LMS/SHP/S08223

Optimization of Sampling at the Shiprock, New Mexico, Site

March 2013

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Appendix

Appendix A Semiannual Sampling Results 2003–2011

Abbreviations

bgs	below ground surface
CM	conceptual model report
COC	contaminant of concern
DOE	U.S. Department of Energy
DQOs	Data Quality Objectives
EPA	U.S. Environmental Protection Agency
ft	feet
GCAP	Ground Water Compliance Action Plan
LMS	Legacy Management Support
LOWESS	locally weighted scatterplot smoothing
MCL	maximum concentration limit (established in 40 CFR 192)
MDW	Many Devils Wash
mg/L	milligrams per liter
NRC	U.S. Nuclear Regulatory Commission
SAP	*Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites*
SOWP	Site Observational Work Plan
UMTRCA	Uranium Mill Tailings Radiation Control Act
VSP	Visual Sample Plan

Executive Summary

The sampling regime at the U.S. Department of Energy (DOE) Office of Legacy Management Shiprock, New Mexico, Site is the most extensive and costly of the Uranium Mill Tailings Radiation Control Act sites currently managed by DOE. The number of monitoring locations has increased from that originally established in the Ground Water Compliance Action Plan (GCAP). The U.S. Nuclear Regulatory Commission concurred with the groundwater compliance strategy proposed in the GCAP, which is the approved remediation strategy for the site. Therefore, the approach to optimizing the sampling regime focuses on the locations added after the GCAP was issued. Stakeholder concerns regarding the compliance strategy in the GCAP have led to an expansion of the remediation system, resulting in a large number of additional monitoring locations. The current sampling regime has become complex, and the specific data objectives for monitoring some of the locations are not clear. This report uses both statistical and logical assessments to recommend changes to the sampling conducted at the Shiprock site while remaining in compliance with the GCAP and the site remediation goals, and ensuring protection of human health and the environment. The format of this report and assessment of current data objectives follow U.S. Environmental Protection Agency guidance on systematic planning using the data quality objectives process. Statistical approaches were used mainly to identify temporal redundancy in the data to support reducing the sampling frequency from semiannual to annual, as proposed in the GCAP. The number of locations and the analytes sampled at each location were compared to the sampling objectives to assess whether any locations or analytes could be eliminated. The report provides recommendations for reducing the magnitude of the sampling effort to be more consistent with the current approved strategy until a new strategy can be developed and the GCAP rewritten. This report makes recommendations as an initial evaluation of the site strategy and objectives that could lead to changes to the remediation strategy.

The changes recommended in this report include (1) reducing the sampling frequency at all locations from semiannual (March and September) to annual (September); (2) eliminating locations or reducing the sampling to water level only at locations where the objective is to delineate the plume for mapping purposes and where adjacent locations provide sufficient data for map preparation; and (3) eliminating locations that are dry and are still being checked and tracked by the sampling crew.

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1.0 Introduction

In 2003, the U.S. Department of Energy (DOE) established a pump-and-treat groundwater remediation system at the Shiprock, New Mexico, Disposal and Processing Site. Many sampling locations have since been added beyond the original 60 called for in the Groundwater Compliance Action Plan (GCAP; DOE 2002) approved by the U.S. Nuclear Regulatory Commission (NRC) to assess the performance of new remediation system components, to better delineate contaminant plumes, and to address stakeholder concerns. Currently, DOE conducts semiannual monitoring at 173 locations, consisting of monitoring wells, surface locations, and treatment system components. The purpose of this report is to evaluate whether the current sampling approach supports the site compliance goals, meets the Data Quality Objectives (DQOs), and complies with the requirements of Title 40 *Code of Federal Regulations* Part 192.20 (40 CFR 192.20), which establishes remedial action standards for the Shiprock site. Guidance in 40 CFR 192.20 (b) (4) states the following:

> Monitoring for assessment and compliance purposes should be sufficient to establish the extent and magnitude of contamination, with reasonable assurance, through use of a carefully chosen minimal number of sampling locations. The location and number of monitoring wells, the frequency and duration of monitoring, and the selection of indicator analytes for long-term groundwater monitoring, and, more generally, the design and operation of the monitoring system, will depend on the potential for risk to receptors and upon other factors, including characteristics of the subsurface environment, such as velocity of groundwater flow, contaminant retardation, time of groundwater or contaminant transit to receptors, results of statistical evaluations of data trends, and modeling of the dynamics of the groundwater system. All of these factors should be incorporated into the design of a site-specific monitoring program that will achieve the purpose of the regulations in this subpart in the most cost-effective manner.

To ensure that an effective and efficient approach is used to monitor groundwater and surface water at the Shiprock site, this report incorporates requirements of the compliance strategy, sampling regime, and site DQOs[1] to design a monitoring approach that provides the data necessary to make decisions regarding groundwater cleanup. The objective is to identify an optimal number of monitoring locations and optimal sampling frequency that comply with the Uranium Mill Tailings Radiation Control Act (UMTRCA) requirements in 40 CFR 192.

2.0 Background

2.1 Site Description

The Shiprock site is located within the Navajo Nation in the northwest corner of New Mexico near the town of Shiprock, approximately 28 miles west of Farmington, New Mexico. The Shiprock site was used for milling of uranium and vanadium ores from 1954 until 1968 and processed about 1.5 million tons of ore. In 1983, DOE and the Navajo Nation entered into an agreement for site cleanup. By September 1986, all the tailings and associated contaminated materials were encapsulated in a disposal cell built on top of the existing tailings piles. The disposal cell and adjacent former mill site sit on a terrace that is trisected by two minor

[1] The EPA document *Guidance on Systematic Planning Using the Data Quality Objectives Process* (EPA 2006) will be used to better define site DQOs.

drainages, Bob Lee Wash and Many Devils Wash. At the northeast edge of the terrace, a steep escarpment 50 to 60 feet (ft) high forms the boundary between the San Juan River floodplain and the terrace areas (Figure 1).

The floodplain alluvial aquifer is north and east of the disposal cell in the floodplain area lying between the San Juan River and the base of the escarpment. Floodplain groundwater occurs in unconsolidated, medium- to coarse-grained sand, gravel, and cobbles underlain by Mancos Shale. This aquifer is hydraulically connected to the San Juan River.

The terrace alluvial groundwater system is bounded to the south of the former mill by a buried escarpment (Figure 1) that trends east-west about 1,500 ft south of the disposal cell. The terrace groundwater system also extends more than a mile to the west and northwest, on the west side of U.S. Highway 491. Terrace alluvium consists mainly of unconsolidated medium- to coarse-grained sand, gravel, and cobbles that are underlain by Mancos Shale. Silty, windblown sediments (loess) overlie many parts of the terrace groundwater system. Past milling operations have left contaminants in the terrace groundwater and in the floodplain alluvial aquifer. Contaminated groundwater from the terrace has infiltrated the upper few feet of the underlying weathered Mancos Shale bedrock and has migrated into the alluvial aquifer on the floodplain. The contaminants of concern (COCs) are ammonia, manganese, nitrate, selenium, strontium, sulfate, and uranium.

3.0 Current Sampling Regime

3.1 Sampling Locations

Sampling at the Shiprock site is conducted to assess the progress of groundwater remediation at the site and to ensure protection of human health and the environment. The remediation approach has been augmented over the years to meet remediation goals and to address stakeholder concerns. The original compliance strategy was established in the *Final Ground Water Compliance Action Plan for Remediation at the Shiprock, New Mexico, UMTRA Site* (DOE 2002). NRC has concurred with the plan. In 2005, DOE reviewed the strategy and updated the site conceptual model, as described in the *Refinement of Conceptual Model and Recommendations for Improving Remediation Efficiency at the Shiprock, New Mexico, Site* (DOE 2005). The strategy was recently reviewed again in the *2010 Review and Evaluation of the Shiprock Remediation Strategy* (DOE 2011). The GCAP and the site conceptual model established monitoring requirements for the site to match the remediation strategy.

Since 2005, a large number of wells and sampling locations have been added to the monitoring network (Figure 2 and Figure 3). Currently, 81 locations are on the sampling list for the floodplain, and 92 are on the sampling list for the terrace; each location is sampled semiannually. The GCAP required 20 floodplain and 40 terrace monitoring locations, whereas the refined conceptual model (DOE 2005) called for a total of 27 and 73 monitoring locations on the floodplain and terrace, respectively. Some of the additional monitoring locations were established in response to stakeholder requests, and others were added to monitor the performance of new treatment system components. Semiannual sampling is currently conducted at 173 locations. Sampling includes checking dry wells and taking water level measurements at

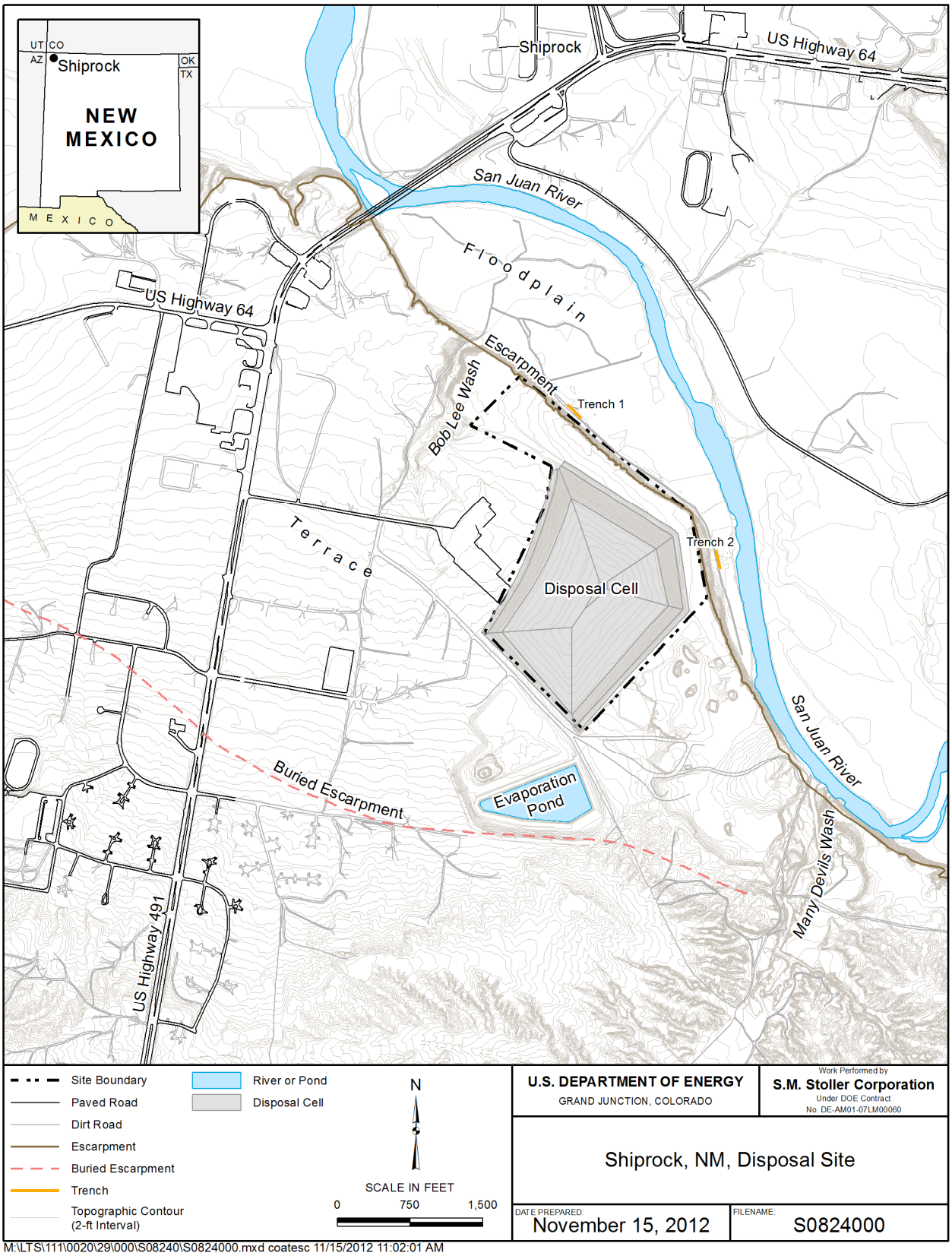
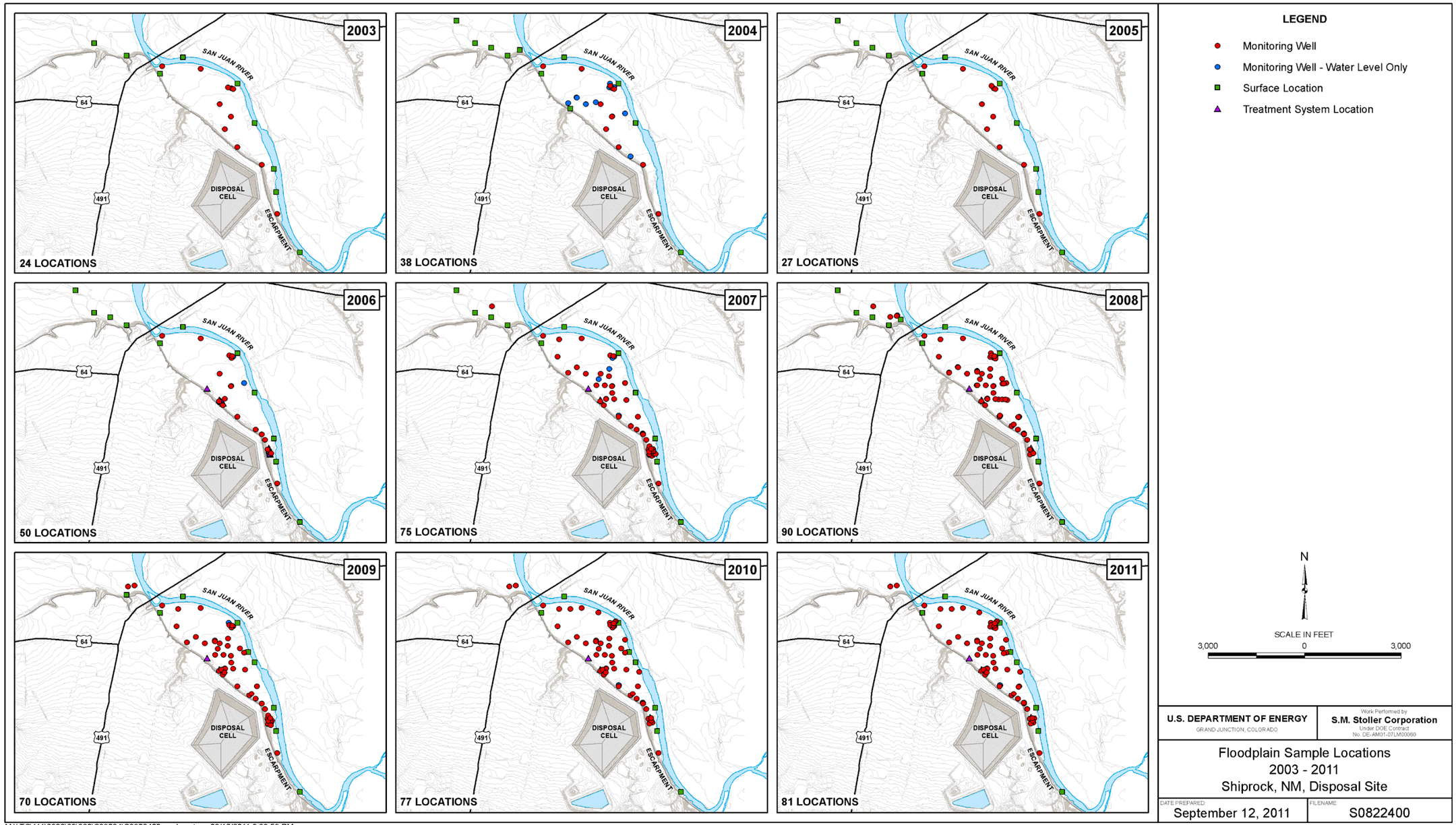


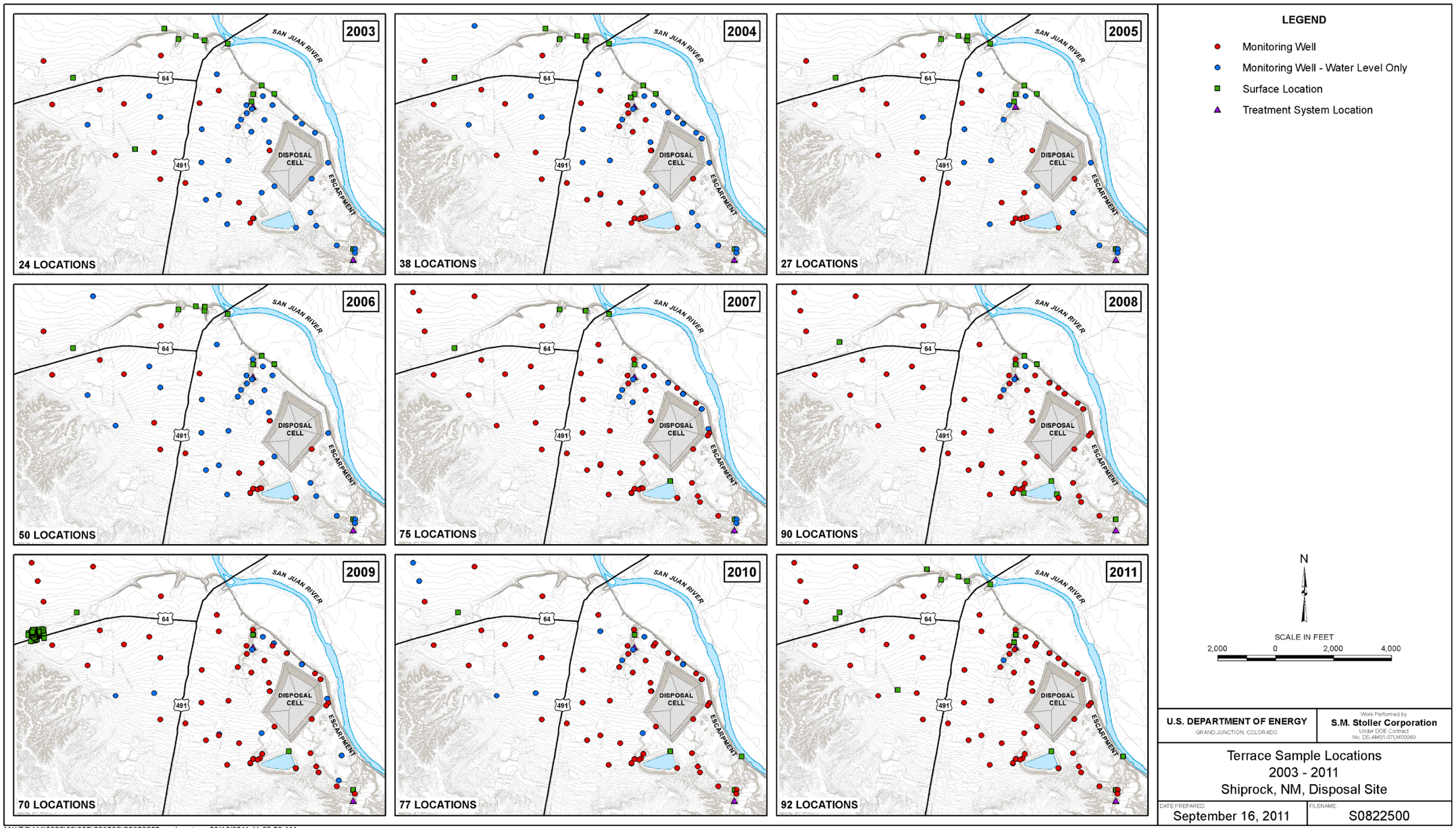
Figure 1. Shiprock Location and Site Features

wells where water level is the only measurement; therefore, analytical results may not be obtained for all 173 locations. 14 locations that are not on the semiannual monitoring list are monitored remotely. In all, 187 locations are being monitored in some way at the site. Table 1 and Table 2 include all of the locations on the sampling list as well as locations that are listed in the GCAP and the refined conceptual model (DOE 2005) that are not on the current sampling list because they have been replaced by newer wells, replaced by a collection system, destroyed, or decommissioned (Table 1 and Table 2).



Map represents all locations that had a result, including nondetects, dry wells, and special study/nonroutine locations. Dry surface locations are not shown.

Figure 2. Floodplain Monitoring Locations: 2003–2011



Map represents all locations that had a result, including nondetects, dry wells, and special study/nonroutine locations. Dry surface locations are not shown.

Figure 3. Terrace Monitoring Locations: 2003–2011

Table 1. Current Floodplain Monitoring Locations

Floodplain Wells										Floodplain Surface Locations				
Location	Date Location Established	Currently Sampled	GCAP 2002	Site Conceptual Model 2005	Location	Date Location Established	Currently Sampled	GCAP 2002	Site Conceptual Model 2005	Location	Date Location Established	Currently Sampled	GCAP 2002	Site Conceptual Model 2005
0608	8/29/1985	Semiannually	Semiannually	Semiannually	0856	10/12/1998	Semiannually			0501	5/19/1986	Semiannually		Semiannually
0610	8/30/1985	Semiannually			0857	10/11/1998	Semiannually			0655	5/19/1993	Semiannually	Semiannually	Semiannually
0611	9/3/1985	Semiannually			0862	9/21/1998	Water Level Only		Water Level Only	0887	12/10/1998	Not Sampled[a]	Semiannually	Semiannually
0612	9/4/1985	Semiannually			0863	11/22/1998	Water Level Only		Water Level Only	0897	12/10/1998	Semiannually	Semiannually	Semiannually
0614	9/4/1985	Semiannually	Semiannually	Semiannually	1000	4/8/2000	Water Level Only		Water Level Only	0898	8/5/1986	Semiannually	Semiannually	
0615	9/6/1985	Semiannually	Semiannually	Semiannually	1001	4/8/2000	Water Level Only		Water Level Only	0899	12/3/1998	Semiannually		
0617	9/5/1985	Datalogger Only			1008	4/13/2000	Semiannually		Semiannually	0937	4/8/1999	Not Sampled[a]		
0618	9/5/1985	Semiannually	Semiannually	Semiannually	1009	4/12/2000	Semiannually			0938	4/8/1999	Not Sampled[a]		
0619	9/6/1985	Semiannually	Semiannually	Semiannually	1062	4/7/2000	Water Level Only		Water Level Only	0939	4/8/1999	Not Sampled[a]		
0622	8/28/1985	Semiannually			1077	8/27/2002	Replaced by 1104		Semiannually	0940	6/6/1999	Semiannually	Semiannually	Semiannually
0623	9/7/1985	Semiannually			1089	6/25/2003	Semiannually		Semiannually	0956	6/16/2000[b]	Semiannually	Semiannually	Semiannually
0625	9/7/1985	Semiannually			1104	4/1/2005	Semiannually			0957	6/19/2000[b]	Replaced by 0965	Semiannually	
0626	9/8/1985	Semiannually			1105	3/3/2005	Semiannually			0959	9/21/2001[b]	Not Sampled[a]	Semiannually	Semiannually
0628	9/9/1985	Semiannually			1109	4/1/2006	Semiannually			0965	3/4/2003	Semiannually		
0630	9/9/1985	Semiannually			1110	4/1/2006	Semiannually			1118	10/11/2006	Semiannually		
0734	3/25/1993	Semiannually	Semiannually	Semiannually	1111	6/7/2006	Semiannually			1203	3/14/2000	Semiannually		Semiannually
0735	3/26/1993	Semiannually	Semiannually	Semiannually	1112	6/7/2006	Semiannually			1205	3/14/2000	Semiannually	Semiannually	Semiannually
0736	3/24/1993	Semiannually	Semiannually	Semiannually	1113	6/7/2006	Semiannually							
0766	10/27/1999	Semiannually			1114	6/6/2006	Semiannually							
0768	10/27/1999	Semiannually			1115	6/6/2006	Semiannually							
0773	10/27/1999	Semiannually			1117	6/6/2006	Semiannually							
0775	10/27/1999	Semiannually			1128	2/6/2007	Semiannually							
0779	10/27/1999	Semiannually			1132	2/7/2007	Semiannually							
0782R	9/16/2008	Semiannually			1134	2/7/2007	Semiannually							
0783R	9/16/2008	Semiannually			1135	1/26/2010	Semiannually							
0792	3/1/2001	Semiannually			1136	1/27/2010	Semiannually							
0793	3/1/2001	Semiannually			1137	1/26/2010	Semiannually							
0797	3/2/2001	Semiannually	Semiannually	Semiannually	1138	1/26/2010	Semiannually							
0798	3/1/2001	Semiannually			1139	1/26/2010	Semiannually							
0850	10/23/1998	Semiannually	Semiannually	Semiannually	1140	5/15/2009	Semiannually							
0853	10/11/1998	Semiannually			1141	5/15/2009	Semiannually							
0854	10/25/1998	Semiannually	Semiannually	Omit	1142	1/27/2010	Semiannually							
0855	10/24/1998	Semiannually			1143	1/25/2010	Semiannually							

[a] Channel destroyed
[b] Date established not recorded; date listed is earliest sampling result

Table 2. Current Terrace Monitoring Locations

Terrace Wells										Terrace Surface Locations				
Location	Date Location Established	Currently Sampled	GCAP 2002	Site Conceptual Model 2005	Location	Date Location Established	Currently Sampled	GCAP 2002	Site Conceptual Model 2005	Location	Date Location Established	Currently Sampled	GCAP 2002	Site Conceptual Model 2005
0600	1/13/1982	Semiannually		WL	0841	11/7/1998	Semiannually	Semiannually	Semiannually	0425	1/7/1991	Replaced by FP 1118		Flow Rate
0602	12/12/1981	Semiannually		WL	0843	12/5/1998	Semiannually			0426	1/7/1991	Replaced by FP 1118		Flow Rate
0603	6/3/1983	Semiannually		WL	0844	11/11/1998	Semiannually		Water Level Only	0662	1/1/1901	Semiannually	Semiannually	
0604	5/27/1983	Semiannually		WL	0846	12/2/1998	Not Sampled[a]	Semiannually	Semiannually	0786	10/29/1999	Semiannually	Semiannually	Flow Rate
0648	10/29/1960	Biennially	Biennially	Biennially	0847	1/1/1995	Not Sampled	Semiannually	Omit	0884	12/10/1998	Not Sampled[a]	Semiannually	
0725	3/28/1993	Semiannually			0848	1/1/1995	Semiannually		Water Level Only	0885	12/3/1998	Semiannually	Semiannually	Water Level Only
0726	3/28/1993	Semiannually		Water Level Only	1002	3/28/2000	Not Sampled[a]		Water Level Only	0886	12/3/1998	Not Sampled	Semiannually	Omit
0727	3/27/1993	Semiannually			1003	3/29/2000	Not Sampled[a]		Water Level Only	0889	12/3/1998	Semiannually	Semiannually	
0728	3/25/1995	Semiannually	Water Level Only	Water Level Only	1004	3/30/2000	Not Sampled[a]		Water Level Only	0933	4/7/1999	Not Sampled[a]	Semiannually	
0730	3/26/1993	Semiannually		Semiannually	1007	4/16/2000	Semiannually	Water Level Only	Water Level Only	0934	4/7/1999	Not Sampled[a]	Semiannually	
0731	3/23/1993	Semiannually		Water Level Only	1011	4/15/2000	Semiannually			0936	4/8/1999	Not Sampled[a]	Semiannually	
0800	9/23/1998	Not Sampled[a]	WL—Annually	WL—Annually	1048	12/14/1999	Semiannually		Water Level Only	0942	6/8/1999	Not Sampled[a]	Semiannually	
0801	11/17/1998	Not Sampled[a]	WL—Annually	WL—Annually	1049	12/15/1999	Semiannually		Water Level Only	0949	9/9/2008[c]	Not Sampled[a]		
0802	9/23/1998	Not Sampled[a]	WL—Annually	WL—Annually	1057	3/26/2000	Semiannually	Water Level Only	Water Level Only	0958	6/15/2000[c]	Not Sampled[a]	Semiannually	Biennially
0803	11/18/1998	Not Sampled[a]	WL—Annually	WL—Annually	1058	3/27/2000	Semiannually			1215	3/8/2007	Semiannually		
0812	10/27/1998	Semiannually	Water Level Only	Water Level Only	1059	4/16/2000	Semiannually		Water Level Only	1218	3/25/2010[c]	Semiannually		
0813	10/25/1998	Semiannually	Water Level Only	Water Level Only	1060	4/14/2000	Not Sampled[a]	Semiannually	Semiannually	1219	3/22/2011[c]	Semiannually		
0814	11/4/1998	Semiannually	Water Level Only	Water Level Only	1065	6/27/2001	Decommissioned[b]	Water Level Only	Water Level Only	1220	3/25/2010[c]	Semiannually		
0815	11/5/1998	Semiannually	Water Level Only	Water Level Only	1066	3/21/2002[c]	Decommissioned[b]	Water Level Only	Water Level Only	1221	3/26/2010[c]	Semiannually		
0816	11/5/1998	Semiannually		Water Level Only	1067	6/26/2001	Water Level Only	Water Level Only	Water Level Only					
0817	10/12/1998	Semiannually	Semiannually	Semiannually	1068	6/26/2001	Semiannually	Water Level Only	Water Level Only					
0818	10/8/1998	Semiannually	Water Level Only	Semiannually	1069	6/26/2001	Semiannually	Water Level Only	Water Level Only					
0819	10/14/1998	Semiannually		Water Level Only	1070	9/1/2002	Semiannually		Semiannually					
0820	9/16/1998	Semiannually		Water Level Only	1071	8/31/2002	Semiannually		Semiannually					
0821	9/17/1998	Not Sampled[a]		Water Level Only	1073	8/30/2002	Semiannually		Water Level Only					
0822	9/17/1998	Semiannually		Water Level Only	1074	8/30/2002	Semiannually							
0823	9/13/1998	Not Sampled[a]		Water Level Only	1078	8/28/2002	Semiannually		Semiannually					
0824	9/12/1998	Semiannually		Water Level Only	1079	8/31/2002	Semiannually	Semiannually	Semiannually					
0825	9/13/1998	Semiannually		Water Level Only	1087	3/3/2003	Semiannually		Semiannually					
0826	10/14/1998	Semiannually		Water Level Only	1088	3/3/2003	Semiannually		Semiannually					
0827	11/13/1998	Semiannually		Water Level Only	1091	7/11/2003	Semiannually		Semiannually					
0828	10/13/1998	Semiannually		Water Level Only	1092	7/19/2003	Semiannually		Semiannually					
0829	10/15/1998	Not Sampled[a]		Water Level Only	1093	7/14/2003	Replaced by 1093R		Semiannually					
0830	11/12/1998	Semiannually		Water Level Only	1093R	9/10/2007	Semiannually							
0832	11/10/1998	Not Sampled[a]	Semiannually	Semiannually	1094	7/24/2003	Replaced by 1093R		Semiannually					
0833	12/3/1998	Semiannually			1095	3/4/2005	Semiannually							
0835	12/6/1998	Semiannually	Semiannually	Semiannually	1096	3/7/2005	Semiannually							
0836	12/7/1998	Semiannually	Semiannually	Semiannually	1120	2/12/2007	Not Sampled[a]							
0837	12/5/1998	Semiannually			1122	2/12/2007	Not Sampled[a]							
0838	12/3/1998	Semiannually	Semiannually	Semiannually	MW1	2/4/1998[c]	Semiannually		Water Level Only					
0839	11/6/1998	Not Sampled[b]	Semiannually	Semiannually	DM7	1/25/1982	Not Sampled[a]		Water Level Only					

[a] Location dried up
[b] Location destroyed
[c] Date established not recorded; date listed is earliest sampling result
FP = Floodplain

3.2 Analytes Sampled

In addition to the site COCs, samples are analyzed for a variety of analytes that define the chemical characteristics of the site water. Table 3 shows the rationale and cost for the analytes monitored. Field measurements consist of data gathered during sampling and are also used as additional indicators of water quality.

Table 3. Rationale and Costs for Analytes Monitored at the Shiprock Site

Analyte	Analysis Type	Reason for Monitoring	Cost per Sample
Alkalinity	Field	Assess Water Chemistry	Negligible
Ammonia as N	Laboratory	GCAP COC	$13
Calcium	Laboratory	Assess Water Chemistry	$16.50
Chloride	Laboratory	Assess Water Chemistry	$13
Magnesium	Laboratory	Assess Water Chemistry	$16.50
Manganese	Laboratory	GCAP COC	$16.50
Nitrate + Nitrite as N	Laboratory	GCAP COC	$22
pH	Field	Assess Water Chemistry	Negligible
Potassium	Laboratory	Assess Water Chemistry	$16.50
Oxidation-Reduction Potential	Field	Assess Water Chemistry	Negligible
Selenium	Laboratory	GCAP COC	$22
Sodium	Laboratory	Assess Water Chemistry	$16.50
Specific Conductance	Field	Assess Water Chemistry	Negligible
Strontium	Laboratory	Ecological Concerns	$16.50
Sulfate	Laboratory	GCAP COC	$13
Temperature	Field	Assess Water Chemistry	Negligible
Turbidity	Field	Assess Water Chemistry	Negligible
Uranium	Laboratory	GCAP COC	$22

3.3 Sampling Quality

Sampling at the Shiprock site is conducted according to the *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites* (SAP) (LMS/PLN/S04351). Data of known, documented quality are produced through the following aspects of the SAP:

- Defensible and comprehensive sampling procedures
- Calibration of field instrumentation
- Collection of field quality-control samples
- Documentation of sampling activities
- Training of sampling personnel
- Records management

- Use of accredited commercial laboratories that:
  - Conform to Quality Systems for Analytical Services requirements
  - Are DOE Consolidated Audit Program (DOECAP)-audited annually
  - Use approved analytical procedures
- Data validation and qualification

The SAP sets the DQOs for data quality; however, DQOs also identify what information is needed for decision-making. In particular, the SAP specifies the analytes and parameters that need to be monitored, monitoring frequency, and monitoring locations. The GCAP established the DQOs for monitoring at the site.

4.0 Compliance Strategy

4.1 Floodplain

The compliance strategy for the floodplain outlined in the GCAP is natural flushing with monitoring supplemented by limited active remediation consisting of groundwater extraction from two extraction wells. The monitoring strategy was designed to determine the progress of natural flushing in meeting compliance standards for the site COCs and to determine the effectiveness of contaminant mass removal from the two extraction wells, which are located in one of the most contaminated parts of the plume. The purpose of the wells was to interdict contaminated groundwater migrating toward the river, thus preventing its discharge to the river. Information in Table 4 is reproduced from Table B-3 of the GCAP and outlines the monitoring requirements for the floodplain.

Table 4. Floodplain Monitoring Requirements Documented in the GCAP

Location	Purpose	Analyses/Measurement	Frequency
Wells 608, 614, 615, 618, 619, 734, 735, 736, 854	Compliance action levels (40 CFR 192)	COCs: manganese, nitrate, selenium, sulfate, uranium (and ammonia and strontium based on ecological concerns) Water chemistry: calcium, chloride, magnesium, potassium, sodium Onsite field analyses: alkalinity, conductivity, oxidation-reduction potential, pH, water level (in wells)	Semiannually through the first 7-year period, then annually through year 12, and every 5 years thereafter
Wells 797,850	Floodplain, background		
Surface 898	San Juan River, background		
Surface 897, 940, 1205	Intake on north side of San Juan River, risk		
Surface 956	San Juan River, downgradient, risk		
Surface 957	Floodplain drainage channel, risk		
Surface 655	Floodplain drainage channel, risk		
Surface 887	Distributary channel, risk		
Surface 959	Distributary channel, risk		

The GCAP requires semiannual monitoring for the initial 7 years of remediation (i.e., after initiation of pumping in 2003), followed by annual monitoring for the next 5 years, then monitoring every 5 years thereafter. The seventh year of semiannual monitoring was in 2009, and monitoring frequency would have been reduced to annually starting in 2010. However, because stakeholders had expressed concerns about the compliance strategy, and recently installed enhancements to the remediation system required additional data, DOE elected to continue sampling semiannually on the floodplain. Sampling locations included the locations required by the GCAP plus numerous additional locations.

4.2 Terrace

The compliance strategy for the terrace as outlined in the GCAP is organized into two parts referred to in the Site Observational Work Plan (SOWP; DOE 2000) as terrace east and terrace west. The strategy for terrace east is active remediation until potential risks to human health and the environment are eliminated. The strategy for terrace west is application of supplemental standards with monitoring. The monitoring strategy for terrace east calls for determining the effectiveness of active remediation in cutting off recharge to terrace west and in drying up the seeps on the escarpment and in the washes. The terrace west monitoring strategy calls for determining whether recharge from terrace east is being cut off (resulting in drying up of seeps in washes), and that milling-related constituents do not affect the current beneficial, limited use of the groundwater. Table 5 is reproduced from Table B-2 of the GCAP and outlines the monitoring requirements for the terrace.

Table 5. Terrace Monitoring Requirements Documented in the GCAP

Location	Purpose	Analyses/Measurement	Frequency
Flowing artesian well 648	Cleanup standards for floodplain	COCs: ammonium, manganese, nitrate, selenium, sulfate, uranium; strontium for ecological risk concerns	Semiannual flow measurements; sample for chemical analyses every 2 years
Terrace east well: 817 Terrace west wells: 832, 835, 836, 838, 839, 841, 846, 847/1079, 1060	Water level and groundwater chemistry	Water chemistry: calcium, chloride, magnesium, potassium, sodium Onsite field analyses: alkalinity, conductivity, oxidation-reduction potential, pH, water level	Semiannually through the 7 year extraction period, then annually through year 12, and every 5 years thereafter
Terrace east wells: 728, 812, 813, 818, 1007, 1057, 1065, 1066, 1067, 1068, 1069 Terrace west wells: 814, 815	Monitor lowering of water levels	Water level	

Table 5 (continued). Terrace Monitoring Requirements Documented in the GCAP

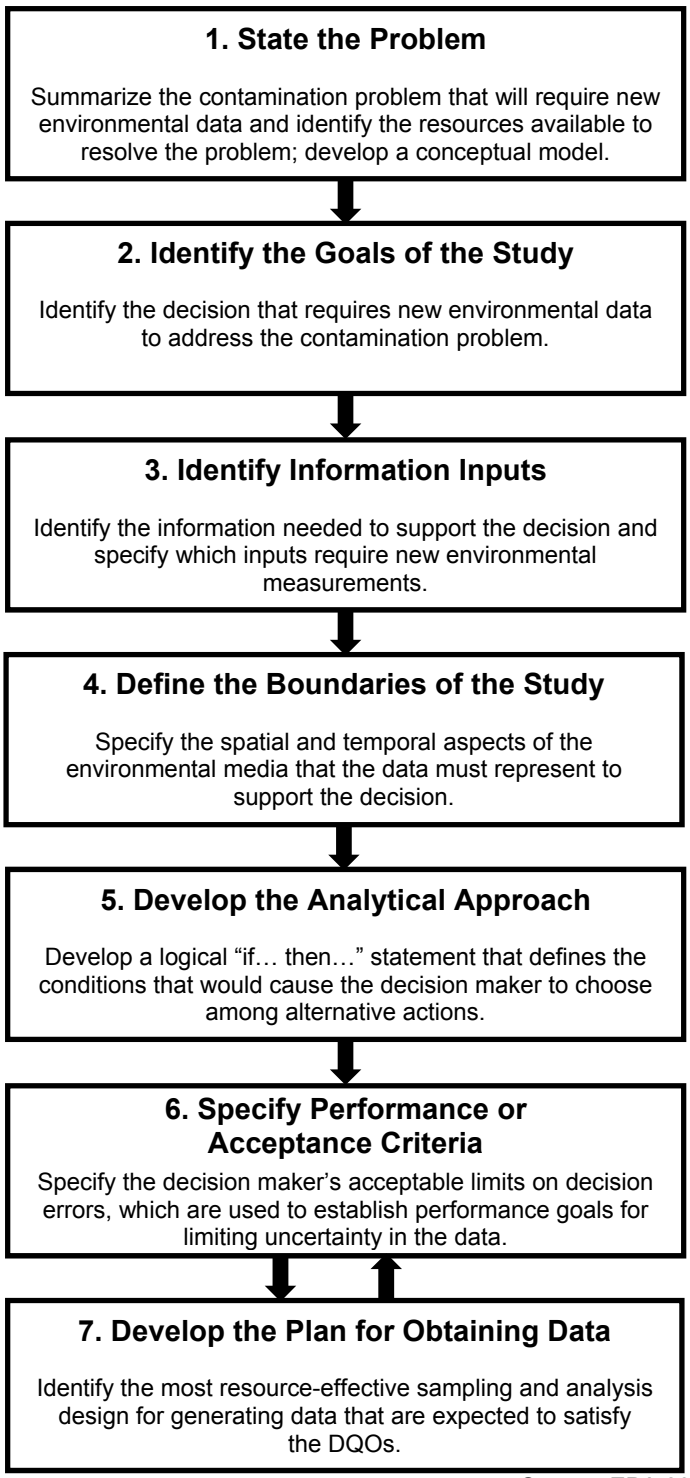
Location	Purpose	Analyses/Measurement	Frequency
Terrace east surface water: 425, 426, 662, 786, 885, 886, 889 Terrace west surface water: 884, 933, 934, 936, 942, 958	Monitor for ecological risks and lowering of water levels	COCs: ammonium, manganese, nitrate, selenium, sulfate, uranium; strontium for ecological risk concerns Water chemistry: calcium, chloride, magnesium, potassium, sodium Onsite field analyses: alkalinity, conductivity, oxidation-reduction potential, and pH Water level for 885, 886, and 889 Flow rate for 425, 426, and 786	Sample location 958 for chemical analysis once every 2 years
Terrace background wells: 800, 801, 802, 803	Presence of groundwater in terrace background	Water level	Annually for the first 5 years

Monitoring is required semiannually for the initial 7 years and then annually for the next 5 years followed by sampling every 5 years. The seventh year of semiannual sampling was in 2009, and annual sampling would have begun in 2010 according to the GCAP. However, as with the sampling frequency for the floodplain, because stakeholders had expressed concerns about the compliance strategy, and recently installed enhancements to the remediation system required additional data, DOE elected to continue sampling semiannually on the terrace. Sampling locations included those required by the GCAP plus numerous additional locations.

5.0 Data Quality Objectives

DQOs identify and document information needed for decision-making, as well as requirements for data quality; specifically, DQOs direct how complete, accurate, timely, and consistent the data need to be to support the decision-making process. Sampling at the Shiprock site is being conducted to monitor the progress of remediation at the site. Indicators of progress are the levels of COCs in the groundwater system and water levels in areas where dewatering is a goal. The approved compliance strategy in the GCAP allows for a reduction in sampling frequency from semiannual to annual. Based on stakeholder comments received on the update to the site conceptual model (DOE 2005) and the 2010 review and evaluation of the remediation system (DOE 2011), the compliance strategy may need to be evaluated. Additionally, an updated GCAP may need to be issued. As a preliminary evaluation, the remediation goals are discussed and matched to an optimal sampling regime to support decisions on the remediation system.

Developing DQOs is a seven-step process (EPA 2006): (1) state the problem, (2) identify the goals of the study, (3) identify information inputs, (4) define the boundaries of the study, (5) develop the analytical approach, (6) specify performance or acceptance criteria, and (7) develop the plan for obtaining data (Figure 4). Sections 6 through 12 of this report describe how these steps in the DQO process are applied to the Shiprock site.



Source: EPA 2006

Figure 4. Data Quality Objectives Process Flow Chart

6.0 State the Problem

In this step, a concise description of the problem is developed, the planning team is established, the site conceptual model is investigated, and resources and constraints are identified.

6.1 Problem Description

The scope and extent of sampling at the Shiprock site has greatly expanded over the years without clear objectives on how the data will be used. An optimized sampling regime is needed that will obtain the necessary data required to make decisions on the progress of remediation at the site while still being protective of human health and the environment.

6.2 Planning Team

Planning team members include:

DOE Office of Legacy Management Site Manager
Legacy Management Support (LMS) Site Lead
LMS technical staff
LMS Task Order Manager

6.3 Site Conceptual Model

The site conceptual model was first developed in the SOWP (DOE 2000) and was updated in the refinement of the site conceptual model report (DOE 2005). Since those documents were prepared, experience with the site conditions and results of remediation have led to further refinements to the site conceptual model. The current understanding of the site conceptual model is summarized below.

6.3.1 Terrace

Terrace groundwater occurs primarily in the alluvium overlying Mancos Shale and in the weathered, upper few feet of the shale. Lesser amounts of groundwater migrate through fractures in the underlying, competent portions of the Mancos Shale. Many sources of water have contributed to the terrace groundwater system. Findings derived from well installation and well development activities at the site, along with observed low extraction rates from terrace wells, indicate that the spatial continuity of saturated alluvium in the terrace groundwater system is limited. Weathered shale may provide a medium for transferring groundwater between isolated locales of saturated alluvium. The largest hydraulic conductivities are observed in the alluvium, whereas competent Mancos Shale is the least-permeable medium in the system. Hydraulic conductivities in the weathered Mancos Shale are intermediate in value between those of the alluvium and competent shale.

In past years, much of the recharge to the groundwater system was provided by infiltrating water used at the former mill and from saturated tailings at the Shiprock site. From the late 1950s to the early 2000s, irrigation water applied to agricultural areas west of Highway 491 also contributed recharge to the groundwater system. Currently, limited amounts of recharge may be attributed to operations conducted at the Navajo Engineering and Construction Authority gravel pit located

immediately south of the disposal cell. In addition, it is possible that some remnant moisture in tailings within the disposal cell is gradually seeping downward into underlying, saturated alluvium. The hydrogeologic conceptual model adopted in the SOWP (DOE 2000) and the GCAP (DOE 2002) assumed that the terrace groundwater system was anthropogenic in origin, and that any natural recharge to the system was insufficient to maintain a saturated domain.

The terrace groundwater system is contaminated as a result of former mill operations and historical leaching of moist to saturated tailings that were emplaced on the terrace during milling years. A recent study of historical field investigations and records associated with milling and the construction of the disposal cell estimated that between 50 million and 390 million gallons of mill-related fluids percolated into the subsurface during the operational life of the mill (DOE 2012). Previous site characterization work and additional recent investigations have shown that some of the high constituent concentrations detected in terrace groundwater could be caused by leaching of constituents that occur naturally in the Mancos Shale. It is also possible that transient leakage from the disposal cell, if it continues to this day, is adding some contaminants to the groundwater system.

Some of the groundwater contaminated by former mill-related activities migrated through competent Mancos Shale adjacent to the escarpment and subsequently migrated toward the floodplain. A portion of this contaminated water historically discharged to seeps located on the escarpment wall, but the vast majority of the contaminated terrace water discharges directly to the alluvial floodplain groundwater system. Although flow in the escarpment-wall seeps has diminished over the past 10 years, available data indicate that contaminated groundwater continues to discharge directly to the floodplain alluvial aquifer. The source of the water causing this discharge is unclear.

6.3.2 Floodplain

The floodplain groundwater system occurs primarily within a surficial alluvial aquifer consisting mostly of coarse-grained sand and gravel. The upper few feet of Mancos Shale underlying the alluvium is typically soft and weathered. Much of the groundwater within the floodplain alluvial aquifer stems from recharge of surface water at the mouth of Bob Lee Wash, which originates as flowing water from artesian well 0648 at the head of a tributary to the wash. Seepage losses from the San Juan River, particularly along the southern third of the river's reach adjacent to the site floodplain area, are another major source of groundwater in the alluvial aquifer. A third, distinctive source of the alluvial aquifer is the terrace groundwater discharge to the floodplain, much of which is contaminated. The floodplain groundwater system is dynamic and is subject to seasonal changes in flow direction due to seasonally variable flows on the river, losses of water to evapotranspiration during summer months, and pumping within the floodplain remediation system.

6.3.3 Contaminants of Concern

The COCs for the site were based on the original risk assessment from the *Baseline Risk Assessment of Ground Water Contamination at the Uranium Mill Tailings Site near Shiprock, New Mexico* (DOE 1994) and an updated risk assessment developed for the SOWP.

Remediation efforts to date have removed contaminant mass from some areas of the terrace groundwater and the floodplain aquifer. The highest concentrations of different COCs occur in different areas of the site.

