

**Abandoned Uranium Mines Project
Navajo Lands**

Central Area

Water Sample Information

Map ID	Sample ID	Field Type	Sample Name	Longitude DMS (W)	Latitude DMS (N)	Elevation (ft)	Sample Date	Sample Time	pH su	Cond uS/cm	Temp C	ORP millivolt	Metals	Radio	Filtration	Preserved	Bacterial Sampling	Ludlum 19 mR/hr	Notes
1	CH990316TCS004	Spring	Dark Cave Spring	109 47 22.11	36 7 34.0452	5931	16-Mar-1999	5:01 pm	9.22	513	10.2	261	Yes	Yes	No	Yes	No	12	Taken from Pump; Sample ID changed from CH990316CWS004 to CH990316
2	CH990316TCS003	Spring	Shonto	109 48 2.063	36 7 25.0607	5945	16-Mar-1999	4:23 pm	9.00	664	11.3	225	Yes	Yes	No	Yes	No	12-15	Taken from Pump; Sample ID changed from CH990316CWS003 to CH990316
3	CH981119TCW001	Well	Cottonwood Chapter House	109 53 20.50	36 4 14.1293	5991	19-Nov-1998	9:27 am	7.63	551	12.5	668	Yes	Yes	No	Yes	No	9-12	From Faucet; Cottonwood Chapter Sample
4	CH990316TCW004	Wind Mill	Tank 10R-51	109 53 1.375	36 4 30.9906	5966	16-Mar-1999	10:29 am	8.79	1,025	10.3	203	Yes	Yes	No	Yes	No	12-16	Taken from Trough; Sample ID changed from CH990316CWW003 to CH9903
5	CH990316TCS001	Spring	Cottonwood Chapter House	109 52 51.68	36 7 46.0829	6229	16-Mar-1999	12:34 pm	8.63	178	10.3	54	Yes	Yes	No	Yes	No	8-10	Used Bailer - No Lid on Container
6	CH990316TCS002	Spring	Refrigerator Springs	109 52 50.58	36 7 51.7181	6220	16-Mar-1999	1:58 pm	8.43	1,049	7.4	72	Yes	Yes	No	Yes	No	8-10	In Refrigerator; Sample ID changed from CH990316CWS002 to CH990316TC
7	CH981119TCW003	Wind Mill	Tank 10T-533	109 52 13.79	36 9 54.6864	6318	19-Nov-1998	11:33 am	8.72	1,000	9.1	312	Yes	Yes	No	Yes	No	15-20	Taken from Trough
8	CH981123BGW001	Well	Tank Blue Gap	109 56 46.25	36 10 17.503	6418	23-Nov-1998	2:51 pm	8.57	914	11.6	237	Yes	Yes	No	Yes	No	12-17	Taken from Trough; Blue Gap Chapter Truck Filling
9	CH981124BGS002	Spring	White Clay Spring	109 52 55.03	36 13 1.4009	6899	24-Nov-1998	12:24 pm	7.52	1,381	9.1	264	Yes	Yes	No	Yes	No	25-32	Used Pump
10	CH981123BGW002	Wind Mill	Tank 4T-386	109 53 32.48	36 13 47.446	6594	23-Nov-1998	3:49 pm	8.22	1,989	10.4	269	Yes	Yes	No	Yes	No	10-14	Taken from Trough
11	CH990315RRS004	Spring	Sweet Water Spring	109 47 57.68	36 16 47.033	5986	15-Mar-1999	5:35 pm	8.86	1,431	14.5	252	Yes	Yes	No	Yes	No	8-15	Stored in Steel Tank
12	CH981104BGS001	Spring	Waterfall Spring	109 49 52.60	36 17 40.953	7116	04-Nov-1998	3:00 pm	8.30	1,181	13.5	247	Yes	Yes	No	Yes	No	22-25	
13	CH990315RRS002	Spring	Alamo Springs	109 47 2.310	36 20 40.486	5771	15-Mar-1999	1:19 pm	7.91	777	11.3	213	Yes	Yes	No	Yes	No	8-10	Used Bailer
