



Verification Monitoring Report for the Slick Rock, Colorado, Processing Sites 2005 Update

February 2007



U.S. Department
of Energy

Office of Legacy Management

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**Verification Monitoring Report
for the Slick Rock, Colorado,
Processing Sites**

2005 Update

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Work Performed by S.M. Stoller Corporation under DOE Contract No. DE-AC01-02GJ79491
for the U.S. Department of Energy Office of Legacy Management, Grand Junction, Colorado

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1.0 Introduction

The Slick Rock, Colorado, Processing sites consist of two former uranium-ore processing facilities, which are referred to as the Slick Rock East (SRE) site (formerly the North Continent site) and the Slick Rock West (SRW) site (formerly the Union Carbide site). The Slick Rock sites are located along the banks of the Dolores River in San Miguel County, Colorado (Figure 1). Steep, juniper-covered hillsides and cliffs of the Dolores River Canyon surround the sites. The SRW site is approximately 1 mile downstream from the SRE site (Figure 2). Surface remediation of the two sites was completed in 1996; mill tailings and other residual radioactive materials were disposed of in a cell located approximately 5 miles east of the processing sites.

1.1 Purpose of Report

The purpose of this verification monitoring report is to evaluate ground water and surface water monitoring data collected at the Slick Rock, Colorado, processing sites since 2000 and assess the status of the compliance strategy for ground water cleanup.

1.2 Compliance Strategy

The proposed compliance strategy for the Slick Rock sites is natural flushing in conjunction with institutional controls and compliance monitoring as stated in the *Draft Final Ground Water Compliance Action Plan for the Slick Rock, Colorado, UMTRA Project Sites (GCAP)* (DOE 2006). Except for manganese and selenium, constituents of potential concern (COPC) concentrations at the Slick Rock sites will be compared to their respective maximum concentration limit (MCL) to assess compliance with Title 40, *Code of Federal Regulations Part 192* (40 CFR 192). Because manganese does not have an MCL, manganese concentrations will be compared to the maximum background concentration (3.5 milligrams per liter [mg/L]) to assess compliance. Ground water modeling predicts that selenium concentrations at the SRW site will not be reduced to below the MCL within 100 years; therefore, a human-health risk-based alternate concentration limit (ACL) of 0.18 mg/L is proposed in the GCAP for selenium. Ground water modeling predicts that natural flushing will be completed within the 100-year regulatory time frame. Public health will be protected during the natural flushing process through institutional controls, which will restrict access to contaminated alluvial ground water. The institutional controls that will be used for the Slick Rock sites are environmental covenants between the State of Colorado, represented by the Colorado Department of Public Health and Environment (CDPHE), and the landowner, Umetco Minerals Corporation (Umetco). Umetco and CDPHE are finalizing the respective environmental covenants. In 2005, the GCAP was reviewed by the U.S. Nuclear Regulatory Commission (NRC), who requested that additional information be provided for clarification of several issues. That information has been compiled and forwarded to the NRC for further review.

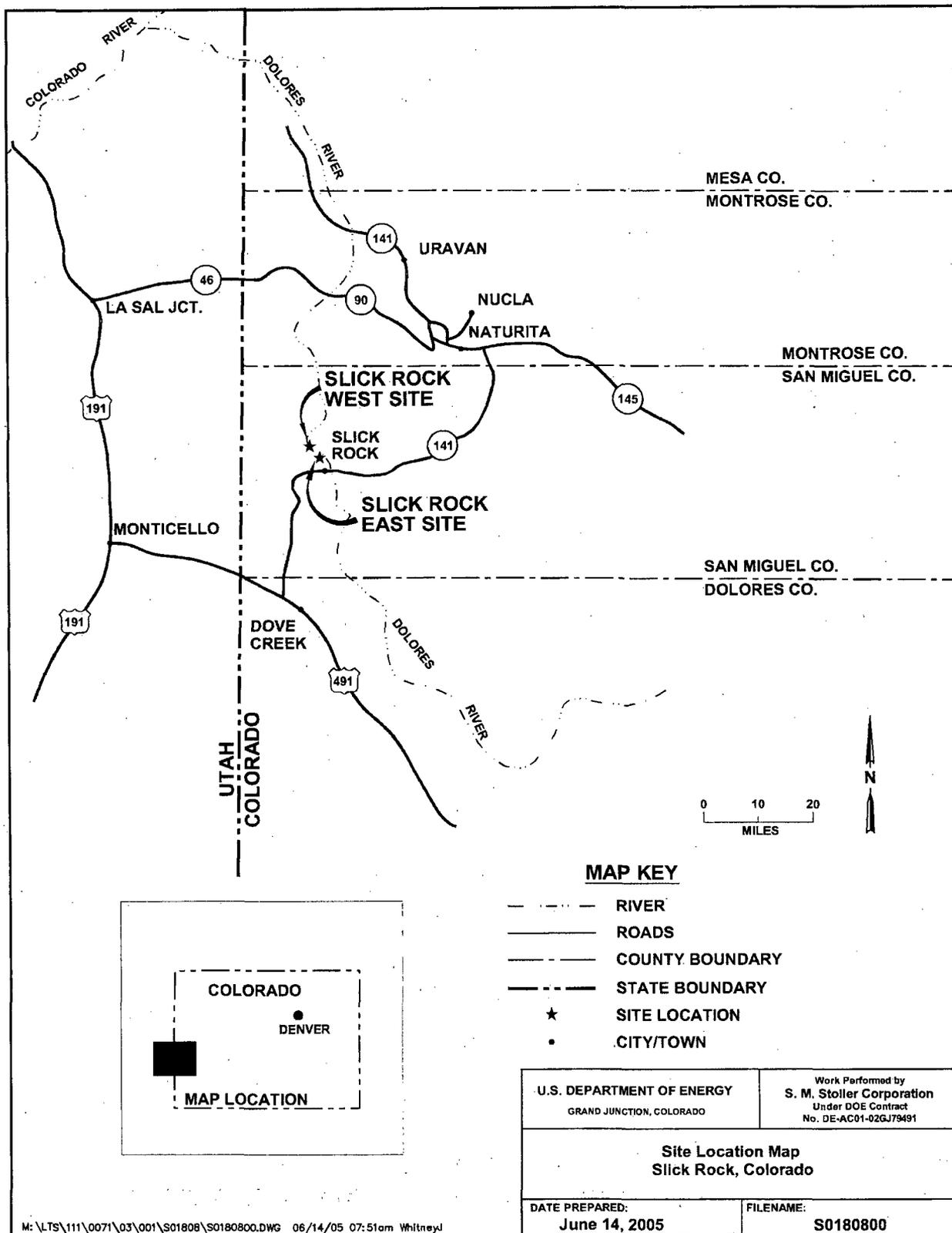


Figure 1. Slick Rock, Colorado, Processing Sites Location Map

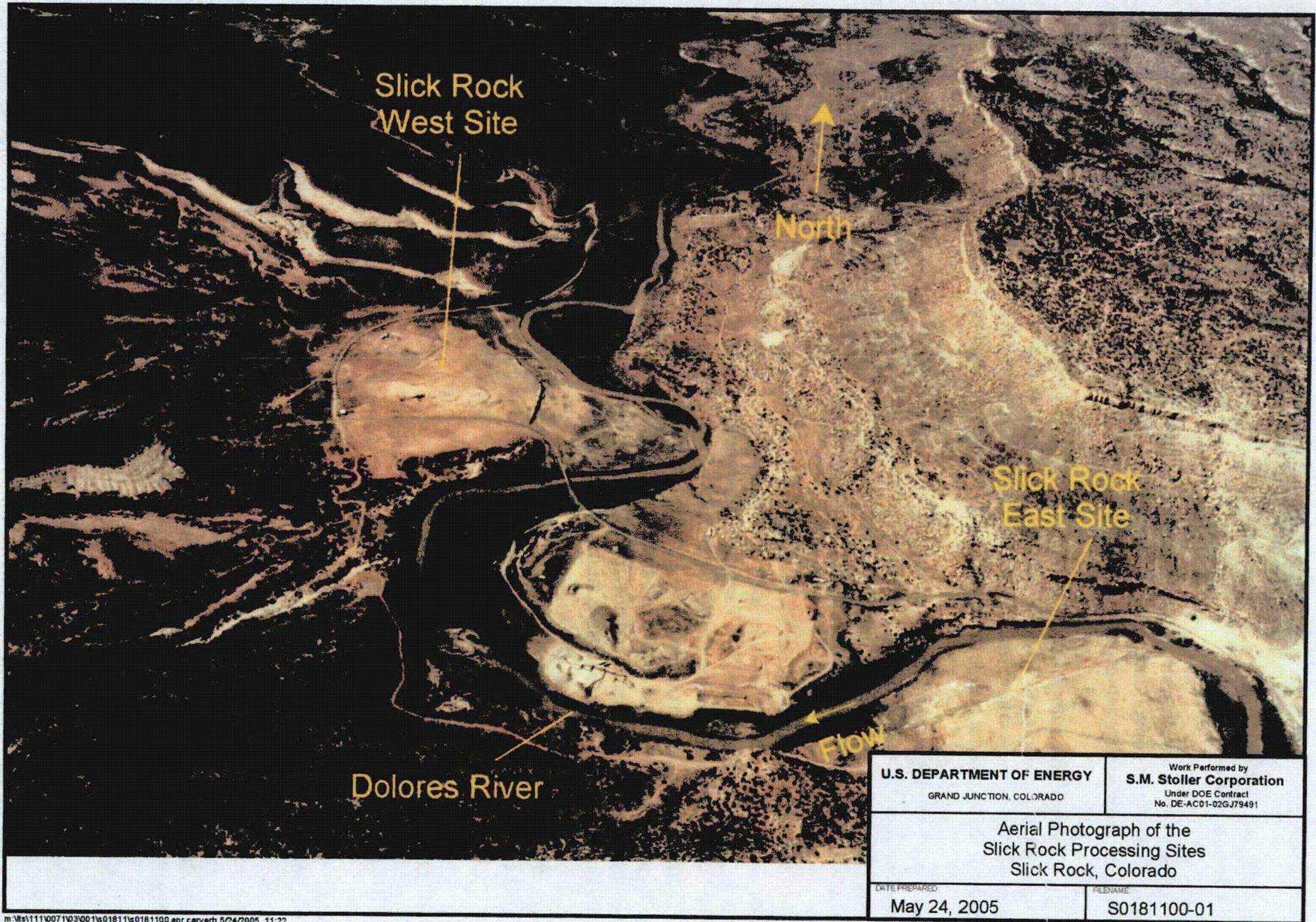


Figure 2. Aerial Photograph of the Slick Rock, Colorado, Processing Sites

2.0 Site Conditions

2.1 Hydrogeology

The Slick Rock sites overlay an alluvial aquifer deposited by the Dolores River. The alluvial aquifer consists of unconsolidated material ranging in thickness from 15 to 20 feet (ft) and consists primarily of silty sands and silty sandy gravels with an occasional interbedded clay lens.