Figure 5 through Figure 11 show plume configurations based on 2011 sampling results at wells and treatment system locations. The color denotations on these maps are different from those of plume maps shown in previous reports, and the current maps cannot be compared visually to previous maps. The compliance standard or cleanup goal established in the GCAP was added to the color scale on the current plume maps for manganese, nitrate, selenium, sulfate, and uranium. The color scale was set to break from blue/green to yellow/red at the concentration corresponding to the standard or goal; therefore, locations with results above the standard or goal will appear as yellow or red. Strontium and ammonia do not have compliance standards or cleanup goals established in the GCAP. The Secondary Acute Value (discussed in Section 12.2.4) was used as a threshold for the strontium map, since strontium is being monitored based on ecological risk. No standard was applied to the ammonia map because the aquatic water quality standard for ammonia varies depending on temperature and pH. Although the plume maps in Figure 5 through Figure 11 depict groundwater conditions for the entire site, the standards and compliance goals do not apply to terrace groundwater. The maps represent all site data; plumes are generated from data for wells screened in both the alluvium [floodplain well depths of 7–25 ft below ground surface (bgs), terrace well depths of 8–72 ft bgs] and Mancos Shale (floodplain well depths of 10–135 ft bgs, terrace well depths of 19–205 ft bgs) and include data from artesian (Jurassic) well 648 (screened in the Morrison Formation; well depth 1,850 ft bgs). These maps should be viewed as a representation of the site data rather than an actual picture of the extent of the groundwater plume. Data from all the well locations were used to interpolate contaminant concentrations between the wells. The floodplain and terrace data were processed separately and placed on the same map; therefore, the floodplain results do not affect the interpolated areas between data points in the terrace, and the terrace data do not affect the floodplain. Three of the floodplain wells (0784, 0783R, and 0782R) were processed as part of the terrace data because their locations are separated from the rest of the floodplain by the river. The background locations on the floodplain southeast of the site were not included in the interpolation process; the results are shown in a box in the lower-right corner of the figures. San Juan River sampling results were also not included on these maps, as the low levels (equivalent to river background levels) typically detected in the river would affect the interpolation of the areas along the river. Excluding the river locations gives a more conservative view of site contamination levels.

6.3.3.1 Manganese

Manganese is monitored as a site COC because it could negatively impact human health if the groundwater were used as a source of drinking water, and the potential for ecological risk was considered high in the floodplain (DOE 2000). Manganese concentrations in groundwater are highest on the terrace at the south corner of the disposal cell in the area of the radon cover borrow pit, and concentrations are also elevated in well 0837 (Figure 5). Floodplain areas with elevated concentrations are along the escarpment from wells 1114 to 0735; between wells 0792, 0857, and 0854; between wells 0628 and 0623; and at well 0782R. Manganese concentrations in background location 0797 also exceed the cleanup goal, which was set at the maximum background concentration detected at the time the GCAP was issued. This indicates that the manganese contamination onsite may be from natural sources. It is likely that the elevated levels

in terrace well 0837 and floodplain well 0782R are from natural sources, given the distance from the former mill site and the disposal cell and the fact that the area between the wells and the mill site/disposal cell has lower concentrations of manganese.

6.3.3.2 Nitrate

Nitrate is monitored as a site COC because concentrations exceeded the maximum concentration limit (MCL) established in 40 CFR 192. Nitrate concentrations in groundwater are highest on the terrace from east of the disposal cell out to wells 1079 and 0835 and in Many Devils Wash. A small area of elevated concentrations is present in the floodplain along the base of the escarpment from well 0735 to seep 0118 (Figure 6).

6.3.3.3 Selenium

Selenium is monitored as a site COC because concentrations exceeded the MCL, and potential ecological risks were considered high in some areas of the site (DOE 2000). Selenium concentrations are elevated in Many Devils Wash, along the buried escarpment on the terrace, and north to well 0843. On the floodplain, elevated concentrations are present along the base of the escarpment and extend northeastward toward well 0618 (Figure 7).

6.3.3.4 Sulfate

Sulfate is monitored as a site COC because concentrations were high enough to be of probable concern (DOE 2000). No standard for sulfate is established in 40 CFR 192, and the GCAP proposed a cleanup goal of 2,000 milligrams per liter (mg/L), which was the maximum background concentration detected at the time. Sulfate concentrations in groundwater are above the compliance goal across most of the site; only a few wells on the terrace and in an area along the river have concentrations below 2,000 mg/L (Figure 8). The concentration in background well 0797 is 3,800 mg/L, which exceeds the current cleanup goal.

6.3.3.5 Uranium

Uranium is monitored as a site COC because concentrations in groundwater at multiple locations exceeded the MCL of 0.044 mg/L (DOE 2000). The highest levels on the terrace occur in the Mancos wells just west of the disposal cell. On the floodplain, the levels are highest along the base of the escarpment and around wells 0618, 0779, and 1104. The background wells have concentrations that are only 0.015 mg/L lower than the MCL, indicating that there is likely a natural component to the uranium levels onsite (Figure 9).

6.3.3.6 Ammonia

Ammonia was retained as a COC because inhalation could present a potential health risk under a residential groundwater-use scenario and could present an ecological risk (DOE 2000). Ammonia concentrations in groundwater are highest on the terrace in the Mancos wells just west of the disposal cell and in a few alluvial wells southeast of the cell. On the floodplain, levels are highest in a small area at the base of the escarpment (Figure 10).

6.3.3.7 Strontium

Strontium was not retained as a health based COC in the SOWP; however, it is listed in the GCAP to be monitored for ecological risk concerns, even though the SOWP stated that strontium was a minor contributor to ecological risk (DOE 2000). Strontium concentrations in groundwater exceed the ecological risk secondary acute value in only a few locations on the terrace. On the floodplain, concentrations are elevated at wells 0735 and 0630. Background concentrations are below the secondary acute value but are high enough to indicate that strontium may occur naturally at the site, and its presence is not milling-related (Figure 11).

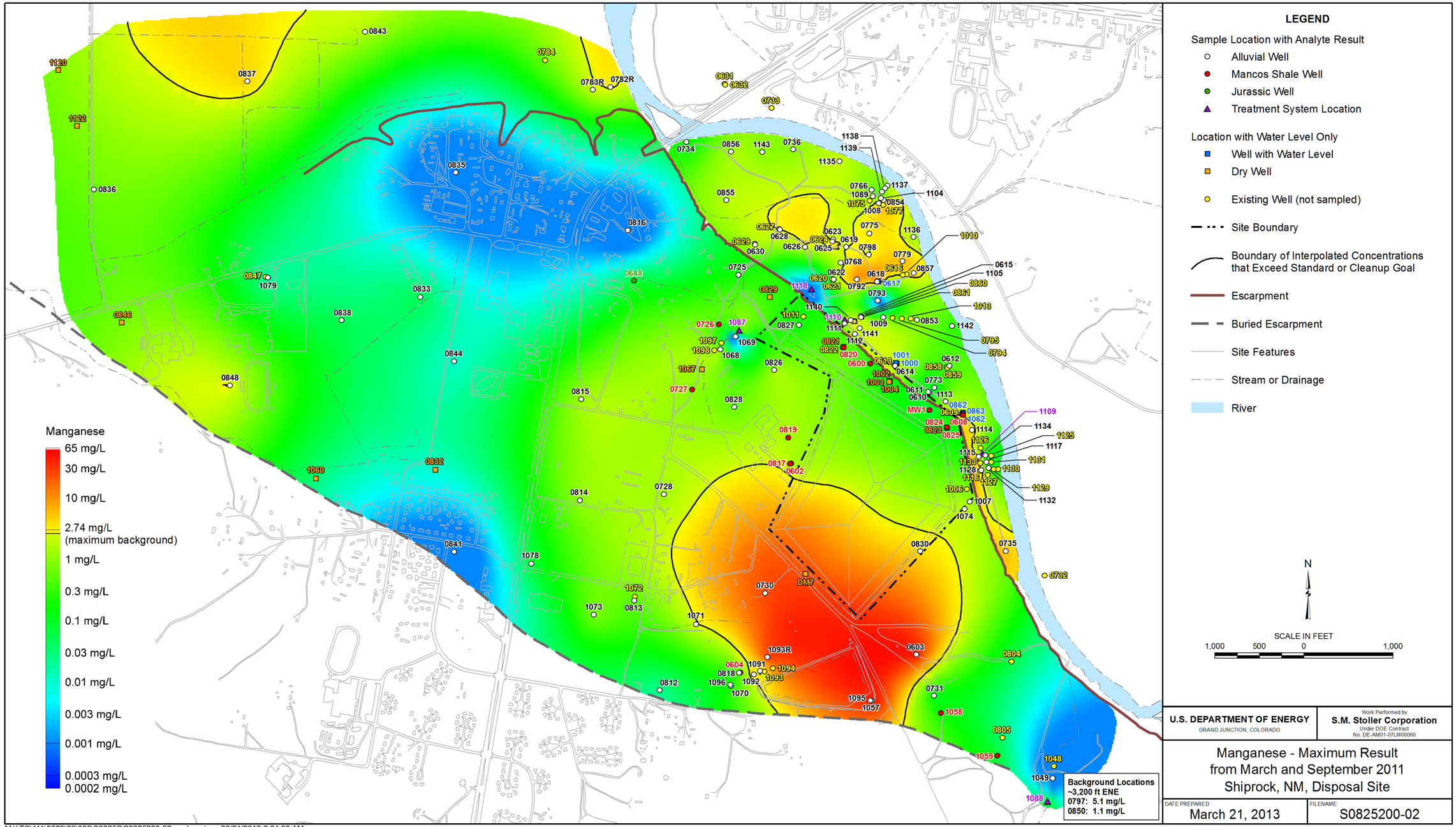


Figure 5. Manganese Maximum Result March and September 2011

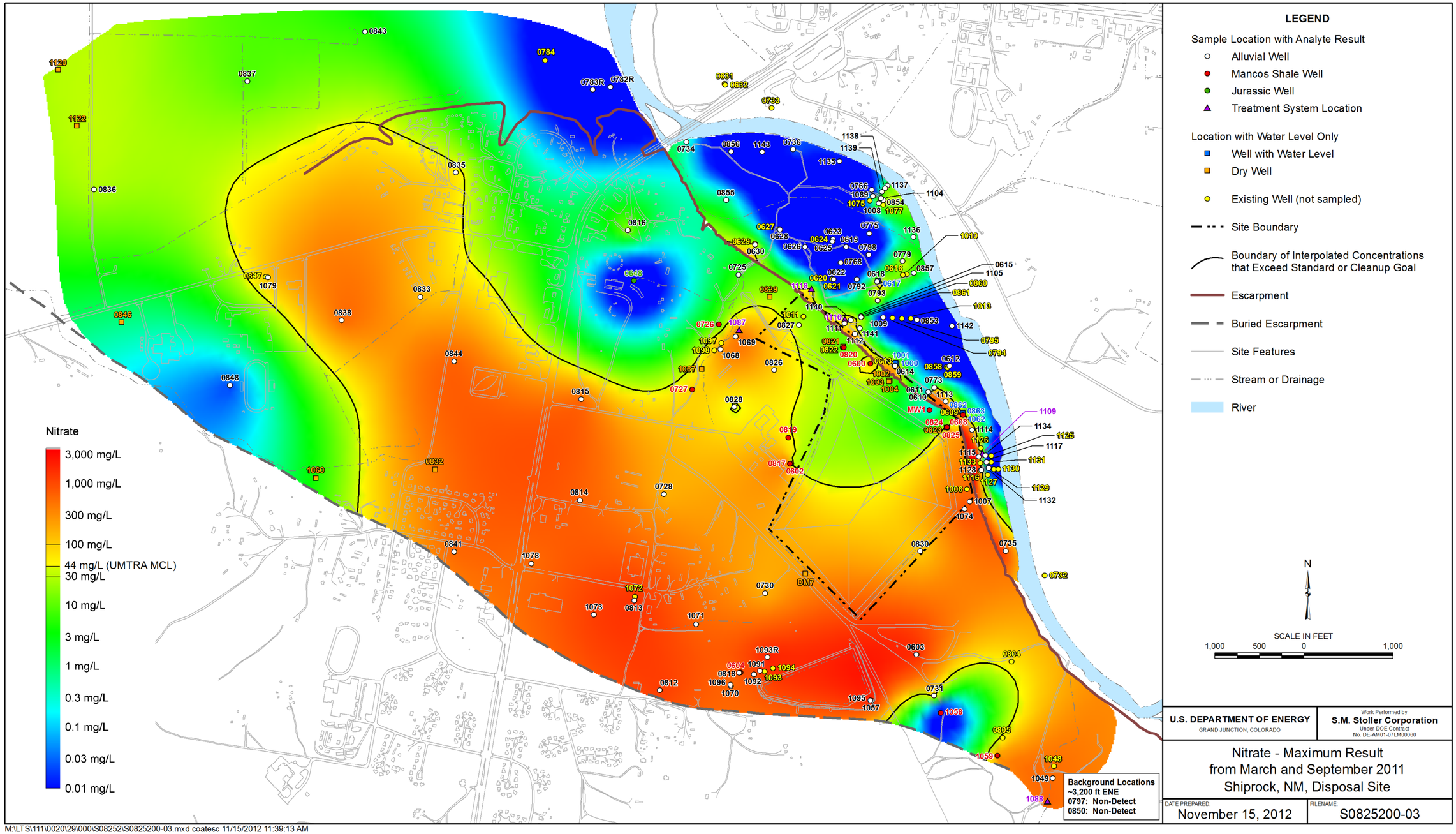


Figure 6. Nitrate Maximum Result March and September 2011

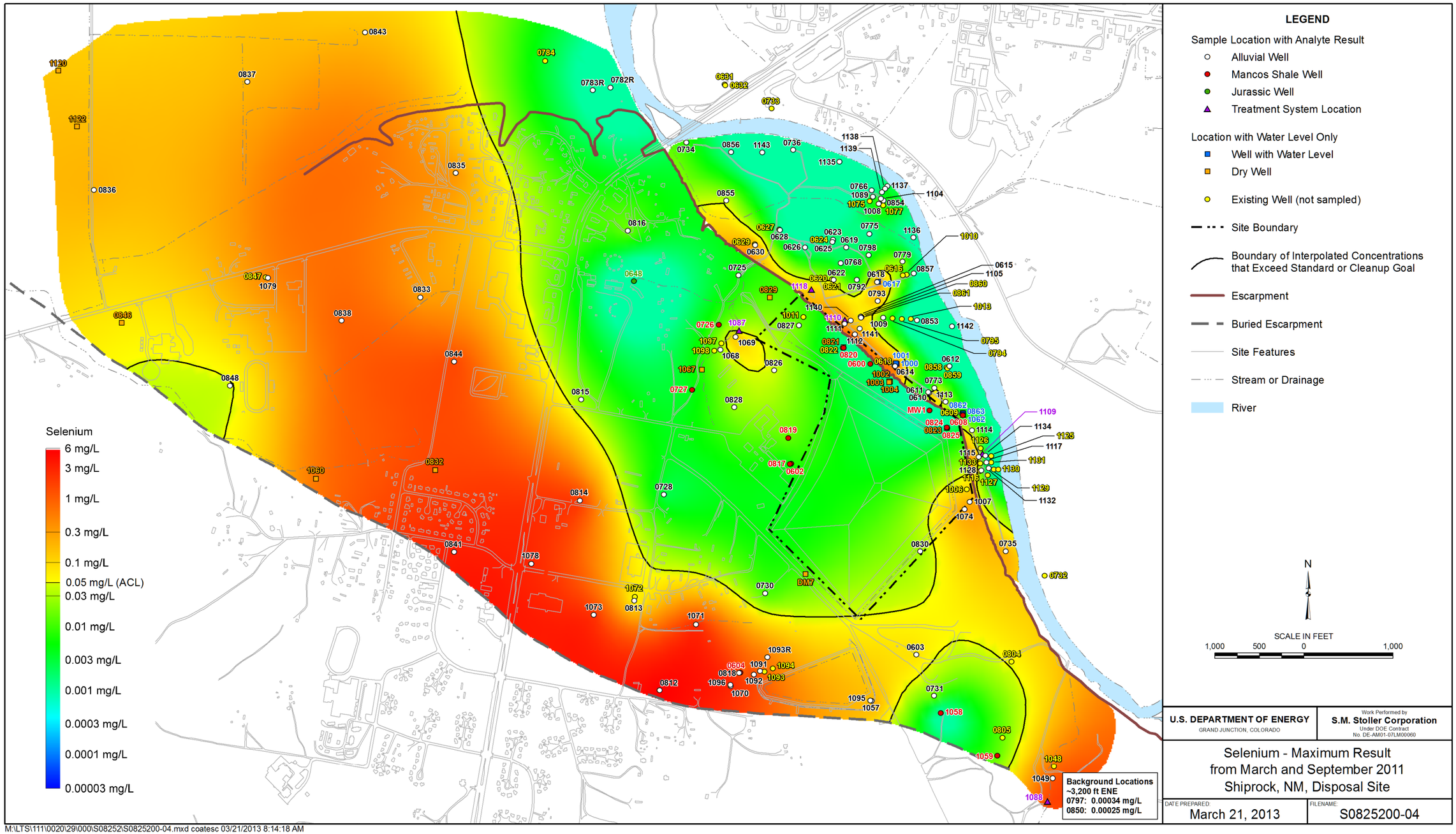


Figure 7. Selenium Maximum Result March and September 2011

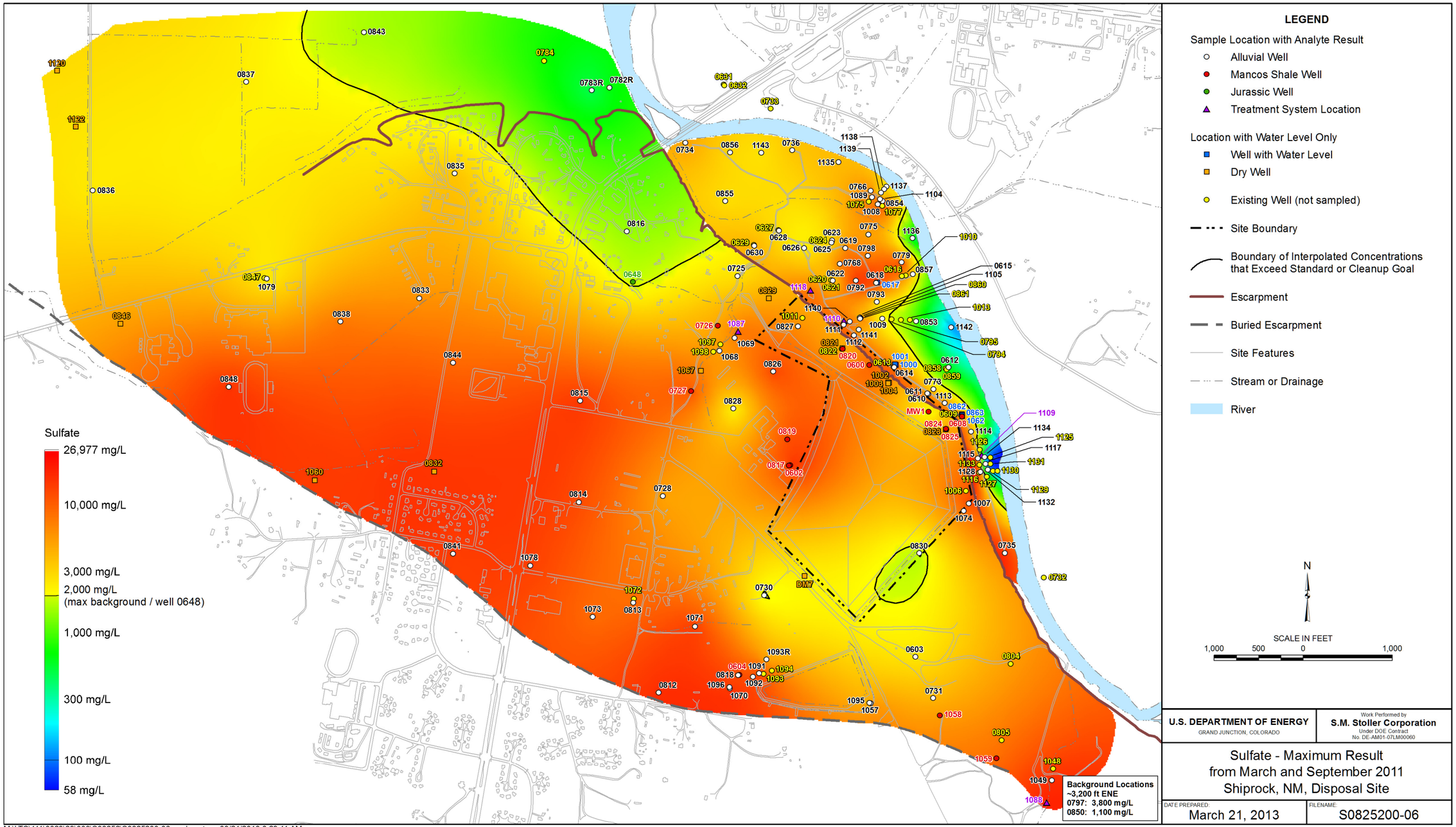


Figure 8. Sulfate Maximum Result March and September 2011

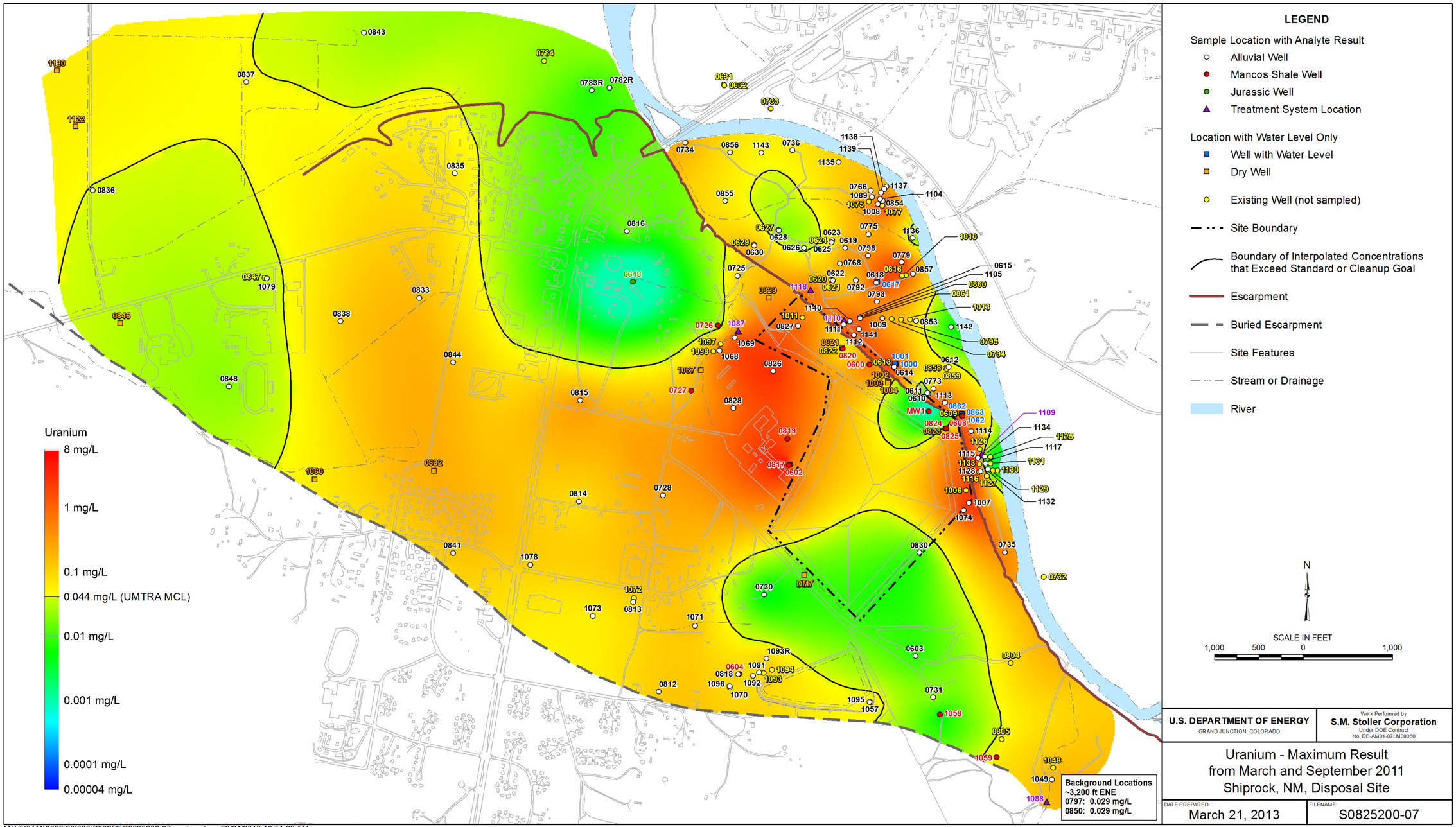


Figure 9. Uranium Maximum Result March and September 2011

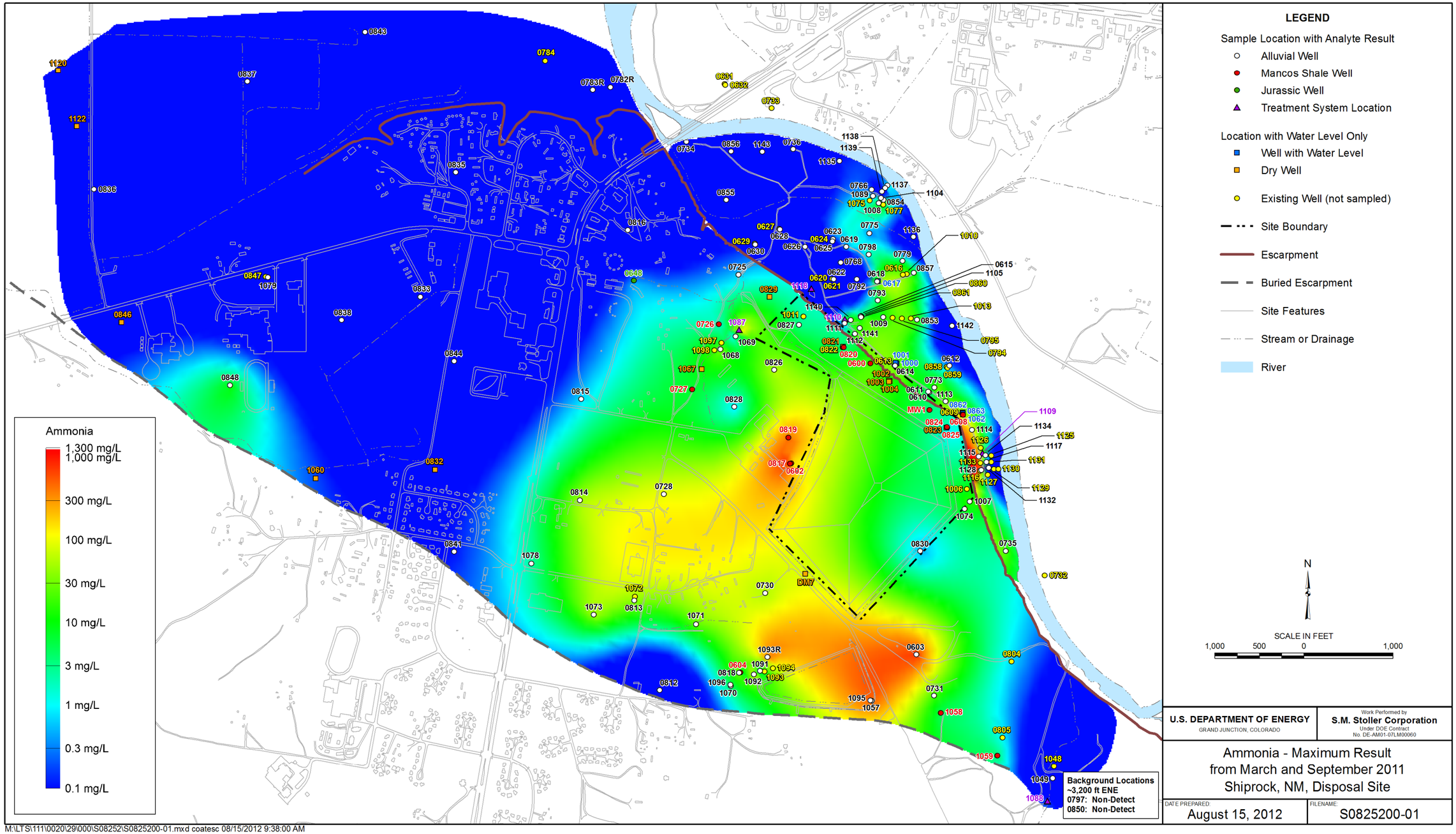


Figure 10. Ammonia Maximum Result March September 2011

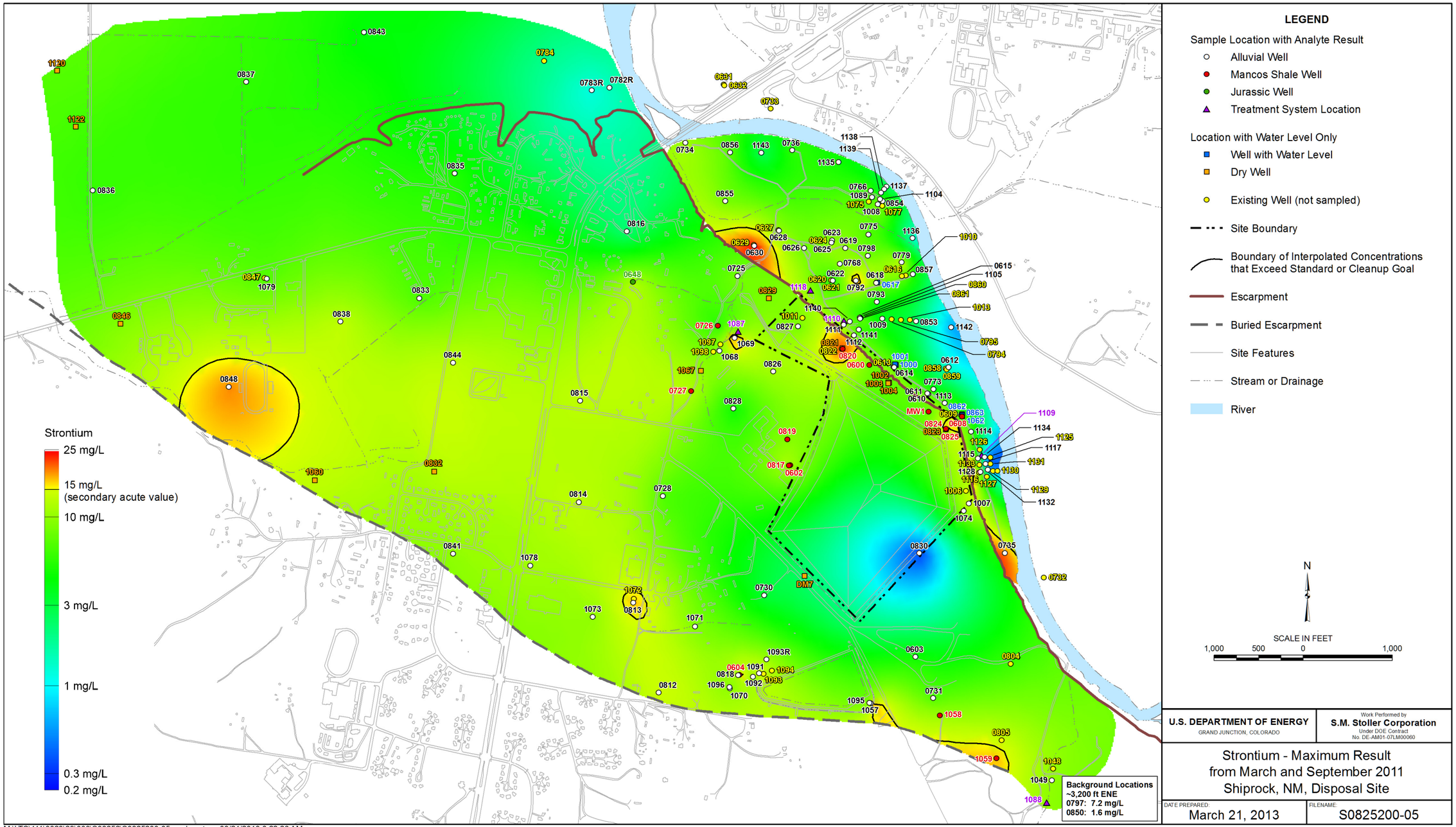


Figure 11. Strontium Maximum Result March and September 2011

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6.3.4 Define Exposure Scenarios

The site conceptual model includes an evaluation of scenarios for potential exposure to site-related contamination. The exposure scenarios were originally assessed in the Baseline Risk Assessment (DOE 1994), which assumed residential use of contaminated groundwater. Contaminated groundwater is not being used as a drinking water source, and because no complete exposure pathway exists, groundwater contaminants currently present no risk to human health. In addition, fence enclosures have been constructed around areas of seeps where humans or livestock could come into contact with groundwater contaminants.

6.4 Resources and Constraints

Of the UMTRCA sites currently managed by DOE, Shiprock has the most extensive monitoring and the highest annual sampling costs (Table 6). The sampling costs exceeded the budget in 2011, and the optimization of the sampling regime would address these budget constraints. Optimization would also allow for resources to be redistributed to higher priority areas of the site.

Table 6. 2011 Monitoring Costs at UMTRCA Sites[a]

Site Name	Location	2011 Monitoring Costs
Shiprock	Navajo Nation	$269,969
Tuba City	Navajo Nation	$204,770
Bluewater	New Mexico	$135,888
Monument Valley	Navajo Nation	$102,962
Rifle	Colorado	$90,379
Riverton	Wyoming	$41,077
Shirley Basin South	Wyoming	$40,617
Durango	Colorado	$38,529
Gunnison	Colorado	$33,241
Grand Junction	Colorado	$30,493
Lakeview	Oregon	$30,267
Slick Rock	Colorado	$26,373
L-Bar	New Mexico	$25,952
Sherwood	Washington	$21,886
Falls City	Texas	$19,123
Ambrosia Lake	New Mexico	$16,555
Green River	Utah	$13,415
Naturita	Colorado	$10,814
Canonsburg	Pennsylvania	$9,616

[a] These costs are fully burdened and include indirect costs such as overhead and project management.

7.0 Identify the Goal of the Study

This step comprises four activities: (1) identify the principal study questions, (2) consider alternative outcomes or actions that can occur upon answering the questions, (3) develop decision statements, organize multiple decisions, and (4) for estimation problems, state what needs to be estimated and key assumptions (not addressed as part of this evaluation).

7.1 Principal Study Question

Are the current temporal, spatial, and analyte requirements in the sampling regime justified and supportive of the site DQOs and regulatory requirements?

7.2 Alternative Outcomes or Actions

Study Question	Potential Outcome or Action
Are there temporal redundancies?	Recommend that the sampling frequency be reduced. Recommend that sampling frequency remain unchanged.
Is there sufficient coverage of hot-spot locations?	Recommend that the number of sampling locations be decreased in well-defined hot-spot areas. Recommend that the number of sampling locations be increased in hot-spot areas that are not well-defined. Recommend that sampling locations remain unchanged.
Are the appropriate analytes being sampled?	Recommend that the number of analytes be reduced. Recommend that the number of analytes remain unchanged. Recommend sampling for different or additional analytes.

7.3 Decision Statement

Determine if (1) the wells sampled are covering the areas of the site where information is needed, (2) sampling frequency is appropriate, (3) the right analytes are being monitored, and (4) the current reasons for sampling can be adequately supported.

8.0 Identify Information Inputs

The Shiprock site has a large historical data set that can be analyzed to resolve the decision statement. This section provides an overview of the tools that can be used to evaluate the sampling data at Shiprock. The data were analyzed using the following tools: (1) Visual Sample Plan Temporal Redundancy module; (2) percent difference between paired averages of spring and fall results; (3) assessment of the reason for sampling an analyte based on compliance goals and DQOs; (4) visual assessment of the spatial distribution of sampled wells in relation to hot-spot areas of the site; and (5) assessment of the reason for sampling a location based on regulatory requirements and site DQOs. Sections 8.1 through 8.5 present an overview of these tools; the results of these analyses and optimization of the sampling design using site-specific information are presented in Sections 12 and 13.

8.1 Visual Sample Plan

Visual Sample Plan (VSP; PNNL 2012) software was used to assess the sampling regime at the Shiprock site. VSP is a tool that supports the development of a defensible sampling plan based on statistical sampling theory and the statistical analysis of sample results. VSP was developed by Pacific Northwest National Laboratory with support from DOE, the U.S. Environmental Protection Agency (EPA), the U.S. Department of Defense, the Department of Homeland Security, the Centers for Disease Control and Prevention, and the United Kingdom. VSP is being recommended by many regulators for defensible sampling design and statistical analysis. The

underlying methodology employs statistically defensible approaches and has strong DQO process underpinnings. The objective is to ensure that the right type, quality, and quantity of data are gathered to support confident decisions. Many statistical sampling designs are available, including random, systematic, sequential, adaptive cluster, collaborative, stratified, transect, multi-increment, combined judgment/probabilistic, and rank set sampling. The Temporal Redundancy module of VSP was used to analyze sampling at the Shiprock site.

8.1.1 Temporal Redundancy Analysis Using VSP

The Temporal Redundancy module of VSP provides methods for examining the temporal spacing of observations. Temporal redundancy is used to analyze data to determine whether sampling can be performed less frequently without losing important trend information or if more frequent sampling is needed. The objective of the module is to identify a technically defensible temporal spacing. Two different sampling goals are addressed here. One is determining if fewer observations could be used to characterize the contaminant concentrations at a sample location over time. A second is to identify the minimum temporal spacing between observations so that they are independent from one another.

Two options—variogram analysis and iterative thinning—are available in the Temporal Redundancy module.

Variogram Analysis

Variogram analysis requires the use of geostatistical techniques to determine a distance relationship between data points in a two-dimensional spatial field. The geostatistical techniques in this module have been adapted where the distance relationship is replaced by a time relationship. Variogram analysis determines how far apart in time samples can be taken before temporal correlation is eliminated. To detect temporal patterns or trends, the sampling interval should be smaller than the estimated maximum interval. Variogram analysis requires a significant amount of data; typically 30 or more observations for each location are needed for this analysis. This method is more complex and requires more data than the iterative thinning method. Insufficient data were available to use variogram analysis for the Shiprock site, and that approach is not used in this report.

Iterative Thinning

The iterative thinning approach is based on an algorithm published by Cameron (2004). The goal of the algorithm is simple: identify the sampling frequency required to reproduce the temporal trend of the full data set (the full data set is assumed to adequately capture the variation in the site data). The trend may include simple upward or downward trends, but the algorithm also allows reproduction of more complex patterns (e.g., cyclical patterns related to seasonal variations in concentration).

The median temporal sample spacing between historical observations is first calculated and used as the baseline sample spacing. The iterative thinning algorithm uses the locally weighted scatterplot smoothing (LOWESS) algorithm to fit a smooth trend and confidence bands (Cleveland 1979) around the full temporal data set. LOWESS is a regression method for applications that fit the general framework of least-squares regression. A percentage of the data

points are removed from the data set, and LOWESS is used with the same bandwidth to fit a smooth trend to the reduced data set.

The ability of the reduced data set to reproduce the temporal trends in the full data set is evaluated by calculating the percentage of the data points on the trend for the reduced data set that fall within the 90 percent confidence interval established using the full data set. Increasing numbers of data points are removed from the data set, and each reduced data set is evaluated for its ability to reproduce the trend observed in the full data set. A default level of 75 percent of the points on the trend for the reduced data falling within the confidence limits around the original trend is deemed acceptable (Cameron 2004). In order to guard against artifacts that might arise from the selection of a single set of data points to remove, the iterative removal process is repeated a large number of times (default number of iterations is 500). The data that can be removed while still reproducing the temporal trend of the full data set is used to estimate an optimal sampling frequency presented as days between sampling events.

8.2 Percent Difference Temporal Analysis

The averages of the spring and fall analytical results from the same calendar year were paired for all of the sampling locations and the five main COCs (uranium, nitrate, manganese, sulfate, and selenium). The percent difference was calculated by subtracting the spring average concentration from the fall average concentration and then dividing by the spring average concentration. Locations with at least two pairs were included. This analysis was used to explore the temporal variation in the data and to supplement and expand on the VSP results. More locations could be assessed using percent difference, since the statistical methods in VSP required 10 or more sampling events. The location analyte pairs in which the percent difference was 100 percent or more and concentrations also exceed a compliance standard or cleanup goal for the spring or fall average, or both, were further assessed graphically.

8.3 Assessment of Analytes

The rationale for retaining a COC based on the risk assessment in the SOWP was reviewed and compared to the current site conditions to see if the rationale was still relevant and if the risk is still present. Non-COC analytes were assessed based on site DQOs and GCAP requirements.

8.4 Spatial Assessment of Hot Spots

A comparison of all the site wells available for sampling and visual representation of site data for the five main COCs was used to determine whether the sampling locations sufficiently cover the different areas of the site with elevated concentrations (hot spots).

8.5 Assessment of Sampling Objectives

This assessment evaluates whether the sampling locations are still appropriate based on the sampling objectives and regulatory requirements. The rationale for adding the location to the sampling regime is compared to the DQOs to determine if the location can be removed from the sampling regime.

9.0 Define the Boundaries of the Study

The current sampling regime has established spatial boundaries that are assessed to determine if the boundaries will be changed in the optimized regime. Currently, sampling is conducted semiannually and at a large number of locations covering all areas of the site. Wells screened in both the alluvium and Mancos Shale are located throughout the floodplain and terrace areas.

10.0 Develop the Analytical Approach

This step combines qualitative information about site contamination with measurable, health-based concentration criteria into an "if-then" statement. Because this is not a new site, contaminant concentration levels have already been established in the GCAP. The current strategy as outlined in the GCAP sets specific standards for the floodplain, and supplemental standards were applied to the terrace. Compliance standards and cleanup goals were only set for five main COCs (uranium, nitrate, manganese, sulfate, and selenium) in the GCAP. Ammonia is a heath-based COC for the terrace, where supplemental standards apply, and is an ecology-based COC for the floodplain. There is no health-based standard for ammonia. Strontium is an ecology-based COC for the terrace and the floodplain, and there is no health-based standard for strontium. Table 7 is reproduced from Table B-1 of the GCAP and shows the health-based compliance standard or cleanup goal for the floodplain.

Table 7. Compliance Standard or Cleanup Goal

Contaminant	Compliance Standard or Cleanup Goal
Uranium	0.044 mg/L (40 CFR 192 MCL)
Nitrate as NO_3	44 mg/L (40 CFR 192 MCL)
Manganese	2.74 mg/L (maximum background concentration)
Sulfate	Approximately 2,000 mg/L (maximum background concentration or concentration in groundwater from flowing artesian well 648)
Selenium	0.05 mg/L (proposed alternate concentration limit using Safe Drinking Water Act standard)

The decision rule is based on the assumption that the locations required by the GCAP are optimized and should therefore be retained in the final optimized regime. In addition, this report focuses on optimizing the locations that have been added since NRC approved the GCAP, since a location required by the GCAP cannot be removed without NRC concurrence.

The decision rule for optimizing the sampling regime is as follows:

- If the location is required by the GCAP, then consider reducing the sampling frequency or number of analytes.
- If the location is not required by the GCAP, then consider reducing the sampling frequency or the number of analytes or removing the location from the sampling regime.

11.0 Specify Performance or Acceptance Goals

This step establishes quantitative performance criteria for the sampling optimization. The following decision errors could be made on interpreting the sampling data:

- Decision Error A: Inadvertently omitting a location that was required by the GCAP.
- Decision Error B: Inadvertently including a location that was not required by the GCAP.

Decision Error A would result in loss of data and noncompliance. Decision Error B would result in additional labor and analysis costs. Decision Error A is potentially the more serious of the two, because missed data and noncompliance could have a greater consequence than would the additional cost of sampling and analysis for an extra location.

12.0 Develop the Plan for Obtaining Data

The sampling regime and data obtained need to be sufficiently robust to allow site personnel to understand the site characteristics, observe the impacts of and assess the effectiveness of remediation, evaluate the compliance strategy, and have sufficient information to make decisions on changes to the remediation system and the compliance strategy. The following questions are asked: (1) Can the sampling frequency be reduced? (2) Are the current reasons for selecting a sampling location or analyte valid? (3) Are the hot-spot areas of the site sufficiently covered?

12.1 Temporal Optimization: Can the Sampling Frequency Be Reduced?

The requirement of semiannual sampling frequency established in the GCAP has been applied to all sampling locations and is still in effect, even though the GCAP only required semiannual sampling for the first 7 years. Annual sampling would have begun in 2010, the eighth year of sampling. This section presents the results of the temporal redundancy analysis performed on the data and determines whether altering the sampling frequency is warranted.

12.1.1 VSP Results

Sampling locations were analyzed for temporal redundancy using the Temporal Redundancy module iterative thinning method in the VSP. The iterative thinning method requires 10 or more observations. Locations with fewer than 10 sampling results could not be analyzed by VSP. The semiannual results from 2003 through 2011 (Appendix A) as well as any other nonroutine sampling events and pre-2003 data were used to maximize the number of location/analyte pairs that could be assessed. The optimal sampling frequencies (in days) calculated by the Temporal Redundancy module are summarized in Table 8 and Table 9.

The floodplain analysis shows that a majority of the well/analyte combinations' optimal sampling frequency is less than semiannual. This indicates that trends and patterns displayed by the semiannual data will still be shown by examining data that are collected annually at the same locations. Nine wells show an optimal sampling frequency greater than semiannual for some analytes; however, none of these wells are required by the GCAP (Table 8).

The terrace results show that the optimal sampling frequency for all well/analyte pairs is less than semiannual. This indicates that trends and patterns displayed by the semiannual data will still be shown by examining data that are collected annually at the same locations.

