ghi)* Perylene (191-24-2)	☐	☐	☐												
9B Benzo *(k)* Fluoranthene (207-08-9)	☐	☐	☐												
10B Bis *(2-Chloroethoxy)* Methane (111-91-1)	☐	☐	☐												
11B Bis *(2-Chloro-ethyl)* Ether (111-44-4)	☐	☐	☐												
12B Bis *(2-Chloroisopropyl)* Ether (102-80-1	☐	☐	☐												
13B Bis*(2-Ethyl-hexyl)* Phthalate (117-81-7)	☐	☐	☐												
14 B 4-Bromo-phenyl Phenyl Ether (101-55-3)	☐	☐	☐												
15B Butyl Benzyl Phthalate (85-68-7)	☐	☐	☐												
16B 2-Chloro-naphthalene (91-58-7)	☐	☐	☐												
17B 4-Chloro-phenyl Phenyl Ether (7005-72-3)	☐	☐	☐												
18B Chrysene (218-01-9)	☐	☐	☐												
19B Dibenzo *(a,h)* Anthracene (53-70-3)	☐	☐	☐												
20B 1,2-Dichloro-benzene (95-50-1)	☐	☐	☐												
21B 1,3-Dichloro-benzene (541-73-1)	☐	☐	☐												

 CONTINUE ON PAGE V-7

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NO. (If available)	2. MARK 'X' a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	(2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	(2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	(2) MASS	d. NO. OF ANALYSES	4. UNITS (specify if blank) a. CONCENTRATION	b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS															
22b 1-4 Dichlorobenzene (106-46-7)	☐	☐	☐												
23B 3-3' Dichlorobenzidine (91-94-1)	☐	☐	☐												
24B Diethyl Phthalate (84-66-2)	☐	☐	☐												
25B Dimethyl Phthalate (131-11-3)	☐	☐	☐												
26B Di-N-Butyl Phthalate (131-11-3)	☐	☐	☐												
27B 2,4-Dinitro-toluene (121-14-2)	☐	☐	☐												
28B 2,6-Dinitro-toluene (606-20-2)	☐	☐	☐			NO		DIS	CHARGE						
29B Di-N-Octyl Phthalate (117-84-0)	☐	☐	☐												
30B 1,2-Diphenyl-hydrazine (as Azo-benzene) (122-66-7)	☐	☐	☐												
31B Fluoranthene (206-44-0)	☐	☐	☐												
32B Fluorene (86-73-7)	☐	☐	☐												
33B Hexa-chlorobenzene (118-74-1)	☐	☐	☐												
34B Hexa-chlorobuta-diene (87-68-3)	☐	☐	☐												
35B Hexachloro-cyclopenta-diene (77-47-4)	☐	☐	☐												
36B Hexa-chloroethane (67-72-1)	☐	☐	☐												
37B Indeno (1,2,3-cd) Pyrene (193-39-5)	☐	☐	☐												
38B Isophorone (78-59-1)	☐	☐	☐												
39B Naphthalene (91-20-3)	☐	☐	☐												
40B Nitrobenzene (98-95-3)	☐	☐	☐												
41B N-Nitro-sodimethylamine (62-75-9)	☐	☐	☐												
42B N-Nitroso-N-Propylamine (621-64-7)	☐	☐	☐												

 CONTINUE ON PAGE V-9

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NO. (if available)	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSIS			a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS		a. CONCENTRATION	b. MASS	(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS (continued)															
43B N-Nitro-sodiphenylamine (86-30-6)	☐	☐	☐												
44B Phenanthrene (85-01-8)	☐	☐	☐												
45B Pyrene (129-00-0)	☐	☐	☐												
46B 1,2,4-Tri-chlorobenzene (120-82-1)	☐	☐	☐												
GC/MS FRACTION - PESTICIDES															
1P Aldrin (309-00-2)	☐	☐	☐												
2P α-BHC(319-85-7)	☐	☐	☐												
4P β-BHC (58-89-9)	☐	☐	☐												
5P γ-BHC (319-86-8)	☐	☐	☐		NO		DIS	CHARGE							
6P Chlordane (57-74-9)	☐	☐	☐												
7P 4,4'-DDT (50-29-3)	☐	☐	☐												
8P 4,4'-DDE (72-55-9)	☐	☐	☐												
9P 4,4'-DDD (72-54-8)	☐	☐	☐												
10P Dieldrin (60-57-1)	☐	☐	☐												
11P Endo-sulfan (115-29-7)	☐	☐	☐												
12P Endo-sulfan (115-29-7	☐	☐	☐												
13P Endosulfan Sulfate (1031-07-8)	☐	☐	☐												
14P Endrin(72-20-8)	☐	☐	☐												
15P Endrin Aldehyde (7421-93-4)	☐	☐	☐												
16P Hepta-chlor (76-44-8)	☐	☐	☐												

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LUTANT AND CAS O. (if available)	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSES			a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS		a. CONCENTRATION	b. MASS	(1) CONCENTRATION	(2) MASS	
achlor Epoxide 3)	☐	☐	☐												
-1242 (53469-21-9)	☐	☐	☐												
-1254 (11097-69-1)	☐	☐	☐			NO	DIS	CHARGE							
-1221 (11104-28-2)	☐	☐	☐												
-1232 (11141-16-5)	☐	☐	☐												
-1248 (12672-29-6)	☐	☐	☐												
-1260 (11096-82-5)	☐	☐	☐												
-1016 (12674-11-2)	☐	☐	☐												
phene (8001-35-2)	☐	☐	☐												
achlor Epoxide (1024-	☐	☐	☐												
-1242 (53469-21-9)	☐	☐	☐												
-1254 (11097-69-1)	☐	☐	☐												
-1221 (11104-28-2)	☐	☐	☐												
-1232 (11141-16-5)	☐	☐	☐												
-1248 (12672-29-6)	☐	☐	☐												

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CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NO. (if available)	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSIS			a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS		a. CONCENTRATION	b. MASS	(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION - PESTICIDES															
17P Heptachlor Epoxide (1024-57-3)	☐	☐	☐												
18P PCB-1242 (53469-21-9)	☐	☐	☐												
19P PCB-1254 (11097-69-1)	☐	☐	☐												
20P PCB-1221 (11104-28-2)	☐	☐	☐			NO	DIS	CHARGE							
21P PCB-1232 (11141-16-5)	☐	☐	☐												
22P PCB-1248 (12672-29-6)	☐	☐	☐												
23P PCB-1260 (11096-82-5)	☐	☐	☐												
24P PCB-1016 (12674-11-2)	☐	☐	☐												
25P Toxaphene (8001-35-2)	☐	☐	☐												

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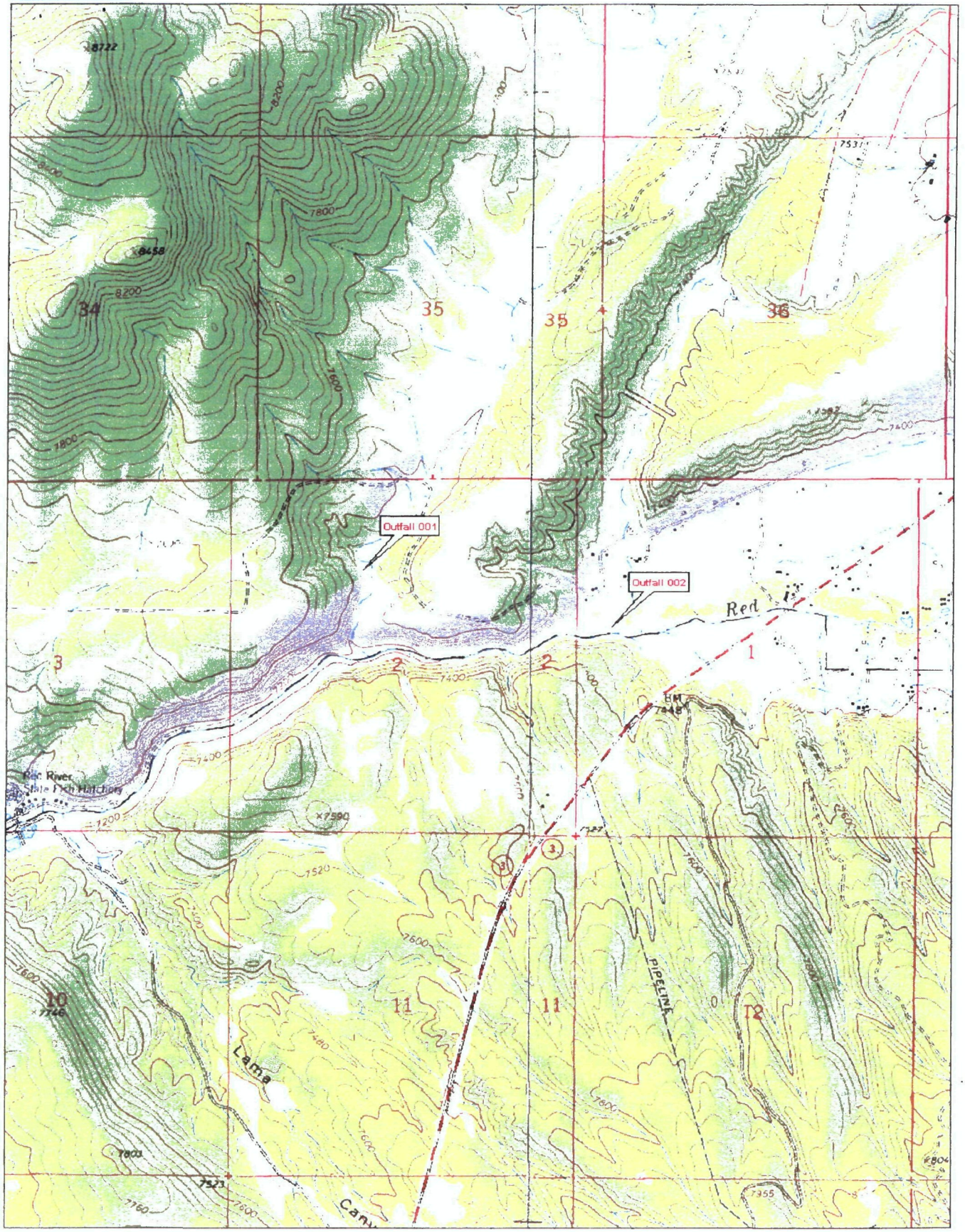
DeLORME

XMap® 4.5



Data use subject to license.

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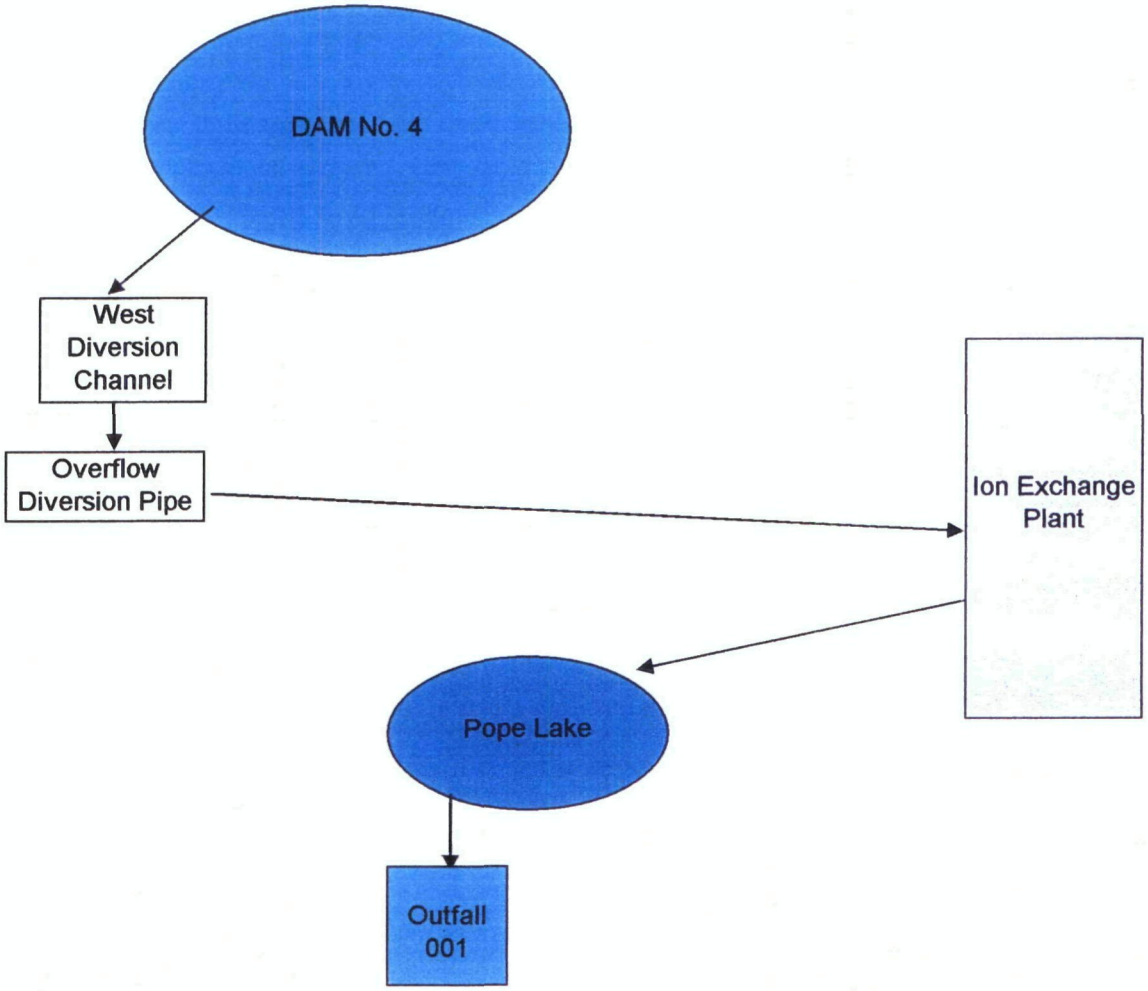
MN (0.0° W)

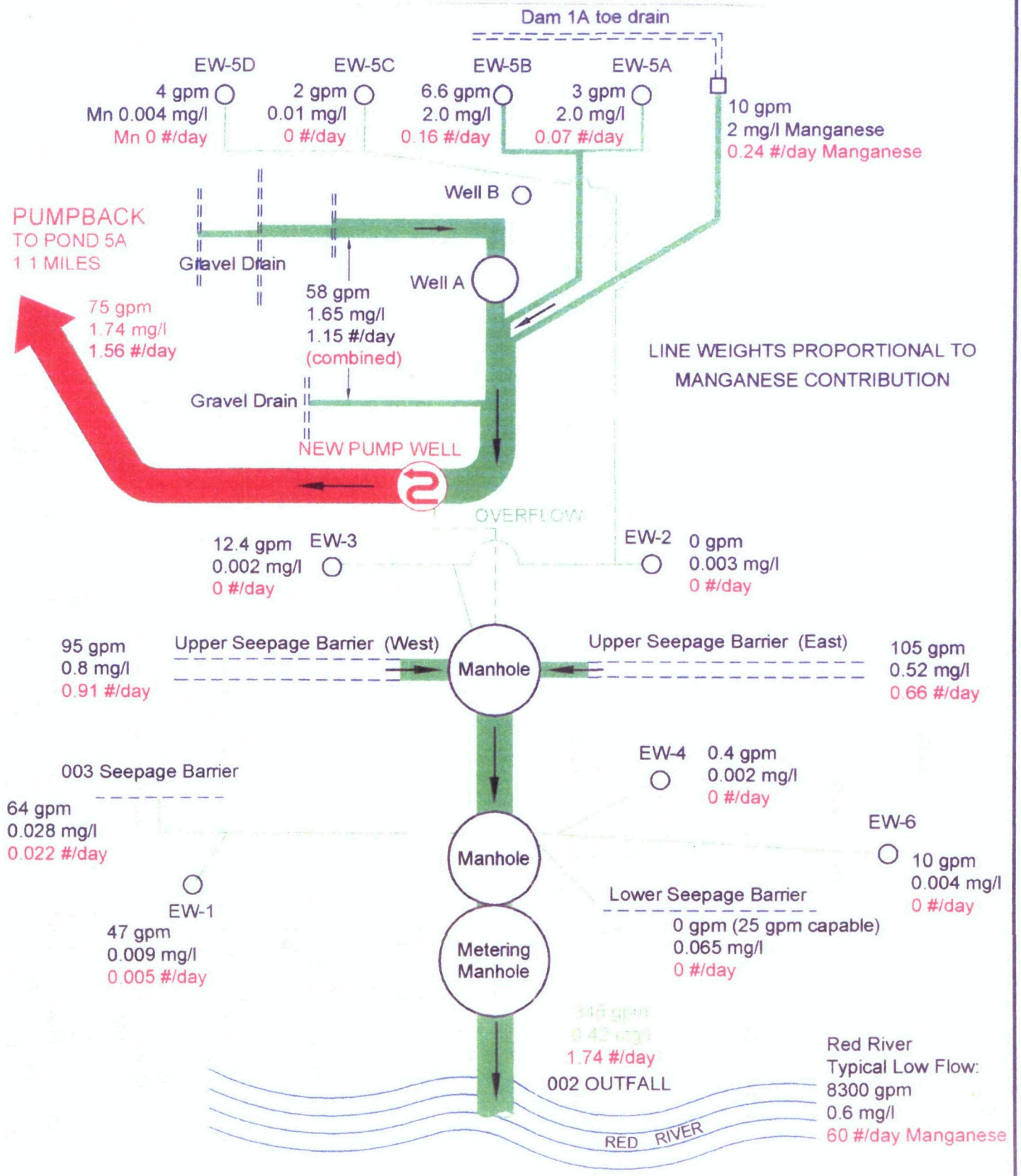
0 600 1200 1800 2400 3000 3600 ft

Data Zoom 13-0

Outfall 001


DAM No. 4
West Diversion Channel
Overflow Diversion Pipe
Ion Exchange Plant
Pope Lake
Outfall 001

TAILINGS POND AREA
SEEPAGE COLLECTION SCHEMATIC
MANGANESE LOADING
PUMP BACK and OUTFALL 002



DATA SUMMARY AND ANALYSIS FOR BAT AND WATER QUALITY BASED EFFLUENT LIMITATIONS

This document is a summary of the data evaluations that were performed for the purpose of determining the appropriate effluent limitations for Discharge 001 and Discharge 002 for the renewal of the NPDES permit for the Molycorp mine at Questa New Mexico, NM 0022306. The effluent data from the Discharge Monitoring Reports (DMRs) and recently conducted, but unrelated to the NPDES permit, remedial investigation (RI) studies were evaluated to determine if there was a technical basis for continuing to monitor all of the parameters in the previous permit. The data from the RI studies provided data on a number of additional parameters that were not limited in the previous permit. The data from the RI studies and the existing USGS data were evaluated to characterize the ambient stream concentrations above the discharge. These data allowed the calculation of a projected worst case in stream waste concentration (IWC) for each parameter and direct comparison of the IWC with the most stringent New Mexico stream standard (July 2005). This comparison allows a determination of whether a discharge causes, has a reasonable potential to cause, or contributes to an in stream excursion above the water quality standard.

Reasonable Potential

Arsenic, Copper, Lead, and Zinc

The reasonable potential analysis, using conservative assumptions and the 2.14 multiplier (from the Region 6 IWC procedure) for the mean effluent values indicates that there is a substantial margin between the predicted worst case in stream waste concentration (Cd) and the most stringent water quality standard for these parameters. **Monitoring for these parameters can be removed from the permit or reduced to quarterly.**

Mercury and Cyanide

The monitoring demonstrates that mercury and cyanide were either absent or not present in detectable amounts. In this case, it is appropriate to depend on the certification of the permittee that these substances are not believed to be present. **Monitoring for these parameters should be removed from the permit.**

Additional Trace Metals

The reasonable potential analysis indicates that there is a substantial margin between the predicted worst case in stream waste concentration (Cd) and the most stringent water quality standard for **antimony, barium, beryllium, chromium, cobalt, nickel, selenium, silver, thallium and vanadium. The data confirms that permit monitoring is unnecessary for these metals.**

Best Available Treatment

The existing concentration limits **for flow, pH, Chemical Oxygen Demand, Total Suspended Solids, fluoride, iron, molybdenum, and manganese** have effluent limitations that are not based on water quality standards. The effluent limitations for the parameters in this section are not water quality based effluent limitations (WQBELs). The effluent limitations are based on Best Available Treatment and are not calculated from stream standards, stream background concentrations, and stream flows and permitted capacities. Monitoring is required and is not dependent on the calculation of Reasonable Potential. There is new data on many of these parameters from both the plant discharge and from the special RI studies that have been performed. This data has been summarized, but has not been used to develop or evaluate effluent limitations.

BAT effluent guidelines are established in the Clean Water Act as the principal national means to control the direct discharge of pollutants where state standards for parameters have not been implemented, or where economically available treatment technologies are available for an industrial subcategory. The uniform application of secondary treatment standards for BOD and TSS for municipal discharges is a good example of effluent guidelines that are applied nationwide.

The mass limits for fluoride, molybdenum, and manganese are BAT limitations. The effluent limitations for these parameters were not evaluated at this time. **The BAT based effluent limitations in the new permit are expected to be the same as the existing permit. (A reevaluation of the basis for the old BAT limits may be appropriate, in some cases.)**

Mass limits for Total Suspended Solids, Chemical Oxygen Demand, and total iron have little meaning since most of the concentration values are "less than" values that are far below the concentration limits and the calculation of a mass loading for these parameters is a function of the "less than" value used in the calculation. **Reporting these mass values has little value and the requirement to calculate and report should be removed from the permit.**

pH (Outfall 002)

- The range of pH values for this discharge was 7.0 to 7.8.
- The median monthly low pH value was 7.28. The median monthly high pH value was 7.48.

Conclusion: The pH is well characterized. The data set has over 200 measurements, shows low variability, and has no outliers that are close to levels of regulatory concern.

TOTAL SUSPENDED SOLIDS (TSS) Concentration (Outfall 002)

- The maximum TSS value for the 50 month period was 7.2 mg/L, and was the only detected measurement.
- The absolute range of TSS values for this discharge could be estimated to be between 2 to 7.2 mg/L.

Conclusion: The TSS concentration is well characterized. The data set has a median of "less than" 4 mg/L and has no outliers that are close to the BAT levels of regulatory concern - 30 mg/L.

CHEMICAL OXYGEN DEMAND (COD) concentration (Outfall 002)

- The range of COD values for this discharge could be estimated to be between 5 to 25 mg/L.

Conclusion: The COD concentration is well characterized. The data set has a median of "less than" 10mg/L and has no outliers that are close to the levels of regulatory concern - 90 mg/L.

FLUORIDE concentrations (Outfall 002)

The existing effluent limitations are based on Best Available Treatment or Best Professional Judgment and are not calculated from stream standards, stream background concentrations, and stream flows and permitted capacities. Monitoring is required and is not used in the calculation of Reasonable Potential.

DMR data

- The range of fluoride values for the 50 month period was 0.94 – 2.0 mg/L.
- The variability is low. The coefficient of variation is 16.0 %.

Conclusion: The fluoride concentration is well characterized. The measured and predicted outliers are below the BPJ regulatory level of concern - 3.0 mg/L.

FLUORIDE Mass (Outfall 002)

- The range of fluoride mass values for this discharge was approximately 3.4 to 9.9 pounds per day.
- The variability is moderate. The coefficient of variation is 18.6%.

Conclusion: The fluoride mass is well characterized. The data set has one value above the level of regulatory concern, 8.75 lb/day, which may be an outlier. There is reasonable potential for fluoride mass to exceed the existing effluent limitation.

MANGANESE Concentration (Outfall 002)

DMR Data

- The range of manganese values for the DMR data set was 0.46 to 1.3 mg/L.
- The variability is moderate. The coefficient of variation is 25.6%.

RI Data Set

The RI data was taken between November 2002 and April 2004 at approximately quarterly intervals. There are twelve samples taken at two sites, Outfall 002 and Outfall 002 Pipe.

- The range of manganese values for the RI data set was 0.46 to 0.73 mg/L.
- The mean manganese concentration for the RI data set is 0.61 mg/L.

Conclusion: The manganese concentration is well characterized. The data shows moderate variability, and has no outliers that are greater than the BAT level of regulatory concern, 1.5 mg/L. The mean was characterized in two separate data sets in the 0.61 to 0.67 range.

MANGANESE Mass (OUTFALL 002)

- The range of manganese mass values for this data set was 1.6 to 4.1 #/day.
- The variability is moderate. The coefficient of variation is 22.6%.

Conclusion: The manganese mass is well characterized. The data set has no values above the level of regulatory concern, 4.38 #/day. There are several values within two standard deviations of the standard, suggesting that the value of 4.1 #/day is not an outlier. Treatment modifications were performed to reduce the manganese mass.

MOLYBDENUM Concentration (Outfall 002)

DMR Data

- The range of molybdenum values for this discharge was approximately 1.1 to 1.8 mg/L.
- The variability is low. The coefficient of variation is 13.1%.

RI Data Set

The RI data was taken between November 2002 and April 2004 at approximately quarterly intervals. There are twelve samples taken at two sites, Outfall 002 and Outfall 002 Pipe.

- The range of molybdenum values for the RI data set was 1.1 to 1.4 mg/L.
- The mean molybdenum concentration for the RI data set is 1.2 mg/L.

Conclusion: The molybdenum concentration is well characterized. The mean was characterized in two separate data sets in the 1.2 to 1.37 range. The data shows low variability, and has no outliers that are close to the levels of regulatory concern - 5.03 mg/L. There is no reasonable potential for molybdenum concentration to exceed the existing BAT/BPJ effluent limitation.

MOLYBDENUM Mass (Outfall 002)

DMR data set

- The range of molybdenum mass values for this discharge was 4.3 to 7.2 #/day.
- The variability is low. The coefficient of variation is 13.5%.

Conclusion: The molybdenum mass is well characterized. The data set has no values close to the level of regulatory concern, - 14.7 # per day. There is no reasonable potential for molybdenum mass to exceed the existing BAT effluent limitation.

IRON TOTAL Concentration (Outfall 002)

DMR data

- The range of iron values for this data set could be estimated to be between 50 and 280 µg/L.

RI Data Set

The RI data was taken between November 2002 and April 2004 at approximately quarterly intervals. There are twelve samples taken at two sites, Outfall 002 and Outfall 002 Pipe. Only two values were measured in this data set.

- The range total iron values for was 25 to 170 µg/L.

Conclusion: The iron (total) concentration is well characterized. The data set has a median of "less than" 100 µg/L and has no outliers that are close to the levels of regulatory concern - 600 µg/L.

IRON, TOTAL, (Iron) Mass (Outfall 002)

- The range of iron mass values for this discharge could be estimated to be 0.2 to 1.38 #/day.

Conclusion: The iron (total) mass is well characterized. The data set has over 50 measurements. The data set has a median of 0.43 #/day based on calculations using 100 µg/L as the concentration and has no outliers that are close to the levels of regulatory concern, 1.75 #/day.

Water Quality Based Effluent Limitations

There is additional data that has been generated on a number of parameters since the last permit for this discharge was issued. The new data includes the plant discharge data on seven metals and cyanide that have been generated monthly as a Discharge Monitoring Report (DMR) requirement, plant discharge data on twenty two metals on grab samples taken from the grab samples of 002, and data from the Red River at numerous sites in three discrete segments of the river (RI data). These data were summarized and discussed in the Data Analysis and Discussion document. Spreadsheets of the raw data and spreadsheets with parameters of interest extracted and summarized are included in the data package.

The data for these parameters were evaluated using the procedures for determining the potential to exceed numeric criteria, given in the *Region VI Implementation Guidance for State of New Mexico Standards for Interstate and Intrastate Streams*. This procedure uses ambient concentrations of the receiving body and the historical effluent data, along with the statistically based low flow and plant permitted capacities to calculate an estimate of the worst case in stream waste concentration (IWC) that is likely to occur. This worst case IWC value is then compared to the most restrictive stream standard that would apply to the receiving stream to determine if there is a reasonable potential for the discharge to cause or contribute to the exceedance of this stream standard. The additional data allows that comparison to be made.

The following tables summarize this analysis.

Table 1
Reasonable Potential Spreadsheet - Discharge 002

F = Fraction of stream allowed for mixing
Ca = Ambient stream concentration (dissolved) above the discharge. Values are arithmetic or geometric means.
Qe = WWTP design flow 4.30 MGD for 001 plus .746 MGD
Cp = Average effluent concentration for WWTP. Values are total metals.
Ce = Estimated 95th percentile effluent concentration
Cd = Cd is a worst case IWC calculation using the 2.14 multiplier for Cp
WQCt = Total water quality standard
C/Ct = Fraction of total metal that is dissolved. Values in table from previous permit calculation.
WQCd = Dissolved water quality standard
Hardness based metals are based on a hardness of 127 mg/L as CaCO3

Existing Permit Parameters that have effluent limitations that are based on Water Quality Standards

Parameter	F	Qa	Ca	Qe	Cp	Ce	Cd	WQCt	C/Ct	WQCd
	MZ adj	4Q3 mgd	Ambient µg/L	Max Flow mgd	mean µg/L	95th%tile µg/L	(IWC) µg/L	Total µg/L		Dissolved µg/L
Arsenic	1	4.58	0.43	0.726	0.5	1.07	**0.47**	**4.4**	0.528	2.3
Cadmium*	1	4.58	0.33	0.726	0.6	1.28	**0.39**	**0.29**	1	0.29
Cadmium	1	4.58	0.33	0.726	0.6	1.28	**0.39**	**2.67**	1	2.67
Copper	1	4.58	2.5	0.726	2.5	5.35	**2.68**	**31.8**	0.346	10.99
Lead	1	4.58	0.35	0.726	0.35	0.75	**0.37**	**17.7**	0.184	3.26
Zinc	1	4.58	15	0.726	15	32.10	**16**	**501.7**	0.286	143.5
Molybdenum**	1	4.58	46	0.726	1400	2996	**230**	**1000.0**	1	1000
Aluminum	1	4.58	166	0.726	100	214	**169**	**750.0**	1	750

*The dissolved water quality standard for cadmium is based on the equations given in State of New Mexico Standards for Interstate and Intrastate Surface Waters as amended July 17, 2005.

**Molybdenum is limited by BAT

***The recommendation is to set the permit limit based on the acute aluminum water quality standard.

Table 2
Additional parameters to evaluate effluent limits based on Water Quality Standards 002

Parameter	F MZ adj	Qa 4Q3 mgd	Ca Ambient µg/L	Qe Max Flow mgd	Cp Median* µg/L	Ce 95th%tile µg/L	Cd (IWC) µg/L	WQCt Total µg/L	C/Ct	WQCd Dissolved µg/L
Antimony	1	4.58	0.5	0.726	1.0	2.14	**0.60**	**5.6**	1	5.6
Barium	1	4.58	37	0.726	29.0	62.06	**38.6**	**2000**	1	2000
Beryllium	1	4.58	0.2	0.726	0.3	0.64	**0.23**	**4.0**	1	4
Boron	1	4.58	12	0.726	31.0	66.34	**15.4**	**750**	1	750
Chromium	1	4.58	1	0.726	1.5	3.21	**1.14**	**90.1**	1	90.1
Cobalt	1	4.58	3	0.726	2.5	5.35	**3.1**	**50.0**	1	50
Nickel	1	4.58	10.3	0.726	3.0	6.42	**10**	**63.7**	1	63.7
Selenium	1	4.58	0.75	0.726	1.5	3.21	**0.9**	**5.0**	1	5
Silver	1	4.58	0.2	0.726	0.2	0.43	**0.21**	**5.0**	1	4.95
Thallium	1	4.58	0.1	0.726	0.2	0.43	**0.12**	**1.7**	1	1.7
Vanadium	1	4.58	0.3	0.726	1.6	3.42	**0.49**	**100**	1	100

* Due to the large number of non detect values, the median value was used instead of the mean values for most parameters.

Table 3

Reasonable Potential Spreadsheet - Discharges 001 and 002 Combined

F = Fraction of stream allowed for mixing
Qa = Critical low flow at discharge point - 4Q3 7.05 cfs – 4.58 MGD
Ca = Ambient stream concentration (dissolved) above the discharge. Values are arithmetic or geometric means.
Qe = WWTP design flow 4.30 MGD for 001 plus .746 MGD for 002
Cp = Average effluent concentration for WWTP. Values are total metals.
Ce = Estimated 95th percentile effluent concentration
Cd = Cd is a worst case IWC calculation using the 2.14 multiplier for Cp
WQCt = Total water quality standard
C/Ct = Fraction of total metal that is dissolved. Values in table from previous permit calculation.
WQCd = Dissolved water quality standard
Hardness based metals are based on a hardness of 127 mg/L as CaCO3

Existing Permit Parameters that have effluent limitations that are based on Water Quality Standards

Parameter	F MZ adj	Qa 4Q3 mgd	Ca Ambient µg/L	Qe Max Flow mgd	Cp mean µg/L	Ce 95th%tile µg/L	Cd (IWC) µg/L	WQCt Total µg/L	C/Ct	WQCd Dissolved µg/L	
Arsenic	1	4.58	0.43	5.05	0.5	1.07	**0.77**	**4.4**	0.528	2.3	
Cadmium*	1	4.58	0.33	5.05	0.6	1.28	**0.83**	**0.29**	1	0.29	New
Cadmium	1	4.58	0.33	5.05	0.6	1.28	**0.83**	**2.67**	1	2.67	Old
Copper	1	4.58	2.5	5.05	2.5	5.35	**3.99**	**31.8**	0.346	10.99	
Lead	1	4.58	0.35	5.05	0.35	0.75	**0.56**	**17.7**	0.184	3.26	
Zinc	1	4.58	15	5.05	15	32.10	**24**	**501.7**	0.286	143.5	
Molybdenum**	1	4.58	46	5.05	1400	2996	**1592**	**1000**	1	1000	Irrigation
Aluminum	1	4.58	166	5.05	100	214	**191**	**750.0**	1	750	Acute

*The dissolved water quality standard for cadmium is based on the equations given in State of New Mexico Standards for Interstate and Intrastate Surface Waters as amended July 17, 2005.

**Molybdenum is limited by BAT

***The recommendation is to set the permit limit based on the acute aluminum water quality standard.

Table 4

Additional parameters to evaluate effluent limits based on Water Quality Standards 001 and 002

Parameter	F MZ adj	Qa 4Q3 mgd	Ca Ambient µg/L	Qe Max Flow Mgd	Cp Median* µg/L	Ce 95th%tile µg/L	Cd (IWC) µg/L	WQCt Total µg/L	C/Ct	WQCd Dissolved µg/L
Antimony	1	4.58	0.5	5.046	1.0	2.14	**1.36**	**5.6**	1	5.6
Barium	1	4.58	37	5.046	29.0	62.06	**50.1**	**2000**	1	2000
Beryllium	1	4.58	0.2	5.046	0.3	0.64	**0.43**	**4.0**	1	4
Boron	1	4.58	12	5.046	31.0	66.34	**40.5**	**750**	1	750
Chromium	1	4.58	1	5.046	1.5	3.21	**2.16**	**90.1**	1	90.1
Cobalt	1	4.58	3	5.046	2.5	5.35	**4.2**	**50.0**	1	50
Nickel	1	4.58	10.3	5.046	3.0	6.42	**8**	**63.7**	1	63.7
Selenium	1	4.58	0.75	5.046	1.5	3.21	**2.0**	**5.0**	1	5
Silver	1	4.58	0.2	5.046	0.2	0.43	**0.32**	**5.0**	1	4.95
Thallium	1	4.58	0.1	5.046	0.2	0.43	**0.27**	**1.7**	1	1.7
Vanadium	1	4.58	0.3	5.046	1.6	3.42	**1.94**	**100**	1	100

* Due to the large number of non detect values, the median value was used instead of the mean values for most parameters.

Effluent Limitations for Discharge 002

The State of New Mexico Standards for Interstate and Intrastate Surface Waters, 20.6.4 NMAC, as amended through July 17, 2005 was used as the source of the water quality standards that were compared with the worst case IWC (Cd in the above tables). These water quality standards may not have been approved by EPA Region VI.

Cadmium was the only parameter that demonstrated a reasonable potential to cause or contribute to an exceedance of a water quality standard. The July 17, 2005 standards used a new equation for calculating the hardness based cadmium standard. Based on this calculation, the ambient upstream concentration exceeds the new cadmium stream standard. If the new cadmium standard is correct, this segment will need to be evaluated for a TMDL or a site specific standard.

The evaluation used the acute standard for dissolved aluminum of 750 µg/L instead of the chronic standard of 87 µg/L. The stream data clearly indicates that the ambient aluminum concentrations upstream of the discharge substantially exceed the chronic dissolved aluminum standard of 87 µg/L. The chronic aluminum standard is currently under evaluation in other states and EPA regions. Our recommendation is to base the effluent limitation on the acute standard of 750 µg/L until the standards can be re-evaluated or a site specific standard can be developed.

Effluent Limitations for 001 and 002 Combined

There was no discharge from Discharge 001 during the permitting period, there was no new data on the quality of the discharge. For the reasonable potential analysis, it was assumed that the effluent concentrations of 001 would be equal to the concentrations of 002.

There was one additional parameter that demonstrated reasonable potential when the combined impact of 001 and 002 was evaluated. The analysis indicated that there was reasonable potential for the combined discharge to cause or contribute to an exceedance of the molybdenum stream standard for irrigation of 1.0 mg/L.

The water quality based effluent limitation was calculated for the combined discharge

Parameter	Qa	F	Ca	Qe	Cs	Cp - Daily Max Concentration	Monthy Average
Molybdenum	4.58	1	46	5.046	1000	1866	1244

Where:

Qa	= Critical low flow at discharge point - 4Q3	4.58 MGD	001	002
F	= Fraction of stream allowed for mixing			
Ca	= Ambient stream concentration			
Qe	= WWTP design flow – 001 plus 002		4.3 MGD	0.746 MGD
Cs	= Water quality standard for irrigation	1000 µg/L		

In previous permits, different limits have been set for the two discharges. The 30 day average effluent limitation for molybdenum for Discharge 002 (flow = 0.746 MGD) was set at 3.3 mg/L. Since the monthly average effluent limitation for the combined flow from 001 and 002 has been calculated, the flow and the effluent limitation for 002 is known the monthly average effluent limitation for Discharge 001 can be calculated using the mixing equation.

$$\text{Monthly Average Limit for 001} = \frac{(1244 \times 5.046) - (3300 \times .746)}{4.3 \text{ MGD}} = 887\ \mu g/L$$

A calculated monthly average effluent limitation for molybdenum for 001 of 0.9 mg/L is required to meet the water quality based standard for irrigation of 1.0 mg/L in the Red River, if a monthly average BAT limit of 3.3 mg/L is allocated to 002. This is consistent with past permitting practice and recognizes that discharge from 001 is infrequent (There was no discharge during the entire term of the previous permit). If discharge 001 is to resume, the permit could be amended to assign a lower molybdenum effluent limit to 002 and calculate a higher limit for molybdenum at 001.

Parameters that could not be evaluated

Cyanide and mercury were included in the DMR monitoring, and mercury was included in the RI monitoring of Discharge 002 and on the Red River sites. The detection limit of the methods used for these analyses was not low enough to determine if the water quality standard had been met. There is no reason to believe that mercury and cyanide is present in the discharge, and the monitoring that was performed verified that mercury and cyanide were not present in detectable concentrations.

Monitoring Recommendations

Best Available Treatment (BAT) Parameters

BAT effluent guidelines are established in the Clean Water Act as the principal national means to control the direct discharge of pollutants where state standards for parameters have not been implemented, or where economically available treatment technologies are available for an industrial subcategory. The uniform application of secondary treatment standards for BOD and TSS for municipal discharges is a good example of effluent guidelines that are applied nationwide.

Monitoring frequency, and concentration limits for flow, pH, Chemical Oxygen Demand, Total Suspended Solids, fluoride, iron, molybdenum, and manganese are BAT limitations. Mass limits for fluoride, molybdenum, and manganese are BAT limitations. The effluent limitations for these parameters were not evaluated at this time (a reevaluation of the basis for the old BAT limits may be appropriate, in some cases).

Mass limits for Total Suspended Solids, Chemical Oxygen Demand, and total iron have little meaning since most of the concentration values are "less than" values that are far below the concentration limits and the calculation of a mass loading for these parameters is a function of the "less than" value used in the calculation.

Reporting these mass values has little value and the requirement to calculate and report should be removed from the permit.

Aluminum

The aluminum issue is not resolved. There is no reasonable potential if the acute standard of 750 µg/L for dissolved aluminum is applied. There is reasonable potential if the chronic standard of 87 µg/L is applied. However, it is not clear whether the aluminum concentrations in 002 could consistently meet a 87 µg/L effluent limitation. The recommended approach is to set the effluent limitation based at the acute dissolved standard of 750 µg/L with re-opener language pending resolution of the chronic aluminum standard issue.

Monthly monitoring should be continued. The permit should specify that a method with a detection limit of at least 25 µg/L be used.

Cadmium

The July 15 amendments to the New Mexico standards lowered the stream standard for cadmium by almost a factor of ten (2.67 µg/L to 0.29 µg/L). This change moves this segment of the Red River from full attainment, with a large margin of safety to a situation where the upstream ambient values may be greater than the water quality standard. Detection limit was not a factor in determining compliance with a stream standard of 2.67 µg/L. Detection limit problems with the existing data set make it difficult to determine if either the ambient cadmium concentrations or the effluent concentrations at 002 are above or below the new stream standard.

Monthly monitoring should be continued. The permit should specify that a method with a detection limit of at least 0.05 µg/L be used. Effluent limitations should not be established until the ambient cadmium concentrations can be determined using more sensitive analytical techniques (if they are available.)

Arsenic, Copper, Lead, and Zinc

The reasonable potential analysis, using conservative assumptions and the 2.14 multiplier (from the Region 6 IWC procedure) for the mean effluent values indicates that there is a substantial margin between the predicted worst case in stream waste concentration (Cd) and the most stringent water quality standard for these parameters. The predicted worst case in stream waste concentrations are between eight and thirty times less than the stream standard. By observation there is no reasonable potential for the discharge to

cause or contribute to an exceedance of the stream standard for these parameters and a more formal Reasonable Potential analysis is unnecessary.

Monitoring for these parameters can be removed from the permit or reduced to quarterly.

Additional Trace Metals

The RI data sets provided a good characterization of ambient conditions for a number of trace metals in the Red River immediately above the discharge and in discharge 002 These data were subjected to the same IWC evaluation and comparison with stream standards procedure that was used for the permitted metals.

The metals analyzed were: Antimony, barium, beryllium, chromium, cobalt, nickel, selenium, silver, thallium and vanadium. Again, the predicted worst case in stream waste concentrations are between eight and thirty times less than the stream standard for either the separate or combined discharges. By observation there is no reasonable potential for the discharge to cause or contribute to an exceedance of the stream standard for these parameters and a more formal Reasonable Potential analysis is unnecessary.

The data confirms that permit monitoring is unnecessary for these metals.

Mercury and Cyanide

No useful information was obtained from monitoring these two parameters. The detection limit limitations made it impossible to determine if these compounds were present or absent. The monitoring demonstrated that they were either absent or not present in detectable amounts. In this case, it is appropriate to depend on the certification of the permittee that these substances are not believed to be present.

Monitoring for these parameters should be removed from the permit.

CRITICAL ANALYSIS of the EXISTING WATER-QUALITY DATABASE

PERMIT RENEWAL APPLICATION FOR NM0022306

There is additional effluent data that has been generated on a number of parameters since the last permit for this discharge was issued. The new effluent data includes the plant discharge data on seven metals and cyanide that have been generated monthly as a Discharge Monitoring Report (DMR) requirement and plant discharge data on 22 (twenty two) metals taken on RI samples from Outfall 002 and Outfall 002 pipe.

Data on the Red River above discharge 002 - The previous permit relied on the USGS gage and limited water quality sampling on the Red River upstream of discharges 001 and 002. The site is USGS 08265000 Red River near Questa, New Mexico, latitude 36° 42'12", longitude 105° 34'04". The site is approximately 3.2 miles above discharge 002, just west of the Questa Ranger station. The USGS site is upstream of the diversion for Eagle Rock Lake, a small off channel reservoir, the confluence with Cabresto Creek, and the discharge from the Town of Questa WWTP. The period of record is 1978 through 1986. The sampling frequency is approximately monthly.

There is additional, more recent data on the Red River in the reach just above discharges 001 and 002 collected as part of remedial investigation (RI) studies unrelated to the NPDES permit. The RI data set includes five discrete sites in Surface Water Area 11. Surface Water Area 11 is downstream of the USGS site and Cabresto Creek confluence, and, as such, closer to Outfall 002. The period of record is September 2002 to September 2003. The reach is described as Red River along Tailings Piles.

These data sets have been analyzed to characterize the effluent concentrations for parameters that were monitored in the existing permit and to characterize the ambient stream concentration upstream of the discharge.

FLOW – Outfall 002

- Flow is measured daily.
- The data is summarized on the DMR. The reported data include the monthly average and the maximum daily flow during the calendar month. Raw flow data was not analyzed
- There is data for fifty months.

Monthly Average Flows

- There are 50 data points for Monthly Average
- The average of the 50 monthly averages reported is .523 MGD. The range of monthly averages was 0.400 MGD to .655 MGD

- The average of monthly averages appears to be normally distributed with the mean and median in close agreement.
- The monthly averages show little variability. Coefficient of variation is 12.6%

Monthly Maximum Flow

- The maximum flow for the 50 month period was 0.726 MGD. This flow is the maximum value recorded over a data set of approximately 1500 days.
- The average of the 50 monthly maximums reported is .646 MGD. The range of monthly maximums was 0.464 MGD to .726 MGD
- The average of monthly maximums appears to be normally distributed with the mean and median in close agreement.
- The monthly maximums show little variability. Coefficient of variation is 12.8%

Conclusion: The flow is well characterized. The data set has over 1500 measurements, and shows low variability. The average monthly flow is about 0.50 MGD, with maximum daily flows of about 0.75 MGD.

River Data

There is a USGS gage and water quality sampling site on the Red River upstream of discharges 001 and 002. The site is USGS 08265000 Red River near Questa, New Mexico. Latitude 36° 42'12", Longitude 105° 34'04". The site is approximately 3.2 miles above discharge 002. The site is just south of SR-38 just west of the Questa Ranger station. It is upstream of the diversion for Eagle Rock Lake, a small off channel reservoir, and the confluence with Cabresto Creek. The site is above the discharge from the Town of Questa WWTP.

The period of record is 1978 through 1986

River Flow

The flow is measured when water quality samples are taken. There are continuous flow records for determining statistical low flows. This analysis is from the period of record and covers a wide range of flows over an eight year period.

- There are 69 flow values in the data set.
- The range is from 5 cfs to 1100 cfs.
- The flow values show strong seasonality, with the majority of high flow values in May and June and the low values from October through March.
- The data is not normally distributed. The arithmetic mean (77 CFS) is significantly different than the median (24 cfs).
- The geometric mean (32 cfs) and the median (24 cfs) are fairly close, which suggests that the data is lognormally distributed.

- The 2nd percentile flow is 5 cfs. The 5th percentile flow is 7.1 cfs. This low flow range is consistent with the receiving stream critical low flow (4Q3) of 7.05 cfs.

Conclusion: The range, seasonality and characteristic low flows are well characterized by this data set.

Qa – River flow for developing WQBELS and RP will continue to be 7.05 CFS.

pH (Outfall 002)

- The frequency of pH measurement is weekly.
- The data set includes 50 months or approximately 200 pH measurements.
- The data is summarized on the DMR. The monthly minimum and the monthly maximum values are reported.
- The minimum pH value for the 50 month period was 7.00 SU. This pH value is the minimum value recorded over a data set of approximately 200 measurements.
- The maximum pH value for the 50 month period was 7.77 SU. This pH value is the maximum value recorded over a data set of approximately 200 measurements.
- The range of pH values for this discharge was 7.0 to 7.8.
- The median monthly low pH value was 7.28. The median monthly high pH value was 7.48.
- A characteristic pH range for this discharge is approximately 7.3 to 7.5.

Conclusion: The pH is well characterized. The data set has over 200 measurements, shows low variability, and has no outliers that are close to levels of regulatory concern.

River pH

- pH is measured when water quality samples are taken
- The data set includes 63 pH measurements.
- The minimum pH value for the data set was 3.8 SU. There were 2 pH values less than 6.0 in the data set.
- The maximum pH value for the data set was 8.2 SU. There were six pH values equal or greater than 8.0 SU.
- The range of pH values for this data set was approximately 3.8 to 8.2.
- The median pH value was 7.5. (Since pH is a logarithmic function, median is a better indication of central tendency than arithmetic average.)
- A characteristic pH range for this stream segment is 7.0 to 7.9

Conclusion: The pH is well characterized. The data set has over 60 measurements. The data contains low pH outliers that are not typical of stream pH data sets and are at levels that are of regulatory concern.

FLUORIDE concentrations (Outfall 002)

The effluent limitations for fluoride are not water quality based effluent limitations (WQBELs). The effluent limitations are based on Best Available Treatment and are not calculated from stream standards, stream background concentrations, and stream flows and permitted capacities. Monitoring is required and is not dependent on the calculation of Reasonable Potential.

DMR data

- The frequency of fluoride measurement is once per month.
- The DMR data set includes 50 months or approximately 50 measurements. (On some occasions more than one sample was analyzed.) A value was measured for each of the 50 samples taken. There were no "non-detects" in this data set. This data set can be subjected to standard statistical analysis.
- The data is summarized on the DMR. The monthly average and the monthly maximum values are reported. However since there is usually only one data point per month, the maximum value can be treated as a discrete data point.
- The minimum fluoride value for the 50 month period was 0.94 mg/L. This fluoride value is the minimum value recorded over a data set of approximately 50 measurements.
- The maximum fluoride value for the 50 month period was 2.0 mg/L. This fluoride value is the maximum value recorded over a data set of approximately 50 measurements.
- The range of fluoride values for this discharge was 0.94 to 2.0 mg/L.
- The data is normally distributed. There is close agreement between the median (1.40 mg/L) and the mean (1.43 mg/L).
- The variability is low. The coefficient of variation is 16.0 %.

Conclusion: The fluoride concentration is well characterized. The data set has over 50 measurements, and shows low variability. The data set has no outliers that are close to levels of regulatory concern. The measured and predicted outliers are below the BAT regulatory level of concern - 3.0 mg/L.

FLUORIDE Mass (Outfall 002)

- The frequency of fluoride measurement is once per month.
- The data set includes 50 months or approximately 50 measurements. The mass values were calculated using the fluoride measurement and the corresponding flow from that day.
- The data is summarized on the DMR. The monthly average and the monthly maximum values are reported. However since there is usually only one data point per month, the maximum value can be treated as a discrete data point.

- The minimum fluoride mass value for the 50 month period was 3.38 pounds per day. This fluoride value is the minimum mass value recorded over a data set of approximately 50 measurements.
- The maximum fluoride mass value for the 50 month period was 9.84 pounds per day. This fluoride value is the maximum mass value recorded over a data set of approximately 50 measurements.
- The range of fluoride mass values for this discharge was approximately 3.4 to 9.9 pounds per day.
- The data are normally distributed. There is close agreement between the median (5.99 mg/L) and the mean (6.16 mg/L).
- The variability is moderate. The coefficient of variation is 18.6%.

Conclusion: The fluoride mass is well characterized. The data set has over 50 measurements. The data shows moderate variability. The data set has one value above the level of regulatory concern, 8.75 lb/day, which may be an outlier. There are five values within one standard deviation of 8.75 lb/day. There is reasonable potential for fluoride mass to exceed the existing effluent limitation.

MANGANESE Concentration (Outfall 002)

The effluent limitations for manganese are not water quality based effluent limitations (WQBELs). The effluent limitations are based on Best Available Treatment and are not calculated from stream standards, stream background concentrations, and stream flows and permitted capacities. Monitoring is required and is not dependent on the calculation of Reasonable Potential.

DMR Data

- The frequency of manganese measurement is once per month.
- The data set includes 50 months or approximately 50 measurements. (On some occasions more than one sample was analyzed.) A value was measured for each of the 50 samples taken. There were no "non-detects" in this data set. This data set can be subjected to standard statistical analysis.
- The data is summarized on the DMR. The monthly average and the monthly maximum values are reported. However since there is usually only one data point per month, the maximum value can be treated as a discrete data point.
- The minimum manganese value for the 50 month period was 0.46 mg/L
- The maximum manganese value for the 50 month period was 1.3 mg/L.
- The range of manganese values for the DMR data set was 0.46 to 1.3 mg/L.
- The data is normally distributed. There is close agreement between the median (0.68 mg/L) and the mean (0.72 mg/L).
- The variability is moderate. The coefficient of variation is 25.6%.

RI Data Set

The RI data was taken between November 2002 and April 2004 at approximately quarterly intervals. There are twelve samples taken at two sites, Outfall 002 and Outfall 002 Pipe.

- The minimum manganese value for 12 samples was 0.46 mg/L.
- The maximum manganese value for 12 samples was 0.74 mg/L.
- The range of manganese values for the RI data set was 0.46 to 0.73 mg/L.
- The mean manganese concentration for the RI data set is 0.61 mg/L.

Conclusion: The manganese concentration is well characterized. The data set has over 60 measurements. The data shows moderate variability, and has no outliers that are greater than the levels of regulatory concern, 1.5 mg/L. The mean was characterized in two separate data sets in the 0.61 to 0.67 range. There are three values within two standard deviations of the effluent limit, suggesting that the value 1.3 mg/L is not an outlier. The New Mexico approach of estimating the 95th percentile by multiplying the mean by 2.14 gives a value of 1.43 mg/L which appears to be reasonable.

MANGANESE Mass (OUTFALL 002)

- The frequency of manganese measurement is once per month.
- The data set includes 50 months or approximately 50 measurements. The mass values were calculated using the manganese measurement and the corresponding flow from that day.
- The data is summarized on the DMR. The monthly average and the monthly maximum values are reported. However since there is usually only one data point per month, the maximum value can be treated as a discrete data point.
- The minimum manganese mass value for the 50 month period was 1.6 #/day.
- The maximum manganese mass value for the 50 month period was 4.12 #/day. .
- The range of manganese mass values for this data set was 1.6 to 4.1 #/day.
- The data appear normally distributed. There is reasonable agreement between the median (3.28 #/day) and the mean (3.20 #/day).
- The variability is moderate. The coefficient of variation is 22.6%.

Conclusion: The manganese mass is well characterized. The data set has over 50 measurements. The data shows moderate variability. The data set has no values above the level of regulatory concern, 4.38 #/day. There are several values within two standard deviations of the standard, suggesting that the value of 4.1 #/day is not an outlier.

MOLYBDENUM Concentration (Outfall 002)

The effluent limitations for molybdenum are not water quality based effluent limitations (WQBELs). The effluent limitations are based on Best Available Treatment and are not

calculated from stream standards, stream background concentrations, and stream flows and permitted capacities. Monitoring is required and is not dependent on the calculation of Reasonable Potential.

DMR Data

- The frequency of molybdenum measurement is once per month.
- The data set includes 50 months or approximately 50 measurements. (On some occasions more than one sample was analyzed.) A value was measured for each of the 50 samples taken. There were no "non-detects" in this data set. This data set can be subjected to standard statistical analysis.
- The data is summarized on the DMR. The monthly average and the monthly maximum values are reported. However since there is usually only one data point per month, the maximum value can be treated as a discrete data point.
- The minimum molybdenum value for the 50 month period was 1.10 mg/L.
- The maximum molybdenum value for the 50 month period was 1.8 mg/L.
- The absolute range of manganese values for this discharge was approximately 1.1 to 1.8 mg/L.
- The data is normally distributed. There is close agreement between the median (1.30 mg/L) and the mean (1.37 mg/L).
- The variability is low. The coefficient of variation is 13.1%.

RI Data Set

The RI data was taken between November 2002 and April 2004 at approximately quarterly intervals. There are twelve samples taken at two sites, Outfall 002 and Outfall 002 Pipe.

- The minimum molybdenum value for 12 samples was 1.1 mg/L.
- The maximum molybdenum value for 12 samples was 1.4 mg/L.
- The range of molybdenum values for the RI data set was 1.1 to 1.4 mg/L.
- The mean molybdenum concentration for the RI data set is 1.2 mg/L.

Conclusion: The molybdenum concentration is well characterized. The combined data sets have over 60 measurements. The mean was characterized in two separate data sets in the 1.2 to 1.37 range. The data shows low variability, and has no outliers that are close to the levels of regulatory concern - 5.03 mg/L. There are no values within three standard deviations of the effluent limit, suggesting that there is no reasonable potential for molybdenum concentration to exceed the existing BAT effluent limitation.

MOLYBDENYM Mass (Outfall 002)

DMR data set

- The frequency of molybdenum measurement is once per month.

- The data set includes 50 months or approximately 50 measurements. The mass values were calculated using the molybdenum measurement and the corresponding flow from that day.
- The data is summarized on the DMR. The monthly average and the monthly maximum values are reported. However since there is usually only one data point per month, the maximum value can be treated as a discrete data point.
- The minimum molybdenum mass value for the 50 month period was 4.32 #/day.
- The maximum molybdenum mass value for the 50 month period was 7.15 #/day. This molybdenum value is the maximum mass value recorded over a data set of approximately 35 measurements.
- The absolute range of molybdenum mass values for this discharge was approximately 4.3 to 7.2 #/day.
- The data is probably normally distributed. There is good agreement between the median (5.93 #/day) and the mean (5.75 #/day).
- The variability is low. The coefficient of variation is 13.5%.

Conclusion: The molybdenum mass is well characterized. The data set has over 50 measurements. The data shows low variability. The data set has no values close to the level of regulatory concern, - 14.7 # per day. There are no measurements within three standard deviations of the standard, suggesting that there is no reasonable potential for molybdenum mass to exceed the existing BAT effluent limitation.

TOTAL SUSPENDED SOLIDS (TSS) Concentration (Outfall 002)

The effluent limitations for total suspended solids are not water quality based effluent limitations (WQBELs). The effluent limitations are based on Best Available Treatment and are not calculated from stream standards, stream background concentrations, and stream flows and permitted capacities. Monitoring is required and is not dependent on the calculation of Reasonable Potential.

- The frequency of TSS measurement is once per month.
- The data set includes 50 months or approximately 50 measurements. (On some occasions more than one sample was analyzed.) Only one value was measured in the 50 samples taken. There were 34 "non-detects" at a reporting limit of 4 mg/L in this data set. This data set cannot be subjected to standard statistical analysis.
- The data is summarized on the DMR. The monthly average and the monthly maximum values are reported. However since there is usually only one data point per month, the maximum value can be treated as a discrete data point.
- The minimum TSS value for the 50 month period was somewhere between zero and 4 mg/L.
- The maximum TSS value for the 50 month period was 7.2 mg/L, and the only detected measurement. This TSS value is the maximum value recorded over a data set of approximately 35 measurements.
- The absolute range of TSS values for this discharge could be estimated to be between 2 to 7.2 mg/L.

- The data distribution cannot be determined.
- The variability cannot be determined.

Conclusion: The TSS concentration is well characterized. The data set has over 50 measurements. The data set has a median of "less than" 4 mg/L and has no outliers that are close to the BAT levels of regulatory concern - 30 mg/L. The factor of 7 between the conservative estimate of the median and the effluent limitation demonstrates that there is no reasonable potential for the TSS concentration to exceed the existing effluent limitation.

TOTAL SUSPENDED SOLIDS (TSS) Mass (Outfall 002)

- The frequency of TSS measurement is once per month.
- The data set includes 50 months or approximately 50 measurements. (On some occasions more than one sample was analyzed.) Only one value was measured in the 50samples taken. There were 34 "non detects" at a reporting limit of 4 mg/L in this data set. This data set cannot be subjected to standard statistical analysis.
- The data is summarized on the DMR. The monthly average and the monthly maximum values are reported. However since there is usually only one data point per month, the maximum value can be treated as a discrete data point. A calculated mass value was reported, using by assuming the TSS concentrations for all "less than" were at the reporting limit of 4 mg/L. This is a conservative assumption.
- The minimum TSS mass value for the 50 month period was somewhere between zero and 13.7 #/day.
- The maximum TSS mass value for the 50 month period was 35.5 #/day.
- The range of TSS mass values for this discharge could be estimated to be between 10 and 36 #/day.
- The data distribution cannot be determined.
- The variability cannot be determined.

Conclusion: The TSS mass is well characterized. The data set has over 50 measurements. The data set has a median of 17 #/day based on calculations substituting 4 mg/L for the less than values in the concentration, and has no outliers that are close to the levels of regulatory concern - 87.6 #/day. The factor of 5 between the conservative estimate of the median and the effluent limitation demonstrates that there is no reasonable potential for the TSS mass to exceed the existing BAT effluent limitation.

CHEMICAL OXYGEN DEMAND (COD) concentration (Outfall 002)

The effluent limitations for chemical oxygen demand are not water quality based effluent limitations (WQBELs). The effluent limitations are based on Best Available Treatment and are not calculated from stream standards, stream background concentrations, and stream flows and permitted capacities. Monitoring is required and is not dependent on the calculation of Reasonable Potential.

- The frequency of COD measurement is once per month.
- The data set includes 50 months or approximately 50 measurements. (On some occasions more than one sample was analyzed.) Only four values were measured in the 50 samples taken. There were 46 "non-detects" at a reporting limit of 10 mg/L in this data set. This data set cannot be subjected to standard statistical analysis.
- The data is summarized on the DMR. The monthly average and the monthly maximum values are reported. However since there is usually only one data point per month, the maximum value can be treated as a discrete data point.
- The minimum COD value for the 50 month period was somewhere between zero and 10 mg/L.
- The maximum COD value for the 50 month period was 25 mg/L.
- The range of COD values for this discharge could be estimated to be between 5 to 25 mg/L.
- The data distribution cannot be determined.
- The variability cannot be determined.

Conclusion: The COD concentration is well characterized. The data set has over 50 measurements. The data set has a median of "less than" 10mg/L and has no outliers that are close to the levels of regulatory concern - 90 mg/L. The factor of almost 4 between the conservative estimate of the median and the effluent limitation demonstrates that there is no reasonable potential for the COD concentration to exceed the existing BAT effluent limitation.

CHEMICAL OXYGEN DEMAND (COD) Mass (Outfall 001)

- The frequency of COD measurement is once per month.
- The data set includes 50 months or approximately 50 measurements. (On some occasions more than one sample was analyzed.) Only three values were measured in the 50 samples taken. There were 46 "non-detects" at a reporting limit of 10 mg/L in this data set. This data set cannot be subjected to standard statistical analysis.
- The data is summarized on the DMR. The monthly average and the monthly maximum values are reported. However since there is usually only one data point per month, the maximum value can be treated as a discrete data point. A calculated mass value was reported, using by assuming the COD concentrations for all "less than" were at the reporting limit of 10 mg/L. This is a conservative assumption.
- The minimum COD mass value for the 50 month period was somewhere between zero and 34 pounds per day.
- The maximum COD mass value for the 50 month period was 113.7 #/day.
- The absolute range of COD mass values for this discharge could be estimated to be 20 to 114 pounds per day.
- The data distribution cannot be determined.

- The variability cannot be determined.

Conclusion: The COD mass is well characterized. The data set has over 50 measurements. The data set has a median of 42 #/day based on calculations substituting 10 mg/L as the concentration and has no outliers that are close to the levels of BAT regulatory concern - 263 #/day. The factor of 6 between the conservative estimate of the median and the effluent limitation demonstrates that there is no reasonable potential for the COD mass to exceed the existing effluent limitation.

IRON TOTAL Concentration (Outfall 002)

The effluent limitations for iron are not water quality based effluent limitations (WQBELs). The effluent limitations are based on Best Available Treatment and are not calculated from stream standards, stream background concentrations, and stream flows and permitted capacities. Monitoring is required and is not dependent on the calculation of Reasonable Potential.

DMR data

- The frequency of iron measurement is once per month.
- The data set includes 50 months or approximately 50 measurements. (On some occasions more than one sample was analyzed.) Only five values were measured in 50 samples taken. There were 45 "non-detects" at a reporting limit of 100 µg/L in this data set. This data set cannot be subjected to standard statistical analysis. The data is summarized on the DMR. The monthly average and the monthly maximum values are reported. However since there is usually only one data point per month, the maximum value can be treated as a discrete data point.
- The minimum iron value for the 50 month period was somewhere between zero and 100 µg/L.
- The maximum iron value for the 50 month period was 280 µg/L.
- The range of iron values for this data set could be estimated to be between 50 and 280 µg/L.
- The data distribution cannot be determined.
- The variability cannot be determined.

RI Data Set

The RI data was taken between November 2002 and April 2004 at approximately quarterly intervals. There are twelve samples taken at two sites, Outfall 002 and Outfall 002 Pipe. Only two values were measured in this data set.

- The minimum total iron value for 12 samples was 25 µg/L.
- The maximum total iron value for 12 samples was 170 µg/L.

Conclusion: The iron (total) concentration is well characterized. The data set has over 50 measurements. The data set has a median of "less than" 100 µg/L and has no outliers that are close to the levels of regulatory concern - 600 µg/L. The factor of almost 6 between the conservative estimate of the median and the effluent limitation demonstrates that there is no reasonable potential for the iron, total concentration to exceed the existing effluent limitation.

IRON, TOTAL, (Iron) Mass (Outfall 002)

- The frequency of iron measurement is once per month.
- The data set includes 50 months or approximately 50 measurements. (On some occasions more than one sample was analyzed.) Only five values were measured in the 50 samples taken. There were 45 "non detects" at a reporting limit of 100 µg/L in this data set. This data set cannot be subjected to standard statistical analysis.
- The data is summarized on the DMR. The monthly average and the monthly maximum values are reported. However since there is usually only one data point per month, the maximum value can be treated as a discrete data point. A calculated mass value was reported, by assuming the iron concentrations for all "less than" were at the reporting limit of 100µg/L. This is a conservative assumption.
- The minimum iron mass value for the 50 month period was somewhere between zero and 0.234 #/day.
- The maximum iron mass value for the 50month period was 1.38 #/day.
- The range of iron mass values for this discharge could be estimated to be 0.2 to 1.38 #/day.
- The data distribution cannot be determined.
- The variability cannot be determined.

Conclusion: The iron (total) mass is well characterized. The data set has over 50 measurements. The data set has a median of 0.43 #/day based on calculations using 100 µg/L as the concentration and has no outliers that are close to the levels of regulatory concern, 1.75 #/day. The factor of 4 between the conservative estimate of the median and the effluent limitation demonstrates that there is no reasonable potential for the iron, total mass to exceed the existing effluent limitation.

ALUMINUM, Total, Concentration (Outfall 002)

Aluminum is a metal that can be regulated as a water quality based effluent limitation. However, in this case, the background aluminum concentrations measured upstream of the discharge are substantially greater than the concentration of the aluminum in the discharge. The background concentration of aluminum definitely exceeds the current stream standard. The concentration of aluminum in discharge 002 may have values that exceed the current stream standard. Aluminum is a candidate for a Total Maximum Daily

Load or a re evaluation of the stream standard. Calculating a WQBEL using normal procedures has no real value.

- The frequency of aluminum measurement is once per month.
- The data set includes 50 months or approximately 50 measurements. (On some occasions more than one sample was analyzed.) Only one value was measured in 50 samples taken. There were 49 "non-detects" at a reporting limit of 50 µg/L to 100 µg/L in this data set. This data set cannot be subjected to standard statistical analysis. The data is summarized on the DMR. The monthly average and the monthly maximum values are reported. However since there is usually only one data point per month, the maximum value can be treated as a discrete data point.
- The minimum aluminum value for the 50 month period was somewhere between zero and 50 µg/L.
- The maximum aluminum value for the 50 month period was 120 µg/L.
- The range of aluminum values for this data set could be estimated to be between 30 to 120 µg/L.
- The data distribution cannot be determined.
- The variability cannot be determined.

The RI data was taken between November 2002 and April 2004 at approximately quarterly intervals. There are twelve samples taken at two sites, Outfall 002 and Outfall 002 Pipe. Only two values were measured in this data set.

- The minimum total aluminum value for 12 samples was 35 µg/L.
- The maximum total aluminum value for 12 samples was 200 µg/L.
- There were 4 total aluminum values in the data set that were less than 35 µg/L.

Conclusion: The characterization of the aluminum, total concentration is further complicated by the change of reporting limits during the reporting period from 100 µg/L to 50 µg/L and the low aluminum permit limit of 87 µg/L. Without a reasonable estimate at the median concentration, it cannot be determined if the measured value of 120 µg/L is an outlier. The data cannot be used to calculate or to estimate if there is a reasonable potential for the aluminum concentrations to exceed the water quality based permit limitation of 87 µg/L.

Effluent RI data

Aluminum, total

- There were 2 measured values out of 25samples in this data set.
- The range of measured values was 35 to 200 µg/L.
- Ten values in the data set were less than 35 µg/L

River Data

RI Data Set

The RI data was taken between November 2002 and April 2004 at approximately quarterly intervals. There are twelve samples taken at two sites, Outfall 002 and Outfall 002 Pipe. The detection limits were lower for this data set than in the DMR data set.

Aluminum, Dissolved

- There were 13 measured values out of 25 samples in this data set.
- The range of measured values was 65 to 150 µg/L.
- The mean of the measured values was 106 µg/L

TRACE METALS and CYANIDE

DMR data

The frequency of measurement for the following seven parameters is once per month. These parameters are candidates for water Quality based effluent limitations (WQBELs)

The data set includes data from 50 months or approximately 50 measurements for each of the seven parameters. (On some occasions more than one sample was analyzed.) No values were measured in 50 samples taken. There were 50 "non-detects" in each data set. These data sets cannot be subjected to standard statistical analysis. However, the reporting limit for each parameter can be compared to the existing permit limit to determine the significance of the 50 "non-detected" values.

The effluent limits are given as a range. Some of these parameters have a maximum daily value and a monthly average value. For months where only one sample is analyzed, the monthly average and the maximum daily value are the same, and in effect, the lower monthly average value becomes the daily maximum limit, by default.

Parameter	Detected/Analyzed	Reporting Limit	Effluent Limits
Cyanide	0/50	10 µg/L	14 – 22 µg/L
Arsenic	0/50	5 µg/L	429 – 644 µg/L
Cadmium	0/50	1.0 µg/L	4.8 – 7.0 µg/L
Copper	0/50	10 µg/L	41 – 62 µg/L
Lead	0/50	3 µg/L	216 – 235 µg/L
Mercury	0/50	0.200 µg/L	0.111 - 0.170 µg/L
Zinc	0/50	20 µg/L	200-200 µg/L

Effluent RI Data

RI Data Set

The RI data was taken between November 2002 and April 2004 at approximately quarterly intervals. There are twelve samples taken at two sites, Outfall 002 and Outfall 002 Pipe. The detection limits were lower for this data set than in the DMR data set.

Arsenic

- There were eight measured values out of 12 samples in this data set.
- The range of measured values was 0.36 to 0.61 µg/L.
- All twelve values in the data set were less than 0.61 µg/L

Cadmium

- There was one measured value out of 12 samples in this data set.
- The measured value was 0.20 µg/L.
- All twelve values in the data set were less than 0.6 µg/L

Copper

- There were three measured values out of 12 samples in this data set.
- The measured values were between 1.0 and 8.3 µg/L.
- Ten values in the data set were less than 2.5 µg/L

Lead

- There were two measured values out of 12 samples in this data set.
- The measured values were between 1.0 and 8.3 µg/L.
- Ten values in the data set were less than 2.5 µg/L.

Zinc

- There were no measured values out of 12 samples in this data set.
- Seven values in the data set were less than 15 µg/L.

Arsenic, Cadmium, Copper, Lead and Zinc Concentrations for 002

The 50 "non-detect" values for arsenic, cadmium, copper, lead and zinc are a factor of four to eighty times below the present effluent limitations. Fifty samples over a 50 month period should adequately characterize the maximum value in a data set. The magnitude of the difference between the maximum concentration, conservatively estimated to be at the Reporting Limit, and the present permit limit demonstrates that there is no reasonable

potential for any of these parameters to cause or contribute to an exceedance of an effluent limitation.

The smaller RI data set allows estimates of the median values for these parameters that may be used in the calculation of Reasonable Potential. The median from the RI data sets was compared with the New Mexico approach of substituting one half the detection limit in the calculation of an average value.

Parameter	One half the DL	Values from RI data	Reason
Arsenic	2.5 µg/L	**0.5 µg/L**	Median value from good data set
Cadmium	0.5 µg/L	**0.6 µg/L**	Max value from good data set
Copper	5 µg/L	**2.5 µg/L**	Median is < 2.5 µg/L
Lead	1.5 µg/L	**0.35 µg/L**	Median is < 0.35 µg/L
Zinc	10 µg/L	**15 µg/L**	Median value is < 15 µg/L

Conclusion: The effluent data indicates that the concentrations of all parameters except cadmium are well below the stream standard. The mean and median concentrations for cadmium cannot be calculated for the effluent because of the large number of non-detects in the RI data set, which has the lower detection limits of the two data sets.

River Arsenic, Cadmium, Copper, Lead and Zinc Concentrations

USGS Data

There is a USGS gauge and water quality sampling site on the Red River just above discharges 001 and 002. The site is USGS 08265000 Red River near Questa, New Mexico. Latitude 36° 42'12", Longitude 105° 34'04". The site is approximately 3.2 miles above discharge 002. The site is just south of SR-38 just west of the Questa Ranger station. The site is upstream of the diversion for Eagle Rock Lake, a small off channel reservoir, and the confluence with Cabresto Creek. The site is also above the discharge from the Town of Questa WWTP. The period of record is 1978 through 1986. The sampling frequency is approximately monthly.

RI Data

The RI data set includes five discrete sites in Surface Water Area 11, which are downstream of the USGS site, and, as such, closer to Outfall 002. The period of record is September 2002 to September 2003. The reach is described as Red River Along Tailings Piles.

ARSENIC

USGS

The data set for arsenic is too small to characterize the ambient concentration of either the dissolved or total forms of the either metal.

RI – SW Area 11

Arsenic

- There was one measured values out of 25 samples in this data set.
- The measured value was 0.41 µg/L.
- All twenty five values in the data set were less than 0.43 µg/L

CADMIUM

USGS

The data set for total cadmium has more than 50 measurements, but a high percentage of the data (over 88%) are "non-detects". The concentration of total cadmium cannot be characterized statistically. The data indicate that the characteristic range for total cadmium is zero to 1.4 µg/L. The median is less than 1.0 µg/L.

RI data - SW area 11

- There were 25 measured values out of 25 samples in this data set.
- The range was 0.2 to 0.56 µg/L
- The mean of this data set was 0.34 µg/L
- The geometric mean of this data set was 0.33 µg/L

COPPER

USGS – Dissolved Copper

The dissolved copper data set is small (9 values) and has a high percentage of non-detects (more than 65%). Dissolved copper levels cannot be characterized by this data set.

RI data - SW area 11 – Dissolved Copper

- There were 22 measured values out of 25 samples in this data set.
- The range was 1.7 to 14 µg/L
- The mean of this data set was 4.9 µg/L
- The geometric mean of this data set was 3.7 µg/L

LEAD

USGS

The data set for dissolved lead is too small to characterize the ambient concentration of either the dissolved or total forms of the either metal.

RI – SW Area 11

Lead

- There were 8 measured values out of 25 samples in this data set.
- The range of measured values was 0.7 to 1.4 µg/L.
- Eighteen values in the data set were less than 0.2 µg/L

ZINC

USGS – Total and Dissolved Zinc

The data set includes data for both dissolved and total zinc. The total data set has few "less than values" and is subject to direct statistical analysis. The dissolved data set has a small percentage of "less than values" and statistical analysis is appropriate with the understanding that analysis of only the numerical values tends to overestimate the actual values for the calculated statistic by an indeterminate extent. The following discussion is based on the measured values in each data set.

Statistic	Total Zinc	Dissolved Zinc
Count	64 values out of 64 analyses	61 values out of 64 analyses
Minimum	50 µg/L	10 µg/L
Maximum	4400 µg/L	2600 µg/L
Absolute Range	50 – 4400 µg/L	10 – 2600 µg/L
Characteristic range	50 – 700 µg/L	10 – 400 µg/L
Mean	236 µg/L	138 µg/L
Median	130 µg/L	60 µg/L
Geometric Mean	146 µg/L	71 µg/L
Substituted Geometric mean	146 µg/L	63 µg/L

RI data - SW area 11 – Dissolved Zinc

- There were 22 measured values out of 25 samples in this data set.
- The range was 13 to 120 µg/L
- The mean of this data set was 52 µg/L
- The geometric mean of this data set was 46 µg/L

Conclusion: The RI data set provides a good characterization of arsenic, lead, cadmium, copper and zinc in river samples. Arsenic and lead had a large number of non-detects, but the median and maximum values are both well below the stream standard.

Cadmium, copper, and zinc had good data sets with few less than values and mean and geometric means can be calculated. Copper and zinc values are well below the stream standards. Cadmium has a mean of 0.34 µg/L and a geometric mean of 0.33 µg/L which is below the new stream standard for cadmium.

Effluent Cyanide and Mercury

The reporting limit for cyanide is only slightly lower than the most restrictive effluent limit of 14 µg/L. The actual cyanide concentration cannot be determined from the measurements performed. No statistical analysis can be performed on this data set. It can be concluded that the maximum value in the data set was somewhere between zero and 10 µg/L. The magnitude of the difference between the maximum concentration, conservatively estimated to be at the Reporting Limit and the present permit limit does not demonstrate that there is no reasonable potential for cyanide to cause or contribute to an exceedance of an effluent limitation.

River Cyanide Concentrations

USGS

The data set for total cyanide has more than 35 measurements but a high percentage of the data (over 94%) are "non-detects". The concentration of total cyanide cannot be characterized statistically. The data indicate that the characteristic range for total cyanide is 0 to 10 µg/L. The median is less than 10 µg/L. The substituted geometric mean is 5.2 µg/L.

The substituted geometric mean can be calculated from the data sets using the New Mexico procedure, but the value will be completely dependent on the value used in the substitution for the non-detect values. The substituted geometric mean for total cyanide is 5.2 µg/L. Even though this geometric mean is statistically uncertain, the geometric mean for total cyanide is substantially lower than the stream standard.

Effluent Mercury Concentrations

The reporting limit for mercury (200 ng/L) is substantially higher than the most restrictive effluent limit of 110 ng/L. The actual mercury concentration cannot be determined from the measurements performed. No statistical analysis can be performed on this data set. All that can be concluded is that the maximum value for mercury in the data set was somewhere between zero and 200 ng/L. Compliance or non compliance

with the existing effluent limitations cannot be determined from the fifty measurements performed.

River Mercury Concentrations

The data sets for mercury are too small to characterize the ambient concentration. The detection limit is much higher than the stream standard. The data does not provide any indication of whether mercury is present or if the stream standard is met.

SUMMARY

Parameters that have Effluent Limitations that are Determined by BAT

Parameter	Representative Plant Concentration Range	Representative Red River Concentration Range
Flow	0.4 – 0.655 MGD	
pH	7.0 – 7.8 SU	7.0 – 7.9 SU
Fluoride	0.94 – 2.0 mg/L	0.1 – 1.8 mg/L
Manganese, Dissolved	0.46 – 1.3 mg/L	.12 - .37 mg/L
Molybdenum	1.1 – 1.8 mg/L	.001 - .053 mg/L
Iron, Dissolved	.025 - .280 mg/L	0.17 - .78 mg/L

Reasonable Potential and WQBEL Parameters

Parameter	Plant Concentration For Determining Reasonable Potential	Ambient Stream Concentration	Basis for Stream Concentration
Arsenic	0.5 µg/L	0.43 µg/L	Maximum RI data
Cadmium	0.6 µg/L	0.33 µg/L	Geo Mean RI data
Copper	2.5 µg/L	3.7 µg/L	Geo Mean RI data
Lead	0.35 µg/L	0.2 µg/L	Maximum RI data
Zinc	15 ug/L	46 µg/L	Geo Mean RI data
Zinc	15 µg/L	71 µg/L	Geo Mean USGS

These values come from RI data sets, DMR data, and the USGS. The DMR data is the best data set with fifty monthly values sampled recently. However, this data set does not include ambient stream data. The RI data sets are recent, have a moderate number of values, and have contemporaneous effluent and stream data. The USGS data is a large data set but the data is not recent.

Reasonable Potential and WQBEL Parameters

Parameter	Plant Concentration For Determining Reasonable Potential	Ambient Stream Concentration Along Tailings	Basis for Stream Concentration
Antimony	<1.0 µg/L	<0.5 µg/L	Median RI data
Barium	29 µg/L	37 µg/L	Median RI data
Beryllium	<0.3 µg/L	<0.2 µg/L	Median RI data
Boron	31 µg/L	0.2 µg/L	Median RI data
Chromium	<1.5ug/L	<1 µg/L	Median RI data
Cobalt	<2.5µg/L	<3 µg/L	Median RI data
Nickel	<3.0 µg/L	<10.3 µg/L	Median RI data
Selenium	<1.5 µg/L	<0.75 µg/L	Median RI data
Silver	<0.2µg/L	<0.2µg/L	Median RI data
Thallium	<0.2 µg/L	<0.1 µg/L	Median RI data
Vanadium	<1.6 µg/L	<0.3 µg/L	Median RI data

All of this data comes from RI data sets. In most cases the majority of data was below the detection limit. However, the median to 80th percentile value could be identified with certainty that 50 to 80 percent of the values were below the value selected. The actual median value is probably lower than the value in these tables. However, these values could be used to demonstrate unequivocally the relationship between the worst case IWC (using the Region 6 procedure) and the stream standard.

Calculations used the following flow values:

001A	-	4.3 MGD	
002	-	0.746 MGD	
Red River	-	4.58 MGD	(7.05 cfs)

The 4Q3 was value not recalculated. Inspection indicated that the statistical low flow was probably in the 5 to 10 cfs range. Since there were few WQBELs there was little reason to revisit the 4Q3.

Hardness

The hardness value of 127 mg/L as $CaCO_3$ was used for calculation of hardness-based metals limits. Inspection of the data set indicated that hardness at low flow was probably in the 140 to 150 mg/L range if hardness values were associated with low flows, as many states and EPA regions allow. Since there were few WQBELs there was little reason to revisit the hardness procedure. The hardness data set is not current.

Dissolved Metals Summaries from Three Red River Data Sets

Parameter	USGS			RI Along Tailings			RI along Mine		
	Range	Mean	Geo mean	Range	Mean	Geo mean	Range	Mean	Geo mean
	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
Aluminum				65 - 150	106	104	49 - 630	184	166
Barium				29 - 60	37	37	13 - 59	34	33
Cadmium				.2 - .56	.34	.33	0.13 - 0.75	.4	.36
Copper				1.7 - 14	4.9	3.7	2.1 - 22	5	4.4
Manganese	60 - 1700	531	404	120 - 370	250	239	58 - 570	222	191
Molybdenum	1 - 53	8.6	5.5	3 - 91	46	32	0.9 – 6.8	2	2.1
Nickel				6.4 - 18	10	9.8	3.2 - 35	13	11.3
Zinc	10 - 360	94	67	13 - 120	52	45	8.6 - 210	74	57

SUPPLEMENTAL INFORMATION

1. *White Paper – Aluminum*
2. *Executive Summary of Data on the Red River in the Vicinity of NPDES Permitted Outfalls 001 and 002*
3. *Manganese Pumpback System Summary*
4. *Best Management Practices Implementation Summary*

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White Paper - Aluminum

Geochemistry of Aluminum

Aluminum is a common element that is present in significant concentrations in most soils and sediments. Aluminum makes up about 8.3 % of the earth's crust by weight. Aluminum is the most common metal in the earth's crust (chemists consider silicon to be a non metal). In order of abundance, the metal composition of the earth's crust is: Aluminum – 8.3 %, Iron – 4.8 %, Calcium – 4.1 %., Sodium – 2.3%, Magnesium – 1.9%.

The most common form of aluminum in soils is the clay component of the soil structure. Chemically, clays like kaolin and bentonite, are a hydrated aluminum silicate, with a formula of $Al_2O_3.2SiO_2.2\ H_20$. Clay has a sheet structure with a silicon dioxide tetrahedral layer alternating with an octahedral aluminum oxide (alumina) layer. Two extremely inert materials, silicon dioxide, and aluminum oxide are chemically bonded into a stable soil component. (The alternate layers are responsible for the lubricating qualities of clays like bentonite which is commonly used as a lubricant in drilling.) A pure clay material, like kaolin (a fine white clay that is the basic raw material for the ceramic industry) is approximately 24% aluminum. Most clays are in the 18 – 25% aluminum range. Clays are formed in nature by chemical weathering of feldspar and aluminum silicate rocks. Another well known clay material, is bentonite, which is a found as a hydrated silica mineral called montmorillanite, usually associated with volcanic ash. Bentonite includes other alkaline earth metals, such as calcium and magnesium in the chemical structure, but chemically it is primarily a hydrated aluminum silicate.

Aluminum is a common component of soils and sediments in the grams per kilogram range, but is not generally found in water above the low micrograms per liter level. This is because the predominant form of aluminum is the compound aluminum oxide, Al_2O_3 and as a component of the clay minerals as aluminum silicates. Aluminum oxide is similar to silicon dioxide (sand), which is a hard, stable, insoluble compound (both are used commercially in sand paper). Neither aluminum nor silicon is found in appreciable concentrations in the dissolved form in water, even though the soils and sediments contain large quantities of both elements. The cation-anion balance, a standard method for checking the correctness of water sample analysis (Standard Methods 1030 F) does not even include aluminum in the enumeration of cations. Dissolved aluminum is just not expected to be present in appreciable amounts in water samples, despite being an extremely common element in the environment.

The abundance of aluminum in soils and sediments and the insolubility of the predominant aluminum compounds, (aluminum silicates), are characteristics that account for the wide variation between the measurements of dissolved aluminum and total aluminum in water samples. The measured values of total aluminum in environmental samples, over time, typically show an extremely large variation in values. The range of total aluminum values in a natural

stream system can range from less than 10 micrograms per liter to over 200,000 micrograms per liter. The range of dissolved aluminum values in the same systems are usually in the 10 to 400 micrograms per liter range. The difference in the variability of measurements of the two forms of the metal indicate that the sediments are the primary source of the aluminum in the aluminum measurements on whole water samples. This is exactly what would be predicted given the geochemistry and abundance of aluminum in the environment. The same pattern holds for total and dissolved iron, where iron oxides are a common component of soils and sediments. Dissolved iron in stream samples commonly is found in the 10 to 100 micrograms per liter range, while total iron values from the same streams vary from to 10 to 50,000 micrograms per liter. **The other conclusion that can be drawn from the difference in variability is that the presence of high concentrations of high aluminum content sediments is not a major factor in predicting the concentration of dissolved aluminum in the same sample.** In fact, some of the variability in the dissolved aluminum measurements may be due to colloidal particles that pass the 0.45 micron pore size during the filtration step that differentiates the dissolved from the total form of the metal being analyzed (the crystal structure of the aluminum silicate results in the formation of small negatively charged particles with large surface area).

There has been a legitimate discussion in the environmental community about the merits of basing environmental evaluations and effluent limitations of the total and dissolved form of the metal. Some of that debate has been resolved with the use of the total/dissolved ratios and translator provisions that have been evolving. These discussions have merit when the metals concentrations in the sediment are low and there is a significant solubility of the metal compounds at equilibrium. These discussions do not apply well to aluminum and iron because both metals naturally are present in large concentrations in the form of compounds which have extremely low solubility.

Data from Red River Sites

Site specific data from sites on the Red River are consistent with the above discussion. **There are significant quantities of aluminum in the Red River sediments.** In 36 samples, taken from sites RR3 – RR6 (above the mine site), representing riffle, depositional, and composite sample types, the range of total aluminum concentrations was 2610 to 20,800 mg/kg, with an arithmetic average of 6626 mg/kg.

The total aluminum concentrations in the Red River whole water samples were variable. In 17 samples, taken from sites RR3 – RR6 and at Zwergle (above the mine site), the range of total aluminum concentrations was less than 11 to 3400 µg/L. The sampling was conducted in the months of March, July, September, and October which are low flow months. The range would probably have been broader with a data set that represented months with higher flows and the associated sediment loads.

The dissolved aluminum concentrations in the Red River water samples were less variable. In 17 samples, taken from sites RR3 – RR6 and at Zwergle (above the mine site), the range of dissolved aluminum concentrations was 3 to 260 µg/l.

Permitting Issues

The data clearly indicates that the total aluminum concentrations in the Red River above the mine area frequently exceed stream standards for total aluminum of 87 µg/l (see

accompanying table). Over 82 percent of the measured values are greater than the stream standard. Over 64 percent of the values exceed the stream standard by a factor of three or more. The geometric mean is estimated to be between 170 and 288 µg/l, depending on the substitution procedure used for handling the below detection limit values.

Reference: Red River above Mine Site						
			Raw Data	Substituted Values		
SITE ID	SAMPLE_DATE	Sample type	Total Aluminum mg/L	Below DL as DL	Below DL as 1/2 DL	Below DL as .001 mg/l
RR-1	04-Oct-02	Surface Water	0.042	0.042	0.042	0.042
RR-1	21-Mar-03	Surface Water	<0.43			
RR-1	16-Jul-03	Surface Water	<0.071	0.071	0.0355	0.001
RR-1	25-Sep-03	Surface Water	<0.051	0.051	0.0255	0.001
RR-3	03-Oct-02	Surface Water	0.45	0.45	0.45	0.45
RR-3	21-Mar-03	Surface Water	3.4	3.4	3.4	3.4
RR-3	16-Jul-03	Surface Water	0.35	0.35	0.35	0.35
RR-3	25-Sep-03	Surface Water	0.31	0.31	0.31	0.31
RR-4	04-Oct-02	Surface Water	0.47	0.47	0.47	0.47
RR-4	21-Mar-03	Surface Water	0.5	0.5	0.5	0.5
RR-4	16-Jul-03	Surface Water	0.36	0.36	0.36	0.36
RR-4	25-Sep-03	Surface Water	0.31	0.31	0.31	0.31
RR-5	03-Oct-02	Surface Water	0.48	0.48	0.48	0.48
RR-5	21-Mar-03	Surface Water	<0.89			
RR-5	16-Jul-03	Surface Water	0.27	0.27	0.27	0.27
RR-5	24-Sep-03	Surface Water	0.27	0.27	0.27	0.27
RR-6	04-Oct-02	Surface Water	0.88	0.88	0.88	0.88
RR-6	21-Mar-03	Surface Water	1.4	1.4	1.4	1.4
RR-6	16-Jul-03	Surface Water	0.62	0.62	0.62	0.62
RR-6	24-Sep-03	Surface Water	0.66	0.66	0.66	0.66
RR-6A	04-Oct-02	Surface Water	0.79	0.79	0.79	0.79
RR-6A	21-Mar-03	Surface Water	1.3	1.3	1.3	1.3
RR-6A	15-Jul-03	Surface Water	0.55	0.55	0.55	0.55
RR-6A	24-Sep-03	Surface Water	0.6	0.6	0.6	0.6
RR-6V	16-Jul-03	Surface Water	0.22	0.22	0.22	0.22
RR-6V	24-Sep-03	Surface Water	0.26	0.26	0.26	0.26
Zwergle	07-Oct-02	Surface Water	<0.011	0.011	0.0055	0.001
Zwergle	23-Mar-03	Surface Water	0.11	0.11	0.11	0.11
Zwergle	16-Jul-03	Surface Water	<0.067	0.067	0.0335	0.001
Zwergle	25-Sep-03	Surface Water	0.038	0.038	0.038	0.038
			Geometric Mean	**0.288**	**0.260**	**0.170**

Red = Data point removed before data analyzed

Blue = Substituted value for less than value

The data clearly indicate that the total aluminum concentration in Discharge 002A is lower than the total aluminum concentrations in the Red River. The absolute range for the total aluminum concentration is 30 to 120 µg/l. Over 98 percent of the values are less than the detection limit of 100 µg/l that was used for the majority of permit monitoring measurements.

The data indicates that there is not a reasonable potential for the discharge from 002A to cause or contribute to an increase in the baseline concentration of the Red River. In most cases, the total aluminum concentration in the river will be decreased as the result of the discharge from 002A.

River Data and Analysis

Two data points were removed from the data set. The values were "less than values" that were far above the expected detection limit for aluminum and have little value in understanding the distribution of data. Including these data points as substituted values would bias the data set high. The "less than" values that are more in the range of expected detection limits for aluminum (50 – 100 µg/l) indicate that the distribution includes a significant number of low values. The "less thans" indicate that as many as 18 percent of the values may be below the stream standard.

Substitution techniques that involve the substitution of a rule based value for a "less than" value can provide an estimate of the central tendency of the data set. If a value of 1 microgram per liter is substituted for each of the "less than" values in the data set, the geometric mean would still be estimated to be 170 micrograms per liter. (A value of 1 microgram per liter was selected to be very near zero, since a zero can't be used in the calculation of a geometric mean). **Even with the most generous substitution, the geometric mean of 170 µg/l is estimated to be almost two times the stream standard of 87 µg/l.** For this data set, the New Mexico procedure of substituting one half the detection limit for values below the detection limit is appropriate and provides a reasonable approximation of the baseline concentration of aluminum.

Outfall 002

The effluent data does not lend itself to the kind of data analysis used on the Red River samples above the mine area since there are not enough measured data points to suggest a data distribution. The data set includes 50 measurements taken at approximately monthly intervals. Only one value was measured in 50 samples taken. There were 49 "non-detects" at a reporting limit of 50 µg/L to 100 µg/L in this data set. There were seven values that were "less than" 50 µg/l.

This data set cannot be subjected to standard statistical analysis. The minimum aluminum value for the 50 month period was between zero and 50 µg/L. The maximum aluminum value for the 50 month period was 120 µg/L. This aluminum value is the maximum value recorded over a data set of approximately 50 measurements.

Conclusion:

The characterization of the aluminum, total concentration is complicated by the change of reporting limits during the reporting period from 100 µg/L to 50 µg/L and the low aluminum permit limit of 87 µg/L. Without a reasonable estimate at the median concentration, it cannot be determined if the measured value of 120 µg/l is an outlier. The

data cannot be used to calculate or to estimate if there is a reasonable potential for the aluminum concentrations to exceed the permit limitation of 87 µg/l.

Aluminum Water Quality Criteria and other States' Approaches

The existing USEPA aluminum criteria (1988) were derived from a limited acute toxicity database of 14 genera (that just meets the "8 family rule" for criteria development) and two chronic toxicity studies that revealed heightened sensitivity of brook trout and striped bass to aluminum. Chadwick Ecologcial Consultants Inc., (CEC) recently conducted a technical review and update of the existing USEPA criteria as part of remedial investigation/risk assessment studies on the Red River unrelated to the NPDES permit (see Technical Memo attached). An evaluation of the existing data revealed multiple undefined acute toxicity values that warrant removal and/or correction. Furthermore, a review of the studies used to lower the chronic criterion were not conducted according to USEPA protocol (Stephan et al. 1985) and therefore not typically used in criteria derivation. More specifically, unusual dilution water with pH<6.5 and hardness <50mg/L were used to generate the no observable effect concentration value of 87ug/L for the striped bass, which is the lowered chronic criterion.

The CEC literature review located eighteen new acute toxicity values, which included toxicity data for four new genera, as well as five new chronic toxicity values. These new data were added to the respective databases. The new acute toxicity data revealed a significant relationship between water hardness and aluminum toxicity that was not apparent in the existing limited database. Recalculating the final acute value (FAV) and final chronic value (FCV) with hardness normalized genus mean acute values (GMCV) and an updated acute-to-chronic ratio results in the following acute and chronic equations:

$$\text{Acute} = e^{[0.7602(\ln \text{hardness})+4.0061]}$$
$$\text{Chronic} = e^{[0.7602(\ln \text{hardness})+2.7279]}$$

The Colorado Water Quality Control Commission (CWQCC) recently recognized the abnormal water quality conditions used to derive the 1988 chronic criterion. To address this matter, the CWQCC will be adding a footnote (similar to the footnote within Utah's water quality standards) to the existing water quality criteria as a result of its 2005 Basic Standards Hearing.

"Where the pH is equal to or greater than 7.0 and the hardness is equal to or greater than 50 mg/L CaCO3 in the receiving water after mixing, the 87 ug/L chronic total recoverable aluminum criterion will not apply, and aluminum will be regulated on compliance with the 750 ug/L acute total recoverable aluminum criterion."

Recommended Permitting Approach

New Mexico uses a statistical approach to examine the historical data on a discharge to determine if there is a reasonable potential for that discharge to cause or contribute to a violation of the stream standard. In this case, there is one data point with a value greater than the stream standard. However there is not enough information to estimate the central tendency of the data or to determine if the one measured value is an outlier. **The data set does not allow a determination that there is a "reasonable potential" for the discharge to cause or contribute to a violation of the stream standard.**

The data clearly demonstrates that the total aluminum concentration of the effluent is consistently less than the background concentration in the Red River. The data indicates that it is not reasonable to expect that the effluent discharge will cause or contribute to an increase in the total aluminum concentration.

The data clearly demonstrates that the total aluminum concentration in the Red River consistently and significantly exceeds the stream standard in samples taken above the mine area. Streams that have background concentrations greater than the stream standard in many states are candidates for either an ambient standard or the development of a Total Maximum Daily Load (TMDL).

Since it has not been clearly demonstrated that there is reasonable potential for discharge 002A to cause or contribute to the violation of the total aluminum stream standard, it would be appropriate to set no effluent limitation for total aluminum on discharge 002A. There is no risk in this approach because it is clear that the background total aluminum concentrations in the stream are significantly higher than the effluent concentrations. Discharge 002A will not cause or contribute to an increase in the total aluminum concentration in the stream.

It would be appropriate to continue to require that both total and dissolved aluminum be monitored and that a method with a detection limit of 10 μg/l or less be used. This would allow a determination of reasonable potential for total aluminum to be developed and the need for an effluent limitation for total aluminum to be determined. This approach would allow time for New Mexico to fully evaluate appropriate aluminum criteria for the protection of aquatic life and if total aluminum is the appropriate metal species for the stream standard.

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TECHNICAL MEMORANDUM

April 2004

POTENTIAL TIER III ACUTE AND CHRONIC SCREENING LEVEL CRITERIA FOR ALUMINUM

INTRODUCTION

At the request of Molycorp, Inc., Chadwick Ecological Consultants, Inc. (CEC) has reviewed the scientific literature with the goal of reviewing the available screening level water quality criteria (SLC) for aluminum for the protection of aquatic life. These criteria would potentially be included as part of a larger effort to interpret ambient water quality in the Red River near Questa, New Mexico, as part of RI/FS activities. Currently, the ecological risk assessment is using existing U.S. Environmental Protection Agency (and State of New Mexico) ambient water quality criteria (AWQC) for aluminum of 750 µg/L acute and 87 µg/L chronic. The purpose of this report is to summarize our technical review of the AWQC and recommend potential Tier III acute and chronic aluminum SLCs, where appropriate.

Preliminary Review of Existing Aluminum Criteria

CEC's evaluation of the existing U.S. Environmental Protection Agency (U.S. EPA) aluminum WQC document (1988) and development of potential Tier III SLCs was conducted in two primary phases. The first phase of this process reviewed the existing criteria document to determine if U.S. EPA methods were followed and whether or not any errors were made in development of the existing AWQC. The conclusions of this first phase were that, in general, U.S. EPA methods were followed in development of the existing AWQC. However, the final development of the chronic criterion did not follow current criteria development methodologies and a significant error was made in calculation of the final acute criterion which, when corrected, results in a higher acute criterion. The correction of a transcription error made in development of the current acute criterion (750 µg/L) results in a corrected criterion of 825 µg/L. With regard to the chronic value, the concentration with no observed effect (NOEC) from two studies of brook trout and striped bass were used to establish a chronic criterion of 87 µg/L. The current approach for determining a chronic value

is to calculate the geometric mean of the LOEC (lowest observed effect concentration, the treatment with the lowest concentration of toxicant determined to have an adverse effect) and the NOEC (U.S. EPA 1998). Using this approach, these two studies would have produced a chronic value of approximately 122 µg/L, rather than 87 µg/L. This finding from our first phase has been noted previously with regard to aluminum exceedences in the Red River as part of technical comments to the TMDL proposed by the New Mexico Environment Department (NMED).

REVISION OF ALUMINUM CRITERIA

Based upon the results of the first phase of this technical review, a second phase was conducted. The goal of this additional effort was to 1) assemble and critically review all available aluminum toxicity literature (especially those studies published since the 1988 criteria document) in order to develop updated acute and chronic toxicity databases; 2) determine if sufficient toxicity data had been generated since July 1986, when the last comprehensive data review was conducted for the current document (U.S. EPA 1988), to justify developing an updated criteria based on new data; and 3) produce preliminary updated aluminum criteria or their equivalent that could be considered as Tier III SLCs for the ecological risk assessment for the Molycorp RI/FS.

To date, approximately 300 scientific papers and documents relating to aluminum toxicity to aquatic life have been critically reviewed for content. Useable toxicity endpoints gleaned from this review have been assembled into acute and chronic toxicity databases (comparable to Tables 1 and 2 of a U.S. EPA AWQC document). Once assembled, these updated toxicity databases can potentially be used to calculate acute and chronic SLCs based upon the most current scientific data.

In order to determine which toxicity data were acceptable for inclusion in these updated databases, it was necessary to develop a set of criteria for review of data from relevant studies. For example, in addition to guidance provided by the U.S. EPA for determining the suitability of data for inclusion in toxicity databases (Stephan *et al.* 1985), only data from tests conducted at a pH between 6.5 and 9.0 were included. A pH range of 6.5 to 9.0 was established as a limit for data used in the update of the aluminum toxicity databases, because the U.S. EPA has established this as an acceptable range for pH in ambient freshwater (U.S. EPA 1999). Further, this is the range over which the current U.S. EPA criteria for aluminum are

applicable (U.S. EPA 1988). Typically, if data were not included in the final updated database, it was for one of the following reasons: 1) test organisms do not have reproducing, wild populations in North America, 2) study did not use an adequate control treatment, 3) data are presented in such a format that their quality cannot be insured, or 4) data were derived using solutions with a pH of less than 6.5.

Updated Toxicity Databases

Of the 300 scientific papers that have been reviewed for aluminum toxicity data, relatively few of these studies contain reliable toxicity endpoints for North American freshwater biota at pH values between 6.5 and 9.0. Much of the research into aluminum toxicity has been concerned with the additive toxicity of aluminum in acidic solutions (especially studies related to "acid rain"). However, due to the chemical activity of aluminum in solution, the vast majority of aluminum in a given solution at a circum-neutral pH is present as less toxic and largely insoluble hydroxides. Further, much of the literature has been concerned with the differing toxicity of aluminum in solutions of varying pH, and not necessarily with the absolute toxicity of aluminum at each pH value. Thus, much of the research into aluminum toxicity in the pH range of 6.5 to 9.0 found no effect (i.e., not tested at high enough concentrations), and simply had to be reported as toxicity values in excess of (i.e., "greater than") the highest tested concentration. Historically, such values have been included in U.S. EPA toxicity databases as an absolute value. Yet, many of these values can be unrealistically low - simply as an artifact of the experimental design. As such, these "greater than" values were evaluated, and a decision whether or not to include them in the database made, on a case-by-case basis.

Typically, if the value was similar to other values for a species or genus, it was included. An example of how a "greater than" value was removed from the database is the case of *Micropterus*. The genus mean acute value (GMAV) for *Micropterus* of >217 µg/L would represent the most sensitive value in the database if left as is. However, a review of this study reveals that while 217 µg/L was the highest concentration tested at a pH of 7.5 (and it had no toxicity), an acute value of >978 µg/L was generated at a pH of 6.1 in the same study (Kane and Rabeni 1987). Because the toxicity of aluminum increases with increasingly acidic solutions, a value determined to be non-toxic at a pH of 6.1 would certainly be expected to be non-toxic at a pH of 7.5. Thus, including a value of 217 µg/L as an acutely toxic endpoint for *Micropterus* is not scientifically defensible or reasonable. Because of this, and the fact that this was the only acute toxicity value

for *Micropterus* generated at a circum-neutral pH, no acute aluminum toxicity data were included for *Micropterus* in our final calculations.

A final consideration in screening data for calculation of both species mean acute values (SMAV) is that data generated using flow-through methods with measured toxicant concentrations are used to the exclusion of all other data (Stephan *et al.* 1985). In the updated database, this rule affected the calculation of the SMAV for *Oncorhynchus mykiss* (rainbow trout). There are eight acute aluminum toxicity values for *O. mykiss* in the database from two different studies. The first of these studies (Call 1984) used static methods and measured the concentration of aluminum in the test chambers. The more recent study (Gundersen *et al.* 1994) used flow-through methods and also measured the concentration of aluminum in the test. Because the Gundersen *et al.* (1994) data were generated using flow-through methods with measured concentrations, the Call (1984) data were excluded from a calculation of the SMAV for *O. mykiss*. Thus, the SMAV for *O. mykiss* was determined to be 6,707 µg/L using only flow-through data, rather than 9,086 µg/L using all available data (Table 1).

The updated acute toxicity database (Table 1), using all data from studies with a pH of 6.5-9.0, contains toxicity data for 18 genera, with new data added for five of the original 14 genera in the 1988 U.S. EPA database. However, when the suspect "greater than" values are removed, the database again becomes based on 14 genera. The most sensitive genus in this database is *Ceriodaphnia*, with a corrected GMAV of 2,759 µg/L.

TABLE 1: Acute toxicity of aluminum to aquatic animals. Only values determined at pH values of 6.5 - 9.0 were included in the data base. SMAV = species mean acute value; GMAV = genus mean acute value. All aluminum values as µg/L.

New Data?	Rank	Species	Method	Hardness (mg/L as $CaCO_3$)	pH	LC50	SMAV	GMAV	Normalized SMAV (hardness = 50 mg/L as $CaCO_3$)	Normalized GMAV (hardness = 50 mg/L as $CaCO_3$)	Reference
N	14	Midge *Tanytarsus dissimilis*	S,U,T	17.43	7.71-6.85	>77,700	>77,700	>77,700	>17,3119	>17,3119	Lamb & Bailey 1981
N	13	Yellow perch *Perca flavescens*	S,M,T	47.4	7.55	49,800	49,800	49,800	51,863	51,863	Call 1984
N	12	Channel catfish *Ictalurus punctatus*	S,M,T	47.4	7.54	47,900	47,900	47,900	49,885	49,885	Call 1984
N		Snail *Physa* sp.	S,M,T	47.4	6.59	>23,400					Call 1984
N		Snail *Physa* sp.	S,M,T	47.4	7 .46	>72,100					Call 1984
N		Snail *Physa* sp.	S,M,T	47.4	7.55	>30,600					Call 1984
N	11	Snail *Physa* sp.	S,M,T	47.4	8.17	>24,700	>33,604	>33,604	>34,996	>34,996	Call 1984
N	10	Stonefly *Acroneuria* sp.	S,M,T	47.4	7.46	>22,600	>22,600	>22,600	>23,536	>23,536	Call 1984
N		Rainbow trout *Oncorhynchus mykiss*	S,M,T	47.4	6.59	7,400					Call 1984
N		Rainbow trout *Oncorhynchus mykiss*	S,M,T	47.4	7.31	14,600					Call 1984

TABLE 1: Continued.

New Data?	Rank	Species	Method	Hardness (mg/L as $CaCO_3$)	pH	LC50	SMAV	GMAV	Normalized SMAV (hardness = 50 mg/L as $CaCO_3$)	Normalized GMAV (hardness = 50 mg/L as $CaCO_3$)	Reference
N		Rainbow trout *Oncorhynchus mykiss*	S,M,T	47.4	7.46	8,600					Call 1984
N		Rainbow trout *Oncorhychus mykiss*	S,M,T	47.4	8.17	>24,700					Call 1984
Y		Rainbow trout *Oncorhychus mykiss*	F,M,T	23.2	8.25	6,170					Gundersen *et al.* 1994
Y		Rainbow trout *Oncorhychus mykiss*	F,M,T	35	8.25	6,170					Gundersen *et al.* 1994
Y		Rainbow trout *Oncorhychus mykiss*	F,M,T	83.6	8.29	7,670					Gundersen *et al.* 1994
Y		Rainbow trout *Oncorhychus mykiss*	F,M,T	115.8	8.29	6,930	6,707		6,697		Gundersen *et al.* 1994
N	9	Chinook Salmon *Oncorhynchus tschawytscha*	S,M,N	28	7	>40,000	>40,000	>16,379	>62,157	20,403	Peterson *et al.* 1974
N		Fathead minnow *Pimephales promelas*	S,M,T	220	7.34	35,000					Kimball, mss.
N		Fathead minnow *Pimephales promelas*	S,U,T	--	7.6	>18,900					Boyd 1979

TABLE 1: Continued.

New Data?	Rank	Species	Method	Hardness	pH	LC50	SMAV	GMAV	Normalized SMAV (hardness = 50 mg/L as $CaCO_3$)	Normalized GMAV (hardness = 50 mg/L as $CaCO_3$)	Reference
N		Fathead minnow *Pimephales promelas*	S,M,T	47.4	7.61	>48,200					Call 1984
N		Fathead minnow *Pimephales promelas*	S,M,T	47.4	8.05	>49,800					Call 1984
Y		Fathead minnow *Pimephales promelas*	S,M,T	26	7.8	1,160					ENSR 1992b
Y		Fathead minnow *Pimephales promelas*	S,M,T	46	7.6	8,180					ENSR 1992b
Y		Fathead minnow *Pimephales promelas*	S,M,T	96	8.1	20,300					ENSR 1992b
Y	8	Fathead minnow *Pimephales promelas*	S,M,T	194	8.1	44,800	18,497	18,497	13,878	13,878	ENSR 1992b
N	7	Flatworm *Dugesia tigrina*	S,M,T	47.4	7.48	>16,600	>16,600	>16,600	>17,288	>17,288	Brooke *et al.* 1985
N		Cladoceran *Daphnia magna*	S,M,T	220	7.05	38,200					Kimball, mss.
N		Cladoceran *Daphnia magna*	S,M,T	45.4	7.61	>25,300					Brooke *et al.* 1985
N	6	Cladoceran *Daphnia magna*	S,U,T	45.3	6.5-7.5	3,900	15,563	15,563	11,234	11,234	Biesinger & Christensen 1972

TABLE 1: Continued.

New Data?	Rank	Species	Method	Hardness (mg/L as $CaCO_3$)	pH	LC50	SMAV	GMAV	Normalized SMAV (hardness = 50 mg/L as $CaCO_3$)	Normalized GMAV (hardness = 50 mg/L as $CaCO_3$)	Reference
Y	5	Amphipod *Crangonyx pseudogracilis*	S,U,T	50	6.75	9,190	9,190	9,190	9,190	9,190	Martin & Holdich 1986
N		Amphipod *Gammarus pseudolimnaeus*	S,M,T	47.4	7.53	22,000	22,000		22,911		Call 1984
Y	4	Amphipod *Gammarus pulex*	S,U,T	--	6.9	>2,698	>2,698	>7,704	>7,704	7,862	Storey *et al.* 1992
N		Green sunfish *Lepomis cyanellus*	S,M,T	47.4	7.55	>50,000	>50,000		>52,072		Call 1984
Y		Bluegill *Lepomis macrochirus*	F,U,T	20-25	6.5	>400					Palmer *et al.* 1988
Y	†	Bluegill *Lepomis macrochirus*	F,U,T	20-25	7.5	>400	>400	>4,472	>734	>6,182	Palmer *et al.* 1988
Y	3	Isopod *Asellus aquaticus*	S,U,T	50	6.75	4,370	4,370	4,370	4,370	4,370	Martin & Holdich 1986
N	2	Brook trout *Salvelinus fontinalis*	F,M,T	--	6.5	3,600	3,600	3,600	3,600	3,600	Decker & Menendez 1974
N		Cladoceran *Ceriodaphnia dubia*	S,M,T	50	7.42	1,900					McCauley *et al.* 1986
N		Cladoceran *Ceriodaphnia dubia*	S,M,T	50	7.86	1,500					McCauley *et al.* 1986

TABLE 1: Continued.

New Data?	Rank	Species	Method	Hardness (mg/L as $CaCO_3$)	pH	LC50	SMAV	GMAV	Normalized SMAV (hardness = 50 mg/L as $CaCO_3$)	Normalized GMAV (hardness = 50 mg/L as $CaCO_3$)	Reference
N		Cladoceran *Ceriodaphnia dubia*	S,M,T	50	8.13	2,560					McCauley *et al.* 1986
Y		Cladoceran *Ceriodaphnia dubia*	S,M,T	26	7.5	720					ENSR 1992a
Y		Cladoceran *Ceriodaphnia dubia*	S,M,T	46	7.6	1,880					ENSR 1992a
Y		Cladoceran *Ceriodaphnia dubia*	S,M,T	96	7.8	2,450					ENSR 1992a
Y		Cladoceran *Ceriodaphnia dubia*	S,M,T	194	8.1	>99,600					ENSR 1992a
Y		Cladoceran *Ceriodaphnia dubia*	S,M,T	98.5	76	2,880	3,021		2,510		Soucek *et al.* 2001
N		Cladoceran *Ceriodaphnia* sp.	S,M,T	47.4	7.36	2,300					Call 1984
N	1	Cladoceran *Ceriodaphnia* sp.	S,M,T	47.4	7.68	3,690	2,913	2,967	3,034	2,760	Call 1984
N		Common carp *Cyprinus carpio*	S,U,T	--	6.5	>4,000					Muramoto 1981
N		Common carp *Cyprinus carpio*	S,U,T	--	6.6	>2,000					Muramoto 1981
N		Common carp *Cyprinus carpio*	S,U,T	--	6.6	>4,000					Muramota 1981

TABLE 1: Continued.

New Data?	Rank	Species	Method	Hardness (mg/L as $CaCO_3$)	pH	LC50	SMAV	GMAV	Normalized SMAV (hardness = 50 mg/L as $CaCO_3$)	Normalized GMAV (hardness = 50 mg/L as $CaCO_3$)	Reference
N	†	Common carp	S,U,T	--	6.7	>2,000	>2,828	>2,828**	>2,828**	>2,828	Muramota 1981
Y	†	Common carp Copepod *Cyclops viridis*	S,U,T	--	6.9	>2,698	>2,698	>2,698*	>2,698*	>2,698*	Storey *et al.* 1992
Y	†	Smallmouth bass *Micropterus dolomieui*	S,M,T	12.1-12.8	7.5	>217	>217	>217*	>623*	>623*	Kane & Rabeni 1987

* Value not used in final calculations since study found higher NOEC at lower pH.
** Value not used in 1988 document or present re-analysis.
† Value not used in final criteria development.
S Static test.
F Flow-through test.
U Nominal aluminum concentration.
M Measured aluminum concentration.
T Aluminum values presented are as total aluminum.
N Document unavailable for review; value used in 1988 document, assume aluminum value as total.

Based on our literature review, chronic aluminum toxicity data for six genera of freshwater animals generated using test solutions with a pH between 6.5 and 9.0 were compiled (Table 2). Unlike the acute database which contains several potentially suspect "greater than" values, only the genus mean chronic value (GMCV) for *Salvelinus* (>224.5 µg/L) contains "greater than" toxicity values. All but one of the available chronic values for *Salvelinus* were "greater than" values. Although a *Salvelinus* chronic value of 87 µg/L was used to lower the current calculated chronic criterion from 750 µg/L to 87 µg/L, this value was not included in the original development of the chronic toxicity database in the current aluminum criteria (U.S. EPA 1988). The study upon which the 87 µg/L value was based was published in 1989 following publication of the criteria document (Cleveland *et al.* 1989). Re-evaluation of this study resulted in a chronic value of 121.95 µg/L derived from the geometric mean of the NOEC of 88 µg/L and a LOEC of 169 µg/L. This is the only study available that presents chronic toxicity data to *Salvelinus* at a pH between 6.5 and 9.0 (exposure pH ranged from 6.5 to 6.6 in this study).

Because there are too few chronic data to develop a separate chronic criterion, an acute-to-chronic ratio will have to be used to translate the final acute value (FAV) to a final chronic value (FCV) - as was the case with the original criteria document. The updated toxicity databases contained paired acute and chronic data for five genera (Table 3), a sufficient number to calculate a new ACR. However, U.S. EPA guidance dictates that a difference between the smallest and largest ACR should not be greater than a factor of 10. In this case, the largest difference in this data set is 13.5, suggesting that further refinement of this relationship may be warranted and that the calculated ACR of 7.18 (Table 3) should be considered preliminary.

TABLE 2: Chronic toxicity of aluminum to aquatic animals. All values determined at pH values < 6.5 were excluded from database. All aluminum values as total µg/L. SMCV = species mean chronic value; GMCV = genus mean chronic value.

New Data?	Rank	Species	Test	Chemical	Hardness (mg/L as $CaCO_3$)	pH	Limits	Chronic Value	SMCV	GMCV	Reference
Y		Cladoceran *Ceriodaphnia dubia*	LC	aluminum chloride	47.4	7.58	--	12,100	12,100		Call 1984
N	6	Cladoceran *Ceriodaphnia dubia*	LC	aluminum chloride	50	7.15	1,400-2,600	1,908	1,908	4,805	McCauley *et al.* 1986
N	5	Fathead minnow *Pimephales promelas*	ELS	aluminum sulfate	220	7.24-8.15	2,300-4,700	3,288	3,288	3,288	Kimball, mss.
N	4	Cladoceran *Ceriodaphnia dubia*	LC	aluminum chloride	50	7.15	1,400-2,600	1,908	1,908	1,908	McCauley *et al.* 1986
Y		Rainbow trout *Oncorhynchus mykiss*	ELS	aluminum chloride	103	7.94-8.10	--	3,910			Gundersen *et al.* 1994
Y	3	Rainbow trout *Oncorhynchus mykiss*	ELS	aluminum chloride	20.3	7.97-8.14	--	1,940	2,754.2	2,754.2	Gundersen *et al.* 1994
N	2	Cladoceran *Daphnia magna*	LC	aluminum sulfate	220	8.3	540-1,020	742.2	742.2	742.2	Kimball, mss.
Y		Brook trout *Salvelinus fontinalis*	ELS	aluminum sulfate	285	7.2	--	>242			Cleveland *et al.* 1986
Y		Brook trout *Salvelinus fontinalis*	ELS	n/s	--	7.81	--	>283			Hunn *et al.* 1987
N		Brook trout *Salvelinus fontinalis*	ELS	aluminum sulfate	12	6.5-6.6	88-169	121.95			Cleveland *et al.* 1989
Y	1	Brook trout *Salvelinus fontinalis*	ELS	aluminum sulfate	--	7.2	--	>303.9	224.5	224.5	Cleveland *et al.* 1991

LC = Life-cycle test.
ELS = Early life stage used in testing.

TABLE 3: Acute-to-chronic ratio of aluminum toxicity to five genera.

Genus	Acute Value (µg/L)	Chronic Value (µg/L)	Acute to Chronic Ratio
Pimephales	18,497	3,288	5.63
Ceriodaphnia	2,966.5	1,908	1.55
Oncorhynchus	19,064	2,925	6.52
Daphnia	15,563	742.2	20.97
Salvelinus	3,600	224.5	16.03
Geometric Mean			**7.18**

Hardness Relationship

A significant result of our review of the aluminum toxicity literature was the discovery of an apparent inverse relationship between the toxicity of aluminum and the hardness of the solution. Using data presented in the updated acute database (Table 1), a hardness modifier for the aluminum criteria can be developed. This relationship between the acute toxicity of aluminum and hardness was evaluated following guidance from the U.S. EPA (Stephan *et al.* 1985) and using the recently issued cadmium criteria document (U.S. EPA 2001) as a guide.

At a minimum, a range of toxicity values at differing hardness values should be available from two different species in the toxicity database. This range of hardness values for a given species should be such that the highest hardness value is at least three times the lowest and there is a minimum difference of 100 mg/L as $CaCO_3$ between the highest and lowest hardness value. After sorting the data using these criteria, a relationship was developed between aluminum toxicity and hardness using data from *C. dubia*, *D. magna*, and *P. promelas*. A linear regression was performed between log-transformed hardness values normalized to a mean for each species and log-transformed LC_{50} values normalized in the same manner (Fig. 1). The result of this analysis is a significant ($p = 0.0012$), positive (slope = 0.7602) relationship indicating an inverse relationship between hardness and toxicity. The slope of this line can then be used to develop a hardness-based equation to calculate an updated aluminum criteria between a hardness of 25 and 400 mg/L as $CaCO_3$ similar to that used for many other metals.

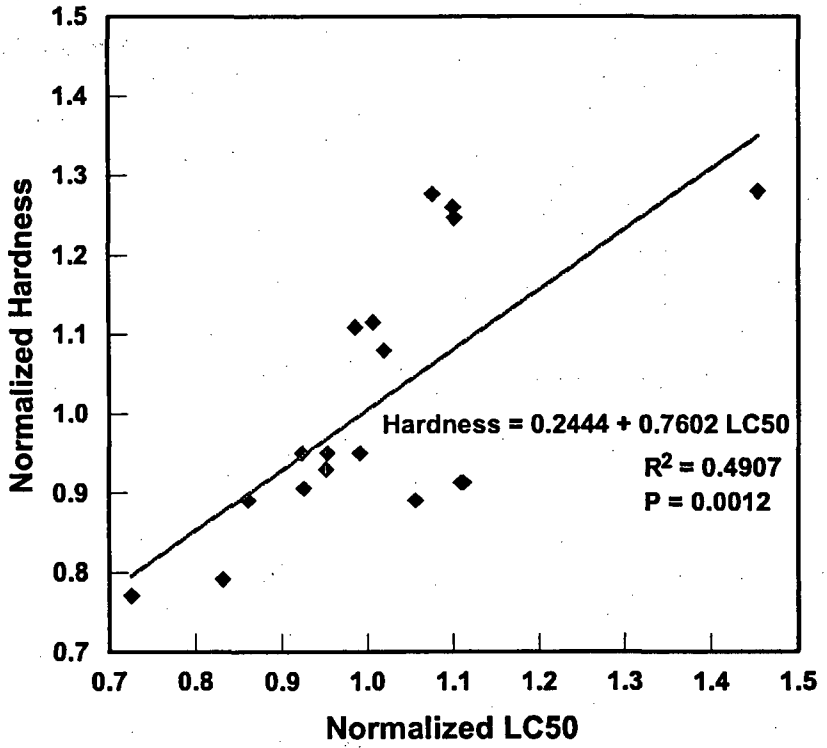

FIGURE 1: Relationship between the acute toxicity of aluminum and the hardness (mg/L as $CaCO_3$) of the test solution. Straight line is the result of a simple linear regression of the data, and is defined by the included equation.

REVISED ACUTE AND CHRONIC CRITERIA FOR ALUMINUM

Using the updated toxicity databases and the relationship between water hardness and aluminum toxicity developed using these databases, an updated, hardness-based acute aluminum screening level criterion can be developed (Table 4). The resulting acute criterion equation is $e^{[0.7602(\ln \text{hardness})+4.0061]}$. At a hardness value of 100 mg/L as $CaCO_3$ the updated acute aluminum criterion based upon this equation is 1,821 µg/L (Table 4). These preliminary calculations indicate that an updated acute SLC for the Molycorp ecorisk analysis would be substantially higher than the existing 1988 criterion. Further, these values are more environmentally realistic in that the criteria increase as the hardness of the solution increases.

TABLE 4: Recalculation of the final acute and chronic values for aluminum using updated toxicity databases (N = 14 genera, R = sensitivity rank in database, P = rank ÷ N+1).

Rank	Genus	GMAV (µg/L)	ln GMAV	$(\ln GMAV)^2$	P = R/(N+1)	√P
4	*Gammarus*	7862	8.9698	80.4572	0.2667	0.5164
3	*Asellus*	4370	8.3825	70.2666	0.2000	0.4472
2	*Salvelinus*	3600	8.1887	67.0546	0.1333	0.3651
1	*Ceriodaphnia*	2759.6	7.9228	62.7714	0.0667	0.2582
		Sum of columns	33.4638	280.5499	0.6667	1.5870

Calculations:

Acute Criterion

$$S^2 = \frac{\Sigma(\ln GMAV)^2 - (\Sigma \ln GMAV)^2/4}{\Sigma P - (\Sigma \sqrt{P})^2/4} = \frac{280.5499 - (33.4638)^2/4}{0.6667 - (1.5870)^2/4} = 16.0136 \qquad S = 4.0017$$

$L = [\Sigma \ln GMAV - S(\Sigma\sqrt{P})]/4 = [33.4638 - 4.0017\,(1.5870)]/4 = 6.7783$

$A = S\,(\sqrt{0.05}) + L = (4.0017)(0.2236) + 6.7783 = 7.6731$

Final Acute Value = FAV $= e^{A} = 2149.7867$

CMC = ½ FAV = 1074.8934

Pooled Slope = 0.7602

ln (Criteria Maximum Incercept) = 4.0061

Recalculated Acute Aluminum Criterion $= e^{[0.7602\,(\ln \text{hardness})+4.0061]} = 1{,}821$ µg/L at a hardness of 100 mg/L

Assumed Chronic Slope = 0.7602

Final Acute-to-Chronic ratio (FACR) = 7.18

Final Chronic Value (FCV) = FAV ÷ ACR = 2149.7867 ÷ 7.18 = 299.4132

ln (Final Chronic Intercept) = 2.7279

Recalculated Chronic Aluminum Criterion $= e^{[0.7602(\ln \text{hardness})+2.7279]} = 507$ µg/L at a hardness of 100 mg/L

The chronic SLC can also be updated using both the hardness relationship and the ACR of 7.18 calculated during this study. Using this new information, the new chronic criteria equation is $e^{[0.7602(\ln \text{hardness})+2.7279]}$. At a hardness value of 100 mg/L as $CaCO_3$, the updated chronic aluminum criterion based upon this equation is 507 µg/L (Table 4). As with the acute criteria values, the updated chronic value is higher than

the existing 1988 chronic criterion. In addition, the updated chronic criterion presented here is hardness-dependant and increases with increasing hardness of the solution.

RECOMMENDED TIER III SCREENING LEVEL CRITERIA FOR ALUMINUM

Based on this review of the 1988 aluminum criteria document,, a detailed literature review, and subsequent technical updates of criteria, new Tier III aluminum SLCs were developed which could be utilized for the Molycorp ecorisk (Table 5). These would be 1.8 mg/L acute and 0.5 mg/L chronic (at hardness 100 mg/L).

TABLE 5: Summary of updated acute and chronic aluminum criteria values compared to existing and corrected existing U.S. EPA water quality criteria.

Hardness of 100 mg/L (as $CaCO_3$)	1988 Criterion (µg/L)	Corrected Criterion (µg/L)	Updated Tier III Study (µg/L)
Acute	750	825	1,800
Chronic	87	122	500

It is important to note that these updated SLCs are based upon studies that measured aluminum as total aluminum in circum-neutral solutions. The 1988 criteria (U.S. EPA 1988) were also based upon total aluminum data. However, the U.S. EPA suggested in that document that implementing these criteria as dissolved rather than as total may be more appropriate. And, in fact, the existing criteria have often been adopted by States as regulating dissolved and not total aluminum. It is our understanding that for the ecological risk assessment, it has been decided to use these numbers as total aluminum (appropriate for the database).