The Dolores River alluvium is laterally restricted by bedrock that forms the terraces and canyon walls adjacent to the Dolores River. In addition, the Dolores River floodplain is discontinuous and pinches out in areas where the Dolores River meets the canyon wall. Depth to ground water in the unconfined alluvial aquifer ranges from 7 to 15 ft below ground surface (bgs).

The Salt Wash Member of the Jurassic Morrison Formation and the Jurassic Summerville Formation underlie the Quaternary Dolores River alluvium at the SRE site. Because the Morrison Formation and the Summerville Formation have an abundance of fine-grained, low-permeability units, these formations are considered aquitards at the SRE site (DOE 2002).

The hydrostratigraphic units at the SRW site are, in descending stratigraphic order, the Quaternary Dolores River alluvium (the uppermost aquifer), the Jurassic Entrada Sandstone, and the Jurassic Navajo Sandstone. The Entrada Sandstone ranges from 40 to 60 ft thick in the floodplain area, with depths to ground water ranging from 6 to 8 ft bgs. The thickness of the Navajo Sandstone is approximately 180 ft in the Slick Rock area (DOE 2002). Wells completed in the Navajo Sandstone and located on the floodplain at the SRW site have an upward vertical gradient with respect to the alluvial aquifer and the Entrada Sandstone; therefore, contamination in the alluvial aquifer will not cross-contaminate the Navajo Sandstone aquifer.

The Dolores River alluvium is the only unit affected by site-related contamination and is therefore the primary subject of this verification monitoring report. Ground water flow direction generally follows the downstream direction of the Dolores River.

2.2 Ground Water Quality

2.2.1 SRE Site

Alluvial ground water beneath the SRE site was contaminated as a result of former uranium processing activities. COPC in the uppermost (alluvial) aquifer at the SRE site are selenium and uranium (DOE 2002). Uranium concentrations in the alluvial aquifer are up to two orders of magnitude greater than the MCL of 0.044 mg/L established by the U.S. Environmental Protection Agency (EPA) at 40 CFR 192. Selenium contamination at the SRE site is confined to one well (0305) and is not considered a major contaminant at the SRE site. Ground water quality data for 2005 are provided in Appendix A.

2.2.2 SRW Site

The former uranium processing activities also contaminated the ground water beneath the SRW site. COPC in the uppermost (alluvial) aquifer at the SRW site include manganese, molybdenum, nitrate, selenium, uranium, radium-226, radium-228, benzene, and toluene. All of these COPC have been found in concentrations greater than the MCL or background

concentrations (in the case of manganese) in the alluvial aquifer. Contaminant plumes in the alluvial aquifer are all contained on site. The radium-226, radium-228, benzene, and toluene contamination is isolated to one well (0319); radium 226+228 concentration were less than the MCL in 2005. Manganese concentrations tend to be near background levels. The most pervasive contaminants in the alluvial aquifer are molybdenum, nitrate, selenium, and uranium, with concentrations as high as two orders of magnitude greater than their respective MCLs.

Samples from wells completed in the Entrada Sandstone on the floodplain at the SRW site have contained elevated concentrations of COPC. Historically, concentrations of molybdenum (well 0317), nitrate (well 0324), and selenium (well 0324) exceeded their respective MCLs.

These concentrations are thought to be a product of drilling and installing monitor wells through the contaminated alluvial aquifer. This theory is supported by hydrologic data that indicate there is slight upward vertical gradient between the alluvial and Entrada aquifers and that the hydraulic conductivity in the alluvial aquifer is two orders of magnitude greater than the Entrada aquifer. These hydrologic conditions should inhibit ground water from flowing vertically downward into the Entrada aquifer. Sampling of well 0324 was discontinued in 2004 because the nitrate and selenium concentrations were below the MCLs for three consecutive rounds of sampling.

Results of the 2005 ground water monitoring program are provided in Appendix A.

2.3 Surface Water Quality

The Dolores River is the only perennial surface water feature in the vicinity of the Slick Rock sites. Results from surface-water sampling have demonstrated minimal impact to the Dolores River from site contamination. Concentrations of COPC in samples collected from the Dolores River have not exceeded their respective CDPHE water-quality benchmark (CDPHE 1998).

Results of the 2005 surface water monitoring program are provided in Appendix B.

2.4 Remediation Activities

Surface remediation at the Slick Rock sites commenced in 1995 and was completed in 1996. Abandoned uranium mill tailings and other contaminated surface residual radioactive material associated with the former milling operations were relocated to the Slick Rock Disposal Cell (formerly the Burro Canyon disposal cell), approximately 5 miles east of the Slick Rock sites. The sites were re-graded with on-site material, and subsequent revegetation efforts have been deemed successful.

2.5 Land and Water Use

The SRE and SRW sites are currently owned by Umetco. The SRE site is not fenced and is currently used for livestock grazing. The majority of the SRW site is enclosed with a barbed-wire fence. Land between the two sites is privately owned. Land use between the two sites includes irrigated alfalfa fields, livestock grazing, and gravel mining operations. Water used to irrigate the alfalfa is pumped from the Dolores River.

There is no current use of alluvial ground water beneath the former processing sites. Historically, a hand-dug alluvial well located between the two sites was used as a domestic source, but the well is no longer used. Recent water-level measurements show the well is dry.

Ground water use from the Entrada Sandstone is limited. Water from the Entrada Sandstone is used to water livestock via a "collector system." The collector system consists of a plastic pipe installed into the cliff face formed by the Entrada Sandstone. Water discharges from the pipe into a stock tank at a rate of approximately 1 liter/minute. The collector system is located northwest and upgradient of the SRW site.

Ground water used in the Slick Rock area is primarily supplied by the Navajo Sandstone aquifer. Currently, domestic wells completed in the Navajo Sandstone provide water to three residences and their livestock. Historically, wells completed in the Navajo Sandstone provided water for the milling operations and for the mill community at the SRW site.

3.0 Monitoring Program

3.1 Monitoring Network

Monitoring is to be performed annually for the first 10 years after NRC concurrence with the GCAP to ascertain that natural flushing is progressing as predicted by ground water flow and transport modeling (DOE 2006). After 10 years, the monitoring frequency will decrease to every 5 years.

At the SRE site, the monitoring network consists of seven monitor wells and three surface water locations (Figure 3 and Table 1). Two monitoring wells (0310 and 0312) and one surface water location (0700) were added to the sampling scheme in 2005 in an effort to better delineate the extent of contamination seen at and adjacent to well 0311. These locations will be sampled for the next several rounds of sampling to collect the data needed to assess the contaminant behavior.

At the SRW site, the monitoring network consists of seven monitor wells and four surface water locations (Figure 4 and Table 2). Monitoring is to be conducted until analytical data demonstrate that ground water contaminants in the alluvial aquifer have decreased to acceptable levels (MCLs, ACLs, or background).

3.2 Results of Monitoring Program

3.2.1 SRE Site

At the SRE site, results of the monitoring program indicate that natural flushing appears to be progressing. The well with the consistently highest uranium concentrations (0303) has been showing a decline; downgradient wells have exhibited increases, as expected with the downgradient movement of the plume centroid (Figure 5 and Figure 6). Eventually these downgradient wells should also decline. Concentrations of uranium in well 0305 versus ground water model predictions are shown in Figure 7.