14	CH990315RRS003	Spring	Tanizohnnie Nez Spring	109 47 2.203	36 20 40.364	5778	15-Mar-1999	3:03 pm	8.04	1,239	11.2	308	Yes	Yes	No	Yes	No	8-12	Used Bailer - Well Inwash
15	CH981104BMS001	Spring	Coal Spring	109 54 39.38	36 18 9.3617	6910	04-Nov-1998	11:19 am	8.37	1,313	11.4	140	Yes	Yes	No	Yes	No	13-15	
16	CH981105BMW004	Well	Begay Well	109 53 48.85	36 20 19.976	7084	05-Nov-1998	2:57 pm	7.45	2,280	11.6	306	Yes	Yes	No	Yes	No	10	Shallow Well
17	CH981120RRS001	Spring	Trading Post Spring	109 52 15.79	36 24 13.659	6186	20-Nov-1998	9:36 am	7.70	332	9.3	404	Yes	Yes	No	Yes	No	10-14	Taken from Trough
18	CH981120RRW001	Well	Rough Rock Chapter House	109 51 39.67	36 24 43.447	6156	20-Nov-1998	9:00 am	9.32	738	12.4	900	Yes	Yes	No	Yes	No	12-15	From Faucett; Rough Rock Chapter Sample
19	KY981008CHS004	Spring	Red Tree Spring	109 54 22.66	36 26 1.0871	5902	08-Oct-1998	2:49 pm	8.01	676	20.6	215	Yes	Yes	No	Yes	No	10 - 40	
20	KY981008CHS003	Spring	Tinyehtoh Spring	109 53 20.35	36 26 52.555	5842	08-Oct-1998	12:49 pm	8.50	1,478	19.1	213	Yes	Yes	No	Yes	No	10-15	
21	KY981008CHS002	Spring	Burro Spring	109 54 2.482	36 27 5.2350	5764	08-Oct-1998	12:12 pm	7.50	5,520	16.8	214	Yes	Yes	No	Yes	No	10 - 14	
22	KY981008CHS001	Spring	Benally Spring	109 52 51.42	36 28 45.424	5632	08-Oct-1998	11:09 am	7.68	5,550	18.5	203	Yes	Yes	No	Yes	No	8 - 10	
23	KY981008CHW002	Wind Mill	Tank 8T-518	109 54 13.09	36 31 13.289	5554	08-Oct-1998	3:54 pm	9.59	595	19.8	219	Yes	Yes	No	Yes	No	10 - 25	From Trough
24	KY981008CHW003	Wind Mill	Tank 8T-528	109 59 9.309	36 32 50.293	5727	08-Oct-1998	4:34 pm	10.22	602	17.1	199	Yes	Yes	No	Yes	No	10 - 12	From Trough
25	KY981008CHW004	Wind Mill	Tank 8A-121	110 1 21.108	36 33 45.539	5579	08-Oct-1998	5:14 pm	9.01	2,250	19.1	185	Yes	Yes	No	Yes	No	12 - 15	From Spigot
26	KY981008CHW001	Well	Chilchinbito Chapter House	110 4 53.186	36 31 41.326	5871	08-Oct-1998	10:20 am	9.55	414	22.2	178	Yes	Yes	No	Yes	No	8 - 10	Chilchinbito Chapter House Sample
27	CH981105BMS002	Spring	Aspen Spring	110 0 18.760	36 26 36.655	7340	05-Nov-1998	11:33 am	7.44	784	12.7	228	Yes	Yes	No	Yes	No	14-16	
28	CH981103BMW001	Wind Mill	Tank 4T-399	109 59 21.76	36 21 50.019	6764	03-Nov-1998	8:57 am	8.77	1,500	8.3	178	Yes	Yes	No	Yes	No	12-13	Taken from Trough
29	CH981105BMW003	Well	Black Mesa Chapter House	110 3 53.725	36 20 45.302	6628	05-Nov-1998	9:16 am	9.80	955	12.2	398	Yes	Yes	No	Yes	No	22-26	Black Mesa Chapter Sample
30	CH981105BMS003	Spring	Cliff Spring	110 9 10.102	36 17 24.576	6466	05-Nov-1998	4:46 pm	8.65	274	10.0	271	Yes	Yes	No	Yes	No	28-30	
31	CH981105BMW005	Wind Mill	Tank 308-1	110 14 12.33	36 12 55.229	6238	05-Nov-1998	5:37 pm	9.17	2,180	6.4	242	Yes	Yes	No	Yes	No	18-20	

