N61165.AR.003319
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TECHNICAL MEMORANDUM FOR PRELIMINARY RESULTS FOR ADDITIONAL BACKGROUND PAH SAMPLING MAIN BASE RAILROAD LINES AND ANNEX (ZONE K) CNC CHARLESTON SC

5/3/2001

CH2M HILL

BACKGROUND DATA/VALUE PRESENTATION JUL 01
Charleston NAVAL COMPLEX.

Preliminary Results for Additional Background PAH Sampling from CNC Main Base Railroad Lines and Annex (Zone K)

TO: CNCBCT

FROM: CH2M HILL

DATE: May 3, 2001

This memorandum presents the preliminary analytical results for soil samples collected to establish reference concentraitons for benzo(a)pyrene equivalent (BEQ), arsenic and copper for the Naval Annex (Zone K) and areas adjacent to the railroad lines at the Charleston Naval Complex (CNC). The analytical results are still being validated however reported values are not expected to change significantly from validation. The Figures 1 and 2 present the approximate sample locations along with station identifiers for data presented in the appendices. Table 1 summarizes the sample location descriptions. Appendix A presents the analytical results summaries for the 7-PAHs, arsenic, and copper as well as the BEQ calculation per sample. The analytical result forms from the laboratory will be presented in the final form of this memorandum, along with the figures and photographs of the locations taken during sampling. Table 2 and 3 in this memorandum present the analytical data summaries for BEQs, arsenic and copper. The methodology followed for BEQ calculations is the same as previous CNC BEQ background study (CH2M HILL, February 2001).

Railroad Lines Sampling Results

A total of 21 surface soil samples were collected from railroad tracks and adjacent areas. Two duplicate samples and 3 other samples (MS/MSD, and Equipment blanks (EB)) collected were not included in this data summary, as they were for QA/QC check during data validation.

Six of the sampling locations were paired (GDLSB00201-GDLSB00301, GDLSB00601-GDLSB00701, GDLSB00801-GDLSB00901, GDLSB01201-GDLSB01301, GDLSB01401-GDLSB01501, GDLSB01601- GDLSB01701) to represent soil within a railroad track and the potential runoff in the immediate downgradient location for the railroad sample. Results for this analysis are presented in Table A1, in Appendix A. As can be noted from the BEQ values, and the inorganics in these paired samples, a pattern is not discernible. Runoff samples are similar in concentrations to the railroad soil samples. The field team reported that for the most part, railroad soils had to be sampled under the ballast material, which is often greater than 2 ft deep. This may have prevented direct deposition of the railroad tie creosote material on to the soils underneath. Since there is no significant or discernible difference between railroads and runoff samples, all samples were combined into a single data set to estimate a mean and a 2 times mean (2XMean) concentration. These values will be used in comparing against site concentrations for BEQs detected in sites located adjacent

to the railroads across CNC. Table 2 includes a summary of the data for the 21 background samples.

Table 2: Data Summary - Railroad Track Background Sample Analytical Results for BEQs, Arsenic and Copper

		Samples #	Detects #	Max.	Mean	Minimum	2XMean
Chemical	**TEF**			**(ug/kg)**	**(ug/kg)**	**(ug/kg)**	**(ug/kg)**
Benzo(a)anthracene	0.1	21	20	378	76	4	151
Benzo(a)pyrene	1	21	20	3780	1189	50	2378
Benzo(b)fluoranthene	0.1	21	21	635	207	9	415
Benzo(k)fluoranthene	0.01	21	17	40	8	0.3	16
Chrysene	0.001	21	20	5	1	0.1	2
Dibenzo(a,h)anthracene	1	21	2	728	122	2	244
Indeno(1,2,3-c,d)pyrene	0.1	21	17	300	95	4	191
BEQ		21	21	**5133***	**1698**	**87**	**3397**
Inorganics				**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Arsenic		21	21	92	26	2	53
Copper		21	21	109	37	5	75

BEQ calculations include half of reporting limit values for non-detects.
Max = maximum concentration
* - represents an individual sample maximum (not total of the max. value in the column).

BEQs: All 21 samples had detectable levels of BEQs (at least one of the 7 PAHs per sample), resulting in a 100% frequency of detection. The estimated BEQ concentrations ranged between 87 ug/kg to 5133 mg/kg (in sample GDLSB01401). The total of maximum detected BEQs from different samples was 5866 ug/kg. The 2Xmean value for railroad track BEQs is estimated at 3397 ug/kg. The overall railroad tracks BEQs were elevated compared to CNC general background surface soils and frequency of detections were higher. Therefore the BEQ value range as well as the estimated 2XMean value should be considered when comparing against BEQs detected in sites located in the vicinity of railroad tracks and runoff areas from asphalt paved areas.

Arsenic and Copper: Arsenic and copper were analyzed in all 21 samples and they were detected in all samples. The arsenic concentrations were similar between railroad soil samples and runoff area soil samples. The range of arsenic concentrations was between 2 mg/kg and 92 mg/kg, with a mean concentration of 26 mg/kg. The 2XMean arsenic value is 53 mg/kg for the railroad tracks and adjacent runoff areas. The copper was detected between 5 mg/kg and 109 mg/kg, with a mean concentration of 37 mg/kg. The 2XMean value for copper is 75 mg/kg. These chemicals could be associated with the base maintenance activities.

Naval Annex - Zone K

The Naval Annex was sampled in 6 locations for surface soils, and three of these locations were also sampled for subsurface soils. All samples were analyzed for PAHs, arsenic and copper. The results for surface soil are summarized in Table 3a. Results for subsurface soil

are summarized in Tables 3b. Appendix A includes the data reports forms the analytical laboratory and Appendix B includes analytical summary tables.

BEQs: Very few of the PAHs were detected in six surface soil samples and none were detected in the subsurface soil samples. The laboratory reported much lower detection limits than previous background sampling effort. The estimated 2XMean background BEQ value, using the detected values and half of the nondetected (reporting limit) value, is 88 ug/kg.

Arsenic and Copper: All 6 surface soil and 3 subsurface soil samples were analyzed for arsenic and copper. The arsenic concentration ranged between 0.57 mg/kg and 92 mg/kg, with a mean concentration of 18 mg/kg. The 2XMean arsenic concentration was 36 mg/kg. These background arsenic levels are much higher than those detected in previous background sampling effort.

The copper was detected in 5 of the 6 surface soils at a concentration range of 0.2 mg/kg to 2.5 mg/kg, at a mean concentration of 1 mg/kg. The 2XMean copper concentration was estimated at 2 mg/kg.