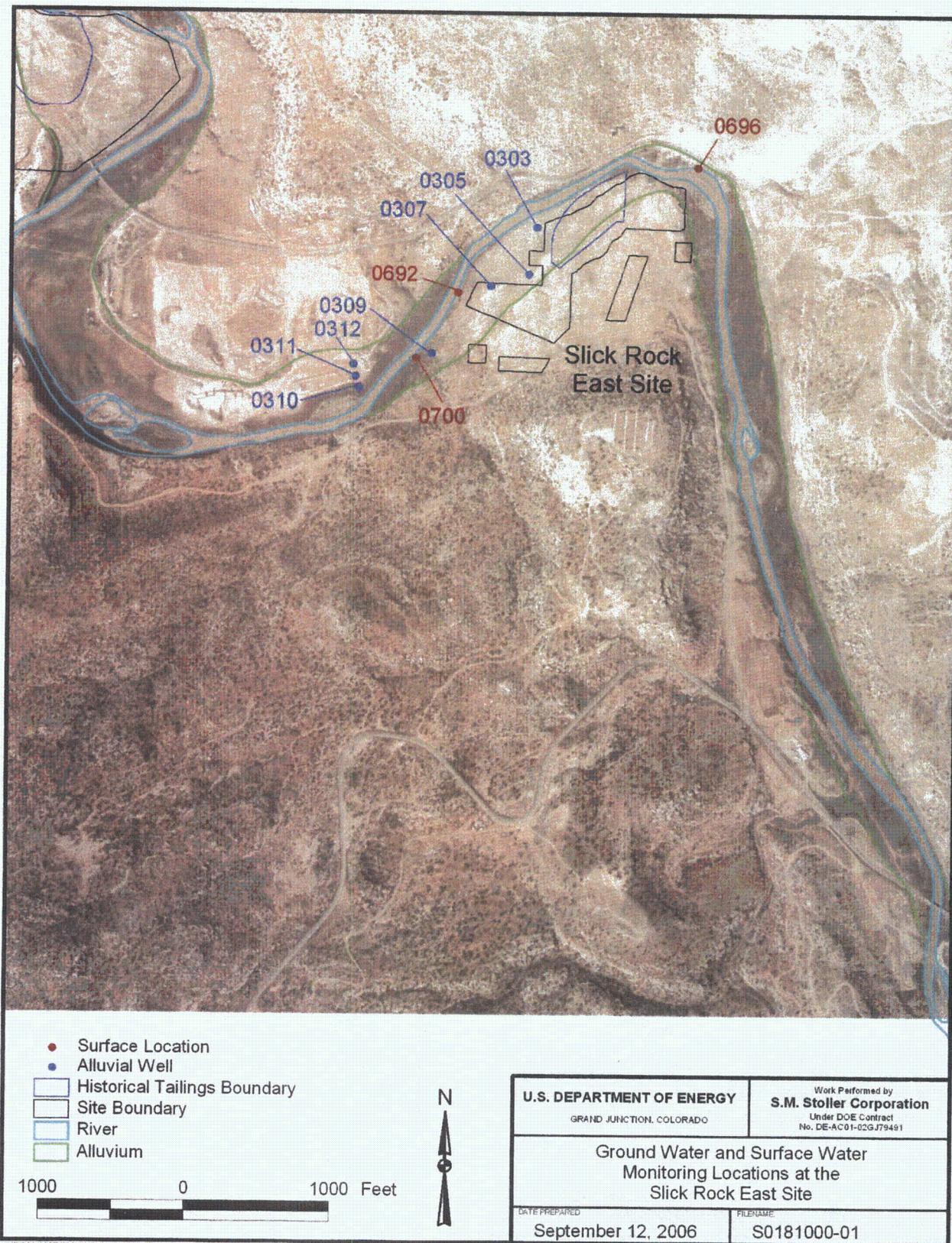


Figure 3. Ground Water and Surface Water Monitoring Locations at the SRE Site



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Figure 4. Ground Water and Surface Water Monitoring Locations at the SRW Site

Table 1. Monitoring Program at the SRE Site

ID	Matrix	Location	Rationale	Analytes
0696	Surface Water	Upstream	Background for SRE site.	Uranium
0692	Surface Water	Adjacent to site	Predicted location where the centroid of the uranium plume intersects the river.	Uranium
0700	Surface Water	Downstream	Across river from well 0311.	Uranium
0303	Ground Water	On site	Hot spot for uranium.	Uranium
0305	Ground Water	On site	Hot spot for uranium; selenium above the MCL.	Uranium, Selenium
0307	Ground Water	On site	Downgradient of hot spots, monitor plume migration.	Uranium, Selenium
0309	Ground Water	On site	Farthest downgradient well on site.	Uranium
0310	Ground Water	Downgradient	Adjacent and south of well 0311.	Uranium
0311	Ground Water	Downgradient	Off site across the river. Monitor migration of the uranium plume between sites.	Uranium
0312	Ground Water	Downgradient	Adjacent and north of well 0311.	Uranium

Table 2. Monitoring Program at the SRW Site

ID	Matrix	Location	Rationale	Analytes
0693	Surface Water	Upstream	Background for SRW site.	Manganese, Molybdenum, Nitrate, Selenium, and Uranium
0347	Surface Water	Adjacent to site	Predicted location where the centroid of the selenium plume intersects the river. Point of exposure for selenium.	Manganese, Molybdenum, Nitrate, Selenium, and Uranium
0349	Surface Water	Adjacent to site	Predicted location where the centroid of the contaminant plumes intersect the river. Potential point of exposure.	Manganese, Molybdenum, Nitrate, Selenium, and Uranium
0694	Surface Water	Downstream	Potential for contaminant plumes to discharge to the river at this location.	Manganese, Molybdenum, Nitrate, Selenium, and Uranium
0318	Ground Water	On site	Hot spot for several COPC.	Manganese, Molybdenum, Nitrate, Selenium, and Uranium
0508	Ground Water	On site	High selenium, nitrate, molybdenum, and uranium.	Manganese, Molybdenum, Nitrate, Selenium, and Uranium
0510	Ground Water	On site	Edge of former tailings pile, high COPC concentrations.	Manganese, Molybdenum, Nitrate, Selenium, and Uranium
0317	Ground Water	On site	Entrada Sandstone well, exceeds molybdenum MCL.	Molybdenum
0324	Ground Water	On site	Entrada Sandstone well, previously exceeded nitrate and selenium MCLs.	Removed from sampling network in 2004 because contaminant concentrations dropped below MCLs
0319	Ground Water	On site	Hot spot for benzene, toluene and radium-226/radium-228.	Benzene, Toluene, Ethylbenzene, Xylene, Radium-226, and Radium-228
0320	Ground Water	On site	Farthest downgradient well on site; monitor plume movement.	Manganese, Molybdenum, Nitrate, Selenium, and Uranium
0684	Ground Water	Off site	Verify that contaminants are not migrating off site.	Manganese, Molybdenum, Nitrate, Selenium, and Uranium

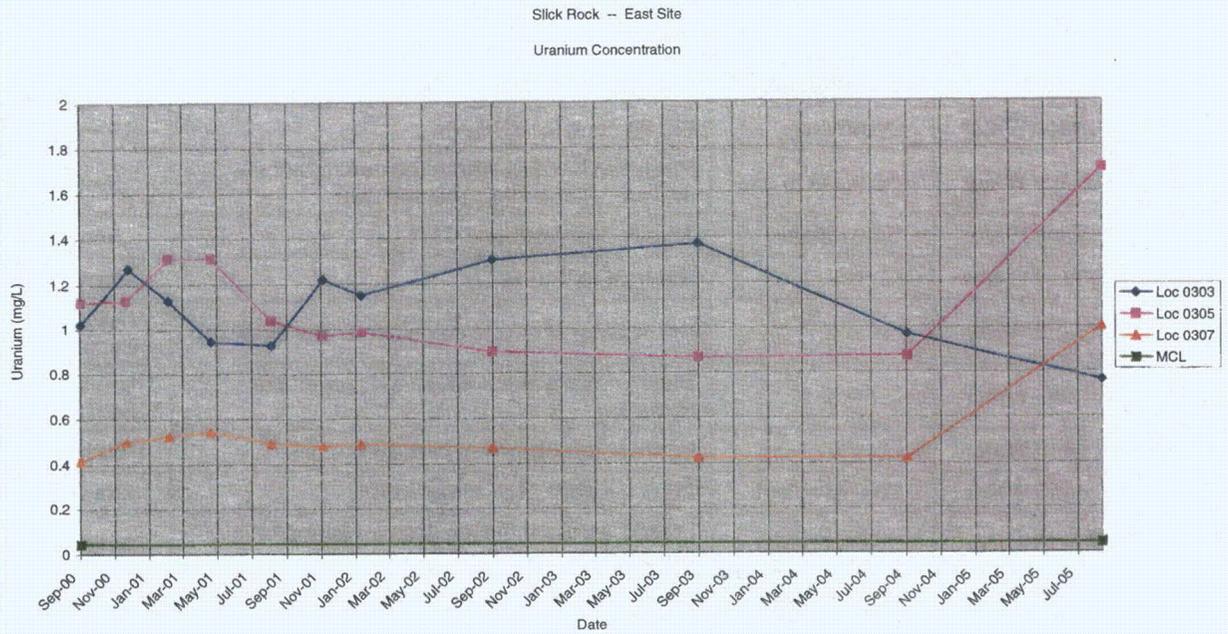


Figure 5. Uranium Concentrations Versus Time in the Middle of the SRE Site

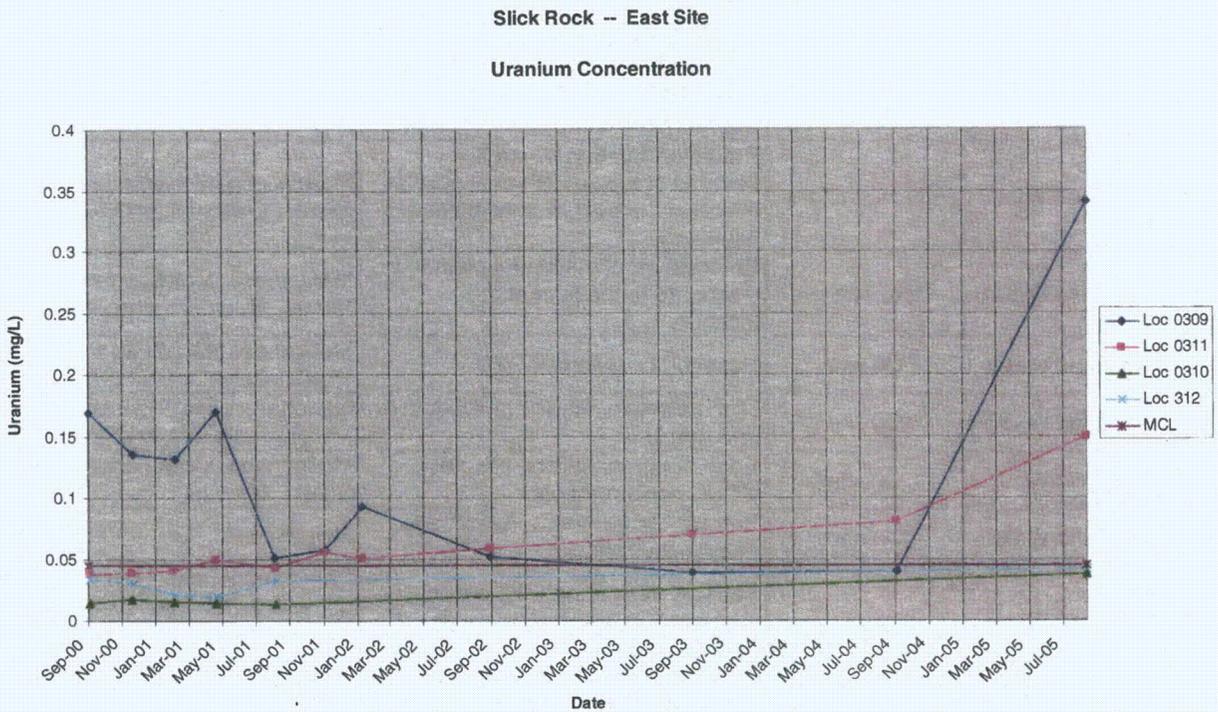


Figure 6. Uranium Concentrations Versus Time in the Downgradient Portion of the SRE Site

