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Groundwater Monitoring at Sandia National Laboratories/New Mexico Groundwater Protection Program Conducted by NMED DOE OB for FFY 2011 Q-3

The New Mexico Environment Department (NMED) DOE Oversight Bureau (Bureau) has compiled and assessed groundwater data collected during May 2012. The Bureau collected groundwater samples from Groundwater Protection Program (GWPP) monitoring wells MRN-3D, SFR-2S, SWTA3-MW3 and TRE-1. Samples were also collected from Coyote Springs located in Arroyo del Coyote. Split samples were collected using standard Sandia National Laboratories/New Mexico (SNL/NM) sampling equipment and procedures. The samples were submitted for analysis to an independent analytical laboratory for Target Analyte List (TAL) metals plus uranium, total mercury, major anions, nitrate-nitrite, total cyanide, high explosive (HE) compounds, volatile organic compounds (VOCs), gamma emitting isotopes, gross alpha, gross beta, radium-226, radium-228 and isotopic uranium. An elevated concentration of beryllium was observed in the sample collected from Coyote Springs.

Data Assessment

All groundwater samples were collected and analyzed in accordance with U.S. Environmental Protection Agency (EPA) protocols. Data results are compared to applicable Maximum Contaminant Levels (MCLs) established by the U.S. EPA National Primary Drinking Water Regulations (40 CFR 141), National Primary Drinking Water Standards, EPA, July 2002.

Results

Analytical results for Target Analyte List (TAL) metals are presented in Table-1. Samples were analyzed for dissolved TAL metals plus uranium and total mercury. No metal parameters were detected above established regulatory standards, except for beryllium. Beryllium was detected above the EPA MCL of 0.004 mg/L in a sample collected from Coyote Springs at a concentration of 0.0072 mg/L.

General chemistry analytical results are presented in Table-2. Samples were analyzed for major anions (bromide, chloride, fluoride and sulfate), nitrate-nitrite and total cyanide. No samples exceeded their associated MCL.

Analytical results for HE compounds are listed in Table-3. Samples were analyzed for HE compounds from samples collected at monitoring wells SFR-2S, SWTA3-MW3 and TRE-1. The compound 1,3-dinitrobenzene was detected above the laboratory method detection limit

(MDL) at monitoring wells SFR-2S and CTF-MW2 at concentrations of 0.068 µg/L and 0.022 µg/L, respectively. Values were detected below the practical quantitation limits (PQLs) and qualified with “J” as estimated values. No EPA drinking water standard exists for 1,3-dinitrobenzene.

Table-4 summarizes detected volatile organic compounds (VOCs). No VOCs were detected at concentrations above established MCLs. Chloroform was detected at a concentration of 0.6 µg/L in the sample collected from TRE-1. The concentration was detected above the laboratory MDL, but below PQL. As a result, the value reported by the laboratory, was qualified with “J” as an estimated concentration. The laboratory MDLs for the remaining VOCs analyzed from GWPP monitoring wells are presented in Table-5.

Analytical results for radionuclides are listed in Table-4. Samples were analyzed for gross alpha, gross beta, gamma emitting isotopes, radium 226 and 228 and isotopic uranium. Unadjusted gross alpha activity ranged from 2.89 ± 1.9 pCi/L at MRN-3D to 23.9 ± 7.8 pCi/L at TRE-1. The EPA MCL for gross alpha activity of 15 pCi/L is based on a corrected gross alpha value, which excludes both total uranium and radon from initial gross alpha count. When the total uranium activity was subtracted from the gross alpha value, the gross activity was below the MCL. All other gamma emitters and radium isotopes were below established MCLs.

Response

Questions or comments should be addressed to Chris Armijo by phone at (505) 383-2070, by e-mail at chris.armijo1@state.nm.us, or to the address in the letterhead.

- Enclosure:
- (1) Table-1 Dissolved Target Analyte List Metals plus Uranium and Total Mercury Results
 - (2) Table-2 Major Anions, Nitrate-Nitrite and Total Cyanide Results
 - (3) Table-3 High Explosive Compounds Results
 - (4) Table-4 Detected Volatile Organic Compounds Results
 - (5) Table-5 Method Detection Limits for Volatile Organic Compounds
 - (6) Table-6 Gamma Spectroscopy, Gross Alpha, Gross Beta, Radium-226, Radium-228 and Isotopic Uranium Results

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**Table-1 NMED DOE OB FFY 2012 Q-3 Groundwater Protection Program Groundwater Quality Results:
Dissolved Target Analyte List Metals plus Uranium and Total Mercury**