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Central Area

Water Sample Analysis for Stable Metals

Map ID	Sample ID	Sample Name	Field Type	Aluminum	Antimony ²	Arsenic ^{2,4}	Barium	Beryllium ^{2,4}	Cadmium ^{2,4}	Calcium	Chromium ^{2,5}	Cobalt ²	Copper ²	Iron ²	Lead ²	Magnesium	Manganese ²	Mercury ²	Nickel ²	Potassium ²	Selenium ²	Silver ²	Sodium	Thallium ^{2,5}	Vanadium ²	Zinc ²	ILCR ^{1,6}	HI ^{3,6}		
				Primary MCLs in Micrograms per Liter (ug/L) ⁷	6	50	1000	4	5	NONE	100	NONE	1300	300	15	NONE	50	2	NONE	NONE	50	100	NONE	2	NONE	5000				
				PRG Limits in Micrograms per Liter (ug/L)	15	0.045	2600	73	18	NONE	180	2200	1400	1100	4	NONE	1700	11	730	NONE	189	180	NONE	2.6	260	11000				
1	CH990316TCS004	Dark Cave Spring	Spring	24.0	2.8	0	13.9	0	0	9,180	0	1.2	40.3	151.0	2.4	3,100	1.8	0.071	0	2,630	4.4	0	97,200	4.2	2.7	69.6	0.00E+00	1.90		
2	CH990316TCS003	Shonto	Spring	31.2	0	0	12.5	0.2	0	21,100	0	0.9	17.9	486.0	0	6,320	4.9	0.072	0	3,410	25.9	0	118,000	0	1.3	106.0	0.00E+00	0.23		
3	CH981119TCW001	Cottonwood Chapter House	Well	42.3	0	6.0	87.5	0	0.4	16,000	10.2	1.2	4.6	127.0	0	5,200	1.8	0.180	0	5,990	3.2	1.4	94,800	6.2	2.7	80.5	1.33E-004	3.12		
4	CH990316TCW004	Tank 10R-51	Wind Mill	6,390.0	0	0	25.4	0.2	0	333,000	4.2	2.5	8.8	4,240.0	2.3	84,400	261.0	0.081	3.9	11,500	0	0	897,000	0	9.2	66.6	0.00E+00	0.81		
5	CH990316TCS001	Cottonwood Chapter House	Spring	47.1	3.6	3.5	88.2	0	0	56,600	0	1.5	16.5	53.6	0	10,800	1.5	0.069	0	9,060	2.9	0	111,000	0	6.0	23.6	7.78E-005	0.66		
6	CH990316TCS002	Refrigerator Springs	Spring	39.6	2.7	0	99.9	0	0.3	86,200	0	1.7	0	355.0	2.4	41,100	207.0	0.074	0	753	0	0	100,000	4.6	0.9	24.6	0.00E+00	2.17		
7	CH981119TCW003	Tank 10T-533	Wind Mill	58.8	0	0	9.1	0	0	52,400	0	0	0	1,060.0	0	19,600	57.3	0.057	0	7,830	0	0	207,000	0	0	94.2	0.00E+00	0.15		
8	CH981123BGW001	Tank Blue Gap	Well	129.0	0	6.2	21.8	0	0	112,000	0	0.6	0	1,010.0	1.3	36,800	433.0	0.120	1.1	8,460	0	0	143,000	0	0	132.0	1.38E-004	0.95		
9	CH981124BGS002	White Clay Spring	Spring	148.0	0	0	20.1	0	0	271,000	0	0	0	16.7	0	80,300	1.1	0.200	0	5,750	28.6	0	61,200	0	1.8	6.5	0.00E+00	0.19		
10	CH981123BGW002	Tank 4T-386	Wind Mill	158.0	0	0	7.6	0	0	334,000	0	0.8	0	260.0	0	149,000	321.0	0.310	1.5	9,060	0	0	167,000	6.3	0	1,460.0	0.00E+00	2.81		
11	CH990315RRS004	Sweet Water Spring	Spring	37.7	0	0	11.1	0	0	11,700	4.8	1.1	0	5,930.0	0	3,620	61.7	0.075	1.4	11,200	208.0	0.9	266,000	0	168.0	0.00E+00	2.37			
12	CH981104BGS001	Waterfall Spring	Spring	160.0	0	0	45.5	0.6	0	176,000	0	0	0	0	0	58,500	2.7	0	2.3	3,230	23.5	0	18,800	0	19.4	31.4	0.00E+00	0.24		
13	CH990315RRS002	Alamo Springs	Spring	27.3	3.7	0	99.9	0	0	106,000	0	1.2	6.5	17.0	0	28,400	1.4	0.069	0	3,100	3.3	0	25,500	0	4.7	21.4	0.00E+00	0.34		