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July 2005

TECHNICAL MEMORANDUM

Executive Summary of Data on the Red River in the Vicinity of NPDES Permitted Outfalls 001 and 002

Introduction

This memorandum provides an executive summary of the aquatic biological and chemical data collected on the Red River in the vicinity of Outfalls 001 and 002 permitted through the National Pollution Discharge and Elimination System (NPDES). The information is presented for the Molycorp, Inc. (Molycorp) NPDES renewal process. Data supporting this renewal report come primarily from long-term aquatic biological monitoring reports from Chadwick Ecological Consultants, Inc. (CEC) prepared on behalf of Molycorp (CEC 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2005) and data collected by the Remedial Investigation (RI) Study as presented in the Molycorp Preliminary Site Characterization Report (URS 2005).

Site Descriptions

Sites bracketing each outfall were chosen to characterize the aquatic biota and water and sediment chemistry in the vicinity of each outfall (Fig. 1). Study site names are based on names used during the Molycorp Remedial Investigation/Feasibility Study ([RI/FS] URS 2005). Study sites used for this summary include:

LR-1 - upstream of Outfall 002, biological sampling/water chemistry/sediment chemistry
LR-5 - downstream of Outfall 002, water chemistry/sediment chemistry
LR-8A - downstream of Outfall 002, biological sampling/water chemistry/sediment chemistry
LR-11A - downstream of Outfall 002 and upstream of Outfall 001, water chemistry/sediment chemistry
LR-13 - downstream of Outfall 002 and upstream of Outfall 001, water chemistry/sediment chemistry
LR-16 - downstream of Outfalls 001 and 002, biological sampling/water chemistry/sediment chemistry

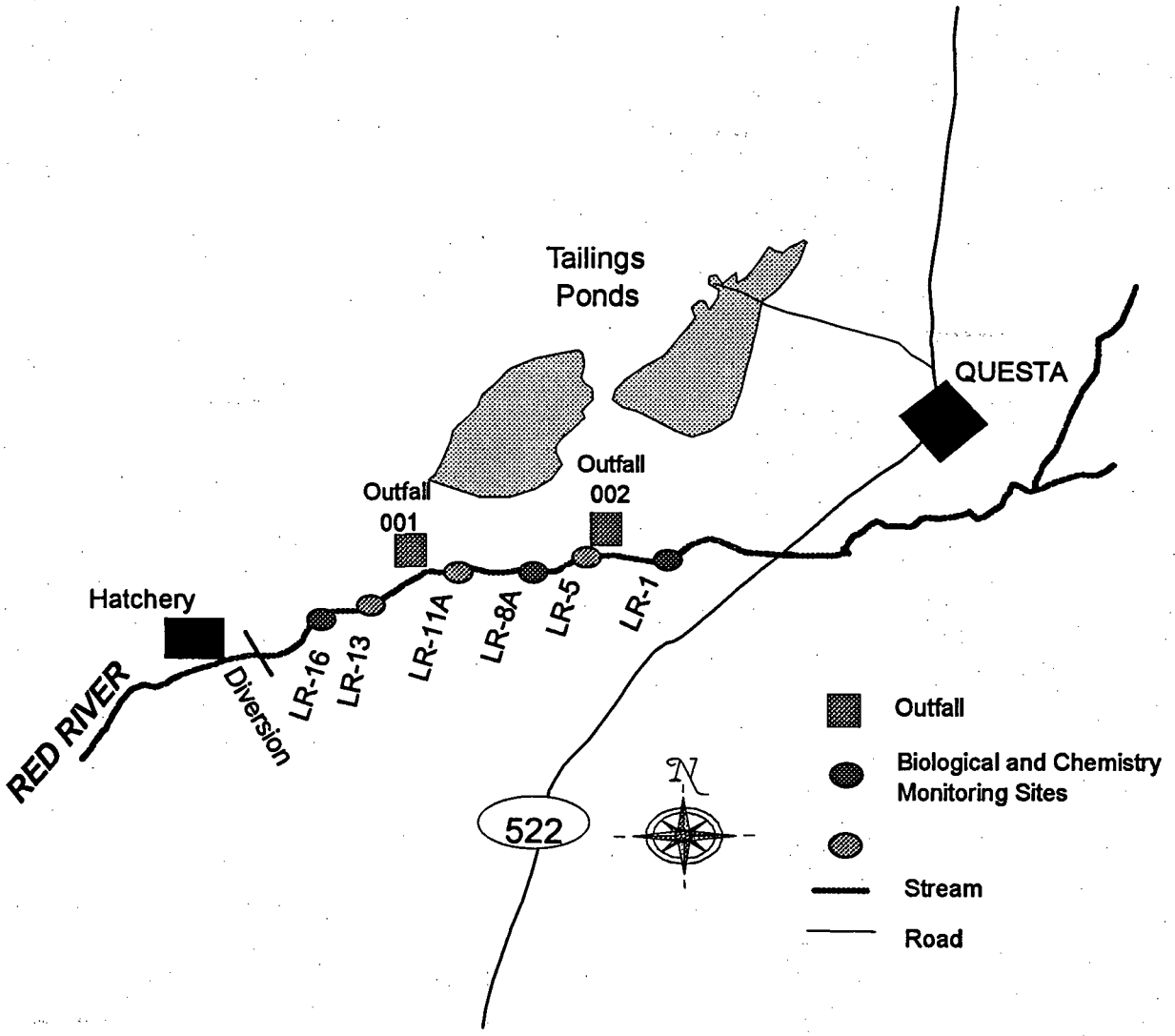

FIGURE 1: Study sites in the vicinity of Outfall 002 and Outfall 001.

Outfall 002 is the only NPDES permitted outfall currently in active use by Molycorp on the Red River. The GPS coordinates for this outfall are N36°41'31.36" W105°37'16.58", and it is at an elevation of 7,226 ft. Biological sampling has been conducted at Sites LR-1 and LR-8A bracketing this outfall (Fig. 1). During the RI, water and sediment samples were collected at those two sites, as well as Site LR-5, downstream of Outfall 002.

Outfall 001 is the outlet from Pope Lake, but has not been used for discharge since the last permit was granted. The GPS coordinates for this outfall are N36°41'40.15" W105°38'3.37", and it is at an elevation of 7,331 ft. Biological sampling has been conducted downstream of this outfall at Site LR-16. During the RI, water and sediment samples were collected at that site, as well as at Site LR-11A, upstream of Outfall 001, and LR-13, downstream of Outfall 001 (Fig. 1).

Media Sampled

Fish, benthic invertebrate, and periphyton populations have been sampled at each biological monitoring site. Fish populations were quantitatively sampled using electrofishing gear and a multiple-pass depletion technique. Fish species include rainbow trout, hybrid rainbow/cutthroat trout, brown trout, and white sucker. Rainbow trout found in the study area represent fish stocked by the New Mexico Game and Fish Department and the Town of Red River. These fish generally exist in the river for a short period of time because they are quickly harvested. Therefore, rainbow trout are not considered resident fish and are not discussed in this data summary. Benthic invertebrate populations were quantitatively sampled by taking five replicate samples using a modified Hess sampler. Periphyton populations were qualitatively sampled by scraping algae from the stream bottom substrates.

Fish and invertebrate tissue samples have also been collected during the RI. Rooted macrophytes were uncommon in the study area, so bryophytes (moss) were used for plant tissue samples.

Water quality samples were collected for the RI as grab samples at each collection date. Sediment samples collected in fall 2002 were a composite of erosional and depositional sediment due to a lack of appropriate riffles in many areas of the stream. Low flows allowed sediment to accumulate, and storms partially dammed the river with sediment in 2002, especially downstream of Hot 'n Tot and Hansen creeks. Sediment samples collected at other times were obtained separately from riffles and depositional zones.

Tissues, water, and sediment samples were analyzed for a suite of 25 elements. These elemental analytes were analyzed in both the total and dissolved fractions of the water samples. At sites generally co-located with biological monitoring sites, water and sediment samples were also analyzed (in total

fractions) for a suite of 138 organic compounds, including 43 volatile organic compounds, 62 semi-volatile organic compounds, 5 explosive organic compounds, and 28 pesticides/PCBs, in fall 2002. Because the concentrations of these organic compounds (except ∃-hexachlorocyclohexane and 2-butanone in sediment) were nearly all below detection limits at all sites, no further analysis was conducted for those analytes. Inorganic ions, pH, alkalinity, specific conductance, % solids, and other similar laboratory and physical parameters were measured on the appropriate media for each sample (URS 2005).

Screening level criteria used for analysis of the water and sediment data were based on U.S. EPA Region 6 Risk-Based Screening Level Criteria for Human Health, promulgated New Mexico Surface Water Quality Standards, or pertinent National Recommended Ambient Water Quality Criteria for ecological receptors, as required in the Data Quality Objectives for the Molycorp RI/FS (URS 2002).

Screening level criteria do not exist for tissue-based samples (i.e., fish, benthic invertebrate, and plant samples); therefore, the measured concentrations were compared between sites (upstream - downstream of an outfall) and between years (2002 and 2003).

Screening level chronic toxicity tests were performed using *Ceriodaphnia dubia* on baseflow water samples in October 2002. Full dilution series chronic toxicity tests were performed using *C. dubia* for snowmelt runoff samples in late April 2003. Full dilution series acute toxicity tests were performed using *C. dubia* for three sets of stormwater samples from July through September 2003. Ten-day chronic sediment toxicity tests using *Hyalella azteca* and *Chironomus tentans* were performed on sediment samples at each site in October 2002. Chronic and acute toxicity test procedures followed methods described in U.S. EPA documentation (Lewis *et al.* 1994, U.S. EPA 2000, U.S. EPA 2002).

Habitat variables were measured in the sites used for fish population monitoring, generally representative of the reach in which it was located. Habitat units were identified by type according to the R1/R4 Habitat Inventory procedures used by the U.S. Forest Service (Overton *et al.* 1997). The length, widths, and depths of each habitat unit were measured, and a subjective score, ranging from 0.0 (degraded) to 5.0 (optimal), was assessed.

Summary of Data

Outfall 002 Sites

Fish Populations

Fish population samples have been collected at sites upstream and downstream of Outfall 002 in fall 2002, 2003, and 2004. At both sites, brown trout have been collected each year, and white suckers were also collected at Site LR-1 upstream of Outfall 002 in fall 2004. Brown trout densities have consistently exceeded 100 fish/acre, ranging up to 520 fish/acre, with higher densities found downstream of Outfall 002 at both Sites LR-8A and LR-16 (Fig. 2).

Brown trout biomass varied between sites and between years; however, biomass has been consistently greater downstream of Outfall 002 than upstream of Outfall 002 (Fig. 2). At the site above Outfall 002, brown trout biomass exceeded 25 lbs/acre. Downstream of Outfall 002, biomass of brown trout exceeded 40 lbs/acre every year except in 2002.

Fish Tissues

Metals were found in fish tissues both upstream and downstream of Outfall 002. In fall 2002, more analytes were below the detection limit at the upstream site than in the downstream site for size classes. In fall 2003, there were more analytes below the detection limits at the upstream site in brown trout >8 inches, but the trend was reversed for young-of-the-year (YOY) brown trout. In brown trout <8 inches, the same number of analytes were below the detection limits at both sites.

Tissue-based screening criteria have not been produced for analysis of these data. For 2002 data, there were lower concentrations of Cd in brown trout >8 inches and higher concentrations of Ba and Fe in brown trout <8 inches in the downstream site as compared to the upstream site. For 2003 data, there were higher concentrations of Al, Cr, Fe, Mn, Ni, and Se in brown trout >8 inches, higher concentrations of Cr, Ni, and Se in brown trout <8 inches, and higher concentrations of Hg and Se in YOY brown trout in the downstream site compared to the upstream site. From fall 2002 to fall 2003, Al and Mn concentrations decreased at the upstream site in brown trout >8 inches. At the downstream site in brown trout >8 inches, Cr and Mn concentrations increased from 2002 to 2003, and in brown trout <8 inches, Cr and Ni

concentrations increased from 2002 to 2003. All other metal concentrations were fairly consistent between years.

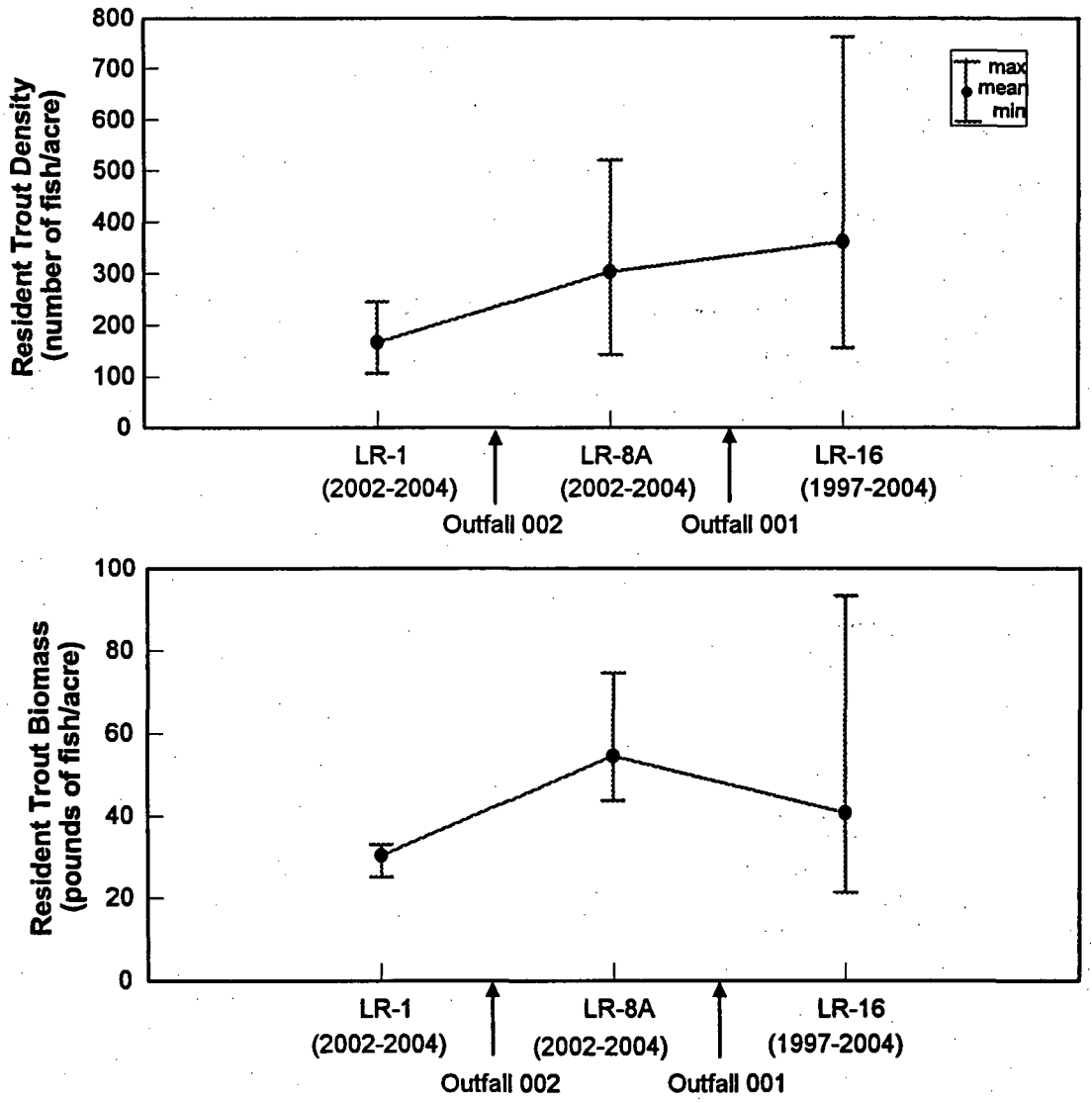

FIGURE 2: Comparison of resident trout density (number of fish/acre) and biomass (pounds of fish/ acre) at sites in the vicinity of NPDES permitted Outfalls 001 and 002 on the Red River, Taos County, New Mexico. Data collected in years indicated in parentheses.

Benthic Invertebrate Populations

Benthic invertebrate populations have been sampled at Site LR-1 upstream of Outfall 002 in spring and fall since spring 2002, and at Site LR-8A downstream of Outfall 002 in spring and fall since fall 2002. Densities have consistently been greater downstream of Outfall 002 (Fig. 3), with some seasonal fluctuations. Number of taxa has ranged from 22 taxa at the site upstream of Outfall 002 in spring 2004 to 45 taxa at the site downstream of Outfall 002 in spring 2003 (Fig. 3). There have been more than eight EPT (Ephemeroptera, Plecoptera, and Trichoptera) taxa collected in every sample. Shannon-Weaver diversity index values have generally been above 3.00, with only one value below 2.50 at the site upstream of Outfall 002 in spring 2002.

Benthic Invertebrate Tissues

Benthic invertebrate tissue samples were collected at both biological monitoring sites in spring 2002, fall 2002, and fall 2003. A reduced number of parameters was analyzed in spring 2002. Similar numbers of analytes were below detection limits at the sites upstream and downstream of Outfall 002. In fall 2002, Cd and Mo concentrations were lower at the downstream site as compared to the upstream site, and Se concentrations were lower at the downstream site in fall 2003. There was high variability between years at both sites.

Periphyton Populations

Periphyton population samples were collected at both sites bracketing Outfall 002 in fall 2002 and fall 2003. At the site upstream of Outfall 002, 18 - 19 taxa were collected, of which 17 were diatom taxa. Diatoms comprised well over half of the density in both years, with the rest of the population being blue-green algae in 2002 and blue-green algae plus green algae in 2003. At the downstream site, the number of algal taxa ranged from 19 - 22 taxa, with 16 - 20 taxa being diatom taxa. Diatoms comprised 91.2% of the density in 2002, with the remainder being blue-green and other algae. In 2003, diatoms comprised less than half of the density, blue-green algal density decreased from 2002 values, and other algae (mostly green algae) comprised just over half of the remaining density.

Plant Tissues

Most analytes (∃80%) were above detection limits in tissue samples from plants collected at the two sites in the vicinity of Outfall 002. In fall 2002, concentrations of Co, Mn, and Mo were higher at the

downstream site as compared to the upstream site; in fall 2003, only concentrations of Mo were higher at the downstream site, and Pb concentrations were lower at the downstream site.

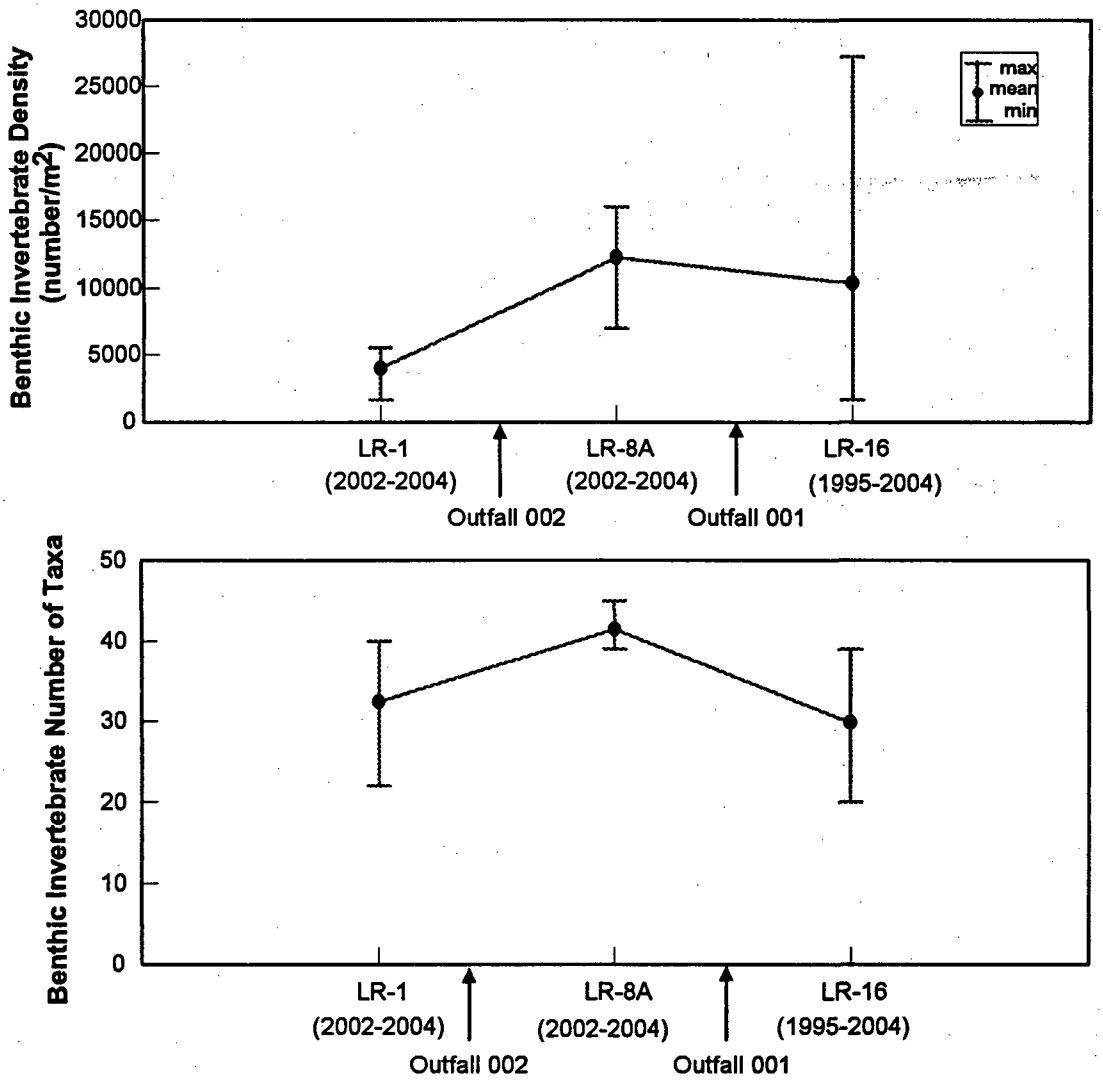

FIGURE 3: Comparison of benthic invertebrate density (number/m^2) and number of taxa at sites in the vicinity of NPDES permitted Outfalls 001 and 002 on the Red River, Taos County, New Mexico. Data collected in years indicated in parentheses.

Water Quality

Dissolved Ba concentrations and total Al concentrations exceeded ecological chronic screening level criteria at all three sites in the vicinity of Outfall 002 during each sample event. Dissolved B concentrations also exceeded the ecological chronic screening level criteria in spring, summer, and fall 2003 at all three sites. Dissolved Cd concentrations exceeded ecological chronic screening level criteria at all three sites in spring, summer, and fall 2003, but only at Site LR-1 upstream of Outfall 002 and Site LR-5 downstream of Outfall 002 in fall 2002. All other analyte concentrations were either below detection limits or below all screening level criteria, or screening level criteria do not exist.

Sediment Chemistry

Human health screening level criteria were exceeded by As concentrations at all sites on each sample date. Iron concentrations also exceeded human health screening level criteria in the composite samples from all three sites in fall 2002 and in depositional samples from all three sites in spring 2003 and fall 2003. ∃-Hexachlorocyclohexane and 2-butanone concentrations exceeded ecological screening level criteria in composite samples from fall 2002 at all sites. Concentrations of Ni exceeded ecological screening level criteria in all samples from spring 2003, and concentrations of Cu, Pb, and Zn exceeded ecological screening level criteria in all samples from depositional zones in spring 2003. Otherwise, concentrations of As, Cd, Cu, Fe, Pb, Mn, Ni, Se, and Zn exceeded ecological screening level criteria in various samples on various dates, with most of these analytes found either upstream only or both upstream and downstream of Outfall 002. Concentrations exceeded ecological screening level criteria in downstream sites only for Cd in riffle and depositional zone samples in spring 2003 and Pb in riffle samples in summer 2003. All other analyte concentrations were either below detection limits or below all screening level criteria, or screening level criteria do not exist.

Habitat Evaluations

Habitat parameters were evaluated at the sites bracketing Outfall 002 in fall of 2002, 2003, and 2004. A reduced number of habitat parameters was evaluated in spring 2004. Upstream of Outfall 002, there have been four habitat units consistently identified, comprised of low gradient riffles and runs. Average depths have been less than one foot, and maximum depths have been less than 1.5 feet. Habitat quality ratings have ranged from 2.5 - 3.3 at this site. At the site downstream of Outfall 002, seven to eight habitat units have been identified, comprised of low gradient riffles, runs, and small pools. The

average depth has been about one foot, with average maximum depths at least 1.5 feet. Habitat quality ratings were consistently 2.5 - 2.6.

Toxicity Tests

Screening level chronic toxicity tests using *C. dubia* were performed on water collected at the biological monitoring sites upstream and downstream of Outfall 002 in October 2002. There were no significant effects on survival in these tests; however, there were significant reproductive effects when compared to control organisms. A subsequent full dilution series chronic toxicity test using *C. dubia* was then performed on water from Outfall 002 and the sites bracketing the outfall in October 2002. The No Observed Effect Concentration (NOEC) for survival and reproduction was 100% in these tests. The IC_{25} values for the test using Outfall 002 water were 93.8% effluent for survival and 95.9% effluent for growth. However, no confidence limits could be calculated for these values and they cannot, therefore, be determined to be significantly different from 100% test waters. For the sites bracketing Outfall 002, the IC_{25} values for survival and reproduction were all >100% river water. Ten-day sediment toxicity tests using *H. azteca* and *C. tentans* were performed on sediment samples collected from the biological monitoring sites in October 2002 and October 2003. No significant effects on survival or growth were detected in any of these tests. Acute toxicity tests were run using stream water collected during three rainfall events (stormwater testing) in summer-fall at Site LR-16 downstream of Outfall 002. No significant acute toxicity (i.e., LC50 >100% streamwater) was detected in any of the storms.

<u>Outfall 001 Sites</u>

Fish Populations

Fish populations were initially sampled in Spring 1997 and subsequently each fall since 1997. Brown trout have had an average density of 380 fish/acre and an average biomass of 42.5 lbs/acre (Fig. 2). Values were consistently higher at the site downstream of Outfall 001 than at Site LR-1 upstream of both Outfalls 002 and 001.

Fish Tissues

In fish tissue samples, the number of analytes below detection limits in both brown trout >8 inches and brown trout <8 inches increased from 2002 to 2003.

Benthic Invertebrate Populations

Benthic invertebrate population sampling was conducted in fall 1997, 1998, and 1999, and in spring and fall since 2000. Densities have varied widely, with a particularly low density of 1,606 organisms/m^2 in fall 1997 to densities over 20,000 organisms/m^2 in fall 2000, fall 2002, and spring 2003 (Fig. 3). Number of taxa has consistently been greater than 20 taxa, with >30 taxa found in four of the 12 sample periods (Fig. 3). Number of EPT taxa has consistently ranged from nine to thirteen taxa. Shannon-Weaver diversity values have been generally good, with only two values below the threshold of 2.50 (fall 1998 and fall 1999). All other values have been greater than 2.50, with half of the values ∃ 3.00. The values for these parameters indicate healthy, generally abundant invertebrate populations downstream of Outfall 001. In addition, densities downstream of Outfall 001 were generally larger than at Site LR-1, upstream of both Outfalls 002 and 001. The number of taxa, number of EPT taxa, and diversity have not demonstrated clear trends among Sites LR-1, LR-8A, and LR-16.

Benthic Invertebrate Tissues

Only 5 - 6 analytes were below detection limits in benthic invertebrate tissue samples in 2002 and 2003. Concentrations of As, Ba, Fe, Pb, and V decreased and concentrations of Cd and Zn increased at this site from 2002 to 2003.

Periphyton Populations

Periphyton populations have been sampled at the site below Outfall 001 in fall 2002 and 2003. In both years, 19 algal taxa were collected, of which 18 - 19 taxa were diatoms. Diatoms comprised 92.1 - 100% of the population on those dates, whereas blue-green algae comprised the remainder of the population.

Plant Tissues

Between 3 - 5 analytes were below the detection limits in tissue samples from plants collected in fall 2002 and fall 2003. Concentrations of B increased in 2003 compared to 2002, but concentrations of Mo and Se decreased.

Water Chemistry

Dissolved Ba concentrations and total Al concentrations exceeded ecological chronic screening level criteria at all three sites in the vicinity of Outfall 001 during each sample event. Dissolved B concentrations also exceeded the ecological chronic screening level criteria in spring, summer, and fall 2003 at all three sites. Dissolved Cd concentrations exceeded ecological chronic screening level criteria at all three sites in spring and fall 2003, but only at Site LR-11A upstream of Outfall 001 and Site LR-13 downstream of Outfall 001 in summer 2003 and at Site LR-16 downstream of Outfall 001 in fall 2002. Total Fe concentrations exceeded screening level criteria at the Site LR-11A upstream of Outfall 001 and Site LR-16 downstream of Outfall 001 in fall 2002. All other analyte concentrations were below detection limits or below all screening level criteria, or screening level criteria do not exist.

Sediment Chemistry

Human health screening level criteria were exceeded by As concentrations at all sites on each sample date. Iron concentrations also exceeded human health screening level criteria in the composite samples from sites upstream and downstream of Outfall 001 in fall 2002 and in depositional samples from at least two sites in the vicinity of Outfall 001 in spring 2003 and summer 2003. ∃-Hexachlorocyclohexane and 2-butanone concentrations exceeded ecological screening level criteria in composite samples from fall 2002 at all sites. Concentrations of Ni exceeded ecological screening level criteria in all samples from spring 2003, and concentrations of Cu, Pb, and Zn exceeded ecological screening level criteria in all samples from depositional zones in spring 2003. Otherwise, concentrations of As, Cd, Cu, Fe, Pb, Mn, Ni, Se, Ag, and Zn exceeded ecological screening level criteria in various samples on various dates, with most of these analytes found either upstream only or both upstream and downstream of Outfall 001. Concentrations exceeded ecological screening level criteria in downstream sites only for Pb in riffle samples in spring 2003, Se in depositional samples in spring 2003, Cu and Mn in riffle samples from summer 2003, Fe in depositional samples in summer 2003, and Mn, Ni, and Zn in depositional samples in fall 2003. All other analyte concentrations were either below detection limits or below all screening level criteria, or screening level criteria do not exist.

Habitat Evaluations

Habitat evaluations at this site were conducted in fall 1999, 2002, 2003, and 2004, with a reduced set of parameters evaluated in spring 2004. Generally, eight habitat units were identified, except in 1999

when six units were identified. Mean depths have ranged from 0.9 - 1.7 feet, and mean maximum depths have ranged from 1.7 - 3.5 feet. Habitat quality ratings have varied from 2.5 - 3.6.

Toxicity Tests

Screening level chronic toxicity tests using *Ceriodaphnia dubia* were performed on water collected at the biological monitoring site downstream of Outfall 001 in October 2002. There were no significant effects on survival or reproduction in these tests. A full dilution series chronic toxicity test using *C. dubia* was conducted on water collected during snowmelt runoff in April 2003. The NOEC for survival was 100% and the NOEC for reproduction was 75% in this test, with corresponding IC_{25} values of >100% and 89.2%, respectively. These values were not significantly different from 100% test water. Full dilution series acute toxicity tests were also performed on water collected during three storm events in summer-fall 2003, each resulting in no significant acute toxicity (i.e., an LC_{50} of >100% test water) at the Site LR-16 downstream of Outfall 001.

Ten-day sediment toxicity tests using *H. azteca* and *C. tentans* were performed on sediment samples collected from the biological monitoring site downstream of Outfall 001 in October 2002 and October 2003. No significant effects on survival or growth were detected in the tests using *C. tentans*; however, there was only 71.3% survival in the October 2002 tests using *H. azteca*, significantly different from the control. Other tests using *H. azteca* showed no significant differences from control values.

Summary

Even though Outfall 002 is the only NPDES permitted outfall currently in active use by Molycorp, chemical concentrations in the water frequently differ upstream and downstream of both Outfalls 001 and 002, reflecting changes in chemistry occurring through this study reach unrelated to surface discharges. Regardless, biota population parameters show no measurable effects when comparing sites upstream and downstream of each outfall and are frequently greater downstream of outfall locations.

Literature Cited

Chadwick Ecological Consultants, Inc. 1997. *Aquatic Biological Assessment of the Red River, New Mexico, in the Vicinity of the Questa Molybdenum Mine.* Report prepared for Molycorp, Inc., Questa, NM.

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U.S. Environmental Protection Agency. 2002. *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms.* EPA-821-R-02-012. Office of Water, Washington, DC.

MOLYCORP, INC
QUESTA DIVISION
NPDES PERMIT NM0022306 APPLICATION

SUPPLEMENTAL INFORMATION

MANGANESE PUMP BACK SYSTEM SUMMARY

Background

The U.S. EPA Region 6 issued an Administrative Order Docket No. CWA-6-01-1204, (AO), dated February 2, 2001, advising Molycorp, Inc. that the manganese loadings discharged from Outfall 002 exceeded those authorized by NPDES Permit NM0022306. The AO further directed Molycorp to develop and implement a plan to achieve full compliance with the new Permit limitations by February 1, 2004

Outfall 002 discharges collected seepage water from tailings ponds and intercepted groundwater to the Red River. Analysis by Vail Engineering, Inc. indicated that elevated manganese loadings were primarily due to the manganese in water transported to the tailings ponds rather than from seepage of such water through the deposited tailings. Water discharged to the ponds include combined well waters and surface waters diverted in the mill area, as well as water used to convey waste ore in a slurry and water from the mine de-watering operation. Vail Engineering found a large variation in the manganese concentrations of these various water streams, with the highest concentrations in the well water pumped for tailings transport and mine de-watering. Vail Engineering determined that 90% of the total manganese loading at Outfall 002 derived from the original drain lines developed in the area down gradient of Dam 1A.

Remediation Program

Vail Engineering recommended that all intercepted water from drain system components that had manganese concentrations in excess of 1.0 mg/L be diverted to a new well. This thus captured high manganese water would then be pumped a distance of 6,000 feet to the Dam 5A pond area and discharged to this upper pond.

The investigation, analyses, and recommendation details are documented in the report, which is included herein by reference.

Implementation of the recommendation was completed by Molycorp in January 2004, consistent with the AO, and Outfall 002 discharge has been in compliance with the Permit Manganese loading limitations since the installation of the pump back system was completed. Molycorp, Inc. submitted the required documentation to EPA Region 6 in a letter dated December 30, 2003. EPA officially closed the AO in a letter dated January

27, 2004. Molycorp, Inc, in a letter to U.S. EPA Region 6 dated February 13, 2004, further demonstrated such compliance

Literature Cited

Vail Engineering. 2003. *Report on Analysis of Molycorp's Outfall 002 Drain System and Proposed Seepage Pump Back System.* Report to Molycorp, Inc., Questa NM, May 2002 (Revised May 2003)

MOLYCORP, INC
QUESTA DIVISION
NPDES PERMIT NM0022306 APPLICATION

SUPPLEMENTAL INFORMATION

BEST MANAGEMENT PRACTICES IMPLEMENTATION SUMMARY

Background

NPDES Permit NM0022306, at Part I.B. prohibited the discharge of pollutants traceable to point source mine operations through a hydrologic connection to the Red River, except in trace amounts. The area in question is marked by natural springs and groundwater seeps, and is thought to originate, in part, from the mine rock piles. The exact source and nature of these springs and seeps has not been determined, nor is it expected that they will be in the near term. Therefore, a requirement to implement Best Management Practices (BMPs) to intercept these non-point flows was included in the Permit in lieu of precise source identification. Part I. C. included a Schedule of Compliance which, in part, scheduled the implementation of the BMPs specified in Part II.B. of the Permit. The design of the BMPs was provided in Part II.A. of the Permit. Satisfaction of BMP implementation requirement constituted compliance with the I.B. prohibition.

The BMPs included the design and construction of two French drains at the Spring 13 and Spring 39 seepage zones, and the construction of three groundwater extraction wells below the toe of the Sugar Shack South mine rock pile. More detailed configurations and locations of the improvements are provided in Part II.A. of the Permit.

Field investigations, both before and after implementation of the BMPs, were specified in the Permit to determine any appropriate changes to the design of the BMPs, and to assess the effectiveness of the BMPs at intercepting the potential seepage. Specified reporting requirements were also included in the Permit provision.

Evaluation of Effectiveness

The above required effectiveness evaluation was conducted by Vail Engineering, Inc. of Santa Fe, New Mexico. The evaluation and its results are documented in a report, (Vail Engineering 2003), which is included herein by reference.

In summary, the evaluation found the following:

Spring 13

During the first several weeks after installation, there was no noticeable seepage and no visible milkyness along the river north shore line. Subsequently, even though there was an apparent reduction in inlet flow to the French drain system, there remained a considerable reduction in visible seepage along the shoreline in this reach of the river.

Spring 39

The Spring 39 drainage system appears to be operating satisfactorily, and has eliminated visual seepage flow along the adjacent shore line.

Groundwater Wells

The groundwater withdrawal wells are functioning as expected, and are having the beneficial effect anticipated. However, because of the low permeability of the basin aquifer along the north side in the vicinity of the wells, the effects of such pumpage will accrue over a longer period of time then anticipated. Gradual reduction in conductance in the water pumped during the initial weeks of the system operation indicates and increasing percentage of basin flow water that is being drawn from outside the seepage plume.

Literature Cited

Vail Engineering. 2003. *Evaluation of Effectiveness, Spring 13 & Spring 39 Seepage Collection Systems, Ground Water Withdrawal Wells,* Report to Molycorp, Inc., Questa, NM, April 30, 2003

These data are permit data subsequent to the RI sampling efforts.

These data have all previously been submitted to regulatory agencies per the permit requirements.

These data have been validated.

The Calcium and Magnesium values are presented in separate tables for the hardness calculation.

There are no non-metals data (field, inorganics, or hardness parameter data) for the dissolved portion of the samples.
Therefore, there is no table provided.

EXPOSURE_AREA_LOOKUP_DESCRIPTION	SITE_ID	SAMP_DATE	SAMP_ID	MEDIUM_TYPE_LOOKUP_DESCRIPTION	SAMP_FRACTION	Aluminum MG/L	Arsenic mg/L	Barium MG/L	Beryllium mg/L	Cadmium mg/L	Chromium mg/L	Cobalt mg/L	Copper MG/L	Iron mg/L	Lead mg/L	Manganese mg/L	Mercury mg/L	Molybdenum mg/L	Nickel mg/L	Selenium mg/L	Silver mg/L	Vanadium mg/L	Zinc mg/L
Surface Water Area 1 - Red River Along Mine	RR-10	09-Jul-04	RR-10 T01N SFW-070904	Surface Water	T	0.43:	<0.005:	0.033:	<0.004:	<0.001:	<0.01:	0.0014J	0.0056J	0.11:	<0.003J	0.076:	<0.0002J	<0.1:	0.0049J	<0.005J	0.00063J	<0.01:	0.022:
Surface Water Area 1 - Red River Along Mine	RR-10	19-Oct-04	RR-10-T01N-SFW-101904	Surface Water	T	0.6:	<0.005:	0.037:	<0.004:	<0.001:	0.0015J	0.0019J	0.0092J	0.24:	<0.003:	0.13:	<0.0002:	<0.02:	0.0085J	<0.005:	<0.002:	<0.01:	0.057:
Surface Water Area 1 - Red River Along Mine	RR-10	18-Jan-05	RR-10-T01N-SFW-011805	Surface Water	T	0.4J	<0.005:	0.033:	<0.004:	<0.001:	<0.01:	0.0025J	0.0046J	<0.1J	<0.003:	0.17:	<0.0002:	<0.02:	<0.02:	<0.005:	<0.002:	<0.01:	0.042J
Surface Water Area 1 - Red River Along Mine	RR-10A1	09-Jul-04	RR10-A1 T01N SFW-070904	Surface Water	T	0.32:	<0.005:	0.036:	<0.004:	<0.001:	<0.01:	0.0012J	0.0049J	0.18:	<0.003:	0.06:	<0.0002:	<0.1:	0.0043J	<0.005J	<0.002:	<0.01:	0.017J
Surface Water Area 1 - Red River Along Mine	RR-10A1	19-Oct-04	RR-10A1-T01N-SFW-101904	Surface Water	T	0.51:	<0.005:	0.039:	<0.004:	<0.001:	<0.01:	0.0015J	0.0073J	<0.19:	<0.003:	0.11:	<0.0002:	<0.02:	<0.02:	<0.005:	<0.002:	<0.01:	0.05:
Surface Water Area 1 - Red River Along Mine	RR-10A1	18-Jan-05	RR-10A1-T01N-SFW-011805	Surface Water	T	0.31J	<0.005:	0.036:	<0.004:	<0.001:	<0.01:	0.0018J	<0.01:	<0.1:	<0.003:	0.12:	<0.0002:	<0.02:	<0.02:	<0.005:	<0.002:	<0.01:	0.034J
Surface Water Area 1 - Red River Along Mine	RR-11A1	09-Jul-04	RR11-A1 T01N SFW-070904	Surface Water	T	0.33:	<0.005:	0.037:	<0.004:	<0.001:	<0.01:	0.0011J	0.0045J	0.11:	<0.003J	0.07:	<0.0002J	<0.1:	0.004J	<0.005J	<0.002:	<0.01:	0.019J
Surface Water Area 1 - Red River Along Mine	RR-11A1	19-Oct-04	RR-11A1-T01N-SFW-101904	Surface Water	T	0.51:	<0.005:	0.04:	<0.004:	<0.001:	<0.01:	0.0012J	0.008J	<0.2:	<0.003:	0.11:	<0.0002:	<0.02:	0.0071J	<0.005:	<0.002:	<0.01:	0.056:
Surface Water Area 1 - Red River Along Mine	RR-11A1	18-Jan-05	RR-11A1-T01N-SFW-011805	Surface Water	T	0.29J	<0.005:	0.034:	<0.004:	<0.001:	<0.01:	0.0014J	0.0031J	<0.1:	<0.003:	0.11:	<0.0002:	<0.02:	<0.02:	<0.005:	<0.002:	<0.01:	0.029J
Surface Water Area 1 - Red River Along Mine	RR-11C	09-Jul-04	RR-11C T01N SFW-070904	Surface Water	T	0.44:	<0.005:	0.037:	<0.004:	<0.001:	<0.01:	0.0015J	0.0048J	<0.1:	<0.003J	0.077:	<0.0002J	<0.1:	0.012J	<0.0053:	0.00086J	<0.01:	0.074:
Surface Water Area 1 - Red River Along Mine	RR-11C	19-Oct-04	RR-11C-T01N-SFW-101904	Surface Water	T	0.57:	<0.005:	0.037:	<0.004:	<0.001:	<0.01:	0.0011J	0.011J	0.25:	<0.003:	0.11:	<0.0002:	<0.02:	0.017J	<0.005:	<0.002:	<0.01:	0.081:
Surface Water Area 1 - Red River Along Mine	RR-11C	18-Jan-05	RR-11C-T01N-SFW-011805	Surface Water	T	0.5J	<0.005:	0.031:	<0.004:	<0.001:	<0.01:	0.0013J	0.0036J	<0.1:	<0.003:	0.094:	<0.0002:	<0.02:	<0.02:	<0.005:	<0.002:	<0.01:	0.14J
Surface Water Area 1 - Red River Along Mine	RR-12	09-Jul-04	RR-12 T01N SFW-070904	Surface Water	T	0.42:	<0.005:	0.036:	<0.004:	0.00021J	<0.01:	0.0013J	0.0045J	0.14:	<0.003J	0.077:	<0.0002:	<0.1:	0.011J	<0.005J	<0.002:	<0.01:	0.071:
Surface Water Area 1 - Red River Along Mine	RR-12	18-Oct-04	RR-12-T01N-SFW-101804	Surface Water	T	0.59:	0.0044J	0.038:	<0.004:	<0.001:	0.0013J	0.0016J	0.0077J	0.25:	<0.003:	0.098:	<0.0002:	<0.02:	0.013J	0.0053:	<0.002:	0.00041J	0.093:
Surface Water Area 1 - Red River Along Mine	RR-12	18-Jan-05	RR-12-T01N-SFW-011805	Surface Water	T	0.51J	<0.005:	0.032:	<0.004:	<0.001:	<0.01:	0.0016J	0.0039J	<0.1:	<0.003:	0.1:	<0.0002:	<0.02:	<0.021:	<0.005:	<0.002:	<0.01:	0.13J
Surface Water Area 1 - Red River Along Mine	RR-13	08-Jul-04	RR-13 T01N SFW-070804	Surface Water	T	0.65:	<0.005:	0.034:	<0.004:	<0.001:	<0.01:	0.0014J	0.008J	0.31:	<0.003J	0.086:	<0.0002:	<0.1:	0.01J	0.0025J	<0.002:	<0.01:	0.062:
Surface Water Area 1 - Red River Along Mine	RR-13	18-Oct-04	RR-13-T01N-SFW-101804	Surface Water	T	0.79:	<0.005:	0.037:	<0.004:	<0.001:	<0.01:	0.0017J	0.0098J	0.25:	<0.003:	0.12:	<0.0002:	<0.02:	0.012J	<0.005:	<0.002:	<0.01:	0.091:
Surface Water Area 1 - Red River Along Mine	RR-13	18-Jan-05	RR-13-T01N-SFW-011805	Surface Water	T	0.92J	<0.005:	0.031:	<0.004:	<0.001:	<0.01:	0.0019J	0.0099J	<0.12:	<0.003:	0.16:	<0.0002:	<0.02:	<0.02:	<0.005:	<0.002:	<0.01:	0.13J
Surface Water Area 1 - Red River Along Mine	RR-14	08-Jul-04	RR-14 T01N SFW-070804	Surface Water	T	0.93:	<0.005:	0.036:	<0.004:	<0.001:	<0.01:	0.0022J	0.01:	0.23:	<0.003J	0.13:	<0.0002:	<0.1:	0.011J	<0.005J	<0.002:	<0.01:	0.077:
Surface Water Area 1 - Red River Along Mine	RR-14	18-Oct-04	RR-14-T01N-SFW-101804	Surface Water	T	1.2:	0.0023J	0.038:	<0.004:	<0.001:	<0.01:	0.0025J	0.014J	0.35:	<0.003:	0.18:	<0.0002:	<0.02:	0.014J	<0.005:	<0.002:	<0.01:	0.11:
Surface Water Area 1 - Red River Along Mine	RR-14	18-Jan-05	RR-14-T01N-SFW-011805	Surface Water	T	1.4J	<0.005:	0.031:	0J	<0.001:	<0.01:	0.0032J	0.014:	0.19:	<0.003:	0.23:	<0.0002:	<0.02:	<0.022:	<0.005:	<0.002:	<0.01:	0.15J
Surface Water Area 1 - Red River Along Mine	RR-16	08-Jul-04	RR-16 T01N SFW-070804	Surface Water	T	1:	<0.005:	0.036:	0.00044J	0.0003J	<0.01:	0.0022J	0.011:	0.13:	<0.003J	0.17:	<0.0002:	<0.1:	0.012J	<0.005J	<0.002:	<0.01:	0.092:
Surface Water Area 1 - Red River Along Mine	RR-16	18-Oct-04	RR-16-T01N-SFW-101804	Surface Water	T	1.4:	<0.005:	0.038:	<0.004:	<0.001:	0.00066J	0.0031J	0.016J	0.44:	0.0015J	0.24:	<0.0002:	<0.02:	0.015J	<0.005:	<0.002:	<0.01:	0.1:
Surface Water Area 1 - Red River Along Mine	RR-16	18-Jan-05	RR-16-T01N-SFW-011805	Surface Water	T	2J	<0.005:	0.033:	0.00035J	<0.0012:	<0.01:	0.0049:	0.019:	0.27:	<0.003:	0.47:	<0.0002:	<0.02:	0.025:	<0.005:	<0.002:	<0.01:	<0.21J
Surface Water Area 1 - Red River Along Mine	RR-7	09-Jul-04	RR-7 T01N SFW-070904	Surface Water	T	0.48:	<0.005:	0.033:	<0.004:	<0.001:	<0.01:	0.0015J	0.0067J	0.17:	<0.003J	0.085:	<0.0002J	<0.1:	0.005J	<0.005J	0.00077J	<0.01:	0.023:
Surface Water Area 1 - Red River Along Mine	RR-7	19-Oct-04	RR-7-T01N-SFW-101904	Surface Water	T	0.64:	<0.005:	0.037:	<0.004:	<0.001:	0.0012J	0.0019J	0.0095J	0.23:	0.0049:	0.14:	<0.0002:	<0.02:	0.0088J	<0.005:	<0.002:	<0.01:	0.067:
Surface Water Area 1 - Red River Along Mine	RR-7	18-Jan-05	RR-7-T01N-SFW-011805	Surface Water	T	0.8J	<0.005:	0.035:	<0.004:	<0.001:	<0.01:	0.0039J	0.0088J	<0.11:	<0.003:	0.23:	<0.0002:	<0.02:	<0.02:	<0.005:	<0.002:	<0.01:	0.069J

EXPOSURE_AREA_LOOKUP_DESCRIPTION	SITE_ID	SAMP_DATE	SAMP_ID	MEDIUM_TYPE_LOOKUP_DESCRIPTION	SAMP_FRACTION	Aluminum MG/L	Arsenic mg/L	Barium MG/L	Beryllium mg/L	Cadmium mg/L	Chromium mg/L	Cobalt mg/L	Copper MG/L	Iron mg/L	Lead mg/L	Manganese mg/L	Mercury mg/L	Molybdenum mg/L	Nickel mg/L	Selenium mg/L	Silver mg/L	Vanadium mg/L	Zinc mg/L
Surface Water Area 1 - Red River Along Mine	RR-10	09-Jul-04	RR-10 T01N SFW-070904	Surface Water	T	0.43	0.005	0.033	0.004	0.001	0.01	0.0014	0.0056	0.11	0.003	0.076	0.0002	0.1	0.0049	0.005	0.00063	0.01	0.022
Surface Water Area 1 - Red River Along Mine	RR-10	19-Oct-04	RR-10-T01N-SFW-101904	Surface Water	T	0.6	0.005	0.037	0.004	0.001	0.0015	0.0019	0.0092	0.24	0.003	0.13	0.0002	0.02	0.0085	0.005	0.002	0.01	0.057
Surface Water Area 1 - Red River Along Mine	RR-10	18-Jan-05	RR-10-T01N-SFW-011805	Surface Water	T	0.4	0.005	0.033	0.004	0.001	0.01	0.0025	0.0046	0.1	0.003	0.17	0.0002	0.02	0.02	0.005	0.002	0.01	0.042
Surface Water Area 1 - Red River Along Mine	RR-10A1	09-Jul-04	RR10-A1 T01N SFW-070904	Surface Water	T	0.32	0.005	0.036	0.004	0.001	0.01	0.0012	0.0049	0.18	0.003	0.06	0.0002	0.1	0.0043	0.005	0.002	0.01	0.017
Surface Water Area 1 - Red River Along Mine	RR-10A1	19-Oct-04	RR-10A1-T01N-SFW-101904	Surface Water	T	0.51	0.005	0.039	0.004	0.001	0.01	0.0015	0.0073	0.19	0.003	0.11	0.0002	0.02	0.02	0.005	0.002	0.01	0.05
Surface Water Area 1 - Red River Along Mine	RR-10A1	18-Jan-05	RR-10A1-T01N-SFW-011805	Surface Water	T	0.31	0.005	0.036	0.004	0.001	0.01	0.0018	0.01	0.1	0.003	0.12	0.0002	0.02	0.02	0.005	0.002	0.01	0.034
Surface Water Area 1 - Red River Along Mine	RR-11A1	09-Jul-04	RR11-A1 T01N SFW-070904	Surface Water	T	0.33	0.005	0.037	0.004	0.001	0.01	0.0011	0.0045	0.11	0.003	0.07	0.0002	0.1	0.004	0.005	0.002	0.01	0.019
Surface Water Area 1 - Red River Along Mine	RR-11A1	19-Oct-04	RR-11A1-T01N-SFW-101904	Surface Water	T	0.51	0.005	0.04	0.004	0.001	0.01	0.0012	0.008	0.2	0.003	0.11	0.0002	0.02	0.0071	0.005	0.002	0.01	0.056
Surface Water Area 1 - Red River Along Mine	RR-11A1	18-Jan-05	RR-11A1-T01N-SFW-011805	Surface Water	T	0.29	0.005	0.034	0.004	0.001	0.01	0.0014	0.0031	0.1	0.003	0.11	0.0002	0.02	0.02	0.005	0.002	0.01	0.029
Surface Water Area 1 - Red River Along Mine	RR-11C	09-Jul-04	RR-11C T01N SFW-070904	Surface Water	T	0.44	0.005	0.037	0.004	0.001	0.01	0.0015	0.0048	0.1	0.003	0.077	0.0002	0.1	0.012	0.0053	0.00086	0.01	0.074
Surface Water Area 1 - Red River Along Mine	RR-11C	19-Oct-04	RR-11C-T01N-SFW-101904	Surface Water	T	0.57	0.005	0.037	0.004	0.001	0.01	0.0011	0.011	0.25	0.003	0.11	0.0002	0.02	0.017	0.005	0.002	0.01	0.081
Surface Water Area 1 - Red River Along Mine	RR-11C	18-Jan-05	RR-11C-T01N-SFW-011805	Surface Water	T	0.5	0.005	0.031	0.004	0.001	0.01	0.0013	0.0036	0.1	0.003	0.094	0.0002	0.02	0.02	0.005	0.002	0.01	0.14
Surface Water Area 1 - Red River Along Mine	RR-12	09-Jul-04	RR-12 T01N SFW-070904	Surface Water	T	0.42	0.005	0.036	0.004	0.00021	0.01	0.0013	0.0045	0.14	0.003	0.077	0.0002	0.1	0.011	0.005	0.002	0.01	0.071
Surface Water Area 1 - Red River Along Mine	RR-12	18-Oct-04	RR-12-T01N-SFW-101804	Surface Water	T	0.59	0.0044	0.038	0.004	0.001	0.0013	0.0016	0.0077	0.25	0.003	0.098	0.0002	0.02	0.013	0.0053	0.002	0.00041	0.093
Surface Water Area 1 - Red River Along Mine	RR-12	18-Jan-05	RR-12-T01N-SFW-011805	Surface Water	T	0.51	0.005	0.032	0.004	0.001	0.01	0.0016	0.0039	0.1	0.003	0.1	0.0002	0.02	0.021	0.005	0.002	0.01	0.13
Surface Water Area 1 - Red River Along Mine	RR-13	08-Jul-04	RR-13 T01N SFW-070804	Surface Water	T	0.65	0.005	0.034	0.004	0.001	0.01	0.0014	0.008	0.31	0.003	0.086	0.0002	0.1	0.01	0.0025	0.002	0.01	0.062
Surface Water Area 1 - Red River Along Mine	RR-13	18-Oct-04	RR-13-T01N-SFW-101804	Surface Water	T	0.79	0.005	0.037	0.004	0.001	0.01	0.0017	0.0098	0.25	0.003	0.12	0.0002	0.02	0.012	0.005	0.002	0.01	0.091
Surface Water Area 1 - Red River Along Mine	RR-13	18-Jan-05	RR-13-T01N-SFW-011805	Surface Water	T	0.92	0.005	0.031	0.004	0.001	0.01	0.0019	0.0099	0.12	0.003	0.16	0.0002	0.02	0.02	0.005	0.002	0.01	0.13
Surface Water Area 1 - Red River Along Mine	RR-14	08-Jul-04	RR-14 T01N SFW-070804	Surface Water	T	0.93	0.005	0.036	0.004	0.001	0.01	0.0022	0.01	0.23	0.003	0.13	0.0002	0.1	0.011	0.005	0.002	0.01	0.077
Surface Water Area 1 - Red River Along Mine	RR-14	18-Oct-04	RR-14-T01N-SFW-101804	Surface Water	T	1.2	0.0023	0.038	0.004	0.001	0.01	0.0025	0.014	0.35	0.003	0.18	0.0002	0.02	0.014	0.005	0.002	0.01	0.11
Surface Water Area 1 - Red River Along Mine	RR-14	18-Jan-05	RR-14-T01N-SFW-011805	Surface Water	T	1.4	0.005	0.031	0	0.001	0.01	0.0032	0.014	0.19	0.003	0.23	0.0002	0.02	0.022	0.005	0.002	0.01	0.15
Surface Water Area 1 - Red River Along Mine	RR-16	08-Jul-04	RR-16 T01N SFW-070804	Surface Water	T	1	0.005	0.036	0.00044	0.0003	0.01	0.0022	0.011	0.13	0.003	0.17	0.0002	0.1	0.012	0.005	0.002	0.01	0.092
Surface Water Area 1 - Red River Along Mine	RR-16	18-Oct-04	RR-16-T01N-SFW-101804	Surface Water	T	1.4	0.005	0.038	0.004	0.001	0.00066	0.0031	0.016	0.44	0.0015	0.24	0.0002	0.02	0.015	0.005	0.002	0.01	0.1
Surface Water Area 1 - Red River Along Mine	RR-16	18-Jan-05	RR-16-T01N-SFW-011805	Surface Water	T	2	0.005	0.033	0.00035	0.0012	0.01	0.0049	0.019	0.27	0.003	0.47	0.0002	0.02	0.025	0.005	0.002	0.01	0.21
Surface Water Area 1 - Red River Along Mine	RR-7	09-Jul-04	RR-7 T01N SFW-070904	Surface Water	T	0.48	0.005	0.033	0.004	0.001	0.01	0.0015	0.0067	0.17	0.003	0.085	0.0002	0.1	0.005	0.005	0.00077	0.01	0.023
Surface Water Area 1 - Red River Along Mine	RR-7	19-Oct-04	RR-7-T01N-SFW-101904	Surface Water	T	0.64	0.005	0.037	0.004	0.001	0.0012	0.0019	0.0095	0.23	0.0049	0.14	0.0002	0.02	0.0088	0.005	0.002	0.01	0.067
Surface Water Area 1 - Red River Along Mine	RR-7	18-Jan-05	RR-7-T01N-SFW-011805	Surface Water	T	0.8	0.005	0.035	0.004	0.001	0.01	0.0039	0.0088	0.11	0.003	0.23	0.0002	0.02	0.02	0.005	0.002	0.01	0.069

EXPOSURE_AREA_LOOKUP_DESCRIPTION	SITE_ID	SAMP_DATE	SAMP_ID	MEDIUM_TYPE_LOOKUP_DESCRIPTION	SAMP_FRACTION	DO mg/L	Eh millivolts	flow cfs	Fluoride mg/L	PH SU	Specific Conductance uS/cm	Sulfate mg/L	TEMPERATURE Celsius
Surface Water Area 1 - Red River Along Mine	RR-10	09-Jul-04	RR-10 T01N SFW-070904	Surface Water	T				<0.5:			65:	
Surface Water Area 1 - Red River Along Mine	RR-10	09-Jul-04	RR-10 T01N SFW-070904	Surface Water	T	6.6:	135:	21.7:		9:	254:		11.3:
Surface Water Area 1 - Red River Along Mine	RR-10	19-Oct-04	RR-10-T01N-SFW-101904	Surface Water	T	7.1:	50:	16.6:	<0.5:	7.8:	248:	71:	6.6:
Surface Water Area 1 - Red River Along Mine	RR-10	18-Jan-05	RR-10-T01N-SFW-011805	Surface Water	T	9.6	0		<0.5:	7.5	282	92:	0.82
Surface Water Area 1 - Red River Along Mine	RR-10A1	09-Jul-04	RR10-A1 T01N SFW-070904	Surface Water	T			29.9:	<0.5:			53:	
Surface Water Area 1 - Red River Along Mine	RR-10A1	09-Jul-04	RR-10A1-T01N-SFW-070904	Surface Water	T	6.7:	131:			8.8:	237:		9.6:
Surface Water Area 1 - Red River Along Mine	RR-10A1	19-Oct-04	RR-10A1-T01N-SFW-101904	Surface Water	T	6.9:	47:	17.4:	<0.5:	7.8:	271:	60:	7.6:
Surface Water Area 1 - Red River Along Mine	RR-10A1	18-Jan-05	RR-10A1-T01N-SFW-011805	Surface Water	T	9.6	0		<0.5:	7.4	244	68:	0.96
Surface Water Area 1 - Red River Along Mine	RR-11A1	09-Jul-04	RR11-A1 T01N SFW-070904	Surface Water	T			31.7:	<0.5:			54:	
Surface Water Area 1 - Red River Along Mine	RR-11A1	09-Jul-04	RR-11A1-T01N-SFW-070904	Surface Water	T	7:	153:			8.7:	236:		9.1:
Surface Water Area 1 - Red River Along Mine	RR-11A1	19-Oct-04	RR-11A1-T01N-SFW-101904	Surface Water	T	10.8:	97:	19.3:	<0.5:	7.4:	268:	60:	3.3:
Surface Water Area 1 - Red River Along Mine	RR-11A1	18-Jan-05	RR-11A1-T01N-SFW-011805	Surface Water	T	9.6	0		<0.5:	7.5	228	68:	1
Surface Water Area 1 - Red River Along Mine	RR-11C	09-Jul-04	RR-11C T01N SFW-070904	Surface Water	T				<0.5:			76:	
Surface Water Area 1 - Red River Along Mine	RR-11C	09-Jul-04	RR-11C T01N SFW-070904	Surface Water	T	6.6:	173:	35.6:		7.7:	280:		9.3:
Surface Water Area 1 - Red River Along Mine	RR-11C	19-Oct-04	RR-11C-T01N-SFW-101904	Surface Water	T	7:	72:	22.8:	0.51:	7.4:	311:	83:	6.7:
Surface Water Area 1 - Red River Along Mine	RR-11C	18-Jan-05	RR-11C-T01N-SFW-011805	Surface Water	T	8.9	0	12	0.8:	7	310	110:	1.5
Surface Water Area 1 - Red River Along Mine	RR-12	09-Jul-04	RR-12 T01N SFW-070904	Surface Water	T				0.54:			77:	
Surface Water Area 1 - Red River Along Mine	RR-12	09-Jul-04	RR-12 T01N SFW-070904	Surface Water	T	3.9:	197:	30:		8:	288:		12.9:
Surface Water Area 1 - Red River Along Mine	RR-12	18-Oct-04	RR-12-T01N-SFW-101804	Surface Water	T	8.9:	94:	27.4:	0.59:	7.6:	286:	84:	7.5:
Surface Water Area 1 - Red River Along Mine	RR-12	18-Jan-05	RR-12-T01N-SFW-011805	Surface Water	T	9.2	0	12.6	0.77:	7.3	315	110:	1.9
Surface Water Area 1 - Red River Along Mine	RR-13	08-Jul-04	RR-13 T01N SFW-070804	Surface Water	T				<0.5:			78:	
Surface Water Area 1 - Red River Along Mine	RR-13	08-Jul-04	RR-13 T01N SFW-070804	Surface Water	T		257:	29.4:		7.9:	280:		22:
Surface Water Area 1 - Red River Along Mine	RR-13	18-Oct-04	RR-13-T01N-SFW-101804	Surface Water	T	9:	93:	26.2:	<0.5:	7.7:	290:	86:	7.7:
Surface Water Area 1 - Red River Along Mine	RR-13	18-Jan-05	RR-13-T01N-SFW-011805	Surface Water	T	9.1	0	13.1	0.84:	7.2	309	130:	2.1
Surface Water Area 1 - Red River Along Mine	RR-14	08-Jul-04	RR-14 T01N SFW-070804	Surface Water	T				0.57:			81:	
Surface Water Area 1 - Red River Along Mine	RR-14	08-Jul-04	RR-14 T01N SFW-070804	Surface Water	T	4.4:	267:	31.6:		7.8:	285:		16.5:
Surface Water Area 1 - Red River Along Mine	RR-14	18-Oct-04	RR-14-T01N-SFW-101804	Surface Water	T	8.6:	78:	28.3:	0.61:	7.5:	294:	92:	6.5:
Surface Water Area 1 - Red River Along Mine	RR-14	18-Jan-05	RR-14-T01N-SFW-011805	Surface Water	T	9.3	0	13.3	0.84:	7.2	321	130:	1.7
Surface Water Area 1 - Red River Along Mine	RR-16	08-Jul-04	RR-16 T01N SFW-070804	Surface Water	T				0.61:			84:	
Surface Water Area 1 - Red River Along Mine	RR-16	08-Jul-04	RR-16 T01N SFW-070804	Surface Water	T	7.9:	262:	31.1:		7.8:	287:		15.7:
Surface Water Area 1 - Red River Along Mine	RR-16	18-Oct-04	RR-16-T01N-SFW-101804	Surface Water	T	9.3:	121:	23.4:	0.69:	7.4:	298:	95:	7:
Surface Water Area 1 - Red River Along Mine	RR-16	18-Jan-05	RR-16-T01N-SFW-011805	Surface Water	T	9.7	32		1.2:	7	328	130:	2.4
Surface Water Area 1 - Red River Along Mine	RR-7	09-Jul-04	RR-7 T01N SFW-070904	Surface Water	T				<0.5:			65:	
Surface Water Area 1 - Red River Along Mine	RR-7	09-Jul-04	RR-7 T01N SFW-070904	Surface Water	T	6.6:	150:	22.5:		9:	253:		12.3:
Surface Water Area 1 - Red River Along Mine	RR-7	19-Oct-04	RR-7-T01N-SFW-101904	Surface Water	T	7.1:	50:	15.5:	<0.5:	7.8:	237:	72:	7.3:
Surface Water Area 1 - Red River Along Mine	RR-7	18-Jan-05	RR-7-T01N-SFW-011805	Surface Water	T	9.5	0	8.5	<0.5:	7.4	290	100:	0.19

EXPOSURE_AREA_LOOKUP_DESCRIPTION	SITE_ID	SAMP_DATE	SAMP_ID	MEDIUM_TYPE_LOOKUP_DESCRIPTION	SAMP_FRACTION	DO mg/L	Eh millivolts	flow cfs	Fluoride mg/L	PH SU	Specific Conductance uS/cm	Sulfate mg/L	TEMPERATURE Celsius
Surface Water Area 1 - Red River Along Mine	RR-10	09-Jul-04	RR-10 T01N SFW-070904	Surface Water	T				0.5			65	
Surface Water Area 1 - Red River Along Mine	RR-10	09-Jul-04	RR-10 T01N SFW-070904	Surface Water	T	6.6	135	21.7		9	254		11.3
Surface Water Area 1 - Red River Along Mine	RR-10	19-Oct-04	RR-10-T01N-SFW-101904	Surface Water	T	7.1	50	16.6	0.5	7.8	248	71	6.6
Surface Water Area 1 - Red River Along Mine	RR-10	18-Jan-05	RR-10-T01N-SFW-011805	Surface Water	T	9.6	0		0.5	7.5	282	92	0.82
Surface Water Area 1 - Red River Along Mine	RR-10A1	09-Jul-04	RR10-A1 T01N SFW-070904	Surface Water	T			29.9	0.5			53	
Surface Water Area 1 - Red River Along Mine	RR-10A1	09-Jul-04	RR-10A1-T01N-SFW-070904	Surface Water	T	6.7	131			8.8	237		9.6
Surface Water Area 1 - Red River Along Mine	RR-10A1	19-Oct-04	RR-10A1-T01N-SFW-101904	Surface Water	T	6.9	47	17.4	0.5	7.8	271	60	7.6
Surface Water Area 1 - Red River Along Mine	RR-10A1	18-Jan-05	RR-10A1-T01N-SFW-011805	Surface Water	T	9.6	0		0.5	7.4	244	68	0.96
Surface Water Area 1 - Red River Along Mine	RR-11A1	09-Jul-04	RR11-A1 T01N SFW-070904	Surface Water	T			31.7	0.5			54	
Surface Water Area 1 - Red River Along Mine	RR-11A1	09-Jul-04	RR-11A1-T01N-SFW-070904	Surface Water	T	7	153			8.7	236		9.1
Surface Water Area 1 - Red River Along Mine	RR-11A1	19-Oct-04	RR-11A1-T01N-SFW-101904	Surface Water	T	10.8	97	19.3	0.5	7.4	268	60	3.3
Surface Water Area 1 - Red River Along Mine	RR-11A1	18-Jan-05	RR-11A1-T01N-SFW-011805	Surface Water	T	9.6	0		0.5	7.5	228	68	1
Surface Water Area 1 - Red River Along Mine	RR-11C	09-Jul-04	RR-11C T01N SFW-070904	Surface Water	T				0.5			76	
Surface Water Area 1 - Red River Along Mine	RR-11C	09-Jul-04	RR-11C T01N SFW-070904	Surface Water	T	6.6	173	35.6		7.7	280		9.3
Surface Water Area 1 - Red River Along Mine	RR-11C	19-Oct-04	RR-11C-T01N-SFW-101904	Surface Water	T	7	72	22.8	0.51	7.4	311	83	6.7
Surface Water Area 1 - Red River Along Mine	RR-11C	18-Jan-05	RR-11C-T01N-SFW-011805	Surface Water	T	8.9	0	12	0.8	7	310	110	1.5
Surface Water Area 1 - Red River Along Mine	RR-12	09-Jul-04	RR-12 T01N SFW-070904	Surface Water	T				0.54			77	
Surface Water Area 1 - Red River Along Mine	RR-12	09-Jul-04	RR-12 T01N SFW-070904	Surface Water	T	3.9	197	30		8	288		12.9
Surface Water Area 1 - Red River Along Mine	RR-12	18-Oct-04	RR-12-T01N-SFW-101804	Surface Water	T	8.9	94	27.4	0.59	7.6	286	84	7.5
Surface Water Area 1 - Red River Along Mine	RR-12	18-Jan-05	RR-12-T01N-SFW-011805	Surface Water	T	9.2	0	12.6	0.77	7.3	315	110	1.9
Surface Water Area 1 - Red River Along Mine	RR-13	08-Jul-04	RR-13 T01N SFW-070804	Surface Water	T				0.5			78	
Surface Water Area 1 - Red River Along Mine	RR-13	08-Jul-04	RR-13 T01N SFW-070804	Surface Water	T		257	29.4		7.9	280		22
Surface Water Area 1 - Red River Along Mine	RR-13	18-Oct-04	RR-13-T01N-SFW-101804	Surface Water	T	9	93	26.2	0.5	7.7	290	86	7.7
Surface Water Area 1 - Red River Along Mine	RR-13	18-Jan-05	RR-13-T01N-SFW-011805	Surface Water	T	9.1	0	13.1	0.84	7.2	309	130	2.1
Surface Water Area 1 - Red River Along Mine	RR-14	08-Jul-04	RR-14 T01N SFW-070804	Surface Water	T				0.57			81	
Surface Water Area 1 - Red River Along Mine	RR-14	08-Jul-04	RR-14 T01N SFW-070804	Surface Water	T	4.4	267	31.6		7.8	285		16.5
Surface Water Area 1 - Red River Along Mine	RR-14	18-Oct-04	RR-14-T01N-SFW-101804	Surface Water	T	8.6	78	28.3	0.61	7.5	294	92	6.5
Surface Water Area 1 - Red River Along Mine	RR-14	18-Jan-05	RR-14-T01N-SFW-011805	Surface Water	T	9.3	0	13.3	0.84	7.2	321	130	1.7
Surface Water Area 1 - Red River Along Mine	RR-16	08-Jul-04	RR-16 T01N SFW-070804	Surface Water	T				0.61			84	
Surface Water Area 1 - Red River Along Mine	RR-16	08-Jul-04	RR-16 T01N SFW-070804	Surface Water	T	7.9	262	31.1		7.8	287		15.7
Surface Water Area 1 - Red River Along Mine	RR-16	18-Oct-04	RR-16-T01N-SFW-101804	Surface Water	T	9.3	121	23.4	0.69	7.4	298	95	7
Surface Water Area 1 - Red River Along Mine	RR-16	18-Jan-05	RR-16-T01N-SFW-011805	Surface Water	T	9.7	32		1.2	7	328	130	2.4
Surface Water Area 1 - Red River Along Mine	RR-7	09-Jul-04	RR-7 T01N SFW-070904	Surface Water	T				0.5			65	
Surface Water Area 1 - Red River Along Mine	RR-7	09-Jul-04	RR-7 T01N SFW-070904	Surface Water	T	6.6	150	22.5		9	253		12.3
Surface Water Area 1 - Red River Along Mine	RR-7	19-Oct-04	RR-7-T01N-SFW-101904	Surface Water	T	7.1	50	15.5	0.5	7.8	237	72	7.3
Surface Water Area 1 - Red River Along Mine	RR-7	18-Jan-05	RR-7-T01N-SFW-011805	Surface Water	T	9.5	0	8.5	0.5	7.4	290	100	0.19

EXPOSURE_AREA_LOOKUP_DESCRIPTION	SITE_ID	SAMP_DATE	SAMP_ID	MEDIUM_TYPE_LOOKUP_DESCRIPTION	SAMP_FRACTION	Calcium MG/L	Magnesium MG/L
Surface Water Area 1 - Red River Along Mine	RR-10	09-Jul-04	RR-10 T01N SFW-070904	Surface Water	T	36:	7.3:
Surface Water Area 1 - Red River Along Mine	RR-10	19-Oct-04	RR-10-T01N-SFW-101904	Surface Water	T	38:	7.6:
Surface Water Area 1 - Red River Along Mine	RR-10	18-Jan-05	RR-10-T01N-SFW-011805	Surface Water	T	41:	9.3:
Surface Water Area 1 - Red River Along Mine	RR-10A1	09-Jul-04	RR10-A1 T01N SFW-070904	Surface Water	T	33:	6.2:
Surface Water Area 1 - Red River Along Mine	RR-10A1	19-Oct-04	RR-10A1-T01N-SFW-101904	Surface Water	T	36:	6.8:
Surface Water Area 1 - Red River Along Mine	RR-10A1	18-Jan-05	RR-10A1-T01N-SFW-011805	Surface Water	T	36:	7.4:
Surface Water Area 1 - Red River Along Mine	RR-11A1	09-Jul-04	RR11-A1 T01N SFW-070904	Surface Water	T	34:	6.4:
Surface Water Area 1 - Red River Along Mine	RR-11A1	19-Oct-04	RR-11A1-T01N-SFW-101904	Surface Water	T	36:	6.7:
Surface Water Area 1 - Red River Along Mine	RR-11A1	18-Jan-05	RR-11A1-T01N-SFW-011805	Surface Water	T	36:	7.3:
Surface Water Area 1 - Red River Along Mine	RR-11C	09-Jul-04	RR-11C T01N SFW-070904	Surface Water	T	41:	8.3:
Surface Water Area 1 - Red River Along Mine	RR-11C	19-Oct-04	RR-11C-T01N-SFW-101904	Surface Water	T	42:	8.2:
Surface Water Area 1 - Red River Along Mine	RR-11C	18-Jan-05	RR-11C-T01N-SFW-011805	Surface Water	T	46:	10:
Surface Water Area 1 - Red River Along Mine	RR-12	09-Jul-04	RR-12 T01N SFW-070904	Surface Water	T	40:	8:
Surface Water Area 1 - Red River Along Mine	RR-12	18-Oct-04	RR-12-T01N-SFW-101804	Surface Water	T	42:	8.1:
Surface Water Area 1 - Red River Along Mine	RR-12	18-Jan-05	RR-12-T01N-SFW-011805	Surface Water	T	47:	10:
Surface Water Area 1 - Red River Along Mine	RR-13	08-Jul-04	RR-13 T01N SFW-070804	Surface Water	T	39:	7.8:
Surface Water Area 1 - Red River Along Mine	RR-13	18-Oct-04	RR-13-T01N-SFW-101804	Surface Water	T	42:	8.1:
Surface Water Area 1 - Red River Along Mine	RR-13	18-Jan-05	RR-13-T01N-SFW-011805	Surface Water	T	48:	11:
Surface Water Area 1 - Red River Along Mine	RR-14	08-Jul-04	RR-14 T01N SFW-070804	Surface Water	T	39:	7.9:
Surface Water Area 1 - Red River Along Mine	RR-14	18-Oct-04	RR-14-T01N-SFW-101804	Surface Water	T	42:	8.2:
Surface Water Area 1 - Red River Along Mine	RR-14	18-Jan-05	RR-14-T01N-SFW-011805	Surface Water	T	48:	11:
Surface Water Area 1 - Red River Along Mine	RR-16	08-Jul-04	RR-16 T01N SFW-070804	Surface Water	T	40:	8.2:
Surface Water Area 1 - Red River Along Mine	RR-16	18-Oct-04	RR-16-T01N-SFW-101804	Surface Water	T	42:	8.3:
Surface Water Area 1 - Red River Along Mine	RR-16	18-Jan-05	RR-16-T01N-SFW-011805	Surface Water	T	48:	11:
Surface Water Area 1 - Red River Along Mine	RR-7	09-Jul-04	RR-7 T01N SFW-070904	Surface Water	T	36:	7.3:
Surface Water Area 1 - Red River Along Mine	RR-7	19-Oct-04	RR-7-T01N-SFW-101904	Surface Water	T	38:	7.6:
Surface Water Area 1 - Red River Along Mine	RR-7	18-Jan-05	RR-7-T01N-SFW-011805	Surface Water	T	42:	9.6:

EXPOSURE_AREA_LOOKUP_DESCRIPTION	SITE_ID	SAMP_DATE	SAMP_ID	MEDIUM_TYPE_LOOKUP_DESCRIPTION	SAMP_FRACTION	Calcium MG/L	Magnesium MG/L
Surface Water Area 1 - Red River Along Mine	RR-10	09-Jul-04	RR-10 T01N SFW-070904	Surface Water	T	36	7.3
Surface Water Area 1 - Red River Along Mine	RR-10	19-Oct-04	RR-10-T01N-SFW-101904	Surface Water	T	38	7.6
Surface Water Area 1 - Red River Along Mine	RR-10	18-Jan-05	RR-10-T01N-SFW-011805	Surface Water	T	41	9.3
Surface Water Area 1 - Red River Along Mine	RR-10A1	09-Jul-04	RR10-A1 T01N SFW-070904	Surface Water	T	33	6.2
Surface Water Area 1 - Red River Along Mine	RR-10A1	19-Oct-04	RR-10A1-T01N-SFW-101904	Surface Water	T	36	6.8
Surface Water Area 1 - Red River Along Mine	RR-10A1	18-Jan-05	RR-10A1-T01N-SFW-011805	Surface Water	T	36	7.4
Surface Water Area 1 - Red River Along Mine	RR-11A1	09-Jul-04	RR11-A1 T01N SFW-070904	Surface Water	T	34	6.4
Surface Water Area 1 - Red River Along Mine	RR-11A1	19-Oct-04	RR-11A1-T01N-SFW-101904	Surface Water	T	36	6.7
Surface Water Area 1 - Red River Along Mine	RR-11A1	18-Jan-05	RR-11A1-T01N-SFW-011805	Surface Water	T	36	7.3
Surface Water Area 1 - Red River Along Mine	RR-11C	09-Jul-04	RR-11C T01N SFW-070904	Surface Water	T	41	8.3
Surface Water Area 1 - Red River Along Mine	RR-11C	19-Oct-04	RR-11C-T01N-SFW-101904	Surface Water	T	42	8.2
Surface Water Area 1 - Red River Along Mine	RR-11C	18-Jan-05	RR-11C-T01N-SFW-011805	Surface Water	T	46	10
Surface Water Area 1 - Red River Along Mine	RR-12	09-Jul-04	RR-12 T01N SFW-070904	Surface Water	T	40	8
Surface Water Area 1 - Red River Along Mine	RR-12	18-Oct-04	RR-12-T01N-SFW-101804	Surface Water	T	42	8.1
Surface Water Area 1 - Red River Along Mine	RR-12	18-Jan-05	RR-12-T01N-SFW-011805	Surface Water	T	47	10
Surface Water Area 1 - Red River Along Mine	RR-13	08-Jul-04	RR-13 T01N SFW-070804	Surface Water	T	39	7.8
Surface Water Area 1 - Red River Along Mine	RR-13	18-Oct-04	RR-13-T01N-SFW-101804	Surface Water	T	42	8.1
Surface Water Area 1 - Red River Along Mine	RR-13	18-Jan-05	RR-13-T01N-SFW-011805	Surface Water	T	48	11
Surface Water Area 1 - Red River Along Mine	RR-14	08-Jul-04	RR-14 T01N SFW-070804	Surface Water	T	39	7.9
Surface Water Area 1 - Red River Along Mine	RR-14	18-Oct-04	RR-14-T01N-SFW-101804	Surface Water	T	42	8.2
Surface Water Area 1 - Red River Along Mine	RR-14	18-Jan-05	RR-14-T01N-SFW-011805	Surface Water	T	48	11
Surface Water Area 1 - Red River Along Mine	RR-16	08-Jul-04	RR-16 T01N SFW-070804	Surface Water	T	40	8.2
Surface Water Area 1 - Red River Along Mine	RR-16	18-Oct-04	RR-16-T01N-SFW-101804	Surface Water	T	42	8.3
Surface Water Area 1 - Red River Along Mine	RR-16	18-Jan-05	RR-16-T01N-SFW-011805	Surface Water	T	48	11
Surface Water Area 1 - Red River Along Mine	RR-7	09-Jul-04	RR-7 T01N SFW-070904	Surface Water	T	36	7.3
Surface Water Area 1 - Red River Along Mine	RR-7	19-Oct-04	RR-7-T01N-SFW-101904	Surface Water	T	38	7.6
Surface Water Area 1 - Red River Along Mine	RR-7	18-Jan-05	RR-7-T01N-SFW-011805	Surface Water	T	42	9.6

EXPOSURE_AREA_LOOKUP_DESCRIPTION	SITE_ID	SAMP_DATE	SAMP_ID	MEDIUM_TYPE_LOOKUP_DESCRIPTION	SAMP_FRACTION	Aluminum mg/L	Arsenic mg/L	Barium mg/L	Beryllium mg/L	Cadmium mg/L	Chromium mg/L	Cobalt mg/L	Copper mg/L	Iron mg/L	Lead mg/L	Manganese MG/L	Mercury mg/L	Molybdenum mg/L	Nickel mg/L	Selenium mg/L	Silver mg/L	Vanadium mg/L	Zinc mg/L
Surface Water Area 1 - Red River Along Mine	RR-10	09-Jul-04	RR-10 D01N SFW-070904	Surface Water	D	0.23:	<0.005:	0.032:	<0.004:	<0.001:	<0.01:	0.0021J	0.0029J	0.21:	<0.003J	0.069:	<0.0002J	<0.1:	0.0047J	<0.005J	<0.002:	<0.01:	0.014J
Surface Water Area 1 - Red River Along Mine	RR-10	19-Oct-04	RR-10-D01N-SFW-101904	Surface Water	D	0.23:	<0.005:	0.036J	<0.004:	<0.001:	<0.01:	0.0033J	0.006J	<0.18:	<0.003:	0.12:		<0.02:	0.013J	<0.005:	<0.002:	0.0004J	0.047:
Surface Water Area 1 - Red River Along Mine	RR-10	18-Jan-05	RR-10-D01N-SFW-011805	Surface Water	D	0.013J	<0.005:	0.032:	<0.004:	<0.001:	<0.01:	0.0033J	0.001J	0.37J	0.002J	0.17:		<0.02:	<0.02:	<0.005:	<0.002:	<0.01:	0.25J
Surface Water Area 1 - Red River Along Mine	RR-10A1	09-Jul-04	RR10-A1 D01N SFW-070904	Surface Water	D	0.15:	<0.005:	0.035:	<0.004:	<0.001:	<0.01:	0.0049J	0.0021J	<0.1:	<0.003:	0.06:	<0.0002:	<0.1:	0.0044J	<0.005J	<0.002:	<0.01:	0.0093J
Surface Water Area 1 - Red River Along Mine	RR-10A1	19-Oct-04	RR-10A1-D01N-SFW-101904	Surface Water	D	<0.17:	<0.005:	0.037J	<0.004:	<0.001:	<0.01:	0.0037J	0.0022J	<0.1:	<0.003:	0.1:		<0.02:	0.0069J	<0.005:	<0.002:	<0.01:	0.062:
Surface Water Area 1 - Red River Along Mine	RR-10A1	18-Jan-05	RR-10A1-D01N-SFW-011805	Surface Water	D	<0.05J	<0.005:	0.035:	<0.004:	<0.001:	<0.01:	0.0036J	0.00096J	<0.1:	<0.003:	0.12:		<0.02:	<0.02:	<0.005:	<0.002:	<0.01:	0.032J
Surface Water Area 1 - Red River Along Mine	RR-11A1	09-Jul-04	RR11-A1 D01N SFW-070904	Surface Water	D	0.16:	<0.005:	0.036:	<0.004:	<0.001:	<0.01:	0.0079J	0.0023J	<0.1:	<0.003J	0.073:	<0.0002J	<0.1:	0.0048J	<0.005J	0.00063J	<0.01:	0.011J
Surface Water Area 1 - Red River Along Mine	RR-11A1	19-Oct-04	RR-11A1-D01N-SFW-101904	Surface Water	D	<0.17:	<0.005:	0.037J	<0.004:	<0.001:	<0.01:	0.0018J	0.0025J	<0.1:	<0.003:	0.1:		<0.02:	0.0063J	<0.005:	<0.002:	0.0004J	0.042:
Surface Water Area 1 - Red River Along Mine	RR-11A1	18-Jan-05	RR-11A1-D01N-SFW-011805	Surface Water	D	0.0089J	<0.005:	0.034:	<0.004:	<0.001:	<0.01:	0.0031J	0.00085J	<0.1:	<0.003:	0.11:		<0.02:	<0.02:	<0.005:	<0.002:	<0.01:	0.02J
Surface Water Area 1 - Red River Along Mine	RR-11C	09-Jul-04	RR-11C D01N SFW-070904	Surface Water	D	0.19:	<0.005:	0.035:	<0.004:	<0.001:	<0.01:	0.0077J	0.0025J	<0.1:	<0.003J	0.08:	<0.0002J	<0.1:	0.012J	<0.005:	<0.002:	<0.01:	0.065:
Surface Water Area 1 - Red River Along Mine	RR-11C	19-Oct-04	RR-11C-D01N-SFW-101904	Surface Water	D	<0.19:	<0.005:	0.036J	<0.004:	<0.001:	<0.01:	0.0023J	0.0024J	<0.1:	<0.003:	0.098:		<0.02:	0.013J	<0.005:	<0.002:	<0.01:	0.094:
Surface Water Area 1 - Red River Along Mine	RR-11C	18-Jan-05	RR-11C-D01N-SFW-011805	Surface Water	D	0.061J	<0.005:	0.03:	<0.004:	<0.001:	<0.01:	0.0037J	0.0011J	<0.1:	<0.003:	0.095:		<0.02:	<0.02:	<0.005:	<0.002:	<0.01:	0.12J
Surface Water Area 1 - Red River Along Mine	RR-12	09-Jul-04	RR-12 D01N SFW-070904	Surface Water	D	0.18:	<0.005:	0.035:	<0.004:	<0.001:	<0.01:	0.0011J	0.0033J	<0.1:	<0.003J	0.073:	<0.0002:	<0.1:	0.012J	<0.005J	<0.002:	<0.01:	0.06:
Surface Water Area 1 - Red River Along Mine	RR-12	18-Oct-04	RR-12-D01N-SFW-101804	Surface Water	D	0.21:	<0.005:	0.035J	<0.004:	<0.001:	<0.01:	0.0036J	0.0022J	<0.1:	<0.003:	0.095:		<0.02:	0.011J	<0.005:	<0.002:	<0.01:	0.15:
Surface Water Area 1 - Red River Along Mine	RR-12	18-Jan-05	RR-12-D01N-SFW-011805	Surface Water	D	0.049J	<0.005:	0.031:	<0.004:	<0.001:	<0.01:	0.0022J	0.0012J	<0.1:	<0.003:	0.1:		<0.02:	<0.02:	<0.005:	<0.002:	<0.01:	0.12J
Surface Water Area 1 - Red River Along Mine	RR-13	08-Jul-04	RR-13 D01N SFW-070804	Surface Water	D	0.35:	<0.005:	0.033:	<0.004:	<0.001J	<0.01:	0.00089J	0.0039J	<0.1:	<0.003J	0.077:	<0.0002:	<0.1:	0.0091J	<0.005J	<0.002:	<0.01:	0.041:
Surface Water Area 1 - Red River Along Mine	RR-13	18-Oct-04	RR-13-D01N-SFW-101804	Surface Water	D	0.32:	<0.005:	0.035J	<0.004:	<0.001:	<0.01:	0.0028J	0.0061J	<0.1:	<0.003:	0.12:		<0.02:	0.012J	0.0053:	<0.002:	<0.01:	0.091:
Surface Water Area 1 - Red River Along Mine	RR-13	18-Jan-05	RR-13-D01N-SFW-011805	Surface Water	D	0.13J	<0.005:	0.03:	<0.004:	<0.001:	<0.01:	0.0045J	0.0029J	0.17:	<0.003:	0.17:		<0.02:	<0.021:	<0.005:	<0.001:	<0.01:	0.12J
Surface Water Area 1 - Red River Along Mine	RR-14	08-Jul-04	RR-14 D01N SFW-070804	Surface Water	D	0.27:	<0.005:	0.033:	<0.004:	<0.001:	<0.01:	0.0016J	0.0037J	<0.1:	<0.003J	0.12:	<0.0002:	<0.1:	0.011J	<0.005J	<0.002:	<0.01:	0.048:
Surface Water Area 1 - Red River Along Mine	RR-14	18-Oct-04	RR-14-D01N-SFW-101804	Surface Water	D	0.23:	0.0025J	0.034J	<0.004:	<0.001:	<0.01:	0.0084J	0.0033J	<0.11:	<0.003:	0.18:		<0.02:	0.014J	<0.005:	<0.002:	<0.01:	0.069:
Surface Water Area 1 - Red River Along Mine	RR-14	18-Jan-05	RR-14-D01N-SFW-011805	Surface Water	D	0.043J	<0.005:	0.03:	<0.004:	<0.001:	<0.01:	0.0039J	0.0025J	<0.1:	<0.003:	0.23:		<0.02:	<0.023:	<0.005:	<0.002:	<0.01:	0.13J
Surface Water Area 1 - Red River Along Mine	RR-16	08-Jul-04	RR-16 D01N SFW-070804	Surface Water	D	0.26:	<0.005:	0.034:	<0.004:	<0.001:	<0.01:	0.0017J	0.0034J	<0.1:	<0.003J	0.16:	<0.0002:	<0.1:	0.012J	<0.005J	<0.002:	<0.01:	0.056:
Surface Water Area 1 - Red River Along Mine	RR-16	18-Oct-04	RR-16-D01N-SFW-101804	Surface Water	D	0.26:	0.0021J	0.034J	<0.004:	0.00025J	<0.01:	0.0031J	0.0034J	<0.1:	<0.003:	0.23:		<0.02:	0.014J	0.0064:	<0.002:	<0.01:	0.083J
Surface Water Area 1 - Red River Along Mine	RR-16	18-Jan-05	RR-16-D01N-SFW-011805	Surface Water	D	0.048J	<0.005:	0.03:	<0.004:	<0.001:	<0.01:	0.0075J	0.0033J	<0.1:	<0.003:	0.34:		<0.02:	0.026:	<0.005:	<0.002:	<0.01:	0.15J
Surface Water Area 1 - Red River Along Mine	RR-7	09-Jul-04	RR-7 D01N SFW-070904	Surface Water	D	0.27:	<0.005:	0.032:	<0.004:	<0.001:	<0.01:	0.0037J	0.003J	<0.1:	<0.003J	0.082:	<0.0002J	<0.1:	0.0049J	<0.005J	<0.002:	<0.01:	0.018J
Surface Water Area 1 - Red River Along Mine	RR-7	19-Oct-04	RR-7-D01N-SFW-101904	Surface Water	D	0.2:	<0.005:	0.035J	<0.004:	<0.001:	0.0022J	0.0028J	0.0025J	<0.1:	<0.003:	0.13:		<0.02:	0.0089J	<0.005:	<0.002:	<0.01:	0.043:
Surface Water Area 1 - Red River Along Mine	RR-7	18-Jan-05	RR-7-D01N-SFW-011805	Surface Water	D	0.034J	<0.005:	0.033:	<0.004:	<0.001:	<0.01:	0.0072J	0.0016J	<0.1:	<0.003:	0.23:		<0.02:	<0.02:	<0.005:	<0.002:	<0.01:	0.052J

EXPOSURE_AREA_LOOKUP_DESCRIPTION	SITE_ID	SAMP_DATE	SAMP_ID	MEDIUM_TYPE_LOOKUP_DESCRIPTION	SAMP_FRACTION	Aluminum mg/L	Arsenic mg/L	Barium mg/L	Beryllium mg/L	Cadmium mg/L	Chromium mg/L	Cobalt mg/L	Copper mg/L	Iron mg/L	Lead mg/L	Manganese MG/L	Mercury mg/L	Molybdenum mg/L	Nickel mg/L	Selenium mg/L	Silver mg/L	Vanadium mg/L	Zinc mg/L
Surface Water Area 1 - Red River Along Mine	RR-10	09-Jul-04	RR-10 D01N SFW-070904	Surface Water	D	0.23	0.005	0.032	0.004	0.001	0.01	0.0021	0.0029	0.21	0.003	0.069	0.0002	0.1	0.0047	0.005	0.002	0.01	0.014
Surface Water Area 1 - Red River Along Mine	RR-10	19-Oct-04	RR-10-D01N-SFW-101904	Surface Water	D	0.23	0.005	0.036	0.004	0.001	0.01	0.0033	0.006	0.18	0.003	0.12		0.02	0.013	0.005	0.002	0.0004	0.047
Surface Water Area 1 - Red River Along Mine	RR-10	18-Jan-05	RR-10-D01N-SFW-011805	Surface Water	D	0.013	0.005	0.032	0.004	0.001	0.01	0.0033	0.001	0.37	0.002	0.17		0.02	0.02	0.005	0.002	0.01	0.25
Surface Water Area 1 - Red River Along Mine	RR-10A1	09-Jul-04	RR10-A1 D01N SFW-070904	Surface Water	D	0.15	0.005	0.035	0.004	0.001	0.01	0.0049	0.0021	0.1	0.003	0.06	0.0002	0.1	0.0044	0.005	0.002	0.01	0.0093
Surface Water Area 1 - Red River Along Mine	RR-10A1	19-Oct-04	RR-10A1-D01N-SFW-101904	Surface Water	D	0.17	0.005	0.037	0.004	0.001	0.01	0.0037	0.0022	0.1	0.003	0.1		0.02	0.0069	0.005	0.002	0.01	0.062
Surface Water Area 1 - Red River Along Mine	RR-10A1	18-Jan-05	RR-10A1-D01N-SFW-011805	Surface Water	D	0.05	0.005	0.035	0.004	0.001	0.01	0.0036	0.00096	0.1	0.003	0.12		0.02	0.02	0.005	0.002	0.01	0.032
Surface Water Area 1 - Red River Along Mine	RR-11A1	09-Jul-04	RR11-A1 D01N SFW-070904	Surface Water	D	0.16	0.005	0.036	0.004	0.001	0.01	0.0079	0.0023	0.1	0.003	0.073	0.0002	0.1	0.0048	0.005	0.00063	0.01	0.011
Surface Water Area 1 - Red River Along Mine	RR-11A1	19-Oct-04	RR-11A1-D01N-SFW-101904	Surface Water	D	0.17	0.005	0.037	0.004	0.001	0.01	0.0018	0.0025	0.1	0.003	0.1		0.02	0.0063	0.005	0.002	0.0004	0.042
Surface Water Area 1 - Red River Along Mine	RR-11A1	18-Jan-05	RR-11A1-D01N-SFW-011805	Surface Water	D	0.0089	0.005	0.034	0.004	0.001	0.01	0.0031	0.00085	0.1	0.003	0.11		0.02	0.02	0.005	0.002	0.01	0.02
Surface Water Area 1 - Red River Along Mine	RR-11C	09-Jul-04	RR-11C D01N SFW-070904	Surface Water	D	0.19	0.005	0.035	0.004	0.001	0.01	0.0077	0.0025	0.1	0.003	0.08	0.0002	0.1	0.012	0.005	0.002	0.01	0.065
Surface Water Area 1 - Red River Along Mine	RR-11C	19-Oct-04	RR-11C-D01N-SFW-101904	Surface Water	D	0.19	0.005	0.036	0.004	0.001	0.01	0.0023	0.0024	0.1	0.003	0.098		0.02	0.013	0.005	0.002	0.01	0.094
Surface Water Area 1 - Red River Along Mine	RR-11C	18-Jan-05	RR-11C-D01N-SFW-011805	Surface Water	D	0.061	0.005	0.03	0.004	0.001	0.01	0.0037	0.0011	0.1	0.003	0.095		0.02	0.02	0.005	0.002	0.01	0.12
Surface Water Area 1 - Red River Along Mine	RR-12	09-Jul-04	RR-12 D01N SFW-070904	Surface Water	D	0.18	0.005	0.035	0.004	0.001	0.01	0.0011	0.0033	0.1	0.003	0.073	0.0002	0.1	0.012	0.005	0.002	0.01	0.06
Surface Water Area 1 - Red River Along Mine	RR-12	18-Oct-04	RR-12-D01N-SFW-101804	Surface Water	D	0.21	0.005	0.035	0.004	0.001	0.01	0.0036	0.0022	0.1	0.003	0.095		0.02	0.011	0.005	0.002	0.01	0.15
Surface Water Area 1 - Red River Along Mine	RR-12	18-Jan-05	RR-12-D01N-SFW-011805	Surface Water	D	0.049	0.005	0.031	0.004	0.001	0.01	0.0022	0.0012	0.1	0.003	0.1		0.02	0.02	0.005	0.002	0.01	0.12
Surface Water Area 1 - Red River Along Mine	RR-13	08-Jul-04	RR-13 D01N SFW-070804	Surface Water	D	0.35	0.005	0.033	0.004	0.001	0.01	0.00089	0.0039	0.1	0.003	0.077	0.0002	0.1	0.0091	0.005	0.002	0.01	0.041
Surface Water Area 1 - Red River Along Mine	RR-13	18-Oct-04	RR-13-D01N-SFW-101804	Surface Water	D	0.32	0.005	0.035	0.004	0.001	0.01	0.0028	0.0061	0.1	0.003	0.12		0.02	0.012	0.0053	0.002	0.01	0.091
Surface Water Area 1 - Red River Along Mine	RR-13	18-Jan-05	RR-13-D01N-SFW-011805	Surface Water	D	0.13	0.005	0.03	0.004	0.001	0.01	0.0045	0.0029	0.17	0.003	0.17		0.02	0.021	0.005	0.001	0.01	0.12
Surface Water Area 1 - Red River Along Mine	RR-14	08-Jul-04	RR-14 D01N SFW-070804	Surface Water	D	0.27	0.005	0.033	0.004	0.001	0.01	0.0016	0.0037	0.1	0.003	0.12	0.0002	0.1	0.011	0.005	0.002	0.01	0.048
Surface Water Area 1 - Red River Along Mine	RR-14	18-Oct-04	RR-14-D01N-SFW-101804	Surface Water	D	0.23	0.0025	0.034	0.004	0.001	0.01	0.0084	0.0033	0.11	0.003	0.18		0.02	0.014	0.005	0.002	0.01	0.069
Surface Water Area 1 - Red River Along Mine	RR-14	18-Jan-05	RR-14-D01N-SFW-011805	Surface Water	D	0.043	0.005	0.03	0.004	0.001	0.01	0.0039	0.0025	0.1	0.003	0.23		0.02	0.023	0.005	0.002	0.01	0.13
Surface Water Area 1 - Red River Along Mine	RR-16	08-Jul-04	RR-16 D01N SFW-070804	Surface Water	D	0.26	0.005	0.034	0.004	0.001	0.01	0.0017	0.0034	0.1	0.003	0.16	0.0002	0.1	0.012	0.005	0.002	0.01	0.056
Surface Water Area 1 - Red River Along Mine	RR-16	18-Oct-04	RR-16-D01N-SFW-101804	Surface Water	D	0.26	0.0021	0.034	0.004	0.00025	0.01	0.0031	0.0034	0.1	0.003	0.23		0.02	0.014	0.0064	0.002	0.01	0.083
Surface Water Area 1 - Red River Along Mine	RR-16	18-Jan-05	RR-16-D01N-SFW-011805	Surface Water	D	0.048	0.005	0.03	0.004	0.001	0.01	0.0075	0.0033	0.1	0.003	0.34		0.02	0.026	0.005	0.002	0.01	0.15
Surface Water Area 1 - Red River Along Mine	RR-7	09-Jul-04	RR-7 D01N SFW-070904	Surface Water	D	0.27	0.005	0.032	0.004	0.001	0.01	0.0037	0.003	0.1	0.003	0.082	0.0002	0.1	0.0049	0.005	0.002	0.01	0.018
Surface Water Area 1 - Red River Along Mine	RR-7	19-Oct-04	RR-7-D01N-SFW-101904	Surface Water	D	0.2	0.005	0.035	0.004	0.001	0.0022	0.0028	0.0025	0.1	0.003	0.13		0.02	0.0089	0.005	0.002	0.01	0.043
Surface Water Area 1 - Red River Along Mine	RR-7	18-Jan-05	RR-7-D01N-SFW-011805	Surface Water	D	0.034	0.005	0.033	0.004	0.001	0.01	0.0072	0.0016	0.1	0.003	0.23		0.02	0.02	0.005	0.002	0.01	0.052

EXPOSURE_AREA_LOOKUP_DESCRIPTION	SITE_ID	SAMP_DATE	SAMP_ID	MEDIUM_TYPE_LOOKUP_DESCRIPTION	SAMP_FRACTION	Calcium MG/L	Magnesium MG/L
Surface Water Area 1 - Red River Along Mine	RR-10	09-Jul-04	RR-10 D01N SFW-070904	Surface Water	D	36:	7.3:
Surface Water Area 1 - Red River Along Mine	RR-10	19-Oct-04	RR-10-D01N-SFW-101904	Surface Water	D	38:	7.5:
Surface Water Area 1 - Red River Along Mine	RR-10	18-Jan-05	RR-10-D01N-SFW-011805	Surface Water	D	41:	9.2:
Surface Water Area 1 - Red River Along Mine	RR-10A1	09-Jul-04	RR10-A1 D01N SFW-070904	Surface Water	D	33:	6.2:
Surface Water Area 1 - Red River Along Mine	RR-10A1	19-Oct-04	RR-10A1-D01N-SFW-101904	Surface Water	D	36:	6.8:
Surface Water Area 1 - Red River Along Mine	RR-10A1	18-Jan-05	RR-10A1-D01N-SFW-011805	Surface Water	D	36:	7.4:
Surface Water Area 1 - Red River Along Mine	RR-11A1	09-Jul-04	RR11-A1 D01N SFW-070904	Surface Water	D	34:	6.4:
Surface Water Area 1 - Red River Along Mine	RR-11A1	19-Oct-04	RR-11A1-D01N-SFW-101904	Surface Water	D	36:	6.7:
Surface Water Area 1 - Red River Along Mine	RR-11A1	18-Jan-05	RR-11A1-D01N-SFW-011805	Surface Water	D	36:	7.3:
Surface Water Area 1 - Red River Along Mine	RR-11C	09-Jul-04	RR-11C D01N SFW-070904	Surface Water	D	41:	8.2:
Surface Water Area 1 - Red River Along Mine	RR-11C	19-Oct-04	RR-11C-D01N-SFW-101904	Surface Water	D	42:	8.1:
Surface Water Area 1 - Red River Along Mine	RR-11C	18-Jan-05	RR-11C-D01N-SFW-011805	Surface Water	D	46:	10:
Surface Water Area 1 - Red River Along Mine	RR-12	09-Jul-04	RR-12 D01N SFW-070904	Surface Water	D	40:	8:
Surface Water Area 1 - Red River Along Mine	RR-12	18-Oct-04	RR-12-D01N-SFW-101804	Surface Water	D	42:	8:
Surface Water Area 1 - Red River Along Mine	RR-12	18-Jan-05	RR-12-D01N-SFW-011805	Surface Water	D	47:	10:
Surface Water Area 1 - Red River Along Mine	RR-13	08-Jul-04	RR-13 D01N SFW-070804	Surface Water	D	39:	7.8:
Surface Water Area 1 - Red River Along Mine	RR-13	18-Oct-04	RR-13-D01N-SFW-101804	Surface Water	D	42:	8.2:
Surface Water Area 1 - Red River Along Mine	RR-13	18-Jan-05	RR-13-D01N-SFW-011805	Surface Water	D	48:	11:
Surface Water Area 1 - Red River Along Mine	RR-14	08-Jul-04	RR-14 D01N SFW-070804	Surface Water	D	39:	7.9:
Surface Water Area 1 - Red River Along Mine	RR-14	18-Oct-04	RR-14-D01N-SFW-101804	Surface Water	D	42:	8.2:
Surface Water Area 1 - Red River Along Mine	RR-14	18-Jan-05	RR-14-D01N-SFW-011805	Surface Water	D	48:	11:
Surface Water Area 1 - Red River Along Mine	RR-16	08-Jul-04	RR-16 D01N SFW-070804	Surface Water	D	40:	8.1:
Surface Water Area 1 - Red River Along Mine	RR-16	18-Oct-04	RR-16-D01N-SFW-101804	Surface Water	D	43:	8.4:
Surface Water Area 1 - Red River Along Mine	RR-16	18-Jan-05	RR-16-D01N-SFW-011805	Surface Water	D	47:	11:
Surface Water Area 1 - Red River Along Mine	RR-7	09-Jul-04	RR-7 D01N SFW-070904	Surface Water	D	35:	7.2:
Surface Water Area 1 - Red River Along Mine	RR-7	19-Oct-04	RR-7-D01N-SFW-101904	Surface Water	D	38:	7.6:
Surface Water Area 1 - Red River Along Mine	RR-7	18-Jan-05	RR-7-D01N-SFW-011805	Surface Water	D	42:	9.6:

EXPOSURE_AREA_LOOKUP_DESCRIPTION	SITE_ID	SAMP_DATE	SAMP_ID	MEDIUM_TYPE_LOOKUP_DESCRIPTION	SAMP_FRACTION	Calcium MG/L	Magnesium MG/L
Surface Water Area 1 - Red River Along Mine	RR-10	09-Jul-04	RR-10 D01N SFW-070904	Surface Water	D	36	7.3
Surface Water Area 1 - Red River Along Mine	RR-10	19-Oct-04	RR-10-D01N-SFW-101904	Surface Water	D	38	7.5
Surface Water Area 1 - Red River Along Mine	RR-10	18-Jan-05	RR-10-D01N-SFW-011805	Surface Water	D	41	9.2
Surface Water Area 1 - Red River Along Mine	RR-10A1	09-Jul-04	RR10-A1 D01N SFW-070904	Surface Water	D	33	6.2
Surface Water Area 1 - Red River Along Mine	RR-10A1	19-Oct-04	RR-10A1-D01N-SFW-101904	Surface Water	D	36	6.8
Surface Water Area 1 - Red River Along Mine	RR-10A1	18-Jan-05	RR-10A1-D01N-SFW-011805	Surface Water	D	36	7.4
Surface Water Area 1 - Red River Along Mine	RR-11A1	09-Jul-04	RR11-A1 D01N SFW-070904	Surface Water	D	34	6.4
Surface Water Area 1 - Red River Along Mine	RR-11A1	19-Oct-04	RR-11A1-D01N-SFW-101904	Surface Water	D	36	6.7
Surface Water Area 1 - Red River Along Mine	RR-11A1	18-Jan-05	RR-11A1-D01N-SFW-011805	Surface Water	D	36	7.3
Surface Water Area 1 - Red River Along Mine	RR-11C	09-Jul-04	RR-11C D01N SFW-070904	Surface Water	D	41	8.2
Surface Water Area 1 - Red River Along Mine	RR-11C	19-Oct-04	RR-11C-D01N-SFW-101904	Surface Water	D	42	8.1
Surface Water Area 1 - Red River Along Mine	RR-11C	18-Jan-05	RR-11C-D01N-SFW-011805	Surface Water	D	46	10
Surface Water Area 1 - Red River Along Mine	RR-12	09-Jul-04	RR-12 D01N SFW-070904	Surface Water	D	40	8
Surface Water Area 1 - Red River Along Mine	RR-12	18-Oct-04	RR-12-D01N-SFW-101804	Surface Water	D	42	8
Surface Water Area 1 - Red River Along Mine	RR-12	18-Jan-05	RR-12-D01N-SFW-011805	Surface Water	D	47	10
Surface Water Area 1 - Red River Along Mine	RR-13	08-Jul-04	RR-13 D01N SFW-070804	Surface Water	D	39	7.8
Surface Water Area 1 - Red River Along Mine	RR-13	18-Oct-04	RR-13-D01N-SFW-101804	Surface Water	D	42	8.2
Surface Water Area 1 - Red River Along Mine	RR-13	18-Jan-05	RR-13-D01N-SFW-011805	Surface Water	D	48	11
Surface Water Area 1 - Red River Along Mine	RR-14	08-Jul-04	RR-14 D01N SFW-070804	Surface Water	D	39	7.9
Surface Water Area 1 - Red River Along Mine	RR-14	18-Oct-04	RR-14-D01N-SFW-101804	Surface Water	D	42	8.2
Surface Water Area 1 - Red River Along Mine	RR-14	18-Jan-05	RR-14-D01N-SFW-011805	Surface Water	D	48	11
Surface Water Area 1 - Red River Along Mine	RR-16	08-Jul-04	RR-16 D01N SFW-070804	Surface Water	D	40	8.1
Surface Water Area 1 - Red River Along Mine	RR-16	18-Oct-04	RR-16-D01N-SFW-101804	Surface Water	D	43	8.4
Surface Water Area 1 - Red River Along Mine	RR-16	18-Jan-05	RR-16-D01N-SFW-011805	Surface Water	D	47	11
Surface Water Area 1 - Red River Along Mine	RR-7	09-Jul-04	RR-7 D01N SFW-070904	Surface Water	D	35	7.2
Surface Water Area 1 - Red River Along Mine	RR-7	19-Oct-04	RR-7-D01N-SFW-101904	Surface Water	D	38	7.6
Surface Water Area 1 - Red River Along Mine	RR-7	18-Jan-05	RR-7-D01N-SFW-011805	Surface Water	D	42	9.6

EFFLUENT QUALITY DATA from Discharge Monitoring Reports from December 2000 to January 2005

This data is summarized from the monthly DMR forms submitted by Molycorp Inc. Questa Division, for permit Number NM0022306.
The data summary was prepared by Regulatory Management Inc. Only chemical data was summarized.
The DMR forms covered Discharges 001A, 002A, 004A and 005A. However, during this time period data was reported only for Discharge 002A.
The period of record is December 2000 through January 2005.
Statistical summaries provided only for numeric values. Mass values were reported on the DMR, but were calculated using "less than" values.
Discharge 002A is located approximately 3200 feet west of where SR 552 crosses the Red River. Approximate map coordinates N 36° 41.52' W 105° 37.28'.