Monitoring Well/ Sample Date	Analyte	Result (mg/L)	EPA MCL (mg/L)	Quantitation Limit (mg/L)	MDL (mg/L)	Laboratory Qualifier	Analytical Method
COYOTE SPRINGS 15-May-12	Aluminum	0.28	NE	0.2	0.048		SW846-6010B
	Antimony	0.0098	0.006	0.02	0.0098	U	SW846-6010B
	Arsenic	0.012	0.01	0.02	0.012	U	SW846-6010B
	Barium	0.045	2	0.005	0.0025		SW846-6010B
	Beryllium	0.0072	0.004	0.002	0.0003		SW846-6010B
	Cadmium	0.0005	0.005	0.002	0.0005	U	SW846-6010B
	Calcium	295	NE	0.5	0.05		SW846-6010B
	Chromium	0.0012	0.1	0.008	0.0012	U	SW846-6010B
	Cobalt	0.011	NE	0.005	0.003		SW846-6010B
	Copper	0.0021	1.3	0.01	0.0021	U	SW846-6010B
	Iron	0.06	NE	0.1	0.02	B	SW846-6010B
	Lead	0.0025	0.015	0.005	0.0025	U	SW846-6010B
	Magnesium	64	NE	0.5	0.04		SW846-6010B
	Manganese	1.6	NE	0.005	0.0025		SW846-6010B
	Mercury (Total)	0.0001	0.002	0.0002	0.0001	U	SW-846:7470A
	Mercury (Dissolved)	0.0001	0.002	0.0002	0.0001	U	SW-846:7471A
	Nickel	0.029	NE	0.005	0.0024		SW846-6010B
	Potassium	33	NE	1	0.093		SW846-6010B
	Selenium	0.013	0.05	0.02	0.013	U	SW846-6010B
	Silver	0.00084	NE	0.005	0.00084	U	SW846-6010B
	Sodium	433	NE	10	2.5	D	SW846-6010B
Thallium	0.009	0.002	0.02	0.009	U	SW846-6010B	
Uranium	0.0065	0.03	0.001	0.0002		SW846-6020	
Vanadium	0.0019	NE	0.005	0.0019	U	SW846-6010B	
Zinc	0.05	NE	0.01	0.003		SW846-6010B	

B = Estimated result. Result is less than RL.

D = Dilution

J = Method blank contamination. The associated method blank contains the target analyte at a reportable level.

NE = Not Established

U = Analyte not detected at or above the reporting limit or MDL

**Table-1 NMED DOE OB FFY 2012 Q-3 Groundwater Protection Program Groundwater Quality Results:
Dissolved Target Analyte List Metals plus Uranium and Total Mercury**

Monitoring Well/ Sample Date	Analyte	Result (mg/L)	EPA MCL (mg/L)	Quantitation Limit (mg/L)	MDL (mg/L)	Laboratory Qualifier	Analytical Method
MRN-3D 3-May-12	Aluminum	0.048	NE	0.2	0.048	U	SW846-6010B
	Antimony	0.0098	0.006	0.02	0.0098	U	SW846-6010B
	Arsenic	0.012	0.01	0.02	0.012	U	SW846-6010B
	Barium	0.13	2	0.005	0.0025		SW846-6010B
	Beryllium	0.0003	0.004	0.002	0.0003	U	SW846-6010B
	Cadmium	0.0005	0.005	0.002	0.0005	U	SW846-6010B
	Calcium	62.5	NE	0.5	0.05		SW846-6010B
	Chromium	0.0012	0.1	0.008	0.0012	U	SW846-6010B
	Cobalt	0.003	NE	0.005	0.003	U	SW846-6010B
	Copper	0.0021	1.3	0.01	0.0021	U	SW846-6010B
	Iron	0.02	NE	0.1	0.02	U	SW846-6010B
	Lead	0.0033	0.015	0.005	0.0025	B	SW846-6010B
	Magnesium	14.4	NE	0.5	0.04		SW846-6010B
	Manganese	0.026	NE	0.005	0.0025		SW846-6010B
	Mercury (Total)	0.0001	0.002	0.0002	0.0001	U	SW-846:7470A
	Mercury (Dissolved)	0.0001	0.002	0.0002	0.0001	U	SW-846:7471A
	Nickel	0.0024	NE	0.005	0.0024	U	SW846-6010B
	Potassium	4.4	NE	1	0.093		SW846-6010B
	Selenium	0.013	0.05	0.02	0.013	U	SW846-6010B
	Silver	0.00084	NE	0.005	0.00084	U	SW846-6010B
	Sodium	28.8	NE	1	0.25		SW846-6010B
	Thallium	0.009	0.002	0.02	0.009	U	SW846-6010B
Uranium	0.0036	0.03	0.001	0.0002		SW846-6020	
Vanadium	0.0062	NE	0.005	0.0019		SW846-6010B	
Zinc	0.092	NE	0.01	0.003		SW846-6010B	

B = Estimated result. Result is less than RL.

D = Dilution

J = Method blank contamination. The associated method blank contains the target analyte at a reportable level.