14	CH990315RRS003	Tanizohnnie Nez Spring	Spring	1,690.0	3.2	2.8	58.3	0.2	0	145,000	2.8	1.2	4.5	2,100.0	9.7	33,000	73.4	0.072	0	5,860	6.9	0	91,900	0	7.2	62.8	6.22E-005	0.87		
15	CH981104BMS001	Coal Spring	Spring	109.0	0	0	7.2	0	0	210,000	0	0	7.7	334.0	0	92,900	4.2	0.066	1.1	5,680	0	0	19,700	0	0	40.0	0.00E+00	0.06		
16	CH981105BMW004	Begay Well	Well	189.0	0	0	28.9	0	0	402,000	0	0.8	0	27.6	0	134,000	3.4	0.078	0	12,300	2.5	0	24,100	5.1	0	36.0	0.00E+00	2.01		
17	CH981120RRS001	Trading Post Spring	Spring	53.0	0	0	84.7	0.2	0.5	56,300	0	0.7	0	0	1.3	11,200	0.3	0.370	0	6,940	0	1.0	8,470	0	0	220.0	0.00E+00	0.13		
18	CH981120RRW001	Rough Rock Chapter House	Well	30.1	0	44.1	8.2	0	0	3,630	17.1	0	2.0	93.6	2.3	846	6.2	0.110	0	1,510	0	0	192,000	0	70.3	21.0	9.80E-004	4.40		
19	KY981008CHS004	Red Tree Spring	Spring	118.0	0	0	51.2	0.4	0	80,100	0	0	0	52.5	0	24,100	3.6	0.120	0	3,420	19.2	0	29,500	0	0	49.7	0.00E+00	0.15		
20	KY981008CHS003	Tinyehtoh Spring	Spring	108.0	0	0	42.4	0.4	0	27,800	0	0	2.1	40.9	0	4,860	1.7	0.097	0	4,560	2.9	0	285,000	4.6	2.6	16.4	0.00E+00	1.84		
21	KY981008CHS002	Burro Spring	Spring	7,900.0	0	3.4	44.5	0	0	544,000	17.3	4.6	10.8	13,900.	6.3	259,000	1,390.0	0.160	17.3	20,500	0	0	757,000	4.8	15.5	661.0	7.56E-005	4.73		
22	KY981008CHS001	Benally Spring	Spring	309.0	0	0	15.2	0	0	451,000	0	0.9	0	0	1.5	289,000	187.0	0.160	0	11,200	69.4	0	643,000	0	0	76.8	0.00E+00	0.51		
23	KY981008CHW002	Tank 8T-518	Wind Mill	60.9	0	28.5	3.7	0	0	997	29.7	0.8	11.3	953.0	1.7	163	7.1	0.220	0	750	0	0	135,000	6.1	81.0	132.0	6.33E-004	5.55		
24	KY981008CHW003	Tank 8T-528	Wind Mill	272.0	0	7.0	6.2	0	0	1,500	5.7	1.0	29.7	354.0	15.9	144	7.8	0.180	0	1,080	0	0	132,000	0	41.2	419.0	1.56E-004	0.95		
25	KY981008CHW004	Tank 8A-121	Wind Mill	63.1	0	0	10.8	0	0	11,500	0	0	1.2	115.0	0	1,740	2.5	0.150	0	3,090	0	0	423,000	4.9	0	251.0	0.00E+00	1.94		
26	KY981008CHW001	Chilchinbito Chapter House	Well	59.5	0	5.3	2.2	0.1	0	667	10.8	0	13.6	53.0	3.7	57	0.8	0.190	0	0	0	0	91,200	0	33.6	32.9	1.18E-004	0.71		
27	CH981105BMS002	Aspen Spring	Spring	71.8	0	0	20.1	0.2	0	120,000	0	0	0	0	0	46,300	0	0.080	0	1,470	4.3	0	6,420	4.1	0	8.1	0.00E+00	1.62		
28	CH981103BMW001	Tank 4T-399	Wind Mill	143.0	0	0	20.5	0	0	261,000	0	1.1	0	51.9	2.4	132,000	448.0	0.054	0	10,400	0	0	56,100	5.9	0	1,960.0	0.00E+00	2.73		
29	CH981105BMW003	Black Mesa Chapter House	Well	92.5	0	17.2	4.1	0.6	0	1,950	4.9	0.9	2.9	69.8	0	201	8.0	0.031	0	1,260	0	0	199,000	4.8	12.6	32.6	3.82E-004	3.52		
30	CH981105BMS003	Cliff Spring	Spring	243.0	0	0	52.8	0.8	0	34,200	0	0	0	42.4	0	5,610	0	0	0	770	0	0	6,200	0	0	5.1	0.00E+00	0.04		
31	CH981105BMW005	Tank 308-1	Wind Mill	102.0	0	0	4.2	0.4	0	11,100	0	0	0	531.0	0	2,040	16.9	0	0	2,190	0	0	580,000	4.0	0	154.0	0.00E+00	1.62		