Summary Data for Discharge 002A

Comment	Date	Flow Avg MGD	Flow Max. MGD	COD #/day	COD mg/L	pH min SU	pH max SU	TSS #/day	TSS mg/L	Fluoride #/day	Fluoride mg/L	Iron #/day	Iron mg/L	Manganese #/day	Manganese mg/L	Moly #/day	Moly mg/L	Cyanide mg/L	Arsenic mg/L	Cadmium mg/L	Copper mg/L	Lead mg/L	Zinc mg/L	Aluminum #/day	Aluminum mg/L	Mercury mg/L
	Dec-00	0.475	0.507	36.05	<10	7.23	7.51	14.41	<4	6.51	1.9	0.361	<.1	4.12	1.2	6.49	1.8	ND	ND	ND	ND	ND	ND	0.343	<.1	ND
	Jan-01	0.427	0.504	35.68	<10	7.34	7.7	14.27	<4	5.77	1.6	0.357	<.1	3.97	1.1	6.37	1.8	ND	ND	ND	ND	ND	ND	0.359	<.1	ND
	Feb-01	0.439	0.505	37.05	<10	7.26	7.46	14.82	<4	5.93	1.6	0.371	<.1	3.56	0.96	5.93	1.6	ND	ND	ND	ND	ND	ND	0.371	<.1	ND
	Mar-01	0.51	0.62	45.87	<10	7.22	7.52	18.36	<4	6.43	1.4	0.459	<.1	3.41	0.76	5.97	1.3	ND	ND	ND	ND	ND	ND	0.229	<.05	ND
	Apr-01	0.508	0.675	43.23	<10	7.1	7.24	17.28	<4	6.05	1.4	0.432	<.1	3.76	0.876	6.92	1.6	ND	ND	ND	ND	ND	ND	0.22	<.05	MD
	May-01	0.517	0.69	42.65	<10	7.18	7.34	17.06	<4	5.54	1.3	0.426	<.1	3.54	0.83	6.4	1.5	ND	ND	ND	ND	ND	ND	0.23	<.05	ND
	Jun-01	0.504	0.626	39.81	<10	7.38	7.56	15.92	<4	6.77	1.7	0.398	<.1	3.62	0.91	6.77	1.7	ND	ND	ND	ND	ND	ND	0.199	<.05	ND
	Jul-01	0.504	0.7	42.04	<10	7.35	7.52	16.82	<4	6.73	1.6	0.421	<.1	3.83	0.91	7.15	1.7	ND	ND	ND	ND	ND	ND	0.21	<.05	ND
	Aug-01	0.547	0.726	46.4	<10	7.22	7.32	18.56	<4	4.64	1	0.464	<.1	3.67	0.79	5.57	1.2	ND	ND	ND	ND	ND	ND	0.232	<.05	ND
	Sep-01	0.547	0.6	45.98	<10	7.44	7.56	18.38	<4	6.89	1.5	0.46	<.1	3.36	1.3	5.98	1.3	ND	ND	ND	ND	ND	ND	0.25	<.05	ND
	Oct-01	0.591	0.58	41.98	<10	7.44	7.64	16.79	<4	5.04	1.2	0.42	<.1	3.27	0.78	5.88	1.4	ND	ND	ND	ND	ND	ND	NR	NR	ND
	Nov-01	0.487	0.596	40.39	<10	7.28	7.41	16.16	<4	5.25	1.3	0.404	<.1	2.71	0.67	5.25	1.3	ND	ND	ND	ND	ND	ND	NR	NR	ND
	Dec-01	0.65	0.726	52.24	<10	7.42	7.76	20.9	<4	7.31	1.4	0.36	0.069	3.55	0.68	6.79	1.3	ND	ND	ND	ND	ND	ND	NR	NR	ND
	Jan-02	0.655	0.726	53.58	<10	7.42	7.56	21.43	<4	5.89	1.1	0.252	0.047	3.54	1.1	5.89	1.1	ND	ND	ND	ND	ND	ND	NR	NR	ND
	Feb-02	0.631	0.726	51.49	<10	7	7.43	20.6	<4	6.69	1.3	0.242	< .1	3.24	0.63	6.18	1.2	ND	ND	ND	ND	ND	ND	NR	NR	ND
	Mar-02	0.61	0.723	50.89	<10	7.01	7.48	20.36	<4	7.13	1.4	0.509	<.1	3.46	0.68	6.11	1.2	ND	ND	ND	ND	ND	ND	NR	NR	ND
	Apr-02	0.585	0.665	47.72	<10	7.15	7.32	19.09	<4	5.25	1.1	0.477	<.1	2.96	0.62	5.73	1.2	ND	ND	ND	ND	ND	ND	NR	NR	ND
	May-02	0.481	0.624	43.8	<10	7.29	7.36	17.52	<4	7.45	1.7	0.438	<.1	3.15	0.72	6.57	1.5	ND	ND	ND	ND	ND	ND	NR	NR	ND
	Jun-02	0.481	0.634	38.31	<10	7.27	7.32	15.32	<4	6.51	1.7	0.234	0.061	2.76	0.72	6.13	1.6	ND	ND	ND	ND	ND	ND	NR	NR	ND
	Jul-02	0.508	0.639	40.96	<10	7.09	7.35	16.38	<4	5.32	1.3	0.41	<.1	3.19	0.78	6.14	1.5	ND	ND	ND	ND	ND	ND	NR	NR	ND
	Aug-02	0.531	0.662	57.37	13	7.02	7.38	17.65	<4	5.3	1.2	0.441	<.1	3.7	0.84	6.18	1.4	ND	ND	ND	ND	ND	ND	NA	ND	ND
	Sep-02	0.551	0.726	46.4	<10	7.38	7.48	18.56	<4	7.42	1.6	0.464	<.1	3.34	0.72	6.03	1.3	ND	ND	ND	ND	ND	ND	NA	ND	ND
	Oct-02	0.561	0.684	46.4	<10	7.44	7.55	18.56	<4	5.8	1.25	0.464	<.10	3.2	0.69	5.8	1.25	ND	ND	ND	ND	ND	ND	NA	ND	ND
	Nov-02	0.562	0.7	46.57	<10	7.26	7.46	18.63	<4	6.99	1.5	0.466	<.1	3.17	0.68	6.05	1.3	ND	ND	ND	ND	ND	ND	NA	ND	ND
	Dec-02	0.556	0.684	87.53	19	7.17	7.41	18.43	<4	5.53	1.2	0.461	<.1	3.36	0.73	6.45	1.4	ND	ND	ND	ND	ND	ND	NA	ND	ND
	Jan-03	0.55	0.685	113.7	25	7.35	7.38	18.19	<4	5.46	1.35	0.455	<0.1	2.96	0.66	5.23	1.15	ND	ND	ND	ND	ND	ND	NA	ND	ND
	Feb-03	0.542	0.681	46.32	<10	7.24	7.49	18.53	<4	6.02	1.3	0.463	<0.1	3.2	0.69	5.56	1.2	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Mar-03	0.522	0.698	44.65	<10	7.32	7.56	17.86	<4	5.8	1.3	0.446	<.1	2.99	0.67	5.36	1.2	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Apr-03	0.473	0.698	40.31	<10	7.47	7.56	16.12	<4	5.64	1.4	0.403	<.1	2.7	0.67	4.84	1.2	ND	ND	ND	ND	ND	ND	ND	ND	ND
	May-03	0.536	0.726	80	17	7.39	7.55	18.83	<4	5.88	1.25	0.471	<.1	3.11	0.66	5.65	1.2	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jun-03	0.6	0.726	45.82	<10	7.29	7.43	18.32	<4	5.96	1.3	0.458	<.1	3.21	0.7	6.41	1.4	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jul-03	0.577	0.716	48.15	<10	7.29	7.49	19.26	<4	6.74	1.4	0.482	<.1	3.08	0.64	6.26	1.3	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Aug-03	0.591	0.726	49.3	<10	7.2	7.2	35.5	7.2	7.4	1.5	1.38	0.28	3.85	0.78	5.92	1.2	ND	ND	ND	ND	ND	ND	0.591	0.12	ND
	Sep-03	0.611	0.726	51.2	<10	7.34	7.49	20.46	<4	7.93	1.55	0.512	<.1	3.53	0.69	6.39	1.25	ND	ND	ND	ND	ND	ND	NA	ND	ND
	Oct-03	0.613	0.726	50.41	<10	7.42	7.77	20.16	<4	7.56	1.5	0.504	<.1	3.28	0.65	6.05	1.2	ND	ND	ND	ND	ND	ND	NA	ND	ND
	Nov-03	0.59	0.723	46.07	<10	7.26	7.56	18.43	<4	7.83	1.7	0.46	0.1	3.46	0.75	6.91	1.5	ND	ND	ND	ND	ND	ND	NA	ND	ND
	Dec-03	0.602	0.726	50.46	<10	7.36	7.58	20.18	<4	7.57	1.5	0.505	<.1	3.38	0.67	6.06	1.2	ND	ND	ND	ND	ND	ND	NA	ND	ND
	1-Jan	0.535	0.726	49.15	<10	7.09	7.45	19.66	<4	9.84	2	0.492	<.1	3.05	0.62	6.39	1.3	ND	ND	ND	ND	ND	ND	NA	ND	ND
	Feb-04	0.485	0.57	39.14	<10	7.07	7.39	15.62	<4	6.25	1.6	0.391	<.1	2.11	0.54	5.08	1.3	ND	ND	ND	ND	ND	ND	NA	ND	ND
	Mar-04	0.47	0.547	40.06	<10	7.21	7.45	16.02	<4	6.41	1.6	0.401	<.1	1.84	0.46	4.81	1.2	ND	ND	ND	ND	ND	ND	NA	ND	ND
	Apr-04	0.469	0.56	40.88	<10	7.32	7.49	16.36	<4	6.54	1.6	0.409	<0.1	1.92	0.47	4.91	1.2	ND	ND	ND	ND	ND	ND	NA	ND	ND
	May-04	0.504	0.648	39.71	<10	7.22	7.62	15.89	<4	7.15	1.8	0.397	<.1	1.99	0.5	5.16	1.3	ND	ND	ND	ND	ND	ND	NA	ND	ND
	Jun-04	0.477	0.588	43.31	<10	7.26	7.47	17.33	<4	4.55	1.05	0.433	<0.1	2.21	0.51	5.41	1.25	ND	ND	ND	ND	ND	ND	NA	ND	ND
	Jul-04	0.434	0.503	34.8	<10	7.15	7.44	13.92	<4	3.83	1.1	0.348	<.1	1.6	0.46	4.87	1.4	ND	ND	ND	ND	ND	ND	NA	ND	ND
	Aug-04	0.415	0.726	34.96	<10	7.33	7.5	14.12	<4	4.94	1.4	0.352	<.1	1.91	0.54	4.5	1.3	ND	ND	ND	ND	ND	ND	NA	ND	ND
	Sep-04	0.415	0.517	34.22	<10	7.37	7.47	13.69	<4	4.79	1.4	0.342	<.1	1.81	0.53	4.45	1.3	ND	ND	ND	ND	ND	ND	NA	ND	ND
	Oct-04	0.433	0.495	35.97	<10	7.27	7.4	14.39	<4	3.38	0.94	0.36	<.1	1.91	0.48	4.32	1.2	ND	ND	ND	ND	ND	ND	NA	ND	ND
	Nov-04	0.4	0.464	35.75	<10	7.18	7.44	14.29	<4	5.12	1.7	0.357	<0.1	1.86	0.61	4.82	1.6	ND	ND	ND	ND	ND	ND	NA	ND	ND
	Dec-04	0.438	0.72	36.09	<10	7.39	7.52	14.78	<4	5.91	1.6	0.37	<.1	2.44	0.66	5.54	1.5	ND	ND	ND	ND	ND	ND	NA	ND	ND
	Jan-05	0.456	0.503	37.12	<10	7.31	7.53	14.88	<4	5.2	1.4	0.372	<.1	1.75	0.47	4.47	1.2	ND	ND	ND	ND	ND	ND	NA	ND	ND
Summary Statistics																										
Number of values		50	50		4	50	50		1	50	50		5	50	50	50	50									
Median		0.520	0.683			7.28	7.48			5.99	1.40			3.20	0.68	5.95	1.30									
Mean		0.523	0.647							6.16	1.43			3.01	0.72	5.80	1.35									
Max		0.655	0.726	113.7	25	7.5	7.77	35.50		9.84	2.00	1.38	0.28	4.12	1.30	7.15	1.80									
Min		0.400	0.464	34.2	13	7.00	7.20	13.69		3.38	0.94	0.234	0.047	1.60	0.46	4.32	1.10									
STD		0.066	0.083							1.1	0.2			0.7	0.18	0.7	0.2									
CV - %		12.6	12.8							18.6	16.0			22.6	25.6	12.2	13.1									
Geomean											1.41				0.69		1.34									

Red River at Questa

Data Extracted from USGS data files. Columns containing data for permitted parameters were copied. Alpha numeric descriptors were added to USGS STORET number column headings.
Site is approximately 1.6 miles east of the junction of SR38 and SR 552. Site is upstream of Discharge 002A. Site is upstream of confluence with Cabresto Creek.
Approximate coordinates from map - N 36° 42.19' W 105°34.06'

agency cd	site no	sample dt	sample tm	Flow CFS p00061	Turbidity NTU p00076	Diss Fluoride p00950	Total Iron p01045	Diss. Iron p01046	Total Manganese p01055	Diss Manganese p01056	Total Molybdenum p01062	Diss Molybdenum p01060	Total Aluminum p01105	Diss Aluminum p01106	pH Field p00400	Hardness CaCO3 p00900	Sp. Cond lab p00095	Diss Zinc p01090	Tot Zinc p01092	Diss Copper p01040	Total Copper p01042	Diss Lead p01049	Total Lead p01051	Diss Arsenic p01000	Total Arsenic p01002	Diss Cadmium p01025	Total Cadmium p01027	Total Cyanide p00720	Diss Cyanide p00723	Total Mercury p71900
5s	15s	10d	4d	12s	12s	12s	12s	12s	12s	12s	12s	12s	12s	12s	12s	12s	12s	12s	12s	12s	12s	12s	12s	12s	12s	12s	12s	12s	12s	12s
USGS	8E+06	1/1/1901	0:00																											
USGS	8E+06	########	10:00	7.7	3.4							12		14		7.7		278	50	90	< 20								0	
USGS	8E+06	########	10:20	7.6																										
USGS	8E+06	########	13:35	9.6																										
USGS	8E+06	########	13:55	9.6	6							17				7.8	110	257		70									0	
USGS	8E+06	1/16/1979	10:00	6.8	8.2	0.7		120		480		10		9		7.8	130	250	100	130	< 20								0	
USGS	8E+06	3/20/1979	11:15	12	13							8				8.2	130	270		120									0	
USGS	8E+06	4/26/1979	8:35	131	99	0.4		< 10		250		10	< 10			7.6	81	150	20	200	< 20								0	
USGS	8E+06	5/23/1979	12:50	359	150	0.4		30		80		17		6		7.7	64	150	< 20	110	U					U				
USGS	8E+06	6/18/1979	14:15	354	140							9				7.9	60	147		180						< 2			0	
USGS	8E+06	7/24/1979	9:40	117	2.5							4				8	87	190		90						< 2			0	
USGS	8E+06	8/29/1979	14:30	45	9.2	0.5		< 10		180		8		12		7.8	110	250	< 3	90	< 20					< 2			0	
USGS	8E+06	9/25/1979	16:00	24	5.7							6				7.7	110	240		60						< 2			0	
USGS	8E+06	########	14:50	24	4.7	0.6		10		310		7		1		7.7	120	281	50	60								0	0	0
USGS	8E+06	12/4/1979	11:40	12	12	1.1		20		600		3	< 10			7.1	140	340	130	140							M		0 M	
USGS	8E+06	########	13:30	14	130	0.5		10		490		52		29		7.8	140	350	80	170							M			
USGS	8E+06	########	14:30	13				10		580		130		53		7.5	170	340	60	270										
USGS	8E+06	2/7/1980	11:55	13	1	0.4		20		490		7	< 10			7.5	140	290	90	160							M			
USGS	8E+06	4/2/1980	15:30	17	8.8	0.7		< 10		450		10	< 10			7.6	130	294	70	120								0	0	
USGS	8E+06	4/28/1980	18:30	38	17	0.5		< 10		390		6	< 10			7.7	120	278	50	110							M		0	
USGS	8E+06	6/3/1980	15:40	176	7.2	0.1		140		110	<0			2		8	67	157	20	50								0	0	0
USGS	8E+06	7/9/1980	16:00	82	2.1	0.5		10		160		6	< 10			7.8	89	190	20	50							M		0	
USGS	8E+06	8/14/1980	16:45	32	66	0.6		20		300		7		6		8	110	238	30	110								0	0	
USGS	8E+06	9/10/1980	9:00	46	40	0.4		20		190		9	< 10			8	110	220	30	140							M		0.01	
USGS	8E+06	########	14:45	12	0.4	1.8		10		490		8		6		7.7	140	302	70	330							M		0	
USGS	8E+06	########	14:20	5	18	0.9		140		940		12	< 10			7	140	320	190								M		0	
USGS	8E+06	1/8/1981	16:15	9.5	13	0.9		80		600		9		10		7.3	140	290	110	140							M		0	
USGS	8E+06	3/10/1981	12:45	5.9	56	1.1		70		950		27	< 10			7.1	160	340	160	260							M		0	
USGS	8E+06	3/11/1981	12:30	5	31	1		110		990		11		14		7.2	160	330	210	220							M		0	
USGS	8E+06	4/13/1981	16:00	12	33	0.8		20		470		100	< 10			7.6	130	278	50	130	M							0	0	
USGS	8E+06	5/14/1981	16:30	19	4.6	0.6		20		350		1	< 10			7.7	120	271	40	160							M		0	
USGS	8E+06	6/10/1981	14:15	51	5.2	0.4		30		160		6	< 10			7.5	90	185	60	60								0	0	
USGS	8E+06	7/14/1981	15:30	20	18	0.7		10		350		19		11		7.8	130	270	30	90							M		0	
USGS	8E+06	7/17/1981	22:00	18			38000	20	700	60		30		19		7.5	130	270	10	230	< 10	110	< 10	200		< 1		0		
USGS	8E+06	8/12/1981	0:00	29			2E+05	< 10	2600	1500		140	< 10				230		360	750	40	480	< 10	800	22	M	M			0.2
USGS	8E+06	8/13/1981	16:00	19	9.1	0.5		< 10		340		8		10		7.5	120	258	40	100							M	> .01		
USGS	8E+06	10/9/1981	14:00	15	8.8	0.8		< 10		390		7		10		7.5	130	280	40	110								0 > .01		
USGS	8E+06	11/5/1981	11:00	13	0.5	0.8		20		460		8	< 10			7.6	140	290	80	120							< 1	0.01		
USGS	8E+06	2/17/1982	11:50	13				30		590		10		10		7.3		325	110	160		40	< 1				< 1	< .01		
USGS	8E+06	3/24/1982	14:15	15				10		510		8		7		7.2		320	70	120		20					M			
USGS	8E+06	4/29/1982	13:30	30				70		270		4		4		7.4		250	50	90		20					M			
USGS	8E+06	6/2/1982	15:00	131				40		90		3		2		6.8		160	30	50		20					M			
USGS	8E+06	7/6/1982	15:00	76				20	M			4		2		7.6		200	40	60	M						M			
USGS	8E+06	8/20/1982	17:00	43				< 3		270		17		45		7.7		285	M	70		30					M	< .01		
USGS	8E+06	9/16/1982	14:35	51				20		260		4		3		7.3		235	60	70		20					M	< .01		
USGS	8E+06	########	16:00	32				30		390		5		5		7.4		265	60	110		20					M			
USGS	8E+06	12/7/1982	16:45	21				40		530		2		4		7.1		295	110	160		20					M			
USGS	8E+06	2/8/1983	16:30	22				30		520		5		4		7.3		310	90	170		40					M			
USGS	8E+06	4/26/1983	15:00	81			M			1200		5		2		6.8		240	190	420		80					M			
USGS	8E+06	6/7/1983	15:15	247				50		130		6	< 1			7.2		145	30	70		20					M			
USGS	8E+06	7/21/1983	13:40	123			M			250		5	< 1			7.3		200	40	120		20					M			
USGS	8E+06	8/31/1983	13:00	47			M			430		4		4		7.2		290	50	160		20					M			
USGS	8E+06	11/4/1983	11:15	14				10		620		12		6		7.2		290	90	200		30					M			
USGS	8E+06	1/10/1984	14:30	9.1				10				8		9		7.3		345	230	310		50					M	< .01		
USGS	8E+06	4/5/1984	10:00	13				60		1400		6		6		7		320	250	330		50					M			
USGS	8E+06	5/25/1984	14:45	351				40		150		13		2		7		132	40	170		80					M	< .01		
USGS	8E+06	6/28/1984	15:00	95				10		270		5		4		7.1		180	50	90		20					M	< .01		
USGS	8E+06	9/27/1984	13:30	18				20		840		5		4		7		310	100	200		30					M	< .01		
USGS	8E+06	1/16/1985	10:00	8.8				200		1700		4		4		6.9		350	340	370		40					M	< .01		
USGS	8E+06	6/12/1985	10:00	332				35		280		1		2		7.4		155	46	190		27					0.49	< .01		
USGS	8E+06	7/12/1985	14:00	93				11	< 1.0			2		2		8.2		225	11	120		16					0.67			
USGS	8E+06	7/20/1985	19:05	108	130			32		860		100	< 1			4.7		420	260	670		320								
USGS	8E+06	########	14:00	33																										
USGS	8E+06	########	16:00	12				120		1600		4		4				345	290	340		52								
USGS	8E+06	5/22/1986	14:30	114				22		250	< 1			2				170	37	60		6					0.27			
USGS	8E+06	6/12/1986	16:30	240	24			290		240		3		6		7.8		160	70	80		21					0.29			
USGS	8E+06	8/26/1986	15:30	44				20		1400		4		5		7.4		280	180	290		56					1.4	< .01		
USGS	8E+06	9/7/1986	22:00	1100			9E+05	130	18000	12000		36		1	220000	3.8		1100	2600	4400	510	2100	< 10	3300	< 1		6	< 1		
USGS	8E+06	########	13:00	25	10			80		990		8		8		7.3		345	190	210		31					1.1			
USGS	8E+06	9/10/2002	8:00	29				< 10		584					30	7.4		400	18		1.8		< .08				0.15			
														60																
			count	69		26	3	48	3	57		63		43	1	2	63	34	65		58	64	3	31		3				
			mean	77.6		0.68		49		732		16.1		8.6				123	275		138	236	184	125						
			median	24.0		0.60		26		450		8.00		6.00			7.5	130	278		60	130	40	30						
			geomean	32.4		0.61	#####	31	3200	429		8.3		5.5				119	259		71	146	33	40						
			max	1100		1.8	9E+05	290	18000	12000		140		53			8.2	230	1100		2600	4400	510	2100		3300				
			min	5.0		0.1	38000	10	700	60		1		1	220000	30	3.8	60	132		10	50	1.8	6		200				
			85th	10.1		0.925		108.5		974		17		11.7			7.8	140	340		190	281	369	80						
			90th	9.0		1.05		123		1280		29.4		14			7.0	154	345		236	330	416	110						
			95th	7.1		1.1		140		1520		95.2		28			6.81	164	350		297.5	412.5	463	400						
			98th	5.3		1.45		205		1688		123		46			5.20	190	414		357	729	491	1128						

Red River Above Questa
Substituted data set using 1/2 apparent DL as per NM Guidelines

agency_cd 5s	site_no 15s	sample_dt 10d	sample_tm 4d	Flow CFS p00061 12s	Turbidity NTU p00076 12s	Diss Fluoride p00950 12s	Total Iron p01045 12s	Diss. Iron p01046 12s	Total Manganese p01055 12s	Diss Manganese p01056 12s	Total Molybdenum p01062 12s	Diss Molybdenum p01060 12s	Total Aluminum p01105 12s	Diss Aluminum p01106 12s	pH Field p00400 12s	Hardness CaCO3 p00900 12s	Sp. Cond lab p00095 12s	Diss Zinc p01090 12s	Total Zinc p01092 12s	Diss Copper p01040 12s	Total Copper p01042 12s	Diss Lead p01049 12s	Total Lead p01051 12s	Diss Arsenic p01000 12s	Total Arsenic p01002 12s	Diss Cadmium p01025 12s	Total Cadmium p01027 12s	Total Cyanide p00720 12s	Diss Cyanide p00723 12s
USGS	8E+06	1/1/1901	0:00																										
USGS	8E+06	########	10:00	7.7	3.4						12	14			7.7		278	50	90	10								0.005	
USGS	8E+06	########	10:20	7.6																									
USGS	8E+06	########	13:35	9.6																									
USGS	8E+06	########	13:55	9.6	6						17				7.8	110	257		70									0.005	
USGS	8E+06	1/16/1979	10:00	6.8	8.2	0.7		120		480		9			7.8	130	250	100	130	10								0.005	
USGS	8E+06	3/20/1979	11:15	12	13						8				8.2	130	270		120									0.005	
USGS	8E+06	4/26/1979	8:35	131	99	0.4		5		250	10	5			7.6	81	150	20	200	10						1		0.005	
USGS	8E+06	5/23/1979	12:50	359	150	0.4		30		80	17	6			7.7	64	150	10	110	10						1			
USGS	8E+06	6/18/1979	14:15	354	140						9				7.9	60	147		180							1		0.005	
USGS	8E+06	7/24/1979	9:40	117	2.5						4				8	87	190		90							1		0.005	
USGS	8E+06	8/29/1979	14:30	45	9.2	0.5		5		180	8	12			7.8	110	250	1.5	90	10						1		0.005	
USGS	8E+06	9/25/1979	16:00	24	5.7						6				7.7	110	240		60							1		0.005	
USGS	8E+06	########	14:50	24	4.7	0.6		10		310	7	5			7.7	120	281	50	60								0.5	0.005	0.005
USGS	8E+06	12/4/1979	11:40	12	12	1.1		20		600	3	5			7.1	140	340	130	140								0.5	0.005	0.005
USGS	8E+06	########	13:30	14	130	0.5		10		490	52	29			7.8	140	350	80	170								0.5		
USGS	8E+06	########	14:30	13				10		580	130	53			7.5	170	340	60	270										
USGS	8E+06	2/7/1980	11:55	13	1	0.4		20		490	7	5			7.5	140	290	90	160								0.5		
USGS	8E+06	4/2/1980	15:30	17	8.8	0.7		5		450	10	5			7.6	130	294	70	120								0.5	0.005	
USGS	8E+06	4/28/1980	18:30	38	17	0.5		5		390	6	5			7.7	120	278	50	110								0.5	0.005	
USGS	8E+06	6/3/1980	15:40	176	7.2	0.1		140		110	5	2			8	67	157	20	50								0.5	0.005	0.005
USGS	8E+06	7/9/1980	16:00	82	2.1	0.5		10		160	6	5			7.8	89	190	20	50								0.5	0.005	
USGS	8E+06	8/14/1980	16:45	32	66	0.6		20		300	7	6			8	110	238	30	110								0.5	0.005	
USGS	8E+06	9/10/1980	9:00	46	40	0.4		20		190	9	5			8	110	220	30	140								0.5	0.01	
USGS	8E+06	########	14:45	12	0.4	1.8		10		490	8	5			7.7	140	302	70	330								0.5	0.005	
USGS	8E+06	########	14:20	5	18	0.9		140		940	12	5			7	140	320	190									0.5	0.005	
USGS	8E+06	1/8/1981	16:15	9.5	13	0.9		80		600	9	10			7.3	140	290	110	140								0.5	0.005	
USGS	8E+06	3/10/1981	12:45	5.9	56	1.1		70		950	27	5			7.1	160	340	160	260								0.5	0.005	
USGS	8E+06	3/11/1981	12:30	5	31	1		110		990	11	14			7.2	160	330	210	220								0.5	0.005	
USGS	8E+06	4/13/1981	16:00	12	33	0.8		20		470	100	5			7.6	130	278	50	130	10							0.5	0.005	
USGS	8E+06	5/14/1981	16:30	19	4.6	0.6		20		350	1	5			7.7	120	271	40	160								0.5	0.005	
USGS	8E+06	6/10/1981	14:15	51	5.2	0.4		30		160	6	5			7.5	90	185	60	60								0.5	0.005	
USGS	8E+06	7/14/1981	15:30	20	18	0.7		10		350	19	11			7.8	130	270	30	90								0.5	0.005	
USGS	8E+06	7/17/1981	22:00	18			38000	20	700	60	30	19			7.5	130	270	10	230	5	110	5	200			0.5	0.5		
USGS	8E+06	8/12/1981	0:00	29			180000	5	2600	1500	140	5				230		360	750	40	480	5	800		22	1	0.5		
USGS	8E+06	8/13/1981	16:00	19	9.1	0.5		5		340	8	10			7.5	120	258	40	100								0.5	0.005	
USGS	8E+06	10/9/1981	14:00	15	8.8	0.8		5		390	7	10			7.5	130	280	40	110								0.5	0.005	
USGS	8E+06	11/5/1981	11:00	13	0.5	0.8		20		460	8	5			7.6	140	290	80	120								0.5	0.01	
USGS	8E+06	2/17/1982	11:50	13				30		590	10	10			7.3		325	110	160		40	0.5					0.5	0.005	
USGS	8E+06	3/24/1982	14:15	15				10		510	8	7			7.2		320	70	120		20						0.5		
USGS	8E+06	4/29/1982	13:30	30				70		270	4	4			7.4		250	50	90		20						0.5		
USGS	8E+06	6/2/1982	15:00	131				40		90	3	2			6.8		160	30	50		20						0.5		
USGS	8E+06	7/6/1982	15:00	76				20		10	4	2			7.6		200	40	60		10						0.5		
USGS	8E+06	8/20/1982	17:00	43				1.5		270	17	45			7.7		285	10	70		30						0.5	0.005	
USGS	8E+06	9/16/1982	14:35	51				20		260	4	3			7.3		235	60	70		20						0.5	0.005	
USGS	8E+06	########	16:00	32				30		390	5	5			7.4		265	60	110		20						0.5		
USGS	8E+06	12/7/1982	16:45	21				40		530	2	4			7.1		295	110	160		20						0.5		
USGS	8E+06	2/8/1983	16:30	22				30		520	5	4			7.3		310	90	170		40						0.5		
USGS	8E+06	4/26/1983	15:00	81				5		1200	5	2			6.8		240	190	420		80						0.5		
USGS	8E+06	6/7/1983	15:15	247				5		130	6	0.5			7.2		145	30	70		20						0.5		
USGS	8E+06	7/21/1983	13:40	123				5		250	5	0.5			7.3		200	40	120		20						0.5		
USGS	8E+06	8/31/1983	13:00	47				5		430	4	4			7.2		290	50	160		20						0.5		
USGS	8E+06	11/4/1983	11:15	14				10		620	12	6			7.2		290	90	200		30						0.5		
USGS	8E+06	1/10/1984	14:30	9.1				10			8	9			7.3		345	230	310		50						0.5	0.005	
USGS	8E+06	4/5/1984	10:00	13				60		1400	6	6			7		320	250	330		50						0.5		
USGS	8E+06	5/25/1984	14:45	351				40		150	13	2			7		132	40	170		80						0.5	0.005	
USGS	8E+06	6/28/1984	15:00	95				10		270	5	4			7.1		180	50	90		20						0.5	0.005	
USGS	8E+06	9/27/1984	13:30	18				20		840	5	4			7		310	100	200		30						0.5	0.005	
USGS	8E+06	1/16/1985	10:00	8.8				200		1700	4	4			6.9		350	340	370		40						0.5	0.005	
USGS	8E+06	6/12/1985	10:00	332				35		280	1	2			7.4		155	46	190		27						0.49	0.005	
USGS	8E+06	7/12/1985	14:00	93				11		10	2	2			8.2		225	11	120		16						0.67		
USGS	8E+06	7/20/1985	19:05	108	130			32		860	100	0.5			4.7		420	260	670		320								
USGS	8E+06	########	14:00	33																									
USGS	8E+06	########	16:00	12				120		1600	4	4					345	290	340		52								
USGS	8E+06	5/22/1986	14:30	114				22		250	0.5	2					170	37	60		6						0.27		
USGS	8E+06	6/12/1986	16:30	240	24			290		240	3	6			7.8		160	70	80		21						0.29		
USGS	8E+06	8/26/1986	15:30	44				20		1400	4	5			7.4		280	180	290		56						1.4	0.005	
USGS	8E+06	9/7/1986	22:00	1100			940000	130	18000	12000	36	1	220000	23000	3.8		1100	2600	4400	510	2100	5	3300	0.5		6	0.5		
USGS	8E+06	########	13:00	25	10			80		990	8	8			7.3		345	190	210		31						1.1		
USGS	8E+06	9/10/2002	8:00	29				5		584				30	7.4		400	18		1.8		0.04				0.15			
			count	69	35	26	3	60	3	59	65	60	1	2	63	34	65	61	64	10	32	5	3	1	1	9	52	39	3
			mean	77.60	31.07	0.68	386000	40	7100	708	16	7	220000	11515	7	123	275	131	236	62	122	3	1433	1	22	1	1	0	0
			median	24	10	0.6	180000	20	2600	430	7	5	220000	11515	7.5	130	278	60	130	10	30	5	800	0.5	22	1	0.5	0.005	0.005
			geomean	**32.37**	**12.08**	**0.61**	**185949**	**20**	**3200**	**377**	**7.91**	**4.91**	**220000**	**831**	**7.3**	**119**	**259**	**63**	**146**	**13**	**38**	**1.20**	**808**	**0.50**	**22**	**0.92**	**0.51**	**0.0052**	**0.0050**
			max	1100	150	1.8	940000	290	18000	12000	140	53	220000	23000	8.2	230	1100	2600	4400	510	2100	5	3300	0.5	22	6	1.4	0.01	0.005
			min	5	0.4	0.1	38000	1.5	700	10	0.5	0.5	220000	30	3.8	60	132	1.5	50	1.8	6	0.04	200	0.5	22	0.15	0.27	0.005	0.005
			85th	121.8	65	0.925	712000	80	13380	962	17	10	220000	19554.5	7.8	140	340	190	281	29.5	80	5	2550	0.5	22	1	0.5	0.005	0.005
			90th	188.8	117.6	1.05	788000	120	14920	1240	28.8	12.2	220000	2327.0	7.88	154	345	230	330	87	107	5	2800	0.5	22	2	0.5	0.005	0.005
			95th	343.4	133	1.1	864000	140	16460	1510	90.4	19.5	220000	1178.5	8	163.5	350	290	412.5	298.5	392	5	3050	0.5	22	4	0.5765	0.0055	0.005
			98th	357.20	143.20	1.45	909600	189	17384	1684	122	42	220000	489.40	8	190	414	356	729	425	1096	5	3200	1	22	5	1	0	0

Reasonable Potential Spreadsheet - Combined Discharges 001A and 002A

Cd = Estimated worst case in-stream concentration
F = Fraction of stream allowed for mixing
Qa = Critical low flow at discharge point - 4Q3
Qe = WWTP design flow
Cp = Average effluent concentration for WWTP
Ce = Estimated 95th percentile effluent concentration
WQCd = Dissolved water quality standard
WQCt = Total water quality standard
C/Ct = Fraction of total metal that is dissolved
Hardness based metals are based on a hardness of 127 mg/L as CaCO3

Exisiting Permit Parameters that have effluent limitations that are based on Water Quality Standards

Parameter	F MZ adj	Qa 4Q3 mgd	Ca Ambient µg/L	Qe Max Flow mgd	Cp mean µg/L	Ce 95th%tile µg/L	Cd (IWC) µg/L	WQCt Total µg/L	C/Ct	WQCd Dissolved µg/L	
Arsenic	1	4.58	0.43	5.046	0.5	1.07	**0.77**	**4.4**	0.528	2.3	
Cadmium*	1	4.58	0.33	5.046	0.6	1.28	**0.83**	**0.29**	1	0.29	New
Cadmium	1	4.58	0.33	5.046	0.6	1.28	**0.83**	**2.67**	1	2.67	Old
Copper	1	4.58	2.5	5.046	2.5	5.35	**3.99**	**31.8**	0.346	10.99	
Lead	1	4.58	0.35	5.046	0.35	0.75	**0.56**	**17.7**	0.184	3.26	
Zinc	1	4.58	15	5.046	15	32.10	**24**	**501.7**	0.286	143.5	
Molybdenum**	1	4.58	46	5.046	1400	2996	**1592**	**1000**	1	1000	Irrigation
Aluminum	1	4.58	166	5.046	100	214	**191**	**750.0**	1	750	Acute

*The dissolved water quality standard for cadmium is based on the equations given in State of New Mexico
Standards for Interstate and Intrastate Surface Waters as amended July 17, 2005.
**Molybdenum is limited by BAT
***The recommendation is to set the permit limit based on the acute aluminum water quality standard.

Additional parameters to evaluate effluent limits based on Water Quality Standards

Parameter	F MZ adj	Qa 4Q3 mgd	Ca Ambient µg/L	Qe Max Flow mgd	Cp mean µg/L	Ce 95th%tile µg/L	Cd (IWC) µg/L	WQCt Total µg/L	C/Ct	WQCd Dissolved µg/L
Antimony	1	4.58	0.5	5.046	1.0	2.14	**1.36**	**5.6**	1	5.6
Barium	1	4.58	37	5.046	29.0	62.06	**50.1**	**2000**	1	2000
Beryllium	1	4.58	0.2	5.046	0.3	0.64	**0.43**	**4.0**	1	4

Boron	1	4.58	12	5.046	31.0	66.34	**40.5**	**750**	1	750
Chromium	1	4.58	1	5.046	1.5	3.21	**2.16**	**90.1**	1	90.1
Cobalt	1	4.58	3	5.046	2.5	5.35	**4.2**	**50.0**	1	50
Nickel	1	4.58	10.3	5.046	3.0	6.42	**8**	**63.7**	1	63.7
Selenium	1	4.58	0.75	5.046	1.5	3.21	**2.0**	**5.0**	1	5
Silver	1	4.58	0.2	5.046	0.2	0.43	**0.32**	**5.0**	1	4.95
Thallium	1	4.58	0.1	5.046	0.2	0.43	**0.27**	**1.7**	1	1.7
Vanadium	1	4.58	0.3	5.046	1.6	3.42	**1.94**	**100**	1	100

Reasonable Potential Spreadsheet - Discharge 002A

Cd = Estimated worst case in-stream concentration
F = Fraction of stream allowed for mixing
Qa = Critical low flow at discharge point - 4Q3
Qe = WWTP design flow
Cp = Average effluent concentration for WWTP
Ce = Estimated 95th percentile effluent concentration
WQCd = Dissolved water quality standard
WQCt = Total water quality standard
C/Ct = Fraction of total metal that is dissolved
Hardness based metals are based on a hardness of 127 mg/L as CaCO3

Exisiting Permit Parameters that have effluent limitations that are based on Water Quality Standards

Parameter	F MZ adj	Qa 4Q3 mgd	Ca Ambient µg/L	Qe Max Flow mgd	Cp mean µg/L	Ce 95th%tile µg/L	Cd (IWC) µg/L	WQCt Total µg/L	C/Ct	WQCd Dissolved µg/L	
Arsenic	1	4.58	0.43	0.726	0.5	1.07	**0.52**	**4.4**	0.528	2.3	
Cadmium*	1	4.58	0.33	0.726	0.6	1.28	**0.46**	**0.29**	1	0.29	New
Cadmium	1	4.58	0.33	0.726	0.6	1.28	**0.46**	**2.67**	1	2.67	Old
Copper	1	4.58	2.5	0.726	2.5	5.35	**2.89**	**31.8**	0.346	10.99	
Lead	1	4.58	0.35	0.726	0.35	0.75	**0.40**	**17.7**	0.184	3.26	
Zinc	1	4.58	15	0.726	15	32.10	**17**	**501.7**	0.286	143.5	
Molybdenum**	1	4.58	46	0.726	1400	2996	**450**	**1000.0**	1	1000	Irrigation
Aluminum	1	4.58	166	0.726	100	214	**173**	**750.0**	1	750	Acute

*The dissolved water quality standard for cadmium is based on the equations given in State of New Mexico
Standards for Interstate and Intrastate Surface Waters as amended July 17, 2005.
**Molybdenum is limited by BAT
***The recommendation is to set the permit limit based on the acute aluminum water quality standard.

Additional parameters to evaluate effluent limits based on Water Quality Standards

Parameter	F MZ adj	Qa 4Q3 mgd	Ca Ambient µg/L	Qe Max Flow mgd	Cp mean µg/L	Ce 95th%tile µg/L	Cd (IWC) µg/L	WQCt Total µg/L	C/Ct	WQCd Dissolved µg/L
Antimony	1	4.58	0.5	0.726	1.0	2.14	**0.72**	**5.6**	1	5.6
Barium	1	4.58	37	0.726	29.0	62.06	**40.4**	**2000**	1	2000
Beryllium	1	4.58	0.2	0.726	0.3	0.64	**0.26**	**4.0**	1	4
Boron	1	4.58	12	0.726	31.0	66.34	**19.4**	**750**	1	750

Chromium	1	4.58	1	0.726	1.5	3.21	**1.30**	**90.1**	1	90.1
Cobalt	1	4.58	3	0.726	2.5	5.35	**3.3**	**50.0**	1	50
Nickel	1	4.58	10.3	0.726	3.0	6.42	**10**	**63.7**	1	63.7
Selenium	1	4.58	0.75	0.726	1.5	3.21	**1.1**	**5.0**	1	5
Silver	1	4.58	0.2	0.726	0.2	0.43	**0.23**	**5.0**	1	4.95
Thallium	1	4.58	0.1	0.726	0.2	0.43	**0.14**	**1.7**	1	1.7
Vanadium	1	4.58	0.3	0.726	1.6	3.42	**0.73**	**100**	1	100

Data for Red River at Questa Downloaded from USGS Web Site - USGS 08265000

Location of the USGS monitoring site approximately 3.2 river miles above Discharge 002A. Approximate map coordinates N 36° 42.19' W 105° 34.06'

Perod of record is October 1978 through December 1986. Data is monthly, with some months missing

US Geological Survey

This file contains water quality sample data
for stations in the water quality samples database
This information includes the following fields
#
agency_cd - Agency Code
site_no - USGS site number
sample_dt - Date of sample
sample_tm - Time of sample
medium_cd - Sample medium code
p00010 - Temperature, water, degrees Celsius
p00020 - Temperature, air, degrees Celsius
p00025 - Barometric pressure, millimeters of mercury
p00027 - Agency collecting sample, code
p00028 - Agency analyzing sample, code
p00042 - Altitude, feet above mean sea level
p00061 - Discharge, instantaneous, cubic feet per second
p00065 - Gage height, feet
p00076 - Turbidity, water, unfiltered, nephelometric turbidity units
p00094 - Specific conductance, water, unfiltered, field, microsiemens per centimeter at 25 degrees Celsius
p00095 - Specific conductance, water, unfiltered, microsiemens per centimeter at 25 degrees Celsius
p00300 - Dissolved oxygen, water, unfiltered, milligrams per liter
p00301 - Dissolved oxygen, water, unfiltered, percent of saturation
p00400 - pH, water, unfiltered, field, standard units
p00403 - pH, water, unfiltered, laboratory, standard units
p00405 - Carbon dioxide, water, unfiltered, milligrams per liter
p00410 - Acid neutralizing capacity, water, unfiltered, fixed endpoint (pH 4.5) titration, field, milligrams per liter as calcium carbonate
p00440 - Bicarbonate, water, unfiltered, fixed endpoint (pH 4.5) titration, field, milligrams per liter
p00445 - Carbonate, water, unfiltered, fixed endpoint (pH 8.3) titration, field, milligrams per liter
p00600 - Total nitrogen, water, unfiltered, milligrams per liter
p00605 - Organic nitrogen, water, unfiltered, milligrams per liter
p00608 - Ammonia, water, filtered, milligrams per liter as nitrogen
p00610 - Ammonia, water, unfiltered, milligrams per liter as nitrogen
p00613 - Nitrite, water, filtered, milligrams per liter as nitrogen
p00615 - Nitrite, water, unfiltered, milligrams per liter as nitrogen
p00618 - Nitrate, water, filtered, milligrams per liter as nitrogen
p00620 - Nitrate, water, unfiltered, milligrams per liter as nitrogen

p00623 - Ammonia plus organic nitrogen, water, filtered, milligrams per liter as nitrogen

p00625 - Ammonia plus organic nitrogen, water, unfiltered, milligrams per liter as nitrogen
p00630 - Nitrite plus nitrate, water, unfiltered, milligrams per liter as nitrogen
p00631 - Nitrite plus nitrate, water, filtered, milligrams per liter as nitrogen
p00650 - Phosphate, water, unfiltered, milligrams per liter
p00660 - Orthophosphate, water, filtered, milligrams per liter
p00665 - Phosphorus, water, unfiltered, milligrams per liter
p00666 - Phosphorus, water, filtered, milligrams per liter
p00671 - Orthophosphate, water, filtered, milligrams per liter as phosphorus
p00680 - Organic carbon, water, unfiltered, milligrams per liter
p00720 - Cyanide, water, unfiltered, milligrams per liter
p00723 - Cyanide, water, filtered, milligrams per liter
p00900 - Hardness, water, milligrams per liter as calcium carbonate
p00902 - Noncarbonate hardness, water, unfiltered, field, milligrams per liter as calcium carbonate
p00915 - Calcium, water, filtered, milligrams per liter
p00925 - Magnesium, water, filtered, milligrams per liter
p00930 - Sodium, water, filtered, milligrams per liter
p00931 - Sodium adsorption ratio, water, number
p00932 - Sodium, water, percent in equivalents of major cations
p00933 - Sodium plus potassium, water, filtered, milligrams per liter as sodium
p00935 - Potassium, water, filtered, milligrams per liter
p00940 - Chloride, water, filtered, milligrams per liter
p00945 - Sulfate, water, filtered, milligrams per liter
p00950 - Fluoride, water, filtered, milligrams per liter
p00955 - Silica, water, filtered, milligrams per liter
p01000 - Arsenic, water, filtered, micrograms per liter
p01002 - Arsenic, water, unfiltered, micrograms per liter
p01005 - Barium, water, filtered, micrograms per liter
p01007 - Barium, water, unfiltered, recoverable, micrograms per liter
p01010 - Beryllium, water, filtered, micrograms per liter
p01025 - Cadmium, water, filtered, micrograms per liter
p01026 - Cadmium, suspended sediment, recoverable, micrograms per liter
p01027 - Cadmium, water, unfiltered, micrograms per liter
p01028 - Cadmium, bed sediment, recoverable, dry weight, micrograms per gram
p01030 - Chromium, water, filtered, micrograms per liter
p01034 - Chromium, water, unfiltered, recoverable, micrograms per liter
p01035 - Cobalt, water, filtered, micrograms per liter
p01040 - Copper, water, filtered, micrograms per liter
p01041 - Copper, suspended sediment, recoverable, micrograms per liter
p01042 - Copper, water, unfiltered, recoverable, micrograms per liter
p01043 - Copper, bed sediment, recoverable, dry weight, micrograms per gram
p01044 - Iron, suspended sediment, recoverable, micrograms per liter
p01045 - Iron, water, unfiltered, recoverable, micrograms per liter
p01046 - Iron, water, filtered, micrograms per liter
p01049 - Lead, water, filtered, micrograms per liter
p01050 - Lead, suspended sediment, recoverable, micrograms per liter
p01051 - Lead, water, unfiltered, recoverable, micrograms per liter
p01052 - Lead, bed sediment, recoverable, dry weight, micrograms per gram
p01053 - Manganese, bed sediment, recoverable, dry weight, micrograms per gram
p01054 - Manganese, suspended sediment, recoverable, micrograms per liter
p01055 - Manganese, water, unfiltered, recoverable, micrograms per liter
p01056 - Manganese, water, filtered, micrograms per liter
p01060 - Molybdenum, water, filtered, micrograms per liter
p01061 - Molybdenum, suspended sediment, recoverable, micrograms per liter
p01062 - Molybdenum, water, unfiltered, recoverable, micrograms per liter
p01063 - Molybdenum, bed sediment, recoverable, dry weight, micrograms per gram
p01065 - Nickel, water, filtered, micrograms per liter
p01067 - Nickel, water, unfiltered, recoverable, micrograms per liter
p01075 - Silver, water, filtered, micrograms per liter
p01080 - Strontium, water, filtered, micrograms per liter
p01085 - Vanadium, water, filtered, micrograms per liter
p01090 - Zinc, water, filtered, micrograms per liter
p01091 - Zinc, suspended sediment, recoverable, micrograms per liter
p01092 - Zinc, water, unfiltered, recoverable, micrograms per liter
p01093 - Zinc, bed sediment, recoverable, dry weight, micrograms per gram
p01105 - Aluminum, water, unfiltered, recoverable, micrograms per liter
p01106 - Aluminum, water, filtered, micrograms per liter
p01130 - Lithium, water, filtered, micrograms per liter
p01147 - Selenium, water, unfiltered, micrograms per liter
p01170 - Iron, bed sediment, total, dry weight, micrograms per gram
p29801 - Alkalinity, water, filtered, fixed endpoint (pH 4.5) titration, laboratory, milligrams per liter as calcium carbonate

p31625 - Fecal coliform, M-FC MF (0.7 micron) method, water, colonies per 100 milliliters
p70301 - Residue, water, filtered, sum of constituents, milligrams per liter
p70302 - Residue, water, filtered, tons per day
p70303 - Residue, water, filtered, tons per acre-foot
p70331 - Suspended sediment, sieve diameter, percent smaller than 0.063 millimeters
p70337 - Suspended sediment, fall diameter (deionized water), percent smaller than 0.002 millimeters
p70338 - Suspended sediment, fall diameter (deionized water), percent smaller than 0.004 millimeters
p70340 - Suspended sediment, fall diameter (deionized water), percent smaller than 0.016 millimeters
p70507 - Orthophosphate, water, unfiltered, milligrams per liter as phosphorus
p71825 - Acidity, water, unfiltered, heated, milligrams per liter as hydrogen ion
p71845 - Ammonia, water, unfiltered, milligrams per liter as NH4
p71846 - Ammonia, water, filtered, milligrams per liter as NH4
p71851 - Nitrate, water, filtered, milligrams per liter
p71856 - Nitrite, water, filtered, milligrams per liter
p71886 - Phosphorus, water, unfiltered, milligrams per liter as phosphate
p71887 - Total nitrogen, water, unfiltered, milligrams per liter as nitrate
p71900 - Mercury, water, unfiltered, recoverable, micrograms per liter
p71999 - Sample purpose, code
p80154 - Suspended sediment concentration, milligrams per liter
p80155 - Suspended sediment discharge, tons per day
p82068 - Potassium-40, water, filtered, picocuries per liter
p82398 - Sampling method, code
p84164 - Sampler type, code
p90095 - Specific conductance, water, unfiltered, laboratory, microsiemens per centimeter at 25 degrees Celsius
p90410 - Acid neutralizing capacity, water, unfiltered, fixed endpoint (pH 4.5) titration, laboratory, milligrams per liter as calcium carbonate
p95410 - Acid neutralizing capacity, water, unfiltered, fixed endpoint (pH 4.5) titration, laboratory, milligrams per liter as calcium carbonate
p95902 - Noncarbonate hardness, water, milligrams per liter as calcium carbonate
p99430 - Carbonate, water, unfiltered, incremental titration, field, milligrams per liter as calcium carbonate
p99440 - Bicarbonate, water, unfiltered, incremental titration, field, milligrams per liter
p99445 - Carbonate, water, unfiltered, incremental titration, field, milligrams per liter
#
Description of remark_cd column
< - Actual value is known to be less than the value shown
> - Actual value is known to be greater than the value shown
A - Average value
E - Estimated value
M - Presence of material verified but not quantified
N - Presumptive evidence of presence of material
S - Most probable value
U - Material specifically analyzed for but not detected
V - Value affected by contamination
#
Data for the following sites are included:
USGS 08265000 RED RIVER NEAR QUESTA, NM
#

WARNING: Some spreadsheet programs do not allow more than 256 columns. This retrieval
may not be imported into those programs without manually editing this file
#

[illegible]	

Red River Along Mine

18 sites in Surface Water Area 1

Period of record - September 2002 to September 2003 - Monitoring Frequency

Numbers in red are measured values above the detection limit.

EXPOSURE AREA LOOKUP DESCRIPTION	SITE ID	SAMP DATE	SAMP FRACTION	Aluminum mg/L	Antimony mg/L	Arsenic mg/L	Barium mg/L	Beryllium mg/L	Boron mg/L	Cadmium mg/L	Chromium mg/L	Chromium, Hexavalent mg/L	Cobalt mg/L	Copper mg/L	Iron mg/L	Lead mg/L	Manganese mg/L	Mercury mg/L	Molybdenum mg/L	Nickel mg/L	Selenium mg/L	Silver mg/L	Thallium mg/L	Vanadium mg/L	Zinc mg/L
Surface Water Area 1-Red River Along Mine	LR-1	30-Sep-02	D	0.14	<0.0002:	<0.0002:	0.027	<0.0002:	<0.0074:	0.0003	0.0025		0.0024	0.0027	<0.046:	<0.0001:	0.33	<0.0001:	0.0039	0.01	0.0003	<0.0059:	<0.0001:	<0.0001:	0.031
Surface Water Area 1-Red River Along Mine	LR-1	30-Sep-02	D	2.2:	<0.0002:	0.00023	0.049	0.00036	<0.005:	0.00039	0.0019	<0.01:	0.0033	0.014	1.7:	0.0014	0.36	<0.0001:	0.003	0.011	0.00029	<0.0059:	<0.0001:	0.00042	0.08
Surface Water Area 1-Red River Along Mine	LR-1	20-Mar-03	D	0.1	<0.0006:	<0.0002:	0.037	<0.0003J	0.0087	0.00047	<0.001:		<0.0038:	0.0053	<0.42:	<0.0002:	0.38	<0.0001:	0.0024	0.02	<0.001:	<0.0002:	<0.0002:	<0.0002:	0.099
Surface Water Area 1-Red River Along Mine	LR-1	15-Jul-03	D	0.12	<0.0005:	<0.0002:	0.035	<0.0002:	0.0084	0.00036	<0.0014:		<0.002:	0.0032	<0.033:	<0.0001:	0.14	<0.0001:	0.0068	0.01	<0.0016:	<0.0001J	<0.0001:	<0.00079:	0.054
Surface Water Area 1-Red River Along Mine	LR-1	24-Sep-03	D	0.11	<0.00016:	<0.00038:	0.035	<0.00047:	<0.0087:	0.00044	<0.001:		0.003	<0.0026:	<0.044:	<0.00004:	0.22	<0.00006:	0.0046	0.014	<0.00073:	<0.0002:	<0.00001:	<0.00044:	<0.063:
Surface Water Area 1-Red River Along Mine	RR-10	03-Oct-02	D	0.11	<0.0002:	<0.0002:	0.028	<0.0002:	<0.0048:	0.00017	<0.0046:		<0.0022:	0.0024	<0.023:	<0.0001:	0.16	<0.0001:	0.0014	0.0042	<0.0002:	<0.0001:	<0.0001:	0.00014	<0.0069:
Surface Water Area 1-Red River Along Mine	RR-10	21-Jan-03	D	<0.11J	<0.0006:	<0.0002J	0.028	<0.0002:	<0.0098:	0.00034J	<0.0037:		0.0026	<0.0017:	<0.27:	<0.0002:	0.27	<0.0001:	<0.0011:	0.013	<0.0016:	<0.0002:	<0.0002:	<0.0004:	0.05
Surface Water Area 1-Red River Along Mine	RR-10	20-Mar-03	D	0.14	<0.0006:	<0.0002:	0.035	<0.0003J	0.0087	<0.0002:	<0.001:		<0.0038:	0.0051	<0.42:	<0.0002:	0.22	<0.0001:	<0.0023:	0.0083	<0.001:	<0.0002:	<0.0002:	<0.0002:	<0.039:
Surface Water Area 1-Red River Along Mine	RR-10	03-Apr-03	D	<0.14:	<0.0003:	<0.0002:	0.034	<0.00074:	<0.0084:	<0.0005:	<0.001:		<0.0038:	0.0032	<0.031:	<0.0001:	0.14	<0.0001:	<0.0023:	0.0047	0.00053	<0.0001:	<0.0001:	<0.0001:	0.01
Surface Water Area 1-Red River Along Mine	RR-10	15-Jul-03	D	0.2	<0.0005:	<0.0002:	0.031	<0.0004:	0.007	<0.0002:	<0.0019:		<0.0037:	0.0034	<0.067:	<0.0001:	0.078	<0.00018:	0.0012	0.0039	<0.0008:	<0.0001J	<0.0001:	<0.0002:	<0.0095:
Surface Water Area 1-Red River Along Mine	RR-10	24-Sep-03	D	0.18	<0.00095:	<0.00038:	0.035	<0.00047:	<0.0072:	0.0002	<0.001:		0.0019	0.0025	<0.044:	<0.00004:	0.12	<0.00006:	<0.0019:	0.0063	<0.00073:	<0.0002:	<0.00001:	<0.00028:	0.013
Surface Water Area 1-Red River Along Mine	RR-10	19-Oct-03	D	0.18	<0.0005:	<0.0002:	0.036	<0.0004:	<0.0063:	<0.0002:	<0.0011:		0.0039	0.0027	<0.028:	<0.0002:	0.15	<0.0001J	0.0011	0.0051J	<0.0003:	<0.0001:	<0.0001:	<0.0001:	0.021
Surface Water Area 1-Red River Along Mine	RR-10	13-Jan-04	D	0.077	<0.0012:	<0.0002:	0.03	<0.001:	<0.012:	0.00023	<0.0057:		<0.0037:	0.0038	<0.042:	<0.0001:	0.19	<0.0001:	<0.0012:	<0.017:	0.00032J	<0.0001:	<0.0001:	<0.0002:	0.036
Surface Water Area 1-Red River Along Mine	RR-10	24-Feb-04	D	0.054	<0.0002J	<0.0001:	0.029	<0.0003:	0.0055	0.00029J	<0.0015J		0.0059	0.0028J	<0.036:	<0.0001J	0.23	<0.0001:	<0.0007:	0.014	<0.00086:	<0.0001J	<0.0001:	<0.0001J	0.043
Surface Water Area 1-Red River Along Mine	RR-10	19-Apr-04	D	0.29	<0.00055:	<0.0002:	0.034	<0.0002:	0.0054	<0.0002:	<0.0008J		0.0032	0.0068	0.09	<0.0015:	0.071	<0.0001:	<0.0022:	0.0053	<0.0007:	<0.0001J	<0.00012:	0.00037	0.01
Surface Water Area 1-Red River Along Mine	RR-	03-Oct-02	D	0.63	<0.0002:	0.00026	0.04	<0.0002:	<0.0048:	0.00013	<0.0046:		<0.0022:	0.0055	0.56	<0.0014:	0.15	<0.0001:	0.0015	0.0041	<0.0002:	<0.0001:	<0.0001:	0.00046	0.014
Surface Water Area 1-Red River Along Mine	RR-	20-Jan-03	D	<0.083J	<0.0006:	<0.0002J	0.028	<0.0002:	0.0044	0.00033J	<0.0037:		0.0029	<0.0017:	<0.27:	<0.0002:	0.27	<0.0001:	<0.0017:	0.013	<0.0016:	<0.0002:	<0.0002:	<0.0004:	0.053
Surface Water Area 1-Red River Along Mine	RR-	20-Mar-03	D	<0.6:	<0.0006:	<0.0004J	0.039	<0.0003J	<0.0084:	<0.0005:	<0.001:		<0.0038:	0.0068	<0.31:	<0.0002:	0.17	<0.0001:	0.0023	0.009	<0.0016J	<0.0002:	<0.0002:	<0.0002:	<0.027:
Surface Water Area 1-Red River Along Mine	RR-	03-Apr-03	D	<0.12:	<0.0003:	<0.0002:	0.035	<0.0012:	<0.0084:	<0.0005:	<0.001:		<0.0038:	0.0029	<0.031:	<0.0001:	0.11	<0.0001:	<0.0023:	0.0032	<0.0005:	<0.0001:	<0.0001:	0.00019	0.0091:
Surface Water Area 1-Red River Along Mine	RR-	15-Jul-03	D	0.15	<0.0005:	<0.0002:	0.034	<0.0004:	0.0078	<0.0002:	<0.0019:		<0.0037:	0.0033	<0.067:	<0.0001:	0.064	<0.00018:	0.0016	0.0034	<0.0008:	<0.0001J	<0.0001:	0.00022	<0.0091:
Surface Water Area 1-Red River Along Mine	RR-	24-Sep-03	D	0.14	<0.00015:	<0.00038:	0.038	<0.00047:	<0.007:	0.00016	<0.001:		0.0032	0.0021	<0.044:	<0.00004:	0.11	0.00008:	<0.0013:	0.0053	<0.00073:	<0.0002:	<0.00001:	<0.00028:	0.015
Surface Water Area 1-Red River Along Mine	RR-	19-Oct-03	D	0.12	<0.0005:	<0.0002:	0.037	<0.0004:	<0.0063:	0.00021	<0.0011:		0.0039	0.0025	<0.028:	<0.0002:	0.12	<0.0001J	0.0014	0.0046J	<0.0003:	<0.0001:	<0.0001:	<0.0001:	0.02
Surface Water Area 1-Red River Along Mine	RR-	13-Jan-04	D	0.087	<0.0012:	<0.0002:	0.033	<0.001:	<0.012:	0.00029	<0.0057:		0.0051	0.0031	<0.042:	0.00019	0.16	<0.0001:	<0.0015:	<0.017:	0.00053J	<0.0001:	<0.0001:	<0.0002:	0.045
Surface Water Area 1-Red River Along Mine	RR-	19-Apr-04	D	0.25	<0.00063:	<0.0002:	0.031	<0.0002:	0.0048	0.00021	<0.0008J		0.0025	0.0073	0.039	<0.0014:	0.16	<0.0001:	<0.0031:	0.0083	<0.0007:	<0.0001J	<0.00012:	0.00034	0.037
Surface Water Area 1-Red River Along Mine	RR-	03-Oct-02	D	0.1	<0.0002:	<0.0002:	0.03	<0.0002:	<0.0048:	<0.0001:	<0.0046:		<0.0022:	0.0022	<0.023:	<0.0001:	0.13	<0.0001:	0.0015	0.0034	<0.0002:	<0.0001:	<0.0001:	0.00015	<0.0069:
Surface Water Area 1-Red River Along Mine	RR-	20-Jan-03	D	<0.069J	<0.0006:	<0.0002J	0.033	<0.0002:	<0.0088:	0.00025J	<0.0037:		0.0023	0.0038	<0.27:	<0.0002:	0.19	<0.0001:	0.0012	0.0098	<0.0016:	<0.0002:	<0.0002:	<0.0004:	0.034
Surface Water Area 1-Red River Along Mine	RR-	21-Mar-03	D	0.092	<0.0006:	<0.0002:	0.035	<0.0003J	<0.0084:	0.00021	<0.001:		<0.0038:	0.0038	<0.31:	<0.0002:	0.19	<0.0001:	0.0023	0.0075	<0.0034J	<0.0002:	<0.0002:	<0.0002:	<0.036:
Surface Water Area 1-Red River Along Mine	RR-	03-Apr-03	D	<0.12:	<0.0003:	<0.0002:	0.038	<0.0011:	<0.0084:	<0.0005:	<0.001:		<0.0038:	0.0032	<0.046:	<0.0001:	0.12	<0.0001:	0.0032	0.0033	<0.0005:	<0.0001:	<0.0001:	0.00012	0.0086
Surface Water Area 1-Red River Along Mine	RR-	15-Jul-03	D	0.19	<0.0005:	<0.0002:	0.034	<0.0004:	0.0061	<0.0002:	<0.0019:		<0.0037:	0.004	<0.067:	<0.0001:	0.11	<0.00017:	0.0015	0.0046	<0.0008:	<0.0001J	<0.0001:	0.00035	<0.02:
Surface Water Area 1-Red River Along Mine	RR-	24-Sep-03	D	0.13	<0.00028:	<0.00038:	0.039	<0.00047:	<0.0069:	0.00014	<0.001:		0.0037	0.0022	<0.044:	0.00006	0.11	<0.00006:	<0.0014:	0.0054	<0.00073:	<0.0002:	<0.00001:	<0.00028:	0.015
Surface Water Area 1-Red River Along Mine	RR-	19-Oct-03	D	0.14	<0.0005:	<0.0002:	0.038	<0.0004:	<0.0063:	<0.0002:	<0.0011:		0.0057	0.0028	<0.028:	<0.0002:	0.12	<0.0001J	0.0014	0.0044J	<0.0003:	<0.0001:	<0.0001:	<0.0001:	0.02
Surface Water Area 1-Red River Along Mine	RR-	13-Jan-04	D	<0.062:	<0.0012:	<0.0002:	0.032	<0.001:	<0.012:	0.00029	<0.0057:		0.0039	0.0032	<0.042:	0.00014	0.16	<0.0001:	<0.0017:	<0.017:	0.00056J	<0.0001:	<0.0001:	<0.0002:	0.032
Surface Water Area 1-Red River Along Mine	RR-	19-Apr-04	D	0.27	<0.00063:	<0.0002:	0.034	<0.0002:	0.0067	<0.0002:	<0.0008J		0.0015	0.006	0.083	<0.0013:	0.058	<0.0001:	<0.0025:	0.0043	<0.0007:	<0.0001J	<0.00012:	0.00044	0.0092
Surface Water Area 1-Red River Along Mine	RR-11B	03-Oct-02	D	0.12	<0.0002:	<0.0002:	0.03	<0.0002:	<0.0048:	<0.0001:	<0.0046:		<0.0022:	0.0048	<0.023:	<0.0001:	0.13	<0.0001:	0.0015	0.0047	<0.0002:	<0.0001:	<0.0001:	0.00014	0.013
Surface Water Area 1-Red River Along Mine	RR-11B	20-Mar-03	D	0.16	<0.0006:	<0.0002:	0.034	<0.0003J	<0.0084:	0.00047	<0.001:		<0.0038:	0.0052	<0.42:	<0.0002:	0.24	<0.0001:	0.0029	0.021	<0.0012:	<0.0002:	<0.0002:	<0.0002:	0.1
Surface Water Area 1-Red River Along Mine	RR-11B	15-Jul-03	D	0.36	<0.0005:	<0.0002:	0.033	<0.00034:	0.0057	0.00047	<0.0014:		<0.002:	0.0045	<0.033:	<0.0001:	0.099	<0.0001:	0.002	0.017	<0.0016:	<0.0001J	<0.0001:	<0.00045:	0.11
Surface Water Area 1-Red River Along Mine	RR-11B	24-Sep-03	D	0.2	<0.00018:	<0.00038:	0.037	<0.00047:	<0.0064:	0.00029	<0.001:		0.0027	0.0025	<0.044:	<0.00004:	0.1	<0.00006:	<0.0015:	0.013	<0.00073:	<0.0002:	<0.00001:	<0.00041:	0.068
Surface Water Area 1-Red River Along Mine	RR-11C	01-Oct-02	D	0.11	<0.0002:	<0.0002:	0.031	<0.0002:	<0.0054:	0.00022	<0.0046:		<0.0022:	0.0024	<0.023:	<0.0001:	0.14	<0.0001:	0.0021	0.0072	0.00021	<0.0001:	<0.0001:	0.00013	0.034
Surface Water Area 1-Red River Along Mine	RR-11C	20-Jan-03	D	<0.16J	<0.0006:	<0.0002J	0.031	<0.0002:	0.0035	0.00062J	<0.0037:		0.0026	<0.0017:	<0.27:	<0.0002:	0.17	<0.0001:	<0.0043:	0.03	<0.0016:	<0.0002:	<0.0002:	<0.0004:	0.18
Surface Water Area 1-Red River Along Mine	RR-11C	20-Mar-03	D	0.17	<0.0006:	<0.0002:	0.038	<0.0003J	<0.0084:	0.00043	<0.001:		<0.0038:	0.0044	<0.42:	<0.0002:	0.19	<0.0001:	<0.0023:	0.021	<0.001:	<0.0002:	<0.0002:	<0.0002:	0.14
Surface Water Area 1-Red River Along Mine	RR-11C	03-Apr-03	D	<0.1:	<0.00061:	<0.0002:	0.035	<0.00069:	<0.0084:	<0.0005:	<0.001:		<0.0038:	0.0029	<0.031:	<0.0001:	0.11	<0.0001:	0.0032	0.015	0.00059	<0.0001:	<0.0001:	<0.0001:	0.074
Surface Water Area 1-Red River Along Mine	RR-11C	15-Jul-03	D	0.22	<0.0005:	<0.0002:	0.034	<0.0004:	0.0058	0.00049	<0.0019:		<0.0037:	0.0035	0.077	<0.0001:	0.097	<0.00018:	0.002	0.016	<0.0008:	<0.0001J	<0.0001:	0.00032	0.1
Surface Water Area 1-Red River Along Mine	RR-11C	25-Sep-03	D	0.15	<0.00052:	<0.00038:	0.037	<0.00047:	<0.0091:	0.00038	<0.001:		0.0014	<0.0028:	<0.1:	<0.00004:	0.11	<0.00006:	0.0022	0.015	<0.00073:	<0.0002:	<0.00001:	<0.00028:	0.085
Surface Water Area 1-Red River Along Mine	RR-11C	19-Oct-03	D	0.13	<0.0005:	<0.0002:	0.039	<0.0004:	<0.0063:	0.00045	<0.0011:		0.0041	0.0023	<0.028:	<0.0002:	0.12	<0.0001J	0.0022	0.014	<0.0003:	<0.0001:	<0.0001:	<0.0001:	0.1
Surface Water Area 1-Red River Along Mine	RR-11C	13-Jan-04	D	0.093	<0.0012:	<0.0002:	0.035	<0.001:	<0.012:	0.00032	<0.0057:		0.0054	0.0036	<0.042:	<0.0001:	0.12	<0.0001:	<0.0029:	<0.017:	0.00035J	<0.0001:	<0.0001:	<0.0002:	0.08
Surface Water Area 1-Red River Along Mine	RR-11C	19-Apr-04	D	0.24	<0.00061:	<0.0002:	0.033	<0.0002:	0.0058	<0.0002:	<0.0008J		0.0027	0.0064	0.073	<0.0014:	0.06	<0.0001:	<0.0028:	0.006	<0.0007:	<0.0001J	<0.00012:	0.0004	0.019
Surface Water Area 1-Red River Along Mine	RR-12	03-Oct-02	D	0.12	0.00023	0.00021	0.03	<0.0002:	<0.0052:	0.00024	<0.0046:		<0.0022:	0.0032	<0.023:	<0.0001:	0.14	<0.0001:	0.0022	0.0095	<0.0002:	<0.0001:	<0.0001:	<0.0001:	0.026
Surface Water Area 1-Red River Along Mine	RR-12	20-Jan-03	D	<0.11J	<0.0006:	<0.0002J	0.034	<0.0002:	<0.0062:	0.00059J	<0.0037:		0.0027	0.0035	<0.27:	<0.0002:	0.19	<0.0001:	<0.0031:	0.028	<0.0016:	<0.0002:	<0.0002:	<0.0004:	0.16
Surface Water Area 1-Red River Along Mine	RR-12	20-Mar-03	D	0.42	<0.0006:	<0.0002:	0.038	<0.0003J	<0.0084:	0.00043	<0.001:		<0.0038:	0.0073	<0.31:	<0.0002:	0.18	<0.0001:	<0.0023:	0.022	<0.001:	<0.0002:	<0.0002:	<0.0002:	0.13
Surface Water Area 1-Red River Along Mine	RR-12	03-Apr-03	D	<0.12:	<0.0003:	<0.0002:	0.034	<0.00097:	<0.0084:	<0.0005:	<0.001:		<0.0038:	0.0025	<0.031:	<0.0001:	0.12	<0.0001:	<0.0023:	0.015	0.00057	<0.0001:	<0.0001:	0.0001	0.067
Surface Water Area 1-Red River Along Mine	RR-12	15-Jul-03	D	0.2	<0.0005:	<0.0002:	0.034	<0.0004:	0.0071	0.00047	<0.0019:		<0.0037:	0.0034	<0.067:	<0.0001:	0.1	<0.00019:	0.002	0.016	<0.0008:	<0.0001J	<0.0001:	0.00023	0.087
Surface Water Area 1-Red River Along Mine	RR-12	24-Sep-03	D	0.17	<0.00025:	<0.00038:	0.038	<0.00047:	<0.0077:	0.00037	<0.001:		0.0016	<0.0029:	<0.044:	<0.00004:	0.11	<0.00006:	<0.002:	0.015	<0.00073:	<0.0002:	<0.00001:	<0.00052:	0.077
Surface Water Area 1-Red River Along Mine	RR-12	19-Oct-03	D	0.12	<0.0005:	<0.0002:	0.037	<0.0004:	<0.0063:	0.00041	<0.0011:		0.0056	0.0026	<0.028:	<0.0002:	0.12	<0.0001:	0.0023	0.015	<0.0003:	<0.0001:	<0.0001:	<0.0001:	0.094
Surface Water Area 1-Red River Along Mine	RR-12	13-Jan-04	D	0.1	<0.0012:	<0.0002:	0.033	<0.001:	<0.012:	0.00047	<0.0057:		0.0058	<0.0025:	<0.042:	<0.0001:	0.13	<0.0001:	0.0027	<0.017:	0.00054J	<0.0001:	<0.0001:	<0.0002:	0.072
Surface Water Area 1-Red River Along Mine	RR-12	19-Apr-04	D	0.24	<0.00064:	<0.0002:	0.032	<0.0002J	0.0053	<0.0002:	<0.0008J		0.0025J	0.0059	0.072J	<0.0015:	0.064	<0.0001:	<0.0028:	0.006	<0.0007:	<0.0001J	<0.00012:	0.00043	0.017
Surface Water Area 1-Red River Along Mine	RR-13	01-Oct-02	D	0.26	<0.0002:	<0.0002:	0.03	<0.0002:	<0.0053:	0.00022	<0.0046:		<0.0022:	0.0035	<0.023:	<0.0001:	0.19	<0.0001:	0.0022	0.0084	0.00032	<0.0001:	<0.0001:	0.00012	0.035
Surface Water Area 1-Red River Along Mine	RR-13	01-Oct-02	D	1.1	<0.0002:	<0.0002:	0.035	<0.0002:	<0.005:	0.00029	<0.0046:	<0.01:	<0.0022:	0.013	0.45	0.00094	0.21	<0.0001:	0.0018	0.009	0.0002	<0.0001:	<0.0001:	0.00033	0.058
Surface Water Area 1-Red River Along Mine	RR-13	20-Jan-03	D	<0.13J	<0.0006:	<0.0002J	0.033	<0.0002:	<0.0048:	0.00056J	<0.0037:		0.0035	0.0053	<0.27:	<0.0002:	0.25	<0.0001:	<0.0025:	0.028	<0.0016:	<0.0002:	<0.0002:	<0.0004:	0.14
Surface Water Area 1-Red River Along Mine	RR-13	20-Mar-03	D	0.13	<0.0006:	<0.0002:	0.038	<0.0003J	<0.0084:	0.00036	<0.001:		<0.0038:	0.005	<0.42:	<0.0002:	0.17	<0.0001:	0.0027	0.021	<0.001:	<0.0002:	<0.0002:	<0.0002:	0.12
Surface Water Area 1-Red River Along Mine	RR-13	03-Apr-03	D	<0.2:	<0.0003:	<0.0002:	0.035	<0.00059:	<0.0084:	<0.0005:	<0.001:		<0.0038:	0.0042	<0.031:	<0.0001:	0.17:	<0.0001:	0.0027	0.015	<0.0005:	<0.0001:	<0.0001:	<0.0001:	0.074
Surface Water Area 1-Red River Along Mine	RR-13	15-Jul-03	D	0.32	<0.0005:	<0.0002:	0.033	<0.0004:	0.0064	0.00052	<0.0019:		<0.0037:	0.0047	<0.067:	<0.0001:	0.13	<0.00012:	0.0019	0.016	<0.0008:	<0.0001J	<0.0001:	<0.0002:	0.094
Surface Water Area 1-Red River Along Mine	RR-13	24-Sep-03	D	0.3	<0.00026:	<0.00038:	0.036	<0.00047:	<0.0059:	0.00037	<0.001:		0.0026	0.0037	<0.044:	<0.00004:	0.14	<0.00006:	<0.002:	0.015	<0.00073:	<0.0002:	<0.00001:	<0.00029:	0.062
Surface Water Area 1-Red River Along Mine	RR-13	25-Sep-03	D	<0.018:	<0.00045:	<0.00038:	0.013	<0.00047:	0.0054	<0.00008:	<0.001:		<0.0011:	<0.00038:	<0.044:	<0.00004:	<0.0013:	<0.00006:	<0.0009:	<0.00091:	<0.00073:	<0.0002:	<0.00001:	<0.0005:	<0.013:
Surface Water Area 1-Red River Along Mine	RR-13	19-Oct-03	D	0.24	<0.0005:	<0.0002:	0.037	<0.0004:	<0.0063:	0.00044	<0.0011:		<0.0029:	0.004	<0.028:	<0.0002:	0.15	<0.0001J	0.0023	0.016	<0.0003:	<0.0001:	<0.0001:	<0.0001:	0.098
Surface Water Area 1-Red River Along Mine	RR-13	13-Jan-04	D	0.064	<0.0012:	<0.0002:	0.032	<0.0026:	<0.012:	0.00034:	<0.0057:		0.0083	0.0039	<0.042:	<0.0001:	0.2	<0.0001:	0.0025	0.014	0.00056J	<0.0001:	<0.0001:	<0.0002:	0.077
Surface Water Area 1-Red River Along Mine	RR-13	19-Apr-04	D	0.33	<0.00061:	<0.0002:	0.032	<0.0002:	0.0058	<0.0002:	<0.0008J		0.004J	0.0073	0.15	<0.0014:	0.086	<0.0001:	<0.0028:	0.0066	<0.0007:	<0.0001J	<0.00012:	0.00037	0.023
Surface Water Area 1-Red River Along Mine	RR-14	01-Oct-02	D	0.14	0.00055	<0.0002:	0.03	<0.0002:	<0.0052:	0.00034	<0.0046:		0.0032	0.0038	0.054	<0.0001:	0.32	<0.0001:	0.0025	0.011	0.00027	<0.0001:	<0.0001:	<0.0001:	0.052
Surface Water Area 1-Red River Along Mine	RR-14	01-Oct-02	D	1.9:	<0.0002:	0.00021	0.035	<0.0002:	<0.0048:	0.00043	<0.0046:	<0.01:	0.0037	0.02	0.6	0.0011	0.32	<0.0001:	0.0019	0.012	0.00038	<0.0001:	<0.0001:	0.00031	0.086
Surface Water Area 1-Red River Along Mine	RR-14	19-Jan-03	D	<0.074J	<0.0016:	<0.0002J	0.032	<0.0002:	<0.0088:	0.00084J	<0.0037:		0.0068	0.0064	<0.27:	<0.0002:	0.5	<0.0001:	<0.0047:	0.035	<0.0016:	<0.0002:	<0.0002:	<0.0004:	0.21
Surface Water Area 1-Red River Along Mine	RR-14	20-Mar-03	D	0.12J	<0.0006:	<0.0002:	0.035	<0.0003:	0.01	0.00056	<0.001:		<0.0038:	0.0074	<0.42:	<0.0002:	0.38	<0.0001:	<0.0023:	0.025	<0.001J	<0.0002:	<0.0002:	<0.0002:	0.16
Surface Water Area 1-Red River Along Mine	RR-14	03-Apr-03	D	<0.079:	<0.0003:	<0.0002:	0.035	<0.0003:	<0.0084:	<0.0005:	<0.001:		<0.0038:	0.0048	<0.14:	<0.0001:	0.27	<0.0001:	0.0027	0.018	<0.0005:	<0.0001:	<0.0001:	<0.0001:	0.099
Surface Water Area 1-Red River Along Mine	RR-14	15-Jul-03	D	0.23	<0.0005:	<0.0002:	0.035	<0.0002:	0.0075	0.00059	<0.0014:		0.0027	0.0041	<0.033:	<0.00012:	0.19	0.00012:	0.0022	0.019	<0.0008:	<0.0001J	<0.0001:	<0.0002:	0.096
Surface Water Area 1-Red River Along Mine	RR-14	24-Sep-03	D	0.19	<0.00054:	<0.00038:	0.035	<0.00047:	<0.0062:	0.00042	<0.001:		0.0031	0.0034	<0.044:	<0.00004:	0.2	<0.00006:	0.0024	0.015	<0.00073:	<0.0002:	<0.00001:	<0.00034:	0.07
Surface Water Area 1-Red River Along Mine	RR-14	19-Oct-03	D	0.14	<0.0005:	<0.0002:	0.036	<0.0004:	<0.0063:	0.00043	<0.0011:		0.0039	0.0038	0.065	<0.0002:	0.22	<0.0001J	0.0026	0.016	<0.0003:	<0.0001:	<0.0001:	<0.0001:	0.1
Surface Water Area 1-Red River Along Mine	RR-14	13-Jan-04	D	<0.062:	<0.0012:	<0.0002:	0.032	<0.001:	<0.012:	0.00052	<0.0057:		0.0086	0.0059	<0.082:	0.0001	0.3	<0.0001:	0.003	<0.017:	0.00059J	<0.0001:	<0.0001:	<0.0002:	0.098
Surface Water Area 1-Red River Along Mine	RR-14	24-Feb-04	D	0.049	<0.0002J	<0.0001:	0.03	<0.0003:	0.0051	0.00078J	<0.0015J		0.0064	0.0057	0.14	<0.0001J	0.33	<0.0001:	0.0028	0.021	<0.00089:	<0.0001J	<0.0001:	<0.0001J	0.099
Surface Water Area 1-Red River Along Mine	RR-14	19-Apr-04	D	0.26	<0.00061:	<0.0002:	0.032	<0.0002:	0.0062	<0.0002:	<0.0008J		0.0058J	0.007	0.072	<0.0012:	0.13	<0.0001:	<0.003:	0.0077	<0.0007:	<0.0001J	<0.00012:	0.00034	0.035
Surface Water Area 1-Red River Along Mine	RR-15	01-Oct-02	D	0.17	<0.0002:	<0.0002:	0.029	<0.0002:	<0.0048:	0.00031	<0.0046:		0.0036	0.0033	<0.023:	<0.0001:	0.38:	<0.0001:	0.0024	0.012	<0.0002:	<0.0001:	<0.0001:	<0.0001:	0.057
Surface Water Area 1-Red River Along Mine	RR-15	01-Oct-02	D	2.2:	<0.0002:	<0.0002:	0.035	0.00028	<0.0053:	0.00046	<0.0046:	<0.01:	0.0041	0.022	0.64	0.00088	0.41	<0.0001:	0.0018	0.014	0.0003	<0.0001:	<0.0001:	0.00029	0.11
Surface Water Area 1-Red River Along Mine	RR-15	21-Mar-03	D	0.11	<0.0006:	<0.0002:	0.033	<0.0003J	<0.0084:	0.00073	<0.001:		0.0052	0.0064	<0.31:	<0.0002:	0.42	<0.0001:	<0.0023:	0.025	<0.001:	<0.0002:	<0.0002:	<0.0002:	0.15
Surface Water Area 1-Red River Along Mine	RR-15	15-Jul-03	D	0.22	<0.0005:	<0.0002:	0.035	<0.0002:	0.0056	0.0006	<0.0014:		0.0023	0.0053	<0.033:	<0.0001:	0.23	<0.0001:	0.0022	0.019	<0.0016:	<0.0001J	<0.0001:	<0.00027:	0.11
Surface Water Area 1-Red River Along Mine	RR-15	24-Sep-03	D	0.24	<0.0012:	<0.00038:	0.036	<0.00047:	<0.008:	0.00048	<0.001:		0.003	<0.004:	<0.044:	<0.00004:	0.25	<0.00006:	0.003	0.016	<0.00073:	<0.0002:	<0.00001:	<0.00028:	0.079
Surface Water Area 1-Red River Along Mine	RR-16	01-Oct-02	D	0.18	<0.0002:	<0.0002:	0.029	<0.0002:	<0.0053:	0.00035	<0.0046:		0.0041	0.0033	<0.023:	<0.0001:	0.41	<0.0001:	0.0024	0.012	<0.0002:	<0.0001:	<0.0001:	<0.0001:	0.06
Surface Water Area 1-Red River Along Mine	RR-16	01-Oct-02	D	2.2	<0.0002:	0.0002	0.035	0.00034	<0.0052:	0.00048	<0.0046:	<0.01:	0.0045	0.022	0.65	0.00099	0.43	<0.0001:	0.0018	0.014	0.00034	<0.0001:	<0.0001:	0.00037	0.11
Surface Water Area 1-Red River Along Mine	RR-16	19-Jan-03	D	<0.073J	<0.0006:	<0.0002J	0.029	<0.0002:	0.0063	0.00077J	<0.0037:		0.0066	0.005	<0.27:	<0.0002:	0.57	<0.0001:	<0.0035:	0.031	<0.0016:	<0.0002:	<0.0002:	<0.0004:	0.21
Surface Water Area 1-Red River Along Mine	RR-16	19-Mar-03	D	<0.11:	<0.0006:	<0.0002:	0.033	<0.0003:	<0.0084:	0.00058	<0.001:		0.0041	0.0056	<0.42:	<0.0002:	0.45	<0.0001:	0.0023	0.024	<0.0016:	<0.0002:	<0.0002:	<0.0004:	0.15
Surface Water Area 1-Red River Along Mine	RR-16	03-Apr-03	D	<0.088:	<0.0003:	<0.0002:	0.034	<0.00085:	<0.0084:	<0.0005:	<0.001:		<0.0038:	0.0037	<0.031:	<0.0001:	0.36	<0.0001:	<0.0023:	0.021	<0.0005:	<0.0001:	<0.0001:	<0.0001:	0.11
Surface Water Area 1-Red River Along Mine	RR-16	15-Jul-03	D	0.29	<0.00061:	<0.0002:	0.035	<0.0004:	0.007	0.00059	<0.0019:		<0.0037:	0.0052	<0.067:	<0.0001:	0.24	<0.0002:	0.0024	0.02	<0.0008:	<0.0001J	<0.0001:	<0.0002:	0.11
Surface Water Area 1-Red River Along Mine	RR-16	23-Sep-03	D	0.27	<0.00029:	<0.00038:	0.034	<0.00047:	<0.0048:	0.00043	<0.001:		0.0028	<0.0034:	<0.044:	<0.00004:	0.26	<0.00006:	0.0022	0.015	<0.00073:	<0.0002:	<0.00001:	<0.00057:	0.064
Surface Water Area 1-Red River Along Mine	RR-16	19-Oct-03	D	0.16	<0.0005:	<0.0002:	0.036	<0.0004:	<0.0063:	0.00049	<0.0011:		0.007	0.0039	<0.028:	<0.0002:	0.29	<0.0001J	0.0026	0.018	<0.0003:	<0.0001:	<0.0001:	<0.0001:	0.11
Surface Water Area 1-Red River Along Mine	RR-16	13-Jan-04	D	0.07	<0.0012:	<0.0002:	0.032	<0.001:	<0.012:	0.00068	<0.0057:		0.0072	0.0032	<0.037:	<0.0001:	0.4	<0.0001:	0.0027	0.018	0.00091J	<0.0001:	<0.0001:	<0.0002:	0.12
Surface Water Area 1-Red River Along Mine	RR-16	19-Apr-04	D	0.25	<0.00056:	<0.0002:	0.035	<0.0002:	0.0054	<0.0002:	<0.0008J		0.0019	0.006	0.085	<0.0013:	0.06	<0.0001:	<0.0025:	0.0046	<0.0007:	<0.0001J	<0.00012:	0.00044	0.0095
Surface Water Area 1-Red River Along Mine	RR-17	01-Oct-02	D	0.18	<0.0002:	<0.0002:	0.029	<0.0002:	<0.0056:	0.00047:	<0.0046:		0.0041	0.0033	<0.023:	<0.0001:	0.47	<0.0001:	0.0024	0.015	0.00026	<0.0001:	<0.0001:	<0.0001:	0.074
Surface Water Area 1-Red River Along Mine	RR-17	01-Oct-02	D	1.9:	<0.0002:	0.00024	0.032	0.00031	<0.006:	0.00058	<0.0046:	<0.01:	0.0044	0.019	0.58	0.001	0.46	<0.0001:	0.0017	0.016	0.00044	<0.0001:	<0.0001:	0.00035	0.12
Surface Water Area 1-Red River Along Mine	RR-17	19-Mar-03	D	<0.12:	<0.0006:	<0.0002:	0.034	<0.0003:	<0.0084:	0.00068	<0.001:		0.004	0.0057	<0.44:	<0.0002:	0.5	<0.0001:	<0.0023:	0.027	<0.0016:	<0.0002:	<0.0002:	<0.0004:	0.17
Surface Water Area 1-Red River Along Mine	RR-17	15-Jul-03	D		<0.0005:	<0.0002:	0.034	<0.0004:	0.0065	0.00064	<0.0019:		<0.0037:	0.004	<0.067:	<0.0001:	0.27	<0.00016:	0.0022	0.02	<0.0008:	<0.0001J	<0.0001:	0.00024	0.11
Surface Water Area 1-Red River Along Mine	RR-17	23-Sep-03	D	0.28	<0.0024:	<0.00038:	0.034	<0.00047:	<0.0048:	0.0005	<0.001:		0.0024	<0.0036:	<0.044:	<0.00004:	0.28	<0.00006:	0.0037	0.017	<0.00073:	<0.0002:	<0.00001:	<0.00055:	0.077
Surface Water Area 1-Red River Along Mine	RR-18A	01-Oct-02	D	0.15	<0.0002:	<0.0002:	0.026	<0.0002:	<0.0052:	0.00042	<0.0046:		0.0038	0.0027	<0.023:	<0.0001:	0.44	<0.0001:	0.0025J	0.014	<0.0002:	<0.0001:	<0.0001:	<0.0001:	0.059
Surface Water Area 1-Red River Along Mine	RR-18A	19-Mar-03	D	<0.1:	<0.0006:	<0.0002:	0.035	0.0003	<0.0084:	0.00075	<0.001:		0.0043	0.0064	<0.42:	<0.0002:	0.51	0.00011:	0.0027	0.028	<0.0016:	<0.0002:	<0.0002:	<0.0004:	0.18
Surface Water Area 1-Red River Along Mine	RR-18A	16-Jul-03	D	0.24	<0.0005:	<0.0002:	0.034	<0.0002:	0.0059	0.00062	<0.0014:		0.0022	0.0043	<0.033:	<0.0001:	0.26	<0.00012:	0.0029	0.019	<0.0008:	<0.0001J	<0.0001:	<0.0002:	0.1
Surface Water Area 1-Red River Along Mine	RR-18A	23-Sep-03	D	0.26	<0.0004:	<0.00038:	0.034	<0.00047:	<0.0048:	0.00046	<0.001:		0.0028	<0.0034:	<0.044:	<0.00004:	0.28	<0.00006:	0.0023	0.016	<0.00073:	<0.0002:	<0.00001:	<0.00046:	0.072
Surface Water Area 1-Red River Along Mine	RR-18B	30-Sep-02	D	0.2	<0.0002:	<0.0002:	0.026	<0.0002:	<0.0071:	0.00037	<0.0046:		0.0032	0.0029	<0.023:	<0.0001:	0.41	<0.0001:	0.0024	0.011	<0.0002:	<0.0001:	<0.0001:	0.00011	0.034
Surface Water Area 1-Red River Along Mine	RR-18B	30-Sep-02	D	1.9	<0.00024:	0.00021	0.033	0.00033	<0.0076:	0.0005	<0.0046:	<0.01:	0.0039:	0.018	0.65	0.0011	0.43	<0.0001:	0.0017	0.014	0.00038	<0.0001:	<0.0001:	0.00035	0.1
Surface Water Area 1-Red River Along Mine	RR-18B	19-Mar-03	D	<0.2:	<0.0006:	<0.0002:	0.033	<0.0003:	<0.0084:	0.00063	<0.001:		<0.0038:	0.006	<0.46:	<0.0002:	0.43	<0.0001:	<0.0023:	0.023	<0.0016:	<0.0002:	<0.0002:	<0.0004:	0.17
Surface Water Area 1-Red River Along Mine	RR-18B	16-Jul-03	D	0.22	<0.0005:	<0.0002:	0.034	<0.0002:	0.0062	0.00056	<0.0014:		<0.002:	0.0044	<0.033:	<0.0001:	0.25	<0.00015:	0.0026	0.018	<0.0008:	<0.0001J	<0.0001:	<0.0002:	0.1
Surface Water Area 1-Red River Along Mine	RR-18B	23-Sep-03	D	0.34	<0.00011:	<0.00038:	0.037	<0.00047:	<0.0048:	0.00055	<0.001:		0.0029	<0.0048:	<0.044:	<0.00006:	0.29	<0.00006:	0.0022	0.017	<0.00073J	<0.0002:	<0.00001:	<0.0003:	0.079
Surface Water Area 1-Red River Along Mine	RR-20	30-Sep-02	D	0.15	<0.0002:	<0.0002:	0.026	<0.0002:	<0.0073:	0.00032	<0.0012:		0.0025	0.0022	<0.046:	<0.0001:	0.35	<0.0001:	0.0035	0.0096	<0.0002:	<0.0059:	<0.0001:	<0.0001:	0.028
Surface Water Area 1-Red River Along Mine	RR-20	30-Sep-02	D	2.8:	<0.0002:	<0.0002:	0.059	0.00051	<0.005:	0.00048	0.0022:	<0.01:	0.0038	0.017	2.2:	0.0012	0.41	<0.0001:	0.0025	0.013	0.00035	<0.0059:	<0.0001:	0.00038	0.097
Surface Water Area 1-Red River Along Mine	RR-20	21-Mar-03	D	<0.54:	<0.00066:	<0.0004J	0.035	<0.0003J	<0.0084:	0.00056	<0.001:		0.004	0.0059	<0.31:	<0.0002:	0.36	<0.0001:	<0.0023:	0.021	<0.0031:	<0.0002:	<0.0002:	<0.0002:	0.11
Surface Water Area 1-Red River Along Mine	RR-20	15-Jul-03	D	0.072J	<0.0005:	<0.0002:	0.035	<0.0002:	0.0068	0.00035	<0.0014:		<0.002:	0.0026	<0.033:	<0.0001:	0.16	<0.0001:	0.0054	0.0098	<0.0016:	<0.0001J	<0.0001:	<0.00076:	0.058
Surface Water Area 1-Red River Along Mine	RR-20	23-Sep-03	D	0.11	<0.00011:	<0.00038:	0.034	<0.00047:	<0.0051:	0.0004	0.0039J		0.0028	<0.0028:	<0.044:	<0.00006:	0.23	<0.00006:	0.0031	0.012	<0.00073J	<0.0002:	<0.00001:	<0.00028:	0.066
Surface Water Area 1-Red River Along Mine	RR-7	04-Oct-02	D	0.15	<0.0002:	<0.0002:	0.034	<0.0002:	<0.0048:	0.00018	<0.0046:		<0.0022:	<0.0027:	<0.023:	<0.0001:	0.2	<0.0001:	0.0011	0.008	<0.0002:	<0.0001:	<0.0001:	<0.0001:	<0.02:

Surface Water Area 1-Red River Along Mine	RR-7	21-Jan-03	D	<0.12J	<0.0006:	<0.0002J	0.033	<0.0002:	0.011	0.00042J	<0.0037:		0.0051	0.0032	<0.27:	<0.0002:	0.35	<0.0001:	<0.0011:	0.018	<0.0016:	<0.0002:	<0.0002:	<0.0004:	0.076
Surface Water Area 1-Red River Along Mine	RR-7	21-Mar-03	D	0.11	<0.0006:	<0.0002:	0.038	<0.0003:	0.0094	0.00026	<0.001:		0.0038	0.0048	<0.42:	<0.0002:	0.3	<0.0001J	<0.0023:	0.011	<0.0039J	<0.0002:	<0.0002:	<0.0002:	<0.049:
Surface Water Area 1-Red River Along Mine	RR-7	03-Apr-03	D	<0.16:	<0.0003:	<0.0002:	0.037	<0.0008:	<0.0084:	<0.0005:	<0.001:		<0.0038:	0.0034	<0.031:	<0.0001:	0.17	<0.0001:	<0.0023:	0.0066	<0.0005:	<0.0001:	<0.0001:	0.00014	0.021
Surface Water Area 1-Red River Along Mine	RR-7	15-Jul-03	D	0.25	<0.0005:	<0.0002:	0.033	<0.0002:	0.0067	<0.0002:	<0.0014:		<0.002:	0.0036	<0.033:	<0.00013:	0.093	0.00014:	0.0011	0.0051	<0.0008:	<0.0001J	<0.0001:	<0.0002:	0.023
Surface Water Area 1-Red River Along Mine	RR-7	24-Sep-03	D	0.18	<0.00011:	<0.00038:	0.036	<0.00047:	<0.0068:	0.00023	0.0017:		0.0026	<0.0027:	<0.044:	<0.00004:	0.14	<0.00006:	<0.0011:	0.0073	<0.00073J	<0.0002:	<0.00001:	<0.00045:	<0.025:
Surface Water Area 1-Red River Along Mine	RR-7	19-Oct-03	D	0.17	<0.0005:	<0.0002:	0.035	<0.0004:	<0.0063:	0.00023	<0.0011:		0.0041	0.003	<0.028:	<0.0002:	0.16	<0.0001J	0.0009	0.0064J	<0.0003:	<0.0001:	<0.0001:	<0.0001:	0.025
Surface Water Area 1-Red River Along Mine	RR-7	13-Jan-04	D	0.1	<0.0012:	0.0002:	0.033	<0.0018:	<0.012:	0.00033	<0.0057:		0.0075	0.0038	<0.042:	<0.0001:	0.24	<0.0001:	0.001	0.012	0.00085J	<0.0001:	<0.0001:	<0.0002:	0.048
Surface Water Area 1-Red River Along Mine	RR-7	24-Feb-04	D	0.077	<0.0002J	<0.0001:	0.029	<0.0003:	0.0064	0.00036J	<0.0015J		0.0032	0.0049J	<0.036:	<0.0001:	0.23	<0.0001:	<0.0007:	0.013J	<0.00057:	<0.0001J	<0.0001:	<0.0001J	0.041
Surface Water Area 1-Red River Along Mine	RR-7	19-Apr-04	D	0.29	<0.00055:	<0.0002:	0.035	<0.0002:	0.0061	<0.0002:	<0.0008J		0.0014	0.0074:	0.081	<0.0013:	0.08	<0.0001:	<0.0022:	0.0058	<0.0007:	<0.0001J	<0.00012:	0.00045	0.016
Surface Water Area 1-Red River Along Mine	RR-8	04-Oct-02	D	0.13	<0.0002:	<0.0002:	0.032	<0.0002:	<0.0048:	0.00014	<0.0046:		<0.0022:	<0.0031:	<0.023:	<0.0001:	0.2	<0.0001:	0.0012	0.0064	<0.0002:	<0.0001:	<0.0001:	<0.0001:	<0.015:
Surface Water Area 1-Red River Along Mine	RR-8	21-Mar-03	D	0.13	<0.0006:	<0.0002:	0.036	<0.0003J	<0.0084:	<0.0002:	<0.001:		0.0038	0.0043	<0.42:	<0.0002:	0.28	<0.0001:	<0.0023:	0.0098	<0.001:	<0.0002:	<0.0002:	<0.0002:	<0.039:
Surface Water Area 1-Red River Along Mine	RR-8	15-Jul-03	D	0.22	<0.0005:	<0.0002:	0.031	<0.0002:	0.007	<0.0002:	<0.0014:		<0.002:	0.0042	<0.033:	<0.0001:	0.077	<0.0001:	<0.0017:	0.0033	<0.0016:	<0.0001J	<0.0001:	<0.0007:	<0.0093:
Surface Water Area 1-Red River Along Mine	RR-8	24-Sep-03	D	0.14	<0.00043:	<0.00038:	0.035	<0.00047:	<0.0085:	0.00022	<0.001:		0.0022	0.0028	<0.044:	<0.00004:	0.13	<0.00006:	<0.0015:	0.0069	<0.00073:	<0.0002:	<0.00001:	<0.00028:	0.02
Surface Water Area 1-Red River Along Mine	RR-8A	04-Oct-02	D	0.093	<0.0002:	<0.0002:	0.031	<0.0003:	<0.005:	0.00018	<0.00034:		0.0021	<0.0023:	<0.038:	<0.0001:	0.2	<0.0001:	0.0013:	0.0067	0.00049	<0.0001:	<0.0001:	<0.0001:	<0.0073J
Surface Water Area 1-Red River Along Mine	RR-8A	21-Mar-03	D	<0.58:	<0.0006:	<0.0004:	0.035	<0.0003J	<0.0084:	<0.0005:	<0.0011:		<0.0038:	0.0036	<0.42:	<0.0002:	0.26	<0.0001:	<0.0023:	0.0091	<0.001:	<0.0002:	<0.0002:	<0.0002:	<0.039:
Surface Water Area 1-Red River Along Mine	RR-8A	15-Jul-03	D	0.24	<0.0005:	<0.0002:	0.031	<0.0002:	0.0064	<0.0002:	<0.0014:		<0.002:	0.0037	<0.033:	<0.00014:	0.073	0.00015:	0.0013	0.0045	<0.0008:	<0.0001J	<0.0001:	<0.0002:	<0.0067:
Surface Water Area 1-Red River Along Mine	RR-8A	24-Sep-03	D	0.23	<0.00017:	<0.00038:	0.035	<0.00047:	<0.0079:	0.00018	<0.001:		0.0021	0.0029	<0.044:	0.00006	0.12	<0.00006:	<0.0012:	0.006	<0.00073:	<0.0002:	<0.00001:	<0.00029:	0.015

Red River Along Tailings Facility
Data extracted from RI Spreadsheets. Surface Water Area 11 data sorted by Site ID
Period of record is September 2002 to September 2003

EXPOSURE_AREA_LOOKUP_DESCRIPTION	SITE_ID	SAMP_DATE	SAMP_FRACTION	Aluminum mg/L	Antimony mg/L	Arsenic mg/L	Barium mg/L	Beryllium mg/L	Boron mg/L	Cadmium mg/L	Chromium mg/L	Chromium, Hexavalent mg/L	Cobalt mg/L	Copper mg/L	Iron mg/L	Lead mg/L	Manganese mg/L	Mercury mg/L	Molybdenum mg/L	Nickel mg/L	Selenium mg/L	Silver mg/L	Thallium mg/L	Vanadium mg/L	Zinc mg/L
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	27-Sep-02	D	<0.085:	<0.0002:	<0.0002:	0.033	<0.0002:	<0.011:	0.00025	<0.0012:		0.002	0.0022	<0.046:	<0.0001:	0.3	<0.0001:	0.06	0.0079	0.00025	<0.0059:	<0.0001:	<0.0001:	0.021
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	27-Sep-02	D	2.2:	<0.0002:	<0.0002:	0.045	0.00031	<0.018:	0.00033	0.002	<0.01:	0.0027	0.012	1.1:	0.0011:	0.31	<0.0001:	0.058	0.0096	0.00023	<0.0059:	<0.0001:	0.0004	0.067
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	20-Mar-03	D	0.065	<0.0006:	<0.0002:	0.035	<0.0003J	0.01	0.00056	<0.001:		<0.0038:	0.0043	<0.42:	<0.0002:	0.34	<0.0001:	0.059	0.017	<0.001:	<0.0002:	<0.0002:	<0.0002:	0.11
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	14-Jul-03	D	<0.081J	<0.0005:	<0.0002:	0.037	<0.0002:	0.014	0.00027	<0.0006J		<0.0018:	0.0026	<0.017:	<0.0001:	0.16	<0.00019:	0.061	0.0083	<0.0008:	<0.0001J	<0.0001:	<0.0002:	0.04
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	23-Sep-03	D	0.13	<0.00018:	<0.00038:	0.035	<0.00047:	0.0076	0.00035	<0.001:		0.0015	<0.0026:	<0.044:	<0.00004:	0.21	<0.00006:	0.039	0.011	<0.00073:	<0.0002:	<0.00001:	<0.00063:	0.041
Surface Water Area 11-Red River Along Tailings Facility	LR-13	26-Sep-02	D	0.098	<0.0002:	<0.0002:	0.032	<0.0002:	<0.0099:	0.0002	0.0014		0.0021	0.0017	<0.046:	<0.0001:	0.25	<0.0001:	0.061	0.0065	<0.0002:	<0.0059:	<0.0001:	0.00014	0.019
Surface Water Area 11-Red River Along Tailings Facility	LR-13	26-Sep-02	D	1.4:	<0.0002:	<0.0002:	0.043	0.00027	<0.011:	0.00032	<0.0012:	<0.01:	0.0026	0.011	0.96	0.0011:	0.27	<0.0001:	0.057	0.0083	0.00036	<0.0059:	<0.0001:	0.00036	0.052
Surface Water Area 11-Red River Along Tailings Facility	LR-13	20-Mar-03	D	0.1	<0.0006:	<0.0002:	0.037	<0.0003:	0.014	0.00029	<0.001:		<0.0038:	0.0043	<0.42:	<0.0002:	0.26	<0.0001J	0.064	0.014	<0.001J	<0.0002:	<0.0002:	<0.0002:	<0.041:
Surface Water Area 11-Red River Along Tailings Facility	LR-13	14-Jul-03	D	<0.044J	<0.0005:	<0.0002:	0.037	<0.0002:	0.015	0.00027	<0.0006J		<0.0018:	0.0019	<0.017:	<0.0001:	0.14	<0.00016:	0.057	0.0074	<0.0008:	<0.0001J	<0.0001:	0.00022	0.032
Surface Water Area 11-Red River Along Tailings Facility	LR-13	21-Sep-03	D	0.11	<0.00022:	<0.00038:	0.035	<0.00047:	<0.0088:	0.00035	<0.001:		0.0023	0.0023	<0.044:	0.00007:	0.2	<0.00006:	0.036	0.011	<0.00073:	<0.0002:	<0.00001:	<0.00054:	0.041
Surface Water Area 11-Red River Along Tailings Facility	LR-16	26-Sep-02	D	0.092	<0.0002:	<0.0002:	0.031	<0.0002:	<0.014:	0.00044	<0.0012:		<0.0018:	0.0021	<0.046:	<0.0001:	0.23	<0.0001:	0.065	0.0066	<0.0002:	<0.0059:	<0.0001:	0.00049	0.013
Surface Water Area 11-Red River Along Tailings Facility	LR-16	26-Sep-02	D	2.1:	<0.00022:	0.00041	0.06	0.00033	<0.018:	0.00052	0.002	<0.01:	0.0029	0.013	2	0.0014:	0.29	<0.0001:	0.055	0.0091	0.00043	<0.0059:	<0.0001:	0.00093	0.063
Surface Water Area 11-Red River Along Tailings Facility	LR-16	20-Mar-03	D	0.097	<0.0006:	<0.0002:	0.037	<0.0003:	0.016	0.00029	<0.001:		<0.0038:	0.0044	<0.42:	<0.0002:	0.26	<0.0001:	0.066	0.012	<0.0014J	<0.0002:	<0.0002:	0.00056	<0.049:
Surface Water Area 11-Red River Along Tailings Facility	LR-16	14-Jul-03	D	<0.051J	<0.0005:	<0.0002:	0.036	<0.0002:	0.015	0.00021	<0.0006J		<0.0018:	0.0018	<0.017:	0.00014:	0.12	<0.0001:	0.059	0.0064	<0.0008:	<0.0001J	<0.0001:	0.0005	0.027
Surface Water Area 11-Red River Along Tailings Facility	LR-16	21-Sep-03	D	0.11	<0.00059:	<0.00038:	0.037	<0.00047:	<0.01:	<0.00034:	<0.001:		0.0028	0.0022	<0.044:	0.00008:	0.2	<0.00006:	0.037	0.011	<0.00073:	<0.0002:	<0.00001:	<0.00087:	0.044
Surface Water Area 11-Red River Along Tailings Facility	LR-5	30-Sep-02	D	0.1	<0.0002:	<0.0002:	0.029	<0.0002:	<0.006:	0.00029	<0.0012:		0.0029	0.003	<0.046:	<0.0001:	0.33	<0.0001:	0.0042	0.0093	<0.0002:	<0.0059:	<0.0001:	<0.0001:	0.032
Surface Water Area 11-Red River Along Tailings Facility	LR-5	30-Sep-02	D	1.5:	<0.0002:	<0.0002:	0.034	0.00033	<0.0088:	0.00042	<0.0012:	<0.01:	0.0033	0.014	0.59	0.0013:	0.34	<0.0001:	0.003	0.011	<0.0002:	<0.0059:	<0.0001:	0.00039	0.074
Surface Water Area 11-Red River Along Tailings Facility	LR-5	21-Mar-03	D	0.07	<0.0006:	<0.0002:	0.035	<0.0003:	0.0093	0.00049	<0.001:		<0.0038:	0.0056	<0.42:	<0.0002:	0.37	<0.0001J	0.003	0.018	<0.001:	<0.0002:	<0.0002:	<0.0002:	0.12
Surface Water Area 11-Red River Along Tailings Facility	LR-5	15-Jul-03	D	0.14	<0.0005:	<0.0002:	0.036	<0.0002J	0.011	0.00032	<0.0014:		<0.002:	0.0025	0.046	<0.00015:	0.14	0.00018:	0.0069	0.011	<0.0008:	<0.0001J	<0.0001:	<0.0002:	0.072
Surface Water Area 11-Red River Along Tailings Facility	LR-5	23-Sep-03	D	0.15	<0.0004:	<0.00038:	0.037	<0.00047:	0.0068	0.00038	<0.001:		0.004	<0.0029:	<0.044:	<0.00004:	0.21	<0.00006:	0.0047	0.012	<0.00073:	<0.0002:	<0.00001:	<0.00028:	0.046
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	27-Sep-02	D	<0.082	<0.0002:	<0.0002:	0.035	<0.0002:	<0.01:	0.00023	<0.0012:		0.0025	0.0017	<0.046:	<0.0001:	0.28	<0.0001:	0.054	0.0071	<0.0002:	<0.0059:	<0.0001:	0.00013	0.03
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	27-Sep-02	D	1.2:	<0.0002:	<0.0002:	0.044	0.00026	<0.012:	0.00035	0.0012	<0.01:	0.0024	0.0086	0.78	0.00068:	0.29	<0.0001:	0.049	0.0083	0.0003	<0.0059:	<0.0001:	0.00027	0.056
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	23-Mar-03	D	<0.085	<0.0006:	<0.00043:	0.035	<0.001:	0.012	<0.0005:	<0.001:		<0.0038:	0.0037	<0.42:	<0.0002:	0.36	<0.0001:	0.091	0.017	<0.0045:	<0.0002:	<0.0002:	<0.0002:	0.093
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	15-Jul-03	D	<0.063	<0.0005:	<0.0002:	0.036	<0.0004:	0.014	0.0003	<0.0019:		<0.0037:	0.002	<0.067:	<0.0001:	0.15	<0.00015:	0.056	0.0084	<0.0008:	<0.0001J	<0.0001:	<0.0002:	0.052
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	23-Sep-03	D	0.12	<0.00012:	<0.00038:	0.04	<0.00047:	0.01	0.00036	<0.001:		0.0046	<0.0027:	<0.044:	<0.00004:	0.23	<0.00006:	0.055	0.011	<0.00073:	<0.0002:	<0.00001:	<0.00028:	0.051

Data from Outfall 002

Data is from RI data sets.
Period of record is November 2002 to April 2004. Sample interval is quarterly
Data is extracted from original sheets. Data sorted by site and then into Dissolved and Total fractions
Red indicates that the value is a measured value, above the detection limit. Data was converted from a label to a value in this sheet.

EXPOSURE_AREA_LOOKUP_DESCRIPTION	SITE_ID	SAMP_DATE	SAMP_FRACTION	Aluminum mg/L	Antimony mg/L	Arsenic mg/L	Barium mg/L	Beryllium mg/L	Boron mg/L	Cadmium mg/L	Chromium mg/L	Chromium, Hexavalent mg/L	Cobalt mg/L	Copper mg/L	Iron mg/L	Lead mg/L	Manganese mg/L	Mercury mg/L	Molybdenum mg/L	Nickel mg/L	Selenium mg/L	Silver mg/L	Thallium mg/L	Vanadium mg/L	Zinc mg/L
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002 Pipe	11-Jan-03	D	<0.14:	<0.0006:	<0.0004:	0.028	<0.0002:	<0.034:	<0.0004:	<0.0037:		<0.0016:	<0.0019:	<0.49:	<0.0002:	0.65	<0.0001:	1.2	<0.0015:	<0.0016:	<0.0002:	<0.0002:	0.0013	<0.039:
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002 Pipe	07-Nov-02	D	<0.006:	<0.0004:	0.00049J	0.028	<0.0002:	0.034	0.00047J	<0.0046:		<0.0022:	<0.00079:	<0.023:	<0.0002:	0.66	<0.0001:	1.2	0.0024J	0.0011	<0.0002:	<0.0002:	0.0014	<0.0069:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	07-Jan-04	D	<0.033:	<0.0012:	0.00059	0.026	<0.0003:	0.03	0.00042	<0.0015:		<0.0023:	0.0019	<0.036:	<0.0001:	0.59	<0.0001J	1.3	0.0042	<0.0015:	<0.0001:	<0.0001:	0.0013	<0.004:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	14-Apr-04	D	<0.2:	<0.0008:	<0.0004:	0.029	<0.0002:	0.027	<0.0003J	0.0011J		<0.0011J	<0.0007J	<0.29:	<0.0008:	0.5	<0.0001:	1.3	<0.0014:	<0.0014:	<0.0002J	<0.0002:	0.0017	<0.024:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	08-Jul-03	D	<0.63:	<0.001:	<0.0004:	0.028	<0.0002J	<0.036:	<0.0003:	<0.0006J		0.002	<0.0014:	<0.67:	<0.0002:	0.65	<0.0001:	1.2	<0.002:	<0.0016J	<0.0002J	<0.0002:	0.0015	<0.037:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	20-Oct-03	D	<0.022:	<0.0005:	0.00041	0.029	<0.0004:	0.028	0.00024	<0.0011J		<0.0029:	<0.0017:	<0.028:	<0.0002:	0.45	<0.0001:	1.1	0.0031	0.00083	<0.0001:	<0.0001:	0.0013	<0.0023:
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002 PIPE	02-Apr-03	D	<0.028:	<0.0006:	0.00039	0.028	<0.0003:	0.027	<0.0004:	<0.0009:		<0.0029:	<0.0024:	<0.42:	<0.0002:	0.68	<0.0001:	1.3	<0.0026:	0.0019	<0.0002:	<0.0002:	0.0016	<0.039:
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002 Pipe	11-Jan-03	T	<0.14:	<0.0006:	<0.0004:	0.03	<0.0002:	<0.036:	<0.0004:	<0.0037:		<0.0016:	<0.0045:	<0.49:	<0.0002:	0.73:	<0.0001:	1.3	<0.0017:	<0.0016:	<0.0002:	<0.0002:	0.0013	<0.039:
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002 Pipe	07-Nov-02	T	<0.02:	<0.0004:	0.0005J	0.029	<0.0002:	0.035	0.00031J	<0.0046:		<0.0022:	<0.00099:	0.025:	<0.0002:	0.68:	<0.0001:	1.2	0.002J	0.00082	<0.0002:	<0.0002:	0.0014	<0.0069:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	07-Jan-04	T	<0.033:	0.0014	0.00056	0.026	<0.0003:	0.032	0.00023J	<0.0015:		<0.0023:	0.001	<0.036:	<0.0001:	0.6:	<0.0001J	1.3	<0.0035:	<0.0015J	<0.0001:	<0.0001:	0.0014	<0.004:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	14-Apr-04	T	<0.2:	0.00082	<0.0004:	0.029	<0.00028:	0.026	<0.0003J	<0.0008J		0.0045J	<0.0012J	<0.29J	<0.0008:	0.46:	<0.0001:	1.2	0.0019	<0.0014:	<0.0002J	<0.0002:	0.0016	<0.024:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	08-Jul-03	T	<0.63:	<0.001:	<0.0004:	0.029	<0.0002J	<0.035:	<0.0003:	<0.0006J		<0.0018:	<0.0014:	<0.67:	<0.0002:	0.67:	<0.0001:	1.2	<0.002:	<0.0016:	<0.0002J	<0.0002:	0.0015	<0.037:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	20-Oct-03	T	0.2	<0.0005:	0.00041	0.032	<0.0004:	0.028	0.00021	<0.0012J		<0.0029:	<0.0017:	0.17:	0.00035:	0.48:	<0.0001:	1.1	0.0035	0.00082	<0.0001:	<0.0001:	0.0017	<0.0023:
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002 PIPE	02-Apr-03	T	0.035	<0.0006:	0.00049	0.028	<0.0003:	0.032	<0.0004:	<0.0009:		<0.0029:	<0.0024:	<0.42:	<0.0002:	0.63:	<0.0001:	1.2	<0.0026:	0.002	<0.0002:	<0.0002:	0.0016	<0.039:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	14-Apr-04	D	<0.18J	<0.0008:	<0.0004:	0.027:	<0.0002:	0.03:	<0.0003:	<0.0012:		<0.0052:	<0.0007J	<0.19J	<0.0008:	0.54:	<0.0001:	1.3:	0.0027:	<0.0014:	<0.0002J	<0.0002:	0.0018J	<0.015:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	08-Jul-03	D	<0.24:	<0.001:	<0.0004:	0.03:	<0.0002:	0.03:	<0.0006:	<0.0014:		<0.002:	<0.0024:	<0.33:	<0.0002:	0.71:	<0.0001J	1.3:	<0.0021:	<0.0016J	<0.0002J	<0.0002:	0.0017:	<0.01:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	20-Oct-03	D	<0.022:	<0.0005:	0.00032:	0.03:	<0.0004:	0.027:	<0.0002:	<0.0011J		<0.0029:	<0.0017:	<0.028:	<0.0002:	0.48:	<0.0001:	1.1:	0.0036:	0.00044:	<0.0001:	<0.0001:	0.0014:	<0.0023:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	07-Nov-02	D									<0.01:													
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002	03-Apr-03	D	<0.28:	<0.0006J	<0.0004:	0.023:	<0.0003:	0.03:	<0.0004:	<0.0009J		<0.0029:	<0.0024J	<0.3:	<0.0002:	0.77:	<0.0001:	1.3:	<0.0026:	<0.001:	<0.0002:	<0.0002:	0.0013J	<0.025:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	07-Jan-04	D	<0.033:	<0.0012:	0.00053:	0.027:	<0.0003:	0.031:	0.00038:	<0.0015:		<0.0023:	0.0017:	<0.036:	<0.0001:	0.62:	<0.0001:	1.3:	0.0044:	<0.0013:	<0.0001:	<0.0001:	0.0014:	<0.004:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	07-Jan-04	T	<0.033:	<0.0012:	0.00061	0.027	<0.0003:	0.03	0.0003J	<0.0015:		<0.0023:	0.0016	<0.036:	0.00011	0.62	<0.0001J	1.2	<0.004:	<0.0014:	<0.0001:	<0.0001:	0.0014	<0.004:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	14-Apr-04	T	<0.18J	<0.0008:	0.00041	0.027	<0.0002:	0.029	<0.0003:	<0.0011:		<0.0011:	<0.0007:	<0.19J	<0.0008:	0.52	<0.0001:	1.2	0.0028:	<0.0014:	<0.0002J	<0.0002:	0.0019J	<0.015:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	08-Jul-03	T	<0.24:	<0.001:	0.00048	0.032	<0.0002:	0.032	<0.0006:	<0.0014:		<0.002:	0.0083	<0.33:	<0.0002:	0.74	<0.0001J	1.4	<0.0021:	<0.0016:	<0.0002J	<0.0002:	0.0017	<0.011:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	20-Oct-03	T	<0.11:	<0.0005:	0.00036	0.032	<0.0004:	0.03	<0.0002:	<0.0012J		<0.0029:	<0.0017:	<0.1:	<0.0002:	0.51	<0.0001:	1.2	0.0031:	0.00074	<0.0001:	<0.0001:	0.0014	<0.0023:
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002	03-Apr-03	T	<0.28:	<0.0006J	0.00051	0.024	<0.0003:	0.032	<0.0004:	<0.0009J		<0.0029:	<0.0024J	<0.3:	<0.0002:	0.7	<0.0001:	1.2	<0.0026:	0.0012	<0.0002:	<0.0002:	0.0026	<0.025:

The attached tables contain RI Groundwater Water data from the requested sites (outfalls).

As appropriate to the given medium, the data are limited to the Field Parameters, hardness, and the COPCs (if COPC for tailings facility or mine site, human health or eco, or total or dissolved it's included). Excludes the COPCs agreed by EPA not to include in a conference call March 30 2005.

Wqual indicates that the concentration contains "<" when not detected, Next the value, and the validated data qualifier (Usually : or J). If you need just the results for the detectable values, an easy way to do this is to do a global replace of ":" and of "J" and of "R" with null and then format the cells as number. A sort brings all the detects to a contiguous arrangement.

The numeric tables have the concentration (for detects) and the Reporting Limit (for non-detects) presented as a numeric value for graphing purposes.

In both data table types, the units are located after the parameter name (column header).
All units have been standardized to mg/L where appropriate.

EXPOSURE_AREA_LOOKUP_DESCRIPTION	SITE_ID	SAMP_DATE	SAMP_ID	MEDIUM_TYPE_LOOKUP_DESCRIPTION	SAMP_FRACTION	Aluminum mg/L	Antimony mg/L	Arsenic mg/L	Barium mg/L	Beryllium mg/L	Boron mg/L	Cadmium mg/L	Chromium mg/L	Chromium, Hexavalent mg/L	Cobalt mg/L	Copper mg/L	Iron mg/L	Lead mg/L	Manganese mg/L	Mercury mg/L	Molybdenum mg/L	Nickel mg/L	Selenium mg/L	Silver mg/L	Thallium mg/L	Vanadium mg/L	Zinc mg/L
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	07-Jan-04	OUTFALL002-D01N-GRW-010704	Groundwater	D	<0.033:	<0.0012:	0.00053:	0.027:	<0.0003:	0.031:	0.00038:	<0.0015:		<0.0023:	0.0017:	<0.036:	<0.0001:	0.62:	<0.0001:	1.3:	0.0044:	<0.0013:	<0.0001:	<0.0001:	0.0014:	<0.004:
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002 Pipe	11-Jan-03	OUTFALL002-D01N-GRW-011103	Groundwater	D	<0.14:	<0.0006:	<0.0004:	0.028:	<0.0002:	<0.034:	<0.0004:	<0.0037:		<0.0016:	<0.0019:	<0.49:	<0.0002:	0.65:	<0.0001:	1.2:	<0.0015:	<0.0016:	<0.0002:	<0.0002:	0.0013:	<0.039:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	14-Apr-04	OUTFALL002-D01N-GRW-041404	Groundwater	D	<0.18J	<0.0008:	<0.0004:	0.027:	<0.0002:	0.03:	<0.0003:	<0.0012:		<0.0052:	<0.0007J	<0.19J	<0.0008:	0.54:	<0.0001:	1.3:	0.0027:	<0.0014:	<0.0002J	<0.0002:	0.0018J	<0.015:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	08-Jul-03	OUTFALL002-D01N-GRW-070803	Groundwater	D	<0.24:	<0.001:	<0.0004:	0.03:	<0.0002:	0.03:	<0.0006:	<0.0014:		<0.002:	<0.0024:	<0.33:	<0.0002:	0.71:	<0.0001J	1.3:	<0.0021:	<0.0016J	<0.0002J	<0.0002:	0.0017:	<0.01:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	20-Oct-03	OUTFALL002-D01N-GRW-102003	Groundwater	D	<0.022:	<0.0005:	0.00032:	0.03:	<0.0004:	0.027:	<0.0002:	<0.0011J		<0.0029:	<0.0017:	<0.028:	<0.0002:	0.48:	<0.0001:	1.1:	0.0036:	0.00044:	<0.0001:	<0.0001:	0.0014:	<0.0023:
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002 Pipe	07-Nov-02	OUTFALL002-D01N-GRW-110702	Groundwater	D	<0.006:	<0.0004:	0.00049J	0.028:	<0.0002:	0.034:	0.00047J	<0.0046:		<0.0022:	<0.00079:	<0.023:	<0.0002:	0.66:	<0.0001:	1.2:	0.0024J	0.0011:	<0.0002:	<0.0002:	0.0014:	<0.0069:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	07-Jan-04	OUTFALL002-T01N-GRW-010704	Groundwater	T	<0.033:	<0.0012:	0.00061:	0.027:	<0.0003:	0.03:	0.0003J	<0.0015:		<0.0023:	0.0016:	<0.036:	0.00011:	0.62:	<0.0001J	1.2:	<0.004:	<0.0014:	<0.0001:	<0.0001:	0.0014:	<0.004:
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002 Pipe	11-Jan-03	OUTFALL002-T01N-GRW-011103	Groundwater	T	<0.14:	<0.0006:	<0.0004:	0.03:	<0.0002:	<0.036:	<0.0004:	<0.0037:		<0.0016:	<0.0045:	<0.49:	<0.0002:	0.73:	<0.0001:	1.3:	<0.0017:	<0.0016:	<0.0002:	<0.0002:	0.0013:	<0.039:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	14-Apr-04	OUTFALL002-T01N-GRW-041404	Groundwater	T	<0.18J	<0.0008:	0.00041:	0.027:	<0.0002:	0.029:	<0.0003:	<0.0011:		<0.0011:	<0.0007:	<0.19J	<0.0008:	0.52:	<0.0001:	1.2:	0.0028:	<0.0014:	<0.0002J	<0.0002:	0.0019J	<0.015:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	08-Jul-03	OUTFALL002-T01N-GRW-070803	Groundwater	T	<0.24:	<0.001:	0.00048:	0.032:	<0.0002:	0.032:	<0.0006:	<0.0014:		<0.002:	0.0083:	<0.33:	<0.0002:	0.74:	<0.0001J	1.4:	<0.0021:	<0.0016:	<0.0002J	<0.0002:	0.0017:	<0.011:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	20-Oct-03	OUTFALL002-T01N-GRW-102003	Groundwater	T	<0.11:	<0.0005:	0.00036:	0.032:	<0.0004:	0.03:	<0.0002:	<0.0012J		<0.0029:	<0.0017:	<0.1:	<0.0002:	0.51:	<0.0001:	1.2:	0.0031:	0.00074:	<0.0001:	<0.0001:	0.0014:	<0.0023:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	07-Nov-02	OUTFALL002-T01N-GRW-110702	Groundwater	D									<0.01:													
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002 Pipe	07-Nov-02	OUTFALL002-T01N-GRW-110702	Groundwater	T	<0.02:	<0.0004:	0.0005J	0.029:	<0.0002:	0.035:	0.00031J	<0.0046:		<0.0022:	<0.00099:	0.025:	<0.0002:	0.68:	<0.0001:	1.2:	0.002J	0.00082:	<0.0002:	<0.0002:	0.0014:	<0.0069:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	07-Jan-04	OUTFALL002PIPE-D01N-GRW-010704	Groundwater	D	<0.033:	<0.0012:	0.00059:	0.026:	<0.0003:	0.03:	0.00042:	<0.0015:		<0.0023:	0.0019:	<0.036:	<0.0001:	0.59:	<0.0001J	1.3:	0.0042:	<0.0015:	<0.0001:	<0.0001:	0.0013:	<0.004:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	14-Apr-04	OUTFALL002PIPE-D01N-GRW-041404	Groundwater	D	<0.2:	<0.0008:	<0.0004:	0.029:	<0.0002:	0.027:	<0.0003J	0.0011J		<0.0011J	<0.0007J	<0.29:	<0.0008:	0.5:	<0.0001:	1.3:	<0.0014:	<0.0014:	<0.0002J	<0.0002:	0.0017:	<0.024:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	08-Jul-03	OUTFALL002PIPE-D01N-GRW-070803	Groundwater	D	<0.63:	<0.001:	<0.0004:	0.028:	<0.0002J	<0.036:	<0.0003:	<0.0006J		0.002:	<0.0014:	<0.67:	<0.0002:	0.65:	<0.0001:	1.2:	<0.002:	<0.0016J	<0.0002J	<0.0002:	0.0015:	<0.037:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	20-Oct-03	OUTFALL002PIPE-D01N-GRW-102003	Groundwater	D	<0.022:	<0.0005:	0.00041:	0.029:	<0.0004:	0.028:	0.00024:	<0.0011J		<0.0029:	<0.0017:	<0.028:	<0.0002:	0.45:	<0.0001:	1.1:	0.0031:	0.00083:	<0.0001:	<0.0001:	0.0013:	<0.0023:
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002 PIPE	02-Apr-03	OUTFALL002PIPE-D01N-SFW-040203	Groundwater	D	<0.028:	<0.0006:	0.00039:	0.028:	<0.0003:	0.027:	<0.0004:	<0.0009:		<0.0029:	<0.0024:	<0.42:	<0.0002:	0.68:	<0.0001:	1.3:	<0.0026:	0.0019:	<0.0002:	<0.0002:	0.0016:	<0.039:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	07-Jan-04	OUTFALL002PIPE-T01N-GRW-010704	Groundwater	T	<0.033:	0.0014:	0.00056:	0.026:	<0.0003:	0.032:	0.00023J	<0.0015:		<0.0023:	0.001:	<0.036:	<0.0001:	0.6:	<0.0001J	1.3:	<0.0035:	<0.0015J	<0.0001:	<0.0001:	0.0014:	<0.004:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	14-Apr-04	OUTFALL002PIPE-T01N-GRW-041404	Groundwater	T	<0.2:	0.00082:	<0.0004:	0.029:	<0.00028:	0.026:	<0.0003J	<0.0008J		0.0045J	<0.0012J	<0.29J	<0.0008:	0.46:	<0.0001:	1.2:	0.0019:	<0.0014:	<0.0002J	<0.0002:	0.0016:	<0.024:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	08-Jul-03	OUTFALL002PIPE-T01N-GRW-070803	Groundwater	T	<0.63:	<0.001:	<0.0004:	0.029:	<0.0002J	<0.035:	<0.0003:	<0.0006J		<0.0018:	<0.0014:	<0.67:	<0.0002:	0.67:	<0.0001:	1.2:	<0.002:	<0.0016:	<0.0002J	<0.0002:	0.0015:	<0.037:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	20-Oct-03	OUTFALL002PIPE-T01N-GRW-102003	Groundwater	T	0.2:	<0.0005:	0.00041:	0.032:	<0.0004:	0.028:	0.00021:	<0.0012J		<0.0029:	<0.0017:	0.17:	0.00035:	0.48:	<0.0001:	1.1:	0.0035:	0.00082:	<0.0001:	<0.0001:	0.0017:	<0.0023:
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002 PIPE	02-Apr-03	OUTFALL002PIPE-T01N-SFW-040203	Groundwater	T	0.035:	<0.0006:	0.00049:	0.028:	<0.0003:	0.032:	<0.0004:	<0.0009:		<0.0029:	<0.0024:	<0.42:	<0.0002:	0.63:	<0.0001:	1.2:	<0.0026:	0.002:	<0.0002:	<0.0002:	0.0016:	<0.039:
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002	03-Apr-03	OUTFALL002SUMP-D01N-GRW-040303	Groundwater	D	<0.28:	<0.0006J	<0.0004:	0.023:	<0.0003:	0.03:	<0.0004:	<0.0009J		<0.0029:	<0.0024J	<0.3:	<0.0002:	0.77:	<0.0001:	1.3:	<0.0026:	<0.001:	<0.0002:	<0.0002:	0.0013J	<0.025:
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002	03-Apr-03	OUTFALL002SUMP-T01N-GRW-040303	Groundwater	T	<0.28:	<0.0006J	0.00051:	0.024:	<0.0003:	0.032:	<0.0004:	<0.0009J		<0.0029:	<0.0024J	<0.3:	<0.0002:	0.7:	<0.0001:	1.2:	<0.0026:	0.0012:	<0.0002:	<0.0002:	0.0026:	<0.025:

EXPOSURE_AREA_LOOKUP_DESCRIPTION	SITE_ID	SAMP_DATE	SAMP_ID	MEDIUM_TYPE_LOOKUP_DESCRIPTION	SAMP_FRACTION	DO mg/L	Eh millivolts	FLOW gpm	Fluoride mg/L	Hardness mg/L	Nitrite mg/L	pH SU	Specific Conductance uS/cm	Sulfate mg/L	Temperature Celsius	Turbidity NTU
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002 Pipe	20-Mar-03	Outfall-002 Pipe-T01N-GRW-032003	Groundwater	T			300:								
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002 Pipe	02-Apr-03	Outfall-002 Pipe-T01N-GRW-040203	Groundwater	T	7.6:	381:	241:				7.3:	1700:		10.6:	0:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	03-Apr-03	Outfall-002 Pipe-T01N-GRW-040303	Groundwater	T	8.3:	322:					7.1:	1650:		11.8:	0:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	07-Jan-04	OUTFALL002-D01N-GRW-010704	Groundwater	D					884:						
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002 Pipe	11-Jan-03	OUTFALL002-D01N-GRW-011103	Groundwater	D					884:						
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	14-Apr-04	OUTFALL002-D01N-GRW-041404	Groundwater	D					945:						
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	08-Jul-03	OUTFALL002-D01N-GRW-070803	Groundwater	D					872:						
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	20-Oct-03	OUTFALL002-D01N-GRW-102003	Groundwater	D					820:						
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002 Pipe	07-Nov-02	OUTFALL002-D01N-GRW-110702	Groundwater	D					890:						
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	07-Jan-04	OUTFALL002-T01N-GRW-010704	Groundwater	T	11.1:	316:					7.1:	1720:		9.2:	12.3:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	07-Jan-04	OUTFALL002-T01N-GRW-010704	Groundwater	T				1.1:	865:	<0.005J			844:		
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002 Pipe	11-Jan-03	OUTFALL002-T01N-GRW-011103	Groundwater	T				1.1:	899:	<0.005J			843J		
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002 Pipe	11-Jan-03	OUTFALL002-T01N-GRW-011103	Groundwater	T	8.7:		300:				6.4:	3400:		10:	0.1:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	14-Apr-04	OUTFALL002-T01N-GRW-041404	Groundwater	T	7:	179:	328:				7.2:	1610:		13.3:	0.8:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	14-Apr-04	OUTFALL002-T01N-GRW-041404	Groundwater	T				1.1:	911:	<0.005J			821:		
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	08-Jul-03	OUTFALL002-T01N-GRW-070803	Groundwater	T	8.9:	322:		1.2:	899:	<0.005:	7.6:	1570:	919J	15.1:	47.1:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	20-Oct-03	OUTFALL002-T01N-GRW-102003	Groundwater	T				1.3:	858:	<0.005:			763J		
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002 Pipe	07-Nov-02	OUTFALL002-T01N-GRW-110702	Groundwater	T				1.1:	907:	<0.005J			989:		
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002 Pipe	07-Nov-02	OUTFALL002-T01N-GRW-110702	Groundwater	T	5.6:	322:					7:	1620:		11.6:	0:
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002 PIPE	26-Sep-03	OUTFALL002-T01N-SFW-092603	Groundwater	T			404:								
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002	20-Oct-03	OUTFALL002-T01N-SFW-102003	Groundwater	T	7.6:	116:					6.6:	1690:		12.2:	15.8:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	07-Jan-04	OUTFALL002PIPE-D01N-GRW-010704	Groundwater	D					859:						
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	14-Apr-04	OUTFALL002PIPE-D01N-GRW-041404	Groundwater	D					912:						
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	08-Jul-03	OUTFALL002PIPE-D01N-GRW-070803	Groundwater	D					878:						
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	20-Oct-03	OUTFALL002PIPE-D01N-GRW-102003	Groundwater	D					819:						
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002 PIPE	02-Apr-03	OUTFALL002PIPE-D01N-SFW-040203	Groundwater	D					917:						
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	07-Jan-04	OUTFALL002PIPE-T01N-GRW-010704	Groundwater	T	7.2:	298:					7.3:	1700:		9.3:	0.7:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	07-Jan-04	OUTFALL002PIPE-T01N-GRW-010704	Groundwater	T				1.2:	866:	<0.005J			862:		
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	14-Apr-04	OUTFALL002PIPE-T01N-GRW-041404	Groundwater	T	8.1:	230:		1.2:	878:	<0.005J	7.3:	1640:	697:	11.6:	0:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	08-Jul-03	OUTFALL002PIPE-T01N-GRW-070803	Groundwater	T	9:	364:	289:	1.6:	903:	<0.005J	6.7:	1550:	711J	11.8:	20.5:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	20-Oct-03	OUTFALL002PIPE-T01N-GRW-102003	Groundwater	T	8.8:	93.4:	400:				7.7:	1680:		11.8:	2.5:
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	20-Oct-03	OUTFALL002PIPE-T01N-GRW-102003	Groundwater	T				1.2:	833:	<0.005J			791J		
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002 PIPE	02-Apr-03	OUTFALL002PIPE-T01N-SFW-040203	Groundwater	T				1.2:	863:	<0.005J			845:		
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002	03-Apr-03	OUTFALL002SUMP-D01N-GRW-040303	Groundwater	D					962:						
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002	03-Apr-03	OUTFALL002SUMP-T01N-GRW-040303	Groundwater	T				1.1:	936:	<0.005:			801J		

EXPOSURE AREA LOOKUP DESCRIPTION	SITE ID	SAMP DATE	SAMP ID	MEDIUM TYPE LOOKUP DESCRIPTION	SAMP FRACTION	Aluminum mg/L	Antimony mg/L	Arsenic mg/L	Barium mg/L	Beryllium mg/L	Boron mg/L	Cadmium mg/L	Chromium mg/L	Chromium, Hexavalent mg/L	Cobalt mg/L	Copper mg/L	Iron mg/L	Lead mg/L	Manganese mg/L	Mercury mg/L	Molybdenum mg/L	Nickel mg/L	Selenium mg/L	Silver mg/L	Thallium mg/L	Vanadium mg/L	Zinc mg/L
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	07-Nov-02	OUTFALL002-T01N-GRW-110702	Groundwater	D									0.01													
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002	03-Apr-03	OUTFALL002SUMP-D01N-GRW-040303	Groundwater	D	0.28	0.0006	0.0004	0.023	0.0003	0.03	0.0004	0.0009		0.0029	0.0024	0.3	0.0002	0.77	0.0001	1.3	0.0026	0.001	0.0002	0.0002	0.0013	0.025
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002	03-Apr-03	OUTFALL002SUMP-T01N-GRW-040303	Groundwater	T	0.28	0.0006	0.00051	0.024	0.0003	0.032	0.0004	0.0009		0.0029	0.0024	0.3	0.0002	0.7	0.0001	1.2	0.0026	0.0012	0.0002	0.0002	0.0026	0.025
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	08-Jul-03	OUTFALL002-D01N-GRW-070803	Groundwater	D	0.24	0.001	0.0004	0.03	0.0002	0.03	0.0006	0.0014		0.002	0.0024	0.33	0.0002	0.71	0.0001	1.3	0.0021	0.0016	0.0002	0.0002	0.0017	0.01
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	08-Jul-03	OUTFALL002-T01N-GRW-070803	Groundwater	T	0.24	0.001	0.00048	0.032	0.0002	0.032	0.0006	0.0014		0.002	0.0083	0.33	0.0002	0.74	0.0001	1.4	0.0021	0.0016	0.0002	0.0002	0.0017	0.011
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	20-Oct-03	OUTFALL002-D01N-GRW-102003	Groundwater	D	0.022	0.0005	0.00032	0.03	0.0004	0.027	0.0002	0.0011		0.0029	0.0017	0.028	0.0002	0.48	0.0001	1.1	0.0036	0.00044	0.0001	0.0001	0.0014	0.0023
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	20-Oct-03	OUTFALL002-T01N-GRW-102003	Groundwater	T	0.11	0.0005	0.00036	0.032	0.0004	0.03	0.0002	0.0012		0.0029	0.0017	0.1	0.0002	0.51	0.0001	1.2	0.0031	0.00074	0.0001	0.0001	0.0014	0.0023
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	07-Jan-04	OUTFALL002-D01N-GRW-010704	Groundwater	D	0.033	0.0012	0.00053	0.027	0.0003	0.031	0.00038	0.0015		0.0023	0.0017	0.036	0.0001	0.62	0.0001	1.3	0.0044	0.0013	0.0001	0.0001	0.0014	0.004
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	07-Jan-04	OUTFALL002-T01N-GRW-010704	Groundwater	T	0.033	0.0012	0.00061	0.027	0.0003	0.03	0.0003	0.0015		0.0023	0.0016	0.036	0.00011	0.62	0.0001	1.2	0.004	0.0014	0.0001	0.0001	0.0014	0.004
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	14-Apr-04	OUTFALL002-D01N-GRW-041404	Groundwater	D	0.18	0.0008	0.0004	0.027	0.0002	0.03	0.0003	0.0012		0.0052	0.0007	0.19	0.0008	0.54	0.0001	1.3	0.0027	0.0014	0.0002	0.0002	0.0018	0.015
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	14-Apr-04	OUTFALL002-T01N-GRW-041404	Groundwater	T	0.18	0.0008	0.00041	0.027	0.0002	0.029	0.0003	0.0011		0.0011	0.0007	0.19	0.0008	0.52	0.0001	1.2	0.0028	0.0014	0.0002	0.0002	0.0019	0.015
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002 Pipe	07-Nov-02	OUTFALL002-D01N-GRW-110702	Groundwater	D	0.006	0.0004	0.00049	0.028	0.0002	0.034	0.00047	0.0046		0.0022	0.00079	0.023	0.0002	0.66	0.0001	1.2	0.0024	0.0011	0.0002	0.0002	0.0014	0.0069
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002 Pipe	07-Nov-02	OUTFALL002-T01N-GRW-110702	Groundwater	T	0.02	0.0004	0.0005	0.029	0.0002	0.035	0.00031	0.0046		0.0022	0.00099	0.025	0.0002	0.68	0.0001	1.2	0.002	0.00082	0.0002	0.0002	0.0014	0.0069
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002 Pipe	11-Jan-03	OUTFALL002-D01N-GRW-011103	Groundwater	D	0.14	0.0006	0.0004	0.028	0.0002	0.034	0.0004	0.0037		0.0016	0.0019	0.49	0.0002	0.65	0.0001	1.2	0.0015	0.0016	0.0002	0.0002	0.0013	0.039
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002 Pipe	11-Jan-03	OUTFALL002-T01N-GRW-011103	Groundwater	T	0.14	0.0006	0.0004	0.03	0.0002	0.036	0.0004	0.0037		0.0016	0.0045	0.49	0.0002	0.73	0.0001	1.3	0.0017	0.0016	0.0002	0.0002	0.0013	0.039
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002 PIPE	02-Apr-03	OUTFALL002PIPE-D01N-SFW-040203	Groundwater	D	0.028	0.0006	0.00039	0.028	0.0003	0.027	0.0004	0.0009		0.0029	0.0024	0.42	0.0002	0.68	0.0001	1.3	0.0026	0.0019	0.0002	0.0002	0.0016	0.039
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002 PIPE	02-Apr-03	OUTFALL002PIPE-T01N-SFW-040203	Groundwater	T	0.035	0.0006	0.00049	0.028	0.0003	0.032	0.0004	0.0009		0.0029	0.0024	0.42	0.0002	0.63	0.0001	1.2	0.0026	0.002	0.0002	0.0002	0.0016	0.039
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	08-Jul-03	OUTFALL002PIPE-D01N-GRW-070803	Groundwater	D	0.63	0.001	0.0004	0.028	0.0002	0.036	0.0003	0.0006		0.002	0.0014	0.67	0.0002	0.65	0.0001	1.2	0.002	0.0016	0.0002	0.0002	0.0015	0.037
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	08-Jul-03	OUTFALL002PIPE-T01N-GRW-070803	Groundwater	T	0.63	0.001	0.0004	0.029	0.0002	0.035	0.0003	0.0006		0.0018	0.0014	0.67	0.0002	0.67	0.0001	1.2	0.002	0.0016	0.0002	0.0002	0.0015	0.037
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	20-Oct-03	OUTFALL002PIPE-D01N-GRW-102003	Groundwater	D	0.022	0.0005	0.00041	0.029	0.0004	0.028	0.00024	0.0011		0.0029	0.0017	0.028	0.0002	0.45	0.0001	1.1	0.0031	0.00083	0.0001	0.0001	0.0013	0.0023
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	20-Oct-03	OUTFALL002PIPE-T01N-GRW-102003	Groundwater	T	0.2	0.0005	0.00041	0.032	0.0004	0.028	0.00021	0.0012		0.0029	0.0017	0.17	0.00035	0.48	0.0001	1.1	0.0035	0.00082	0.0001	0.0001	0.0017	0.0023
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	07-Jan-04	OUTFALL002PIPE-D01N-GRW-010704	Groundwater	D	0.033	0.0012	0.00059	0.026	0.0003	0.03	0.00042	0.0015		0.0023	0.0019	0.036	0.0001	0.59	0.0001	1.3	0.0042	0.0015	0.0001	0.0001	0.0013	0.004
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	07-Jan-04	OUTFALL002PIPE-T01N-GRW-010704	Groundwater	T	0.033	0.0014	0.00056	0.026	0.0003	0.032	0.00023	0.0015		0.0023	0.001	0.036	0.0001	0.6	0.0001	1.3	0.0035	0.0015	0.0001	0.0001	0.0014	0.004
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	14-Apr-04	OUTFALL002PIPE-D01N-GRW-041404	Groundwater	D	0.2	0.0008	0.0004	0.029	0.0002	0.027	0.0003	0.0011		0.0011	0.0007	0.29	0.0008	0.5	0.0001	1.3	0.0014	0.0014	0.0002	0.0002	0.0017	0.024
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	14-Apr-04	OUTFALL002PIPE-T01N-GRW-041404	Groundwater	T	0.2	0.00082	0.0004	0.029	0.00028	0.026	0.0003	0.0008		0.0045	0.0012	0.29	0.0008	0.46	0.0001	1.2	0.0019	0.0014	0.0002	0.0002	0.0016	0.024

EXPOSURE_AREA_LOOKUP_DESCRIPTION	SITE_ID	SAMP_DATE	SAMP_ID	MEDIUM_TYPE_LOOKUP_DESCRIPTION	SAMP_FRACTION	DO mg/L	EH millivolts	FLOW gpm	Fluoride mg/L	Hardness mg/L	Nitrite mg/L	pH SU	Specific Conductance uS/cm	Sulfate mg/L	Temperature Celsius	Turbidity NTU
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	03-Apr-03	Outfall-002 Pipe-T01N-GRW-040303	Groundwater	T	8.3	322					7.1	1650		11.8	0
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002	03-Apr-03	OUTFALL002SUMP-D01N-GRW-040303	Groundwater	D					962						
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002	03-Apr-03	OUTFALL002SUMP-T01N-GRW-040303	Groundwater	T				1.1	936	0.005			801		
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	08-Jul-03	OUTFALL002-D01N-GRW-070803	Groundwater	D					872						
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	08-Jul-03	OUTFALL002-T01N-GRW-070803	Groundwater	T	8.9	322		1.2	899	0.005	7.6	1570	919	15.1	47.1
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002	20-Oct-03	OUTFALL002-T01N-SFW-102003	Groundwater	T	7.6	116					6.6	1690		12.2	15.8
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	20-Oct-03	OUTFALL002-D01N-GRW-102003	Groundwater	D					820						
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	20-Oct-03	OUTFALL002-T01N-GRW-102003	Groundwater	T				1.3	858	0.005			763		
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	07-Jan-04	OUTFALL002-T01N-GRW-010704	Groundwater	T	11.1	316					7.1	1720		9.2	12.3
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	07-Jan-04	OUTFALL002-D01N-GRW-010704	Groundwater	D					884						
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	07-Jan-04	OUTFALL002-T01N-GRW-010704	Groundwater	T				1.1	865	0.005			844		
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	14-Apr-04	OUTFALL002-T01N-GRW-041404	Groundwater	T	7	179	328				7.2	1610		13.3	0.8
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	14-Apr-04	OUTFALL002-D01N-GRW-041404	Groundwater	D					945						
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002	14-Apr-04	OUTFALL002-T01N-GRW-041404	Groundwater	T				1.1	911	0.005			821		
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002 Pipe	07-Nov-02	OUTFALL002-D01N-GRW-110702	Groundwater	D					890						
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002 Pipe	07-Nov-02	OUTFALL002-T01N-GRW-110702	Groundwater	T				1.1	907	0.005			989		
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002 Pipe	07-Nov-02	OUTFALL002-T01N-GRW-110702	Groundwater	T	5.6	322					7	1620		11.6	0
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002 Pipe	11-Jan-03	OUTFALL002-D01N-GRW-011103	Groundwater	D					884						
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002 Pipe	11-Jan-03	OUTFALL002-T01N-GRW-011103	Groundwater	T				1.1	899	0.005			843		
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002 Pipe	11-Jan-03	OUTFALL002-T01N-GRW-011103	Groundwater	T	8.7		300				6.4	3400		10	0.1
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002 Pipe	20-Mar-03	Outfall-002 Pipe-T01N-GRW-032003	Groundwater	T			300								
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002 PIPE	02-Apr-03	OUTFALL002PIPE-D01N-SFW-040203	Groundwater	D					917						
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002 PIPE	02-Apr-03	OUTFALL002PIPE-T01N-SFW-040203	Groundwater	T				1.2	863	0.005			845		
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002 Pipe	02-Apr-03	Outfall-002 Pipe-T01N-GRW-040203	Groundwater	T	7.6	381	241				7.3	1700		10.6	0
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	08-Jul-03	OUTFALL002PIPE-D01N-GRW-070803	Groundwater	D					878						
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	08-Jul-03	OUTFALL002PIPE-T01N-GRW-070803	Groundwater	T	9	364	289	1.6	903	0.005	6.7	1550	711	11.8	20.5
Groundwater Area 13 - Groundwater for Tailings facility area	Outfall-002 PIPE	26-Sep-03	OUTFALL002-T01N-SFW-092603	Groundwater	T			404								
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	20-Oct-03	OUTFALL002PIPE-T01N-GRW-102003	Groundwater	T	8.8	93.4	400				7.7	1680		11.8	2.5
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	20-Oct-03	OUTFALL002PIPE-D01N-GRW-102003	Groundwater	D					819						
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	20-Oct-03	OUTFALL002PIPE-T01N-GRW-102003	Groundwater	T				1.2	833	0.005			791		
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	07-Jan-04	OUTFALL002PIPE-T01N-GRW-010704	Groundwater	T	7.2	298					7.3	1700		9.3	0.7
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	07-Jan-04	OUTFALL002PIPE-D01N-GRW-010704	Groundwater	D					859						
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	07-Jan-04	OUTFALL002PIPE-T01N-GRW-010704	Groundwater	T				1.2	866	0.005			862		
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	14-Apr-04	OUTFALL002PIPE-D01N-GRW-041404	Groundwater	D					912						
Groundwater Area 13 - Groundwater for Tailings facility area	OUTFALL-002 PIPE	14-Apr-04	OUTFALL002PIPE-T01N-GRW-041404	Groundwater	T	8.1	230		1.2	878	0.005	7.3	1640	697	11.6	0

The attached tables contain RI Surface Water data from the requested sites.