NE = Not Established

U = Analyte not detected at or above the reporting limit or MDL

**Table-1 NMED DOE OB FFY 2012 Q-3 Groundwater Protection Program Groundwater Quality Results:
Dissolved Target Analyte List Metals plus Uranium and Total Mercury**

Monitoring Well/ Sample Date	Analyte	Result (mg/L)	EPA MCL (mg/L)	Quantitation Limit (mg/L)	MDL (mg/L)	Laboratory Qualifier	Analytical Method
SFR-2S 1-May-12	Aluminum	0.048	NE	0.2	0.048	U	SW846-6010B
	Antimony	0.0098	0.006	0.02	0.0098	U	SW846-6010B
	Arsenic	0.012	0.01	0.02	0.012	U	SW846-6010B
	Barium	0.059	2	0.005	0.0025		SW846-6010B
	Beryllium	0.0003	0.004	0.002	0.0003	U	SW846-6010B
	Cadmium	0.0005	0.005	0.002	0.0005	U	SW846-6010B
	Calcium	134	NE	0.5	0.05	J	SW846-6010B
	Chromium	0.0012	0.1	0.008	0.0012	U	SW846-6010B
	Cobalt	0.003	NE	0.005	0.003	U	SW846-6010B
	Copper	0.0021	1.3	0.01	0.0021	U	SW846-6010B
	Iron	0.02	NE	0.1	0.02	U	SW846-6010B
	Lead	0.0025	0.015	0.005	0.0025	U	SW846-6010B
	Magnesium	37.4	NE	0.5	0.04		SW846-6010B
	Manganese	0.0042	NE	0.005	0.0025	B	SW846-6010B
	Mercury (Total)	0.0001	0.002	0.0002	0.0001	U	SW-846:7470A
	Mercury (Dissolved)	0.0001	0.002	0.0002	0.0001	U	SW-846:7471A
	Nickel	0.029	NE	0.005	0.0024		SW846-6010B
	Potassium	7.4	NE	1	0.093	J	SW846-6010B
	Selenium	0.015	0.05	0.02	0.013	B	SW846-6010B
	Silver	0.00084	NE	0.005	0.00084	U	SW846-6010B
	Sodium	85.5	NE	1	0.25		SW846-6010B
Thallium	0.009	0.002	0.02	0.009	U	SW846-6010B	
Uranium	0.016	0.03	0.001	0.0002		SW846-6020	
Vanadium	0.003	NE	0.005	0.0019	B	SW846-6010B	
Zinc	0.0035	NE	0.01	0.003	B	SW846-6010B	

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NE = Not Established

U = Analyte not detected at or above the reporting limit or MDL

**Table-1 NMED DOE OB FFY 2012 Q-3 Groundwater Protection Program Groundwater Quality Results:
Dissolved Target Analyte List Metals plus Uranium and Total Mercury**

Monitoring Well/ Sample Date	Analyte	Result (mg/L)	EPA MCL (mg/L)	Quantitation Limit (mg/L)	MDL (mg/L)	Laboratory Qualifier	Analytical Method
SWTA3-MW3 7-May-12	Aluminum	0.048	NE	0.2	0.048	U	SW846-6010B
	Antimony	0.0098	0.006	0.02	0.0098	U	SW846-6010B
	Arsenic	0.012	0.01	0.02	0.012	U	SW846-6010B
	Barium	0.063	2	0.005	0.0025		SW846-6010B
	Beryllium	0.0003	0.004	0.002	0.0003	U	SW846-6010B
	Cadmium	0.0005	0.005	0.002	0.0005	U	SW846-6010B
	Calcium	39	NE	0.5	0.05		SW846-6010B
	Chromium	0.0012	0.1	0.008	0.0012	U	SW846-6010B
	Cobalt	0.003	NE	0.005	0.003	U	SW846-6010B
	Copper	0.0021	1.3	0.01	0.0021	U	SW846-6010B
	Iron	0.02	NE	0.1	0.02	U	SW846-6010B
	Lead	0.0025	0.015	0.005	0.0025	U	SW846-6010B
	Magnesium	11	NE	0.5	0.04		SW846-6010B
	Manganese	0.0025	NE	0.005	0.0025	U	SW846-6010B
	Mercury (Total)	0.0001	0.002	0.0002	0.0001	U	SW-846:7470A
	Mercury (Dissolved)	0.0001	0.002	0.0002	0.0001	U	SW-846:7471A
	Nickel	0.0024	NE	0.005	0.0024	U	SW846-6010B
	Potassium	4.8	NE	1	0.093		SW846-6010B
	Selenium	0.013	0.05	0.02	0.013	U	SW846-6010B
	Silver	0.00084	NE	0.005	0.00084	U	SW846-6010B
	Sodium	48.4	NE	1	0.25		SW846-6010B
	Thallium	0.009	0.002	0.02	0.009	U	SW846-6010B
Uranium	0.0024	0.03	0.001	0.0002		SW846-6020	
Vanadium	0.0075	NE	0.005	0.0019		SW846-6010B	
Zinc	0.003	NE	0.01	0.003	U	SW846-6010B	

B = Estimated result. Result is less than RL.

D = Dilution

J = Method blank contamination. The associated method blank contains the target analyte at a reportable level.