Table 3a: Zone K Background Sample Analytical Results for BEQs, Arsenic and Copper

				Surface Soil			
				Max	**Mean**	**Minimum**	**2Xmean**
Chemical	**TEF**	**N**	**Detects**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**
Benzo(a)anthracene	0.1	6	0	2.2	1.9	1.8	3.8
Benzo(a)pyrene	1	6	1	21.6	18.9	17.3	37.8
Benzo(b)fluoranthene	0.1	6	2	2.5	1.9	1.0	3.7
Benzo(k)fluoranthene	0.01	6	1	0.2	0.2	0.2	0.4
Chrysene	0.001	6	0	0.02	0.02	0.02	0.04
Dibenzo(a,h)anthracene	1	6	0	21.6	19.0	18.0	38.1
Indeno(1,2,3-c,d)pyrene	0.1	6	0	2.2	1.9	1.8	3.8
BEQ		6	2	**49.8**	**43.8**	**41.5**	**87.6**
Inorganics				**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Arsenic		6	6	92.3	18.0	0.6	**35.9**
Copper		6	5	2.5	1.0	0.2	**2.1**

BEQ calculations include half of reporting limit values for non-detects.

The subsurface soil had no detectable BEQs, therefore estimated BEQ values are based on reporting limits. The reporting limit based subsurface soil BEQ value is 92 ug/kg.

The arsenic was detected in 2 out of 3 subsurface soil samples at 0.6 mg/kg and 5.8 mg/kg, with a mean concentration of 2.3 mg/kg. The 2XMean arsenic concentration was estimated at 4.6 mg/kg for the subsurface soil at Annex.

Copper was detected between 0.2 to 1.4 mg/kg, with a mean concentration of 0.2. Thus the 2Xmean concentration for copper in subsurface soil at Annex is 1.2 mg/kg.

Table 3b: Zone K Background Sample Analytical Results for BEQs, Arsenic and Copper

				Subsurface Soil			
				Max	Mean	Minimum	2Xmean
Chemical	**TEF**	**N**	**Detects**	**Ug/kg**	**ug/kg**	**Ug/kg**	**ug/kg**
Benzo(a)anthracene	0.1	3	0	2.2	2.0	1.8	4.0
Benzo(a)pyrene	1	3	0	21.6	19.9	18.0	39.7
Benzo(b)fluoranthene	0.1	3	0	2.2	2.0	1.8	4.0
Benzo(k)fluoranthene	0.01	3	0	0.2	0.2	0.2	0.4
Chrysene	0.001	3	0	0.02	0.02	0.02	0.04
Dibenzo(a,h)anthracene	1	3	0	21.6	19.9	18.0	39.7
Indeno(1,2,3-c,d)pyrene	0.1	3	0	2.2	2.0	1.8	4.0
BEQ		3	0	**49.8**	**45.9**	**41.5**	**91.8**
Inorganics				**mg/kg**	**mg/kg**	**Mg/kg**	**mg/kg**
Arsenic		3	2	5.8	2.3	0.6	**4.6**
Copper		3	3	1.4	0.6	0.2	**1.2**

BEQ calculations include half of reporting limit values for non-detects.

Table 1: Background Sample Locations at Zone K Annex and Railroad Tracks within CNC

Field Flag Number	Sample ID	Station ID	Sample Location Description	Zone	QA/QC Comment
K1 - Surface soil	GDKSB01701	KGDKSB017	At the entrance to the Annex from Remount Rd, on eastside of the entrance road. Intended to represent the asphalt and vehicular traffic related PAHs. Clearly out of SWMU/AOC influence	Zone K	Collect MS/MSD
	GDKSB01701MS	KGDKSB017	QA/QC Sample		
	GDKSB01701SD	KGDKSB017	QA/QC Sample		
K2 -Surface soil	GDKSB01401	KGDKSB014	Located within the Basketball court, asphalt paved area (facility number 2550)	Zone K	
K2 -Subsurface soil	GDKSB01402	KGDKSB014	same as K2 surface location	Zone K	Collect FD
K2 -Subsurface soil	GDKCB01402	KGDKSB014	QA/QC Sample	Zone K	FD
K2 - Equipment Blank	GDKEB01401	KGDKEB01401	QA/QC Sample	Zone K	EB
K3 - Surface soil	GDKSB01801	KGDKSB018	Located along Highway 26. A specific location was not selected. Intended to be form an area uninfluenced by Zone, represent heavy traffic areas with asphalt pavement	Zone K	
K4 - Surface soil	GDKSB01501	KGDKSB015	Located across from building 2533 in the asphalt paved, heavy vehicle maintenance/parking area	Zone K	
K4-Subsurface soil	GDKSB01502	KGDKSB015	same as K4 surface soil location	Zone K	
K5 - Surface soil	GDKSB01901	KGDKSB019	Across from SWMUs164/163, parking lot across the fence where trucks are parked. If not possible to sample on the offbase property, collect along the fence	Zone K	
K6 - Surface soil	GDKSB01601	KGDKSB016	Sample at the metal gate across from SWMu 185, near the offsite ditch, closer to the asphalt paved road	Zone K	
K6 - Subsurface soil	GDKSB01602	KGDKSB016	Same as K6	Zone K	

Sampling from Railroad Tracks within CNC

Field Flag Number	Sample ID	Station ID	Sample Location Description	Zone	QA/QC Comment
1 - Surface soil	GDLSB00101	LFGDLSB001	Located across from Pier J, near a fenced area with visible old railroad lines, along a fence	Zone F (and E boundary)	
2 (paired with 3) - Surface soil	GDLSB00201	LFGDLSB002	Along the road at the southern boundary of the Zone F across from Tanks farm. Two samples (paired - one from RR and one from suspected runoff area)	Zone F (and G boundary)	
3 (paired with 2) - runoff soil	GDLSB00301	LFGDLSB003	Same as sample 2, in the downgradient/runoff location	Zone F (and G boundary)	
4 - Surface soil	GDLSB00401	LFGDLSB004	Area north of samples 2 and 3, where rail engines received refueling (dead-end of tracks)	Zone F (and G boundary)	
4 - Field Dup	GDLSB00401	LFGDLSB004	QA/QC Sample	Zone F (and G boundary)	Collect FD
5 - Surface soil	GDLSB00501	LFGDLSB005	Along the same track as the samples 2,3,and 4,, near a guard booth with restricted access beyond the fenced area	Zone F(and E boundary)	
6 (paired with 7) - Surface soil	GDLSB00601	LFGDLSB006	Located further north of Sample 5, near grassy area, across form asphalt paved parking lot.	Zone F	
7(paired with 6) - runoff soil	GDLSB00701	LFGDLSB007	Same as sample 7, in the downgradient/runoff location to west (towards the road)	Zone F	