As appropriate to the given medium, the data are limited to the Field Parameters, hardness, and the COPCs (if COPC for tailings facility or mine site, human health or eco, or total or dissolved it's included). Excludes the COPCs agreed by EPA not to include in a conference call March 30 2005.

Wqual indicates that the concentration contains "<" when not detected, Next the value, and the validated data qualifier (Usually : or J). If you need just the results for the detectable values, an easy way to do this is to do a global replace of ":" and of "J" and of "R" with null and then format the cells as number. A sort brings all the detects to a contiguous arrangement.

The numeric tables have the concentration (for detects) and the Reporting Limit (for non-detects) presented as a numeric value for graphing purposes.

In both data table types, the units are located after the parameter name (column header).
All units have been standardized to mg/L where appropriate.

EXPOSURE_AREA_LOOKUP_DESCRIPTION	SITE_ID	SAMP_DATE	SAMP_ID	MEDIUM_TYPE_LOOKUP_DESCRIPTION	SAMP_FRACTION	Aluminum mg/L	Antimony mg/L	Arsenic mg/L	Barium mg/L	Beryllium mg/L	Boron mg/L	Cadmium mg/L	Chromium mg/L	Chromium, Hexavalent mg/L	Cobalt mg/L	Copper mg/L	Iron mg/L	Lead mg/L	Manganese mg/L	Mercury mg/L	Molybdenum mg/L	Nickel mg/L	Selenium mg/L	Silver mg/L	Thallium mg/L	Vanadium mg/L	Zinc mg/L
Reference Lower Cabresto Creek Riparian	RRS-18	06-Oct-02	RRS-18-T01N-SFW-100602	Surface Water	T	<0.013	<0.0002	<0.0002	0.025	<0.0002	<0.0048	<0.0001	<0.0046		<0.0022	<0.0003	0.5J	<0.0001	0.007	<0.0001	0.00082	0.00026	<0.0002	<0.0001	<0.0001	0.00012	<0.0069
Reference Lower Cabresto Creek Riparian	RRS-18	23-Mar-03	RRS-18-T01N-SFW-032303	Surface Water	T	<0.05	<0.0006	<0.00038	0.02	<0.0003	<0.0084	<0.0005	<0.001		<0.0038	<0.004	<0.42	<0.0002	0.018	<0.0001	<0.0022	<0.003	<0.0031	<0.0002	<0.0002	<0.0002	<0.039
Reference Lower Cabresto Creek Riparian	RRS-18	25-Sep-03	RRS-18-T01N-SFW-092503	Surface Water	T	0.03	0.0024	<0.00038	0.018	<0.00047	0.0052	<0.00008	<0.001		<0.0011	<0.00041	0.068	<0.0001	0.012	<0.00006	<0.0023	<0.0011	<0.00073	<0.0002	<0.00001	0.00038	0.017
Reference Lower Cabresto Creek Riparian	RRS-20	06-Oct-02	RRS-20-T01N-SFW-100602	Surface Water	T	0.021	<0.0002	0.00023	0.026	<0.0003	<0.005	<0.0001	<0.00032		<0.0001	<0.0005	<0.054	<0.0001	0.009	<0.0001	0.00067	<0.0002	0.00028	<0.0001	<0.0001	0.00014	<0.0048J
Reference Lower Cabresto Creek Riparian	RRS-20	23-Mar-03	RRS-20-T01N-SFW-032303	Surface Water	T	<0.05	<0.0006	<0.00044	0.018	<0.0013	<0.0084	<0.0005	<0.001		<0.0038	<0.0015J	<0.42	<0.0002	<0.013	<0.0001	<0.0023	<0.003	<0.0015	<0.0002	<0.0002	<0.0002	<0.039
Reference Lower Cabresto Creek Riparian	RRS-20	16-Jul-03	RRS-20-T01N-SFW-071603	Surface Water	T	<0.081	<0.0005	0.00044	0.027	<0.0002	<0.0048	<0.0002	<0.0014		<0.002	<0.0024	0.46	0.00038	0.12	<0.00015	<0.0017	<0.0021	<0.0008	<0.0001J	<0.0001	<0.0002	<0.0092
Reference Lower Cabresto Creek Riparian	RRS-20	25-Sep-03	RRS-20-T01N-SFW-092503	Surface Water	T	<0.017	<0.00021	<0.00038	0.019	<0.00047	0.0056	<0.00008	<0.001		<0.0011	<0.00046	0.047	<0.00006	0.0068	<0.00006	<0.00089	<0.00084	<0.00073	<0.0002	<0.00001	0.00037	<0.013
Reference Lower Cabresto Creek Riparian	RRS-23	06-Oct-02	RRS-23-T01N-SFW-100602	Surface Water	T	<0.021	<0.0002	<0.0002	0.026	<0.0002	<0.0048	<0.0001	<0.0046		<0.0022	0.0025	<0.023	<0.00016	<0.0045	<0.0001	<0.00071	0.0011	<0.0002	<0.0001	<0.0001	0.00015	0.012
Reference Lower Cabresto Creek Riparian	RRS-23	23-Mar-03	RRS-23-T01N-SFW-032303	Surface Water	T	<0.05	<0.0006	<0.00049	0.022	<0.0003	<0.0084	<0.0005	<0.001		<0.0038	<0.0043	<0.42	<0.0002	<0.013	<0.0001	<0.0022	<0.003	<0.001	<0.0002	<0.0002	<0.0002	<0.039
Reference Lower Cabresto Creek Riparian	RRS-23	16-Jul-03	RRS-23-T01N-SFW-071603	Surface Water	T	<0.034	<0.0005	<0.0002	0.035	<0.0002	0.0051	<0.0002	<0.0014		<0.002	<0.0024	<0.067	<0.0001	0.011	<0.00016	<0.0017	<0.0021	<0.0008	<0.0001J	<0.0001	<0.0002	<0.0051
Reference Lower Cabresto Creek Riparian	RRS-23	25-Sep-03	RRS-23-T01N-SFW-092503	Surface Water	T	0.018	<0.0006	<0.00038	0.017	<0.00047	<0.0048	<0.00008	<0.001		<0.0011	<0.0005	<0.044	<0.00006	0.0014	<0.00006	<0.0011	0.00097	<0.00073	<0.0002	<0.00001	<0.00061	<0.013
Reference Lower Cabresto Creek Riparian	RRS-27	06-Oct-02	RRS-27-T01N-SFW-100602	Surface Water	T	<0.025	<0.0002	<0.0002	0.055	<0.0002	<0.0048	<0.0001	<0.0046		<0.0022	0.00066	0.32	<0.00073	0.027	<0.0001	<0.00064	0.00046	0.00028	<0.0001	<0.0001	0.00016	0.0079
Reference Lower Cabresto Creek Riparian	RRS-27	23-Mar-03	RRS-27-T01N-SFW-032303	Surface Water	T	<0.05	<0.0006	<0.00052	0.024	<0.0013	<0.0084	<0.0005	<0.001		<0.0038	<0.0015J	<0.42	<0.0002	<0.013	<0.0001	<0.0023	<0.003	<0.001	<0.0002	<0.0002	<0.0002	<0.039
Reference Lower Cabresto Creek Riparian	RRS-27	16-Jul-03	RRS-27-T01N-SFW-071603	Surface Water	T	<0.05	<0.0005	0.00025	0.036	<0.0002	0.0065	<0.0002	<0.0014		<0.002	<0.0024	0.18	0.00012	0.043	<0.00013	<0.0017	<0.0021	<0.0008	<0.0001J	<0.0001	<0.0002	<0.011
Reference Lower Cabresto Creek Riparian	RRS-27	25-Sep-03	RRS-27-T01N-SFW-092503	Surface Water	T	<0.016	<0.00027	<0.00038	0.019	<0.00047	<0.0048	<0.00008	<0.001		<0.0011	<0.00056	<0.044	<0.00006	0.0019	<0.00006	<0.00088	0.00091	<0.00073	<0.0002	<0.00001	<0.00073	<0.013
Reference Red River Above Mine Site	RR-1	04-Oct-02	RR-1-T01N-SFW-100402	Surface Water	T	0.042	<0.0002	<0.0002	0.047	<0.0002	<0.0048	<0.0001	<0.0046		<0.0022	<0.00058	<0.023	<0.00011	<0.0027	<0.0001	0.00093	<0.0002	<0.0002	<0.0001	<0.0001	0.00036	<0.0069
Reference Red River Above Mine Site	RR-1	21-Mar-03	RR-1-T01N-SFW-032103	Surface Water	T	<0.43	<0.0006	<0.0004J	0.054	<0.0003	<0.0084	<0.0005J	<0.001		<0.0038	<0.0015	<0.42	<0.0002	<0.013	<0.0001J	<0.0023	<0.003	<0.0013J	<0.0002	<0.0002	0.00027	<0.039
Reference Red River Above Mine Site	RR-1	16-Jul-03	RR-1-T01N-SFW-071603	Surface Water	T	<0.071	<0.0005	<0.0002	0.038	<0.0002	<0.0048	<0.0002	<0.0014		<0.002	<0.0024	0.11	0.00034	0.0069	<0.00015	<0.0017	<0.0021	<0.0008	<0.0001J	<0.0001	0.00038	<0.0055
Reference Red River Above Mine Site	RR-1	25-Sep-03	RR-1-T01N-SFW-092503	Surface Water	T	<0.051	0.0016	<0.00038	0.044	<0.00047	<0.0048	<0.00008	<0.001		<0.0011	<0.00045	<0.077	<0.00014	<0.0045	<0.00006	<0.0019	<0.001	<0.00073	<0.0002	<0.00001	0.00059	<0.013
Reference Red River Above Mine Site	RR-3	03-Oct-02	RR-3-T01N-SFW-100302	Surface Water	T	0.45	<0.0002	<0.0002	0.047	<0.0002	<0.0048	0.00036	<0.0046		<0.0022	0.016	0.22	0.0028	0.12	<0.0001	<0.00096	0.0064	<0.0002	<0.0001	<0.0001	0.00025	0.05
Reference Red River Above Mine Site	RR-3	21-Mar-03	RR-3-T01N-SFW-032103	Surface Water	T	3.4	<0.0006	<0.0004J	0.075	<0.0003	<0.0084	<0.0005J	0.0037		<0.0038	0.034	2.9J	0.0059	0.21	<0.0001J	<0.0023	0.0077	<0.001J	<0.0002	<0.0002	0.0047	0.082
Reference Red River Above Mine Site	RR-3	16-Jul-03	RR-3-T01N-SFW-071603	Surface Water	T	0.35	<0.0005	<0.0002	0.04	<0.0002	<0.0048	0.00028	<0.0014J		<0.002	0.016	0.11J	0.00028	0.099	<0.0001	0.0008	0.0052	<0.0008	<0.0001J	<0.0001	0.00036	0.038
Reference Red River Above Mine Site	RR-3	25-Sep-03	RR-3-T01N-SFW-092503	Surface Water	T	0.31	<0.00036	<0.00038	0.042	<0.00047	<0.0048	0.00029	<0.001		0.0015	0.011	<0.13	<0.00017	0.09	<0.00006	<0.001	<0.0053	<0.00073J	<0.0002	<0.00001	<0.00061	0.037
Reference Red River Above Mine Site	RR-4	04-Oct-02	RR-4-T01N-SFW-100402	Surface Water	T	0.47	<0.0002	<0.0002	0.051	<0.0002	<0.0048	0.00027	<0.0046		<0.0022	0.017	0.62	<0.0035	0.17	<0.0001	0.00096	0.0075	0.00026	<0.0001	<0.0001	0.00048	0.045
Reference Red River Above Mine Site	RR-4	21-Mar-03	RR-4-T01N-SFW-032103	Surface Water	T	0.5	<0.0006	<0.00057	0.05	<0.0003	<0.0084	<0.0005	<0.001		<0.0038	0.021	<0.44	0.00031	0.21	<0.0001	<0.0022J	0.0099	<0.0026	<0.0002	<0.0002	<0.0002	0.076
Reference Red River Above Mine Site	RR-4	16-Jul-03	RR-4-T01N-SFW-071603	Surface Water	T	0.36	<0.0005	<0.0002	0.04	<0.0002	0.0058	0.00026	<0.0014		<0.002	0.015	0.29	0.00031	0.11	<0.00015	0.0021	0.0033	<0.0008	<0.0001J	<0.0001	0.00032	0.033
Reference Red River Above Mine Site	RR-4	25-Sep-03	RR-4-T01N-SFW-092503	Surface Water	T	0.31	<0.00011	<0.00038	0.047	<0.00047	0.0051	0.00026	<0.001		0.0014	0.0098	0.28	<0.00022	0.12	<0.00006	<0.00099	0.0057	<0.00073J	<0.0002	<0.00001	0.00053	0.039
Reference Red River Above Mine Site	RR-5	03-Oct-02	RR-5-T01N-SFW-100302	Surface Water	T	0.48	<0.00046	0.00024	0.048	<0.0002	<0.0048	0.00029	<0.0046		<0.0022	0.015	1.1	<0.0016	0.14	<0.0001	0.0017	0.0064	<0.0002	<0.0001	<0.0001	0.00092	0.034
Reference Red River Above Mine Site	RR-5	21-Mar-03	RR-5-T01N-SFW-032103	Surface Water	T	<0.89	<0.0006	<0.0004J	0.05	<0.0003J	<0.0084	<0.0005	<0.0014		<0.0038	0.023	0.49	0.0009	0.2	<0.0001	<0.0023	0.0073	<0.001	<0.0002	<0.0002	0.00051	0.078
Reference Red River Above Mine Site	RR-5	16-Jul-03	RR-5-T01N-SFW-071603	Surface Water	T	0.27	<0.0005	<0.0002	0.038	<0.0002	0.0074	<0.0002	<0.0014		<0.002	0.01	0.3	0.0006	0.08	<0.00012	<0.0017	0.0039	<0.0008	<0.0001J	<0.0001	0.00026	<0.025
Reference Red River Above Mine Site	RR-5	24-Sep-03	RR-5-T01N-SFW-092403	Surface Water	T	0.27	<0.00013	<0.00038	0.042	<0.00047	<0.0059	0.00017	<0.001		<0.0011	0.0077	0.28	0.00043	0.085	<0.00006	<0.0011	0.0045	<0.00073	<0.0002	<0.00001	0.00034	0.02
Reference Red River Above Mine Site	RR-6	04-Oct-02	RR-6-T01N-SFW-100402	Surface Water	T	0.88	0.0043	0.00075	0.053	0.00051	<0.0048	0.00074	<0.0046		0.0061	0.02	0.51	0.0051	0.22	<0.0001	0.0057	0.017	0.00037	0.00048	0.00047	0.0053	0.059
Reference Red River Above Mine Site	RR-6	21-Mar-03	RR-6-T01N-SFW-032103	Surface Water	T	1.4	<0.0006	<0.0004	0.045	<0.0003	<0.0084	<0.0005	<0.001		<0.0038	0.021	<0.42	0.00057	0.3	<0.0001J	<0.0023	0.011	<0.001	<0.0002	<0.0002	0.00025	0.092
Reference Red River Above Mine Site	RR-6	16-Jul-03	RR-6-T01N-SFW-071603	Surface Water	T	0.62	<0.0005	<0.0002	0.037	<0.0002	0.0061	<0.0002	<0.0014J		0.0021	0.011	0.25J	0.0008	0.12	<0.0001	0.0012	0.0066	<0.0008	<0.0001J	<0.0001	0.00042	0.036
Reference Red River Above Mine Site	RR-6	24-Sep-03	RR-6-T01N-SFW-092403	Surface Water	T	0.66	<0.00039	<0.00038	0.04	<0.00047	0.038	0.00026	<0.001		0.0024	0.0084	0.33	0.00075	0.14	<0.00006	<0.0012	0.0079	<0.00073J	<0.0002	<0.00001	0.00047	<0.04
Reference Red River Above Mine Site	RR-6A	04-Oct-02	RR-6A-T01N-SFW-100402	Surface Water	T	0.79	<0.0002	<0.0002	0.039	<0.0002	<0.0048	0.00025	<0.0046		0.0024	0.012	0.39	0.0024	0.21	<0.0001	0.0013	0.0086	<0.0002	<0.0001	<0.0001	0.00051	<0.045
Reference Red River Above Mine Site	RR-6A	21-Mar-03	RR-6A-T01N-SFW-032103	Surface Water	T	1.3	<0.0006	0.00047	0.043	<0.0003	0.0092	<0.0005	<0.001		<0.0038	0.018	<0.42	0.00075	0.29	<0.0001J	<0.0023	0.011	<0.0014	<0.0002	<0.0002	0.00041	0.088
Reference Red River Above Mine Site	RR-6A	15-Jul-03	RR-6A-T01N-SFW-071503	Surface Water	T	0.55	<0.0005	<0.0002	0.035	<0.0002	0.006	<0.0002	<0.0014		<0.002	0.007	0.15	<0.00039	0.11	0.00017	0.0011	0.0059	<0.0008	<0.0001J	<0.0001	<0.0002	0.034
Reference Red River Above Mine Site	RR-6A	24-Sep-03	RR-6A-T01N-SFW-092403	Surface Water	T	0.6	<0.00029	<0.00038	0.038	<0.00047	<0.0087	0.00026	<0.001		0.0022	0.0083	0.3	<0.00049	0.14	<0.00006	<0.0012	0.0078	<0.00073J	<0.0002	<0.00001	0.00059	<0.046
Reference Red River Above Mine Site	RR-6V	16-Jul-03	RR-6V-T01N-SFW-071603	Surface Water	T	0.22	<0.0005	<0.0002	0.038	<0.0002	0.0059	<0.0002	<0.0014J		<0.002	0.02	0.22J	0.00092	0.057	<0.0001	0.001	0.0035	<0.0008	<0.0001J	<0.0001	0.0003	0.017
Reference Red River Above Mine Site	RR-6V	24-Sep-03	RR-6V-T01N-SFW-092403	Surface Water	T	0.26	<0.0016	<0.00038	0.041	<0.00047	<0.0084	0.00016	<0.001		0.0012	<0.0069	0.29	0.0006	0.074	<0.00006	<0.0022	0.0043	<0.00073	<0.0002	<0.00001	0.0005	<0.02
Reference Red River Above Mine Site	Zwergle	07-Oct-02	ZWERGEL-T01N-SFW-100702	Surface Water	T	<0.011	<0.0002	<0.0002	0.036	<0.0003	<0.005	<0.0001	<0.00045	<0.01	<0.0001	<0.00075	<0.052	<0.0001	<0.0035	<0.0001	0.00087	<0.0002	<0.0002	<0.0001	<0.0001	0.00036	<0.0021J
Reference Red River Above Mine Site	Zwergle	23-Mar-03	ZWERGEL-T01N-SFW-032303	Surface Water	T	0.11	<0.0006	<0.00036	0.054	<0.0003	<0.0084	<0.0005	<0.0014		<0.0038	<0.0034	<0.42	<0.0002	<0.013	<0.0001	<0.0022J	<0.003	<0.0014	<0.0002	<0.0002	0.00042	<0.039
Reference Red River Above Mine Site	Zwergle	16-Jul-03	ZWERGEL-T01N-SFW-071603	Surface Water	T	<0.067	<0.0005	<0.0002	0.028	<0.0002	<0.0048	<0.0002	<0.0014		<0.002	<0.0024	0.083	<0.0001	0.0078	<0.0002	<0.0017	<0.0021	<0.0008	<0.0001J	<0.0001	0.00034	<0.0098
Reference Red River Above Mine Site	ZWERGLE	25-Sep-03	ZWERGEL-T01N-SFW-092503	Surface Water	T	0.038	<0.00011	<0.00038	0.033	<0.00047	<0.0048	<0.00008	<0.001		<0.0011	<0.00064	<0.044	<0.00006	<0.0035	<0.00006	<0.001	<0.001	<0.00073	<0.0002	<0.00001	0.00056	<0.013
Reference Upper Cabresto Creek Riparian	RRS-12	07-Oct-02	RRS-12-T01N-SFW-100702	Surface Water	T	0.17	<0.0002	<0.0002	0.025	<0.0003	<0.005	<0.0001	<0.00034	0.0015J	<0.0001	<0.00078	<0.082	<0.00012	0.028	<0.0001	0.00053	0.0012	0.00024	<0.0001	<0.0001	0.00013	<0.031J
Reference Upper Cabresto Creek Riparian	RRS-12	23-Mar-03	RRS-12-T01N-SFW-032303	Surface Water	T	<0.17	<0.0006	<0.00046	0.023	<0.0015	<0.0084	<0.0005	<0.0013		<0.0038	<0.0015	<0.42	<0.0002	<0.013	<0.0001	<0.0023	<0.003	<0.001	<0.0002	<0.0002	<0.0002	<0.04
Reference Upper Cabresto Creek Riparian	RRS-12	16-Jul-03	RRS-12-T01N-SFW-071603	Surface Water	T	0.1	<0.0005	<0.0002	0.026	<0.0002	<0.0048	<0.0002	<0.0014J		<0.002	<0.0009	<0.033J	0.00011	0.0096	<0.0001	0.00042	0.0016	<0.0008	<0.0001J	<0.0001	0.00023	0.02
Reference Upper Cabresto Creek Riparian	RRS-12	25-Sep-03	RRS-12-T01N-SFW-092503	Surface Water	T	0.15	<0.00011	<0.00038	0.025	<0.00047	<0.0048	<0.00008	<0.001		<0.0011	<0.00058	<0.061	<0.00015	0.0091	<0.00006	<0.0011	<0.002	<0.00073	<0.0002	<0.00001	<0.00052	0.023
Reference Upper Cabresto Creek Riparian	RRS-13	06-Oct-02	RRS-13-T01N-SFW-100602	Surface Water	T	0.052	<0.0002	<0.0002	0.016	<0.0002	<0.0048	0.00013	<0.0046		<0.0022	0.00075	<0.023	<0.00018	<0.0029	<0.0001	<0.00067	0.00061	0.0004	<0.0001	<0.0001	0.0002	0.01
Reference Upper Cabresto Creek Riparian	RRS-13	23-Mar-03	RRS-13-T01N-SFW-032303	Surface Water	T	<0.08	<0.0006	<0.00048	0.015	<0.0014	<0.0084	<0.0005	<0.0011		<0.0038	<0.0015	<0.42	<0.0002	<0.013	<0.0001	<0.0023	<0.003	<0.0021	<0.0002	<0.0002	<0.0002	<0.039
Reference Upper Cabresto Creek Riparian	RRS-13	16-Jul-03	RRS-13-T01N-SFW-071603	Surface Water	T	0.035	<0.0005	<0.0002	0.011	<0.0002	<0.0048	<0.0002	<0.0014J		<0.002	<0.0024	<0.033	<0.0001	0.00076J	<0.0001	<0.0017	<0.0021J	<0.0008	<0.0001J	<0.0001	0.00033	<0.0038
Reference Upper Cabresto Creek Riparian	RRS-13	25-Sep-03	RR-13-T01N-SFW-092503	Surface Water	T	0.059	<0.00059	<0.00038	0.013	<0.00047	<0.0048	<0.00008	<0.001		<0.0011	<0.00048	<0.076	<0.00019	<0.0041	<0.00006	<0.0011	<0.00094	<0.00073	<0.0002	<0.00001	0.00056	<0.013
Reference Upper Cabresto Creek Riparian	RRS-15	06-Oct-02	RRS-15-T01N-SFW-100602	Surface Water	T	0.041	<0.0002	<0.0002	0.016	<0.0002	<0.0048	<0.0001	<0.0046		<0.0022	0.0003	0.031	<0.00011	<0.0025	<0.0001	<0.00081	0.0004	0.00028	<0.0001	<0.0001	0.00026	0.0086
Reference Upper Cabresto Creek Riparian	RRS-15	23-Mar-03	RRS-15-T01N-SFW-032303	Surface Water	T	<0.057	<0.00084	<0.00051	0.016	<0.00047	<0.0084	<0.0005	<0.001		<0.0038	<0.0015	<0.42	<0.0002	<0.013	<0.0001	<0.0023	<0.003	<0.0018	<0.0002	<0.0002	<0.0002	<0.039
Reference Upper Cabresto Creek Riparian	RRS-15	16-Jul-03	RRS-15-T01N-SFW-071603	Surface Water	T	<0.024	<0.0005	<0.0002	0.011	<0.0002	<0.0048	<0.0002	<0.0014J		<0.002	0.0011	<0.033J	<0.0001	0.00091J	<0.0001	0.0005	<0.0006	<0.0008	<0.0001J	<0.0001	0.00032	<0.0069J
Reference Upper Cabresto Creek Riparian	RRS-15	25-Sep-03	RRS-15-T01N-SFW-092503	Surface Water	T	0.14	<0.00073	<0.00038	0.014	<0.00047	<0.0048	<0.00008	0.0011		<0.0011	<0.00065	0.13	<0.00039	0.0068	<0.00006	<0.0012	<0.0011	<0.00073	<0.0002	<0.00001	0.00059	<0.013
Reference Upper Cabresto Creek Riparian	RRS-9	07-Oct-02	RRS-9-T01N-SFW-100702	Surface Water	T	0.056	<0.00022	<0.0002	0.03	<0.0003J	<0.005J	<0.0001	<0.0019	0.0015J	<0.0034	0.00077	<0.038	<0.0001	<0.0036	<0.0001J	0.00062	<0.0002	<0.0002J	<0.0001	<0.0001	0.00024	<0.0021J
Reference Upper Cabresto Creek Riparian	RRS-9	23-Mar-03	RRS-9-T01N-SFW-032303	Surface Water	T	<0.05	<0.0006	<0.00053	0.031	<0.0003	<0.0084	<0.0005	<0.001		<0.0038	<0.004	<0.42	<0.0002	<0.013	<0.0001	<0.0022	<0.003	<0.001	<0.0002	<0.0002	0.00021	<0.039
Reference Upper Cabresto Creek Riparian	RRS-9	16-Jul-03	RRS-9-T01N-SFW-071603	Surface Water	T	0.051	<0.0005	<0.0002	0.026	<0.0002	<0.0048	<0.0002	<0.0014J		<0.002	0.001	0.042J	<0.0001	0.013	<0.0001	0.00039	<0.0006	<0.0008	<0.0001J	<0.0001	0.00044	<0.0016J
Reference Upper Cabresto Creek Riparian	RRS-9	25-Sep-03	RRS-9-T01N-SFW-092503	Surface Water	T	<0.031	<0.00011	<0.00038	0.03	<0.00047	<0.0048	<0.00008	<0.001		<0.0011	<0.0005	<0.044	<0.00006	0.0077	<0.00006	<0.00073	<0.00092	<0.00073J	<0.0002	<0.00001	<0.00071	<0.013
Reference Upper Cabresto Creek Riparian	UPPER CABRESTO CREEK	23-Mar-03	UCC-T01N-SFW-032303	Surface Water	T	0.06	<0.0018	0.00025	0.015	0.00069	<0.0084	<0.0005	<0.001		<0.0038	<0.0015	<0.31	<0.0002	<0.01	<0.0001	<0.0023	<0.003	<0.0024	<0.0002	<0.0002	0.0002	<0.021
Reference Upper Cabresto Creek Riparian	UPPER CABRESTO CREEK	16-Jul-03	UPPERCABRESTO-T01N-SFW-071603	Surface Water	T	0.03	<0.0005	<0.0002	0.032	<0.0002	<0.0048	<0.0002	<0.0014J		<0.002	<0.0024	<0.033	<0.00014	<0.0007J	<0.0001	0.0022	<0.0021J	<0.0008	<0.0001J	<0.0001	0.0003	<0.0031
Reference Upper Cabresto Creek Riparian	UPPER CABRESTO CREEK	25-Sep-03	UPPERCABRESTO-T01N-SFW-092503	Surface Water	T	0.056	<0.00011	<0.00038	0.014	<0.00047	<0.0048	<0.00008	<0.001		<0.0011	<0.0005	0.056	<0.00016	<0.003	<0.00006	<0.00073	<0.00096	<0.00073	<0.0002	<0.00001	0.0005	<0.013
Surface Water Area 1-Red River Along Mine	LR-1	30-Sep-02	LR-1-T01N-SFW-093002	Surface Water	T	2.2	<0.0002	0.00023	0.049	0.00036	<0.005	0.00039	0.0019	<0.01	0.0033	0.014	1.7	0.0014	0.36	<0.0001	0.003	0.011	0.00029	<0.0059	<0.0001	0.00042	0.08
Surface Water Area 1-Red River Along Mine	LR-1	20-Mar-03	LR-1-T01N-SFW-032003	Surface Water	T	<1.9	<0.0006	<0.0004	0.042	<0.0003J	<0.0084	<0.0005	<0.0011		0.0041	0.02	<0.42	0.00067	0.38	<0.0001	0.0023	0.019	<0.001	<0.0002	<0.0002	<0.0002	0.17
Surface Water Area 1-Red River Along Mine	LR-1	15-Jul-03	LR-1-T01N-SFW-071503	Surface Water	T	0.45	<0.0021	0.00035	0.036	0.00028	0.0091	0.00038	<0.0014		<0.002	0.0056	0.11	0.00026	0.15	<0.0001	0.0076	0.0093	<0.0016	<0.0001J	<0.0001	<0.0014	0.068
Surface Water Area 1-Red River Along Mine	LR-1	24-Sep-03	LR-1-T01N-SFW-092403	Surface Water	T	0.89	<0.00011	<0.00038	0.042	<0.00047	<0.008	0.00043	<0.001		0.0024	0.009	0.55	0.0012	0.23	<0.00006	0.0037	0.013	<0.00073	<0.0002	<0.00001	<0.00047	0.1
Surface Water Area 1-Red River Along Mine	RR-10	03-Oct-02	RR-10-T01N-SFW-100302	Surface Water	T	1.9	<0.0002	0.00035	0.06	0.00021	<0.0048	0.00026	<0.0046		<0.0022	0.014	2.3	0.0025	0.21	<0.0001	<0.00094	0.0069	0.00033	<0.0001	<0.0001	0.00075	0.039
Surface Water Area 1-Red River Along Mine	RR-10	21-Jan-03	RR-10-T01N-SFW-012103	Surface Water	T	1.1J	<0.0006	<0.0004J	0.032	0.0002	<0.01	<0.0004J	<0.0037		0.0039	0.014	<0.27J	0.00032	0.28	<0.0001	<0.0011	0.015	<0.0016	<0.0002	<0.0002	<0.0004	0.073
Surface Water Area 1-Red River Along Mine	RR-10	20-Mar-03	RR-10-T01N-SFW-032003	Surface Water	T	<1.6	<0.0006	<0.0004	0.045	<0.0003J	<0.0084	<0.0005	<0.001		0.0039	0.022	0.74	0.001	0.27	<0.0001	<0.0023	0.0096	<0.001	<0.0002	<0.0002	0.00027	0.081
Surface Water Area 1-Red River Along Mine	RR-10	03-Apr-03	RR-10-T01N-SFW-040303	Surface Water	T	1.4	<0.0003	0.00027	0.047	<0.0011	<0.0084	<0.0005	<0.001		<0.0038	0.016	0.86	0.00088	0.19	<0.0001	<0.0023	0.013	0.00068	<0.0001	<0.0001	0.00036	0.049
Surface Water Area 1-Red River Along Mine	RR-10	15-Jul-03	RR-10-T01N-SFW-071503	Surface Water	T	0.52	<0.0005	<0.0002	0.034	<0.0004	0.0071	<0.0002	<0.0019		<0.0037	0.0071	0.22	0.00058	0.099	<0.00017	0.0011	0.0048	<0.0008	<0.0001J	<0.0001	0.00026	<0.03
Surface Water Area 1-Red River Along Mine	RR-10	24-Sep-03	RR-10-T01N-SFW-092403	Surface Water	T	0.61	<0.00011	<0.00038	0.04	<0.00047	<0.0055	0.00024	<0.001		0.0018	0.0075	0.4	0.00086	0.13	<0.00006	<0.0013	0.007	<0.00073	<0.0002	<0.00001	0.00061	0.034
Surface Water Area 1-Red River Along Mine	RR-10	19-Oct-03	RR-10-T01N-SFW-101903	Surface Water	T	0.7	<0.0005	<0.0002	0.038	<0.0004	<0.0063	<0.0002	<0.0011		<0.0029	0.0089	0.19	0.00033	0.15	<0.0001J	0.0012	0.0058J	<0.0003	<0.0001	<0.0001	0.00012	0.044J
Surface Water Area 1-Red River Along Mine	RR-10	13-Jan-04	RR-10-T01N-SFW-011304	Surface Water	T	1	<0.0012	<0.0002	0.033	<0.001	<0.012	0.00034	<0.0057		<0.0037	0.013	0.28	0.0003	0.21	<0.0001	<0.0012	<0.017	<0.0003J	<0.0001	<0.0001	<0.0002	0.063
Surface Water Area 1-Red River Along Mine	RR-10	24-Feb-04	RR-10-T01N-SFW-022404	Surface Water	T	0.97	<0.0002J	0.0001	0.032	0.00035	0.0056	0.00041	<0.0015J		0.0034	0.013	<0.2	0.0002J	0.25	<0.0001	<0.0007	0.015	<0.00094J	<0.0001J	<0.0001	<0.0001J	0.075
Surface Water Area 1-Red River Along Mine	RR-10	19-Apr-04	RR-10-T01N-SFW-041904	Surface Water	T	1.3	<0.00052	0.00027	0.052	<0.0002	0.0084	0.00023	<0.0008J		0.0017	0.017	1.1	<0.0027	0.14	<0.0001	<0.002	0.0075	<0.0007	<0.0001J	<0.00012	0.00083	0.045
Surface Water Area 1-Red River Along Mine	RR-10A1	03-Oct-02	RR-10A1-T01N-SFW-100302	Surface Water	T	1.2	<0.0002	0.0002	0.049	<0.0002	<0.0048	0.00019	<0.0046		<0.0022	0.0089	1.3	0.002	0.16	<0.0001	0.0014	0.0047	0.00024	<0.0001	<0.0001	0.00048	0.024
Surface Water Area 1-Red River Along Mine	RR-10A1	20-Jan-03	RR-10A1-T01N-SFW-012003	Surface Water	T	<1.1J	<0.0006	<0.0004J	0.033	<0.0002	0.0041	<0.0004J	<0.0037		0.0033	0.0079	<0.44J	0.00031	0.29	<0.0001	<0.0027	0.014	<0.0016	<0.0002	<0.0002	<0.0004	0.081
Surface Water Area 1-Red River Along Mine	RR-10A1	20-Mar-03	RR-10A1-T01N-SFW-032003	Surface Water	T	<1.4	<0.0006	<0.0004J	0.042	<0.0003J	<0.0084	<0.0005	<0.001		<0.0038	0.016	<0.31	0.0008	0.19	<0.0001	<0.0023	0.0085	<0.001	<0.0002	<0.0002	0.00046	<0.06
Surface Water Area 1-Red River Along Mine	RR-10A1	03-Apr-03	RR-10A1-T01N-SFW-040303	Surface Water	T	1.1	<0.0003	<0.0002	0.045	<0.00076	<0.0084	<0.0005	<0.001		<0.0038	0.012	0.64	0.0007	0.15	<0.0001	<0.0023	0.0054	<0.0005	<0.0001	<0.0001	0.00033	0.038
Surface Water Area 1-Red River Along Mine	RR-10A1	15-Jul-03	RR-10A1-T01N-SFW-071503	Surface Water	T	0.3	<0.0005	<0.0002	0.035	<0.0004	0.0075	<0.0002	<0.0019		<0.0037	0.005	0.073	0.00021	0.066	<0.00013	0.0018	0.0037	<0.0008	<0.0001J	<0.0001	0.00038	<0.019
Surface Water Area 1-Red River Along Mine	RR-10A1	24-Sep-03	RR-10A1-T01N-SFW-092403	Surface Water	T	0.52	<0.00011	<0.00038	0.044	<0.00047	<0.013	0.00021	<0.001		0.0017	0.0065	0.38	0.00081	0.12	<0.00006	<0.0013	0.0061	<0.00073	<0.0002	<0.00001	0.00062	0.031
Surface Water Area 1-Red River Along Mine	RR-10A1	19-Oct-03	RR-10A1-T01N-SFW-101903	Surface Water	T	0.54	<0.0005	<0.0002	0.039	<0.0004	<0.0084	<0.0002	<0.0011		<0.0029	0.0072	0.16	0.00023	0.12	<0.0001J	0.0013	0.0043J	0.0003	<0.0001	<0.0001	0.00013	0.042J
Surface Water Area 1-Red River Along Mine	RR-10A1	13-Jan-04	RR-10A1-T01N-SFW-011304	Surface Water	T	0.92	<0.0012	<0.0002	0.035	<0.001	<0.012	0.00029	<0.0057		<0.0037	0.012	0.21	0.00032	0.17	<0.0001	<0.0017	<0.017	0.00061J	<0.0001	<0.0001	<0.0002	0.065
Surface Water Area 1-Red River Along Mine	RR-10A1	19-Apr-04	RR-10A1-T01N-SFW-041904	Surface Water	T	2.4	<0.00049	0.00024	0.049	0.00025	0.0058	0.00033	<0.0008J		0.0025	0.022	1.5	<0.0031	0.22	<0.0001	<0.0027	0.011	<0.0007	<0.0001J	<0.00013	0.001	0.082
Surface Water Area 1-Red River Along Mine	RR-11A1	03-Oct-02	RR-11A1-T01N-SFW-100302	Surface Water	T	0.79	<0.0002	0.00029	0.044	<0.0002	<0.0048	0.00021	<0.0046		<0.0022	0.011	0.83	<0.0014	0.16	<0.0001	0.0012	0.0052	<0.0002	<0.0001	<0.0001	0.00053	0.025
Surface Water Area 1-Red River Along Mine	RR-11A1	20-Jan-03	RR-11A1-T01N-SFW-012003	Surface Water	T	1.1J	<0.0017	<0.0004J	0.037	0.00022	<0.013	<0.0004J	<0.0037		0.0025	0.0092	<0.56J	0.00034	0.2	<0.0001	<0.0011	0.011	<0.0016	<0.0002	<0.0002	<0.0004	0.056
Surface Water Area 1-Red River Along Mine	RR-11A1	21-Mar-03	RR-11A1-T01N-SFW-032103	Surface Water	T	<1.6	<0.0006	<0.0004J	0.049	<0.0003J	<0.0084	<0.0005	<0.0015		<0.0038	0.018	0.89	0.0025	0.22	<0.0001	<0.0023	0.01	<0.001	<0.0002	<0.0002	0.0011	0.07
Surface Water Area 1-Red River Along Mine	RR-11A1	03-Apr-03	RR-11A1-T01N-SFW-040303	Surface Water	T	1	<0.0003	0.00022	0.046	<0.00097	<0.0084	<0.0005	<0.001		<0.0038	0.014	0.48	0.0008	0.16	<0.0001	<0.0023	0.0044	0.00057	<0.0001	<0.0001	0.00037	0.044
Surface Water Area 1-Red River Along Mine	RR-11A1	15-Jul-03	RR-11A1-T01N-SFW-071503	Surface Water	T	0.41	<0.0005	<0.0002	0.035	<0.0004	0.007	<0.0002	<0.0019		<0.0037	0.0062	0.088	0.00027	0.12	<0.00021	0.0014	0.005	<0.0008	<0.0001J	<0.0001	<0.0002	0.04
Surface Water Area 1-Red River Along Mine	RR-11A1	24-Sep-03	RR-11A1-T01N-SFW-092403	Surface Water	T	0.51	<0.00039	<0.00038	0.043	<0.00047	<0.0067	0.00022	<0.001		0.0018	0.0067	0.38	0.0009	0.12	<0.00006	<0.0015	0.0061	<0.00073	<0.0002	<0.00001	0.00038	0.032
Surface Water Area 1-Red River Along Mine	RR-11A1	19-Oct-03	RR-11A1-T01N-SFW-101903	Surface Water	T	0.55	<0.0005	<0.0002	0.039	<0.0004	<0.0063	<0.0002	<0.0011		<0.0029	0.0071	0.13	0.00039	0.12	<0.0001J	0.0014	0.0047J	0.00034	<0.0001	<0.0001	0.00019	0.038J
Surface Water Area 1-Red River Along Mine	RR-11A1	13-Jan-04	RR-11A1-T01N-SFW-011304	Surface Water	T	1.2	<0.0012	0.00024	0.04	<0.001	<0.012	0.0003	<0.0057		<0.0037	0.013	0.28	0.00036	0.19	<0.0001	<0.0016	<0.017	0.00055J	<0.0001	<0.0001	0.0002	0.069
Surface Water Area 1-Red River Along Mine	RR-11A1	19-Apr-04	RR-11A1-T01N-SFW-041904	Surface Water	T	0.71	<0.00058	0.00026	0.044	<0.0002	0.0067	0.00024	<0.0008J		<0.0011	0.015	0.56	<0.003	0.11	<0.0001	<0.0024	0.0063	<0.0007	<0.0001J	<0.00013	0.00097	0.035
Surface Water Area 1-Red River Along Mine	RR-11B	03-Oct-02	RR-11B-T01N-SFW-100302	Surface Water	T	0.71	<0.0002	0.0002	0.04	<0.0002	<0.0048	0.00017	<0.0046		<0.0022	0.0098	0.69	<0.0013	0.15	<0.0001	0.0011	0.0061	<0.0002	<0.0001	<0.0001	0.00045	0.036
Surface Water Area 1-Red River Along Mine	RR-11B	20-Mar-03	RR-11B-T01N-SFW-032003	Surface Water	T	<1.1	<0.0018	<0.0004	0.041	<0.0003J	0.01	<0.0005	<0.001		<0.0038	0.014	0.51	0.00036	0.18	<0.0001	0.0029	0.022	<0.001	<0.0002	<0.0002	0.00025	0.17
Surface Water Area 1-Red River Along Mine	RR-11B	15-Jul-03	RR-11B-T01N-SFW-071503	Surface Water	T	0.59	<0.0005	<0.0002	0.036	<0.00041	0.0058	0.00063	<0.0014		<0.002	0.0079	0.097	0.00015	0.11	<0.0001	<0.0017	0.017	<0.0016	<0.0001J	<0.0001	<0.00021	0.13
Surface Water Area 1-Red River Along Mine	RR-11B	24-Sep-03	RR-11B-T01N-SFW-092403	Surface Water	T	0.68	<0.00014	<0.00038	0.044	<0.00047	<0.0055	0.00036	<0.001		0.0016	0.007	0.54	0.0016	0.11	<0.00006	<0.0016	0.013	<0.00073	<0.0002	<0.00001	0.00056	0.083
Surface Water Area 1-Red River Along Mine	RR-11C	01-Oct-02	RR-11C-T01N-SFW-100102	Surface Water	T	0.76	<0.0002	0.00023	0.037	<0.0002	<0.0059	0.00026	<0.0046		<0.0022	0.0083	0.45	0.001	0.16	<0.0001	0.0016	0.0082	0.00034	<0.0001	<0.0001	0.00039	0.052
Surface Water Area 1-Red River Along Mine	RR-11C	20-Jan-03	RR-11C-T01N-SFW-012003	Surface Water	T	<0.76J	<0.0006	<0.0004J	0.033	<0.0002	0.0035	0.00045J	<0.0037		0.0021	0.0087	<0.27J	0.00022	0.18	<0.0001	<0.0031	0.032	<0.0016	<0.0002	<0.0002	<0.0004	0.19
Surface Water Area 1-Red River Along Mine	RR-11C	20-Mar-03	RR-11C-T01N-SFW-032003	Surface Water	T	<1.2	<0.0006	<0.0004	0.04	0.00034J	<0.0084	<0.0005	<0.001		<0.0038	0.011	<0.42	0.00053	0.17	<0.0001	<0.0023	0.021	<0.001	<0.0002	<0.0002	0.0002	0.16
Surface Water Area 1-Red River Along Mine	RR-11C	03-Apr-03	RR-11C-T01N-SFW-040303	Surface Water	T	1.5	<0.0003	0.00046	0.056	<0.0011	<0.0084	<0.0005	<0.001		<0.0038	0.014	1.2	0.0041J	0.16	<0.0001	<0.0023	0.016	0.00074	<0.0001	<0.0001	0.0013	0.12
Surface Water Area 1-Red River Along Mine	RR-11C	15-Jul-03	RR-11C-T01N-SFW-071503	Surface Water	T	0.54	<0.0005	<0.0002	0.036	<0.0004	0.0063	0.00053	<0.0019		<0.0037	0.0062	0.092	0.00023	0.1	<0.00018	0.0019	0.017	<0.0008	<0.0001J	<0.0001	0.00027	0.12
Surface Water Area 1-Red River Along Mine	RR-11C	25-Sep-03	RR-11C-T01N-SFW-092503	Surface Water	T	0.59	<0.0013	<0.00038	0.044	<0.00047	<0.011	0.00039	<0.001		0.0019	<0.0062	0.47	0.00097	0.12	<0.00006	0.0027	0.015	<0.00073	<0.0002	<0.00001	<0.00043	0.092
Surface Water Area 1-Red River Along Mine	RR-11C	19-Oct-03	RR-11C-T01N-SFW-101903	Surface Water	T	0.53	<0.0005	<0.0002	0.04	<0.0004	<0.0063	0.00035	<0.0011		<0.0029	0.0057	0.1	<0.0002	0.11	<0.0001J	0.0022	0.014	0.00036	<0.0001	<0.0001	<0.0001	0.11J
Surface Water Area 1-Red River Along Mine	RR-11C	13-Jan-04	RR-11C-T01N-SFW-011304	Surface Water	T	0.57	<0.0012	<0.0002	0.036	<0.001	<0.012	0.00033	<0.0057		<0.0037	0.0054	0.095	0.00019	0.11	<0.0001	<0.0027	<0.017	0.0006J	<0.0001	<0.0001	<0.0002	0.084
Surface Water Area 1-Red River Along Mine	RR-11C	19-Apr-04	RR-11C-T01N-SFW-041904	Surface Water	T	1.6	<0.00049	0.0002	0.048	<0.0002	0.0061	0.00021	<0.0008J		<0.0011	0.012	1.2	<0.0023	0.1	<0.0001	<0.0026	0.0071	<0.0007	<0.0001J	<0.00012	0.00084	0.041
Surface Water Area 1-Red River Along Mine	RR-12	03-Oct-02	RR-12-T01N-SFW-100302	Surface Water	T	1.3	<0.0002	0.0003	0.047	<0.0002	<0.0048	0.00032	<0.0046		<0.0022	0.0099	1.3	0.0023	0.17	<0.0001	0.0017	0.0091	<0.0002	<0.0001	<0.0001	0.00059	0.05
Surface Water Area 1-Red River Along Mine	RR-12	20-Jan-03	RR-12-T01N-SFW-012003	Surface Water	T	<0.77J	<0.0011	<0.0004J	0.036	0.00024	<0.0087	0.00067J	<0.0037		0.0031	0.011	<0.27J	0.0003	0.19	<0.0001	<0.0034	0.029	<0.0016	<0.0002	<0.0002	<0.0004	0.18
Surface Water Area 1-Red River Along Mine	RR-12	20-Mar-03	RR-12-T01N-SFW-032003	Surface Water	T	<1.1	<0.0006	<0.0004J	0.038	<0.0003J	<0.0084	<0.0005	<0.001		<0.0038	0.011	<0.31	0.00026	0.18	<0.0001	<0.0023	0.021	<0.001	<0.0002	<0.0002	0.00022	0.15
Surface Water Area 1-Red River Along Mine	RR-12	03-Apr-03	RR-12-T01N-SFW-040303	Surface Water	T	1.3	<0.00056	0.00025	0.045	<0.0014	<0.0084	<0.0005	<0.001		<0.0038	0.013	0.79	0.001	0.15	<0.0001	0.003	0.016	0.00067	<0.0001	<0.0001	0.0004	0.11
Surface Water Area 1-Red River Along Mine	RR-12	15-Jul-03	RR-12-T01N-SFW-071503	Surface Water	T	0.53	<0.0005	<0.0002	0.034	<0.0004	0.0063	0.0005	<0.0019		<0.0037	0.0064	0.084	0.00024	0.11	<0.00018	0.0019	0.016	<0.0008	<0.0001J	<0.0001	0.00023	0.12
Surface Water Area 1-Red River Along Mine	RR-12	24-Sep-03	RR-12-T01N-SFW-092403	Surface Water	T	0.63	<0.00016	<0.00038	0.042	<0.00047	<0.0078	0.00042	<0.001		0.0017	<0.0067	0.38	0.00096	0.11	<0.00006	<0.002	0.015	<0.00073	<0.0002	<0.00001	<0.0007	0.087
Surface Water Area 1-Red River Along Mine	RR-12	19-Oct-03	RR-12-T01N-SFW-101903	Surface Water	T	0.55	<0.0005	<0.0002	0.038	<0.0004	<0.0063	0.00044	<0.0011		<0.0029	0.0062	0.089	0.00024	0.12	<0.0001	0.0023	0.015	<0.0003	<0.0001	<0.0001	<0.0001	0.11J
Surface Water Area 1-Red River Along Mine	RR-12	13-Jan-04	RR-12-T01N-SFW-011304	Surface Water	T	0.59	<0.0012	<0.0002	0.04	<0.001	<0.012	0.0003	<0.0057		<0.0037	0.0066	0.12	0.00022	0.13	<0.0001	0.0025	<0.017	0.001J	<0.0001	<0.0001	<0.0002	0.081
Surface Water Area 1-Red River Along Mine	RR-12	19-Apr-04	RR-12-T01N-SFW-041904	Surface Water	T	0.94	<0.00053	0.00023	0.047	<0.0002J	0.0039	0.00025	<0.0008J		0.002J	0.015	0.83	<0.0028	0.12	<0.0001	<0.0024	0.0082	<0.0007	<0.0001J	<0.00012	0.00086	0.05
Surface Water Area 1-Red River Along Mine	RR-13	01-Oct-02	RR-13-T01N-SFW-100102	Surface Water	T	1.1	<0.0002	<0.0002	0.035	<0.0002	<0.005	0.00029	<0.0046	<0.01	<0.0022	0.013	0.45	0.00094	0.21	<0.0001	0.0018	0.0092	0.0002	<0.0001	<0.0001	0.00033	0.058
Surface Water Area 1-Red River Along Mine	RR-13	20-Jan-03	RR-13-T01N-SFW-012003	Surface Water	T	<1.1J	<0.0006	<0.0004J	0.035	0.00026	<0.006	0.00081J	<0.0037		0.0037	0.017	<0.27J	0.00027	0.26	<0.0001	<0.0021	0.028	<0.0016	<0.0002	<0.0002	<0.0004	0.16
Surface Water Area 1-Red River Along Mine	RR-13	20-Mar-03	RR-13-T01N-SFW-032003	Surface Water	T	<1.4	<0.00082	<0.0004	0.037	0.00044J	<0.0084	<0.0005	<0.001		0.0039	0.017	<0.42	0.00038	0.25	<0.0001	<0.0023	0.021	<0.001	<0.0002	<0.0002	<0.0002	0.15
Surface Water Area 1-Red River Along Mine	RR-13	03-Apr-03	RR-13-T01N-SFW-040303	Surface Water	T	2.1	<0.0003	0.00028	0.055	<0.0014	<0.0084	<0.0005	<0.001		<0.0038	0.021	1.4	0.0015	0.21	<0.0001	0.0029	0.018	0.00054	<0.0001	<0.0001	0.00055	0.13
Surface Water Area 1-Red River Along Mine	RR-13	15-Jul-03	RR-13-T01N-SFW-071503	Surface Water	T	0.71	<0.0005	<0.0002	0.036	<0.0004	0.0061	0.00057	<0.0019		<0.0037	0.0086	0.1	0.00023	0.14	<0.00015	0.0019	0.017	<0.0008	<0.0001J	<0.0001	<0.0002	0.13
Surface Water Area 1-Red River Along Mine	RR-13	24-Sep-03	RR-13-T01N-SFW-092403	Surface Water	T	0.84	<0.00037	<0.00038	0.044	<0.00047	<0.0083	0.00044	<0.001		0.0026	0.0096	0.43	0.00093	0.15	<0.00006	<0.0021	0.015	<0.00073	<0.0002	<0.00001	0.0005	0.093
Surface Water Area 1-Red River Along Mine	RR-13	19-Oct-03	RR-13-T01N-SFW-101903	Surface Water	T	0.83	<0.0005	<0.0002	0.038	0.0005	<0.0063	0.00048	<0.0011		<0.0029	0.0094	0.13	<0.0002	0.16	<0.0001J	0.0021	0.015	<0.0003	<0.0001	<0.0001	0.00011	0.12J
Surface Water Area 1-Red River Along Mine	RR-13	13-Jan-04	RR-13-T01N-SFW-011304	Surface Water	T	1	<0.0012	<0.0002	0.033	<0.0017	<0.012	0.00044	<0.0057		<0.0037	0.012	0.12	0.00024	0.2	<0.0001	0.0024	0.014	0.0007J	<0.0001	<0.0001	<0.0002	0.089
Surface Water Area 1-Red River Along Mine	RR-13	19-Apr-04	RR-13-T01N-SFW-041904	Surface Water	T	0.97	<0.00047	0.00021	0.043	<0.0002	0.0043	0.00021	<0.0008J		0.0016J	0.017	0.66	<0.0026	0.14	<0.0001	<0.0024	0.0087	<0.0007	<0.0001J	<0.00012	0.00081	0.052
Surface Water Area 1-Red River Along Mine	RR-14	01-Oct-02	RR-14-T01N-SFW-100102	Surface Water	T	1.9	<0.0002	0.00021	0.035	<0.0002	<0.0048	0.00043	<0.0046	<0.01	0.0037	0.02	0.61	0.0011	0.32	<0.0001	0.0019	0.012	0.00038	<0.0001	<0.0001	0.00031	0.086
Surface Water Area 1-Red River Along Mine	RR-14	19-Jan-03	RR-14-T01N-SFW-011903	Surface Water	T	3.3J	<0.0006	<0.0004J	0.037	0.00071	<0.0092	0.0013J	<0.0037		0.0073	0.035	<0.79J	0.00024	0.53	<0.0001	<0.0036	0.037	<0.0016	<0.0002	<0.0002	<0.0004	0.25
Surface Water Area 1-Red River Along Mine	RR-14	20-Mar-03	RR-14-T01N-SFW-032003	Surface Water	T	<2.1	<0.0006	<0.0004J	0.038	<0.0003	0.009	<0.0005J	<0.001		0.0049	0.026	<0.42	0.0004	0.37	<0.0001	0.0024	0.025	<0.001J	<0.0002	<0.0002	<0.0002	0.2
Surface Water Area 1-Red River Along Mine	RR-14	03-Apr-03	RR-14-T01N-SFW-040303	Surface Water	T	2.3	<0.00054	<0.0002	0.045	<0.0015	<0.0084	<0.0005	<0.001		<0.0038	0.025	1	0.00054	0.29	<0.0001	0.0026	0.019	<0.0005	<0.0001	<0.0001	0.00021	0.15
Surface Water Area 1-Red River Along Mine	RR-14	15-Jul-03	RR-14-T01N-SFW-071503	Surface Water	T	1.1	<0.0005	<0.0002	0.036	<0.0002J	0.006	0.00067	<0.0014		0.002	0.013	0.23	<0.00043	0.19	0.00017	0.0023	0.021	<0.0008	<0.0001J	<0.0001	0.00022	0.13
Surface Water Area 1-Red River Along Mine	RR-14	24-Sep-03	RR-14-T01N-SFW-092403	Surface Water	T	1.3	<0.0011	<0.00038	0.049	<0.00047	<0.0067	0.00048	<0.001		0.0032	0.013	0.65	0.0013	0.23	<0.00006	0.0029	0.016	<0.00073	<0.0002	<0.00001	<0.00077	0.11
Surface Water Area 1-Red River Along Mine	RR-14	19-Oct-03	RR-14-T01N-SFW-101903	Surface Water	T	1.3	<0.0011	<0.0002	0.038	0.00056	0.0074	0.00042	<0.0011		0.0031	0.014	0.24	0.00031	0.23	<0.0001J	0.0024	0.016	0.00037	<0.0001	<0.0001	<0.0001	0.13J
Surface Water Area 1-Red River Along Mine	RR-14	13-Jan-04	RR-14-T01N-SFW-011304	Surface Water	T	1.7	<0.0012	<0.0002	0.034	<0.001	<0.012	0.00043	<0.0057		0.0039	0.018	<0.22	0.00016	0.29	<0.0001	0.0027	<0.017	0.00091J	<0.0001	<0.0001	<0.0002	0.12
Surface Water Area 1-Red River Along Mine	RR-14	24-Feb-04	RR-14-T01N-SFW-022404	Surface Water	T	2.1	<0.0002J	<0.0001	0.032	0.00049	0.005	0.00058	<0.0015J		0.0044	0.025	0.29	<0.0001J	0.34	<0.0001	0.0024	0.021	<0.00074J	<0.0001J	<0.0001	<0.0001J	0.12
Surface Water Area 1-Red River Along Mine	RR-14	19-Apr-04	RR-14-T01N-SFW-041904	Surface Water	T	1.3	<0.00047	0.00026	0.043	<0.0002	0.0065	0.00034	<0.0008J		0.0017J	0.021	0.75	<0.0026	0.19	<0.0001	<0.0025	0.0099	<0.0007	<0.0001J	<0.00012	0.00083	0.067
Surface Water Area 1-Red River Along Mine	RR-15	01-Oct-02	RR-15-T01N-SFW-100102	Surface Water	T	2.2	<0.0002	<0.0002	0.035	0.00028	<0.0053	0.00046	<0.0046	<0.01	0.0041	0.022	0.64	0.00088	0.41	<0.0001	0.0018	0.014	0.0003	<0.0001	<0.0001	0.00029	0.11
Surface Water Area 1-Red River Along Mine	RR-15	21-Mar-03	RR-15-T01N-SFW-032103	Surface Water	T	<3.5	<0.0006	<0.0004J	0.044	<0.0003J	<0.0084	0.00054	<0.001		0.0054	0.034	0.83	0.0014	0.47	<0.0001	<0.0023	0.028	<0.0025J	<0.0002	<0.0002	0.00057	0.23
Surface Water Area 1-Red River Along Mine	RR-15	15-Jul-03	RR-15-T01N-SFW-071503	Surface Water	T	1.2	<0.0005	<0.0002	0.038	<0.00046	0.006	0.00066	<0.0014		0.0022	0.015	0.2	0.00029	0.24	<0.0001	0.0027	0.021	<0.0016	<0.0001J	<0.0001	<0.0007	0.16
Surface Water Area 1-Red River Along Mine	RR-15	24-Sep-03	RR-15-T01N-SFW-092403	Surface Water	T	1.4	<0.00038	<0.00038	0.037	<0.00047	<0.0067	0.0006	<0.001		0.0031	0.015	0.44	0.00098	0.24	<0.00006	<0.0023	0.017	<0.00073	<0.0002	<0.00001	0.00044	0.11
Surface Water Area 1-Red River Along Mine	RR-16	01-Oct-02	RR-16-T01N-SFW-100102	Surface Water	T	2.2	<0.0002	0.0002	0.035	0.00034	<0.0052	0.00048	<0.0046	<0.01	0.0045	0.022	0.65	0.00099	0.43	<0.0001	0.0018	0.014	0.00034	<0.0001	<0.0001	0.00037	0.11
Surface Water Area 1-Red River Along Mine	RR-16	19-Jan-03	RR-16-T01N-SFW-011903	Surface Water	T	2.9J	<0.0013	<0.0004J	0.032	0.00057	0.01	0.001J	<0.0037		0.007	0.029	<0.5J	0.00024	0.6	<0.0001	<0.004	0.032	<0.0016	<0.0002	<0.0002	<0.0004	0.25
Surface Water Area 1-Red River Along Mine	RR-16	19-Mar-03	RR-16-T01N-SFW-031903	Surface Water	T	2.1	<0.0006	<0.0004	0.035	0.00054	<0.0084	0.00064	0.001		0.0048	0.027	<0.42	0.00034	0.45	<0.0001	<0.0023	0.024	<0.0016	<0.0002	<0.0002	<0.0004	0.21
Surface Water Area 1-Red River Along Mine	RR-16	03-Apr-03	RR-16-T01N-SFW-040303	Surface Water	T	2.9	<0.0003	0.00023	0.05	<0.0015	<0.0084	0.00061	<0.001		<0.0038	0.028	1.2	0.0012	0.38	<0.0001	0.0042	0.022	0.00062	<0.0001	<0.0001	0.0004	0.17
Surface Water Area 1-Red River Along Mine	RR-16	15-Jul-03	RR-16-T01N-SFW-071503	Surface Water	T	1.3	<0.0005	<0.0002	0.035	0.00053	0.006	0.00065	<0.0019		<0.0037	0.015	0.23	0.0004	0.24	<0.00015	0.002	0.02	<0.0008	<0.0001J	<0.0001	0.00032	0.16
Surface Water Area 1-Red River Along Mine	RR-16	23-Sep-03	RR-16-T01N-SFW-092303	Surface Water	T	1.4	<0.00051	<0.00038	0.037	<0.00047	<0.0048	0.00054	<0.001		0.0027	0.014	0.44	0.00083	0.26	<0.00006	<0.0022	0.017	<0.00073	<0.0002	<0.00001	<0.00084	0.11
Surface Water Area 1-Red River Along Mine	RR-16	19-Oct-03	RR-16-T01N-SFW-101903	Surface Water	T	1.6	<0.0005	<0.0002	0.039	0.00049	<0.0063	0.00058	<0.0011		0.0033	0.016	0.25	0.00028	0.3	<0.0001J	0.0025	0.033	0.00038	<0.0001	<0.0001	0.0001	0.15J
Surface Water Area 1-Red River Along Mine	RR-16	13-Jan-04	RR-16-T01N-SFW-011304	Surface Water	T	2.1	<0.0012	<0.0002	0.034	<0.001	<0.012	0.00075	<0.0057		0.004	0.02	<0.2	0.00016	0.4	<0.0001	0.0028	0.019	0.001J	<0.0001	<0.0001	<0.0002	0.15
Surface Water Area 1-Red River Along Mine	RR-16	19-Apr-04	RR-16-T01N-SFW-041904	Surface Water	T	0.83	<0.00047	0.00024	0.049	<0.0002	0.0068	<0.0002	<0.0008J		<0.0011	0.016	0.73	<0.0025	0.12	<0.0001	<0.0021	0.0068	<0.0007	<0.0001J	<0.00012	0.00089	0.04
Surface Water Area 1-Red River Along Mine	RR-17	01-Oct-02	RR-17-T01N-SFW-100102	Surface Water	T	1.9	<0.0002	0.00024	0.032	0.00031	<0.006	0.00058	<0.0046	<0.01	0.0044	0.019	0.58	0.001	0.46	<0.0001	0.0017	0.016	0.00044	<0.0001	<0.0001	0.00035	0.12
Surface Water Area 1-Red River Along Mine	RR-17	19-Mar-03	RR-17-T01N-SFW-031903	Surface Water	T	2	<0.0006	<0.0004	0.037	0.00063	<0.0084	0.00058	<0.001		0.0041	0.026	<0.42	0.00049	0.47	<0.0001	<0.0023	0.028	<0.0016	<0.0002	<0.0002	<0.0004	0.23
Surface Water Area 1-Red River Along Mine	RR-17	15-Jul-03	RR-17-T01N-SFW-071503	Surface Water	T	1.1	<0.0005	<0.0002	0.036	0.00047	0.0063	0.00072	<0.0019		<0.0037	0.011	0.16	0.00025	0.28	<0.00012	0.002	0.021	<0.0008	<0.0001J	<0.0001	<0.0002	0.16
Surface Water Area 1-Red River Along Mine	RR-17	23-Sep-03	RR-17-T01N-SFW-092303	Surface Water	T	1.4	0.0028	<0.00038	0.039	<0.00047	<0.0048	0.00062	<0.001		0.0028	0.014	0.42	0.00069	0.29	<0.00006	0.0038	0.018	<0.00073	<0.0002	<0.00001	<0.00068	0.13
Surface Water Area 1-Red River Along Mine	RR-18A	01-Oct-02	RR-18A-T01N-SFW-100102	Surface Water	T	2	<0.0002	0.00025	0.034	0.0003	<0.0053	0.0006	<0.0046		0.0044	0.02	0.74	0.0013	0.47	<0.0001	0.0016J	0.016	0.00026	<0.0001	<0.0001	0.00035	0.12
Surface Water Area 1-Red River Along Mine	RR-18A	19-Mar-03	RR-18A-T01N-SFW-031903	Surface Water	T	2.4	<0.0006	<0.0004	0.039	0.00086	0.01	<0.0005	<0.001		0.0038	0.028	<0.98	0.00082	0.53	<0.0001	<0.0023	0.028	<0.0016	<0.0002	<0.0002	<0.0004	0.25
Surface Water Area 1-Red River Along Mine	RR-18A	16-Jul-03	RR-18A-T01N-SFW-071603	Surface Water	T	1.2	<0.0005	<0.0002	0.037	0.00035	0.0056	0.00071	<0.0014		0.0024	0.013	0.26	0.0017	0.27	<0.00017	0.0031	0.021	<0.0008	<0.0001J	<0.0001	<0.0002	0.16
Surface Water Area 1-Red River Along Mine	RR-18A	23-Sep-03	RR-18A-T01N-SFW-092303	Surface Water	T	1.4	<0.00083	<0.00038	0.039	<0.00047	<0.0048	0.00064	<0.001		0.0025	0.014	0.41	0.00058	0.29	<0.00006	<0.0026	0.018	<0.00073	<0.0002	<0.00001	<0.00061	0.13
Surface Water Area 1-Red River Along Mine	RR-18B	30-Sep-02	RR-18B-T01N-SFW-093002	Surface Water	T	1.9	<0.00024	0.00021	0.033	0.00033	<0.0076	0.0005	<0.0046	<0.01	0.0039	0.018	0.65	0.0011	0.43	<0.0001	0.0017	0.014	0.00038	<0.0001	<0.0001	0.00035	0.1
Surface Water Area 1-Red River Along Mine	RR-18B	19-Mar-03	RR-18B-T01N-SFW-031903	Surface Water	T	1.8	<0.0006	<0.0004	0.036	0.00047	<0.0084	<0.0005	<0.001		<0.0038	0.023	<0.7	0.0006	0.44	<0.0001	<0.0023	0.023	<0.0016	<0.0002	<0.0002	<0.0004	0.22
Surface Water Area 1-Red River Along Mine	RR-18B	16-Jul-03	RR-18B-T01N-SFW-071603	Surface Water	T	1.2	<0.0005	<0.0002	0.037	0.0003	0.0056	0.00071	<0.0014		<0.002	0.013	0.25	0.00031	0.27	<0.00015	0.0026	0.02	<0.0008	<0.0001J	<0.0001	<0.0002	0.16
Surface Water Area 1-Red River Along Mine	RR-18B	23-Sep-03	RR-18B-T01N-SFW-092303	Surface Water	T	1.3	<0.00011	<0.00038	0.042	<0.00053	<0.0048	0.00061	<0.001		0.0039	0.014	0.52	0.00085	0.3	0.00007	<0.0022	0.018	<0.00073J	<0.0002	<0.00001	0.00056	0.13
Surface Water Area 1-Red River Along Mine	RR-20	30-Sep-02	RR-20-T01N-SFW-093002	Surface Water	T	2.8	<0.0002	<0.0002	0.059	0.00051	<0.005	0.00048	0.0022	<0.01	0.0038	0.017	2.2	0.0012	0.41	<0.0001	0.0025	0.013	0.00035	<0.0059	<0.0001	0.00038	0.097
Surface Water Area 1-Red River Along Mine	RR-20	21-Mar-03	RR-20-T01N-SFW-032103	Surface Water	T	<2.4	<0.0006	<0.0004J	0.041	<0.0003J	<0.0084	0.00055	<0.001		<0.0038	0.022	<0.31	0.00034	0.39	<0.0001	0.0023	0.023	<0.0027	<0.0002	<0.0002	0.00023	0.17
Surface Water Area 1-Red River Along Mine	RR-20	15-Jul-03	RR-20-T01N-SFW-071503	Surface Water	T	0.5	<0.0005	<0.0002	0.036	<0.00034	0.006	0.00037	<0.0014		<0.002	0.0065	0.13	0.00024	0.16	<0.0001	0.0052	0.011	<0.0016	<0.0001J	<0.0001	<0.00052	0.078
Surface Water Area 1-Red River Along Mine	RR-20	23-Sep-03	RR-20-T01N-SFW-092303	Surface Water	T	1.1	<0.00011	<0.00038	0.041	<0.00047	<0.0048	0.00049	<0.001J		0.0022	0.012	0.67	0.0017	0.24	<0.00006	0.0034	0.015	<0.00073J	<0.0002	<0.00001	0.0005	0.11
Surface Water Area 1-Red River Along Mine	RR-7	04-Oct-02	RR-7-T01N-SFW-100402	Surface Water	T	0.85	<0.0002	<0.0002	0.041	<0.0002	<0.0048	0.00025	<0.0046		0.0025	0.013	0.5	0.0011	0.22	<0.0001	0.001	0.0088	<0.0002	<0.0001	<0.0001	0.00037	0.049
Surface Water Area 1-Red River Along Mine	RR-7	21-Jan-03	RR-7-T01N-SFW-012103	Surface Water	T	1.1J	<0.0006	<0.0004J	0.034	0.00024	<0.011	0.0005J	<0.0037		0.006	0.016	<0.28J	<0.0002	0.36	<0.0001	<0.0011	0.02	<0.0016	<0.0002	<0.0002	<0.0004	0.11
Surface Water Area 1-Red River Along Mine	RR-7	21-Mar-03	RR-7-T01N-SFW-032103	Surface Water	T	1.2	<0.0006	<0.0004J	0.045	<0.0003	<0.0084	<0.0005J	<0.001		<0.0038	0.018	<0.42	0.0011	0.31	<0.0001J	<0.0023	0.011	<0.001J	<0.0002	<0.0002	0.00046	0.093
Surface Water Area 1-Red River Along Mine	RR-7	03-Apr-03	RR-7-T01N-SFW-040303	Surface Water	T	1.1	<0.00036	<0.0002	0.046	<0.0014	<0.0084	<0.0005	<0.001		<0.0038	0.015	0.62	0.0007	0.2	<0.0001	0.0024	0.0078	<0.0005	<0.0001	<0.0001	0.00037	0.053
Surface Water Area 1-Red River Along Mine	RR-7	15-Jul-03	RR-7-T01N-SFW-071503	Surface Water	T	0.49	<0.0005	<0.0002	0.032	<0.0002	0.006	<0.0002	<0.0014		<0.002	0.0067	0.12	<0.00036	0.092	0.00019	0.0011	0.0054	<0.0008	<0.0001J	<0.0001	<0.0002	0.031
Surface Water Area 1-Red River Along Mine	RR-7	24-Sep-03	RR-7-T01N-SFW-092403	Surface Water	T	0.56	<0.00011	<0.00038	0.038	<0.00047	<0.0075	0.00024	<0.001		0.0021	0.0076	0.3	<0.00047	0.14	<0.00006	<0.00094	0.0075	<0.00073J	<0.0002	<0.00001	0.00064	<0.044
Surface Water Area 1-Red River Along Mine	RR-7	19-Oct-03	RR-7-T01N-SFW-101903	Surface Water	T	0.74	<0.0005	<0.0002	0.038	<0.0004	<0.0063	0.00027	<0.0011		<0.0029	0.0097	0.17	0.00028	0.17	<0.0001J	0.00094	0.0066J	<0.0003	<0.0001	<0.0001	0.00016	0.052J
Surface Water Area 1-Red River Along Mine	RR-7	13-Jan-04	RR-7-T01N-SFW-011304	Surface Water	T	1	<0.0012	<0.0002	0.036	<0.0015	<0.012	0.00037	<0.0057		<0.0037	0.014	0.29	0.0007	0.24	<0.0001	0.001	0.012	0.00074J	<0.0001	<0.0001	<0.0002	0.071
Surface Water Area 1-Red River Along Mine	RR-7	24-Feb-04	RR-7-T01N-SFW-022404	Surface Water	T	1.1	<0.0002J	<0.0001	0.031	0.00034	0.0064	0.00037	<0.0015J		0.0033	0.012	0.19	0.00022	0.24	<0.0001	<0.0007	0.012	<0.00086J	<0.0001J	<0.0001	<0.0001J	0.064
Surface Water Area 1-Red River Along Mine	RR-7	19-Apr-04	RR-7-T01N-SFW-041904	Surface Water	T	0.71	<0.00047	0.00022	0.043	<0.0002	0.0058	<0.0002	<0.0008J		0.0019	0.015	0.54	<0.0022	0.12	<0.0001	<0.0019	0.0071	<0.0007	<0.0001J	<0.00012	0.00074	0.04
Surface Water Area 1-Red River Along Mine	RR-8	04-Oct-02	RR-8-T01N-SFW-100402	Surface Water	T	0.81	<0.0002	0.00031	0.039	<0.0002	<0.0048	0.00026	<0.0046		<0.0022	0.013	0.54	0.0048	0.21	<0.0001	0.0017	0.0085	0.0002	<0.0001	<0.0001	0.00096	<0.042
Surface Water Area 1-Red River Along Mine	RR-8	21-Mar-03	RR-8-T01N-SFW-032103	Surface Water	T	<1.4	<0.0006	<0.0004	0.044	<0.0003J	<0.0084	<0.0005	<0.0011		<0.0038	0.018	0.64	0.0015	0.28	<0.0001	<0.0023	0.01	<0.001	<0.0002	<0.0002	0.00048	0.076
Surface Water Area 1-Red River Along Mine	RR-8	15-Jul-03	RR-8-T01N-SFW-071503	Surface Water	T	0.44	<0.0005	<0.0002	0.033	<0.0002	0.0073	<0.0002	<0.0014		<0.002	0.0075	0.14	0.00039	0.086	<0.0001	0.0024	0.0047	<0.0016	<0.0001J	<0.0001	<0.00055	0.024
Surface Water Area 1-Red River Along Mine	RR-8	24-Sep-03	RR-8-T01N-SFW-092403	Surface Water	T	0.59	<0.001	<0.00038	0.042	<0.00047	<0.0075	0.00025	<0.001		0.0023	0.0077	0.4	0.00091	0.15	<0.00006	<0.002	0.0076	<0.00073	<0.0002	<0.00001	0.00034	0.041
Surface Water Area 1-Red River Along Mine	RR-8A	04-Oct-02	RR-8A-T01N-SFW-100402	Surface Water	T	0.96	<0.0002	0.00023	0.041	<0.0003	<0.005	0.00031	<0.00065		0.0027	0.013	0.82	0.0011	0.22	<0.0001	0.00092	0.0081	0.0003	<0.0001	<0.0001	0.00037	0.034J
Surface Water Area 1-Red River Along Mine	RR-8A	21-Mar-03	RR-8A-T01N-SFW-032103	Surface Water	T	<2.1	<0.0006	<0.0004	0.045	<0.0003J	<0.0084	<0.0005	<0.0012		0.0044	0.019	0.69	0.0011	0.3	<0.0001	<0.0023	0.012	<0.001	<0.0002	<0.0002	0.00047	0.086
Surface Water Area 1-Red River Along Mine	RR-8A	15-Jul-03	RR-8A-T01N-SFW-071503	Surface Water	T	0.49	<0.0005	<0.0002	0.034	<0.0002	0.0069	<0.0002	<0.0014		<0.002	0.007	0.18	0.00062	0.087	0.00016	0.0011	0.0048	<0.0008	<0.0001J	<0.0001	0.00021	0.029
Surface Water Area 1-Red River Along Mine	RR-8A	24-Sep-03	RR-8A-T01N-SFW-092403	Surface Water	T	0.56	<0.00011	<0.00038	0.039	<0.00047	<0.0063	0.00021	<0.001		0.002	0.0072	0.31	0.0006	0.13	<0.00006	<0.0012	0.0067	<0.00073	<0.0002	<0.00001	0.00048	0.033
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	27-Sep-02	LR-11A-T01N-SFW-092702	Surface Water	T	2.2	<0.0002	<0.0002	0.045	0.00031	<0.018	0.00033	0.002	<0.01	0.0027	0.012	1.1	0.0011	0.31	<0.0001	0.058	0.0096	0.00023	<0.0059	<0.0001	0.0004	0.067
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	20-Mar-03	LR-11A-T01N-SFW-032003	Surface Water	T	<1.7	<0.0006	<0.0004	0.041	<0.00031J	0.012	<0.0005	<0.001		<0.0038	0.019	<0.42	0.00077	0.37	<0.0001	0.061	0.018	<0.001	<0.0002	<0.0002	0.00022	0.15
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	14-Jul-03	LR-11A-T01N-SFW-071403	Surface Water	T	0.33	<0.0005	<0.0002	0.039	<0.0002	0.013	0.00033	<0.0006J		<0.0018	0.0044	<0.082	0.00018	0.15	<0.00018	0.059	0.0077	<0.0008	<0.0001J	<0.0001	0.00023	0.049
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	23-Sep-03	LR-11A-T01N-SFW-092303	Surface Water	T	0.97	<0.00016	<0.00038	0.047	<0.00047	0.0085	0.00041	<0.001		0.0016	0.0095	0.82	0.0019	0.24	<0.00006	0.035	0.012	<0.00073	<0.0002	<0.00001	<0.0011	0.087
Surface Water Area 11-Red River Along Tailings Facility	LR-13	26-Sep-02	LR-13-T01N-SFW-092602	Surface Water	T	1.4	<0.0002	<0.0002	0.043	0.00027	<0.011	0.00032	<0.0012	<0.01	0.0026	0.011	0.96	0.0011	0.27	<0.0001	0.057	0.0083	0.00036	<0.0059	<0.0001	0.00036	0.052
Surface Water Area 11-Red River Along Tailings Facility	LR-13	20-Mar-03	LR-13-T01N-SFW-032003	Surface Water	T	1.1	<0.0006	<0.0004J	0.039	<0.0003	0.011	<0.0005J	<0.001		<0.0038	0.014	<0.42	0.00056	0.27	<0.0001J	0.064	0.013	<0.001J	<0.0002	<0.0002	<0.0002	<0.097
Surface Water Area 11-Red River Along Tailings Facility	LR-13	14-Jul-03	LR-13-T01N-SFW-071403	Surface Water	T	0.32	<0.0005	<0.0002	0.038	<0.0002	0.012	0.00027	<0.0014		<0.002	<0.0076	<0.11	0.00013	0.14	<0.0001	0.056	0.0079	<0.0008	<0.0001J	<0.0001	<0.0002	0.038J

Surface Water Area 11-Red River Along Tailings Facility	LR-13	21-Sep-03	LR-13-T01N-SFW-092103	Surface Water	T	0.9	<0.00028	<0.00038	0.044	<0.00058	<0.011	0.00046	<0.001		0.0024	0.0087	0.53	0.0011	0.22	<0.00006	0.043	0.013	<0.00073	<0.0002	<0.00001	<0.00074	0.085
Surface Water Area 11-Red River Along Tailings Facility	LR-16	26-Sep-03	LR-16-T01N-SFW-092603	Surface Water	T	2.1	<0.00022	0.00041	0.06	0.00033	<0.018	0.00042	0.002	<0.01	0.0029	0.015	3	0.0014	0.29	<0.00011	0.065	0.0081	0.00043	<0.0002	<0.00001	0.00065	0.083
Surface Water Area 11-Red River Along Tailings Facility	LR-16	20-Mar-03	LR-16-T01N-SFW-032003	Surface Water	T	0.9	<0.0006	<0.00041	0.036	<0.0003	0.016	<0.0005J	<0.001		<0.0038	0.012	<0.42	0.00029	0.25	<0.00011J	0.062	0.012	<0.001J	<0.0002	<0.0002	0.00062	0.1
Surface Water Area 11-Red River Along Tailings Facility	LR-16	14-Jul-03	LR-16-T01N-SFW-071403	Surface Water	T	<0.22	<0.0005	<0.0002	0.037	<0.0002	0.014	0.0003	<0.0006J		<0.0018	0.0031	<0.03	0.00011	0.13	<0.00017	0.059	0.0059	<0.0008	<0.0001J	<0.0001	0.00052	0.037
Surface Water Area 11-Red River Along Tailings Facility	LR-16	21-Jan-03	LR-16-T01N-SFW-012103	Surface Water	T	0.69	<0.00011	<0.00038	0.049	<0.00047	<0.0097	0.00047	<0.001		0.003	0.01	0.66	0.0014	0.29	<0.00006	0.064	0.015	<0.00073	<0.0002	<0.00001	<0.0011	0.17
Surface Water Area 11-Red River Along Tailings Facility	LR-5	30-Sep-02	LR-5-T01N-SFW-093002	Surface Water	T	1.5	<0.0002	<0.0002	0.034	0.00033	<0.0088	0.00042	<0.0012	<0.01	0.0033	0.014	0.59	0.0013	0.34	<0.0001	0.003	0.011	<0.0002	<0.0059	<0.0001	0.00039	0.074
Surface Water Area 11-Red River Along Tailings Facility	LR-5	21-Mar-03	LR-5-T01N-SFW-032103	Surface Water	T	2	0.00072	<0.0004	0.04	<0.0003	0.011	<0.0005	<0.001		<0.0038	0.019	0.45	0.00058	0.39	<0.00012	0.0042	0.019	<0.001	<0.0002	<0.0002	0.0002	0.18
Surface Water Area 11-Red River Along Tailings Facility	LR-5	15-Jul-03	LR-5-T01N-SFW-071503	Surface Water	T	0.44	<0.0006	<0.0002	0.038	<0.0003	0.011	0.00036	<0.0014		<0.0022	0.0056	0.14	<0.00015	0.14	0.00014	0.0064	0.011	<0.0008	<0.0001J	<0.0001	<0.0002	0.049
Surface Water Area 11-Red River Along Tailings Facility	LR-5	23-Sep-03	LR-5-T01N-SFW-092303	Surface Water	T	1	<0.00011	<0.00038	0.04	<0.00047	0.0058	0.0004	<0.001		0.0023	0.01	0.66	0.0016	0.2	<0.00006	0.0063	0.012	<0.00073	<0.0002	<0.00001	0.00057	0.078
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	27-Sep-02	LR-8A-T01N-SFW-092702	Surface Water	T	1.2	<0.0002	<0.0002	0.044	0.00026	<0.012	0.00035	0.0012	<0.01	0.0024	0.0086	0.78	0.00068	0.29	<0.0001	0.049	0.0083	0.0003	<0.0059	<0.0001	0.00027	0.056
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	25-Mar-03	LR-8A-T01N-SFW-032503	Surface Water	T	1.6	<0.0006	<0.00029	0.041	<0.0016	0.016	<0.0005	<0.001		<0.0038	0.015	<0.49	0.0012	0.38	<0.0001	0.088	0.018	<0.001	<0.0002	<0.0002	0.00047	0.14
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	15-Jul-03	LR-8A-T01N-SFW-071503	Surface Water	T	0.4	<0.00066	<0.0002	0.038	<0.0004	0.014	0.00031	<0.0019		<0.0037	0.0048	0.11	0.00021	0.16	<0.00015	0.054	0.009	<0.0008	<0.0001J	<0.0001	<0.0002	0.066
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	23-Sep-03	LR-8A-T01N-SFW-092303	Surface Water	T	0.86	<0.00011	<0.00038	0.041	<0.00047	0.0097	0.00044	<0.001		0.0023	0.0089	0.45	0.00096	0.22	<0.00006	0.051	0.012	<0.00073	<0.0002	<0.00001	0.00053	0.076

EXPOSURE_AREA_LOOKUP_DESCRIPTION	SITE_ID	SAMP_DATE	SAMP_ID	MEDIUM_TYPE_LOOKUP_DESCRIPTION	SAMP_FRACTION	Aluminum mg/L	Antimony mg/L	Arsenic mg/L	Barium mg/L	Beryllium mg/L	Boron mg/L	Cadmium mg/L	Chromium mg/L	Chromium, Hexavalent mg/L	Cobalt mg/L	Copper mg/L	Iron mg/L	Lead mg/L	Manganese mg/L	Mercury mg/L	Molybdenum mg/L	Nickel mg/L	Selenium mg/L	Silver mg/L	Thallium mg/L	Vanadium mg/L	Zinc mg/L
Surface Water Area 1-Red River Along Mine	LR-1	30-Sep-02	LR-1-T01N-SFW-093002	Surface Water	T	2.2	0.0002	0.00023	0.049	0.00036	0.005	0.00039	0.0019	0.01	0.0033	0.014	1.7	0.0014	0.36	0.0001	0.003	0.011	0.00029	0.0059	0.0001	0.00042	0.08
Surface Water Area 1-Red River Along Mine	LR-1	20-Mar-03	LR-1-T01N-SFW-032003	Surface Water	T	1.9	0.0006	0.0004	0.042	0.0003	0.0084	0.0005	0.0011		0.0041	0.02	0.42	0.00067	0.38	0.0001	0.0023	0.019	0.001	0.0002	0.0002	0.0002	0.17
Surface Water Area 1-Red River Along Mine	LR-1	15-Jul-03	LR-1-T01N-SFW-071503	Surface Water	T	0.45	0.0021	0.00035	0.036	0.00028	0.0091	0.00038	0.0014		0.002	0.0056	0.11	0.00026	0.15	0.0001	0.0076	0.0093	0.0016	0.0001	0.0001	0.0014	0.068
Surface Water Area 1-Red River Along Mine	LR-1	24-Sep-03	LR-1-T01N-SFW-092403	Surface Water	T	0.89	0.00011	0.00038	0.042	0.00047	0.008	0.00043	0.001		0.0024	0.009	0.55	0.0012	0.23	0.00006	0.0037	0.013	0.00073	0.0002	0.00001	0.00047	0.1
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	27-Sep-02	LR-11A-T01N-SFW-092702	Surface Water	T	2.2	0.0002	0.0002	0.045	0.00031	0.018	0.00033	0.002	0.01	0.0027	0.012	1.1	0.0011	0.31	0.0001	0.058	0.0096	0.00023	0.0059	0.0001	0.0004	0.067
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	20-Mar-03	LR-11A-T01N-SFW-032003	Surface Water	T	1.7	0.0006	0.0004	0.041	0.00031	0.012	0.0005	0.001		0.0038	0.019	0.42	0.00077	0.37	0.0001	0.061	0.018	0.001	0.0002	0.0002	0.00022	0.15
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	14-Jul-03	LR-11A-T01N-SFW-071403	Surface Water	T	0.33	0.0005	0.0002	0.039	0.0002	0.013	0.00033	0.0006		0.0018	0.0044	0.082	0.00018	0.15	0.00018	0.059	0.0077	0.0008	0.0001	0.0001	0.00023	0.049
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	23-Sep-03	LR-11A-T01N-SFW-092303	Surface Water	T	0.97	0.00016	0.00038	0.047	0.00047	0.0085	0.00041	0.001		0.0016	0.0095	0.82	0.0019	0.24	0.00006	0.035	0.012	0.00073	0.0002	0.00001	0.0011	0.087
Surface Water Area 11-Red River Along Tailings Facility	LR-13	26-Sep-02	LR-13-T01N-SFW-092602	Surface Water	T	1.4	0.0002	0.0002	0.043	0.00027	0.011	0.00032	0.0012	0.01	0.0026	0.011	0.96	0.0011	0.27	0.0001	0.057	0.0083	0.00036	0.0059	0.0001	0.00036	0.052
Surface Water Area 11-Red River Along Tailings Facility	LR-13	20-Mar-03	LR-13-T01N-SFW-032003	Surface Water	T	1.1	0.0006	0.0004	0.039	0.0003	0.011	0.0005	0.001		0.0038	0.014	0.42	0.00056	0.27	0.0001	0.064	0.013	0.001	0.0002	0.0002	0.0002	0.097
Surface Water Area 11-Red River Along Tailings Facility	LR-13	14-Jul-03	LR-13-T01N-SFW-071403	Surface Water	T	0.32	0.0005	0.0002	0.038	0.0002	0.012	0.00027	0.0014		0.002	0.0076	0.11	0.00013	0.14	0.0001	0.056	0.0079	0.0008	0.0001	0.0001	0.0002	0.038
Surface Water Area 11-Red River Along Tailings Facility	LR-13	21-Sep-03	LR-13-T01N-SFW-092103	Surface Water	T	0.9	0.00028	0.00038	0.044	0.00058	0.011	0.00046	0.001		0.0024	0.0087	0.53	0.0011	0.22	0.00006	0.043	0.013	0.00073	0.0002	0.00001	0.00074	0.085
Surface Water Area 11-Red River Along Tailings Facility	LR-16	26-Sep-02	LR-16-T01N-SFW-092602	Surface Water	T	2.1	0.00022	0.00041	0.06	0.00033	0.018	0.00052	0.002	0.01	0.0029	0.013	2	0.0014	0.29	0.0001	0.055	0.0091	0.00043	0.0059	0.0001	0.00093	0.063
Surface Water Area 11-Red River Along Tailings Facility	LR-16	20-Mar-03	LR-16-T01N-SFW-032003	Surface Water	T	0.9	0.0006	0.0004	0.036	0.0003	0.016	0.0005	0.001		0.0038	0.012	0.42	0.00029	0.25	0.0001	0.062	0.012	0.001	0.0002	0.0002	0.00062	0.1
Surface Water Area 11-Red River Along Tailings Facility	LR-16	14-Jul-03	LR-16-T01N-SFW-071403	Surface Water	T	0.22	0.0005	0.0002	0.037	0.0002	0.014	0.0003	0.0006		0.0018	0.0031	0.03	0.00011	0.13	0.00017	0.059	0.0059	0.0008	0.0001	0.0001	0.00052	0.037
Surface Water Area 11-Red River Along Tailings Facility	LR-16	21-Sep-03	LR-16-T01N-SFW-092103	Surface Water	T	0.92	0.00011	0.00038	0.049	0.00047	0.0097	0.00047	0.001		0.002	0.01	0.68	0.0015	0.25	0.00006	0.035	0.013	0.00073	0.0002	0.00001	0.0011	0.12
Surface Water Area 11-Red River Along Tailings Facility	LR-5	30-Sep-02	LR-5-T01N-SFW-093002	Surface Water	T	1.5	0.0002	0.0002	0.034	0.00033	0.0088	0.00042	0.0012	0.01	0.0033	0.014	0.59	0.0013	0.34	0.0001	0.003	0.011	0.0002	0.0059	0.0001	0.00039	0.074
Surface Water Area 11-Red River Along Tailings Facility	LR-5	21-Mar-03	LR-5-T01N-SFW-032103	Surface Water	T	2	0.00072	0.0004	0.04	0.0003	0.011	0.0005	0.001		0.0038	0.019	0.45	0.00058	0.39	0.0001	0.0042	0.019	0.001	0.0002	0.0002	0.0002	0.18
Surface Water Area 11-Red River Along Tailings Facility	LR-5	15-Jul-03	LR-5-T01N-SFW-071503	Surface Water	T	0.44	0.0005	0.0002	0.038	0.0002	0.011	0.00039	0.0014		0.002	0.0056	0.14	0.00033	0.14	0.00016	0.0064	0.011	0.0008	0.0001	0.0001	0.0002	0.089
Surface Water Area 11-Red River Along Tailings Facility	LR-5	23-Sep-03	LR-5-T01N-SFW-092303	Surface Water	T	1	0.00011	0.00038	0.04	0.00047	0.0058	0.0004	0.001		0.0023	0.01	0.66	0.0016	0.2	0.00006	0.0063	0.012	0.00073	0.0002	0.00001	0.00057	0.078
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	27-Sep-02	LR-8A-T01N-SFW-092702	Surface Water	T	1.2	0.0002	0.0002	0.044	0.00026	0.012	0.00035	0.0012	0.01	0.0024	0.0086	0.78	0.00068	0.29	0.0001	0.049	0.0083	0.0003	0.0059	0.0001	0.00027	0.056
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	23-Mar-03	LR-8A-T01N-SFW-032303	Surface Water	T	1.6	0.0006	0.00059	0.041	0.0016	0.015	0.0005	0.001		0.0038	0.015	0.49	0.0012	0.38	0.0001	0.088	0.018	0.004	0.0002	0.0002	0.00047	0.14
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	15-Jul-03	LR-8A-T01N-SFW-071503	Surface Water	T	0.4	0.00066	0.0002	0.038	0.0004	0.014	0.00031	0.0019		0.0037	0.0048	0.11	0.00021	0.16	0.00015	0.054	0.009	0.0008	0.0001	0.0001	0.0002	0.066
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	23-Sep-03	LR-8A-T01N-SFW-092303	Surface Water	T	0.86	0.00011	0.00038	0.041	0.00047	0.0097	0.00044	0.001		0.0023	0.0089	0.45	0.00096	0.22	0.00006	0.051	0.012	0.00073	0.0002	0.00001	0.00053	0.076
Reference Red River Above Mine Site	RR-1	04-Oct-02	RR-1-T01N-SFW-100402	Surface Water	T	0.042	0.0002	0.0002	0.047	0.0002	0.0048	0.0001	0.0046		0.0022	0.00058	0.023	0.00011	0.0027	0.0001	0.00093	0.0002	0.0002	0.0001	0.0001	0.00036	0.0069
Reference Red River Above Mine Site	RR-1	21-Mar-03	RR-1-T01N-SFW-032103	Surface Water	T	0.43	0.0006	0.0004	0.054	0.0003	0.0084	0.0005	0.001		0.0038	0.0015	0.42	0.0002	0.013	0.0001	0.0023	0.003	0.0013	0.0002	0.0002	0.00027	0.039
Reference Red River Above Mine Site	RR-1	16-Jul-03	RR-1-T01N-SFW-071603	Surface Water	T	0.071	0.0005	0.0002	0.038	0.0002	0.0048	0.0002	0.0014		0.002	0.0024	0.11	0.00034	0.0069	0.00015	0.0017	0.0021	0.0008	0.0001	0.0001	0.00038	0.0055
Reference Red River Above Mine Site	RR-1	25-Sep-03	RR-1-T01N-SFW-092503	Surface Water	T	0.051	0.0016	0.00038	0.044	0.00047	0.0048	0.00008	0.001		0.0011	0.00045	0.077	0.00014	0.0045	0.00006	0.0019	0.001	0.00073	0.0002	0.00001	0.00059	0.013
Surface Water Area 1-Red River Along Mine	RR-10	03-Oct-02	RR-10-T01N-SFW-100302	Surface Water	T	1.9	0.0002	0.00035	0.06	0.00021	0.0048	0.00026	0.0046		0.0022	0.014	2.3	0.0025	0.21	0.0001	0.00094	0.0069	0.00033	0.0001	0.0001	0.00075	0.039
Surface Water Area 1-Red River Along Mine	RR-10	21-Jan-03	RR-10-T01N-SFW-012103	Surface Water	T	1.1	0.0006	0.0004	0.032	0.0002	0.01	0.0004	0.0037		0.0039	0.014	0.27	0.00032	0.28	0.0001	0.0011	0.015	0.0016	0.0002	0.0002	0.0004	0.073
Surface Water Area 1-Red River Along Mine	RR-10	20-Mar-03	RR-10-T01N-SFW-032003	Surface Water	T	1.6	0.0006	0.0004	0.045	0.0003	0.0084	0.0005	0.001		0.0039	0.022	0.74	0.001	0.27	0.0001	0.0023	0.0096	0.001	0.0002	0.0002	0.00027	0.081
Surface Water Area 1-Red River Along Mine	RR-10	03-Apr-03	RR-10-T01N-SFW-040303	Surface Water	T	1.4	0.0003	0.00027	0.047	0.0011	0.0084	0.0005	0.001		0.0038	0.016	0.86	0.00088	0.19	0.0001	0.0023	0.013	0.00068	0.0001	0.0001	0.00036	0.049
Surface Water Area 1-Red River Along Mine	RR-10	15-Jul-03	RR-10-T01N-SFW-071503	Surface Water	T	0.52	0.0005	0.0002	0.034	0.0004	0.0071	0.0002	0.0019		0.0037	0.0071	0.22	0.00058	0.099	0.00017	0.0011	0.0048	0.0008	0.0001	0.0001	0.00026	0.03
Surface Water Area 1-Red River Along Mine	RR-10	24-Sep-03	RR-10-T01N-SFW-092403	Surface Water	T	0.61	0.00011	0.00038	0.04	0.00047	0.0055	0.00024	0.001		0.0018	0.0075	0.4	0.00086	0.13	0.00006	0.0013	0.007	0.00073	0.0002	0.00001	0.00061	0.034
Surface Water Area 1-Red River Along Mine	RR-10	19-Oct-03	RR-10-T01N-SFW-101903	Surface Water	T	0.7	0.0005	0.0002	0.038	0.0004	0.0063	0.0002	0.0011		0.0029	0.0089	0.19	0.00033	0.15	0.0001	0.0012	0.0058	0.0003	0.0001	0.0001	0.00012	0.044
Surface Water Area 1-Red River Along Mine	RR-10	13-Jan-04	RR-10-T01N-SFW-011304	Surface Water	T	1	0.0012	0.0002	0.033	0.001	0.012	0.00034	0.0057		0.0037	0.013	0.28	0.0003	0.21	0.0001	0.0012	0.017	0.0003	0.0001	0.0001	0.0002	0.063
Surface Water Area 1-Red River Along Mine	RR-10	24-Feb-04	RR-10-T01N-SFW-022404	Surface Water	T	0.97	0.0002	0.0001	0.032	0.00035	0.0056	0.00041	0.0015		0.0034	0.013	0.2	0.0002	0.25	0.0001	0.0007	0.015	0.00094	0.0001	0.0001	0.0001	0.075
Surface Water Area 1-Red River Along Mine	RR-10	19-Apr-04	RR-10-T01N-SFW-041904	Surface Water	T	1.3	0.00052	0.00027	0.052	0.0002	0.0084	0.00023	0.0008		0.0017	0.017	1.1	0.0027	0.14	0.0001	0.002	0.0075	0.0007	0.0001	0.00012	0.00083	0.045
Surface Water Area 1-Red River Along Mine	RR-10A1	03-Oct-02	RR-10A1-T01N-SFW-100302	Surface Water	T	1.2	0.0002	0.0002	0.049	0.0002	0.0048	0.00019	0.0046		0.0022	0.0089	1.3	0.002	0.16	0.0001	0.0014	0.0047	0.00024	0.0001	0.0001	0.00048	0.024
Surface Water Area 1-Red River Along Mine	RR-10A1	20-Jan-03	RR-10A1-T01N-SFW-012003	Surface Water	T	1.1	0.0006	0.0004	0.033	0.0002	0.0041	0.0004	0.0037		0.0033	0.0079	0.44	0.00031	0.29	0.0001	0.0027	0.014	0.0016	0.0002	0.0002	0.0004	0.081
Surface Water Area 1-Red River Along Mine	RR-10A1	20-Mar-03	RR-10A1-T01N-SFW-032003	Surface Water	T	1.4	0.0006	0.0004	0.042	0.0003	0.0084	0.0005	0.001		0.0038	0.016	0.31	0.0008	0.19	0.0001	0.0023	0.0085	0.001	0.0002	0.0002	0.00046	0.06
Surface Water Area 1-Red River Along Mine	RR-10A1	03-Apr-03	RR-10A1-T01N-SFW-040303	Surface Water	T	1.1	0.0003	0.0002	0.045	0.00076	0.0084	0.0005	0.001		0.0038	0.012	0.64	0.0007	0.15	0.0001	0.0023	0.0054	0.0005	0.0001	0.0001	0.00033	0.038
Surface Water Area 1-Red River Along Mine	RR-10A1	15-Jul-03	RR-10A1-T01N-SFW-071503	Surface Water	T	0.3	0.0005	0.0002	0.035	0.0004	0.0075	0.0002	0.0019		0.0037	0.005	0.073	0.00021	0.066	0.00013	0.0018	0.0037	0.0008	0.0001	0.0001	0.00038	0.019
Surface Water Area 1-Red River Along Mine	RR-10A1	24-Sep-03	RR-10A1-T01N-SFW-092403	Surface Water	T	0.52	0.00011	0.00038	0.044	0.00047	0.013	0.00021	0.001		0.0017	0.0065	0.38	0.00081	0.12	0.00006	0.0013	0.0061	0.00073	0.0002	0.00001	0.00062	0.031
Surface Water Area 1-Red River Along Mine	RR-10A1	19-Oct-03	RR-10A1-T01N-SFW-101903	Surface Water	T	0.54	0.0005	0.0002	0.039	0.0004	0.0084	0.0002	0.0011		0.0029	0.0072	0.16	0.00023	0.12	0.0001	0.0013	0.0043	0.0003	0.0001	0.0001	0.00013	0.042
Surface Water Area 1-Red River Along Mine	RR-10A1	13-Jan-04	RR-10A1-T01N-SFW-011304	Surface Water	T	0.92	0.0012	0.0002	0.035	0.001	0.012	0.00029	0.0057		0.0037	0.012	0.21	0.00032	0.17	0.0001	0.0017	0.017	0.00061	0.0001	0.0001	0.0002	0.065
Surface Water Area 1-Red River Along Mine	RR-10A1	19-Apr-04	RR-10A1-T01N-SFW-041904	Surface Water	T	2.4	0.00049	0.00024	0.049	0.00025	0.0058	0.00033	0.0008		0.0025	0.022	1.5	0.0031	0.22	0.0001	0.0027	0.011	0.0007	0.0001	0.00013	0.001	0.082
Surface Water Area 1-Red River Along Mine	RR-11A1	03-Oct-02	RR-11A1-T01N-SFW-100302	Surface Water	T	0.79	0.0002	0.00029	0.044	0.0002	0.0048	0.00021	0.0046		0.0022	0.011	0.83	0.0014	0.16	0.0001	0.0012	0.0052	0.0002	0.0001	0.0001	0.00053	0.025
Surface Water Area 1-Red River Along Mine	RR-11A1	20-Jan-03	RR-11A1-T01N-SFW-012003	Surface Water	T	1.1	0.0017	0.0004	0.037	0.00022	0.013	0.0004	0.0037		0.0025	0.0092	0.56	0.00034	0.2	0.0001	0.0011	0.011	0.0016	0.0002	0.0002	0.0004	0.056
Surface Water Area 1-Red River Along Mine	RR-11A1	21-Mar-03	RR-11A1-T01N-SFW-032103	Surface Water	T	1.6	0.0006	0.0004	0.049	0.0003	0.0084	0.0005	0.0015		0.0038	0.018	0.89	0.0025	0.22	0.0001	0.0023	0.01	0.001	0.0002	0.0002	0.0011	0.07
Surface Water Area 1-Red River Along Mine	RR-11A1	03-Apr-03	RR-11A1-T01N-SFW-040303	Surface Water	T	1	0.0003	0.00022	0.046	0.00097	0.0084	0.0005	0.001		0.0038	0.014	0.48	0.0008	0.16	0.0001	0.0023	0.0044	0.00057	0.0001	0.0001	0.00037	0.044
Surface Water Area 1-Red River Along Mine	RR-11A1	15-Jul-03	RR-11A1-T01N-SFW-071503	Surface Water	T	0.41	0.0005	0.0002	0.035	0.0004	0.007	0.0002	0.0019		0.0037	0.0062	0.088	0.00027	0.12	0.00021	0.0014	0.005	0.0008	0.0001	0.0001	0.0002	0.04
Surface Water Area 1-Red River Along Mine	RR-11A1	24-Sep-03	RR-11A1-T01N-SFW-092403	Surface Water	T	0.51	0.00039	0.00038	0.043	0.00047	0.0067	0.00022	0.001		0.0018	0.0067	0.38	0.0009	0.12	0.00006	0.0015	0.0061	0.00073	0.0002	0.00001	0.00038	0.032
Surface Water Area 1-Red River Along Mine	RR-11A1	19-Oct-03	RR-11A1-T01N-SFW-101903	Surface Water	T	0.55	0.0005	0.0002	0.039	0.0004	0.0063	0.0002	0.0011		0.0029	0.0071	0.13	0.00039	0.12	0.0001	0.0014	0.0047	0.00034	0.0001	0.0001	0.00019	0.038
Surface Water Area 1-Red River Along Mine	RR-11A1	13-Jan-04	RR-11A1-T01N-SFW-011304	Surface Water	T	1.2	0.0012	0.00024	0.04	0.001	0.012	0.0003	0.0057		0.0037	0.013	0.28	0.00036	0.19	0.0001	0.0016	0.017	0.00055	0.0001	0.0001	0.0002	0.069
Surface Water Area 1-Red River Along Mine	RR-11A1	19-Apr-04	RR-11A1-T01N-SFW-041904	Surface Water	T	0.71	0.00058	0.00026	0.044	0.0002	0.0067	0.00024	0.0008		0.0011	0.015	0.56	0.003	0.11	0.0001	0.0024	0.0063	0.0007	0.0001	0.00013	0.00097	0.035
Surface Water Area 1-Red River Along Mine	RR-11B	03-Oct-02	RR-11B-T01N-SFW-100302	Surface Water	T	0.71	0.0002	0.0002	0.04	0.0002	0.0048	0.00017	0.0046		0.0022	0.0098	0.69	0.0013	0.15	0.0001	0.0011	0.0061	0.0002	0.0001	0.0001	0.00045	0.036
Surface Water Area 1-Red River Along Mine	RR-11B	20-Mar-03	RR-11B-T01N-SFW-032003	Surface Water	T	1.1	0.0018	0.0004	0.041	0.0003	0.01	0.0005	0.001		0.0038	0.014	0.51	0.00036	0.18	0.0001	0.0029	0.022	0.001	0.0002	0.0002	0.00025	0.17
Surface Water Area 1-Red River Along Mine	RR-11B	15-Jul-03	RR-11B-T01N-SFW-071503	Surface Water	T	0.59	0.0005	0.0002	0.036	0.00041	0.0058	0.00063	0.0014		0.002	0.0079	0.097	0.00015	0.11	0.0001	0.0017	0.017	0.0016	0.0001	0.0001	0.00021	0.13
Surface Water Area 1-Red River Along Mine	RR-11B	24-Sep-03	RR-11B-T01N-SFW-092403	Surface Water	T	0.68	0.00014	0.00038	0.044	0.00047	0.0055	0.00036	0.001		0.0016	0.007	0.54	0.0016	0.11	0.00006	0.0016	0.013	0.00073	0.0002	0.00001	0.00056	0.083
Surface Water Area 1-Red River Along Mine	RR-11C	01-Oct-02	RR-11C-T01N-SFW-100102	Surface Water	T	0.76	0.0002	0.00023	0.037	0.0002	0.0059	0.00026	0.0046		0.0022	0.0083	0.45	0.001	0.16	0.0001	0.0016	0.0082	0.00034	0.0001	0.0001	0.00039	0.052
Surface Water Area 1-Red River Along Mine	RR-11C	20-Jan-03	RR-11C-T01N-SFW-012003	Surface Water	T	0.76	0.0006	0.0004	0.033	0.0002	0.0035	0.00045	0.0037		0.0021	0.0087	0.27	0.00022	0.18	0.0001	0.0031	0.032	0.0016	0.0002	0.0002	0.0004	0.19
Surface Water Area 1-Red River Along Mine	RR-11C	20-Mar-03	RR-11C-T01N-SFW-032003	Surface Water	T	1.2	0.0006	0.0004	0.04	0.00034	0.0084	0.0005	0.001		0.0038	0.011	0.42	0.00053	0.17	0.0001	0.0023	0.021	0.001	0.0002	0.0002	0.0002	0.16
Surface Water Area 1-Red River Along Mine	RR-11C	03-Apr-03	RR-11C-T01N-SFW-040303	Surface Water	T	1.5	0.0003	0.00046	0.056	0.0011	0.0084	0.0005	0.001		0.0038	0.014	1.2	0.0041	0.16	0.0001	0.0023	0.016	0.00074	0.0001	0.0001	0.0013	0.12
Surface Water Area 1-Red River Along Mine	RR-11C	15-Jul-03	RR-11C-T01N-SFW-071503	Surface Water	T	0.54	0.0005	0.0002	0.036	0.0004	0.0063	0.00053	0.0019		0.0037	0.0062	0.092	0.00023	0.1	0.00018	0.0019	0.017	0.0008	0.0001	0.0001	0.00027	0.12
Surface Water Area 1-Red River Along Mine	RR-11C	25-Sep-03	RR-11C-T01N-SFW-092503	Surface Water	T	0.59	0.0013	0.00038	0.044	0.00047	0.011	0.00039	0.001		0.0019	0.0062	0.47	0.00097	0.12	0.00006	0.0027	0.015	0.00073	0.0002	0.00001	0.00043	0.092
Surface Water Area 1-Red River Along Mine	RR-11C	19-Oct-03	RR-11C-T01N-SFW-101903	Surface Water	T	0.53	0.0005	0.0002	0.04	0.0004	0.0063	0.00035	0.0011		0.0029	0.0057	0.1	0.0002	0.11	0.0001	0.0022	0.014	0.00036	0.0001	0.0001	0.0001	0.11
Surface Water Area 1-Red River Along Mine	RR-11C	13-Jan-04	RR-11C-T01N-SFW-011304	Surface Water	T	0.57	0.0012	0.0002	0.036	0.001	0.012	0.00033	0.0057		0.0037	0.0054	0.095	0.00019	0.11	0.0001	0.0027	0.017	0.0006	0.0001	0.0001	0.0002	0.084
Surface Water Area 1-Red River Along Mine	RR-11C	19-Apr-04	RR-11C-T01N-SFW-041904	Surface Water	T	1.6	0.00049	0.0002	0.048	0.0002	0.0061	0.00021	0.0008		0.0011	0.012	1.2	0.0023	0.1	0.0001	0.0026	0.0071	0.0007	0.0001	0.00012	0.00084	0.041
Surface Water Area 1-Red River Along Mine	RR-12	03-Oct-02	RR-12-T01N-SFW-100302	Surface Water	T	1.3	0.0002	0.0003	0.047	0.0002	0.0048	0.00032	0.0046		0.0022	0.0099	1.3	0.0023	0.17	0.0001	0.0017	0.0091	0.0002	0.0001	0.0001	0.00059	0.05
Surface Water Area 1-Red River Along Mine	RR-12	20-Jan-03	RR-12-T01N-SFW-012003	Surface Water	T	0.77	0.0011	0.0004	0.036	0.00024	0.0087	0.00067	0.0037		0.0031	0.011	0.27	0.0003	0.19	0.0001	0.0034	0.029	0.0016	0.0002	0.0002	0.0004	0.18
Surface Water Area 1-Red River Along Mine	RR-12	20-Mar-03	RR-12-T01N-SFW-032003	Surface Water	T	1.1	0.0006	0.0004	0.038	0.0003	0.0084	0.0005	0.001		0.0038	0.011	0.31	0.00026	0.18	0.0001	0.0023	0.021	0.001	0.0002	0.0002	0.00022	0.15
Surface Water Area 1-Red River Along Mine	RR-12	03-Apr-03	RR-12-T01N-SFW-040303	Surface Water	T	1.3	0.00056	0.00025	0.045	0.0014	0.0084	0.0005	0.001		0.0038	0.013	0.79	0.001	0.15	0.0001	0.003	0.016	0.00067	0.0001	0.0001	0.0004	0.11
Surface Water Area 1-Red River Along Mine	RR-12	15-Jul-03	RR-12-T01N-SFW-071503	Surface Water	T	0.53	0.0005	0.0002	0.034	0.0004	0.0063	0.0005	0.0019		0.0037	0.0064	0.084	0.00024	0.11	0.00018	0.0019	0.016	0.0008	0.0001	0.0001	0.00023	0.12
Surface Water Area 1-Red River Along Mine	RR-12	24-Sep-03	RR-12-T01N-SFW-092403	Surface Water	T	0.63	0.00016	0.00038	0.042	0.00047	0.0078	0.00042	0.001		0.0017	0.0067	0.38	0.00096	0.11	0.00006	0.002	0.015	0.00073	0.0002	0.00001	0.0007	0.087
Surface Water Area 1-Red River Along Mine	RR-12	19-Oct-03	RR-12-T01N-SFW-101903	Surface Water	T	0.55	0.0005	0.0002	0.038	0.0004	0.0063	0.00044	0.0011		0.0029	0.0062	0.089	0.00024	0.12	0.0001	0.0023	0.015	0.0003	0.0001	0.0001	0.0001	0.11
Surface Water Area 1-Red River Along Mine	RR-12	13-Jan-04	RR-12-T01N-SFW-011304	Surface Water	T	0.59	0.0012	0.0002	0.04	0.001	0.012	0.0003	0.0057		0.0037	0.0066	0.12	0.00022	0.13	0.0001	0.0025	0.017	0.001	0.0001	0.0001	0.0002	0.081
Surface Water Area 1-Red River Along Mine	RR-12	19-Apr-04	RR-12-T01N-SFW-041904	Surface Water	T	0.94	0.00053	0.00023	0.047	0.0002	0.0039	0.00025	0.0008		0.002	0.015	0.83	0.0028	0.12	0.0001	0.0024	0.0082	0.0007	0.0001	0.00012	0.00086	0.05
Surface Water Area 1-Red River Along Mine	RR-13	01-Oct-02	RR-13-T01N-SFW-100102	Surface Water	T	1.1	0.0002	0.0002	0.035	0.0002	0.005	0.00029	0.0046	0.01	0.0022	0.013	0.45	0.00094	0.21	0.0001	0.0018	0.0092	0.0002	0.0001	0.0001	0.00033	0.058
Surface Water Area 1-Red River Along Mine	RR-13	20-Jan-03	RR-13-T01N-SFW-012003	Surface Water	T	1.1	0.0006	0.0004	0.035	0.00026	0.006	0.00081	0.0037		0.0037	0.017	0.27	0.00027	0.26	0.0001	0.0021	0.028	0.0016	0.0002	0.0002	0.0004	0.16
Surface Water Area 1-Red River Along Mine	RR-13	20-Mar-03	RR-13-T01N-SFW-032003	Surface Water	T	1.4	0.00082	0.0004	0.037	0.00044	0.0084	0.0005	0.001		0.0039	0.017	0.42	0.00038	0.25	0.0001	0.0023	0.021	0.001	0.0002	0.0002	0.0002	0.15
Surface Water Area 1-Red River Along Mine	RR-13	03-Apr-03	RR-13-T01N-SFW-040303	Surface Water	T	2.1	0.0003	0.00028	0.055	0.0014	0.0084	0.0005	0.001		0.0038	0.021	1.4	0.0015	0.21	0.0001	0.0029	0.018	0.00054	0.0001	0.0001	0.00055	0.13
Surface Water Area 1-Red River Along Mine	RR-13	15-Jul-03	RR-13-T01N-SFW-071503	Surface Water	T	0.71	0.0005	0.0002	0.036	0.0004	0.0061	0.00057	0.0019		0.0037	0.0086	0.1	0.00023	0.14	0.00015	0.0019	0.017	0.0008	0.0001	0.0001	0.0002	0.13
Surface Water Area 1-Red River Along Mine	RR-13	24-Sep-03	RR-13-T01N-SFW-092403	Surface Water	T	0.84	0.00037	0.00038	0.044	0.00047	0.0083	0.00044	0.001		0.0026	0.0096	0.43	0.00093	0.15	0.00006	0.0021	0.015	0.00073	0.0002	0.00001	0.0005	0.093
Surface Water Area 1-Red River Along Mine	RR-13	19-Oct-03	RR-13-T01N-SFW-101903	Surface Water	T	0.83	0.0005	0.0002	0.038	0.0005	0.0063	0.00048	0.0011		0.0029	0.0094	0.13	0.0002	0.16	0.0001	0.0021	0.015	0.0003	0.0001	0.0001	0.00011	0.12
Surface Water Area 1-Red River Along Mine	RR-13	13-Jan-04	RR-13-T01N-SFW-011304	Surface Water	T	1	0.0012	0.0002	0.033	0.0017	0.012	0.00044	0.0057		0.0037	0.012	0.12	0.00024	0.2	0.0001	0.0024	0.014	0.0007	0.0001	0.0001	0.0002	0.089
Surface Water Area 1-Red River Along Mine	RR-13	19-Apr-04	RR-13-T01N-SFW-041904	Surface Water	T	0.97	0.00047	0.00021	0.043	0.0002	0.0043	0.00021	0.0008		0.0016	0.017	0.66	0.0026	0.14	0.0001	0.0024	0.0087	0.0007	0.0001	0.00012	0.00081	0.052
Surface Water Area 1-Red River Along Mine	RR-14	01-Oct-02	RR-14-T01N-SFW-100102	Surface Water	T	1.9	0.0002	0.00021	0.035	0.0002	0.0048	0.00043	0.0046	0.01	0.0037	0.02	0.61	0.0011	0.32	0.0001	0.0019	0.012	0.00038	0.0001	0.0001	0.00031	0.086
Surface Water Area 1-Red River Along Mine	RR-14	19-Jan-03	RR-14-T01N-SFW-011903	Surface Water	T	3.3	0.0006	0.0004	0.037	0.00071	0.0092	0.0013	0.0037		0.0073	0.035	0.79	0.00024	0.53	0.0001	0.0036	0.037	0.0016	0.0002	0.0002	0.0004	0.25
Surface Water Area 1-Red River Along Mine	RR-14	20-Mar-03	RR-14-T01N-SFW-032003	Surface Water	T	2.1	0.0006	0.0004	0.038	0.0003	0.009	0.0005	0.001		0.0049	0.026	0.42	0.0004	0.37	0.0001	0.0024	0.025	0.001	0.0002	0.0002	0.0002	0.2
Surface Water Area 1-Red River Along Mine	RR-14	03-Apr-03	RR-14-T01N-SFW-040303	Surface Water	T	2.3	0.00054	0.0002	0.045	0.0015	0.0084	0.0005	0.001		0.0038	0.025	1	0.00054	0.29	0.0001	0.0026	0.019	0.0005	0.0001	0.0001	0.00021	0.15
Surface Water Area 1-Red River Along Mine	RR-14	15-Jul-03	RR-14-T01N-SFW-071503	Surface Water	T	1.1	0.0005	0.0002	0.036	0.0002	0.006	0.00067	0.0014		0.002	0.013	0.23	0.00043	0.19	0.00017	0.0023	0.021	0.0008	0.0001	0.0001	0.00022	0.13
Surface Water Area 1-Red River Along Mine	RR-14	24-Sep-03	RR-14-T01N-SFW-092403	Surface Water	T	1.3	0.0011	0.00038	0.049	0.00047	0.0067	0.00048	0.001		0.0032	0.013	0.65	0.0013	0.23	0.00006	0.0029	0.016	0.00073	0.0002	0.00001	0.00077	0.11
Surface Water Area 1-Red River Along Mine	RR-14	19-Oct-03	RR-14-T01N-SFW-101903	Surface Water	T	1.3	0.0011	0.0002	0.038	0.00056	0.0074	0.00042	0.0011		0.0031	0.014	0.24	0.00031	0.23	0.0001	0.0024	0.016	0.00037	0.0001	0.0001	0.0001	0.13
Surface Water Area 1-Red River Along Mine	RR-14	13-Jan-04	RR-14-T01N-SFW-011304	Surface Water	T	1.7	0.0012	0.0002	0.034	0.001	0.012	0.00043	0.0057		0.0039	0.018	0.22	0.00016	0.29	0.0001	0.0027	0.017	0.00091	0.0001	0.0001	0.0002	0.12
Surface Water Area 1-Red River Along Mine	RR-14	24-Feb-04	RR-14-T01N-SFW-022404	Surface Water	T	2.1	0.0002	0.0001	0.032	0.00049	0.005	0.00058	0.0015		0.0044	0.025	0.29	0.0001	0.34	0.0001	0.0024	0.021	0.00074	0.0001	0.0001	0.0001	0.12
Surface Water Area 1-Red River Along Mine	RR-14	19-Apr-04	RR-14-T01N-SFW-041904	Surface Water	T	1.3	0.00047	0.00026	0.043	0.0002	0.0065	0.00034	0.0008		0.0017	0.021	0.75	0.0026	0.19	0.0001	0.0025	0.0099	0.0007	0.0001	0.00012	0.00083	0.067
Surface Water Area 1-Red River Along Mine	RR-15	01-Oct-02	RR-15-T01N-SFW-100102	Surface Water	T	2.2	0.0002	0.0002	0.035	0.00028	0.0053	0.00046	0.0046	0.01	0.0041	0.022	0.64	0.00088	0.41	0.0001	0.0018	0.014	0.0003	0.0001	0.0001	0.00029	0.11
Surface Water Area 1-Red River Along Mine	RR-15	21-Mar-03	RR-15-T01N-SFW-032103	Surface Water	T	3.5	0.0006	0.0004	0.044	0.0003	0.0084	0.00054	0.001		0.0054	0.034	0.83	0.0014	0.47	0.0001	0.0023	0.028	0.0025	0.0002	0.0002	0.00057	0.23
Surface Water Area 1-Red River Along Mine	RR-15	15-Jul-03	RR-15-T01N-SFW-071503	Surface Water	T	1.2	0.0005	0.0002	0.038	0.00046	0.006	0.00066	0.0014		0.0022	0.015	0.2	0.00029	0.24	0.0001	0.0027	0.021	0.0016	0.0001	0.0001	0.0007	0.16
Surface Water Area 1-Red River Along Mine	RR-15	24-Sep-03	RR-15-T01N-SFW-092403	Surface Water	T	1.4	0.00038	0.00038	0.037	0.00047	0.0067	0.0006	0.001		0.0031	0.015	0.44	0.00098	0.24	0.00006	0.0023	0.017	0.00073	0.0002	0.00001	0.00044	0.11
Surface Water Area 1-Red River Along Mine	RR-16	01-Oct-02	RR-16-T01N-SFW-100102	Surface Water	T	2.2	0.0002	0.0002	0.035	0.00034	0.0052	0.00048	0.0046	0.01	0.0045	0.022	0.65	0.00099	0.43	0.0001	0.0018	0.014	0.00034	0.0001	0.0001	0.00037	0.11
Surface Water Area 1-Red River Along Mine	RR-16	19-Jan-03	RR-16-T01N-SFW-011903	Surface Water	T	2.9	0.0013	0.0004	0.032	0.00057	0.01	0.001	0.0037		0.007	0.029	0.5	0.00024	0.6	0.0001	0.004	0.032	0.0016	0.0002	0.0002	0.0004	0.25
Surface Water Area 1-Red River Along Mine	RR-16	19-Mar-03	RR-16-T01N-SFW-031903	Surface Water	T	2.1	0.0006	0.0004	0.035	0.00054	0.0084	0.00064	0.001		0.0048	0.027	0.42	0.00034	0.45	0.0001	0.0023	0.024	0.0016	0.0002	0.0002	0.0004	0.21
Surface Water Area 1-Red River Along Mine	RR-16	03-Apr-03	RR-16-T01N-SFW-040303	Surface Water	T	2.9	0.0003	0.00023	0.05	0.0015	0.0084	0.00061	0.001		0.0038	0.028	1.2	0.0012	0.38	0.0001	0.0042	0.022	0.00062	0.0001	0.0001	0.0004	0.17
Surface Water Area 1-Red River Along Mine	RR-16	15-Jul-03	RR-16-T01N-SFW-071503	Surface Water	T	1.3	0.0005	0.0002	0.035	0.00053	0.006	0.00065	0.0019		0.0037	0.015	0.23	0.0004	0.24	0.00015	0.002	0.02	0.0008	0.0001	0.0001	0.00032	0.16
Surface Water Area 1-Red River Along Mine	RR-16	23-Sep-03	RR-16-T01N-SFW-092303	Surface Water	T	1.4	0.00051	0.00038	0.037	0.00047	0.0048	0.00054	0.001		0.0027	0.014	0.44	0.00083	0.26	0.00006	0.0022	0.017	0.00073	0.0002	0.00001	0.00084	0.11
Surface Water Area 1-Red River Along Mine	RR-16	19-Oct-03	RR-16-T01N-SFW-101903	Surface Water	T	1.6	0.0005	0.0002	0.039	0.00049	0.0063	0.00058	0.0011		0.0033	0.016	0.25	0.00028	0.3	0.0001	0.0025	0.033	0.00038	0.0001	0.0001	0.0001	0.15
Surface Water Area 1-Red River Along Mine	RR-16	13-Jan-04	RR-16-T01N-SFW-011304	Surface Water	T	2.1	0.0012	0.0002	0.034	0.001	0.012	0.00075	0.0057		0.004	0.02	0.2	0.00016	0.4	0.0001	0.0028	0.019	0.001	0.0001	0.0001	0.0002	0.15
Surface Water Area 1-Red River Along Mine	RR-16	19-Apr-04	RR-16-T01N-SFW-041904	Surface Water	T	0.83	0.00047	0.00024	0.049	0.0002	0.0068	0.0002	0.0008		0.0011	0.016	0.73	0.0025	0.12	0.0001	0.0021	0.0068	0.0007	0.0001	0.00012	0.00089	0.04
Surface Water Area 1-Red River Along Mine	RR-17	01-Oct-02	RR-17-T01N-SFW-100102	Surface Water	T	1.9	0.0002	0.00024	0.032	0.00031	0.006	0.00058	0.0046	0.01	0.0044	0.019	0.58	0.001	0.46	0.0001	0.0017	0.016	0.00044	0.0001	0.0001	0.00035	0.12
Surface Water Area 1-Red River Along Mine	RR-17	19-Mar-03	RR-17-T01N-SFW-031903	Surface Water	T	2	0.0006	0.0004	0.037	0.00063	0.0084	0.00058	0.001		0.0041	0.026	0.42	0.00049	0.47	0.0001	0.0023	0.028	0.0016	0.0002	0.0002	0.0004	0.23
Surface Water Area 1-Red River Along Mine	RR-17	15-Jul-03	RR-17-T01N-SFW-071503	Surface Water	T	1.1	0.0005	0.0002	0.036	0.00047	0.0063	0.00072	0.0019		0.0037	0.011	0.16	0.00025	0.28	0.00012	0.002	0.021	0.0008	0.0001	0.0001	0.0002	0.16
Surface Water Area 1-Red River Along Mine	RR-17	23-Sep-03	RR-17-T01N-SFW-092303	Surface Water	T	1.4	0.0028	0.00038	0.039	0.00047	0.0048	0.00062	0.001		0.0028	0.014	0.42	0.00069	0.29	0.00006	0.0038	0.018	0.00073	0.0002	0.00001	0.00068	0.13
Surface Water Area 1-Red River Along Mine	RR-18A	01-Oct-02	RR-18A-T01N-SFW-100102	Surface Water	T	2	0.0002	0.00025	0.034	0.0003	0.0053	0.0006	0.0046		0.0044	0.02	0.74	0.0013	0.47	0.0001	0.0016	0.016	0.00026	0.0001	0.0001	0.00035	0.12
Surface Water Area 1-Red River Along Mine	RR-18A	19-Mar-03	RR-18A-T01N-SFW-031903	Surface Water	T	2.4	0.0006	0.0004	0.039	0.00086	0.01	0.0005	0.001		0.0038	0.028	0.98	0.00082	0.53	0.0001	0.0023	0.028	0.0016	0.0002	0.0002	0.0004	0.25
Surface Water Area 1-Red River Along Mine	RR-18A	16-Jul-03	RR-18A-T01N-SFW-071603	Surface Water	T	1.2	0.0005	0.0002	0.037	0.00035	0.0056	0.00071	0.0014		0.0024	0.013	0.26	0.0017	0.27	0.00017	0.0031	0.021	0.0008	0.0001	0.0001	0.0002	0.16
Surface Water Area 1-Red River Along Mine	RR-18A	23-Sep-03	RR-18A-T01N-SFW-092303	Surface Water	T	1.4	0.00083	0.00038	0.039	0.00047	0.0048	0.00064	0.001		0.0025	0.014	0.41	0.00058	0.29	0.00006	0.0026	0.018	0.00073	0.0002	0.00001	0.00061	0.13
Surface Water Area 1-Red River Along Mine	RR-18B	30-Sep-02	RR-18B-T01N-SFW-093002	Surface Water	T	1.9	0.00024	0.00021	0.033	0.00033	0.0076	0.0005	0.0046	0.01	0.0039	0.018	0.65	0.0011	0.43	0.0001	0.0017	0.014	0.00038	0.0001	0.0001	0.00035	0.1
Surface Water Area 1-Red River Along Mine	RR-18B	19-Mar-03	RR-18B-T01N-SFW-031903	Surface Water	T	1.8	0.0006	0.0004	0.036	0.00047	0.0084	0.0005	0.001		0.0038	0.023	0.7	0.0006	0.44	0.0001	0.0023	0.023	0.0016	0.0002	0.0002	0.0004	0.22
Surface Water Area 1-Red River Along Mine	RR-18B	16-Jul-03	RR-18B-T01N-SFW-071603	Surface Water	T	1.2	0.0005	0.0002	0.037	0.0003	0.0056	0.00071	0.0014		0.002	0.013	0.25	0.00031	0.27	0.00015	0.0026	0.02	0.0008	0.0001	0.0001	0.0002	0.16
Surface Water Area 1-Red River Along Mine	RR-18B	23-Sep-03	RR-18B-T01N-SFW-092303	Surface Water	T	1.3	0.00011	0.00038	0.042	0.00053	0.0048	0.00061	0.001		0.0039	0.014	0.52	0.00085	0.3	0.00007	0.0022	0.018	0.00073	0.0002	0.00001	0.00056	0.13
Surface Water Area 1-Red River Along Mine	RR-20	30-Sep-02	RR-20-T01N-SFW-093002	Surface Water	T	2.8	0.0002	0.0002	0.059	0.00051	0.005	0.00048	0.0022	0.01	0.0038	0.017	2.2	0.0012	0.41	0.0001	0.0025	0.013	0.00035	0.0059	0.0001	0.00038	0.097
Surface Water Area 1-Red River Along Mine	RR-20	21-Mar-03	RR-20-T01N-SFW-032103	Surface Water	T	2.4	0.0006	0.0004	0.041	0.0003	0.0084	0.00055	0.001		0.0038	0.022	0.31	0.00034	0.39	0.0001	0.0023	0.023	0.0027	0.0002	0.0002	0.00023	0.17
Surface Water Area 1-Red River Along Mine	RR-20	15-Jul-03	RR-20-T01N-SFW-071503	Surface Water	T	0.5	0.0005	0.0002	0.036	0.00034	0.006	0.00037	0.0014		0.002	0.0065	0.13	0.00024	0.16	0.0001	0.0052	0.011	0.0016	0.0001	0.0001	0.00052	0.078
Surface Water Area 1-Red River Along Mine	RR-20	23-Sep-03	RR-20-T01N-SFW-092303	Surface Water	T	1.1	0.00011	0.00038	0.041	0.00047	0.0048	0.00049	0.001		0.0022	0.012	0.67	0.0017	0.24	0.00006	0.0034	0.015	0.00073	0.0002	0.00001	0.0005	0.11
Reference Red River Above Mine Site	RR-3	03-Oct-02	RR-3-T01N-SFW-100302	Surface Water	T	0.45	0.0002	0.0002	0.047	0.0002	0.0048	0.00036	0.0046		0.0022	0.016	0.22	0.0028	0.12	0.0001	0.00096	0.0064	0.0002	0.0001	0.0001	0.00025	0.05
Reference Red River Above Mine Site	RR-3	21-Mar-03	RR-3-T01N-SFW-032103	Surface Water	T	3.4	0.0006	0.0004	0.075	0.0003	0.0084	0.0005	0.0037		0.0038	0.034	2.9	0.0059	0.21	0.0001	0.0023	0.0077	0.001	0.0002	0.0002	0.0047	0.082
Reference Red River Above Mine Site	RR-3	16-Jul-03	RR-3-T01N-SFW-071603	Surface Water	T	0.35	0.0005	0.0002	0.04	0.0002	0.0048	0.00028	0.0014		0.002	0.016	0.11	0.00028	0.099	0.0001	0.0008	0.0052	0.0008	0.0001	0.0001	0.00036	0.038
Reference Red River Above Mine Site	RR-3	25-Sep-03	RR-3-T01N-SFW-092503	Surface Water	T	0.31	0.00036	0.00038	0.042	0.00047	0.0048	0.00029	0.001		0.0015	0.011	0.13	0.00017	0.09	0.00006	0.001	0.0053	0.00073	0.0002	0.00001	0.00061	0.037
Reference Red River Above Mine Site	RR-4	04-Oct-02	RR-4-T01N-SFW-100402	Surface Water	T	0.47	0.0002	0.0002	0.051	0.0002	0.0048	0.00027	0.0046		0.0022	0.017	0.62	0.0035	0.17	0.0001	0.00096	0.0075	0.00026	0.0001	0.0001	0.00048	0.045
Reference Red River Above Mine Site	RR-4	21-Mar-03	RR-4-T01N-SFW-032103	Surface Water	T	0.5	0.0006	0.00057	0.05	0.0003	0.0084	0.0005	0.001		0.0038	0.021	0.44	0.00031	0.21	0.0001	0.0022	0.0099	0.0026	0.0002	0.0002	0.0002	0.076
Reference Red River Above Mine Site	RR-4	16-Jul-03	RR-4-T01N-SFW-071603	Surface Water	T	0.36	0.0005	0.0002	0.04	0.0002	0.0058	0.00026	0.0014		0.002	0.015	0.29	0.00031	0.11	0.00015	0.0021	0.0033	0.0008	0.0001	0.0001	0.00032	0.033
Reference Red River Above Mine Site	RR-4	25-Sep-03	RR-4-T01N-SFW-092503	Surface Water	T	0.31	0.00011	0.00038	0.047	0.00047	0.0051	0.00026	0.001		0.0014	0.0098	0.28	0.00022	0.12	0.00006	0.00099	0.0057	0.00073	0.0002	0.00001	0.00053	0.039
Reference Red River Above Mine Site	RR-5	03-Oct-02	RR-5-T01N-SFW-100302	Surface Water	T	0.48	0.00046	0.00024	0.048	0.0002	0.0048	0.00029	0.0046		0.0022	0.015	1.1	0.0016	0.14	0.0001	0.0017	0.0064	0.0002	0.0001	0.0001	0.00092	0.034
Reference Red River Above Mine Site	RR-5	21-Mar-03	RR-5-T01N-SFW-032103	Surface Water	T	0.89	0.0006	0.0004	0.05	0.0003	0.0084	0.0005	0.0014		0.0038	0.023	0.49	0.0009	0.2	0.0001	0.0023	0.0073	0.001	0.0002	0.0002	0.00051	0.078
Reference Red River Above Mine Site	RR-5	16-Jul-03	RR-5-T01N-SFW-071603	Surface Water	T	0.27	0.0005	0.0002	0.038	0.0002	0.0074	0.0002	0.0014		0.002	0.01	0.3	0.0006	0.08	0.00012	0.0017	0.0039	0.0008	0.0001	0.0001	0.00026	0.025
Reference Red River Above Mine Site	RR-5	24-Sep-03	RR-5-T01N-SFW-092403	Surface Water	T	0.27	0.00013	0.00038	0.042	0.00047	0.0059	0.00017	0.001		0.0011	0.0077	0.28	0.00043	0.085	0.00006	0.0011	0.0045	0.00073	0.0002	0.00001	0.00034	0.02
Reference Red River Above Mine Site	RR-6	04-Oct-02	RR-6-T01N-SFW-100402	Surface Water	T	0.88	0.0043	0.00075	0.053	0.00051	0.0048	0.00074	0.0046		0.0061	0.02	0.51	0.0051	0.22	0.0001	0.0057	0.017	0.00037	0.00048	0.00047	0.0053	0.059
Reference Red River Above Mine Site	RR-6	21-Mar-03	RR-6-T01N-SFW-032103	Surface Water	T	1.4	0.0006	0.0004	0.045	0.0003	0.0084	0.0005	0.001		0.0038	0.021	0.42	0.00057	0.3	0.0001	0.0023	0.011	0.001	0.0002	0.0002	0.00025	0.092
Reference Red River Above Mine Site	RR-6	16-Jul-03	RR-6-T01N-SFW-071603	Surface Water	T	0.62	0.0005	0.0002	0.037	0.0002	0.0061	0.0002	0.0014		0.0021	0.011	0.25	0.0008	0.12	0.0001	0.0012	0.0066	0.0008	0.0001	0.0001	0.00042	0.036
Reference Red River Above Mine Site	RR-6	24-Sep-03	RR-6-T01N-SFW-092403	Surface Water	T	0.66	0.00039	0.00038	0.04	0.00047	0.038	0.00026	0.001		0.0024	0.0084	0.33	0.00075	0.14	0.00006	0.0012	0.0079	0.00073	0.0002	0.00001	0.00047	0.04
Reference Red River Above Mine Site	RR-6A	04-Oct-02	RR-6A-T01N-SFW-100402	Surface Water	T	0.79	0.0002	0.0002	0.039	0.0002	0.0048	0.00025	0.0046		0.0024	0.012	0.39	0.0024	0.21	0.0001	0.0013	0.0086	0.0002	0.0001	0.0001	0.00051	0.045
Reference Red River Above Mine Site	RR-6A	21-Mar-03	RR-6A-T01N-SFW-032103	Surface Water	T	1.3	0.0006	0.00047	0.043	0.0003	0.0092	0.0005	0.001		0.0038	0.018	0.42	0.00075	0.29	0.0001	0.0023	0.011	0.0014	0.0002	0.0002	0.00041	0.088
Reference Red River Above Mine Site	RR-6A	15-Jul-03	RR-6A-T01N-SFW-071503	Surface Water	T	0.55	0.0005	0.0002	0.035	0.0002	0.006	0.0002	0.0014		0.002	0.007	0.15	0.00039	0.11	0.00017	0.0011	0.0059	0.0008	0.0001	0.0001	0.0002	0.034
Reference Red River Above Mine Site	RR-6A	24-Sep-03	RR-6A-T01N-SFW-092403	Surface Water	T	0.6	0.00029	0.00038	0.038	0.00047	0.0087	0.00026	0.001		0.0022	0.0083	0.3	0.00049	0.14	0.00006	0.0012	0.0078	0.00073	0.0002	0.00001	0.00059	0.046
Reference Red River Above Mine Site	RR-6V	16-Jul-03	RR-6V-T01N-SFW-071603	Surface Water	T	0.22	0.0005	0.0002	0.038	0.0002	0.0059	0.0002	0.0014		0.002	0.02	0.22	0.00092	0.057	0.0001	0.001	0.0035	0.0008	0.0001	0.0001	0.0003	0.017
Reference Red River Above Mine Site	RR-6V	24-Sep-03	RR-6V-T01N-SFW-092403	Surface Water	T	0.26	0.0016	0.00038	0.041	0.00047	0.0084	0.00016	0.001		0.0012	0.0069	0.29	0.0006	0.074	0.00006	0.0022	0.0043	0.00073	0.0002	0.00001	0.0005	0.02
Surface Water Area 1-Red River Along Mine	RR-7	04-Oct-02	RR-7-T01N-SFW-100402	Surface Water	T	0.85	0.0002	0.0002	0.041	0.0002	0.0048	0.00025	0.0046		0.0025	0.013	0.5	0.0011	0.22	0.0001	0.001	0.0088	0.0002	0.0001	0.0001	0.00037	0.049
Surface Water Area 1-Red River Along Mine	RR-7	21-Jan-03	RR-7-T01N-SFW-012103	Surface Water	T	1.1	0.0006	0.0004	0.034	0.00024	0.011	0.0005	0.0037		0.006	0.016	0.28	0.0002	0.36	0.0001	0.0011	0.02	0.0016	0.0002	0.0002	0.0004	0.11
Surface Water Area 1-Red River Along Mine	RR-7	21-Mar-03	RR-7-T01N-SFW-032103	Surface Water	T	1.2	0.0006	0.0004	0.045	0.0003	0.0084	0.0005	0.001		0.0038	0.018	0.42	0.0011	0.31	0.0001	0.0023	0.011	0.001	0.0002	0.0002	0.00046	0.093
Surface Water Area 1-Red River Along Mine	RR-7	03-Apr-03	RR-7-T01N-SFW-040303	Surface Water	T	1.1	0.00036	0.0002	0.046	0.0014	0.0084	0.0005	0.001		0.0038	0.015	0.62	0.0007	0.2	0.0001	0.0024	0.0078	0.0005	0.0001	0.0001	0.00037	0.053
Surface Water Area 1-Red River Along Mine	RR-7	15-Jul-03	RR-7-T01N-SFW-071503	Surface Water	T	0.49	0.0005	0.0002	0.032	0.0002	0.006	0.0002	0.0014		0.002	0.0067	0.12	0.00036	0.092	0.00019	0.0011	0.0054	0.0008	0.0001	0.0001	0.0002	0.031
Surface Water Area 1-Red River Along Mine	RR-7	24-Sep-03	RR-7-T01N-SFW-092403	Surface Water	T	0.56	0.00011	0.00038	0.038	0.00047	0.0075	0.00024	0.001		0.0021	0.0076	0.3	0.00047	0.14	0.00006	0.00094	0.0075	0.00073	0.0002	0.00001	0.00064	0.044
Surface Water Area 1-Red River Along Mine	RR-7	19-Oct-03	RR-7-T01N-SFW-101903	Surface Water	T	0.74	0.0005	0.0002	0.038	0.0004	0.0063	0.00027	0.0011		0.0029	0.0097	0.17	0.00028	0.17	0.0001	0.00094	0.0066	0.0003	0.0001	0.0001	0.00016	0.052
Surface Water Area 1-Red River Along Mine	RR-7	13-Jan-04	RR-7-T01N-SFW-011304	Surface Water	T	1	0.0012	0.0002	0.036	0.0015	0.012	0.00037	0.0057		0.0037	0.014	0.29	0.0007	0.24	0.0001	0.001	0.012	0.00074	0.0001	0.0001	0.0002	0.071
Surface Water Area 1-Red River Along Mine	RR-7	24-Feb-04	RR-7-T01N-SFW-022404	Surface Water	T	1.1	0.0002	0.0001	0.031	0.00034	0.0064	0.00037	0.0015		0.0033	0.012	0.19	0.00022	0.24	0.0001	0.0007	0.012	0.00086	0.0001	0.0001	0.0001	0.064
Surface Water Area 1-Red River Along Mine	RR-7	19-Apr-04	RR-7-T01N-SFW-041904	Surface Water	T	0.71	0.00047	0.00022	0.043	0.0002	0.0058	0.0002	0.0008		0.0019	0.015	0.54	0.0022	0.12	0.0001	0.0019	0.0071	0.0007	0.0001	0.00012	0.00074	0.04