NE = Not Established

U = Analyte not detected at or above the reporting limit or MDL

**Table-1 NMED DOE OB FFY 2012 Q-3 Groundwater Protection Program Groundwater Quality Results:
Dissolved Target Analyte List Metals plus Uranium and Total Mercury**

Monitoring Well/ Sample Date	Analyte	Result (mg/L)	EPA MCL (mg/L)	Quantitation Limit (mg/L)	MDL (mg/L)	Laboratory Qualifier	Analytical Method
TRE-1 2-May-12	Aluminum	0.048	NE	0.2	0.048	U	SW846-6010B
	Antimony	0.0098	0.006	0.02	0.0098	U	SW846-6010B
	Arsenic	0.012	0.01	0.02	0.012	U	SW846-6010B
	Barium	0.047	2	0.005	0.0025		SW846-6010B
	Beryllium	0.0003	0.004	0.002	0.0003	U	SW846-6010B
	Cadmium	0.0005	0.005	0.002	0.0005	U	SW846-6010B
	Calcium	180	NE	0.5	0.05		SW846-6010B
	Chromium	0.0012	0.1	0.008	0.0012	U	SW846-6010B
	Cobalt	0.003	NE	0.005	0.003	U	SW846-6010B
	Copper	0.0021	1.3	0.01	0.0021	U	SW846-6010B
	Iron	0.02	NE	0.1	0.02	U	SW846-6010B
	Lead	0.0025	0.015	0.005	0.0025	U	SW846-6010B
	Magnesium	38.7	NE	0.5	0.04		SW846-6010B
	Manganese	0.0025	NE	0.005	0.0025	U	SW846-6010B
	Mercury (Total)	0.0001	0.002	0.0002	0.0001	U	SW-846:7470A
	Mercury (Dissolved)	0.0001	0.002	0.0002	0.0001	U	SW-846:7471A
	Nickel	0.0024	NE	0.005	0.0024	U	SW846-6010B
	Potassium	7.1	NE	1	0.093		SW846-6010B
	Selenium	0.013	0.05	0.02	0.013	U	SW846-6010B
	Silver	0.00084	NE	0.005	0.00084	U	SW846-6010B
	Sodium	113	NE	1	0.25		SW846-6010B
Thallium	0.009	0.002	0.02	0.009	U	SW846-6010B	
Uranium	0.017	0.03	0.001	0.0002		SW846-6020	
Vanadium	0.0028	NE	0.005	0.0019	B	SW846-6010B	
Zinc	0.003	NE	0.01	0.003	U	SW846-6010B	

B = Estimated result. Result is less than RL.

D = Dilution

J = Method blank contamination. The associated method blank contains the target analyte at a reportable level.

NE = Not Established

U = Analyte not detected at or above the reporting limit or MDL

Table-2 NMED DOE OB FFY 2012 Q-3 Groundwater Protection Program Groundwater Quality Results: Anions, Nitrate-Nitrite and Total Cyanide

Monitoring Well/ Sample Date	Analyte	Result	EPA MCL	Quantitation Limit	MDL	Units	Laboratory Qualifier	Analytical Method
COYOTE SPRINGS 15-May-12	Bromide	2.1	NE	2.5	0.44	mg/L	D,B,G	EPA:300.0
	Chloride	536	NE	100	3.7	mg/L	D,Q	EPA:300.0
	Cyanide, Total	2.1	200	10	1.5	ug/L	J	SW-846:9012A
	Fluoride	2.5	4	2.5	0.3	mg/L	D,G	EPA:300.0
	Nitrate-Nitrite	0.42	10	0.05	0.0053	mg/L		EPA:353.2
	Sulfate	133	NE	5	0.24	mg/L	D,Q	EPA:300.0
MRN-3D 3-May-12	Bromide	0.27	NE	0.5	0.088	mg/L	B	EPA:300.0
	Chloride	16.3	NE	2	0.074	mg/L	D,Q	EPA:300.0
	Cyanide, Total	1.5	200	10	1.5	ug/L	U	SW-846:9012A
	Fluoride	0.55	4	0.5	0.059	mg/L		EPA:300.0
	Nitrate-Nitrite	2.3	10	0.25	0.026	mg/L	D,Q	EPA:353.2
	Sulfate	79.2	NE	2	0.098	mg/L	D,Q	EPA:300.0
SFR-2S 1-May-12	Bromide	0.55	NE	0.5	0.088	mg/L		EPA:300.0
	Chloride	130	NE	20	0.74	mg/L	D,Q	EPA:300.0
	Cyanide, Total	1.5	200	10	1.5	ug/L	U	SW-846:9012A
	Fluoride	1.6	4	0.5	0.059	mg/L		EPA:300.0
	Nitrate-Nitrite	0.92	10	0.05	0.0053	mg/L		EPA:353.2
	Sulfate	70.4	NE	5	0.24	mg/L	D,Q	EPA:300.0
SWTA3-MW3 7-May-12	Bromide	0.25	NE	0.5	0.088	mg/L	B	EPA:300.0
	Chloride	15.4	NE	2	0.074	mg/L	D,Q	EPA:300.0
	Cyanide, Total	1.5	200	10	1.5	ug/L	U	SW-846:9012A
	Fluoride	1.4	4	0.5	0.059	mg/L		EPA:300.0
	Nitrate-Nitrite	0.54	10	0.05	0.0053	mg/L		EPA:353.2
	Sulfate	68.7	NE	2	0.098	mg/L	D,Q	EPA:300.0
TRE-1 2-May-12	Bromide	0.62	NE	0.5	0.088	mg/L		EPA:300.0
	Chloride	147	NE	20	0.74	mg/L	D,Q	EPA:300.0
	Cyanide, Total	1.5	200	10	1.5	ug/L	U	SW-846:9012A
	Fluoride	1.7	4	0.5	0.059	mg/L		EPA:300.0
	Nitrate-Nitrite	2.2	10	0.25	0.026	mg/L	D,Q	EPA:353.2
	Sulfate	111	NE	5	0.24	mg/L	D,Q	EPA:300.0