Field Flag Number	Sample ID	Station ID	Sample Location Description	Zone	QA/QC Comment
8 (paired with 9) - Surface soil	GDLSB00801	LFGDLSB008	Area south of Power house, across from Zone E industrial area, to be collected form under asphalt paved areas of the railroad tracks	Zone E	
9 (paired with 8) - runoff soils	GDLSB00901	LFGDLSB009	Downgradient (north of Sample 8, near the rail signal, in the grass area)	Zone E	
10 - Surface soil	GDLSB01001	LFGDLSB010	From the area with parked rail engine, fueling area north of the power house (next to a trailer)	Zone E	
11 - Surface soil	GDLSB01101	LFGDLSB011	Rail road sample from a location parallel to McMillan Avenue, near corner of the border to Zone C (see Figure SAP memo)	Zone C/D	
12 (paired with 13) - Surface soil	GDLSB01201	LFGDLSB012	Parallel railroad tracks to the sample 11 location, slightly west and south of Sample 11. Sample 13 is in the lower grassy area	Zone C/D	
12 - MS/MSD	GDLSB01201MS	LFGDLSB012	QA/QC Sample	Zone C/D	
12- MS/MSD	GDLSB01201SD	LFGDLSB012	QA/QC Sample	Zone C/D	
13 (paired with 12) - runoff soil	GDLSB01301	LFGDLSB013	Adjacent to the Sample 12 in the grassy area	Zone C/D	
14 - Surface soil	GDLSB01401	LFGDLSB014	On the most used train tracks adjacent to Avenue D (?)	Zone B/C	
15 (paired with 16) - Surface soil	GDLSB01501	LFGDLSB015	North of Sample 14 along the railroad tracks, within oil stained areas	Zone B/C	
16 (paired with 15) - runoff soil	GDLSB01601	LFGDLSB016	Directly east (towards the nearby housing area/Golf Course, low lying wetlands etc) of Sample 15 indicating runoff from RR tracks	Zone B/C	
17 (paired with 18) - Surface soil	GDLSB01701	LFGDLSB017	From north of Samples 15/16, adjacent to the drainage ditch/runoff area, from oil stained areas within this location, if possible)	Zone B/C	Collect FD
17 (paired with 18) - Surface soil - Filed Dup.	GDLCB01701	LFGDLSB017	QA/QC Sample	ZoneB/C	FD
18 (paired with 17) - runoff soil	GDLSB01801	LFGDLSB018	From the soil adjacent to the ditch	Zone C	
19 - Surface soil	GDLSB01901	LFGDLSB019	From location near the Noisette Creek at the intersection of the roadway and the RR tracks, within the asphalt paved area	Zone C	
20 - Surface soil	GDLSB02001	LFGDLSB020	From abandoned railroad tracks with ties lying around	Zone A	
21 - Surface Soil	GDLSB02101	LFGDLSB021	Along the roadway going north towards the gate, where railroads have been removed and building is still remaining. Collect from near the intersection between bedding and remaining RR	Zone A	
22- Surface soil	GDLSB02201	LFGDLSB022	From area outside the north gate, within the active RR tracks	Outside CNC	
EB	GDLEB00101	LFGDLEB001	QA/QC Sample		

Note:
Sample within the RR tracks as much as possible, especially underneath the RR ties at a slight angle
Try to locate samples within freshly installed RR ties with most leachable creosote

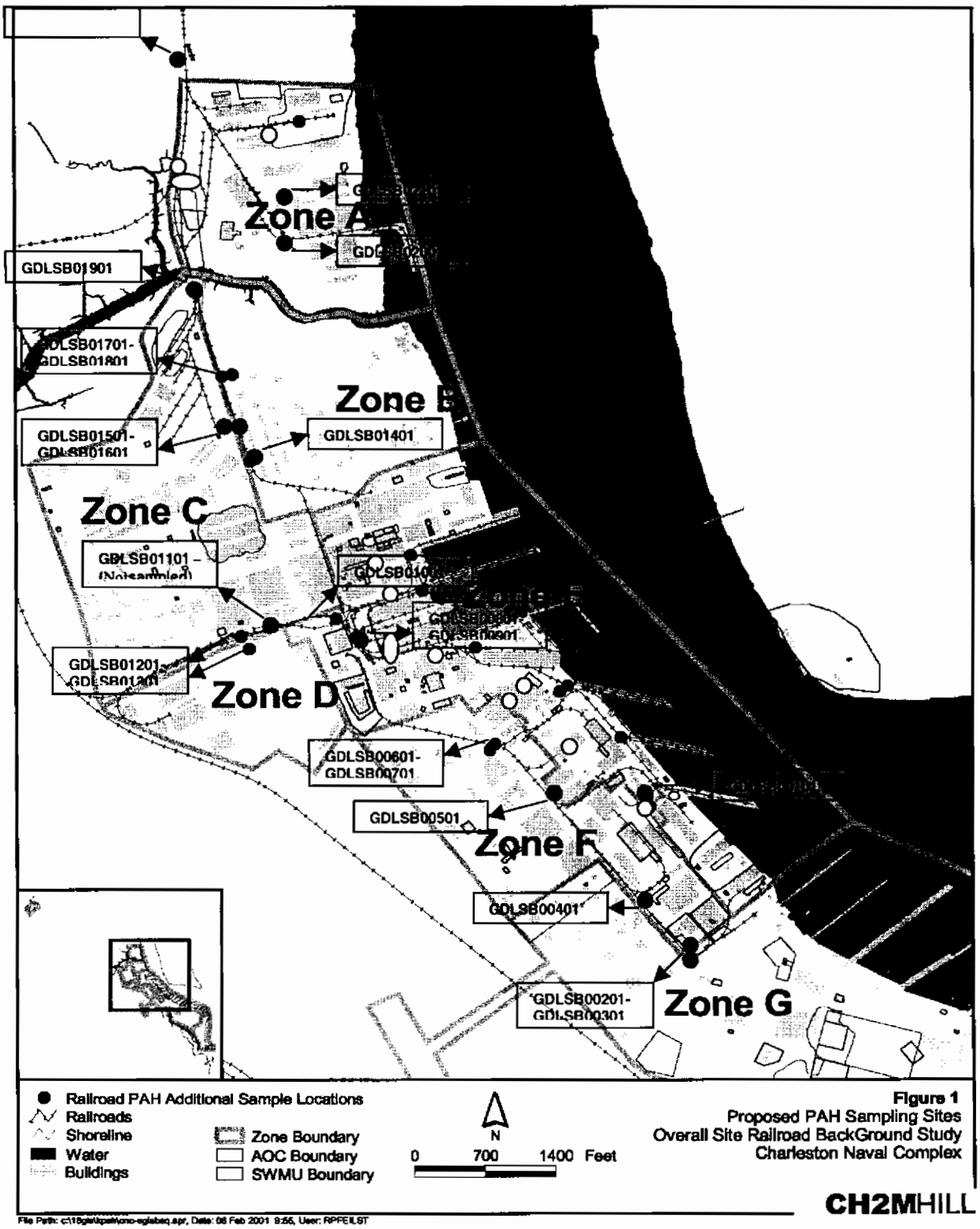

Figure 1
Proposed PAH Sampling Sites
Overall Site Railroad BackGround Study
Charleston Naval Complex