Slick Rock - East Site
Well 305

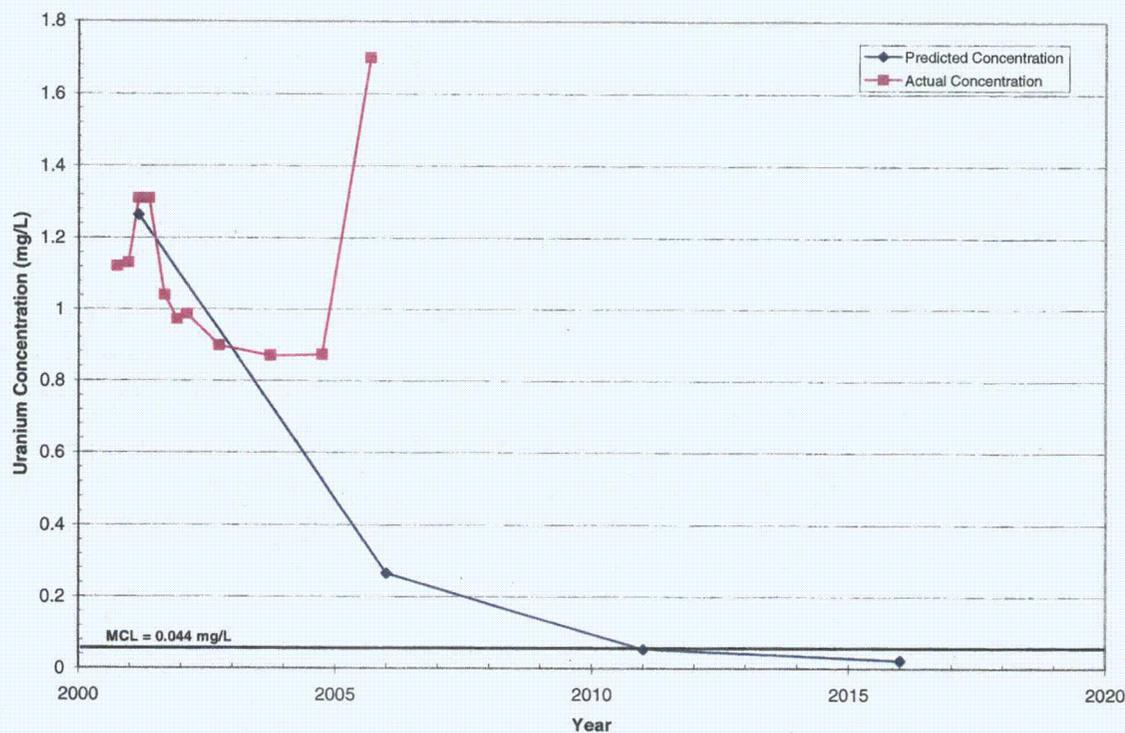


Figure 7. Uranium Concentrations in Well 0305 Versus Ground Water Model Predictions at the SRE Site

Trends for uranium in wells 0310, 0311, and 0312 indicate that some contaminated ground water may be flowing under the river. These wells will continue to be monitored. If it is determined that site-related contamination is affecting the alluvial aquifer across the river, this will be addressed in the final GCAP for the site.

3.2.2 SRW Site

Results of the monitoring program from the SRW site also indicate that, overall, natural flushing is progressing. Concentrations of most contaminants are lower than their maximum observed values (Table 3), and constituents in a number of wells appear to be declining or remaining steady. However, results for most constituents in wells 0318 and 0319 did increase sharply during the most recent sampling round. The reason for the sharp increases is not readily apparent, although flooding of the sites over the last 2 years caused submergence of several wells. Vadose-zone constituents could have mobilized as a result. In addition, it may be noteworthy that three different analytical laboratories have been used in the last 3 years. It could also be that incomplete characterization did not identify the highest concentration portion of the plume and that the actual plume centroid was upgradient from the assumed centroid.

Concentrations of selenium and nitrate in the alluvial ground water have generally decreased over time as shown in Figure 8 and Figure 9, respectively. Historically, concentrations of molybdenum in the Entrada Sandstone well (well 0317) have been slightly above the MCL and the levels continue to decrease slightly (Figure 10). Concentrations of nitrate, molybdenum, and selenium in well 0508 versus model predictions are displayed in Figure 11, Figure 12, and

Figure 13, respectively. The deviation between the actual concentrations of molybdenum in well 0508 and the model predictions appears anomalous and should be closely monitored over the next several sampling rounds to better understand the alluvial system.

Several minor COPC are limited to well 0319 only. Benzene and toluene concentrations in well 0319 had markedly decreased compared to historic levels, though concentrations increase sharply in 2005, as did those of most other constituents. Radium-226 plus radium-228 activities in well 0319 were below the standard of 5 picoCuries per liter (pCi/L) (Table 3) during the 2005 sampling event. With the exception of uranium, the highest 2005 concentrations of all constituents were from wells located at the SRW site.

Table 3. Comparison of COPC Concentrations in the Alluvial Aquifer to Benchmark Values

COPC	Benchmark ^a	Maximum Concentration ^b	Maximum 2004 Concentration ^c	Maximum 2005 Concentration ^d	Well Location
Benzene	0.005	19.8	3.64	12.0	0319
Manganese	3.5	12.80	2.97	4.8	0510
Molybdenum	0.10	1.83	0.459	4.4	0318
Nitrate	44.27	4,090	N/A	725	0318
Radium-226 + Radium-228	5	7.21	5.56	4.28	0319
Toluene	1	13.7	2.25	8.5	0319
Selenium	0.18	2.57	1.29	3.5	0318
Uranium	0.044	1.37	0.967	1.7	0305

^aBenchmark values are MCLs except for selenium (ACL) and manganese (background). Units are in mg/L, except for radium-226 and radium-228, which are in picoCuries per liter (pCi/L).

^bMaximum concentration in the alluvial aquifer from September 2000 to September 2002.

^cConcentration in September 2004.

^dConcentration in September 2005.