B = Estimated result. Result is less than RL and greater than or equal to the IDL.

D = Dilution

G = Elevated reporting limit. The reporting limit is elevated due to matrix interference.

J = Estimated: The analyte was positively identified; the quantitation is an estimation

NE = Not established

Q = Elevated reporting limit. The reporting limit is elevated due to high analyte levels.

U = Analyte not detected at or above the reporting limit or MDL

Table-3 NMED DOE OB FFY 2012 Q-3 Groundwater Protection Program Groundwater Quality Results: High Explosive Compounds

Monitoring Well/ Sample Date	Analyte	Result (µg/L)	Quantitation Limit (µg/L)	MDL (µg/L)	Laboratory Qualifier	Analytical Method
SFR-2S 1-May-12	1,3,5-trinitrobenzene	0.018	0.22	0.018	D,U	SW846-SW8321A
	1,3-Dinitrobenzene	0.068	0.22	0.019	D,J	SW846-SW8321A
	2,4,6-Trinitrotoluene	0.011	0.22	0.011	D,U	SW846-SW8321A
	2,4-Dinitrotoluene	0.02	0.22	0.02	D,U	SW846-SW8321A
	2,6-Dinitrotoluene	0.016	0.22	0.016	D,U	SW846-SW8321A
	2-Amino-4,6-dinitrotoluene	0.028	0.22	0.028	D,U	SW846-SW8321A
	2-nitrotoluene	0.019	0.22	0.019	D,U	SW846-SW8321A
	3-Nitrotoluene	0.025	0.22	0.025	D,U	SW846-SW8321A
	4-Amino-2,6-dinitrotoluene	0.017	0.22	0.017	D,U	SW846-SW8321A
	4-Methylnitrobenzene	0.025	0.22	0.025	D,U	SW846-SW8321A
	HMX	0.052	0.22	0.052	D,U	SW846-SW8321A
	Nitrobenzene	0.014	0.22	0.014	D,U	SW846-SW8321A
	RDX	0.022	0.22	0.022	D,U	SW846-SW8321A
Tetryl	0.02	0.22	0.02	D,U	SW846-SW8321A	
SWTA3-MW3 7-May-12	1,3,5-trinitrobenzene	0.019	0.23	0.019	D,U	SW846-SW8321A
	1,3-Dinitrobenzene	0.02	0.23	0.02	D,U	SW846-SW8321A
	2,4,6-Trinitrotoluene	0.012	0.23	0.012	D,U	SW846-SW8321A
	2,4-Dinitrotoluene	0.022	0.23	0.022	D,U	SW846-SW8321A
	2,6-Dinitrotoluene	0.017	0.23	0.017	D,U	SW846-SW8321A
	2-Amino-4,6-dinitrotoluene	0.03	0.23	0.03	D,U	SW846-SW8321A
	2-nitrotoluene	0.02	0.23	0.02	D,U	SW846-SW8321A
	3-Nitrotoluene	0.027	0.23	0.027	D,U	SW846-SW8321A
	4-Amino-2,6-dinitrotoluene	0.018	0.23	0.018	D,U	SW846-SW8321A
	4-Methylnitrobenzene	0.027	0.23	0.027	D,U	SW846-SW8321A
	HMX	0.055	0.23	0.055	D,U	SW846-SW8321A
	Nitrobenzene	0.015	0.23	0.015	D,U	SW846-SW8321A
	RDX	0.023	0.23	0.023	D,U	SW846-SW8321A
Tetryl	0.021	0.23	0.021	D,U	SW846-SW8321A	

D = Dilution

J = Estimated result. Result is less than RL.