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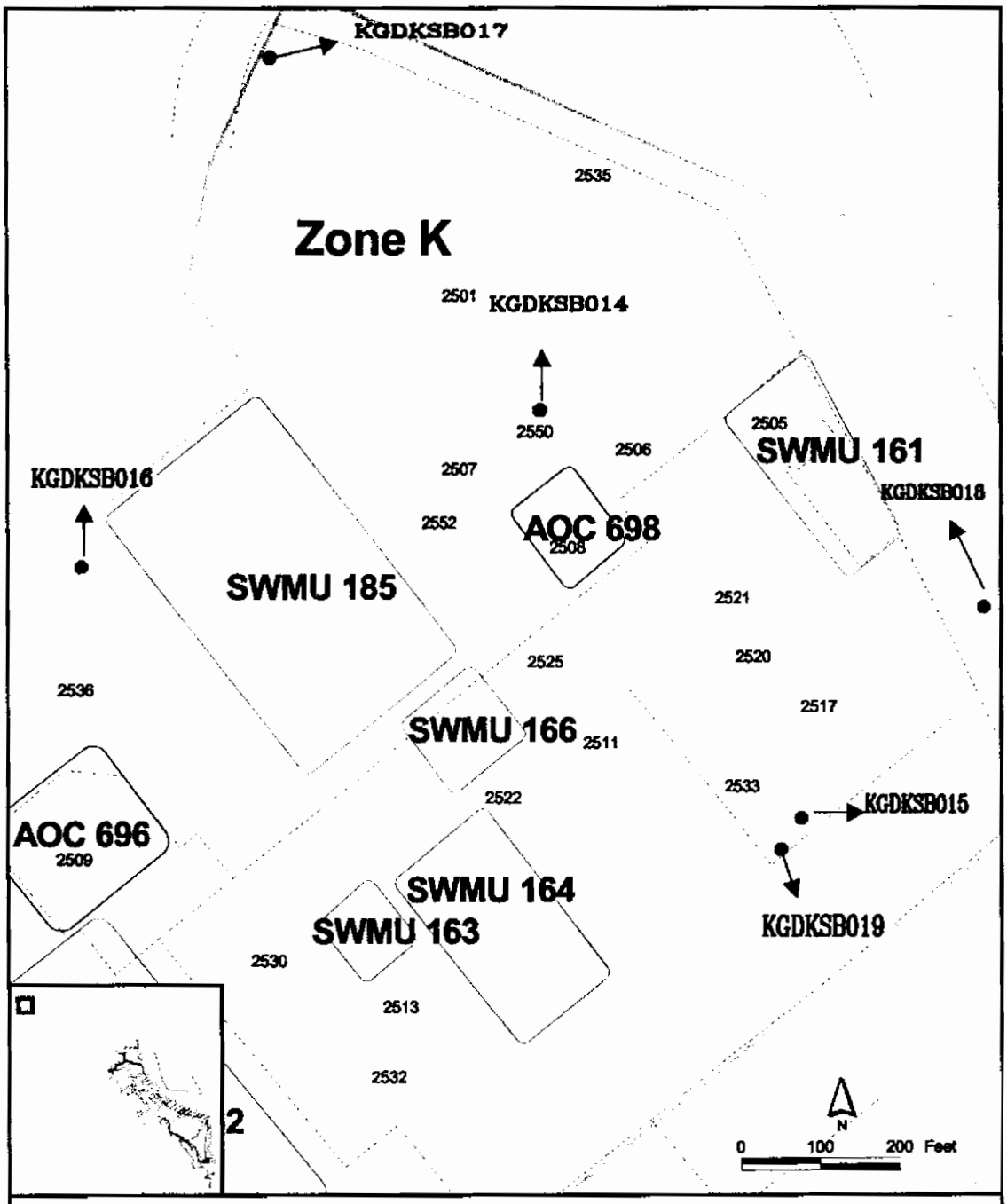

Background Sample Locations PAH
AOC Boundary
SWMU Boundary
Fence
Roads
Buildings
Zone Boundary

Figure 2
PAH Background Proposed Sampling Location
Zone K
Charleston Naval Complex

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APPENDIX A

Table A1: Railroad Track Background Sample Analytical Results for the 7-Carcinogenic PAHs, Arsenic and Copper

						Off of RR - runoff area-02			
	SamID -	GDLSB00101		GDLSB00201		GDLSB00301		GDLSB00401	
Chemical	TEF	Conc. (ug/kg)	BEQ	Conc. (ug/kg)	BEQ	Conc. (ug/kg)	BEQ	Conc. (ug/kg)	BEQ
Benzo(a)anthracene	0.1	35.4 J	3.54	149 J	14.9	78.5 U	7.85	893	89.3
Benzo(a)pyrene	1	218	218	874	874	78.5 U	78.5	1820	1820
Benzo(b)fluoranthene	0.1	252	25.2	976	97.6	805	80.5	3220	322
Benzo(k)fluoranthene	0.01	77.7	0.777	209	2.09	29.4 J	0.294	1920	19.2
Chrysene	0.001	60.7	0.0607	223	0.223	78.5 U	0.0785	1910	1.91
Dibenzo(a,h)anthracene	1	19 U	19	79.5 U	79.5	78.5 U	78.5	728	728
Indeno(1,2,3-c,d)pyrene	0.1	88.4	8.84	827	82.7	78.5 U	7.85	1630	163
BEQ			**275**		**1151**		**254**		**3143**
Inorganics									
Arsenic		8200		4820		5950		1900 4-dup	2560
Copper		14900		14900		13200		15300	8520

U = Half of reporting limit values

Table A1: Railroad Track

					Off of RR - runoff area -06				Off of RR - runoff area-08	
	GDLSB00501		GDLSB00601		GDLSB00701		GDLSB00801		GDLSB00901	
Chemical	**Conc. (ug/kg)**	BEQ	**Conc. (ug/kg)**	BEQ	**Conc. (ug/kg)**	BEQ	**Conc. (ug/kg)**	BEQ	**Conc. (ug/kg)**	BEQ
Benzo(a)anthracene	912	91.2	206	20.6	159	15.9	71.6 J	7.16	780	78
Benzo(a)pyrene	1700	1700	434	434	386	386	74 U	74	810	810
Benzo(b)fluoranthene	3260	326	624	62.4	558	55.8	808	80.8	1160	116
Benzo(k)fluoranthene	74 U	0.74	324	3.24	332	3.32	54.8 J	0.548	848	8.48
Chrysene	1590	1.59	395	0.395	331	0.331	75.1 J	0.0751	1070	1.07
Dibenzo(a,h)anthracene	74 U	74	20.9 U	20.9	20.3 U	20.3	74 U	74	18.65 U	18.65
Indeno(1,2,3-c,d)pyrene	1360	136	368	36.8	333	33.3	74 U	7.4	572 U	57.2
BEQ		**2330**		**578**		**515**		**244**		**1089**
Inorganics										
Arsenic	16600		13700		15500		2950		9070	
Copper	49400		19400		31000		14400		94200	