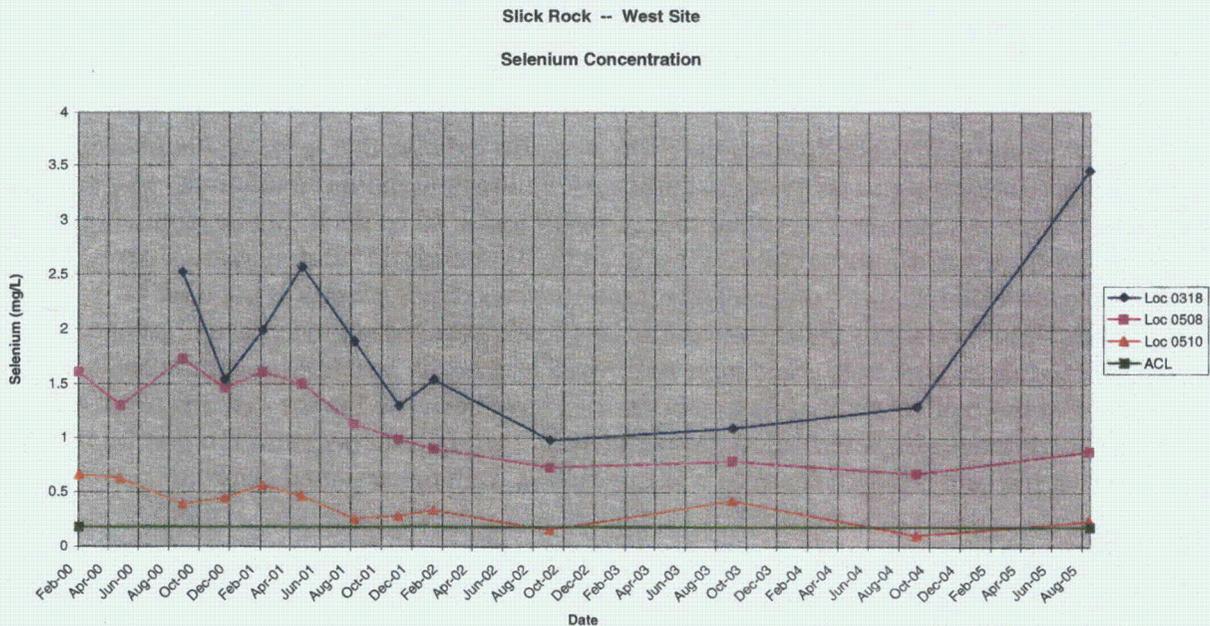


Figure 8. Selenium Concentrations Versus Time at the SRW Site

SLICK ROCK - West Site

Nitrate as NO3

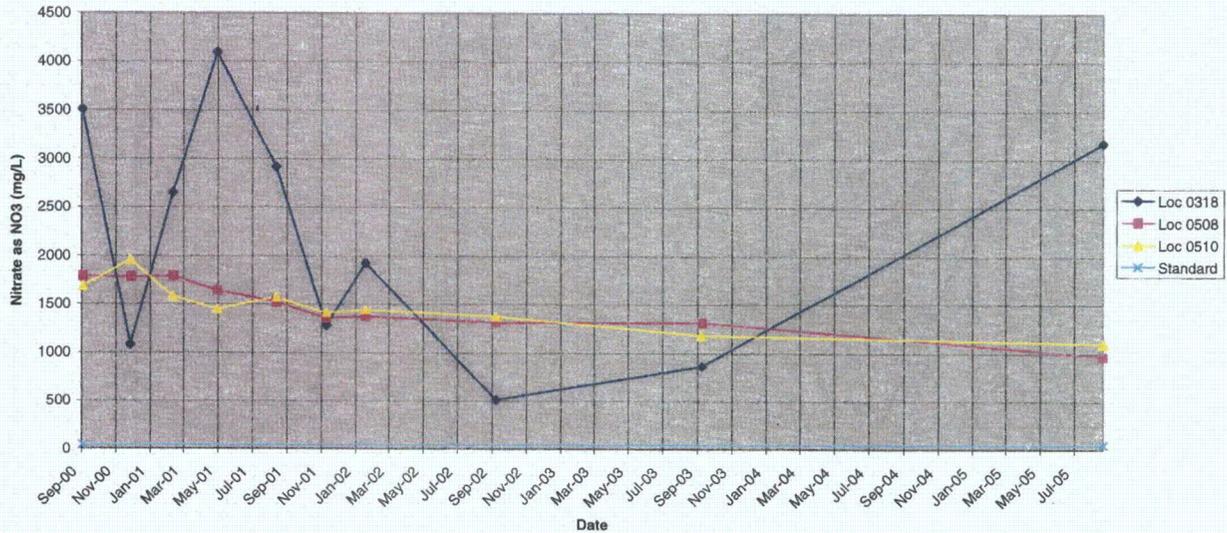


Figure 9. Nitrate Concentrations Versus Time at the SRW Site

Slick Rock - West Site

Molybdenum Concentration

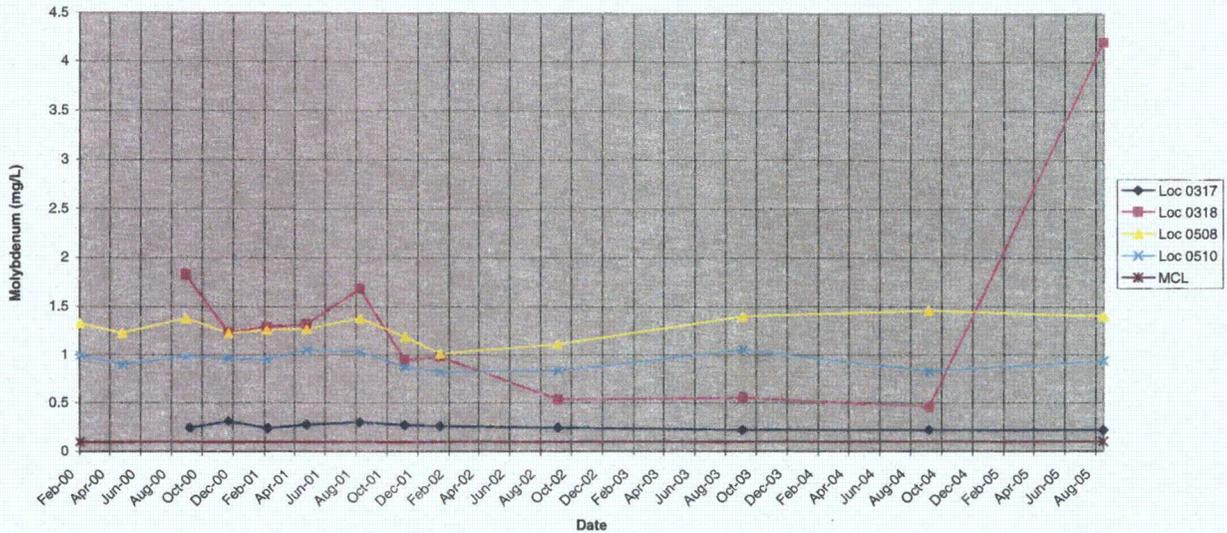


Figure 10. Molybdenum Concentrations Versus Time at the SRW Site

Slick Rock - West Site
Well 508

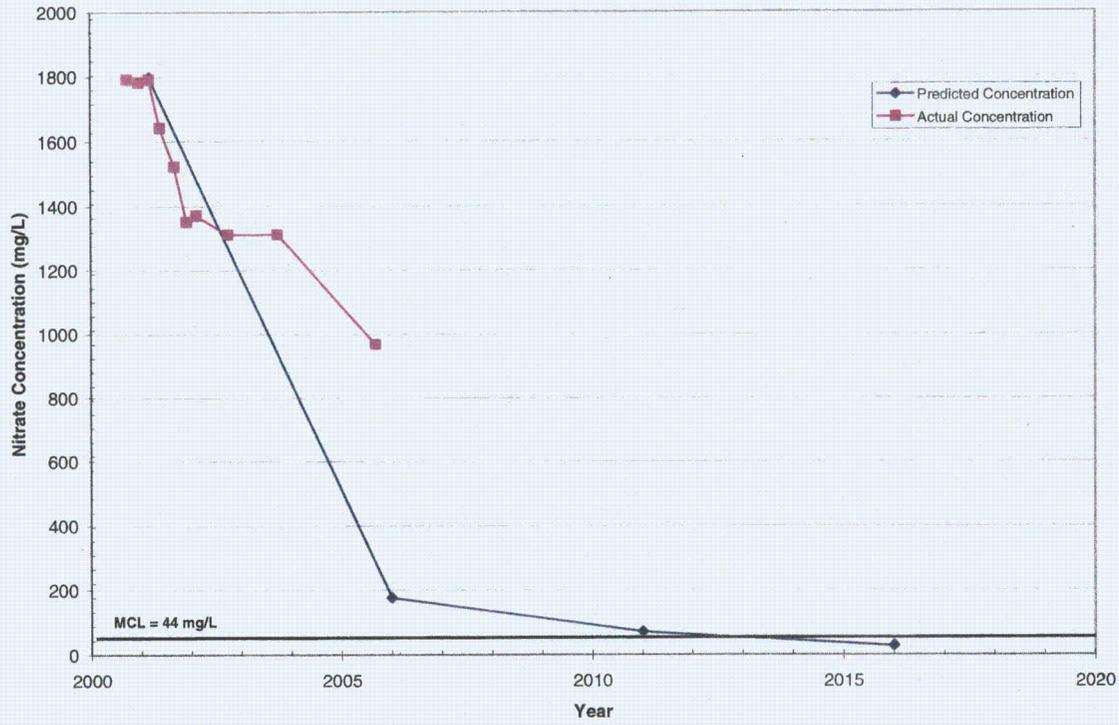


Figure 11. Predicted Nitrate Concentrations in Well 0508 Versus Ground Water Model Predictions at the SRW Site

Slick Rock - West Site
Well 508

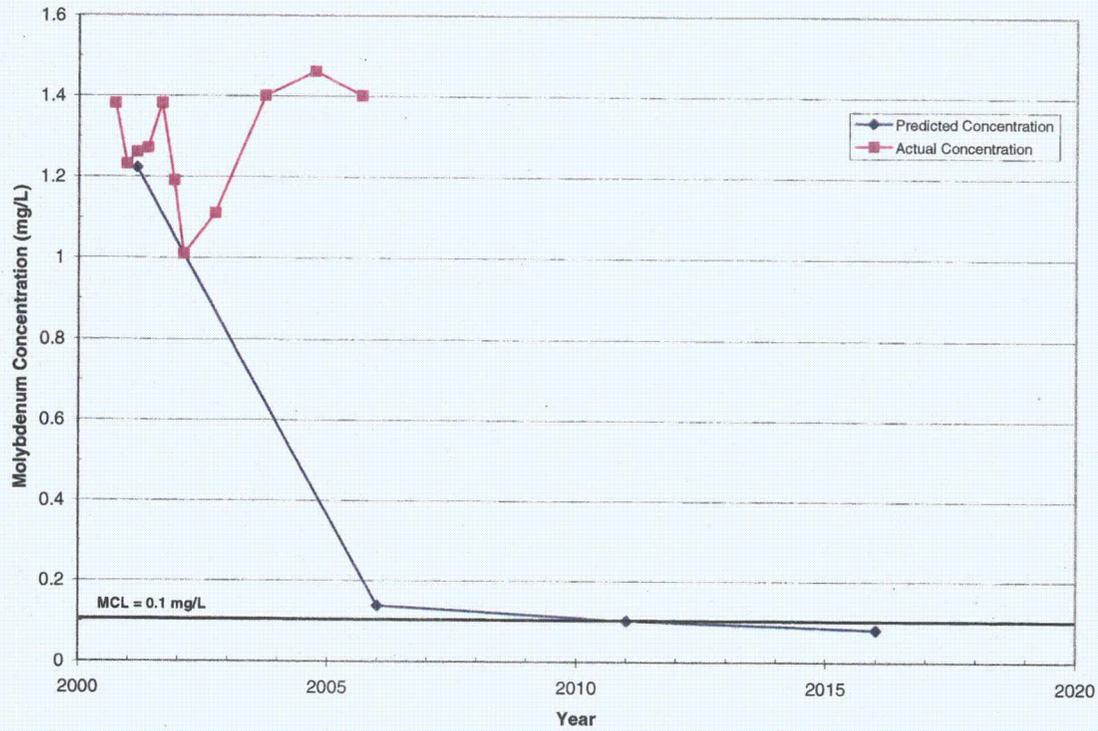


Figure 12. Predicted Molybdenum Concentrations in Well 0508 Versus Ground Water Model Predictions at the SRW Site

Slick Rock - West Site
Well 508

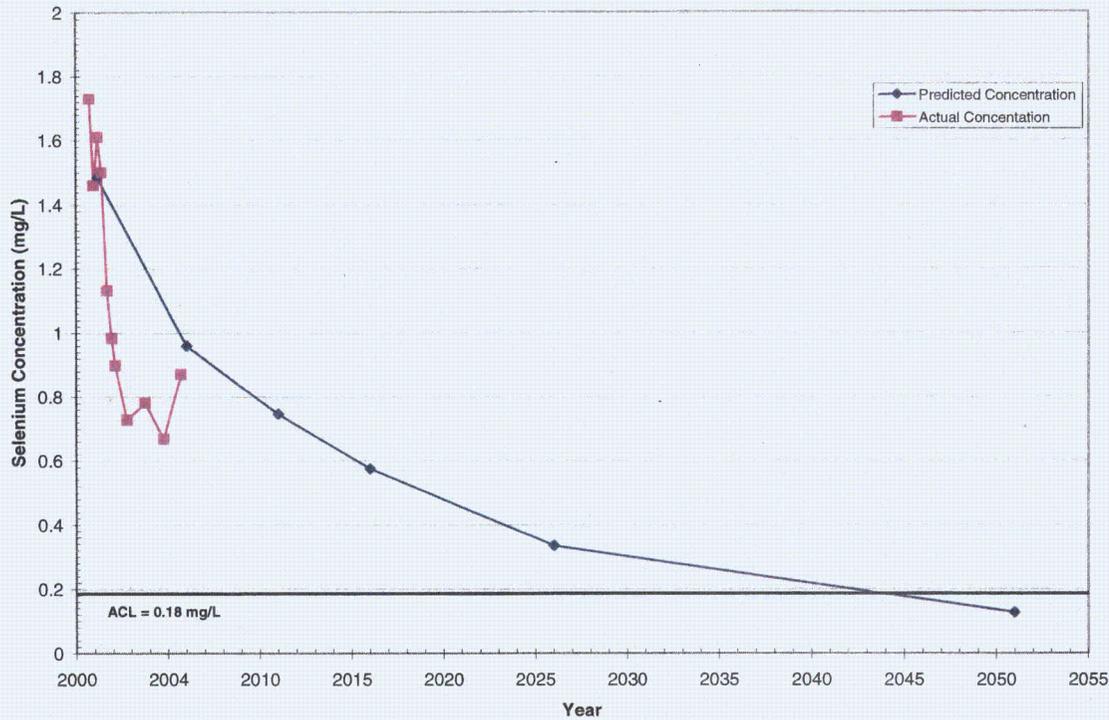


Figure 13. Selenium Concentrations in Well 0508 Versus Ground Water Model Predictions at the SRW Site

3.3 Surface Water

Results from surface water sampling (Appendix B) demonstrate essentially no impact to the Dolores River from site activities. In 2005, one sampling location exceeded the CDPHE water-quality benchmark for manganese; no other benchmarks were exceeded at any location, as shown in Table 4.