U = Analyte not detected at or above the reporting limit or MDL

**Table-3 NMED DOE OB FFY 2012 Q-3 Groundwater Protection Program Groundwater Quality Results:
High Explosive Compounds**

Monitoring Well/ Sample Date	Analyte	Result (µg/L)	Quantitation Limit (µg/L)	MDL (µg/L)	Laboratory Qualifier	Analytical Method
TRE-1 2-May-12	1,3,5-trinitrobenzene	0.018	0.22	0.018	D,U	SW846-SW8321A
	1,3-Dinitrobenzene	0.022	0.22	0.019	D,J	SW846-SW8321A
	2,4,6-Trinitrotoluene	0.012	0.22	0.012	D,U	SW846-SW8321A
	2,4-Dinitrotoluene	0.021	0.22	0.021	D,U	SW846-SW8321A
	2,6-Dinitrotoluene	0.016	0.22	0.016	D,U	SW846-SW8321A
	2-Amino-4,6-dinitrotoluene	0.029	0.22	0.029	D,U	SW846-SW8321A
	2-nitrotoluene	0.019	0.22	0.019	D,U	SW846-SW8321A
	3-Nitrotoluene	0.026	0.22	0.026	D,U	SW846-SW8321A
	4-Amino-2,6-dinitrotoluene	0.017	0.22	0.017	D,U	SW846-SW8321A
	4-Methylnitrobenzene	0.026	0.22	0.026	D,U	SW846-SW8321A
	HMX	0.053	0.22	0.053	D,U	SW846-SW8321A
	Nitrobenzene	0.014	0.22	0.014	D,U	SW846-SW8321A
	RDX	0.022	0.22	0.022	D,U	SW846-SW8321A
	Tetryl	0.02	0.22	0.02	D,U	SW846-SW8321A

D = Dilution

J = Estimated result. Result is less than RL.

U = Analyte not detected at or above the reporting limit or MDL

Table-4 NMED DOE OB FFY 2012 Q-3 Groundwater Protection Program Groundwater Quality Results: Detected Volatile Organic Compounds

Monitoring Well/ Sample Date	Analyte	Result (µg/L)	EPA MCL (µg/L)	Quantitation Limit (µg/L)	MDL (µg/L)	Laboratory Qualifier	Analytical Method
TRE-1 2-May-12	Chloroform	0.6	NE	1	0.12	J	SW-846:8260B

J = Estimated result. Result is less than RL.

NE = Not established

Table-5 NMED DOE OB FFY 2012 Q-3 Groundwater Protection Program Groundwater Quality Results: Method Detection Limits for Volatile Organic Compounds

Analyte	MDL (µg/L)	Analytical Method
4-Methyl-2-pentanone (MIBK)	0.18	SW-846:8260B
Acetone	2.1	SW-846:8260B
Benzene	0.13	SW-846:8260B
Bromodichloromethane	0.14	SW-846:8260B
Bromoform	0.1	SW-846:8260B
Bromomethane	0.29	SW-846:8260B
Butanone[2-]	0.35	SW-846:8260B
Carbon Disulfide	0.16	SW-846:8260B
Carbon Tetrachloride	0.15	SW-846:8260B
Chlorobenzene	0.12	SW-846:8260B
Chloroethane	0.34	SW-846:8260B
Chloroform	0.12	SW-846:8260B
Chloromethane	0.25	SW-846:8260B
Dibromochloromethane	0.13	SW-846:8260B
Dichloroethane[1,1-]	0.1	SW-846:8260B
Dichloroethane[1,2-]	0.22	SW-846:8260B
Dichloroethene[1,1-]	0.14	SW-846:8260B
Dichloroethene[cis-1,2-]	0.1	SW-846:8260B
Dichloroethene[trans-1,2-]	0.11	SW-846:8260B
Dichloropropane[1,2-]	0.15	SW-846:8260B
Dichloropropene[cis-1,3-]	0.22	SW-846:8260B
Dichloropropene[trans-1,3-]	0.08	SW-846:8260B
Ethylbenzene	0.1	SW-846:8260B
Hexanone[2-]	0.17	SW-846:8260B
Methylene Chloride	0.35	SW-846:8260B
Styrene	0.15	SW-846:8260B
Tetrachloroethane[1,1,2,2-]	0.09	SW-846:8260B
Tetrachloroethene	0.1	SW-846:8260B
Toluene	0.25	SW-846:8260B
Trichloroethane[1,1,1-]	0.19	SW-846:8260B
Trichloroethane[1,1,2-]	0.31	SW-846:8260B
Trichloroethene	0.13	SW-846:8260B
Vinyl acetate	0.21	SW-846:8260B
Vinyl Chloride	0.22	SW-846:8260B
Xylene (Total)	0.18	SW-846:8260B

Table-6 NMED DOE OB FFY 2012 Q-3 Groundwater Protection Program Groundwater Quality Results: Gamma Spectroscopy, Gross Alpha, Gross Beta, Radium 226, Radium 228 and Isotopic Uranium