U = Half of reporting limit v

Table A1: Railroad Track

					Off of RR - runoff area-12					
	GDLSB01001		GDLSB01201		GDLSB01301		GDLSB01401		GDLSB01501	
Chemical	**Conc. (ug/kg)**	BEQ	**Conc. (ug/kg)**	BEQ	**Conc. (ug/kg)**	BEQ	**Conc. (ug/kg)**	BEQ	**Conc. (ug/kg)**	BEQ
Benzo(a)anthracene	1700	170	1760	176	1580	158	3780	378	83.5 U	8.35
Benzo(a)pyrene	1760	1760	2670	2670	2720	2720	3780	3780	762	762
Benzo(b)fluoranthene	2300	230	6350	635	4280	428	5520	552	898	89.8
Benzo(k)fluoranthene	1980	19.8	402 U	4.02	3240	32.4	4000	40	97.8 J	0.978
Chrysene	2120	2.12	4110	4.11	2890	2.89	4920	4.92	81.9 J	0.0819
Dibenzo(a,h)anthracene	663	663	2 U	2	79.5 U	79.5	78 U	78	83.5 U	83.5
Indeno(1,2,3-c,d)pyrene	1370	137	2180	218	2150	215	3000	300	83.5 U	8.35
BEQ		**2982**		**3709**		**3636**		**5133**		**953**
Inorganics										
Arsenic	68300		74100		91700		26200		7290	
Copper	109000		30800		43300		49000		24700	

U = Half of reporting limit va

Table A1: Railroad Track

	Off of RR - runoff area-15				Off of RR - runoff area-17					
	GDLSB01601		GDLSB01701		GDLSB01801		GDLSB01901		GDLSB02001	
Chemical	**Conc. (ug/kg)**	BEQ	**Conc. (ug/kg)**	BEQ	**Conc. (ug/kg)**	BEQ	**Conc. (ug/kg)**	BEQ	**Conc. (ug/kg)**	BEQ
Benzo(a)anthracene	350	35	296	29.6	373	37.3	157	15.7	1050	105
Benzo(a)pyrene	1090	1090	1150	1150	1260	1260	179	179	1080	1080
Benzo(b)fluoranthene	1280	128	1420	142	1840	184	260	26	2100	210
Benzo(k)fluoranthene	558	5.58	328	3.28	225 U	2.25	145 J	1.45	1860	18.6
Chrysene	488	0.488	448	0.448	572	0.572	217	0.217	1720	1.72
Dibenzo(a,h)anthracene	80 U	80	107.5 U	107.5	112.5 U	112.5	73 U	73	80.5 U	80.5
Indeno(1,2,3-c,d)pyrene	972	97.2	1150	115	1190	119	123 J	12.3	777	77.7
BEQ		**1436**		**1548**		**1716**		**308**		**1574**
Inorganics										
Arsenic	17400		34300 17-	30100	27900		14500		41100	
Copper	18200		38500	37300	37800		88700		34500	

U = Half of reporting limit v

Table A1: Railroad Track

	GDLSB02101		GDLSB02201		Samples #	Detects #	Max	Mean	Minimum	2XMean
Chemical	**Conc. (ug/kg)**	BEQ	**Conc. (ug/kg)**	BEQ			**(ug/kg)**	**(ug/kg)**	**(ug/kg)**	**(ug/kg)**
Benzo(a)anthracene	37.7 J	3.77	1420	142	21	20	378	75.6	3.5	151
Benzo(a)pyrene	49.8	49.8	2070	2070	21	20	3780	1188.8	49.8	2378
Benzo(b)fluoranthene	94.2	9.42	5550	555	21	21	635	207.4	9.4	415
Benzo(k)fluoranthene	50.3	0.503	72 U	0.72	21	17	40	8.0	0.3	16
Chrysene	50.1	0.0501	1980	1.98	21	20	4.92	1.2	0.1	2
Dibenzo(a,h)anthracene	19.45 U	19.45	72 U	72	21	2	728	122.1	2.0	244
Indeno(1,2,3-c,d)pyrene	42.1	4.21	1660	166	21	17	300	95.4	4.2	191
BEQ		**87**		**3008**	21	21	**5133**	**1698**	**87**	**3397**
Inorganics							**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Arsenic	2040		70700		21	21	91.7	26.4	1.9	52.8
Copper	5030		36300		21	21	109	37.3	5.03	74.5
							5865.9	1698.5	69.3	3397

U = Half of reporting limit v

Table A2: Zone K Additonal Background Sample Analytical Results for the 7-Carcinogenic PAHs, Arsenic and Copper

		Surface Soil							
	SamID -	**GDKSB01401**		**GDKSB01501**		**GDKSB01601**		**GDKSB01701**	
Chemical	**TEF**	**Conc. (ug/kg)**	BEQ	**Conc. (ug/kg)**	BEQ	**Conc. (ug/kg)**	BEQ	**Conc. (ug/kg)**	BEQ
Benzo(a)anthracene	0.1	18.6 U	1.86	18.2 U	1.82	19.35 U	1.935	18.1 U	1.81
Benzo(a)pyrene	1	17.3 J	17.3	18.2 U	18.2	19.35 U	19.35	18.1 U	18.1
Benzo(b)fluoranthene	0.1	24.8 J	2.48	18.2 U	1.82	19.35 U	1.935	18.1 U	1.81
Benzo(k)fluoranthene	0.01	23.8 J	0.238	18.2 U	0.182	19.35 U	0.1935	18.1 U	0.181
Chrysene	0.001	18.6 U	0.0186	18.2 U	0.0182	19.35 U	0.01935	18.1 U	0.0181
Dibenzo(a,h)anthracene	1	18.6 U	18.6	18.2 U	18.2	19.35 U	19.35	18.1 U	18.1
Indeno(1,2,3-c,d)pyrene	0.1	18.6 U	1.86	18.2 U	1.82	19.35 U	1.935	18.1 U	1.81
BEQ			**42**		**42**		**45**		**42**
Arsenic		92300		1580		55200		2760	
Copper		1670		444 J		2530		811 U	

U = Half of reporting limit values for PAH/BEQ calculations.