1. ILCR = Incremental Lifetime Cancer Risk with Respect to Stable Metals.
2. The values of "0" represent a result of either "not detected" at the detection limit of the laboratory method or a negative count. In both cases, the result can be considered "0".
3. The evaluation of Beta is in two steps. The initial screening level is 50 pCi/L. If the measured level of Beta exceeds the 50 pCi/L, a further evaluation is merited. Beta-emitting radionuclides would be screened.
4. The values of "0" in the Pb210 column represent analytical results that measured less than the Minimum Detectable Activity (MDA).
5. Definition of final calculations and ranking will be fully described and published in a final report.
6. When comparing these PRG's with the U.S. EPA's PRG list, the calculated PRG used for U238 is less than the EPA's PRG for U238D (D meaning that its decay daughters are included in the risk calculations).
7. MCL- Maximum Contaminant Levels are the maximum permissible level of a contaminant in water delivered to users of a public water system. This level is not always based on health or risk criteria.
8. PRG- Preliminary Remediation Goals are tools for evaluating and cleaning up contaminated sites. They are risk-based concentrations derived from standardized equations, combining exposure information assumptions and EPA toxicity data.

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Central Area

Water Sample Analysis for Radioactive Metals

Map ID	Sample ID	Sample Name	Field Type ⁷	Alpha ²	Beta ³	Lead210 ⁴	Radium226 ²	Radium228 ²	Thorium228 ²	Thorium230 ²	Thorium232 ²	Uranium234 ²	Uranium235 ²	Uranium238 ^{2,6}	ILCRrad ^{1,5}		
				15	50	NONE	5	5	NONE	NONE	NONE	20	20	20			
				PRG Limits ⁸ in pico Curies per Liter (pCi/L)	NONE	NONE	0.047	0.16	0.19	0.21	1.3	1.5	1.1	1.1	0.71		
1	CH990316TCS004	Dark Cave Spring	Spring	3.52	3.83	0.39	0.106	0.394	0	0.013	0	3.00	0.073	1.93	8.26E-006		
2	CH990316TCS003	Shonto	Spring	4.69	6.37	0.44	0.092	0.101	0.030	0	0	4.62	0.124	3.40	1.04E-005		
3	CH981119TCW001	Cottonwood Chapter House	Well	15.00	13.80	0.58	0.298	0.219	0.010	0.005	0.005	7.68	0.151	8.56	2.22E-005		
4	CH990316TCW004	Tank 10R-51	Wind Mill	17.80	24.10	0.38	0.156	0.368	0.108	0.070	0.070	13.20	0.389	8.73	2.82E-005		
5	CH990316TCS001	Cottonwood Chapter House	Spring	13.80	10.80	0.04	0.108	0.206	0.041	0	0	6.92	0.310	3.56	1.35E-005		
6	CH990316TCS002	Refrigerator Springs	Spring	14.80	4.31	0.48	0.039	0.320	0.003	0	0	6.80	0.125	4.15	1.41E-005		
7	CH981119TCW003	Tank 10T-533	Wind Mill	39.30	42.70	0.67	0.082	0.554	0.031	0.009	0	20.00	1.910	51.10	9.55E-005		