Table 4. Comparison of COPC Concentrations in the Dolores River to CDPHE Benchmarks.

COPC	CDPHE Benchmark ^a (mg/L)	Dolores River Location						
		SRE site			SRW site			
		0696	0692	0700	0693	0347	0349	0694
2005 Concentration (mg/L)								
Manganese ^b	0.05	-	-	-	0.0008	0.0032	0.140	0.0018
Selenium	0.005	-	-	-	0.0013	0.0005	0.0028	0.0005
Uranium	0.059	0.0011	0.0016	0.0014	0.0012	0.0011	0.0031	0.0011

^aCDPHE surface water benchmark (CDPHE 1998).

^bStandard for chronic exposure.

4.0 Conclusions

4.1 Status of Site Compliance

While both the SRE and SRW sites still have COPC concentrations in the alluvial aquifer that exceed the respective MCL, ACL, or background concentrations, levels are generally lower than maximum concentrations observed since 2000. The exceptions to this are concentrations of molybdenum, selenium, and uranium, which were the highest ever observed during the most recent sampling event. In addition, it appears that some site-related contamination may be migrating beneath the Dolores River. This situation will continue to be monitored. If warranted, additional evaluation may be conducted and any necessary actions (e.g., extension of institutional controls) documented in the final GCAP for the site.

4.2 Recommendations

It is recommended that verification monitoring of ground water from designated monitor wells and surface water locations continue on an annual basis as specified in the draft final GCAP (DOE 2006). At the specified time, a reevaluation of monitoring requirements will be completed. It had been anticipated that monitoring could eventually be decreased to every 5 years. However, if recently observed fluctuations in contaminant concentrations continue or if contamination persists on the other side of the Dolores River, it may be advisable to continue an annual monitoring frequency.

5.0 References

Colorado Department of Public Health and Environment, 1998. Water Quality Commission, Regulation No. 35, *Classifications and Numeric Standards for Gunnison and Lower Dolores River Basins*, Denver, Colorado.

U. S. Department of Energy, 2002. *Site Observational Work Plan for the Slick Rock, Colorado, UMTRA Project Site*. GJO-2001-257-TAR MAC-GWSKR 1.1, Grand Junction, Colorado.

———, 2006. *Draft Preliminary Final Ground Water Compliance Action Plan for the Slick Rock, Colorado, UMTRA Project Sites*. DOE-LM/1327-2006, Grand Junction, Colorado, September.

40 CFR 192. U.S. Environmental Protection Agency, 2002. "Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings," *Code of Federal Regulations*, July 1.

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Appendix A

Ground Water Quality Data by Parameter

GROUND WATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE SRK01, Slick Rock Processing Sites
 REPORT DATE: 2/26/2007 10:02 am

PARAMETER	UNITS	LOCATION ID	LOCATION TYPE	SAMPLE:		DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS:			DETECTION LIMIT	UN-CERTAINTY
				DATE	ID			LAB	DATA	QA		
Alkalinity, Total (As CaCO3)	mg/L	0303	WL	09/06/2005	0001	4.30 - 14.30	347	F	#	-	-	
	mg/L	0305	WL	09/06/2005	0001	8.70 - 18.70	504	F	#	-	-	
	mg/L	0307	WL	09/06/2005	0001	4.40 - 14.40	704	F	#	-	-	
	mg/L	0309	WL	09/06/2005	0001	10.20 - 20.20	823	F	#	-	-	
	mg/L	0310	WL	09/06/2005	0001	14.70 - 19.70	232	F	#	-	-	
	mg/L	0311	WL	09/06/2005	0001	14.10 - 19.10	401	F	#	-	-	
	mg/L	0312	WL	09/06/2005	0001	14.50 - 19.50	306	F	#	-	-	
	mg/L	0317	WL	09/07/2005	0001	19.46 - 39.52	259	F	#	-	-	
	mg/L	0318	WL	09/07/2005	0001	4.99 - 15.02	214	F	#	-	-	
	mg/L	0319	WL	09/07/2005	0001	4.55 - 14.58	1069	F	#	-	-	
	mg/L	0320	WL	09/07/2005	0001	4.92 - 9.96	368	F	#	-	-	
	mg/L	0508	WL	09/07/2005	0001	1.01 - 11.01	568	F	#	-	-	
	mg/L	0510	WL	09/07/2005	0001	4.92 - 13.92	306	F	#	-	-	
mg/L	0684	WL	09/07/2005	0001	11.00 - 21.00	228	F	#	-	-		
Benzene	ug/L	0319	WL	09/07/2005	N001	4.55 - 14.58	13000	F	#	260	-	
	ug/L	0319	WL	09/07/2005	N002	4.55 - 14.58	11000	F	#	160	-	
m,p-Xylene	ug/L	0319	WL	09/07/2005	N001	4.55 - 14.58	4800	F	#	63	-	
	ug/L	0319	WL	09/07/2005	N002	4.55 - 14.58	4300	F	#	63	-	
Manganese	mg/L	0318	WL	09/07/2005	0001	4.99 - 15.02	1.100	F	#	0.00048	-	
	mg/L	0318	WL	09/07/2005	0002	4.99 - 15.02	1.100	F	#	0.00048	-	
	mg/L	0320	WL	09/07/2005	0001	4.92 - 9.96	0.530	F	#	9.5E-05	-	
	mg/L	0508	WL	09/07/2005	0001	1.01 - 11.01	4.600	F	#	0.00048	-	
	mg/L	0510	WL	09/07/2005	0001	4.92 - 13.92	4.800	F	#	0.00048	-	
	mg/L	0684	WL	09/07/2005	0001	11.00 - 21.00	0.820	F	#	9.5E-05	-	
Molybdenum	mg/L	0317	WL	09/07/2005	0001	19.46 - 39.52	0.220	F	#	0.00087	-	

GROUND WATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE SRK01, Slick Rock Processing Sites
 REPORT DATE: 2/26/2007 10:02 am

PARAMETER	UNITS	LOCATION ID	LOCATION TYPE	SAMPLE:		DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS:			DETECTION LIMIT	UN-CERTAINTY
				DATE	ID			LAB	DATA	QA		
Molybdenum	mg/L	0318	WL	09/07/2005	0001	4.99 - 15.02	4.000	F	#	0.017	-	
	mg/L	0318	WL	09/07/2005	0002	4.99 - 15.02	4.400	F	#	0.017	-	
	mg/L	0320	WL	09/07/2005	0001	4.92 - 9.96	0.0083	F	#	0.00017	-	
	mg/L	0508	WL	09/07/2005	0001	1.01 - 11.01	1.400	F	#	0.0087	-	
	mg/L	0510	WL	09/07/2005	0001	4.92 - 13.92	0.930	F	#	0.0035	-	
	mg/L	0684	WL	09/07/2005	0001	11.00 - 21.00	0.0044	F	#	0.00017	-	
Nitrate + Nitrite as Nitrogen	mg/L	0318	WL	09/07/2005	0001	4.99 - 15.02	720	F	#	5	-	
	mg/L	0318	WL	09/07/2005	0002	4.99 - 15.02	730	F	#	5	-	
	mg/L	0320	WL	09/07/2005	0001	4.92 - 9.96	0.01	U	F	#	0.01	-
	mg/L	0508	WL	09/07/2005	0001	1.01 - 11.01	220	F	#	2	-	
	mg/L	0510	WL	09/07/2005	0001	4.92 - 13.92	250	F	#	2	-	
	mg/L	0684	WL	09/07/2005	0001	11.00 - 21.00	0.01	U	F	#	0.01	-
Oxidation Reduction Potent	mV	0303	WL	09/06/2005	N001	4.30 - 14.30	-112	F	#	-	-	
	mV	0305	WL	09/06/2005	N001	8.70 - 18.70	-19	F	#	-	-	
	mV	0307	WL	09/06/2005	N001	4.40 - 14.40	-89	F	#	-	-	
	mV	0309	WL	09/06/2005	N001	10.20 - 20.20	-22	F	#	-	-	
	mV	0310	WL	09/06/2005	N001	14.70 - 19.70	-100	F	#	-	-	
	mV	0311	WL	09/06/2005	N001	14.10 - 19.10	40	F	#	-	-	
	mV	0312	WL	09/06/2005	N001	14.50 - 19.50	9	F	#	-	-	
	mV	0317	WL	09/07/2005	N001	19.46 - 39.52	112	F	#	-	-	
	mV	0318	WL	09/07/2005	N001	4.99 - 15.02	94	F	#	-	-	
	mV	0319	WL	09/07/2005	N001	4.55 - 14.58	-131	F	#	-	-	
	mV	0320	WL	09/07/2005	N001	4.92 - 9.96	-76	F	#	-	-	
	mV	0508	WL	09/07/2005	N001	1.01 - 11.01	72	F	#	-	-	
	mV	0510	WL	09/07/2005	N001	4.92 - 13.92	76	F	#	-	-	
	mV	0684	WL	09/07/2005	N001	11.00 - 21.00	19	F	#	-	-	

GROUND WATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE SRK01, Slick Rock Processing Sites
 REPORT DATE: 2/26/2007 10:02 am