Surface Water Area 1-Red River Along Mine	RR-8	04-Oct-02	RR-8-T01N-SFW-100402	Surface Water	T	0.81	0.0002	0.00031	0.039	0.0002	0.0048	0.00026	0.0046		0.0022	0.013	0.54	0.0048	0.21	0.0001	0.0017	0.0085	0.0002	0.0001	0.0001	0.00096	0.042
Surface Water Area 1-Red River Along Mine	RR-8	21-Mar-03	RR-8-T01N-SFW-032103	Surface Water	T	1.4	0.0006	0.0004	0.044	0.0003	0.0084	0.0005	0.0011		0.0038	0.018	0.64	0.0015	0.28	0.0001	0.0023	0.01	0.001	0.0002	0.0002	0.00048	0.076
Surface Water Area 1-Red River Along Mine	RR-8	15-Jul-03	RR-8-T01N-SFW-071503	Surface Water	T	0.44	0.0005	0.0002	0.033	0.0002	0.0073	0.0002	0.0014		0.002	0.0075	0.14	0.00039	0.086	0.0001	0.0024	0.0047	0.0016	0.0001	0.0001	0.00055	0.024
Surface Water Area 1-Red River Along Mine	RR-8	24-Sep-03	RR-8-T01N-SFW-092403	Surface Water	T	0.59	0.001	0.00038	0.042	0.00047	0.0075	0.00025	0.001		0.0023	0.0077	0.4	0.00091	0.15	0.00006	0.002	0.0076	0.00073	0.0002	0.00001	0.00034	0.041
Surface Water Area 1-Red River Along Mine	RR-8A	04-Oct-02	RR-8A-T01N-SFW-100402	Surface Water	T	0.96	0.0002	0.00023	0.041	0.0003	0.005	0.00031	0.00065		0.0027	0.013	0.82	0.0011	0.22	0.0001	0.00092	0.0081	0.0003	0.0001	0.0001	0.00037	0.034
Surface Water Area 1-Red River Along Mine	RR-8A	21-Mar-03	RR-8A-T01N-SFW-032103	Surface Water	T	2.1	0.0006	0.0004	0.045	0.0003	0.0084	0.0005	0.0012		0.0044	0.019	0.69	0.0011	0.3	0.0001	0.0023	0.012	0.001	0.0002	0.0002	0.00047	0.086
Surface Water Area 1-Red River Along Mine	RR-8A	15-Jul-03	RR-8A-T01N-SFW-071503	Surface Water	T	0.49	0.0005	0.0002	0.034	0.0002	0.0069	0.0002	0.0014		0.002	0.007	0.18	0.00062	0.087	0.00016	0.0011	0.0048	0.0008	0.0001	0.0001	0.00021	0.029
Surface Water Area 1-Red River Along Mine	RR-8A	24-Sep-03	RR-8A-T01N-SFW-092403	Surface Water	T	0.56	0.00011	0.00038	0.039	0.00047	0.0063	0.00021	0.001		0.002	0.0072	0.31	0.0006	0.13	0.00006	0.0012	0.0067	0.00073	0.0002	0.00001	0.00048	0.033
Reference Upper Cabresto Creek Riparian	RRS-12	07-Oct-02	RRS-12-T01N-SFW-100702	Surface Water	T	0.17	0.0002	0.0002	0.025	0.0003	0.005	0.0001	0.00034	0.0015	0.0001	0.00078	0.082	0.00012	0.028	0.0001	0.00053	0.0012	0.00024	0.0001	0.0001	0.00013	0.031
Reference Upper Cabresto Creek Riparian	RRS-12	23-Mar-03	RRS-12-T01N-SFW-032303	Surface Water	T	0.17	0.0006	0.00046	0.023	0.0015	0.0084	0.0005	0.0013		0.0038	0.0015	0.42	0.0002	0.013	0.0001	0.0023	0.003	0.001	0.0002	0.0002	0.0002	0.04
Reference Upper Cabresto Creek Riparian	RRS-12	16-Jul-03	RRS-12-T01N-SFW-071603	Surface Water	T	0.1	0.0005	0.0002	0.026	0.0002	0.0048	0.0002	0.0014		0.002	0.0009	0.033	0.00011	0.0096	0.0001	0.00042	0.0016	0.0008	0.0001	0.0001	0.00023	0.02
Reference Upper Cabresto Creek Riparian	RRS-12	25-Sep-03	RRS-12-T01N-SFW-092503	Surface Water	T	0.15	0.00011	0.00038	0.025	0.00047	0.0048	0.00008	0.001		0.0011	0.00058	0.061	0.00015	0.0091	0.00006	0.0011	0.002	0.00073	0.0002	0.00001	0.00052	0.023
Reference Upper Cabresto Creek Riparian	RRS-13	06-Oct-02	RRS-13-T01N-SFW-100602	Surface Water	T	0.052	0.0002	0.0002	0.016	0.0002	0.0048	0.00013	0.0046		0.0022	0.00075	0.023	0.00018	0.0029	0.0001	0.00067	0.00061	0.0004	0.0001	0.0001	0.0002	0.01
Reference Upper Cabresto Creek Riparian	RRS-13	23-Mar-03	RRS-13-T01N-SFW-032303	Surface Water	T	0.08	0.0006	0.00048	0.015	0.0014	0.0084	0.0005	0.0011		0.0038	0.0015	0.42	0.0002	0.013	0.0001	0.0023	0.003	0.0021	0.0002	0.0002	0.0002	0.039
Reference Upper Cabresto Creek Riparian	RRS-13	16-Jul-03	RRS-13-T01N-SFW-071603	Surface Water	T	0.035	0.0005	0.0002	0.011	0.0002	0.0048	0.0002	0.0014		0.002	0.0024	0.033	0.0001	0.00076	0.0001	0.0017	0.0021	0.0008	0.0001	0.0001	0.00033	0.0038
Reference Upper Cabresto Creek Riparian	RRS-13	25-Sep-03	RR-13-T01N-SFW-092503	Surface Water	T	0.059	0.00059	0.00038	0.013	0.00047	0.0048	0.00008	0.001		0.0011	0.00048	0.076	0.00019	0.0041	0.00006	0.0011	0.00094	0.00073	0.0002	0.00001	0.00056	0.013
Reference Upper Cabresto Creek Riparian	RRS-15	06-Oct-02	RRS-15-T01N-SFW-100602	Surface Water	T	0.041	0.0002	0.0002	0.016	0.0002	0.0048	0.0001	0.0046		0.0022	0.0003	0.031	0.00011	0.0025	0.0001	0.00081	0.0004	0.00028	0.0001	0.0001	0.00026	0.0086
Reference Upper Cabresto Creek Riparian	RRS-15	23-Mar-03	RRS-15-T01N-SFW-032303	Surface Water	T	0.057	0.00084	0.00051	0.016	0.00047	0.0084	0.0005	0.001		0.0038	0.0015	0.42	0.0002	0.013	0.0001	0.0023	0.003	0.0018	0.0002	0.0002	0.0002	0.039
Reference Upper Cabresto Creek Riparian	RRS-15	16-Jul-03	RRS-15-T01N-SFW-071603	Surface Water	T	0.024	0.0005	0.0002	0.011	0.0002	0.0048	0.0002	0.0014		0.002	0.0011	0.033	0.0001	0.00091	0.0001	0.0005	0.0006	0.0008	0.0001	0.0001	0.00032	0.0069
Reference Upper Cabresto Creek Riparian	RRS-15	25-Sep-03	RRS-15-T01N-SFW-092503	Surface Water	T	0.14	0.00073	0.00038	0.014	0.00047	0.0048	0.00008	0.0011		0.0011	0.00065	0.13	0.00039	0.0068	0.00006	0.0012	0.0011	0.00073	0.0002	0.00001	0.00059	0.013
Reference Lower Cabresto Creek Riparian	RRS-18	06-Oct-02	RRS-18-T01N-SFW-100602	Surface Water	T	0.013	0.0002	0.0002	0.025	0.0002	0.0048	0.0001	0.0046		0.0022	0.0003	0.5	0.0001	0.007	0.0001	0.00082	0.00026	0.0002	0.0001	0.0001	0.00012	0.0069
Reference Lower Cabresto Creek Riparian	RRS-18	23-Mar-03	RRS-18-T01N-SFW-032303	Surface Water	T	0.05	0.0006	0.00038	0.02	0.0003	0.0084	0.0005	0.001		0.0038	0.004	0.42	0.0002	0.018	0.0001	0.0022	0.003	0.0031	0.0002	0.0002	0.0002	0.039
Reference Lower Cabresto Creek Riparian	RRS-18	25-Sep-03	RRS-18-T01N-SFW-092503	Surface Water	T	0.03	0.0024	0.00038	0.018	0.00047	0.0052	0.00008	0.001		0.0011	0.00041	0.068	0.0001	0.012	0.00006	0.0023	0.0011	0.00073	0.0002	0.00001	0.00038	0.017
Reference Lower Cabresto Creek Riparian	RRS-20	06-Oct-02	RRS-20-T01N-SFW-100602	Surface Water	T	0.021	0.0002	0.00023	0.026	0.0003	0.005	0.0001	0.00032		0.0001	0.0005	0.054	0.0001	0.009	0.0001	0.00067	0.0002	0.00028	0.0001	0.0001	0.00014	0.0048
Reference Lower Cabresto Creek Riparian	RRS-20	23-Mar-03	RRS-20-T01N-SFW-032303	Surface Water	T	0.05	0.0006	0.00044	0.018	0.0013	0.0084	0.0005	0.001		0.0038	0.0015	0.42	0.0002	0.013	0.0001	0.0023	0.003	0.0015	0.0002	0.0002	0.0002	0.039
Reference Lower Cabresto Creek Riparian	RRS-20	16-Jul-03	RRS-20-T01N-SFW-071603	Surface Water	T	0.081	0.0005	0.00044	0.027	0.0002	0.0048	0.0002	0.0014		0.002	0.0024	0.46	0.00038	0.12	0.00015	0.0017	0.0021	0.0008	0.0001	0.0001	0.0002	0.0092
Reference Lower Cabresto Creek Riparian	RRS-20	25-Sep-03	RRS-20-T01N-SFW-092503	Surface Water	T	0.017	0.00021	0.00038	0.019	0.00047	0.0056	0.00008	0.001		0.0011	0.00046	0.047	0.00006	0.0068	0.00006	0.00089	0.00084	0.00073	0.0002	0.00001	0.00037	0.013
Reference Lower Cabresto Creek Riparian	RRS-23	06-Oct-02	RRS-23-T01N-SFW-100602	Surface Water	T	0.021	0.0002	0.0002	0.026	0.0002	0.0048	0.0001	0.0046		0.0022	0.0025	0.023	0.00016	0.0045	0.0001	0.00071	0.0011	0.0002	0.0001	0.0001	0.00015	0.012
Reference Lower Cabresto Creek Riparian	RRS-23	23-Mar-03	RRS-23-T01N-SFW-032303	Surface Water	T	0.05	0.0006	0.00049	0.022	0.0003	0.0084	0.0005	0.001		0.0038	0.0043	0.42	0.0002	0.013	0.0001	0.0022	0.003	0.001	0.0002	0.0002	0.0002	0.039
Reference Lower Cabresto Creek Riparian	RRS-23	16-Jul-03	RRS-23-T01N-SFW-071603	Surface Water	T	0.034	0.0005	0.0002	0.035	0.0002	0.0051	0.0002	0.0014		0.002	0.0024	0.067	0.0001	0.011	0.00016	0.0017	0.0021	0.0008	0.0001	0.0001	0.0002	0.0051
Reference Lower Cabresto Creek Riparian	RRS-23	25-Sep-03	RRS-23-T01N-SFW-092503	Surface Water	T	0.018	0.0006	0.00038	0.017	0.00047	0.0048	0.00008	0.001		0.0011	0.0005	0.044	0.00006	0.0014	0.00006	0.0011	0.00097	0.00073	0.0002	0.00001	0.00061	0.013
Reference Lower Cabresto Creek Riparian	RRS-27	06-Oct-02	RRS-27-T01N-SFW-100602	Surface Water	T	0.025	0.0002	0.0002	0.055	0.0002	0.0048	0.0001	0.0046		0.0022	0.00066	0.32	0.00073	0.027	0.0001	0.00064	0.00046	0.00028	0.0001	0.0001	0.00016	0.0079
Reference Lower Cabresto Creek Riparian	RRS-27	23-Mar-03	RRS-27-T01N-SFW-032303	Surface Water	T	0.05	0.0006	0.00052	0.024	0.0013	0.0084	0.0005	0.001		0.0038	0.0015	0.42	0.0002	0.013	0.0001	0.0023	0.003	0.001	0.0002	0.0002	0.0002	0.039
Reference Lower Cabresto Creek Riparian	RRS-27	16-Jul-03	RRS-27-T01N-SFW-071603	Surface Water	T	0.05	0.0005	0.00025	0.036	0.0002	0.0065	0.0002	0.0014		0.002	0.0024	0.18	0.00012	0.043	0.00013	0.0017	0.0021	0.0008	0.0001	0.0001	0.0002	0.011
Reference Lower Cabresto Creek Riparian	RRS-27	25-Sep-03	RRS-27-T01N-SFW-092503	Surface Water	T	0.016	0.00027	0.00038	0.019	0.00047	0.0048	0.00008	0.001		0.0011	0.00056	0.044	0.00006	0.0019	0.00006	0.00088	0.00091	0.00073	0.0002	0.00001	0.00073	0.013
Reference Upper Cabresto Creek Riparian	RRS-9	07-Oct-02	RRS-9-T01N-SFW-100702	Surface Water	T	0.056	0.00022	0.0002	0.03	0.0003	0.005	0.0001	0.0019	0.0015	0.0034	0.00077	0.038	0.0001	0.0036	0.0001	0.00062	0.0002	0.0002	0.0001	0.0001	0.00024	0.0021
Reference Upper Cabresto Creek Riparian	RRS-9	23-Mar-03	RRS-9-T01N-SFW-032303	Surface Water	T	0.05	0.0006	0.00053	0.031	0.0003	0.0084	0.0005	0.001		0.0038	0.004	0.42	0.0002	0.013	0.0001	0.0022	0.003	0.001	0.0002	0.0002	0.00021	0.039
Reference Upper Cabresto Creek Riparian	RRS-9	16-Jul-03	RRS-9-T01N-SFW-071603	Surface Water	T	0.051	0.0005	0.0002	0.026	0.0002	0.0048	0.0002	0.0014		0.002	0.001	0.042	0.0001	0.013	0.0001	0.00039	0.0006	0.0008	0.0001	0.0001	0.00044	0.0016
Reference Upper Cabresto Creek Riparian	RRS-9	25-Sep-03	RRS-9-T01N-SFW-092503	Surface Water	T	0.031	0.00011	0.00038	0.03	0.00047	0.0048	0.00008	0.001		0.0011	0.0005	0.044	0.00006	0.0077	0.00006	0.00073	0.00092	0.00073	0.0002	0.00001	0.00071	0.013
Reference Upper Cabresto Creek Riparian	UPPER CABRESTO CREEK	23-Mar-03	UCC-T01N-SFW-032303	Surface Water	T	0.06	0.0018	0.00025	0.015	0.00069	0.0084	0.0005	0.001		0.0038	0.0015	0.31	0.0002	0.01	0.0001	0.0023	0.003	0.0024	0.0002	0.0002	0.0002	0.021
Reference Upper Cabresto Creek Riparian	UPPER CABRESTO CREEK	16-Jul-03	UPPERCABRESTO-T01N-SFW-071603	Surface Water	T	0.03	0.0005	0.0002	0.032	0.0002	0.0048	0.0002	0.0014		0.002	0.0024	0.033	0.00014	0.0007	0.0001	0.0022	0.0021	0.0008	0.0001	0.0001	0.0003	0.0031
Reference Upper Cabresto Creek Riparian	UPPER CABRESTO CREEK	25-Sep-03	UPPERCABRESTO-T01N-SFW-092503	Surface Water	T	0.056	0.00011	0.00038	0.014	0.00047	0.0048	0.00008	0.001		0.0011	0.0005	0.056	0.00016	0.003	0.00006	0.00073	0.00096	0.00073	0.0002	0.00001	0.0005	0.013
Reference Red River Above Mine Site	Zwergle	07-Oct-02	ZWERGEL-T01N-SFW-100702	Surface Water	T	0.011	0.0002	0.0002	0.036	0.0003	0.005	0.0001	0.00045	0.01	0.0001	0.00075	0.052	0.0001	0.0035	0.0001	0.00087	0.0002	0.0002	0.0001	0.0001	0.00036	0.0021
Reference Red River Above Mine Site	Zwergle	23-Mar-03	ZWERGEL-T01N-SFW-032303	Surface Water	T	0.11	0.0006	0.00036	0.054	0.0003	0.0084	0.0005	0.0014		0.0038	0.0034	0.42	0.0002	0.013	0.0001	0.0022	0.003	0.0014	0.0002	0.0002	0.00042	0.039
Reference Red River Above Mine Site	Zwergle	16-Jul-03	ZWERGEL-T01N-SFW-071603	Surface Water	T	0.067	0.0005	0.0002	0.028	0.0002	0.0048	0.0002	0.0014		0.002	0.0024	0.083	0.0001	0.0078	0.0002	0.0017	0.0021	0.0008	0.0001	0.0001	0.00034	0.0098
Reference Red River Above Mine Site	ZWERGLE	25-Sep-03	ZWERGEL-T01N-SFW-092503	Surface Water	T	0.038	0.00011	0.00038	0.033	0.00047	0.0048	0.00008	0.001		0.0011	0.00064	0.044	0.00006	0.0035	0.00006	0.001	0.001	0.00073	0.0002	0.00001	0.00056	0.013

EXPOSURE_AREA_LOOKUP_DESCRIPTION	SITE_ID	SAMP_DATE	SAMP_ID	MEDIUM_TYPE_LOOKUP_DESCRIPTION	SAMP_FRACTION	DO mg/L	Eh millivolts	Flow cfs	Flow gpm	Fluoride mg/L	Hardness mg/L	Nitrite mg/L	pH SU	Specific Conductance uS/cm	Sulfate mg/L	Temperature Celsius	Turbidity NTU
Reference Lower Cabresto Creek Riparian	RRS-18	06-Oct-02	RRS-18-T01N-SFW-100602	Surface Water	T						109:						
Reference Lower Cabresto Creek Riparian	RRS-18	23-Mar-03	RRS-18-T01N-SFW-032303	Surface Water	T						91.5:						
Reference Lower Cabresto Creek Riparian	RRS-18	25-Sep-03	RRS-18-T01N-SFW-092503	Surface Water	T						80.6:						
Reference Lower Cabresto Creek Riparian	RRS-20	06-Oct-02	RRS-20-T01N-SFW-100602	Surface Water	T						113:						
Reference Lower Cabresto Creek Riparian	RRS-20	23-Mar-03	RRS-20-T01N-SFW-032303	Surface Water	T						90.9:						
Reference Lower Cabresto Creek Riparian	RRS-20	16-Jul-03	RRS-20-T01N-SFW-071603	Surface Water	T						86:						
Reference Lower Cabresto Creek Riparian	RRS-20	25-Sep-03	RRS-20-T01N-SFW-092503	Surface Water	T						83.3:						
Reference Lower Cabresto Creek Riparian	RRS-23	06-Oct-02	RRS-23-T01N-SFW-100602	Surface Water	T						101:						
Reference Lower Cabresto Creek Riparian	RRS-23	23-Mar-03	RRS-23-T01N-SFW-032303	Surface Water	T						92:						
Reference Lower Cabresto Creek Riparian	RRS-23	16-Jul-03	RRS-23-T01N-SFW-071603	Surface Water	T						110:						
Reference Lower Cabresto Creek Riparian	RRS-23	25-Sep-03	RRS-23-T01N-SFW-092503	Surface Water	T						78.3:						
Reference Lower Cabresto Creek Riparian	RRS-27	06-Oct-02	RRS-27-T01N-SFW-100602	Surface Water	T						158:						
Reference Lower Cabresto Creek Riparian	RRS-27	23-Mar-03	RRS-27-T01N-SFW-032303	Surface Water	T						102:						
Reference Lower Cabresto Creek Riparian	RRS-27	16-Jul-03	RRS-27-T01N-SFW-071603	Surface Water	T						115:						
Reference Lower Cabresto Creek Riparian	RRS-27	25-Sep-03	RRS-27-T01N-SFW-092503	Surface Water	T						83.2:						
Reference Red River Above Mine Site	RR-1	04-Oct-02	RR-1-T01N-SFW-100402	Surface Water	T						108:						
Reference Red River Above Mine Site	RR-1	21-Mar-03	RR-1-T01N-SFW-032103	Surface Water	T						115:						
Reference Red River Above Mine Site	RR-1	16-Jul-03	RR-1-T01N-SFW-071603	Surface Water	T						87.4:						
Reference Red River Above Mine Site	RR-1	25-Sep-03	RR-1-T01N-SFW-092503	Surface Water	T						102:						
Reference Red River Above Mine Site	RR-3	03-Oct-02	RR-3-T01N-SFW-100302	Surface Water	T						124:						
Reference Red River Above Mine Site	RR-3	21-Mar-03	RR-3-T01N-SFW-032103	Surface Water	T						128:						
Reference Red River Above Mine Site	RR-3	16-Jul-03	RR-3-T01N-SFW-071603	Surface Water	T						108:						
Reference Red River Above Mine Site	RR-3	25-Sep-03	RR-3-T01N-SFW-092503	Surface Water	T						112:						
Reference Red River Above Mine Site	RR-4	04-Oct-02	RR-4-T01N-SFW-100402	Surface Water	T						133:						
Reference Red River Above Mine Site	RR-4	21-Mar-03	RR-4-T01N-SFW-032103	Surface Water	T						145:						
Reference Red River Above Mine Site	RR-4	16-Jul-03	RR-4-T01N-SFW-071603	Surface Water	T						111:						
Reference Red River Above Mine Site	RR-4	25-Sep-03	RR-4-T01N-SFW-092503	Surface Water	T						126:						
Reference Red River Above Mine Site	RR-5	03-Oct-02	RR-5-T01N-SFW-100302	Surface Water	T						137:						
Reference Red River Above Mine Site	RR-5	21-Mar-03	RR-5-T01N-SFW-032103	Surface Water	T						146:						
Reference Red River Above Mine Site	RR-5	16-Jul-03	RR-5-T01N-SFW-071603	Surface Water	T						114:						
Reference Red River Above Mine Site	RR-5	24-Sep-03	RR-5-T01N-SFW-092403	Surface Water	T						121:						
Reference Red River Above Mine Site	RR-6	04-Oct-02	RR-6-T01N-SFW-100402	Surface Water	T						144:						
Reference Red River Above Mine Site	RR-6	21-Mar-03	RR-6-T01N-SFW-032103	Surface Water	T						172:						
Reference Red River Above Mine Site	RR-6	16-Jul-03	RR-6-T01N-SFW-071603	Surface Water	T						126:						
Reference Red River Above Mine Site	RR-6	24-Sep-03	RR-6-T01N-SFW-092403	Surface Water	T						127:						
Reference Red River Above Mine Site	RR-6A	04-Oct-02	RR-6A-T01N-SFW-100402	Surface Water	T						149:						
Reference Red River Above Mine Site	RR-6A	21-Mar-03	RR-6A-T01N-SFW-032103	Surface Water	T						166:						
Reference Red River Above Mine Site	RR-6A	15-Jul-03	RR-6A-T01N-SFW-071503	Surface Water	T						121:						
Reference Red River Above Mine Site	RR-6A	24-Sep-03	RR-6A-T01N-SFW-092403	Surface Water	T						124:						
Reference Red River Above Mine Site	RR-6V	16-Jul-03	RR-6V-T01N-SFW-071603	Surface Water	T						120:						
Reference Red River Above Mine Site	RR-6V	24-Sep-03	RR-6V-T01N-SFW-092403	Surface Water	T						120:						
Reference Red River Above Mine Site	Zwergle	07-Oct-02	ZWERGEL-T01N-SFW-100702	Surface Water	T						115:						
Reference Red River Above Mine Site	Zwergle	23-Mar-03	ZWERGEL-T01N-SFW-032303	Surface Water	T						117:						
Reference Red River Above Mine Site	Zwergle	16-Jul-03	ZWERGEL-T01N-SFW-071603	Surface Water	T						90.9:						
Reference Red River Above Mine Site	ZWERGLE	25-Sep-03	ZWERGEL-T01N-SFW-092503	Surface Water	T						103:						
Reference Upper Cabresto Creek Riparian	RRS-12	07-Oct-02	RRS-12-T01N-SFW-100702	Surface Water	T						96.1:						
Reference Upper Cabresto Creek Riparian	RRS-12	23-Mar-03	RRS-12-T01N-SFW-032303	Surface Water	T						92.6:						
Reference Upper Cabresto Creek Riparian	RRS-12	16-Jul-03	RRS-12-T01N-SFW-071603	Surface Water	T						90.7:						
Reference Upper Cabresto Creek Riparian	RRS-12	25-Sep-03	RRS-12-T01N-SFW-092503	Surface Water	T						90.5:						
Reference Upper Cabresto Creek Riparian	RRS-13	06-Oct-02	RRS-13-T01N-SFW-100602	Surface Water	T						75.3:						
Reference Upper Cabresto Creek Riparian	RRS-13	23-Mar-03	RRS-13-T01N-SFW-032303	Surface Water	T						77.8:						
Reference Upper Cabresto Creek Riparian	RRS-13	16-Jul-03	RRS-13-T01N-SFW-071603	Surface Water	T						57.4:						
Reference Upper Cabresto Creek Riparian	RRS-13	25-Sep-03	RR-13-T01N-SFW-092503	Surface Water	T						64.2:						
Reference Upper Cabresto Creek Riparian	RRS-15	06-Oct-02	RRS-15-T01N-SFW-100602	Surface Water	T						78.6:						
Reference Upper Cabresto Creek Riparian	RRS-15	23-Mar-03	RRS-15-T01N-SFW-032303	Surface Water	T						79.6:						
Reference Upper Cabresto Creek Riparian	RRS-15	16-Jul-03	RRS-15-T01N-SFW-071603	Surface Water	T						58.5:						
Reference Upper Cabresto Creek Riparian	RRS-15	25-Sep-03	RRS-15-T01N-SFW-092503	Surface Water	T						63:						
Reference Upper Cabresto Creek Riparian	RRS-9	07-Oct-02	RRS-9-T01N-SFW-100702	Surface Water	T						81.4:						
Reference Upper Cabresto Creek Riparian	RRS-9	23-Mar-03	RRS-9-T01N-SFW-032303	Surface Water	T						78:						
Reference Upper Cabresto Creek Riparian	RRS-9	16-Jul-03	RRS-9-T01N-SFW-071603	Surface Water	T						65:						
Reference Upper Cabresto Creek Riparian	RRS-9	25-Sep-03	RRS-9-T01N-SFW-092503	Surface Water	T						77.3:						
Reference Upper Cabresto Creek Riparian	UPPER CABRESTO CREEK	23-Mar-03	UCC-T01N-SFW-032303	Surface Water	T						81.9:						
Reference Upper Cabresto Creek Riparian	UPPER CABRESTO CREEK	16-Jul-03	UPPERCABRESTO-T01N-SFW-071603	Surface Water	T						64.6:						
Reference Upper Cabresto Creek Riparian	UPPER CABRESTO CREEK	25-Sep-03	UPPERCABRESTO-T01N-SFW-092503	Surface Water	T						73.2:						
Surface Water Area 1-Red River Along Mine	LR-1	30-Sep-02	LR-1-T01N-SFW-093002	Surface Water	T						194:						
Surface Water Area 1-Red River Along Mine	LR-1	20-Mar-03	LR-1-T01N-SFW-032003	Surface Water	T						213:						
Surface Water Area 1-Red River Along Mine	LR-1	15-Jul-03	LR-1-T01N-SFW-071503	Surface Water	T						169:						
Surface Water Area 1-Red River Along Mine	LR-1	24-Sep-03	LR-1-T01N-SFW-092403	Surface Water	T						171:						
Surface Water Area 1-Red River Along Mine	RR-10	03-Oct-02	RR-10-T01N-SFW-100302	Surface Water	T						152:						
Surface Water Area 1-Red River Along Mine	RR-10	21-Jan-03	RR-10-T01N-SFW-012103	Surface Water	T						154:						
Surface Water Area 1-Red River Along Mine	RR-10	20-Mar-03	RR-10-T01N-SFW-032003	Surface Water	T						170:						
Surface Water Area 1-Red River Along Mine	RR-10	03-Apr-03	RR-10-T01N-SFW-040303	Surface Water	T						146:						
Surface Water Area 1-Red River Along Mine	RR-10	15-Jul-03	RR-10-T01N-SFW-071503	Surface Water	T						121:						
Surface Water Area 1-Red River Along Mine	RR-10	24-Sep-03	RR-10-T01N-SFW-092403	Surface Water	T						136:						
Surface Water Area 1-Red River Along Mine	RR-10	19-Oct-03	RR-10-T01N-SFW-101903	Surface Water	T						144:						
Surface Water Area 1-Red River Along Mine	RR-10	13-Jan-04	RR-10-T01N-SFW-011304	Surface Water	T						149:						
Surface Water Area 1-Red River Along Mine	RR-10	24-Feb-04	RR-10-T01N-SFW-022404	Surface Water	T						144:						
Surface Water Area 1-Red River Along Mine	RR-10	19-Apr-04	RR-10-T01N-SFW-041904	Surface Water	T						103:						
Surface Water Area 1-Red River Along Mine	RR-10A1	03-Oct-02	RR-10A1-T01N-SFW-100302	Surface Water	T						139:						
Surface Water Area 1-Red River Along Mine	RR-10A1	20-Jan-03	RR-10A1-T01N-SFW-012003	Surface Water	T						165:						
Surface Water Area 1-Red River Along Mine	RR-10A1	20-Mar-03	RR-10A1-T01N-SFW-032003	Surface Water	T						146:						
Surface Water Area 1-Red River Along Mine	RR-10A1	03-Apr-03	RR-10A1-T01N-SFW-040303	Surface Water	T						135:						
Surface Water Area 1-Red River Along Mine	RR-10A1	15-Jul-03	RR-10A1-T01N-SFW-071503	Surface Water	T						110:						
Surface Water Area 1-Red River Along Mine	RR-10A1	24-Sep-03	RR-10A1-T01N-SFW-092403	Surface Water	T						130:						
Surface Water Area 1-Red River Along Mine	RR-10A1	19-Oct-03	RR-10A1-T01N-SFW-101903	Surface Water	T						128:						
Surface Water Area 1-Red River Along Mine	RR-10A1	13-Jan-04	RR-10A1-T01N-SFW-011304	Surface Water	T						134:						
Surface Water Area 1-Red River Along Mine	RR-10A1	19-Apr-04	RR-10A1-T01N-SFW-041904	Surface Water	T						110:						
Surface Water Area 1-Red River Along Mine	RR-11A1	03-Oct-02	RR-11A1-T01N-SFW-100302	Surface Water	T						139:						
Surface Water Area 1-Red River Along Mine	RR-11A1	20-Jan-03	RR-11A1-T01N-SFW-012003	Surface Water	T						140:						
Surface Water Area 1-Red River Along Mine	RR-11A1	21-Mar-03	RR-11A1-T01N-SFW-032103	Surface Water	T						132:						
Surface Water Area 1-Red River Along Mine	RR-11A1	03-Apr-03	RR-11A1-T01N-SFW-040303	Surface Water	T						141:						
Surface Water Area 1-Red River Along Mine	RR-11A1	15-Jul-03	RR-11A1-T01N-SFW-071503	Surface Water	T						112:						
Surface Water Area 1-Red River Along Mine	RR-11A1	24-Sep-03	RR-11A1-T01N-SFW-092403	Surface Water	T						128:						
Surface Water Area 1-Red River Along Mine	RR-11A1	19-Oct-03	RR-11A1-T01N-SFW-101903	Surface Water	T						130:						
Surface Water Area 1-Red River Along Mine	RR-11A1	13-Jan-04	RR-11A1-T01N-SFW-011304	Surface Water	T						147:						
Surface Water Area 1-Red River Along Mine	RR-11A1	19-Apr-04	RR-11A1-T01N-SFW-041904	Surface Water	T						92.9:						
Surface Water Area 1-Red River Along Mine	RR-11B	03-Oct-02	RR-11B-T01N-SFW-100302	Surface Water	T						137:						
Surface Water Area 1-Red River Along Mine	RR-11B	20-Mar-03	RR-11B-T01N-SFW-032003	Surface Water	T						173:						
Surface Water Area 1-Red River Along Mine	RR-11B	15-Jul-03	RR-11B-T01N-SFW-071503	Surface Water	T						130:						
Surface Water Area 1-Red River Along Mine	RR-11B	24-Sep-03	RR-11B-T01N-SFW-092403	Surface Water	T						130:						
Surface Water Area 1-Red River Along Mine	RR-11C	01-Oct-02	RR-11C-T01N-SFW-100102	Surface Water	T						174:						
Surface Water Area 1-Red River Along Mine	RR-11C	20-Jan-03	RR-11C-T01N-SFW-012003	Surface Water	T						242:						
Surface Water Area 1-Red River Along Mine	RR-11C	20-Mar-03	RR-11C-T01N-SFW-032003	Surface Water	T						213:						
Surface Water Area 1-Red River Along Mine	RR-11C	03-Apr-03	RR-11C-T01N-SFW-040303	Surface Water	T						171:						
Surface Water Area 1-Red River Along Mine	RR-11C	15-Jul-03	RR-11C-T01N-SFW-071503	Surface Water	T						148:						
Surface Water Area 1-Red River Along Mine	RR-11C	25-Sep-03	RR-11C-T01N-SFW-092503	Surface Water	T						160:						
Surface Water Area 1-Red River Along Mine	RR-11C	19-Oct-03	RR-11C-T01N-SFW-101903	Surface Water	T						171:						
Surface Water Area 1-Red River Along Mine	RR-11C	13-Jan-04	RR-11C-T01N-SFW-011304	Surface Water	T						184:						
Surface Water Area 1-Red River Along Mine	RR-11C	19-Apr-04	RR-11C-T01N-SFW-041904	Surface Water	T						108:						
Surface Water Area 1-Red River Along Mine	RR-12	03-Oct-02	RR-12-T01N-SFW-100302	Surface Water	T						175:						
Surface Water Area 1-Red River Along Mine	RR-12	20-Jan-03	RR-12-T01N-SFW-012003	Surface Water	T						229:						
Surface Water Area 1-Red River Along Mine	RR-12	20-Mar-03	RR-12-T01N-SFW-032003	Surface Water	T						198:						
Surface Water Area 1-Red River Along Mine	RR-12	03-Apr-03	RR-12-T01N-SFW-040303	Surface Water	T						168:						
Surface Water Area 1-Red River Along Mine	RR-12	15-Jul-03	RR-12-T01N-SFW-071503	Surface Water	T						143:						
Surface Water Area 1-Red River Along Mine	RR-12	24-Sep-03	RR-12-T01N-SFW-092403	Surface Water	T						149:						
Surface Water Area 1-Red River Along Mine	RR-12	19-Oct-03	RR-12-T01N-SFW-101903	Surface Water	T						171:						
Surface Water Area 1-Red River Along Mine	RR-12	13-Jan-04	RR-12-T01N-SFW-011304	Surface Water	T						181:						
Surface Water Area 1-Red River Along Mine	RR-12	19-Apr-04	RR-12-T01N-SFW-041904	Surface Water	T						104:						
Surface Water Area 1-Red River Along Mine	RR-13	01-Oct-02	RR-13-T01N-SFW-100102	Surface Water	T						176:						
Surface Water Area 1-Red River Along Mine	RR-13	20-Jan-03	RR-13-T01N-SFW-012003	Surface Water	T						222:						
Surface Water Area 1-Red River Along Mine	RR-13	20-Mar-03	RR-13-T01N-SFW-032003	Surface Water	T						214:						
Surface Water Area 1-Red River Along Mine	RR-13	03-Apr-03	RR-13-T01N-SFW-040303	Surface Water	T						176:						
Surface Water Area 1-Red River Along Mine	RR-13	15-Jul-03	RR-13-T01N-SFW-071503	Surface Water	T						151:						
Surface Water Area 1-Red River Along Mine	RR-13	24-Sep-03	RR-13-T01N-SFW-092403	Surface Water	T						168:						
Surface Water Area 1-Red River Along Mine	RR-13	19-Oct-03	RR-13-T01N-SFW-101903	Surface Water	T						175:						
Surface Water Area 1-Red River Along Mine	RR-13	13-Jan-04	RR-13-T01N-SFW-011304	Surface Water	T						165:						
Surface Water Area 1-Red River Along Mine	RR-13	19-Apr-04	RR-13-T01N-SFW-041904	Surface Water	T						107:						
Surface Water Area 1-Red River Along Mine	RR-14	01-Oct-02	RR-14-T01N-SFW-100102	Surface Water	T						180:						
Surface Water Area 1-Red River Along Mine	RR-14	19-Jan-03	RR-14-T01N-SFW-011903	Surface Water	T						248:						
Surface Water Area 1-Red River Along Mine	RR-14	20-Mar-03	RR-14-T01N-SFW-032003	Surface Water	T						209:						
Surface Water Area 1-Red River Along Mine	RR-14	03-Apr-03	RR-14-T01N-SFW-040303	Surface Water	T						172:						
Surface Water Area 1-Red River Along Mine	RR-14	15-Jul-03	RR-14-T01N-SFW-071503	Surface Water	T						150:						
Surface Water Area 1-Red River Along Mine	RR-14	24-Sep-03	RR-14-T01N-SFW-092403	Surface Water	T						168:						
Surface Water Area 1-Red River Along Mine	RR-14	19-Oct-03	RR-14-T01N-SFW-101903	Surface Water	T						178:						

Surface Water Area 1-Red River Along Mine	RR-14	13-Jan-04	RR-14-T01N-SFW-011304	Surface Water	T						177:							
Surface Water Area 1-Red River Along Mine	RR-14	24-Feb-04	RR-14-T01N-SFW-022404	Surface Water	T						176:							
Surface Water Area 1-Red River Along Mine	RR-14	19-Apr-04	RR-14-T01N-SFW-041904	Surface Water	T						107:							
Surface Water Area 1-Red River Along Mine	RR-15	01-Oct-02	RR-15-T01N-SFW-100102	Surface Water	T						189:							
Surface Water Area 1-Red River Along Mine	RR-15	21-Mar-03	RR-15-T01N-SFW-032103	Surface Water	T						199:							
Surface Water Area 1-Red River Along Mine	RR-15	15-Jul-03	RR-15-T01N-SFW-071503	Surface Water	T						155:							
Surface Water Area 1-Red River Along Mine	RR-15	24-Sep-03	RR-15-T01N-SFW-092403	Surface Water	T						150:							
Surface Water Area 1-Red River Along Mine	RR-16	01-Oct-02	RR-16-T01N-SFW-100102	Surface Water	T						188:							
Surface Water Area 1-Red River Along Mine	RR-16	19-Jan-03	RR-16-T01N-SFW-011903	Surface Water	T						229:							
Surface Water Area 1-Red River Along Mine	RR-16	19-Mar-03	RR-16-T01N-SFW-031903	Surface Water	T						201:							
Surface Water Area 1-Red River Along Mine	RR-16	03-Apr-03	RR-16-T01N-SFW-040303	Surface Water	T						179:							
Surface Water Area 1-Red River Along Mine	RR-16	15-Jul-03	RR-16-T01N-SFW-071503	Surface Water	T						149:							
Surface Water Area 1-Red River Along Mine	RR-16	23-Seo-03	RR-16-T01N-SFW-092303	Surface Water	T						159:							
Surface Water Area 1-Red River Along Mine	RR-16	19-Oct-03	RR-16-T01N-SFW-101903	Surface Water	T						180:							
Surface Water Area 1-Red River Along Mine	RR-16	13-Jan-04	RR-16-T01N-SFW-011304	Surface Water	T						179:							
Surface Water Area 1-Red River Along Mine	RR-16	19-Apr-04	RR-16-T01N-SFW-041904	Surface Water	T						98.5:							
Surface Water Area 1-Red River Along Mine	RR-17	01-Oct-02	RR-17-T01N-SFW-100102	Surface Water	T						186:							
Surface Water Area 1-Red River Along Mine	RR-17	19-Mar-03	RR-17-T01N-SFW-031903	Surface Water	T						203:							
Surface Water Area 1-Red River Along Mine	RR-17	15-Jul-03	RR-17-T01N-SFW-071503	Surface Water	T						159:							
Surface Water Area 1-Red River Along Mine	RR-17	23-Sep-03	RR-17-T01N-SFW-092303	Surface Water	T						170:							
Surface Water Area 1-Red River Along Mine	RR-18A	01-Oct-02	RR-18A-T01N-SFW-100102	Surface Water	T						190:							
Surface Water Area 1-Red River Along Mine	RR-18A	19-Mar-03	RR-18A-T01N-SFW-031903	Surface Water	T						210:							
Surface Water Area 1-Red River Along Mine	RR-18A	16-Jul-03	RR-18A-T01N-SFW-071603	Surface Water	T						157:							
Surface Water Area 1-Red River Along Mine	RR-18A	23-Sep-03	RR-18A-T01N-SFW-092303	Surface Water	T						170:							
Surface Water Area 1-Red River Along Mine	RR-18B	30-Sep-02	RR-18B-T01N-SFW-093002	Surface Water	T						185:							
Surface Water Area 1-Red River Along Mine	RR-18B	19-Mar-03	RR-18B-T01N-SFW-031903	Surface Water	T						195:							
Surface Water Area 1-Red River Along Mine	RR-18B	16-Jul-03	RR-18B-T01N-SFW-071603	Surface Water	T						161:							
Surface Water Area 1-Red River Along Mine	RR-18B	23-Sep-03	RR-18B-T01N-SFW-092303	Surface Water	T						170:							
Surface Water Area 1-Red River Along Mine	RR-20	30-Sep-02	RR-20-T01N-SFW-093002	Surface Water	T						196:							
Surface Water Area 1-Red River Along Mine	RR-20	21-Mar-03	RR-20-T01N-SFW-032103	Surface Water	T						206:							
Surface Water Area 1-Red River Along Mine	RR-20	15-Jul-03	RR-20-T01N-SFW-071503	Surface Water	T						164:							
Surface Water Area 1-Red River Along Mine	RR-20	23-Sep-03	RR-20-T01N-SFW-092303	Surface Water	T						163:							
Surface Water Area 1-Red River Along Mine	RR-7	04-Oct-02	RR-7-T01N-SFW-100402	Surface Water	T						154:							
Surface Water Area 1-Red River Along Mine	RR-7	21-Jan-03	RR-7-T01N-SFW-012103	Surface Water	T						162:							
Surface Water Area 1-Red River Along Mine	RR-7	21-Mar-03	RR-7-T01N-SFW-032103	Surface Water	T						171:							
Surface Water Area 1-Red River Along Mine	RR-7	03-Apr-03	RR-7-T01N-SFW-040303	Surface Water	T						144:							
Surface Water Area 1-Red River Along Mine	RR-7	15-Jul-03	RR-7-T01N-SFW-071503	Surface Water	T						116:							
Surface Water Area 1-Red River Along Mine	RR-7	24-Sep-03	RR-7-T01N-SFW-092403	Surface Water	T						130:							
Surface Water Area 1-Red River Along Mine	RR-7	19-Oct-03	RR-7-T01N-SFW-101903	Surface Water	T						141:							
Surface Water Area 1-Red River Along Mine	RR-7	13-Jan-04	RR-7-T01N-SFW-011304	Surface Water	T						141:							
Surface Water Area 1-Red River Along Mine	RR-7	24-Feb-04	RR-7-T01N-SFW-022404	Surface Water	T						142:							
Surface Water Area 1-Red River Along Mine	RR-7	19-Apr-04	RR-7-T01N-SFW-041904	Surface Water	T						99.8:							
Surface Water Area 1-Red River Along Mine	RR-8	04-Oct-02	RR-8-T01N-SFW-100402	Surface Water	T						149:							
Surface Water Area 1-Red River Along Mine	RR-8	21-Mar-03	RR-8-T01N-SFW-032103	Surface Water	T						159:							
Surface Water Area 1-Red River Along Mine	RR-8	15-Jul-03	RR-8-T01N-SFW-071503	Surface Water	T						119:							
Surface Water Area 1-Red River Along Mine	RR-8	24-Sep-03	RR-8-T01N-SFW-092403	Surface Water	T						141:							
Surface Water Area 1-Red River Along Mine	RR-8A	04-Oct-02	RR-8A-T01N-SFW-100402	Surface Water	T						150:							
Surface Water Area 1-Red River Along Mine	RR-8A	21-Mar-03	RR-8A-T01N-SFW-032103	Surface Water	T						156:							
Surface Water Area 1-Red River Along Mine	RR-8A	15-Jul-03	RR-8A-T01N-SFW-071503	Surface Water	T						122:							
Surface Water Area 1-Red River Along Mine	RR-8A	24-Sep-03	RR-8A-T01N-SFW-092403	Surface Water	T						135:							
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	27-Sep-02	LR-11A-T01N-SFW-092702	Surface Water	T						233:							
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	20-Mar-03	LR-11A-T01N-SFW-032003	Surface Water	T						254:							
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	14-Jul-03	LR-11A-T01N-SFW-071403	Surface Water	T						205:							
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	23-Sep-03	LR-11A-T01N-SFW-092303	Surface Water	T						209:							
Surface Water Area 11-Red River Along Tailings Facility	LR-13	26-Sep-02	LR-13-T01N-SFW-092602	Surface Water	T						232:							
Surface Water Area 11-Red River Along Tailings Facility	LR-13	20-Mar-03	LR-13-T01N-SFW-032003	Surface Water	T						244:							
Surface Water Area 11-Red River Along Tailings Facility	LR-13	14-Jul-03	LR-13-T01N-SFW-071403	Surface Water	T						206:							
Surface Water Area 11-Red River Along Tailings Facility	LR-13	21-Sep-03	LR-13-T01N-SFW-092103	Surface Water	T						205:							
Surface Water Area 11-Red River Along Tailings Facility	LR-16	26-Sep-02	LR-16-T01N-SFW-092602	Surface Water	T						229:							
Surface Water Area 11-Red River Along Tailings Facility	LR-16	20-Mar-03	LR-16-T01N-SFW-032003	Surface Water	T						235:							
Surface Water Area 11-Red River Along Tailings Facility	LR-16	14-Jul-03	LR-16-T01N-SFW-071403	Surface Water	T						202:							
Surface Water Area 11-Red River Along Tailings Facility	LR-16	21-Sep-03	LR-16-T01N-SFW-092103	Surface Water	T						196:							
Surface Water Area 11-Red River Along Tailings Facility	LR-5	30-Sep-02	LR-5-T01N-SFW-093002	Surface Water	T						187:							
Surface Water Area 11-Red River Along Tailings Facility	LR-5	21-Mar-03	LR-5-T01N-SFW-032103	Surface Water	T						216:							
Surface Water Area 11-Red River Along Tailings Facility	LR-5	15-Jul-03	LR-5-T01N-SFW-071503	Surface Water	T						166:							
Surface Water Area 11-Red River Along Tailings Facility	LR-5	23-Sep-03	LR-5-T01N-SFW-092303	Surface Water	T						153:							
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	27-Sep-02	LR-8A-T01N-SFW-092702	Surface Water	T						230:							
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	23-Mar-03	LR-8A-T01N-SFW-032303	Surface Water	T						260:							
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	15-Jul-03	LR-8A-T01N-SFW-071503	Surface Water	T						204:							
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	23-Sep-03	LR-8A-T01N-SFW-092303	Surface Water	T						202:							
Reference Lower Cabresto Creek Riparian	RRS-18	06-Oct-02	RRS-18-T01N-SFW-100602	Surface Water	T	8.4:	313:	0.01:				7:	215:			10.2:	0:	
Reference Lower Cabresto Creek Riparian	RRS-18	23-Mar-03	RRS-18-T01N-SFW-032303	Surface Water	T	6.8:	300:	5.1:				7.1:	380:			3.4:	0:	
Reference Lower Cabresto Creek Riparian	RRS-18	14-Jul-03	RRS-18-T01N-SFW-071403	Surface Water	T				-999:									
Reference Lower Cabresto Creek Riparian	RRS-18	25-Sep-03	RRS-18-T01N-SFW-092503	Surface Water	T	9.2:	331:	1.6:				7:	193:			8.6:	1.3:	
Reference Lower Cabresto Creek Riparian	RRS-20	06-Oct-02	RRS-20-T01N-SFW-100602	Surface Water	T	8.5:	326:	0.01:				6.7:	221:			14.1:	0.4:	
Reference Lower Cabresto Creek Riparian	RRS-20	23-Mar-03	RRS-20-T01N-SFW-032303	Surface Water	T	8.3:	294:	2.2:				6.8:	379:			2.7:	0:	
Reference Lower Cabresto Creek Riparian	RRS-20	16-Jul-03	RRS-20-T01N-SFW-071603	Surface Water	T	3.2:	261:	0.02:				6.3:	211:			14:	5.4:	
Reference Lower Cabresto Creek Riparian	RRS-20	25-Sep-03	RRS-20-T01N-SFW-092503	Surface Water	T	10.1:	250:	1.5:				7.8:	171:			12.8:	27.3:	
Reference Lower Cabresto Creek Riparian	RRS-23	06-Oct-02	RRS-23-T01N-SFW-100602	Surface Water	T	7.8:	352:	0.01:				6.5:	212:			9.8:	0:	
Reference Lower Cabresto Creek Riparian	RRS-23	23-Mar-03	RRS-23-T01N-SFW-032303	Surface Water	T	9.1:	296:	2.1:				6.5:	390:			2.3:	0:	
Reference Lower Cabresto Creek Riparian	RRS-23	16-Jul-03	RRS-23-T01N-SFW-071603	Surface Water	T	8.3:	229:	0.1:				6.5:	256:			14.2:	0.8:	
Reference Lower Cabresto Creek Riparian	RRS-23	25-Sep-03	RRS-23-T01N-SFW-092503	Surface Water	T	8.2:	502:	1.1:				6.6:	177:			15.4:	6.6:	
Reference Lower Cabresto Creek Riparian	RRS-27	06-Oct-02	RRS-27-T01N-SFW-100602	Surface Water	T	8.2:	343:	0.01:				6.7:	331:			13:	0:	
Reference Lower Cabresto Creek Riparian	RRS-27	23-Mar-03	RRS-27-T01N-SFW-032303	Surface Water	T	12.3:	277:	4.6:				6.4:	444:			2.3:	0:	
Reference Lower Cabresto Creek Riparian	RRS-27	16-Jul-03	RRS-27-T01N-SFW-071603	Surface Water	T	10.8:	156:	0.2:				6.3:	263:			14:	0.5:	
Reference Lower Cabresto Creek Riparian	RRS-27	25-Sep-03	RRS-27-T01N-SFW-092503	Surface Water	T	8.6:	250:	1:				7.2:	180:			14.7:	6.8:	
Reference Red River Above Mine Site	RR-1	04-Oct-02	RR-1-T01N-SFW-100402	Surface Water	T	8.2:	108:	8.5:				7.1:	218:			11.5:	7.4:	
Reference Red River Above Mine Site	RR-1	21-Mar-03	RR-1-T01N-SFW-032103	Surface Water	T	9.3:	132:	4.8:				8:	218:			2.8:	46.3:	
Reference Red River Above Mine Site	RR-1	16-Jul-03	RR-1-T01N-SFW-071603	Surface Water	T	8.7:	114:	12.9:				8.6:	176:			14.6:	0:	
Reference Red River Above Mine Site	RR-1	21-Seo-03	RR-1-T01N-SFW-092103	Surface Water	T	8.7:	329:					5.8:	461:			14.1:	2.7:	
Reference Red River Above Mine Site	RR-1	25-Sep-03	RR-1-T01N-SFW-092503	Surface Water	T			12.4:										
Reference Red River Above Mine Site	RR-1	25-May-04	RR-1-T01N-SFW-052504	Surface Water	T	10.1:	205:					7.9:	203:			8.1:	10.1:	
Reference Red River Above Mine Site	RR-3	03-Oct-02	RR-3-T01N-SFW-100302	Surface Water	T	7.9:	110:	9.9:				6.9:	244:			8.6:	6.6:	
Reference Red River Above Mine Site	RR-3	21-Mar-03	RR-3-T01N-SFW-032103	Surface Water	T	10.4:	137:	6.9:				7.4:	267:			3:	76.3:	
Reference Red River Above Mine Site	RR-3	16-Jul-03	RR-3-T01N-SFW-071603	Surface Water	T	8.4:	150:	16.8:				7.7:	210:			14.5:	0:	
Reference Red River Above Mine Site	RR-3	25-Sep-03	RR-3-T01N-SFW-092503	Surface Water	T	10.3:	226:	15.6:				7.3:	232:			7.6:	9.4:	
Reference Red River Above Mine Site	RR-4	04-Oct-02	RR-4-T01N-SFW-100402	Surface Water	T	8.9:	93.1:	10.1:				7.7:	282:			10.4:	19.2:	
Reference Red River Above Mine Site	RR-4	21-Mar-03	RR-4-T01N-SFW-032103	Surface Water	T	11.3:	154:	8.1:				7.3:	294:			0.9:	50.2:	
Reference Red River Above Mine Site	RR-4	16-Jul-03	RR-4-T01N-SFW-071603	Surface Water	T	8.9:	131:	19.9:				8.3:	222:			12.7:	0:	
Reference Red River Above Mine Site	RR-4	25-Sep-03	RR-4-T01N-SFW-092503	Surface Water	T	10.4:	276:	14:				7.1:	249:			6.1:	21.5:	
Reference Red River Above Mine Site	RR-5	03-Oct-02	RR-5-T01N-SFW-100302	Surface Water	T		131:	12.4:				7.4:	282:			7.8:	15.8:	
Reference Red River Above Mine Site	RR-5	21-Mar-03	RR-5-T01N-SFW-032103	Surface Water	T	12.6:	343:	9.6:				8:	591:			2.2:	36.6:	
Reference Red River Above Mine Site	RR-5	16-Jul-03	RR-5-T01N-SFW-071603	Surface Water	T	9.5:	130:	13.7:				8.6:	234:			11.9:	0:	
Reference Red River Above Mine Site	RR-5	24-Sep-03	RR-5-T01N-SFW-092403	Surface Water	T	8.8:	242:	12:				7.5:	256:			13:	7.9:	
Reference Red River Above Mine Site	RR-6	04-Oct-02	RR-6-T01N-SFW-100402	Surface Water	T	10.1:	191:	12.1:				6.8:	330:			5.6:	17.4:	
Reference Red River Above Mine Site	RR-6	21-Mar-03	RR-6-T01N-SFW-032103	Surface Water	T	9.9:	111:	9.7:				8:	340:			4.4:	98.6:	
Reference Red River Above Mine Site	RR-6	13-Jul-03	RR-6-T01N-SFW-071303	Surface Water	T	8:	131:					8.3:	241:			17.5:	0:	
Reference Red River Above Mine Site	RR-6	16-Jul-03	RR-6-T01N-SFW-071603	Surface Water	T	8.1:	245:	23.8:				7.5:	254:			15.1:	3.4:	
Reference Red River Above Mine Site	RR-6	24-Sep-03	RR-6-T01N-SFW-092403	Surface Water	T	9:	286:	13:				7.5:	284:			11.5:	11.5:	
Reference Red River Above Mine Site	RR-6A	04-Oct-02	RR-6A-T01N-SFW-100402	Surface Water	T	9.8:	332:	12.1:				6.8:	320:			11:	7.5:	
Reference Red River Above Mine Site	RR-6A	21-Mar-03	RR-6A-T01N-SFW-032103	Surface Water	T	12.1:	282:	9.2:				7.4:	639:			1.5:	26.8:	
Reference Red River Above Mine Site	RR-6A	15-Jul-03	RR-6A-T01N-SFW-071503	Surface Water	T	8.2:	133:	17.7:				8.3:	244:			14.7:	0:	
Reference Red River Above Mine Site	RR-6A	24-Sep-03	RR-6A-T01N-SFW-092403	Surface Water	T	9.5:	310:	14.2:				7.5:	283:			10.5:	19.3:	
Reference Red River Above Mine Site	RR-6V	16-Jul-03	RR-6V-T01N-SFW-071603	Surface Water	T	8.3:	257:	17.9:				7.8:	254:			16.9:	0:	
Reference Red River Above Mine Site	RR-6V	24-Seo-03	RR-6V-T01N-SFW-092403	Surface Water	T	7.9:	409:	16.3:				7.1:	272:			12.6:	17.4:	
Reference Red River Above Mine Site	Zwerole	07-Oct-02	ZWERGEL-T01N-SFW-100702	Surface Water	T	8.8:	336:	6:				7.1:	212:			10.4:	9:	
Reference Red River Above Mine Site	Zwergle	23-Mar-03	ZWERGEL-T01N-SFW-032303	Surface Water	T	11.6:	187:	4.7:				-999:	227:			0.56:	36.7:	
Reference Red River Above Mine Site	ZWERGLE	16-Jul-03	ZWERGLE-T01N-SFW-071603	Surface Water	T	9:	102:	12.3:				8.7:	170:			12:	0:	
Reference Red River Above Mine Site	ZWERGLE	25-Sep-03	ZWERGEL-T01N-SFW-092503	Surface Water	T	9.9:	201:	12.1:				8.2:	205:			8.3:	8.3:	
Reference Upper Cabresto Creek Riparian	RRS-12	07-Oct-02	RRS-12-T01N-SFW-100702	Surface Water	T	10.1:	336:	2.9:				6.4:	203:			5.1:	9.9:	
Reference Upper Cabresto Creek Riparian	RRS-12	23-Mar-03	RRS-12-T01N-SFW-032303	Surface Water	T	10.2:	169:	2:				7.6:	206:			2.8:	64.6:	
Reference Upper Cabresto Creek Riparian	RRS-12	16-Jul-03	RRS-12-T01N-SFW-071603	Surface Water	T	8.5:	265:	1.1:				7.8:	205:			16.1:	1.7:	
Reference Upper Cabresto Creek Riparian	RRS-12	25-Sep-03	RRS-12-T01N-SFW-092503	Surface Water	T	10.3:	339:	1.4:				7.4:	231:			10.4:	4.2:	
Reference Upper Cabresto Creek Riparian	RRS-13	06-Oct-02	RRS-13-T01N-SFW-100602	Surface Water	T	8.8:	339:	5.1:				6.5:	165:			9.9:	0.3:	
Reference Upper Cabresto Creek Riparian	RRS-13	23-Mar-03	RRS-13-T01N-SFW-032303	Surface Water	T	10.1:	109:	3.4:				7.7:	159:			3:	63.6:	
Reference Upper Cabresto Creek Riparian	RRS-13	16-Jul-03	RRS-13-T01N-SFW-071603	Surface Water	T	8.6:	430:	7.5:				7.3:	131:			13.4:	1.6:	
Reference Upper Cabresto Creek Riparian	RRS-13	25-Sep-03	RRS-13-T01N-SFW-092503	Surface Water	T	9:	265:	5.2:				7.7:	153:			8.8:	1.7:	
Reference Upper Cabresto Creek Riparian	RRS-15	06-Oct-02	RRS-15-T01N-SFW-100602	Surface Water	T	9.6:	350:	3.6:				6.6:	167:			9.6:	0.4:	
Reference Upper Cabresto Creek Riparian	RRS-15	23-Mar-03	RRS-15-T01N-SFW-032303	Surface Water	T	10.7:	124:	3.8:				7.7:	171:			2:	63.4:	
Reference Upper Cabresto Creek Riparian	RRS-15	16-Jul-03	RRS-15-T01N-SFW-071603	Surface Water	T	8.1:	345:	6.9:				7.5:	135:			14.4:	1.9:	
Reference Upper Cabresto Creek Riparian	RRS-15	25-Sep-03	RRS-15-T01N-SFW-092503	Surface Water	T	9.6:	195:	5.1:				7.9:	156:			9.2:	1.7:	
Reference Upper Cabresto Creek Riparian	RRS-9	07-Oct-02	RRS-9-T01N-SFW-100702	Surface Water	T	9.3:	306:	1.3:				6.8:	169:			9.5:	9:	
Reference Upper Cabresto Creek Riparian	RRS-9	23-Mar-03	RRS-9-T01N-SFW-032303	Surface Water	T	10.3:	145:	2.1:				7.8:	156:			3.5:	64:	
Reference Upper Cabresto Creek Riparian	RRS-9	16-Jul-03	RRS-9-T01N-SFW-071603	Surface Water	T	8.1:	264:	1:				7.6:	145:			16.1:	1.7:	
Reference Upper Cabresto Creek Riparian	RRS-9	25-Sep-03	RRS-9-T01N-SFW-092503	Surface Water	T	8.7:	389:	1:				7.8:	178:			12.2:	0.5:	

Reference Upper Cabresto Creek Riparian	Upper Cabresto Creek	23-Mar-03	Upper Cabresto Creek-T01N-SFW-032303	Surface Water	T			4.2:										
Reference Upper Cabresto Creek Riparian	UPPER CABRESTO CREEK	23-Mar-03	UCC-T01N-SFW-032303	Surface Water	T	11:	127:						7.3:	181:		1.7:	63.3:
Reference Upper Cabresto Creek Riparian	UPPER CABRESTO CREEK	16-Jul-03	UPPERCABRESTO-T01N-SFW-071603	Surface Water	T	8.1:	498:	5.6:					7.3:	147:		14.4:	3:
Reference Upper Cabresto Creek Riparian	UPPER CABRESTO CREEK	25-Sep-03	UPPERCABRESTO-T01N-SFW-092503	Surface Water	T	9.4:	329:	5.9:					7.5:	168:		8.1:	5.7:
Surface Water Area 1-Red River Along Mine	LR-1	30-Sep-02	LR-1-T01N-SFW-093002	Surface Water	T	9.1:	358:	21.8:					7.6:	364:		14.9:	20.4:
Surface Water Area 1-Red River Along Mine	LR-1	20-Mar-03	LR-1-T01N-SFW-032003	Surface Water	T	10.3:	290:	11.6:					7:	460:		9.7:	5.2:
Surface Water Area 1-Red River Along Mine	LR-1	15-Jul-03	LR-1-T01N-SFW-071503	Surface Water	T	8.4:	472:	18.4:					6.7:	338:		16.3:	1.5:
Surface Water Area 1-Red River Along Mine	LR-1	24-Sep-03	LR-1-T01N-SFW-092403	Surface Water	T	10.9:	273:	20.7:					6.9:	359:		9.7:	23.7:
Surface Water Area 1-Red River Along Mine	RR-10	03-Oct-02	RR-10-T01N-SFW-100302	Surface Water	T	11:	369:	11.8:					7.1:	316:		8:	36.3:
Surface Water Area 1-Red River Along Mine	RR-10	21-Jan-03	RR-10-T01N-SFW-012103	Surface Water	T	11.5:	385:						6:	354:		1.2:	0:
Surface Water Area 1-Red River Along Mine	RR-10	20-Mar-03	RR-10-T01N-SFW-032003	Surface Water	T	10.2:	258:	8.8:					7.5:	380:		4.5:	43.4:
Surface Water Area 1-Red River Along Mine	RR-10	03-Apr-03	RR-10-T01N-SFW-040303	Surface Water	T	9.6:	280:	11.7:					8.3:	316:		6.2:	14.7:
Surface Water Area 1-Red River Along Mine	RR-10	15-Jul-03	RR-10-T01N-SFW-071503	Surface Water	T	8.7:	155:	19.3:					8.6:	247:		12:	0:
Surface Water Area 1-Red River Along Mine	RR-10	24-Sep-03	RR-10-T01N-SFW-092403	Surface Water	T	9.3:	173:	14.5:					7.7:	327:		11.4:	5.3:
Surface Water Area 1-Red River Along Mine	RR-10	19-Oct-03	RR-10-T01N-SFW-101903	Surface Water	T	9.1:	299:	13.7:					7.8:	286:		9.4:	4:
Surface Water Area 1-Red River Along Mine	RR-10	13-Jan-04	RR-10-T01N-SFW-011304	Surface Water	T	8.8:	166:						7.9:	309:		0:	8.7:
Surface Water Area 1-Red River Along Mine	RR-10	24-Feb-04	RR-10-T01N-SFW-022404	Surface Water	T	11.3:	90.8:		-999:				7.8:	337:		1.5:	3.5:
Surface Water Area 1-Red River Along Mine	RR-10	19-Apr-04	RR-10-T01N-SFW-041904	Surface Water	T	8.2:	69.5:	12.5:					8.1:	226:		10.8:	12.4:
Surface Water Area 1-Red River Along Mine	RR-10A1	03-Oct-02	RR-10A1-T01N-SFW-100302	Surface Water	T	10.9:	336:	13.4:					7.3:	285:		8.5:	14:
Surface Water Area 1-Red River Along Mine	RR-10A1	20-Jan-03	RR-10A1-T01N-SFW-012003	Surface Water	T	11.4:	377:	5.1:					6.5:	345:		2.3:	4.6:
Surface Water Area 1-Red River Along Mine	RR-10A1	20-Mar-03	RR-10A1-T01N-SFW-032003	Surface Water	T	12.9:	269:	5:					7.5:	354:		5.1:	30:
Surface Water Area 1-Red River Along Mine	RR-10A1	03-Apr-03	RR-10A1-T01N-SFW-040303	Surface Water	T	9.7:	285:	17.4:					8.3:	292:		6.4:	7.8:
Surface Water Area 1-Red River Along Mine	RR-10A1	15-Jul-03	RR-10A1-T01N-SFW-071503	Surface Water	T	8.9:	156:	25:					8.5:	228:		11.1:	0:
Surface Water Area 1-Red River Along Mine	RR-10A1	24-Sep-03	RR-10A1-T01N-SFW-092403	Surface Water	T	9.4:	152:	17.5:					7.9:	304:			4.1:
Surface Water Area 1-Red River Along Mine	RR-10A1	19-Oct-03	RR-10A1-T01N-SFW-101903	Surface Water	T	9.3:	312:	14.5:					7.7:	256:		8.3:	2.9:
Surface Water Area 1-Red River Along Mine	RR-10A1	13-Jan-04	RR-10A1-T01N-SFW-011304	Surface Water	T	8.8:	163:						7.9:	284:		0.22:	8.2:
Surface Water Area 1-Red River Along Mine	RR-10A1	19-Apr-04	RR-10A1-T01N-SFW-041904	Surface Water	T	8.5:	96.7:	12.5:					8:	215:		9.8:	14.2:
Surface Water Area 1-Red River Along Mine	RR-11A1	03-Oct-02	RR-11A1-T01N-SFW-100302	Surface Water	T	11:	327:	14.1:					7.8:	284:		8:	20.6:
Surface Water Area 1-Red River Along Mine	RR-11A1	20-Jan-03	RR-11A1-T01N-SFW-012003	Surface Water	T	11.9:	318:	6.1:					7.5:	316:		3.3:	4.9:
Surface Water Area 1-Red River Along Mine	RR-11A1	21-Mar-03	RR-11A1-T01N-SFW-032103	Surface Water	T	9.9:	228:	4.2:					6.8:	333:		1.1:	76.7:
Surface Water Area 1-Red River Along Mine	RR-11A1	03-Apr-03	RR-11A1-T01N-SFW-040303	Surface Water	T	9.7:	315:	13.4:					8.3:	289:		6.7:	14.8:
Surface Water Area 1-Red River Along Mine	RR-11A1	15-Jul-03	RR-11A1-T01N-SFW-071503	Surface Water	T	8.9:	167:	23.8:					7.8:	233:		10.3:	0:
Surface Water Area 1-Red River Along Mine	RR-11A1	24-Sep-03	RR-11A1-T01N-SFW-092403	Surface Water	T	9.7:	162:	19.3:					7.9:	305:		8.1:	6.2:
Surface Water Area 1-Red River Along Mine	RR-11A1	19-Oct-03	RR-11A1-T01N-SFW-101903	Surface Water	T	9.5:	322:	17.5:					7.6:	250:		7.3:	3.7:
Surface Water Area 1-Red River Along Mine	RR-11A1	13-Jan-04	RR-11A1-T01N-SFW-011304	Surface Water	T	8.8:	162:						7.8:	271:		0:	10.2:
Surface Water Area 1-Red River Along Mine	RR-11A1	19-Apr-04	RR-11A1-T01N-SFW-041904	Surface Water	T	8.5:	90.6:	10.7:					8:	212:		9.9:	12.1:
Surface Water Area 1-Red River Along Mine	RR-11B	03-Oct-02	RR-11B-T01N-SFW-100302	Surface Water	T	10.1:	347:	13:					7.2:	289:		7.9:	18.2:
Surface Water Area 1-Red River Along Mine	RR-11B	20-Mar-03	RR-11B-T01N-SFW-032003	Surface Water	T	9.8:	260:	11.5:					7.2:	390:		5.4:	17.1:
Surface Water Area 1-Red River Along Mine	RR-11B	15-Jul-03	RR-11B-T01N-SFW-071503	Surface Water	T	6.6:	168:	28.9:					7.2:	276:		15.4:	28.9:
Surface Water Area 1-Red River Along Mine	RR-11B	24-Sep-03	RR-11B-T01N-SFW-092403	Surface Water	T	9.5:	192:	19.3:					7.5:	328:		8:	6.6:
Surface Water Area 1-Red River Along Mine	RR-11B	19-Apr-04	RR-11B-T01N-SFW-041904	Surface Water	T	8.7:	86.2:						8:	213:		9.1:	18.6:
Surface Water Area 1-Red River Along Mine	RR-11C	01-Oct-02	RR-11C-T01N-SFW-100102	Surface Water	T	9:	325:	16.4:					7.1:	356:		12:	13.8:
Surface Water Area 1-Red River Along Mine	RR-11C	20-Jan-03	RR-11C-T01N-SFW-012003	Surface Water	T	10.3:	330:	5.3:					7.5:	326:		3.1:	2.4:
Surface Water Area 1-Red River Along Mine	RR-11C	20-Mar-03	RR-11C-T01N-SFW-032003	Surface Water	T	11.9:	280:	8.8:					7:	439:		6.9:	2.4:
Surface Water Area 1-Red River Along Mine	RR-11C	03-Apr-03	RR-11C-T01N-SFW-040303	Surface Water	T	9.6:	315:	15.6:					7.6:	368:		6.9:	9:
Surface Water Area 1-Red River Along Mine	RR-11C	15-Jul-03	RR-11C-T01N-SFW-071503	Surface Water	T	1.2:	297:	32.8:					7.1:	314:		13.8:	28.6:
Surface Water Area 1-Red River Along Mine	RR-11C	24-Sep-03	RR-11C-T01N-SFW-092403	Surface Water	T	9.5:	166:	21:					7.3:	382:		7.1:	6.8:
Surface Water Area 1-Red River Along Mine	RR-11C	19-Oct-03	RR-11C-T01N-SFW-101903	Surface Water	T	9.6:	320:	19:					6.7:	336:		6.7:	4.7:
Surface Water Area 1-Red River Along Mine	RR-11C	13-Jan-04	RR-11C-T01N-SFW-011304	Surface Water	T	8:	152:	10.6:					7.2:	367:		6.2:	6.3:
Surface Water Area 1-Red River Along Mine	RR-11C	19-Apr-04	RR-11C-T01N-SFW-041904	Surface Water	T	8.7:	116:	10.6:					7.6:	237:		10.2:	9.9:
Surface Water Area 1-Red River Along Mine	RR-12	03-Oct-02	RR-12-T01N-SFW-100302	Surface Water	T	10.5:	317:	16.5:					6.6:	351:		8.2:	18.9:
Surface Water Area 1-Red River Along Mine	RR-12	20-Jan-03	RR-12-T01N-SFW-012003	Surface Water	T	11.3:	334:	5.6:					7.4:	352:		2.1:	3.7:
Surface Water Area 1-Red River Along Mine	RR-12	20-Mar-03	RR-12-T01N-SFW-032003	Surface Water	T	10.4:	258:	10.5:					7:	458:		5.3:	1:
Surface Water Area 1-Red River Along Mine	RR-12	03-Apr-03	RR-12-T01N-SFW-040303	Surface Water	T	9.9:	326:	18.5:					7.6:	371:		5.9:	15:
Surface Water Area 1-Red River Along Mine	RR-12	15-Jul-03	RR-12-T01N-SFW-071503	Surface Water	T	2.1:	251:	33.8:					7.1:	311:		12.8:	32.5:
Surface Water Area 1-Red River Along Mine	RR-12	24-Sep-03	RR-12-T01N-SFW-092403	Surface Water	T	9.8:	155:	20.2:					7.4:	383:		6.8:	6.5:
Surface Water Area 1-Red River Along Mine	RR-12	19-Oct-03	RR-12-T01N-SFW-101903	Surface Water	T	11.3:	304:	18.6:					7.2:	337:		6.3:	3.2:
Surface Water Area 1-Red River Along Mine	RR-12	13-Jan-04	RR-12-T01N-SFW-011304	Surface Water	T	8.4:	150:						7.6:	375:		1.5:	6.8:
Surface Water Area 1-Red River Along Mine	RR-12	19-Apr-04	RR-12-T01N-SFW-041904	Surface Water	T	10.2:	3.5:	15.4:					7.9:	234:		5.4:	12.2:
Surface Water Area 1-Red River Along Mine	RR-13	01-Oct-02	RR-13-T01N-SFW-100102	Surface Water	T	9.2:	329:	17.9:					7:	363:		11.5:	13.7:
Surface Water Area 1-Red River Along Mine	RR-13	20-Jan-03	RR-13-T01N-SFW-012003	Surface Water	T	11:	386:	8.3:					6.4:	443:		2.3:	5.4:
Surface Water Area 1-Red River Along Mine	RR-13	20-Mar-03	RR-13-T01N-SFW-032003	Surface Water	T	9.6:	276:	12.5:					7.1:	471:		7:	14.3:
Surface Water Area 1-Red River Along Mine	RR-13	03-Apr-03	RR-13-T01N-SFW-040303	Surface Water	T	10.2:	349:	17.4:					7.5:	376:		5.2:	13.3:
Surface Water Area 1-Red River Along Mine	RR-13	15-Jul-03	RR-13-T01N-SFW-071503	Surface Water	T	4.7:	224:	33.8:					7.3:	316:		12.1:	29.2:
Surface Water Area 1-Red River Along Mine	RR-13	24-Sep-03	RR-13-T01N-SFW-092403	Surface Water	T	9.1:	232:	21.1:					7.6:	335:		11.5:	21.4:
Surface Water Area 1-Red River Along Mine	RR-13	19-Oct-03	RR-13-T01N-SFW-101903	Surface Water	T	12.4:	220:	20:					7.1:	344:		5.3:	3.1:
Surface Water Area 1-Red River Along Mine	RR-13	13-Jan-04	RR-13-T01N-SFW-011304	Surface Water	T	8.7:	86.7:	13.3:					6.9:	361:		1.3:	6.6:
Surface Water Area 1-Red River Along Mine	RR-13	19-Apr-04	RR-13-T01N-SFW-041904	Surface Water	T	10.9:	82.6:	24.3:					7.2:	242:		4.1:	23.5:
Surface Water Area 1-Red River Along Mine	RR-14	01-Oct-02	RR-14-T01N-SFW-100102	Surface Water	T	9.4:	249:	18.4:					6.9:	371:		11.6:	17:
Surface Water Area 1-Red River Along Mine	RR-14	19-Jan-03	RR-14-T01N-SFW-011903	Surface Water	T	10.3:	196:	8.3:					7.6:	516:		3.9:	5.3:
Surface Water Area 1-Red River Along Mine	RR-14	20-Mar-03	RR-14-T01N-SFW-032003	Surface Water	T	10.9:	267:	12.2:					6.5:	476:		3.4:	4.7:
Surface Water Area 1-Red River Along Mine	RR-14	03-Apr-03	RR-14-T01N-SFW-040303	Surface Water	T	10.5:	377:	16.6:					7:	384:		3.6:	14.6:
Surface Water Area 1-Red River Along Mine	RR-14	15-Jul-03	RR-14-T01N-SFW-071503	Surface Water	T	8.1:	301:	33:					6.6:	321:		11.7:	29.7:
Surface Water Area 1-Red River Along Mine	RR-14	24-Sep-03	RR-14-T01N-SFW-092403	Surface Water	T	8.7:	323:	27.5:					6.9:	337:		11.1:	27.3:
Surface Water Area 1-Red River Along Mine	RR-14	19-Oct-03	RR-14-T01N-SFW-101903	Surface Water	T		180:	22.5:					7:	348:		4.8:	4.4:
Surface Water Area 1-Red River Along Mine	RR-14	13-Jan-04	RR-14-T01N-SFW-011304	Surface Water	T	8.9:	54.9:	11.2:					7.3:	367:		0.2:	7.8:
Surface Water Area 1-Red River Along Mine	RR-14	24-Feb-04	RR-14-T01N-SFW-022404	Surface Water	T	10.6:	118:		-999:				6.4:	402:		2.5:	4.7:
Surface Water Area 1-Red River Along Mine	RR-14	19-Apr-04	RR-14-T01N-SFW-041904	Surface Water	T	10.9:	35.3:	53:					7.3:	245:		3.5:	21.2:
Surface Water Area 1-Red River Along Mine	RR-15	01-Oct-02	RR-15-T01N-SFW-100102	Surface Water	T	9.6:	279:	22.4:					6.8:	327:		10.5:	16.6:
Surface Water Area 1-Red River Along Mine	RR-15	21-Mar-03	RR-15-T01N-SFW-032103	Surface Water	T	11.2:	320:	14.5:					7.1:	811:		3.4:	46.7:
Surface Water Area 1-Red River Along Mine	RR-15	15-Jul-03	RR-15-T01N-SFW-071503	Surface Water	T	4.9:	328:	35.8:					6.1:	327:		10.6:	31.1:
Surface Water Area 1-Red River Along Mine	RR-15	24-Sep-03	RR-15-T01N-SFW-092403	Surface Water	T	9.4:	218:	24:					7.2:	340:		9.2:	17.6:
Surface Water Area 1-Red River Along Mine	RR-16	01-Oct-02	RR-16-T01N-SFW-100102	Surface Water	T	9.5:	299:	15.7:					6.8:	374:		9.1:	19.9:
Surface Water Area 1-Red River Along Mine	RR-16	19-Jan-03	RR-16-T01N-SFW-011903	Surface Water	T	10.9:	177:	8.9:					8.2:	498:		2:	7.4:
Surface Water Area 1-Red River Along Mine	RR-16	19-Mar-03	RR-16-T01N-SFW-031903	Surface Water	T		403:	11.7:					6.9:	430:		3.9:	85.4:
Surface Water Area 1-Red River Along Mine	RR-16	03-Apr-03	RR-16-T01N-SFW-040303	Surface Water	T	10.7:	394:	18.2:					6.9:	393:		2.4:	14.6:
Surface Water Area 1-Red River Along Mine	RR-16	15-Jul-03	RR-16-T01N-SFW-071503	Surface Water	T	9.1:	180:	23.8:					7.3:	337:		11.2:	1.3:
Surface Water Area 1-Red River Along Mine	RR-16	23-Sep-03	RR-16-T01N-SFW-092303	Surface Water	T	9.1:	321:	18.4:					7.6:	298:		12.1:	10.8:
Surface Water Area 1-Red River Along Mine	RR-16	19-Oct-03	RR-16-T01N-SFW-101903	Surface Water	T	11.6:	213:	19.1:					6.6:	352:		4.9:	5.5:
Surface Water Area 1-Red River Along Mine	RR-16	13-Jan-04	RR-16-T01N-SFW-011304	Surface Water	T	9:	54.5:	10.1:					7.4:	372:		0.11:	8.6:
Surface Water Area 1-Red River Along Mine	RR-16	19-Apr-04	RR-16-T01N-SFW-041904	Surface Water	T	11.3:	89.3:	43:					7.4:	246:		2.8:	22.8:
Surface Water Area 1-Red River Along Mine	RR-17	01-Oct-02	RR-17-T01N-SFW-100102	Surface Water	T	9.7:	365:	15.2:					6.6:	381:		9.1:	21.3:
Surface Water Area 1-Red River Along Mine	RR-17	19-Mar-03	RR-17-T01N-SFW-031903	Surface Water	T		392:	11.2:					7:	434:		4.1:	96.5:
Surface Water Area 1-Red River Along Mine	RR-17	15-Jul-03	RR-17-T01N-SFW-071503	Surface Water	T	8.7:	287:	10.2:					6.6:	345:		12.4:	2.2:
Surface Water Area 1-Red River Along Mine	RR-17	23-Sep-03	RR-17-T01N-SFW-092303	Surface Water	T	9.8:	343:	16.4:					7.4:	300:		12.1:	14.6:
Surface Water Area 1-Red River Along Mine	RR-18A	01-Oct-02	RR-18A-T01N-SFW-100102	Surface Water	T	9.9:	393:	14.6:					6.3:	380:		8.9:	30.4:
Surface Water Area 1-Red River Along Mine	RR-18A	19-Mar-03	RR-18A-T01N-SFW-031903	Surface Water	T		400:	9.4:					6.5:	435:		3.9:	86:
Surface Water Area 1-Red River Along Mine	RR-18A	16-Jul-03	RR-18A-T01N-SFW-071603	Surface Water	T	8.6:	302:	12.1:					7.4:	347:		13.3:	2.6:
Surface Water Area 1-Red River Along Mine	RR-18A	23-Sep-03	RR-18A-T01N-SFW-092303	Surface Water	T	9.4:	280:	19:					7.4:	299:		11.9:	101:
Surface Water Area 1-Red River Along Mine	RR-18B	30-Sep-02	RR-18B-T01N-SFW-093002	Surface Water	T	8.6:	341:	14.4:					7.7:	354:		15.1:	21.6:
Surface Water Area 1-Red River Along Mine	RR-18B	19-Mar-03	RR-18B-T01N-SFW-031903	Surface Water	T		297:	13.4:					6.5:	439:		2:	84.6:
Surface Water Area 1-Red River Along Mine	RR-18B	16-Jul-03	RR-18B-T01N-SFW-071603	Surface Water	T	8.7:	342:	10.5:					6.9:	348:		12.7:	2.5:
Surface Water Area 1-Red River Along Mine	RR-18B	23-Sep-03	RR-18B-T01N-SFW-092303	Surface Water	T	9.4:	471:	20:					7.5:	301:		9.3:	11.2:
Surface Water Area 1-Red River Along Mine	RR-20	30-Sep-02	RR-20-T01N-SFW-093002	Surface Water	T	9:	344:	18.9:					6.7:	357:		14.6:	22.7:
Surface Water Area 1-Red River Along Mine	RR-20	21-Mar-03	RR-20-T01N-SFW-032103	Surface Water	T	9.3:	251:	15.4:					7.1:	472:		8.8:	17.6:
Surface Water Area 1-Red River Along Mine	RR-20	15-Jul-03	RR-20-T01N-SFW-071503	Surface Water	T	7.9:	217:	15.3:					6.8:	332:		16.8:	2.9:
Surface Water Area 1-Red River Along Mine	RR-20	23-Sep-03	RR-20-T01N-SFW-092303	Surface Water	T	10.6:	350:	22:					6.7:	312:		8.7:	15.7:
Surface Water Area 1-Red River Along Mine	RR-7	04-Oct-02	RR-7-T01N-SFW-100402	Surface Water	T	9.4:	348:	12.4:					6.7:	319:		10.2:	8.8:
Surface Water Area 1-Red River Along Mine	RR-7	21-Jan-03	RR-7-T01N-SFW-012103	Surface Water	T	10.8:	388:	3.9:					6.7:	365:		0.42:	0:
Surface Water Area 1-Red River Along Mine	RR-7	21-Mar-03	RR-7-T01N-SFW-032103	Surface Water	T	11.9:	277:	9.1:					7.2:	647:		1.4:	34.3:
Surface Water Area 1-Red River Along Mine	RR-7	03-Apr-03	RR-7-T01N-SFW-040303	Surface Water	T	9.5:	284:	14.8:					8.2:	317:		5.9:	11.5:
Surface Water Area 1-Red River Along Mine	RR-7	15-Jul-03	RR-7-T01N-SFW-071503	Surface Water	T	8.6:	90.8:	18:					8.6:	244:		15.1:	0:
Surface Water Area 1-Red River Along Mine	RR-7	24-Sep-03	RR-7-T01N-SFW-092403	Surface Water	T	9.6:	317:	15.9:					7.4:	281:		8.4:	7:
Surface Water Area 1-Red River Along Mine	RR-7	19-Oct-03	RR-7-T01N-SFW-101903	Surface Water	T	8.9:	281:	17.1:					7.8:	278:		9.7:	2.8:
Surface Water Area 1-Red River Along Mine	RR-7	13-Jan-04	RR-7-T01N-SFW-011304	Surface Water	T	8.5:	184:		-999:				7.9:	313:		1.2:	8.3:
Surface Water Area 1-Red River Along Mine	RR-7	24-Feb-04	RR-7-T01N-SFW-022404	Surface Water	T	10.9:	93:		-999:				7.8:	335:		2.3:	3.1:
Surface Water Area 1-Red River Along Mine	RR-7	19-Apr-04	RR-7-T01N-SFW-041904	Surface Water	T	8.6:	192:	10.4:					8:	224:		9.3:	10.4:
Surface Water Area 1-Red River Along Mine	RR-8	04-Oct-02	RR-8-T01N-SFW-100402	Surface Water	T	9.8:	310:	13.1:					7.5:	316:		8.9:	11.5:
Surface Water Area 1-Red River Along Mine	RR-8	21-Mar-03	RR-8-T01N-SFW-032103	Surface Water	T	10.6:	260:	6.8:					7.6:	337:		1.4:	78.9:
Surface Water Area 1-Red River Along Mine	RR-8	15-Jul-03	RR-8-T01N-SFW-071503	Surface Water	T	8.5:	100:	17.1:					8.8:	245:		14.6:	0:
Surface Water Area 1-Red River Along Mine	RR-8	24-Sep-03	RR-8-T01N-SFW-092403	Surface Water	T	10:	330:	14.1:					6.9:	285:		7.1:	10.2:
Surface Water Area 1-Red River Along Mine	RR-8A	04-Oct-02	RR-8A-T01N-SFW-100402	Surface Water	T	11.1:	346:	11.4:					6.7:	321:		5:	16.5:
Surface Water Area 1-Red River Along Mine	RR-8A	21-Mar-03	RR-8A-T01N-SFW-032103	Surface Water	T	10.6:	257:	6.7:					6.9:	350:		1.1:	76.1:
Surface Water Area 1-Red River Along Mine	RR-8A	15-Jul-03	RR-8A-T01N-SFW-071503	Surface Water	T	8.7:	111:	18.7:					8.7:	245:		13.6:	0:
Surface Water Area 1-Red River Along Mine	RR-8A	24-Sep-03	RR-8A-T01N-SFW-092403	Surface Water	T	8.4:	158:	16:					7.9:	326:		12.8:	4.8:
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	27-Sep-02	LR-11A-T01N-SFW-092702	Surface Water	T		214:	20.5:					6.7:	494:		14.7:	24.1:
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	20-Mar-03	LR-11A-T01N-SFW-032003	Surface Water	T	11.1:	279:	15.7:					7:	565:		3.5:	40.1:
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	14-Jul-03	LR-11A-T01N-SFW-071403	Surface Water	T	8.2:	25.3:	23.1:					7.5:	401:		18.3:	0:
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	23-Sep-03	LR-11A-T01N-SFW-092303	Surface Water	T	8.5:	99.3:	26.4:					7.5:	469:		12.7:	7.6:
Surface Water Area 11-Red River Along Tailings Facility	LR-13	26-Sep-02	LR-13-T01N-SFW-092602	Surface Water	T		234:	21.4:					6.8:	487:		15.1:	26.5:
Surface Water Area 11-Red River Along Tailings Facility	LR-13	20-Mar-03	LR-13-T01N-SFW-032003	Surface Water	T	9.4:	98.2:	15:					8.1:	500:		9.5:	69.7:
Surface Water Area 11-Red River Along Tailings Facility	LR-13	14-Jul-03	LR-13-T01N-SFW-071403	Surface Water	T	8.8:	270:	21.7:					6.8:	420:		17.4:	0.2:
Surface Water Area 11-Red River Along Tailings Facility	LR-13	21-Sep-03	LR-13-T01N-SFW-092103	Surface Water	T	10.4:	342:	37.9:					5.8:	385:		9.4:	10.3:
Surface Water Area 11-Red River Along Tailings Facility	LR-16	26-Sep-02	LR-16-T01N-SFW-092602	Surface Water	T		264:	21.5:					6.4:	488:		14.6:	24.1:
Surface Water Area 11-Red River Along Tailings Facility	LR-16	20-Mar-03	LR-16-T01N-SFW-032003	Surface Water	T	9.5:	152:	15.9:					8.1:	496:		8.3:	68.2:

Surface Water Area 11-Red River Along Tailings Facility	LR-16	14-Jul-03	LR-16-T01N-SFW-071403	Surface Water	T	8.6:	326:	24:					8.4:	413:		17.4:	1.8:
Surface Water Area 11-Red River Along Tailings Facility	LR-16	21-Sep-03	LR-16-T01N-SFW-092103	Surface Water	T	9.9:	306:	38.2:					6.4:	387:		8.5:	15.1:
Surface Water Area 11-Red River Along Tailings Facility	LR-5	30-Sep-02	LR-5-T01N-SFW-093002	Surface Water	T	9.7:	328:	21.8:					7.5:	366:		11.9:	22.1:
Surface Water Area 11-Red River Along Tailings Facility	LR-5	21-Mar-03	LR-5-T01N-SFW-032103	Surface Water	T	10:	302:	17.3:					7:	481:		6.5:	19.5:
Surface Water Area 11-Red River Along Tailings Facility	LR-5	15-Jul-03	LR-5-T01N-SFW-071503	Surface Water	T	9:	153:	21.5:					6.9:	345:		12.4:	2.7:
Surface Water Area 11-Red River Along Tailings Facility	LR-5	23-Sep-03	LR-5-T01N-SFW-092303	Surface Water	T	8.2:	49.2:	21.8:					7.5:	407:		13.6:	5.5:
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	27-Sep-02	LR-8A-T01N-SFW-092702	Surface Water	T	7.9:	235:	18.1:					6.2:	487:		14.4:	41.7:
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	23-Mar-03	LR-8A-T01N-SFW-032303	Surface Water	T	9.7:	299:	17.1:					7:	141:		9.3:	89.5:
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	15-Jul-03	LR-8A-T01N-SFW-071503	Surface Water	T	9.1:	178:	19.7:					6.7:	358:		12.3:	2.3:
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	23-Sep-03	LR-8A-T01N-SFW-092303	Surface Water	T	8.2:	81.7:	22.9:					7.4:	423:		13.2:	6.9:
Reference Lower Cabresto Creek Riparian	RRS-18	06-Oct-02	RRS-18-T01N-SFW-100602	Surface Water	T					<0.31:		<0.005J			48.1:		
Reference Lower Cabresto Creek Riparian	RRS-18	23-Mar-03	RRS-18-T01N-SFW-032303	Surface Water	T					0.36:		<0.005J			40.8:		
Reference Lower Cabresto Creek Riparian	RRS-18	25-Sep-03	RRS-18-T01N-SFW-092503	Surface Water	T					0.32:		<0.005J			33.7J		
Reference Lower Cabresto Creek Riparian	RRS-20	06-Oct-02	RRS-20-T01N-SFW-100602	Surface Water	T					<0.38:		<0.005J			52.1:		
Reference Lower Cabresto Creek Riparian	RRS-20	23-Mar-03	RRS-20-T01N-SFW-032303	Surface Water	T					0.35:		<0.005J			39.9:		
Reference Lower Cabresto Creek Riparian	RRS-20	16-Jul-03	RRS-20-T01N-SFW-071603	Surface Water	T					<0.35J		<0.005J			38.2:		
Reference Lower Cabresto Creek Riparian	RRS-20	25-Sep-03	RRS-20-T01N-SFW-092503	Surface Water	T					0.34:		<0.005:			26.7J		
Reference Lower Cabresto Creek Riparian	RRS-23	06-Oct-02	RRS-23-T01N-SFW-100602	Surface Water	T					0.48:		<0.005J			55.8:		
Reference Lower Cabresto Creek Riparian	RRS-23	23-Mar-03	RRS-23-T01N-SFW-032303	Surface Water	T					0.36:		<0.005J			41.9:		
Reference Lower Cabresto Creek Riparian	RRS-23	16-Jul-03	RRS-23-T01N-SFW-071603	Surface Water	T					<0.5J		<0.005J			54:		
Reference Lower Cabresto Creek Riparian	RRS-23	25-Sep-03	RRS-23-T01N-SFW-092503	Surface Water	T					0.34:		<0.005:			34.5J		
Reference Lower Cabresto Creek Riparian	RRS-27	06-Oct-02	RRS-27-T01N-SFW-100602	Surface Water	T					<0.24:		<0.005J			98.3:		
Reference Lower Cabresto Creek Riparian	RRS-27	23-Mar-03	RRS-27-T01N-SFW-032303	Surface Water	T					0.36:		<0.005J			52.2:		
Reference Lower Cabresto Creek Riparian	RRS-27	16-Jul-03	RRS-27-T01N-SFW-071603	Surface Water	T					<0.43J		<0.005J			55.7:		
Reference Lower Cabresto Creek Riparian	RRS-27	25-Sep-03	RRS-27-T01N-SFW-092503	Surface Water	T					0.39:		<0.005:			35.9J		
Reference Red River Above Mine Site	RR-1	04-Oct-02	RR-1-T01N-SFW-100402	Surface Water	T					<0.2:		<0.005J			21.5:		
Reference Red River Above Mine Site	RR-1	21-Mar-03	RR-1-T01N-SFW-032103	Surface Water	T					<0.1:		<0.005J			15.6:		
Reference Red River Above Mine Site	RR-1	16-Jul-03	RR-1-T01N-SFW-071603	Surface Water	T					<0.1J		<0.005J			18.2:		
Reference Red River Above Mine Site	RR-1	25-Sep-03	RR-1-T01N-SFW-092503	Surface Water	T					<0.1:		<0.005J			19.6J		
Reference Red River Above Mine Site	RR-3	03-Oct-02	RR-3-T01N-SFW-100302	Surface Water	T					<0.2:		<0.005J			47.4:		
Reference Red River Above Mine Site	RR-3	21-Mar-03	RR-3-T01N-SFW-032103	Surface Water	T					0.3:		<0.005J			68.1:		
Reference Red River Above Mine Site	RR-3	16-Jul-03	RR-3-T01N-SFW-071603	Surface Water	T					<0.2J		<0.005J			40.1:		
Reference Red River Above Mine Site	RR-3	25-Sep-03	RR-3-T01N-SFW-092503	Surface Water	T					0.2:		<0.005J			40.6J		
Reference Red River Above Mine Site	RR-4	04-Oct-02	RR-4-T01N-SFW-100402	Surface Water	T					<0.4:		<0.005J			62:		
Reference Red River Above Mine Site	RR-4	21-Mar-03	RR-4-T01N-SFW-032103	Surface Water	T					0.34:		<0.005:			65.6:		
Reference Red River Above Mine Site	RR-4	16-Jul-03	RR-4-T01N-SFW-071603	Surface Water	T					<0.25J		<0.005J			46.8:		
Reference Red River Above Mine Site	RR-4	25-Sep-03	RR-4-T01N-SFW-092503	Surface Water	T					0.22:		<0.005J			46J		
Reference Red River Above Mine Site	RR-5	03-Oct-02	RR-5-T01N-SFW-100302	Surface Water	T					<0.34:		0.008J			67.9:		
Reference Red River Above Mine Site	RR-5	21-Mar-03	RR-5-T01N-SFW-032103	Surface Water	T					0.36:		0.014:			72.4:		
Reference Red River Above Mine Site	RR-5	16-Jul-03	RR-5-T01N-SFW-071603	Surface Water	T					<0.25J		<0.005J			50.6:		
Reference Red River Above Mine Site	RR-5	24-Sep-03	RR-5-T01N-SFW-092403	Surface Water	T					0.26:		0.0052J			45.2J		
Reference Red River Above Mine Site	RR-6	04-Oct-02	RR-6-T01N-SFW-100402	Surface Water	T					<0.37:		<0.005J			90.1:		
Reference Red River Above Mine Site	RR-6	21-Mar-03	RR-6-T01N-SFW-032103	Surface Water	T					0.46:		0.031J			96.8:		
Reference Red River Above Mine Site	RR-6	16-Jul-03	RR-6-T01N-SFW-071603	Surface Water	T					<0.31J		<0.005J			65.5:		
Reference Red River Above Mine Site	RR-6	24-Sep-03	RR-6-T01N-SFW-092403	Surface Water	T					0.32:		<0.005J			74.3J		
Reference Red River Above Mine Site	RR-6A	04-Oct-02	RR-6A-T01N-SFW-100402	Surface Water	T					<0.36:		<0.005J			92.8:		
Reference Red River Above Mine Site	RR-6A	21-Mar-03	RR-6A-T01N-SFW-032103	Surface Water	T					0.42:		0.013J			105:		
Reference Red River Above Mine Site	RR-6A	15-Jul-03	RR-6A-T01N-SFW-071503	Surface Water	T					<0.89J		<0.005:			72.5:		
Reference Red River Above Mine Site	RR-6A	24-Sep-03	RR-6A-T01N-SFW-092403	Surface Water	T					0.3:		<0.005J			66.9J		
Reference Red River Above Mine Site	RR-6V	16-Jul-03	RR-6V-T01N-SFW-071603	Surface Water	T					<0.26J		0.0092J			49.8:		
Reference Red River Above Mine Site	RR-6V	24-Sep-03	RR-6V-T01N-SFW-092403	Surface Water	T					0.27:		<0.005J			49.8J		
Reference Red River Above Mine Site	Zwergle	07-Oct-02	ZWERGEL-T01N-SFW-100702	Surface Water	T					<0.21:		<0.005J			23.3:		
Reference Red River Above Mine Site	Zwergle	23-Mar-03	ZWERGEL-T01N-SFW-032303	Surface Water	T					<0.1:		<0.005J			12.7:		
Reference Red River Above Mine Site	Zwergle	16-Jul-03	ZWERGEL-T01N-SFW-071603	Surface Water	T					<0.1J		<0.005:			19.1:		
Reference Red River Above Mine Site	ZWERGLE	25-Sep-03	ZWERGEL-T01N-SFW-092503	Surface Water	T					<0.1:		<0.005J			21.6J		
Reference Upper Cabresto Creek Riparian	RRS-12	07-Oct-02	RRS-12-T01N-SFW-100702	Surface Water	T					0.47:		<0.005J			65.1:		
Reference Upper Cabresto Creek Riparian	RRS-12	23-Mar-03	RRS-12-T01N-SFW-032303	Surface Water	T					0.47:		<0.005J			55:		
Reference Upper Cabresto Creek Riparian	RRS-12	16-Jul-03	RRS-12-T01N-SFW-071603	Surface Water	T					<0.51:		<0.005:			54.8:		
Reference Upper Cabresto Creek Riparian	RRS-12	25-Sep-03	RRS-12-T01N-SFW-092503	Surface Water	T					0.53:		<0.005:			50.8J		
Reference Upper Cabresto Creek Riparian	RRS-13	06-Oct-02	RRS-13-T01N-SFW-100602	Surface Water	T					0.53:		<0.005J			33.6:		
Reference Upper Cabresto Creek Riparian	RRS-13	23-Mar-03	RRS-13-T01N-SFW-032303	Surface Water	T					0.32:		<0.005J			32:		
Reference Upper Cabresto Creek Riparian	RRS-13	16-Jul-03	RRS-13-T01N-SFW-071603	Surface Water	T					<0.29J		<0.005J			19.1:		
Reference Upper Cabresto Creek Riparian	RRS-13	25-Sep-03	RR-13-T01N-SFW-092503	Surface Water	T					0.3:		<0.005J			20.5J		
Reference Upper Cabresto Creek Riparian	RRS-15	06-Oct-02	RRS-15-T01N-SFW-100602	Surface Water	T					0.44:		<0.005J			36:		
Reference Upper Cabresto Creek Riparian	RRS-15	23-Mar-03	RRS-15-T01N-SFW-032303	Surface Water	T					0.32:		<0.005J			32.7:		
Reference Upper Cabresto Creek Riparian	RRS-15	16-Jul-03	RRS-15-T01N-SFW-071603	Surface Water	T					<0.28J		<0.005:			19.8:		
Reference Upper Cabresto Creek Riparian	RRS-15	25-Sep-03	RRS-15-T01N-SFW-092503	Surface Water	T					0.29:		<0.005J			26.9J		
Reference Upper Cabresto Creek Riparian	RRS-9	07-Oct-02	RRS-9-T01N-SFW-100702	Surface Water	T					<0.23:		<0.005J			26.1:		
Reference Upper Cabresto Creek Riparian	RRS-9	23-Mar-03	RRS-9-T01N-SFW-032303	Surface Water	T					0.21:		<0.005J			23:		
Reference Upper Cabresto Creek Riparian	RRS-9	16-Jul-03	RRS-9-T01N-SFW-071603	Surface Water	T					<0.2J		<0.005:			17.2:		
Reference Upper Cabresto Creek Riparian	RRS-9	25-Sep-03	RRS-9-T01N-SFW-092503	Surface Water	T					0.21:		<0.005:			19.2J		
Reference Upper Cabresto Creek Riparian	UPPER CABRESTO CREEK	23-Mar-03	UCC-T01N-SFW-032303	Surface Water	T					0.35:		<0.005J			36.5J		
Reference Upper Cabresto Creek Riparian	UPPER CABRESTO CREEK	16-Jul-03	UPPERCABRESTO-T01N-SFW-071603	Surface Water	T					<0.32J		<0.005J			33.4:		
Reference Upper Cabresto Creek Riparian	UPPER CABRESTO CREEK	25-Sep-03	UPPERCABRESTO-T01N-SFW-092503	Surface Water	T					0.3:		<0.005J			23.2J		
Surface Water Area 1-Red River Along Mine	LR-1	30-Sep-02	LR-1-T01N-SFW-093002	Surface Water	T					0.76:		<0.005J			134:		
Surface Water Area 1-Red River Along Mine	LR-1	20-Mar-03	LR-1-T01N-SFW-032003	Surface Water	T					1:		0.0079J			143:		
Surface Water Area 1-Red River Along Mine	LR-1	15-Jul-03	LR-1-T01N-SFW-071503	Surface Water	T					<0.93J		<0.005:			113:		
Surface Water Area 1-Red River Along Mine	LR-1	24-Sep-03	LR-1-T01N-SFW-092403	Surface Water	T					0.81:		<0.005J			107J		
Surface Water Area 1-Red River Along Mine	RR-10	03-Oct-02	RR-10-T01N-SFW-100302	Surface Water	T					0.45:		0.006:			94.3:		
Surface Water Area 1-Red River Along Mine	RR-10	21-Jan-03	RR-10-T01N-SFW-012103	Surface Water	T					0.41:		<0.005J			104J		
Surface Water Area 1-Red River Along Mine	RR-10	20-Mar-03	RR-10-T01N-SFW-032003	Surface Water	T					0.47:		0.023J			109:		
Surface Water Area 1-Red River Along Mine	RR-10	03-Apr-03	RR-10-T01N-SFW-040303	Surface Water	T					0.38:		<0.005:			85.5J		
Surface Water Area 1-Red River Along Mine	RR-10	15-Jul-03	RR-10-T01N-SFW-071503	Surface Water	T					<0.31J		<0.005J			60.4:		
Surface Water Area 1-Red River Along Mine	RR-10	24-Sep-03	RR-10-T01N-SFW-092403	Surface Water	T					0.32:		<0.005J			76.8J		
Surface Water Area 1-Red River Along Mine	RR-10	19-Oct-03	RR-10-T01N-SFW-101903	Surface Water	T					0.38:		<0.005:			82.6J		
Surface Water Area 1-Red River Along Mine	RR-10	13-Jan-04	RR-10-T01N-SFW-011304	Surface Water	T					0.42:		0.022:			89.2:		
Surface Water Area 1-Red River Along Mine	RR-10	24-Feb-04	RR-10-T01N-SFW-022404	Surface Water	T					0.49:					102:		
Surface Water Area 1-Red River Along Mine	RR-10	19-Apr-04	RR-10-T01N-SFW-041904	Surface Water	T					0.3:		<0.005:			49.7:		
Surface Water Area 1-Red River Along Mine	RR-10A1	03-Oct-02	RR-10A1-T01N-SFW-100302	Surface Water	T					<0.27:		0.006J			75.5:		
Surface Water Area 1-Red River Along Mine	RR-10A1	20-Jan-03	RR-10A1-T01N-SFW-012003	Surface Water	T					0.46:		0.0093J			103J		
Surface Water Area 1-Red River Along Mine	RR-10A1	20-Mar-03	RR-10A1-T01N-SFW-032003	Surface Water	T					0.44:		0.017J			84.7:		
Surface Water Area 1-Red River Along Mine	RR-10A1	03-Apr-03	RR-10A1-T01N-SFW-040303	Surface Water	T					0.35:		<0.005:			63.5J		
Surface Water Area 1-Red River Along Mine	RR-10A1	15-Jul-03	RR-10A1-T01N-SFW-071503	Surface Water	T					<0.28J		<0.005J			51.8:		
Surface Water Area 1-Red River Along Mine	RR-10A1	24-Sep-03	RR-10A1-T01N-SFW-092403	Surface Water	T					0.31:		<0.005J			69.3J		
Surface Water Area 1-Red River Along Mine	RR-10A1	19-Oct-03	RR-10A1-T01N-SFW-101903	Surface Water	T					0.36:		<0.005:			82.6J		
Surface Water Area 1-Red River Along Mine	RR-10A1	13-Jan-04	RR-10A1-T01N-SFW-011304	Surface Water	T					0.38:		0.019:			79.5:		
Surface Water Area 1-Red River Along Mine	RR-10A1	19-Apr-04	RR-10A1-T01N-SFW-041904	Surface Water	T					0.48:		<0.005:			62.1:		
Surface Water Area 1-Red River Along Mine	RR-11A1	03-Oct-02	RR-11A1-T01N-SFW-100302	Surface Water	T					<0.25:		0.006J			73.8:		
Surface Water Area 1-Red River Along Mine	RR-11A1	20-Jan-03	RR-11A1-T01N-SFW-012003	Surface Water	T					0.42:		<0.005J			85.6J		
Surface Water Area 1-Red River Along Mine	RR-11A1	21-Mar-03	RR-11A1-T01N-SFW-032103	Surface Water	T					0.39:		0.012:			80.3:		
Surface Water Area 1-Red River Along Mine	RR-11A1	03-Apr-03	RR-11A1-T01N-SFW-040303	Surface Water	T					0.35:		<0.005J			65.2J		
Surface Water Area 1-Red River Along Mine	RR-11A1	15-Jul-03	RR-11A1-T01N-SFW-071503	Surface Water	T					<0.34J		<0.005J			54.1:		
Surface Water Area 1-Red River Along Mine	RR-11A1	24-Sep-03	RR-11A1-T01N-SFW-092403	Surface Water	T					0.31:		<0.005J			51.5J		
Surface Water Area 1-Red River Along Mine	RR-11A1	19-Oct-03	RR-11A1-T01N-SFW-101903	Surface Water	T					0.35:		<0.005J			75.7J		
Surface Water Area 1-Red River Along Mine	RR-11A1	13-Jan-04	RR-11A1-T01N-SFW-011304	Surface Water	T					0.38:		0.016:			79.8:		
Surface Water Area 1-Red River Along Mine	RR-11A1	19-Apr-04	RR-11A1-T01N-SFW-041904	Surface Water	T					0.29:		<0.005:			43.5:		
Surface Water Area 1-Red River Along Mine	RR-11B	03-Oct-02	RR-11B-T01N-SFW-100302	Surface Water	T					0.5:		0.006J			79.2:		
Surface Water Area 1-Red River Along Mine	RR-11B	20-Mar-03	RR-11B-T01N-SFW-032003	Surface Water	T					0.78:		0.015J			102:		
Surface Water Area 1-Red River Along Mine	RR-11B	15-Jul-03	RR-11B-T01N-SFW-071503	Surface Water	T					<0.3J		<0.005:			72.9:		
Surface Water Area 1-Red River Along Mine	RR-11B	24-Sep-03	RR-11B-T01N-SFW-092403	Surface Water	T					0.49:		<0.005J			73.4J		
Surface Water Area 1-Red River Along Mine	RR-11C	01-Oct-02	RR-11C-T01N-SFW-100102	Surface Water	T					0.48:		<0.005:			121:		
Surface Water Area 1-Red River Along Mine	RR-11C	20-Jan-03	RR-11C-T01N-SFW-012003	Surface Water	T					0.91:		0.0054J			186J		
Surface Water Area 1-Red River Along Mine	RR-11C	20-Mar-03	RR-11C-T01N-SFW-032003	Surface Water	T					0.87:		0.0085J			139:		
Surface Water Area 1-Red River Along Mine	RR-11C	03-Apr-03	RR-11C-T01N-SFW-040303	Surface Water	T					0.65:		<0.005J			112J		
Surface Water Area 1-Red River Along Mine	RR-11C	15-Jul-03	RR-11C-T01N-SFW-071503	Surface Water	T					<0.71J		<0.005J			99.6:		
Surface Water Area 1-Red River Along Mine	RR-11C	25-Sep-03	RR-11C-T01N-SFW-092503	Surface Water	T					0.58:		<0.005:			87.1J		
Surface Water Area 1-Red River Along Mine	RR-11C	19-Oct-03	RR-11C-T01N-SFW-101903	Surface Water	T					0.72:		<0.005J			96.9J		
Surface Water Area 1-Red River Along Mine	RR-11C	13-Jan-04	RR-11C-T01N-SFW-011304	Surface Water	T					0.79:		0.011J			127:		
Surface Water Area 1-Red River Along Mine	RR-11C	19-Apr-04	RR-11C-T01N-SFW-041904	Surface Water	T					0.38:		<0.005:			53.6:		
Surface Water Area 1-Red River Along Mine	RR-12	03-Oct-02	RR-12-T01N-SFW-100302	Surface Water	T					<0.25:		0.005J			119:		
Surface Water Area 1-Red River Along Mine	RR-12	20-Jan-03	RR-12-T01N-SFW-012003	Surface Water	T					0.95:		0.0062J			155J		
Surface Water Area 1-Red River Along Mine	RR-12	20-Mar-03	RR-12-T01N-SFW-032003	Surface Water	T					0.83:		0.0086J			138:		
Surface Water Area 1-Red River Along Mine	RR-12	03-Apr-03	RR-12-T01N-SFW-040303	Surface Water	T					0.67:		<0.005J			110J		
Surface Water Area 1-Red River Along Mine	RR-12	15-Jul-03	RR-12-T01N-SFW-071503	Surface Water	T					<0.7J		<0.005J			86.9:		
Surface Water Area 1-Red River Along Mine	RR-12	24-Sep-03	RR-12-T01N-SFW-092403	Surface Water	T					0.61:		<0.005J			95.1J		
Surface Water Area 1-Red River Along Mine	RR-12	19-Oct-03	RR-12-T01N-SFW-101903	Surface Water	T					1.8:		<0.005J			95J		
Surface Water Area 1-Red River Along Mine	RR-12	13-Jan-04	RR-12-T01N-SFW-011304	Surface Water	T					0.81:		0.008J			157:		
Surface Water Area 1-Red River Along Mine	RR-12	19-Apr-04	RR-12-T01N-SFW-041904	Surface Water	T					0.38:		<0.005J			51.2:		
Surface Water Area 1-Red River Along Mine	RR-13	01-Oct-02	RR-13-T01N-SFW-100102	Surface Water	T					<0.36:		<0.005:			126:		
Surface Water Area 1-Red River Along Mine	RR-13	20-Jan-03	RR-13-T01N-SFW-012003	Surface Water	T					0.92:		0.0093J			152J		
Surface Water Area 1-Red River Along Mine	RR-13	20-Mar-03	RR-13-T01N-SFW-032003	Surface Water	T					0.93:		0.008J			145:		
Surface Water Area 1-Red River Along Mine	RR-13	03-Apr-03	RR-13-T01N-SFW-040303	Surface Water	T					0.68:		<0.005J			117J		
Surface Water Area 1-Red River Along Mine	RR-13	15-Jul-03	RR-13-T01N-SFW-071503	Surface Water	T					<0.74J		<0.005J			94.8:		
Surface Water Area 1-Red River Along Mine	RR-13	24-Sep-03	RR-13-T01N-SFW-092403	Surface Water	T					0.63:		<0.005J			88.4J		
Surface Water Area 1-Red River Along Mine	RR-13	19-Oct-03	RR-13-T01N-SFW-101903	Surface Water	T					0.75:		<0.005J			108J		