Table A2: Zone K Additona

	Subsurface Soil									
	GDKSB01801		**GDKSB01901**		**GDKSB01402**		**GDKSB01502**		**GDKSB01602**	
Chemical	**Conc. (ug/kg)**	BEQ	**Conc. (ug/kg)**	BEQ	**Conc. (ug/kg)**	BEQ	**Conc. (ug/kg)**	BEQ	**Conc. (ug/kg)**	BEQ
Benzo(a)anthracene	19.45 U	1.945	18.05 U	1.805	17.95 U	1.795	20.1 UJ	2.01	21.55 U	2.155
Benzo(a)pyrene	19.45 U	19.45	18.05 U	18.05	17.95 U	17.95	20.1 UJ	20.1	21.55 U	21.55
Benzo(b)fluoranthene	9.5 J	0.95	18.05 U	1.805	17.95 U	1.795	20.1 UJ	2.01	21.55 U	2.155
Benzo(k)fluoranthene	19.45 U	0.1945	18.05 U	0.1805	17.95 U	0.1795	20.1 UJ	0.201	21.55 U	0.2155
Chrysene	19.45 U	0.01945	18.05 U	0.01805	17.95 U	0.01795	20.1 UJ	0.0201	21.55 U	0.02155
Dibenzo(a,h)anthracene	19.45 U	19.45	18.05 U	18.05	17.95 U	17.95	20.1 UJ	20.1	21.55 U	21.55
Indeno(1,2,3-c,d)pyrene	19.45 U	1.945	18.05 U	1.805	17.95 U	1.795	20.1 UJ	2.01	21.55 U	2.155
BEQ		**44**		**42**		**41**		**46**		**50**
Arsenic	1830		1020		5790		579 U		571 J	
Copper	1670 U		465 U		197 J		171 J		1370	

U = Half of reporting limit va

Table A2: Zone K Additona

	Surface soil						Subsurface Soil			
Chemical	**Max**	**Mean**	**Minimum**	**2Xmean**	**Samples #**	**Detects**	**Max**	**Mean**	**Minimum**	**2Xmean**
Benzo(a)anthracene	2.2	1.9	1.8	**3.8**	6	0	2.2	2.0	1.8	4.0
Benzo(a)pyrene	21.6	18.9	17.3	**38**	6	1	21.6	19.9	18.0	39.7
Benzo(b)fluoranthene	2.5	1.9	1.0	**3.7**	6	2	2.2	2.0	1.8	4.0
Benzo(k)fluoranthene	0.2	0.2	0.2	**0.4**	6	1	0.2	0.2	0.2	0.4
Chrysene	0.02	0.02	0.02	**0.04**	6	0	0.02	0.02	0.02	0.04
Dibenzo(a,h)anthracene	21.6	19.0	18.0	**38**	6	0	21.6	19.9	18.0	39.7
Indeno(1,2,3-c,d)pyrene	2.2	1.9	1.8	**3.8**	6	0	2.2	2.0	1.8	4.0
BEQ	**49.8**	**43.8**	**41.5**	**88**	6	2	49.8	45.9	41.5	91.8
Arsenic	92.3	18.0	0.6	**36**	6	6	5.8	2.3	0.57	4.6
Copper	2.5	1.0	0.2	**2**	6	5	1.4	0.6	0.17	1.2

U = Half of reporting limit v

MEMORANDUM **CH2MHILL**

Sampling Plan for Additional Background PAHs from CNC Main Base Railroad Lines and Annex (Zone K)

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FROM: Vijaya Mylavarapu/CH2M HILL
Casey Hudson/CH2M HILL

DATE: March 9, 2001

This memorandum presents the sample collection protocol for establishing a background benzo(a)pyrene equivalent (BEQ) value for RCRA sites at the Naval Annex (Zone K) and areas adjacent to the Railroad Lines at the Charleston Naval Complex (CNC). The proposed sample collection methodology was modified according to objectives discussed, and finalized during site visits conducted on February 13, 2001. The figures referenced in this memorandum are attached.

Methodology

The soil sampling strategy and procedures will be performed in accordance with the U.S. Environmental Protection Agency (EPA) Environmental Services Division *Standard Operating Procedures and Quality Assurance Manual*, 1996. The soil sample collection methodology used by CH2M-Jones will be consistent with the procedures employed during the RCRA Facility Investigations. Soil samples will be collected using a stainless steel hand auger that will be decontaminated following use at each sample location.

Where encountered, concrete and asphalt surfaces will be cored and the surfaces removed prior to soil sample collection. In addition, gravel surfaces in areas of the proposed soil sample locations will be removed prior to sample collection to verify that none of the material is included with the vadose zone soil. Surface and subsurface soil samples will be collected within the vadose zone at an approximate depth of 0 to 1 foot below land surface (ft bls) and 3 to 5 ft bls, respectively. The soil sample locations will be surveyed and the data included in the ArcView database.

The soil samples will be delivered to a laboratory where they will be analyzed for semivolatile organic compounds (SVOCs) using EPA method 8270C. Sample analyses will be conducted in accordance with the guidance provided in EPA *Test Methods for Evaluating Solid Waste, SW-846, 3rd ed.*, Office of Solid Waste and Emergency Response (SW-846), and

in the EPA Environmental Services Division *Laboratory Operations and Quality Control Manual*. Sample analysis and data collection efforts will satisfy EPA DQO Level III protocol.

Railroad Lines

Only two existing grid-based samples are located within railroad lines. Additional samples are proposed to develop a polycyclic aromatic hydrocarbon (PAH) background data set specific to railroads. These samples will be located both within visibly stained areas of the railroads as well as within areas with no apparent staining. For the BEQ value to be representative, the samples will be collected from the railroads located across the base; especially from locations within lines, oil-stained areas of the lines, and downgradient locations with potential/known surface water runoff from the lines.

A total of 22 samples will be collected, including a minimum of six sample pairs from within the railroad lines and apparent surface water runoff locations that are adjacent to the samples collected within the lines (i.e., 12 samples). The remaining 10 individual samples will be collected from railroad line oil-stained areas.

Analytical results from the 22 new samples and the two existing grid-based samples will be used to develop a statistically reliable background value for the railroad lines. The PAH background value developed from this effort will be used in future site-specific evaluations. Figure 1 presents the proposed sampling locations for the 22 new samples. CH2M-Jones and the South Carolina Department of Health and Environmental Control (SCDHEC) representatives will verify the exact locations in the field. These proposed locations may be slightly re-positioned in the field during sampling activities on the basis of existing site conditions.

Rationale for Railroad Line Sample Locations

Sample locations for railroad lines were selected to evaluate various potential migration pathways of PAHs from railroad lines. These pathways include leaching of PAHs from railroad ties, releases of various lubricants, oils, and other hydrocarbons from railroad engines and equipment to soil beneath the tracks, and runoff of contact storm water from railroad lines. Sample locations were also selected in areas where railroad lines had historically been located but were removed, such as in Solid Waste Management Unit (SWMU) 2.

A complete description of the sampling locations and the selection rationale for each location will be provided in the report that summarizes this sampling event. Electronic photographs, field logs, and figures depicting the soil sample locations will also be provided in the document.