Monitoring Well/ Sample Date	Analyte	Activity (pCi/L)	MDA (pCi/L)	Laboratory Qualifier	Analytical Method
COYOTE SPRINGS 15-May-12	Actinium-228	1.53 ± 16	16.5	U	EPA:901.1M
	Beryllium-7	7 ± 16	27.6	U	EPA:901.1M
	Bismuth-212	-4.74 ± 28	47.2	U	EPA:901.1M
	Bismuth-214	42.6 ± 17	34	U	EPA:901.1M
	Cesium-134	0.734 ± 2.1	3.74	U	EPA:901.1M
	Cesium-137	0.58 ± 2	3.46	U	EPA:901.1M
	Cobalt-60	1.71 ± 2.2	3.96	U	EPA:901.1M
	Gross Alpha	18.7 ± 11	14.3		EPA:900.0
	Gross Beta	27.3 ± 9.2	13		EPA:900.0
	Iodine-131	2.04 ± 3	5.05	U	EPA:901.1M
	Lead-212	-3.24 ± 5.3	5.67	U	EPA:901.1M
	Lead-212	-2.81 ± 6.7	7.4	U	EPA:901.1M
	Potassium-40	-119 ± 65	88.3	U	EPA:901.1M
	Protactinium-234m	184 ± 240	423	U	EPA:901.1M
	Radium-226	0.184 ± 0.11	0.163	J	EPA:903.1M
	Radium-228	0.865 ± 0.29	0.434	J	EPA:904.0M
	Sodium-22	-0.71 ± 2.1	3.59	U	EPA:901.1M
	Tallium-208	-3.91 ± 3.4	3.91	U	EPA:901.1M
	Thorium-234	184 ± 240	423	U	EPA:901.1M
	Uranium-234	11.1 ± 1.9	0.00554		HASL-300:ISOU
Uranium-235	0.130 ± 0.032	0.00911		HASL-300:ISOU	
Uranium-238	2.23 ± 0.38	0.00766		HASL-300:ISOU	

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U = Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda/Mdl, Total Uncert, CRDL, RDL or not identified by gamma scan software.

Table-6 NMED DOE OB FFY 2012 Q-3 Groundwater Protection Program Groundwater Quality Results: Gamma Spectroscopy, Gross Alpha, Gross Beta, Radium 226, Radium 228 and Isotopic Uranium

Monitoring Well/ Sample Date	Analyte	Activity (pCi/L)	MDA (pCi/L)	Laboratory Qualifier	Analytical Method
MRN-3D 3-May-12	Actinium-228	7.69 ± 18	16.5	U	EPA:901.1M
	Beryllium-7	1.4 ± 16	26.5	U	EPA:901.1M
	Bismuth-212	-0.985 ± 27	47.2	U	EPA:901.1M
	Bismuth-214	17.9 ± 29	37.6	U	EPA:901.1M
	Cesium-134	1.90 ± 2.1	3.77	U	EPA:901.1M
	Cesium-137	0.452 ± 2	3.45	U	EPA:901.1M
	Cobalt-60	1.120 ± 2.1	3.77	U	EPA:901.1M
	Gross Alpha	2.89 ± 1.9	2.67		EPA:900.0
	Gross Beta	5.27 ± 1.3	1.65		EPA:900.0
	Iodine-131	0.962 ± 3	5.23	U	EPA:901.1M
	Lead-212	1.180 ± 6.7	5	U	EPA:901.1M
	Lead-212	20.5 ± 9.5	6.41	J	EPA:901.1M
	Potassium-40	-132 ± 64	89.6	U	EPA:901.1M
	Protactinium-234m	189 ± 240	439	U	EPA:901.1M
	Radium-226	0.179 ± 0.14	0.221	U	EPA:903.1M
	Radium-228	0.427 ± 0.29	0.582	U	EPA:904.0M
	Sodium-22	-0.188 ± 2.2	3.78	U	EPA:901.1M
Tallium-208	-5.48 ± 4.3	3.99	U	EPA:901.1M	
Thorium-234	189 ± 240	439	U	EPA:901.1M	

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Table-6 NMED DOE OB FFY 2012 Q-3 Groundwater Protection Program Groundwater Quality Results: Gamma Spectroscopy, Gross Alpha, Gross Beta, Radium 226, Radium 228 and Isotopic Uranium

Monitoring Well/ Sample Date	Analyte	Activity (pCi/L)	MDA (pCi/L)	Laboratory Qualifier	Analytical Method
SFR-2S 1-May-12	Actinium-228	-21.5 ± 18	20.1	U	EPA:901.1M
	Beryllium-7	-7.93 ± 20	34.1	U	EPA:901.1M
	Bismuth-212	23.4 ± 35	60.4	U	EPA:901.1M
	Bismuth-214	39.7 ± 49	24.3	J	EPA:901.1M
	Cesium-134	-1.27 ± 2.7	4.55	U	EPA:901.1M
	Cesium-137	-1.09 ± 2.7	4.49	U	EPA:901.1M
	Cobalt-60	-0.462 ± 2.4	4.01	U	EPA:901.1M
	Gross Alpha	22 ± 6.7	4.84		EPA:900.0
	Gross Beta	12.2 ± 3.2	3.94		EPA:900.0
	Iodine-131	1.76 ± 4.1	7.09	U	EPA:901.1M
	Lead-212	-11.7 ± 7.1	8	U	EPA:901.1M
	Lead-212	30.9 ± 11	8.49	J	EPA:901.1M
	Potassium-40	-327 ± 87	111	U	EPA:901.1M
	Protactinium-234m	-55.5 ± 300	508	U	EPA:901.1M
	Radium-226	0.123 ± 0.14	0.244	U	EPA:903.1M
	Radium-228	0.222 ± 0.28	0.624	U	EPA:904.0M
	Sodium-22	0.261 ± 2.5	4.33	U	EPA:901.1M
	Tallium-208	-5.73 ± 4.4	4.96	U	EPA:901.1M
	Thorium-234	-55.5 ± 300	508	U	EPA:901.1M
	Uranium-234	20.6 ± 3.4	0.00824		HASL-300:ISOU
Uranium-235	0.219 ± 0.046	0.00542		HASL-300:ISOU	
Uranium-238	5.47 ± 0.92	0.00542		HASL-300:ISOU	