PARAMETER	UNITS	LOCATION ID	LOCATION TYPE	SAMPLE DATE	SAMPLE ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB DATA QA	DETECTION LIMIT	UN-CERTAINTY
o-Xylene	ug/L	0319	WL	09/07/2005	N001	4.55 - 14.58	1100	F #	33	-
	ug/L	0319	WL	09/07/2005	N002	4.55 - 14.58	970	F #	33	-
pH	s.u.	0303	WL	09/06/2005	N001	4.30 - 14.30	7.34	F #	-	-
	s.u.	0305	WL	09/06/2005	N001	8.70 - 18.70	7.05	F #	-	-
	s.u.	0307	WL	09/06/2005	N001	4.40 - 14.40	7.08	F #	-	-
	s.u.	0309	WL	09/06/2005	N001	10.20 - 20.20	7.50	F #	-	-
	s.u.	0310	WL	09/06/2005	N001	14.70 - 19.70	7.18	F #	-	-
	s.u.	0311	WL	09/06/2005	N001	14.10 - 19.10	6.89	F #	-	-
	s.u.	0312	WL	09/06/2005	N001	14.50 - 19.50	7.42	F #	-	-
	s.u.	0317	WL	09/07/2005	N001	19.46 - 39.52	7.36	F #	-	-
	s.u.	0318	WL	09/07/2005	N001	4.99 - 15.02	6.51	F #	-	-
	s.u.	0319	WL	09/07/2005	N001	4.55 - 14.58	6.94	F #	-	-
	s.u.	0320	WL	09/07/2005	N001	4.92 - 9.96	7.08	F #	-	-
	s.u.	0508	WL	09/07/2005	N001	1.01 - 11.01	6.90	F #	-	-
	s.u.	0510	WL	09/07/2005	N001	4.92 - 13.92	6.59	F #	-	-
	s.u.	0684	WL	09/07/2005	N001	11.00 - 21.00	7.09	F #	-	-
	Radium-226	pCi/L	0319	WL	09/07/2005	0001	4.55 - 14.58	1.66	FJ #	0.625
pCi/L		0319	WL	09/07/2005	0002	4.55 - 14.58	1.94	F #	0.323	± 0.64
Radium-228	pCi/L	0319	WL	09/07/2005	0001	4.55 - 14.58	2.22	FJ #	1.19	± 0.92
	pCi/L	0319	WL	09/07/2005	0002	4.55 - 14.58	2.34	FJ #	1.18	± 0.95
Selenium	mg/L	0305	WL	09/06/2005	0001	8.70 - 18.70	0.028	F #	0.0002	-
	mg/L	0307	WL	09/06/2005	0001	4.40 - 14.40	0.00012	F #	0.00004	-
	mg/L	0318	WL	09/07/2005	0001	4.99 - 15.02	3.400	F #	0.04	-
	mg/L	0318	WL	09/07/2005	0002	4.99 - 15.02	3.500	F #	0.04	-
	mg/L	0320	WL	09/07/2005	0001	4.92 - 9.96	0.00004 U	F #	0.00004	-

GROUND WATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE SRK01, Slick Rock Processing Sites
 REPORT DATE: 2/26/2007 10:02 am

PARAMETER	UNITS	LOCATION ID	LOCATION TYPE	SAMPLE DATE	SAMPLE ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB DATA QA	DETECTION LIMIT	UN-CERTAINTY
Selenium	mg/L	0508	WL	09/07/2005	0001	1.01 - 11.01	0.870	F #	0.004	-
	mg/L	0510	WL	09/07/2005	0001	4.92 - 13.92	0.230	F #	0.002	-
	mg/L	0684	WL	09/07/2005	0001	11.00 - 21.00	0.00005	B UF #	0.00004	-
Specific Conductance	umhos/cm	0303	WL	09/06/2005	N001	4.30 - 14.30	2603	F #	-	-
	umhos/cm	0305	WL	09/06/2005	N001	8.70 - 18.70	4600	F #	-	-
	umhos/cm	0307	WL	09/06/2005	N001	4.40 - 14.40	8842	F #	-	-
	umhos/cm	0309	WL	09/06/2005	N001	10.20 - 20.20	6675	F #	-	-
	umhos/cm	0310	WL	09/06/2005	N001	14.70 - 19.70	1435	F #	-	-
	umhos/cm	0311	WL	09/06/2005	N001	14.10 - 19.10	3355	F #	-	-
	umhos/cm	0312	WL	09/06/2005	N001	14.50 - 19.50	1763	F #	-	-
	umhos/cm	0317	WL	09/07/2005	N001	19.46 - 39.52	2988	F #	-	-
	umhos/cm	0318	WL	09/07/2005	N001	4.99 - 15.02	6238	F #	-	-
	umhos/cm	0319	WL	09/07/2005	N001	4.55 - 14.58	5401	F #	-	-
	umhos/cm	0320	WL	09/07/2005	N001	4.92 - 9.96	932	F #	-	-
	umhos/cm	0508	WL	09/07/2005	N001	1.01 - 11.01	3985	F #	-	-
	umhos/cm	0510	WL	09/07/2005	N001	4.92 - 13.92	4157	F #	-	-
	umhos/cm	0684	WL	09/07/2005	N001	11.00 - 21.00	1291	F #	-	-
Temperature	C	0303	WL	09/06/2005	N001	4.30 - 14.30	18.8	F #	-	-
	C	0305	WL	09/06/2005	N001	8.70 - 18.70	16.8	F #	-	-
	C	0307	WL	09/06/2005	N001	4.40 - 14.40	16.8	F #	-	-
	C	0309	WL	09/06/2005	N001	10.20 - 20.20	15.0	F #	-	-
	C	0310	WL	09/06/2005	N001	14.70 - 19.70	15.4	F #	-	-
	C	0311	WL	09/06/2005	N001	14.10 - 19.10	16.7	F #	-	-
	C	0312	WL	09/06/2005	N001	14.50 - 19.50	17.5	F #	-	-
	C	0317	WL	09/07/2005	N001	19.46 - 39.52	15.3	F #	-	-
C	0318	WL	09/07/2005	N001	4.99 - 15.02	19.5	F #	-	-	

GROUND WATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE SRK01, Slick Rock Processing Sites
 REPORT DATE: 2/26/2007 10:02 am

PARAMETER	UNITS	LOCATION ID	LOCATION TYPE	SAMPLE DATE	SAMPLE ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB DATA QA	DETECTION LIMIT	UN-CERTAINTY
Temperature	C	0319	WL	09/07/2005	N001	4.55 - 14.58	18.1	F #	-	-
	C	0320	WL	09/07/2005	N001	4.92 - 9.96	19.0	F #	-	-
	C	0508	WL	09/07/2005	N001	1.01 - 11.01	20.1	F #	-	-
	C	0510	WL	09/07/2005	N001	4.92 - 13.92	19.7	F #	-	-
	C	0684	WL	09/07/2005	N001	11.00 - 21.00	15.0	F #	-	-
Toluene	ug/L	0319	WL	09/07/2005	N001	4.55 - 14.58	8500	F #	190	-
	ug/L	0319	WL	09/07/2005	N002	4.55 - 14.58	6700	F #	120	-
Total Xylene	ug/L	0319	WL	09/07/2005	N001	4.55 - 14.58	200	J F #	33	-
	ug/L	0319	WL	09/07/2005	N002	4.55 - 14.58	220	J F #	33	-
Turbidity	NTU	0303	WL	09/06/2005	N001	4.30 - 14.30	1.26	F #	-	-
	NTU	0305	WL	09/06/2005	N001	8.70 - 18.70	5.48	F #	-	-
	NTU	0307	WL	09/06/2005	N001	4.40 - 14.40	5.83	F #	-	-
	NTU	0309	WL	09/06/2005	N001	10.20 - 20.20	7.52	F #	-	-
	NTU	0310	WL	09/06/2005	N001	14.70 - 19.70	2.16	F #	-	-
	NTU	0311	WL	09/06/2005	N001	14.10 - 19.10	1.54	F #	-	-
	NTU	0312	WL	09/06/2005	N001	14.50 - 19.50	5.73	F #	-	-
	NTU	0317	WL	09/07/2005	N001	19.46 - 39.52	2.15	F #	-	-
	NTU	0318	WL	09/07/2005	N001	4.99 - 15.02	5.21	F #	-	-
	NTU	0319	WL	09/07/2005	N001	4.55 - 14.58	6.06	F #	-	-
	NTU	0320	WL	09/07/2005	N001	4.92 - 9.96	3.07	F #	-	-
	NTU	0508	WL	09/07/2005	N001	1.01 - 11.01	2.93	F #	-	-
	NTU	0510	WL	09/07/2005	N001	4.92 - 13.92	9.81	F #	-	-
	NTU	0684	WL	09/07/2005	N001	11.00 - 21.00	5.39	F #	-	-
Uranium	mg/L	0303	WL	09/06/2005	0001	4.30 - 14.30	0.760	F #	7.5E-05	-
	mg/L	0305	WL	09/06/2005	0001	8.70 - 18.70	1.700	F #	0.00019	-

GROUND WATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE SRK01, Slick Rock Processing Sites
 REPORT DATE: 2/26/2007 10:02 am

PARAMETER	UNITS	LOCATION ID	LOCATION TYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB DATA QA	DETECTION LIMIT	UN-CERTAINTY
Uranium	mg/L	0307	WL	09/06/2005	0001	4.40 - 14.40	1.000	F #	7.5E-05	-
	mg/L	0309	WL	09/06/2005	0001	10.20 - 20.20	0.340	F #	3.8E-05	-
	mg/L	0310	WL	09/06/2005	0001	14.70 - 19.70	0.037	F #	3.8E-06	-
	mg/L	0311	WL	09/06/2005	0001	14.10 - 19.10	0.150	F #	1.9E-05	-
	mg/L	0312	WL	09/06/2005	0001	14.50 - 19.50	0.041	F #	3.8E-06	-
	mg/L	0318	WL	09/07/2005	0001	4.99 - 15.02	0.040	F #	1.9E-05	-
	mg/L	0318	WL	09/07/2005	0002	4.99 - 15.02	0.040	F #	1.9E-05	-
	mg/L	0320	WL	09/07/2005	0001	4.92 - 9.96	0.018	F #	3.8E-06	-
	mg/L	0508	WL	09/07/2005	0001	1.01 - 11.01	0.130	F #	0.00019	-
	mg/L	0510	WL	09/07/2005	0001	4.92 - 13.92	0.100	F #	7.5E-05	-
	mg/L	0684	WL	09/07/2005	0001	11.00 - 21.00	0.014	F #	3.8E-06	-

GROUND WATER QUALITY DATA BY PARAMETER WITH DEPTH (USEE200) FOR SITE SRK01, Slick Rock Processing Sites
 REPORT DATE: 2/26/2007 10:02 am

PARAMETER	UNITS	LOCATION ID	LOCATION TYPE	SAMPLE: DATE	SAMPLE: ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB DATA QA	DETECTION LIMIT	UN-CERTAINTY
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RECORDS: SELECTED FROM USEE200 WHERE site_code='SRK01' AND (data_validation_qualifiers IS NULL OR data_validation_qualifiers NOT LIKE '%N%' AND data_validation_qualifiers NOT LIKE '%R%' AND data_validation_qualifiers NOT LIKE '%X%') AND DATE_SAMPLED between #1/1/2005# and #12/31/2005#

SAMPLE ID CODES: 000X = Filtered sample (0.45 µm). N00X = Unfiltered sample. X = replicate number.