Naval Annex - Zone K

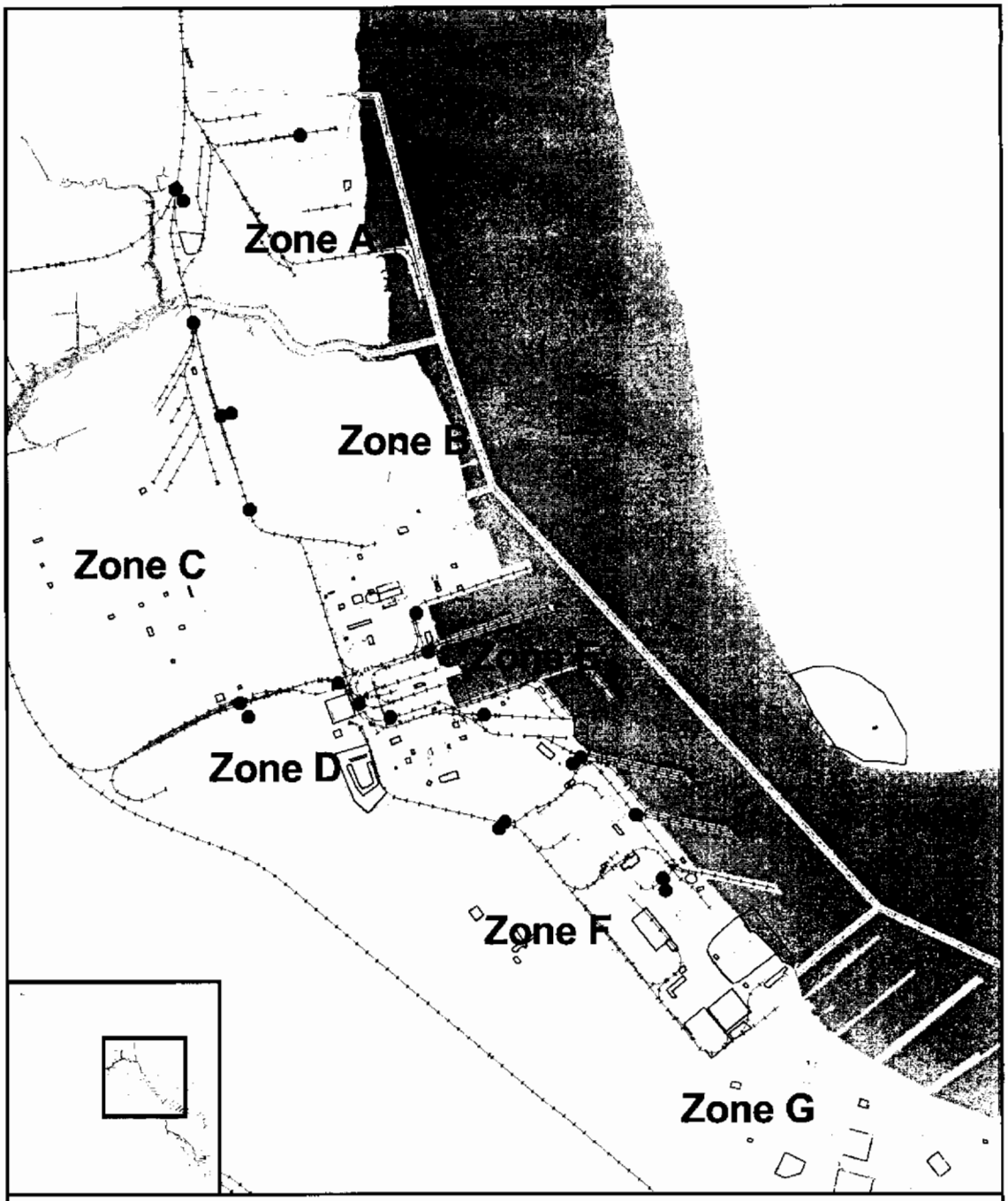
The Naval Annex has two existing areas of concern (AOCs) and six existing SWMUs. Nine surface soil and nine subsurface soil background samples were collected during grid-based sampling at the Annex (station IDs with GD*). However, none of the PAHs were detected in these 18 samples.

On the basis of objectives discussed and resolved during the February 13th site meeting, the task team revised the sampling approach to include the collection of six surface soil samples

in the immediate area of asphalt roads and parking lots. The six surface soil samples are proposed for PAH analysis, since fewer than five surface soil samples from Annex sites had a detected total BEQ concentration greater than 1,000 micrograms per kilogram (μg/kg). The proposed samples will be collected outside of the existing AOC or SWMU boundaries, as well as outside areas that are or may potentially be influenced by these sites.

In addition, three subsurface soil samples will be collected from three of the six proposed locations. Figure 2 presents the proposed sample collection locations at the Annex. CH2M-Jones and SCDHEC representatives will verify the exact locations in the field. These proposed locations may be slightly re-positioned in the field during sampling activities on the basis of existing site conditions.

The PAHs detected in these soil samples will be used to establish a surface and subsurface soil background BEQ concentration at the Naval Annex. The two railroad samples previously collected will be combined with new samples in estimating a background PAH value specific to railroads. The methodology used for estimation of these two sets of PAH background values will be same as the approach used for background BEQ estimations (2X mean) for the CNC main base.



Railroad PAH Additional Sample Locations
Railroads
Shoreline
Water
Buildings
Zone Boundary
AOC Boundary
SWMU Boundary
N
0 700 1400 Feet

Figure 1
Proposed PAH Sampling Sites
Overall Site Railroad BackGround Study
Charleston Naval Complex

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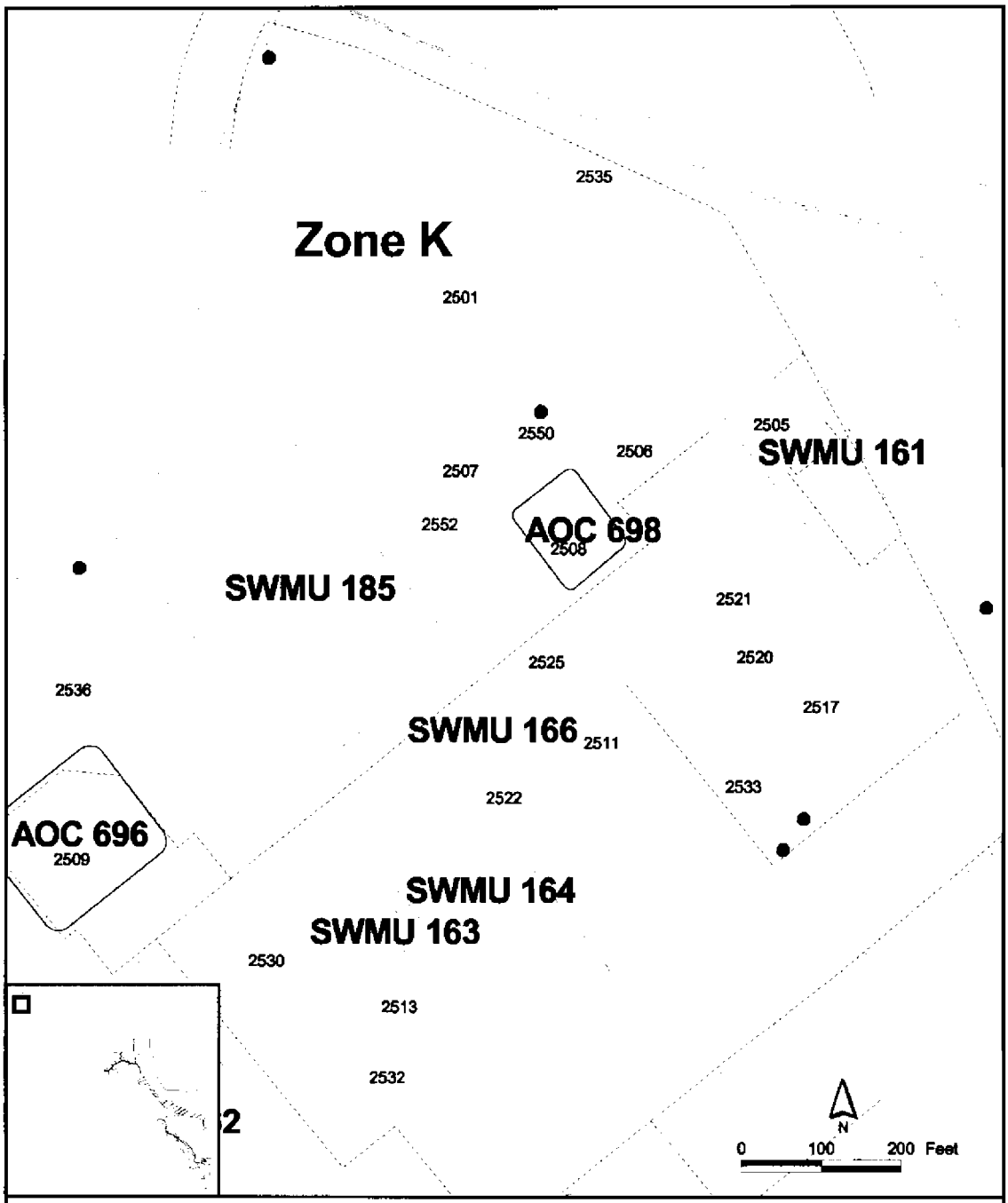