Table 8. Floodplain VSP Optimal Sampling Frequency Results

Location	Location Type	Current Sampling Frequency	Number of Sampling Events					Optimal Frequency (Days)				
			Uranium	Nitrate	Manganese	Sulfate	Selenium	Uranium	Nitrate	Manganese	Sulfate	Selenium
0608	Well	Semiannually	46	46	41	41	46	623	535	315	376	375
0610	Well	Semiannually	26	26	25	25	26	430	430	554	615	526
0612	Well	Semiannually	18	18	17	17	18	808	252	343	262	310
0614	Well	Semiannually	48	48	43	41	48	318	437	340	625	437
0615	Well	Semiannually	44	44	38	35	44	305	366	756	437	406
0618	Well	Semiannually	34	34	29	27	34	427	285	329	411	310
0619	Well	Semiannually	43	43	42	39	43	470	x	342	472	417
0622	Well	Semiannually	12	11	11	11	12	657	x	x	466	328
0623	Well	Semiannually	14	15	13	10	14	116	67	75	x	67
0626	Well	Semiannually	32	32	31	28	32	927	540	316	710	395
0628	Well	Semiannually	26	26	25	25	26	608	473	379	650	426
0630	Well	Semiannually	30	30	29	26	30	520	364	472	345	330
0734	Well	Semiannually	29	27	28	28	27	656	538	505	577	485
0735	Well	Semiannually	37	37	36	33	37	440	352	331	528	352
0736	Well	Semiannually	29	28	28	28	29	452	676	510	582	407
0768	Well	Semiannually	14	14	13	10	14	288	x	136	x	216
0773	Well	Semiannually	13	13	12	9	13	167	118	x	y	154
0775	Well	Semiannually	13	13	12	9	13	404	x	x	y	155
0779	Well	Semiannually	14	14	13	10	14	203	165	138	187	165
0792	Well	Semiannually	15	15	14	11	15	402	163	x	x	188
0797	Well	Semiannually	22	22	22	22	22	332	366	332	472	406
0850	Well	Semiannually	27	27	27	27	27	465	x	620	620	413
0853	Well	Semiannually	19	19	18	15	19	214	253	324	238	310
0854	Well	Semiannually	15	15	14	14	15	376	268	311	x	341
0855	Well	Semiannually	20	20	19	16	20	293	220	322	291	188
0856	Well	Semiannually	18	18	17	14	18	218	200	241	210	201
0857	Well	Semiannually	14	14	13	13	14	1045	x	301	245	313
1008	Well	Semiannually	16	16	15	15	16	315	290	313	197	315
1009	Well	Semiannually	15	15	14	11	15	332	x	x	x	179
1089	Well	Semiannually	22	23	12	12	23	348	309	270	270	340
1104	Well	Semiannually	13	13	10	10	13	364	280	252	315	280
1105	Well	Semiannually	10	10	9	9	10	340	220	y	y	220
1111	Well	Semiannually	12	12	9	9	12	313	268	y	y	268

Table 8 (continued). Floodplain VSP Optimal Sampling Frequency Result

Location	Location Type	Current Sampling Frequency	Number of Sampling Events					Optimal Frequency (Days)				
			Uranium	Nitrate	Manganese	Sulfate	Selenium	Uranium	Nitrate	Manganese	Sulfate	Selenium
1112	Well	Semiannually	15	15	13	10	15	175	175	210	204	175
1113	Well	Semiannually	10	10	7	7	10	343	x	y	y	222
1114	Well	Semiannually	14	14	9	9	14	303	280	y	y	242
1115	Well	Semiannually	19	19	14	11	19	190	174	236	234	174
1117	Well	Semiannually	18	18	14	11	18	265	160	243	234	208
1118	Sump	Semiannually	12	12	10	12	10	255	255	223	255	223
0501	Surface	Semiannually	17	17	17	17	17	312	375	x	288	250
0655	Surface	Semiannually	22	22	22	21	22	645	887	887	651	887
0887	Surface	Semiannually	22	21	21	22	21	437	396	303	318	357
0897	Surface	Semiannually	29	28	29	29	29	324	452	517	402	359
0898	Surface	Semiannually	28	28	28	28	28	298	320	511	326	406
0939	Surface	Semiannually	16	16	13	16	15	320	320	214	270	243
0940	Surface	Semiannually	28	28	27	28	27	372	517	606	305	332
0956	Surface	Semiannually	25	25	25	25	25	334	302	518	334	273
0959	Surface	Semiannually	15	15	12	15	15	238	324	191	238	324
0965	Surface	Semiannually	18	18	18	18	18	286	283	x	286	306
1203	Surface	Semiannually	18	18	18	18	18	375	415	x	287	288
1205	Surface	Semiannually	25	25	25	25	25	363	403	518	330	369

x = Iterative thinning could NOT be calculated
y = Fewer than 10 data points
Green = Optimal sampling frequency less often than or equal to annual
Yellow = Optimal sampling frequency between semiannual and annual
Red = Optimal sampling frequency more often than semiannual
Locations in bold are required by the GCAP

Table 9. Terrace VSP Optimal Sampling Frequency Results

Location	Location Type	Current Sampling Frequency	Number of Sampling Events					Optimal Frequency (Days)				
			Uranium	Nitrate	Manganese	Sulfate	Selenium	Uranium	Nitrate	Manganese	Sulfate	Selenium
0600	Well	Semiannually	25	25	22	25	23	645	677	449	544	x
0602	Well	Semiannually	27	28	24	28	25	280	392	680	720	x
0603	Well	Semiannually	21	21	19	21	19	335	461	393	461	393
0604	Well	Semiannually	15	17	12	17	12	280	314	270	241	315
0648	Well	Biennially	12	12	11	12	11	x	x	984	1050	x
0725	Well	Semiannually	23	23	21	23	21	373	466	x	343	490
0726	Well	Semiannually	22	23	20	23	20	447	530	318	530	424
0727	Well	Semiannually	22	23	20	23	20	334	532	315	472	365
0728	Well	Semiannually	23	23	21	23	21	364	330	356	364	490
0730	Well	Semiannually	21	22	18	22	18	317	435	422	435	345
0731	Well	Semiannually	18	18	16	18	16	267	343	343	232	343
0812	Well	Semiannually	18	19	16	19	16	281	413	343	310	315
0813	Well	Semiannually	20	20	16	20	16	301	402	341	330	268
0814	Well	Semiannually	15	15	13	14	13	315	331	301	315	301
0815	Well	Semiannually	16	16	14	16	14	250	318	315	291	x
0816	Well	Semiannually	19	19	16	19	16	398	398	x	299	208
0817	Well	Semiannually	22	22	22	22	22	404	364	329	402	329
0818	Well	Semiannually	27	28	15	28	15	330	517	262	330	343
0819	Well	Semiannually	16	16	15	16	15	290	343	252	343	252
0820	Well	Semiannually	12	13	10	13	10	198	231	222	302	222
0824	Well	Semiannually	13	14	11	14	11	278	290	241	290	241
0826	Well	Semiannually	17	18	16	18	16	286	420	343	290	290
0827	Well	Semiannually	20	19	17	19	17	386	394	369	295	369
0828	Well	Semiannually	15	16	14	16	14	337	x	313	341	313
0830	Well	Semiannually	22	23	21	22	21	340	524	416	340	340
0832	Well	Semiannually	18	18	17	18	17	301	278	364	258	280
0833	Well	Semiannually	15	15	14	15	14	243	192	315	280	290
0835	Well	Semiannually	28	28	27	28	27	404	520	608	364	456
0836	Well	Semiannually	28	28	27	28	27	388	437	388	356	395
0837	Well	Semiannually	16	16	15	16	15	320	195	260	320	x
0838	Well	Semiannually	28	28	27	28	27	405	455	331	520	608
0839	Well	Semiannually	21	21	19	21	19	324	446	302	324	403
0841	Well	Semiannually	29	29	26	29	26	517	517	462	517	332
0843	Well	Semiannually	16	16	15	16	15	320	251	331	320	192

Table 9 (continued). Terrace VSP Optimal Sampling Frequency Results

Location	Location Type	Current Sampling Frequency	Number of Sampling Events					Optimal Frequency (Days)				
			Uranium	Nitrate	Manganese	Sulfate	Selenium	Uranium	Nitrate	Manganese	Sulfate	Selenium
0844	Well	Semiannually	15	15	14	15	14	332	332	315	332	236
0846	Well	Semiannually	26	26	25	25	25	329	329	520	522	330
0848	Well	Semiannually	15	15	14	15	14	x	x	315	330	x
1007	Well	Semiannually	12	12	12	12	12	213	290	290	290	256
1057	Well	Semiannually	13	13	13	13	13	316	316	277	316	241
1058	Well	Semiannually	11	11	11	11	11	x	x	252	252	252
1059	Well	Semiannually	13	13	13	13	13	290	290	x	x	222
1060	Well	Semiannually	13	13	13	12	13	297	307	x	320	322
1070	Well	Semiannually	19	21	11	21	11	289	375	x	281	221
1071	Well	Semiannually	22	23	14	23	14	269	268	x	268	290
1078	Well	Semiannually	22	23	14	23	14	316	267	289	267	313
1079	Well	Semiannually	19	19	19	19	19	289	280	313	303	330
1091	Well	Semiannually	21	22	12	22	12	290	435	x	386	270
1092	Well	Semiannually	21	22	12	22	12	319	343	268	316	268
1095	Well	Semiannually	11	11	9	11	9	369	283	y	283	y
1096	Well	Semiannually	11	11	10	11	10	246	461	221	246	313
1087	Sump	Semiannually	22	24	15	24	15	269	269	250	269	341
1088	Sump	Semiannually	22	23	15	23	15	318	349	315	316	269
0425	Surface	Semiannually	25	23	23	25	24	330	325	438	358	447
0426	Surface	Semiannually	26	24	24	25	24	511	364	511	303	275
0662	Surface	Semiannually	31	31	31	30	31	414	420	611	611	457
0786	Surface	Semiannually	13	14	13	14	13	269	290	x	290	269
0884	Surface	Semiannually	14	13	13	14	13	214	214	x	214	200
0889	Surface	Semiannually	32	31	30	32	30	352	453	590	500	354
0933	Surface	Semiannually	18	18	16	18	16	293	270	270	391	315
0934	Surface	Semiannually	17	17	16	17	16	x	357	330	357	330
0936	Surface	Semiannually	16	16	15	16	15	214	320	187	183	324
0942	Surface	Semiannually	19	19	18	19	18	275	298	378	298	280

x = Iterative thinning could NOT be calculated.
y = Fewer than 10 data points
Green = Optimal sampling frequency less often than or equal to annual
Yellow = Optimal sampling frequency between semiannual and annual
Locations in bold are required by the GCAP

12.1.2 Percent Difference

Percent difference analysis was performed on the semiannual sampling data from March 2003 through September 2011 (Appendix A) for the five main COCs (uranium, manganese, nitrate, sulfate and selenium). The spring and fall results from each year were paired. Years that had only a fall result or a spring result were not included; duplicates were also not included. The maximum number of pairs that a location could have is nine. Locations with two or more pairs were included in the analysis. Table 10 shows the average of the spring and fall results and the percent difference between the two sampling events. The percent differences were averaged over the entire data set to get an overall difference for each analyte. Uranium, sulfate, and selenium showed very little temporal variability between spring and fall results, supporting annual sampling for these analytes. Manganese and nitrate show more variability; however, concentrations at most of the locations with the greatest variability are well below the compliance standard or cleanup goal. Since these are already in compliance, the variability will not impact site decisions The results were further narrowed down to only locations where concentrations exceed a compliance standard or cleanup goal (Table 11). All of the analytes have an average percent difference of less than or equal to 10 percent and therefore support annual sampling. The locations where concentrations exceeded a compliance standard or cleanup goal and were greater than or equal to 100 percent difference were graphed to see if the data that caused the greater difference occurred more often in the spring or the fall (Figure 12 through Figure 16). With the exception of nitrate at well 0611, the other locations showed the highest results during the fall sampling, indicating that if annual sampling were conducted in the fall, results would be more conservative because data would capture these higher values.

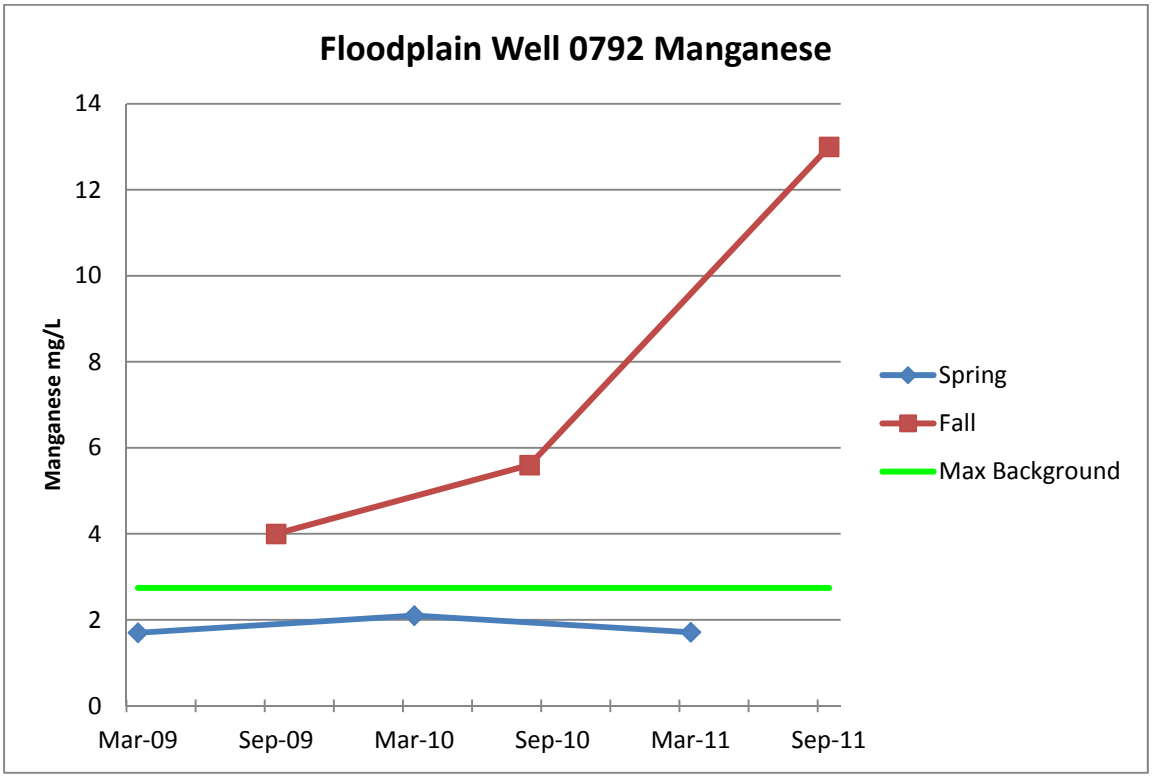

Figure 12. Spring and Fall Pairs: Well 0792

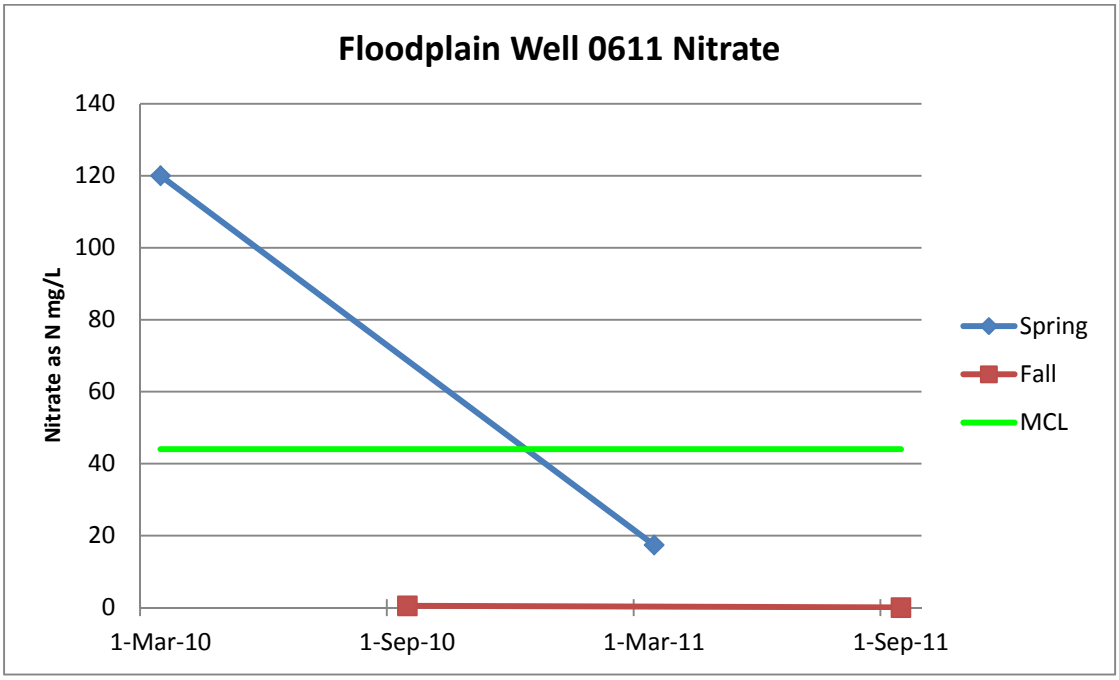

Figure 13. Spring and Fall Pairs: Well 0611

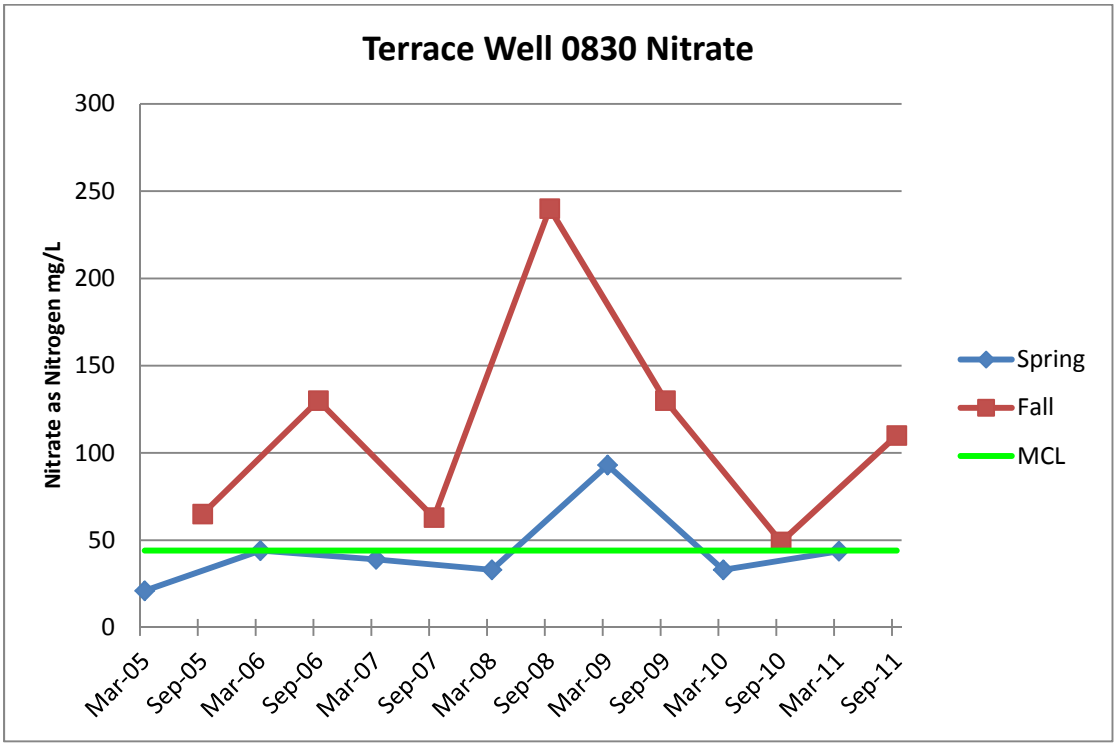

Figure 14. Spring and Fall Pairs: Well 0830

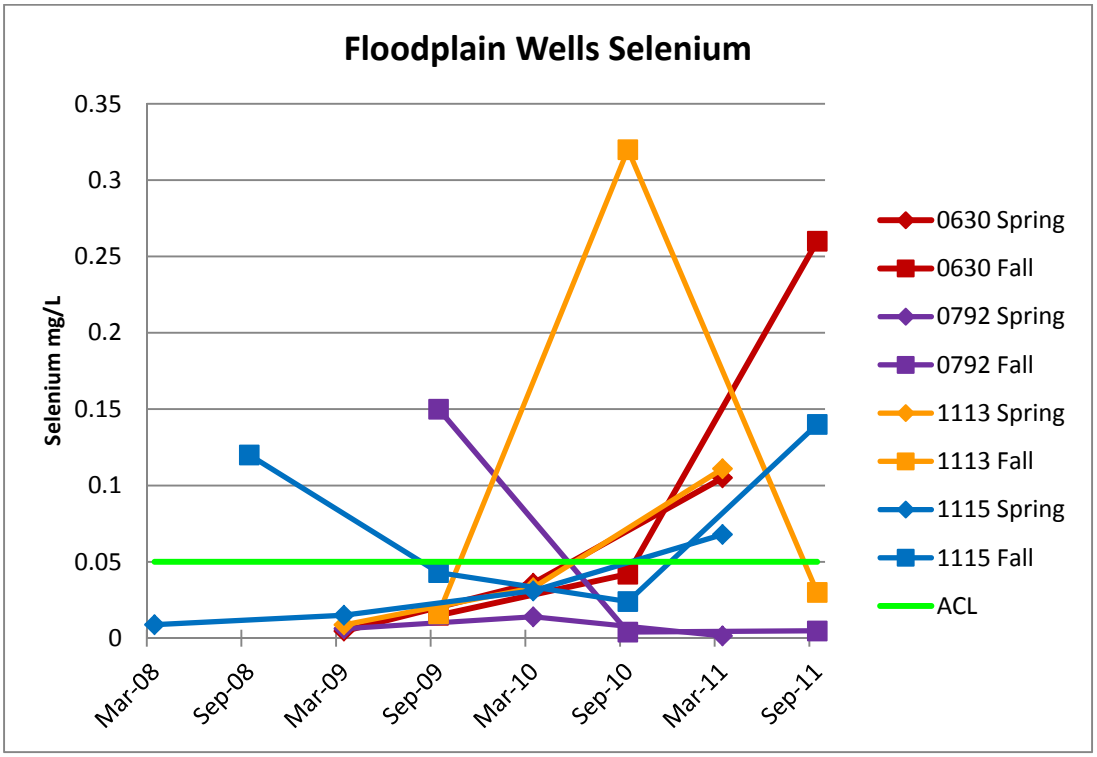

Figure 15. Spring and Fall Pairs: Floodplain Wells

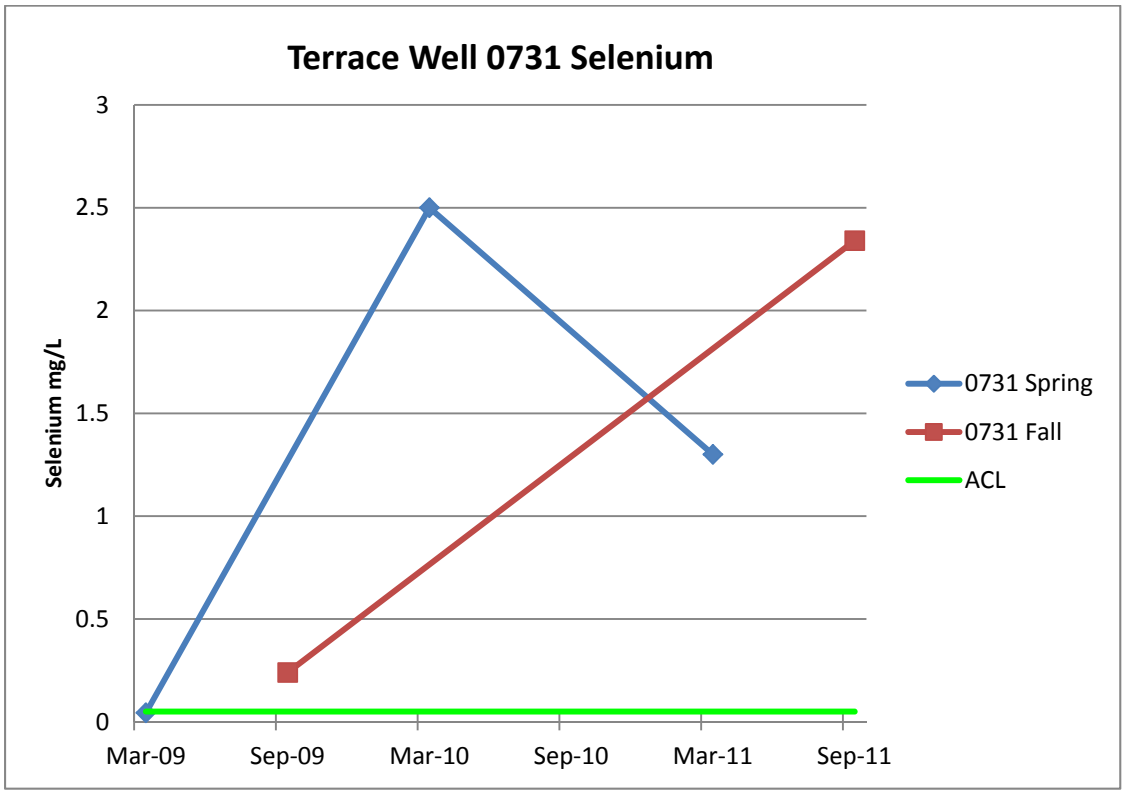

Figure 16. Spring and Fall Pairs: Well 0731

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Table 10. Percent Difference of all Sampling Locations with Two or More Spring/Fall Pairs

Area/Group	Location	Number of Pairs	Spring Mean U	Fall Mean U	Percent Difference	Spring Mean Mn	Fall Mean Mn	Percent Difference	Spring Mean Nitrate	Fall Mean Nitrate	Percent Difference	Spring Mean Sulfate	Fall Mean Sulfate	Percent Difference	Spring Mean Se	Fall Mean Se	Percent Difference
Floodplain Wells/ Treatment System	**0608**	9	1.40	1.37	–2%	4.38	4.00	–9%	349	354	2%	8,300	8,389	1%	0.0057	0.0066	16%
	0610	2	1.05	1.02	–3%	0.02	0.11	323%	230	305	33%	4,835	6,050	25%	0.1995	0.1300	–35%
	0611	2	0.29	0.01	–96%	0.33	0.07	–80%	68.70	0.27	–100%	5,230	5,550	6%	0.0432	0.0010	–98%
	0612	3	0.23	0.06	–73%	2.16	0.48	–78%	0.016	0.019	21%	2,187	403	–82%	0.0012	0.0004	–67%
	0614	9	2.30	2.30	–0.05%	3.62	3.79	5%	739	702	–5%	12,811	12,889	1%	0.3669	0.2726	–26%
	0615	7	2.38	2.26	–5%	3.26	2.89	–12%	439	505	15%	12,077	12,529	4%	0.5481	0.4399	–20%
	0618	9	2.67	2.60	–3%	9.10	9.21	1%	257	242	–6%	13,578	13,456	–1%	0.2764	0.2514	–9%
	0619	9	0.42	0.50	18%	2.50	3.04	21%	0.66	0.12	–83%	5,144	6,834	33%	0.0295	0.0193	–35%
	0622	2	0.15	0.10	–33%	3.91	1.90	–51%	0.19	0.01	–92%	2,815	3,350	19%	0.1155	0.0375	–68%
	0623	2	0.06	0.06	–2%	2.36	1.70	–28%	0.04	0.01	–74%	2,755	2,900	5%	0.0017	0.0018	6%
	0625	3	0.05	0.05	14%	4.22	3.93	–7%	0.03	0.01	–55%	2,413	2,867	19%	0.0018	0.0016	–11%
	0626	3	0.04	0.03	–34%	3.85	3.50	–9%	0.02	0.01	–33%	2,587	2,633	2%	0.0010	0.0015	50%
	0628	3	0.04	0.02	–51%	3.54	3.00	–15%	0.0110	0.0113	3%	3,377	2,767	–18%	0.0041	0.0009	–78%
	0630	3	0.07	0.10	39%	1.62	2.03	26%	5.31	15.36	189%	2,967	3,200	8%	0.0485	0.1057	118%
	0734	5	0.14	0.09	–37%	1.48	0.83	–44%	0.84	0.42	–50%	6,830	3,567	–48%	0.0370	0.0081	–78%
	0735	9	0.25	0.29	16%	2.68	2.98	11%	439	506	15%	7,987	8,856	11%	0.0598	0.0891	49%
	0736	5	0.10	0.18	77%	0.36	2.66	636%	0.06	0.03	–49%	4,498	6,000	33%	0.0010	0.0010	0.00%
	0766	2	0.27	0.29	6%	0.14	0.39	172%	1.70	0.01	–99%	5,595	7,650	37%	0.0030	0.0005	–83%
	0768	2	1.08	0.25	–77%	1.65	1.65	0.30%	0.02	0.01	–39%	14,600	5,950	–59%	0.0052	0.0018	–65%
	0779	2	1.05	1.60	52%	3.75	4.85	30%	2.11	21.50	921%	6,530	8,950	37%	0.0123	0.0270	120%
	0782R	3	0.006	0.009	61%	1.74	2.40	38%	0.01	0.02	73%	383	607	58%	0.0006	0.0002	–67%
	0783R	3	0.009	0.007	–19%	1.41	1.40	–1%	0.01	0.01	9%	522	477	–9%	0.0010	0.0006	–41%
	0792	3	0.65	1.11	71%	1.84	7.53	310%	0.02	0.02	–14%	8,590	15,667	82%	0.0072	0.0529	635%
	0793	2	0.74	0.77	4%	0.20	0.10	–52%	6.43	17.50	172%	3,075	4,050	32%	0.2330	0.1700	–27%
	0797	9	0.02	0.02	7%	1.46	2.47	69%	0.04	0.02	–45%	2,627	2,849	8%	0.0008	0.0003	–63%
	0798	2	0.55	0.72	32%	2.02	3.25	61%	1.30	0.01	–99%	6,460	10,100	56%	0.0881	0.0120	–86%
	0850	9	0.04	0.04	–11%	0.99	0.66	–33%	0.20	0.02	–89%	1,616	1,732	7%	0.0015	0.0003	–80%
	0853	3	0.07	0.05	–26%	0.62	0.59	–5%	0.03	0.01	–50%	569	563	–1%	0.0006	0.0002	–67%
	0854	2	1.69	1.65	–2%	2.96	3.45	17%	70	68	–3%	11,650	12,000	3%	0.0204	0.0156	–24%
	0855	3	0.08	0.07	–10%	1.52	1.40	–8%	0.52	0.30	–42%	3,277	3,100	–5%	0.0189	0.0164	–13%
	0856	3	0.07	0.06	–9%	1.65	1.23	–25%	0.03	0.02	–22%	2,880	2,767	–4%	0.0009	0.0006	–33%
	0857	2	0.43	0.27	–36%	3.47	2.54	–27%	16.89	2.66	–84%	2,485	1,895	–24%	0.0009	0.0006	–33%
	1008	6	1.77	2.21	25%	6.11	6.64	9%	51	85	68%	12,828	14,700	15%	0.1235	0.0787	–36%
	1089	8	0.82	1.09	33%	0.76	1.77	135%	18	36	105%	7,983	9,625	21%	0.0265	0.0336	27%
	1104	6	1.52	1.29	–15%	1.24	2.00	62%	78	66	–15%	11,412	10,150	–11%	0.0353	0.0190	–46%
	1105	4	1.97	2.28	16%	4.00	4.15	4%	370	368	–1%	10,890	10,750	–1%	0.1383	0.1280	–7%
	1109	5	0.14	0.19	34%	0.40	0.61	54%	41	69	67%	841	1,334	59%	0.0117	0.0216	84%
	1110	5	1.18	1.25	6%	0.94	1.70	82%	161	173	7%	8,498	9,280	9%	0.6015	0.3980	–34%
	1111	4	1.01	0.93	–8%	0.45	0.79	74%	23	26	11%	8,825	8,975	2%	0.6053	0.5025	–17%
	1112	3	1.66	1.53	–7%	2.93	2.80	–4%	437	353	–19%	9,533	9,600	1%	1.3400	0.6633	–51%
	1113	3	1.02	0.98	–4%	0.04	1.60	3823%	464	255	–45%	5,593	5,900	5%	0.0509	0.1220	140%
	1114	4	0.59	0.51	–13%	2.10	2.43	16%	92	106	15%	2,523	2,800	11%	0.0086	0.0176	105%
	1115	4	0.68	0.79	16%	1.91	1.98	4%	178	270	52%	3,703	4,775	29%	0.0307	0.0818	166%
	1117	4	0.009	0.005	–48%	0.52	0.55	5%	0.14	0.02	–87%	149	116	–22%	0.0018	0.0003	–84%
	1128	2	1.55	1.50	–3%	4.82	4.30	–11%	503	595	18%	9,450	9,400	–1%	0.0217	0.0245	13%
	1132	3	0.02	0.01	–37%	0.34	0.32	–4%	0.28	0.02	–92%	151	127	–16%	0.0011	0.0004	–64%
	1134	2	0.02	0.01	–9%	0.49	0.44	–11%	2.58	1.71	–34%	231	275	19%	0.0008	0.0033	313%
	1135	2	0.19	0.17	–11%	2.48	2.75	11%	0.01	0.01	0.00%	4,970	5,050	2%	0.0010	0.0004	–60%
	1136	2	0.007	0.012	66%	1.22	1.20	–1%	0.13	0.61	362%	365	400	10%	0.0008	0.0002	–75%
	1137	2	0.33	0.25	–24%	1.46	1.35	–8%	15	6	–64%	2,905	2,650	–9%	0.0024	0.0026	8%
	1138	2	0.29	0.25	–13%	1.26	1.03	–18%	8	11	34%	2,525	2,350	–7%	0.0033	0.0032	–3%
	1139	2	0.51	0.21	–59%	0.40	0.30	–27%	16	4	–77%	3,970	1,950	–51%	0.0191	0.0045	–76%
	1140	2	1.78	1.50	–16%	2.09	3.05	46%	161	120	–25%	9,800	7,800	–20%	0.8600	0.1350	–84%
	1141	2	0.95	1.05	11%	1.80	1.90	6%	43.8	26	–42%	4,505	4,850	8%	0.6280	0.1435	–77%
	1142	2	0.006	0.004	–23%	0.32	0.30	–7%	0.01	0.04	335%	147	125	–15%	0.0021	0.0005	–76%
	1143	2	0.07	0.05	–21%	1.22	0.94	–23%	0.01	0.04	340%	2,900	2,750	–5%	0.0010	0.0002	–80%
Terrace Wells/ Treatment System	0600	2	0.77	0.67	–13%	0.26	0.25	–4%	80	87	9%	14,300	10,000	–30%	0.0084	0.0020	–76%
	0602	2	0.51	0.52	1%	1.75	1.45	–17%	9	22	137%	15,550	17,000	9%	0.0049	0.0081	65%
	0603	3	0.007	0.008	4%	55.47	53.67	–3%	1,933	1,767	–9%	2,803	2,667	–5%	0.0928	0.0883	–5%
	0604	2	0.0874	0.0870	–0.46%	0.75	0.77	2%	1,395	1,100	–21%	10,900	11,500	6%	0.6585	0.8250	25%
	0725	3	0.10	0.09	–11%	0.06	0.39	588%	27	5	–80%	2,973	3,233	9%	0.0192	0.0060	–69%
	0726	3	0.0221	0.0223	1%	0.56	0.45	–19%	5	10	129%	5,057	5,367	6%	0.0118	0.0216	83%
	0727	3	0.27	0.24	–11%	1.16	1.10	–6%	143	123	–14%	11,167	11,333	1%	0.0015	0.0029	93%
	0728	3	0.25	0.25	–1%	1.15	1.08	–6%	168	160	–5%	4,317	4,600	7%	0.0024	0.0045	88%
	0730	5	0.006	0.005	–14%	21.18	21.20	0.09%	164	158	–4%	1,938	2,020	4%	0.0102	0.0094	–8%
	0731	3	0.028	0.027	–2%	0.08	0.11	37%	118	125	6%	4,370	4,300	–2%	0.0417	0.0940	125%
	0812	3	0.14	0.13	–2%	0.11	0.15	36%	1,477	1,400	–5%	15,733	16,333	4%	5.5433	5.7333	3%
	0813	3	0.13	0.12	–10%	0.45	0.58	29%	2,433	2,067	–15%	9,927	10,300	4%	0.0415	0.0673	62%
	0814	2	0.087	0.088	1%	1.39	1.25	–10%	908	835	–8%	12,750	14,000	10%	1.9950	2.2500	13%
	0815	3	0.33	0.36	8%	1.37	1.40	2%	723	680	–6%	14,433	15,000	4%	0.0390	0.0330	–15%
	0816	3	0.023	0.020	–12%	0.0014	0.0010	–29%	31	28	–8%	2,103	1,767	–16%	0.0215	0.0200	–7%
	0817	9	10.76	7.39	–31%	2.12	2.07	–2%	575	618	7%	11,211	11,656	4%	0.0037	0.0032	–14%
	0818	7	0.12	0.12	–4%	0.96	0.84	–12%	1,294	1,186	–8%	12,743	12,714	–0.22%	2.0220	2.1833	8%
	0819	3	0.99	1.12	13%	2.00	1.53	–23%	76	33	–57%	10,867	12,333	13%	0.0550	0.0127	–77%
	0820	2	0.08	0.07	–20%	1.40	0.98	–30%	0.08	4.53	5741%	4,480	4,400	–2%	0.0190	0.0010	–95%
	0824	2	0.30	0.34	10%	0.156	0.155	0%	291	230	–21%	5,090	5,200	2%	0.0053	0.0026	–51%
	0825	2	0.040	0.037	–8%	0.57	0.43	–25%	20	29	45%	5,895	5,900	0.08%	0.0011	0.0009	–18%
	0826	3	3.39	3.47	2%	2.53	2.27	–10%	74	69	–6%	14,700	14,333	–2%	0.0167	0.0183	10%
	0827	3	0.84	0.97	15%	0.25	0.93	276%	106	21	–80%	7,463	8,833	18%	0.0462	0.0183	–60%
	0828	3	0.51	0.71	38%	0.01	0.38	3295%	108	80	–26%	2,267	2,333	3%	0.0867	0.0723	–17%
	0830	7	0.005	0.010	102%	2.95	4.16	41%	44	112	157%	1,640	1,800	10%	0.0259	0.0289	12%
	0832	3	0.16	0.17	11%	0.01	0.01	5%	656	687	5%	12,167	12,933	6%	3.5867	3.6867	3%
	0833	3	0.21	0.20	–5%	0.03	0.04	14%	700	293	–58%	7,373	7,100	–4%	0.3750	0.3200	–15%
	0835	9	0.0703	0.0702	–0.14%	0.006	0.009	60%	105	106	1%	3,734	3,777	1%	0.2971	0.2980	0.30%
	0836	8	0.052	0.052	0.19%	1.96	2.36	20%	16	15	–6%	2,720	2,778	2%	0.1326	0.1249	–6%
	0837	3	0.050	0.048	–3%	4.11	4.57	11%	7	7	2%	2,353	2,467	5%	0.2510	0.2300	–8%
	0838	9	0.052	0.053	2%	0.018	0.025	36%	155	179	16%	3,024	3,424	13%	0.8563	0.4782	–44%
	0841	8	0.12	0.13	6%	0.03	0.04	43%	665	702	6%	14,175	14,575	3%	3.2363	3.2925	2%
	0843	3	0.028	0.026	–8%	1.81	2.03	12%	17	16	–6%	1,660	1,733	4%	0.1987	0.2267	14%
	0844	3	0.17	0.18	4%	0.02	0.01	–56%	748	747	–0.18%	9,147	9,367	2%	1.8467	1.7333	–6%
	0848	3	0.023	0.023	–2%	3.14	2.83	–10%	0.09	0.02	–74%	15,633	16,000	2%	0.0607	0.0480	–21%
	1007	3	2.61	2.70	4%	1.33	1.35	1%	727	710	–2%	12,350	13,500	9%	0.2170	0.1650	–24%
	1049	2	0.16	0.18	11%	0.023	0.002	–90%	562	550	–2%	16,500	17,500	6%	1.2850	1.3500	5%
	1057	2	0.08	0.07	–16%	9.95	10.25	3%	1,500	1,650	10%	10,050	8,250	–18%	0.3050	0.3100	2%
	1058	3	0.0056	0.0063	13%	0.19	0.21	8%	0.26	0.01	–95%	5,103	5,567	9%	0.0007	0.0004	–43%
	1059	3	0.068	0.066	–2%	0.11	0.10	–10%	386	343	–11%	9,350	9,333	–0.18%	0.0078	0.0118	51%
	1068	2	0.70	0.65	–8%	1.02	1.25	23%	270	275	2%	4,875	4,900	1%	0.0745	0.0215	–71%
	1070	5	0.11	0.10	–14%	0.30	0.94	210%	832	760	–9%	15,300	16,000	5%	2.6175	2.7600	5%
	1071	8	0.12	0.13	4%	16.93	8.59	–49%	1,944	1,489	–23%	6,825	8,050	18%	1.2080	1.5600	29%
	1073	3	0.064	0.063	–0.47%	1.17	1.04	–11%	1,497	1,333	–11%	8,797	8,967	2%	2.2167	2.4000	8%
	1074	3	1.88	2.03	8%	1.80	1.87	4%	1,347	1,267	–6%	8,493	8,567	1%	0.2730	0.3067	12%
	1078	8	0.145	0.135	–7%	0.09	0.10	20%	691	711	3%	14,038	14,125	1%	2.8780	2.9625	3%
	1079	9	0.031	0.030	–1%	0.0044	0.0040	–9%	62	74	21%	2,043	2,129	4%	0.3530	0.3841	9%
	1087	8	0.61	0.65	7%	1.10	1.36	23%	333	395	19%	7,346	8,513	16%	0.0446	0.0364	–18%

Table 10 (continued). Percent Difference of all Sampling Locations with Two or More Spring/Fall Pairs

Area/Group	Location	Number of Pairs	Spring Mean U	Fall Mean U	Percent Difference	Spring Mean Mn	Fall Mean Mn	Percent Difference	Spring Mean Nitrate	Fall Mean Nitrate	Percent Difference	Spring Mean Sulfate	Fall Mean Sulfate	Percent Difference	Spring Mean Se	Fall Mean Se	Percent Difference
	1088	8	0.18	0.17	–4%	0.13	0.03	–75%	654	674	3%	17,975	19,625	9%	1.6033	1.5625	–3%
	1091	8	0.116	0.121	4%	3.78	2.06	–46%	1,605	1,475	–8%	11,325	12,625	11%	1.1140	0.7586	–32%
	1092	8	0.11	0.10	–11%	11.98	9.43	–21%	1,596	1,644	3%	10,963	10,625	–3%	1.2960	1.1157	–14%
	1095	5	0.060	0.056	–6%	30.48	29.60	–3%	1,666	1,606	–4%	6,136	5,700	–7%	0.2375	0.2100	–12%
	1096	5	0.110	0.105	–4%	0.27	0.24	–13%	644	636	–1%	13,920	14,400	3%	2.6850	2.6200	–2%
	1093R	4	0.11	0.12	13%	31.15	34.25	10%	2,440	2,550	5%	5,635	5,900	5%	0.5068	0.5625	11%
	MW1	2	0.0006	0.0004	–33%	0.09	0.08	–11%	0.45	0.12	–74%	2,115	2,050	–3%	0.0011	0.0005	–55%
Floodplain Surface	**1118**	5	0.54	0.57	5%	0.03	0.02	–39%	54	40	–25%	5,858	6,680	14%	0.1588	0.0984	–38%
San Juan River	0501	7	0.0016	0.0018	13%	0.01	0.02	145%	0.55	0.42	–23%	149	137	–8%	0.0010	0.0006	–40%
	0897	9	0.0021	0.0019	–10%	0.01	0.02	55%	0.86	0.67	–22%	234	150	–36%	0.0014	0.0013	–7%
San Juan River Bkg	**0898**	9	0.0019	0.0018	–5%	0.010	0.008	–21%	0.49	0.41	–17%	164	148	–10%	0.0011	0.0007	–36%
San Juan River	**0940**	9	0.0050	0.0017	–66%	0.02	0.01	–46%	0.81	0.33	–59%	182	138	–25%	0.0010	0.0006	–40%
	0956	9	0.002	0.002	–5%	0.01	0.02	24%	0.50	0.32	–36%	174	140	–19%	0.0010	0.0006	–43%
	0965	9	0.002	0.018	790%	0.0181	0.0178	–2%	0.53	0.30	–43%	181	131	–27%	0.0011	0.0006	–45%
	1203	7	0.0017	0.0016	–6%	0.01	0.02	111%	0.48	0.37	–24%	150	124	–18%	0.0010	0.0006	–40%
	1205	9	0.0019	0.0019	0.00%	0.01	0.03	300%	0.63	0.46	–27%	163	137	–16%	0.0010	0.0007	–30%
Terrace Surface	**0662**	9	0.0023	0.0002	–91%	0.015	0.008	–49%	1.07	0.22	–79%	1,996	2,067	4%	0.0003	0.0003	0%
	0786	4	0.03	0.03	1%	0.002	0.008	259%	28	17	–39%	3,583	3,943	10%	0.0730	0.0394	–46%
	0889	9	0.20	0.18	–11%	0.01	0.06	392%	789	650	–18%	20,633	20,000	–3%	1.6356	1.4922	–9%
Terrace Surface Bkg	1220	2	0.02	0.03	46%	0.16	0.19	18%	0.98	0.01	–99%	925	1,400	51%	0.0194	0.0056	–71%
	1221	2	0.20	0.22	5%	0.06	0.10	68%	727	785	8%	24,350	29,000	19%	2.1200	2.3000	8%
Evaporation Pond	1215	4	2.38	3.98	67%	0.75	0.28	–63%	1,553	1,850	19%	29,250	47,500	62%	1.5150	2.4250	60%
Average Percentage Difference Over Entire Data Set					4%			86%			50%			3%			–6%

Notes:
Percent difference was calculated by subtracting the mean of the concentration data from the spring sampling events from the mean of the concentration data from the fall events and dividing it by the mean of the concentration data from the spring events.
The pink shaded areas denote when the percent difference is greater than 100 percent or a factor of two between the mean concentration data for the fall and spring sampling events.
All mean values are in mg/L.
Values in red exceed the compliance standard or cleanup goal specified for the floodplain in the GCAP.
Bkg is background location.
Locations in bold print are required by the GCAP.