LOCATION TYPES: WL WELL

LAB QUALIFIERS:

- * Replicate analysis not within control limits.
- + Correlation coefficient for MSA < 0.995.
- > Result above upper detection limit.
- A TIC is a suspected aldol-condensation product.
- B Inorganic: Result is between the IDL and CRDL. Organic & Radiochemistry: Analyte also found in method blank.
- C Pesticide result confirmed by GC-MS.
- D Analyte determined in diluted sample.
- E Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.
- H Holding time expired, value suspect.
- I Increased detection limit due to required dilution.
- J Estimated
- M GFAA duplicate injection precision not met.
- N Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound (TIC).
- P > 25% difference in detected pesticide or Arochlor concentrations between 2 columns.
- S Result determined by method of standard addition (MSA).
- U Analytical result below detection limit.
- W Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
- X Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
- Y Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
- Z Laboratory defined (USEPA CLP organic) qualifier, see case narrative.

DATA QUALIFIERS:

- | | | |
|--|--|--|
| F Low flow sampling method used. | G Possible grout contamination, pH > 9. | J Estimated value. |
| L Less than 3 bore volumes purged prior to sampling. | N Presumptive evidence that analyte is present. The analyte is "tentatively identified". | Q Qualitative result due to sampling technique |
| R Unusable result. | U Parameter analyzed for but was not detected. | X Location is undefined. |

QA QUALIFIER: # = validated according to Quality Assurance guidelines.

Appendix B

Surface Water Quality Data by Parameter

SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE SRK01, Slick Rock Processing Sites
 REPORT DATE: 2/26/2007 10:02 am

PARAMETER	UNITS	LOCATION		SAMPLE:		RESULT	QUALIFIERS:		DETECTION LIMIT	UN- CERTAINTY
		ID	DATE	ID	DATE		LAB	DATA QA		
Alkalinity, Total (As CaCO3)	mg/L	0347	09/07/2005	0001		104		#	-	-
	mg/L	0349	09/07/2005	0001		93		#	-	-
	mg/L	0692	09/06/2005	0001		96		#	-	-
	mg/L	0693	09/06/2005	0001		89		#	-	-
	mg/L	0694	09/07/2005	0001		98		#	-	-
	mg/L	0696	09/06/2005	0001		86		#	-	-
	mg/L	0700	09/06/2005	0001		94		#	-	-
Manganese	mg/L	0347	09/07/2005	0001		0.0032 B		#	9.5E-05	-
	mg/L	0349	09/07/2005	0001		0.140		#	9.5E-05	-
	mg/L	0693	09/06/2005	0001		0.0008 B		#	9.5E-05	-
	mg/L	0694	09/07/2005	0001		0.0018 B	U	#	9.5E-05	-
Molybdenum	mg/L	0347	09/07/2005	0001		0.0035	J	#	0.00017	-
	mg/L	0349	09/07/2005	0001		0.0046		#	0.00017	-
	mg/L	0693	09/06/2005	0001		0.004	J	#	0.00017	-
	mg/L	0694	09/07/2005	0001		0.0031	J	#	0.00017	-
Nitrate + Nitrite as Nitrogen	mg/L	0347	09/07/2005	0001		0.076		#	0.01	-
	mg/L	0349	09/07/2005	0001		5		#	0.1	-
	mg/L	0693	09/06/2005	0001		0.12		#	0.01	-
	mg/L	0694	09/07/2005	0001		0.12		#	0.01	-
Oxidation Reduction Potent	mV	0347	09/07/2005	N001		31		#	-	-
	mV	0349	09/07/2005	N001		33		#	-	-
	mV	0692	09/06/2005	N001		-46		#	-	-
	mV	0693	09/06/2005	N001		-43		#	-	-
	mV	0694	09/07/2005	N001		27		#	-	-
	mV	0696	09/06/2005	N001		-20		#	-	-
	mV	0700	09/06/2005	N001		-3.9		#	-	-
pH	s.u.	0347	09/07/2005	N001		8.01		#	-	-
	s.u.	0349	09/07/2005	N001		7.86		#	-	-
	s.u.	0692	09/06/2005	N001		8.07		#	-	-
	s.u.	0693	09/06/2005	N001		7.97		#	-	-
	s.u.	0694	09/07/2005	N001		7.83		#	-	-
	s.u.	0696	09/06/2005	N001		8.16		#	-	-
	s.u.	0700	09/06/2005	N001		8.20		#	-	-
Selenium	mg/L	0347	09/07/2005	0001		0.0005		#	0.00004	-
	mg/L	0349	09/07/2005	0001		0.0028		#	0.00004	-
	mg/L	0693	09/06/2005	0001		0.0013		#	0.00004	-
	mg/L	0694	09/07/2005	0001		0.0005		#	0.00004	-

SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE SRK01, Slick Rock Processing Sites
 REPORT DATE: 2/26/2007 10:02 am

PARAMETER	UNITS	LOCATION ID	SAMPLE:		RESULT	QUALIFIERS:			DETECTION LIMIT	UN- CERTAINTY
			DATE	ID		LAB	DATA	QA		
Specific Conductance	umhos/cm	0347	09/07/2005	N001	599			#	-	-
	umhos/cm	0349	09/07/2005	N001	658			#	-	-
	umhos/cm	0692	09/06/2005	N001	703			#	-	-
	umhos/cm	0693	09/06/2005	N001	626			#	-	-
	umhos/cm	0694	09/07/2005	N001	573			#	-	-
	umhos/cm	0696	09/06/2005	N001	617			#	-	-
	umhos/cm	0700	09/06/2005	N001	830			#	-	-
Temperature	C	0347	09/07/2005	N001	21.4			#	-	-
	C	0349	09/07/2005	N001	20.9			#	-	-
	C	0692	09/06/2005	N001	23.4			#	-	-
	C	0693	09/06/2005	N001	23.5			#	-	-
	C	0694	09/07/2005	N001	19.9			#	-	-
	C	0696	09/06/2005	N001	22.4			#	-	-
	C	0700	09/06/2005	N001	24.4			#	-	-
Turbidity	NTU	0347	09/07/2005	N001	1000	>		#	-	-
	NTU	0349	09/07/2005	N001	1000	>		#	-	-
	NTU	0692	09/06/2005	N001	1000	>		#	-	-
	NTU	0693	09/06/2005	N001	1000	>		#	-	-
	NTU	0694	09/07/2005	N001	1000	>		#	-	-
	NTU	0696	09/06/2005	N001	1000	>		#	-	-
	NTU	0700	09/06/2005	N001	1000	>		#	-	-
Uranium	mg/L	0347	09/07/2005	0001	0.0011			#	3.8E-06	-
	mg/L	0349	09/07/2005	0001	0.0031			#	3.8E-06	-
	mg/L	0692	09/06/2005	0001	0.0016			#	3.8E-06	-
	mg/L	0693	09/06/2005	0001	0.0012			#	3.8E-06	-
	mg/L	0694	09/07/2005	0001	0.0011			#	3.8E-06	-
	mg/L	0696	09/06/2005	0001	0.0011			#	3.8E-06	-
	mg/L	0700	09/06/2005	0001	0.0014			#	3.8E-06	-

SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE SRK01, Slick Rock Processing Sites
 REPORT DATE: 2/26/2007 10:02 am

PARAMETER	UNITS	LOCATION		SAMPLE:		RESULT	QUALIFIERS:			UN- CERTAINTY
		ID		DATE	ID		LAB	DATA	QA	

RECORDS: SELECTED FROM USEE800 WHERE site_code='SRK01' AND (data_validation_qualifiers IS NULL OR data_validation_qualifiers NOT LIKE '%N%' AND data_validation_qualifiers NOT LIKE '%R%' AND data_validation_qualifiers NOT LIKE '%X%') AND DATE_SAMPLED between #1/1/2005# and #12/31/2005#

SAMPLE ID CODES: 000X = Filtered sample (0.45 µm). N00X = Unfiltered sample. X = replicate number.

LAB QUALIFIERS:

- * Replicate analysis not within control limits.
- + Correlation coefficient for MSA < 0.995.
- > Result above upper detection limit.
- A TIC is a suspected aldol-condensation product.
- B Inorganic: Result is between the IDL and CRDL. Organic & Radiochemistry: Analyte also found in method blank.
- C Pesticide result confirmed by GC-MS.
- D Analyte determined in diluted sample.
- E Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.
- H Holding time expired, value suspect.
- I Increased detection limit due to required dilution.
- J Estimated
- M GFAA duplicate injection precision not met.
- N Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound (TIC).
- P > 25% difference in detected pesticide or Arochlor concentrations between 2 columns.
- S Result determined by method of standard addition (MSA).
- U Analytical result below detection limit.
- W Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
- X Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
- Y Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
- Z Laboratory defined (USEPA CLP organic) qualifier, see case narrative.

DATA QUALIFIERS:

- | | |
|--|--|
| F Low flow sampling method used. | G Possible grout contamination, pH > 9. |
| J Estimated value. | L Less than 3 bore volumes purged prior to sampling. |
| N Presumptive evidence that analyte is present. The analyte is "tentatively identified". | Q Qualitative result due to sampling technique |
| R Unusable result. | U Parameter analyzed for but was not detected. |
| X Location is undefined. | |

QA QUALIFIER: # = validated according to Quality Assurance guidelines.