Surface Water Area 1-Red River Along Mine	RR-13	13-Jan-04	RR-13-T01N-SFW-011304	Surface Water	T					0.78:		0.01J			123:		
Surface Water Area 1-Red River Along Mine	RR-13	19-Apr-04	RR-13-T01N-SFW-041904	Surface Water	T					0.4:		<0.005J			54.3:		
Surface Water Area 1-Red River Along Mine	RR-14	01-Oct-02	RR-14-T01N-SFW-100102	Surface Water	T					0.65:		<0.005:			133:		
Surface Water Area 1-Red River Along Mine	RR-14	19-Jan-03	RR-14-T01N-SFW-011903	Surface Water	T					1.1:		<0.005J			185J		
Surface Water Area 1-Red River Along Mine	RR-14	20-Mar-03	RR-14-T01N-SFW-032003	Surface Water	T					0.96:		0.012J			162:		
Surface Water Area 1-Red River Along Mine	RR-14	03-Apr-03	RR-14-T01N-SFW-040303	Surface Water	T					0.74:		<0.005J			120J		
Surface Water Area 1-Red River Along Mine	RR-14	15-Jul-03	RR-14-T01N-SFW-071503	Surface Water	T					<0.3J		<0.005J			104:		
Surface Water Area 1-Red River Along Mine	RR-14	24-Sep-03	RR-14-T01N-SFW-092403	Surface Water	T					0.69:		<0.005J			93.7J		
Surface Water Area 1-Red River Along Mine	RR-14	19-Oct-03	RR-14-T01N-SFW-101903	Surface Water	T					0.79:		<0.005J			111J		
Surface Water Area 1-Red River Along Mine	RR-14	13-Jan-04	RR-14-T01N-SFW-011304	Surface Water	T					0.81:		0.011J			126:		
Surface Water Area 1-Red River Along Mine	RR-14	24-Feb-04	RR-14-T01N-SFW-022404	Surface Water	T					0.87:					142:		
Surface Water Area 1-Red River Along Mine	RR-14	19-Apr-04	RR-14-T01N-SFW-041904	Surface Water	T					0.45:		<0.005J			59.7:		
Surface Water Area 1-Red River Along Mine	RR-15	01-Oct-02	RR-15-T01N-SFW-100102	Surface Water	T					1.1:		<0.005:			135:		
Surface Water Area 1-Red River Along Mine	RR-15	21-Mar-03	RR-15-T01N-SFW-032103	Surface Water	T					0.96:		0.0079:			146:		
Surface Water Area 1-Red River Along Mine	RR-15	15-Jul-03	RR-15-T01N-SFW-071503	Surface Water	T					<0.8J		<0.005J			104:		
Surface Water Area 1-Red River Along Mine	RR-15	24-Sep-03	RR-15-T01N-SFW-092403	Surface Water	T					0.69:		<0.005J			97.8J		
Surface Water Area 1-Red River Along Mine	RR-16	01-Oct-02	RR-16-T01N-SFW-100102	Surface Water	T					0.73:		<0.005:			143:		
Surface Water Area 1-Red River Along Mine	RR-16	19-Jan-03	RR-16-T01N-SFW-011903	Surface Water	T					1.1:		0.009J			186J		
Surface Water Area 1-Red River Along Mine	RR-16	19-Mar-03	RR-16-T01N-SFW-031903	Surface Water	T					1:		0.0083:			148:		
Surface Water Area 1-Red River Along Mine	RR-16	03-Apr-03	RR-16-T01N-SFW-040303	Surface Water	T					0.81:		<0.005J			124J		
Surface Water Area 1-Red River Along Mine	RR-16	15-Jul-03	RR-16-T01N-SFW-071503	Surface Water	T					<0.81:		<0.005J			104:		
Surface Water Area 1-Red River Along Mine	RR-16	23-Sep-03	RR-16-T01N-SFW-092303	Surface Water	T					0.72:		<0.005:			94.1J		
Surface Water Area 1-Red River Along Mine	RR-16	19-Oct-03	RR-16-T01N-SFW-101903	Surface Water	T					0.86:		<0.005J			111J		
Surface Water Area 1-Red River Along Mine	RR-16	13-Jan-04	RR-16-T01N-SFW-011304	Surface Water	T					0.91:		0.012J			131:		
Surface Water Area 1-Red River Along Mine	RR-16	19-Apr-04	RR-16-T01N-SFW-041904	Surface Water	T					0.3:		<0.005J			43.3:		
Surface Water Area 1-Red River Along Mine	RR-17	01-Oct-02	RR-17-T01N-SFW-100102	Surface Water	T					0.77:		<0.005:			148:		
Surface Water Area 1-Red River Along Mine	RR-17	19-Mar-03	RR-17-T01N-SFW-031903	Surface Water	T					1.1:		0.0084:			151:		
Surface Water Area 1-Red River Along Mine	RR-17	15-Jul-03	RR-17-T01N-SFW-071503	Surface Water	T					<0.93J		<0.005J			114:		
Surface Water Area 1-Red River Along Mine	RR-17	23-Sep-03	RR-17-T01N-SFW-092303	Surface Water	T					0.76:		<0.005:			97.8J		
Surface Water Area 1-Red River Along Mine	RR-18A	01-Oct-02	RR-18A-T01N-SFW-100102	Surface Water	T					0.72:		<0.005:			157:		
Surface Water Area 1-Red River Along Mine	RR-18A	19-Mar-03	RR-18A-T01N-SFW-031903	Surface Water	T					1.1:		0.01:			152:		
Surface Water Area 1-Red River Along Mine	RR-18A	16-Jul-03	RR-18A-T01N-SFW-071603	Surface Water	T					<0.9J		<0.005J			112:		
Surface Water Area 1-Red River Along Mine	RR-18A	23-Sep-03	RR-18A-T01N-SFW-092303	Surface Water	T					0.76:		<0.005:			100J		
Surface Water Area 1-Red River Along Mine	RR-18B	30-Sep-02	RR-18B-T01N-SFW-093002	Surface Water	T					0.76:		<0.005:			132:		
Surface Water Area 1-Red River Along Mine	RR-18B	19-Mar-03	RR-18B-T01N-SFW-031903	Surface Water	T					1:		0.01J			162:		
Surface Water Area 1-Red River Along Mine	RR-18B	16-Jul-03	RR-18B-T01N-SFW-071603	Surface Water	T					<0.9J		<0.005J			109:		
Surface Water Area 1-Red River Along Mine	RR-18B	23-Sep-03	RR-18B-T01N-SFW-092303	Surface Water	T					0.76:		<0.005J			104J		
Surface Water Area 1-Red River Along Mine	RR-20	30-Sep-02	RR-20-T01N-SFW-093002	Surface Water	T					0.67:		<0.005J			133:		
Surface Water Area 1-Red River Along Mine	RR-20	21-Mar-03	RR-20-T01N-SFW-032103	Surface Water	T					0.98:		0.0084:			148:		
Surface Water Area 1-Red River Along Mine	RR-20	15-Jul-03	RR-20-T01N-SFW-071503	Surface Water	T					<0.83J		<0.005:			115:		
Surface Water Area 1-Red River Along Mine	RR-20	23-Sep-03	RR-20-T01N-SFW-092303	Surface Water	T					0.76:		<0.005J			111J		
Surface Water Area 1-Red River Along Mine	RR-7	04-Oct-02	RR-7-T01N-SFW-100402	Surface Water	T					<0.36:		<0.005J			91.9:		
Surface Water Area 1-Red River Along Mine	RR-7	21-Jan-03	RR-7-T01N-SFW-012103	Surface Water	T					0.43:		<0.005J			109J		
Surface Water Area 1-Red River Along Mine	RR-7	21-Mar-03	RR-7-T01N-SFW-032103	Surface Water	T					0.43:		0.014J			99.4:		
Surface Water Area 1-Red River Along Mine	RR-7	03-Apr-03	RR-7-T01N-SFW-040303	Surface Water	T					0.36:		<0.005:			78.4J		
Surface Water Area 1-Red River Along Mine	RR-7	15-Jul-03	RR-7-T01N-SFW-071503	Surface Water	T					<0.88J		<0.005:			77.9:		
Surface Water Area 1-Red River Along Mine	RR-7	24-Sep-03	RR-7-T01N-SFW-092403	Surface Water	T					0.31:		<0.005J			69.3J		
Surface Water Area 1-Red River Along Mine	RR-7	19-Oct-03	RR-7-T01N-SFW-101903	Surface Water	T					0.36:		<0.005:			81.7J		
Surface Water Area 1-Red River Along Mine	RR-7	13-Jan-04	RR-7-T01N-SFW-011304	Surface Water	T					0.47:		0.02:			97.1:		
Surface Water Area 1-Red River Along Mine	RR-7	24-Feb-04	RR-7-T01N-SFW-022404	Surface Water	T					0.55:					99.5:		
Surface Water Area 1-Red River Along Mine	RR-7	19-Apr-04	RR-7-T01N-SFW-041904	Surface Water	T					0.29:		<0.005:			48.6:		
Surface Water Area 1-Red River Along Mine	RR-8	04-Oct-02	RR-8-T01N-SFW-100402	Surface Water	T					<0.36:		<0.005J			92.4:		
Surface Water Area 1-Red River Along Mine	RR-8	21-Mar-03	RR-8-T01N-SFW-032103	Surface Water	T					0.44:		0.014:			86.1:		
Surface Water Area 1-Red River Along Mine	RR-8	15-Jul-03	RR-8-T01N-SFW-071503	Surface Water	T					<0.1J		0.0057:			61:		
Surface Water Area 1-Red River Along Mine	RR-8	24-Sep-03	RR-8-T01N-SFW-092403	Surface Water	T					0.33:		<0.005J			73.7J		
Surface Water Area 1-Red River Along Mine	RR-8A	04-Oct-02	RR-8A-T01N-SFW-100402	Surface Water	T					<0.39:		<0.005J			92.8:		
Surface Water Area 1-Red River Along Mine	RR-8A	21-Mar-03	RR-8A-T01N-SFW-032103	Surface Water	T					0.42:		0.016:			91.8:		
Surface Water Area 1-Red River Along Mine	RR-8A	15-Jul-03	RR-8A-T01N-SFW-071503	Surface Water	T					<0.31J		<0.005J			75:		
Surface Water Area 1-Red River Along Mine	RR-8A	24-Sep-03	RR-8A-T01N-SFW-092403	Surface Water	T					0.32:		<0.005J			76.5J		
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	27-Sep-02	LR-11A-T01N-SFW-092702	Surface Water	T					0.8:		<0.005J			171:		
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	20-Mar-03	LR-11A-T01N-SFW-032003	Surface Water	T					0.98:		0.0098J			190:		
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	14-Jul-03	LR-11A-T01N-SFW-071403	Surface Water	T					<0.89J		<0.005:			141:		
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	23-Sep-03	LR-11A-T01N-SFW-092303	Surface Water	T					0.79:		<0.005:			126J		
Surface Water Area 11-Red River Along Tailings Facility	LR-13	26-Sep-02	LR-13-T01N-SFW-092602	Surface Water	T					0.84:		<0.005:			168:		
Surface Water Area 11-Red River Along Tailings Facility	LR-13	20-Mar-03	LR-13-T01N-SFW-032003	Surface Water	T					1:		0.007J			188:		
Surface Water Area 11-Red River Along Tailings Facility	LR-13	14-Jul-03	LR-13-T01N-SFW-071403	Surface Water	T					<0.86J		<0.005J			153:		
Surface Water Area 11-Red River Along Tailings Facility	LR-13	21-Sep-03	LR-13-T01N-SFW-092103	Surface Water	T					0.79:		<0.005:			110J		
Surface Water Area 11-Red River Along Tailings Facility	LR-16	26-Sep-02	LR-16-T01N-SFW-092602	Surface Water	T					0.8:		<0.005:			169:		
Surface Water Area 11-Red River Along Tailings Facility	LR-16	20-Mar-03	LR-16-T01N-SFW-032003	Surface Water	T					1:		0.0074J			178:		
Surface Water Area 11-Red River Along Tailings Facility	LR-16	14-Jul-03	LR-16-T01N-SFW-071403	Surface Water	T					<0.89J		<0.005J			147:		
Surface Water Area 11-Red River Along Tailings Facility	LR-16	21-Sep-03	LR-16-T01N-SFW-092103	Surface Water	T					0.79:		<0.005J			116J		
Surface Water Area 11-Red River Along Tailings Facility	LR-5	30-Sep-02	LR-5-T01N-SFW-093002	Surface Water	T					0.72:		<0.005J			136:		
Surface Water Area 11-Red River Along Tailings Facility	LR-5	21-Mar-03	LR-5-T01N-SFW-032103	Surface Water	T					0.98:		0.0094J			142:		
Surface Water Area 11-Red River Along Tailings Facility	LR-5	15-Jul-03	LR-5-T01N-SFW-071503	Surface Water	T					<0.83J		<0.005J			114:		
Surface Water Area 11-Red River Along Tailings Facility	LR-5	23-Sep-03	LR-5-T01N-SFW-092303	Surface Water	T					0.79:		<0.005:			97.8J		
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	27-Sep-02	LR-8A-T01N-SFW-092702	Surface Water	T					0.8:		<0.005J			168:		
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	23-Mar-03	LR-8A-T01N-SFW-032303	Surface Water	T					1:		<0.005J			192:		
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	15-Jul-03	LR-8A-T01N-SFW-071503	Surface Water	T					<0.88J		<0.005J			145:		
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	23-Sep-03	LR-8A-T01N-SFW-092303	Surface Water	T					0.79:		<0.005:			123J		

EXPOSURE_AREA_LOOKUP_DESCRIPTION	SITE_ID	SAMP_DATE	SAMP_ID	MEDIUM_TYPE_LOOKUP_DESCRIPTION	SAMP_FRACTION	DO mg/L	Eh millivolts	Flow cfs	Flow gpm	Fluoride mg/L	Hardness mg/L	Nitrite mg/L	pH SU	Specific Conductance uS/cm	Sulfate mg/L	Temperature Celsius	Turbidity NTU
Reference Lower Cabresto Creek Riparian	RRS-18	06-Oct-02	RRS-18-T01N-SFW-100602	Surface Water	T						109						
Reference Lower Cabresto Creek Riparian	RRS-18	23-Mar-03	RRS-18-T01N-SFW-032303	Surface Water	T						91.5						
Reference Lower Cabresto Creek Riparian	RRS-18	25-Sep-03	RRS-18-T01N-SFW-092503	Surface Water	T						80.6						
Reference Lower Cabresto Creek Riparian	RRS-20	06-Oct-02	RRS-20-T01N-SFW-100602	Surface Water	T						113						
Reference Lower Cabresto Creek Riparian	RRS-20	23-Mar-03	RRS-20-T01N-SFW-032303	Surface Water	T						90.9						
Reference Lower Cabresto Creek Riparian	RRS-20	16-Jul-03	RRS-20-T01N-SFW-071603	Surface Water	T						86						
Reference Lower Cabresto Creek Riparian	RRS-20	25-Sep-03	RRS-20-T01N-SFW-092503	Surface Water	T						83.3						
Reference Lower Cabresto Creek Riparian	RRS-23	06-Oct-02	RRS-23-T01N-SFW-100602	Surface Water	T						101						
Reference Lower Cabresto Creek Riparian	RRS-23	23-Mar-03	RRS-23-T01N-SFW-032303	Surface Water	T						92						
Reference Lower Cabresto Creek Riparian	RRS-23	16-Jul-03	RRS-23-T01N-SFW-071603	Surface Water	T						110						
Reference Lower Cabresto Creek Riparian	RRS-23	25-Sep-03	RRS-23-T01N-SFW-092503	Surface Water	T						78.3						
Reference Lower Cabresto Creek Riparian	RRS-27	06-Oct-02	RRS-27-T01N-SFW-100602	Surface Water	T						158						
Reference Lower Cabresto Creek Riparian	RRS-27	23-Mar-03	RRS-27-T01N-SFW-032303	Surface Water	T						102						
Reference Lower Cabresto Creek Riparian	RRS-27	16-Jul-03	RRS-27-T01N-SFW-071603	Surface Water	T						115						
Reference Lower Cabresto Creek Riparian	RRS-27	25-Sep-03	RRS-27-T01N-SFW-092503	Surface Water	T						83.2						
Reference Red River Above Mine Site	RR-1	04-Oct-02	RR-1-T01N-SFW-100402	Surface Water	T						108						
Reference Red River Above Mine Site	RR-1	21-Mar-03	RR-1-T01N-SFW-032103	Surface Water	T						115						
Reference Red River Above Mine Site	RR-1	16-Jul-03	RR-1-T01N-SFW-071603	Surface Water	T						87.4						
Reference Red River Above Mine Site	RR-1	25-Sep-03	RR-1-T01N-SFW-092503	Surface Water	T						102						
Reference Red River Above Mine Site	RR-3	03-Oct-02	RR-3-T01N-SFW-100302	Surface Water	T						124						
Reference Red River Above Mine Site	RR-3	21-Mar-03	RR-3-T01N-SFW-032103	Surface Water	T						128						
Reference Red River Above Mine Site	RR-3	16-Jul-03	RR-3-T01N-SFW-071603	Surface Water	T						108						
Reference Red River Above Mine Site	RR-3	25-Sep-03	RR-3-T01N-SFW-092503	Surface Water	T						112						
Reference Red River Above Mine Site	RR-4	04-Oct-02	RR-4-T01N-SFW-100402	Surface Water	T						133						
Reference Red River Above Mine Site	RR-4	21-Mar-03	RR-4-T01N-SFW-032103	Surface Water	T						145						
Reference Red River Above Mine Site	RR-4	16-Jul-03	RR-4-T01N-SFW-071603	Surface Water	T						111						
Reference Red River Above Mine Site	RR-4	25-Sep-03	RR-4-T01N-SFW-092503	Surface Water	T						126						
Reference Red River Above Mine Site	RR-5	03-Oct-02	RR-5-T01N-SFW-100302	Surface Water	T						137						
Reference Red River Above Mine Site	RR-5	21-Mar-03	RR-5-T01N-SFW-032103	Surface Water	T						146						
Reference Red River Above Mine Site	RR-5	16-Jul-03	RR-5-T01N-SFW-071603	Surface Water	T						114						
Reference Red River Above Mine Site	RR-5	24-Sep-03	RR-5-T01N-SFW-092403	Surface Water	T						121						
Reference Red River Above Mine Site	RR-6	04-Oct-02	RR-6-T01N-SFW-100402	Surface Water	T						144						
Reference Red River Above Mine Site	RR-6	21-Mar-03	RR-6-T01N-SFW-032103	Surface Water	T						172						
Reference Red River Above Mine Site	RR-6	16-Jul-03	RR-6-T01N-SFW-071603	Surface Water	T						126						
Reference Red River Above Mine Site	RR-6	24-Sep-03	RR-6-T01N-SFW-092403	Surface Water	T						127						
Reference Red River Above Mine Site	RR-6A	04-Oct-02	RR-6A-T01N-SFW-100402	Surface Water	T						149						
Reference Red River Above Mine Site	RR-6A	21-Mar-03	RR-6A-T01N-SFW-032103	Surface Water	T						166						
Reference Red River Above Mine Site	RR-6A	15-Jul-03	RR-6A-T01N-SFW-071503	Surface Water	T						121						
Reference Red River Above Mine Site	RR-6A	24-Sep-03	RR-6A-T01N-SFW-092403	Surface Water	T						124						
Reference Red River Above Mine Site	RR-6V	16-Jul-03	RR-6V-T01N-SFW-071603	Surface Water	T						120						
Reference Red River Above Mine Site	RR-6V	24-Sep-03	RR-6V-T01N-SFW-092403	Surface Water	T						120						
Reference Red River Above Mine Site	Zwergle	07-Oct-02	ZWERGEL-T01N-SFW-100702	Surface Water	T						115						
Reference Red River Above Mine Site	Zwergle	23-Mar-03	ZWERGEL-T01N-SFW-032303	Surface Water	T						117						
Reference Red River Above Mine Site	Zwergle	16-Jul-03	ZWERGEL-T01N-SFW-071603	Surface Water	T						90.9						
Reference Red River Above Mine Site	ZWERGLE	25-Sep-03	ZWERGEL-T01N-SFW-092503	Surface Water	T						103						
Reference Upper Cabresto Creek Riparian	RRS-12	07-Oct-02	RRS-12-T01N-SFW-100702	Surface Water	T						96.1						
Reference Upper Cabresto Creek Riparian	RRS-12	23-Mar-03	RRS-12-T01N-SFW-032303	Surface Water	T						92.6						
Reference Upper Cabresto Creek Riparian	RRS-12	16-Jul-03	RRS-12-T01N-SFW-071603	Surface Water	T						90.7						
Reference Upper Cabresto Creek Riparian	RRS-12	25-Sep-03	RRS-12-T01N-SFW-092503	Surface Water	T						90.5						
Reference Upper Cabresto Creek Riparian	RRS-13	06-Oct-02	RRS-13-T01N-SFW-100602	Surface Water	T						75.3						
Reference Upper Cabresto Creek Riparian	RRS-13	23-Mar-03	RRS-13-T01N-SFW-032303	Surface Water	T						77.8						
Reference Upper Cabresto Creek Riparian	RRS-13	16-Jul-03	RRS-13-T01N-SFW-071603	Surface Water	T						57.4						
Reference Upper Cabresto Creek Riparian	RRS-13	25-Sep-03	RR-13-T01N-SFW-092503	Surface Water	T						64.2						
Reference Upper Cabresto Creek Riparian	RRS-15	06-Oct-02	RRS-15-T01N-SFW-100602	Surface Water	T						78.6						
Reference Upper Cabresto Creek Riparian	RRS-15	23-Mar-03	RRS-15-T01N-SFW-032303	Surface Water	T						79.6						
Reference Upper Cabresto Creek Riparian	RRS-15	16-Jul-03	RRS-15-T01N-SFW-071603	Surface Water	T						58.5						
Reference Upper Cabresto Creek Riparian	RRS-15	25-Sep-03	RRS-15-T01N-SFW-092503	Surface Water	T						63						
Reference Upper Cabresto Creek Riparian	RRS-9	07-Oct-02	RRS-9-T01N-SFW-100702	Surface Water	T						81.4						
Reference Upper Cabresto Creek Riparian	RRS-9	23-Mar-03	RRS-9-T01N-SFW-032303	Surface Water	T						78						
Reference Upper Cabresto Creek Riparian	RRS-9	16-Jul-03	RRS-9-T01N-SFW-071603	Surface Water	T						65						
Reference Upper Cabresto Creek Riparian	RRS-9	25-Sep-03	RRS-9-T01N-SFW-092503	Surface Water	T						77.3						
Reference Upper Cabresto Creek Riparian	UPPER CABRESTO CREEK	23-Mar-03	UCC-T01N-SFW-032303	Surface Water	T						81.9						
Reference Upper Cabresto Creek Riparian	UPPER CABRESTO CREEK	16-Jul-03	UPPERCABRESTO-T01N-SFW-071603	Surface Water	T						64.6						
Reference Upper Cabresto Creek Riparian	UPPER CABRESTO CREEK	25-Sep-03	UPPERCABRESTO-T01N-SFW-092503	Surface Water	T						73.2						
Surface Water Area 1-Red River Along Mine	LR-1	30-Sep-02	LR-1-T01N-SFW-093002	Surface Water	T						194						
Surface Water Area 1-Red River Along Mine	LR-1	20-Mar-03	LR-1-T01N-SFW-032003	Surface Water	T						213						
Surface Water Area 1-Red River Along Mine	LR-1	15-Jul-03	LR-1-T01N-SFW-071503	Surface Water	T						169						
Surface Water Area 1-Red River Along Mine	LR-1	24-Sep-03	LR-1-T01N-SFW-092403	Surface Water	T						171						
Surface Water Area 1-Red River Along Mine	RR-10	03-Oct-02	RR-10-T01N-SFW-100302	Surface Water	T						152						
Surface Water Area 1-Red River Along Mine	RR-10	21-Jan-03	RR-10-T01N-SFW-012103	Surface Water	T						154						
Surface Water Area 1-Red River Along Mine	RR-10	20-Mar-03	RR-10-T01N-SFW-032003	Surface Water	T						170						
Surface Water Area 1-Red River Along Mine	RR-10	03-Apr-03	RR-10-T01N-SFW-040303	Surface Water	T						146						
Surface Water Area 1-Red River Along Mine	RR-10	15-Jul-03	RR-10-T01N-SFW-071503	Surface Water	T						121						
Surface Water Area 1-Red River Along Mine	RR-10	24-Sep-03	RR-10-T01N-SFW-092403	Surface Water	T						136						
Surface Water Area 1-Red River Along Mine	RR-10	19-Oct-03	RR-10-T01N-SFW-101903	Surface Water	T						144						
Surface Water Area 1-Red River Along Mine	RR-10	13-Jan-04	RR-10-T01N-SFW-011304	Surface Water	T						149						
Surface Water Area 1-Red River Along Mine	RR-10	24-Feb-04	RR-10-T01N-SFW-022404	Surface Water	T						144						
Surface Water Area 1-Red River Along Mine	RR-10	19-Apr-04	RR-10-T01N-SFW-041904	Surface Water	T						103						
Surface Water Area 1-Red River Along Mine	RR-10A1	03-Oct-02	RR-10A1-T01N-SFW-100302	Surface Water	T						139						
Surface Water Area 1-Red River Along Mine	RR-10A1	20-Jan-03	RR-10A1-T01N-SFW-012003	Surface Water	T						165						
Surface Water Area 1-Red River Along Mine	RR-10A1	20-Mar-03	RR-10A1-T01N-SFW-032003	Surface Water	T						146						
Surface Water Area 1-Red River Along Mine	RR-10A1	03-Apr-03	RR-10A1-T01N-SFW-040303	Surface Water	T						135						
Surface Water Area 1-Red River Along Mine	RR-10A1	15-Jul-03	RR-10A1-T01N-SFW-071503	Surface Water	T						110						
Surface Water Area 1-Red River Along Mine	RR-10A1	24-Sep-03	RR-10A1-T01N-SFW-092403	Surface Water	T						130						
Surface Water Area 1-Red River Along Mine	RR-10A1	19-Oct-03	RR-10A1-T01N-SFW-101903	Surface Water	T						128						
Surface Water Area 1-Red River Along Mine	RR-10A1	13-Jan-04	RR-10A1-T01N-SFW-011304	Surface Water	T						134						
Surface Water Area 1-Red River Along Mine	RR-10A1	19-Apr-04	RR-10A1-T01N-SFW-041904	Surface Water	T						110						
Surface Water Area 1-Red River Along Mine	RR-11A1	03-Oct-02	RR-11A1-T01N-SFW-100302	Surface Water	T						139						
Surface Water Area 1-Red River Along Mine	RR-11A1	20-Jan-03	RR-11A1-T01N-SFW-012003	Surface Water	T						140						
Surface Water Area 1-Red River Along Mine	RR-11A1	21-Mar-03	RR-11A1-T01N-SFW-032103	Surface Water	T						132						
Surface Water Area 1-Red River Along Mine	RR-11A1	03-Apr-03	RR-11A1-T01N-SFW-040303	Surface Water	T						141						
Surface Water Area 1-Red River Along Mine	RR-11A1	15-Jul-03	RR-11A1-T01N-SFW-071503	Surface Water	T						112						
Surface Water Area 1-Red River Along Mine	RR-11A1	24-Sep-03	RR-11A1-T01N-SFW-092403	Surface Water	T						128						
Surface Water Area 1-Red River Along Mine	RR-11A1	19-Oct-03	RR-11A1-T01N-SFW-101903	Surface Water	T						130						
Surface Water Area 1-Red River Along Mine	RR-11A1	13-Jan-04	RR-11A1-T01N-SFW-011304	Surface Water	T						147						
Surface Water Area 1-Red River Along Mine	RR-11A1	19-Apr-04	RR-11A1-T01N-SFW-041904	Surface Water	T						92.9						
Surface Water Area 1-Red River Along Mine	RR-11B	03-Oct-02	RR-11B-T01N-SFW-100302	Surface Water	T						137						
Surface Water Area 1-Red River Along Mine	RR-11B	20-Mar-03	RR-11B-T01N-SFW-032003	Surface Water	T						173						
Surface Water Area 1-Red River Along Mine	RR-11B	15-Jul-03	RR-11B-T01N-SFW-071503	Surface Water	T						130						
Surface Water Area 1-Red River Along Mine	RR-11B	24-Sep-03	RR-11B-T01N-SFW-092403	Surface Water	T						130						
Surface Water Area 1-Red River Along Mine	RR-11C	01-Oct-02	RR-11C-T01N-SFW-100102	Surface Water	T						174						
Surface Water Area 1-Red River Along Mine	RR-11C	20-Jan-03	RR-11C-T01N-SFW-012003	Surface Water	T						242						
Surface Water Area 1-Red River Along Mine	RR-11C	20-Mar-03	RR-11C-T01N-SFW-032003	Surface Water	T						213						
Surface Water Area 1-Red River Along Mine	RR-11C	03-Apr-03	RR-11C-T01N-SFW-040303	Surface Water	T						171						
Surface Water Area 1-Red River Along Mine	RR-11C	15-Jul-03	RR-11C-T01N-SFW-071503	Surface Water	T						148						
Surface Water Area 1-Red River Along Mine	RR-11C	25-Sep-03	RR-11C-T01N-SFW-092503	Surface Water	T						160						
Surface Water Area 1-Red River Along Mine	RR-11C	19-Oct-03	RR-11C-T01N-SFW-101903	Surface Water	T						171						
Surface Water Area 1-Red River Along Mine	RR-11C	13-Jan-04	RR-11C-T01N-SFW-011304	Surface Water	T						184						
Surface Water Area 1-Red River Along Mine	RR-11C	19-Apr-04	RR-11C-T01N-SFW-041904	Surface Water	T						108						
Surface Water Area 1-Red River Along Mine	RR-12	03-Oct-02	RR-12-T01N-SFW-100302	Surface Water	T						175						
Surface Water Area 1-Red River Along Mine	RR-12	20-Jan-03	RR-12-T01N-SFW-012003	Surface Water	T						229						
Surface Water Area 1-Red River Along Mine	RR-12	20-Mar-03	RR-12-T01N-SFW-032003	Surface Water	T						198						
Surface Water Area 1-Red River Along Mine	RR-12	03-Apr-03	RR-12-T01N-SFW-040303	Surface Water	T						168						
Surface Water Area 1-Red River Along Mine	RR-12	15-Jul-03	RR-12-T01N-SFW-071503	Surface Water	T						143						
Surface Water Area 1-Red River Along Mine	RR-12	24-Sep-03	RR-12-T01N-SFW-092403	Surface Water	T						149						
Surface Water Area 1-Red River Along Mine	RR-12	19-Oct-03	RR-12-T01N-SFW-101903	Surface Water	T						171						
Surface Water Area 1-Red River Along Mine	RR-12	13-Jan-04	RR-12-T01N-SFW-011304	Surface Water	T						181						
Surface Water Area 1-Red River Along Mine	RR-12	19-Apr-04	RR-12-T01N-SFW-041904	Surface Water	T						104						
Surface Water Area 1-Red River Along Mine	RR-13	01-Oct-02	RR-13-T01N-SFW-100102	Surface Water	T						176						
Surface Water Area 1-Red River Along Mine	RR-13	20-Jan-03	RR-13-T01N-SFW-012003	Surface Water	T						222						
Surface Water Area 1-Red River Along Mine	RR-13	20-Mar-03	RR-13-T01N-SFW-032003	Surface Water	T						214						
Surface Water Area 1-Red River Along Mine	RR-13	03-Apr-03	RR-13-T01N-SFW-040303	Surface Water	T						176						
Surface Water Area 1-Red River Along Mine	RR-13	15-Jul-03	RR-13-T01N-SFW-071503	Surface Water	T						151						
Surface Water Area 1-Red River Along Mine	RR-13	24-Sep-03	RR-13-T01N-SFW-092403	Surface Water	T						168						
Surface Water Area 1-Red River Along Mine	RR-13	19-Oct-03	RR-13-T01N-SFW-101903	Surface Water	T						175						
Surface Water Area 1-Red River Along Mine	RR-13	13-Jan-04	RR-13-T01N-SFW-011304	Surface Water	T						165						
Surface Water Area 1-Red River Along Mine	RR-13	19-Apr-04	RR-13-T01N-SFW-041904	Surface Water	T						107						
Surface Water Area 1-Red River Along Mine	RR-14	01-Oct-02	RR-14-T01N-SFW-100102	Surface Water	T						180						
Surface Water Area 1-Red River Along Mine	RR-14	19-Jan-03	RR-14-T01N-SFW-011903	Surface Water	T						248						
Surface Water Area 1-Red River Along Mine	RR-14	20-Mar-03	RR-14-T01N-SFW-032003	Surface Water	T						209						
Surface Water Area 1-Red River Along Mine	RR-14	03-Apr-03	RR-14-T01N-SFW-040303	Surface Water	T						172						
Surface Water Area 1-Red River Along Mine	RR-14	15-Jul-03	RR-14-T01N-SFW-071503	Surface Water	T						150						
Surface Water Area 1-Red River Along Mine	RR-14	24-Sep-03	RR-14-T01N-SFW-092403	Surface Water	T						168						
Surface Water Area 1-Red River Along Mine	RR-14	19-Oct-03	RR-14-T01N-SFW-101903	Surface Water	T						178						

Surface Water Area 1-Red River Along Mine	RR-14	13-Jan-04	RR-14-T01N-SFW-011304	Surface Water	T						177						
Surface Water Area 1-Red River Along Mine	RR-14	24-Feb-04	RR-14-T01N-SFW-022404	Surface Water	T						176						
Surface Water Area 1-Red River Along Mine	RR-14	19-Apr-04	RR-14-T01N-SFW-041904	Surface Water	T						107						
Surface Water Area 1-Red River Along Mine	RR-15	01-Oct-02	RR-15-T01N-SFW-100102	Surface Water	T						189						
Surface Water Area 1-Red River Along Mine	RR-15	21-Mar-03	RR-15-T01N-SFW-032103	Surface Water	T						199						
Surface Water Area 1-Red River Along Mine	RR-15	15-Jul-03	RR-15-T01N-SFW-071503	Surface Water	T						155						
Surface Water Area 1-Red River Along Mine	RR-15	24-Sep-03	RR-15-T01N-SFW-092403	Surface Water	T						150						
Surface Water Area 1-Red River Along Mine	RR-16	01-Oct-02	RR-16-T01N-SFW-100102	Surface Water	T						188						
Surface Water Area 1-Red River Along Mine	RR-16	19-Jan-03	RR-16-T01N-SFW-011903	Surface Water	T						229						
Surface Water Area 1-Red River Along Mine	RR-16	19-Mar-03	RR-16-T01N-SFW-031903	Surface Water	T						201						
Surface Water Area 1-Red River Along Mine	RR-16	03-Apr-03	RR-16-T01N-SFW-040303	Surface Water	T						179						
Surface Water Area 1-Red River Along Mine	RR-16	15-Jul-03	RR-16-T01N-SFW-071503	Surface Water	T						149						
Surface Water Area 1-Red River Along Mine	RR-16	23-Seo-03	RR-16-T01N-SFW-092303	Surface Water	T						159						
Surface Water Area 1-Red River Along Mine	RR-16	19-Oct-03	RR-16-T01N-SFW-101903	Surface Water	T						180						
Surface Water Area 1-Red River Along Mine	RR-16	13-Jan-04	RR-16-T01N-SFW-011304	Surface Water	T						179						
Surface Water Area 1-Red River Along Mine	RR-16	19-Apr-04	RR-16-T01N-SFW-041904	Surface Water	T						98.5						
Surface Water Area 1-Red River Along Mine	RR-17	01-Oct-02	RR-17-T01N-SFW-100102	Surface Water	T						186						
Surface Water Area 1-Red River Along Mine	RR-17	19-Mar-03	RR-17-T01N-SFW-031903	Surface Water	T						203						
Surface Water Area 1-Red River Along Mine	RR-17	15-Jul-03	RR-17-T01N-SFW-071503	Surface Water	T						159						
Surface Water Area 1-Red River Along Mine	RR-17	23-Sep-03	RR-17-T01N-SFW-092303	Surface Water	T						170						
Surface Water Area 1-Red River Along Mine	RR-18A	01-Oct-02	RR-18A-T01N-SFW-100102	Surface Water	T						190						
Surface Water Area 1-Red River Along Mine	RR-18A	19-Mar-03	RR-18A-T01N-SFW-031903	Surface Water	T						210						
Surface Water Area 1-Red River Along Mine	RR-18A	16-Jul-03	RR-18A-T01N-SFW-071603	Surface Water	T						157						
Surface Water Area 1-Red River Along Mine	RR-18A	23-Sep-03	RR-18A-T01N-SFW-092303	Surface Water	T						170						
Surface Water Area 1-Red River Along Mine	RR-18B	30-Sep-02	RR-18B-T01N-SFW-093002	Surface Water	T						185						
Surface Water Area 1-Red River Along Mine	RR-18B	19-Mar-03	RR-18B-T01N-SFW-031903	Surface Water	T						195						
Surface Water Area 1-Red River Along Mine	RR-18B	16-Jul-03	RR-18B-T01N-SFW-071603	Surface Water	T						161						
Surface Water Area 1-Red River Along Mine	RR-18B	23-Sep-03	RR-18B-T01N-SFW-092303	Surface Water	T						170						
Surface Water Area 1-Red River Along Mine	RR-20	30-Sep-02	RR-20-T01N-SFW-093002	Surface Water	T						196						
Surface Water Area 1-Red River Along Mine	RR-20	21-Mar-03	RR-20-T01N-SFW-032103	Surface Water	T						206						
Surface Water Area 1-Red River Along Mine	RR-20	15-Jul-03	RR-20-T01N-SFW-071503	Surface Water	T						164						
Surface Water Area 1-Red River Along Mine	RR-20	23-Sep-03	RR-20-T01N-SFW-092303	Surface Water	T						163						
Surface Water Area 1-Red River Along Mine	RR-7	04-Oct-02	RR-7-T01N-SFW-100402	Surface Water	T						154						
Surface Water Area 1-Red River Along Mine	RR-7	21-Jan-03	RR-7-T01N-SFW-012103	Surface Water	T						162						
Surface Water Area 1-Red River Along Mine	RR-7	21-Mar-03	RR-7-T01N-SFW-032103	Surface Water	T						171						
Surface Water Area 1-Red River Along Mine	RR-7	03-Apr-03	RR-7-T01N-SFW-040303	Surface Water	T						144						
Surface Water Area 1-Red River Along Mine	RR-7	15-Jul-03	RR-7-T01N-SFW-071503	Surface Water	T						116						
Surface Water Area 1-Red River Along Mine	RR-7	24-Sep-03	RR-7-T01N-SFW-092403	Surface Water	T						130						
Surface Water Area 1-Red River Along Mine	RR-7	19-Oct-03	RR-7-T01N-SFW-101903	Surface Water	T						141						
Surface Water Area 1-Red River Along Mine	RR-7	13-Jan-04	RR-7-T01N-SFW-011304	Surface Water	T						141						
Surface Water Area 1-Red River Along Mine	RR-7	24-Feb-04	RR-7-T01N-SFW-022404	Surface Water	T						142						
Surface Water Area 1-Red River Along Mine	RR-7	19-Apr-04	RR-7-T01N-SFW-041904	Surface Water	T						99.8						
Surface Water Area 1-Red River Along Mine	RR-8	04-Oct-02	RR-8-T01N-SFW-100402	Surface Water	T						149						
Surface Water Area 1-Red River Along Mine	RR-8	21-Mar-03	RR-8-T01N-SFW-032103	Surface Water	T						159						
Surface Water Area 1-Red River Along Mine	RR-8	15-Jul-03	RR-8-T01N-SFW-071503	Surface Water	T						119						
Surface Water Area 1-Red River Along Mine	RR-8	24-Sep-03	RR-8-T01N-SFW-092403	Surface Water	T						141						
Surface Water Area 1-Red River Along Mine	RR-8A	04-Oct-02	RR-8A-T01N-SFW-100402	Surface Water	T						150						
Surface Water Area 1-Red River Along Mine	RR-8A	21-Mar-03	RR-8A-T01N-SFW-032103	Surface Water	T						156						
Surface Water Area 1-Red River Along Mine	RR-8A	15-Jul-03	RR-8A-T01N-SFW-071503	Surface Water	T						122						
Surface Water Area 1-Red River Along Mine	RR-8A	24-Sep-03	RR-8A-T01N-SFW-092403	Surface Water	T						135						
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	27-Sep-02	LR-11A-T01N-SFW-092702	Surface Water	T						233						
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	20-Mar-03	LR-11A-T01N-SFW-032003	Surface Water	T						254						
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	14-Jul-03	LR-11A-T01N-SFW-071403	Surface Water	T						205						
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	23-Sep-03	LR-11A-T01N-SFW-092303	Surface Water	T						209						
Surface Water Area 11-Red River Along Tailings Facility	LR-13	26-Sep-02	LR-13-T01N-SFW-092602	Surface Water	T						232						
Surface Water Area 11-Red River Along Tailings Facility	LR-13	20-Mar-03	LR-13-T01N-SFW-032003	Surface Water	T						244						
Surface Water Area 11-Red River Along Tailings Facility	LR-13	14-Jul-03	LR-13-T01N-SFW-071403	Surface Water	T						206						
Surface Water Area 11-Red River Along Tailings Facility	LR-13	21-Sep-03	LR-13-T01N-SFW-092103	Surface Water	T						205						
Surface Water Area 11-Red River Along Tailings Facility	LR-16	26-Sep-02	LR-16-T01N-SFW-092602	Surface Water	T						229						
Surface Water Area 11-Red River Along Tailings Facility	LR-16	20-Mar-03	LR-16-T01N-SFW-032003	Surface Water	T						235						
Surface Water Area 11-Red River Along Tailings Facility	LR-16	14-Jul-03	LR-16-T01N-SFW-071403	Surface Water	T						202						
Surface Water Area 11-Red River Along Tailings Facility	LR-16	21-Sep-03	LR-16-T01N-SFW-092103	Surface Water	T						196						
Surface Water Area 11-Red River Along Tailings Facility	LR-5	30-Sep-02	LR-5-T01N-SFW-093002	Surface Water	T						187						
Surface Water Area 11-Red River Along Tailings Facility	LR-5	21-Mar-03	LR-5-T01N-SFW-032103	Surface Water	T						216						
Surface Water Area 11-Red River Along Tailings Facility	LR-5	15-Jul-03	LR-5-T01N-SFW-071503	Surface Water	T						166						
Surface Water Area 11-Red River Along Tailings Facility	LR-5	23-Sep-03	LR-5-T01N-SFW-092303	Surface Water	T						153						
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	27-Sep-02	LR-8A-T01N-SFW-092702	Surface Water	T						230						
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	23-Mar-03	LR-8A-T01N-SFW-032303	Surface Water	T						260						
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	15-Jul-03	LR-8A-T01N-SFW-071503	Surface Water	T						204						
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	23-Sep-03	LR-8A-T01N-SFW-092303	Surface Water	T						202						
Reference Lower Cabresto Creek Riparian	RRS-18	06-Oct-02	RRS-18-T01N-SFW-100602	Surface Water	T	8.4	313	0.01				7	215		10.2	0	
Reference Lower Cabresto Creek Riparian	RRS-18	23-Mar-03	RRS-18-T01N-SFW-032303	Surface Water	T	6.8	300	5.1				7.1	380		3.4	0	
Reference Lower Cabresto Creek Riparian	RRS-18	14-Jul-03	RRS-18-T01N-SFW-071403	Surface Water	T				-999								
Reference Lower Cabresto Creek Riparian	RRS-18	25-Sep-03	RRS-18-T01N-SFW-092503	Surface Water	T	9.2	331	1.6				7	193		8.6	1.3	
Reference Lower Cabresto Creek Riparian	RRS-20	06-Oct-02	RRS-20-T01N-SFW-100602	Surface Water	T	8.5	326	0.01				6.7	221		14.1	0.4	
Reference Lower Cabresto Creek Riparian	RRS-20	23-Mar-03	RRS-20-T01N-SFW-032303	Surface Water	T	8.3	294	2.2				6.8	379		2.7	0	
Reference Lower Cabresto Creek Riparian	RRS-20	16-Jul-03	RRS-20-T01N-SFW-071603	Surface Water	T	3.2	261	0.02				6.3	211		14	5.4	
Reference Lower Cabresto Creek Riparian	RRS-20	25-Sep-03	RRS-20-T01N-SFW-092503	Surface Water	T	10.1	250	1.5				7.8	171		12.8	27.3	
Reference Lower Cabresto Creek Riparian	RRS-23	06-Oct-02	RRS-23-T01N-SFW-100602	Surface Water	T	7.8	352	0.01				6.5	212		9.8	0	
Reference Lower Cabresto Creek Riparian	RRS-23	23-Mar-03	RRS-23-T01N-SFW-032303	Surface Water	T	9.1	296	2.1				6.5	390		2.3	0	
Reference Lower Cabresto Creek Riparian	RRS-23	16-Jul-03	RRS-23-T01N-SFW-071603	Surface Water	T	8.3	229	0.1				6.5	256		14.2	0.8	
Reference Lower Cabresto Creek Riparian	RRS-23	25-Sep-03	RRS-23-T01N-SFW-092503	Surface Water	T	8.2	502	1.1				6.6	177		15.4	6.6	
Reference Lower Cabresto Creek Riparian	RRS-27	06-Oct-02	RRS-27-T01N-SFW-100602	Surface Water	T	8.2	343	0.01				6.7	331		13	0	
Reference Lower Cabresto Creek Riparian	RRS-27	23-Mar-03	RRS-27-T01N-SFW-032303	Surface Water	T	12.3	277	4.6				6.4	444		2.3	0	
Reference Lower Cabresto Creek Riparian	RRS-27	16-Jul-03	RRS-27-T01N-SFW-071603	Surface Water	T	10.8	156	0.2				6.3	263		14	0.5	
Reference Lower Cabresto Creek Riparian	RRS-27	25-Sep-03	RRS-27-T01N-SFW-092503	Surface Water	T	8.6	250	1				7.2	180		14.7	6.8	
Reference Red River Above Mine Site	RR-1	04-Oct-02	RR-1-T01N-SFW-100402	Surface Water	T	8.2	108	8.5				7.1	218		11.5	7.4	
Reference Red River Above Mine Site	RR-1	21-Mar-03	RR-1-T01N-SFW-032103	Surface Water	T	9.3	132	4.8				8	218		2.8	46.3	
Reference Red River Above Mine Site	RR-1	16-Jul-03	RR-1-T01N-SFW-071603	Surface Water	T	8.7	114	12.9				8.6	176		14.6	0	
Reference Red River Above Mine Site	RR-1	21-Seo-03	RR-1-T01N-SFW-092103	Surface Water	T	8.7	329					5.8	461		14.1	2.7	
Reference Red River Above Mine Site	RR-1	25-Sep-03	RR-1-T01N-SFW-092503	Surface Water	T			12.4									
Reference Red River Above Mine Site	RR-1	25-May-04	RR-1-T01N-SFW-052504	Surface Water	T	10.1	205					7.9	203		8.1	10.1	
Reference Red River Above Mine Site	RR-3	03-Oct-02	RR-3-T01N-SFW-100302	Surface Water	T	7.9	110	9.9				6.9	244		8.6	6.6	
Reference Red River Above Mine Site	RR-3	21-Mar-03	RR-3-T01N-SFW-032103	Surface Water	T	10.4	137	6.9				7.4	267		3	76.3	
Reference Red River Above Mine Site	RR-3	16-Jul-03	RR-3-T01N-SFW-071603	Surface Water	T	8.4	150	16.8				7.7	210		14.5	0	
Reference Red River Above Mine Site	RR-3	25-Sep-03	RR-3-T01N-SFW-092503	Surface Water	T	10.3	226	15.6				7.3	232		7.6	9.4	
Reference Red River Above Mine Site	RR-4	04-Oct-02	RR-4-T01N-SFW-100402	Surface Water	T	8.9	93.1	10.1				7.7	282		10.4	19.2	
Reference Red River Above Mine Site	RR-4	21-Mar-03	RR-4-T01N-SFW-032103	Surface Water	T	11.3	154	8.1				7.3	294		0.9	50.2	
Reference Red River Above Mine Site	RR-4	16-Jul-03	RR-4-T01N-SFW-071603	Surface Water	T	8.9	131	19.9				8.3	222		12.7	0	
Reference Red River Above Mine Site	RR-4	25-Sep-03	RR-4-T01N-SFW-092503	Surface Water	T	10.4	276	14				7.1	249		6.1	21.5	
Reference Red River Above Mine Site	RR-5	03-Oct-02	RR-5-T01N-SFW-100302	Surface Water	T		131	12.4				7.4	282		7.8	15.8	
Reference Red River Above Mine Site	RR-5	21-Mar-03	RR-5-T01N-SFW-032103	Surface Water	T	12.6	343	9.6				8	591		2.2	36.6	
Reference Red River Above Mine Site	RR-5	16-Jul-03	RR-5-T01N-SFW-071603	Surface Water	T	9.5	130	13.7				8.6	234		11.9	0	
Reference Red River Above Mine Site	RR-5	24-Sep-03	RR-5-T01N-SFW-092403	Surface Water	T	8.8	242	12				7.5	256		13	7.9	
Reference Red River Above Mine Site	RR-6	04-Oct-02	RR-6-T01N-SFW-100402	Surface Water	T	10.1	191	12.1				6.8	330		5.6	17.4	
Reference Red River Above Mine Site	RR-6	21-Mar-03	RR-6-T01N-SFW-032103	Surface Water	T	9.9	111	9.7				8	340		4.4	98.6	
Reference Red River Above Mine Site	RR-6	13-Jul-03	RR-6-T01N-SFW-071303	Surface Water	T	8	131					8.3	241		17.5	0	
Reference Red River Above Mine Site	RR-6	16-Jul-03	RR-6-T01N-SFW-071603	Surface Water	T	8.1	245	23.8				7.5	254		15.1	3.4	
Reference Red River Above Mine Site	RR-6	24-Sep-03	RR-6-T01N-SFW-092403	Surface Water	T	9	286	13				7.5	284		11.5	11.5	
Reference Red River Above Mine Site	RR-6A	04-Oct-02	RR-6A-T01N-SFW-100402	Surface Water	T	9.8	332	12.1				6.8	320		11	7.5	
Reference Red River Above Mine Site	RR-6A	21-Mar-03	RR-6A-T01N-SFW-032103	Surface Water	T	12.1	282	9.2				7.4	639		1.5	26.8	
Reference Red River Above Mine Site	RR-6A	15-Jul-03	RR-6A-T01N-SFW-071503	Surface Water	T	8.2	133	17.7				8.3	244		14.7	0	
Reference Red River Above Mine Site	RR-6A	24-Sep-03	RR-6A-T01N-SFW-092403	Surface Water	T	9.5	310	14.2				7.5	283		10.5	19.3	
Reference Red River Above Mine Site	RR-6V	16-Jul-03	RR-6V-T01N-SFW-071603	Surface Water	T	8.3	257	17.9				7.8	254		16.9	0	
Reference Red River Above Mine Site	RR-6V	24-Sep-03	RR-6V-T01N-SFW-092403	Surface Water	T	7.9	409	16.3				7.1	272		12.6	17.4	
Reference Red River Above Mine Site	Zwerole	07-Oct-02	ZWERGEL-T01N-SFW-100702	Surface Water	T	8.8	336	6				7.1	212		10.4	9	
Reference Red River Above Mine Site	Zwergle	23-Mar-03	ZWERGEL-T01N-SFW-032303	Surface Water	T	11.6	187	4.7				-999	227		0.56	36.7	
Reference Red River Above Mine Site	ZWERGLE	16-Jul-03	ZWERGLE-T01N-SFW-071603	Surface Water	T	9	102	12.3				8.7	170		12	0	
Reference Red River Above Mine Site	ZWERGLE	25-Sep-03	ZWERGEL-T01N-SFW-092503	Surface Water	T	9.9	201	12.1				8.2	205		8.3	8.3	
Reference Upper Cabresto Creek Riparian	RRS-12	07-Oct-02	RRS-12-T01N-SFW-100702	Surface Water	T	10.1	336	2.9				6.4	203		5.1	9.9	
Reference Upper Cabresto Creek Riparian	RRS-12	23-Mar-03	RRS-12-T01N-SFW-032303	Surface Water	T	10.2	169	2				7.6	206		2.8	64.6	
Reference Upper Cabresto Creek Riparian	RRS-12	16-Jul-03	RRS-12-T01N-SFW-071603	Surface Water	T	8.5	265	1.1				7.8	205		16.1	1.7	
Reference Upper Cabresto Creek Riparian	RRS-12	25-Sep-03	RRS-12-T01N-SFW-092503	Surface Water	T	10.3	339	1.4				7.4	231		10.4	4.2	
Reference Upper Cabresto Creek Riparian	RRS-13	06-Oct-02	RRS-13-T01N-SFW-100602	Surface Water	T	8.8	339	5.1				6.5	165		9.9	0.3	
Reference Upper Cabresto Creek Riparian	RRS-13	23-Mar-03	RRS-13-T01N-SFW-032303	Surface Water	T	10.1	109	3.4				7.7	159		3	63.6	
Reference Upper Cabresto Creek Riparian	RRS-13	16-Jul-03	RRS-13-T01N-SFW-071603	Surface Water	T	8.6	430	7.5				7.3	131		13.4	1.6	
Reference Upper Cabresto Creek Riparian	RRS-13	25-Sep-03	RRS-13-T01N-SFW-092503	Surface Water	T	9	265	5.2				7.7	153		8.8	1.7	
Reference Upper Cabresto Creek Riparian	RRS-15	06-Oct-02	RRS-15-T01N-SFW-100602	Surface Water	T	9.6	350	3.6				6.6	167		9.6	0.4	
Reference Upper Cabresto Creek Riparian	RRS-15	23-Mar-03	RRS-15-T01N-SFW-032303	Surface Water	T	10.7	124	3.8				7.7	171		2	63.4	
Reference Upper Cabresto Creek Riparian	RRS-15	16-Jul-03	RRS-15-T01N-SFW-071603	Surface Water	T	8.1	345	6.9				7.5	135		14.4	1.9	
Reference Upper Cabresto Creek Riparian	RRS-15	25-Sep-03	RRS-15-T01N-SFW-092503	Surface Water	T	9.6	195	5.1				7.9	156		9.2	1.7	
Reference Upper Cabresto Creek Riparian	RRS-9	07-Oct-02	RRS-9-T01N-SFW-100702	Surface Water	T	9.3	306	1.3				6.8	169		9.5	9	
Reference Upper Cabresto Creek Riparian	RRS-9	23-Mar-03	RRS-9-T01N-SFW-032303	Surface Water	T	10.3	145	2.1				7.8	156		3.5	64	
Reference Upper Cabresto Creek Riparian	RRS-9	16-Jul-03	RRS-9-T01N-SFW-071603	Surface Water	T	8.1	264	1				7.6	145		16.1	1.7	
Reference Upper Cabresto Creek Riparian	RRS-9	25-Sep-03	RRS-9-T01N-SFW-092503	Surface Water	T	8.7	389	1				7.8	178		12.2	0.5	

Reference Upper Cabresto Creek Riparian	Upper Cabresto Creek	23-Mar-03	Upper Cabresto Creek-T01N-SFW-032303	Surface Water	T			4.2										
Reference Upper Cabresto Creek Riparian	UPPER CABRESTO CREEK	23-Mar-03	UCC-T01N-SFW-032303	Surface Water	T	11	127						7.3	181		1.7	63.3
Reference Upper Cabresto Creek Riparian	UPPER CABRESTO CREEK	16-Jul-03	UPPERCABRESTO-T01N-SFW-071603	Surface Water	T	8.1	498	5.6					7.3	147		14.4	3
Reference Upper Cabresto Creek Riparian	UPPER CABRESTO CREEK	25-Sep-03	UPPERCABRESTO-T01N-SFW-092503	Surface Water	T	9.4	329	5.9					7.5	168		8.1	5.7
Surface Water Area 1-Red River Along Mine	LR-1	30-Sep-02	LR-1-T01N-SFW-093002	Surface Water	T	9.1	358	21.8					7.6	364		14.9	20.4
Surface Water Area 1-Red River Along Mine	LR-1	20-Mar-03	LR-1-T01N-SFW-032003	Surface Water	T	10.3	290	11.6					7	460		9.7	5.2
Surface Water Area 1-Red River Along Mine	LR-1	15-Jul-03	LR-1-T01N-SFW-071503	Surface Water	T	8.4	472	18.4					6.7	338		16.3	1.5
Surface Water Area 1-Red River Along Mine	LR-1	24-Sep-03	LR-1-T01N-SFW-092403	Surface Water	T	10.9	273	20.7					6.9	359		9.7	23.7
Surface Water Area 1-Red River Along Mine	RR-10	03-Oct-02	RR-10-T01N-SFW-100302	Surface Water	T	11	369	11.8					7.1	316		8	36.3
Surface Water Area 1-Red River Along Mine	RR-10	21-Jan-03	RR-10-T01N-SFW-012103	Surface Water	T	11.5	385						6	354		1.2	0
Surface Water Area 1-Red River Along Mine	RR-10	20-Mar-03	RR-10-T01N-SFW-032003	Surface Water	T	10.2	258	8.8					7.5	380		4.5	43.4
Surface Water Area 1-Red River Along Mine	RR-10	03-Apr-03	RR-10-T01N-SFW-040303	Surface Water	T	9.6	280	11.7					8.3	316		6.2	14.7
Surface Water Area 1-Red River Along Mine	RR-10	15-Jul-03	RR-10-T01N-SFW-071503	Surface Water	T	8.7	155	19.3					8.6	247		12	0
Surface Water Area 1-Red River Along Mine	RR-10	24-Sep-03	RR-10-T01N-SFW-092403	Surface Water	T	9.3	173	14.5					7.7	327		11.4	5.3
Surface Water Area 1-Red River Along Mine	RR-10	19-Oct-03	RR-10-T01N-SFW-101903	Surface Water	T	9.1	299	13.7					7.8	286		9.4	4
Surface Water Area 1-Red River Along Mine	RR-10	13-Jan-04	RR-10-T01N-SFW-011304	Surface Water	T	8.8	166						7.9	309		0	8.7
Surface Water Area 1-Red River Along Mine	RR-10	24-Feb-04	RR-10-T01N-SFW-022404	Surface Water	T	11.3	90.8		-999				7.8	337		1.5	3.5
Surface Water Area 1-Red River Along Mine	RR-10	19-Apr-04	RR-10-T01N-SFW-041904	Surface Water	T	8.2	69.5	12.5					8.1	226		10.8	12.4
Surface Water Area 1-Red River Along Mine	RR-10A1	03-Oct-02	RR-10A1-T01N-SFW-100302	Surface Water	T	10.9	336	13.4					7.3	285		8.5	14
Surface Water Area 1-Red River Along Mine	RR-10A1	20-Jan-03	RR-10A1-T01N-SFW-012003	Surface Water	T	11.4	377	5.1					6.5	345		2.3	4.6
Surface Water Area 1-Red River Along Mine	RR-10A1	20-Mar-03	RR-10A1-T01N-SFW-032003	Surface Water	T	12.9	269	5					7.5	354		5.1	30
Surface Water Area 1-Red River Along Mine	RR-10A1	03-Apr-03	RR-10A1-T01N-SFW-040303	Surface Water	T	9.7	285	17.4					8.3	292		6.4	7.8
Surface Water Area 1-Red River Along Mine	RR-10A1	15-Jul-03	RR-10A1-T01N-SFW-071503	Surface Water	T	8.9	156	25					8.5	228		11.1	0
Surface Water Area 1-Red River Along Mine	RR-10A1	24-Sep-03	RR-10A1-T01N-SFW-092403	Surface Water	T	9.4	152	17.5					7.9	304			4.1
Surface Water Area 1-Red River Along Mine	RR-10A1	19-Oct-03	RR-10A1-T01N-SFW-101903	Surface Water	T	9.3	312	14.5					7.7	256		8.3	2.9
Surface Water Area 1-Red River Along Mine	RR-10A1	13-Jan-04	RR-10A1-T01N-SFW-011304	Surface Water	T	8.8	163						7.9	284		0.22	8.2
Surface Water Area 1-Red River Along Mine	RR-10A1	19-Apr-04	RR-10A1-T01N-SFW-041904	Surface Water	T	8.5	96.7	12.5					8	215		9.8	14.2
Surface Water Area 1-Red River Along Mine	RR-11A1	03-Oct-02	RR-11A1-T01N-SFW-100302	Surface Water	T	11	327	14.1					7.8	284		8	20.6
Surface Water Area 1-Red River Along Mine	RR-11A1	20-Jan-03	RR-11A1-T01N-SFW-012003	Surface Water	T	11.9	318	6.1					7.5	316		3.3	4.9
Surface Water Area 1-Red River Along Mine	RR-11A1	21-Mar-03	RR-11A1-T01N-SFW-032103	Surface Water	T	9.9	228	4.2					6.8	333		1.1	76.7
Surface Water Area 1-Red River Along Mine	RR-11A1	03-Apr-03	RR-11A1-T01N-SFW-040303	Surface Water	T	9.7	315	13.4					8.3	289		6.7	14.8
Surface Water Area 1-Red River Along Mine	RR-11A1	15-Jul-03	RR-11A1-T01N-SFW-071503	Surface Water	T	8.9	167	23.8					7.8	233		10.3	0
Surface Water Area 1-Red River Along Mine	RR-11A1	24-Sep-03	RR-11A1-T01N-SFW-092403	Surface Water	T	9.7	162	19.3					7.9	305		8.1	6.2
Surface Water Area 1-Red River Along Mine	RR-11A1	19-Oct-03	RR-11A1-T01N-SFW-101903	Surface Water	T	9.5	322	17.5					7.6	250		7.3	3.7
Surface Water Area 1-Red River Along Mine	RR-11A1	13-Jan-04	RR-11A1-T01N-SFW-011304	Surface Water	T	8.8	162						7.8	271		0	10.2
Surface Water Area 1-Red River Along Mine	RR-11A1	19-Apr-04	RR-11A1-T01N-SFW-041904	Surface Water	T	8.5	90.6	10.7					8	212		9.9	12.1
Surface Water Area 1-Red River Along Mine	RR-11B	03-Oct-02	RR-11B-T01N-SFW-100302	Surface Water	T	10.1	347	13					7.2	289		7.9	18.2
Surface Water Area 1-Red River Along Mine	RR-11B	20-Mar-03	RR-11B-T01N-SFW-032003	Surface Water	T	9.8	260	11.5					7.2	390		5.4	17.1
Surface Water Area 1-Red River Along Mine	RR-11B	15-Jul-03	RR-11B-T01N-SFW-071503	Surface Water	T	6.6	168	28.9					7.2	276		15.4	28.9
Surface Water Area 1-Red River Along Mine	RR-11B	24-Sep-03	RR-11B-T01N-SFW-092403	Surface Water	T	9.5	192	19.3					7.5	328		8	6.6
Surface Water Area 1-Red River Along Mine	RR-11B	19-Apr-04	RR-11B-T01N-SFW-041904	Surface Water	T	8.7	86.2						8	213		9.1	18.6
Surface Water Area 1-Red River Along Mine	RR-11C	01-Oct-02	RR-11C-T01N-SFW-100102	Surface Water	T	9	325	16.4					7.1	356		12	13.8
Surface Water Area 1-Red River Along Mine	RR-11C	20-Jan-03	RR-11C-T01N-SFW-012003	Surface Water	T	10.3	330	5.3					7.5	326		3.1	2.4
Surface Water Area 1-Red River Along Mine	RR-11C	20-Mar-03	RR-11C-T01N-SFW-032003	Surface Water	T	11.9	280	8.8					7	439		6.9	2.4
Surface Water Area 1-Red River Along Mine	RR-11C	03-Apr-03	RR-11C-T01N-SFW-040303	Surface Water	T	9.6	315	15.6					7.6	368		6.9	9
Surface Water Area 1-Red River Along Mine	RR-11C	15-Jul-03	RR-11C-T01N-SFW-071503	Surface Water	T	1.2	297	32.8					7.1	314		13.8	28.6
Surface Water Area 1-Red River Along Mine	RR-11C	24-Sep-03	RR-11C-T01N-SFW-092403	Surface Water	T	9.5	166	21					7.3	382		7.1	6.8
Surface Water Area 1-Red River Along Mine	RR-11C	19-Oct-03	RR-11C-T01N-SFW-101903	Surface Water	T	9.6	320	19					6.7	336		6.7	4.7
Surface Water Area 1-Red River Along Mine	RR-11C	13-Jan-04	RR-11C-T01N-SFW-011304	Surface Water	T	8	152	10.6					7.2	367		6.2	6.3
Surface Water Area 1-Red River Along Mine	RR-11C	19-Apr-04	RR-11C-T01N-SFW-041904	Surface Water	T	8.7	116	10.6					7.6	237		10.2	9.9
Surface Water Area 1-Red River Along Mine	RR-12	03-Oct-02	RR-12-T01N-SFW-100302	Surface Water	T	10.5	317	16.5					6.6	351		8.2	18.9
Surface Water Area 1-Red River Along Mine	RR-12	20-Jan-03	RR-12-T01N-SFW-012003	Surface Water	T	11.3	334	5.6					7.4	352		2.1	3.7
Surface Water Area 1-Red River Along Mine	RR-12	20-Mar-03	RR-12-T01N-SFW-032003	Surface Water	T	10.4	258	10.5					7	458		5.3	1
Surface Water Area 1-Red River Along Mine	RR-12	03-Apr-03	RR-12-T01N-SFW-040303	Surface Water	T	9.9	326	18.5					7.6	371		5.9	15
Surface Water Area 1-Red River Along Mine	RR-12	15-Jul-03	RR-12-T01N-SFW-071503	Surface Water	T	2.1	251	33.8					7.1	311		12.8	32.5
Surface Water Area 1-Red River Along Mine	RR-12	24-Sep-03	RR-12-T01N-SFW-092403	Surface Water	T	9.8	155	20.2					7.4	383		6.8	6.5
Surface Water Area 1-Red River Along Mine	RR-12	19-Oct-03	RR-12-T01N-SFW-101903	Surface Water	T	11.3	304	18.6					7.2	337		6.3	3.2
Surface Water Area 1-Red River Along Mine	RR-12	13-Jan-04	RR-12-T01N-SFW-011304	Surface Water	T	8.4	150						7.6	375		1.5	6.8
Surface Water Area 1-Red River Along Mine	RR-12	19-Apr-04	RR-12-T01N-SFW-041904	Surface Water	T	10.2	3.5	15.4					7.9	234		5.4	12.2
Surface Water Area 1-Red River Along Mine	RR-13	01-Oct-02	RR-13-T01N-SFW-100102	Surface Water	T	9.2	329	17.9					7	363		11.5	13.7
Surface Water Area 1-Red River Along Mine	RR-13	20-Jan-03	RR-13-T01N-SFW-012003	Surface Water	T	11	386	8.3					6.4	443		2.3	5.4
Surface Water Area 1-Red River Along Mine	RR-13	20-Mar-03	RR-13-T01N-SFW-032003	Surface Water	T	9.6	276	12.5					7.1	471		7	14.3
Surface Water Area 1-Red River Along Mine	RR-13	03-Apr-03	RR-13-T01N-SFW-040303	Surface Water	T	10.2	349	17.4					7.5	376		5.2	13.3
Surface Water Area 1-Red River Along Mine	RR-13	15-Jul-03	RR-13-T01N-SFW-071503	Surface Water	T	4.7	224	33.8					7.3	316		12.1	29.2
Surface Water Area 1-Red River Along Mine	RR-13	24-Sep-03	RR-13-T01N-SFW-092403	Surface Water	T	9.1	232	21.1					7.6	335		11.5	21.4
Surface Water Area 1-Red River Along Mine	RR-13	19-Oct-03	RR-13-T01N-SFW-101903	Surface Water	T	12.4	220	20					7.1	344		5.3	3.1
Surface Water Area 1-Red River Along Mine	RR-13	13-Jan-04	RR-13-T01N-SFW-011304	Surface Water	T	8.7	86.7	13.3					6.9	361		1.3	6.6
Surface Water Area 1-Red River Along Mine	RR-13	19-Apr-04	RR-13-T01N-SFW-041904	Surface Water	T	10.9	82.6	24.3					7.2	242		4.1	23.5
Surface Water Area 1-Red River Along Mine	RR-14	01-Oct-02	RR-14-T01N-SFW-100102	Surface Water	T	9.4	249	18.4					6.9	371		11.6	17
Surface Water Area 1-Red River Along Mine	RR-14	19-Jan-03	RR-14-T01N-SFW-011903	Surface Water	T	10.3	196	8.3					7.6	516		3.9	5.3
Surface Water Area 1-Red River Along Mine	RR-14	20-Mar-03	RR-14-T01N-SFW-032003	Surface Water	T	10.9	267	12.2					6.5	476		3.4	4.7
Surface Water Area 1-Red River Along Mine	RR-14	03-Apr-03	RR-14-T01N-SFW-040303	Surface Water	T	10.5	377	16.6					7	384		3.6	14.6
Surface Water Area 1-Red River Along Mine	RR-14	15-Jul-03	RR-14-T01N-SFW-071503	Surface Water	T	8.1	301	33					6.6	321		11.7	29.7
Surface Water Area 1-Red River Along Mine	RR-14	24-Sep-03	RR-14-T01N-SFW-092403	Surface Water	T	8.7	323	27.5					6.9	337		11.1	27.3
Surface Water Area 1-Red River Along Mine	RR-14	19-Oct-03	RR-14-T01N-SFW-101903	Surface Water	T		180	22.5					7	348		4.8	4.4
Surface Water Area 1-Red River Along Mine	RR-14	13-Jan-04	RR-14-T01N-SFW-011304	Surface Water	T	8.9	54.9	11.2					7.3	367		0.2	7.8
Surface Water Area 1-Red River Along Mine	RR-14	24-Feb-04	RR-14-T01N-SFW-022404	Surface Water	T	10.6	118		-999				6.4	402		2.5	4.7
Surface Water Area 1-Red River Along Mine	RR-14	19-Apr-04	RR-14-T01N-SFW-041904	Surface Water	T	10.9	35.3	53					7.3	245		3.5	21.2
Surface Water Area 1-Red River Along Mine	RR-15	01-Oct-02	RR-15-T01N-SFW-100102	Surface Water	T	9.6	279	22.4					6.8	327		10.5	16.6
Surface Water Area 1-Red River Along Mine	RR-15	21-Mar-03	RR-15-T01N-SFW-032103	Surface Water	T	11.2	320	14.5					7.1	811		3.4	46.7
Surface Water Area 1-Red River Along Mine	RR-15	15-Jul-03	RR-15-T01N-SFW-071503	Surface Water	T	4.9	328	35.8					6.1	327		10.6	31.1
Surface Water Area 1-Red River Along Mine	RR-15	24-Sep-03	RR-15-T01N-SFW-092403	Surface Water	T	9.4	218	24					7.2	340		9.2	17.6
Surface Water Area 1-Red River Along Mine	RR-16	01-Oct-02	RR-16-T01N-SFW-100102	Surface Water	T	9.5	299	15.7					6.8	374		9.1	19.9
Surface Water Area 1-Red River Along Mine	RR-16	19-Jan-03	RR-16-T01N-SFW-011903	Surface Water	T	10.9	177	8.9					8.2	498		2	7.4
Surface Water Area 1-Red River Along Mine	RR-16	19-Mar-03	RR-16-T01N-SFW-031903	Surface Water	T		403	11.7					6.9	430		3.9	85.4
Surface Water Area 1-Red River Along Mine	RR-16	03-Apr-03	RR-16-T01N-SFW-040303	Surface Water	T	10.7	394	18.2					6.9	393		2.4	14.6
Surface Water Area 1-Red River Along Mine	RR-16	15-Jul-03	RR-16-T01N-SFW-071503	Surface Water	T	9.1	180	23.8					7.3	337		11.2	1.3
Surface Water Area 1-Red River Along Mine	RR-16	23-Sep-03	RR-16-T01N-SFW-092303	Surface Water	T	9.1	321	18.4					7.6	298		12.1	10.8
Surface Water Area 1-Red River Along Mine	RR-16	19-Oct-03	RR-16-T01N-SFW-101903	Surface Water	T	11.6	213	19.1					6.6	352		4.9	5.5
Surface Water Area 1-Red River Along Mine	RR-16	13-Jan-04	RR-16-T01N-SFW-011304	Surface Water	T	9	54.5	10.1					7.4	372		0.11	8.6
Surface Water Area 1-Red River Along Mine	RR-16	19-Apr-04	RR-16-T01N-SFW-041904	Surface Water	T	11.3	89.3	43					7.4	246		2.8	22.8
Surface Water Area 1-Red River Along Mine	RR-17	01-Oct-02	RR-17-T01N-SFW-100102	Surface Water	T	9.7	365	15.2					6.6	381		9.1	21.3
Surface Water Area 1-Red River Along Mine	RR-17	19-Mar-03	RR-17-T01N-SFW-031903	Surface Water	T		392	11.2					7	434		4.1	96.5
Surface Water Area 1-Red River Along Mine	RR-17	15-Jul-03	RR-17-T01N-SFW-071503	Surface Water	T	8.7	287	10.2					6.6	345		12.4	2.2
Surface Water Area 1-Red River Along Mine	RR-17	23-Sep-03	RR-17-T01N-SFW-092303	Surface Water	T	9.8	343	16.4					7.4	300		12.1	14.6
Surface Water Area 1-Red River Along Mine	RR-18A	01-Oct-02	RR-18A-T01N-SFW-100102	Surface Water	T	9.9	393	14.6					6.3	380		8.9	30.4
Surface Water Area 1-Red River Along Mine	RR-18A	19-Mar-03	RR-18A-T01N-SFW-031903	Surface Water	T		400	9.4					6.5	435		3.9	86
Surface Water Area 1-Red River Along Mine	RR-18A	16-Jul-03	RR-18A-T01N-SFW-071603	Surface Water	T	8.6	302	12.1					7.4	347		13.3	2.6
Surface Water Area 1-Red River Along Mine	RR-18A	23-Sep-03	RR-18A-T01N-SFW-092303	Surface Water	T	9.4	280	19					7.4	299		11.9	101
Surface Water Area 1-Red River Along Mine	RR-18B	30-Sep-02	RR-18B-T01N-SFW-093002	Surface Water	T	8.6	341	14.4					7.7	354		15.1	21.6
Surface Water Area 1-Red River Along Mine	RR-18B	19-Mar-03	RR-18B-T01N-SFW-031903	Surface Water	T		297	13.4					6.5	439		2	84.6
Surface Water Area 1-Red River Along Mine	RR-18B	16-Jul-03	RR-18B-T01N-SFW-071603	Surface Water	T	8.7	342	10.5					6.9	348		12.7	2.5
Surface Water Area 1-Red River Along Mine	RR-18B	23-Sep-03	RR-18B-T01N-SFW-092303	Surface Water	T	9.4	471	20					7.5	301		9.3	11.2
Surface Water Area 1-Red River Along Mine	RR-20	30-Sep-02	RR-20-T01N-SFW-093002	Surface Water	T	9	344	18.9					6.7	357		14.6	22.7
Surface Water Area 1-Red River Along Mine	RR-20	21-Mar-03	RR-20-T01N-SFW-032103	Surface Water	T	9.3	251	15.4					7.1	472		8.8	17.6
Surface Water Area 1-Red River Along Mine	RR-20	15-Jul-03	RR-20-T01N-SFW-071503	Surface Water	T	7.9	217	15.3					6.8	332		16.8	2.9
Surface Water Area 1-Red River Along Mine	RR-20	23-Sep-03	RR-20-T01N-SFW-092303	Surface Water	T	10.6	350	22					6.7	312		8.7	15.7
Surface Water Area 1-Red River Along Mine	RR-7	04-Oct-02	RR-7-T01N-SFW-100402	Surface Water	T	9.4	348	12.4					6.7	319		10.2	8.8
Surface Water Area 1-Red River Along Mine	RR-7	21-Jan-03	RR-7-T01N-SFW-012103	Surface Water	T	10.8	388	3.9					6.7	365		0.42	0
Surface Water Area 1-Red River Along Mine	RR-7	21-Mar-03	RR-7-T01N-SFW-032103	Surface Water	T	11.9	277	9.1					7.2	647		1.4	34.3
Surface Water Area 1-Red River Along Mine	RR-7	03-Apr-03	RR-7-T01N-SFW-040303	Surface Water	T	9.5	284	14.8					8.2	317		5.9	11.5
Surface Water Area 1-Red River Along Mine	RR-7	15-Jul-03	RR-7-T01N-SFW-071503	Surface Water	T	8.6	90.8	18					8.6	244		15.1	0
Surface Water Area 1-Red River Along Mine	RR-7	24-Sep-03	RR-7-T01N-SFW-092403	Surface Water	T	9.6	317	15.9					7.4	281		8.4	7
Surface Water Area 1-Red River Along Mine	RR-7	19-Oct-03	RR-7-T01N-SFW-101903	Surface Water	T	8.9	281	17.1					7.8	278		9.7	2.8
Surface Water Area 1-Red River Along Mine	RR-7	13-Jan-04	RR-7-T01N-SFW-011304	Surface Water	T	8.5	184		-999				7.9	313		1.2	8.3
Surface Water Area 1-Red River Along Mine	RR-7	24-Feb-04	RR-7-T01N-SFW-022404	Surface Water	T	10.9	93		-999				7.8	335		2.3	3.1
Surface Water Area 1-Red River Along Mine	RR-7	19-Apr-04	RR-7-T01N-SFW-041904	Surface Water	T	8.6	192	10.4					8	224		9.3	10.4
Surface Water Area 1-Red River Along Mine	RR-8	04-Oct-02	RR-8-T01N-SFW-100402	Surface Water	T	9.8	310	13.1					7.5	316		8.9	11.5
Surface Water Area 1-Red River Along Mine	RR-8	21-Mar-03	RR-8-T01N-SFW-032103	Surface Water	T	10.6	260	6.8					7.6	337		1.4	78.9
Surface Water Area 1-Red River Along Mine	RR-8	15-Jul-03	RR-8-T01N-SFW-071503	Surface Water	T	8.5	100	17.1					8.8	245		14.6	0
Surface Water Area 1-Red River Along Mine	RR-8	24-Sep-03	RR-8-T01N-SFW-092403	Surface Water	T	10	330	14.1					6.9	285		7.1	10.2
Surface Water Area 1-Red River Along Mine	RR-8A	04-Oct-02	RR-8A-T01N-SFW-100402	Surface Water	T	11.1	346	11.4					6.7	321		5	16.5
Surface Water Area 1-Red River Along Mine	RR-8A	21-Mar-03	RR-8A-T01N-SFW-032103	Surface Water	T	10.6	257	6.7					6.9	350		1.1	76.1
Surface Water Area 1-Red River Along Mine	RR-8A	15-Jul-03	RR-8A-T01N-SFW-071503	Surface Water	T	8.7	111	18.7					8.7	245		13.6	0
Surface Water Area 1-Red River Along Mine	RR-8A	24-Sep-03	RR-8A-T01N-SFW-092403	Surface Water	T	8.4	158	16					7.9	326		12.8	4.8
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	27-Sep-02	LR-11A-T01N-SFW-092702	Surface Water	T		214	20.5					6.7	494		14.7	24.1
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	20-Mar-03	LR-11A-T01N-SFW-032003	Surface Water	T	11.1	279	15.7					7	565		3.5	40.1
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	14-Jul-03	LR-11A-T01N-SFW-071403	Surface Water	T	8.2	25.3	23.1					7.5	401		18.3	0
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	23-Sep-03	LR-11A-T01N-SFW-092303	Surface Water	T	8.5	99.3	26.4					7.5	469		12.7	7.6
Surface Water Area 11-Red River Along Tailings Facility	LR-13	26-Sep-02	LR-13-T01N-SFW-092602	Surface Water	T		234	21.4					6.8	487		15.1	26.5
Surface Water Area 11-Red River Along Tailings Facility	LR-13	20-Mar-03	LR-13-T01N-SFW-032003	Surface Water	T	9.4	98.2	15					8.1	500		9.5	69.7
Surface Water Area 11-Red River Along Tailings Facility	LR-13	14-Jul-03	LR-13-T01N-SFW-071403	Surface Water	T	8.8	270	21.7					6.8	420		17.4	0.2
Surface Water Area 11-Red River Along Tailings Facility	LR-13	21-Sep-03	LR-13-T01N-SFW-092103	Surface Water	T	10.4	342	37.9					5.8	385		9.4	10.3
Surface Water Area 11-Red River Along Tailings Facility	LR-16	26-Sep-02	LR-16-T01N-SFW-092602	Surface Water	T		264	21.5					6.4	488		14.6	24.1
Surface Water Area 11-Red River Along Tailings Facility	LR-16	20-Mar-03	LR-16-T01N-SFW-032003	Surface Water	T	9.5	152	15.9					8.1	496		8.3	68.2

Surface Water Area 11-Red River Along Tailings Facility	LR-16	14-Jul-03	LR-16-T01N-SFW-071403	Surface Water	T	8.6	326	24				8.4	413		17.4	1.8
Surface Water Area 11-Red River Along Tailings Facility	LR-16	21-Sep-03	LR-16-T01N-SFW-092103	Surface Water	T	9.9	306	38.2				6.4	387		8.5	15.1
Surface Water Area 11-Red River Along Tailings Facility	LR-5	30-Sep-02	LR-5-T01N-SFW-093002	Surface Water	T	9.7	328	21.8				7.5	366		11.9	22.1
Surface Water Area 11-Red River Along Tailings Facility	LR-5	21-Mar-03	LR-5-T01N-SFW-032103	Surface Water	T	10	302	17.3				7	481		6.5	19.5
Surface Water Area 11-Red River Along Tailings Facility	LR-5	15-Jul-03	LR-5-T01N-SFW-071503	Surface Water	T	9	153	21.5				6.9	345		12.4	2.7
Surface Water Area 11-Red River Along Tailings Facility	LR-5	23-Sep-03	LR-5-T01N-SFW-092303	Surface Water	T	8.2	49.2	21.8				7.5	407		13.6	5.5
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	27-Sep-02	LR-8A-T01N-SFW-092702	Surface Water	T	7.9	235	18.1				6.2	487		14.4	41.7
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	23-Mar-03	LR-8A-T01N-SFW-032303	Surface Water	T	9.7	299	17.1				7	141		9.3	89.5
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	15-Jul-03	LR-8A-T01N-SFW-071503	Surface Water	T	9.1	178	19.7				6.7	358		12.3	2.3
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	23-Sep-03	LR-8A-T01N-SFW-092303	Surface Water	T	8.2	81.7	22.9				7.4	423		13.2	6.9
Reference Lower Cabresto Creek Riparian	RRS-18	06-Oct-02	RRS-18-T01N-SFW-100602	Surface Water	T					0.31	0.005			48.1		
Reference Lower Cabresto Creek Riparian	RRS-18	23-Mar-03	RRS-18-T01N-SFW-032303	Surface Water	T					0.36	0.005			40.8		
Reference Lower Cabresto Creek Riparian	RRS-18	25-Seo-03	RRS-18-T01N-SFW-092503	Surface Water	T					0.32	0.005			33.7		
Reference Lower Cabresto Creek Riparian	RRS-20	06-Oct-02	RRS-20-T01N-SFW-100602	Surface Water	T					0.38	0.005			52.1		
Reference Lower Cabresto Creek Riparian	RRS-20	23-Mar-03	RRS-20-T01N-SFW-032303	Surface Water	T					0.35	0.005			39.9		
Reference Lower Cabresto Creek Riparian	RRS-20	16-Jul-03	RRS-20-T01N-SFW-071603	Surface Water	T					0.35	0.005			38.2		
Reference Lower Cabresto Creek Riparian	RRS-20	25-Sep-03	RRS-20-T01N-SFW-092503	Surface Water	T					0.34	0.005			26.7		
Reference Lower Cabresto Creek Riparian	RRS-23	06-Oct-02	RRS-23-T01N-SFW-100602	Surface Water	T					0.48	0.005			55.8		
Reference Lower Cabresto Creek Riparian	RRS-23	23-Mar-03	RRS-23-T01N-SFW-032303	Surface Water	T					0.36	0.005			41.9		
Reference Lower Cabresto Creek Riparian	RRS-23	16-Jul-03	RRS-23-T01N-SFW-071603	Surface Water	T					0.5	0.005			54		
Reference Lower Cabresto Creek Riparian	RRS-23	25-Sep-03	RRS-23-T01N-SFW-092503	Surface Water	T					0.34	0.005			34.5		
Reference Lower Cabresto Creek Riparian	RRS-27	06-Oct-02	RRS-27-T01N-SFW-100602	Surface Water	T					0.24	0.005			98.3		
Reference Lower Cabresto Creek Riparian	RRS-27	23-Mar-03	RRS-27-T01N-SFW-032303	Surface Water	T					0.36	0.005			52.2		
Reference Lower Cabresto Creek Riparian	RRS-27	16-Jul-03	RRS-27-T01N-SFW-071603	Surface Water	T					0.43	0.005			55.7		
Reference Lower Cabresto Creek Riparian	RRS-27	25-Sep-03	RRS-27-T01N-SFW-092503	Surface Water	T					0.39	0.005			35.9		
Reference Red River Above Mine Site	RR-1	04-Oct-02	RR-1-T01N-SFW-100402	Surface Water	T					0.2	0.005			21.5		
Reference Red River Above Mine Site	RR-1	21-Mar-03	RR-1-T01N-SFW-032103	Surface Water	T					0.1	0.005			15.6		
Reference Red River Above Mine Site	RR-1	16-Jul-03	RR-1-T01N-SFW-071603	Surface Water	T					0.1	0.005			18.2		
Reference Red River Above Mine Site	RR-1	25-Sep-03	RR-1-T01N-SFW-092503	Surface Water	T					0.1	0.005			19.6		
Reference Red River Above Mine Site	RR-3	03-Oct-02	RR-3-T01N-SFW-100302	Surface Water	T					0.2	0.005			47.4		
Reference Red River Above Mine Site	RR-3	21-Mar-03	RR-3-T01N-SFW-032103	Surface Water	T					0.3	0.005			68.1		
Reference Red River Above Mine Site	RR-3	16-Jul-03	RR-3-T01N-SFW-071603	Surface Water	T					0.2	0.005			40.1		
Reference Red River Above Mine Site	RR-3	25-Sep-03	RR-3-T01N-SFW-092503	Surface Water	T					0.2	0.005			40.6		
Reference Red River Above Mine Site	RR-4	04-Oct-02	RR-4-T01N-SFW-100402	Surface Water	T					0.4	0.005			62		
Reference Red River Above Mine Site	RR-4	21-Mar-03	RR-4-T01N-SFW-032103	Surface Water	T					0.34	0.005			65.6		
Reference Red River Above Mine Site	RR-4	16-Jul-03	RR-4-T01N-SFW-071603	Surface Water	T					0.25	0.005			46.8		
Reference Red River Above Mine Site	RR-4	25-Sep-03	RR-4-T01N-SFW-092503	Surface Water	T					0.22	0.005			46		
Reference Red River Above Mine Site	RR-5	03-Oct-02	RR-5-T01N-SFW-100302	Surface Water	T					0.34	0.008			67.9		
Reference Red River Above Mine Site	RR-5	21-Mar-03	RR-5-T01N-SFW-032103	Surface Water	T					0.36	0.014			72.4		
Reference Red River Above Mine Site	RR-5	16-Jul-03	RR-5-T01N-SFW-071603	Surface Water	T					0.25	0.005			50.6		
Reference Red River Above Mine Site	RR-5	24-Sep-03	RR-5-T01N-SFW-092403	Surface Water	T					0.26	0.0052			45.2		
Reference Red River Above Mine Site	RR-6	04-Oct-02	RR-6-T01N-SFW-100402	Surface Water	T					0.37	0.005			90.1		
Reference Red River Above Mine Site	RR-6	21-Mar-03	RR-6-T01N-SFW-032103	Surface Water	T					0.46	0.031			96.8		
Reference Red River Above Mine Site	RR-6	16-Jul-03	RR-6-T01N-SFW-071603	Surface Water	T					0.31	0.005			65.5		
Reference Red River Above Mine Site	RR-6	24-Sep-03	RR-6-T01N-SFW-092403	Surface Water	T					0.32	0.005			74.3		
Reference Red River Above Mine Site	RR-6A	04-Oct-02	RR-6A-T01N-SFW-100402	Surface Water	T					0.36	0.005			92.8		
Reference Red River Above Mine Site	RR-6A	21-Mar-03	RR-6A-T01N-SFW-032103	Surface Water	T					0.42	0.013			105		
Reference Red River Above Mine Site	RR-6A	15-Jul-03	RR-6A-T01N-SFW-071503	Surface Water	T					0.89	0.005			72.5		
Reference Red River Above Mine Site	RR-6A	24-Sep-03	RR-6A-T01N-SFW-092403	Surface Water	T					0.3	0.005			66.9		
Reference Red River Above Mine Site	RR-6V	16-Jul-03	RR-6V-T01N-SFW-071603	Surface Water	T					0.26	0.0092			49.8		
Reference Red River Above Mine Site	RR-6V	24-Sep-03	RR-6V-T01N-SFW-092403	Surface Water	T					0.27	0.005			49.8		
Reference Red River Above Mine Site	Zwergle	07-Oct-02	ZWERGEL-T01N-SFW-100702	Surface Water	T					0.21	0.005			23.3		
Reference Red River Above Mine Site	Zwergle	23-Mar-03	ZWERGEL-T01N-SFW-032303	Surface Water	T					0.1	0.005			12.7		
Reference Red River Above Mine Site	Zwergle	16-Jul-03	ZWERGEL-T01N-SFW-071603	Surface Water	T					0.1	0.005			19.1		
Reference Red River Above Mine Site	ZWERGLE	25-Sep-03	ZWERGEL-T01N-SFW-092503	Surface Water	T					0.1	0.005			21.6		
Reference Upper Cabresto Creek Riparian	RRS-12	07-Oct-02	RRS-12-T01N-SFW-100702	Surface Water	T					0.47	0.005			65.1		
Reference Upper Cabresto Creek Riparian	RRS-12	23-Mar-03	RRS-12-T01N-SFW-032303	Surface Water	T					0.47	0.005			55		
Reference Upper Cabresto Creek Riparian	RRS-12	16-Jul-03	RRS-12-T01N-SFW-071603	Surface Water	T					0.51	0.005			54.8		
Reference Upper Cabresto Creek Riparian	RRS-12	25-Sep-03	RRS-12-T01N-SFW-092503	Surface Water	T					0.53	0.005			50.8		
Reference Upper Cabresto Creek Riparian	RRS-13	06-Oct-02	RRS-13-T01N-SFW-100602	Surface Water	T					0.53	0.005			33.6		
Reference Upper Cabresto Creek Riparian	RRS-13	23-Mar-03	RRS-13-T01N-SFW-032303	Surface Water	T					0.32	0.005			32		
Reference Upper Cabresto Creek Riparian	RRS-13	16-Jul-03	RRS-13-T01N-SFW-071603	Surface Water	T					0.29	0.005			19.1		
Reference Upper Cabresto Creek Riparian	RRS-13	25-Sep-03	RR-13-T01N-SFW-092503	Surface Water	T					0.3	0.005			20.5		
Reference Upper Cabresto Creek Riparian	RRS-15	06-Oct-02	RRS-15-T01N-SFW-100602	Surface Water	T					0.44	0.005			36		
Reference Upper Cabresto Creek Riparian	RRS-15	23-Mar-03	RRS-15-T01N-SFW-032303	Surface Water	T					0.32	0.005			32.7		
Reference Upper Cabresto Creek Riparian	RRS-15	16-Jul-03	RRS-15-T01N-SFW-071603	Surface Water	T					0.28	0.005			19.8		
Reference Upper Cabresto Creek Riparian	RRS-15	25-Sep-03	RRS-15-T01N-SFW-092503	Surface Water	T					0.29	0.005			26.9		
Reference Upper Cabresto Creek Riparian	RRS-9	07-Oct-02	RRS-9-T01N-SFW-100702	Surface Water	T					0.23	0.005			26.1		
Reference Upper Cabresto Creek Riparian	RRS-9	23-Mar-03	RRS-9-T01N-SFW-032303	Surface Water	T					0.21	0.005			23		
Reference Upper Cabresto Creek Riparian	RRS-9	16-Jul-03	RRS-9-T01N-SFW-071603	Surface Water	T					0.2	0.005			17.2		
Reference Upper Cabresto Creek Riparian	RRS-9	25-Sep-03	RRS-9-T01N-SFW-092503	Surface Water	T					0.21	0.005			19.2		
Reference Upper Cabresto Creek Riparian	UPPER CABRESTO CREEK	23-Mar-03	UCC-T01N-SFW-032303	Surface Water	T					0.35	0.005			36.5		
Reference Upper Cabresto Creek Riparian	UPPER CABRESTO CREEK	16-Jul-03	UPPERCABRESTO-T01N-SFW-071603	Surface Water	T					0.32	0.005			33.4		
Reference Upper Cabresto Creek Riparian	UPPER CABRESTO CREEK	25-Sep-03	UPPERCABRESTO-T01N-SFW-092503	Surface Water	T					0.3	0.005			23.2		
Surface Water Area 1-Red River Along Mine	LR-1	30-Sep-02	LR-1-T01N-SFW-093002	Surface Water	T					0.76	0.005			134		
Surface Water Area 1-Red River Along Mine	LR-1	20-Mar-03	LR-1-T01N-SFW-032003	Surface Water	T					1	0.0079			143		
Surface Water Area 1-Red River Along Mine	LR-1	15-Jul-03	LR-1-T01N-SFW-071503	Surface Water	T					0.93	0.005			113		
Surface Water Area 1-Red River Along Mine	LR-1	24-Sep-03	LR-1-T01N-SFW-092403	Surface Water	T					0.81	0.005			107		
Surface Water Area 1-Red River Along Mine	RR-10	03-Oct-02	RR-10-T01N-SFW-100302	Surface Water	T					0.45	0.006			94.3		
Surface Water Area 1-Red River Along Mine	RR-10	21-Jan-03	RR-10-T01N-SFW-012103	Surface Water	T					0.41	0.005			104		
Surface Water Area 1-Red River Along Mine	RR-10	20-Mar-03	RR-10-T01N-SFW-032003	Surface Water	T					0.47	0.023			109		
Surface Water Area 1-Red River Along Mine	RR-10	03-Apr-03	RR-10-T01N-SFW-040303	Surface Water	T					0.38	0.005			85.5		
Surface Water Area 1-Red River Along Mine	RR-10	15-Jul-03	RR-10-T01N-SFW-071503	Surface Water	T					0.31	0.005			60.4		
Surface Water Area 1-Red River Along Mine	RR-10	24-Sep-03	RR-10-T01N-SFW-092403	Surface Water	T					0.32	0.005			76.8		
Surface Water Area 1-Red River Along Mine	RR-10	19-Oct-03	RR-10-T01N-SFW-101903	Surface Water	T					0.38	0.005			82.6		
Surface Water Area 1-Red River Along Mine	RR-10	13-Jan-04	RR-10-T01N-SFW-011304	Surface Water	T					0.42	0.022			89.2		
Surface Water Area 1-Red River Along Mine	RR-10	24-Feb-04	RR-10-T01N-SFW-022404	Surface Water	T					0.49				102		
Surface Water Area 1-Red River Along Mine	RR-10	19-Apr-04	RR-10-T01N-SFW-041904	Surface Water	T					0.3	0.005			49.7		
Surface Water Area 1-Red River Along Mine	RR-10A1	03-Oct-02	RR-10A1-T01N-SFW-100302	Surface Water	T					0.27	0.006			75.5		
Surface Water Area 1-Red River Along Mine	RR-10A1	20-Jan-03	RR-10A1-T01N-SFW-012003	Surface Water	T					0.46	0.0093			103		
Surface Water Area 1-Red River Along Mine	RR-10A1	20-Mar-03	RR-10A1-T01N-SFW-032003	Surface Water	T					0.44	0.017			84.7		
Surface Water Area 1-Red River Along Mine	RR-10A1	03-Apr-03	RR-10A1-T01N-SFW-040303	Surface Water	T					0.35	0.005			63.5		
Surface Water Area 1-Red River Along Mine	RR-10A1	15-Jul-03	RR-10A1-T01N-SFW-071503	Surface Water	T					0.28	0.005			51.8		
Surface Water Area 1-Red River Along Mine	RR-10A1	24-Sep-03	RR-10A1-T01N-SFW-092403	Surface Water	T					0.31	0.005			69.3		
Surface Water Area 1-Red River Along Mine	RR-10A1	19-Oct-03	RR-10A1-T01N-SFW-101903	Surface Water	T					0.36	0.005			82.6		
Surface Water Area 1-Red River Along Mine	RR-10A1	13-Jan-04	RR-10A1-T01N-SFW-011304	Surface Water	T					0.38	0.019			79.5		
Surface Water Area 1-Red River Along Mine	RR-10A1	19-Apr-04	RR-10A1-T01N-SFW-041904	Surface Water	T					0.48	0.005			62.1		
Surface Water Area 1-Red River Along Mine	RR-11A1	03-Oct-02	RR-11A1-T01N-SFW-100302	Surface Water	T					0.25	0.006			73.8		
Surface Water Area 1-Red River Along Mine	RR-11A1	20-Jan-03	RR-11A1-T01N-SFW-012003	Surface Water	T					0.42	0.005			85.6		
Surface Water Area 1-Red River Along Mine	RR-11A1	21-Mar-03	RR-11A1-T01N-SFW-032103	Surface Water	T					0.39	0.012			80.3		
Surface Water Area 1-Red River Along Mine	RR-11A1	03-Apr-03	RR-11A1-T01N-SFW-040303	Surface Water	T					0.35	0.005			65.2		
Surface Water Area 1-Red River Along Mine	RR-11A1	15-Jul-03	RR-11A1-T01N-SFW-071503	Surface Water	T					0.34	0.005			54.1		
Surface Water Area 1-Red River Along Mine	RR-11A1	24-Sep-03	RR-11A1-T01N-SFW-092403	Surface Water	T					0.31	0.005			51.5		
Surface Water Area 1-Red River Along Mine	RR-11A1	19-Oct-03	RR-11A1-T01N-SFW-101903	Surface Water	T					0.35	0.005			75.7		
Surface Water Area 1-Red River Along Mine	RR-11A1	13-Jan-04	RR-11A1-T01N-SFW-011304	Surface Water	T					0.38	0.016			79.8		
Surface Water Area 1-Red River Along Mine	RR-11A1	19-Apr-04	RR-11A1-T01N-SFW-041904	Surface Water	T					0.29	0.005			43.5		
Surface Water Area 1-Red River Along Mine	RR-11B	03-Oct-02	RR-11B-T01N-SFW-100302	Surface Water	T					0.5	0.006			79.2		
Surface Water Area 1-Red River Along Mine	RR-11B	20-Mar-03	RR-11B-T01N-SFW-032003	Surface Water	T					0.78	0.015			102		
Surface Water Area 1-Red River Along Mine	RR-11B	15-Jul-03	RR-11B-T01N-SFW-071503	Surface Water	T					0.3	0.005			72.9		
Surface Water Area 1-Red River Along Mine	RR-11B	24-Sep-03	RR-11B-T01N-SFW-092403	Surface Water	T					0.49	0.005			73.4		
Surface Water Area 1-Red River Along Mine	RR-11C	01-Oct-02	RR-11C-T01N-SFW-100102	Surface Water	T					0.48	0.005			121		
Surface Water Area 1-Red River Along Mine	RR-11C	20-Jan-03	RR-11C-T01N-SFW-012003	Surface Water	T					0.91	0.0054			186		
Surface Water Area 1-Red River Along Mine	RR-11C	20-Mar-03	RR-11C-T01N-SFW-032003	Surface Water	T					0.87	0.0085			139		
Surface Water Area 1-Red River Along Mine	RR-11C	03-Apr-03	RR-11C-T01N-SFW-040303	Surface Water	T					0.65	0.005			112		
Surface Water Area 1-Red River Along Mine	RR-11C	15-Jul-03	RR-11C-T01N-SFW-071503	Surface Water	T					0.71	0.005			99.6		
Surface Water Area 1-Red River Along Mine	RR-11C	25-Seo-03	RR-11C-T01N-SFW-092503	Surface Water	T					0.58	0.005			87.1		
Surface Water Area 1-Red River Along Mine	RR-11C	19-Oct-03	RR-11C-T01N-SFW-101903	Surface Water	T					0.72	0.005			96.9		
Surface Water Area 1-Red River Along Mine	RR-11C	13-Jan-04	RR-11C-T01N-SFW-011304	Surface Water	T					0.79	0.011			127		
Surface Water Area 1-Red River Along Mine	RR-11C	19-Apr-04	RR-11C-T01N-SFW-041904	Surface Water	T					0.38	0.005			53.6		
Surface Water Area 1-Red River Along Mine	RR-12	03-Oct-02	RR-12-T01N-SFW-100302	Surface Water	T					0.25	0.005			119		
Surface Water Area 1-Red River Along Mine	RR-12	20-Jan-03	RR-12-T01N-SFW-012003	Surface Water	T					0.95	0.0062			155		
Surface Water Area 1-Red River Along Mine	RR-12	20-Mar-03	RR-12-T01N-SFW-032003	Surface Water	T					0.83	0.0086			138		
Surface Water Area 1-Red River Along Mine	RR-12	03-Apr-03	RR-12-T01N-SFW-040303	Surface Water	T					0.67	0.005			110		
Surface Water Area 1-Red River Along Mine	RR-12	15-Jul-03	RR-12-T01N-SFW-071503	Surface Water	T					0.7	0.005			86.9		
Surface Water Area 1-Red River Along Mine	RR-12	24-Sep-03	RR-12-T01N-SFW-092403	Surface Water	T					0.61	0.005			95.1		
Surface Water Area 1-Red River Along Mine	RR-12	19-Oct-03	RR-12-T01N-SFW-101903	Surface Water	T					1.8	0.005			95		
Surface Water Area 1-Red River Along Mine	RR-12	13-Jan-04	RR-12-T01N-SFW-011304	Surface Water	T					0.81	0.008			157		
Surface Water Area 1-Red River Along Mine	RR-12	19-Apr-04	RR-12-T01N-SFW-041904	Surface Water	T					0.38	0.005			51.2		
Surface Water Area 1-Red River Along Mine	RR-13	01-Oct-02	RR-13-T01N-SFW-100102	Surface Water	T					0.36	0.005			126		
Surface Water Area 1-Red River Along Mine	RR-13	20-Jan-03	RR-13-T01N-SFW-012003	Surface Water	T					0.92	0.0093			152		
Surface Water Area 1-Red River Along Mine	RR-13	20-Mar-03	RR-13-T01N-SFW-032003	Surface Water	T					0.93	0.008			145		
Surface Water Area 1-Red River Along Mine	RR-13	03-Apr-03	RR-13-T01N-SFW-040303	Surface Water	T					0.68	0.005			117		
Surface Water Area 1-Red River Along Mine	RR-13	15-Jul-03	RR-13-T01N-SFW-071503	Surface Water	T					0.74	0.005			94.8		
Surface Water Area 1-Red River Along Mine	RR-13	24-Sep-03	RR-13-T01N-SFW-092403	Surface Water	T					0.63	0.005			88.4		
Surface Water Area 1-Red River Along Mine	RR-13	19-Oct-03	RR-13-T01N-SFW-101903	Surface Water	T					0.75	0.005			108		

Surface Water Area 1-Red River Along Mine	RR-13	13-Jan-04	RR-13-T01N-SFW-011304	Surface Water	T					0.78	0.01			123		
Surface Water Area 1-Red River Along Mine	RR-13	19-Apr-04	RR-13-T01N-SFW-041904	Surface Water	T					0.4	0.005			54.3		
Surface Water Area 1-Red River Along Mine	RR-14	01-Oct-02	RR-14-T01N-SFW-100102	Surface Water	T					0.65	0.005			133		
Surface Water Area 1-Red River Along Mine	RR-14	19-Jan-03	RR-14-T01N-SFW-011903	Surface Water	T					1.1	0.005			185		
Surface Water Area 1-Red River Along Mine	RR-14	20-Mar-03	RR-14-T01N-SFW-032003	Surface Water	T					0.96	0.012			162		
Surface Water Area 1-Red River Along Mine	RR-14	03-Apr-03	RR-14-T01N-SFW-040303	Surface Water	T					0.74	0.005			120		
Surface Water Area 1-Red River Along Mine	RR-14	15-Jul-03	RR-14-T01N-SFW-071503	Surface Water	T					0.3	0.005			104		
Surface Water Area 1-Red River Along Mine	RR-14	24-Sep-03	RR-14-T01N-SFW-092403	Surface Water	T					0.69	0.005			93.7		
Surface Water Area 1-Red River Along Mine	RR-14	19-Oct-03	RR-14-T01N-SFW-101903	Surface Water	T					0.79	0.005			111		
Surface Water Area 1-Red River Along Mine	RR-14	13-Jan-04	RR-14-T01N-SFW-011304	Surface Water	T					0.81	0.011			126		
Surface Water Area 1-Red River Along Mine	RR-14	24-Feb-04	RR-14-T01N-SFW-022404	Surface Water	T					0.87				142		
Surface Water Area 1-Red River Along Mine	RR-14	19-Apr-04	RR-14-T01N-SFW-041904	Surface Water	T					0.45	0.005			59.7		
Surface Water Area 1-Red River Along Mine	RR-15	01-Oct-02	RR-15-T01N-SFW-100102	Surface Water	T					1.1	0.005			135		
Surface Water Area 1-Red River Along Mine	RR-15	21-Mar-03	RR-15-T01N-SFW-032103	Surface Water	T					0.96	0.0079			146		
Surface Water Area 1-Red River Along Mine	RR-15	15-Jul-03	RR-15-T01N-SFW-071503	Surface Water	T					0.8	0.005			104		
Surface Water Area 1-Red River Along Mine	RR-15	24-Sep-03	RR-15-T01N-SFW-092403	Surface Water	T					0.69	0.005			97.8		
Surface Water Area 1-Red River Along Mine	RR-16	01-Oct-02	RR-16-T01N-SFW-100102	Surface Water	T					0.73	0.005			143		
Surface Water Area 1-Red River Along Mine	RR-16	19-Jan-03	RR-16-T01N-SFW-011903	Surface Water	T					1.1	0.009			186		
Surface Water Area 1-Red River Along Mine	RR-16	19-Mar-03	RR-16-T01N-SFW-031903	Surface Water	T					1	0.0083			148		
Surface Water Area 1-Red River Along Mine	RR-16	03-Apr-03	RR-16-T01N-SFW-040303	Surface Water	T					0.81	0.005			124		
Surface Water Area 1-Red River Along Mine	RR-16	15-Jul-03	RR-16-T01N-SFW-071503	Surface Water	T					0.81	0.005			104		
Surface Water Area 1-Red River Along Mine	RR-16	23-Seo-03	RR-16-T01N-SFW-092303	Surface Water	T					0.72	0.005			94.1		
Surface Water Area 1-Red River Along Mine	RR-16	19-Oct-03	RR-16-T01N-SFW-101903	Surface Water	T					0.86	0.005			111		
Surface Water Area 1-Red River Along Mine	RR-16	13-Jan-04	RR-16-T01N-SFW-011304	Surface Water	T					0.91	0.012			131		
Surface Water Area 1-Red River Along Mine	RR-16	19-Apr-04	RR-16-T01N-SFW-041904	Surface Water	T					0.3	0.005			43.3		
Surface Water Area 1-Red River Along Mine	RR-17	01-Oct-02	RR-17-T01N-SFW-100102	Surface Water	T					0.77	0.005			148		
Surface Water Area 1-Red River Along Mine	RR-17	19-Mar-03	RR-17-T01N-SFW-031903	Surface Water	T					1.1	0.0084			151		
Surface Water Area 1-Red River Along Mine	RR-17	15-Jul-03	RR-17-T01N-SFW-071503	Surface Water	T					0.93	0.005			114		
Surface Water Area 1-Red River Along Mine	RR-17	23-Sep-03	RR-17-T01N-SFW-092303	Surface Water	T					0.76	0.005			97.8		
Surface Water Area 1-Red River Along Mine	RR-18A	01-Oct-02	RR-18A-T01N-SFW-100102	Surface Water	T					0.72	0.005			157		
Surface Water Area 1-Red River Along Mine	RR-18A	19-Mar-03	RR-18A-T01N-SFW-031903	Surface Water	T					1.1	0.01			152		
Surface Water Area 1-Red River Along Mine	RR-18A	16-Jul-03	RR-18A-T01N-SFW-071603	Surface Water	T					0.9	0.005			112		
Surface Water Area 1-Red River Along Mine	RR-18A	23-Sep-03	RR-18A-T01N-SFW-092303	Surface Water	T					0.76	0.005			100		
Surface Water Area 1-Red River Along Mine	RR-18B	30-Sep-02	RR-18B-T01N-SFW-093002	Surface Water	T					0.76	0.005			132		
Surface Water Area 1-Red River Along Mine	RR-18B	19-Mar-03	RR-18B-T01N-SFW-031903	Surface Water	T					1	0.01			162		
Surface Water Area 1-Red River Along Mine	RR-18B	16-Jul-03	RR-18B-T01N-SFW-071603	Surface Water	T					0.9	0.005			109		
Surface Water Area 1-Red River Along Mine	RR-18B	23-Sep-03	RR-18B-T01N-SFW-092303	Surface Water	T					0.76	0.005			104		
Surface Water Area 1-Red River Along Mine	RR-20	30-Sep-02	RR-20-T01N-SFW-093002	Surface Water	T					0.67	0.005			133		
Surface Water Area 1-Red River Along Mine	RR-20	21-Mar-03	RR-20-T01N-SFW-032103	Surface Water	T					0.98	0.0084			148		
Surface Water Area 1-Red River Along Mine	RR-20	15-Jul-03	RR-20-T01N-SFW-071503	Surface Water	T					0.83	0.005			115		
Surface Water Area 1-Red River Along Mine	RR-20	23-Sep-03	RR-20-T01N-SFW-092303	Surface Water	T					0.76	0.005			111		
Surface Water Area 1-Red River Along Mine	RR-7	04-Oct-02	RR-7-T01N-SFW-100402	Surface Water	T					0.36	0.005			91.9		
Surface Water Area 1-Red River Along Mine	RR-7	21-Jan-03	RR-7-T01N-SFW-012103	Surface Water	T					0.43	0.005			109		
Surface Water Area 1-Red River Along Mine	RR-7	21-Mar-03	RR-7-T01N-SFW-032103	Surface Water	T					0.43	0.014			99.4		
Surface Water Area 1-Red River Along Mine	RR-7	03-Apr-03	RR-7-T01N-SFW-040303	Surface Water	T					0.36	0.005			78.4		
Surface Water Area 1-Red River Along Mine	RR-7	15-Jul-03	RR-7-T01N-SFW-071503	Surface Water	T					0.88	0.005			77.9		
Surface Water Area 1-Red River Along Mine	RR-7	24-Sep-03	RR-7-T01N-SFW-092403	Surface Water	T					0.31	0.005			69.3		
Surface Water Area 1-Red River Along Mine	RR-7	19-Oct-03	RR-7-T01N-SFW-101903	Surface Water	T					0.36	0.005			81.7		
Surface Water Area 1-Red River Along Mine	RR-7	13-Jan-04	RR-7-T01N-SFW-011304	Surface Water	T					0.47	0.02			97.1		
Surface Water Area 1-Red River Along Mine	RR-7	24-Feb-04	RR-7-T01N-SFW-022404	Surface Water	T					0.55				99.5		
Surface Water Area 1-Red River Along Mine	RR-7	19-Apr-04	RR-7-T01N-SFW-041904	Surface Water	T					0.29	0.005			48.6		
Surface Water Area 1-Red River Along Mine	RR-8	04-Oct-02	RR-8-T01N-SFW-100402	Surface Water	T					0.36	0.005			92.4		
Surface Water Area 1-Red River Along Mine	RR-8	21-Mar-03	RR-8-T01N-SFW-032103	Surface Water	T					0.44	0.014			86.1		
Surface Water Area 1-Red River Along Mine	RR-8	15-Jul-03	RR-8-T01N-SFW-071503	Surface Water	T					0.1	0.0057			61		
Surface Water Area 1-Red River Along Mine	RR-8	24-Sep-03	RR-8-T01N-SFW-092403	Surface Water	T					0.33	0.005			73.7		
Surface Water Area 1-Red River Along Mine	RR-8A	04-Oct-02	RR-8A-T01N-SFW-100402	Surface Water	T					0.39	0.005			92.8		
Surface Water Area 1-Red River Along Mine	RR-8A	21-Mar-03	RR-8A-T01N-SFW-032103	Surface Water	T					0.42	0.016			91.8		
Surface Water Area 1-Red River Along Mine	RR-8A	15-Jul-03	RR-8A-T01N-SFW-071503	Surface Water	T					0.31	0.005			75		
Surface Water Area 1-Red River Along Mine	RR-8A	24-Sep-03	RR-8A-T01N-SFW-092403	Surface Water	T					0.32	0.005			76.5		
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	27-Sep-02	LR-11A-T01N-SFW-092702	Surface Water	T					0.8	0.005			171		
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	20-Mar-03	LR-11A-T01N-SFW-032003	Surface Water	T					0.98	0.0098			190		
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	14-Jul-03	LR-11A-T01N-SFW-071403	Surface Water	T					0.89	0.005			141		
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	23-Sep-03	LR-11A-T01N-SFW-092303	Surface Water	T					0.79	0.005			126		
Surface Water Area 11-Red River Along Tailings Facility	LR-13	26-Sep-02	LR-13-T01N-SFW-092602	Surface Water	T					0.84	0.005			168		
Surface Water Area 11-Red River Along Tailings Facility	LR-13	20-Mar-03	LR-13-T01N-SFW-032003	Surface Water	T					1	0.007			188		
Surface Water Area 11-Red River Along Tailings Facility	LR-13	14-Jul-03	LR-13-T01N-SFW-071403	Surface Water	T					0.86	0.005			153		
Surface Water Area 11-Red River Along Tailings Facility	LR-13	21-Sep-03	LR-13-T01N-SFW-092103	Surface Water	T					0.79	0.005			110		
Surface Water Area 11-Red River Along Tailings Facility	LR-16	26-Sep-02	LR-16-T01N-SFW-092602	Surface Water	T					0.8	0.005			169		
Surface Water Area 11-Red River Along Tailings Facility	LR-16	20-Mar-03	LR-16-T01N-SFW-032003	Surface Water	T					1	0.0074			178		
Surface Water Area 11-Red River Along Tailings Facility	LR-16	14-Jul-03	LR-16-T01N-SFW-071403	Surface Water	T					0.89	0.005			147		
Surface Water Area 11-Red River Along Tailings Facility	LR-16	21-Sep-03	LR-16-T01N-SFW-092103	Surface Water	T					0.79	0.005			116		
Surface Water Area 11-Red River Along Tailings Facility	LR-5	30-Sep-02	LR-5-T01N-SFW-093002	Surface Water	T					0.72	0.005			136		
Surface Water Area 11-Red River Along Tailings Facility	LR-5	21-Mar-03	LR-5-T01N-SFW-032103	Surface Water	T					0.98	0.0094			142		
Surface Water Area 11-Red River Along Tailings Facility	LR-5	15-Jul-03	LR-5-T01N-SFW-071503	Surface Water	T					0.83	0.005			114		
Surface Water Area 11-Red River Along Tailings Facility	LR-5	23-Sep-03	LR-5-T01N-SFW-092303	Surface Water	T					0.79	0.005			97.8		
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	27-Sep-02	LR-8A-T01N-SFW-092702	Surface Water	T					0.8	0.005			168		
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	23-Mar-03	LR-8A-T01N-SFW-032303	Surface Water	T					1	0.005			192		
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	15-Jul-03	LR-8A-T01N-SFW-071503	Surface Water	T					0.88	0.005			145		
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	23-Sep-03	LR-8A-T01N-SFW-092303	Surface Water	T					0.79	0.005			123		