Table 11. Percent Difference of all Sampling Locations that Exceeded a Standard or Cleanup Goal

Area/Group	Location	Number of Pairs	Spring Mean U	Fall Mean U	Percent Difference	Spring Mean Mn	Fall Mean Mn	Percent Difference	Spring Mean Nitrate	Fall Mean Nitrate	Percent Difference	Spring Mean Sulfate	Fall Mean Sulfate	Percent Difference	Spring Mean Se	Fall Mean Se	Percent Difference
Floodplain Wells/ Treatment System	**0608**	9	1.40	1.37	–2%	4.38	4.00	–9%	349	354	2%	8,300	8,389	1%			
	0610	2	1.05	1.02	–3%				230	305	33%	4,835	6,050	25%	0.1995	0.1300	–35%
	0611	2	0.29	0.01	–96%				68.70	0.27	–100%	5,230	5,550	6%			
	0612	3	0.23	0.06	–73%							2,187	403	–82%			
	0614	9	2.30	2.30	0%	3.62	3.79	5%	739	702	–5%	12,811	12,889	1%	0.3669	0.2726	–26%
	0615	7	2.38	2.26	–5%	3.26	2.89	–12%	439	505	15%	12,077	12,529	4%	0.5481	0.4399	–20%
	0618	9	2.67	2.60	–3%	9.10	9.21	1%	257	242	–6%	13,578	13,456	–1%	0.2764	0.2514	–9%
	0619	9	0.42	0.50	18%	2.50	3.04	21%				5,144	6,834	33%			
	0622	2	0.15	0.10	–33%	3.91	1.90	–51%				2,815	3,350	19%	0.1155	0.0375	–68%
	0623	2	0.06	0.06	–2%							2,755	2,900	5%			
	0625	3	0.05	0.05	14%	4.22	3.93	–7%				2,413	2,867	19%			
	0626	3				3.85	3.50	–9%				2,587	2,633	2%			
	0628	3				3.54	3.00	–15%				3,377	2,767	–18%			
	0630	3	0.07	0.10	39%							2,967	3,200	8%	0.0485	0.1057	118%
	0734	5	0.14	0.09	–37%							6,830	3,567	–48%			
	0735	9	0.25	0.29	16%	2.68	2.98	11%	439	506	15%	7,987	8,856	11%	0.0598	0.0891	49%
	0736	5	0.10	0.18	77%							4,498	6,000	33%			
	0766	2	0.27	0.29	6%							5,595	7,650	37%			
	0768	2	1.08	0.25	–77%							14,600	5,950	–59%			
	0779	2	1.05	1.60	52%	3.75	4.85	30%				6,530	8,950	37%			
	0792	3	0.65	1.11	71%	1.84	7.53	310%				8,590	15,667	82%	0.0072	0.0529	635%
	0793	2	0.74	0.77	4%							3,075	4,050	32%	0.2330	0.1700	–27%
	0797	9										2,627	2,849	8%	0.0008	0.0003	–63%
	0798	2	0.55	0.72	32%	2.02	3.25	61%				6,460	10,100	56%	0.0881	0.0120	–86%
	0853	3	0.07	0.05	–26%												
	0854	2	1.69	1.65	–2%	2.96	3.45	17%	70	68	–3%	11,650	12,000	3%			
	0855	3	0.08	0.07	–10%							3,277	3,100	–5%			
	0856	3	0.07	0.06	–9%							2,880	2,767	–4%			
	0857	2	0.43	0.27	–36%	3.47	2.54	–27%				2,485	1,895	–24%			
	1008	6	1.77	2.21	25%	6.11	6.64	9%	51	85	68%	12,828	14,700	15%	0.1235	0.0787	–36%
	1089	8	0.82	1.09	33%							7,983	9,625	21%			
	1104	6	1.52	1.29	–15%				78	66	–15%	11,412	10,150	–11%			
	1105	4	1.97	2.28	16%	4.00	4.15	4%	370	368	–1%	10,890	10,750	–1%	0.1383	0.1280	–7%
	1109	5	0.14	0.19	34%				41	69	67%						
	1110	5	1.18	1.25	6%				161	173	7%	8,498	9,280	9%	0.6015	0.3980	–34%
	1111	4	1.01	0.93	–8%							8,825	8,975	2%	0.6053	0.5025	–17%
	1112	3	1.66	1.53	–7%	2.93	2.80	–4%	437	353	–19%	9,533	9,600	1%	1.3400	0.6633	–51%
	1113	3	1.02	0.98	–4%				464	255	–45%	5,593	5,900	5%	0.0509	0.1220	140%
	1114	4	0.59	0.51	–13%				92	106	15%	2,523	2,800	11%			
	1115	4	0.68	0.79	16%				178	270	52%	3,703	4,775	29%	0.0307	0.0818	166%
	1128	2	1.55	1.50	–3%	4.82	4.30	–11%	503	595	18%	9,450	9,400	–1%			
	1135	2	0.19	0.17	–11%	2.48	2.75	11%				4,970	5,050	2%			
	1137	2	0.33	0.25	–24%							2,905	2,650	–9%			
	1138	2	0.29	0.25	–13%							2,525	2,350	–7%			
	1139	2	0.51	0.21	–59%							3,970	1,950	–51%			
	1140	2	1.78	1.50	–16%	2.09	3.05	46%	161	120	–25%	9,800	7,800	–20%	0.8600	0.1350	–84%
	1141	2	0.95	1.05	11%							4,505	4,850	8%	0.6280	0.1435	–77%
	1143	2	0.07	0.05	–21%							2,900	2,750	–5%			
Terrace Wells Treatment System	0602	2	0.51	0.52	1%							15,550	17,000	9%			
	0603	3				55.47	53.67	–3%	1,933	1,767	–9%	2,803	2,667	–5%	0.0928	0.0883	–5%
	0604	2	0.0874	0.0870	0%				1,395	1,100	–21%	10,900	11,500	6%	0.6585	0.8250	25%
	0725	3	0.10	0.09	–11%							2,973	3,233	9%			
	0726	3										5,057	5,367	6%			
	0727	3	0.27	0.24	–11%				143	123	–14%	11,167	11,333	1%			
	0728	3	0.25	0.25	–1%				168	160	–5%	4,317	4,600	7%			
	0730	5				21.18	21.20	0%	164	158	–4%	1,938	2,020	4%			
	0731	3							118	125	6%	4,370	4,300	–2%	0.0417	0.0940	125%
	0812	3	0.14	0.13	–2%				1,477	1,400	–5%	15,733	16,333	4%	5.5433	5.7333	3%
	0813	3	0.13	0.12	–10%				2,433	2,067	–15%	9,927	10,300	4%	0.0415	0.0673	62%
	0814	2	0.087	0.088	1%				908	835	–8%	12,750	14,000	10%	1.9950	2.2500	13%
	0815	3	0.33	0.36	8%				723	680	–6%	14,433	15,000	4%			
	0816	3										2,103	1,767	–16%			
	0817	9	10.76	7.39	–31%				575	618	7%	11,211	11,656	4%			
	0818	7	0.12	0.12	–4%				1,294	1,186	–8%	12,743	12,714	0%	2.0220	2.1833	8%
	0819	3	0.99	1.12	13%				76	33	–57%	10,867	12,333	13%	0.0550	0.0127	–77%
	0820	2	0.08	0.07	–20%							4,480	4,400	–2%			
	0824	2	0.30	0.34	10%				291	230	–21%	5,090	5,200	2%			
	0825	2										5,895	5,900	0%			
	0826	3	3.39	3.47	2%				74	69	–6%	14,700	14,333	–2%			
	0827	3	0.84	0.97	15%				106	21	–80%	7,463	8,833	18%			
	0828	3	0.51	0.71	38%				108	80	–26%	2,267	2,333	3%	0.0867	0.0723	–17%
	0830	7				2.95	4.16	41%	43.8	112	157%						
	0832	3	0.16	0.17	11%				656	687	5%	12,167	12,933	6%	3.5867	3.6867	3%
	0833	3	0.21	0.20	–5%				700	293	–58%	7,373	7,100	–4%	0.3750	0.3200	–15%
	0835	9	0.0703	0.0702	0%				105	106	1%	3,734	3,777	1%	0.2971	0.2980	0%
	0836	8	0.052	0.052	0%							2,720	2,778	2%	0.1326	0.1249	–6%
	0837	3	0.050	0.048	–3%	4.11	4.57	11%				2,353	2,467	5%	0.2510	0.2300	–8%
	0838	9	0.052	0.053	2%				155	179	16%	3,024	3,424	13%	0.8563	0.4782	–44%
	0841	8	0.12	0.13	6%				665	702	6%	14,175	14,575	3%	3.2363	3.2925	2%
	0843	3													0.1987	0.2267	14%
	0844	3	0.17	0.18	4%				748	747	0%	9,147	9,367	2%	1.8467	1.7333	–6%
	0848	3				3.14	2.83	–10%				15,633	16,000	2%	0.0607	0.0480	–21%
	1007	3	2.61	2.70	4%				727	710	–2%	12,350	13,500	9%	0.2170	0.1650	–24%
	1049	2	0.16	0.18	11%				562	550	–2%	16,500	17,500	6%	1.2850	1.3500	5%
	1057	2	0.08	0.07	–16%	9.95	10.25	3%	1,500	1,650	10%	10,050	8,250	–18%	0.3050	0.3100	2%
	1058	3										5,103	5,567	9%			
	1059	3	0.068	0.066	–2%				386	343	–11%	9,350	9,333	0%			
	1068	2	0.70	0.65	–8%				270	275	2%	4,875	4,900	1%	0.0745	0.0215	–71%
	1070	5	0.11	0.10	–14%				832	760	–9%	15,300	16,000	5%	2.6175	2.7600	5%
	1071	8	0.12	0.13	4%	16.93	8.59	–49%	1,944	1,489	–23%	6,825	8,050	18%	1.2080	1.5600	29%
	1073	3	0.064	0.063	0%				1,497	1,333	–11%	8,797	8,967	2%	2.2167	2.4000	8%
	1074	3	1.88	2.03	8%				1,347	1,267	–6%	8,493	8,567	1%	0.2730	0.3067	12%
	1078	8	0.145	0.135	–7%				691	711	3%	14,038	14,125	1%	2.8780	2.9625	3%
	1079	9							62	74	21%	2,043	2,129	4%	0.3530	0.3841	9%
	1087	8	0.61	0.65	7%				333	395	19%	7,346	8,513	16%			
	1088	8	0.18	0.17	–4%				654	674	3%	17,975	19,625	9%	1.6033	1.5625	–3%
	1091	8	0.116	0.121	4%	3.78	2.06	–46%	1,605	1,475	–8%	11,325	12,625	11%	1.1140	0.7586	–32%
	1092	8	0.11	0.10	–11%	11.98	9.43	–21%	1,596	1,644	3%	10,963	10,625	–3%	1.2960	1.1157	–14%
	1095	5	0.060	0.056	–6%	30.48	29.60	–3%	1,666	1,606	–4%	6,136	5,700	–7%	0.2375	0.2100	–12%
	1096	5	0.110	0.105	–4%				644	636	–1%	13,920	14,400	3%	2.6850	2.6200	–2%
	1093R	4	0.11	0.12	13%	31.15	34.25	10%	2,440	2,550	5%	5,635	5,900	5%	0.5068	0.5625	11%
	MW1	2										2,115	2,050	–3%			

Table 11. Percent Difference of all Sampling Locations that Exceeded a Standard or Cleanup Goal

Area/Group	Location	Number of Pairs	Spring Mean U	Fall Mean U	Percent Difference	Spring Mean Mn	Fall Mean Mn	Percent Difference	Spring Mean Nitrate	Fall Mean Nitrate	Percent Difference	Spring Mean Sulfate	Fall Mean Sulfate	Percent Difference	Spring Mean Se	Fall Mean Se	Percent Difference
Floodplain Surface	**1118**	5	0.54	0.57	5%				54	40	–25%	5,858	6,680	14%	0.1588	0.0984	–38%
Terrace Surface	**0662**	9										1,996	2,067	4%			
	0786	4										3,583	3,943	10%	0.0730	0.0394	–46%
	0889	9	0.20	0.18	–11%				789	650	–18%	20,633	20,000	–3%	1.6356	1.4922	–9%
Terrace Surface Bkg	1221	2	0.20	0.22	5%				727	785	8%	24,350	29,000	19%	2.1200	2.3000	8%
Terrace Wells/TS	0600	2	0.77	0.67	–13%				80	87	9%	14,300	10,000	–30%			
Evaporation Pond	1215	4	2.38	3.98	67%				1,553	1,850	19%	29,250	47,500	62%	1.5150	2.4250	60%
Average Percentage Difference Over Entire Data Set					-1%			10%			–1%			4%			7%

Notes:
Percent difference was calculated by subtracting the mean of the concentration data from the spring sampling events from the mean of the concentration data from the fall events and dividing it by the mean of the concentration data from the spring events.
The pink shaded areas denote when the percent difference is greater than 100 percent or a factor of two between the mean concentration data for the fall and spring sampling events.
All mean values are in mg/L.
Values in red exceed the compliance standard or cleanup goal specified in the GCAP for the floodplain.
Bkg is background location.
Locations in bold print are required by the GCAP.

12.2 Analyte Optimization: Are the Current Reasons for Monitoring an Analyte Valid?

The analytes and parameters monitored at the Shiprock site consist of field measurements for general water quality, common ions used to evaluate water chemistry, human-health-based COCs, and ecology-based COCs. This section assesses the rationale for monitoring these analytes and parameters.

12.2.1 Field Measurements

The field measurements are alkalinity, pH, oxidation-reduction potential, specific conductance, temperature, and turbidity. Turbidity, specific conductance, and pH are considered stabilization parameters; sampling protocol in the SAP requires that measurements of these parameters stabilize during the purging of a well before the well can be sampled. The additional field measurements of alkalinity and oxidation-reduction potential were required in the GCAP and are needed for geochemical analysis of the site water. Temperature can play a role in water chemistry and is therefore also a useful measurement. All of the current field measurements are needed for analyzing the water quality and chemistry; therefore, no changes are recommended for the field measurements.

12.2.2 Water Chemistry

The analytes that are monitored for water chemistry are calcium, chloride, magnesium, potassium, and sodium. Sulfate, carbonate, and bicarbonate are also needed for water chemistry. Sulfate is a site COC and is discussed in the following section, and carbonate and bicarbonate are calculated from alkalinity, which is discussed in Section 12.2.1. These water chemistry analytes were required in the GCAP, and understanding the water chemistry is useful in determining the relationships between the site water and other locations (e.g., San Juan River, background, and terrace vs. floodplain). It is recommended that no changes be made to the water chemistry analytes.

12.2.3 COCs

The COCs monitored based on potential human health risk are ammonia (on the terrace), manganese, nitrate, selenium, sulfate, and uranium. The COCs monitored based on potential ecological risk are all of the human-health-based COCs plus strontium.

Ammonia was retained as a COC for human health as a result of the updated baseline risk assessment in the SOWP. Ammonia was only a potential concern for human health via the inhalation pathway on the terrace. Concentrations of ammonia in air could attain levels that would be detrimental to human health only if ammonia-contaminated water were used in a closed residential structure. The lack of groundwater use in residences renders this pathway incomplete. Moreover, because insufficient groundwater is available on the terrace for domestic use, this pathway will remain incomplete. For these reasons, ammonia may no longer be of concern for human health.

Manganese, nitrate, selenium, and uranium were included as COCs for human health because concentrations exceeded either the 40 CFR 192 MCL or acceptable risk levels. Current

concentrations of these constituents still exceed these levels; therefore, it is recommended that they be retained as health-based COCs, even though the exposure pathways for these constituents are also incomplete.

Sulfate was included as a human-health-based COC because even though toxicity data were still under evaluation by EPA at the time the SOWP was written, the levels were high enough to be of probable concern. EPA still has not established a health-based MCL for sulfate; however, the levels are still elevated, and it is recommended that sulfate be retained as a health-based COC.

Selenium, uranium, and sulfate were retained because they were considered primary ecological risk drivers. Manganese was retained because it was considered an important ecological risk driver for the floodplain, and nitrate was retained because of medium-to-low concern to aquatic life.

Ammonia and strontium were retained based on the ecological risk assessment in the SOWP. Both were of medium-to-low concern to aquatic life and were said to be minor contributors to risk.

At the time of the SOWP completion, EPA was completing significant revisions to its ambient water quality criteria for ammonia. These revisions were subsequently incorporated into the State of New Mexico's revised surface water quality regulations (NMAC 20.6.4). A comparison of surface water sampling results for ammonia in 2011 with the current surface water standards indicates that concentrations are well below the current water quality criteria (most sampling results were at or below the detection limit). Therefore ammonia no longer appears to be of concern for ecological receptors.

Strontium results for surface water 2009–2011 (Table 12) indicate that concentrations at several locations were at or slightly exceeded the Tier II secondary chronic value of 1.5 mg/L (Suter and Tsao 1996) used as a lower screening benchmark in the ecological risk assessment. However, all results were well below the secondary acute value of 15.0 mg/L used as an upper screening benchmark (Suter and Tsao 1996). Guidance on the application of these benchmarks notes that the exceedance of a secondary chronic value implies a low risk; exceedance of any of the other benchmarks (e.g., secondary acute value), however, signals a potential for real risk (Suter and Tsao 1996). Additionally, these aquatic benchmarks are based on dissolved (filtered) concentrations of metals. Only unfiltered samples of Shiprock surface water exceeded the secondary chronic value; all filtered sample results were well below the lower screening benchmark, indicating that strontium is unlikely to be of concern for aquatic organisms.

Table 12. Filtered and Unfiltered Results for Ammonia and Strontium in River Samples

Location	Date Sampled	Ammonia Total as N Filtered mg/L	Ammonia Total as N Unfiltered mg/L	Strontium Filtered mg/L	Strontium Unfiltered mg/L
0501	15-Sep-09	<0.1	<0.1	0.77	1.10
0501	23-Mar-10	<0.1	<0.1	0.87	0.95
0501	01-Sep-10	<0.1	<0.1	0.68	0.75
0501	22-Mar-11	<0.0411	<0.0707	0.79	0.81
0501	13-Sep-11	<0.1	<0.1	0.68	1.70
0897	16-Sep-09	<0.1	<0.1	0.72	1.70
0897	26-Mar-10	<0.1	<0.1	0.87	0.97
0897	02-Sep-10		<0.1	0.69	0.70
0897	22-Mar-11	<0.0746	<0.0814	0.79	0.75
0897	14-Sep-11	<0.1	<0.1	0.69	0.94
0898 -BKg	16-Sep-09	<0.1	<0.1	0.68	2.20
0898 -BKg	25-Mar-10	<0.1	<0.1	0.88	1.00
0898 -BKg	01-Sep-10	<0.1	<0.1	0.69	0.84
0898 -BKg	23-Mar-11	<0.0546	<0.0663	0.84	0.77
0898 -BKg	15-Sep-11	<0.1	<0.1	0.62	3.90
0899	17-Sep-09	<0.1	<0.1	0.79	0.83
0899	24-Mar-10	<0.1	<0.1	0.85	0.83
0899	01-Sep-10	<0.1	<0.1	0.69	0.74
0899	24-Mar-11	<0.047	<0.0924	0.84	0.82
0899	14-Sep-11	<0.1	<0.1	0.69	1.00
0940	03-Mar-03	0.282		1.18	
0940	17-Sep-09	<0.1	<0.1	0.78	0.89
0940	25-Mar-10	<0.1	<0.1	0.86	0.96
0940	31-Aug-10	<0.1	<0.1	0.68	0.74
0940	25-Mar-11	<0.0453	<0.0417	0.82	0.81
0940	15-Sep-11	<0.1	<0.1	0.65	2.10
0956	17-Sep-09	<0.1	<0.1	0.77	0.98
0956	26-Mar-10	<0.1	<0.1	0.84	0.86
0956	02-Sep-10	<0.1	<0.1	0.70	0.73
0956	22-Mar-11	<0.0358	<0.0432	0.78	0.80
0956	13-Sep-11	<0.1	<0.1	0.71	1.50
0965	17-Sep-09	<0.1	<0.1	0.78	0.86
0965	26-Mar-10	<0.1	<0.1	0.85	0.93
0965	02-Sep-10	<0.1	<0.1	0.71	0.72
0965	22-Mar-11	<0.0297	<0.0492	0.81	0.83
0965	13-Sep-11	<0.1	<0.1	0.69	1.50
1203	15-Sep-09	<0.1	<0.1	0.73	0.92
1203	23-Mar-10	<0.1	<0.1	0.89	0.91
1203	01-Sep-10	<0.1	<0.1	0.70	0.76
1203	22-Mar-11	<0.016	<0.0553	0.74	0.75
1203	13-Sep-11	<0.1	<0.1	0.70	1.50
1205	16-Sep-09	<0.1	<0.1	0.65	2.40
1205	24-Mar-10	<0.1	<0.1	0.85	0.84
1205	02-Sep-10	0.1	<0.1	0.69	0.72
1205	23-Mar-11	<0.0302	<0.0346	0.73	0.80
1205	15-Sep-11	<0.1	<0.1	0.50	4.80

Results in red exceed the secondary acute value

12.3 Spatial Optimization: Are the Hot-Spot Areas of the Site Sufficiently Covered?

12.3.1 Spatial Redundancy

Some consideration was given to conducting analyses of spatial redundancy for the numerous monitoring wells at the Shiprock site. If such analyses were to be carried out, their purpose would be to identify pairs of wells that (1) are located relatively close to each other (e.g., separated by no more than 100 ft); (2) are screened in the same formation, whether in alluvium on the terrace or beneath the floodplain, or in Mancos Shale; and (3) have recorded effectively identical contaminant concentrations over a period spanning several years (e.g., 7 or more years). A clear understanding of all groundwater flow, fate, and transport processes potentially affecting the area encompassing each potential well pair was also considered crucial for carrying out any spatial redundancy assessments. This latter requirement was considered important because of instances in which sampling of redundant wells is useful for identifying remediation progress. In the case of two proximate wells screened at different vertical depths within a hydrogeologic unit, it may be helpful to know that contamination in the area is distributed uniformly over the vertical interval sampled collectively by the two wells, rather than being stratified due to water density variations over the vertical domain. Many monitoring locations at the Shiprock site have historically been, and may still be, affected by high water salinity, which can lead to vertical stratification of water chemistry. A comparison of all of the site wells available for sampling (Figure 17) and visual representation of site data for the five main COCs was used to determine whether the sampling locations sufficiently cover the areas of the site with elevated concentrations (hot-spots).

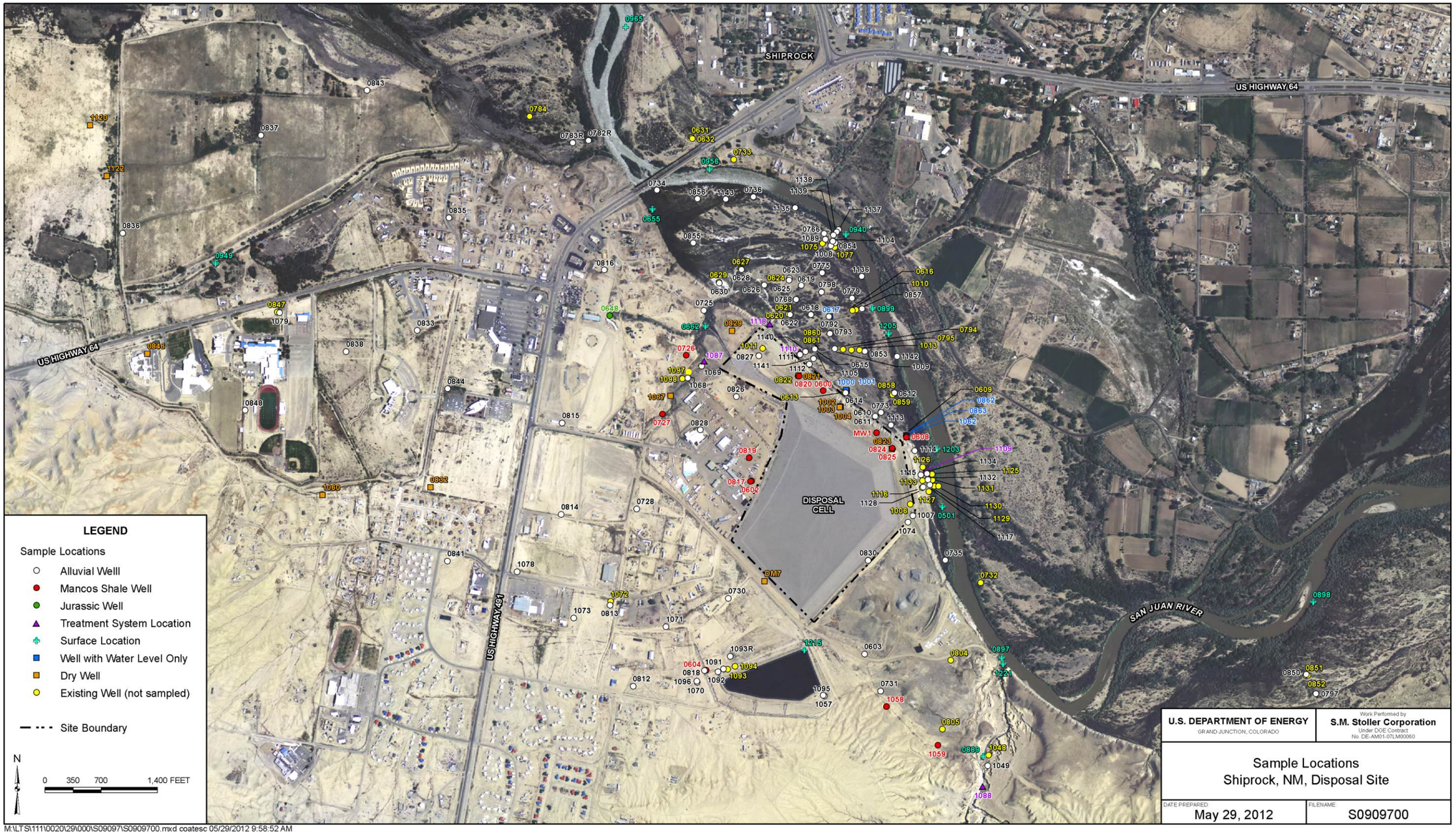

Figure 17. Sample Locations, Shiprock, New Mexico, Disposal Site

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12.3.2 Hot-Spot Coverage

Data maps were prepared using the maximum result from the fall and spring sampling events for the years 2005, 2008, and 2011 for the five main COCs: manganese, nitrate, sulfate, selenium, and uranium at wells and treatment system locations. The year 2005 was chosen because it was after site remediation had begun and includes wells that were required by both the GCAP and the refined site conceptual model. The year 2008 was chosen because it was a year in which the sampling event included a larger number of locations. The data map for 2011 shows the current wells sampled. These maps were prepared in the same fashion as those in Section 6.3.3, showing areas where COC concentrations exceed the standard or goal as red/yellow. Two maps were made for each of the years; one map, labeled "All Wells with Results," shows all the wells that were sampled and had a result exceeding the detection limit (i.e., this map includes data from new wells as they were installed or added to the sampling program). The same wells are not necessarily present in each year, because more wells were added and sampled over the years, and some wells were replaced or were dry at the time of sampling. A second map, labeled "Wells with Results in All Three Years (2005, 2008, and 2011)," uses just the wells that were sampled and had a result in all 3 years (i.e., if a well was dry or had a result below the detection limit for one of the years, it was not included in any of the three maps). The same wells are present in each year. All of the maps include wells required by the GCAP as well as any additional wells that were on the sampling list for that year. San Juan River sampling results were also not included on these maps, as the low levels (equivalent to river background levels) typically detected in the river would affect the interpolation of the areas along the river. Not including the river location gives a more conservative view of site contamination levels. The maps in this section are used to visually assess if the hot-spot areas of the site have a sufficient number of wells being monitored.

12.3.2.1 Manganese

All the maps in Figure 17 show a manganese hot spot around the southeast corner of the disposal cell. This area of contamination appears larger because the well on the south side of the disposal cell (DM7) did not have results for all of the years represented and has been dry since 2008. For the maps where no data are available at well DM7, the mapping software filled in that area based on data from the other wells. It appears that the manganese hot-spot area has not changed since 2005. The appearance of this hot spot on both 2011 maps suggests that the number of sampling locations on the terrace could be reduced, and the hot spot would still be defined. The current floodplain locations, however, appear to be necessary to define the hot-spot areas (Figure 18).

12.3.2.2 Nitrate

Nitrate concentrations are elevated throughout most of the terrace. The 2008 and 2011 maps showing all wells with results best delineate the nitrate contamination. The highest results are along the buried escarpment on the terrace and at well 0735 on the floodplain. The additional wells in these maps better define the area, because without the wells that show results below the standard, the software interpolation creates the appearance of more widespread nitrate contamination than actually exists, as is seen in the maps of the wells with results in all 3 years. A comparison of the 2008 and 2011 maps for all wells with results suggests that the number of locations sampled on the terrace within the area of elevated concentrations could be reduced. The area of elevated concentrations would still be defined as long as the lower-concentration

locations along the escarpment are retained. On the floodplain, concentrations at the majority of the locations are below the MCL. Therefore, fewer floodplain locations could be sampled as long as the locations where concentrations are elevated, and a few wells between those locations and the river, are retained to define the higher-concentration areas (Figure 19).

12.3.2.3 Selenium

Selenium concentrations are elevated along the buried escarpment toward the northwest and in Many Devils Wash on the terrace. On the floodplain, elevated levels are present along the base of the escarpment and around well 0618. The maps that show all wells with results indicate that selenium contamination does not extend as far north as it appears to in the other maps. The number of locations sampled on the terrace within the area of elevated concentrations could be reduced as long as the lower-concentration locations along the escarpment are retained to define the plume edge. On the floodplain, the majority of the locations are below the alternate concentration limit. Therefore, fewer floodplain locations could be sampled as long as the locations with elevated concentrations, and a few wells between those locations and the river, are retained to define the higher-concentration areas (Figure 20).

12.3.2.4 Sulfate

Sulfate concentrations have remained elevated throughout the site; Figure 20 shows a few areas with lower concentrations and no clearly defined hot spots. Fewer locations within the areas of elevated concentrations on both the floodplain and the terrace could be sampled as long as the locations where concentrations are below the cleanup goal are retained to define the lower-concentration areas (Figure 21).

12.3.2.5 Uranium

Uranium concentrations are above the MCL in most of the terrace wells, although a few locations have lower concentrations. Highest concentrations are just west of the disposal cell on the terrace and on the floodplain from well 0735 to extraction wells 1089 and 1104. On the terrace, sampling could be eliminated at a few locations closer to the buried escarpment. On the floodplain, all current sampling locations appear to be necessary to define the extent of contamination (Figure 22).

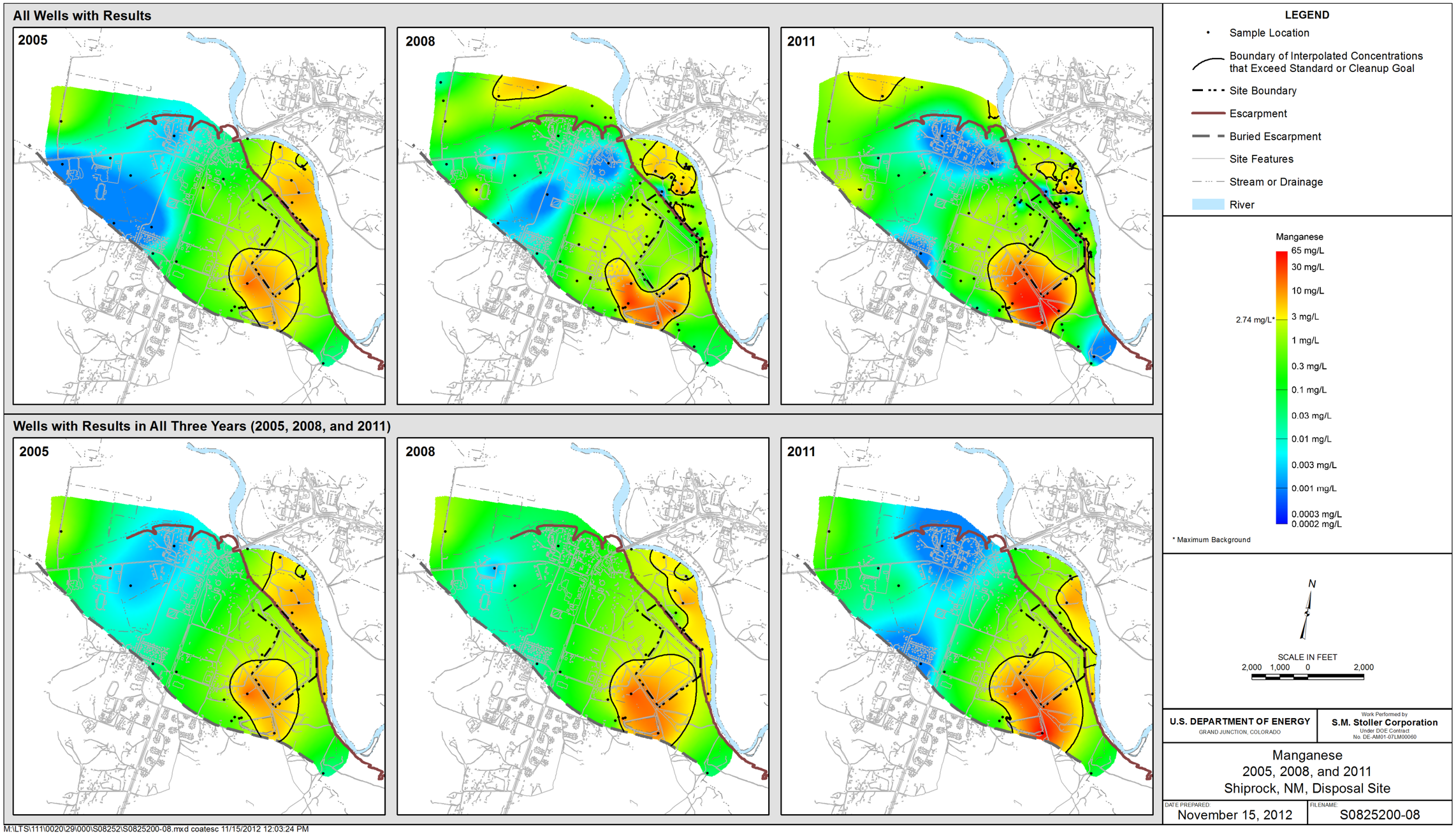

Figure 18. Manganese Concentrations 2005, 2008, and 2011

All Wells with Results

2005

2008

2011

Wells with Results in All Three Years (2005, 2008, and 2011)

2005

2008

2011

LEGEND

- Sample Location
- Boundary of Interpolated Concentrations that Exceed Standard or Cleanup Goal
- Site Boundary
- Escarpment
- Buried Escarpment
- Site Features
- Stream or Drainage
- River

Nitrate

- 3,000 mg/L
- 1,000 mg/L
- 300 mg/L
- 100 mg/L
- 44 mg/L*
- 30 mg/L
- 10 mg/L
- 3 mg/L
- 1 mg/L
- 0.3 mg/L
- 0.1 mg/L
- 0.03 mg/L
- 0.01 mg/L

* UMTRA MCL

N

SCALE IN FEET

2,000 1,000 0 2,000

U.S. DEPARTMENT OF ENERGY
GRAND JUNCTION, COLORADO

Work Performed by
S.M. Stoller Corporation
Under DOE Contract
No. DE-AM01-07LM00060

Nitrate
2005, 2008, and 2011
Shiprock, NM, Disposal Site

DATE PREPARED: November 15, 2012

FILENAME: S0825200-09

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Figure 19. Nitrate Concentrations 2005, 2008, and 2011

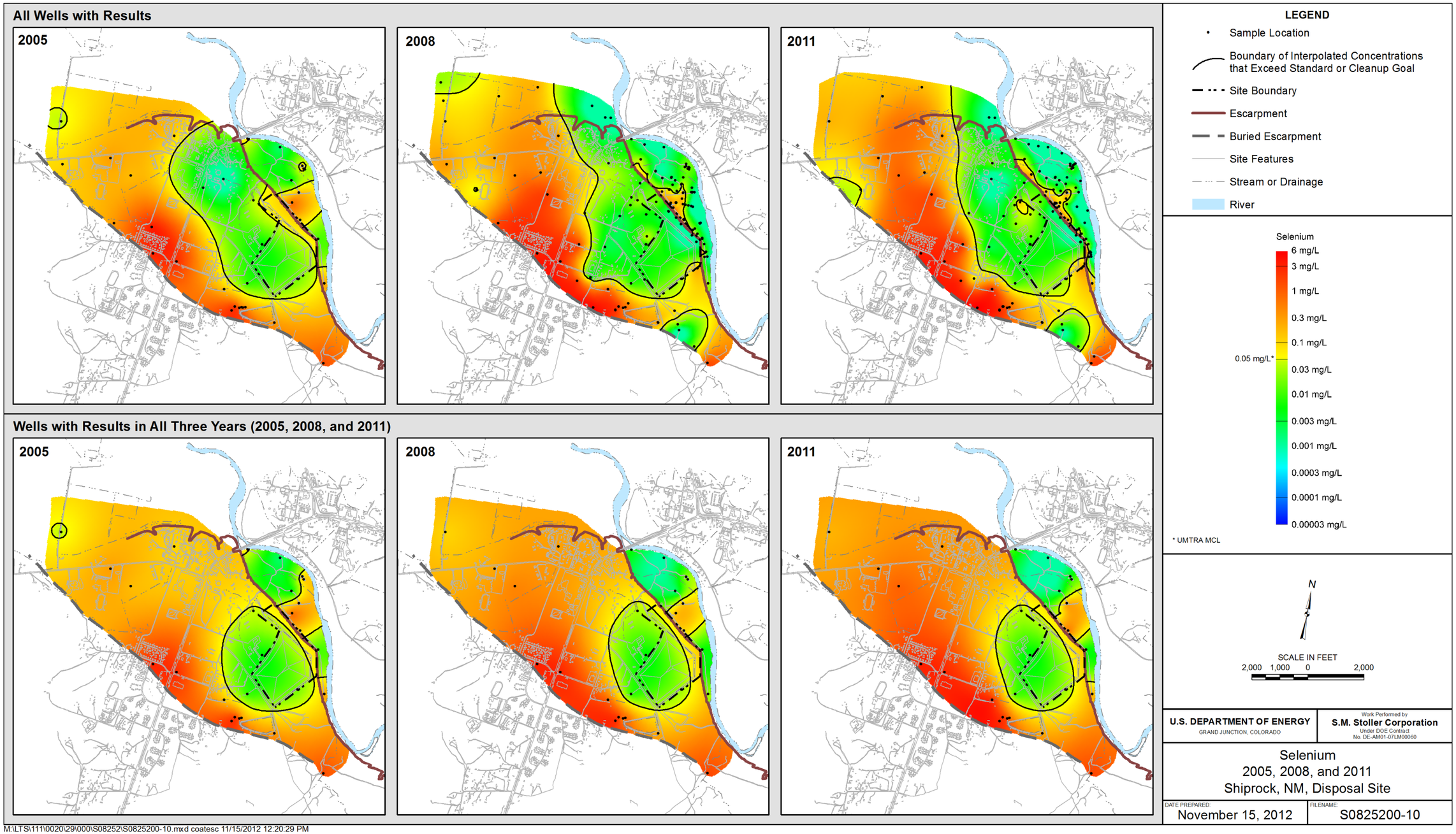

Figure 20. Selenium Concentrations 2005, 2008, and 2011

All Wells with Results

2005

2008

2011

Wells with Results in All Three Years (2005, 2008, and 2011)

2005

2008

2011

LEGEND

- Sample Location
- Boundary of Interpolated Concentrations that Exceed Standard or Cleanup Goal
- Site Boundary
- Escarpment
- Buried Escarpment
- Site Features
- Stream or Drainage
- River

Sulfate

26,977 mg/L

10,000 mg/L

3,000 mg/L

2000 mg/L*

1,000 mg/L

300 mg/L

100 mg/L

58 mg/L

* Maximum Background / Well 0648

N

SCALE IN FEET

2,000 1,000 0 2,000

U.S. DEPARTMENT OF ENERGY
GRAND JUNCTION, COLORADO

Work Performed by
S.M. Stoller Corporation
Under DOE Contract
No. DE-AM01-07LM00060

Sulfate
2005, 2008, and 2011
Shiprock, NM, Disposal Site

DATE PREPARED: November 15, 2012

FILENAME: S0825200-11

M:\LTS\111\0020\29\000\S08252\S0825200-11.mxd coatesc 11/15/2012 12:27:54 PM

Figure 21. Sulfate Concentrations 2005, 2008, and 2011

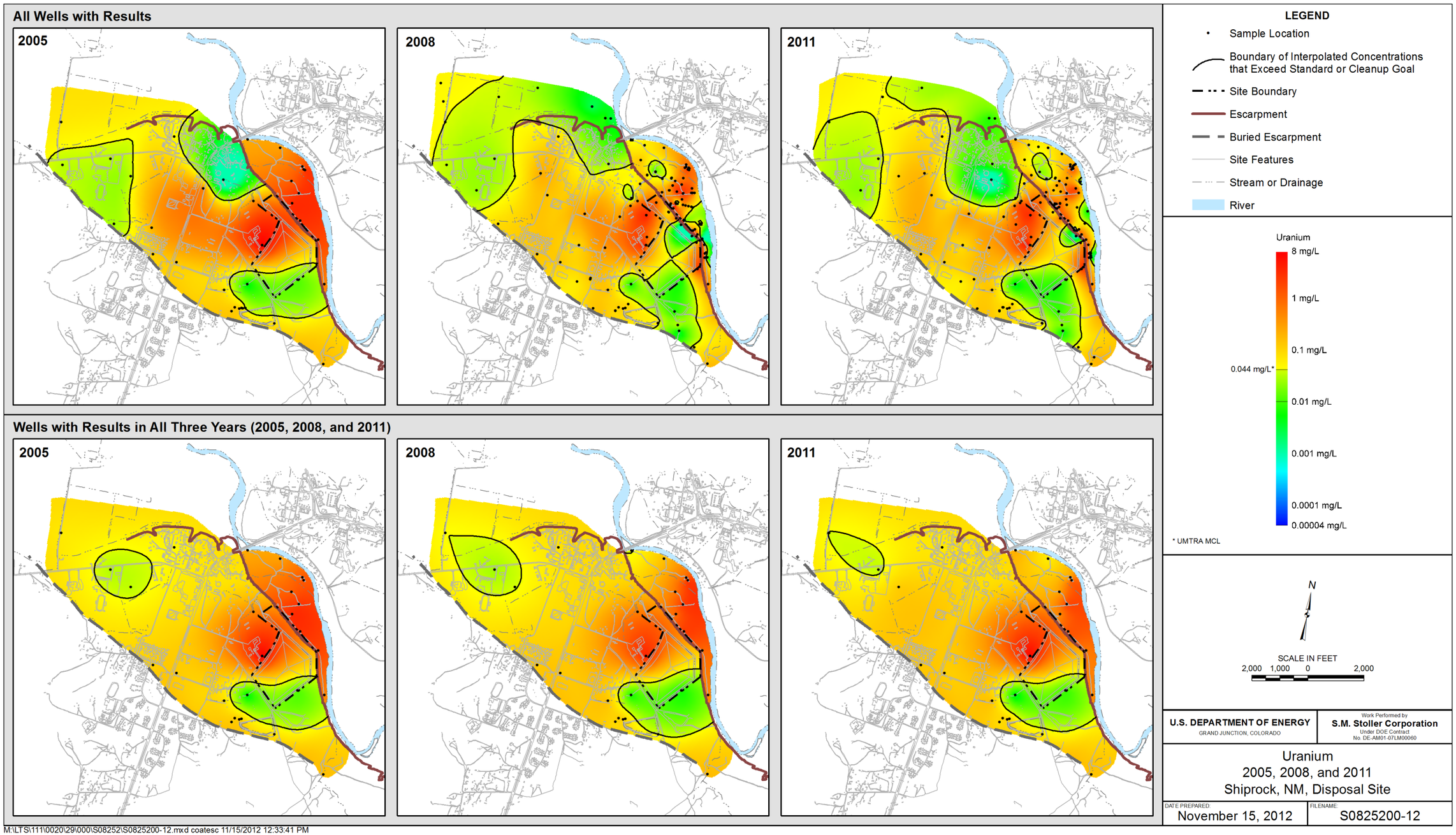

Figure 22. Uranium Concentrations 2005, 2008, and 2011

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12.4 Assessment of Sampling Objectives

The GCAP required wells and surface locations to be monitored to assess potential risks to human health and the environment, establish background levels, understand water chemistry, and assess compliance with standards and cleanup goals. On the terrace, monitoring was conducted to understand potential risks, establish background levels, evaluate the progress of dewatering the terrace groundwater system, and understand terrace water chemistry. The 2005 site conceptual model report (CM; DOE 2005) expanded on the GCAP by adding new locations and replacing locations. Even more locations were added over the years to monitor new components of the remediation system or to conduct detailed studies of the site conditions. Others were added to delineate the extent of the groundwater plumes and to have more data to generate more-accurate plume maps. This section examines the objective for sampling a location coupled with the proximity to other locations that are monitored for the same objective, and makes recommendations for changes to the sampling approach. All the wells required by the GCAP were retained unless the location was not available because it no longer contained water, or it had been destroyed or abandoned. Table 13 and Table 14 show the data objective by sampling location and recommend whether to retain the location in the sampling regime. Wells at locations recommended for removal from the sampling regime should be retained for future monitoring if needed. A recommendation to eliminate a sampling location is not a recommendation to abandon the well.

Floodplain

Six locations are recommended to be removed from the floodplain monitoring network (Table 13). Five locations cannot be sampled because the distributary channel they were in was washed out. The remaining location (well 0783R) is north of the site and across the river from the other floodplain locations. This location and the adjacent location (well 0782R) are being sampled to delineate the northern edge of contamination for plume maps. The results from both locations are below the standards for all analytes except manganese, which is also elevated in background wells. One well should be sufficient to interpolate the plume edge in this location. At this time no other wells are recommended for removal from the floodplain monitoring network, even though the hot-spot assessment indicated that some reduction in the number of wells may be possible.

Terrace

Twenty-eight locations are recommended to be removed from the terrace monitoring network (Table 14). Twenty-two locations cannot be sampled because they are dry. Three locations (1218, 1219, and 1220) are background surface locations that show stable concentrations and are no longer needed. One well (0848) was not installed by DOE, and the screened interval is unknown; therefore, the data are not useful to evaluate site characteristics. Two wells (0837 and 0843) are used to delineate the northwestern edge of contamination for plume maps. One location is sufficient to interpolate the plume in this area; therefore, nearby location 0836, which is required by the GCAP, is recommended to be retained.

The GCAP and the refined conceptual model (DOE 2005) required that many of the terrace locations be monitored only for water levels. However, monitoring at these locations has included all the COCs and water chemistry analyses. The current NRC-approved compliance

strategy does not require specific compliance goals for the terrace; rather, the current remediation goal is dewatering. Based on this goal and the proximity to other wells with sampling results, as well as the hot-spot analysis, 11 locations are recommended for measurements of water level only, and it is suggested that analysis for COCs and water chemistry be discontinued (Table 14).