8	CH981123BGW001	Tank Blue Gap	Well	0	11.50	1.77	1.910	1.950	0	0.005	0	0.13	0.033	0.17	6.02E-005		
9	CH981124BGS002	White Clay Spring	Spring	46.60	28.80	0.81	2.770	1.550	0.090	0	0.024	22.40	0.992	22.50	7.89E-005		
10	CH981123BGW002	Tank 4T-386	Wind Mill	10.00	10.50	1.04	1.460	2.220	0.089	0	0	3.80	0.176	3.43	5.18E-005		
11	CH990315RRS004	Sweet Water Spring	Spring	9.03	17.80	0.31	0.110	0.359	0	0.011	0	5.80	0.384	6.39	1.72E-005		
12	CH981104BGS001	Waterfall Spring	Spring	52.00	25.10	2.26	1.630	4.680	0.133	0.012	0.007	31.90	0.937	28.90	1.06E-004		
13	CH990315RRS002	Alamo Springs	Spring	4.36	5.89	0.37	0.186	0.473	0.005	0	0	4.83	0.138	4.32	1.43E-005		
14	CH990315RRS003	Tanzohinnie Nez Spring	Spring	13.30	10.60	0	0.125	0.247	0.010	0	0	8.47	0.219	4.92	1.70E-005		
15	CH981104BMS001	Coal Spring	Spring	1.99	2.99	0.49	0.074	0.451	0	0.019	0	0.58	0.078	0.34	3.92E-006		
16	CH981105BMW004	Begay Well	Well	11.10	16.50	3.10	0.116	0.987	0.051	0	0.013	2.15	0.068	2.91	1.23E-005		
17	CH981120RRS001	Trading Post Spring	Spring	2.67	8.77	0.80	0.225	0.499	0.001	0.004	0	3.67	0.212	1.77	2.71E-005		
18	CH981120RRW001	Rough Rock Chapter House	Well	14.10	9.97	0.66	0.035	0.308	0.016	0.004	0	11.00	0.235	5.76	2.02E-005		
19	KY981008CHS004	Red Tree Spring	Spring	15.00	6.60	0.17	0.147	0.172	0	0.010	0.004	6.18	0.097	3.04	1.18E-005		
20	KY981008CHS003	Tinyehtoh Spring	Spring	44.40	16.20	1.22	0.098	0	0.007	0.003	0	26.20	0.121	13.60	4.37E-005		
21	KY981008CHS002	Burro Spring	Spring	87.90	54.10	1.03	0.245	1.770	0.143	0	0.094	34.90	1.160	24.00	1.00E-004		
22	KY981008CHS001	Benally Spring	Spring	64.00	36.20	0.88	0.065	0.639	0.533	0	0	26.30	0.826	20.00	5.91E-005		
23	KY981008CHW002	Tank 8T-518	Wind Mill	13.30	5.03	0.23	0.032	0	0	0	0	8.55	0	3.43	1.28E-005		
24	KY981008CHW003	Tank 8T-528	Wind Mill	2.33	1.88	0.85	0.032	0.216	0.013	0.020	0	1.56	0.085	0.78	4.01E-006		
25	KY981008CHW004	Tank 8A-121	Wind Mill	1.79	3.31	0.62	0.069	0	0	0.005	0	0.18	0	0.24	9.37E-007		
26	KY981008CHW001	Chilchinbito Chapter House	Well	2.71	2.01	1.57	0.004	0.242	0	0	0.005	1.78	0	0.50	3.70E-005		
27	CH981105BMS002	Aspen Spring	Spring	4.34	4.86	0.67	0.119	0.097	0.027	0.010	0	1.32	0.033	1.18	4.28E-006		
28	CH981103BMW001	Tank 4T-399	Wind Mill	2.09	13.30	0.45	1.320	5.170	0.257	0	0.008	0.48	0.033	0.62	3.80E-005		
29	CH981105BMW003	Black Mesa Chapter House	Well	1.25	0.98	0.13	0.088	0.530	0.002	0.003	0	0.59	0	0.50	4.59E-006		
30	CH981105BMS003	Cliff Spring	Spring	9.06	4.53	0.73	0.703	0.572	0.018	0.020	0.016	3.00	0.073	2.62	1.40E-005		
31	CH981105BMW005	Tank 308-1	Wind Mill	2.82	2.77	0.96	0.283	0.571	0.052	0.005	0	0.42	0	0	5.41E-006		