EXPOSURE_AREA_LOOKUP_DESCRIPTION	SITE_ID	SAMP_DATE	SAMP_ID	MEDIUM_TYPE_LOOKUP_DESCRIPTION	SAMP_FRACTION	Aluminum mg/L	Antimony mg/L	Arsenic mg/L	Barium mg/L	Beryllium mg/L	Boron mg/L	Cadmium mg/L	Chromium mg/L	Chromium, Hexavalent mg/L	Cobalt mg/L	Copper mg/L	Iron mg/L	Lead mg/L	Manganese mg/L	Mercury mg/L	Molybdenum mg/L	Nickel mg/L	Selenium mg/L	Silver mg/L	Thallium mg/L	Vanadium mg/L	Zinc mg/L
Reference Lower Cabresto Creek Riparian	RRS-18	06-Oct-02	RRS-18-D01N-SFW-100602	Surface Water	D	<0.003:	<0.0002:	<0.0002:	0.024:	<0.0002:	<0.0048:	<0.0001:	<0.0046:		<0.0022:	<0.0003:	<0.023:	<0.0001:	0.0055:	<0.0001:	0.00077:	0.00021:	<0.0002:	<0.0001:	<0.0001:	0.00013:	<0.0069:
Reference Lower Cabresto Creek Riparian	RRS-18	23-Mar-03	RRS-18-D01N-SFW-032303	Surface Water	D	<0.05:	<0.0006:	<0.00051:	0.019:	<0.0003:	<0.0084:	<0.0005:	<0.001:		<0.0038:	<0.0045:	<0.42:	<0.0002:	<0.013:	<0.0001:	<0.0022:	<0.003:	<0.001:	<0.0002:	<0.0002:	<0.0002:	<0.039:
Reference Lower Cabresto Creek Riparian	RRS-18	25-Sep-03	RRS-18-D01N-SFW-092503	Surface Water	D	<0.0053:	0.0028:	<0.00038:	0.018:	<0.00047:	<0.0048:	<0.00008:	<0.001:		<0.0011:	<0.00047:	<0.044:	<0.00004:	0.0099:	<0.00006:	0.0025:	<0.001:	<0.00073:	<0.0002:	<0.00001:	<0.00041:	<0.013:
Reference Lower Cabresto Creek Riparian	RRS-20	06-Oct-02	RRS-20-D01N-SFW-100602	Surface Water	D	<0.0076:	<0.0002:	<0.0002:	0.025:	<0.0003:	<0.005:	<0.0001:	<0.00032:		<0.0001:	<0.00039:	<0.038:	<0.0001:	0.0079:	<0.0001:	0.00066:	<0.0002:	<0.0002:	<0.0001:	<0.0001:	0.0002:	<0.0021J
Reference Lower Cabresto Creek Riparian	RRS-20	23-Mar-03	RRS-20-D01N-SFW-032303	Surface Water	D	<0.05:	<0.0006:	<0.00043:	0.017:	<0.001:	<0.0084:	<0.0005:	<0.001:		<0.0038:	<0.0015J	<0.42:	<0.0002:	<0.013:	<0.0001:	<0.0023:	<0.003:	<0.0035:	<0.0002:	<0.0002:	0.00024:	<0.039:
Reference Lower Cabresto Creek Riparian	RRS-20	16-Jul-03	RRS-20-D01N-SFW-071603	Surface Water	D	<0.031:	<0.0005:	0.00036:	0.026:	<0.0002:	<0.0048:	<0.0002:	<0.0014:		<0.002:	<0.0024:	0.21:	<0.0001:	0.1:	<0.0001:	<0.0017:	<0.0021:	<0.0008:	<0.0001J	<0.0001:	<0.0002:	<0.012:
Reference Lower Cabresto Creek Riparian	RRS-20	25-Sep-03	RRS-20-D01N-SFW-092503	Surface Water	D	<0.0082:	<0.0002:	<0.00038:	0.018:	<0.00047:	0.005:	<0.00008:	<0.001:		<0.0011:	<0.00065:	<0.044:	<0.00005:	<0.0068:	<0.00006:	<0.00088:	<0.0011:	<0.00073:	<0.0002:	<0.00001:	<0.00048:	<0.013:
Reference Lower Cabresto Creek Riparian	RRS-23	06-Oct-02	RRS-23-D01N-SFW-100602	Surface Water	D	<0.003:	<0.0002:	<0.0002:	0.026:	<0.0002:	<0.0048:	<0.0001:	<0.0046:		<0.0022:	0.0017:	0.028:	<0.0006:	0.0046:	<0.0001:	<0.00067:	0.00025:	<0.0002:	<0.0001:	<0.0001:	0.00011:	0.014:
Reference Lower Cabresto Creek Riparian	RRS-23	23-Mar-03	RRS-23-D01N-SFW-032303	Surface Water	D	<0.05:	<0.0006:	<0.00054:	0.022:	<0.0003:	<0.0084:	<0.0005:	<0.001:		<0.0038:	<0.004:	<0.42:	<0.0002:	<0.013:	<0.0001:	<0.0022:	<0.003:	<0.001:	<0.0002:	<0.0002:	<0.0002:	<0.039:
Reference Lower Cabresto Creek Riparian	RRS-23	16-Jul-03	RRS-23-D01N-SFW-071603	Surface Water	D	<0.024:	<0.0005:	<0.0002:	0.035:	<0.0002:	0.0048:	<0.0002:	<0.0014:		<0.002:	<0.0024:	<0.039:	<0.0001:	0.0096:	<0.00016:	<0.0017:	<0.0021:	<0.0008:	<0.0001J	<0.0001:	<0.0002:	<0.0066:
Reference Lower Cabresto Creek Riparian	RRS-23	25-Sep-03	RRS-23-D01N-SFW-092503	Surface Water	D	<0.0088:	<0.00061:	<0.00038:	0.017:	<0.00047:	<0.0048:	<0.00008:	<0.001:		<0.0011:	<0.00053:	<0.044:	<0.00004:	<0.0022:	<0.00006:	<0.00097:	0.0011:	<0.00073:	<0.0002:	<0.00001:	<0.00064:	<0.013:
Reference Lower Cabresto Creek Riparian	RRS-27	06-Oct-02	RRS-27-D01N-SFW-100602	Surface Water	D	<0.003:	<0.0002:	<0.0002:	0.056:	<0.0002:	<0.0048:	<0.0001:	<0.0046:		<0.0022:	0.00046:	<0.023:	<0.0001:	0.015:	<0.0001:	<0.00075:	0.00032:	<0.0002:	<0.0001:	<0.0001:	<0.0001:	<0.0069:
Reference Lower Cabresto Creek Riparian	RRS-27	23-Mar-03	RRS-27-D01N-SFW-032303	Surface Water	D	<0.05:	<0.0006:	<0.00059:	0.023:	<0.0017:	<0.0084:	<0.0005:	<0.0013:		<0.0038:	<0.0015J	<0.42:	<0.0002:	<0.013:	<0.0001:	<0.0023:	<0.003:	<0.001:	<0.0002:	<0.0002:	<0.0002:	<0.039:
Reference Lower Cabresto Creek Riparian	RRS-27	16-Jul-03	RRS-27-D01N-SFW-071603	Surface Water	D	<0.025:	<0.0005:	<0.0002:	0.035:	<0.0002:	0.0066:	<0.0002:	<0.0014:		<0.002:	<0.0024:	0.078:	0.0003:	0.039:	<0.00012:	0.002:	<0.0021:	<0.0008:	<0.0001J	<0.0001:	0.0011:	<0.014:
Reference Lower Cabresto Creek Riparian	RRS-27	25-Sep-03	RRS-27-D01N-SFW-092503	Surface Water	D	<0.0053:	<0.00087:	<0.00038:	0.02:	<0.00047:	<0.0048:	<0.00008:	<0.001:		<0.0011:	<0.00075:	<0.044:	<0.00004:	<0.0018:	<0.00006:	<0.00087:	0.00095:	<0.00073:	<0.0002:	<0.00001:	<0.00075:	<0.013:
Reference Red River Above Mine Site	RR-1	04-Oct-02	RR-1-D01N-SFW-100402	Surface Water	D	<0.0064:	<0.0002:	<0.0002:	0.048:	<0.0002:	<0.0048:	<0.0001:	<0.0046:		<0.0022:	0.0054:	<0.023:	<0.0001:	<0.0025:	<0.0001:	0.0009:	<0.0002:	<0.0002:	<0.0001:	<0.0001:	0.00032:	<0.0069:
Reference Red River Above Mine Site	RR-1	21-Mar-03	RR-1-D01N-SFW-032103	Surface Water	D	<0.063:	<0.0006:	<0.0002:	0.052:	<0.0003:	<0.0084:	<0.0002:	<0.001:		<0.0038:	<0.0015:	<0.42:	<0.0002:	<0.013:	<0.0001J	<0.0023:	<0.003:	<0.001J	<0.0002:	<0.0002:	<0.0002:	<0.039:
Reference Red River Above Mine Site	RR-1	16-Jul-03	RR-1-D01N-SFW-071603	Surface Water	D	<0.031:	<0.0005:	<0.0002:	0.036:	<0.0002:	<0.0048:	<0.0002:	<0.0014:		<0.002:	0.0047:	<0.033:	<0.0001:	0.0039:	<0.0002:	<0.0017:	<0.0021:	<0.0008:	<0.0001J	<0.0001:	0.00027:	<0.0043:
Reference Red River Above Mine Site	RR-1	25-Sep-03	RR-1-D01N-SFW-092503	Surface Water	D	<0.0036:	<0.0016:	<0.00038:	0.044:	<0.00047:	<0.0048:	<0.00008:	<0.001:		<0.0011:	<0.00055:	<0.044:	<0.00005:	<0.0022:	<0.00006:	<0.0019:	<0.001:	<0.00073:	<0.0002:	<0.00001:	<0.00037:	<0.013:
Reference Red River Above Mine Site	RR-3	03-Oct-02	RR-3-D01N-SFW-100302	Surface Water	D	0.13:	<0.0002:	<0.0002:	0.044:	<0.0002:	<0.0048:	0.00044:	<0.0046:		<0.0022:	0.0082:	0.034:	<0.0001:	0.11:	<0.0001:	0.0011:	0.0062:	<0.0002:	<0.0001:	<0.0001:	0.00023:	0.041:
Reference Red River Above Mine Site	RR-3	21-Mar-03	RR-3-D01N-SFW-032103	Surface Water	D	<0.063:	<0.0006:	<0.0002:	0.044:	<0.0003:	<0.0084:	0.00037:	0.0036:		<0.0038:	0.0065:	0.042J	<0.0002:	0.23:	<0.0001J	<0.0023:	0.0047:	<0.0022J	<0.0002:	<0.0002:	<0.0002:	<0.06:
Reference Red River Above Mine Site	RR-3	16-Jul-03	RR-3-D01N-SFW-071603	Surface Water	D	0.14:	<0.0005:	<0.0002:	0.039:	<0.0002:	<0.0048:	0.00028:	<0.0014J		<0.002:	0.0085:	<0.033J	<0.0001:	0.093:	<0.0001:	0.00094:	0.0051:	<0.0008:	<0.0001J	<0.0001:	0.00026:	0.028:
Reference Red River Above Mine Site	RR-3	25-Sep-03	RR-3-D01N-SFW-092503	Surface Water	D	0.13:	<0.00021:	<0.00038:	0.044:	<0.00047:	<0.0048:	0.00028:	<0.001:		0.0019:	<0.0066:	<0.044:	<0.00004:	0.092:	<0.00006:	<0.001:	<0.0051:	<0.00073J	<0.0002:	<0.00001:	<0.00061:	0.034:
Reference Red River Above Mine Site	RR-4	04-Oct-02	RR-4-D01N-SFW-100402	Surface Water	D	<0.08:	<0.0002:	<0.0002:	0.044:	<0.0002:	<0.0048:	0.0004:	<0.0046:		<0.0022:	0.003:	<0.023:	<0.0001:	0.16:	<0.0001:	0.0012:	0.0062:	<0.0002:	<0.0001:	<0.0001:	0.00013:	0.023:
Reference Red River Above Mine Site	RR-4	21-Mar-03	RR-4-D01N-SFW-032103	Surface Water	D	<0.05:	<0.0006:	<0.00043:	0.05:	<0.0003:	<0.0084:	<0.00055:	<0.001:		<0.0038:	<0.0053:	<0.42:	<0.0002:	0.2:	<0.0001:	<0.0022J	0.0095:	<0.0037:	<0.0002:	<0.0002:	<0.0002:	<0.059:
Reference Red River Above Mine Site	RR-4	16-Jul-03	RR-4-D01N-SFW-071603	Surface Water	D	<0.16:	<0.0005:	<0.0002:	0.037:	<0.0002:	<0.0048:	<0.0002:	<0.0014:		<0.002:	0.0055:	0.053:	<0.0001:	0.096:	<0.00015:	0.002:	0.0038:	<0.0008:	<0.0001J	<0.0001:	<0.0002:	<0.022:
Reference Red River Above Mine Site	RR-4	25-Sep-03	RR-4-D01N-SFW-092503	Surface Water	D	0.11:	<0.00011:	<0.00038:	0.041:	<0.00047:	<0.0048:	0.00025:	<0.001:		0.0015:	<0.0042:	<0.044:	<0.00004:	0.11:	<0.00006:	<0.0011:	0.0056:	<0.00073J	<0.0002:	<0.00001:	<0.00042:	0.03:
Reference Red River Above Mine Site	RR-5	03-Oct-02	RR-5-D01N-SFW-100302	Surface Water	D	0.09:	<0.0002:	<0.0002:	0.04:	<0.0002:	<0.0048:	0.00018:	<0.0046:		<0.0022:	0.0036:	<0.023:	<0.0001:	0.13:	<0.0001:	0.0014:	0.0045:	<0.0002:	<0.0001:	<0.0001:	0.00017:	0.014:
Reference Red River Above Mine Site	RR-5	21-Mar-03	RR-5-D01N-SFW-032103	Surface Water	D	0.064:	<0.0006:	<0.0002:	0.042:	<0.0003J	<0.0084:	<0.0002:	<0.001:		<0.0038:	0.0051:	<0.31:	<0.0002:	0.17:	<0.0001:	<0.0023:	0.005:	<0.0012J	<0.0002:	<0.0002:	<0.0002:	<0.031:
Reference Red River Above Mine Site	RR-5	16-Jul-03	RR-5-D01N-SFW-071603	Surface Water	D	<0.13:	<0.0005:	<0.0002:	0.036:	<0.0002:	0.007:	<0.0002:	<0.0014:		<0.002:	0.0056:	0.066:	<0.0001:	0.072:	<0.00014:	<0.0017:	0.0044:	<0.0008:	<0.0001J	<0.0001:	<0.0002:	<0.021:
Reference Red River Above Mine Site	RR-5	24-Sep-03	RR-5-D01N-SFW-092403	Surface Water	D	0.12:	<0.0012:	<0.00038:	0.037:	<0.00047:	<0.0067:	0.00014:	<0.001:		<0.0011:	0.0038:	<0.044:	0.0001:	0.075:	<0.00006:	<0.002:	0.0045:	<0.00073:	<0.0002:	<0.00001:	<0.00029:	<0.013:
Reference Red River Above Mine Site	RR-6	04-Oct-02	RR-6-D01N-SFW-100402	Surface Water	D	0.13:	<0.00023:	<0.0002:	0.035:	<0.0002:	<0.0048:	0.00024:	<0.0046:		0.0024:	0.0049:	<0.023:	<0.0001:	0.21:	<0.0001:	0.0012:	0.011:	0.00029:	<0.0001:	<0.0001:	0.0001:	<0.033:
Reference Red River Above Mine Site	RR-6	21-Mar-03	RR-6-D01N-SFW-032103	Surface Water	D	0.11:	<0.0006:	<0.0002:	0.04:	<0.0003:	0.011:	0.00031:	<0.001:		<0.0038:	0.0063:	<0.42:	<0.0002:	0.28:	<0.0001J	<0.0023:	0.011:	<0.001:	<0.0002:	<0.0002:	<0.0002:	<0.052:
Reference Red River Above Mine Site	RR-6	16-Jul-03	RR-6-D01N-SFW-071603	Surface Water	D	0.26:	<0.0005:	<0.0002:	0.033:	<0.0002:	0.006:	<0.0002:	<0.0014J		<0.002:	0.0051:	0.054J	<0.0001:	0.1:	<0.0001:	0.0012:	0.0059:	<0.0008:	<0.0001J	<0.0001:	<0.0002:	0.022:
Reference Red River Above Mine Site	RR-6	24-Sep-03	RR-6-D01N-SFW-092403	Surface Water	D	0.19:	<0.00033:	<0.00038:	0.037:	<0.00047:	<0.011:	0.00021:	<0.001:		0.0019:	<0.0027:	<0.044:	<0.00004:	0.14:	<0.00006:	<0.0011:	0.0073:	<0.00073J	<0.0002:	<0.00001:	<0.00038:	<0.03:
Reference Red River Above Mine Site	RR-6A	04-Oct-02	RR-6A-D01N-SFW-100402	Surface Water	D	0.16:	<0.0002:	<0.0002:	0.034:	<0.0002:	<0.0048:	0.00017:	<0.0046:		0.0024:	<0.003:	<0.023:	<0.0001:	0.19:	<0.0001:	0.0013:	0.0079:	0.0002:	<0.0001:	<0.0001:	<0.0001:	<0.018:
Reference Red River Above Mine Site	RR-6A	21-Mar-03	RR-6A-D01N-SFW-032103	Surface Water	D	0.12:	<0.0006:	<0.0002:	0.036:	<0.0003:	0.0089:	0.00032:	<0.001:		<0.0038:	0.0064:	<0.42:	<0.0002:	0.28:	<0.0001J	<0.0023:	0.0095:	<0.001:	<0.0002:	<0.0002:	<0.0002:	<0.047:
Reference Red River Above Mine Site	RR-6A	15-Jul-03	RR-6A-D01N-SFW-071503	Surface Water	D	0.24:	<0.0005:	<0.0002:	0.032:	<0.0002:	0.0056:	<0.0002:	<0.0014:		<0.002:	0.0037:	<0.033:	<0.00014:	0.098:	0.00017:	0.0012:	0.0061:	<0.0008:	<0.0001J	<0.0001:	<0.0002:	0.018:
Reference Red River Above Mine Site	RR-6A	24-Sep-03	RR-6A-D01N-SFW-092403	Surface Water	D	0.18:	<0.00022:	<0.00038:	0.035:	<0.00047:	<0.016:	0.0002:	<0.001:		0.0026:	<0.0026:	<0.044:	<0.00004:	0.13:	<0.00006:	<0.0011:	0.0071:	<0.00073J	<0.0002:	<0.00001:	<0.00042:	<0.024:
Reference Red River Above Mine Site	RR-6V	16-Jul-03	RR-6V-D01N-SFW-071603	Surface Water	D	0.091:	<0.0005:	<0.0002:	0.034:	<0.0002:	0.0067:	<0.0002:	<0.0014J		<0.002:	0.024:	<0.033J	<0.0001:	0.045:	<0.0001:	0.0012:	0.0029:	<0.0008:	<0.0001J	<0.0001:	0.00025:	0.012J
Reference Red River Above Mine Site	RR-6V	24-Sep-03	RR-6V-D01N-SFW-092403	Surface Water	D	0.11:	<0.00069:	<0.00038:	0.035:	<0.00047:	<0.0084:	0.00014:	<0.001:		0.0012:	<0.0032:	<0.044:	<0.00006:	0.063:	<0.00006:	<0.0016:	0.0042:	<0.00073J	<0.0002:	<0.00001:	<0.0004:	<0.013:
Reference Red River Above Mine Site	Zwergle	07-Oct-02	ZWERGEL-D01N-SFW-100702	Surface Water	D	<0.003:	<0.0002:	<0.0002:	0.035:	<0.0003:	<0.005:	<0.0001:	<0.0004:		<0.0001:	<0.00034:	0.042:	<0.0001:	0.0012:	<0.0001:	0.00096:	<0.0002:	0.00024:	<0.0001:	<0.0001:	0.00029:	<0.0021J
Reference Red River Above Mine Site	Zwergle	07-Oct-02	ZWERGEL-T01N-SFW-100702	Surface Water	D	<0.011:	<0.0002:	<0.0002:	0.036:	<0.0003:	<0.005:	<0.0001:	<0.00045:	<0.01:	<0.0001:	<0.00075:	<0.052:	<0.0001:	<0.0035:	<0.0001:	0.00087:	<0.0002:	<0.0002:	<0.0001:	<0.0001:	0.00036:	<0.0021J
Reference Red River Above Mine Site	Zwergle	23-Mar-03	ZWERGEL-D01N-SFW-032303	Surface Water	D	<0.05:	<0.0006:	<0.0004:	0.052:	<0.0003:	<0.0084:	<0.00052:	<0.001:		<0.0038:	<0.0041:	<0.42:	<0.0002:	<0.013:	<0.0001:	<0.0022J	<0.003:	<0.0022:	<0.0002:	<0.0002:	0.00026:	<0.039:
Reference Red River Above Mine Site	Zwergle	16-Jul-03	ZWERGEL-D01N-SFW-071603	Surface Water	D	<0.024:	<0.0005:	<0.0002:	0.025:	<0.0002:	<0.0048:	<0.0002:	<0.0014:		<0.002:	<0.0024:	0.039:	<0.0001:	0.0036:	<0.00021:	<0.0017:	<0.0021:	<0.0008:	<0.0001J	<0.0001:	0.00028:	<0.0032:
Reference Red River Above Mine Site	Zwergle	25-Sep-03	ZWERGEL-D01N-SFW-092503	Surface Water	D	<0.0029:	<0.00017:	<0.00038:	0.034:	<0.00047:	<0.0048:	<0.00008:	<0.001:		<0.0011:	<0.00049:	<0.044:	<0.00004:	<0.0018:	<0.00006:	<0.00096:	<0.001:	<0.00073:	<0.0002:	<0.00001:	<0.00058:	<0.013:
Reference Upper Cabresto Creek Riparian	RRS-12	07-Oct-02	RRS-12-D01N-SFW-100702	Surface Water	D	0.089:	<0.0002:	<0.0002:	0.025:	<0.0003:	<0.005:	<0.0001:	<0.00033:		<0.0001:	<0.0012:	0.04:	<0.0001:	0.018:	<0.0001:	0.00051:	0.0016:	<0.0002:	<0.0001:	<0.0001:	<0.0001:	0.026:
Reference Upper Cabresto Creek Riparian	RRS-12	07-Oct-02	RRS-12-T01N-SFW-100702	Surface Water	D	0.17:	<0.0002:	<0.0002:	0.025:	<0.0003:	<0.005:	<0.0001:	<0.00034:	0.0015J	<0.0001:	<0.00078:	<0.082:	<0.00012:	0.028:	<0.0001:	0.00053:	0.0012:	0.00024:	<0.0001:	<0.0001:	0.00013:	<0.031J
Reference Upper Cabresto Creek Riparian	RRS-12	23-Mar-03	RRS-12-D01N-SFW-032303	Surface Water	D	<0.08:	<0.0006:	<0.00048:	0.023:	<0.00076:	<0.0084:	<0.0005:	<0.001:		<0.0038:	<0.0015:	<0.42:	<0.0002:	<0.013:	<0.0001:	<0.0023:	<0.003:	<0.0035:	<0.0002:	<0.0002:	<0.0002:	<0.039:
Reference Upper Cabresto Creek Riparian	RRS-12	16-Jul-03	RRS-12-D01N-SFW-071603	Surface Water	D	0.072:	<0.0005:	<0.0002:	0.025:	<0.0002:	<0.0048:	<0.0002:	<0.0014J		<0.002:	<0.0009:	<0.033J	<0.0001:	0.0055J	<0.0001:	0.00041:	0.0014:	<0.0008:	<0.0001J	<0.0001:	<0.0002:	0.016:
Reference Upper Cabresto Creek Riparian	RRS-12	25-Sep-03	RRS-12-D01N-SFW-092503	Surface Water	D	0.079:	<0.00021:	<0.00038:	0.025:	<0.00047:	0.0048:	<0.00008:	<0.001:		<0.0011:	<0.00056:	<0.044:	<0.00004:	<0.007:	<0.00006:	<0.00087:	<0.002:	<0.00073J	<0.0002:	<0.00001:	<0.00044:	0.022:
Reference Upper Cabresto Creek Riparian	RRS-13	06-Oct-02	RRS-13-D01N-SFW-100602	Surface Water	D	<0.037:	<0.0002:	<0.0002:	0.016:	<0.0002:	<0.0048:	<0.0001:	<0.0046:		<0.0022:	0.0019:	0.023:	<0.0001:	0.0025:	<0.0001:	<0.0007:	0.00096:	<0.0002:	<0.0001:	<0.0001:	0.0002:	0.01:
Reference Upper Cabresto Creek Riparian	RRS-13	23-Mar-03	RRS-13-D01N-SFW-032303	Surface Water	D	<0.05:	<0.0006:	<0.00059:	0.015:	<0.0014:	<0.0084:	<0.0005:	<0.001:		<0.0038:	<0.0015:	<0.42:	<0.0002:	<0.013:	<0.0001:	<0.0023:	<0.003:	<0.001:	<0.0002:	<0.0002:	<0.0002:	<0.039:
Reference Upper Cabresto Creek Riparian	RRS-13	16-Jul-03	RRS-13-D01N-SFW-071603	Surface Water	D	<0.024:	<0.0005:	<0.0002:	0.011:	<0.0002:	<0.0048:	<0.0002:	<0.0014J		<0.002:	<0.0024:	<0.033:	<0.0001:	<0.0007J	<0.0001:	<0.0017:	<0.0021J	<0.0008:	<0.0001J	<0.0001:	0.0003:	<0.0038:
Reference Upper Cabresto Creek Riparian	RRS-15	06-Oct-02	RRS-15-D01N-SFW-100602	Surface Water	D	<0.026:	<0.0002:	<0.0002:	0.015:	<0.0002:	<0.0048:	<0.0001:	<0.0046:		<0.0022:	<0.0003:	<0.023:	<0.0001:	<0.0025:	<0.0001:	<0.0007:	0.00043:	<0.0002:	<0.0001:	<0.0001:	0.00019:	0.0078:
Reference Upper Cabresto Creek Riparian	RRS-15	23-Mar-03	RRS-15-D01N-SFW-032303	Surface Water	D	<0.05:	<0.0006:	<0.00054:	0.015:	0.00085:	<0.0084:	<0.0005:	<0.001:		<0.0038:	<0.0015:	<0.42:	<0.0002:	<0.013:	<0.0001:	<0.0023:	<0.003:	<0.0038:	<0.0002:	<0.0002:	<0.0002:	<0.039:
Reference Upper Cabresto Creek Riparian	RRS-15	16-Jul-03	RRS-15-D01N-SFW-071603	Surface Water	D	<0.024:	<0.0005:	<0.0002:	0.011:	<0.0002:	<0.0048:	<0.0002:	<0.0014J		<0.002:	<0.0009:	<0.033J	<0.0001:	<0.0007J	<0.0001:	0.00058:	<0.0006:	<0.0008:	<0.0001J	<0.0001:	0.00033:	<0.0033J
Reference Upper Cabresto Creek Riparian	RRS-15	25-Sep-03	RRS-15-D01N-SFW-092503	Surface Water	D	<0.016:	<0.00054:	<0.00038:	0.012:	<0.00047:	<0.0048:	<0.00008:	<0.001:		<0.0011:	<0.00045:	<0.044:	<0.00004:	<0.00073:	<0.00006:	<0.00094:	<0.00085:	<0.00073:	<0.0002:	<0.00001:	<0.00065:	<0.013:
Reference Upper Cabresto Creek Riparian	RRS-9	07-Oct-02	RRS-9-D01N-SFW-100702	Surface Water	D	<0.003:	<0.0002:	<0.0002:	0.029:	<0.0003J	<0.005J	<0.0001:	<0.0019:		<0.0034:	<0.0003:	<0.038:	<0.0001:	<0.003:	<0.0001J	0.00063:	<0.0002:	<0.0002J	<0.0001:	<0.0001:	0.00024:	<0.0021J
Reference Upper Cabresto Creek Riparian	RRS-9	07-Oct-02	RRS-9-T01N-SFW-100702	Surface Water	D	0.056:	<0.00022:	<0.0002:	0.03:	<0.0003J	<0.005J	<0.0001:	<0.0019:	0.0015J	<0.0034:	0.00077:	<0.038:	<0.0001:	<0.0036:	<0.0001J	0.00062:	<0.0002:	<0.0002J	<0.0001:	<0.0001:	0.00024:	<0.0021J
Reference Upper Cabresto Creek Riparian	RRS-9	23-Mar-03	RRS-9-D01N-SFW-032303	Surface Water	D	<0.05:	<0.0006:	<0.00056:	0.029:	<0.0003:	<0.0084:	<0.0005:	<0.0011:		<0.0038:	<0.0047:	<0.42:	<0.0002:	<0.013:	<0.0001:	<0.0022:	<0.003:	<0.001:	<0.0002:	<0.0002:	0.00023:	<0.039:
Reference Upper Cabresto Creek Riparian	RRS-9	16-Jul-03	RRS-9-D01N-SFW-071603	Surface Water	D	<0.024:	<0.0005:	<0.0002:	0.027:	<0.0002:	<0.0048:	<0.0002:	<0.0014J		<0.002:	<0.0009:	<0.033J	<0.0001:	0.0053J	<0.0001:	0.00046:	<0.0006:	<0.0008:	<0.0001J	<0.0001:	0.00037:	<0.0031J
Reference Upper Cabresto Creek Riparian	RRS-9	25-Sep-03	RRS-9-D01N-SFW-092503	Surface Water	D	<0.0038:	<0.00011:	<0.00038:	0.03:	<0.00047:	0.0052:	<0.00008:	<0.001:		<0.0011:	<0.00053:	<0.044:	<0.00005:	<0.0057:	<0.00006:	<0.00075:	<0.00084:	<0.00073J	<0.0002:	<0.00001:	<0.00056:	<0.013:
Reference Upper Cabresto Creek Riparian	UPPER CABRESTO CREEK	23-Mar-03	UCC-D01N-SFW-032303	Surface Water	D	<0.05:	<0.0006:	<0.00053:	0.016:	<0.0003:	<0.0084:	<0.0005:	<0.001:		<0.0038:	<0.0015:	<0.31:	<0.0002:	<0.01:	<0.0001:	<0.0023:	<0.003:	<0.001:	<0.0002:	<0.0002:	<0.0002:	<0.02:
Reference Upper Cabresto Creek Riparian	UPPER CABRESTO CREEK	16-Jul-03	UPPERCABRESTO-D01N-SFW-071603	Surface Water	D	<0.024:	<0.0005:	<0.0002:	0.012:	<0.0002:	<0.0048:	<0.0002:	<0.0014J		<0.002:	<0.0024:	<0.033:	<0.0001:	<0.0007J	<0.0001:	<0.0017:	<0.0021J	<0.0008:	<0.0001J	<0.0001:	0.0003:	<0.0037:
Reference Upper Cabresto Creek Riparian	UPPER CABRESTO CREEK	25-Sep-03	UPPERCABRESTO-D01N-SFW-092503	Surface Water	D	<0.016:	<0.00013:	<0.00038:	0.013:	<0.00047:	<0.0048:	<0.00008:	<0.001:		0.0017:	<0.00045:	<0.044:	<0.00004:	<0.0036:	0.00007:	<0.00078:	<0.001:	<0.00073J	<0.0002:	<0.00001:	<0.00052:	<0.013:
Surface Water Area 1-Red River Along Mine	LR-1	30-Sep-02	LR-1-D01N-SFW-093002	Surface Water	D	0.14:	<0.0002:	<0.0002:	0.027:	<0.0002:	<0.0074:	0.0003:	0.0025:		0.0024:	0.0027:	<0.046:	<0.0001:	0.33:	<0.0001:	0.0039:	0.01:	0.0003:	<0.0059:	<0.0001:	<0.0001:	0.031:
Surface Water Area 1-Red River Along Mine	LR-1	30-Sep-02	LR-1-T01N-SFW-093002	Surface Water	D	2.2:	<0.0002:	0.00023:	0.049:	0.00036:	<0.005:	0.00039:	0.0019:	<0.01:	0.0033:	0.014:	1.7:	0.0014:	0.36:	<0.0001:	0.003:	0.011:	0.00029:	<0.0059:	<0.0001:	0.00042:	0.08:
Surface Water Area 1-Red River Along Mine	LR-1	20-Mar-03	LR-1-D01N-SFW-032003	Surface Water	D	0.1:	<0.0006:	<0.0002:	0.037:	<0.0003J	0.0087:	0.00047:	<0.001:		<0.0038:	0.0053:	<0.42:	<0.0002:	0.38:	<0.0001:	0.0024:	0.02:	<0.001:	<0.0002:	<0.0002:	<0.0002:	0.099:
Surface Water Area 1-Red River Along Mine	LR-1	15-Jul-03	LR-1-D01N-SFW-071503	Surface Water	D	0.12:	<0.0005:	<0.0002:	0.035:	<0.0002:	0.0084:	0.00036:	<0.0014:		<0.002:	0.0032:	<0.033:	<0.0001:	0.14:	<0.0001:	0.0068:	0.01:	<0.0016:	<0.0001J	<0.0001:	<0.00079:	0.054:
Surface Water Area 1-Red River Along Mine	LR-1	24-Sep-03	LR-1-D01N-SFW-092403	Surface Water	D	0.11:	<0.00016:	<0.00038:	0.035:	<0.00047:	<0.0087:	0.00044:	<0.001:		0.003:	<0.0026:	<0.044:	<0.00004:	0.22:	<0.00006:	0.0046:	0.014:	<0.00073:	<0.0002:	<0.00001:	<0.00044:	<0.063:
Surface Water Area 1-Red River Along Mine	RR-10	03-Oct-02	RR-10-D01N-SFW-100302	Surface Water	D	0.11:	<0.0002:	<0.0002:	0.028:	<0.0002:	<0.0048:	0.00017:	<0.0046:		<0.0022:	0.0024:	<0.023:	<0.0001:	0.16:	<0.0001:	0.0014:	0.0042:	<0.0002:	<0.0001:	<0.0001:	0.00014:	<0.0069:
Surface Water Area 1-Red River Along Mine	RR-10	21-Jan-03	RR-10-D01N-SFW-012103	Surface Water	D	<0.11J	<0.0006:	<0.0002J	0.028:	<0.0002:	<0.0098:	0.00034J	<0.0037:		0.0026:	<0.0017:	<0.27:	<0.0002:	0.27:	<0.0001:	<0.0011:	0.013:	<0.0016:	<0.0002:	<0.0002:	<0.0004:	0.05:
Surface Water Area 1-Red River Along Mine	RR-10	20-Mar-03	RR-10-D01N-SFW-032003	Surface Water	D	0.14:	<0.0006:	<0.0002:	0.035:	<0.0003J	0.0087:	<0.0002:	<0.001:		<0.0038:	0.0051:	<0.42:	<0.0002:	0.22:	<0.0001:	<0.0023:	0.0083:	<0.001:	<0.0002:	<0.0002:	<0.0002:	<0.039:
Surface Water Area 1-Red River Along Mine	RR-10	03-Apr-03	RR-10-D01N-SFW-040303	Surface Water	D	<0.14:	<0.0003:	<0.0002:	0.034:	<0.00074:	<0.0084:	<0.0005:	<0.001:		<0.0038:	0.0032:	<0.031:	<0.0001:	0.14:	<0.0001:	<0.0023:	0.0047:	0.00053:	<0.0001:	<0.0001:	<0.0001:	0.01:
Surface Water Area 1-Red River Along Mine	RR-10	15-Jul-03	RR-10-D01N-SFW-071503	Surface Water	D	0.2:	<0.0005:	<0.0002:	0.031:	<0.0004:	0.007:	<0.0002:	<0.0019:		<0.0037:	0.0034:	<0.067:	<0.0001:	0.078:	<0.00018:	0.0012:	0.0039:	<0.0008:	<0.0001J	<0.0001:	<0.0002:	<0.0095:
Surface Water Area 1-Red River Along Mine	RR-10	24-Sep-03	RR-10-D01N-SFW-092403	Surface Water	D	0.18:	<0.00095:	<0.00038:	0.035:	<0.00047:	<0.0072:	0.0002:	<0.001:		0.0019:	0.0025:	<0.044:	<0.00004:	0.12:	<0.00006:	<0.0019:	0.0063:	<0.00073:	<0.0002:	<0.00001:	<0.00028:	0.013:
Surface Water Area 1-Red River Along Mine	RR-10	19-Oct-03	RR-10-D01N-SFW-101903	Surface Water	D	0.18:	<0.0005:	<0.0002:	0.036:	<0.0004:	<0.0063:	<0.0002:	<0.0011:		0.0039:	0.0027:	<0.028:	<0.0002:	0.15:	<0.0001J	0.0011:	0.0051J	<0.0003:	<0.0001:	<0.0001:	<0.0001:	0.021:
Surface Water Area 1-Red River Along Mine	RR-10	13-Jan-04	RR-10-D01N-SFW-011304	Surface Water	D	0.077:	<0.0012:	<0.0002:	0.03:	<0.001:	<0.012:	0.00023:	<0.0057:		<0.0037:	0.0038:	<0.042:	<0.0001:	0.19:	<0.0001:	<0.0012:	<0.017:	0.00032J	<0.0001:	<0.0001:	<0.0002:	0.036:
Surface Water Area 1-Red River Along Mine	RR-10	24-Feb-04	RR-10-D01N-SFW-022404	Surface Water	D	0.054:	<0.0002J	<0.0001:	0.029:	<0.0003:	0.0055:	0.00029J	<0.0015J		0.0059:	0.0028J	<0.036:	<0.0001J	0.23:	<0.0001:	<0.0007:	0.014:	<0.00086:	<0.0001J	<0.0001:	<0.0001J	0.043:
Surface Water Area 1-Red River Along Mine	RR-10	19-Apr-04	RR-10-D01N-SFW-041904	Surface Water	D	0.29:	<0.00055:	<0.0002:	0.034:	<0.0002:	0.0054:	<0.0002:	<0.0008J		0.0032:	0.0068:	0.09:	<0.0015:	0.071:	<0.0001:	<0.0022:	0.0053:	<0.0007:	<0.0001J	<0.00012:	0.00037:	0.01:
Surface Water Area 1-Red River Along Mine	RR-10A1	03-Oct-02	RR-10A1-D01N-SFW-100302	Surface Water	D	0.63:	<0.0002:	0.00026:	0.04:	<0.0002:	<0.0048:	0.00013:	<0.0046:		<0.0022:	0.0055:	0.56:	<0.0014:	0.15:	<0.0001:	0.0015:	0.0041:	<0.0002:	<0.0001:	<0.0001:	0.00046:	0.014:
Surface Water Area 1-Red River Along Mine	RR-10A1	20-Jan-03	RR-10A1-D01N-SFW-012003	Surface Water	D	<0.083J	<0.0006:	<0.0002J	0.028:	<0.0002:	0.0044:	0.00033J	<0.0037:		0.0029:	<0.0017:	<0.27:	<0.0002:	0.27:	<0.0001:	<0.0017:	0.013:	<0.0016:	<0.0002:	<0.0002:	<0.0004:	0.053:
Surface Water Area 1-Red River Along Mine	RR-10A1	20-Mar-03	RR-10A1-D01N-SFW-032003	Surface Water	D	<0.6:	<0.0006:	<0.0004J	0.039:	<0.0003J	<0.0084:	<0.0005:	<0.001:		<0.0038:	0.0068:	<0.31:	<0.0002:	0.17:	<0.0001:	0.0023:	0.009:	<0.0016J	<0.0002:	<0.0002:	<0.0002:	<0.027:
Surface Water Area 1-Red River Along Mine	RR-10A1	03-Apr-03	RR-10A1-D01N-SFW-040303	Surface Water	D	<0.12:	<0.0003:	<0.0002:	0.035:	<0.0012:	<0.0084:	<0.0005:	<0.001:		<0.0038:	0.0029:	<0.031:	<0.0001:	0.11:	<0.0001:	<0.0023:	0.0032:	<0.0005:	<0.0001:	<0.0001:	0.00019:	0.0091:
Surface Water Area 1-Red River Along Mine	RR-10A1	15-Jul-03	RR-10A1-D01N-SFW-071503	Surface Water	D	0.15:	<0.0005:	<0.0002:	0.034:	<0.0004:	0.0078:	<0.0002:	<0.0019:		<0.0037:	0.0033:	<0.067:	<0.0001:	0.064:	<0.00018:	0.0016:	0.0034:	<0.0008:	<0.0001J	<0.0001:	0.00022:	<0.0091:
Surface Water Area 1-Red River Along Mine	RR-10A1	24-Sep-03	RR-10A1-D01N-SFW-092403	Surface Water	D	0.14:	<0.00015:	<0.00038:	0.038:	<0.00047:	<0.007:	0.00016:	<0.001:		0.0032:	0.0021:	<0.044:	<0.00004:	0.11:	0.00008:	<0.0013:	0.0053:	<0.00073:	<0.0002:	<0.00001:	<0.00028:	0.015:
Surface Water Area 1-Red River Along Mine	RR-10A1	19-Oct-03	RR-10A1-D01N-SFW-101903	Surface Water	D	0.12:	<0.0005:	<0.0002:	0.037:	<0.0004:	<0.0063:	0.00021:	<0.0011:		0.0039:	0.0025:	<0.028:	<0.0002:	0.12:	<0.0001J	0.0014:	0.0046J	<0.0003:	<0.0001:	<0.0001:	<0.0001:	0.02:
Surface Water Area 1-Red River Along Mine	RR-10A1	13-Jan-04	RR-10A1-D01N-SFW-011304	Surface Water	D	0.087:	<0.0012:	<0.0002:	0.033:	<0.001:	<0.012:	0.00029:	<0.0057:		0.0051:	0.0031:	<0.042:	0.00019:	0.16:	<0.0001:	<0.0015:	<0.017:	0.00053J	<0.0001:	<0.0001:	<0.0002:	0.045:
Surface Water Area 1-Red River Along Mine	RR-10A1	19-Apr-04	RR-10A1-D01N-SFW-041904	Surface Water	D	0.25:	<0.00063:	<0.0002:	0.031:	<0.0002:	0.0048:	0.00021:	<0.0008J		0.0025:	0.0073:	0.039:	<0.0014:	0.16:	<0.0001:	<0.0031:	0.0083:	<0.0007:	<0.0001J	<0.00012:	0.00034:	0.037:
Surface Water Area 1-Red River Along Mine	RR-11A1	03-Oct-02	RR-11A1-D01N-SFW-100302	Surface Water	D	0.1:	<0.0002:	<0.0002:	0.03:	<0.0002:	<0.0048:	<0.0001:	<0.0046:		<0.0022:	0.0022:	<0.023:	<0.0001:	0.13:	<0.0001:	0.0015:	0.0034:	<0.0002:	<0.0001:	<0.0001:	0.00015:	<0.0069:
Surface Water Area 1-Red River Along Mine	RR-11A1	20-Jan-03	RR-11A1-D01N-SFW-012003	Surface Water	D	<0.069J	<0.0006:	<0.0002J	0.033:	<0.0002:	<0.0088:	0.00025J	<0.0037:		0.0023:	0.0038:	<0.27:	<0.0002:	0.19:	<0.0001:	0.0012:	0.0098:	<0.0016:	<0.0002:	<0.0002:	<0.0004:	0.034:
Surface Water Area 1-Red River Along Mine	RR-11A1	21-Mar-03	RR-11A1-D01N-SFW-032103	Surface Water	D	0.092:	<0.0006:	<0.0002:	0.035:	<0.0003J	<0.0084:	0.00021:	<0.001:		<0.0038:	0.0038:	<0.31:	<0.0002:	0.19:	<0.0001:	0.0023:	0.0075:	<0.0034J	<0.0002:	<0.0002:	<0.0002:	<0.036:
Surface Water Area 1-Red River Along Mine	RR-11A1	03-Apr-03	RR-11A1-D01N-SFW-040303	Surface Water	D	<0.12:	<0.0003:	<0.0002:	0.038:	<0.0011:	<0.0084:	<0.0005:	<0.001:		<0.0038:	0.0032:	<0.046:	<0.0001:	0.12:	<0.0001:	0.0032:	0.0033:	<0.0005:	<0.0001:	<0.0001:	0.00012:	0.0086:
Surface Water Area 1-Red River Along Mine	RR-11A1	15-Jul-03	RR-11A1-D01N-SFW-071503	Surface Water	D	0.19:	<0.0005:	<0.0002:	0.034:	<0.0004:	0.0061:	<0.0002:	<0.0019:		<0.0037:	0.004:	<0.067:	<0.0001:	0.11:	<0.00017:	0.0015:	0.0046:	<0.0008:	<0.0001J	<0.0001:	0.00035:	<0.02:
Surface Water Area 1-Red River Along Mine	RR-11A1	24-Sep-03	RR-11A1-D01N-SFW-092403	Surface Water	D	0.13:	<0.00028:	<0.00038:	0.039:	<0.00047:	<0.0069:	0.00014:	<0.001:		0.0037:	0.0022:	<0.044:	0.00006:	0.11:	<0.00006:	<0.0014:	0.0054:	<0.00073:	<0.0002:	<0.00001:	<0.00028:	0.015:
Surface Water Area 1-Red River Along Mine	RR-11A1	19-Oct-03	RR-11A1-D01N-SFW-101903	Surface Water	D	0.14:	<0.0005:	<0.0002:	0.038:	<0.0004:	<0.0063:	<0.0002:	<0.0011:		0.0057:	0.0028:	<0.028:	<0.0002:	0.12:	<0.0001J	0.0014:	0.0044J	<0.0003:	<0.0001:	<0.0001:	<0.0001:	0.02:
Surface Water Area 1-Red River Along Mine	RR-11A1	13-Jan-04	RR-11A1-D01N-SFW-011304	Surface Water	D	<0.062:	<0.0012:	<0.0002:	0.032:	<0.001:	<0.012:	0.00029:	<0.0057:		0.0039:	0.0032:	<0.042:	0.00014:	0.16:	<0.0001:	<0.0017:	<0.017:	0.00056J	<0.0001:	<0.0001:	<0.0002:	0.032:
Surface Water Area 1-Red River Along Mine	RR-11A1	19-Apr-04	RR-11A1-D01N-SFW-041904	Surface Water	D	0.27:	<0.00063:	<0.0002:	0.034:	<0.0002:	0.0067:	<0.0002:	<0.0008J		0.0015:	0.006:	0.083:	<0.0013:	0.058:	<0.0001:	<0.0025:	0.0043:	<0.0007:	<0.0001J	<0.00012:	0.00044:	0.0092:
Surface Water Area 1-Red River Along Mine	RR-11B	03-Oct-02	RR-11B-D01N-SFW-100302	Surface Water	D	0.12:	<0.0002:	<0.0002:	0.03:	<0.0002:	<0.0048:	<0.0001:	<0.0046:		<0.0022:	0.0048:	<0.023:	<0.0001:	0.13:	<0.0001:	0.0015:	0.0047:	<0.0002:	<0.0001:	<0.0001:	0.00014:	0.013:
Surface Water Area 1-Red River Along Mine	RR-11B	20-Mar-03	RR-11B-D01N-SFW-032003	Surface Water	D	0.16:	<0.0006:	<0.0002:	0.034:	<0.0003J	<0.0084:	0.00047:	<0.001:		<0.0038:	0.0052:	<0.42:	<0.0002:	0.24:	<0.0001:	0.0029:	0.021:	<0.0012:	<0.0002:	<0.0002:	<0.0002:	0.1:
Surface Water Area 1-Red River Along Mine	RR-11B	15-Jul-03	RR-11B-D01N-SFW-071503	Surface Water	D	0.36:	<0.0005:	<0.0002:	0.033:	<0.00034:	0.0057:	0.00047:	<0.0014:		<0.002:	0.0045:	<0.033:	<0.0001:	0.099:	<0.0001:	0.002:	0.017:	<0.0016:	<0.0001J	<0.0001:	<0.00045:	0.11:
Surface Water Area 1-Red River Along Mine	RR-11B	24-Sep-03	RR-11B-D01N-SFW-092403	Surface Water	D	0.2:	<0.00018:	<0.00038:	0.037:	<0.00047:	<0.0064:	0.00029:	<0.001:		0.0027:	0.0025:	<0.044:	<0.00004:	0.1:	<0.00006:	<0.0015:	0.013:	<0.00073:	<0.0002:	<0.00001:	<0.00041:	0.068:
Surface Water Area 1-Red River Along Mine	RR-11C	01-Oct-02	RR-11C-D01N-SFW-100102	Surface Water	D	0.11:	<0.0002:	<0.0002:	0.031:	<0.0002:	<0.0054:	0.00022:	<0.0046:		<0.0022:	0.0024:	<0.023:	<0.0001:	0.14:	<0.0001:	0.0021:	0.0072:	0.00021:	<0.0001:	<0.0001:	0.00013:	0.034:
Surface Water Area 1-Red River Along Mine	RR-11C	20-Jan-03	RR-11C-D01N-SFW-012003	Surface Water	D	<0.16J	<0.0006:	<0.0002J	0.031:	<0.0002:	0.0035:	0.00062J	<0.0037:		0.0026:	<0.0017:	<0.27:	<0.0002:	0.17:	<0.0001:	<0.0043:	0.03:	<0.0016:	<0.0002:	<0.0002:	<0.0004:	0.18:
Surface Water Area 1-Red River Along Mine	RR-11C	20-Mar-03	RR-11C-D01N-SFW-032003	Surface Water	D	0.17:	<0.0006:	<0.0002:	0.038:	<0.0003J	<0.0084:	0.00043:	<0.001:		<0.0038:	0.0044:	<0.42:	<0.0002:	0.19:	<0.0001:	<0.0023:	0.021:	<0.001:	<0.0002:	<0.0002:	<0.0002:	0.14:
Surface Water Area 1-Red River Along Mine	RR-11C	03-Apr-03	RR-11C-D01N-SFW-040303	Surface Water	D	<0.1:	<0.00061:	<0.0002:	0.035:	<0.00069:	<0.0084:	<0.0005:	<0.001:		<0.0038:	0.0029:	<0.031:	<0.0001:	0.11:	<0.0001:	0.0032:	0.015:	0.00059:	<0.0001:	<0.0001:	<0.0001:	0.074:
Surface Water Area 1-Red River Along Mine	RR-11C	15-Jul-03	RR-11C-D01N-SFW-071503	Surface Water	D	0.22:	<0.0005:	<0.0002:	0.034:	<0.0004:	0.0058:	0.00049:	<0.0019:		<0.0037:	0.0035:	0.077:	<0.0001:	0.097:	<0.00018:	0.002:	0.016:	<0.0008:	<0.0001J	<0.0001:	0.00032:	0.1:
Surface Water Area 1-Red River Along Mine	RR-11C	25-Sep-03	RR-11C-D01N-SFW-092503	Surface Water	D	0.15:	<0.00052:	<0.00038:	0.037:	<0.00047:	<0.0091:	0.00038:	<0.001:		0.0014:	<0.0028:	<0.1:	<0.00004:	0.11:	<0.00006:	0.0022:	0.015:	<0.00073:	<0.0002:	<0.00001:	<0.00028:	0.085:
Surface Water Area 1-Red River Along Mine	RR-11C	19-Oct-03	RR-11C-D01N-SFW-101903	Surface Water	D	0.13:	<0.0005:	<0.0002:	0.039:	<0.0004:	<0.0063:	0.00045:	<0.0011:		0.0041:	0.0023:	<0.028:	<0.0002:	0.12:	<0.0001J	0.0022:	0.014:	<0.0003:	<0.0001:	<0.0001:	<0.0001:	0.1:
Surface Water Area 1-Red River Along Mine	RR-11C	13-Jan-04	RR-11C-D01N-SFW-011304	Surface Water	D	0.093:	<0.0012:	<0.0002:	0.035:	<0.001:	<0.012:	0.00032:	<0.0057:		0.0054:	0.0036:	<0.042:	<0.0001:	0.12:	<0.0001:	<0.0029:	<0.017:	0.00035J	<0.0001:	<0.0001:	<0.0002:	0.08:
Surface Water Area 1-Red River Along Mine	RR-11C	19-Apr-04	RR-11C-D01N-SFW-041904	Surface Water	D	0.24:	<0.00061:	<0.0002:	0.033:	<0.0002:	0.0058:	<0.0002:	<0.0008J		0.0027:	0.0064:	0.073:	<0.0014:	0.06:	<0.0001:	<0.0028:	0.006:	<0.0007:	<0.0001J	<0.00012:	0.0004:	0.019:
Surface Water Area 1-Red River Along Mine	RR-12	03-Oct-02	RR-12-D01N-SFW-100302	Surface Water	D	0.12:	0.00023:	0.00021:	0.03:	<0.0002:	<0.0052:	0.00024:	<0.0046:		<0.0022:	0.0032:	<0.023:	<0.0001:	0.14:	<0.0001:	0.0022:	0.0095:	<0.0002:	<0.0001:	<0.0001:	<0.0001:	0.026:
Surface Water Area 1-Red River Along Mine	RR-12	20-Jan-03	RR-12-D01N-SFW-012003	Surface Water	D	<0.11J	<0.0006:	<0.0002J	0.034:	<0.0002:	<0.0062:	0.00059J	<0.0037:		0.0027:	0.0035:	<0.27:	<0.0002:	0.19:	<0.0001:	<0.0031:	0.028:	<0.0016:	<0.0002:	<0.0002:	<0.0004:	0.16:
Surface Water Area 1-Red River Along Mine	RR-12	20-Mar-03	RR-12-D01N-SFW-032003	Surface Water	D	0.42:	<0.0006:	<0.0002:	0.038:	<0.0003J	<0.0084:	0.00043:	<0.001:		<0.0038:	0.0073:	<0.31:	<0.0002:	0.18:	<0.0001:	<0.0023:	0.022:	<0.001:	<0.0002:	<0.0002:	<0.0002:	0.13:
Surface Water Area 1-Red River Along Mine	RR-12	03-Apr-03	RR-12-D01N-SFW-040303	Surface Water	D	<0.12:	<0.0003:	<0.0002:	0.034:	<0.00097:	<0.0084:	<0.0005:	<0.001:		<0.0038:	0.0025:	<0.031:	<0.0001:	0.12:	<0.0001:	<0.0023:	0.015:	0.00057:	<0.0001:	<0.0001:	0.0001:	0.067:
Surface Water Area 1-Red River Along Mine	RR-12	15-Jul-03	RR-12-D01N-SFW-071503	Surface Water	D	0.2:	<0.0005:	<0.0002:	0.034:	<0.0004:	0.0071:	0.00047:	<0.0019:		<0.0037:	0.0034:	<0.067:	<0.0001:	0.1:	<0.00019:	0.002:	0.016:	<0.0008:	<0.0001J	<0.0001:	0.00023:	0.087:
Surface Water Area 1-Red River Along Mine	RR-12	24-Sep-03	RR-12-D01N-SFW-092403	Surface Water	D	0.17:	<0.00025:	<0.00038:	0.038:	<0.00047:	<0.0077:	0.00037:	<0.001:		0.0016:	<0.0029:	<0.044:	<0.00004:	0.11:	<0.00006:	<0.002:	0.015:	<0.00073:	<0.0002:	<0.00001:	<0.00052:	0.077:
Surface Water Area 1-Red River Along Mine	RR-12	19-Oct-03	RR-12-D01N-SFW-101903	Surface Water	D	0.12:	<0.0005:	<0.0002:	0.037:	<0.0004:	<0.0063:	0.00041:	<0.0011:		0.0056:	0.0026:	<0.028:	<0.0002:	0.12:	<0.0001:	0.0023:	0.015:	<0.0003:	<0.0001:	<0.0001:	<0.0001:	0.094:
Surface Water Area 1-Red River Along Mine	RR-12	13-Jan-04	RR-12-D01N-SFW-011304	Surface Water	D	0.1:	<0.0012:	<0.0002:	0.033:	<0.001:	<0.012:	0.00047:	<0.0057:		0.0058:	<0.0025:	<0.042:	<0.0001:	0.13:	<0.0001:	0.0027:	<0.017:	0.00054J	<0.0001:	<0.0001:	<0.0002:	0.072:
Surface Water Area 1-Red River Along Mine	RR-12	19-Apr-04	RR-12-D01N-SFW-041904	Surface Water	D	0.24:	<0.00064:	<0.0002:	0.032:	<0.0002J	0.0053:	<0.0002:	<0.0008J		0.0025J	0.0059:	0.072J	<0.0015:	0.064:	<0.0001:	<0.0028:	0.006:	<0.0007:	<0.0001J	<0.00012:	0.00043:	0.017:
Surface Water Area 1-Red River Along Mine	RR-13	01-Oct-02	RR-13-D01N-SFW-100102	Surface Water	D	0.26:	<0.0002:	<0.0002:	0.03:	<0.0002:	<0.0053:	0.00022:	<0.0046:		<0.0022:	0.0035:	<0.023:	<0.0001:	0.19:	<0.0001:	0.0022:	0.0084:	0.00032:	<0.0001:	<0.0001:	0.00012:	0.035:
Surface Water Area 1-Red River Along Mine	RR-13	01-Oct-02	RR-13-T01N-SFW-100102	Surface Water	D	1.1:	<0.0002:	<0.0002:	0.035:	<0.0002:	<0.005:	0.00029:	<0.0046:	<0.01:	<0.0022:	0.013:	0.45:	0.00094:	0.21:	<0.0001:	0.0018:	0.0092:	0.0002:	<0.0001:	<0.0001:	0.00033:	0.058:
Surface Water Area 1-Red River Along Mine	RR-13	20-Jan-03	RR-13-D01N-SFW-012003	Surface Water	D	<0.13J	<0.0006:	<0.0002J	0.033:	<0.0002:	<0.0048:	0.00056J	<0.0037:		0.0035:	0.0053:	<0.27:	<0.0002:	0.25:	<0.0001:	<0.0025:	0.028:	<0.0016:	<0.0002:	<0.0002:	<0.0004:	0.14:
Surface Water Area 1-Red River Along Mine	RR-13	20-Mar-03	RR-13-D01N-SFW-032003	Surface Water	D	0.13:	<0.0006:	<0.0002:	0.038:	<0.0003J	<0.0084:	0.00036:	<0.001:		<0.0038:	0.005:	<0.42:	<0.0002:	0.17:	<0.0001:	0.0027:	0.021:	<0.001:	<0.0002:	<0.0002:	<0.0002:	0.12:
Surface Water Area 1-Red River Along Mine	RR-13	03-Apr-03	RR-13-D01N-SFW-040303	Surface Water	D	<0.2:	<0.0003:	<0.0002:	0.035:	<0.00059:	<0.0084:	<0.0005:	<0.001:		<0.0038:	0.0042:	<0.031:	<0.0001:	0.17:	<0.0001:	0.0027:	0.015:	<0.0005:	<0.0001:	<0.0001:	<0.0001:	0.074:
Surface Water Area 1-Red River Along Mine	RR-13	15-Jul-03	RR-13-D01N-SFW-071503	Surface Water	D	0.32:	<0.0005:	<0.0002:	0.033:	<0.0004:	0.0064:	0.00052:	<0.0019:		<0.0037:	0.0047:	<0.067:	<0.0001:	0.13:	<0.00012:	0.0019:	0.016:	<0.0008:	<0.0001J	<0.0001:	<0.0002:	0.094:
Surface Water Area 1-Red River Along Mine	RR-13	24-Sep-03	RR-13-D01N-SFW-092403	Surface Water	D	0.3:	<0.00026:	<0.00038:	0.036:	<0.00047:	<0.0059:	0.00037:	<0.001:		0.0026:	0.0037:	<0.044:	<0.00004:	0.14:	<0.00006:	<0.002:	0.015:	<0.00073:	<0.0002:	<0.00001:	<0.00029:	0.062:
Surface Water Area 1-Red River Along Mine	RR-13	25-Sep-03	RR-13-D01N-SFW-092503	Surface Water	D	<0.018:	<0.00045:	<0.00038:	0.013:	<0.00047:	0.0054:	<0.00008:	<0.001:		<0.0011:	<0.00038:	<0.044:	<0.00004:	<0.0013:	<0.00006:	<0.0009:	<0.00091:	<0.00073:	<0.0002:	<0.00001:	<0.0005:	<0.013:
Surface Water Area 1-Red River Along Mine	RR-13	19-Oct-03	RR-13-D01N-SFW-101903	Surface Water	D	0.24:	<0.0005:	<0.0002:	0.037:	<0.0004:	<0.0063:	0.00044:	<0.0011:		<0.0029:	0.004:	<0.028:	<0.0002:	0.15:	<0.0001J	0.0023:	0.016:	<0.0003:	<0.0001:	<0.0001:	<0.0001:	0.098:
Surface Water Area 1-Red River Along Mine	RR-13	13-Jan-04	RR-13-D01N-SFW-011304	Surface Water	D	0.064:	<0.0012:	<0.0002:	0.032:	<0.0026:	<0.012:	0.00034:	<0.0057:		0.0083:	0.0039:	<0.042:	<0.0001:	0.2:	<0.0001:	0.0025:	0.014:	0.00056J	<0.0001:	<0.0001:	<0.0002:	0.077:
Surface Water Area 1-Red River Along Mine	RR-13	19-Apr-04	RR-13-D01N-SFW-041904	Surface Water	D	0.33:	<0.00061:	<0.0002:	0.032:	<0.0002:	0.0058:	<0.0002:	<0.0008J		0.004J	0.0073:	0.15:	<0.0014:	0.086:	<0.0001:	<0.0028:	0.0066:	<0.0007:	<0.0001J	<0.00012:	0.00037:	0.023:
Surface Water Area 1-Red River Along Mine	RR-14	01-Oct-02	RR-14-D01N-SFW-100102	Surface Water	D	0.14:	0.00055:	<0.0002:	0.03:	<0.0002:	<0.0052:	0.00034:	<0.0046:		0.0032:	0.0038:	0.054:	<0.0001:	0.32:	<0.0001:	0.0025:	0.011:	0.00027:	<0.0001:	<0.0001:	<0.0001:	0.052:
Surface Water Area 1-Red River Along Mine	RR-14	01-Oct-02	RR-14-T01N-SFW-100102	Surface Water	D	1.9:	<0.0002:	0.00021:	0.035:	<0.0002:	<0.0048:	0.00043:	<0.0046:	<0.01:	0.0037:	0.02:	0.61:	0.0011:	0.32:	<0.0001:	0.0019:	0.012:	0.00038:	<0.0001:	<0.0001:	0.00031:	0.086:
Surface Water Area 1-Red River Along Mine	RR-14	19-Jan-03	RR-14-D01N-SFW-011903	Surface Water	D	<0.074J	<0.0016:	<0.0002J	0.032:	<0.0002:	<0.0088:	0.00084J	<0.0037:		0.0068:	0.0064:	<0.27:	<0.0002:	0.5:	<0.0001:	<0.0047:	0.035:	<0.0016:	<0.0002:	<0.0002:	<0.0004:	0.21:
Surface Water Area 1-Red River Along Mine	RR-14	20-Mar-03	RR-14-D01N-SFW-032003	Surface Water	D	0.12J	<0.0006:	<0.0002:	0.035:	<0.0003:	0.01:	0.00056:	<0.001:		<0.0038:	0.0074:	<0.42:	<0.0002:	0.38:	<0.0001:	<0.0023:	0.025:	<0.001J	<0.0002:	<0.0002:	<0.0002:	0.16:
Surface Water Area 1-Red River Along Mine	RR-14	03-Apr-03	RR-14-D01N-SFW-040303	Surface Water	D	<0.079:	<0.0003:	<0.0002:	0.035:	<0.0003:	<0.0084:	<0.0005:	<0.001:		<0.0038:	0.0048:	<0.14:	<0.0001:	0.27:	<0.0001:	0.0027:	0.018:	<0.0005:	<0.0001:	<0.0001:	<0.0001:	0.099:
Surface Water Area 1-Red River Along Mine	RR-14	15-Jul-03	RR-14-D01N-SFW-071503	Surface Water	D	0.23:	<0.0005:	<0.0002:	0.035:	<0.0002:	0.0075:	0.00059:	<0.0014:		0.0027:	0.0041:	<0.033:	<0.00012:	0.19:	0.00012:	0.0022:	0.019:	<0.0008:	<0.0001J	<0.0001:	<0.0002:	0.096:
Surface Water Area 1-Red River Along Mine	RR-14	24-Sep-03	RR-14-D01N-SFW-092403	Surface Water	D	0.19:	<0.00054:	<0.00038:	0.035:	<0.00047:	<0.0062:	0.00042:	<0.001:		0.0031:	0.0034:	<0.044:	<0.00004:	0.2:	<0.00006:	0.0024:	0.015:	<0.00073:	<0.0002:	<0.00001:	<0.00034:	0.07:
Surface Water Area 1-Red River Along Mine	RR-14	19-Oct-03	RR-14-D01N-SFW-101903	Surface Water	D	0.14:	<0.0005:	<0.0002:	0.036:	<0.0004:	<0.0063:	0.00043:	<0.0011:		0.0039:	0.0038:	0.065:	<0.0002:	0.22:	<0.0001J	0.0026:	0.016:	<0.0003:	<0.0001:	<0.0001:	<0.0001:	0.1:
Surface Water Area 1-Red River Along Mine	RR-14	13-Jan-04	RR-14-D01N-SFW-011304	Surface Water	D	<0.062:	<0.0012:	<0.0002:	0.032:	<0.001:	<0.012:	0.00052:	<0.0057:		0.0086:	0.0059:	<0.082:	0.0001:	0.3:	<0.0001:	0.003:	<0.017:	0.00059J	<0.0001:	<0.0001:	<0.0002:	0.098:
Surface Water Area 1-Red River Along Mine	RR-14	24-Feb-04	RR-14-D01N-SFW-022404	Surface Water	D	0.049:	<0.0002J	<0.0001:	0.03:	<0.0003:	0.0051:	0.00078J	<0.0015J		0.0064:	0.0057:	0.14:	<0.0001J	0.33:	<0.0001:	0.0028:	0.021:	<0.00089:	<0.0001J	<0.0001:	<0.0001J	0.099:
Surface Water Area 1-Red River Along Mine	RR-14	19-Apr-04	RR-14-D01N-SFW-041904	Surface Water	D	0.26:	<0.00061:	<0.0002:	0.032:	<0.0002:	0.0062:	<0.0002:	<0.0008J		0.0058J	0.0072:	0.072:	<0.0012:	0.13:	<0.0001:	<0.003:	0.0077:	<0.0007:	<0.0001J	<0.00012:	0.00034:	0.035:
Surface Water Area 1-Red River Along Mine	RR-15	01-Oct-02	RR-15-D01N-SFW-100102	Surface Water	D	0.17:	<0.0002:	<0.0002:	0.029:	<0.0002:	<0.0048:	0.00031:	<0.0046:		0.0036:	0.0033:	<0.023:	<0.0001:	0.38:	<0.0001:	0.0024:	0.012:	<0.0002:	<0.0001:	<0.0001:	<0.0001:	0.057:
Surface Water Area 1-Red River Along Mine	RR-15	01-Oct-02	RR-15-T01N-SFW-100102	Surface Water	D	2.2:	<0.0002:	<0.0002:	0.035:	0.00028:	<0.0053:	0.00046:	<0.0046:	<0.01:	0.0041:	0.022:	0.64:	0.00088:	0.41:	<0.0001:	0.0018:	0.014:	0.0003:	<0.0001:	<0.0001:	0.00029:	0.11:
Surface Water Area 1-Red River Along Mine	RR-15	21-Mar-03	RR-15-D01N-SFW-032103	Surface Water	D	0.11:	<0.0006:	<0.0002:	0.033:	<0.0003J	<0.0084:	0.00073:	<0.001:		0.0052:	0.0064:	<0.31:	<0.0002:	0.42:	<0.0001:	<0.0023:	0.025:	<0.001:	<0.0002:	<0.0002:	<0.0002:	0.15:
Surface Water Area 1-Red River Along Mine	RR-15	15-Jul-03	RR-15-D01N-SFW-071503	Surface Water	D	0.22:	<0.0005:	<0.0002:	0.035:	<0.0002:	0.0056:	0.0006:	<0.0014:		0.0023:	0.0053:	<0.033:	<0.0001:	0.23:	<0.0001:	0.0022:	0.019:	<0.0016:	<0.0001J	<0.0001:	<0.00027:	0.11:
Surface Water Area 1-Red River Along Mine	RR-15	24-Sep-03	RR-15-D01N-SFW-092403	Surface Water	D	0.24:	<0.0012:	<0.00038:	0.036:	<0.00047:	<0.008:	0.00048:	<0.001:		0.003:	<0.004:	<0.044:	<0.00004:	0.25:	<0.00006:	0.003:	0.016:	<0.00073:	<0.0002:	<0.00001:	<0.00028:	0.079:
Surface Water Area 1-Red River Along Mine	RR-16	01-Oct-02	RR-16-D01N-SFW-100102	Surface Water	D	0.18:	<0.0002:	<0.0002:	0.029:	<0.0002:	<0.0053:	0.00035:	<0.0046:		0.0041:	0.0033:	<0.023:	<0.0001:	0.41:	<0.0001:	0.0024:	0.012:	<0.0002:	<0.0001:	<0.0001:	<0.0001:	0.06:
Surface Water Area 1-Red River Along Mine	RR-16	01-Oct-02	RR-16-T01N-SFW-100102	Surface Water	D	2.2:	<0.0002:	0.0002:	0.035:	0.00034:	<0.0052:	0.00048:	<0.0046:	<0.01:	0.0045:	0.022:	0.65:	0.00099:	0.43:	<0.0001:	0.0018:	0.014:	0.00034:	<0.0001:	<0.0001:	0.00037:	0.11:
Surface Water Area 1-Red River Along Mine	RR-16	19-Jan-03	RR-16-D01N-SFW-011903	Surface Water	D	<0.073J	<0.0006:	<0.0002J	0.029:	<0.0002:	0.0063:	0.00077J	<0.0037:		0.0066:	0.0051:	<0.27:	<0.0002:	0.57:	<0.0001:	<0.0035:	0.031:	<0.0016:	<0.0002:	<0.0002:	<0.0004:	0.21:
Surface Water Area 1-Red River Along Mine	RR-16	19-Mar-03	RR-16-D01N-SFW-031903	Surface Water	D	<0.11:	<0.0006:	<0.0002:	0.033:	<0.0003:	<0.0084:	0.00058:	<0.001:		0.0041:	0.0056:	<0.42:	<0.0002:	0.45:	<0.0001:	0.0023:	0.024:	<0.0016:	<0.0002:	<0.0002:	<0.0004:	0.15:
Surface Water Area 1-Red River Along Mine	RR-16	03-Apr-03	RR-16-D01N-SFW-040303	Surface Water	D	<0.088:	<0.0003:	<0.0002:	0.034:	<0.00085:	<0.0084:	<0.0005:	<0.001:		<0.0038:	0.0037:	<0.031:	<0.0001:	0.36:	<0.0001:	<0.0023:	0.021:	<0.0005:	<0.0001:	<0.0001:	<0.0001:	0.11:
Surface Water Area 1-Red River Along Mine	RR-16	15-Jul-03	RR-16-D01N-SFW-071503	Surface Water	D	0.29:	<0.00061:	<0.0002:	0.035:	<0.0004:	0.007:	0.00059:	<0.0019:		<0.0037:	0.0052:	<0.067:	<0.0001:	0.24:	<0.0002:	0.0024:	0.02:	<0.0008:	<0.0001J	<0.0001:	<0.0002:	0.11:
Surface Water Area 1-Red River Along Mine	RR-16	23-Sep-03	RR-16-D01N-SFW-092303	Surface Water	D	0.27:	<0.00029:	<0.00038:	0.034:	<0.00047:	<0.0048:	0.00043:	<0.001:		0.0028:	<0.0034:	<0.044:	<0.00004:	0.26:	<0.00006:	0.0022:	0.015:	<0.00073:	<0.0002:	<0.00001:	<0.00057:	0.064:
Surface Water Area 1-Red River Along Mine	RR-16	19-Oct-03	RR-16-D01N-SFW-101903	Surface Water	D	0.16:	<0.0005:	<0.0002:	0.036:	<0.0004:	<0.0063:	0.00049:	<0.0011:		0.007:	0.0039:	<0.028:	<0.0002:	0.29:	<0.0001J	0.0026:	0.018:	<0.0003:	<0.0001:	<0.0001:	<0.0001:	0.11:
Surface Water Area 1-Red River Along Mine	RR-16	13-Jan-04	RR-16-D01N-SFW-011304	Surface Water	D	0.07:	<0.0012:	<0.0002:	0.032:	<0.001:	<0.012:	0.00068:	<0.0057:		0.0072:	0.0032:	<0.037:	<0.0001:	0.4:	<0.0001:	0.0027:	0.018:	0.00091J	<0.0001:	<0.0001:	<0.0002:	0.12:
Surface Water Area 1-Red River Along Mine	RR-16	19-Apr-04	RR-16-D01N-SFW-041904	Surface Water	D	0.25:	<0.00056:	<0.0002:	0.035:	<0.0002:	0.0054:	<0.0002:	<0.0008J		0.0019:	0.006:	0.085:	<0.0013:	0.06:	<0.0001:	<0.0025:	0.0046:	<0.0007:	<0.0001J	<0.00012:	0.00044:	0.0095:

Surface Water Area 1-Red River Along Mine	RR-17	01-Oct-02	RR-17-D01N-SFW-100102	Surface Water	D	0.18:	<0.0002:	<0.0002:	0.029:	<0.0002:	<0.0056:	0.00047:	<0.0046:		0.0041:	0.0033:	<0.023:	<0.0001:	0.47:	<0.0001:	0.0024:	0.015:	0.00026:	<0.0001:	<0.0001:	<0.0001:	0.074:
Surface Water Area 1-Red River Along Mine	RR-17	01-Oct-02	RR-17-T01N-SFW-100102	Surface Water	D	1.9:	<0.0002:	0.00024:	0.032:	0.00031:	<0.006:	0.00058:	<0.0046:	<0.01:	0.0044:	0.019:	0.58:	0.001:	0.46:	<0.0001:	0.0017:	0.016:	0.00044:	<0.0001:	<0.0001:	0.00035:	0.12:
Surface Water Area 1-Red River Along Mine	RR-17	19-Mar-03	RR-17-D01N-SFW-031903	Surface Water	D	<0.12:	<0.0006:	<0.0002:	0.034:	<0.0003:	<0.0084:	0.00068:	<0.001:		0.004:	0.0057:	<0.44:	<0.0002:	0.5:	<0.0001:	<0.0023:	0.027:	<0.0016:	<0.0002:	<0.0002:	<0.0004:	0.17:
Surface Water Area 1-Red River Along Mine	RR-17	15-Jul-03	RR-17-D01N-SFW-071503	Surface Water	D	0.23:	<0.0005:	<0.0002:	0.034:	<0.0004:	0.0065:	0.00064:	<0.0019:		<0.0037:	0.004:	<0.067:	<0.0001:	0.27:	<0.00016:	0.0022:	0.02:	<0.0008:	<0.0001J	<0.0001:	0.00024:	0.11:
Surface Water Area 1-Red River Along Mine	RR-17	23-Sep-03	RR-17-D01N-SFW-092303	Surface Water	D	0.28:	<0.0024:	<0.00038:	0.034:	<0.00047:	<0.0048:	0.0005:	<0.001:		0.0024:	<0.0036:	<0.044:	<0.00004:	0.28:	<0.00006:	0.0037:	0.017:	<0.00073:	<0.0002:	<0.00001:	<0.00055:	0.077:
Surface Water Area 1-Red River Along Mine	RR-18A	01-Oct-02	RR-18A-D01N-SFW-100102	Surface Water	D	0.15:	<0.0002:	<0.0002:	0.026:	<0.0002:	<0.0052:	0.00042:	<0.0046:		0.0038:	0.0027:	<0.023:	<0.0001:	0.44:	<0.0001:	0.0025J	0.014:	<0.0002:	<0.0001:	<0.0001:	<0.0001:	0.059:
Surface Water Area 1-Red River Along Mine	RR-18A	19-Mar-03	RR-18A-D01N-SFW-031903	Surface Water	D	<0.1:	<0.0006:	<0.0002:	0.035:	0.0003:	<0.0084:	0.00075:	<0.001:		0.0043:	0.0064:	<0.42:	<0.0002:	0.51:	0.00011:	0.0027:	0.028:	<0.0016:	<0.0002:	<0.0002:	<0.0004:	0.18:
Surface Water Area 1-Red River Along Mine	RR-18A	16-Jul-03	RR-18A-D01N-SFW-071603	Surface Water	D	0.24:	<0.0005:	<0.0002:	0.034:	<0.0002:	0.0059:	0.00062:	<0.0014:		0.0022:	0.0043:	<0.033:	<0.0001:	0.26:	<0.00012:	0.0029:	0.019:	<0.0008:	<0.0001J	<0.0001:	<0.0002:	0.1:
Surface Water Area 1-Red River Along Mine	RR-18A	23-Sep-03	RR-18A-D01N-SFW-092303	Surface Water	D	0.26:	<0.0004:	<0.00038:	0.034:	<0.00047:	<0.0048:	0.00046:	<0.001:		0.0028:	<0.0034:	<0.044:	<0.00004:	0.28:	<0.00006:	0.0023:	0.016:	<0.00073:	<0.0002:	<0.00001:	<0.00046:	0.072:
Surface Water Area 1-Red River Along Mine	RR-18B	30-Sep-02	RR-18B-D01N-SFW-093002	Surface Water	D	0.2:	<0.0002:	<0.0002:	0.026:	<0.0002:	<0.0071:	0.00037:	<0.0046:		0.0032:	0.0029:	<0.023:	<0.0001:	0.41:	<0.0001:	0.0024:	0.011:	<0.0002:	<0.0001:	<0.0001:	0.00011:	0.034:
Surface Water Area 1-Red River Along Mine	RR-18B	30-Sep-02	RR-18B-T01N-SFW-093002	Surface Water	D	1.9:	<0.00024:	0.00021:	0.033:	0.00033:	<0.0076:	0.0005:	<0.0046:	<0.01:	0.0039:	0.018:	0.65:	0.0011:	0.43:	<0.0001:	0.0017:	0.014:	0.00038:	<0.0001:	<0.0001:	0.00035:	0.1:
Surface Water Area 1-Red River Along Mine	RR-18B	19-Mar-03	RR-18B-D01N-SFW-031903	Surface Water	D	<0.2:	<0.0006:	<0.0002:	0.033:	<0.0003:	<0.0084:	0.00063:	<0.001:		<0.0038:	0.006:	<0.46:	<0.0002:	0.43:	<0.0001:	<0.0023:	0.023:	<0.0016:	<0.0002:	<0.0002:	<0.0004:	0.17:
Surface Water Area 1-Red River Along Mine	RR-18B	16-Jul-03	RR-18B-D01N-SFW-071603	Surface Water	D	0.22:	<0.0005:	<0.0002:	0.034:	<0.0002:	0.0062:	0.00056:	<0.0014:		<0.002:	0.0044:	<0.033:	<0.0001:	0.25:	<0.00015:	0.0026:	0.018:	<0.0008:	<0.0001J	<0.0001:	<0.0002:	0.1:
Surface Water Area 1-Red River Along Mine	RR-18B	23-Sep-03	RR-18B-D01N-SFW-092303	Surface Water	D	0.34:	<0.00011:	<0.00038:	0.037:	<0.00047:	<0.0048:	0.00055:	<0.001:		0.0029:	<0.0048:	<0.044:	<0.00006:	0.29:	<0.00006:	0.0022:	0.017:	<0.00073J	<0.0002:	<0.00001:	<0.0003:	0.079:
Surface Water Area 1-Red River Along Mine	RR-20	30-Sep-02	RR-20-D01N-SFW-093002	Surface Water	D	0.15:	<0.0002:	<0.0002:	0.026:	<0.0002:	<0.0073:	0.00032:	<0.0012:		0.0025:	0.0022:	<0.046:	<0.0001:	0.35:	<0.0001:	0.0035:	0.0096:	<0.0002:	<0.0059:	<0.0001:	<0.0001:	0.028:
Surface Water Area 1-Red River Along Mine	RR-20	30-Sep-02	RR-20-T01N-SFW-093002	Surface Water	D	2.8:	<0.0002:	<0.0002:	0.059:	0.00051:	<0.005:	0.00048:	0.0022:	<0.01:	0.0038:	0.017:	2.2:	0.0012:	0.41:	<0.0001:	0.0025:	0.013:	0.00035:	<0.0059:	<0.0001:	0.00038:	0.097:
Surface Water Area 1-Red River Along Mine	RR-20	21-Mar-03	RR-20-D01N-SFW-032103	Surface Water	D	<0.54:	<0.00066:	<0.0004J	0.035:	<0.0003J	<0.0084:	0.00056:	<0.001:		0.004:	0.0059:	<0.31:	<0.0002:	0.36:	<0.0001:	<0.0023:	0.021:	<0.0031:	<0.0002:	<0.0002:	<0.0002:	0.11:
Surface Water Area 1-Red River Along Mine	RR-20	15-Jul-03	RR-20-D01N-SFW-071503	Surface Water	D	0.072J	<0.0005:	<0.0002:	0.035:	<0.0002:	0.0068:	0.00035:	<0.0014:		<0.002:	0.0026:	<0.033:	<0.0001:	0.16:	<0.0001:	0.0054:	0.0098:	<0.0016:	<0.0001J	<0.0001:	<0.00076:	0.058:
Surface Water Area 1-Red River Along Mine	RR-20	23-Sep-03	RR-20-D01N-SFW-092303	Surface Water	D	0.11:	<0.00011:	<0.00038:	0.034:	<0.00047:	<0.0051:	0.0004:	0.0039J		0.0028:	<0.0028:	<0.044:	<0.00006:	0.23:	<0.00006:	0.0031:	0.012:	<0.00073J	<0.0002:	<0.00001:	<0.00028:	0.066:
Surface Water Area 1-Red River Along Mine	RR-7	04-Oct-02	RR-7-D01N-SFW-100402	Surface Water	D	0.15:	<0.0002:	<0.0002:	0.034:	<0.0002:	<0.0048:	0.00018:	<0.0046:		<0.0022:	<0.0027:	<0.023:	<0.0001:	0.2:	<0.0001:	0.0011:	0.008:	<0.0002:	<0.0001:	<0.0001:	<0.0001:	<0.02:
Surface Water Area 1-Red River Along Mine	RR-7	21-Jan-03	RR-7-D01N-SFW-012103	Surface Water	D	<0.12J	<0.0006:	<0.0002J	0.033:	<0.0002:	0.011:	0.0004J	<0.0037:		0.0051:	0.0032:	<0.27:	<0.0002:	0.35:	<0.0001:	<0.0011:	0.018:	<0.0016:	<0.0002:	<0.0002:	<0.0004:	0.076:
Surface Water Area 1-Red River Along Mine	RR-7	21-Mar-03	RR-7-D01N-SFW-032103	Surface Water	D	0.11:	<0.0006:	<0.0002:	0.038:	<0.0003:	0.0094:	0.00026:	<0.001:		0.0038:	0.0048:	<0.42:	<0.0002:	0.3:	<0.0001J	<0.0023:	0.011:	<0.0039J	<0.0002:	<0.0002:	<0.0002:	<0.049:
Surface Water Area 1-Red River Along Mine	RR-7	03-Apr-03	RR-7-D01N-SFW-040303	Surface Water	D	<0.16:	<0.0003:	<0.0002:	0.037:	<0.0008:	<0.0084:	<0.0005:	<0.001:		<0.0038:	0.0034:	<0.031:	<0.0001:	0.17:	<0.0001:	<0.0023:	0.0066:	<0.0005:	<0.0001:	<0.0001:	0.00014:	0.021:
Surface Water Area 1-Red River Along Mine	RR-7	15-Jul-03	RR-7-D01N-SFW-071503	Surface Water	D	0.25:	<0.0005:	<0.0002:	0.033:	<0.0002:	0.0067:	<0.0002:	<0.0014:		<0.002:	0.0036:	<0.033:	<0.00013:	0.093:	0.00014:	0.0011:	0.0051:	<0.0008:	<0.0001J	<0.0001:	<0.0002:	0.023:
Surface Water Area 1-Red River Along Mine	RR-7	24-Sep-03	RR-7-D01N-SFW-092403	Surface Water	D	0.18:	<0.00011:	<0.00038:	0.036:	<0.00047:	<0.0068:	0.00023:	0.0017:		0.0026:	<0.0027:	<0.044:	<0.00004:	0.14:	<0.00006:	<0.0011:	0.0073:	<0.00073J	<0.0002:	<0.00001:	<0.00045:	<0.025:
Surface Water Area 1-Red River Along Mine	RR-7	19-Oct-03	RR-7-D01N-SFW-101903	Surface Water	D	0.17:	<0.0005:	<0.0002:	0.035:	<0.0004:	<0.0063:	0.00023:	<0.0011:		0.0041:	0.003:	<0.028:	<0.0002:	0.16:	<0.0001J	0.0009:	0.0064J	<0.0003:	<0.0001:	<0.0001:	<0.0001:	0.025:
Surface Water Area 1-Red River Along Mine	RR-7	13-Jan-04	RR-7-D01N-SFW-011304	Surface Water	D	0.1:	<0.0012:	0.0002:	0.033:	<0.0018:	<0.012:	0.00033:	<0.0057:		0.0075:	0.0038:	<0.042:	<0.0001:	0.24:	<0.0001:	0.001:	0.012:	0.00085J	<0.0001:	<0.0001:	<0.0002:	0.048:
Surface Water Area 1-Red River Along Mine	RR-7	24-Feb-04	RR-7-D01N-SFW-022404	Surface Water	D	0.077:	<0.0002J	<0.0001:	0.029:	<0.0003:	0.0064:	0.00036J	<0.0015J		0.0032:	0.0049J	<0.036:	<0.0001:	0.23:	<0.0001:	<0.0007:	0.013J	<0.00057:	<0.0001J	<0.0001:	<0.0001J	0.041:
Surface Water Area 1-Red River Along Mine	RR-7	19-Apr-04	RR-7-D01N-SFW-041904	Surface Water	D	0.29:	<0.00055:	<0.0002:	0.035:	<0.0002:	0.0061:	<0.0002:	<0.0008J		0.0014:	0.0074:	0.081:	<0.0013:	0.08:	<0.0001:	<0.0022:	0.0058:	<0.0007:	<0.0001J	<0.00012:	0.00045:	0.016:
Surface Water Area 1-Red River Along Mine	RR-8	04-Oct-02	RR-8-D01N-SFW-100402	Surface Water	D	0.13:	<0.0002:	<0.0002:	0.032:	<0.0002:	<0.0048:	0.00014:	<0.0046:		<0.0022:	<0.0031:	<0.023:	<0.0001:	0.2:	<0.0001:	0.0012:	0.0064:	<0.0002:	<0.0001:	<0.0001:	<0.0001:	<0.015:
Surface Water Area 1-Red River Along Mine	RR-8	21-Mar-03	RR-8-D01N-SFW-032103	Surface Water	D	0.13:	<0.0006:	<0.0002:	0.036:	<0.0003J	<0.0084:	<0.0002:	<0.001:		0.0038:	0.0043:	<0.42:	<0.0002:	0.28:	<0.0001:	<0.0023:	0.0098:	<0.001:	<0.0002:	<0.0002:	<0.0002:	<0.039:
Surface Water Area 1-Red River Along Mine	RR-8	15-Jul-03	RR-8-D01N-SFW-071503	Surface Water	D	0.22:	<0.0005:	<0.0002:	0.031:	<0.0002:	0.007:	<0.0002:	<0.0014:		<0.002:	0.0042:	<0.033:	<0.0001:	0.077:	<0.0001:	<0.0017:	0.0033:	<0.0016:	<0.0001J	<0.0001:	<0.0007:	<0.0093:
Surface Water Area 1-Red River Along Mine	RR-8	24-Sep-03	RR-8-D01N-SFW-092403	Surface Water	D	0.14:	<0.00043:	<0.00038:	0.035:	<0.00047:	<0.0085:	0.00022:	<0.001:		0.0022:	0.0028:	<0.044:	<0.00004:	0.13:	<0.00006:	<0.0015:	0.0069:	<0.00073:	<0.0002:	<0.00001:	<0.00028:	0.02:
Surface Water Area 1-Red River Along Mine	RR-8A	04-Oct-02	RR-8A-D01N-SFW-100402	Surface Water	D	0.093:	<0.0002:	<0.0002:	0.031:	<0.0003:	<0.005:	0.00018:	<0.00034:		0.0021:	<0.0023:	<0.038:	<0.0001:	0.2:	<0.0001:	0.0013:	0.0067:	0.00049:	<0.0001:	<0.0001:	<0.0001:	<0.0073J
Surface Water Area 1-Red River Along Mine	RR-8A	21-Mar-03	RR-8A-D01N-SFW-032103	Surface Water	D	<0.58:	<0.0006:	<0.0004:	0.035:	<0.0003J	<0.0084:	<0.0005:	<0.0011:		<0.0038:	0.0036:	<0.42:	<0.0002:	0.26:	<0.0001:	<0.0023:	0.0091:	<0.001:	<0.0002:	<0.0002:	<0.0002:	<0.039:
Surface Water Area 1-Red River Along Mine	RR-8A	15-Jul-03	RR-8A-D01N-SFW-071503	Surface Water	D	0.24:	<0.0005:	<0.0002:	0.031:	<0.0002:	0.0064:	<0.0002:	<0.0014:		<0.002:	0.0037:	<0.033:	<0.00014:	0.073:	0.00015:	0.0013:	0.0045:	<0.0008:	<0.0001J	<0.0001:	<0.0002:	<0.0067:
Surface Water Area 1-Red River Along Mine	RR-8A	24-Sep-03	RR-8A-D01N-SFW-092403	Surface Water	D	0.23:	<0.00017:	<0.00038:	0.035:	<0.00047:	<0.0079:	0.00018:	<0.001:		0.0021:	0.0029:	<0.044:	0.00006:	0.12:	<0.00006:	<0.0012:	0.006:	<0.00073:	<0.0002:	<0.00001:	<0.00029:	0.015:
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	27-Sep-02	LR-11A-D01N-SFW-092702	Surface Water	D	<0.085:	<0.0002:	<0.0002:	0.033:	<0.0002:	<0.011:	0.00025:	<0.0012:		0.002:	0.0022:	<0.046:	<0.0001:	0.3:	<0.0001:	0.06:	0.0079:	0.00025:	<0.0059:	<0.0001:	<0.0001:	0.021:
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	27-Sep-02	LR-11A-T01N-SFW-092702	Surface Water	D	2.2:	<0.0002:	<0.0002:	0.045:	0.00031:	<0.018:	0.00033:	0.002:	<0.01:	0.0027:	0.012:	1.1:	0.0011:	0.31:	<0.0001:	0.058:	0.0096:	0.00023:	<0.0059:	<0.0001:	0.0004:	0.067:
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	20-Mar-03	LR-11A-D01N-SFW-032003	Surface Water	D	0.065:	<0.0006:	<0.0002:	0.035:	<0.0003J	0.01:	0.00056:	<0.001:		<0.0038:	0.0043:	<0.42:	<0.0002:	0.34:	<0.0001:	0.059:	0.017:	<0.001:	<0.0002:	<0.0002:	<0.0002:	0.11:
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	14-Jul-03	LR-11A-D01N-SFW-071403	Surface Water	D	<0.081J	<0.0005:	<0.0002:	0.037:	<0.0002:	0.014:	0.00027:	<0.0006J		<0.0018:	0.0026:	<0.017:	<0.0001:	0.16:	<0.00019:	0.061:	0.0083:	<0.0008:	<0.0001J	<0.0001:	<0.0002:	0.04:
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	23-Sep-03	LR-11A-D01N-SFW-092303	Surface Water	D	0.13:	<0.00018:	<0.00038:	0.035:	<0.00047:	0.0076:	0.00035:	<0.001:		0.0015:	<0.0026:	<0.044:	<0.00004:	0.21:	<0.00006:	0.039:	0.011:	<0.00073:	<0.0002:	<0.00001:	<0.00063:	0.041:
Surface Water Area 11-Red River Along Tailings Facility	LR-13	26-Sep-02	LR-13-D01N-SFW-092602	Surface Water	D	0.098:	<0.0002:	<0.0002:	0.032:	<0.0002:	<0.0099:	0.0002:	0.0014:		0.0021:	0.0017:	<0.046:	<0.0001:	0.25:	<0.0001:	0.061:	0.0065:	<0.0002:	<0.0059:	<0.0001:	0.00014:	0.019:
Surface Water Area 11-Red River Along Tailings Facility	LR-13	26-Sep-02	LR-13-T01N-SFW-092602	Surface Water	D	1.4:	<0.0002:	<0.0002:	0.043:	0.00027:	<0.011:	0.00032:	<0.0012:	<0.01:	0.0026:	0.011:	0.96:	0.0011:	0.27:	<0.0001:	0.057:	0.0083:	0.00036:	<0.0059:	<0.0001:	0.00036:	0.052:
Surface Water Area 11-Red River Along Tailings Facility	LR-13	20-Mar-03	LR-13-D01N-SFW-032003	Surface Water	D	0.1:	<0.0006:	<0.0002:	0.037:	<0.0003:	0.014:	0.00029:	<0.001:		<0.0038:	0.0043:	<0.42:	<0.0002:	0.26:	<0.0001J	0.064:	0.014:	<0.001J	<0.0002:	<0.0002:	<0.0002:	<0.041:
Surface Water Area 11-Red River Along Tailings Facility	LR-13	14-Jul-03	LR-13-D01N-SFW-071403	Surface Water	D	<0.044J	<0.0005:	<0.0002:	0.037:	<0.0002:	0.015:	0.00027:	<0.0006J		<0.0018:	0.0019:	<0.017:	<0.0001:	0.14:	<0.00016:	0.057:	0.0074:	<0.0008:	<0.0001J	<0.0001:	0.00022:	0.032:
Surface Water Area 11-Red River Along Tailings Facility	LR-13	21-Sep-03	LR-13-D01N-SFW-092103	Surface Water	D	0.11:	<0.00022:	<0.00038:	0.035:	<0.00047:	<0.0088:	0.00035:	<0.001:		0.0023:	0.0023:	<0.044:	0.00007:	0.2:	<0.00006:	0.036:	0.011:	<0.00073:	<0.0002:	<0.00001:	<0.00054:	0.041:
Surface Water Area 11-Red River Along Tailings Facility	LR-16	26-Sep-02	LR-16-D01N-SFW-092602	Surface Water	D	0.092:	<0.0002:	<0.0002:	0.031:	<0.0002:	<0.014:	0.00044:	<0.0012:		<0.0018:	0.0021:	<0.046:	<0.0001:	0.23:	<0.0001:	0.065:	0.0066:	<0.0002:	<0.0059:	<0.0001:	0.00049:	0.013:
Surface Water Area 11-Red River Along Tailings Facility	LR-16	26-Sep-02	LR-16-T01N-SFW-092602	Surface Water	D	2.1:	<0.0002:	0.0004J	0.06:	0.00033:	<0.018:	0.00052:	0.002:	<0.01:	0.0029:	0.013:	2:	0.0014:	0.29:	<0.0001:	0.055:	0.0091:	0.00043:	<0.0059:	<0.0001:	0.00093:	0.063:
Surface Water Area 11-Red River Along Tailings Facility	LR-16	20-Mar-03	LR-16-D01N-SFW-032003	Surface Water	D	0.097:	<0.0006:	<0.0002:	0.037:	<0.0003:	0.016:	0.00029:	<0.001:		<0.0038:	0.0044:	<0.42:	<0.0002:	0.26:	<0.0001:	0.066:	0.012:	<0.001J	<0.0002:	<0.0002:	<0.0002:	<0.049:
Surface Water Area 11-Red River Along Tailings Facility	LR-16	14-Jul-03	LR-16-D01N-SFW-071403	Surface Water	D	<0.051J	<0.0005:	<0.0002:	0.036:	<0.0002:	0.015:	0.00021:	<0.0006J		<0.0018:	0.0018:	<0.017:	0.00014:	0.12:	<0.0001:	0.059:	0.0064:	<0.0008:	<0.0001J	<0.0001:	0.0005:	0.027:
Surface Water Area 11-Red River Along Tailings Facility	LR-16	21-Sep-03	LR-16-D01N-SFW-092103	Surface Water	D	0.11:	<0.00059:	<0.00038:	0.037:	<0.00047:	<0.01:	<0.00034:	<0.001:		0.0028:	0.0022:	<0.044:	0.00008:	0.2:	<0.00006:	0.037:	0.011:	<0.00073:	<0.0002:	<0.00001:	<0.00087:	0.044:
Surface Water Area 11-Red River Along Tailings Facility	LR-5	30-Sep-02	LR-5-D01N-SFW-093002	Surface Water	D	0.1:	<0.0002:	<0.0002:	0.029:	<0.0002:	<0.006:	0.00029:	<0.0012:		0.0029:	0.003:	<0.046:	<0.0001:	0.33:	<0.0001:	0.0042:	0.0093:	<0.0002:	<0.0059:	<0.0001:	<0.0001:	0.032:
Surface Water Area 11-Red River Along Tailings Facility	LR-5	30-Sep-02	LR-5-T01N-SFW-093002	Surface Water	D	1.5:	<0.0002:	<0.0002:	0.034:	0.00033:	<0.0088:	0.00042:	<0.0012:	<0.01:	0.0033:	0.014:	0.59:	0.0013:	0.34:	<0.0001:	0.003:	0.011:	<0.0002:	<0.0059:	<0.0001:	0.00039:	0.074:
Surface Water Area 11-Red River Along Tailings Facility	LR-5	21-Mar-03	LR-5-D01N-SFW-032103	Surface Water	D	0.07:	<0.0006:	<0.0002:	0.035:	<0.0003:	0.0093:	0.00049:	<0.001:		<0.0038:	0.0056:	<0.42:	<0.0002:	0.37:	<0.0001J	0.003:	0.018:	<0.001:	<0.0002:	<0.0002:	<0.0002:	0.12:
Surface Water Area 11-Red River Along Tailings Facility	LR-5	15-Jul-03	LR-5-D01N-SFW-071503	Surface Water	D	0.14:	<0.0005:	<0.0002:	0.036:	<0.0002J	0.011:	0.00032:	<0.0014:		<0.002:	0.0025:	0.046:	<0.00015:	0.14:	0.00018:	0.0069:	0.011:	<0.0008:	<0.0001J	<0.0001:	<0.0002:	0.072:
Surface Water Area 11-Red River Along Tailings Facility	LR-5	23-Sep-03	LR-5-D01N-SFW-092303	Surface Water	D	0.15:	<0.0004:	<0.00038:	0.037:	<0.00047:	0.0068:	0.00038:	<0.001:		0.004:	<0.0029:	<0.044:	<0.00004:	0.21:	<0.00006:	0.0047:	0.012:	<0.00073:	<0.0002:	<0.00001:	<0.00028:	0.046:
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	27-Sep-02	LR-8A-D01N-SFW-092702	Surface Water	D	<0.082:	<0.0002:	<0.0002:	0.036:	<0.0002:	<0.01:	0.00032:	<0.0012:		0.0025:	0.0017:	<0.046:	<0.0001:	0.28:	<0.0001:	0.054:	0.0071:	<0.0002:	<0.0059:	<0.0001:	0.00013:	0.03:
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	27-Sep-02	LR-8A-T01N-SFW-092702	Surface Water	D	1.2:	<0.0002:	<0.0002:	0.044:	0.00026:	<0.012:	0.00035:	0.0012:	<0.01:	0.0024:	0.0086:	0.78:	0.00068:	0.29:	<0.0001:	0.049:	0.0083:	0.0003:	<0.0059:	<0.0001:	0.00027:	0.056:
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	23-Mar-03	LR-8A-D01N-SFW-032303	Surface Water	D	<0.085:	<0.0006:	<0.0004J:	0.035:	<0.001:	0.012:	<0.0005:	<0.001:		<0.0038:	0.0037:	<0.42:	<0.0002:	0.36:	<0.0001:	0.091:	0.017:	<0.0045:	<0.0002:	<0.0002:	<0.0002:	0.093:
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	15-Jul-03	LR-8A-D01N-SFW-071503	Surface Water	D	<0.063:	<0.0005:	<0.0002:	0.036:	<0.0004:	0.014:	0.0003:	<0.0019:		<0.0037:	0.002:	<0.067:	<0.0001:	0.15:	<0.00015:	0.056:	0.0084:	<0.0008:	<0.0001J	<0.0001:	<0.0002:	0.052:
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	23-Sep-03	LR-8A-D01N-SFW-092303	Surface Water	D	0.12:	<0.00012:	<0.00038:	0.04:	<0.00047:	0.01:	0.00036:	<0.001:		0.0046:	<0.0027:	<0.044:	<0.00004:	0.23:	<0.00006:	0.055:	0.011:	<0.00073:	<0.0002:	<0.00001:	<0.00028:	0.051:

EXPOSURE_AREA_LOOKUP_DESCRIPTION	SITE_ID	SAMP_DATE	SAMP_ID	MEDIUM_TYPE_LOOKUP_DESCRIPTION	SAMP_FRACTION	Aluminum mg/L	Antimony mg/L	Arsenic mg/L	Barium mg/L	Beryllium mg/L	Boron mg/L	Cadmium mg/L	Chromium mg/L	Chromium, Hexavalent mg/L	Cobalt mg/L	Copper mg/L	Iron mg/L	Lead mg/L	Manganese mg/L	Mercury mg/L	Molybdenum mg/L	Nickel mg/L	Selenium mg/L	Silver mg/L	Thallium mg/L	Vanadium mg/L	Zinc mg/L
Surface Water Area 1-Red River Along Mine	LR-1	30-Sep-02	LR-1-D01N-SFW-093002	Surface Water	D	0.14	0.0002	0.0002	0.027	0.0002	0.0074	0.0003	0.0025		0.0024	0.0027	0.046	0.0001	0.33	0.0001	0.0039	0.01	0.0003	0.0059	0.0001	0.0001	0.031
Surface Water Area 1-Red River Along Mine	LR-1	30-Sep-02	LR-1-T01N-SFW-093002	Surface Water	D	2.2	0.0002	0.00023	0.049	0.00036	0.005	0.00039	0.0019	0.01	0.0033	0.014	1.7	0.0014	0.36	0.0001	0.003	0.011	0.00029	0.0059	0.0001	0.00042	0.08
Surface Water Area 1-Red River Along Mine	LR-1	20-Mar-03	LR-1-D01N-SFW-032003	Surface Water	D	0.1	0.0006	0.0002	0.037	0.0003	0.0087	0.00047	0.001		0.0038	0.0053	0.42	0.0002	0.38	0.0001	0.0024	0.02	0.001	0.0002	0.0002	0.0002	0.099
Surface Water Area 1-Red River Along Mine	LR-1	15-Jul-03	LR-1-D01N-SFW-071503	Surface Water	D	0.12	0.0005	0.0002	0.035	0.0002	0.0084	0.00036	0.0014		0.002	0.0032	0.033	0.0001	0.14	0.0001	0.0068	0.01	0.0016	0.0001	0.0001	0.00079	0.054
Surface Water Area 1-Red River Along Mine	LR-1	24-Sep-03	LR-1-D01N-SFW-092403	Surface Water	D	0.11	0.00016	0.00038	0.035	0.00047	0.0087	0.00044	0.001		0.003	0.0026	0.044	0.00004	0.22	0.00006	0.0046	0.014	0.00073	0.0002	0.00001	0.00044	0.063
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	27-Sep-02	LR-11A-D01N-SFW-092702	Surface Water	D	0.085	0.0002	0.0002	0.033	0.0002	0.011	0.00025	0.0012		0.002	0.0022	0.046	0.0001	0.3	0.0001	0.06	0.0079	0.00025	0.0059	0.0001	0.0001	0.021
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	27-Sep-02	LR-11A-T01N-SFW-092702	Surface Water	D	2.2	0.0002	0.0002	0.045	0.00031	0.018	0.00033	0.002	0.01	0.0027	0.012	1.1	0.0011	0.31	0.0001	0.058	0.0096	0.00023	0.0059	0.0001	0.0004	0.067
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	20-Mar-03	LR-11A-D01N-SFW-032003	Surface Water	D	0.065	0.0006	0.0002	0.035	0.0003	0.01	0.00056	0.001		0.0038	0.0043	0.42	0.0002	0.34	0.0001	0.059	0.017	0.001	0.0002	0.0002	0.0002	0.11
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	14-Jul-03	LR-11A-D01N-SFW-071403	Surface Water	D	0.081	0.0005	0.0002	0.037	0.0002	0.014	0.00027	0.0006		0.0018	0.0026	0.017	0.0001	0.16	0.00019	0.061	0.0083	0.0008	0.0001	0.0001	0.0002	0.04
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	23-Sep-03	LR-11A-D01N-SFW-092303	Surface Water	D	0.13	0.00018	0.00038	0.035	0.00047	0.0076	0.00035	0.001		0.0015	0.0026	0.044	0.00004	0.21	0.00006	0.039	0.011	0.00073	0.0002	0.00001	0.00063	0.041
Surface Water Area 11-Red River Along Tailings Facility	LR-13	26-Sep-02	LR-13-D01N-SFW-092602	Surface Water	D	0.098	0.0002	0.0002	0.032	0.0002	0.0099	0.0002	0.0014		0.0021	0.0017	0.046	0.0001	0.25	0.0001	0.061	0.0065	0.0002	0.0059	0.0001	0.00014	0.019
Surface Water Area 11-Red River Along Tailings Facility	LR-13	26-Sep-02	LR-13-T01N-SFW-092602	Surface Water	D	1.4	0.0002	0.0002	0.043	0.00027	0.011	0.00032	0.0012	0.01	0.0026	0.011	0.96	0.0011	0.27	0.0001	0.057	0.0083	0.00036	0.0059	0.0001	0.00036	0.052
Surface Water Area 11-Red River Along Tailings Facility	LR-13	20-Mar-03	LR-13-D01N-SFW-032003	Surface Water	D	0.1	0.0006	0.0002	0.037	0.0003	0.014	0.00029	0.001		0.0038	0.0043	0.42	0.0002	0.26	0.0001	0.064	0.014	0.001	0.0002	0.0002	0.0002	0.041
Surface Water Area 11-Red River Along Tailings Facility	LR-13	14-Jul-03	LR-13-D01N-SFW-071403	Surface Water	D	0.044	0.0005	0.0002	0.037	0.0002	0.015	0.00027	0.0006		0.0018	0.0019	0.017	0.0001	0.14	0.00016	0.057	0.0074	0.0008	0.0001	0.0001	0.00022	0.032
Surface Water Area 11-Red River Along Tailings Facility	LR-13	21-Sep-03	LR-13-D01N-SFW-092103	Surface Water	D	0.11	0.00022	0.00038	0.035	0.00047	0.0088	0.00035	0.001		0.0023	0.0023	0.044	0.00007	0.2	0.00006	0.036	0.011	0.00073	0.0002	0.00001	0.00054	0.041
Surface Water Area 11-Red River Along Tailings Facility	LR-16	26-Sep-02	LR-16-D01N-SFW-092602	Surface Water	D	0.092	0.0002	0.0002	0.031	0.0002	0.014	0.00044	0.0012		0.0018	0.0021	0.046	0.0001	0.23	0.0001	0.065	0.0066	0.0002	0.0059	0.0001	0.00049	0.013
Surface Water Area 11-Red River Along Tailings Facility	LR-16	26-Sep-02	LR-16-T01N-SFW-092602	Surface Water	D	2.1	0.00022	0.00041	0.06	0.00033	0.018	0.00052	0.002	0.01	0.0029	0.013	2	0.0014	0.29	0.0001	0.055	0.0091	0.00043	0.0059	0.0001	0.00093	0.063
Surface Water Area 11-Red River Along Tailings Facility	LR-16	20-Mar-03	LR-16-D01N-SFW-032003	Surface Water	D	0.097	0.0006	0.0002	0.037	0.0003	0.016	0.00029	0.001		0.0038	0.0044	0.42	0.0002	0.26	0.0001	0.066	0.012	0.0014	0.0002	0.0002	0.00056	0.049
Surface Water Area 11-Red River Along Tailings Facility	LR-16	14-Jul-03	LR-16-D01N-SFW-071403	Surface Water	D	0.051	0.0005	0.0002	0.036	0.0002	0.015	0.00021	0.0006		0.0018	0.0018	0.017	0.00014	0.12	0.0001	0.059	0.0064	0.0008	0.0001	0.0001	0.0005	0.027
Surface Water Area 11-Red River Along Tailings Facility	LR-16	21-Sep-03	LR-16-D01N-SFW-092103	Surface Water	D	0.11	0.00059	0.00038	0.037	0.00047	0.01	0.00034	0.001		0.0028	0.0022	0.044	0.00008	0.2	0.00006	0.037	0.011	0.00073	0.0002	0.00001	0.00087	0.044
Surface Water Area 11-Red River Along Tailings Facility	LR-5	30-Sep-02	LR-5-D01N-SFW-093002	Surface Water	D	0.1	0.0002	0.0002	0.029	0.0002	0.006	0.00029	0.0012		0.0029	0.003	0.046	0.0001	0.33	0.0001	0.0042	0.0093	0.0002	0.0059	0.0001	0.0001	0.032
Surface Water Area 11-Red River Along Tailings Facility	LR-5	30-Sep-02	LR-5-T01N-SFW-093002	Surface Water	D	1.5	0.0002	0.0002	0.034	0.00033	0.0088	0.00042	0.0012	0.01	0.0033	0.014	0.59	0.0013	0.34	0.0001	0.003	0.011	0.0002	0.0059	0.0001	0.00039	0.074
Surface Water Area 11-Red River Along Tailings Facility	LR-5	21-Mar-03	LR-5-D01N-SFW-032103	Surface Water	D	0.07	0.0006	0.0002	0.035	0.0003	0.0093	0.00049	0.001		0.0038	0.0056	0.42	0.0002	0.37	0.0001	0.003	0.018	0.001	0.0002	0.0002	0.0002	0.12
Surface Water Area 11-Red River Along Tailings Facility	LR-5	15-Jul-03	LR-5-D01N-SFW-071503	Surface Water	D	0.14	0.0005	0.0002	0.036	0.0002	0.011	0.00032	0.0014		0.002	0.0025	0.046	0.00015	0.14	0.00018	0.0069	0.011	0.0008	0.0001	0.0001	0.0002	0.072
Surface Water Area 11-Red River Along Tailings Facility	LR-5	23-Sep-03	LR-5-D01N-SFW-092303	Surface Water	D	0.15	0.0004	0.00038	0.037	0.00047	0.0068	0.00038	0.001		0.004	0.0029	0.044	0.00004	0.21	0.00006	0.0047	0.012	0.00073	0.0002	0.00001	0.00028	0.046
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	27-Sep-02	LR-8A-D01N-SFW-092702	Surface Water	D	0.082	0.0002	0.0002	0.035	0.0002	0.01	0.00023	0.0012		0.0025	0.0017	0.046	0.0001	0.28	0.0001	0.054	0.0071	0.0002	0.0059	0.0001	0.00013	0.03
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	27-Sep-02	LR-8A-T01N-SFW-092702	Surface Water	D	1.2	0.0002	0.0002	0.044	0.00026	0.012	0.00035	0.0012	0.01	0.0024	0.0086	0.78	0.00068	0.29	0.0001	0.049	0.0083	0.0003	0.0059	0.0001	0.00027	0.056
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	23-Mar-03	LR-8A-D01N-SFW-032303	Surface Water	D	0.085	0.0006	0.00043	0.035	0.001	0.012	0.0005	0.001		0.0038	0.0037	0.42	0.0002	0.36	0.0001	0.091	0.017	0.0045	0.0002	0.0002	0.0002	0.093
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	15-Jul-03	LR-8A-D01N-SFW-071503	Surface Water	D	0.063	0.0005	0.0002	0.036	0.0004	0.014	0.0003	0.0019		0.0037	0.002	0.067	0.0001	0.15	0.00015	0.056	0.0084	0.0008	0.0001	0.0001	0.0002	0.052
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	23-Sep-03	LR-8A-D01N-SFW-092303	Surface Water	D	0.12	0.00012	0.00038	0.04	0.00047	0.01	0.00036	0.001		0.0046	0.0027	0.044	0.00004	0.23	0.00006	0.055	0.011	0.00073	0.0002	0.00001	0.00028	0.051
Reference Red River Above Mine Site	RR-1	04-Oct-02	RR-1-D01N-SFW-100402	Surface Water	D	0.0064	0.0002	0.0002	0.048	0.0002	0.0048	0.0001	0.0046		0.0022	0.0054	0.023	0.0001	0.0025	0.0001	0.0009	0.0002	0.0002	0.0001	0.0001	0.00032	0.0069
Reference Red River Above Mine Site	RR-1	21-Mar-03	RR-1-D01N-SFW-032103	Surface Water	D	0.063	0.0006	0.0002	0.052	0.0003	0.0084	0.0002	0.001		0.0038	0.0015	0.42	0.0002	0.013	0.0001	0.0023	0.003	0.001	0.0002	0.0002	0.0002	0.039
Reference Red River Above Mine Site	RR-1	16-Jul-03	RR-1-D01N-SFW-071603	Surface Water	D	0.031	0.0005	0.0002	0.036	0.0002	0.0048	0.0002	0.0014		0.002	0.0047	0.033	0.0001	0.0039	0.0002	0.0017	0.0021	0.0008	0.0001	0.0001	0.00027	0.0043
Reference Red River Above Mine Site	RR-1	25-Sep-03	RR-1-D01N-SFW-092503	Surface Water	D	0.0036	0.0016	0.00038	0.044	0.00047	0.0048	0.00008	0.001		0.0011	0.00055	0.044	0.00005	0.0022	0.00006	0.0019	0.001	0.00073	0.0002	0.00001	0.00037	0.013
Surface Water Area 1-Red River Along Mine	RR-10	03-Oct-02	RR-10-D01N-SFW-100302	Surface Water	D	0.11	0.0002	0.0002	0.028	0.0002	0.0048	0.00017	0.0046		0.0022	0.0024	0.023	0.0001	0.16	0.0001	0.0014	0.0042	0.0002	0.0001	0.0001	0.00014	0.0069
Surface Water Area 1-Red River Along Mine	RR-10	21-Jan-03	RR-10-D01N-SFW-012103	Surface Water	D	0.11	0.0006	0.0002	0.028	0.0002	0.0098	0.00034	0.0037		0.0026	0.0017	0.27	0.0002	0.27	0.0001	0.0011	0.013	0.0016	0.0002	0.0002	0.0004	0.05
Surface Water Area 1-Red River Along Mine	RR-10	20-Mar-03	RR-10-D01N-SFW-032003	Surface Water	D	0.14	0.0006	0.0002	0.035	0.0003	0.0087	0.0002	0.001		0.0038	0.0051	0.42	0.0002	0.22	0.0001	0.0023	0.0083	0.001	0.0002	0.0002	0.0002	0.039
Surface Water Area 1-Red River Along Mine	RR-10	03-Apr-03	RR-10-D01N-SFW-040303	Surface Water	D	0.14	0.0003	0.0002	0.034	0.00074	0.0084	0.0005	0.001		0.0038	0.0032	0.031	0.0001	0.14	0.0001	0.0023	0.0047	0.00053	0.0001	0.0001	0.0001	0.01
Surface Water Area 1-Red River Along Mine	RR-10	15-Jul-03	RR-10-D01N-SFW-071503	Surface Water	D	0.2	0.0005	0.0002	0.031	0.0004	0.007	0.0002	0.0019		0.0037	0.0034	0.067	0.0001	0.078	0.00018	0.0012	0.0039	0.0008	0.0001	0.0001	0.0002	0.0095
Surface Water Area 1-Red River Along Mine	RR-10	24-Sep-03	RR-10-D01N-SFW-092403	Surface Water	D	0.18	0.00095	0.00038	0.035	0.00047	0.0072	0.0002	0.001		0.0019	0.0025	0.044	0.00004	0.12	0.00006	0.0019	0.0063	0.00073	0.0002	0.00001	0.00028	0.013
Surface Water Area 1-Red River Along Mine	RR-10	19-Oct-03	RR-10-D01N-SFW-101903	Surface Water	D	0.18	0.0005	0.0002	0.036	0.0004	0.0063	0.0002	0.0011		0.0039	0.0027	0.028	0.0002	0.15	0.0001	0.0011	0.0051	0.0003	0.0001	0.0001	0.0001	0.021
Surface Water Area 1-Red River Along Mine	RR-10	13-Jan-04	RR-10-D01N-SFW-011304	Surface Water	D	0.077	0.0012	0.0002	0.03	0.001	0.012	0.00023	0.0057		0.0037	0.0038	0.042	0.0001	0.19	0.0001	0.0012	0.017	0.00032	0.0001	0.0001	0.0002	0.036
Surface Water Area 1-Red River Along Mine	RR-10	24-Feb-04	RR-10-D01N-SFW-022404	Surface Water	D	0.054	0.0002	0.0001	0.029	0.0003	0.0055	0.00029	0.0015		0.0059	0.0028	0.036	0.0001	0.23	0.0001	0.0007	0.014	0.00086	0.0001	0.0001	0.0001	0.043
Surface Water Area 1-Red River Along Mine	RR-10	19-Apr-04	RR-10-D01N-SFW-041904	Surface Water	D	0.29	0.00055	0.0002	0.034	0.0002	0.0054	0.0002	0.0008		0.0032	0.0068	0.09	0.0015	0.071	0.0001	0.0022	0.0053	0.0007	0.0001	0.00012	0.00037	0.01
Surface Water Area 1-Red River Along Mine	RR-10A1	03-Oct-02	RR-10A1-D01N-SFW-100302	Surface Water	D	0.63	0.0002	0.00026	0.04	0.0002	0.0048	0.00013	0.0046		0.0022	0.0055	0.56	0.0014	0.15	0.0001	0.0015	0.0041	0.0002	0.0001	0.0001	0.00046	0.014
Surface Water Area 1-Red River Along Mine	RR-10A1	20-Jan-03	RR-10A1-D01N-SFW-012003	Surface Water	D	0.083	0.0006	0.0002	0.028	0.0002	0.0044	0.00033	0.0037		0.0029	0.0017	0.27	0.0002	0.27	0.0001	0.0017	0.013	0.0016	0.0002	0.0002	0.0004	0.053
Surface Water Area 1-Red River Along Mine	RR-10A1	20-Mar-03	RR-10A1-D01N-SFW-032003	Surface Water	D	0.6	0.0006	0.0004	0.039	0.0003	0.0084	0.0005	0.001		0.0038	0.0068	0.31	0.0002	0.17	0.0001	0.0023	0.009	0.0016	0.0002	0.0002	0.0002	0.027
Surface Water Area 1-Red River Along Mine	RR-10A1	03-Apr-03	RR-10A1-D01N-SFW-040303	Surface Water	D	0.12	0.0003	0.0002	0.035	0.0012	0.0084	0.0005	0.001		0.0038	0.0029	0.031	0.0001	0.11	0.0001	0.0023	0.0032	0.0005	0.0001	0.0001	0.00019	0.0091
Surface Water Area 1-Red River Along Mine	RR-10A1	15-Jul-03	RR-10A1-D01N-SFW-071503	Surface Water	D	0.15	0.0005	0.0002	0.034	0.0004	0.0078	0.0002	0.0019		0.0037	0.0033	0.067	0.0001	0.064	0.00018	0.0016	0.0034	0.0008	0.0001	0.0001	0.00022	0.0091
Surface Water Area 1-Red River Along Mine	RR-10A1	24-Sep-03	RR-10A1-D01N-SFW-092403	Surface Water	D	0.14	0.00015	0.00038	0.038	0.00047	0.007	0.00016	0.001		0.0032	0.0021	0.044	0.00004	0.11	0.00008	0.0013	0.0053	0.00073	0.0002	0.00001	0.00028	0.015
Surface Water Area 1-Red River Along Mine	RR-10A1	19-Oct-03	RR-10A1-D01N-SFW-101903	Surface Water	D	0.12	0.0005	0.0002	0.037	0.0004	0.0063	0.00021	0.0011		0.0039	0.0025	0.028	0.0002	0.12	0.0001	0.0014	0.0046	0.0003	0.0001	0.0001	0.0001	0.02
Surface Water Area 1-Red River Along Mine	RR-10A1	13-Jan-04	RR-10A1-D01N-SFW-011304	Surface Water	D	0.087	0.0012	0.0002	0.033	0.001	0.012	0.00029	0.0057		0.0051	0.0031	0.042	0.00019	0.16	0.0001	0.0015	0.017	0.00053	0.0001	0.0001	0.0002	0.045
Surface Water Area 1-Red River Along Mine	RR-10A1	19-Apr-04	RR-10A1-D01N-SFW-041904	Surface Water	D	0.25	0.00063	0.0002	0.031	0.0002	0.0048	0.00021	0.0008		0.0025	0.0073	0.039	0.0014	0.16	0.0001	0.0031	0.0083	0.0007	0.0001	0.00012	0.00034	0.037
Surface Water Area 1-Red River Along Mine	RR-11A1	03-Oct-02	RR-11A1-D01N-SFW-100302	Surface Water	D	0.1	0.0002	0.0002	0.03	0.0002	0.0048	0.0001	0.0046		0.0022	0.0022	0.023	0.0001	0.13	0.0001	0.0015	0.0034	0.0002	0.0001	0.0001	0.00015	0.0069
Surface Water Area 1-Red River Along Mine	RR-11A1	20-Jan-03	RR-11A1-D01N-SFW-012003	Surface Water	D	0.069	0.0006	0.0002	0.033	0.0002	0.0088	0.00025	0.0037		0.0023	0.0038	0.27	0.0002	0.19	0.0001	0.0012	0.0098	0.0016	0.0002	0.0002	0.0004	0.034
Surface Water Area 1-Red River Along Mine	RR-11A1	21-Mar-03	RR-11A1-D01N-SFW-032103	Surface Water	D	0.092	0.0006	0.0002	0.035	0.0003	0.0084	0.00021	0.001		0.0038	0.0038	0.31	0.0002	0.19	0.0001	0.0023	0.0075	0.0034	0.0002	0.0002	0.0002	0.036
Surface Water Area 1-Red River Along Mine	RR-11A1	03-Apr-03	RR-11A1-D01N-SFW-040303	Surface Water	D	0.12	0.0003	0.0002	0.038	0.0011	0.0084	0.0005	0.001		0.0038	0.0032	0.046	0.0001	0.12	0.0001	0.0032	0.0033	0.0005	0.0001	0.0001	0.00012	0.0086
Surface Water Area 1-Red River Along Mine	RR-11A1	15-Jul-03	RR-11A1-D01N-SFW-071503	Surface Water	D	0.19	0.0005	0.0002	0.034	0.0004	0.0061	0.0002	0.0019		0.0037	0.004	0.067	0.0001	0.11	0.00017	0.0015	0.0046	0.0008	0.0001	0.0001	0.00035	0.02
Surface Water Area 1-Red River Along Mine	RR-11A1	24-Sep-03	RR-11A1-D01N-SFW-092403	Surface Water	D	0.13	0.00028	0.00038	0.039	0.00047	0.0069	0.00014	0.001		0.0037	0.0022	0.044	0.00006	0.11	0.00006	0.0014	0.0054	0.00073	0.0002	0.00001	0.00028	0.015
Surface Water Area 1-Red River Along Mine	RR-11A1	19-Oct-03	RR-11A1-D01N-SFW-101903	Surface Water	D	0.14	0.0005	0.0002	0.038	0.0004	0.0063	0.0002	0.0011		0.0057	0.0028	0.028	0.0002	0.12	0.0001	0.0014	0.0044	0.0003	0.0001	0.0001	0.0001	0.02
Surface Water Area 1-Red River Along Mine	RR-11A1	13-Jan-04	RR-11A1-D01N-SFW-011304	Surface Water	D	0.062	0.0012	0.0002	0.032	0.001	0.012	0.00029	0.0057		0.0039	0.0032	0.042	0.00014	0.16	0.0001	0.0017	0.017	0.00056	0.0001	0.0001	0.0002	0.032
Surface Water Area 1-Red River Along Mine	RR-11A1	19-Apr-04	RR-11A1-D01N-SFW-041904	Surface Water	D	0.27	0.00063	0.0002	0.034	0.0002	0.0067	0.0002	0.0008		0.0015	0.006	0.083	0.0013	0.058	0.0001	0.0025	0.0043	0.0007	0.0001	0.00012	0.00044	0.0092
Surface Water Area 1-Red River Along Mine	RR-11B	03-Oct-02	RR-11B-D01N-SFW-100302	Surface Water	D	0.12	0.0002	0.0002	0.03	0.0002	0.0048	0.0001	0.0046		0.0022	0.0048	0.023	0.0001	0.13	0.0001	0.0015	0.0047	0.0002	0.0001	0.0001	0.00014	0.013
Surface Water Area 1-Red River Along Mine	RR-11B	20-Mar-03	RR-11B-D01N-SFW-032003	Surface Water	D	0.16	0.0006	0.0002	0.034	0.0003	0.0084	0.00047	0.001		0.0038	0.0052	0.42	0.0002	0.24	0.0001	0.0029	0.021	0.0012	0.0002	0.0002	0.0002	0.1
Surface Water Area 1-Red River Along Mine	RR-11B	15-Jul-03	RR-11B-D01N-SFW-071503	Surface Water	D	0.36	0.0005	0.0002	0.033	0.00034	0.0057	0.00047	0.0014		0.002	0.0045	0.033	0.0001	0.099	0.0001	0.002	0.017	0.0016	0.0001	0.0001	0.00045	0.11
Surface Water Area 1-Red River Along Mine	RR-11B	24-Sep-03	RR-11B-D01N-SFW-092403	Surface Water	D	0.2	0.00018	0.00038	0.037	0.00047	0.0064	0.00029	0.001		0.0027	0.0025	0.044	0.00004	0.1	0.00006	0.0015	0.013	0.00073	0.0002	0.00001	0.00041	0.068
Surface Water Area 1-Red River Along Mine	RR-11C	01-Oct-02	RR-11C-D01N-SFW-100102	Surface Water	D	0.11	0.0002	0.0002	0.031	0.0002	0.0054	0.00022	0.0046		0.0022	0.0024	0.023	0.0001	0.14	0.0001	0.0021	0.0072	0.00021	0.0001	0.0001	0.00013	0.034
Surface Water Area 1-Red River Along Mine	RR-11C	20-Jan-03	RR-11C-D01N-SFW-012003	Surface Water	D	0.16	0.0006	0.0002	0.031	0.0002	0.0035	0.00062	0.0037		0.0026	0.0017	0.27	0.0002	0.17	0.0001	0.0043	0.03	0.0016	0.0002	0.0002	0.0004	0.18
Surface Water Area 1-Red River Along Mine	RR-11C	20-Mar-03	RR-11C-D01N-SFW-032003	Surface Water	D	0.17	0.0006	0.0002	0.038	0.0003	0.0084	0.00043	0.001		0.0038	0.0044	0.42	0.0002	0.19	0.0001	0.0023	0.021	0.001	0.0002	0.0002	0.0002	0.14
Surface Water Area 1-Red River Along Mine	RR-11C	03-Apr-03	RR-11C-D01N-SFW-040303	Surface Water	D	0.1	0.00061	0.0002	0.035	0.00069	0.0084	0.0005	0.001		0.0038	0.0029	0.031	0.0001	0.11	0.0001	0.0032	0.015	0.00059	0.0001	0.0001	0.0001	0.074
Surface Water Area 1-Red River Along Mine	RR-11C	15-Jul-03	RR-11C-D01N-SFW-071503	Surface Water	D	0.22	0.0005	0.0002	0.034	0.0004	0.0058	0.00049	0.0019		0.0037	0.0035	0.077	0.0001	0.097	0.00018	0.002	0.016	0.0008	0.0001	0.0001	0.00032	0.1
Surface Water Area 1-Red River Along Mine	RR-11C	25-Sep-03	RR-11C-D01N-SFW-092503	Surface Water	D	0.15	0.00052	0.00038	0.037	0.00047	0.0091	0.00038	0.001		0.0014	0.0028	0.1	0.00004	0.11	0.00006	0.0022	0.015	0.00073	0.0002	0.00001	0.00028	0.085
Surface Water Area 1-Red River Along Mine	RR-11C	19-Oct-03	RR-11C-D01N-SFW-101903	Surface Water	D	0.13	0.0005	0.0002	0.039	0.0004	0.0063	0.00045	0.0011		0.0041	0.0023	0.028	0.0002	0.12	0.0001	0.0022	0.014	0.0003	0.0001	0.0001	0.0001	0.1
Surface Water Area 1-Red River Along Mine	RR-11C	13-Jan-04	RR-11C-D01N-SFW-011304	Surface Water	D	0.093	0.0012	0.0002	0.035	0.001	0.012	0.00032	0.0057		0.0054	0.0036	0.042	0.0001	0.12	0.0001	0.0029	0.017	0.00035	0.0001	0.0001	0.0002	0.08
Surface Water Area 1-Red River Along Mine	RR-11C	19-Apr-04	RR-11C-D01N-SFW-041904	Surface Water	D	0.24	0.00061	0.0002	0.033	0.0002	0.0058	0.0002	0.0008		0.0027	0.0064	0.073	0.0014	0.06	0.0001	0.0028	0.006	0.0007	0.0001	0.00012	0.0004	0.019
Surface Water Area 1-Red River Along Mine	RR-12	03-Oct-02	RR-12-D01N-SFW-100302	Surface Water	D	0.12	0.00023	0.00021	0.03	0.0002	0.0052	0.00024	0.0046		0.0022	0.0032	0.023	0.0001	0.14	0.0001	0.0022	0.0095	0.0002	0.0001	0.0001	0.0001	0.026
Surface Water Area 1-Red River Along Mine	RR-12	20-Jan-03	RR-12-D01N-SFW-012003	Surface Water	D	0.11	0.0006	0.0002	0.034	0.0002	0.0062	0.00059	0.0037		0.0027	0.0035	0.27	0.0002	0.19	0.0001	0.0031	0.028	0.0016	0.0002	0.0002	0.0004	0.16
Surface Water Area 1-Red River Along Mine	RR-12	20-Mar-03	RR-12-D01N-SFW-032003	Surface Water	D	0.42	0.0006	0.0002	0.038	0.0003	0.0084	0.00043	0.001		0.0038	0.0073	0.31	0.0002	0.18	0.0001	0.0023	0.022	0.001	0.0002	0.0002	0.0002	0.13
Surface Water Area 1-Red River Along Mine	RR-12	03-Apr-03	RR-12-D01N-SFW-040303	Surface Water	D	0.12	0.0003	0.0002	0.034	0.00097	0.0084	0.0005	0.001		0.0038	0.0025	0.031	0.0001	0.12	0.0001	0.0023	0.015	0.00057	0.0001	0.0001	0.0001	0.067
Surface Water Area 1-Red River Along Mine	RR-12	15-Jul-03	RR-12-D01N-SFW-071503	Surface Water	D	0.2	0.0005	0.0002	0.034	0.0004	0.0071	0.00047	0.0019		0.0037	0.0034	0.067	0.0001	0.1	0.00019	0.002	0.016	0.0008	0.0001	0.0001	0.00023	0.087
Surface Water Area 1-Red River Along Mine	RR-12	24-Sep-03	RR-12-D01N-SFW-092403	Surface Water	D	0.17	0.00025	0.00038	0.038	0.00047	0.0077	0.00037	0.001		0.0016	0.0029	0.044	0.00004	0.11	0.00006	0.002	0.015	0.00073	0.0002	0.00001	0.00052	0.077
Surface Water Area 1-Red River Along Mine	RR-12	19-Oct-03	RR-12-D01N-SFW-101903	Surface Water	D	0.12	0.0005	0.0002	0.037	0.0004	0.0063	0.00041	0.0011		0.0056	0.0026	0.028	0.0002	0.12	0.0001	0.0023	0.015	0.0003	0.0001	0.0001	0.0001	0.094
Surface Water Area 1-Red River Along Mine	RR-12	13-Jan-04	RR-12-D01N-SFW-011304	Surface Water	D	0.1	0.0012	0.0002	0.033	0.001	0.012	0.00047	0.0057		0.0058	0.0025	0.042	0.0001	0.13	0.0001	0.0027	0.017	0.00054	0.0001	0.0001	0.0002	0.072
Surface Water Area 1-Red River Along Mine	RR-12	19-Apr-04	RR-12-D01N-SFW-041904	Surface Water	D	0.24	0.00064	0.0002	0.032	0.0002	0.0053	0.0002	0.0008		0.0025	0.0059	0.072	0.0015	0.064	0.0001	0.0028	0.006	0.0007	0.0001	0.00012	0.00043	0.017
Surface Water Area 1-Red River Along Mine	RR-13	01-Oct-02	RR-13-D01N-SFW-100102	Surface Water	D	0.26	0.0002	0.0002	0.03	0.0002	0.0053	0.00022	0.0046		0.0022	0.0035	0.023	0.0001	0.19	0.0001	0.0022	0.0084	0.00032	0.0001	0.0001	0.00012	0.035
Surface Water Area 1-Red River Along Mine	RR-13	01-Oct-02	RR-13-T01N-SFW-100102	Surface Water	D	1.1	0.0002	0.0002	0.035	0.0002	0.005	0.00029	0.0046	0.01	0.0022	0.013	0.45	0.00094	0.21	0.0001	0.0018	0.0092	0.0002	0.0001	0.0001	0.00033	0.058
Surface Water Area 1-Red River Along Mine	RR-13	20-Jan-03	RR-13-D01N-SFW-012003	Surface Water	D	0.13	0.0006	0.0002	0.033	0.0002	0.0048	0.00056	0.0037		0.0035	0.0053	0.27	0.0002	0.25	0.0001	0.0025	0.028	0.0016	0.0002	0.0002	0.0004	0.14
Surface Water Area 1-Red River Along Mine	RR-13	20-Mar-03	RR-13-D01N-SFW-032003	Surface Water	D	0.13	0.0006	0.0002	0.038	0.0003	0.0084	0.00036	0.001		0.0038	0.005	0.42	0.0002	0.17	0.0001	0.0027	0.021	0.001	0.0002	0.0002	0.0002	0.12
Surface Water Area 1-Red River Along Mine	RR-13	03-Apr-03	RR-13-D01N-SFW-040303	Surface Water	D	0.2	0.0003	0.0002	0.035	0.00059	0.0084	0.0005	0.001		0.0038	0.0042	0.031	0.0001	0.17	0.0001	0.0027	0.015	0.0005	0.0001	0.0001	0.0001	0.074
Surface Water Area 1-Red River Along Mine	RR-13	15-Jul-03	RR-13-D01N-SFW-071503	Surface Water	D	0.32	0.0005	0.0002	0.033	0.0004	0.0064	0.00052	0.0019		0.0037	0.0047	0.067	0.0001	0.13	0.00012	0.0019	0.016	0.0008	0.0001	0.0001	0.0002	0.094
Surface Water Area 1-Red River Along Mine	RR-13	24-Sep-03	RR-13-D01N-SFW-092403	Surface Water	D	0.3	0.00026	0.00038	0.036	0.00047	0.0059	0.00037	0.001		0.0026	0.0037	0.044	0.00004	0.14	0.00006	0.002	0.015	0.00073	0.0002	0.00001	0.00029	0.062
Surface Water Area 1-Red River Along Mine	RR-13	25-Sep-03	RR-13-D01N-SFW-092503	Surface Water	D	0.018	0.00045	0.00038	0.013	0.00047	0.0054	0.00008	0.001		0.0011	0.00038	0.044	0.00004	0.0013	0.00006	0.0009	0.00091	0.00073	0.0002	0.00001	0.0005	0.013
Surface Water Area 1-Red River Along Mine	RR-13	19-Oct-03	RR-13-D01N-SFW-101903	Surface Water	D	0.24	0.0005	0.0002	0.037	0.0004	0.0063	0.00044	0.0011		0.0029	0.004	0.028	0.0002	0.15	0.0001	0.0023	0.016	0.0003	0.0001	0.0001	0.0001	0.098
Surface Water Area 1-Red River Along Mine	RR-13	13-Jan-04	RR-13-D01N-SFW-011304	Surface Water	D	0.064	0.0012	0.0002	0.032	0.0026	0.012	0.00034	0.0057		0.0083	0.0039	0.042	0.0001	0.2	0.0001	0.0025	0.014	0.00056	0.0001	0.0001	0.0002	0.077
Surface Water Area 1-Red River Along Mine	RR-13	19-Apr-04	RR-13-D01N-SFW-041904	Surface Water	D	0.33	0.00061	0.0002	0.032	0.0002	0.0058	0.0002	0.0008		0.004	0.0073	0.15	0.0014	0.086	0.0001	0.0028	0.0066	0.0007	0.0001	0.00012	0.00037	0.023
Surface Water Area 1-Red River Along Mine	RR-14	01-Oct-02	RR-14-D01N-SFW-100102	Surface Water	D	0.14	0.00055	0.0002	0.03	0.0002	0.0052	0.00034	0.0046		0.0032	0.0038	0.054	0.0001	0.32	0.0001	0.0025	0.011	0.00027	0.0001	0.0001	0.0001	0.052
Surface Water Area 1-Red River Along Mine	RR-14	01-Oct-02	RR-14-T01N-SFW-100102	Surface Water	D	1.9	0.0002	0.00021	0.035	0.0002	0.0048	0.00043	0.0046	0.01	0.0037	0.02	0.61	0.0011	0.32	0.0001	0.0019	0.012	0.00038	0.0001	0.0001	0.00031	0.086
Surface Water Area 1-Red River Along Mine	RR-14	19-Jan-03	RR-14-D01N-SFW-011903	Surface Water	D	0.074	0.0016	0.0002	0.032	0.0002	0.0088	0.00084	0.0037		0.0068	0.0064	0.27	0.0002	0.5	0.0001	0.0047	0.035	0.0016	0.0002	0.0002	0.0004	0.21
Surface Water Area 1-Red River Along Mine	RR-14	20-Mar-03	RR-14-D01N-SFW-032003	Surface Water	D	0.12	0.0006	0.0002	0.035	0.0003	0.01	0.00056	0.001		0.0038	0.0074	0.42	0.0002	0.38	0.0001	0.0023	0.025	0.001	0.0002	0.0002	0.0002	0.16
Surface Water Area 1-Red River Along Mine	RR-14	03-Apr-03	RR-14-D01N-SFW-040303	Surface Water	D	0.079	0.0003	0.0002	0.035	0.0003	0.0084	0.0005	0.001		0.0038	0.0048	0.14	0.0001	0.27	0.0001	0.0027	0.018	0.0005	0.0001	0.0001	0.0001	0.099
Surface Water Area 1-Red River Along Mine	RR-14	15-Jul-03	RR-14-D01N-SFW-071503	Surface Water	D	0.23	0.0005	0.0002	0.035	0.0002	0.0075	0.00059	0.0014		0.0027	0.0041	0.033	0.00012	0.19	0.00012	0.0022	0.019	0.0008	0.0001	0.0001	0.0002	0.096
Surface Water Area 1-Red River Along Mine	RR-14	24-Sep-03	RR-14-D01N-SFW-092403	Surface Water	D	0.19	0.00054	0.00038	0.035	0.00047	0.0062	0.00042	0.001		0.0031	0.0034	0.044	0.00004	0.2	0.00006	0.0024	0.015	0.00073	0.0002	0.00001	0.00034	0.07
Surface Water Area 1-Red River Along Mine	RR-14	19-Oct-03	RR-14-D01N-SFW-101903	Surface Water	D	0.14	0.0005	0.0002	0.036	0.0004	0.0063	0.00043	0.0011		0.0039	0.0038	0.065	0.0002	0.22	0.0001	0.0026	0.016	0.0003	0.0001	0.0001	0.0001	0.1
Surface Water Area 1-Red River Along Mine	RR-14	13-Jan-04	RR-14-D01N-SFW-011304	Surface Water	D	0.062	0.0012	0.0002	0.032	0.001	0.012	0.00052	0.0057		0.0086	0.0059	0.082	0.0001	0.3	0.0001	0.003	0.017	0.00059	0.0001	0.0001	0.0002	0.098
Surface Water Area 1-Red River Along Mine	RR-14	24-Feb-04	RR-14-D01N-SFW-022404	Surface Water	D	0.049	0.0002	0.0001	0.03	0.0003	0.0051	0.00078	0.0015		0.0064	0.0057	0.14	0.0001	0.33	0.0001	0.0028	0.021	0.00089	0.0001	0.0001	0.0001	0.099
Surface Water Area 1-Red River Along Mine	RR-14	19-Apr-04	RR-14-D01N-SFW-041904	Surface Water	D	0.26	0.00061	0.0002	0.032	0.0002	0.0062	0.0002	0.0008		0.0058	0.0072	0.072	0.0012	0.13	0.0001	0.003	0.0077	0.0007	0.0001	0.00012	0.00034	0.035
Surface Water Area 1-Red River Along Mine	RR-15	01-Oct-02	RR-15-D01N-SFW-100102	Surface Water	D	0.17	0.0002	0.0002	0.029	0.0002	0.0048	0.00031	0.0046		0.0036	0.0033	0.023	0.0001	0.38	0.0001	0.0024	0.012	0.0002	0.0001	0.0001	0.0001	0.057
Surface Water Area 1-Red River Along Mine	RR-15	01-Oct-02	RR-15-T01N-SFW-100102	Surface Water	D	2.2	0.0002	0.0002	0.035	0.00028	0.0053	0.00046	0.0046	0.01	0.0041	0.022	0.64	0.00088	0.41	0.0001	0.0018	0.014	0.0003	0.0001	0.0001	0.00029	0.11
Surface Water Area 1-Red River Along Mine	RR-15	21-Mar-03	RR-15-D01N-SFW-032103	Surface Water	D	0.11	0.0006	0.0002	0.033	0.0003	0.0084	0.00073	0.001		0.0052	0.0064	0.31	0.0002	0.42	0.0001	0.0023	0.025	0.001	0.0002	0.0002	0.0002	0.15
Surface Water Area 1-Red River Along Mine	RR-15	15-Jul-03	RR-15-D01N-SFW-071503	Surface Water	D	0.22	0.0005	0.0002	0.035	0.0002	0.0056	0.0006	0.0014		0.0023	0.0053	0.033	0.0001	0.23	0.0001	0.0022	0.019	0.0016	0.0001	0.0001	0.00027	0.11
Surface Water Area 1-Red River Along Mine	RR-15	24-Sep-03	RR-15-D01N-SFW-092403	Surface Water	D	0.24	0.0012	0.00038	0.036	0.00047	0.008	0.00048	0.001		0.003	0.004	0.044	0.00004	0.25	0.00006	0.003	0.016	0.00073	0.0002	0.00001	0.00028	0.079
Surface Water Area 1-Red River Along Mine	RR-16	01-Oct-02	RR-16-D01N-SFW-100102	Surface Water	D	0.18	0.0002	0.0002	0.029	0.0002	0.0053	0.00035	0.0046		0.0041	0.0033	0.023	0.0001	0.41	0.0001	0.0024	0.012	0.0002	0.0001	0.0001	0.0001	0.06
Surface Water Area 1-Red River Along Mine	RR-16	01-Oct-02	RR-16-T01N-SFW-100102	Surface Water	D	2.2	0.0002	0.0002	0.035	0.00034	0.0052	0.00048	0.0046	0.01	0.0045	0.022	0.65	0.00099	0.43	0.0001	0.0018	0.014	0.00034	0.0001	0.0001	0.00037	0.11
Surface Water Area 1-Red River Along Mine	RR-16	19-Jan-03	RR-16-D01N-SFW-011903	Surface Water	D	0.073	0.0006	0.0002	0.029	0.0002	0.0063	0.00077	0.0037		0.0066	0.0051	0.27	0.0002	0.57	0.0001	0.0035	0.031	0.0016	0.0002	0.0002	0.0004	0.21
Surface Water Area 1-Red River Along Mine	RR-16	19-Mar-03	RR-16-D01N-SFW-031903	Surface Water	D	0.11	0.0006	0.0002	0.033	0.0003	0.0084	0.00058	0.001		0.0041	0.0056	0.42	0.0002	0.45	0.0001	0.0023	0.024	0.0016	0.0002	0.0002	0.0004	0.15
Surface Water Area 1-Red River Along Mine	RR-16	03-Apr-03	RR-16-D01N-SFW-040303	Surface Water	D	0.088	0.0003	0.0002	0.034	0.00085	0.0084	0.0005	0.001		0.0038	0.0037	0.031	0.0001	0.36	0.0001	0.0023	0.021	0.0005	0.0001	0.0001	0.0001	0.11
Surface Water Area 1-Red River Along Mine	RR-16	15-Jul-03	RR-16-D01N-SFW-071503	Surface Water	D	0.29	0.00061	0.0002	0.035	0.0004	0.007	0.00059	0.0019		0.0037	0.0052	0.067	0.0001	0.24	0.0002	0.0024	0.02	0.0008	0.0001	0.0001	0.0002	0.11
Surface Water Area 1-Red River Along Mine	RR-16	23-Sep-03	RR-16-D01N-SFW-092303	Surface Water	D	0.27	0.00029	0.00038	0.034	0.00047	0.0048	0.00043	0.001		0.0028	0.0034	0.044	0.00004	0.26	0.00006	0.0022	0.015	0.00073	0.0002	0.00001	0.00057	0.064
Surface Water Area 1-Red River Along Mine	RR-16	19-Oct-03	RR-16-D01N-SFW-101903	Surface Water	D	0.16	0.0005	0.0002	0.036	0.0004	0.0063	0.00049	0.0011		0.007	0.0039	0.028	0.0002	0.29	0.0001	0.0026	0.018	0.0003	0.0001	0.0001	0.0001	0.11
Surface Water Area 1-Red River Along Mine	RR-16	13-Jan-04	RR-16-D01N-SFW-011304	Surface Water	D	0.07	0.0012	0.0002	0.032	0.001	0.012	0.00068	0.0057		0.0072	0.0032	0.037	0.0001	0.4	0.0001	0.0027	0.018	0.00091	0.0001	0.0001	0.0002	0.12
Surface Water Area 1-Red River Along Mine	RR-16	19-Apr-04	RR-16-D01N-SFW-041904	Surface Water	D	0.25	0.00056	0.0002	0.035	0.0002	0.0054	0.0002	0.0008		0.0019	0.006	0.085	0.0013	0.06	0.0001	0.0025	0.0046	0.0007	0.0001	0.00012	0.00044	0.0095
Surface Water Area 1-Red River Along Mine	RR-17	01-Oct-02	RR-17-D01N-SFW-100102	Surface Water	D	0.18	0.0002	0.0002	0.029	0.0002	0.0056	0.00047	0.0046		0.0041	0.0033	0.023	0.0001	0.47	0.0001	0.0024	0.015	0.00026	0.0001	0.0001	0.0001	0.074
Surface Water Area 1-Red River Along Mine	RR-17	01-Oct-02	RR-17-T01N-SFW-100102	Surface Water	D	1.9	0.0002	0.00024	0.032	0.00031	0.006	0.00058	0.0046	0.01	0.0044	0.019	0.58	0.001	0.46	0.0001	0.0017	0.016	0.00044	0.0001	0.0001	0.00035	0.12
Surface Water Area 1-Red River Along Mine	RR-17	19-Mar-03	RR-17-D01N-SFW-031903	Surface Water	D	0.12	0.0006	0.0002	0.034	0.0003	0.0084	0.00068	0.001		0.004	0.0057	0.44	0.0002	0.5	0.0001	0.0023	0.027	0.0016	0.0002	0.0002	0.0004	0.17
Surface Water Area 1-Red River Along Mine	RR-17	15-Jul-03	RR-17-D01N-SFW-071503	Surface Water	D	0.23	0.0005	0.0002	0.034	0.0004	0.0065	0.00064	0.0019		0.0037	0.004	0.067	0.0001	0.27	0.00016	0.0022	0.02	0.0008	0.0001	0.0001	0.00024	0.11
Surface Water Area 1-Red River Along Mine	RR-17	23-Sep-03	RR-17-D01N-SFW-092303	Surface Water	D	0.28	0.0024	0.00038	0.034	0.00047	0.0048	0.0005	0.001		0.0024	0.0036	0.044	0.00004	0.28	0.00006	0.0037	0.017	0.00073	0.0002	0.00001	0.00055	0.077
Surface Water Area 1-Red River Along Mine	RR-18A	01-Oct-02	RR-18A-D01N-SFW-100102	Surface Water	D	0.15	0.0002	0.0002	0.026	0.0002	0.0052	0.00042	0.0046		0.0038	0.0027	0.023	0.0001	0.44	0.0001	0.0025	0.014	0.0002	0.0001	0.0001	0.0001	0.059
Surface Water Area 1-Red River Along Mine	RR-18A	19-Mar-03	RR-18A-D01N-SFW-031903	Surface Water	D	0.1	0.0006	0.0002	0.035	0.0003	0.0084	0.00075	0.001		0.0043	0.0064	0.42	0.0002	0.51	0.00011	0.0027	0.028	0.0016	0.0002	0.0002	0.0004	0.18
Surface Water Area 1-Red River Along Mine	RR-18A	16-Jul-03	RR-18A-D01N-SFW-071603	Surface Water	D	0.24	0.0005	0.0002	0.034	0.0002	0.0059	0.00062	0.0014		0.0022	0.0043	0.033	0.0001	0.26	0.00012	0.0029	0.019	0.0008	0.0001	0.0001	0.0002	0.1
Surface Water Area 1-Red River Along Mine	RR-18A	23-Sep-03	RR-18A-D01N-SFW-092303	Surface Water	D	0.26	0.0004	0.00038	0.034	0.00047	0.0048	0.00046	0.001		0.0028	0.0034	0.044	0.00004	0.28	0.00006	0.0023	0.016	0.00073	0.0002	0.00001	0.00046	0.072
Surface Water Area 1-Red River Along Mine	RR-18B	30-Sep-02	RR-18B-D01N-SFW-093002	Surface Water	D	0.2	0.0002	0.0002	0.026	0.0002	0.0071	0.00037	0.0046		0.0032	0.0029	0.023	0.0001	0.41	0.0001	0.0024	0.011	0.0002	0.0001	0.0001	0.00011	0.034
Surface Water Area 1-Red River Along Mine	RR-18B	30-Sep-02	RR-18B-T01N-SFW-093002	Surface Water	D	1.9	0.00024	0.00021	0.033	0.00033	0.0076	0.0005	0.0046	0.01	0.0039	0.018	0.65	0.0011	0.43	0.0001	0.0017	0.014	0.00038	0.0001	0.0001	0.00035	0.1
Surface Water Area 1-Red River Along Mine	RR-18B	19-Mar-03	RR-18B-D01N-SFW-031903	Surface Water	D	0.2	0.0006	0.0002	0.033	0.0003	0.0084	0.00063	0.001		0.0038	0.006	0.46	0.0002	0.43	0.0001	0.0023	0.023	0.0016	0.0002	0.0002	0.0004	0.17
Surface Water Area 1-Red River Along Mine	RR-18B	16-Jul-03	RR-18B-D01N-SFW-071603	Surface Water	D	0.22	0.0005	0.0002	0.034	0.0002	0.0062	0.00056	0.0014		0.002	0.0044	0.033	0.0001	0.25	0.00015	0.0026	0.018	0.0008	0.0001	0.0001	0.0002	0.1
Surface Water Area 1-Red River Along Mine	RR-18B	23-Sep-03	RR-18B-D01N-SFW-092303	Surface Water	D	0.34	0.00011	0.00038	0.037	0.00047	0.0048	0.00055	0.001		0.0029	0.0048	0.044	0.00006	0.29	0.00006	0.0022	0.017	0.00073	0.0002	0.00001	0.0003	0.079
Surface Water Area 1-Red River Along Mine	RR-20	30-Sep-02	RR-20-D01N-SFW-093002	Surface Water	D	0.15	0.0002	0.0002	0.026	0.0002	0.0073	0.00032	0.0012		0.0025	0.0022	0.046	0.0001	0.35	0.0001	0.0035	0.0096	0.0002	0.0059	0.0001	0.0001	0.028
Surface Water Area 1-Red River Along Mine	RR-20	30-Sep-02	RR-20-T01N-SFW-093002	Surface Water	D	2.8	0.0002	0.0002	0.059	0.00051	0.005	0.00048	0.0022	0.01	0.0038	0.017	2.2	0.0012	0.41	0.0001	0.0025	0.013	0.00035	0.0059	0.0001	0.00038	0.097
Surface Water Area 1-Red River Along Mine	RR-20	21-Mar-03	RR-20-D01N-SFW-032103	Surface Water	D	0.54	0.00066	0.0004	0.035	0.0003	0.0084	0.00056	0.001		0.004	0.0059	0.31	0.0002	0.36	0.0001	0.0023	0.021	0.0031	0.0002	0.0002	0.0002	0.11
Surface Water Area 1-Red River Along Mine	RR-20	15-Jul-03	RR-20-D01N-SFW-071503	Surface Water	D	0.072	0.0005	0.0002	0.035	0.0002	0.0068	0.00035	0.0014		0.002	0.0026	0.033	0.0001	0.16	0.0001	0.0054	0.0098	0.0016	0.0001	0.0001	0.00076	0.058
Surface Water Area 1-Red River Along Mine	RR-20	23-Sep-03	RR-20-D01N-SFW-092303	Surface Water	D	0.11	0.00011	0.00038	0.034	0.00047	0.0051	0.0004	0.0039		0.0028	0.0028	0.044	0.00006	0.23	0.00006	0.0031	0.012	0.00073	0.0002	0.00001	0.00028	0.066
Reference Red River Above Mine Site	RR-3	03-Oct-02	RR-3-D01N-SFW-100302	Surface Water	D	0.13	0.0002	0.0002	0.044	0.0002	0.0048	0.00044	0.0046		0.0022	0.0082	0.034	0.0001	0.11	0.0001	0.0011	0.0062	0.0002	0.0001	0.0001	0.00023	0.041
Reference Red River Above Mine Site	RR-3	21-Mar-03	RR-3-D01N-SFW-032103	Surface Water	D	0.063	0.0006	0.0002	0.044	0.0003	0.0084	0.00037	0.0036		0.0038	0.0065	0.042	0.0002	0.23	0.0001	0.0023	0.0047	0.0022	0.0002	0.0002	0.0002	0.06
Reference Red River Above Mine Site	RR-3	16-Jul-03	RR-3-D01N-SFW-071603	Surface Water	D	0.14	0.0005	0.0002	0.039	0.0002	0.0048	0.00028	0.0014		0.002	0.0085	0.033	0.0001	0.093	0.0001	0.00094	0.0051	0.0008	0.0001	0.0001	0.00026	0.028
Reference Red River Above Mine Site	RR-3	25-Sep-03	RR-3-D01N-SFW-092503	Surface Water	D	0.13	0.00021	0.00038	0.044	0.00047	0.0048	0.00028	0.001		0.0019	0.0066	0.044	0.00004	0.092	0.00006	0.001	0.0051	0.00073	0.0002	0.00001	0.00061	0.034
Reference Red River Above Mine Site	RR-4	04-Oct-02	RR-4-D01N-SFW-100402	Surface Water	D	0.08	0.0002	0.0002	0.044	0.0002	0.0048	0.0004	0.0046		0.0022	0.003	0.023	0.0001	0.16	0.0001	0.0012	0.0062	0.0002	0.0001	0.0001	0.00013	0.023
Reference Red River Above Mine Site	RR-4	21-Mar-03	RR-4-D01N-SFW-032103	Surface Water	D	0.05	0.0006	0.00043	0.05	0.0003	0.0084	0.00055	0.001		0.0038	0.0053	0.42	0.0002	0.2	0.0001	0.0022	0.0095	0.0037	0.0002	0.0002	0.0002	0.059
Reference Red River Above Mine Site	RR-4	16-Jul-03	RR-4-D01N-SFW-071603	Surface Water	D	0.16	0.0005	0.0002	0.037	0.0002	0.0048	0.0002	0.0014		0.002	0.0055	0.053	0.0001	0.096	0.00015	0.002	0.0038	0.0008	0.0001	0.0001	0.0002	0.022
Reference Red River Above Mine Site	RR-4	25-Sep-03	RR-4-D01N-SFW-092503	Surface Water	D	0.11	0.00011	0.00038	0.041	0.00047	0.0048	0.00025	0.001		0.0015	0.0042	0.044	0.00004	0.11	0.00006	0.0011	0.0056	0.00073	0.0002	0.00001	0.00042	0.03
Reference Red River Above Mine Site	RR-5	03-Oct-02	RR-5-D01N-SFW-100302	Surface Water	D	0.09	0.0002	0.0002	0.04	0.0002	0.0048	0.00018	0.0046		0.0022	0.0036	0.023	0.0001	0.13	0.0001	0.0014	0.0045	0.0002	0.0001	0.0001	0.00017	0.014
Reference Red River Above Mine Site	RR-5	21-Mar-03	RR-5-D01N-SFW-032103	Surface Water	D	0.064	0.0006	0.0002	0.042	0.0003	0.0084	0.0002	0.001		0.0038	0.0051	0.31	0.0002	0.17	0.0001	0.0023	0.005	0.0012	0.0002	0.0002	0.0002	0.031
Reference Red River Above Mine Site	RR-5	16-Jul-03	RR-5-D01N-SFW-071603	Surface Water	D	0.13	0.0005	0.0002	0.036	0.0002	0.007	0.0002	0.0014		0.002	0.0056	0.066	0.0001	0.072	0.00014	0.0017	0.0044	0.0008	0.0001	0.0001	0.0002	0.021
Reference Red River Above Mine Site	RR-5	24-Sep-03	RR-5-D01N-SFW-092403	Surface Water	D	0.12	0.0012	0.00038	0.037	0.00047	0.0067	0.00014	0.001		0.0011	0.0038	0.044	0.0001	0.075	0.00006	0.002	0.0045	0.00073	0.0002	0.00001	0.00029	0.013
Reference Red River Above Mine Site	RR-6	04-Oct-02	RR-6-D01N-SFW-100402	Surface Water	D	0.13	0.00023	0.0002	0.035	0.0002	0.0048	0.00024	0.0046		0.0024	0.0049	0.023	0.0001	0.21	0.0001	0.0012	0.011	0.00029	0.0001	0.0001	0.0001	0.033
Reference Red River Above Mine Site	RR-6	21-Mar-03	RR-6-D01N-SFW-032103	Surface Water	D	0.11	0.0006	0.0002	0.04	0.0003	0.011	0.00031	0.001		0.0038	0.0063	0.42	0.0002	0.28	0.0001	0.0023	0.011	0.001	0.0002	0.0002	0.0002	0.052
Reference Red River Above Mine Site	RR-6	16-Jul-03	RR-6-D01N-SFW-071603	Surface Water	D	0.26	0.0005	0.0002	0.033	0.0002	0.006	0.0002	0.0014		0.002	0.0051	0.054	0.0001	0.1	0.0001	0.0012	0.0059	0.0008	0.0001	0.0001	0.0002	0.022
Reference Red River Above Mine Site	RR-6	24-Sep-03	RR-6-D01N-SFW-092403	Surface Water	D	0.19	0.00033	0.00038	0.037	0.00047	0.011	0.00021	0.001		0.0019	0.0027	0.044	0.00004	0.14	0.00006	0.0011	0.0073	0.00073	0.0002	0.00001	0.00038	0.03
Reference Red River Above Mine Site	RR-6A	04-Oct-02	RR-6A-D01N-SFW-100402	Surface Water	D	0.16	0.0002	0.0002	0.034	0.0002	0.0048	0.00017	0.0046		0.0024	0.003	0.023	0.0001	0.19	0.0001	0.0013	0.0079	0.0002	0.0001	0.0001	0.0001	0.018
Reference Red River Above Mine Site	RR-6A	21-Mar-03	RR-6A-D01N-SFW-032103	Surface Water	D	0.12	0.0006	0.0002	0.036	0.0003	0.0089	0.00032	0.001		0.0038	0.0064	0.42	0.0002	0.28	0.0001	0.0023	0.0095	0.001	0.0002	0.0002	0.0002	0.047