Table 13. Floodplain Locations Recommended Sampling Regime Changes

Floodplain Sampling Locations										
Location	**Location Type**	**Type**	**Data Objective**	**Retain Location?**	**Location**	**Location Type**	**Type**	**Data Objective**	**Retain Location?**	**Notes**
0610	Alluvial Well	Monitoring	Plume Delineation	Yes	1135	Alluvial Well	Monitoring	Monitor River Interaction	Yes	
0612	Alluvial Well	Monitoring	Plume Delineation	Yes	1136	Alluvial Well	Monitoring	Monitor River Interaction	Yes	
0615	Alluvial Well	Monitoring	GCAP- Compliance	Yes	1137	Alluvial Well	Monitoring	Monitor River Interaction	Yes	
0618	Alluvial Well	Monitoring	GCAP- Compliance	Yes	1138	Alluvial Well	Monitoring	Monitor River Interaction	Yes	
0619	Alluvial Well	Monitoring	GCAP- Compliance	Yes	1139	Alluvial Well	Monitoring	Monitor River Interaction	Yes	
0622	Alluvial Well	Monitoring	Plume Delineation	Yes	1140	Alluvial Well	Monitoring	Monitor Remediation System	Yes	
0623	Alluvial Well	Monitoring	Plume Delineation	Yes	1141	Alluvial Well	Monitoring	Monitor Remediation System	Yes	
0625	Alluvial Well	Monitoring	Plume Delineation	Yes	1142	Alluvial Well	Monitoring	Plume Delineation	Yes	
0626	Alluvial Well	Monitoring	Plume Delineation	Yes	1143	Alluvial Well	Monitoring	Plume Delineation	Yes	
0628	Alluvial Well	Monitoring	Plume Delineation	Yes	0782R	Alluvial Well	Monitoring	Plume Delineation	Yes	
0630	Alluvial Well	Monitoring	Plume Delineation	Yes	0783R	Alluvial Well	Monitoring	Plume Delineation	No	Covered by 0782R
0734	Alluvial Well	Monitoring	GCAP- Compliance	Yes	0611	Alluvial/Mancos Well	Monitoring	Plume Delineation	Yes	
0735	Alluvial Well	Monitoring	GCAP- Compliance	Yes	0614	Alluvial/Mancos Well	Monitoring	GCAP—Compliance	Yes	
0736	Alluvial Well	Monitoring	GCAP- Compliance	Yes	0617	Alluvial Well	Data Logger Only	Monitor Water Level	Yes	
0766	Alluvial Well	Monitoring	Monitor Remediation System	Yes	1089	Alluvial Well	Extraction	CM—Compliance	Yes	
0768	Alluvial Well	Monitoring	Plume Delineation	Yes	1104	Alluvial Well	Extraction	CM—Compliance	Yes	
0773	Alluvial Well	Monitoring	Plume Delineation	Yes	0608	Mancos Well	Monitoring	GCAP- Compliance	Yes	
0775	Alluvial Well	Monitoring	Plume Delineation	Yes	0862	Mancos Well	Water Level Only	CM—Water Level	Yes	Water Level Only
0779	Alluvial Well	Monitoring	Plume Delineation	Yes	0863	Mancos Well	Water Level Only	CM—Water Level	Yes	Water Level Only
0792	Alluvial Well	Monitoring	Plume Delineation	Yes	1000	Mancos Well	Water Level Only	CM—Water Level	Yes	Water Level Only
0793	Alluvial Well	Monitoring	Plume Delineation	Yes	1001	Mancos Well	Water Level Only	CM—Water Level	Yes	Water Level Only
0797	Alluvial Well	Monitoring	GCAP-Background	Yes	1062	Mancos Well	Water Level Only	CM—Water Level	Yes	Water Level Only
0798	Alluvial Well	Monitoring	Plume Delineation	Yes	1109	Remediation System Sump	Extraction	Monitor Remediation System	Yes	
0850	Alluvial Well	Monitoring	GCAP-Background	Yes	1110	Remediation System Sump	Extraction	Monitor Remediation System	Yes	
0853	Alluvial Well	Monitoring	Plume Delineation	Yes	0887	Distributary Channel	Surface	GCAP—Risk	No	Channel Destroyed
0854	Alluvial Well	Monitoring	GCAP- Compliance	Yes	0937	Distributary Channel	Surface	Plume Delineation	No	Channel Destroyed
0855	Alluvial Well	Monitoring	Plume Delineation	Yes	0938	Distributary Channel	Surface	Plume Delineation	No	Channel Destroyed
0856	Alluvial Well	Monitoring	Plume Delineation	Yes	0939	Distributary Channel	Surface	Plume Delineation	No	Channel Destroyed
0857	Alluvial Well	Monitoring	Plume Delineation	Yes	0959	Distributary Channel	Surface	GCAP—Risk	No	Channel Destroyed
1008	Alluvial Well	Monitoring	CM - Compliance	Yes	0655	Drainage Channel	Surface	GCAP—Risk	Yes	
1009	Alluvial Well	Monitoring	Plume Delineation	Yes	0501	River	Surface	CM—Risk	Yes	
1105	Alluvial Well	Monitoring	Monitor Remediation System	Yes	0897	River	Surface	GCAP—Risk	Yes	
1111	Alluvial Well	Monitoring	Monitor Remediation System	Yes	0940	River	Surface	GCAP—Risk	Yes	
1112	Alluvial Well	Monitoring	Monitor Remediation System	Yes	0956	River	Surface	GCAP—Risk	Yes	
1113	Alluvial Well	Monitoring	Plume Delineation	Yes	0965	River	Surface	CM—Risk	Yes	Replaced 957
1114	Alluvial Well	Monitoring	Plume Delineation	Yes	1203	River	Surface	CM—Risk	Yes	
1115	Alluvial Well	Monitoring	Monitor Remediation System	Yes	1205	River	Surface	GCAP—Risk	Yes	
1117	Alluvial Well	Monitoring	Monitor Remediation System	Yes	0898	River	Surface	GCAP-Background	Yes	
1128	Alluvial Well	Monitoring	Monitor Remediation System	Yes	0899	Stilling Well	Water Level Only	Monitor River	Yes	
1132	Alluvial Well	Monitoring	Monitor Remediation System	Yes	1118	Seep Sump	Extraction	GCAP—Risk	Yes	Replaced terrace 0425 and 0426
1134	Alluvial Well	Monitoring	Monitor Remediation System	Yes						

Table 14. Terrace Locations Recommended Sampling Regime Changes

Terrace Locations											
Location	**Location Type**	**Type**	**Data Objective**	**Retain Location?**	**Notes**	**Location**	**Location Type**	**Type**	**Data Objective**	**Retain Location?**	**Notes**
1091	Alluvial Well	Extraction	CM - Mass Removal	Yes		1069	Alluvial/Mancos Well	Monitoring	GCAP—Water Level	Water Level Only	
1092	Alluvial Well	Extraction	CM - Mass Removal	Yes		1073	Alluvial/Mancos Well	Monitoring	CM—Water Level	Yes	
1095	Alluvial Well	Extraction	Monitor Remediation System	Yes		0648	Artesian Well	Biennially	GCAP—Cleanup Standards	Yes	
1096	Alluvial Well	Extraction	Monitor Remediation System	Yes		0800	Mancos Well	Background	GCAP—Background Water Level	No	Well is Dry
1093R	Alluvial Well	Extraction	CM - Mass Removal	Yes	Replaced 1093 and 1094	0801	Mancos Well	Background	GCAP—Background Water Level	No	Well is Dry
0730	Alluvial Well	Monitoring	CM - Chemistry/ Water Level	Yes		0802	Mancos Well	Background	GCAP—Background Water Level	No	Well is Dry
0818	Alluvial Well	Extraction	GCAP - Water Level	Yes	CM recommended omitting location	0803	Mancos Well	Background	GCAP—Background Water Level	No	Well is Dry
0833	Alluvial Well	Monitoring	Plume Delineation	Yes		0600	Mancos Well	Monitoring	CM—Water Level	Yes	
0835	Alluvial Well	Monitoring	GCAP - Chemistry/ Water Level	Yes		0602	Mancos Well	Monitoring	CM—Water Level	Yes	
0836	Alluvial Well	Monitoring	GCAP - Chemistry/ Water Level	Yes		0604	Mancos Well	Monitoring	CM—Water Level	Water Level Only	
0837	Alluvial Well	Monitoring	Plume Delineation	No	Area covered by 0836	0726	Mancos Well	Monitoring	CM—Water Level	Water Level Only	
0838	Alluvial Well	Monitoring	GCAP - Chemistry/ Water Level	Yes		0727	Mancos Well	Monitoring	Plume Delineation	Yes	
0843	Alluvial Well	Monitoring	Plume Delineation	No	Area covered by 0836	0817	Mancos Well	Monitoring	CM—Chemistry	Yes	
1068	Alluvial Well	Monitoring	GCAP - Water Level	Water Level Only		0819	Mancos Well	Monitoring	CM—Water Level	Yes	
1074	Alluvial Well	Monitoring	Plume Delineation	Yes		0820	Mancos Well	Monitoring	CM—Water Level	Yes	
1079	Alluvial Well	Monitoring	GCAP - Chemistry/ Water Level	Yes		0821	Mancos Well	Monitoring	CM—Water Level	No	Well is Dry
1120	Alluvial Well	Monitoring	Evaluate Potential Phyto	No	Well is Dry	0823	Mancos Well	Monitoring	CM—Water Level	No	Well is Dry
1122	Alluvial Well	Monitoring	Evaluate Potential Phyto	No	Well is Dry	0824	Mancos Well	Monitoring	CM—Water Level	Yes	
1067	Alluvial Well	Water Level Only	GCAP - Water Level	Yes		0825	Mancos Well	Monitoring	CM—Water Level	Water Level Only	
1070	Alluvial/Mancos Well	Extraction	CM - Mass Removal	Yes		0829	Mancos Well	Monitoring	CM—Water Level	No	Well is Dry
1071	Alluvial/Mancos Well	Extraction	CM - Mass Removal	Yes		1002	Mancos Well	Monitoring	CM—Water Level	No	Well is Dry
1078	Alluvial/Mancos Well	Extraction	CM - Mass Removal	Yes		1003	Mancos Well	Monitoring	CM—Water Level	No	Well is Dry
0603	Alluvial/Mancos Well	Monitoring	CM - Water Level	Yes		1004	Mancos Well	Monitoring	CM—Water Level	No	Well is Dry
0725	Alluvial/Mancos Well	Monitoring	Plume Delineation	Yes		1058	Mancos Well	Monitoring	Plume Delineation	Yes	
0728	Alluvial/Mancos Well	Monitoring	GCAP - Water Level	Water Level Only		1059	Mancos Well	Monitoring	CM—Water Level	Yes	
0731	Alluvial/Mancos Well	Monitoring	CM - Water Level	Yes		DM7	Mancos Well	Monitoring	CM—Water Level	No	Well is Dry
0812	Alluvial/Mancos Well	Monitoring	GCAP - Water Level	Yes		MW1	Mancos Well	Monitoring	CM—Water Level	Yes	
0813	Alluvial/Mancos Well	Monitoring	GCAP - Water Level	Water Level Only		0822	Mancos Well	Monitoring	CM—Water Level	Water Level Only	Sampled Fall 2009, Spring and Fall 2010
0814	Alluvial/Mancos Well	Monitoring	GCAP - Water Level	Yes		1087	Bob Lee Wash Sump	Extraction	CM—Mass Removal	Yes	
0815	Alluvial/Mancos Well	Monitoring	GCAP - Water Level	Yes		1088	Many Devils Wash Sump	Extraction	CM—Mass Removal	Yes	
0816	Alluvial/Mancos Well	Monitoring	CM - Water Level	Yes		0662	Surface Water	Surface	GCAP—Risk	Yes	
0826	Alluvial/Mancos Well	Monitoring	CM - Water Level	Yes		0786	Surface Water	Surface	GCAP—Risk	Yes	
0827	Alluvial/Mancos Well	Monitoring	CM - Water Level	Yes		0884	Surface Water	Surface	GCAP—Risk	No	Location is Dry
0828	Alluvial/Mancos Well	Monitoring	CM - Water Level	Yes		0885	Surface Water	Surface	GCAP—Risk	Yes	
0830	Alluvial/Mancos Well	Monitoring	CM - Water Level	Yes		0889	Surface Water	Surface	GCAP—Risk	Yes	
0832	Alluvial/Mancos Well	Monitoring	GCAP - Chemistry/ Water Level	No	Well is Dry	0933	Surface Water	Surface	GCAP—Risk	No	Location is Dry
0841	Alluvial/Mancos Well	Monitoring	GCAP - Chemistry	Yes		0934	Surface Water	Surface	GCAP—Risk	No	Location is Dry
0844	Alluvial/Mancos Well	Monitoring	CM - Water Level	Water Level Only		0936	Surface Water	Surface	GCAP—Risk	No	Location is Dry
0846	Alluvial/Mancos Well	Monitoring	GCAP - Chemistry	No	Well is Dry	0942	Surface Water	Surface	GCAP—Risk	No	Replaced by SHP02 949 - Dry
0848	Alluvial/Mancos Well	Monitoring	CM - Water Level	No	Screened interval is unknown. Well was not installed by DOE	0949	Surface Water	Surface	GCAP—Risk	Yes	Replaced SHP02 942
1007	Alluvial/Mancos Well	Monitoring	GCAP - Water Level	Yes		0958	Surface Water	Surface	GCAP—Risk	No	Location is Dry
1011	Alluvial/Mancos Well	Monitoring	Plume Delineation	Yes	Only Sampled in Fall 2010	1218	Surface Water	Surface	New Background	No	Background Levels Established
1048	Alluvial/Mancos Well	Monitoring	CM - Water Level	Water Level Only	Only Sampled in Spring 2010	1219	Surface Water	Surface	New Background	No	Background Levels Established
1049	Alluvial/Mancos Well	Monitoring	CM - Water Level	Yes		1220	Surface Water	Surface	New Background	No	Background Levels Established
1057	Alluvial/Mancos Well	Monitoring	GCAP - Water Level	Water Level Only		1221	Surface Water	Surface	NN Request	Yes	
1060	Alluvial/Mancos Well	Monitoring	GCAP - Chemistry	No	Well is Dry	1215	Evaporation Pond	Pond	Monitor Pond	Yes	

13.0 Proposed Optimal Sampling Regime

This section summarizes the recommended changes to optimize the sampling regime. The recommended changes are at locations that are not required by the GCAP or are changes that comply with the GCAP. The goal of this report is to optimize the sampling regime and to be a preliminary assessment of the sampling that will support changes to the compliance strategy and issuance of a new GCAP.

13.1 Reduce the Sampling Frequency from Semiannual to Annual

The GCAP allowed for sampling to change from semiannual to annual in 2010. Moreover, VSP temporal analysis and the percent difference analysis indicate that the sampling frequency can be reduced without the loss of information. The annual sampling event is recommended to occur in the fall, because the fall results tend to have higher concentrations and would therefore provide more conservative data. The additional data set obtained from semiannual sampling is not used for any specific analysis of site trends or conditions. Typically, the greater of the spring and fall sampling result or the most recent result is used to prepare plume maps, and overall trends are assessed using both sampling events. The reduction of sampling frequency to annual will result in a cost savings of at least 50 percent ($134,985 based on the monitoring costs in Table 6) while still supplying sufficient data to characterize the site and ensure that conditions remain protective of human health and the environment.

13.2 Reduce the Number of Locations Sampled on the Floodplain and Terrace

Information in the GCAP was used to determine whether a location would be considered for removal from the sampling regime. All the locations that were required by the GCAP and that had not been destroyed, or decommissioned were retained. Because the floodplain is a dynamic system that is still being evaluated, more terrace locations than floodplain locations were recommended for removal from the sampling regime. In all, 34 locations are recommended for removal from the sampling regime.

13.3 Reduce the Number of Analyses

It is recommended that chemical analyses for 11 of the terrace wells be discontinued and that the locations be measured only for water levels. The GCAP only required water levels at these locations, and they are in areas where other wells would provide sufficient coverage for plume mapping (which is assumed to be the DQO for sampling the locations that only require water level measurements).

The proposed optimal sampling regime locations and sampling frequencies are shown in Table 15. This table is reproduced from the table of sampling frequencies in the SAP, with changes shown in red.

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Table 15. Sampling Frequencies for Locations at Shiprock, New Mexico

Location ID	Quarterly	Semiannually	Annually	Biennially	Not Sampled	Notes
Monitoring Wells						
FLOODPLAIN—SHP01						
0608			X			Low flow
0610			X			
0611			X			
0612			X			
0614			X			Low flow
0615			X			Low flow
0617					X	Data logger only
0618			X			Low flow
0619			X			Low flow
0622			X			
0623			X			
0625			X			
0626			X			
0628			X			
0630			X			
0734			X			Low flow
0735			X			Low flow
0736			X			Low flow; data logger
0766			X			
0768			X			
0773			X			
0775			X			
0779			X			
0782R			X			
0783R					X	Covered by 0782R
0792			X			
0793			X			
0797			X			Low flow
0798			X			
0850			X			Low flow
0853			X			
0854			X			Data logger
0855			X			
0856			X			
0857			X			Data logger
0862					X	WLs only
0863					X	WLs only
1000					X	WLs only
1001					X	WLs only
1008			X			Data logger
1009			X			
1062					X	WLs only
1089			X			U, SO_4, NO_3 only at vault
1104			X			U, SO_4, NO_3 only at vault
1105			X			
1109			X			Trench 2; U, SO_4, NO_3 only at vault
1110			X			Trench 1; U, SO_4, NO_3 only at vault
1111			X			Well point; U, SO_4, NO_3 only. Purge 1 casing volume, then sample
1112			X			Well point; U, SO_4, NO_3 only. Purge 1 casing volume, then sample
1113			X			Well point; U, SO_4, NO_3 only. Purge 1 casing volume, then sample
1114			X			Well point; U, SO_4, NO_3 only. Purge 1 casing volume, then sample
1115			X			Well point; U, SO_4, NO_3 only. Purge 1 casing volume, then sample
1117			X			Well point; U, SO_4, NO_3 only. Purge 1 casing volume, then sample
1128			X			
1132			X			
1134			X			
1135			X			
1136			X			
1137			X			
1138			X			
1139			X			
1140			X			
1141			X			
1142			X			
1143			X			

Table 15 (continued). Sampling Frequencies for Locations at Shiprock, New Mexico

Location ID	Quarterly	Semiannually	Annually	Biennially	Not Sampled	Notes
TERRACE—SHP02						
0600			X			
0602			X			Data logger
0603			X			
0604					X	Data logger WLs only
0648				Odd year		Measure flow rate annually; sample biennially; next in 2013
0725			X			Data logger
0726					X	WLs only
0727			X			
0728					X	Data logger WLs only
0730			X			Data logger
0731			X			Data logger
0800					X	WLs only Dry
0801					X	WLs only Dry
0802					X	WLs only Dry
0803					X	WLs only Dry
0812			X			
0813					X	Data logger WLs only
0814			X			
0815			X			
0816			X			
0817			X			Low flow
0818			X			Ext. well; U, SO_4, NO_3 only at vault
0819			X			Data logger
0820			X			
0821					X	Dry
0822					X	WLs only
0823					X	Dry
0824			X			
0825					X	WLs only
0826			X			Data logger
0827			X			Data logger
0828			X			Data logger
0829					X	Dry
0830			X			Data logger
0832					X	Low flow Dry
0833			X			
0835			X			Low flow; data logger
0836			X			Low flow; data logger
0837					X	Data logger area covered by 0836
0838			X			Low flow
0841			X			Low flow; data logger
0843					X	Data logger area covered by 0836
0844					X	WLs only
0846					X	Low flow; data logger Dry
0848					X	Remove data logger
1002					X	Dry
1003					X	Dry
1004					X	Dry
1007			X			
1011			X			
1048					X	WLs only
1049			X			
1057					X	WLs only
1058			X			
1059			X			
1060					X	Low flow; data logger Dry
1067					X	WL only; Bob Lee Wash
1068					X	Bob Lee Wash WLs only
1069					X	Bob Lee Wash; data logger WLs only
1070			X			Ext. well; U, SO_4, NO_3 only at vault
1071			X			Ext. well; U, SO_4, NO_3 only at vault
1073			X			Data logger
1074			X			
1078			X			Ext. well; U, SO_4, NO_3 only at vault
1079			X			Low flow
1087			X			SUMP-Bob Lee Wash
1088			X			SUMP-Many Devils Wash
1091			X			Ext. well; U, SO_4, NO_3 only at vault
1092			X			Ext. well; U, SO_4, NO_3 only at vault
1093R			X			Ext. well; U, SO_4, NO_3 only at vault
1095			X			Ext. well; U, SO_4, NO_3 only at vault
1096			X			Ext. well; U, SO_4, NO_3 only at vault
1120					X	Dry
1122					X	Dry
MW1			X			
DM7					X	Dry

Table 15 (continued). Sampling Frequencies for Locations at Shiprock, New Mexico

Location ID	Quarterly	Semiannually	Annually	Biennially	Not Sampled	Notes
Surface Locations						
FLOODPLAIN—SHP01						
0501			X			East of disposal cell
0655			X			Drainage channel
0887					X	Distributary channel location destroyed
0897			X			Just below mouth of Many Devils Wash
0898			X			San Juan River upgradient
0899					X	WLs only
0937					X	Location Destroyed
0938					X	Location Destroyed
0939					X	Location Destroyed
0940			X			Just NE of 1004, San Juan River
0956			X			San Juan River at intake
0959					X	Distributary channel just below 1st wash location destroyed
0965			X			San Juan River about 1500 ft below dist. channel
1118			X			Seep sump (425/426) U, SO_4, NO_3 only at vault
1203			X			East of disposal cell
1205			X			San Juan River E of well 853
TERRACE—SHP02						
0662			X			Lower Bob Lee Wash
0786			X			Seep below US Hwy 491 bridge; flow rate
0884					X	Irrigation return flow Dry
0885			X			Upper Bob Lee Wash; water level
0889			X			Many Devils Wash
0933					X	1st wash W of Highway 491 Dry
0934					X	2nd wash W of Highway 491 Dry
0936					X	Seep between 1st & 2nd washes Dry
0942					X	Pond NW of 847 Dry
0949			X			
0958					X	Helium lateral canal where water comes into canal at pump station Dry
1215			X			
1218					X	New location background levels established
1219					X	New location background levels established
1220					X	New location background levels established
1221		X				New location

Sampling conducted in September.

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Appendix A

Semiannual Sampling Results: 2003–2011

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Table A–1. Floodplain

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
Floodplain											
SHP01	0608	WL	3/5/2003	0001	302.019	7.8	524.0569	0.0065	10.7	10500	1.78
SHP01	0608	WL	8/25/2003	0001	303.571	6.98	515.0215	0.0071	11.3	10600	1.75
SHP01	0608	WL	3/4/2004	0001	220	4.4	510	0.0055	12	11000	1.8
SHP01	0608	WL	9/16/2004	0001	230	4.3	470	0.0093	12	9800	1.7
SHP01	0608	WL	3/1/2005	0001	420	7.4	520	0.011	10	10000	1.8
SHP01	0608	WL	9/20/2005	0001	310	5.7	650	0.011	11	12000	2
SHP01	0608	WL	3/9/2006	0001	240	5.2	560	0.006	12	12000	2
SHP01	0608	WL	9/12/2006	0001	260	4.3	550	0.007	12	11000	1.9
SHP01	0608	WL	3/6/2007	0001	190	4	480	0.0079	12	11000	1.8
SHP01	0608	WL	9/11/2007	0001	200	3.9	450	0.0059	12	11000	1.8
SHP01	0608	WL	3/6/2008	N001	170	3.2	260	0.0046	8.2	6900	1.2
SHP01	0608	WL	9/9/2008	N001	180	2.9	220	0.0051	8.1	6200	0.97
SHP01	0608	WL	3/10/2009	N001	100	2.3	120	0.0038	4.5	3600	0.69
SHP01	0608	WL	9/15/2009	N001	130	2.7	170	0.005	5.8	4500	0.78
SHP01	0608	WL	3/23/2010	N001	99	2.6	130	0.0039	6.1	4800	0.74
SHP01	0608	WL	9/1/2010	N001	130	2.6	95	0.0046	6.2	5100	0.72
SHP01	0608	WL	3/22/2011	N001	68	2.55	35.7	0.00225	7.17	4900	0.756
SHP01	0608	WL	9/13/2011	N001	82	2.6	69	0.0046	6.6	5300	0.67
SHP01	0610	WL	9/11/2007	0001	15	1.2	780	0.026	10	11000	2.1
SHP01	0610	WL	9/9/2008	N001	12	0.52	660	0.042	10	9100	1.7
SHP01	0610	WL	9/15/2009	N001	6.7	0.55	400	0.045	7.9	7300	1.4
SHP01	0610	WL	3/23/2010	N001	0.76	0.0096	190	0.16	5.5	4800	0.9
SHP01	0610	WL	9/1/2010	N001	2.4	0.15	250	0.12	6.3	5700	0.93
SHP01	0610	WL	3/23/2011	N001	0.367	<0.04	270	0.239	6.53	4870	1.19
SHP01	0610	WL	9/13/2011	N001	2.3	0.06	360	0.14	7.8	6400	1.1
SHP01	0611	WL	9/15/2009	N001	1.6	0.067	0.66	0.00061	7.7	5700	0.0067
SHP01	0611	WL	3/23/2010	N001	10	0.51	120	0.084	8.7	4900	0.52
SHP01	0611	WL	9/1/2010	N001	1.9	0.064	0.5	0.0014	7	5700	0.014
SHP01	0611	WL	3/23/2011	N001	2.3	0.151	17.4	0.00249	8.2	5560	0.0602
SHP01	0611	WL	9/13/2011	N001	2.8	0.069	0.042	0.00061	7	5400	0.0081
SHP01	0612	WL	9/11/2007	0001	0.21	0.27	<0.01	0.00013	0.76	310	0.074
SHP01	0612	WL	9/10/2008	N001	<0.1	1.8	<0.01	0.00095	1.5	580	0.13
SHP01	0612	WL	3/10/2009	N001	0.91	2.8	0.027	0.00033	3.2	1800	0.18

Table A–1 (continued). Floodplain

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
SHP01	0612	WL	9/16/2009	N001	0.39	0.49	0.021	0.00049	1	350	0.1
SHP01	0612	WL	3/23/2010	N001	0.52	2.2	<0.01	0.0019	3.3	2100	0.22
SHP01	0612	WL	9/2/2010	N001	0.7	0.47	0.026	0.00029	0.57	250	0.021
SHP01	0612	WL	3/23/2011	N001	0.51	1.47	<0.01	<0.0015	3.93	2660	0.284
SHP01	0612	WL	9/14/2011	N001	0.32	0.47	<0.01	0.00054	1.3	610	0.066
SHP01	0614	WL	3/6/2003	0001	39.053	5.98	957.7592	0.291	12.9	14400	2.42
SHP01	0614	WL	8/26/2003	0001	40.683	5.71	885.4755	0.146	12.2	13300	2.2
SHP01	0614	WL	3/4/2004	0001	32	5.1	950	0.06	12	13000	2.3
SHP01	0614	WL	9/16/2004	0001	40	5.3	870	0.065	12	13000	2.4
SHP01	0614	WL	3/1/2005	0001	42	4.8	1100	0.051	12	13000	2.1
SHP01	0614	WL	9/20/2005	0001	26	3.5	1100	0.11	12	17000	3
SHP01	0614	WL	3/9/2006	0001	25	3.8	870	0.13	12	16000	3.1
SHP01	0614	WL	9/12/2006	0001	36	3.1	890	0.14	11	15000	3
SHP01	0614	WL	3/6/2007	0001	17	2.5	1000	0.46	12	17000	3.2
SHP01	0614	WL	9/11/2007	0001	37	3.9	820	0.059	13	15000	2.8
SHP01	0614	WL	3/6/2008	N001	35	2.7	610	0.3	11	14000	2.3
SHP01	0614	WL	9/9/2008	N001	37	3.2	610	0.11	13	15000	2.4
SHP01	0614	WL	3/11/2009	N001	37	2.7	390	0.31	9.3	10000	1.8
SHP01	0614	WL	9/16/2009	N001	65	4.2	570	0.093	11	9700	1.8
SHP01	0614	WL	3/23/2010	N001	48	3	420	0.71	9.1	9500	1.5
SHP01	0614	WL	9/1/2010	N001	78	2.8	360	1.1	7.9	9400	1.6
SHP01	0614	WL	3/23/2011	N001	17.4	2.02	353	0.99	9.53	8400	1.99
SHP01	0614	WL	9/13/2011	N001	31	2.4	210	0.63	8.1	8600	1.5
SHP01	0615	WL	3/6/2003	0001	39.596	5.56	939.6883	1.16	14.4	19900	3.78
SHP01	0615	WL	8/26/2003	0001	28.416	7.74	1156.539	1.27	17	23100	4.23
SHP01	0615	WL	3/4/2004	0001	17	3.4	950	0.64	14	20000	3.8
SHP01	0615	WL	3/1/2005	0001	52	7.5	960	0.78	14	20000	3.5
SHP01	0615	WL	9/20/2005	0001	52	6.9	1200	0.78	14	24000	3.4
SHP01	0615	WL	3/9/2006	0001	39	6.7	960	0.73	14	22000	4.2
SHP01	0615	WL	9/12/2006	0001	3.8	0.68	980	0.46	12	20000	4.8
SHP01	0615	WL	3/6/2007	0001	2.1	1.2	320	0.31	6.7	9700	2.6
SHP01	0615	WL	3/6/2008	N001	1.1	0.52	140	0.53	6.3	6300	1.6
SHP01	0615	WL	9/9/2008	N001	1.3	0.48	14	0.18	6	4300	0.93
SHP01	0615	WL	3/11/2009	N001	0.35	0.46	37	0.23	4.8	3500	0.83
SHP01	0615	WL	9/16/2009	N001	8.2	1.9	150	0.23	8.1	6900	1.2
SHP01	0615	WL	3/24/2010	N001	1.9	0.54	14	0.13	5.5	4500	0.97

Table A–1 (continued). Floodplain

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
SHP01	0615	WL	9/2/2010	N001	10	1.3	30	0.11	5.7	5400	0.76
SHP01	0615	WL	3/23/2011	N001	8.03	1.56	22.9	0.277	7.76	8340	1.79
SHP01	0615	WL	9/14/2011	N001	3.1	1.2	3	0.049	4.9	4000	0.5
SHP01	0618	WL	3/6/2003	0001		11.3	277.8405	0.352	11.2	13300	3.12
SHP01	0618	WL	8/26/2003	0001	59.317	10.5	225.661	0.303	10.6	14100	3.21
SHP01	0618	WL	3/1/2004	0001	54	8.6	200	0.31	11	14000	3
SHP01	0618	WL	3/1/2004	0002	49.1	9.48	174	0.468	11.3	12500	2.85
SHP01	0618	WL	9/16/2004	0001	52	8.7	180	0.33	9.8	13000	3.1
SHP01	0618	WL	3/1/2005	0001	46	8.2	180	0.25	9.3	13000	3
SHP01	0618	WL	9/20/2005	0001	51	8.6	220	0.22	8.6	14000	2.9
SHP01	0618	WL	3/8/2006	0001	45	8.8	250	0.23	9.8	14000	2.7
SHP01	0618	WL	9/13/2006	0001	46	8.4	250	0.26	9.5	14000	2.9
SHP01	0618	WL	3/6/2007	0001	44	8.7	320	0.25	9.9	13000	2.7
SHP01	0618	WL	9/12/2007	0001	52	8.5	360	0.24	9.5	13000	2.5
SHP01	0618	WL	3/6/2008	N001	41	8.3	330	0.23	9.8	15000	2.6
SHP01	0618	WL	9/9/2008	N001	60	9.6	290	0.16	11	14000	2.4
SHP01	0618	WL	3/11/2009	N001	45	9.7	330	0.16	11	13000	2.4
SHP01	0618	WL	9/17/2009	N001	46	10	340	0.18	11	14000	2.5
SHP01	0618	WL	3/24/2010	N001	42	9.7	350	0.23	11	14000	2.3
SHP01	0618	WL	8/31/2010	N001	72	9.4	220	0.25	8.9	13000	2
SHP01	0618	WL	3/24/2011	N001	34.4	8.57	75.4	0.476	9.99	12900	2.22
SHP01	0618	WL	9/14/2011	N001	46	9.2	88	0.32	9.2	12000	1.9
SHP01	0619	WL	3/6/2003	0001	2.252	3.13	4.9469	0.213	7.32	6280	0.48
SHP01	0619	WL	8/26/2003	0001	0.00901	4.64	0.8945	0.158	8.17	9510	0.764
SHP01	0619	WL	3/2/2004	0001	1.6	1.8	0.65	0.041	5.7	4400	0.33
SHP01	0619	WL	3/2/2004	0003	1.56	2.02	0.19	0.057	5.25	4310	0.345
SHP01	0619	WL	9/15/2004	0001	0.67	2.4	<0.01	0.0059	6.2	5400	0.45
SHP01	0619	WL	3/1/2005	0001	0.95	4.1	<0.01	0.0012	6.5	6000	0.63
SHP01	0619	WL	9/20/2005	0001	0.14	6.4	0.015	0.0039	9.3	14000	1.2
SHP01	0619	WL	3/8/2006	0001	0.9	3.7	0.05	0.00053	6.7	7100	0.64
SHP01	0619	WL	9/13/2006	0001	0.3	2.4	<0.01	0.00041	5.2	5400	0.47
SHP01	0619	WL	3/6/2007	0001	0.29	4.6	<0.01	0.0046	8.2	10000	1.1
SHP01	0619	WL	9/12/2007	0001	0.85	1.7	<0.05	0.00043	6.1	4800	0.27
SHP01	0619	WL	3/6/2008	N001	0.79	1.3	0.061	0.0022	5.9	3300	0.18
SHP01	0619	WL	9/10/2008	N001	0.28	3.8	<0.01	0.0015	8.5	8300	0.69
SHP01	0619	WL	3/12/2009	N001	0.42	1.2	0.1	0.0003	5.9	3000	0.17

Table A–1 (continued). Floodplain

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
SHP01	0619	WL	9/17/2009	N001	0.35	1.8	0.017	0.00068	6.1	3800	0.22
SHP01	0619	WL	3/25/2010	N001	0.33	1.2	0.075	0.00096	6	2900	0.13
SHP01	0619	WL	8/31/2010	N001	0.48	1.5	0.023	0.00065	6.2	3500	0.13
SHP01	0619	WL	3/24/2011	N001	0.552	1.5	<0.05	<0.0015	8.33	3320	0.152
SHP01	0619	WL	9/15/2011	N001	0.71	2.7	<0.01	0.0018	9.7	6800	0.3
SHP01	0622	WL	9/12/2007	0001	<0.1	1.1	3.4	0.29	7.8	5600	0.44
SHP01	0622	WL	9/10/2008	N001	<0.1	1.9	0.023	0.083	6.3	4500	0.24
SHP01	0622	WL	9/17/2009	N001	<0.1	0.67	0.014	0.23	6.9	3700	0.2
SHP01	0622	WL	3/24/2010	N001	<0.1	6.2	0.02	0.024	4.8	2600	0.073
SHP01	0622	WL	8/31/2010	N001	<0.1	2.2	0.019	0.024	5.9	3400	0.097
SHP01	0622	WL	3/24/2011	N001	<0.0646	1.61	0.356	0.207	7.95	3030	0.223
SHP01	0622	WL	9/15/2011	N001	<0.1	1.6	<0.01	0.051	5.4	3300	0.1
SHP01	0623	WL	9/10/2008	0001	<0.1	1.5	<0.01	0.0026	8.9	780	0.084
SHP01	0623	WL	9/17/2009	N001	<0.1	1.6	<0.01	0.0019	9	2700	0.066
SHP01	0623	WL	3/25/2010	N001	<0.1	2.7	0.067	0.0019	8.4	2700	0.062
SHP01	0623	WL	8/31/2010	N001	<0.1	1.8	<0.01	0.0014	8.1	2700	0.053
SHP01	0623	WL	3/24/2011	N001	<0.102	2.01	<0.01	<0.0015	9.9	2810	0.0666
SHP01	0623	WL	9/15/2011	N001	0.22	1.6	<0.01	0.0021	9.3	3100	0.073
SHP01	0625	WL	3/12/2009	N001	<0.1	5.1	0.038	0.0018	8.8	2600	0.054
SHP01	0625	WL	9/17/2009	N001	<0.1	4.4	0.022	0.0018	9.6	2700	0.06
SHP01	0625	WL	3/25/2010	N001	<0.1	4.3	0.045	0.002	8.9	2600	0.04
SHP01	0625	WL	8/31/2010	N001	<0.1	3	<0.01	0.0018	8.7	2800	0.048
SHP01	0625	WL	3/24/2011	N001	<0.0568	3.25	<0.01	<0.0015	11	2040	0.0479
SHP01	0625	WL	9/15/2011	N001	<0.1	4.4	<0.01	0.0013	11	3100	0.054
SHP01	0626	WL	9/13/2007	0001	0.18	3.3	<0.05	0.00046	10	3200	0.052
SHP01	0626	WL	9/11/2008	N001	0.19	3.9	<0.01	0.0019	11	3400	0.047
SHP01	0626	WL	3/12/2009	N001	<0.1	3.5	0.013	0.00037	10	2800	0.043
SHP01	0626	WL	9/17/2009	N001	<0.1	4.9	0.017	0.0011	11	2700	0.039
SHP01	0626	WL	3/26/2010	N001	<0.1	4.5	0.032	0.00098	12	2600	0.035
SHP01	0626	WL	8/31/2010	N001	0.14	3.1	<0.01	0.0024	11	2800	0.013
SHP01	0626	WL	3/24/2011	N001	0.214	3.54	<0.01	<0.0015	10.7	2360	0.0533
SHP01	0626	WL	9/15/2011	N001	0.17	2.5	<0.01	0.0011	8.1	2400	0.034
SHP01	0628	WL	9/13/2007	0001	<0.1	5.1	<0.05	0.00029	15	3500	0.045
SHP01	0628	WL	9/11/2008	N001	<0.1	5.3	<0.01	0.00093	14	3300	0.041
SHP01	0628	WL	3/12/2009	N001	<0.1	4.1	<0.01	0.002	12	4800	0.08
SHP01	0628	WL	9/17/2009	N001	<0.1	4.8	0.014	0.0011	17	3300	0.039

Table A–1 (continued). Floodplain

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
SHP01	0628	WL	3/26/2010	N001	<0.1	1.9	0.013	0.006	6.1	2700	0.034
SHP01	0628	WL	8/31/2010	N001	<0.1	1.4	<0.01	0.00074	12	2200	0.0064
SHP01	0628	WL	3/24/2011	N001	<0.0525	4.61	<0.01	0.0043	9.91	2630	0.0162
SHP01	0628	WL	9/15/2011	N001	<0.1	2.8	<0.01	0.001	10	2800	0.018
SHP01	0630	WL	9/13/2007	0001	<0.1	0.35	5.6	0.047	11	2500	0.042
SHP01	0630	WL	9/11/2008	N001	<0.1	2.7	3.8	0.057	14	2800	0.069
SHP01	0630	WL	3/12/2009	N001	<0.1	1.2	0.019	0.0046	9.2	2200	0.026
SHP01	0630	WL	9/17/2009	N001	<0.1	3.2	0.48	0.015	11	2300	0.031
SHP01	0630	WL	3/26/2010	N001	<0.1	2	3.5	0.036	16	2800	0.051
SHP01	0630	WL	9/2/2010	N001	<0.1	1.2	2.6	0.042	13	2900	0.056
SHP01	0630	WL	3/24/2011	N001	<0.0283	1.65	12.4	0.105	24.5	3900	0.137
SHP01	0630	WL	9/15/2011	N001	<0.1	1.7	43	0.26	25	4400	0.21
SHP01	0734	WL	3/5/2003	0001	<0.00311	0.656	1.678	0.0086	6.63	4940	0.0735
SHP01	0734	WL	3/2/2004	0001	<0.1	1.2	5.5	0.015	9	6000	0.061
SHP01	0734	WL	3/2/2004	0002	<0.0159	1.37	1.07	0.0309	9.52	6570	0.0637
SHP01	0734	WL	2/28/2005	0001	<0.1	0.35	0.078	0.063	12	11000	0.25
SHP01	0734	WL	3/15/2006	0001	<0.1	3.1	1.2	0.0095	8.6	5400	0.18
SHP01	0734	WL	3/5/2007	0001	<0.1	0.1	<0.01	0.0075	9.6	6700	0.19
SHP01	0734	WL	9/13/2007	0001	<0.1	0.51	<0.05	0.0075	3.4	2200	0.073
SHP01	0734	WL	3/5/2008	N001	<0.1	4.5	0.21	0.0052	11	7100	0.085
SHP01	0734	WL	9/11/2008	N001	<0.1	1.7	1.2	0.0059	3.8	2900	0.041
SHP01	0734	WL	3/12/2009	0001	<0.1	1.6	3.2	0.016	11	7500	0.12
SHP01	0734	WL	9/17/2009	0001		1.3		0.016	2.9		0.018
SHP01	0734	WL	3/26/2010	0001	<0.1	0.012	0.4	0.14	11	7700	0.2
SHP01	0734	WL	9/2/2010	N001	<0.1	0.47	<0.01	0.0032	7.5	5600	0.076
SHP01	0734	WL	3/23/2011	N001	<0.091	1.2	0.357	0.0162	11	5150	0.095
SHP01	0734	WL	9/15/2011	N001		0.15		0.0081	11		0.23
SHP01	0735	WL	3/5/2003	0001	11.491	3.47	454.0321	0.159	9.3	6980	0.24
SHP01	0735	WL	8/25/2003	0001	11.879	1.51	243.9575	0.0573	4.17	3700	0.095
SHP01	0735	WL	3/4/2004	0001	14	3.1	530	0.041	8.7	7500	0.25
SHP01	0735	WL	9/16/2004	0001	6.9	0.51	70	0.031	1.3	1300	0.046
SHP01	0735	WL	3/1/2005	0001	3.8	1.2	89	0.075	2.5	1900	0.058
SHP01	0735	WL	9/20/2005	0001	22	5.6	1200	0.27	14	15000	0.56
SHP01	0735	WL	3/9/2006	0001	20	3.5	570	0.051	10	9300	0.33
SHP01	0735	WL	9/12/2006	0001	16	2.3	400	0.037	7.1	6400	0.2
SHP01	0735	WL	3/6/2007	0001	13	2.5	380	0.032	7.7	7100	0.25

Table A–1 (continued). Floodplain

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
SHP01	0735	WL	9/10/2007	0001	15	2.1	330	0.024	7.5	6300	0.19
SHP01	0735	WL	3/5/2008	N001	7.3	1	120	0.043	3.5	3000	0.081
SHP01	0735	WL	9/8/2008	N001	25	4.3	360	0.029	15	15000	0.54
SHP01	0735	WL	3/10/2009	N001	16	3.3	790	0.022	12	12000	0.44
SHP01	0735	WL	9/15/2009	N001	22	2.8	570	0.07	10	9000	0.26
SHP01	0735	WL	3/22/2010	N001	9.9	1.9	370	0.044	7.1	6900	0.18
SHP01	0735	WL	9/1/2010	N001	15	2	390	0.054	6.7	7000	0.17
SHP01	0735	WL	3/22/2011	N001	12.1	4.19	645	0.0712	14.1	17200	0.393
SHP01	0735	WL	9/15/2011	N001	23	5.7	990	0.23	20	16000	0.51
SHP01	0736	WL	3/6/2003	0001	0.0715	1.54	0.0188	0.00066	6.79	3480	0.146
SHP01	0736	WL	3/4/2004	0001	<0.1	0.33	0.23	0.00085	6.1	5200	0.15
SHP01	0736	WL	2/28/2005	0001	<0.1	0.18	0.01	0.00068	6.6	5200	0.15
SHP01	0736	WL	9/20/2005	0001	<0.1	4.7	<0.01	0.0017	9.1	8600	0.32
SHP01	0736	WL	3/10/2006	0001	<0.1	0.83	0.052	<0.000097	5.7	4400	0.099
SHP01	0736	WL	9/13/2006	0001	<0.1	3.5	0.025	0.00046	9.4	6900	0.24
SHP01	0736	WL	3/5/2007	0001	<0.1	0.94	<0.01	0.0018	11	4300	0.071
SHP01	0736	WL	3/6/2008	N001	<0.1	0.29	0.084	0.0024	7.2	5200	0.12
SHP01	0736	WL	9/10/2008	N001	<0.1	3.7	<0.01	0.00074	8.6	6400	0.16
SHP01	0736	WL	3/12/2009	N001	<0.1	0.54	0.026	<0.00012	6	4600	0.081
SHP01	0736	WL	3/26/2010	N001	<0.1	0.15	0.13	0.00047	6.2	4100	0.087
SHP01	0736	WL	9/2/2010	N001	<0.1	0.38	0.074	0.0018	6.2	4500	0.11
SHP01	0736	WL	3/24/2011	N001	0.0569	0.354	<0.01	<0.0015	5	3590	0.0479
SHP01	0736	WL	9/15/2011	N001	<0.1	1	0.027	0.00031	5.7	3600	0.064
SHP01	0766	WL	3/25/2010	N001	<0.1	0.17	0.088	0.0014	4.8	5900	0.27
SHP01	0766	WL	8/31/2010	N001	0.11	0.15	<0.01	0.00065	6.1	8100	0.37
SHP01	0766	WL	3/24/2011	N001	<0.0881	0.117	3.32	0.00463	4.79	5290	0.277
SHP01	0766	WL	9/15/2011	N001	0.15	0.63	<0.01	0.00044	6.3	7200	0.21
SHP01	0768	WL	3/12/2009	N001	<0.1	0.96	0.034	0.0057	11	14000	0.66
SHP01	0768	WL	3/25/2010	N001	<0.1	1.7	0.023	0.0088	11	14000	1.4
SHP01	0768	WL	8/31/2010	N001	<0.1	1.5	<0.01	0.0012	6.9	4300	0.16
SHP01	0768	WL	3/24/2011	N001	0.277	1.59	<0.01	<0.0015	14.8	15200	0.757
SHP01	0768	WL	9/15/2011	N001	<0.1	1.8	<0.01	0.0024	9.4	7600	0.34
SHP01	0773	WL	3/10/2009	N001	1.9	<0.012	26	0.032	3.4	2800	0.68
SHP01	0773	WL	3/23/2010	N001	0.19	<0.00057	130	0.29	5	4100	0.68
SHP01	0773	WL	3/23/2011	N001	0.511	<0.002	27.1	0.0589	2.74	2150	0.389
SHP01	0773	WL	9/13/2011	N001		0.1	61	0.048	4.3	3100	0.35

Table A–1 (continued). Floodplain

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
SHP01	0775	WL	3/11/2009	N001	<0.1	0.47	0.049	0.0039	6.3	7100	0.65
SHP01	0775	WL	3/25/2010	N001	<0.1	0.34	0.18	0.072	7.1	7600	0.64
SHP01	0775	WL	3/24/2011	N001	<0.0551	0.575	<0.01	0.00199	5.8	4180	0.205
SHP01	0775	WL	9/15/2011	N001	0.3	3.7	<0.01	0.001	6.7	5100	0.22
SHP01	0779	WL	3/11/2009	N001	0.96	2.8	34	0.0093	7.9	7600	1.1
SHP01	0779	WL	3/25/2010	N001	1.3	1.6	4.2	0.023	6	6400	1.1
SHP01	0779	WL	8/31/2010	N001	11	3.3	2	0.024	6.7	6900	0.9
SHP01	0779	WL	3/24/2011	N001	2	5.89	<0.01	<0.0015	8.44	6660	1
SHP01	0779	WL	9/14/2011	N001	6.7	6.4	41	0.03	13	11000	2.3
SHP01	0782R	WL	9/16/2008	N001	<0.1	1.2	<0.01	0.00037	0.67	240	0.0027
SHP01	0782R	WL	3/12/2009	N001	<0.1	2.1	<0.01	<0.000074	1.1	380	0.0054
SHP01	0782R	WL	9/17/2009	N001	<0.1	2.2	0.032	0.00035	1.3	630	0.0097
SHP01	0782R	WL	3/25/2010	N001	<0.1	1.4	<0.01	0.0001	0.92	310	0.0047
SHP01	0782R	WL	9/1/2010	N001	<0.1	1.8	<0.01	0.00014	1.1	530	0.0068
SHP01	0782R	WL	3/24/2011	N001	<0.0721	1.72	<0.01	<0.0015	1.02	459	0.00713
SHP01	0782R	WL	9/13/2011	N001	<0.1	3.2	<0.01	0.00018	1.5	660	0.011
SHP01	0783R	WL	9/17/2008	N001	<0.1	0.78	<0.01	0.0004	1	430	0.0082
SHP01	0783R	WL	3/12/2009	N001	<0.1	0.39	0.012	0.0012	0.86	340	0.007
SHP01	0783R	WL	9/17/2009	N001	<0.1	0.95	<0.01	0.00036	1.1	410	0.0073
SHP01	0783R	WL	3/25/2010	N001	<0.1	2	<0.01	0.00036	1.4	610	0.01
SHP01	0783R	WL	9/1/2010	N001	<0.1	0.95	0.015	0.00095	1.2	540	0.0072
SHP01	0783R	WL	3/24/2011	N001	<0.0399	1.84	<0.01	<0.0015	1.4	615	0.0104
SHP01	0783R	WL	9/13/2011	N001	<0.1	2.3	<0.01	0.00056	1.2	480	0.0076
SHP01	0784	WL	9/12/2007	0001	<0.1	1.2	<0.05	<0.000049	0.94	280	0.0025
SHP01	0784	WL	9/17/2008	N001	<0.1	1	<0.01	0.00026	0.95	270	0.0024
SHP01	0792	WL	9/12/2007	0001	<0.1	1.1	0.11	1.3	21	26000	2.7
SHP01	0792	WL	9/15/2008	N001	<0.1	7.6	0.029	0.017	21	27000	3.1
SHP01	0792	WL	3/11/2009	N001	<0.1	1.7	0.039	0.0062	9.4	9600	0.92
SHP01	0792	WL	9/17/2009	N001	<0.1	4	0.024	0.15	19	18000	2.4
SHP01	0792	WL	3/24/2010	N001	<0.1	2.1	<0.01	0.014	9.7	10000	0.79
SHP01	0792	WL	8/31/2010	N001	<0.1	5.6	0.012	0.004	13	13000	0.8
SHP01	0792	WL	3/24/2011	N001	<0.0799	1.71	<0.01	<0.0015	8.29	6170	0.239
SHP01	0792	WL	9/14/2011	N001	<0.1	13	0.015	0.0048	19	16000	0.14
SHP01	0793	WL	9/12/2007	0001	17	1.6	140	0.37	6.7	7300	1.7
SHP01	0793	WL	9/16/2008	N001	10	0.39	9	0.23	3.8	3700	0.96
SHP01	0793	WL	9/16/2009	N001	4.5	0.14	7.5	0.15	4	3000	0.88