1. ILCR = Incremental Lifetime Cancer Risk with Respect to Radioactive Metals.

2. The values of "0" represent a result of either "not detected" at the detection limit of the laboratory method or a negative count. In both cases, the result can be considered "0".

3. The evaluation of Beta is in two steps. The initial screening level is 50 pCi/L. If the measured level of Beta exceeds the 50 pCi/L, a further evaluation is merited. Beta-emitting radionuclides would be screened.

4. The values of "0" in the Pb210 column represent analytical results that measured less than the Minimum Detectable Activity (MDA).

5. Definition of final calculations and ranking will be fully described and published in a final report.

6. When comparing these PRG's with the U.S. EPA's PRG list, the calculated PRG used for U238 is less than the EPA's PRG for U238D (D meaning that its decay daughters are included in the risk calculations).

7. MCL- Maximum Contaminant Levels are the maximum permissible level of a contaminant in water delivered to users of a public water system. This level is not always based on health or risk criteria.

8. PRG- Preliminary Remediation Goals are tools for evaluating and cleaning up contaminated sites. They are risk-based concentrations derived from standardized equations, combining exposure information assumptions and EPA toxicity data.

**Abandoned Uranium Mines Project
Navajo Lands**

Central Area

**Water Quality Analysis: Stable and Radioactive Metals
In Order of Risk Ranking**

Map ID	Sample ID	Field Type	Alpha ² MCL: ⁹ PRG: ¹⁰	Beta ²	ILCR for Stable Metals ¹	ILCR for Rad Metals ¹	Total Cancer Risk	Hazard Index (HI)	Arsenic ³	Lead ³	Total U ²	Water Quality with Respect to Stable and Radioactive Metals ⁴			Risk Category	Risk Ranking ⁶	Map ID	Bacteria Present ⁷	Total Coliform Detected/ Fecal Coliform Not Detected ⁷	Total Coliform & Fecal Coliform Detected ⁸
												Less Risk	Some Risk	More Risk						
15	CH981104BMS001	Spring	1.99	2.99	0.00E+000	3.92E-006	3.92E-006	0.06	0	0	0.92	X		LESS	1	15				
25	KY981008CHW004	Wind Mill	1.79	3.31	0.00E+000	9.37E-007	9.37E-007	1.94	0	0	0.24		HI	SOME	2	25				
31	CH981105BMW005	Wind Mill	2.82	2.77	0.00E+000	5.41E-006	5.41E-006	1.62	0	0	0.42		HI	SOME	3	31				
27	CH981105BMS002	Spring	4.34	4.86	0.00E+000	4.28E-006	4.28E-006	1.62	0	0	2.50		HI	SOME	4	27				
16	CH981105BMW004	Well	11.10	16.50	0.00E+000	1.23E-005	1.23E-005	2.01	0	0	5.06		IICR, HI	SOME	5	16				
30	CH981105BMS003	Spring	9.06	4.53	0.00E+000	1.40E-005	1.40E-005	0.04	0	0	5.62		IICR	SOME	6	30				
28	CH981103BMW001	Wind Mill	2.09	13.30	0.00E+000	3.80E-005	3.80E-005	2.73	0	2.4	1.09		IICR, HI	SOME	7	28				
2	CH990316TCS003	Spring	4.69	6.37	0.00E+000	1.04E-005	1.04E-005	0.23	0	0	8.02		IICR	SOME	8	2				
17	CH981120RRS001	Spring	2.67	8.77	0.00E+000	2.71E-005	2.71E-005	0.13	0	1.3	5.44		IICR	SOME	9	17				
19	KY981008CHS004	Spring	15.00	6.60	0.00E+000	1.18E-005	1.18E-005	0.15	0	0	9.22		IICR	SOME	10	19				
10	CH981123BGW002	Wind Mill	10.00	10.50	0.00E+000	5.18E-005	5.18E-005	2.81	0	0	7.23		IICR, HI	SOME	11	10				
13	CH990315RRS002	Spring	4.36	5.89	0.00E+000	1.43E-005	1.43E-005	0.34	0	0	9.15		IICR	SOME	12	13				
1	CH990316TCS004	Spring	3.52	3.83	0.00E+000	8.26E-006	8.26E-006	1.90	0	2.4	4.93		HI	SOME	13	1				
8	CH981123BGW001	Well	0	11.50	1.38E-004	6.02E-005	1.98E-004	0.95	6.2	1.3	0.00		IICR	SOME	14	8				
11	CH990315RRS004	Spring	9.03	17.80	0.00E+000	1.72E-005	1.72E-005	2.37	0	0	12.57		IICR, HI	SOME	15	11				
5	CH990316TCS001	Spring	13.80	10.80	7.78E-005	1.35E-005	9.13E-005	0.66	3.5	0	10.79		IICR	SOME	16	5				
6	CH990316TCS002	Spring	14.80	4.31	0.00E+000	1.41E-005	1.41E-005	2.17	0	2.4	10.95		IICR, HI	SOME	17	6				
26	KY981008CHW001	Well	2.71	2.01	1.18E-004	3.70E-005	1.55E-004	0.71	5.3	3.7	2.28		IICR	SOME	18	26				
29	CH981105BMW003	Well	1.25	0.98	3.82E-004	4.59E-006	3.87E-004	3.52	17.2	0	1.09		IICR, HI	SOME	19	29				
3	CH981119TCW001	Well	15.00	13.80	1.33E-004	2.22E-005	1.56E-004	3.12	6.0	0	16.24		IICR, HI	SOME	20	3				
4	CH990316TCW004	Wind Mill	17.80	24.10	0.00E+000	2.82E-005	2.82E-005	0.81	0	2.3	22.32		IICR	SOME	21	4				
14	CH990315RRS003	Spring	13.30	10.60	6.22E-005	1.70E-005	7.92E-005	0.87	2.8	9.7	13.61		IICR, Lead	SOME	22	14				
20	KY981008CHS003	Spring	44.40	16.20	0.00E+000	4.37E-005	4.37E-005	1.84	0	0	39.80		Total U	MORE	23	20				
24	KY981008CHW003	Wind Mill	2.33	1.88	1.56E-004	4.01E-006	1.60E-004	0.95	7.0	15.9	2.34		Lead	MORE	24	24				
23	KY981008CHW002	Wind Mill	13.30	5.03	6.33E-004	1.28E-005	6.46E-004	5.55	28.5	1.7	11.98		IICR	MORE	25	23				
9	CH981124BGS002	Spring	46.60	28.80	0.00E+000	7.89E-005	7.89E-005	0.19	0	0	45.89		Total U	MORE	26	9				
22	KY981008CHS001	Spring	64.00	36.20	0.00E+000	5.91E-005	5.91E-005	0.51	0	1.5	47.13		Total U	MORE	27	22				
12	CH981104BGS001	Spring	52.00	25.10	0.00E+000	1.06E-004	1.06E-004	0.24	0	0	61.74		Total U	MORE	28	12				
18	CH981120RRW001	Well	14.10	9.97	9.80E-004	2.02E-005	1.00E-003	4.40	44.1	2.3	17.00		IICR	MORE	29	18				
7	CH981119TCW003	Wind Mill	39.30	42.70	0.00E+000	9.55E-005	9.55E-005	0.15	0	0	73.01		Total U	MORE	30	7				
21	KY981008CHS002	Spring	87.90	54.10	7.56E-005	1.00E-004	1.76E-004	4.73	3.4	6.3	60.06		Total U	MORE	31	21				