Reference Red River Above Mine Site	RR-6A	15-Jul-03	RR-6A-D01N-SFW-071503	Surface Water	D	0.24	0.0005	0.0002	0.032	0.0002	0.0056	0.0002	0.0014		0.002	0.0037	0.033	0.00014	0.098	0.00017	0.0012	0.0061	0.0008	0.0001	0.0001	0.0002	0.018
Reference Red River Above Mine Site	RR-6A	24-Sep-03	RR-6A-D01N-SFW-092403	Surface Water	D	0.18	0.00022	0.00038	0.035	0.00047	0.016	0.0002	0.001		0.0026	0.0026	0.044	0.00004	0.13	0.00006	0.0011	0.0071	0.00073	0.0002	0.00001	0.00042	0.024
Reference Red River Above Mine Site	RR-6V	16-Jul-03	RR-6V-D01N-SFW-071603	Surface Water	D	0.091	0.0005	0.0002	0.034	0.0002	0.0067	0.0002	0.0014		0.002	0.024	0.033	0.0001	0.045	0.0001	0.0012	0.0029	0.0008	0.0001	0.0001	0.00025	0.012
Reference Red River Above Mine Site	RR-6V	24-Sep-03	RR-6V-D01N-SFW-092403	Surface Water	D	0.11	0.00069	0.00038	0.035	0.00047	0.0084	0.00014	0.001		0.0012	0.0032	0.044	0.00006	0.063	0.00006	0.0016	0.0042	0.00073	0.0002	0.00001	0.0004	0.013
Surface Water Area 1-Red River Along Mine	RR-7	04-Oct-02	RR-7-D01N-SFW-100402	Surface Water	D	0.15	0.0002	0.0002	0.034	0.0002	0.0048	0.00018	0.0046		0.0022	0.0027	0.023	0.0001	0.2	0.0001	0.0011	0.008	0.0002	0.0001	0.0001	0.0001	0.02
Surface Water Area 1-Red River Along Mine	RR-7	21-Jan-03	RR-7-D01N-SFW-012103	Surface Water	D	0.12	0.0006	0.0002	0.033	0.0002	0.011	0.00042	0.0037		0.0051	0.0032	0.27	0.0002	0.35	0.0001	0.0011	0.018	0.0016	0.0002	0.0002	0.0004	0.076
Surface Water Area 1-Red River Along Mine	RR-7	21-Mar-03	RR-7-D01N-SFW-032103	Surface Water	D	0.11	0.0006	0.0002	0.038	0.0003	0.0094	0.00026	0.001		0.0038	0.0048	0.42	0.0002	0.3	0.0001	0.0023	0.011	0.0039	0.0002	0.0002	0.0002	0.049
Surface Water Area 1-Red River Along Mine	RR-7	03-Apr-03	RR-7-D01N-SFW-040303	Surface Water	D	0.16	0.0003	0.0002	0.037	0.0008	0.0084	0.0005	0.001		0.0038	0.0034	0.031	0.0001	0.17	0.0001	0.0023	0.0066	0.0005	0.0001	0.0001	0.00014	0.021
Surface Water Area 1-Red River Along Mine	RR-7	15-Jul-03	RR-7-D01N-SFW-071503	Surface Water	D	0.25	0.0005	0.0002	0.033	0.0002	0.0067	0.0002	0.0014		0.002	0.0036	0.033	0.00013	0.093	0.00014	0.0011	0.0051	0.0008	0.0001	0.0001	0.0002	0.023
Surface Water Area 1-Red River Along Mine	RR-7	24-Sep-03	RR-7-D01N-SFW-092403	Surface Water	D	0.18	0.00011	0.00038	0.036	0.00047	0.0068	0.00023	0.0017		0.0026	0.0027	0.044	0.00004	0.14	0.00006	0.0011	0.0073	0.00073	0.0002	0.00001	0.00045	0.025
Surface Water Area 1-Red River Along Mine	RR-7	19-Oct-03	RR-7-D01N-SFW-101903	Surface Water	D	0.17	0.0005	0.0002	0.035	0.0004	0.0063	0.00023	0.0011		0.0041	0.003	0.028	0.0002	0.16	0.0001	0.0009	0.0064	0.0003	0.0001	0.0001	0.0001	0.025
Surface Water Area 1-Red River Along Mine	RR-7	13-Jan-04	RR-7-D01N-SFW-011304	Surface Water	D	0.1	0.0012	0.0002	0.033	0.0018	0.012	0.00033	0.0057		0.0075	0.0038	0.042	0.0001	0.24	0.0001	0.001	0.012	0.00085	0.0001	0.0001	0.0002	0.048
Surface Water Area 1-Red River Along Mine	RR-7	24-Feb-04	RR-7-D01N-SFW-022404	Surface Water	D	0.077	0.0002	0.0001	0.029	0.0003	0.0064	0.00036	0.0015		0.0032	0.0049	0.036	0.0001	0.23	0.0001	0.0007	0.013	0.00057	0.0001	0.0001	0.0001	0.041
Surface Water Area 1-Red River Along Mine	RR-7	19-Apr-04	RR-7-D01N-SFW-041904	Surface Water	D	0.29	0.00055	0.0002	0.035	0.0002	0.0061	0.0002	0.0008		0.0014	0.0074	0.081	0.0013	0.08	0.0001	0.0022	0.0058	0.0007	0.0001	0.00012	0.00045	0.016
Surface Water Area 1-Red River Along Mine	RR-8	04-Oct-02	RR-8-D01N-SFW-100402	Surface Water	D	0.13	0.0002	0.0002	0.032	0.0002	0.0048	0.00014	0.0046		0.0022	0.0031	0.023	0.0001	0.2	0.0001	0.0012	0.0064	0.0002	0.0001	0.0001	0.0001	0.015
Surface Water Area 1-Red River Along Mine	RR-8	21-Mar-03	RR-8-D01N-SFW-032103	Surface Water	D	0.13	0.0006	0.0002	0.036	0.0003	0.0084	0.0002	0.001		0.0038	0.0043	0.42	0.0002	0.28	0.0001	0.0023	0.0098	0.001	0.0002	0.0002	0.0002	0.039
Surface Water Area 1-Red River Along Mine	RR-8	15-Jul-03	RR-8-D01N-SFW-071503	Surface Water	D	0.22	0.0005	0.0002	0.031	0.0002	0.007	0.0002	0.0014		0.002	0.0042	0.033	0.0001	0.077	0.0001	0.0017	0.0033	0.0016	0.0001	0.0001	0.0007	0.0093
Surface Water Area 1-Red River Along Mine	RR-8	24-Sep-03	RR-8-D01N-SFW-092403	Surface Water	D	0.14	0.00043	0.00038	0.035	0.00047	0.0085	0.00022	0.001		0.0022	0.0028	0.044	0.00004	0.13	0.00006	0.0015	0.0069	0.00073	0.0002	0.00001	0.00028	0.02
Surface Water Area 1-Red River Above Mine	RR-8A	04-Oct-02	RR-8A-D01N-SFW-100402	Surface Water	D	0.093	0.0002	0.0002	0.031	0.0003	0.005	0.00018	0.00034		0.0021	0.0023	0.038	0.0001	0.2	0.0001	0.0013	0.0067	0.00049	0.0001	0.0001	0.0001	0.0073
Surface Water Area 1-Red River Above Mine	RR-8A	21-Mar-03	RR-8A-D01N-SFW-032103	Surface Water	D	0.58	0.0006	0.0004	0.035	0.0003	0.0084	0.0005	0.0011		0.0038	0.0036	0.42	0.0002	0.26	0.0001	0.0023	0.0091	0.001	0.0002	0.0002	0.0002	0.039
Surface Water Area 1-Red River Above Mine	RR-8A	15-Jul-03	RR-8A-D01N-SFW-071503	Surface Water	D	0.24	0.0005	0.0002	0.031	0.0002	0.0064	0.0002	0.0014		0.002	0.0037	0.033	0.00014	0.073	0.00015	0.0013	0.0045	0.0008	0.0001	0.0001	0.0002	0.0067
Surface Water Area 1-Red River Above Mine	RR-8A	24-Sep-03	RR-8A-D01N-SFW-092403	Surface Water	D	0.23	0.00017	0.00038	0.035	0.00047	0.0079	0.00018	0.001		0.0021	0.0029	0.044	0.00006	0.12	0.00006	0.0012	0.006	0.00073	0.0002	0.00001	0.00029	0.015
Reference Upper Cabresto Creek Riparian	RRS-12	07-Oct-02	RRS-12-D01N-SFW-100702	Surface Water	D	0.089	0.0002	0.0002	0.025	0.0003	0.005	0.0001	0.00033		0.0001	0.0012	0.04	0.0001	0.018	0.0001	0.00051	0.0016	0.0002	0.0001	0.0001	0.0001	0.026
Reference Upper Cabresto Creek Riparian	RRS-12	07-Oct-02	RRS-12-T01N-SFW-100702	Surface Water	D	0.17	0.0002	0.0002	0.025	0.0003	0.005	0.0001	0.00034	0.0015	0.0001	0.00078	0.082	0.00012	0.028	0.0001	0.00053	0.0012	0.00024	0.0001	0.0001	0.00013	0.031
Reference Upper Cabresto Creek Riparian	RRS-12	23-Mar-03	RRS-12-D01N-SFW-032303	Surface Water	D	0.08	0.0006	0.00048	0.023	0.00076	0.0084	0.0005	0.001		0.0038	0.0015	0.42	0.0002	0.013	0.0001	0.0023	0.003	0.0035	0.0002	0.0002	0.0002	0.039
Reference Upper Cabresto Creek Riparian	RRS-12	16-Jul-03	RRS-12-D01N-SFW-071603	Surface Water	D	0.072	0.0005	0.0002	0.025	0.0002	0.0048	0.0002	0.0014		0.002	0.0009	0.033	0.0001	0.0055	0.0001	0.00041	0.0014	0.0008	0.0001	0.0001	0.0002	0.016
Reference Upper Cabresto Creek Riparian	RRS-12	25-Sep-03	RRS-12-D01N-SFW-092503	Surface Water	D	0.079	0.00021	0.00038	0.025	0.00047	0.0048	0.00008	0.001		0.0011	0.00056	0.044	0.00004	0.007	0.00006	0.00087	0.002	0.00073	0.0002	0.00001	0.00044	0.022
Reference Upper Cabresto Creek Riparian	RRS-13	06-Oct-02	RRS-13-D01N-SFW-100602	Surface Water	D	0.037	0.0002	0.0002	0.016	0.0002	0.0048	0.0001	0.0046		0.0022	0.0019	0.023	0.0001	0.0025	0.0001	0.0007	0.00096	0.0002	0.0001	0.0001	0.0002	0.01
Reference Upper Cabresto Creek Riparian	RRS-13	23-Mar-03	RRS-13-D01N-SFW-032303	Surface Water	D	0.05	0.0006	0.00059	0.015	0.0014	0.0084	0.0005	0.001		0.0038	0.0015	0.42	0.0002	0.013	0.0001	0.0023	0.003	0.001	0.0002	0.0002	0.0002	0.039
Reference Upper Cabresto Creek Riparian	RRS-13	16-Jul-03	RRS-13-D01N-SFW-071603	Surface Water	D	0.024	0.0005	0.0002	0.011	0.0002	0.0048	0.0002	0.0014		0.002	0.0024	0.033	0.0001	0.0007	0.0001	0.0017	0.0021	0.0008	0.0001	0.0001	0.0003	0.0038
Reference Upper Cabresto Creek Riparian	RRS-15	06-Oct-02	RRS-15-D01N-SFW-100602	Surface Water	D	0.026	0.0002	0.0002	0.015	0.0002	0.0048	0.0001	0.0046		0.0022	0.0003	0.023	0.0001	0.0025	0.0001	0.0007	0.00043	0.0002	0.0001	0.0001	0.00019	0.0078
Reference Upper Cabresto Creek Riparian	RRS-15	23-Mar-03	RRS-15-D01N-SFW-032303	Surface Water	D	0.05	0.0006	0.00054	0.015	0.00085	0.0084	0.0005	0.001		0.0038	0.0015	0.42	0.0002	0.013	0.0001	0.0023	0.003	0.0038	0.0002	0.0002	0.0002	0.039
Reference Upper Cabresto Creek Riparian	RRS-15	16-Jul-03	RRS-15-D01N-SFW-071603	Surface Water	D	0.024	0.0005	0.0002	0.011	0.0002	0.0048	0.0002	0.0014		0.002	0.0009	0.033	0.0001	0.0007	0.0001	0.00058	0.0006	0.0008	0.0001	0.0001	0.00033	0.0033
Reference Upper Cabresto Creek Riparian	RRS-15	25-Sep-03	RRS-15-D01N-SFW-092503	Surface Water	D	0.016	0.00054	0.00038	0.012	0.00047	0.0048	0.00008	0.001		0.0011	0.00045	0.044	0.00004	0.00073	0.00006	0.00094	0.00085	0.00073	0.0002	0.00001	0.00065	0.013
Reference Lower Cabresto Creek Riparian	RRS-18	06-Oct-02	RRS-18-D01N-SFW-100602	Surface Water	D	0.003	0.0002	0.0002	0.024	0.0002	0.0048	0.0001	0.0046		0.0022	0.0003	0.023	0.0001	0.0055	0.0001	0.00077	0.00021	0.0002	0.0001	0.0001	0.00013	0.0069
Reference Lower Cabresto Creek Riparian	RRS-18	23-Mar-03	RRS-18-D01N-SFW-032303	Surface Water	D	0.05	0.0006	0.00051	0.019	0.0003	0.0084	0.0005	0.001		0.0038	0.0045	0.42	0.0002	0.013	0.0001	0.0022	0.003	0.001	0.0002	0.0002	0.0002	0.039
Reference Lower Cabresto Creek Riparian	RRS-18	25-Sep-03	RRS-18-D01N-SFW-092503	Surface Water	D	0.0053	0.0028	0.00038	0.018	0.00047	0.0048	0.00008	0.001		0.0011	0.00047	0.044	0.00004	0.0099	0.00006	0.0025	0.001	0.00073	0.0002	0.00001	0.00041	0.013
Reference Lower Cabresto Creek Riparian	RRS-20	06-Oct-02	RRS-20-D01N-SFW-100602	Surface Water	D	0.0076	0.0002	0.0002	0.025	0.0003	0.005	0.0001	0.00032		0.0001	0.00039	0.038	0.0001	0.0079	0.0001	0.00066	0.0002	0.0002	0.0001	0.0001	0.0002	0.0021
Reference Lower Cabresto Creek Riparian	RRS-20	23-Mar-03	RRS-20-D01N-SFW-032303	Surface Water	D	0.05	0.0006	0.00043	0.017	0.001	0.0084	0.0005	0.001		0.0038	0.0015	0.42	0.0002	0.013	0.0001	0.0023	0.003	0.0035	0.0002	0.0002	0.00024	0.039
Reference Lower Cabresto Creek Riparian	RRS-20	16-Jul-03	RRS-20-D01N-SFW-071603	Surface Water	D	0.031	0.0005	0.00036	0.026	0.0002	0.0048	0.0002	0.0014		0.002	0.0024	0.21	0.0001	0.1	0.0001	0.0017	0.0021	0.0008	0.0001	0.0001	0.0002	0.012
Reference Lower Cabresto Creek Riparian	RRS-20	25-Sep-03	RRS-20-D01N-SFW-092503	Surface Water	D	0.0082	0.0002	0.00038	0.018	0.00047	0.005	0.00008	0.001		0.0011	0.00065	0.044	0.00005	0.0068	0.00006	0.00088	0.0011	0.00073	0.0002	0.00001	0.00048	0.013
Reference Lower Cabresto Creek Riparian	RRS-23	06-Oct-02	RRS-23-D01N-SFW-100602	Surface Water	D	0.003	0.0002	0.0002	0.026	0.0002	0.0048	0.0001	0.0046		0.0022	0.0017	0.028	0.0006	0.0046	0.0001	0.00067	0.00025	0.0002	0.0001	0.0001	0.00011	0.014
Reference Lower Cabresto Creek Riparian	RRS-23	23-Mar-03	RRS-23-D01N-SFW-032303	Surface Water	D	0.05	0.0006	0.00054	0.022	0.0003	0.0084	0.0005	0.001		0.0038	0.004	0.42	0.0002	0.013	0.0001	0.0022	0.003	0.001	0.0002	0.0002	0.0002	0.039
Reference Lower Cabresto Creek Riparian	RRS-23	16-Jul-03	RRS-23-D01N-SFW-071603	Surface Water	D	0.024	0.0005	0.0002	0.035	0.0002	0.0048	0.0002	0.0014		0.002	0.0024	0.039	0.0001	0.0096	0.00016	0.0017	0.0021	0.0008	0.0001	0.0001	0.0002	0.0066
Reference Lower Cabresto Creek Riparian	RRS-23	25-Sep-03	RRS-23-D01N-SFW-092503	Surface Water	D	0.0088	0.00061	0.00038	0.017	0.00047	0.0048	0.00008	0.001		0.0011	0.00053	0.044	0.00004	0.0022	0.00006	0.00097	0.0011	0.00073	0.0002	0.00001	0.00064	0.013
Reference Lower Cabresto Creek Riparian	RRS-27	06-Oct-02	RRS-27-D01N-SFW-100602	Surface Water	D	0.003	0.0002	0.0002	0.056	0.0002	0.0048	0.0001	0.0046		0.0022	0.00046	0.023	0.0001	0.015	0.0001	0.00075	0.00032	0.0002	0.0001	0.0001	0.0001	0.0069
Reference Lower Cabresto Creek Riparian	RRS-27	23-Mar-03	RRS-27-D01N-SFW-032303	Surface Water	D	0.05	0.0006	0.00059	0.023	0.0017	0.0084	0.0005	0.0013		0.0038	0.0015	0.42	0.0002	0.013	0.0001	0.0023	0.003	0.001	0.0002	0.0002	0.0002	0.039
Reference Lower Cabresto Creek Riparian	RRS-27	16-Jul-03	RRS-27-D01N-SFW-071603	Surface Water	D	0.025	0.0005	0.0002	0.035	0.0002	0.0066	0.0002	0.0014		0.002	0.0024	0.078	0.0003	0.039	0.00012	0.002	0.0021	0.0008	0.0001	0.0001	0.0011	0.014
Reference Lower Cabresto Creek Riparian	RRS-27	25-Sep-03	RRS-27-D01N-SFW-092503	Surface Water	D	0.0053	0.00087	0.00038	0.02	0.00047	0.0048	0.00008	0.001		0.0011	0.00075	0.044	0.00004	0.0018	0.00006	0.00087	0.00095	0.00073	0.0002	0.00001	0.00075	0.013
Reference Upper Cabresto Creek Riparian	RRS-9	07-Oct-02	RRS-9-D01N-SFW-100702	Surface Water	D	0.003	0.0002	0.0002	0.029	0.0003	0.005	0.0001	0.0019		0.0034	0.0003	0.038	0.0001	0.003	0.0001	0.00063	0.0002	0.0002	0.0001	0.0001	0.00024	0.0021
Reference Upper Cabresto Creek Riparian	RRS-9	07-Oct-02	RRS-9-T01N-SFW-100702	Surface Water	D	0.056	0.00022	0.0002	0.03	0.0003	0.005	0.0001	0.0019	0.0015	0.0034	0.00077	0.038	0.0001	0.0036	0.0001	0.00062	0.0002	0.0002	0.0001	0.0001	0.00024	0.0021
Reference Upper Cabresto Creek Riparian	RRS-9	23-Mar-03	RRS-9-D01N-SFW-032303	Surface Water	D	0.05	0.0006	0.00056	0.029	0.0003	0.0084	0.0005	0.0011		0.0038	0.0047	0.42	0.0002	0.013	0.0001	0.0022	0.003	0.001	0.0002	0.0002	0.00023	0.039
Reference Upper Cabresto Creek Riparian	RRS-9	16-Jul-03	RRS-9-D01N-SFW-071603	Surface Water	D	0.024	0.0005	0.0002	0.027	0.0002	0.0048	0.0002	0.0014		0.002	0.0009	0.033	0.0001	0.0053	0.0001	0.00046	0.0006	0.0008	0.0001	0.0001	0.00037	0.0031
Reference Upper Cabresto Creek Riparian	RRS-9	25-Sep-03	RRS-9-D01N-SFW-092503	Surface Water	D	0.0038	0.00011	0.00038	0.03	0.00047	0.0052	0.00008	0.001		0.0011	0.00053	0.044	0.00005	0.0057	0.00006	0.00075	0.00084	0.00073	0.0002	0.00001	0.00056	0.013
Reference Upper Cabresto Creek Riparian	UPPER CABRESTO CREEK	23-Mar-03	UCC-D01N-SFW-032303	Surface Water	D	0.05	0.0006	0.00053	0.016	0.0003	0.0084	0.0005	0.001		0.0038	0.0015	0.31	0.0002	0.01	0.0001	0.0023	0.003	0.001	0.0002	0.0002	0.0002	0.02
Reference Upper Cabresto Creek Riparian	UPPER CABRESTO CREEK	16-Jul-03	UPPERCABRESTO-D01N-SFW-071603	Surface Water	D	0.024	0.0005	0.0002	0.012	0.0002	0.0048	0.0002	0.0014		0.002	0.0024	0.033	0.0001	0.0007	0.0001	0.0017	0.0021	0.0008	0.0001	0.0001	0.0003	0.0037
Reference Upper Cabresto Creek Riparian	UPPER CABRESTO CREEK	25-Sep-03	UPPERCABRESTO-D01N-SFW-092503	Surface Water	D	0.016	0.00013	0.00038	0.013	0.00047	0.0048	0.00008	0.001		0.0017	0.00045	0.044	0.00004	0.0036	0.00007	0.00078	0.001	0.00073	0.0002	0.00001	0.00052	0.013
Reference Red River Above Mine Site	Zwergle	07-Oct-02	ZWERGEL-D01N-SFW-100702	Surface Water	D	0.003	0.0002	0.0002	0.035	0.0003	0.005	0.0001	0.0004		0.0001	0.00034	0.042	0.0001	0.0012	0.0001	0.00096	0.0002	0.00024	0.0001	0.0001	0.00029	0.0021
Reference Red River Above Mine Site	Zwergle	07-Oct-02	ZWERGEL-T01N-SFW-100702	Surface Water	D	0.011	0.0002	0.0002	0.036	0.0003	0.005	0.0001	0.00045	0.01	0.0001	0.00075	0.052	0.0001	0.0035	0.0001	0.00087	0.0002	0.0002	0.0001	0.0001	0.00036	0.0021
Reference Red River Above Mine Site	Zwergle	23-Mar-03	ZWERGEL-D01N-SFW-032303	Surface Water	D	0.05	0.0006	0.0004	0.052	0.0003	0.0084	0.00052	0.001		0.0038	0.0041	0.42	0.0002	0.013	0.0001	0.0022	0.003	0.0022	0.0002	0.0002	0.00026	0.039
Reference Red River Above Mine Site	Zwergle	16-Jul-03	ZWERGEL-D01N-SFW-071603	Surface Water	D	0.024	0.0005	0.0002	0.025	0.0002	0.0048	0.0002	0.0014		0.002	0.0024	0.039	0.0001	0.0036	0.00021	0.0017	0.0021	0.0008	0.0001	0.0001	0.00028	0.0032
Reference Red River Above Mine Site	Zwergle	25-Sep-03	ZWERGEL-D01N-SFW-092503	Surface Water	D	0.0029	0.00017	0.00038	0.034	0.00047	0.0048	0.00008	0.001		0.0011	0.00049	0.044	0.00004	0.0018	0.00006	0.00096	0.001	0.00073	0.0002	0.00001	0.00058	0.013

EXPOSURE_AREA_LOOKUP_DESCRIPTION	SITE_ID	SAMP_DATE	SAMP_ID	MEDIUM_TYPE_LOOKUP_DESCRIPTION	SAMP_FRACTION	DO mg/L	Eh millivolts	Flow cfs	Fluoride mg/L	Hardness mg/L	Nitrite mg/L	pH SU	Specific Conductance uS/cm	Sulfate mg/L	Temperature Celsius	Turbidity NTU
Reference Lower Cabresto Creek Riparian	RRS-18	06-Oct-02	RRS-18-D01N-SFW-100602	Surface Water	D					105:						
Reference Lower Cabresto Creek Riparian	RRS-18	23-Mar-03	RRS-18-D01N-SFW-032303	Surface Water	D					89:						
Reference Lower Cabresto Creek Riparian	RRS-20	06-Oct-02	RRS-20-D01N-SFW-100602	Surface Water	D					111:						
Reference Lower Cabresto Creek Riparian	RRS-20	23-Mar-03	RRS-20-D01N-SFW-032303	Surface Water	D					87.4:						
Reference Lower Cabresto Creek Riparian	RRS-20	16-Jul-03	RRS-20-D01N-SFW-071603	Surface Water	D					84.9:						
Reference Lower Cabresto Creek Riparian	RRS-20	25-Sep-03	RRS-20-D01N-SFW-092503	Surface Water	D					81.5:						
Reference Lower Cabresto Creek Riparian	RRS-23	06-Oct-02	RRS-23-D01N-SFW-100602	Surface Water	D					99.6:						
Reference Lower Cabresto Creek Riparian	RRS-23	23-Mar-03	RRS-23-D01N-SFW-032303	Surface Water	D					95.2:						
Reference Lower Cabresto Creek Riparian	RRS-23	16-Jul-03	RRS-23-D01N-SFW-071603	Surface Water	D					111:						
Reference Lower Cabresto Creek Riparian	RRS-23	25-Sep-03	RRS-23-D01N-SFW-092503	Surface Water	D					76.7:						
Reference Lower Cabresto Creek Riparian	RRS-27	06-Oct-02	RRS-27-D01N-SFW-100602	Surface Water	D					162:						
Reference Lower Cabresto Creek Riparian	RRS-27	23-Mar-03	RRS-27-D01N-SFW-032303	Surface Water	D					102:						
Reference Lower Cabresto Creek Riparian	RRS-27	16-Jul-03	RRS-27-D01N-SFW-071603	Surface Water	D					112:						
Reference Lower Cabresto Creek Riparian	RRS-27	25-Sep-03	RRS-27-D01N-SFW-092503	Surface Water	D					84.4:						
Reference Red River Above Mine Site	RR-1	04-Oct-02	RR-1-D01N-SFW-100402	Surface Water	D					112:						
Reference Red River Above Mine Site	RR-1	21-Mar-03	RR-1-D01N-SFW-032103	Surface Water	D					111:						
Reference Red River Above Mine Site	RR-1	16-Jul-03	RR-1-D01N-SFW-071603	Surface Water	D					91.1:						
Reference Red River Above Mine Site	RR-1	25-Sep-03	RR-1-D01N-SFW-092503	Surface Water	D					104:						
Reference Red River Above Mine Site	RR-3	03-Oct-02	RR-3-D01N-SFW-100302	Surface Water	D					119:						
Reference Red River Above Mine Site	RR-3	21-Mar-03	RR-3-D01N-SFW-032103	Surface Water	D					123:						
Reference Red River Above Mine Site	RR-3	16-Jul-03	RR-3-D01N-SFW-071603	Surface Water	D					109:						
Reference Red River Above Mine Site	RR-3	25-Sep-03	RR-3-D01N-SFW-092503	Surface Water	D					120:						
Reference Red River Above Mine Site	RR-4	04-Oct-02	RR-4-D01N-SFW-100402	Surface Water	D					131:						
Reference Red River Above Mine Site	RR-4	21-Mar-03	RR-4-D01N-SFW-032103	Surface Water	D					147:						
Reference Red River Above Mine Site	RR-4	16-Jul-03	RR-4-D01N-SFW-071603	Surface Water	D					110:						
Reference Red River Above Mine Site	RR-4	25-Sep-03	RR-4-D01N-SFW-092503	Surface Water	D					114:						
Reference Red River Above Mine Site	RR-5	03-Oct-02	RR-5-D01N-SFW-100302	Surface Water	D					138:						
Reference Red River Above Mine Site	RR-5	21-Mar-03	RR-5-D01N-SFW-032103	Surface Water	D					136:						
Reference Red River Above Mine Site	RR-5	16-Jul-03	RR-5-D01N-SFW-071603	Surface Water	D					116:						
Reference Red River Above Mine Site	RR-5	24-Sep-03	RR-5-D01N-SFW-092403	Surface Water	D					114:						
Reference Red River Above Mine Site	RR-6	04-Oct-02	RR-6-D01N-SFW-100402	Surface Water	D					149:						
Reference Red River Above Mine Site	RR-6	21-Mar-03	RR-6-D01N-SFW-032103	Surface Water	D					173:						
Reference Red River Above Mine Site	RR-6	16-Jul-03	RR-6-D01N-SFW-071603	Surface Water	D					127:						
Reference Red River Above Mine Site	RR-6	24-Sep-03	RR-6-D01N-SFW-092403	Surface Water	D					134:						
Reference Red River Above Mine Site	RR-6A	04-Oct-02	RR-6A-D01N-SFW-100402	Surface Water	D					146:						
Reference Red River Above Mine Site	RR-6A	21-Mar-03	RR-6A-D01N-SFW-032103	Surface Water	D					161:						
Reference Red River Above Mine Site	RR-6A	15-Jul-03	RR-6A-D01N-SFW-071503	Surface Water	D					117:						
Reference Red River Above Mine Site	RR-6A	24-Sep-03	RR-6A-D01N-SFW-092403	Surface Water	D					124:						
Reference Red River Above Mine Site	RR-6V	16-Jul-03	RR-6V-D01N-SFW-071603	Surface Water	D					116:						
Reference Red River Above Mine Site	RR-6V	24-Sep-03	RR-6V-D01N-SFW-092403	Surface Water	D					113:						
Reference Red River Above Mine Site	Zwergle	07-Oct-02	ZWERGEL-D01N-SFW-100702	Surface Water	D					115:						
Reference Red River Above Mine Site	Zwergle	07-Oct-02	ZWERGEL-T01N-SFW-100702	Surface Water	D					115:						
Reference Red River Above Mine Site	Zwergle	23-Mar-03	ZWERGEL-D01N-SFW-032303	Surface Water	D					119:						
Reference Red River Above Mine Site	Zwergle	16-Jul-03	ZWERGEL-D01N-SFW-071603	Surface Water	D					85.9:						
Reference Red River Above Mine Site	Zwergle	25-Sep-03	ZWERGEL-D01N-SFW-092503	Surface Water	D					106:						
Reference Upper Cabresto Creek Riparian	RRS-12	07-Oct-02	RRS-12-D01N-SFW-100702	Surface Water	D					95:						
Reference Upper Cabresto Creek Riparian	RRS-12	07-Oct-02	RRS-12-T01N-SFW-100702	Surface Water	D					96.1:						
Reference Upper Cabresto Creek Riparian	RRS-12	23-Mar-03	RRS-12-D01N-SFW-032303	Surface Water	D					91.4:						
Reference Upper Cabresto Creek Riparian	RRS-12	16-Jul-03	RRS-12-D01N-SFW-071603	Surface Water	D					90.6:						
Reference Upper Cabresto Creek Riparian	RRS-12	25-Sep-03	RRS-12-D01N-SFW-092503	Surface Water	D					90.4:						
Reference Upper Cabresto Creek Riparian	RRS-13	06-Oct-02	RRS-13-D01N-SFW-100602	Surface Water	D					74.9:						
Reference Upper Cabresto Creek Riparian	RRS-13	23-Mar-03	RRS-13-D01N-SFW-032303	Surface Water	D					75.7:						
Reference Upper Cabresto Creek Riparian	RRS-13	16-Jul-03	RRS-13-D01N-SFW-071603	Surface Water	D					56.5:						
Reference Upper Cabresto Creek Riparian	RRS-15	06-Oct-02	RRS-15-D01N-SFW-100602	Surface Water	D					77.2:						
Reference Upper Cabresto Creek Riparian	RRS-15	23-Mar-03	RRS-15-D01N-SFW-032303	Surface Water	D					80:						
Reference Upper Cabresto Creek Riparian	RRS-15	16-Jul-03	RRS-15-D01N-SFW-071603	Surface Water	D					61.6:						
Reference Upper Cabresto Creek Riparian	RRS-9	07-Oct-02	RRS-9-D01N-SFW-100702	Surface Water	D					79.1:						
Reference Upper Cabresto Creek Riparian	RRS-9	07-Oct-02	RRS-9-T01N-SFW-100702	Surface Water	D					81.4:						
Reference Upper Cabresto Creek Riparian	RRS-9	23-Mar-03	RRS-9-D01N-SFW-032303	Surface Water	D					77.7:						
Reference Upper Cabresto Creek Riparian	RRS-9	16-Jul-03	RRS-9-D01N-SFW-071603	Surface Water	D					69:						
Reference Upper Cabresto Creek Riparian	RRS-9	25-Sep-03	RRS-9-D01N-SFW-092503	Surface Water	D					78.6:						
Reference Upper Cabresto Creek Riparian	UPPER CABRESTO CREEK	23-Mar-03	UCC-D01N-SFW-032303	Surface Water	D					90.2:						
Reference Upper Cabresto Creek Riparian	UPPER CABRESTO CREEK	16-Jul-03	UPPERCABRESTO-D01N-SFW-071603	Surface Water	D					61.5:						
Reference Upper Cabresto Creek Riparian	UPPER CABRESTO CREEK	25-Sep-03	UPPERCABRESTO-D01N-SFW-092503	Surface Water	D					69.1:						
Surface Water Area 1-Red River Along Mine	LR-1	30-Sep-02	LR-1-D01N-SFW-093002	Surface Water	D					189:						
Surface Water Area 1-Red River Along Mine	LR-1	30-Sep-02	LR-1-T01N-SFW-093002	Surface Water	D					194:						
Surface Water Area 1-Red River Along Mine	LR-1	20-Mar-03	LR-1-D01N-SFW-032003	Surface Water	D					222:						
Surface Water Area 1-Red River Along Mine	LR-1	15-Jul-03	LR-1-D01N-SFW-071503	Surface Water	D					168:						
Surface Water Area 1-Red River Along Mine	LR-1	24-Sep-03	LR-1-D01N-SFW-092403	Surface Water	D					170:						
Surface Water Area 1-Red River Along Mine	RR-10	03-Oct-02	RR-10-D01N-SFW-100302	Surface Water	D					151:						
Surface Water Area 1-Red River Along Mine	RR-10	21-Jan-03	RR-10-D01N-SFW-012103	Surface Water	D					152:						
Surface Water Area 1-Red River Along Mine	RR-10	20-Mar-03	RR-10-D01N-SFW-032003	Surface Water	D					162:						
Surface Water Area 1-Red River Along Mine	RR-10	03-Apr-03	RR-10-D01N-SFW-040303	Surface Water	D					142:						
Surface Water Area 1-Red River Along Mine	RR-10	15-Jul-03	RR-10-D01N-SFW-071503	Surface Water	D					122:						
Surface Water Area 1-Red River Along Mine	RR-10	24-Sep-03	RR-10-D01N-SFW-092403	Surface Water	D					133:						
Surface Water Area 1-Red River Along Mine	RR-10	19-Oct-03	RR-10-D01N-SFW-101903	Surface Water	D					146:						
Surface Water Area 1-Red River Along Mine	RR-10	13-Jan-04	RR-10-D01N-SFW-011304	Surface Water	D					146:						
Surface Water Area 1-Red River Along Mine	RR-10	24-Feb-04	RR-10-D01N-SFW-022404	Surface Water	D					143:						
Surface Water Area 1-Red River Along Mine	RR-10	19-Apr-04	RR-10-D01N-SFW-041904	Surface Water	D					101:						
Surface Water Area 1-Red River Along Mine	RR-10A1	03-Oct-02	RR-10A1-D01N-SFW-100302	Surface Water	D					139:						
Surface Water Area 1-Red River Along Mine	RR-10A1	20-Jan-03	RR-10A1-D01N-SFW-012003	Surface Water	D					160:						
Surface Water Area 1-Red River Along Mine	RR-10A1	20-Mar-03	RR-10A1-D01N-SFW-032003	Surface Water	D					145:						
Surface Water Area 1-Red River Along Mine	RR-10A1	03-Apr-03	RR-10A1-D01N-SFW-040303	Surface Water	D					130:						
Surface Water Area 1-Red River Along Mine	RR-10A1	15-Jul-03	RR-10A1-D01N-SFW-071503	Surface Water	D					112:						
Surface Water Area 1-Red River Along Mine	RR-10A1	24-Sep-03	RR-10A1-D01N-SFW-092403	Surface Water	D					127:						
Surface Water Area 1-Red River Along Mine	RR-10A1	19-Oct-03	RR-10A1-D01N-SFW-101903	Surface Water	D					130:						
Surface Water Area 1-Red River Along Mine	RR-10A1	13-Jan-04	RR-10A1-D01N-SFW-011304	Surface Water	D					135:						
Surface Water Area 1-Red River Along Mine	RR-10A1	19-Apr-04	RR-10A1-D01N-SFW-041904	Surface Water	D					109:						
Surface Water Area 1-Red River Along Mine	RR-11A1	03-Oct-02	RR-11A1-D01N-SFW-100302	Surface Water	D					135:						
Surface Water Area 1-Red River Along Mine	RR-11A1	20-Jan-03	RR-11A1-D01N-SFW-012003	Surface Water	D					140:						
Surface Water Area 1-Red River Along Mine	RR-11A1	21-Mar-03	RR-11A1-D01N-SFW-032103	Surface Water	D					134:						
Surface Water Area 1-Red River Along Mine	RR-11A1	03-Apr-03	RR-11A1-D01N-SFW-040303	Surface Water	D					141:						
Surface Water Area 1-Red River Along Mine	RR-11A1	15-Jul-03	RR-11A1-D01N-SFW-071503	Surface Water	D					112:						
Surface Water Area 1-Red River Along Mine	RR-11A1	24-Sep-03	RR-11A1-D01N-SFW-092403	Surface Water	D					132:						
Surface Water Area 1-Red River Along Mine	RR-11A1	19-Oct-03	RR-11A1-D01N-SFW-101903	Surface Water	D					133:						
Surface Water Area 1-Red River Along Mine	RR-11A1	13-Jan-04	RR-11A1-D01N-SFW-011304	Surface Water	D					133:						
Surface Water Area 1-Red River Along Mine	RR-11A1	19-Apr-04	RR-11A1-D01N-SFW-041904	Surface Water	D					95.2:						
Surface Water Area 1-Red River Along Mine	RR-11B	03-Oct-02	RR-11B-D01N-SFW-100302	Surface Water	D					144:						
Surface Water Area 1-Red River Along Mine	RR-11B	20-Mar-03	RR-11B-D01N-SFW-032003	Surface Water	D					206:						
Surface Water Area 1-Red River Along Mine	RR-11B	15-Jul-03	RR-11B-D01N-SFW-071503	Surface Water	D					127:						
Surface Water Area 1-Red River Along Mine	RR-11B	24-Sep-03	RR-11B-D01N-SFW-092403	Surface Water	D					136:						
Surface Water Area 1-Red River Along Mine	RR-11C	01-Oct-02	RR-11C-D01N-SFW-100102	Surface Water	D					175:						
Surface Water Area 1-Red River Along Mine	RR-11C	20-Jan-03	RR-11C-D01N-SFW-012003	Surface Water	D					241:						
Surface Water Area 1-Red River Along Mine	RR-11C	20-Mar-03	RR-11C-D01N-SFW-032003	Surface Water	D					228:						
Surface Water Area 1-Red River Along Mine	RR-11C	03-Apr-03	RR-11C-D01N-SFW-040303	Surface Water	D					170:						
Surface Water Area 1-Red River Along Mine	RR-11C	15-Jul-03	RR-11C-D01N-SFW-071503	Surface Water	D					147:						
Surface Water Area 1-Red River Along Mine	RR-11C	25-Sep-03	RR-11C-D01N-SFW-092503	Surface Water	D					155:						
Surface Water Area 1-Red River Along Mine	RR-11C	19-Oct-03	RR-11C-D01N-SFW-101903	Surface Water	D					177:						
Surface Water Area 1-Red River Along Mine	RR-11C	13-Jan-04	RR-11C-D01N-SFW-011304	Surface Water	D					183:						
Surface Water Area 1-Red River Along Mine	RR-11C	19-Apr-04	RR-11C-D01N-SFW-041904	Surface Water	D					105:						
Surface Water Area 1-Red River Along Mine	RR-12	03-Oct-02	RR-12-D01N-SFW-100302	Surface Water	D					172:						
Surface Water Area 1-Red River Along Mine	RR-12	20-Jan-03	RR-12-D01N-SFW-012003	Surface Water	D					230:						
Surface Water Area 1-Red River Along Mine	RR-12	20-Mar-03	RR-12-D01N-SFW-032003	Surface Water	D					203:						
Surface Water Area 1-Red River Along Mine	RR-12	03-Apr-03	RR-12-D01N-SFW-040303	Surface Water	D					169:						
Surface Water Area 1-Red River Along Mine	RR-12	15-Jul-03	RR-12-D01N-SFW-071503	Surface Water	D					146:						
Surface Water Area 1-Red River Along Mine	RR-12	24-Sep-03	RR-12-D01N-SFW-092403	Surface Water	D					159:						
Surface Water Area 1-Red River Along Mine	RR-12	19-Oct-03	RR-12-D01N-SFW-101903	Surface Water	D					173:						
Surface Water Area 1-Red River Along Mine	RR-12	13-Jan-04	RR-12-D01N-SFW-011304	Surface Water	D					182:						
Surface Water Area 1-Red River Along Mine	RR-12	19-Apr-04	RR-12-D01N-SFW-041904	Surface Water	D					105:						
Surface Water Area 1-Red River Along Mine	RR-13	01-Oct-02	RR-13-D01N-SFW-100102	Surface Water	D					177:						
Surface Water Area 1-Red River Along Mine	RR-13	01-Oct-02	RR-13-T01N-SFW-100102	Surface Water	D					176:						
Surface Water Area 1-Red River Along Mine	RR-13	20-Jan-03	RR-13-D01N-SFW-012003	Surface Water	D					218:						
Surface Water Area 1-Red River Along Mine	RR-13	20-Mar-03	RR-13-D01N-SFW-032003	Surface Water	D					177:						
Surface Water Area 1-Red River Along Mine	RR-13	03-Apr-03	RR-13-D01N-SFW-040303	Surface Water	D					178:						
Surface Water Area 1-Red River Along Mine	RR-13	15-Jul-03	RR-13-D01N-SFW-071503	Surface Water	D					146:						
Surface Water Area 1-Red River Along Mine	RR-13	24-Sep-03	RR-13-D01N-SFW-092403	Surface Water	D					158:						
Surface Water Area 1-Red River Along Mine	RR-13	25-Sep-03	RR-13-D01N-SFW-092503	Surface Water	D					66:						

Surface Water Area 1-Red River Along Mine	RR-13	19-Oct-03	RR-13-D01N-SFW-101903	Surface Water	D					175:							
Surface Water Area 1-Red River Along Mine	RR-13	13-Jan-04	RR-13-D01N-SFW-011304	Surface Water	D					167:							
Surface Water Area 1-Red River Along Mine	RR-13	19-Apr-04	RR-13-D01N-SFW-041904	Surface Water	D					106:							
Surface Water Area 1-Red River Along Mine	RR-14	01-Oct-02	RR-14-D01N-SFW-100102	Surface Water	D					191:							
Surface Water Area 1-Red River Along Mine	RR-14	01-Oct-02	RR-14-T01N-SFW-100102	Surface Water	D					180:							
Surface Water Area 1-Red River Along Mine	RR-14	19-Jan-03	RR-14-D01N-SFW-011903	Surface Water	D					234:							
Surface Water Area 1-Red River Along Mine	RR-14	20-Mar-03	RR-14-D01N-SFW-032003	Surface Water	D					214:							
Surface Water Area 1-Red River Along Mine	RR-14	03-Apr-03	RR-14-D01N-SFW-040303	Surface Water	D					182:							
Surface Water Area 1-Red River Along Mine	RR-14	15-Jul-03	RR-14-D01N-SFW-071503	Surface Water	D					152:							
Surface Water Area 1-Red River Along Mine	RR-14	24-Sep-03	RR-14-D01N-SFW-092403	Surface Water	D					158:							
Surface Water Area 1-Red River Along Mine	RR-14	19-Oct-03	RR-14-D01N-SFW-101903	Surface Water	D					173:							
Surface Water Area 1-Red River Along Mine	RR-14	13-Jan-04	RR-14-D01N-SFW-011304	Surface Water	D					176:							
Surface Water Area 1-Red River Along Mine	RR-14	24-Feb-04	RR-14-D01N-SFW-022404	Surface Water	D					172:							
Surface Water Area 1-Red River Along Mine	RR-14	19-Apr-04	RR-14-D01N-SFW-041904	Surface Water	D					109:							
Surface Water Area 1-Red River Along Mine	RR-15	01-Oct-02	RR-15-D01N-SFW-100102	Surface Water	D					184:							
Surface Water Area 1-Red River Along Mine	RR-15	01-Oct-02	RR-15-T01N-SFW-100102	Surface Water	D					189:							
Surface Water Area 1-Red River Along Mine	RR-15	21-Mar-03	RR-15-D01N-SFW-032103	Surface Water	D					189:							
Surface Water Area 1-Red River Along Mine	RR-15	15-Jul-03	RR-15-D01N-SFW-071503	Surface Water	D					154:							
Surface Water Area 1-Red River Along Mine	RR-15	24-Sep-03	RR-15-D01N-SFW-092403	Surface Water	D					162:							
Surface Water Area 1-Red River Along Mine	RR-16	01-Oct-02	RR-16-D01N-SFW-100102	Surface Water	D					189:							
Surface Water Area 1-Red River Along Mine	RR-16	01-Oct-02	RR-16-T01N-SFW-100102	Surface Water	D					188:							
Surface Water Area 1-Red River Along Mine	RR-16	19-Jan-03	RR-16-D01N-SFW-011903	Surface Water	D					222:							
Surface Water Area 1-Red River Along Mine	RR-16	19-Mar-03	RR-16-D01N-SFW-031903	Surface Water	D					208:							
Surface Water Area 1-Red River Along Mine	RR-16	03-Apr-03	RR-16-D01N-SFW-040303	Surface Water	D					183:							
Surface Water Area 1-Red River Along Mine	RR-16	15-Jul-03	RR-16-D01N-SFW-071503	Surface Water	D					156:							
Surface Water Area 1-Red River Along Mine	RR-16	23-Sep-03	RR-16-D01N-SFW-092303	Surface Water	D					168:							
Surface Water Area 1-Red River Along Mine	RR-16	19-Oct-03	RR-16-D01N-SFW-101903	Surface Water	D					177:							
Surface Water Area 1-Red River Along Mine	RR-16	13-Jan-04	RR-16-D01N-SFW-011304	Surface Water	D					176:							
Surface Water Area 1-Red River Along Mine	RR-16	19-Apr-04	RR-16-D01N-SFW-041904	Surface Water	D					98:							
Surface Water Area 1-Red River Along Mine	RR-17	01-Oct-02	RR-17-D01N-SFW-100102	Surface Water	D					199:							
Surface Water Area 1-Red River Along Mine	RR-17	01-Oct-02	RR-17-T01N-SFW-100102	Surface Water	D					186:							
Surface Water Area 1-Red River Along Mine	RR-17	19-Mar-03	RR-17-D01N-SFW-031903	Surface Water	D					204:							
Surface Water Area 1-Red River Along Mine	RR-17	15-Jul-03	RR-17-D01N-SFW-071503	Surface Water	D					158:							
Surface Water Area 1-Red River Along Mine	RR-17	23-Sep-03	RR-17-D01N-SFW-092303	Surface Water	D					169:							
Surface Water Area 1-Red River Along Mine	RR-18A	01-Oct-02	RR-18A-D01N-SFW-100102	Surface Water	D					189:							
Surface Water Area 1-Red River Along Mine	RR-18A	19-Mar-03	RR-18A-D01N-SFW-031903	Surface Water	D					213:							
Surface Water Area 1-Red River Along Mine	RR-18A	16-Jul-03	RR-18A-D01N-SFW-071603	Surface Water	D					159:							
Surface Water Area 1-Red River Along Mine	RR-18A	23-Sep-03	RR-18A-D01N-SFW-092303	Surface Water	D					168:							
Surface Water Area 1-Red River Along Mine	RR-18B	30-Sep-02	RR-18B-D01N-SFW-093002	Surface Water	D					184:							
Surface Water Area 1-Red River Along Mine	RR-18B	30-Sep-02	RR-18B-T01N-SFW-093002	Surface Water	D					185:							
Surface Water Area 1-Red River Along Mine	RR-18B	19-Mar-03	RR-18B-D01N-SFW-031903	Surface Water	D					202:							
Surface Water Area 1-Red River Along Mine	RR-18B	16-Jul-03	RR-18B-D01N-SFW-071603	Surface Water	D					160:							
Surface Water Area 1-Red River Along Mine	RR-18B	23-Sep-03	RR-18B-D01N-SFW-092303	Surface Water	D					172:							
Surface Water Area 1-Red River Along Mine	RR-20	30-Sep-02	RR-20-D01N-SFW-093002	Surface Water	D					182:							
Surface Water Area 1-Red River Along Mine	RR-20	30-Sep-02	RR-20-T01N-SFW-093002	Surface Water	D					196:							
Surface Water Area 1-Red River Along Mine	RR-20	21-Mar-03	RR-20-D01N-SFW-032103	Surface Water	D					193:							
Surface Water Area 1-Red River Along Mine	RR-20	15-Jul-03	RR-20-D01N-SFW-071503	Surface Water	D					166:							
Surface Water Area 1-Red River Along Mine	RR-20	23-Sep-03	RR-20-D01N-SFW-092303	Surface Water	D					166:							
Surface Water Area 1-Red River Along Mine	RR-7	04-Oct-02	RR-7-D01N-SFW-100402	Surface Water	D					147:							
Surface Water Area 1-Red River Along Mine	RR-7	21-Jan-03	RR-7-D01N-SFW-012103	Surface Water	D					162:							
Surface Water Area 1-Red River Along Mine	RR-7	21-Mar-03	RR-7-D01N-SFW-032103	Surface Water	D					172:							
Surface Water Area 1-Red River Along Mine	RR-7	03-Apr-03	RR-7-D01N-SFW-040303	Surface Water	D					143:							
Surface Water Area 1-Red River Along Mine	RR-7	15-Jul-03	RR-7-D01N-SFW-071503	Surface Water	D					124:							
Surface Water Area 1-Red River Along Mine	RR-7	24-Sep-03	RR-7-D01N-SFW-092403	Surface Water	D					131:							
Surface Water Area 1-Red River Along Mine	RR-7	19-Oct-03	RR-7-D01N-SFW-101903	Surface Water	D					138:							
Surface Water Area 1-Red River Along Mine	RR-7	13-Jan-04	RR-7-D01N-SFW-011304	Surface Water	D					141:							
Surface Water Area 1-Red River Along Mine	RR-7	24-Feb-04	RR-7-D01N-SFW-022404	Surface Water	D					143:							
Surface Water Area 1-Red River Along Mine	RR-7	19-Apr-04	RR-7-D01N-SFW-041904	Surface Water	D					101:							
Surface Water Area 1-Red River Along Mine	RR-8	04-Oct-02	RR-8-D01N-SFW-100402	Surface Water	D					153:							
Surface Water Area 1-Red River Along Mine	RR-8	21-Mar-03	RR-8-D01N-SFW-032103	Surface Water	D					174:							
Surface Water Area 1-Red River Along Mine	RR-8	15-Jul-03	RR-8-D01N-SFW-071503	Surface Water	D					118:							
Surface Water Area 1-Red River Along Mine	RR-8	24-Sep-03	RR-8-D01N-SFW-092403	Surface Water	D					132:							
Surface Water Area 1-Red River Along Mine	RR-8A	04-Oct-02	RR-8A-D01N-SFW-100402	Surface Water	D					156:							
Surface Water Area 1-Red River Along Mine	RR-8A	21-Mar-03	RR-8A-D01N-SFW-032103	Surface Water	D					155:							
Surface Water Area 1-Red River Along Mine	RR-8A	15-Jul-03	RR-8A-D01N-SFW-071503	Surface Water	D					119:							
Surface Water Area 1-Red River Along Mine	RR-8A	24-Sep-03	RR-8A-D01N-SFW-092403	Surface Water	D					132:							
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	27-Sep-02	LR-11A-D01N-SFW-092702	Surface Water	D					243:							
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	27-Sep-02	LR-11A-T01N-SFW-092702	Surface Water	D					233:							
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	20-Mar-03	LR-11A-D01N-SFW-032003	Surface Water	D					249:							
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	14-Jul-03	LR-11A-D01N-SFW-071403	Surface Water	D					208:							
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	23-Sep-03	LR-11A-D01N-SFW-092303	Surface Water	D					205:							
Surface Water Area 11-Red River Along Tailings Facility	LR-13	26-Sep-02	LR-13-D01N-SFW-092602	Surface Water	D					238:							
Surface Water Area 11-Red River Along Tailings Facility	LR-13	26-Sep-02	LR-13-T01N-SFW-092602	Surface Water	D					232:							
Surface Water Area 11-Red River Along Tailings Facility	LR-13	20-Mar-03	LR-13-D01N-SFW-032003	Surface Water	D					247:							
Surface Water Area 11-Red River Along Tailings Facility	LR-13	14-Jul-03	LR-13-D01N-SFW-071403	Surface Water	D					209:							
Surface Water Area 11-Red River Along Tailings Facility	LR-13	21-Sep-03	LR-13-D01N-SFW-092103	Surface Water	D					191:							
Surface Water Area 11-Red River Along Tailings Facility	LR-16	26-Sep-02	LR-16-D01N-SFW-092602	Surface Water	D					230:							
Surface Water Area 11-Red River Along Tailings Facility	LR-16	26-Sep-02	LR-16-T01N-SFW-092602	Surface Water	D					229:							
Surface Water Area 11-Red River Along Tailings Facility	LR-16	20-Mar-03	LR-16-D01N-SFW-032003	Surface Water	D					255:							
Surface Water Area 11-Red River Along Tailings Facility	LR-16	14-Jul-03	LR-16-D01N-SFW-071403	Surface Water	D					201:							
Surface Water Area 11-Red River Along Tailings Facility	LR-16	21-Sep-03	LR-16-D01N-SFW-092103	Surface Water	D					203:							
Surface Water Area 11-Red River Along Tailings Facility	LR-5	30-Sep-02	LR-5-D01N-SFW-093002	Surface Water	D					191:							
Surface Water Area 11-Red River Along Tailings Facility	LR-5	30-Sep-02	LR-5-T01N-SFW-093002	Surface Water	D					187:							
Surface Water Area 11-Red River Along Tailings Facility	LR-5	21-Mar-03	LR-5-D01N-SFW-032103	Surface Water	D					214:							
Surface Water Area 11-Red River Along Tailings Facility	LR-5	15-Jul-03	LR-5-D01N-SFW-071503	Surface Water	D					170:							
Surface Water Area 11-Red River Along Tailings Facility	LR-5	23-Sep-03	LR-5-D01N-SFW-092303	Surface Water	D					176:							
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	27-Sep-02	LR-8A-D01N-SFW-092702	Surface Water	D					233:							
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	27-Sep-02	LR-8A-T01N-SFW-092702	Surface Water	D					230:							
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	23-Mar-03	LR-8A-D01N-SFW-032303	Surface Water	D					270:							
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	15-Jul-03	LR-8A-D01N-SFW-071503	Surface Water	D					201:							
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	23-Sep-03	LR-8A-D01N-SFW-092303	Surface Water	D					223:							
Reference Red River Above Mine Site	Zwergle	07-Oct-02	ZWERGEL-T01N-SFW-100702	Surface Water	D	8.8:	336:	6:				7.1:	212:		10.4:	9:	
Reference Upper Cabresto Creek Riparian	RRS-12	07-Oct-02	RRS-12-T01N-SFW-100702	Surface Water	D	10.1:	336:	2.9:				6.4:	203:		5.1:	9.9:	
Reference Upper Cabresto Creek Riparian	RRS-9	07-Oct-02	RRS-9-T01N-SFW-100702	Surface Water	D	9.3:	306:	1.3:				6.8:	169:		9.5:	9:	
Surface Water Area 1-Red River Along Mine	LR-1	30-Sep-02	LR-1-T01N-SFW-093002	Surface Water	D	9.1:	358:	21.8:				7.6:	364:		14.9:	20.4:	
Surface Water Area 1-Red River Along Mine	RR-13	01-Oct-02	RR-13-T01N-SFW-100102	Surface Water	D	9.2:	329:	17.9:				7:	363:		11.5:	13.7:	
Surface Water Area 1-Red River Along Mine	RR-14	01-Oct-02	RR-14-T01N-SFW-100102	Surface Water	D	9.4:	249:	18.4:				6.9:	371:		11.6:	17:	
Surface Water Area 1-Red River Along Mine	RR-15	01-Oct-02	RR-15-T01N-SFW-100102	Surface Water	D	9.6:	279:	22.4:				6.8:	327:		10.5:	16.6:	
Surface Water Area 1-Red River Along Mine	RR-16	01-Oct-02	RR-16-T01N-SFW-100102	Surface Water	D	9.5:	299:	15.7:				6.8:	374:		9.1:	19.9:	
Surface Water Area 1-Red River Along Mine	RR-17	01-Oct-02	RR-17-T01N-SFW-100102	Surface Water	D	9.7:	365:	15.2:				6.6:	381:		9.1:	21.3:	
Surface Water Area 1-Red River Along Mine	RR-18B	30-Sep-02	RR-18B-T01N-SFW-093002	Surface Water	D	8.6:	341:	14.4:				7.7:	354:		15.1:	21.6:	
Surface Water Area 1-Red River Along Mine	RR-20	30-Sep-02	RR-20-T01N-SFW-093002	Surface Water	D	9:	344:	18.9:				6.7:	357:		14.6:	22.7:	
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	27-Sep-02	LR-11A-T01N-SFW-092702	Surface Water	D		214:	20.5:				6.7:	494:		14.7:	24.1:	
Surface Water Area 11-Red River Along Tailings Facility	LR-13	26-Sep-02	LR-13-T01N-SFW-092602	Surface Water	D		234:	21.4:				6.8:	487:		15.1:	26.5:	
Surface Water Area 11-Red River Along Tailings Facility	LR-16	26-Sep-02	LR-16-T01N-SFW-092602	Surface Water	D		264:	21.5:				6.4:	488:		14.6:	24.1:	
Surface Water Area 11-Red River Along Tailings Facility	LR-5	30-Sep-02	LR-5-T01N-SFW-093002	Surface Water	D	9.7:	328:	21.8:				7.5:	366:		11.9:	22.1:	
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	27-Sep-02	LR-8A-T01N-SFW-092702	Surface Water	D	7.9:	235:	18.1:				6.2:	487:		14.4:	41.7:	
Reference Red River Above Mine Site	Zwergle	07-Oct-02	ZWERGEL-T01N-SFW-100702	Surface Water	D				<0.21:		<0.005J			23.3:			
Reference Upper Cabresto Creek Riparian	RRS-12	07-Oct-02	RRS-12-T01N-SFW-100702	Surface Water	D				0.47:		<0.005J			65.1:			
Reference Upper Cabresto Creek Riparian	RRS-9	07-Oct-02	RRS-9-T01N-SFW-100702	Surface Water	D				<0.23:		<0.005J			26.1:			
Surface Water Area 1-Red River Along Mine	LR-1	30-Sep-02	LR-1-T01N-SFW-093002	Surface Water	D				0.76:		<0.005J			134:			
Surface Water Area 1-Red River Along Mine	RR-13	01-Oct-02	RR-13-T01N-SFW-100102	Surface Water	D				<0.36:		<0.005:			126:			
Surface Water Area 1-Red River Along Mine	RR-14	01-Oct-02	RR-14-T01N-SFW-100102	Surface Water	D				0.65:		<0.005:			133:			
Surface Water Area 1-Red River Along Mine	RR-15	01-Oct-02	RR-15-T01N-SFW-100102	Surface Water	D				1.1:		<0.005:			135:			
Surface Water Area 1-Red River Along Mine	RR-16	01-Oct-02	RR-16-T01N-SFW-100102	Surface Water	D				0.73:		<0.005:			143:			
Surface Water Area 1-Red River Along Mine	RR-17	01-Oct-02	RR-17-T01N-SFW-100102	Surface Water	D				0.77:		<0.005:			148:			
Surface Water Area 1-Red River Along Mine	RR-18B	30-Sep-02	RR-18B-T01N-SFW-093002	Surface Water	D				0.76:		<0.005:			132:			
Surface Water Area 1-Red River Along Mine	RR-20	30-Sep-02	RR-20-T01N-SFW-093002	Surface Water	D				0.67:		<0.005J			133:			
Surface Water Area 11-Red River Along Tailings Facility	LR-11A	27-Sep-02	LR-11A-T01N-SFW-092702	Surface Water	D				0.8:		<0.005J			171:			
Surface Water Area 11-Red River Along Tailings Facility	LR-13	26-Sep-02	LR-13-T01N-SFW-092602	Surface Water	D				0.84:		<0.005:			168:			
Surface Water Area 11-Red River Along Tailings Facility	LR-16	26-Sep-02	LR-16-T01N-SFW-092602	Surface Water	D				0.8:		<0.005:			169:			
Surface Water Area 11-Red River Along Tailings Facility	LR-5	30-Sep-02	LR-5-T01N-SFW-093002	Surface Water	D				0.72:		<0.005J			136:			
Surface Water Area 11-Red River Along Tailings Facility	LR-8A	27-Sep-02	LR-8A-T01N-SFW-092702	Surface Water	D				0.8:		<0.005J			168:			

	EXPOSURE_AREA_LOOKUP_DESCRIPTION	SITE_ID	SAMP_DATE	SAMP_ID	MEDIUM_TYPE_LOOKUP_DESCRIPTION	SAMP_FRACTION	DO mg/L	Eh millivolts	Flow cfs	Fluoride mg/L	Hardness mg/L	Nitrite mg/L	pH SU	Specific Conductance uS/cm	Sulfate mg/L	Temperature Celsius	Turbidity NTU
	Reference Lower Cabresto Creek Riparian	RRS-18	06-Oct-02	RRS-18-D01N-SFW-100602	Surface Water	D					105						
	Reference Lower Cabresto Creek Riparian	RRS-18	23-Mar-03	RRS-18-D01N-SFW-032303	Surface Water	D					89						
	Reference Lower Cabresto Creek Riparian	RRS-20	06-Oct-02	RRS-20-D01N-SFW-100602	Surface Water	D					111						
	Reference Lower Cabresto Creek Riparian	RRS-20	23-Mar-03	RRS-20-D01N-SFW-032303	Surface Water	D					87.4						
	Reference Lower Cabresto Creek Riparian	RRS-20	16-Jul-03	RRS-20-D01N-SFW-071603	Surface Water	D					84.9						
	Reference Lower Cabresto Creek Riparian	RRS-20	25-Sep-03	RRS-20-D01N-SFW-092503	Surface Water	D					81.5						
	Reference Lower Cabresto Creek Riparian	RRS-23	06-Oct-02	RRS-23-D01N-SFW-100602	Surface Water	D					99.6						
	Reference Lower Cabresto Creek Riparian	RRS-23	23-Mar-03	RRS-23-D01N-SFW-032303	Surface Water	D					95.2						
	Reference Lower Cabresto Creek Riparian	RRS-23	16-Jul-03	RRS-23-D01N-SFW-071603	Surface Water	D					111						
	Reference Lower Cabresto Creek Riparian	RRS-23	25-Sep-03	RRS-23-D01N-SFW-092503	Surface Water	D					76.7						
	Reference Lower Cabresto Creek Riparian	RRS-27	06-Oct-02	RRS-27-D01N-SFW-100602	Surface Water	D					162						
	Reference Lower Cabresto Creek Riparian	RRS-27	23-Mar-03	RRS-27-D01N-SFW-032303	Surface Water	D					102						
	Reference Lower Cabresto Creek Riparian	RRS-27	16-Jul-03	RRS-27-D01N-SFW-071603	Surface Water	D					112						
	Reference Lower Cabresto Creek Riparian	RRS-27	25-Sep-03	RRS-27-D01N-SFW-092503	Surface Water	D					84.4						
	Reference Red River Above Mine Site	RR-1	04-Oct-02	RR-1-D01N-SFW-100402	Surface Water	D					112						
	Reference Red River Above Mine Site	RR-1	21-Mar-03	RR-1-D01N-SFW-032103	Surface Water	D					111						
	Reference Red River Above Mine Site	RR-1	16-Jul-03	RR-1-D01N-SFW-071603	Surface Water	D					91.1						
	Reference Red River Above Mine Site	RR-1	25-Sep-03	RR-1-D01N-SFW-092503	Surface Water	D					104						
	Reference Red River Above Mine Site	RR-3	03-Oct-02	RR-3-D01N-SFW-100302	Surface Water	D					119						
	Reference Red River Above Mine Site	RR-3	21-Mar-03	RR-3-D01N-SFW-032103	Surface Water	D					123						
	Reference Red River Above Mine Site	RR-3	16-Jul-03	RR-3-D01N-SFW-071603	Surface Water	D					109						
	Reference Red River Above Mine Site	RR-3	25-Sep-03	RR-3-D01N-SFW-092503	Surface Water	D					120						
	Reference Red River Above Mine Site	RR-4	04-Oct-02	RR-4-D01N-SFW-100402	Surface Water	D					131						
	Reference Red River Above Mine Site	RR-4	21-Mar-03	RR-4-D01N-SFW-032103	Surface Water	D					147						
	Reference Red River Above Mine Site	RR-4	16-Jul-03	RR-4-D01N-SFW-071603	Surface Water	D					110						
	Reference Red River Above Mine Site	RR-4	25-Sep-03	RR-4-D01N-SFW-092503	Surface Water	D					114						
	Reference Red River Above Mine Site	RR-5	03-Oct-02	RR-5-D01N-SFW-100302	Surface Water	D					138						
	Reference Red River Above Mine Site	RR-5	21-Mar-03	RR-5-D01N-SFW-032103	Surface Water	D					136						
	Reference Red River Above Mine Site	RR-5	16-Jul-03	RR-5-D01N-SFW-071603	Surface Water	D					116						
	Reference Red River Above Mine Site	RR-5	24-Sep-03	RR-5-D01N-SFW-092403	Surface Water	D					114						
	Reference Red River Above Mine Site	RR-6	04-Oct-02	RR-6-D01N-SFW-100402	Surface Water	D					149						
	Reference Red River Above Mine Site	RR-6	21-Mar-03	RR-6-D01N-SFW-032103	Surface Water	D					173						
	Reference Red River Above Mine Site	RR-6	16-Jul-03	RR-6-D01N-SFW-071603	Surface Water	D					127						
	Reference Red River Above Mine Site	RR-6	24-Sep-03	RR-6-D01N-SFW-092403	Surface Water	D					134						
	Reference Red River Above Mine Site	RR-6A	04-Oct-02	RR-6A-D01N-SFW-100402	Surface Water	D					146						
	Reference Red River Above Mine Site	RR-6A	21-Mar-03	RR-6A-D01N-SFW-032103	Surface Water	D					161						
	Reference Red River Above Mine Site	RR-6A	15-Jul-03	RR-6A-D01N-SFW-071503	Surface Water	D					117						
	Reference Red River Above Mine Site	RR-6A	24-Sep-03	RR-6A-D01N-SFW-092403	Surface Water	D					124						
	Reference Red River Above Mine Site	RR-6V	16-Jul-03	RR-6V-D01N-SFW-071603	Surface Water	D					116						
	Reference Red River Above Mine Site	RR-6V	24-Sep-03	RR-6V-D01N-SFW-092403	Surface Water	D					113						
	Reference Red River Above Mine Site	Zwergle	07-Oct-02	ZWERGEL-D01N-SFW-100702	Surface Water	D					115						
	Reference Red River Above Mine Site	Zwergle	07-Oct-02	ZWERGEL-T01N-SFW-100702	Surface Water	D					115						
	Reference Red River Above Mine Site	Zwergle	23-Mar-03	ZWERGEL-D01N-SFW-032303	Surface Water	D					119						
	Reference Red River Above Mine Site	Zwergle	16-Jul-03	ZWERGEL-D01N-SFW-071603	Surface Water	D					85.9						
	Reference Red River Above Mine Site	Zwergle	25-Sep-03	ZWERGEL-D01N-SFW-092503	Surface Water	D					106						
	Reference Upper Cabresto Creek Riparian	RRS-12	07-Oct-02	RRS-12-D01N-SFW-100702	Surface Water	D					95						
	Reference Upper Cabresto Creek Riparian	RRS-12	07-Oct-02	RRS-12-T01N-SFW-100702	Surface Water	D					96.1						
	Reference Upper Cabresto Creek Riparian	RRS-12	23-Mar-03	RRS-12-D01N-SFW-032303	Surface Water	D					91.4						
	Reference Upper Cabresto Creek Riparian	RRS-12	16-Jul-03	RRS-12-D01N-SFW-071603	Surface Water	D					90.6						
	Reference Upper Cabresto Creek Riparian	RRS-12	25-Sep-03	RRS-12-D01N-SFW-092503	Surface Water	D					90.4						
	Reference Upper Cabresto Creek Riparian	RRS-13	06-Oct-02	RRS-13-D01N-SFW-100602	Surface Water	D					74.9						
	Reference Upper Cabresto Creek Riparian	RRS-13	23-Mar-03	RRS-13-D01N-SFW-032303	Surface Water	D					75.7						
	Reference Upper Cabresto Creek Riparian	RRS-13	16-Jul-03	RRS-13-D01N-SFW-071603	Surface Water	D					56.5						
	Reference Upper Cabresto Creek Riparian	RRS-15	06-Oct-02	RRS-15-D01N-SFW-100602	Surface Water	D					77.2						
	Reference Upper Cabresto Creek Riparian	RRS-15	23-Mar-03	RRS-15-D01N-SFW-032303	Surface Water	D					80						
	Reference Upper Cabresto Creek Riparian	RRS-15	16-Jul-03	RRS-15-D01N-SFW-071603	Surface Water	D					61.6						
	Reference Upper Cabresto Creek Riparian	RRS-9	07-Oct-02	RRS-9-D01N-SFW-100702	Surface Water	D					79.1						
	Reference Upper Cabresto Creek Riparian	RRS-9	07-Oct-02	RRS-9-T01N-SFW-100702	Surface Water	D					81.4						
	Reference Upper Cabresto Creek Riparian	RRS-9	23-Mar-03	RRS-9-D01N-SFW-032303	Surface Water	D					77.7						
	Reference Upper Cabresto Creek Riparian	RRS-9	16-Jul-03	RRS-9-D01N-SFW-071603	Surface Water	D					69						
	Reference Upper Cabresto Creek Riparian	RRS-9	25-Sep-03	RRS-9-D01N-SFW-092503	Surface Water	D					78.6						
	Reference Upper Cabresto Creek Riparian	UPPER CABRESTO CREEK	23-Mar-03	UCC-D01N-SFW-032303	Surface Water	D					90.2						
	Reference Upper Cabresto Creek Riparian	UPPER CABRESTO CREEK	16-Jul-03	UPPERCABRESTO-D01N-SFW-071603	Surface Water	D					61.5						
	Reference Upper Cabresto Creek Riparian	UPPER CABRESTO CREEK	25-Sep-03	UPPERCABRESTO-D01N-SFW-092503	Surface Water	D					69.1						
	Surface Water Area 1-Red River Along Mine	LR-1	30-Sep-02	LR-1-D01N-SFW-093002	Surface Water	D					189						
	Surface Water Area 1-Red River Along Mine	LR-1	30-Sep-02	LR-1-T01N-SFW-093002	Surface Water	D					194						
	Surface Water Area 1-Red River Along Mine	LR-1	20-Mar-03	LR-1-D01N-SFW-032003	Surface Water	D					222						
	Surface Water Area 1-Red River Along Mine	LR-1	15-Jul-03	LR-1-D01N-SFW-071503	Surface Water	D					168						
	Surface Water Area 1-Red River Along Mine	LR-1	24-Sep-03	LR-1-D01N-SFW-092403	Surface Water	D					170						
	Surface Water Area 1-Red River Along Mine	RR-10	03-Oct-02	RR-10-D01N-SFW-100302	Surface Water	D					151						
	Surface Water Area 1-Red River Along Mine	RR-10	21-Jan-03	RR-10-D01N-SFW-012103	Surface Water	D					152						
	Surface Water Area 1-Red River Along Mine	RR-10	20-Mar-03	RR-10-D01N-SFW-032003	Surface Water	D					162						
	Surface Water Area 1-Red River Along Mine	RR-10	03-Apr-03	RR-10-D01N-SFW-040303	Surface Water	D					142						
	Surface Water Area 1-Red River Along Mine	RR-10	15-Jul-03	RR-10-D01N-SFW-071503	Surface Water	D					122						
	Surface Water Area 1-Red River Along Mine	RR-10	24-Sep-03	RR-10-D01N-SFW-092403	Surface Water	D					133						
	Surface Water Area 1-Red River Along Mine	RR-10	19-Oct-03	RR-10-D01N-SFW-101903	Surface Water	D					146						
	Surface Water Area 1-Red River Along Mine	RR-10	13-Jan-04	RR-10-D01N-SFW-011304	Surface Water	D					146						
	Surface Water Area 1-Red River Along Mine	RR-10	24-Feb-04	RR-10-D01N-SFW-022404	Surface Water	D					143						
	Surface Water Area 1-Red River Along Mine	RR-10	19-Apr-04	RR-10-D01N-SFW-041904	Surface Water	D					101						
	Surface Water Area 1-Red River Along Mine	RR-10A1	03-Oct-02	RR-10A1-D01N-SFW-100302	Surface Water	D					139						
	Surface Water Area 1-Red River Along Mine	RR-10A1	20-Jan-03	RR-10A1-D01N-SFW-012003	Surface Water	D					160						
	Surface Water Area 1-Red River Along Mine	RR-10A1	20-Mar-03	RR-10A1-D01N-SFW-032003	Surface Water	D					145						
	Surface Water Area 1-Red River Along Mine	RR-10A1	03-Apr-03	RR-10A1-D01N-SFW-040303	Surface Water	D					130						
	Surface Water Area 1-Red River Along Mine	RR-10A1	15-Jul-03	RR-10A1-D01N-SFW-071503	Surface Water	D					112						
	Surface Water Area 1-Red River Along Mine	RR-10A1	24-Sep-03	RR-10A1-D01N-SFW-092403	Surface Water	D					127						
	Surface Water Area 1-Red River Along Mine	RR-10A1	19-Oct-03	RR-10A1-D01N-SFW-101903	Surface Water	D					130						
	Surface Water Area 1-Red River Along Mine	RR-10A1	13-Jan-04	RR-10A1-D01N-SFW-011304	Surface Water	D					135						
	Surface Water Area 1-Red River Along Mine	RR-10A1	19-Apr-04	RR-10A1-D01N-SFW-041904	Surface Water	D					109						
	Surface Water Area 1-Red River Along Mine	RR-11A1	03-Oct-02	RR-11A1-D01N-SFW-100302	Surface Water	D					135						
	Surface Water Area 1-Red River Along Mine	RR-11A1	20-Jan-03	RR-11A1-D01N-SFW-012003	Surface Water	D					140						
	Surface Water Area 1-Red River Along Mine	RR-11A1	21-Mar-03	RR-11A1-D01N-SFW-032103	Surface Water	D					134						
	Surface Water Area 1-Red River Along Mine	RR-11A1	03-Apr-03	RR-11A1-D01N-SFW-040303	Surface Water	D					141						
	Surface Water Area 1-Red River Along Mine	RR-11A1	15-Jul-03	RR-11A1-D01N-SFW-071503	Surface Water	D					112						
	Surface Water Area 1-Red River Along Mine	RR-11A1	24-Sep-03	RR-11A1-D01N-SFW-092403	Surface Water	D					132						
	Surface Water Area 1-Red River Along Mine	RR-11A1	19-Oct-03	RR-11A1-D01N-SFW-101903	Surface Water	D					133						
	Surface Water Area 1-Red River Along Mine	RR-11A1	13-Jan-04	RR-11A1-D01N-SFW-011304	Surface Water	D					133						
	Surface Water Area 1-Red River Along Mine	RR-11A1	19-Apr-04	RR-11A1-D01N-SFW-041904	Surface Water	D					95.2						
	Surface Water Area 1-Red River Along Mine	RR-11B	03-Oct-02	RR-11B-D01N-SFW-100302	Surface Water	D					144						
	Surface Water Area 1-Red River Along Mine	RR-11B	20-Mar-03	RR-11B-D01N-SFW-032003	Surface Water	D					206						
	Surface Water Area 1-Red River Along Mine	RR-11B	15-Jul-03	RR-11B-D01N-SFW-071503	Surface Water	D					127						
	Surface Water Area 1-Red River Along Mine	RR-11B	24-Sep-03	RR-11B-D01N-SFW-092403	Surface Water	D					136						
	Surface Water Area 1-Red River Along Mine	RR-11C	01-Oct-02	RR-11C-D01N-SFW-100102	Surface Water	D					175						
	Surface Water Area 1-Red River Along Mine	RR-11C	20-Jan-03	RR-11C-D01N-SFW-012003	Surface Water	D					241						
	Surface Water Area 1-Red River Along Mine	RR-11C	20-Mar-03	RR-11C-D01N-SFW-032003	Surface Water	D					228						
	Surface Water Area 1-Red River Along Mine	RR-11C	03-Apr-03	RR-11C-D01N-SFW-040303	Surface Water	D					170						
	Surface Water Area 1-Red River Along Mine	RR-11C	15-Jul-03	RR-11C-D01N-SFW-071503	Surface Water	D					147						
	Surface Water Area 1-Red River Along Mine	RR-11C	25-Sep-03	RR-11C-D01N-SFW-092503	Surface Water	D					155						
	Surface Water Area 1-Red River Along Mine	RR-11C	19-Oct-03	RR-11C-D01N-SFW-101903	Surface Water	D					177						
	Surface Water Area 1-Red River Along Mine	RR-11C	13-Jan-04	RR-11C-D01N-SFW-011304	Surface Water	D					183						
	Surface Water Area 1-Red River Along Mine	RR-11C	19-Apr-04	RR-11C-D01N-SFW-041904	Surface Water	D					105						
	Surface Water Area 1-Red River Along Mine	RR-12	03-Oct-02	RR-12-D01N-SFW-100302	Surface Water	D					172						
	Surface Water Area 1-Red River Along Mine	RR-12	20-Jan-03	RR-12-D01N-SFW-012003	Surface Water	D					230						
	Surface Water Area 1-Red River Along Mine	RR-12	20-Mar-03	RR-12-D01N-SFW-032003	Surface Water	D					203						
	Surface Water Area 1-Red River Along Mine	RR-12	03-Apr-03	RR-12-D01N-SFW-040303	Surface Water	D					169						
	Surface Water Area 1-Red River Along Mine	RR-12	15-Jul-03	RR-12-D01N-SFW-071503	Surface Water	D					146						
	Surface Water Area 1-Red River Along Mine	RR-12	24-Sep-03	RR-12-D01N-SFW-092403	Surface Water	D					159						
	Surface Water Area 1-Red River Along Mine	RR-12	19-Oct-03	RR-12-D01N-SFW-101903	Surface Water	D					173						
	Surface Water Area 1-Red River Along Mine	RR-12	13-Jan-04	RR-12-D01N-SFW-011304	Surface Water	D					182						
	Surface Water Area 1-Red River Along Mine	RR-12	19-Apr-04	RR-12-D01N-SFW-041904	Surface Water	D					105						
	Surface Water Area 1-Red River Along Mine	RR-13	01-Oct-02	RR-13-D01N-SFW-100102	Surface Water	D					177						
	Surface Water Area 1-Red River Along Mine	RR-13	01-Oct-02	RR-13-T01N-SFW-100102	Surface Water	D					176						
	Surface Water Area 1-Red River Along Mine	RR-13	20-Jan-03	RR-13-D01N-SFW-012003	Surface Water	D					218						
	Surface Water Area 1-Red River Along Mine	RR-13	20-Mar-03	RR-13-D01N-SFW-032003	Surface Water	D					177						
	Surface Water Area 1-Red River Along Mine	RR-13	03-Apr-03	RR-13-D01N-SFW-040303	Surface Water	D					178						
	Surface Water Area 1-Red River Along Mine	RR-13	15-Jul-03	RR-13-D01N-SFW-071503	Surface Water	D					146						
	Surface Water Area 1-Red River Along Mine	RR-13	24-Sep-03	RR-13-D01N-SFW-092403	Surface Water	D					158						
	Surface Water Area 1-Red River Along Mine	RR-13	25-Sep-03	RR-13-D01N-SFW-092503	Surface Water	D					66						
	Surface Water Area 1-Red River Along Mine	RR-13	19-Oct-03	RR-13-D01N-SFW-101903	Surface Water	D					175						
	Surface Water Area 1-Red River Along Mine	RR-13	13-Jan-04	RR-13-D01N-SFW-011304	Surface Water	D					167						
	Surface Water Area 1-Red River Along Mine	RR-13	19-Apr-04	RR-13-D01N-SFW-041904	Surface Water	D					106						
	Surface Water Area 1-Red River Along Mine	RR-14	01-Oct-02	RR-14-D01N-SFW-100102	Surface Water	D					191						

	Surface Water Area 1-Red River Along Mine	RR-14	01-Oct-02	RR-14-T01N-SFW-100102	Surface Water	D					180						
	Surface Water Area 1-Red River Along Mine	RR-14	19-Jan-03	RR-14-D01N-SFW-011903	Surface Water	D					234						
	Surface Water Area 1-Red River Along Mine	RR-14	20-Mar-03	RR-14-D01N-SFW-032003	Surface Water	D					214						
	Surface Water Area 1-Red River Along Mine	RR-14	03-Apr-03	RR-14-D01N-SFW-040303	Surface Water	D					182						
	Surface Water Area 1-Red River Along Mine	RR-14	15-Jul-03	RR-14-D01N-SFW-071503	Surface Water	D					152						
	Surface Water Area 1-Red River Along Mine	RR-14	24-Sep-03	RR-14-D01N-SFW-092403	Surface Water	D					158						
	Surface Water Area 1-Red River Along Mine	RR-14	19-Oct-03	RR-14-D01N-SFW-101903	Surface Water	D					173						
	Surface Water Area 1-Red River Along Mine	RR-14	13-Jan-04	RR-14-D01N-SFW-011304	Surface Water	D					176						
	Surface Water Area 1-Red River Along Mine	RR-14	24-Feb-04	RR-14-D01N-SFW-022404	Surface Water	D					172						
	Surface Water Area 1-Red River Along Mine	RR-14	19-Apr-04	RR-14-D01N-SFW-041904	Surface Water	D					109						
	Surface Water Area 1-Red River Along Mine	RR-15	01-Oct-02	RR-15-D01N-SFW-100102	Surface Water	D					184						
	Surface Water Area 1-Red River Along Mine	RR-15	01-Oct-02	RR-15-T01N-SFW-100102	Surface Water	D					189						
	Surface Water Area 1-Red River Along Mine	RR-15	21-Mar-03	RR-15-D01N-SFW-032103	Surface Water	D					189						
	Surface Water Area 1-Red River Along Mine	RR-15	15-Jul-03	RR-15-D01N-SFW-071503	Surface Water	D					154						
	Surface Water Area 1-Red River Along Mine	RR-15	24-Sep-03	RR-15-D01N-SFW-092403	Surface Water	D					162						
	Surface Water Area 1-Red River Along Mine	RR-16	01-Oct-02	RR-16-D01N-SFW-100102	Surface Water	D					189						
	Surface Water Area 1-Red River Along Mine	RR-16	01-Oct-02	RR-16-T01N-SFW-100102	Surface Water	D					188						
	Surface Water Area 1-Red River Along Mine	RR-16	19-Jan-03	RR-16-D01N-SFW-011903	Surface Water	D					222						
	Surface Water Area 1-Red River Along Mine	RR-16	19-Mar-03	RR-16-D01N-SFW-031903	Surface Water	D					208						
	Surface Water Area 1-Red River Along Mine	RR-16	03-Apr-03	RR-16-D01N-SFW-040303	Surface Water	D					183						
	Surface Water Area 1-Red River Along Mine	RR-16	15-Jul-03	RR-16-D01N-SFW-071503	Surface Water	D					156						
	Surface Water Area 1-Red River Along Mine	RR-16	23-Sep-03	RR-16-D01N-SFW-092303	Surface Water	D					168						
	Surface Water Area 1-Red River Along Mine	RR-16	19-Oct-03	RR-16-D01N-SFW-101903	Surface Water	D					177						
	Surface Water Area 1-Red River Along Mine	RR-16	13-Jan-04	RR-16-D01N-SFW-011304	Surface Water	D					176						
	Surface Water Area 1-Red River Along Mine	RR-16	19-Apr-04	RR-16-D01N-SFW-041904	Surface Water	D					98						
	Surface Water Area 1-Red River Along Mine	RR-17	01-Oct-02	RR-17-D01N-SFW-100102	Surface Water	D					199						
	Surface Water Area 1-Red River Along Mine	RR-17	01-Oct-02	RR-17-T01N-SFW-100102	Surface Water	D					186						
	Surface Water Area 1-Red River Along Mine	RR-17	19-Mar-03	RR-17-D01N-SFW-031903	Surface Water	D					204						
	Surface Water Area 1-Red River Along Mine	RR-17	15-Jul-03	RR-17-D01N-SFW-071503	Surface Water	D					158						
	Surface Water Area 1-Red River Along Mine	RR-17	23-Sep-03	RR-17-D01N-SFW-092303	Surface Water	D					169						
	Surface Water Area 1-Red River Along Mine	RR-18A	01-Oct-02	RR-18A-D01N-SFW-100102	Surface Water	D					189						
	Surface Water Area 1-Red River Along Mine	RR-18A	19-Mar-03	RR-18A-D01N-SFW-031903	Surface Water	D					213						
	Surface Water Area 1-Red River Along Mine	RR-18A	16-Jul-03	RR-18A-D01N-SFW-071603	Surface Water	D					159						
	Surface Water Area 1-Red River Along Mine	RR-18A	23-Sep-03	RR-18A-D01N-SFW-092303	Surface Water	D					168						
	Surface Water Area 1-Red River Along Mine	RR-18B	30-Sep-02	RR-18B-D01N-SFW-093002	Surface Water	D					184						
	Surface Water Area 1-Red River Along Mine	RR-18B	30-Sep-02	RR-18B-T01N-SFW-093002	Surface Water	D					185						
	Surface Water Area 1-Red River Along Mine	RR-18B	19-Mar-03	RR-18B-D01N-SFW-031903	Surface Water	D					202						
	Surface Water Area 1-Red River Along Mine	RR-18B	16-Jul-03	RR-18B-D01N-SFW-071603	Surface Water	D					160						
	Surface Water Area 1-Red River Along Mine	RR-18B	23-Sep-03	RR-18B-D01N-SFW-092303	Surface Water	D					172						
	Surface Water Area 1-Red River Along Mine	RR-20	30-Sep-02	RR-20-D01N-SFW-093002	Surface Water	D					182						
	Surface Water Area 1-Red River Along Mine	RR-20	30-Sep-02	RR-20-T01N-SFW-093002	Surface Water	D					196						
	Surface Water Area 1-Red River Along Mine	RR-20	21-Mar-03	RR-20-D01N-SFW-032103	Surface Water	D					193						
	Surface Water Area 1-Red River Along Mine	RR-20	15-Jul-03	RR-20-D01N-SFW-071503	Surface Water	D					166						
	Surface Water Area 1-Red River Along Mine	RR-20	23-Sep-03	RR-20-D01N-SFW-092303	Surface Water	D					166						
	Surface Water Area 1-Red River Along Mine	RR-7	04-Oct-02	RR-7-D01N-SFW-100402	Surface Water	D					147						
	Surface Water Area 1-Red River Along Mine	RR-7	21-Jan-03	RR-7-D01N-SFW-012103	Surface Water	D					162						
	Surface Water Area 1-Red River Along Mine	RR-7	21-Mar-03	RR-7-D01N-SFW-032103	Surface Water	D					172						
	Surface Water Area 1-Red River Along Mine	RR-7	03-Apr-03	RR-7-D01N-SFW-040303	Surface Water	D					143						
	Surface Water Area 1-Red River Along Mine	RR-7	15-Jul-03	RR-7-D01N-SFW-071503	Surface Water	D					124						
	Surface Water Area 1-Red River Along Mine	RR-7	24-Sep-03	RR-7-D01N-SFW-092403	Surface Water	D					131						
	Surface Water Area 1-Red River Along Mine	RR-7	19-Oct-03	RR-7-D01N-SFW-101903	Surface Water	D					138						
	Surface Water Area 1-Red River Along Mine	RR-7	13-Jan-04	RR-7-D01N-SFW-011304	Surface Water	D					141						
	Surface Water Area 1-Red River Along Mine	RR-7	24-Feb-04	RR-7-D01N-SFW-022404	Surface Water	D					143						
	Surface Water Area 1-Red River Along Mine	RR-7	19-Apr-04	RR-7-D01N-SFW-041904	Surface Water	D					101						
	Surface Water Area 1-Red River Along Mine	RR-8	04-Oct-02	RR-8-D01N-SFW-100402	Surface Water	D					153						
	Surface Water Area 1-Red River Along Mine	RR-8	21-Mar-03	RR-8-D01N-SFW-032103	Surface Water	D					174						
	Surface Water Area 1-Red River Along Mine	RR-8	15-Jul-03	RR-8-D01N-SFW-071503	Surface Water	D					118						
	Surface Water Area 1-Red River Along Mine	RR-8	24-Sep-03	RR-8-D01N-SFW-092403	Surface Water	D					132						
	Surface Water Area 1-Red River Along Mine	RR-8A	04-Oct-02	RR-8A-D01N-SFW-100402	Surface Water	D					156						
	Surface Water Area 1-Red River Along Mine	RR-8A	21-Mar-03	RR-8A-D01N-SFW-032103	Surface Water	D					155						
	Surface Water Area 1-Red River Along Mine	RR-8A	15-Jul-03	RR-8A-D01N-SFW-071503	Surface Water	D					119						
	Surface Water Area 1-Red River Along Mine	RR-8A	24-Sep-03	RR-8A-D01N-SFW-092403	Surface Water	D					132						
	Surface Water Area 11-Red River Along Tailings Facility	LR-11A	27-Sep-02	LR-11A-D01N-SFW-092702	Surface Water	D					243						
	Surface Water Area 11-Red River Along Tailings Facility	LR-11A	27-Sep-02	LR-11A-T01N-SFW-092702	Surface Water	D					233						
	Surface Water Area 11-Red River Along Tailings Facility	LR-11A	20-Mar-03	LR-11A-D01N-SFW-032003	Surface Water	D					249						
	Surface Water Area 11-Red River Along Tailings Facility	LR-11A	14-Jul-03	LR-11A-D01N-SFW-071403	Surface Water	D					208						
	Surface Water Area 11-Red River Along Tailings Facility	LR-11A	23-Sep-03	LR-11A-D01N-SFW-092303	Surface Water	D					205						
	Surface Water Area 11-Red River Along Tailings Facility	LR-13	26-Sep-02	LR-13-D01N-SFW-092602	Surface Water	D					238						
	Surface Water Area 11-Red River Along Tailings Facility	LR-13	26-Sep-02	LR-13-T01N-SFW-092602	Surface Water	D					232						
	Surface Water Area 11-Red River Along Tailings Facility	LR-13	20-Mar-03	LR-13-D01N-SFW-032003	Surface Water	D					247						
	Surface Water Area 11-Red River Along Tailings Facility	LR-13	14-Jul-03	LR-13-D01N-SFW-071403	Surface Water	D					209						
	Surface Water Area 11-Red River Along Tailings Facility	LR-13	21-Sep-03	LR-13-D01N-SFW-092103	Surface Water	D					191						
	Surface Water Area 11-Red River Along Tailings Facility	LR-16	26-Sep-02	LR-16-D01N-SFW-092602	Surface Water	D					230						
	Surface Water Area 11-Red River Along Tailings Facility	LR-16	26-Sep-02	LR-16-T01N-SFW-092602	Surface Water	D					229						
	Surface Water Area 11-Red River Along Tailings Facility	LR-16	20-Mar-03	LR-16-D01N-SFW-032003	Surface Water	D					255						
	Surface Water Area 11-Red River Along Tailings Facility	LR-16	14-Jul-03	LR-16-D01N-SFW-071403	Surface Water	D					201						
	Surface Water Area 11-Red River Along Tailings Facility	LR-16	21-Sep-03	LR-16-D01N-SFW-092103	Surface Water	D					203						
	Surface Water Area 11-Red River Along Tailings Facility	LR-5	30-Sep-02	LR-5-D01N-SFW-093002	Surface Water	D					191						
	Surface Water Area 11-Red River Along Tailings Facility	LR-5	30-Sep-02	LR-5-T01N-SFW-093002	Surface Water	D					187						
	Surface Water Area 11-Red River Along Tailings Facility	LR-5	21-Mar-03	LR-5-D01N-SFW-032103	Surface Water	D					214						
	Surface Water Area 11-Red River Along Tailings Facility	LR-5	15-Jul-03	LR-5-D01N-SFW-071503	Surface Water	D					170						
	Surface Water Area 11-Red River Along Tailings Facility	LR-5	23-Sep-03	LR-5-D01N-SFW-092303	Surface Water	D					176						
	Surface Water Area 11-Red River Along Tailings Facility	LR-8A	27-Sep-02	LR-8A-D01N-SFW-092702	Surface Water	D					233						
	Surface Water Area 11-Red River Along Tailings Facility	LR-8A	27-Sep-02	LR-8A-T01N-SFW-092702	Surface Water	D					230						
	Surface Water Area 11-Red River Along Tailings Facility	LR-8A	23-Mar-03	LR-8A-D01N-SFW-032303	Surface Water	D					270						
	Surface Water Area 11-Red River Along Tailings Facility	LR-8A	15-Jul-03	LR-8A-D01N-SFW-071503	Surface Water	D					201						
	Surface Water Area 11-Red River Along Tailings Facility	LR-8A	23-Sep-03	LR-8A-D01N-SFW-092303	Surface Water	D					223						
	Reference Red River Above Mine Site	Zwergle	07-Oct-02	ZWERGEL-T01N-SFW-100702	Surface Water	D	8.8	336	6			7.1	212		10.4	9	
	Reference Upper Cabresto Creek Riparian	RRS-12	07-Oct-02	RRS-12-T01N-SFW-100702	Surface Water	D	10.1	336	2.9			6.4	203		5.1	9.9	
	Reference Upper Cabresto Creek Riparian	RRS-9	07-Oct-02	RRS-9-T01N-SFW-100702	Surface Water	D	9.3	306	1.3			6.8	169		9.5	9	
	Surface Water Area 1-Red River Along Mine	LR-1	30-Sep-02	LR-1-T01N-SFW-093002	Surface Water	D	9.1	358	21.8			7.6	354		14.9	20.4	
	Surface Water Area 1-Red River Along Mine	RR-13	01-Oct-02	RR-13-T01N-SFW-100102	Surface Water	D	9.2	329	17.9			7	363		11.5	13.7	
	Surface Water Area 1-Red River Along Mine	RR-14	01-Oct-02	RR-14-T01N-SFW-100102	Surface Water	D	9.4	249	18.4			6.9	371		11.6	17	
	Surface Water Area 1-Red River Along Mine	RR-15	01-Oct-02	RR-15-T01N-SFW-100102	Surface Water	D	9.6	279	22.4			6.8	327		10.5	16.6	
	Surface Water Area 1-Red River Along Mine	RR-16	01-Oct-02	RR-16-T01N-SFW-100102	Surface Water	D	9.5	299	15.7			6.8	374		9.1	19.9	
	Surface Water Area 1-Red River Along Mine	RR-17	01-Oct-02	RR-17-T01N-SFW-100102	Surface Water	D	9.7	365	15.2			6.6	381		9.1	21.3	
	Surface Water Area 1-Red River Along Mine	RR-18B	30-Sep-02	RR-18B-T01N-SFW-093002	Surface Water	D	8.6	341	14.4			7.7	354		15.1	21.6	
	Surface Water Area 1-Red River Along Mine	RR-20	30-Sep-02	RR-20-T01N-SFW-093002	Surface Water	D	9	344	18.9			6.7	357		14.6	22.7	
	Surface Water Area 11-Red River Along Tailings Facility	LR-11A	27-Sep-02	LR-11A-T01N-SFW-092702	Surface Water	D		214	20.5			6.7	494		14.7	24.1	
	Surface Water Area 11-Red River Along Tailings Facility	LR-13	26-Sep-02	LR-13-T01N-SFW-092602	Surface Water	D		234	21.4			6.8	487		15.1	26.5	
	Surface Water Area 11-Red River Along Tailings Facility	LR-16	26-Sep-02	LR-16-T01N-SFW-092602	Surface Water	D		264	21.5			6.4	488		14.6	24.1	
	Surface Water Area 11-Red River Along Tailings Facility	LR-5	30-Sep-02	LR-5-T01N-SFW-093002	Surface Water	D	9.7	328	21.8			7.5	366		11.9	22.1	
	Surface Water Area 11-Red River Along Tailings Facility	LR-8A	27-Sep-02	LR-8A-T01N-SFW-092702	Surface Water	D	7.9	235	18.1			6.2	487		14.4	41.7	
	Reference Red River Above Mine Site	Zwergle	07-Oct-02	ZWERGEL-T01N-SFW-100702	Surface Water	D				0.21		0.005		23.3			
	Reference Upper Cabresto Creek Riparian	RRS-12	07-Oct-02	RRS-12-T01N-SFW-100702	Surface Water	D				0.47		0.005		65.1			
	Reference Upper Cabresto Creek Riparian	RRS-9	07-Oct-02	RRS-9-T01N-SFW-100702	Surface Water	D				0.23		0.005		26.1			
	Surface Water Area 1-Red River Along Mine	LR-1	30-Sep-02	LR-1-T01N-SFW-093002	Surface Water	D				0.76		0.005		134			
	Surface Water Area 1-Red River Along Mine	RR-13	01-Oct-02	RR-13-T01N-SFW-100102	Surface Water	D				0.36		0.005		126			
	Surface Water Area 1-Red River Along Mine	RR-14	01-Oct-02	RR-14-T01N-SFW-100102	Surface Water	D				0.65		0.005		133			
	Surface Water Area 1-Red River Along Mine	RR-15	01-Oct-02	RR-15-T01N-SFW-100102	Surface Water	D				1.1		0.005		135			
	Surface Water Area 1-Red River Along Mine	RR-16	01-Oct-02	RR-16-T01N-SFW-100102	Surface Water	D				0.73		0.005		143			
	Surface Water Area 1-Red River Along Mine	RR-17	01-Oct-02	RR-17-T01N-SFW-100102	Surface Water	D				0.77		0.005		148			
	Surface Water Area 1-Red River Along Mine	RR-18B	30-Sep-02	RR-18B-T01N-SFW-093002	Surface Water	D				0.76		0.005		132			
	Surface Water Area 1-Red River Along Mine	RR-20	30-Sep-02	RR-20-T01N-SFW-093002	Surface Water	D				0.67		0.005		133			
	Surface Water Area 11-Red River Along Tailings Facility	LR-11A	27-Sep-02	LR-11A-T01N-SFW-092702	Surface Water	D				0.8		0.005		171			
	Surface Water Area 11-Red River Along Tailings Facility	LR-13	26-Sep-02	LR-13-T01N-SFW-092602	Surface Water	D				0.84		0.005		168			
	Surface Water Area 11-Red River Along Tailings Facility	LR-16	26-Sep-02	LR-16-T01N-SFW-092602	Surface Water	D				0.8		0.005		169			
	Surface Water Area 11-Red River Along Tailings Facility	LR-5	30-Sep-02	LR-5-T01N-SFW-093002	Surface Water	D				0.72		0.005		136			
	Surface Water Area 11-Red River Along Tailings Facility	LR-8A	27-Sep-02	LR-8A-T01N-SFW-092702	Surface Water	D				0.8		0.005		168			