Table A–1 (continued). Floodplain

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
SHP01	0793	WL	3/24/2010	N001	2.8	0.042	5.1	0.22	3.6	3000	0.83
SHP01	0793	WL	9/2/2010	N001	2.3	0.18	4	0.16	4.4	5100	1
SHP01	0793	WL	3/24/2011	N001	4.84	0.355	7.76	0.246	4.26	3150	0.648
SHP01	0793	WL	9/14/2011	N001	6.3	<0.012	31	0.18	4.2	3000	0.54
SHP01	0797	WL	3/5/2003	0001	<0.00311	1.17	0.0596	0.0019	1.57	515	0.01
SHP01	0797	WL	8/25/2003	0001	0.0456	0.424	<0.00402	<0.0001	1.27	679	0.01
SHP01	0797	WL	3/3/2004	0001	<0.1	0.26	0.023	0.0005	1.5	740	0.01
SHP01	0797	WL	9/15/2004	0001	<0.1	0.59	0.016	0.00011	0.93	520	0.0083
SHP01	0797	WL	3/2/2005	0001	<0.1	3.1	0.012	0.00011	2.6	1700	0.012
SHP01	0797	WL	9/21/2005	0001	<0.1	3.6	0.027	0.00039	5.1	2800	0.014
SHP01	0797	WL	3/7/2006	0001	<0.1	7.2	0.025	0.00014	7.1	4000	0.013
SHP01	0797	WL	9/13/2006	0001	<0.1	5.3	0.01	<0.00011	6.7	4000	0.013
SHP01	0797	WL	3/7/2007	0001	<0.1	0.22	0.067	0.0017	6.1	4000	0.029
SHP01	0797	WL	9/12/2007	0001	<0.1	2	0.036	0.0002	6.9	4300	0.024
SHP01	0797	WL	3/4/2008	N001	<0.1	0.016	0.06	0.00071	5.3	3200	0.024
SHP01	0797	WL	9/18/2008	N001	<0.1	3.5	0.018	0.00065	10	5200	0.032
SHP01	0797	WL	3/11/2009	N001	<0.1	0.28	0.11	0.00015	6.6	3600	0.026
SHP01	0797	WL	9/16/2009	N001	<0.1	1.5	0.059	0.00068	7.9	240	0.036
SHP01	0797	WL	3/25/2010	N001	<0.1	0.5	0.024	0.0005	7	3200	0.037
SHP01	0797	WL	9/1/2010	N001	<0.1	0.18	0.036	0.00054	6.9	4100	0.032
SHP01	0797	WL	3/23/2011	N001	<0.102	0.4	<0.01	<0.0015	4.7	2690	0.0235
SHP01	0797	WL	9/15/2011	N001	<0.1	5.1	<0.01	0.00034	7.2	3800	0.029
SHP01	0798	WL	9/12/2007	0001	1.1	3.6	5.4	0.52	13	18000	2
SHP01	0798	WL	9/10/2008	N001	0.6	5.2	0.9	0.07	15	15000	1.6
SHP01	0798	WL	9/17/2009	N001	1.5	4.3	1.4	0.059	13	15000	2.1
SHP01	0798	WL	3/25/2010	N001	1.9	2.5	1.9	0.14	7.2	7300	0.78
SHP01	0798	WL	8/31/2010	N001	1.8	4.2	0.014	0.02	10	13000	0.97
SHP01	0798	WL	3/24/2011	N001	1.25	1.54	0.69	0.0362	5.66	5620	0.315
SHP01	0798	WL	9/15/2011	N001	2.4	2.3	<0.01	0.0039	8	7200	0.47
SHP01	0850	WL	3/5/2003	0001	0.00388	5.18	<0.00452	<0.0001	1.98	1730	0.0255
SHP01	0850	WL	8/25/2003	0001	0.0314	0.743	<0.00402	0.00032	1.02	866	0.0118
SHP01	0850	WL	3/3/2004	0001	<0.1	0.85	<0.01	0.00018	2	1800	0.024
SHP01	0850	WL	9/15/2004	0001	<0.1	0.31	<0.01	0.00018	0.73	610	0.0069
SHP01	0850	WL	3/2/2005	0001	<0.1	0.76	<0.01	0.0015	2.9	2300	0.04
SHP01	0850	WL	9/21/2005	0001	<0.1	1.2	<0.01	0.00033	2.2	1800	0.017
SHP01	0850	WL	3/7/2006	0001	<0.1	1.2	1.7	0.002	3.7	2600	0.058

Table A–1 (continued). Floodplain

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
SHP01	0850	WL	9/13/2006	0001	<0.1	0.44	0.027	0.00022	2	1500	0.068
SHP01	0850	WL	3/7/2007	0001	<0.1	0.43	<0.01	0.001	1.5	1400	0.042
SHP01	0850	WL	9/12/2007	0001	<0.1	0.6	<0.1	0.00019	2.4	1900	0.071
SHP01	0850	WL	3/4/2008	0001	<0.1	0.18	0.018	0.001	2.1	1800	0.049
SHP01	0850	WL	9/17/2008	N001	<0.1	1.4	<0.01	0.00059	4.3	3000	0.12
SHP01	0850	WL	3/11/2009	0001	<0.1	0.1	<0.01	0.0026	1.4	1500	0.064
SHP01	0850	WL	9/16/2009	0001	<0.1	0.096	<0.01	0.00036	0.25	4600	0.0046
SHP01	0850	WL	3/25/2010	N001	<0.1	0.14	0.01	0.002	0.53	770	0.037
SHP01	0850	WL	9/1/2010	N001	<0.1	0.086	<0.01	0.00017	0.18	210	0.0038
SHP01	0850	WL	3/23/2011	N001	<0.0739	0.0287	<0.01	0.00351	0.44	642	0.0348
SHP01	0850	WL	9/15/2011	0001	<0.1	1.1	<0.01	0.00025	1.6	1100	0.029
SHP01	0852	WL	9/17/2008	N001	<0.1	0.67	0.014	0.0022	2.5	2700	0.087
SHP01	0853	WL	9/12/2007	0001	20	0.55	<0.01	0.00011	1.3	520	0.052
SHP01	0853	WL	9/10/2008	N001	18	0.47	<0.01	<0.00041	1.2	420	0.041
SHP01	0853	WL	3/11/2009	N001	13	0.49	0.05	<0.000091	1.3	480	0.051
SHP01	0853	WL	9/16/2009	N001	12	0.41	<0.01	0.00028	1.1	360	0.04
SHP01	0853	WL	3/24/2010	N001	10	0.45	0.018	0.00013	1.2	410	0.055
SHP01	0853	WL	9/2/2010	N001	10	0.37	0.019	0.00012	0.9	330	0.037
SHP01	0853	WL	3/23/2011	N001	11.8	0.928	<0.01	<0.0015	2.09	818	0.108
SHP01	0853	WL	9/14/2011	N001	18	1	<0.01	0.0001	2.6	1000	0.081
SHP01	0854	WL	9/17/2009	N001	3.5	2.5	120	0.028	8.1	9300	1.8
SHP01	0854	WL	3/25/2010	N001	8.1	2.5	100	0.025	10	12000	2
SHP01	0854	WL	8/30/2010	N001	8.5	3.1	110	0.022	8.8	12000	1.8
SHP01	0854	WL	3/25/2011	N001	7.55	3.42	40.6	0.0157	8.34	11300	1.38
SHP01	0854	WL	9/15/2011	N001	8.9	3.8	26	0.0091	9.4	12000	1.5
SHP01	0855	WL	9/13/2007	0001	<0.1	1.2	0.048	0.02	6.9	3100	0.092
SHP01	0855	WL	9/11/2008	N001	<0.1	2.3	0.51	0.044	11	5300	0.15
SHP01	0855	WL	3/12/2009	N001	<0.1	1.2	0.29	0.02	6.9	2700	0.07
SHP01	0855	WL	9/17/2009	N001	<0.1	1	<0.01	0.0025	6.6	2900	0.068
SHP01	0855	WL	3/26/2010	N001	<0.1	1.5	0.15	0.018	9.3	3200	0.08
SHP01	0855	WL	9/2/2010	N001	<0.1	1.3	<0.01	0.0028	8.9	3600	0.074
SHP01	0855	WL	3/24/2011	N001	<0.0549	1.85	1.11	0.0188	11.7	3930	0.085
SHP01	0855	WL	9/15/2011	N001	<0.1	1.9	0.88	0.044	8.6	2800	0.07
SHP01	0856	WL	9/13/2007	0001	<0.1	1.3	0.028	0.0002	4.9	3100	0.076
SHP01	0856	WL	9/11/2008	N001	<0.1	1.7	<0.01	0.00066	5.1	3200	0.064
SHP01	0856	WL	3/12/2009	N001	<0.1	2	0.043	0.00064	6.8	2900	0.079

Table A–1 (continued). Floodplain

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
SHP01	0856	WL	9/17/2009	N001	<0.1	0.99	0.015	0.00043	5.7	2700	0.064
SHP01	0856	WL	3/26/2010	N001	<0.1	1.4	0.032	0.00058	6	2700	0.054
SHP01	0856	WL	9/2/2010	N001	<0.1	1.1	0.041	0.00039	5.2	2600	0.044
SHP01	0856	WL	3/24/2011	N001	<0.0734	1.55	<0.01	<0.0015	7.58	3040	0.0665
SHP01	0856	WL	9/15/2011	N001	<0.1	1.6	<0.01	0.001	7.2	3000	0.074
SHP01	0857	WL	9/12/2007	0001	9.4	2.4	1.9	0.0014	3.1	2400	0.3
SHP01	0857	WL	9/9/2008	N001	11	1.5	<0.01	0.00055	1.8	1400	0.15
SHP01	0857	WL	9/17/2009	N001	4.9	0.8	<0.01	0.00033	1.1	620	0.18
SHP01	0857	WL	3/24/2010	N001	3.8	0.67	0.18	0.00029	0.92	470	0.09
SHP01	0857	WL	9/1/2010	N001	6.3	0.77	0.014	0.00017	0.95	590	0.076
SHP01	0857	WL	3/24/2011	N001	14.5	6.27	33.6	<0.0015	8.39	4500	0.769
SHP01	0857	WL	9/14/2011	N001	13	4.3	5.3	0.001	5.3	3200	0.47
SHP01	1008	WL	3/5/2003	0001	22.205	6.61	38.8525	0.169	10.2	13900	2.05
SHP01	1008	WL	8/26/2003	0001	15.528	5.96	79.9639	0.124	12.3	18200	2.58
SHP01	1008	WL	3/2/2004	0001	17	6	47	0.24	9.5	12000	1.6
SHP01	1008	WL	9/16/2004	0001	15	7	73	0.15	10	13000	2
SHP01	1008	WL	2/28/2005	0001	12	5.5	43	0.2	8.7	11000	1.5
SHP01	1008	WL	9/19/2005	0001	12	5.6	46	0.13	8.4	11000	1.3
SHP01	1008	WL	3/10/2006	0001	13	7	74	0.077	10	16000	1.7
SHP01	1008	WL	9/13/2006	0001	17	8.3	160	0.036	12	18000	3
SHP01	1008	WL	9/17/2009	N001	16	8.2	170	0.021	12	18000	3.1
SHP01	1008	WL	3/25/2010	N001	14	7.5	83	0.032	11	16000	2.5
SHP01	1008	WL	8/30/2010	N001	21	8.2	130	0.021	12	18000	3.1
SHP01	1008	WL	3/24/2011	N001	8.5	4.04	18.4	0.0231	8.39	8070	1.28
SHP01	1008	WL	9/15/2011	N001	10	4.8	21	0.011	8.8	10000	1.3
SHP01	1009	WL	9/12/2007	0001	27	3	130	0.17	5.3	4400	0.58
SHP01	1009	WL	9/10/2008	N001	25	2.1	27	0.21	5.3	2900	0.38
SHP01	1009	WL	9/16/2009	N001	16	0.37	17	0.34	5.3	3300	0.43
SHP01	1009	WL	3/24/2010	N001	14	0.42	0.42	0.11	4.3	2700	0.3
SHP01	1009	WL	9/2/2010	N001	14	0.49	0.027	0.13	4.5	2800	0.28
SHP01	1009	WL	3/23/2011	N001	10.8	0.933	<0.05	0.049	3.58	1830	0.246
SHP01	1009	WL	9/14/2011	N001	14	0.87	<0.01	0.0084	3.8	2100	0.24
SHP01	1075	WL	3/6/2003	0001	15.761	6.58	44.7255	0.0541	12.1	17800	2.71
SHP01	1077	WL	3/6/2003	0001	16.537	4.52	68.6695	0.134	10.3	14900	2.05
SHP01	1077	WL	3/1/2004	0001			86			14000	2.1
SHP01	1077	WL	9/16/2004	0001	11	5.3	320	0.04	13	16000	2.8

Table A–1 (continued). Floodplain

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
SHP01	1077	WL	3/1/2005	0001			88			13000	2.1
SHP01	1077	WL	9/20/2005	0001	1.2	4.3	270	0.023	12	22000	2.9
SHP01	1089	WL	3/1/2004	0001			30			12000	1.5
SHP01	1089	WL	9/16/2004	0001	3.2	2.5	83	0.048	10	15000	2.1
SHP01	1089	WL	3/1/2005	0001			28			9500	1.1
SHP01	1089	WL	9/20/2005	0001	0.72	2	71	0.094	9.9	15000	1.3
SHP01	1089	WL	3/14/2006	0001			27			10000	1
SHP01	1089	WL	9/13/2006	0001	1.4	2.6	46	0.034	8.6	12000	1.5
SHP01	1089	WL	3/6/2007	0001			8.9			7400	0.65
SHP01	1089	WL	9/12/2007	0001	0.44	1.5	33	0.022	6.5	8200	0.9
SHP01	1089	WL	3/6/2008	N001	0.49	1.1	21	0.024	6.1	6800	0.79
SHP01	1089	WL	9/10/2008	N001	1.1	2.2	30	0.026	8.4	7000	0.94
SHP01	1089	WL	3/11/2009	N001	0.62	1.1	18	0.019	7	7700	0.79
SHP01	1089	WL	9/17/2009	N001	0.78	1.5	21	0.024	6.8	7800	1.1
SHP01	1089	WL	3/25/2010	N001	0.47	0.77	5.4	0.017	5	5700	0.48
SHP01	1089	WL	8/30/2010	N001	0.56	1.1	5.9	0.015	5.5	6500	0.55
SHP01	1089	WL	3/24/2011	N001	0.176	0.0537	3.75	0.046	5.85	4760	0.232
SHP01	1089	WL	9/14/2011	N001	0.53	0.79	0.88	0.0054	5.8	5500	0.29
SHP01	1104	WL	3/14/2006	0001			180			19000	2.6
SHP01	1104	WL	9/13/2006	0001	2.4	3.2	100	0.029	10	19000	2
SHP01	1104	WL	3/6/2007	0001			110			14000	2.1
SHP01	1104	WL	9/12/2007	0001	1.9	1.9	110	0.014	7.5	9900	1.5
SHP01	1104	WL	3/6/2008	N001	0.74	1.2	28	0.026	6.4	7400	0.93
SHP01	1104	WL	9/11/2008	N001	3.4	2.9	84	0.018	6.9	6100	0.97
SHP01	1104	WL	3/11/2009	N001	3.4	2.5	95	0.037	9.7	12000	1.8
SHP01	1104	WL	9/17/2009	N001	0.81	1.7	31	0.023	7.2	7900	1.2
SHP01	1104	WL	3/25/2010	N001	1.6	1.2	37	0.047	6.8	8100	1.1
SHP01	1104	WL	8/30/2010	N001	1.6	1.3	57	0.02	7.1	8900	1.2
SHP01	1104	WL	3/24/2011	N001	0.124	<0.04	16.3	0.0311	6.46	7970	0.595
SHP01	1104	WL	9/14/2011	N001	1.7	0.98	15	0.0097	7.7	9100	0.87
SHP01	1105	WL	3/6/2007	0001	51	9.1	1100	0.28	16	21000	4.3
SHP01	1105	WL	3/6/2008	N001	43	6.3	770	0.054	12	16000	3.1
SHP01	1105	WL	9/9/2008	N001	42	6.6	730	0.047	14	14000	3.2
SHP01	1105	WL	3/11/2009	N001	18	3.9	380	0.069	9.7	9900	1.6
SHP01	1105	WL	9/16/2009	N001	3.1	2.5	300	0.16	11	10000	2.1
SHP01	1105	WL	3/24/2010	N001	8	3.3	270	0.12	11	9600	1.6

Table A–1 (continued). Floodplain

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
SHP01	1105	WL	9/2/2010	N001	4.8	3	220	0.095	10	9900	1.7
SHP01	1105	WL	3/23/2011	N001	12.7	2.51	60	0.31	8.08	8060	1.57
SHP01	1105	WL	9/14/2011	N001	31	4.5	220	0.21	9.4	9100	2.1
SHP01	1111	WL	3/7/2007	0001	<0.1	0.51	28	0.74	8.1	8600	1.1
SHP01	1111	WL	9/11/2007	0001	<0.1	0.81	43	0.73	9.4	9000	1
SHP01	1111	WL	3/6/2008	N001	<0.1	0.43	51	0.71	9.1	8100	0.94
SHP01	1111	WL	3/11/2009	N001	<0.1	0.48	14	0.51	10	8300	0.91
SHP01	1111	WL	9/16/2009	N001	0.1	0.82	12	0.58	11	9000	0.87
SHP01	1111	WL	3/24/2010	N001	<0.1	0.34	12	0.6	10	7900	0.79
SHP01	1111	WL	9/2/2010	N001	<0.1	0.58	16	0.4	12	9400	0.89
SHP01	1111	WL	3/23/2011	N001	0.122	0.487	38.8	0.571	14.2	10500	1.23
SHP01	1111	WL	9/14/2011	N001	0.45	0.95	32	0.3	12	8500	0.95
SHP01	1112	WL	3/7/2007	0001	35	3.5	840	0.4	12	14000	2.4
SHP01	1112	WL	3/6/2008	N001	26	2.4	700	1.2	12	13000	2
SHP01	1112	WL	3/11/2009	N001	31	3	560	0.33	9.7	9900	1.7
SHP01	1112	WL	9/16/2009	N001	44	3.7	540	0.49	11	11000	1.9
SHP01	1112	WL	3/26/2010	N001	38	2.9	300	0.62	8.1	8300	1.4
SHP01	1112	WL	9/1/2010	N001	91	2.5	230	0.5	7.8	8600	1.2
SHP01	1112	WL	3/23/2011	N001	22.9	2.88	452	3.07	11.4	10400	1.87
SHP01	1112	WL	9/13/2011	N001	25	2.2	290	1	9	9200	1.5
SHP01	1113	WL	3/6/2008	N001	0.21	0.017	900	0.018	11	9600	1.7
SHP01	1113	WL	3/10/2009	N001	0.83	0.045	380	0.0087	7.8	5400	1.1
SHP01	1113	WL	9/15/2009	N001	98	2.4	96	0.016	4.7	4100	0.78
SHP01	1113	WL	3/23/2010	N001	0.15	0.037	620	0.033	9.2	7300	1.2
SHP01	1113	WL	9/1/2010	N001	10	0.59	380	0.32	8.6	8100	1.4
SHP01	1113	WL	3/22/2011	0001	0.121	<0.04	391	0.111	7.37	4080	0.762
SHP01	1113	WL	9/13/2011	N001	25	1.8	290	0.03	7.7	5500	0.76
SHP01	1114	WL	9/10/2007	0001	120	1	61	0.0064	1.7	1500	0.33
SHP01	1114	WL	3/5/2008	N001	91	1.4	59	0.0042	2	1800	0.4
SHP01	1114	WL	9/9/2008	N001	82	1.3	47	0.0054	2.1	1500	0.24
SHP01	1114	WL	3/10/2009	N001	84	1.5	27	0.0042	2.8	1800	0.52
SHP01	1114	WL	9/15/2009	N001	130	2.1	65	0.0098	3.2	2400	0.46
SHP01	1114	WL	3/23/2010	N001	90	2.4	150	0.011	4.1	3300	0.69
SHP01	1114	WL	9/1/2010	N001	440	2.3	100	0.012	3.1	2800	0.45
SHP01	1114	WL	3/22/2011	N001	97.5	3.09	131	0.0149	4.71	3190	0.73
SHP01	1114	WL	9/13/2011	N001	120	4	210	0.043	6.6	4500	0.89

Table A–1 (continued). Floodplain

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
SHP01	1115	WL	9/10/2007	0001	150	1.6	150	0.035	3.6	3600	0.55
SHP01	1115	WL	3/5/2008	N001	68	0.85	65	0.0088	2	1500	0.36
SHP01	1115	WL	9/9/2008	N001	150	1.6	150	0.12	4.1	3300	0.58
SHP01	1115	WL	3/10/2009	N001	65	0.87	48	0.015	2.1	1500	0.31
SHP01	1115	WL	9/15/2009	N001	110	1.4	190	0.043	3.7	3000	0.51
SHP01	1115	WL	3/23/2010	N001	210	2.6	220	0.031	5.1	4900	0.95
SHP01	1115	WL	9/1/2010	N001	410	1.7	160	0.024	4.4	4300	0.66
SHP01	1115	WL	3/22/2011	N001	255	3.3	378	0.0679	7.36	6910	1.1
SHP01	1115	WL	9/13/2011	N001	320	3.2	580	0.14	7.4	8500	1.4
SHP01	1116	WL	3/5/2008	N001	330	3.1	490	0.01	6.5	6300	1
SHP01	1116	WL	3/10/2009	0001	520	4.2	600	0.019	9.4	9400	1.6
SHP01	1116	WL	9/15/2009	0001	320	3.9	650	0.015	8.6	8200	1.3
SHP01	1117	WL	9/10/2007	0001	0.52	0.39	0.038	0.00031	0.46	100	0.0075
SHP01	1117	WL	3/5/2008	N001	<0.1	0.33	0.063	0.00053	0.7	140	0.0092
SHP01	1117	WL	9/9/2008	N001	0.29	0.54	0.033	0.00048	0.65	150	0.0054
SHP01	1117	WL	3/10/2009	N001	<0.1	0.8	0.49	0.0048	0.74	160	0.0078
SHP01	1117	WL	9/14/2009	N001	<0.1	0.87	<0.01	0.00047	0.49	87	0.0047
SHP01	1117	WL	3/23/2010	N001	<0.1	0.3	<0.01	0.00045	0.74	140	0.0092
SHP01	1117	WL	9/1/2010	N001	<0.1	0.62	0.022	0.00019	0.55	97	0.0038
SHP01	1117	WL	3/22/2011	N001	0.242	0.652	<0.01	<0.0015	0.693	154	0.0101
SHP01	1117	WL	9/13/2011	N001	<0.1	0.16	<0.01	0.00023	0.71	130	0.005
SHP01	1126	WL	9/17/2009	N001	6.4	0.23	110	0.032	2.5	1600	0.2
SHP01	1127	WL	9/17/2009	N001	0.14	0.14	<0.01	0.0014	0.49	93	0.0068
SHP01	1128	WL	3/23/2010	N001	390	4.3	470	0.021	8.5	8900	1.6
SHP01	1128	WL	9/1/2010	N001	430	4.3	560	0.025	9.4	10000	1.6
SHP01	1128	WL	3/22/2011	N001	470	5.33	535	0.0223	12.1	10000	1.49
SHP01	1128	WL	9/13/2011	N001	440	4.3	630	0.024	9.7	8800	1.4
SHP01	1131	WL	9/17/2009	N001	0.28	1	0.023	0.00023	0.54	75	0.0046
SHP01	1132	WL	3/10/2009	N001	1.1	0.29	0.16	0.00092	0.71	160	0.018
SHP01	1132	WL	9/15/2009	N001	0.9	0.3	<0.01	0.00044	0.56	110	0.013
SHP01	1132	WL	3/23/2010	N001	0.92	0.45	<0.01	0.00075	0.66	140	0.02
SHP01	1132	WL	9/1/2010	N001	0.88	0.35	0.02	0.00035	0.57	120	0.011
SHP01	1132	WL	3/22/2011	N001	1.12	0.268	0.67	<0.0015	0.626	154	0.0221
SHP01	1132	WL	9/13/2011	N001	1.2	0.32	0.04	0.00043	0.65	150	0.014
SHP01	1133	WL	3/10/2009	N001	140	2.4	480	0.025	5.6	6600	0.92
SHP01	1133	WL	9/17/2009	N001	160	2.5	430	0.043	6.9	7000	1.3

Table A–1 (continued). Floodplain

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
SHP01	1134	WL	3/10/2009	N001	0.59	0.49	<0.01	<0.000099	0.89	120	0.013
SHP01	1134	WL	9/15/2009	N001	1.1	0.63	3.4	0.0064	1.5	410	0.02
SHP01	1134	WL	3/23/2010	N001	0.56	0.34	<0.01	0.00018	0.64	130	0.0095
SHP01	1134	WL	3/22/2011	N001	1.07	0.494	5.14	<0.0015	1.14	342	0.0187
SHP01	1134	WL	9/13/2011	N001	0.72	0.25	<0.01	0.00015	0.68	140	0.009
SHP01	1135	WL	3/25/2010	N001	<0.1	2.9	<0.01	0.00046	5.3	5800	0.24
SHP01	1135	WL	8/31/2010	0001	<0.1	3.2	<0.01	0.00059	6	6100	0.22
SHP01	1135	WL	3/24/2011	0001	<0.0642	2.05	<0.01	<0.0015	4.42	4140	0.141
SHP01	1135	WL	9/15/2011	N001	0.11	2.3	0.01	0.0003	4.7	4000	0.12
SHP01	1136	WL	3/25/2010	N001	<0.1	1.4	<0.01	0.00013	1.2	360	0.0072
SHP01	1136	WL	8/31/2010	N001	<0.1	1	<0.01	<0.000068	1	310	0.0046
SHP01	1136	WL	3/24/2011	N001	<0.0411	1.03	0.252	<0.0015	0.972	370	0.00693
SHP01	1136	WL	9/14/2011	N001	<0.1	1.4	1.2	0.00031	1.3	490	0.019
SHP01	1137	WL	3/25/2010	N001	0.78	2	27	0.002	3	3800	0.49
SHP01	1137	WL	8/31/2010	N001	0.54	1.3	6.5	0.0029	1.9	2500	0.28
SHP01	1137	WL	3/25/2011	N001	0.567	0.924	3.99	0.00278	1.72	2010	0.172
SHP01	1137	WL	9/15/2011	N001	1.1	1.4	4.7	0.0022	2.5	2800	0.22
SHP01	1138	WL	3/25/2010	N001	0.42	1.4	10	0.0014	2.8	2600	0.34
SHP01	1138	WL	8/31/2010	N001	0.3	0.56	5.8	0.0018	1.1	1700	0.16
SHP01	1138	WL	3/25/2011	N001	0.271	1.11	6.22	0.00516	2.68	2450	0.237
SHP01	1138	WL	9/15/2011	N001	0.4	1.5	16	0.0045	3.4	3000	0.34
SHP01	1139	WL	3/25/2010	N001	<0.1	0.081	1.9	0.013	1.6	1200	0.18
SHP01	1139	WL	8/31/2010	N001	<0.1	0.083	3.2	0.0065	1.8	1400	0.13
SHP01	1139	WL	3/24/2011	N001	0.13	0.728	29.9	0.0252	7.75	6740	0.845
SHP01	1139	WL	9/15/2011	N001	<0.1	0.51	4	0.0025	3.1	2500	0.29
SHP01	1140	WL	9/16/2009	N001	25	3.6	320	0.17	9	8900	1.7
SHP01	1140	WL	3/24/2010	N001	15	2.2	190	0.5	6.3	7000	1.3
SHP01	1140	WL	9/2/2010	N001	23	2.8	130	0.14	6.6	7400	1.2
SHP01	1140	WL	3/23/2011	N001	6.93	1.97	131	1.22	9.23	12600	2.26
SHP01	1140	WL	9/14/2011	N001	25	3.3	110	0.13	7.8	8200	1.8
SHP01	1141	WL	9/16/2009	N001	13	2	33	0.26	5.8	4800	0.98
SHP01	1141	WL	3/24/2010	N001	12	1.7	29	0.55	5	4100	0.83
SHP01	1141	WL	9/1/2010	N001	15	2.1	39	0.19	6.1	5200	1.1
SHP01	1141	WL	3/23/2011	N001	10	1.89	58.5	0.706	6.36	4910	1.07
SHP01	1141	WL	9/14/2011	N001	13	1.7	12	0.097	5.7	4500	1
SHP01	1142	WL	3/24/2010	N001	<0.1	0.29	<0.01	0.0027	0.72	150	0.0056

Table A–1 (continued). Floodplain

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
SHP01	1142	WL	9/2/2010	N001	<0.1	0.33	0.077	0.00055	0.66	130	0.0042
SHP01	1142	WL	3/23/2011	N001	0.124	0.355	<0.01	<0.0015	0.69	144	0.00574
SHP01	1142	WL	9/14/2011	N001	<0.1	0.27	<0.01	0.00036	0.61	120	0.0046
SHP01	1143	WL	3/26/2010	N001	<0.1	1.1	<0.01	0.00049	2.3	2800	0.065
SHP01	1143	WL	9/2/2010	N001	<0.1	0.89	0.078	0.00025	2.4	2800	0.056
SHP01	1143	WL	3/24/2011	N001	<0.0502	1.33	<0.01	<0.0015	2.86	3000	0.0722
SHP01	1143	WL	9/15/2011	N001	<0.1	0.98	<0.01	0.00013	2.6	2700	0.053
SHP01	1109	TS	9/12/2006	0001	88	1.4	110	0.0082	2.3	2100	0.38
SHP01	1109	TS	3/7/2007	0001	39	0.72	61	0.0062	1.5	1200	0.22
SHP01	1109	TS	9/11/2007	0001	35	0.51	37	0.0069	1.2	860	0.14
SHP01	1109	TS	3/5/2008	N001	13	0.23	34	0.01	0.99	560	0.1
SHP01	1109	TS	9/9/2008	N001	50	0.61	41	0.0095	1.5	1100	0.16
SHP01	1109	TS	3/10/2009	N001	20	0.39	33	0.009	1.2	730	0.12
SHP01	1109	TS	9/15/2009	N001	15	0.9	130	0.054	2.7	2100	0.32
SHP01	1109	TS	3/23/2010	N001	21	0.42	51	0.022	1.6	1100	0.2
SHP01	1109	TS	9/1/2010	N001	48	0.77	100	0.028	2.3	1900	0.25
SHP01	1109	TS	3/23/2011	N001	5.03	0.232	27.3	0.0115	1.43	617	0.0832
SHP01	1109	TS	9/14/2011	N001	20	0.28	36	0.0098	1.3	710	0.1
SHP01	1109-B	TS	9/17/2009	N001	2.9	0.16	25	0.022	0.85	520	0.056
SHP01	1109-D	TS	9/17/2009	N001	140	5.2	820	0.014	9.7	12000	1.8
SHP01	1110	TS	9/12/2006	0001	16	3	310	0.59	11	14000	2.1
SHP01	1110	TS	3/6/2007	0001			390			12000	2
SHP01	1110	TS	9/11/2007	0001	11	2.2	250	0.4	10	11000	1.5
SHP01	1110	TS	3/6/2008	N001	8.8	1.3	200	0.75	10	11000	1.5
SHP01	1110	TS	9/11/2008	N001	13	2.5	300	0.42	11	12000	1.5
SHP01	1110	TS	3/11/2009	N001	2.5	1.1	88	0.51	8.9	7700	0.99
SHP01	1110	TS	9/16/2009	N001	4.6	1.3	130	0.39	9.4	8000	1.3
SHP01	1110	TS	3/24/2010	N001	4.6	1.3	100	0.53	7.6	7000	0.89
SHP01	1110	TS	9/2/2010	N001	2.5	1	63	0.39	9.2	7400	0.77
SHP01	1110	TS	3/23/2011	N001	<0.0774	<0.04	24.9	0.616	9.72	4790	0.51
SHP01	1110	TS	9/14/2011	N001	8.2	1.5	120	0.39	9.2	8000	1.2
SHP01	1118	TS	9/14/2006	0001	<0.1	0.09	29	0.083	9.1	4500	0.38
SHP01	1118	TS	3/6/2007	0001			71			4100	0.28
SHP01	1118	TS	9/12/2007	0001	<0.1	0.0083	35	0.13	9.2	4800	0.37
SHP01	1118	TS	3/5/2008	N001	<0.1	0.06	40	0.16	9.3	5600	0.56
SHP01	1118	TS	9/11/2008	N001	<0.1	<0.012	40	0.11	9.5	5900	0.45

Table A–1 (continued). Floodplain

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
SHP01	1118	TS	3/9/2009	N001	<0.1	0.019	26	0.062	9.2	5600	0.48
SHP01	1118	TS	9/16/2009	N001	<0.1	0.037	30	0.071	9.5	6700	0.64
SHP01	1118	TS	3/26/2010	N001	<0.1	0.018	38	0.1	8.2	7100	0.67
SHP01	1118	TS	8/31/2010	N001	<0.1	0.017	36	0.061	8.7	7900	0.63
SHP01	1118	TS	3/23/2011	N001	<0.0755	<0.02	92.5	0.313	9.86	6890	0.717
SHP01	1118	TS	9/14/2011	0001	<0.1	<0.015	59	0.12	9.8	8100	0.76
SHP01	0501	SL	8/25/2003	0001	0.0232	0.0023	0.7048	0.00089	0.989	216	0.0027
SHP01	0501	SL	3/2/2005	0001	<0.1	0.0022	0.62	0.0012	1	190	0.0014
SHP01	0501	SL	9/20/2005	0001	<0.1	0.014	0.027	0.00068	0.86	160	0.0018
SHP01	0501	SL	3/9/2006	0001	<0.1	0.02	0.87	0.00068	0.92	180	0.0019
SHP01	0501	SL	9/12/2006	0001	<0.1	<0.0026	0.44	0.00028	0.71	120	0.0016
SHP01	0501	SL	3/6/2007	0001	<0.1	0.0076	0.41	0.00081	0.77	150	0.0015
SHP01	0501	SL	9/10/2007	0001	<0.1	0.0025	0.23	0.00041	0.61	96	0.0011
SHP01	0501	SL	3/5/2008	0001	<0.1	0.0066	0.2	0.00056	0.44	74	0.00087
SHP01	0501	SL	9/9/2008	N001	<0.1	0.079	0.38	0.00069	0.75	130	0.0018
SHP01	0501	SL	3/9/2009	0001	<0.1	0.0089	0.47	0.0014	0.84	150	0.0017
SHP01	0501	SL	9/15/2009	0001	<0.1	<0.0074	0.63	0.00054	0.77	120	0.0017
SHP01	0501	SL	9/15/2009	N001	<0.1	0.73	0.61	0.00064	1.1	130	0.0046
SHP01	0501	SL	3/23/2010	0001	<0.1	0.011	0.71	0.001	0.87	160	0.0019
SHP01	0501	SL	3/23/2010	N001	<0.1	0.29	0.58	0.0018	0.95	150	0.0025
SHP01	0501	SL	9/1/2010	0001	<0.1	<0.0029	0.35	0.0006	0.68	120	0.0013
SHP01	0501	SL	9/1/2010	N001	<0.1	0.33	0.3	0.0008	0.75	110	0.0017
SHP01	0501	SL	3/22/2011	0001	<0.0411	0.00932	0.565	<0.0015	0.787	140	0.00191
SHP01	0501	SL	3/22/2011	N001	<0.0707	0.0683	0.675	<0.0015	0.806	144	0.00196
SHP01	0501	SL	9/13/2011	0002	<0.1	0.073	0.62	0.00094	0.68	130	0.0022
SHP01	0501	SL	9/13/2011	N001	<0.1	2.2	0.61	0.0037	1.7	140	0.0084
SHP01	0655	SL	3/4/2003	0001	0.0357	0.476	5.1728	0.0086	10.6	3100	0.0517
SHP01	0655	SL	3/4/2004	0001	<0.1	2.1	1	0.0019	9.7	3700	0.059
SHP01	0655	SL	3/1/2005	0001	<0.1	0.67	1.5	0.0065	9	3900	0.091
SHP01	0655	SL	3/15/2006	0001	<0.1	1.3	0.75	0.0016	8.2	3000	0.043
SHP01	0655	SL	3/5/2007	0001	<0.1	1.2	1.3	0.0019	9.9	3400	0.055
SHP01	0655	SL	3/4/2008	N001	<0.1	0.97	0.23	0.0056	12	3700	0.09
SHP01	0655	SL	3/9/2009	N001	<0.1	0.28	0.33	0.0012	11	3300	0.052
SHP01	0655	SL	3/26/2010	N001	<0.1	0.2	0.9	0.0023	13	3900	0.069
SHP01	0655	SL	3/23/2011	N001	<0.131	0.0556	0.66	0.00308	12.2	3040	0.0413
SHP01	0887	SL	3/4/2003	0001	0.0386	0.495	95.0983	0.349	7.3	3430	0.0708

Table A–1 (continued). Floodplain

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
SHP01	0887	SL	8/26/2003	0001	0.0181	0.0928	0.4314	0.0112	5.11	1940	0.0141
SHP01	0887	SL	3/3/2004	0001	<0.1	0.32	62	0.14	7.5	3200	0.057
SHP01	0887	SL	3/1/2005	0001	<0.1	0.83	40	0.15	6.1	2900	0.051
SHP01	0887	SL	9/22/2005	0001	<0.1	0.011	11	0.021	4.8	2700	0.032
SHP01	0887	SL	3/7/2006	0001	<0.1	0.28	16	0.074	5.7	2900	0.048
SHP01	0887	SL	3/7/2007	0001	<0.1	0.48	20	0.076	5.7	3000	0.051
SHP01	0887	SL	9/12/2007	0001	<0.1	<0.0021	0.028	0.00049	0.61	100	0.0014
SHP01	0887	SL	3/3/2008	0001	0.14	0.0091	0.56	0.0011	0.52	110	0.0015
SHP01	0887	SL	9/9/2008	N001	<0.1	0.018	0.13	0.00088	0.74	120	0.0017
SHP01	0897	SL	3/3/2003	0001	0.32	0.0155	0.8426	0.0021	1.13	279	0.0028
SHP01	0897	SL	8/26/2003	0001	<0.00419	0.0028	0.567	0.00072	1.01	227	0.003
SHP01	0897	SL	3/3/2004	0001	0.16	0.0035	1.1	0.0013	1.2	220	0.0027
SHP01	0897	SL	9/16/2004	0001	<0.1	0.0051	0.17	0.00073	0.85	160	0.0015
SHP01	0897	SL	3/1/2005	0001	0.15	0.0017	0.98	0.0018	1	180	0.0016
SHP01	0897	SL	9/21/2005	0001	<0.1	0.016	0.16	0.00084	0.88	170	0.0023
SHP01	0897	SL	3/9/2006	0001	<0.1	0.034	1.1	0.0011	0.93	190	0.002
SHP01	0897	SL	9/13/2006	0001	<0.1	0.0023	0.41	0.00027	0.73	120	0.0016
SHP01	0897	SL	3/7/2007	0001	<0.1	0.0052	0.52	0.0011	0.77	150	0.0017
SHP01	0897	SL	9/13/2007	0001	<0.1	<0.0061	0.75	0.0019	0.59	120	0.0012
SHP01	0897	SL	3/4/2008	0001	<0.1	0.0051	0.23	0.00061	0.47	77	0.001
SHP01	0897	SL	9/9/2008	N001	<0.1	0.091	2	0.0047	0.74	190	0.0023
SHP01	0897	SL	3/9/2009	0001	<0.1	0.0081	0.52	0.0014	0.83	150	0.0017
SHP01	0897	SL	9/16/2009	0001	<0.1	<0.0072	0.74	0.00081	0.72	130	0.0022
SHP01	0897	SL	9/16/2009	N001	<0.1	1.6	0.68	0.00076	1.7	130	0.0075
SHP01	0897	SL	3/26/2010	0001	<0.1	0.0067	0.62	0.0012	0.87	150	0.0018
SHP01	0897	SL	3/26/2010	N001	<0.1	0.47	0.55	0.0013	0.97	150	0.0024
SHP01	0897	SL	9/2/2010	0001		0.0035		0.00073	0.69	110	0.0014
SHP01	0897	SL	9/2/2010	N001	<0.1	0.099	0.36	0.00069	0.7		0.0014
SHP01	0897	SL	3/22/2011	0001	<0.0746	0.00736	1.8	0.00182	0.786	713	0.00329
SHP01	0897	SL	3/22/2011	N001	<0.0814	0.0558	0.56	<0.0015	0.751	148	0.00192
SHP01	0897	SL	9/14/2011	0002	<0.1	<0.0012	0.54	0.00091	0.69	120	0.0016
SHP01	0897	SL	9/14/2011	N001	<0.1	0.57	0.46	0.0021	0.94	120	0.0037
SHP01	0898	SL	3/5/2003	0001	0.163	0.0072	0.7929	0.0019	0.987	206	0.0027
SHP01	0898	SL	8/25/2003	0001	0.129	0.0016	0.4292	0.00076	0.969	193	0.0023
SHP01	0898	SL	3/3/2004	0001	<0.1	0.0053	1	0.00093	1.2	220	0.0028
SHP01	0898	SL	9/15/2004	0001	<0.1	0.0037	0.25	0.00069	0.79	150	0.0014

Table A–1 (continued). Floodplain

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
SHP01	0898	SL	3/2/2005	0001	<0.1	0.0022	0.64	0.0011	1	170	0.0015
SHP01	0898	SL	9/21/2005	0001	<0.1	0.012	0.01	0.00057	0.89	170	0.0019
SHP01	0898	SL	3/7/2006	0001	<0.1	0.025	0.17	0.00068	0.96	180	0.002
SHP01	0898	SL	9/13/2006	0001	<0.1	0.0015	0.43	0.00027	0.74	120	0.0015
SHP01	0898	SL	3/7/2007	0001	<0.1	0.01	0.4	0.00077	0.75	150	0.0015
SHP01	0898	SL	9/12/2007	0001	<0.1	<0.0016	0.22	0.00045	0.59	99	0.0011
SHP01	0898	SL	3/4/2008	0001	<0.1	0.0045	0.17	0.00055	0.48	80	0.00096
SHP01	0898	SL	9/17/2008	N001	<0.1	0.012	0.2	0.00071	0.66	110	0.0015
SHP01	0898	SL	3/11/2009	0001	<0.1	0.021	0.42	0.0013	0.87	160	0.0018
SHP01	0898	SL	9/16/2009	0001	<0.1	0.02	0.83	0.00082	0.68	130	0.0025
SHP01	0898	SL	9/16/2009	N001	<0.1	2.5	0.84	0.00072	2.2	130	0.0087
SHP01	0898	SL	3/25/2010	0001	<0.1	0.0087	0.53	0.001	0.88	160	0.0019
SHP01	0898	SL	3/25/2010	N001	<0.1	0.8	0.53	0.0015	1	150	0.0028
SHP01	0898	SL	9/1/2010	0001	<0.1	<0.0032	0.38	0.00058	0.69	120	0.0013
SHP01	0898	SL	9/1/2010	N001	<0.1	0.68	0.37	0.0011	0.84	120	0.002
SHP01	0898	SL	3/23/2011	0001	<0.0546	0.00831	0.329	<0.0015	0.843	146	0.00198
SHP01	0898	SL	3/23/2011	N001	<0.0663	0.0447	0.323	<0.0015	0.77	152	0.00191
SHP01	0898	SL	9/15/2011	0001	<0.1	0.017	0.94	0.0015	0.62	240	0.0031
SHP01	0898	SL	9/15/2011	N001	<0.1	6.2	1.4	0.013	3.9	240	0.028
SHP01	0899	SL	9/17/2009	0001	<0.1	0.054	0.48	0.00057	0.79	130	0.002
SHP01	0899	SL	9/17/2009	N001	<0.1	0.08	0.51	0.00054	0.83	130	0.0023
SHP01	0899	SL	3/24/2010	0001	<0.1	0.007	0.54	0.0016	0.85	140	0.0024
SHP01	0899	SL	3/24/2010	N001	<0.1	0.23	0.51	0.0016	0.83	140	0.0028
SHP01	0899	SL	9/1/2010	0001	<0.1	<0.0021	0.34	0.00055	0.69	110	0.0013
SHP01	0899	SL	9/1/2010	N001	<0.1	0.21	0.35	0.00064	0.74	110	0.0015
SHP01	0899	SL	3/24/2011	0001	<0.047	0.00775	0.358	<0.0015	0.835	135	0.00187
SHP01	0899	SL	3/24/2011	N001	<0.0924	0.053	0.344	<0.0015	0.821	135	0.00196
SHP01	0899	SL	9/14/2011	0001	<0.1	0.0019	0.61	0.0011	0.69	120	0.0016
SHP01	0899	SL	9/14/2011	N001	<0.1	0.7	0.57	0.0026	1	120	0.0043
SHP01	0937	SL	3/2/2005	0001	<0.1	0.85	37	0.11	6.3	3200	0.053
SHP01	0937	SL	3/16/2006	0001	<0.1	0.42	18	0.074	6.1	3100	0.056
SHP01	0937	SL	9/12/2006	0001	<0.1	0.003	0.018	0.00055	0.7	160	0.0024
SHP01	0937	SL	3/7/2007	0001	<0.1	0.78	17	0.077	5.7	2800	0.051
SHP01	0937	SL	3/4/2008	0001	<0.1	0.024	0.54	0.0012	0.53	110	0.0013
SHP01	0938	SL	3/4/2008	0001	<0.1	0.0081	0.2	0.00061	0.46	77	0.00098
SHP01	0939	SL	3/2/2005	0001	<0.1	1.8	45	0.16	5.6	2500	0.045

Table A–1 (continued). Floodplain

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
SHP01	0939	SL	3/7/2006	0001	<0.1	2.5	27	0.16	6.2	3100	0.056
SHP01	0939	SL	9/12/2006	0001	<0.1	0.07	0.1	0.00066	0.69	180	0.0029
SHP01	0939	SL	3/7/2007	0001	<0.1	2.3	14	0.13	6.6	4000	0.088
SHP01	0939	SL	9/12/2007	0001	<0.1	0.033	0.014	0.00057	0.64	100	0.0014
SHP01	0939	SL	3/3/2008	0001	<0.1	0.027	0.41	0.001	0.53	120	0.0016
SHP01	0939	SL	9/9/2008	N001	<0.1	0.071	0.18	0.0011	0.81	150	0.0021
SHP01	0940	SL	3/3/2003	0001	0.282	0.0724	2.2589	0.0014	1.18	330	0.0177
SHP01	0940	SL	8/26/2003	0001	<0.00419	0.0018	0.3908	0.00064	0.99	190	0.0032
SHP01	0940	SL	3/2/2004	0001	0.12	0.032	2.1	0.001	1.3	280	0.013
SHP01	0940	SL	9/14/2004	0001	<0.1	0.0041	0.09	0.00053	0.82	140	0.0014
SHP01	0940	SL	3/1/2005	0001	<0.1	0.01	0.81	0.0012	1	180	0.0037
SHP01	0940	SL	9/20/2005	0001	<0.1	0.015	0.034	0.00051	0.89	170	0.0022
SHP01	0940	SL	3/14/2006	0001	<0.1	0.022	0.27	0.00058	0.89	180	0.0023
SHP01	0940	SL	9/13/2006	0001	<0.1	0.002	0.42	0.00024	0.74	120	0.0016
SHP01	0940	SL	3/6/2007	0001	<0.1	0.01	0.46	0.00083	0.77	160	0.0022
SHP01	0940	SL	9/12/2007	0001	<0.1	0.0012	0.22	0.00037	0.59	98	0.001
SHP01	0940	SL	3/4/2008	0001	<0.1	0.006	0.19	0.00044	0.47	76	0.00095
SHP01	0940	SL	9/9/2008	N001	<0.1	0.073	0.29	0.00079	0.73	130	0.0017
SHP01	0940	SL	3/9/2009	0001	<0.1	0.016	0.36	0.001	0.81	150	0.0017
SHP01	0940	SL	9/17/2009	0001	<0.1	<0.0046	0.46	0.00061	0.78	130	0.0012
SHP01	0940	SL	9/17/2009	N001	<0.1	0.18	0.36	0.00048	0.89	130	0.0024
SHP01	0940	SL	3/25/2010	0001	<0.1	0.0055	0.55	0.0011	0.86	150	0.0019
SHP01	0940	SL	3/25/2010	N001	<0.1	0.64	0.53	0.0014	0.96	150	0.0027
SHP01	0940	SL	8/31/2010	0001	<0.1	0.0035	0.34	0.00056	0.68	110	0.0015
SHP01	0940	SL	8/31/2010	N001	<0.1	0.19	0.33	0.00062	0.74	110	0.0016
SHP01	0940	SL	3/25/2011	0001	<0.0453	0.0305	0.325	<0.0015	0.819	136	0.00187
SHP01	0940	SL	3/25/2011	N001	<0.0417	0.0601	0.328	<0.0015	0.814	137	0.00188
SHP01	0940	SL	9/15/2011	0002	<0.1	0.0048	0.74	0.00089	0.65	150	0.0018
SHP01	0940	SL	9/15/2011	N001	<0.1	2.3	0.71	0.0063	2.1	150	0.0097
SHP01	0956	SL	3/4/2003	0001	0.199	0.027	1.003	0.0018	1.17	330	0.0037
SHP01	0956	SL	8/26/2003	0001	0.0327	0.0026	0.6099	0.00065	0.972	213	0.003
SHP01	0956	SL	3/3/2004	0001	0.16	0.01	1	0.00084	1.2	220	0.0026
SHP01	0956	SL	9/16/2004	0001	<0.1	0.0062	0.17	0.00076	0.87	160	0.0016
SHP01	0956	SL	3/2/2005	0001	<0.1	0.0054	0.55	0.001	1	180	0.0014
SHP01	0956	SL	9/20/2005	0001	<0.1	0.023	0.02	0.00063	0.92	180	0.002
SHP01	0956	SL	3/16/2006	0001	<0.1	0.028	0.16	0.00057	0.9	180	0.0019