1. ILCR = Incremental Lifetime Cancer Risk with Respect to Stable Metals and Radioactive Metals.

2. The PRG's and MCL's for Alpha, Beta, and Uranium are in Pico-Curies per Liter (pCi/L).

3. The PRG's and MCL's for Lead and Arsenic are in Micrograms per Liter (ug/L).

4. Water Quality Levels:

- Less Risk Total Cancer Risk is less than or equal to 1E-05 and Hazard Index is less than or equal to 1 and Lead is less than 4 and total U less than 30.
- Some Risk Total Cancer Risk is less than or equal to 6E-04 but greater than 1E-05 or Hazard Index is less than 10 but greater than 1 or Lead is less than 15 but greater than 4 and total U less than 30.
- More Risk Total Cancer Risk is greater than 6E-04 or Hazard Index is greater than 10 or Lead is greater than 15 or total U equal to or greater than 30.

The three categories will be color coded on the associated map to be published with the final document.

5. Proposed EPA MCL is 30 pCi/L for the sum of three U isotopes.

6. The definitions of the risk categories and the ranking will be fully described and published in the final report.

7. No change in water quality assessment with respect to stable and radioactive metals results.

8. In accordance with USEPA emergency response procedures for purifying bacteria - impacted water, please use the following methods of emergency disinfection. These methods will not remove stable metals or radionuclides from water.

Boiling: Vigorous boiling for one minute will kill any disease-causing microorganisms present in water. The flat taste of boiled water can be improved by pouring it back and forth from one container to another (called aeration), by allowing it to stand for a few hours, or by adding a small pinch of salt for each quart of water boiled.

Chemical Treatment: When boiling is not practical, chemical disinfection should be used. The two chemicals commonly used are chlorine and iodine. Chlorine and iodine are somewhat effective in protecting against exposure to Giardia, but may not be effective in controlling Cryptosporidium.

Therefore, use iodine or chlorine only to disinfect well water (as opposed to surface water sources such as rivers, lakes, and springs), because well water is unlikely to contain these disease causing organisms. Chlorine is generally more effective than iodine in controlling Giardia, and both disinfectants work much better in warmer water.

Chlorine Bleach: Common household bleach contains a chlorine compound that will disinfect water. The procedure to be followed is usually written on the label. When the necessary procedure is not given, find the percentage of available chlorine on the label and use the information in the following tabulation as a guide.

Available Chlorine	1%	4-6%	7-10%
Drops per Quart of Clear Water	10	2	1

(If strength is unknown, add ten drops per quart of water. Double amount of chlorine for cloudy or colored water.) The treated water should be mixed thoroughly and allowed to stand for 30 minutes. The water should have a slight chlorine odor, if not, repeat the dosage and allow the water to stand for an additional 15 minutes.

If the treated water has too strong a chlorine taste, it can be made more pleasing by allowing the water to stand exposed to the air for a few hours or by pouring it from one clean container to another several times.

9. MCL- Maximum Contaminant Levels are the maximum permissible level of a contaminant in water delivered to users of a public water system. This level is not always based on health or risk criteria.

10. PRG- Preliminary Remediation Goals are tools for evaluating and cleaning up contaminated sites. They are risk-based concentrations derived from standardized equations, combining exposure information assumptions and EPA toxicity data.