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Table-6 NMED DOE OB FFY 2012 Q-3 Groundwater Protection Program Groundwater Quality Results: Gamma Spectroscopy, Gross Alpha, Gross Beta, Radium 226, Radium 228 and Isotopic Uranium

Monitoring Well/ Sample Date	Analyte	Activity (pCi/L)	MDA (pCi/L)	Laboratory Qualifier	Analytical Method
SWTA3-MW3 7-May-12	Actinium-228	-21.9 ± 18	20.6	U	EPA:901.1M
	Beryllium-7	7.050 ± 21	35.9	U	EPA:901.1M
	Bismuth-212	38.0 ± 37	65.1	U	EPA:901.1M
	Bismuth-214	78.8 ± 38	27	J	EPA:901.1M
	Cesium-134	2.34 ± 2.9	5.05	U	EPA:901.1M
	Cesium-137	-0.131 ± 2.7	4.63	U	EPA:901.1M
	Cobalt-60	-0.059 ± 2.5	4.27	U	EPA:901.1M
	Gross Alpha	3.3 ± 2.1	2.86		EPA:900.0
	Gross Beta	5.51 ± 1.3	1.58		EPA:900.0
	Iodine-131	-0.16 ± 3.1	5.22	U	EPA:901.1M
	Lead-212	-0.62 ± 7.6	8.44	U	EPA:901.1M
	Lead-212	63.2 ± 15	8.79	J	EPA:901.1M
	Potassium-40	-265 ± 87	119	U	EPA:901.1M
	Protactinium-234m	35.1 ± 310	527	U	EPA:901.1M
	Radium-226	-0.004 ± 0.11	0.236	U	EPA:903.1M
	Radium-228	0.236 ± 0.26	0.57	U	EPA:904.0M
	Sodium-22	0.227 ± 2.6	4.6	U	EPA:901.1M
Tallium-208	-5.11 ± 4.6	5.26	U	EPA:901.1M	
Thorium-234	35.1 ± 310	527	U	EPA:901.1M	

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Table-6 NMED DOE OB FFY 2012 Q-3 Groundwater Protection Program Groundwater Quality Results: Gamma Spectroscopy, Gross Alpha, Gross Beta, Radium 226, Radium 228 and Isotopic Uranium

Monitoring Well/ Sample Date	Analyte	Activity (pCi/L)	MDA (pCi/L)	Laboratory Qualifier	Analytical Method
TRE-1 2-May-12	Actinium-228	-1.02 ± 15	17.1	U	EPA:901.1M
	Beryllium-7	-0.235 ± 17	28.4	U	EPA:901.1M
	Bismuth-212	25.7 ± 28	51	U	EPA:901.1M
	Bismuth-214	94.8 ± 38	25.6	J	EPA:901.1M
	Cesium-134	0.226 ± 2.3	3.94	U	EPA:901.1M
	Cesium-137	-2.52 ± 2.2	3.5	U	EPA:901.1M
	Cobalt-60	-1.74 ± 2.3	3.84	U	EPA:901.1M
	Gross Alpha	23.9 ± 7.8	5.3		EPA:900.0
	Gross Beta	9.55 ± 3.2	4.39		EPA:900.0
	Iodine-131	1.29 ± 3	5.24	U	EPA:901.1M
	Lead-212	5.95 ± 6.6	4.88	J	EPA:901.1M
	Lead-212	82.4 ± 14	6.75	J	EPA:901.1M
	Potassium-40	-170 ± 64	85	U	EPA:901.1M
	Protactinium-234m	226 ± 250	455	U	EPA:901.1M
	Radium-226	0.185 ± 0.13	0.211	U	EPA:903.1M
	Radium-228	0.425 ± 0.3	0.589	U	EPA:904.0M
	Sodium-22	-1.86 ± 2.2	3.65	U	EPA:901.1M
	Tallium-208	-6.22 ± 4.4	4.06	U	EPA:901.1M
	Thorium-234	226 ± 250	455	U	EPA:901.1M
	Uranium-234	24.1 ± 4	0.00521		HASL-300:ISOU
Uranium-235	0.259 ± 0.053	0.00521		HASL-300:ISOU	
Uranium-238	5.860 ± 0.98	0.00793		HASL-300:ISOU	

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