Table A–1 (continued). Floodplain

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
SHP01	0956	SL	9/13/2006	0001	<0.1	0.0034	0.38	0.00021	0.74	120	0.0015
SHP01	0956	SL	3/6/2007	0001	<0.1	0.0076	0.35	0.00079	0.77	150	0.0016
SHP01	0956	SL	9/13/2007	0001	<0.1	0.0035	0.21	0.0005	0.57	99	0.0011
SHP01	0956	SL	3/4/2008	0001	<0.1	0.01	0.17	0.00051	0.46	78	0.00094
SHP01	0956	SL	9/9/2008	N001	<0.1	0.091	0.23	0.00074	0.73	120	0.0017
SHP01	0956	SL	3/12/2009	0001	<0.1	0.021	0.45	0.0011	0.85	150	0.0017
SHP01	0956	SL	9/17/2009	0001	<0.1	<0.0062	0.44	0.00057	0.77	130	0.0018
SHP01	0956	SL	9/17/2009	N001	<0.1	0.5	0.37	0.00049	0.98	120	0.0036
SHP01	0956	SL	3/26/2010	0001	<0.1	0.01	0.49	0.00098	0.84	140	0.0017
SHP01	0956	SL	3/26/2010	N001	<0.1	0.29	0.47	0.0011	0.86	140	0.0021
SHP01	0956	SL	9/2/2010	0001	<0.1	0.0038	0.3	0.00057	0.7	110	0.0013
SHP01	0956	SL	9/2/2010	N001	<0.1	0.1	0.31	0.00053	0.73	110	0.0014
SHP01	0956	SL	3/22/2011	0001	<0.0358	0.00728	0.35	<0.0015	0.784	138	0.0017
SHP01	0956	SL	3/22/2011	N001	<0.0432	0.0657	0.348	<0.0015	0.802	137	0.00163
SHP01	0956	SL	9/13/2011	0002	<0.1	0.016	0.53	0.00064	0.71	130	0.002
SHP01	0956	SL	9/13/2011	N001	<0.1	1.7	0.43	0.0037	1.5	130	0.0081
SHP01	0957	SL	9/15/2004	0001	<0.1	0.0031	0.19	0.00059	0.8	150	0.0015
SHP01	0957	SL	3/2/2005	0001	<0.1	0.0038	0.59	0.0011	1	190	0.0016
SHP01	0957	SL	9/21/2005	0001	<0.1	0.0098	<0.01	0.00063	0.9	170	0.0019
SHP01	0957	SL	3/7/2006	0001	<0.1	0.022	1.3	0.00061	0.95	180	0.0022
SHP01	0957	SL	9/12/2006	0001	<0.1	0.0064	0.38	0.00033	0.7	110	0.0016
SHP01	0959	SL	3/4/2003	0001	0.0322	0.0733	55.3422	0.16	7.39	4650	0.0766
SHP01	0959	SL	8/27/2003	0001	0.0169	0.0045	28.6876	0.106	7.23	4550	0.0725
SHP01	0959	SL	9/14/2004	0001	<0.1	0.0057	4.1	0.024	6.3	3800	0.047
SHP01	0959	SL	3/1/2005	0001	<0.1	1.7	5.2	0.027	6.2	2900	0.033
SHP01	0959	SL	3/15/2006	0001	<0.1	0.053	5.7	0.026	5.8	2800	0.039
SHP01	0959	SL	9/12/2006	0001	<0.1	0.0049	0.24	0.00049	0.62	170	0.0027
SHP01	0959	SL	3/7/2007	0001	<0.1	1.8	4.1	0.022	6.5	3400	0.054
SHP01	0959	SL	3/4/2008	0001	<0.1	0.029	0.54	0.0013	0.54	110	0.0014
SHP01	0959	SL	3/12/2009	N001	<0.1	0.038	51	0.12	7.4	3500	0.072
SHP01	0965	SL	3/4/2003	0001	0.213	0.061	0.9555	0.0018	1.23	357	0.0034
SHP01	0965	SL	8/27/2003	0001	<0.00419	0.011	0.3501	0.00054	0.933	173	0.0022
SHP01	0965	SL	3/3/2004	0001	0.12	0.021	1	0.00079	1.2	230	0.0028
SHP01	0965	SL	9/16/2004	0001	<0.1	0.0093	0.19	0.00064	0.86	160	0.0015
SHP01	0965	SL	2/28/2005	0001	0.81	0.005	0.7	0.0013	1	190	0.002
SHP01	0965	SL	9/22/2005	0001	<0.1	0.012	<0.01	0.00063	0.85	150	0.0017

Table A–1 (continued). Floodplain

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
SHP01	0965	SL	3/16/2006	0001	<0.1	0.031	0.16	0.00058	0.9	180	0.002
SHP01	0965	SL	9/13/2006	0001	<0.1	0.0043	0.38	0.00024	0.73	120	0.0015
SHP01	0965	SL	3/6/2007	0001	<0.1	0.0077	0.36	0.0008	0.76	150	0.0017
SHP01	0965	SL	9/13/2007	0001	<0.1	0.0032	0.21	0.00047	0.59	100	0.0012
SHP01	0965	SL	3/4/2008	0001	<0.1	0.0042	0.18	0.00057	0.47	75	0.00096
SHP01	0965	SL	9/9/2008	N001	<0.1	0.094	0.25	0.00071	0.73	120	0.0017
SHP01	0965	SL	3/12/2009	0001	<0.1	0.016	0.49	0.0011	0.86	160	0.0018
SHP01	0965	SL	9/17/2009	0001	<0.1	0.0098	0.46	0.00058	0.78	120	0.0022
SHP01	0965	SL	9/17/2009	N001	<0.1	0.17	0.46	0.00056	0.86	130	0.0028
SHP01	0965	SL	3/26/2010	0001	<0.1	0.01	0.49	0.0011	0.85	150	0.0018
SHP01	0965	SL	3/26/2010	N001	<0.1	0.46	0.57	0.0012	0.93	150	0.0024
SHP01	0965	SL	9/2/2010	0001	<0.1	0.0048	0.3	0.00052	0.71	110	0.0013
SHP01	0965	SL	9/2/2010	N001	<0.1	0.12	0.3	0.00053	0.72	110	0.0014
SHP01	0965	SL	3/22/2011	0001	<0.0297	0.00673	0.417	<0.0015	0.814	139	0.00179
SHP01	0965	SL	3/22/2011	N001	<0.0492	0.0578	0.354	<0.0015	0.83	136	0.00179
SHP01	0965	SL	9/13/2011	0002	<0.1	0.012	0.55	0.00071	0.69	130	0.0019
SHP01	0965	SL	9/13/2011	N001	<0.1	1.8	0.54	0.0038	1.5	130	0.0087
SHP01	1203	SL	8/25/2003	0001	0.0434	0.0028	0.5805	0.00089	0.988	209	0.0031
SHP01	1203	SL	2/28/2005	0001	<0.1	0.0028	0.69	0.0012	1	190	0.002
SHP01	1203	SL	9/20/2005	0001	<0.1	0.01	<0.01	0.00052	0.85	160	0.0018
SHP01	1203	SL	3/9/2006	0001	<0.1	0.02	0.71	0.00068	0.91	180	0.0019
SHP01	1203	SL	9/12/2006	0001	<0.1	0.0044	0.41	0.00029	0.71	110	0.0016
SHP01	1203	SL	3/6/2007	0001	<0.1	0.0068	0.44	0.00088	0.76	150	0.0015
SHP01	1203	SL	9/11/2007	0001	<0.1	0.0028	0.2	0.00044	0.59	96	0.0011
SHP01	1203	SL	3/5/2008	0001	<0.1	0.0048	0.19	0.00048	0.45	74	0.00088
SHP01	1203	SL	9/9/2008	N001	<0.1	0.076	0.4	0.00072	0.72	130	0.0016
SHP01	1203	SL	3/9/2009	0001	<0.1	0.013	0.43	0.001	0.83	150	0.0017
SHP01	1203	SL	9/15/2009	0001	<0.1	0.02	0.62	0.00069	0.73	130	0.0018
SHP01	1203	SL	9/15/2009	N001	<0.1	0.47	0.55	0.00076	0.92	130	0.0035
SHP01	1203	SL	3/23/2010	0001	<0.1	0.017	0.53	0.0011	0.89	160	0.002
SHP01	1203	SL	3/23/2010	N001	<0.1	0.28	0.66	0.0017	0.91	160	0.0024
SHP01	1203	SL	9/1/2010	0001	<0.1	0.0021	0.34	0.00054	0.7	110	0.0013
SHP01	1203	SL	9/1/2010	N001	<0.1	0.28	0.32	0.00066	0.76	110	0.0015
SHP01	1203	SL	3/22/2011	0001	<0.016	0.0183	0.369	<0.0015	0.741	147	0.00165
SHP01	1203	SL	3/22/2011	N001	<0.0553	0.0847	0.362	<0.0015	0.746	147	0.0019
SHP01	1203	SL	9/13/2011	0002	<0.1	0.059	0.58	0.00078	0.7	130	0.0021

Table A–1 (continued). Floodplain

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
SHP01	1203	SL	9/13/2011	N001	<0.1	1.8	0.6	0.0037	1.5	130	0.0081
SHP01	1205	SL	3/3/2003	0001	0.229	0.0177	0.646	0.0014	1.1	235	0.0031
SHP01	1205	SL	8/26/2003	0001	0.108	0.00099	0.3479	0.00062	0.975	177	0.0022
SHP01	1205	SL	3/2/2004	0001	0.18	0.0081	1	0.00086	1.1	210	0.0027
SHP01	1205	SL	9/14/2004	0001	<0.1	0.014	0.2	0.00056	0.84	140	0.0014
SHP01	1205	SL	2/28/2005	0001	<0.1	0.0022	0.68	0.0012	1	180	0.002
SHP01	1205	SL	9/20/2005	0001	<0.1	0.015	0.025	0.00044	0.89	170	0.0018
SHP01	1205	SL	3/9/2006	0001	<0.1	0.018	1.5	0.00066	0.92	190	0.0019
SHP01	1205	SL	9/12/2006	0001	<0.1	0.0028	0.37	0.00023	0.7	110	0.0015
SHP01	1205	SL	3/6/2007	0001	<0.1	0.0039	0.44	0.00084	0.75	150	0.0016
SHP01	1205	SL	9/12/2007	0001	<0.1	0.001	0.24	0.00048	0.6	100	0.0011
SHP01	1205	SL	3/5/2008	0001	<0.1	0.0029	0.18	0.00059	0.45	74	0.00088
SHP01	1205	SL	9/9/2008	N001	<0.1	0.083	0.31	0.00068	0.71	120	0.0016
SHP01	1205	SL	3/9/2009	0001	<0.1	0.011	0.39	0.0011	0.82	150	0.0017
SHP01	1205	SL	9/16/2009	0001	<0.1	0.04	0.85	0.00082	0.65	130	0.0025
SHP01	1205	SL	9/16/2009	N001	<0.1	3.3	0.77	0.00085	2.4	140	0.016
SHP01	1205	SL	3/24/2010	0001	<0.1	0.0086	0.47	0.0011	0.85	140	0.0019
SHP01	1205	SL	3/24/2010	N001	<0.1	0.27	0.54	0.0023	0.84	150	0.0023
SHP01	1205	SL	9/2/2010	0001	0.1	0.0028	0.3	0.00054	0.69	110	0.0013
SHP01	1205	SL	9/2/2010	N001	<0.1	0.12	0.3	0.00062	0.72	110	0.0014
SHP01	1205	SL	3/23/2011	0001	<0.0302	0.00501	0.388	<0.0015	0.727	142	0.00173
SHP01	1205	SL	3/23/2011	N001	<0.0346	0.126	0.379	<0.0015	0.796	144	0.00183
SHP01	1205	SL	9/15/2011	0001	<0.1	0.15	1.5	0.0016	0.5	180	0.0036
SHP01	1205	SL	9/15/2011	N001	<0.1	6.6	1.5	0.015	4.8	190	0.029

Table A–2. Terrace

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
SHP02	0600	WL	9/11/2007	0001	130	0.69	160	0.0015	7.5	8900	1.1
SHP02	0600	WL	9/17/2008	N001	49	0.24	100	0.0019	7.9	11000	0.71
SHP02	0600	WL	3/23/2010	N001	28	0.27	75	0.0017	7.8	9900	0.78
SHP02	0600	WL	9/2/2010	N001	26	0.25	83	0.0019	8.2	10000	0.63
SHP02	0600	WL	3/24/2011	N001	10.8	0.24	84.8	<0.015	8.63	18700	0.76
SHP02	0600	WL	9/14/2011	N001	25	0.24	91	0.0021	7.9	10000	0.71
SHP02	0602	WL	9/11/2007	0001	290	1.7	19	0.0056	11	17000	0.7
SHP02	0602	WL	9/10/2008	N001	380	1.6	28	0.009	12	18000	0.66
SHP02	0602	WL	9/15/2009	N001	330	1.8	15	0.0071	12	16000	0.68
SHP02	0602	WL	3/24/2010	N001	310	1.7	13	0.0083	11	16000	0.57
SHP02	0602	WL	9/1/2010	N001	150	1.6	17	0.0084	11	18000	0.53
SHP02	0602	WL	3/25/2011	N001	323	1.79	5.17	<0.0015	12.6	15100	0.451
SHP02	0602	WL	9/14/2011	N001	120	1.3	26	0.0077	11	16000	0.5
SHP02	0603	WL	9/11/2007	0001	750	25	780	0.087	2.4	3100	0.0077
SHP02	0603	WL	9/18/2008	N001	880	27	1500	0.09	3.2	3000	0.0073
SHP02	0603	WL	3/12/2009	N001	920	55	2000	0.087	4.7	3000	0.0065
SHP02	0603	WL	9/15/2009	N001	870	55	1800	0.083	4.6	2600	0.0068
SHP02	0603	WL	3/23/2010	N001	830	58	1700	0.097	4.4	2600	0.006
SHP02	0603	WL	8/31/2010	N001	800	57	1800	0.098	4.5	2800	0.008
SHP02	0603	WL	3/23/2011	N001	834	53.4	2100	0.0944	4.99	2810	0.00976
SHP02	0603	WL	9/14/2011	N001	780	49	1700	0.084	4.8	2600	0.0082
SHP02	0604	WL	9/16/2009	0001	0.28	0.61	1200	0.27	18	11000	0.096
SHP02	0604	WL	3/24/2010	0001	0.13	0.73	1200	0.38	17	11000	0.077
SHP02	0604	WL	8/31/2010	0001	1.6	0.77	1200	0.65	17	11000	0.085
SHP02	0604	WL	3/25/2011	0001	5.94	0.773	1590	0.937	19	10800	0.0977
SHP02	0604	WL	9/15/2011	0001	4.7	0.77	1000	1	17	12000	0.089
SHP02	0648	WL	3/5/2003	0001	0.502	0.0914	0.0416	<0.0001	11.3	1870	<0.00035
SHP02	0648	WL	3/3/2005	0001	0.44	0.086	<0.01	0.00023	12	2000	<0.000041
SHP02	0648	WL	3/8/2007	0001	0.48	0.086	<0.01	0.00077	11	2000	<0.000065
SHP02	0648	WL	3/12/2009	N001	0.49	0.084	<0.01	<0.000037	12	2200	<0.000029
SHP02	0648	WL	3/23/2011	N001	0.457	0.085	<0.01	<0.0015	12.1	1810	<0.000067
SHP02	0725	WL	9/13/2007	0001	<0.1	0.51	7.6	0.0061	9.7	3500	0.099
SHP02	0725	WL	9/17/2008	N001	<0.1	0.61	4.9	0.0063	9.8	3800	0.082
SHP02	0725	WL	3/11/2009	N001	<0.1	0.03	2.3	0.0065	10	2800	0.062

Table A–2 (continued). Terrace

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
SHP02	0725	WL	9/16/2009	N001	<0.1	0.44	0.37	0.0025	12	3300	0.083
SHP02	0725	WL	3/24/2010	N001	<0.1	0.088	8	0.019	11	3100	0.056
SHP02	0725	WL	9/2/2010	N001	<0.1	0.54	8.5	0.01	12	3600	0.077
SHP02	0725	WL	3/24/2011	N001	0.059	0.0536	70.3	0.0322	15	3020	0.175
SHP02	0725	WL	9/14/2011	N001	0.63	0.2	7	0.0056	8.6	2800	0.1
SHP02	0726	WL	9/13/2007	0001	2	0.1	27	0.004	6.5	6200	0.032
SHP02	0726	WL	9/18/2008	N001	0.83	0.32	7.1	0.013	6.8	5600	0.02
SHP02	0726	WL	3/11/2009	N001	0.34	0.61	2.2	0.0028	6.4	5200	0.022
SHP02	0726	WL	9/14/2009	N001	1.4	0.38	8.2	0.0018	6.3	6100	0.023
SHP02	0726	WL	3/24/2010	N001	0.11	0.59	6.6	0.025	6.1	4800	0.019
SHP02	0726	WL	8/30/2010	N001	0.14	0.59	11	0.051	6.3	5000	0.021
SHP02	0726	WL	3/24/2011	N001	1.42	0.475	4.84	0.00751	7.08	5170	0.0252
SHP02	0726	WL	9/13/2011	N001	1.7	0.38	12	0.012	5.5	5000	0.023
SHP02	0727	WL	9/18/2008	N001	12	1.4	180	0.002	11	12000	0.29
SHP02	0727	WL	3/11/2009	0001	0.59	1	150	0.0012	12	12000	0.27
SHP02	0727	WL	9/16/2009	N001	0.13	1.1	180	0.0024	12	12000	0.23
SHP02	0727	WL	3/24/2010	N001	1.8	1.3	130	0.0017	11	11000	0.27
SHP02	0727	WL	9/1/2010	N001	31	1.2	92	0.0018	11	11000	0.29
SHP02	0727	WL	3/21/2011	N001	23.4	1.19	148	<0.0015	12	10500	0.269
SHP02	0727	WL	9/14/2011	N001	7	0.99	98	0.0044	12	11000	0.2
SHP02	0728	WL	9/11/2007	0001	130	0.88	48	0.0017	6.8	5200	0.32
SHP02	0728	WL	9/17/2008	N001	220	1.8	500	0.0027	9.9	8600	0.38
SHP02	0728	WL	3/10/2009	N001	97	1.3	200	0.0016	7	4900	0.27
SHP02	0728	WL	9/16/2009	0001	100	1	180	0.0054	6.3	4500	0.27
SHP02	0728	WL	3/24/2010	N001	74	1	150	0.004	5.4	3800	0.22
SHP02	0728	WL	9/1/2010	N001	69	0.93	120	0.0057	5.1	4100	0.21
SHP02	0728	WL	3/22/2011	N001	70	1.14	154	<0.0015	6.25	4250	0.264
SHP02	0728	WL	9/13/2011	N001	99	1.3	180	0.0025	6.9	5200	0.27
SHP02	0730	WL	3/4/2004	0001	91	20	98	0.013	2.7	2100	0.00056
SHP02	0730	WL	3/3/2005	0001	93	22	120	0.012	2.6	2100	0.0039
SHP02	0730	WL	9/21/2005	0001	77	18	110	0.0097	2.5	2100	0.0045
SHP02	0730	WL	3/6/2006	0001	83	20	130	0.0098	2.8	2000	0.0049
SHP02	0730	WL	9/14/2006	0001	100	21	150	0.0092	2.6	2000	0.0048
SHP02	0730	WL	3/7/2007	0001	68	19	130	0.011	2.7	1900	0.0056
SHP02	0730	WL	9/11/2007	0001	80	20	160	0.0087	2.8	2000	0.0063
SHP02	0730	WL	3/4/2008	N001	73	20	170	0.0076	3.1	1900	0.0072

Table A–2 (continued). Terrace

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
SHP02	0730	WL	9/10/2008	0001	83	21	190	0.0086	3.1	2100	0.0063
SHP02	0730	WL	3/23/2011	N001	50.5	24.9	270	0.0107	3.47	1790	0.00766
SHP02	0730	WL	9/13/2011	0001	54	26	180	0.011	3.2	1900	0.0037
SHP02	0731	WL	9/11/2007	0001	32	0.23	140	0.013	8.7	5100	0.049
SHP02	0731	WL	9/18/2008	N001	46	0.14	120	0.021	8.2	5100	0.035
SHP02	0731	WL	3/10/2009	N001	32	0.14	140	0.02	8.3	4600	0.036
SHP02	0731	WL	9/15/2009	N001	27	0.2	150	0.015	8.9	4800	0.041
SHP02	0731	WL	3/24/2010	N001	32	0.089	170	0.075	7.7	4000	0.03
SHP02	0731	WL	8/31/2010	N001	18	0.045	160	0.25	6.7	3800	0.018
SHP02	0731	WL	3/24/2011	N001	10.9	0.0206	44.7	0.03	6.32	4510	0.0175
SHP02	0731	WL	9/14/2011	N001	18	0.096	65	0.017	7.1	4300	0.023
SHP02	0812	WL	9/11/2007	0001	<0.1	0.26	1400	4.9	13	16000	0.13
SHP02	0812	WL	9/11/2008	N001	<0.1	0.29	1500	5.3	14	17000	0.14
SHP02	0812	WL	3/11/2009	0001	<0.1	<0.0048	1500	5.5	15	16000	0.14
SHP02	0812	WL	9/16/2009	0001	<0.1	0.18	1400	5.5	14	16000	0.14
SHP02	0812	WL	3/24/2010	N001	<0.1	0.23	1500	5.6	13	16000	0.13
SHP02	0812	WL	8/31/2010	0001	<0.1	0.24	1500	5.6	13	16000	0.13
SHP02	0812	WL	3/24/2011	0001	<0.112	0.0901	1430	5.53	15.8	15200	0.139
SHP02	0812	WL	9/13/2011	N001	<0.1	0.022	1300	6.1	14	17000	0.13
SHP02	0813	WL	9/11/2007	0001	71	0.35	2300	0.039	17	10000	0.13
SHP02	0813	WL	9/11/2008	N001	56	0.85	2500	0.058	17	11000	0.12
SHP02	0813	WL	3/11/2009	N001	81	0.31	2600	0.038	20	10000	0.14
SHP02	0813	WL	9/15/2009	N001	59	0.56	2300	0.045	18	11000	0.13
SHP02	0813	WL	3/24/2010	N001	76	0.71	2300	0.072	17	10000	0.11
SHP02	0813	WL	8/31/2010	N001	57	0.71	2300	0.1	17	11000	0.12
SHP02	0813	WL	3/23/2011	N001	42.5	0.333	2400	0.0146	19.3	9780	0.152
SHP02	0813	WL	9/13/2011	N001	41	0.47	1600	0.057	17	8900	0.11
SHP02	0814	WL	9/12/2007	0001	40	1.3	970	2.1	12	14000	0.12
SHP02	0814	WL	9/17/2008	N001	59	1.3	980	1.9	13	14000	0.1
SHP02	0814	WL	9/16/2009	0001	67	1.2	910	2	12	13000	0.096
SHP02	0814	WL	3/24/2010	0001	140	1.4	930	1.9	12	13000	0.082
SHP02	0814	WL	8/31/2010	0001	160	1.4	960	2.3	12	14000	0.085
SHP02	0814	WL	3/22/2011	0001	92.9	1.38	885	2.09	13.5	12500	0.0919
SHP02	0814	WL	9/14/2011	0001	54	1.1	710	2.2	13		0.09
SHP02	0815	WL	9/11/2007	0001	<0.1	1.2	560	0.054	11	15000	0.33
SHP02	0815	WL	9/18/2008	N001	<0.1	1.4	800	0.048	12	16000	0.38

Table A–2 (continued). Terrace

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
SHP02	0815	WL	3/11/2009	N001	<0.1	1.3	680	0.06	12	15000	0.38
SHP02	0815	WL	9/16/2009	N001	<0.1	1.4	660	0.042	13	15000	0.37
SHP02	0815	WL	3/24/2010	N001	<0.1	1.4	600	0.039	12	15000	0.31
SHP02	0815	WL	9/1/2010	N001	0.12	1.4	720	0.032	12	15000	0.34
SHP02	0815	WL	3/22/2011	N001	0.575	1.42	888	0.018	13.4	13300	0.304
SHP02	0815	WL	9/13/2011	N001	0.77	1.4	660	0.025	13	15000	0.36
SHP02	0816	WL	9/12/2007	0001	<0.1	<0.00015	24	0.015	0.75	700	0.014
SHP02	0816	WL	9/17/2008	N001	<0.1	<0.001	61	0.026	3.9	3000	0.033
SHP02	0816	WL	3/12/2009	N001	<0.1	<0.0013	40	0.027	3.9	2600	0.032
SHP02	0816	WL	9/16/2009	N001	0.11	<0.00052	43	0.03	4	2700	0.029
SHP02	0816	WL	3/24/2010	N001	<0.1	0.00086	36	0.022	2.7	2200	0.021
SHP02	0816	WL	9/1/2010	N001	<0.1	0.00059	24	0.013	1.1	1100	0.014
SHP02	0816	WL	3/23/2011	N001	<0.0543	<0.002	16.1	0.0156	1.94	1510	0.0162
SHP02	0816	WL	9/13/2011	N001	<0.1	<0.0019	18	0.017	2.3	1500	0.018
SHP02	0817	WL	3/4/2003	0001	573.758	2.04	740.9081	0.002	11.3	8600	10.3
SHP02	0817	WL	8/27/2003	0001	799.6894	2.07	641.518	0.002	11.5	10900	8.78
SHP02	0817	WL	3/3/2004	0001	700	1.8	670	0.0022	12	10000	10
SHP02	0817	WL	9/17/2004	0001	860	2	490	0.0031	11	10000	8.1
SHP02	0817	WL	3/3/2005	0001	760	2.1	670	0.0025	11	11000	9.4
SHP02	0817	WL	9/22/2005	0001	910	2.1	1400	0.0047	11	12000	8.1
SHP02	0817	WL	3/15/2006	0001	730	1.9	640	0.0028	11	9900	10
SHP02	0817	WL	9/14/2006	0001	960	2	500	0.0016	10	11000	7.6
SHP02	0817	WL	3/7/2007	0001	730	2	630	0.0066	11	9700	9.8
SHP02	0817	WL	9/12/2007	0001	480	1.8	610	0.0024	10	10000	9.3
SHP02	0817	WL	3/5/2008	N001	900	2.3	370	0.0044	12	14000	5.6
SHP02	0817	WL	9/10/2008	N001	860	2.1	390	0.0046	11	15000	3.9
SHP02	0817	WL	3/10/2009	N001	910	2.3	300	0.0041	12	14000	3.8
SHP02	0817	WL	9/15/2009	N001	960	2.1	510	0.003	11	11000	6.7
SHP02	0817	WL	3/25/2010	N001	1400	2.3	500	0.0031	11	12000	7.5
SHP02	0817	WL	9/1/2010	N001	1000	2.2	520	0.0031	11	12000	6.8
SHP02	0817	WL	3/25/2011	N001	1010	2.31	655	0.00561	11.6	11700	
SHP02	0817	WL	9/14/2011	0001	920	2.3	500	0.004	12	13000	7.2
SHP02	0818	WL	3/3/2003	0001	145.186	0.438	1682.855	3.68	14.6	10900	0.1
SHP02	0818	WL	3/1/2004	0001			1900			11000	0.14
SHP02	0818	WL	3/2/2005	0001			1800			12000	0.12
SHP02	0818	WL	9/21/2005	0001	120	0.45	1600	2.3	13	14000	0.13

Table A–2 (continued). Terrace

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
SHP02	0818	WL	3/14/2006	0001			1600			12000	0.15
SHP02	0818	WL	9/12/2006	0001	150		1700			11000	0.14
SHP02	0818	WL	3/8/2007	0001	130	0.61	1600	1.9	14	11000	0.13
SHP02	0818	WL	9/12/2007	0001	72	0.52	1500	2	13	12000	0.12
SHP02	0818	WL	3/4/2008	N001	140	0.53	1400	1.8	15	12000	0.12
SHP02	0818	WL	9/10/2008	N001	91	2.4	990	2.1	13	14000	0.13
SHP02	0818	WL	3/10/2009	N001	59	2.5	950	2.2	12	14000	0.14
SHP02	0818	WL	9/14/2009	N001	90	0.56	860	1.9	12	12000	0.097
SHP02	0818	WL	3/24/2010	N001	240	0.59	850	2.1	11	12000	0.095
SHP02	0818	WL	9/1/2010	N001	130	0.59	880	2.6	12	13000	0.11
SHP02	0818	WL	3/23/2011	N001	55.5	0.547	858	2.11	13.4	16200	0.115
SHP02	0818	WL	9/12/2011	N001	54	0.52	770	2.2	12	13000	0.11
SHP02	0819	WL	9/11/2007	0001	540	1.5	67	0.0039	8.7	12000	1.3
SHP02	0819	WL	9/10/2008	N001	620	1.5	77	0.054	8.9	12000	0.98
SHP02	0819	WL	3/10/2009	N001	460	2	42	0.019	9.8	13000	1.2
SHP02	0819	WL	9/15/2009	N001	2.5	1.4	11	0.01	9.6	13000	1.2
SHP02	0819	WL	3/24/2010	N001	910	2.1	130	0.075	8.1	8000	0.87
SHP02	0819	WL	9/1/2010	N001	510	1.7	37	0.013	8.9	12000	0.76
SHP02	0819	WL	3/25/2011	N001	520	1.91	56.5	0.0709	8.99	11600	0.913
SHP02	0819	WL	9/14/2011	N001	490	1.5	51	0.015	9.3	12000	1.4
SHP02	0820	WL	9/17/2008	0001	2.4	0.65	1.9	0.0014	23	6200	0.093
SHP02	0820	WL	9/15/2009	0001	1.5	0.9	0.12	0.0025	20	5000	0.093
SHP02	0820	WL	3/23/2010	N001	2.6	1.2	0.024	0.00048	19	4700	0.09
SHP02	0820	WL	9/2/2010	N001	3.5	1.3	0.053	0.001	19	4200	0.072
SHP02	0820	WL	3/25/2011	N001	4.73	1.6	0.131	<0.0375	20.8	4260	0.0732
SHP02	0820	WL	9/14/2011	N001	4	0.66	9	0.001	22	4600	0.059
SHP02	0822	WL	9/15/2009	N001	2.6	0.44	12	0.00094	17	5800	0.082
SHP02	0822	WL	3/23/2010	N001	1.3	0.39	14	0.00076	16	5900	0.083
SHP02	0822	WL	9/2/2010	N001	<0.1	0.37	12	0.0013	17	6100	0.088
SHP02	0824	WL	9/16/2009	0001	13	0.5	84	0.0022	19	5700	0.15
SHP02	0824	WL	3/23/2010	N001	5.4	0.18	260	0.003	13	5300	0.29
SHP02	0824	WL	9/2/2010	N001	3.6	0.21	200	0.0028	14	5500	0.27
SHP02	0824	WL	3/24/2011	N001	1.28	0.131	321	<0.0075	14.2	4880	0.319
SHP02	0824	WL	9/14/2011	N001	0.76	0.1	260	0.0023	13	4900	0.4
SHP02	0825	WL	9/16/2009	N001	7.8	0.84	1.9	0.00083	22	6400	0.048
SHP02	0825	WL	3/23/2010	N001	7.3	0.7	11	0.00071	20	6400	0.049

Table A–2 (continued). Terrace

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
SHP02	0825	WL	9/2/2010	N001	4	0.51	28	0.00098	20	6500	0.041
SHP02	0825	WL	3/24/2011	N001	2.45	0.432	29.1	<0.0015	20.6	5390	0.0304
SHP02	0825	WL	9/14/2011	N001	2.2	0.34	30	0.00082	18	5300	0.032
SHP02	0826	WL	9/11/2007	0001	100	2.5	40	0.0028	11	15000	3.5
SHP02	0826	WL	9/10/2008	N001	130	2.7	63	0.0042	12	16000	3.6
SHP02	0826	WL	3/10/2009	N001	120	2.9	49	0.0039	13	16000	3.8
SHP02	0826	WL	9/15/2009	N001	110	2.9	49	0.0039	13	15000	3.7
SHP02	0826	WL	3/24/2010	N001	99	2.8	47	0.0033	12	15000	3.3
SHP02	0826	WL	9/1/2010	N001	65	2.3	59	0.007	12	15000	3.5
SHP02	0826	WL	3/25/2011	N001	57	1.88	125	0.0428	13.3	13100	3.08
SHP02	0826	WL	9/14/2011	N001	58	1.6	100	0.044	11	13000	3.2
SHP02	0827	WL	9/11/2007	0001	9.7	0.53	13	0.012	8.6	8600	0.65
SHP02	0827	WL	9/17/2008	N001	12	0.76	19	0.018	11	10000	1
SHP02	0827	WL	3/10/2009	0001	3.3	0.27	29	0.064	9.5	8400	0.68
SHP02	0827	WL	9/16/2009	N001	22	1.2	18	0.015	11	11000	1.1
SHP02	0827	WL	3/23/2010	N001	2.7	0.33	22	0.048	9.3	8000	0.87
SHP02	0827	WL	9/2/2010	N001	7.7	1.4	18	0.024	9.9	9300	0.88
SHP02	0827	WL	3/25/2011	N001	2.79	0.14	266	0.0265	9.41	5990	0.978
SHP02	0827	WL	9/14/2011	N001	3.1	0.18	28	0.016	8.7	6200	0.93
SHP02	0828	WL	3/11/2009	N001	<0.1	<0.0002	48	0.069	4.5	1700	0.21
SHP02	0828	WL	9/17/2009	N001	<0.1	<0.00052	130	0.13	6.5	2300	0.58
SHP02	0828	WL	3/24/2010	N001	<0.1	0.031	100	0.098	5.7	2500	0.54
SHP02	0828	WL	9/1/2010	N001	0.17	0.54	73	0.063	5	2500	0.65
SHP02	0828	WL	3/25/2011	N001	<0.143	<0.002	177	0.0931	5.62	2600	0.79
SHP02	0828	WL	9/13/2011	N001	0.79	0.59	36	0.024	4.7	2200	0.89
SHP02	0830	WL	3/4/2004	0001	11	3.2	45	0.022	0.23	1700	0.0028
SHP02	0830	WL	3/2/2005	0001	1.6	1.5	21	0.022	0.25	1600	0.0056
SHP02	0830	WL	9/22/2005	0001	4	2.7	65	0.019	0.24	1800	0.012
SHP02	0830	WL	3/9/2006	0001	11	3.7	44	0.024	0.25	1700	0.0045
SHP02	0830	WL	9/13/2006	0001	16	3.5	130	0.033	0.26	1800	0.0094
SHP02	0830	WL	3/7/2007	0001	7	3.3	39	0.029	0.27	1600	0.0048
SHP02	0830	WL	9/10/2007	0001	15	4.4	63	0.028	0.38	1800	0.011
SHP02	0830	WL	3/5/2008	N001	1.3	1.6	33	0.022	0.34	1600	0.0039
SHP02	0830	WL	9/11/2008	N001	11	4.1	240	0.029	0.32	1900	0.0065
SHP02	0830	WL	3/10/2009	N001	2.6	5.6	93	0.03	0.31	1700	0.0089
SHP02	0830	WL	9/16/2009	N001	1.1	6.1	130	0.031	0.44	1700	0.014

Table A–2 (continued). Terrace

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
SHP02	0830	WL	3/23/2010	N001	0.1	2.1	33	0.024	0.23	1600	0.0041
SHP02	0830	WL	9/2/2010	N001	0.25	4.2	49	0.033	0.26	1900	0.0099
SHP02	0830	WL	3/24/2011	N001	0.542	2.88	43.7	0.0304	0.228	1680	0.00399
SHP02	0830	WL	9/15/2011	N001	0.45	4.1	110	0.029	0.33	1700	0.0092
SHP02	0832	WL	3/4/2003	0001	<0.00311	<0.0003	528.5747	3.66	9.23	11500	0.135
SHP02	0832	WL	8/27/2003	0001	0.0377	0.00066	589.564	3.26	9.4	12800	0.155
SHP02	0832	WL	3/2/2004	0001	<0.1	<0.0017	670	3.3	10	13000	0.17
SHP02	0832	WL	3/2/2004	0002	<0.0159	<0.00805	600	4.95	9.58	12400	0.164
SHP02	0832	WL	9/15/2004	0001	<0.1	0.04	670	4	9.7	12000	0.16
SHP02	0832	WL	3/3/2005	0001	<0.1	0.04	770	3.8	9.5	12000	0.16
SHP02	0832	WL	9/21/2005	0001	<0.1	<0.0034	800	3.8	8.6	14000	0.2
SHP02	0832	WL	3/8/2006	0001	<0.1	0.028	660	3.8	9.8	13000	0.17
SHP02	0832	WL	9/13/2007	0001	<0.1	0.18	680	4.1	12	11000	0.15
SHP02	0833	WL	9/13/2007	0001	<0.1	0.037	510	0.64	10	9200	0.26
SHP02	0833	WL	9/17/2008	N001	<0.1	0.032	490	0.43	10	9100	0.23
SHP02	0833	WL	3/12/2009	N001	<0.1	0.033	470	0.36	10	8800	0.25
SHP02	0833	WL	9/17/2009	N001	<0.1	0.043	370	0.29	8.9	7700	0.23
SHP02	0833	WL	3/25/2010	N001	<0.1	0.031	370	0.31	8.5	7300	0.19
SHP02	0833	WL	8/31/2010	N001	<0.1	0.024	360	0.35	8.4	7500	0.18
SHP02	0833	WL	3/22/2011	N001	0.099	<0.04	1260	0.455	8.34	6020	0.184
SHP02	0833	WL	9/14/2011	N001	<0.1	0.052	150	0.32	6.8	6100	0.18
SHP02	0835	WL	3/5/2003	0001	<0.00311	<0.0003	140.276	0.326	6.89	3000	0.0453
SHP02	0835	WL	8/27/2003	0001	<0.00419	0.00041	214.818	0.452	7.72	3490	0.0577
SHP02	0835	WL	3/2/2004	0001	<0.1	<0.00068	240	0.45	8.4	4200	0.078
SHP02	0835	WL	3/2/2004	0002	<0.0159	<0.00805	228	0.587	8.75	4110	0.0851
SHP02	0835	WL	9/15/2004	0001	<0.1	0.0027	200	0.4	7.5	4200	0.093
SHP02	0835	WL	3/3/2005	0001	<0.1	0.00066	100	0.21	6.4	4100	0.073
SHP02	0835	WL	9/22/2005	0001	<0.1	0.0016	55	0.11	5.1	3900	0.051
SHP02	0835	WL	3/8/2006	0001	<0.1	<0.00051	42	0.13	6	3600	0.05
SHP02	0835	WL	9/14/2006	0001	<0.1	0.016	53	0.16	4.9	3200	0.054
SHP02	0835	WL	3/8/2007	0001	<0.1	0.0018	68	0.23	5.7	3500	0.065
SHP02	0835	WL	9/13/2007	0001	<0.1	0.0058	88	0.26	5.9	3600	0.076
SHP02	0835	WL	3/3/2008	N001	<0.1	0.0047	110	0.27	6.3	3900	0.088
SHP02	0835	WL	9/11/2008	N001	<0.1	0.052	97	0.3	5.9	4100	0.08
SHP02	0835	WL	3/12/2009	N001	<0.1	<0.00071	79	0.28	6.2	3800	0.083
SHP02	0835	WL	9/17/2009	N001	<0.1	0.0011	91	0.29	5.6	3800	0.08

Table A–2 (continued). Terrace

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
SHP02	0835	WL	3/24/2010	N001	<0.1	0.0018	81	0.32	5.5	3900	0.073
SHP02	0835	WL	8/31/2010	N001	<0.1	<0.00057	83	0.35	5.4	4000	0.07
SHP02	0835	WL	3/22/2011	N001	<0.0498	<0.04	83	0.458	5.68	3610	0.0771
SHP02	0835	WL	9/14/2011	N001	<0.1	<0.0017	71	0.36	5.2	3700	0.07
SHP02	0836	WL	3/4/2003	0001	<0.00311	1.98	25.2993	0.231	5.97	2830	0.0489
SHP02	0836	WL	8/26/2003	0001	<0.00419	1.99	18.568	0.163	6.27	3020	0.0536
SHP02	0836	WL	9/15/2004	0001	<0.1	2	6.9	0.063	5.9	2900	0.064
SHP02	0836	WL	3/3/2005	0001	<0.1	2.1	5.8	0.052	5.9	2700	0.063
SHP02	0836	WL	9/22/2005	0001	<0.1	2.1	7.2	0.041	5.9	3000	0.069
SHP02	0836	WL	3/8/2006	0001	<0.1	2.1	7.2	0.085	6.1	2800	0.054
SHP02	0836	WL	9/14/2006	0001	<0.1	2.3	3.6	0.035	5.5	2700	0.069
SHP02	0836	WL	3/8/2007	0001	<0.1	2.2	9.7	0.091	5.9	2700	0.061
SHP02	0836	WL	9/11/2007	0001	<0.1	1.8	14	0.11	5.6	2800	0.053
SHP02	0836	WL	3/3/2008	N001	<0.1	2.5	15	0.099	6.1	2700	0.055
SHP02	0836	WL	9/17/2008	N001	<0.1	1.8	15	0.11	5.9	2900	0.044
SHP02	0836	WL	3/11/2009	N001	<0.1	2	14	0.12	6.3	2700	0.042
SHP02	0836	WL	9/17/2009	N001	<0.1	7.2	14	0.13	6.1	2600	0.041
SHP02	0836	WL	3/22/2010	N001	<0.1	2.5	20	0.16	6.1	2600	0.042
SHP02	0836	WL	8/31/2010	N001	<0.1	0.97	18	0.2	5.8	2700	0.041
SHP02	0836	WL	3/22/2011	N001	<0.0336	0.322	29	0.223	6.31	2730	0.0465
SHP02	0836	WL	9/13/2011	N001	<0.1	0.69	28	0.21	5.9	2500	0.043
SHP02	0837	WL	9/13/2007	0001	<0.1	3.7	3.7	0.099	4.9	2000	0.045
SHP02	0837	WL	9/16/2008	N001	<0.1	3.7	5.3	0.11	5.1	2100	0.04
SHP02	0837	WL	3/11/2009	0001	<0.1	3.6	5.9	0.14	5.4	2000	0.042
SHP02	0837	WL	9/17/2009	N001	<0.1	4.9	8.1	0.17	5.9	2300	0.045
SHP02	0837	WL	3/25/2010	N001	<0.1	4.7	6.6	0.25	6.3	2600	0.048
SHP02	0837	WL	8/31/2010	N001	<0.1	4.1	5.2	0.32	6	2700	0.055
SHP02	0837	WL	3/23/2011	N001	<0.109	4.04	9.12	0.363	6.92	2460	0.0597
SHP02	0837	WL	9/13/2011	N001	<0.1	4.7	8.8	0.2	5.7	2400	0.045
SHP02	0838	WL	3/4/2003	0001	<0.00311	0.0062	23.7181	0.167	4.88	1740	0.0317
SHP02	0838	WL	8/27/2003	0001	<0.00419	0.0328	29.817	0.184	4.99	1920	0.0327
SHP02	0838	WL	3/2/2004	0001	<0.1	0.035	32	0.2	4.6	1700	0.024
SHP02	0838	WL	9/15/2004	0001	<0.1	0.0049	34	0.19	4.2	1600	0.027
SHP02	0838	WL	3/3/2005	0001	<0.1	0.0043	37	0.23	4.4	1700	0.025
SHP02	0838	WL	9/21/2005	0001	<0.1	0.002	50	0.18	5	2200	0.035
SHP02	0838	WL	3/8/2006	0001	<0.1	<0.0038	62	0.35	6.3	2400	0.039

Table A–2 (continued). Terrace

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
SHP02	0838	WL	9/14/2006	0001	<0.1	0.012	76	0.41	6.1	2500	0.04
SHP02	0838	WL	3/8/2007	0001	<0.1	0.0015	99	0.47	7.3	2800	0.049
SHP02	0838	WL	9/13/2007	0001	<0.1	<0.00075	110	0.5	7.1	2900	0.047
SHP02	0838	WL	3/4/2008	N001	<0.1	0.017	130	0.48	7.9	3100	0.051
SHP02	0838	WL	9/16/2008	N001	<0.1	0.04	170	0.51	7.7	3400	0.042
SHP02	0838	WL	3/12/2009	N001	<0.1	0.0088	110	0.46	8.3	3000	0.045
SHP02	0838	WL	9/15/2009	N001	<0.1	0.016	110	0.42	7.7	3000	0.043
SHP02	0838	WL	3/25/2010	N001	<0.1	0.048	310	0.64	10	3700	0.068
SHP02	0838	WL	8/31/2010	N001	<0.1	0.062	440	0.93	11	5300	0.084
SHP02	0838	WL	3/22/2011	N001	<0.0923	<0.04	587	4.71	13.4	7080	0.138
SHP02	0838	WL	9/12/2011	N001	<0.1	0.053	590	0.98	13	8000	0.13
SHP02	0839	WL	3/5/2003	0001	74.767	0.935	539.869	0.0013	10.7	10700	0.563
SHP02	0839	WL	8/27/2003	0001	104.037	0.831	569.2342	0.0011	10.6	11600	0.691
SHP02	0839	WL	3/3/2004	0001	110	0.71	600	0.00099	10	12000	0.73
SHP02	0839	WL	9/17/2004	0001	89	0.83	590	0.0016	10	11000	0.68
SHP02	0839	WL	3/1/2005	0001	63	1.2	600	0.0011	11	11000	0.46
SHP02	0839	WL	9/22/2005	0001	69	1	600	0.0035	10	12000	0.6
SHP02	0839	WL	3/15/2006	0001	66	1.1	530	0.0013	11	11000	0.5
SHP02	0839	WL	9/13/2006	0001	41	1.2	460	0.00095	10	11000	0.41
SHP02	0839	WL	3/8/2007	0001	32	1.1	510	0.0068	11	11000	0.47
SHP02	0839	WL	9/11/2007	0001	44	1	550	0.0013	10	11000	0.41
SHP02	0841	WL	3/4/2003	0001	0.00598	0.0203	557.9399	3.29	8.18	13400	0.103
SHP02	0841	WL	8/27/2003	0001	<0.00419	0.0295	625.7059	3.04	8.19	13600	0.106
SHP02	0841	WL	3/2/2004	0001	<0.1	0.035	680	3.4	8.8	14000	0.12
SHP02	0841	WL	9/15/2004	0001	<0.1	0.029	670	3	7.6	13000	0.12
SHP02	0841	WL	3/3/2005	0001	<0.1	0.044	680	2.7	7.7	14000	0.1
SHP02	0841	WL	9/21/2005	0001	<0.1	0.025	740	3	7.2	14000	0.12
SHP02	0841	WL	3/7/2006	0001	<0.1	0.031	620	3.5	7.9	13000	0.11
SHP02	0841	WL	9/14/2006	0001	<0.1	0.014	660	3.5	8.1	14000	0.12
SHP02	0841	WL	3/8/2007	0001	<0.1	0.013	680	3.3	8.4	14000	0.14
SHP02	0841	WL	9/11/2007	0001	<0.1	0.017	640	3.4	7.8	15000	0.14
SHP02	0841	WL	3/4/2008	N001	<0.1	0.022	720	3.1	7.9	14000	0.13
SHP02	0841	WL	9/11/2008	N001	<0.1	0.015	920	3.3	8.5	16000	0.14
SHP02	0841	WL	3/10/2009	N001	<0.1	0.028	690	3.2	8.5	15000	0.14
SHP02	0841	WL	9/15/2009	N001	<0.1	0.093	690	3.1	9.3	15000	0.15
SHP02	0841	WL	3/24/2010	N001	<0.1	0.0096	690	3.4	9.1	16000	0.13

Table A–2 (continued). Terrace

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
SHP02	0841	WL	8/31/2010	N001	<0.1	0.068	670	4	8.4	16000	0.13
SHP02	0841	WL	3/22/2011	N001	0.108	<0.04	625	3.57	10	14300	0.142
SHP02	0843	WL	9/13/2007	0001	<0.1	2.3	26	0.22	5.2	2100	0.03
SHP02	0843	WL	9/16/2008	N001	<0.1	6	27	0.21	4.4	1800	0.023
SHP02	0843	WL	3/11/2009	N001	<0.1	2.7	25	0.22	5.2	1900	0.033
SHP02	0843	WL	9/17/2009	N001	<0.1	3	21	0.24	4.8	1900	0.029
SHP02	0843	WL	3/25/2010	N001	<0.1	1.7	19	0.24	4.6	1900	0.028
SHP02	0843	WL	8/31/2010	N001	<0.1	1.5	22	0.26	3.8	1700	0.022
SHP02	0843	WL	3/23/2011	N001	<0.121	1.04	7.95	0.136	3.42	1180	0.0238
SHP02	0843	WL	9/13/2011	N001	<0.1	1.6	5.7	0.18	4.1	1600	0.027
SHP02	0844	WL	9/13/2007	0001	<0.1	<0.0015	650	1.8	11	8400	0.15
SHP02	0844	WL	9/16/2008	N001	<0.1	<0.002	710	1.8	12	9700	0.15
SHP02	0844	WL	3/12/2009	N001	<0.1	0.016	750	1.8	13	9300	0.16
SHP02	0844	WL	9/17/2009	N001	0.31	0.013	740	1.7	12	9400	0.2
SHP02	0844	WL	3/25/2010	N001	0.1	0.016	700	1.9	12	9400	0.17
SHP02	0844	WL	8/31/2010	N001	<0.1	0.0075	800	1.9	12	9400	0.16
SHP02	0844	WL	3/22/2011	N001	0.046	<0.04	794	1.84	14	8740	0.181
SHP02	0844	WL	9/12/2011	N001	<0.1	0.011	700	1.6	13	9300	0.17
SHP02	0846	WL	3/4/2003	0001	0.0554	0.0566	38.1748	0.386	5.33	2750	0.034
SHP02	0846	WL	8/26/2003	0001	<0.00419	0.0006	23.2663	0.243	4.37	2150	0.0324
SHP02	0846	WL	3/3/2004	0001	<0.1	0.039	27	0.25	5.5	2600	0.032
SHP02	0846	WL	9/15/2004	0001	<0.1	0.0029	19	0.2	4.1	2000	0.029
SHP02	0846	WL	3/3/2005	0001	<0.1	0.033	23	0.25	4.9	2400	0.028
SHP02	0846	WL	9/21/2005	0001	<0.1	<0.00019	17	0.11	4	2000	0.033
SHP02	0846	WL	3/8/2006	0001	<0.1	<0.00011	17	0.26	5.1	2500	0.033
SHP02	0846	WL	9/14/2006	0001	<0.1	<0.00036	15	0.15	4.9	2300	0.033
SHP02	0846	WL	3/8/2007	0001	<0.1	0.0026	21	0.18	4.2	2000	0.033
SHP02	0846	WL	9/13/2007	0001	<0.1	0.0025	28	0.21	3.9	2000	0.032
SHP02	0846	WL	3/3/2008	N001	<0.1	0.0026	33	0.28	4.6	2100	0.036
SHP02	0846	WL	9/11/2008	N001	<0.1	0.018	47	0.34	4.6	2300	0.035
SHP02	0846	WL	3/10/2009	0001	<0.1	<0.0024	56	0.37	4.9	2300	0.036
SHP02	0846	WL	9/17/2009	0001	<0.1	0.003	58	0.36	5.1	2200	0.036
SHP02	0846	WL	3/25/2010	0001	<0.1	0.0019	22	0.21	4.7	2200	0.029
SHP02	0846	WL	8/31/2010	0001	<0.1	0.0049	38	0.34	4.7		0.039
SHP02	0848	WL	9/11/2007	0001	8	3.1	<0.05	0.035	17	16000	0.028
SHP02	0848	WL	9/16/2008	0001	13	3.1	0.037	0.044	20	17000	0.024

Table A–2 (continued). Terrace

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
SHP02	0848	WL	3/10/2009	N001	3.2	3.1	0.24	0.041	20	16000	0.024
SHP02	0848	WL	9/15/2009	N001	2.8	2.9	0.034	0.045	18	16000	0.026
SHP02	0848	WL	3/25/2010	N001	3.4	3.3	<0.01	0.052	20	16000	0.023
SHP02	0848	WL	8/31/2010	N001	3.9	2.8	0.014	0.054	18	16000	0.021
SHP02	0848	WL	3/23/2011	N001	9.48	3.03	<0.01	0.089	20	14900	0.0224
SHP02	0848	WL	9/14/2011	N001	9.9	2.8	0.02	0.045	19	16000	0.021
SHP02	1007	WL	9/13/2007	0001	24	1.5	490	0.11	11	13000	2.5
SHP02	1007	WL	9/11/2008	N001	24	1.5	740	0.1	11	13000	2.4
SHP02	1007	WL	9/15/2009	N001	18	1.7	590	0.085	13	13000	2.4
SHP02	1007	WL	3/23/2010	N001	19	1.8	540	0.068	11	13000	2.2
SHP02	1007	WL	9/2/2010	N001	39	1.4	700	0.1	11	14000	2.5
SHP02	1007	WL	3/24/2011	N001	23.9	0.865	913	0.366	13	11700	3.01
SHP02	1007	WL	9/14/2011	N001	18	1.3	720	0.23	13	13000	2.9
SHP02	1011	WL	9/2/2010	0001	0.13	0.0086	150	0.21	6		0.42
SHP02	1048	WL	3/25/2010	N001	<0.1	0.016	640	1.2	9	17000	0.16
SHP02	1049	WL	9/16/2009	0001	<0.1	0.0011	530	1.1	10	18000	0.18
SHP02	1049	WL	3/25/2010	N001	<0.1	0.0064	340	1.2	8.9	17000	0.16
SHP02	1049	WL	8/31/2010	N001	<0.1	<0.0011	550	1.4	9.3	18000	0.16
SHP02	1049	WL	3/24/2011	N001	0.095	<0.04	783	1.37	10.2	16000	0.164
SHP02	1049	WL	9/15/2011	0001	<0.1	<0.0035	550	1.3	9.9	17000	0.2
SHP02	1057	WL	3/4/2004	0001	1400	6.9	1400	0.39	9.5	14000	0.11
SHP02	1057	WL	9/14/2004	0001	1200	6.5	1500	0.38	9.6	11000	0.091
SHP02	1057	WL	3/2/2005	0001	1300	6.6	1700	0.35	10	11000	0.084
SHP02	1057	WL	3/14/2006	0001	1100	6.4	1600	0.33	8.7	9400	0.058
SHP02	1057	WL	9/12/2007	0001	410	13	2400	0.23	8.1	6000	0.051
SHP02	1057	WL	3/5/2008	N001	610	13	1600	0.22	9.2	6100	0.052
SHP02	1057	WL	9/10/2008	N001	640	14	1800	0.24	8.6	5500	0.045
SHP02	1057	WL	3/23/2011	N001	521	64.6	2370	0.273	17.7	5990	0.0717
SHP02	1058	WL	9/10/2007	0001	2.9	0.12	0.39	0.00059	5.2	3000	0.0043
SHP02	1058	WL	9/17/2008	0001	3	0.25	0.017	<0.00029	7.7	4100	0.0031
SHP02	1058	WL	3/10/2009	N001	1.2	0.17	0.74	0.0004	9.2	4900	0.0051
SHP02	1058	WL	9/15/2009	N001	2.8	0.23	0.017	0.00054	11	5500	0.0089
SHP02	1058	WL	3/23/2010	N001	2.8	0.21	0.023	0.0003	10	5200	0.0064
SHP02	1058	WL	8/31/2010	N001	2.6	0.2	<0.01	0.00028	10	5600	0.0052
SHP02	1058	WL	3/24/2011	N001	4.25	0.203	<0.0108	<0.0015	11.6	5210	0.00529
SHP02	1058	WL	9/13/2011	N001	4.5	0.2	<0.01	0.00037	11	5600	0.0049

Table A–2 (continued). Terrace

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
SHP02	1059	WL	9/10/2007	0001	0.59	0.048	290	0.021	16	8800	0.061
SHP02	1059	WL	9/10/2008	N001	0.64	0.054	370	0.027	16	9300	0.059
SHP02	1059	WL	3/10/2009	N001	8.4	0.14	380	0.016	17	9600	0.074
SHP02	1059	WL	9/15/2009	N001	3.5	0.12	350	0.0075	18	9600	0.067
SHP02	1059	WL	3/23/2010	N001	3.1	0.094	380	0.006	17	9400	0.063
SHP02	1059	WL	8/31/2010	N001	1.8	0.1	350	0.013	17	9500	0.063
SHP02	1059	WL	3/24/2011	N001	4.52	0.0947	397	<0.0015	18.9	9050	0.066
SHP02	1059	WL	9/13/2011	N001	3.7	0.077	330	0.015	17	8900	0.069
SHP02	1060	WL	3/4/2003	0001	0.0476	0.475	356.9008	3	9.43	7850	0.152
SHP02	1060	WL	8/27/2003	0001	<0.00419	0.0243	127.626	0.863	2.51	3390	0.0492
SHP02	1060	WL	3/3/2004	0001	<0.1	0.23	530	2.5	10		0.16
SHP02	1060	WL	9/17/2004	0001	<0.1	0.0046	240	1.5	3.7	5600	0.076
SHP02	1060	WL	3/3/2005	0001	<0.1		470			9200	
SHP02	1060	WL	9/21/2005	0001	<0.1	<0.00019	83	0.36	1.1	2400	0.027
SHP02	1060	WL	9/11/2007	0001	<0.1	0.0016	450	3.2	8.9	11000	0.22
SHP02	1060	WL	9/17/2008	N001	<0.1	0.0024	320	1.7	4.1	6900	0.096
SHP02	1068	WL	9/12/2007	0001	62	1.4	220	0.03	9.2	6400	0.63
SHP02	1068	WL	9/18/2008	N001	52	1.3	270	0.014	9.4	5900	0.69
SHP02	1068	WL	9/16/2009	0001	120	1.4	340	0.023	11	8000	0.81
SHP02	1068	WL	3/24/2010	0001	40	0.92	200	0.041	7.5	4400	0.58
SHP02	1068	WL	9/2/2010	0001	22	1.1	250	0.019	8.4	4900	0.55
SHP02	1068	WL	3/22/2011	0001	12	1.11	339	0.108	8.26	5350	0.822
SHP02	1068	WL	9/14/2011	0001	34	1.4	300	0.024	9.3		0.74
SHP02	1069	WL	3/22/2011	0001	0.814	<0.04	515	0.215	21.4	6750	1.73
SHP02	1070	WL	3/3/2003	0001	31.134	0.207	1133.951	4.11	13.5	15400	0.124
SHP02	1070	WL	3/3/2004	0001			990			16000	0.14
SHP02	1070	WL	9/14/2004	0001	22	3.5	880	2.8	11	15000	0.12
SHP02	1070	WL	3/2/2005	0001			780			15000	0.13
SHP02	1070	WL	9/14/2006	0001	20		680			39000	0.12
SHP02	1070	WL	9/12/2007	0001	6.4	0.46	850	2.5	9.4	16000	0.11
SHP02	1070	WL	3/4/2008	N001	7.6	0.43	780	2.1	9.5	14000	0.12
SHP02	1070	WL	9/17/2008	N001	8.9	0.4	780	2.6	10	17000	0.089
SHP02	1070	WL	3/10/2009	N001	9.2	0.34	970	2.5	11	16000	0.1
SHP02	1070	WL	9/14/2009	N001	8	0.29	730	2.6	10	16000	0.1
SHP02	1070	WL	3/24/2010	N001	8.3	0.31	750	2.9	10	16000	0.096
SHP02	1070	WL	9/1/2010	N001	7.9	0.25	710	3	8.7	16000	0.087

Table A–2 (continued). Terrace

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
SHP02	1070	WL	3/23/2011	N001	4.39	0.129	668	2.97	10.3	14500	0.107
SHP02	1070	WL	9/12/2011	0001	4.7	0.25	700	2.8	10	16000	0.086
SHP02	1071	WL	3/3/2003	0001	11.335	0.142	641.518	3.29	10.9	11900	0.111
SHP02	1071	WL	3/1/2004	0001			2500			3700	0.2
SHP02	1071	WL	9/14/2004	0001	160	0.93	600	0.17	9.5	2700	0.19
SHP02	1071	WL	3/2/2005	0001			2800			2600	0.077
SHP02	1071	WL	9/21/2005	0001	150	1.1	2800	0.16	9.1	2800	0.088
SHP02	1071	WL	3/7/2006	0001			1900			4600	0.11
SHP02	1071	WL	9/14/2006	0001	7.6	0.076	680	2.9	10	13000	0.14
SHP02	1071	WL	3/8/2007	0001	21	0.36	1000	2.3	10	10000	0.12
SHP02	1071	WL	9/12/2007	0001	220	1.9	3400	0.15	9.7	3900	0.059
SHP02	1071	WL	3/4/2008	N001	330	2.1	2600	0.13	11	3600	0.053
SHP02	1071	WL	9/10/2008	N001	580	2	1700	1	13	13000	0.15
SHP02	1071	WL	3/10/2009	N001	900	3.1	2300	0.18	16	11000	0.14
SHP02	1071	WL	9/15/2009	N001	80	48	1100	2.3	6.3	6100	0.14
SHP02	1071	WL	3/24/2010	N001	260	60	1100	2	6.7	6800	0.13
SHP02	1071	WL	9/1/2010	N001	52	12	950	2.8	7.5	8900	0.1
SHP02	1071	WL	3/22/2011	N001	585	19.1	1350	1.43	13.3	12300	0.145
SHP02	1071	WL	9/13/2011	N001	26	2.7	680	3	9.2	14000	0.15
SHP02	1072	WL	9/11/2007	0001	0.27	1.2	1400	0.0013	14	12000	0.16
SHP02	1072	WL	9/11/2008	N001	<0.1	1.3	1500	0.0024	15	14000	0.14
SHP02	1073	WL	9/11/2007	0001	68	1.1	1300	1.9	9.2	8800	0.06
SHP02	1073	WL	9/11/2008	N001	200	1.2	1500	2.3	10	9700	0.068
SHP02	1073	WL	3/11/2009	0001	150	1.1	1500	2	10	9200	0.069
SHP02	1073	WL	9/15/2009	0001	140	1.2	1500	2.2	11	9000	0.066
SHP02	1073	WL	3/25/2010	0001	200	1.3	1300	2.3	10	8900	0.058
SHP02	1073	WL	9/2/2010	0001	130	1.1	1200	2.5	9.6	8800	0.061
SHP02	1073	WL	3/23/2011	0001	96.2	1.12	1690	2.35	11.6	8290	0.0637
SHP02	1073	WL	9/13/2011	N001	48	0.82	1300	2.5	10	9100	0.063
SHP02	1074	WL	9/10/2007	0001	2.7	1.8	1100	0.29	10	7700	1.7
SHP02	1074	WL	9/11/2008	N001	2.7	1.5	1500	0.27	11	8900	1.9
SHP02	1074	WL	3/10/2009	N001	4.3	1.5	1400	0.25	11	8700	1.9
SHP02	1074	WL	9/15/2009	N001	7.5	2.1	1400	0.27	12	8700	2
SHP02	1074	WL	3/23/2010	N001	9.4	2	1400	0.27	11	8600	1.9
SHP02	1074	WL	9/2/2010	N001	4.6	1.6	1300	0.32	9.7	8800	2
SHP02	1074	WL	3/24/2011	N001	10.6	1.89	1240	0.299	12.1	8180	1.84

Table A–2 (continued). Terrace

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
SHP02	1074	WL	9/15/2011	N001	8.6	1.9	1100	0.33	11	8200	2.1
SHP02	1078	WL	3/3/2003	0001	9.2391	0.134	603.1172	3.32	10.9	12400	0.112
SHP02	1078	WL	3/3/2004	0001			730			14000	0.14
SHP02	1078	WL	9/14/2004	0001	10	0.13	740	2.9	10	14000	0.13
SHP02	1078	WL	3/2/2005	0001			800			14000	0.14
SHP02	1078	WL	9/21/2005	0001	4.3	0.13	810	2.6	9.1	14000	0.13
SHP02	1078	WL	3/7/2006	0001			630			14000	0.14
SHP02	1078	WL	9/14/2006	0001	3.5	0.091	640	2.9	9.8	13000	0.14
SHP02	1078	WL	3/8/2007	0001	3.6	0.092	690	2.8	10	13000	0.16
SHP02	1078	WL	9/12/2007	0001	2.8	0.11	830	3.3	9.5	14000	0.15
SHP02	1078	WL	3/4/2008	N001	3.3	0.075	820	2.6	9.9	14000	0.15
SHP02	1078	WL	9/10/2008	N001	3.6	0.099	810	3	10	15000	0.14
SHP02	1078	WL	3/11/2009	N001	2.6	0.09	680	3.2	10	15000	0.13
SHP02	1078	WL	9/14/2009	N001	2.9	0.13	640	2.9	11	15000	0.15
SHP02	1078	WL	3/24/2010	N001	2.7	0.12	620	3	9.7	14000	0.15
SHP02	1078	WL	9/1/2010	N001	2.4	0.065	640	3.2	8.9	14000	0.12
SHP02	1078	WL	3/22/2011	N001	1.85	0.0597	555	2.79	11.4	14300	0.149
SHP02	1078	WL	9/12/2011	N001	2.5	0.083	580	2.9	11	14000	0.12
SHP02	1079	WL	3/4/2003	0001	<0.00311	0.0087	47.6621	0.383	5.94	2210	0.0297
SHP02	1079	WL	8/27/2003	0001	<0.00419	0.005	64.1518	0.537	6.36	2260	0.0323
SHP02	1079	WL	3/2/2004	0001	<0.1	0.0023	76	0.51	7.6	2400	0.026
SHP02	1079	WL	9/15/2004	0001	<0.1	0.0011	84	0.56	6	2200	0.031
SHP02	1079	WL	3/3/2005	0001	<0.1	0.0034	91	0.65	6.6	2500	0.032
SHP02	1079	WL	9/21/2005	0001	<0.1	0.0043	76	0.31	5.3	2300	0.032
SHP02	1079	WL	3/8/2006	0001	<0.1	<0.0012	42	0.27	4.4	1700	0.026
SHP02	1079	WL	9/14/2006	0001	<0.1	<0.0018	35	0.21	4.2	1600	0.026
SHP02	1079	WL	3/8/2007	0001	<0.1	<0.00052	43	0.25	4.6	1800	0.03
SHP02	1079	WL	9/13/2007	0001	<0.1	<0.0003	44	0.25	4.4	1700	0.023
SHP02	1079	WL	3/4/2008	N001	<0.1	0.007	52	0.2	5.1	1800	0.029
SHP02	1079	WL	9/16/2008	N001	<0.1	0.0018	67	0.26	4.9	2000	0.026
SHP02	1079	WL	3/10/2009	N001	<0.1	<0.0095	55	0.26	5.3	1900	0.028
SHP02	1079	WL	9/15/2009	N001	<0.1	<0.00052	71	0.31	5.7	2100	0.03
SHP02	1079	WL	3/22/2010	N001	<0.1	0.0046	51	0.21	4.8	1800	0.031
SHP02	1079	WL	8/31/2010	N001	<0.1	0.002	89	0.54	6.7	2500	0.037
SHP02	1079	WL	3/23/2011	N001	<0.0453	<0.002	96	0.444	7.45	2280	0.0454
SHP02	1079	WL	9/13/2011	N001	<0.1	0.019	140	0.48	7.1	2500	0.036

Table A–2 (continued). Terrace

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
SHP02	1091	WL	3/3/2004	0001			1600			12000	0.12
SHP02	1091	WL	9/14/2004	0001	2.7	1.2	1600	0.51	13	11000	0.13
SHP02	1091	WL	3/2/2005	0001	0.47	1.1	1700	0.35	13	12000	0.12
SHP02	1091	WL	9/21/2005	0001	0.83	1.1	1700	0.31	13	13000	0.12
SHP02	1091	WL	3/14/2006	0001			1600			11000	0.12
SHP02	1091	WL	9/11/2006	0001	1.7		1800			11000	0.12
SHP02	1091	WL	3/8/2007	0001			2300			7700	0.13
SHP02	1091	WL	9/10/2007	0001	1	1.1	1500	0.66	13	12000	0.13
SHP02	1091	WL	3/5/2008	N001	190	1.2	1500	1	15	12000	0.12
SHP02	1091	WL	9/10/2008	N001	220	6.7	1700	1.1	13	12000	0.11
SHP02	1091	WL	3/10/2009	N001	280	15	2100	0.76	13	10000	0.092
SHP02	1091	WL	9/15/2009	N001	0.63	1.3	1100	0.95	14	15000	0.14
SHP02	1091	WL	3/23/2010	N001	0.32	1.2	1000	0.99	13	13000	0.11
SHP02	1091	WL	9/1/2010	N001	<0.1	1	1100	1	12	14000	0.11
SHP02	1091	WL	3/23/2011	N001	34	0.419	1040	2.47	11.7	12900	0.119
SHP02	1091	WL	9/13/2011	0001	3	2	1300	0.78	15	13000	0.11
SHP02	1092	WL	3/3/2004	0001			1600			14000	0.12
SHP02	1092	WL	9/14/2004	0001	1.2	1.6	1500	2.1	12	12000	0.12
SHP02	1092	WL	3/2/2005	0001	0.11	1	1600	1.7	13	12000	0.1
SHP02	1092	WL	9/21/2005	0001	0.1	0.96	1900	1.4	12	13000	0.12
SHP02	1092	WL	3/14/2006	0001			1500			13000	0.12
SHP02	1092	WL	9/11/2006	0001			1400			13000	0.13
SHP02	1092	WL	3/8/2007	0001			1400			13000	0.14
SHP02	1092	WL	9/10/2007	0001	0.11	0.94	890	1.4	12	14000	0.13
SHP02	1092	WL	3/5/2008	N001	500	12	1600	1.4	12	9800	0.11
SHP02	1092	WL	9/10/2008	N001	810	32	2900	0.41	11	5500	0.098
SHP02	1092	WL	3/11/2009	0001	630	35	2700	0.52	11	5300	0.11
SHP02	1092	WL	9/15/2009	N001	180	14	2400	0.25	12	6400	0.041
SHP02	1092	WL	3/23/2010	0001	290	8.9	1500	0.48	11	8200	0.057
SHP02	1092	WL	9/1/2010	0001	140	11	1300	0.45	9.2	9100	0.045
SHP02	1092	WL	3/23/2011	N001	28.5	2.99	869	2.38	11.6	12400	0.11
SHP02	1092	WL	9/13/2011	0001	100	5.5	860	1.8	10	12000	0.092
SHP02	1093	WL	3/3/2004	0001			3200			6900	0.08
SHP02	1093	WL	9/14/2004	0001	110	0.66	890	1.9	17	5700	0.08
SHP02	1093	WL	3/2/2005	0001	100	0.48	3400	1.3	17	5600	0.066
SHP02	1093	WL	9/21/2005	0001	110	0.51	3600	1.3	17	5600	0.073

Table A–2 (continued). Terrace

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
SHP02	1093	WL	3/14/2006	0001			3100			5300	0.084
SHP02	1093	WL	9/11/2006	0001			2500			2900	0.079
SHP02	1093	WL	3/8/2007	0001			3400			3600	0.1
SHP02	1093	WL	9/10/2007	0001	710	28	2600	0.38	10	3800	0.063
SHP02	1093R	WL	3/5/2008	N001	860	24	2500	0.38	12	5800	0.11
SHP02	1093R	WL	9/10/2008	N001	870	35	2900	0.42	11	5000	0.11
SHP02	1093R	WL	3/10/2009	N001	670	34	2900	0.51	11	5700	0.11
SHP02	1093R	WL	9/14/2009	N001	790	40	2700	0.52	11	5800	0.14
SHP02	1093R	WL	3/23/2010	N001	680	35	2300	0.67	11	6700	0.13
SHP02	1093R	WL	9/1/2010	N001	620	32	2400	0.71	12	7600	0.12
SHP02	1093R	WL	3/23/2011	N001	288	31.6	2060	0.467	9.94	4340	0.0851
SHP02	1093R	WL	9/13/2011	N001	410	30	2200	0.6	11	5200	0.12
SHP02	1094	WL	3/1/2004	0001			5500			2200	0.045
SHP02	1094	WL	9/14/2004	0001	690	4.9	1000	0.55	13	6800	0.087
SHP02	1094	WL	3/1/2005	0001			390			4000	0.041
SHP02	1094	WL	9/21/2005	0001	260	2.4	3800	0.42	13	4800	0.041
SHP02	1095	WL	9/13/2006	0001	1100		1500			7500	0.069
SHP02	1095	WL	3/8/2007	0001			1600			7200	0.07
SHP02	1095	WL	9/12/2007	0001	670	23	930	0.2	7.3	6600	0.06
SHP02	1095	WL	3/5/2008	N001	850	26	1700	0.3	8.4	7200	0.068
SHP02	1095	WL	9/10/2008	N001	820	26	1900	0.27	8.2	6800	0.066
SHP02	1095	WL	3/10/2009	N001	700	29	1700	0.25	7.6	5900	0.059
SHP02	1095	WL	9/14/2009	N001	670	31	1800	0.21	8	5500	0.051
SHP02	1095	WL	3/23/2010	N001	980	32	1500	0.21	7.4	5500	0.047
SHP02	1095	WL	9/1/2010	N001	710	31	1600	0.2	7.8	5100	0.049
SHP02	1095	WL	3/23/2011	N001	468	34.9	1830	0.19	8.79	4880	0.0536
SHP02	1095	WL	9/12/2011	N001	520	37	1800	0.17	8	4500	0.054
SHP02	1096	WL	9/14/2006	0001	20	0.23	700	2.8	11	14000	0.12
SHP02	1096	WL	3/8/2007	0001			660			15000	0.12
SHP02	1096	WL	9/12/2007	0001	18	0.48	690	2.3	9.1	14000	0.12
SHP02	1096	WL	3/4/2008	N001	14	0.18	630	2.1	9.4	13000	0.11
SHP02	1096	WL	9/10/2008	N001	23	0.2	630	2.3	10	15000	0.094
SHP02	1096	WL	3/10/2009	N001	12	0.32	640	2.9	9.6	14000	0.11
SHP02	1096	WL	9/14/2009	N001	15	0.21	630	2.4	10	14000	0.12
SHP02	1096	WL	3/24/2010	N001	2.7	0.47	640	2.8	9.4	14000	0.1
SHP02	1096	WL	9/1/2010	N001	7.1	0.14	610	3.1	9.4	15000	0.1

Table A–2 (continued). Terrace

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
SHP02	1096	WL	3/23/2011	N001	4.98	0.113	648	2.94	10.3	13600	0.11
SHP02	1096	WL	9/12/2011	N001	4.4	0.15	620	3	9.4	14000	0.093
SHP02	1120	WL	9/13/2007	0001	<0.1	0.072	0.97	0.022	5.1	2200	0.056
SHP02	1120	WL	9/16/2008	N001	<0.1	0.015	0.21	0.027	5.1	2300	0.052
SHP02	1120	WL	3/11/2009	0001		0.032		0.049	5.3		0.05
SHP02	1120	WL	9/17/2009	0001		0.0073		0.058	5.3		0.048
SHP02	1122	WL	9/13/2007	0001	<0.1	0.96	1.7	0.039	3.5	1500	0.042
SHP02	1122	WL	9/16/2008	N001	<0.1	0.9	6.7	0.072	4.5	2200	0.046
SHP02	1122	WL	3/11/2009	0001	<0.1	1.2	5.7	0.074	5.1	8200	0.048
SHP02	1122	WL	9/17/2009	0001		0.0097		0.097	5.6		0.052
SHP02	DM7	WL	9/11/2007	0001	<0.1	0.25	220	0.011	15	10000	0.056
SHP02	DM7	WL	9/18/2008	N001	0.57	0.092	240	0.0072	16	11000	0.046
SHP02	DM7	WL	3/11/2009	N001	0.71	0.15	240	0.013	16	9800	0.047
SHP02	DM7	WL	9/15/2009	0001	0.12	0.073	260	0.027	16	10000	0.045
SHP02	DM7	WL	3/24/2010	0001	0.29	0.12	290	0.05	15	9400	0.04
SHP02	DM7	WL	9/2/2010	N001	0.49		730			9600	
SHP02	MW1	WL	9/11/2007	0001	4.5	0.13	<0.1	0.00021	6.4	1800	0.00087
SHP02	MW1	WL	9/11/2008	N001	1.4	0.083	0.13	<0.00003	7.1	1900	0.00058
SHP02	MW1	WL	9/15/2009	0001	0.9	0.067	0.092	0.001	7.4	2100	0.00041
SHP02	MW1	WL	3/25/2010	N001	0.62	0.088	0.49	<0.00065	7.3	2000	0.0004
SHP02	MW1	WL	9/2/2010	N001	0.57	0.075	0.057	0.00068	7.5	2100	0.00036
SHP02	MW1	WL	3/24/2011	N001	3.23	0.0836	0.412	<0.0015	8.64	2230	0.000842
SHP02	MW1	WL	9/14/2011	N001	3.4	0.077	0.18	0.00031	7.9	2000	0.0004
SHP02	1087	TS	3/3/2003	0001	127.329	2.14	241.6987	0.0275	9.72	7460	0.617
SHP02	1087	TS	3/1/2004	0001			360			7900	0.72
SHP02	1087	TS	9/14/2004	0001	160	1.6	370	0.037	9.6	8000	0.62
SHP02	1087	TS	3/3/2005	0001	60	0.81	140	0.066	6.2	5000	0.43
SHP02	1087	TS	9/22/2005	0001	130	1	320	0.041	7.4	6600	0.49
SHP02	1087	TS	3/14/2006	0001			430			9100	0.69
SHP02	1087	TS	9/14/2006	0001	220	1.7	490	0.038	11	10000	0.85
SHP02	1087	TS	3/8/2007	0001	140	1.3	330	0.038	8.9	7900	0.61
SHP02	1087	TS	9/12/2007	0001	150	1.6	510	0.034	10	10000	0.87
SHP02	1087	TS	3/5/2008	N001	180	1.3	320	0.035	8.8	8000	0.62
SHP02	1087	TS	9/17/2008	N001	220	1.4	440	0.03	9.6	9500	0.62
SHP02	1087	TS	3/12/2009	N001	160	1.4	420	0.03	9.4	8600	0.66
SHP02	1087	TS	9/16/2009	N001	260	1.5	440	0.03	10	9900	0.76

Table A–2 (continued). Terrace

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
SHP02	1087	TS	3/24/2010	N001	190	0.81	190	0.056	7.1	5900	0.47
SHP02	1087	TS	9/1/2010	N001	220	0.88	250	0.047	7	6000	0.42
SHP02	1087	TS	3/22/2011	N001	105	0.989	473	0.0428	8.9	6370	0.66
SHP02	1087	TS	9/14/2011	N001	160	1.2	340	0.034	9.7	8100	0.58
SHP02	1088	TS	3/3/2003	0001	0.405	0.11	612.1527	1.71	9.19	14800	0.119
SHP02	1088	TS	3/3/2004	0001			690			17000	0.18
SHP02	1088	TS	9/14/2004	0001	<0.1	0.038	660	1.2	8.7	16000	0.17
SHP02	1088	TS	3/3/2005	0001	<0.1	0.021	660	1.4	8.6	17000	0.15
SHP02	1088	TS	9/22/2005	0001	<0.1	0.02	710	1.4	9.2	20000	0.17
SHP02	1088	TS	3/14/2006	0001			720			19000	0.2
SHP02	1088	TS	9/14/2006	0001	<0.1	0.025	480	1.2	8.3	15000	0.14
SHP02	1088	TS	3/7/2007	0001	0.1	0.0088	650	1.6	9.3	18000	0.18
SHP02	1088	TS	9/12/2007	0001	<0.1	0.03	600	1.5	9.1	18000	0.15
SHP02	1088	TS	3/5/2008	N001	<0.1	0.07	530	1.4	9.6	18000	0.17
SHP02	1088	TS	9/10/2008	N001	<0.1	0.037	860	1.7	11	22000	0.18
SHP02	1088	TS	3/10/2009	N001	<0.1	<0.025	710	1.7	11	18000	0.2
SHP02	1088	TS	9/14/2009	N001	<0.1	0.026	720	1.7	10	26000	0.23
SHP02	1088	TS	3/23/2010	N001	<0.1	0.014	680	1.5	10	20000	0.17
SHP02	1088	TS	9/1/2010	0001	<0.1	<0.0011	720	2.1	7.7	21000	0.18
SHP02	1088	TS	3/22/2011	N001	0.291	0.626	593	2.02	10.9	16800	0.192
SHP02	1088	TS	9/13/2011	0001	0.16	0.077	640	1.7	10	19000	0.16
SHP02	0425	SL	3/3/2003	0001	<0.00311	0.0201	37.7231	0.0359	8.13	4660	0.509
SHP02	0425	SL	8/26/2003	0001	0.0163	0.0173	41.789	0.0294	8.69	5910	0.636
SHP02	0425	SL	3/1/2004	0001	<0.1	<0.001	41	0.03	11	6300	0.76
SHP02	0425	SL	3/1/2004	0002	<0.0159	<0.00805	24.9	0.046	9.61	6760	0.734
SHP02	0425	SL	9/16/2004	0001	<0.1	0.0078	40	0.03	9.3	6800	0.84
SHP02	0425	SL	2/28/2005	0001	0.43	0.015	59	0.081	7.2	4900	0.49
SHP02	0425	SL	9/20/2005	0001	0.17	0.14	48	0.032	8.2	6600	0.72
SHP02	0425	SL	3/14/2006	0001	<0.1	<0.00027	50	0.025	9.6	7200	0.84
SHP02	0426	SL	3/3/2003	0001	0.016	0.0393	89.9029	0.178	12.3	4070	0.387
SHP02	0426	SL	8/26/2003	0001	0.0168	0.0123	15.699	0.0477	9.61	3900	0.234
SHP02	0426	SL	3/1/2004	0001	<0.1	0.012	13	0.033	10	3600	0.18
SHP02	0426	SL	3/1/2004	0002	<0.0159	0.0118	12.2	0.0449	9.11	4000	0.172
SHP02	0426	SL	9/14/2004	0001	<0.1	0.076	14	0.041	8.7	3600	0.23
SHP02	0426	SL	3/1/2005	0001	<0.1	0.0098	57	0.24	9.9	3600	0.25
SHP02	0426	SL	9/20/2005	0001	<0.1	0.03	57	0.23	9	4100	0.28

Table A–2 (continued). Terrace

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
SHP02	0426	SL	3/14/2006	0001	<0.1	0.031	20	0.1	8.8	3600	0.19
SHP02	0662	SL	3/4/2003	0001	0.257	0.009	1.493	0.00018	11.5	1980	0.0079
SHP02	0662	SL	8/26/2003	0001	0.0464	0.0084	<0.00402	<0.0001	11.1	2100	<0.00044
SHP02	0662	SL	3/4/2004	0001	<0.1	0.0039	0.25	<0.000025	12	1900	0.00021
SHP02	0662	SL	9/14/2004	0001	<0.1	0.0031	0.1	0.00004	11	2000	<0.000076
SHP02	0662	SL	3/1/2005	0001	<0.1	<0.0017	0.47	0.000076	11	1800	0.0008
SHP02	0662	SL	9/20/2005	0001	<0.1	0.0052	0.18	<0.00004	11	2000	0.00021
SHP02	0662	SL	3/14/2006	0001	<0.1	0.0025	0.29	<0.000033	11	2000	0.0002
SHP02	0662	SL	9/13/2006	0001	<0.1	<0.0043	0.099	<0.000016	10	2000	0.00013
SHP02	0662	SL	3/8/2007	0001	<0.1	0.0038	0.27	0.00076	11	2000	0.00021
SHP02	0662	SL	9/13/2007	0001	<0.1	<0.0061	0.64	0.0013	11	2200	0.00034
SHP02	0662	SL	3/5/2008	N001	<0.1	0.075	0.29	0.00017	12	2000	0.00062
SHP02	0662	SL	9/17/2008	N001	<0.1	<0.011	0.18	<0.00034	11	2200	0.00039
SHP02	0662	SL	3/12/2009	0001	<0.1	<0.00048	0.39	<0.000093	12	2100	<0.000074
SHP02	0662	SL	9/17/2009	0001	<0.1	0.017	0.27	0.00024	12	2000	0.00012
SHP02	0662	SL	3/25/2010	0001	<0.1	0.0065	0.32	0.00009	11	1900	0.00051
SHP02	0662	SL	9/2/2010	N001	<0.1	0.0076	0.26	0.000086	11	2100	0.000075
SHP02	0662	SL	3/22/2011	N001	0.549	0.0302	5.85	<0.0015	12	2280	0.0102
SHP02	0662	SL	9/15/2011	N001	<0.1	0.0058	0.28	0.00016	12	2000	0.00032
SHP02	0786	SL	3/5/2003	0001	0.0146	0.001	57.6011	0.166	6.71	3550	0.0378
SHP02	0786	SL	8/26/2003	0001	0.0137	0.0015	22.5887	0.0432	6.63	4430	0.0418
SHP02	0786	SL	3/4/2004	0001	<0.1	0.0045	17	0.029	6.6	4000	0.034
SHP02	0786	SL	9/14/2004	0001	<0.1	0.0011	11	0.024	6.1	3600	0.032
SHP02	0786	SL	3/1/2005	0001	<0.1	<0.001	9	0.024	6.5	3200	0.031
SHP02	0786	SL	9/20/2005	0001	<0.1	0.021	17	0.051	6	3800	0.03
SHP02	0786	SL	3/15/2006	0001	<0.1	0.0015	3.1	0.011	6.6	3400	0.032
SHP02	0786	SL	9/13/2007	0001	<0.1	0.31	6	0.02	6.5	4100	0.028
SHP02	0884	SL	3/4/2003	0001	0.0132	0.0022	45.1773	0.39	5.51	2290	0.0358
SHP02	0884	SL	8/26/2003	0001	0.0182	0.00089	4.066	0.0496	2.51	903	0.0114
SHP02	0884	SL	3/3/2004	0001	0.13	0.03	33	0.28	5.3	2100	0.03
SHP02	0884	SL	9/15/2004	0001	<0.1	0.0029	0.2	0.012	3.4	1400	0.011
SHP02	0885	SL	3/4/2003	0001	44.565	0.343	208.042	0.0179	9.93	6580	1.15
SHP02	0885	SL	3/1/2005	0001	0.71	0.047	160	0.054	7.3	4500	0.95
SHP02	0889	SL	3/4/2003	0001	0.0463	0.0138	668.6244	1.89	9.59	17600	0.168
SHP02	0889	SL	8/26/2003	0001	0.0839	0.0041	702.5073	1.26	9.58	18800	0.172
SHP02	0889	SL	3/3/2004	0001	<0.1	0.0007	730	1.1	9.3	18000	0.2

Table A–2 (continued). Terrace

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
SHP02	0889	SL	9/16/2004	0001	<0.1	<0.0039	710	1.4	8.9	17000	0.18
SHP02	0889	SL	3/1/2005	0001	<0.1	<0.0013	730	1.5	8.9	18000	0.18
SHP02	0889	SL	9/21/2005	0001	<0.1	<0.00095	730	1.4	9.2	20000	0.19
SHP02	0889	SL	3/9/2006	0001	<0.1	<0.0048	600	1.6	9.6	20000	0.19
SHP02	0889	SL	9/13/2006	0001	<0.1	0.089	370	0.9	5.6	11000	0.11
SHP02	0889	SL	3/7/2007	0001	<0.1	0.01	810	1.9	10	24000	0.26
SHP02	0889	SL	9/13/2007	0001	<0.1	<0.0038	900	2.1	9.2	26000	0.28
SHP02	0889	SL	3/5/2008	N001	<0.1	0.017	600	1.5	9.8	23000	0.2
SHP02	0889	SL	9/10/2008	N001	<0.1	0.013	810	2.2	9.6	26000	0.22
SHP02	0889	SL	3/9/2009	N001	<0.1	<0.018	730	1.6	10	21000	0.22
SHP02	0889	SL	9/16/2009	0001	1.8	0.37	830	2.2	12	36000	0.25
SHP02	0889	SL	3/25/2010	0001	<0.1	<0.0028	890	2	8.9	26000	0.2
SHP02	0889	SL	8/31/2010	0001	<0.1	0.03	690	1.7	9.3	21000	0.17
SHP02	0889	SL	3/22/2011	N001	0.061	<0.04	1340	1.63	10.9	18100	0.187
SHP02	0889	SL	9/15/2011	0001	0.25	0.016	110	0.27	2.8	4200	0.028
SHP02	0933	SL	3/4/2003	0001	0.227	0.252	15.021	0.047	6.37	3440	0.0555
SHP02	0933	SL	8/27/2003	0001	0.713	1.41	10.843	0.03	7.91	4550	0.0451
SHP02	0933	SL	3/4/2004	0001	<0.1	0.096	14	0.032	7	3100	0.045
SHP02	0933	SL	9/14/2004	0001	<0.1	0.051	6.5	0.024	5.5	2900	0.04
SHP02	0933	SL	3/1/2005	0001	<0.1	0.17	2.5	0.014	5.6	2500	0.028
SHP02	0933	SL	9/22/2005	0001	<0.1	0.28	0.12	0.0033	3.1	1400	0.0093
SHP02	0933	SL	3/15/2006	0001	0.34	0.69	1.1	0.0041	5.3	2100	0.02
SHP02	0933	SL	3/8/2007	0001	0.16	0.25	6.2	0.018	5.9	2500	0.056
SHP02	0934	SL	3/6/2003	0001	0.0262	0.0022	128.755	0.319	6.59	3090	0.0722
SHP02	0934	SL	3/3/2004	0001	<0.1	0.0044	110	0.22	6.5	3100	0.068
SHP02	0934	SL	9/16/2004	0001	0.19	0.031	38	0.12	6.3	3800	0.14
SHP02	0934	SL	3/1/2005	0001	<0.1	<0.00014	4.4	0.02	1.2	470	0.011
SHP02	0934	SL	9/22/2005	0001	<0.1	<0.00086	0.78	0.0038	1	310	0.0064
SHP02	0934	SL	3/16/2006	0001	<0.1	0.0011	3.5	0.015	1.2	390	0.0092
SHP02	0934	SL	9/13/2007	0001	0.11	0.22	0.22	0.00062	0.62	100	0.0012
SHP02	0935	SL	3/4/2004	0001	0.11	0.015	21	0.07	7.9	4400	0.071
SHP02	0935	SL	9/14/2004	0001	0.18	0.039	16	0.079	6.3	4300	0.068
SHP02	0935	SL	3/1/2005	0001	<0.1	0.024	13	0.074	6.5	3700	0.054
SHP02	0935	SL	9/22/2005	0001	<0.1	<0.0009	16	0.13	5.9	3600	0.048
SHP02	0935	SL	3/15/2006	0001	<0.1	0.027	5.8	0.048	6	3400	0.05
SHP02	0936	SL	3/4/2003	0001		0.164	180.258	0.613	10.6	7040	0.293

Table A–2 (continued). Terrace

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
SHP02	0936	SL	8/27/2003	0001	0.0161	0.152	148.859	0.603	9.55	4360	0.0992
SHP02	0936	SL	3/4/2004	0001	<0.1	0.042	20	0.062	6.6	2600	0.037
SHP02	0936	SL	9/14/2004	0001	<0.1	0.66	55	0.21	6.8	3600	0.059
SHP02	0936	SL	3/1/2005	0001	<0.1	0.018	54	0.2	6.3	2600	0.041
SHP02	0936	SL	9/22/2005	0001	<0.1	0.01	13	0.057	5.8	2700	0.041
SHP02	0936	SL	3/15/2006	0001	<0.1	0.0043	28	0.15	6.2	2700	0.047
SHP02	0936	SL	9/12/2006	0001	<0.1	0.1	37	0.27	6.8	3500	0.064
SHP02	0942	SL	3/4/2003	0001	0.00334	0.0026	43.3702	0.375	5.34	2490	0.0336
SHP02	0942	SL	8/26/2003	0001	0.0149	0.0208	0.6573	0.0065	1.47	393	0.0057
SHP02	0942	SL	3/3/2004	0001	<0.1	0.0056	31	0.24	5.1	2200	0.029
SHP02	0942	SL	9/17/2004	0001	<0.1	0.025	0.37	0.0088	1.8	630	0.0084
SHP02	0942	SL	3/1/2005	0001	<0.1	0.01	37	0.31	5.4	2300	0.029
SHP02	0942	SL	9/22/2005	0001	<0.1	0.043	6	0.089	3.7	1900	0.024
SHP02	0942	SL	9/12/2006	0001	0.25	0.062	2.5	0.065	4.6	2200	0.023
SHP02	0942	SL	3/7/2007	0001	<0.1	0.021	40	0.3	5.3	2400	0.033
SHP02	0942	SL	9/12/2007	0001	<0.1	0.025	58	0.37	5.4	1200	0.037
SHP02	0949	SL	9/9/2008	N001	<0.1	0.089	71	0.37	5.8	2800	0.036
SHP02	0949	SL	3/11/2009	0001	<0.1	0.015	42	0.27	5.6	2600	0.035
SHP02	0949	SL	9/17/2009	0001	<0.1	0.0056	52	0.38	6	2700	0.038
SHP02	0949	SL	3/25/2010	0001	<0.1	0.016	53	0.37	5.5	2700	0.039
SHP02	0949	SL	8/31/2010	0001	<0.1	0.023	60	0.49	6.3	2900	0.025
SHP02	0949	SL	3/22/2011	N001	0.553	0.287	45.5	0.47	5.78	2430	0.0508
SHP02	0958	SL	8/26/2003	0001	<0.00419	0.00048	0.323	0.00039	0.953	174	0.0024
SHP02	1215	SL	3/8/2007	0001			1600			34000	3.8
SHP02	1215	SL	3/6/2008	N001	53	1.1	770	0.86	6.7	20000	1.7
SHP02	1215	SL	9/18/2008	N001	35	0.1	1400	1.7	11	35000	3
SHP02	1215	SL	3/9/2009	N001	35	0.58	1100	1.3	11	27000	2.3
SHP02	1215	SL	9/17/2009	0001	25	0.096	1800	2.1	14	44000	3.9
SHP02	1215	SL	3/23/2010	N001	32	0.74	880	1.4	10	27000	2.1
SHP02	1215	SL	9/1/2010	N001	25	0.33	1600	2.2	14	45000	3.6
SHP02	1215	SL	3/23/2011	N001	10.6	0.597	3460	2.5	14.9	43000	3.43
SHP02	1215	SL	9/12/2011	N001	24	0.6	2600	3.7	16	66000	5.4
SHP02	1218	SL	3/25/2010	N001	<0.1	0.02	120	0.085	7.8	8800	0.079
SHP02	1218	SL	3/22/2011	N001	0.679	<0.04	466	0.365	23.3	15600	0.197
SHP02	1219	SL	3/22/2011	N001	<0.136	<0.04	5.57	0.0313	11.5	1790	0.0306
SHP02	1219	SL	9/13/2011	N001	<0.1	<0.0036	22	0.12	5.5	1800	0.027

Table A–2 (continued). Terrace

SITE CODE	LOCATION CODE	LOCATION TYPE	DATE SAMPLED	SAMPLE ID	Ammonia Total as N (reporting)	Manganese	Nitrate as Nitrogen (reporting)	Selenium	Strontium	Sulfate	Uranium
SHP02	1220	SL	3/25/2010	0001	<0.1	0.18	0.035	0.0076	2.8	760	0.017
SHP02	1220	SL	9/2/2010	0001	<0.1	0.37	<0.01	0.0017	4.4	1400	0.028
SHP02	1220	SL	3/22/2011	N001	<0.0851	0.149	1.92	0.0312	3.52	1090	0.0208
SHP02	1220	SL	9/13/2011	N001	<0.1	0.019	<0.01	0.0095	3.9	1400	0.027
SHP02	1221	SL	3/26/2010	0001	<0.1	0.019	760	1.9	9.6	26000	0.21
SHP02	1221	SL	9/2/2010	0001	0.29	0.13	930	2.8	9.4	35000	0.26
SHP02	1221	SL	3/22/2011	N001	<0.197	<0.1	694	2.34	10.4	22700	0.198
SHP02	1221	SL	9/14/2011	0001	0.15	0.07	640	1.8	9.2	23000	0.17