Background Sample Locations PAH
AOC Boundary
SWMU Boundary
Fence
Roads
Buildings
Zone Boundary

Figure 2
PAH Background Proposed Sampling Location
Zone K
Charleston Naval Complex

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Holcom Fuel Farm
Redevelopment mtg

13 Dec 00

Henry Kerr - SSA
TRIP SNELSON - CH2M JONES
Forrest Foshee - S&ME, INC.
ALAN TOWNSEND - HGBD, INC.
Nina Marshtein - General Engineering
Lee Tigner, SSA
Tom Hutto, General Engineering
GARY FOSTER - CH2M JONES
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Harrell, Robert (Efdsouth)

From: Mihir Mehta [MehtaM@columb34.dhec.state.sc.us]
Sent: Thursday, January 04, 2001 4:22 PM
To: dwilliam@ch2m.com; gfoster1@ch2m.com; pfavara@ch2m.com; tbeisel@ch2m.com; vmylavar@ch2m.com; Harrell, Robert (Efdsouth); Hunt, Tony (Efdsouth); spariosu.dann@epamail.epa.gov
Cc: BERGSTPM@columb34.dhec.state.sc.us; BYRDSK@columb34.dhec.state.sc.us; DANIELMW@columb34.dhec.state.sc.us; FRADYME@columb34.dhec.state.sc.us; MALIKMN@columb34.dhec.state.sc.us
Subject: Information regarding PAH Evaluation

Guys, based on the discussion with internal DHEC folks we need more information to understand the use of non-detects values, especially the following question/concerns:

1.Why do we have flagged values-based on lab analysis/initial evaluation
2. Why do we have high flagged values
3. What were the lab reported quantitation limits
4. What were the lab reported detection limits
5. Who assigned these flagged values
6. What labs were used to perform this data analysis
7. Where the samples diluted-if so why and how much
8. How many non-detects were reported at detection limit
9. How many non-detects were reported with dilution and how much dilution
10. Define various qualifiers and their use in the data evaluation-not theoretical but based on what the lab provided or who assigned the qualifiers

Please go through the original lab data and try to provide appropriate information to address the above concerns. Examples of high flagged values and rational behind the qualifier would be beneficial.

Please provide this information as a package for discussion. If you should have any questions or clarification please contact Paul or I.

Paul, Susan B, Mike, Mansour and Elizabeth, please feel free to add to this e-mail if I missed any points or need other information.
thanks a lot.
mihir

TABLE 5A: PROPOSED PAH REFERENCE VALUES USING 'U' VALUES FOR ADJUSTED MEAN ESTIMATES

Parameter Name	Number of Analysis	Number of Detects	Min Detect	Max Detect	Mean Detect	Adjusted Mean Value*	2X Mean of Detects	2X Adjusted Mean Value*
Surface Soil								
BENZO(a)ANTHRACENE	190	47	34	2100	362	308	724	616
BENZO(a)PYRENE	190	47	45	1500	328	299	657	598
BENZO(b)FLUORANTHENE	190	40	49	1800	367	304	734	608
BENZO(k)FLUORANTHENE	190	43	42	1700	339	298	678	596
CHRYSENE	190	51	40	3000	390	310	779	620
DIBENZ(a,h)ANTHRACENE	190	14	64	440	169	262	337	525
INDENO(1,2,3-c,d)PYRENE	190	33	42	670	206	262	412	525
						BEQ	**1189**	**1304**
Subsurface Soil								
BENZO(a)ANTHRACENE	137	16	55	3400	434	314	868	627
BENZO(a)PYRENE	137	13	93	2600	415	312	830	623
BENZO(b)FLUORANTHENE	137	12	57	2600	418	315	836	631
BENZO(k)FLUORANTHENE	137	11	92	2300	381	305	763	609
CHRYSENE	137	18	57	3400	406	308	811	616
DIBENZ(a,h)ANTHRACENE	137	3	160	780	367	293	733	586
INDENO(1,2,3-c,d)PYRENE	137	8	54	1600	346	296	691	592
						BEQ	**1811**	**1400**

Note: * - Includes non-detects at half of the reported detection limit value
All values in ug/kg

Table 5a: Proposed Background Values for PAHs (BEQs) within Surface and Subsurface Soils for all Zones, Except Zone K at CNC

ParamName	Units	NoAnalysis	Detects	MinDet	MaxDet	MeanDet	MeanVal	MinND	MaxND	2x Mean of Detects	2x Adjusted Mean	BEQ (2x Mean Value)	BEQ (2x Adj Mean Value)
Surface Soil													
BENZO(a)ANTHRACENE	UG/KG	190	47	34	2100	362	308	340	4000	724	616	72.40	61.64
BENZO(a)PYRENE	UG/KG	190	47	45	1500	328	299	340	4000	657	598	656.98	597.99
BENZO(b)FLUORANTHENE	UG/KG	190	40	49	1800	367	304	340	4000	734	608	73.41	60.82
BENZO(k)FLUORANTHENE	UG/KG	190	43	42	1700	339	298	340	4000	678	596	6.78	5.96
CHRYSENE	UG/KG	190	51	40	3000	390	310	340	4000	779	620	0.78	0.62
DIBENZ(a,h)ANTHRACENE	UG/KG	190	14	64	440	169	262	340	4000	337	525	337.14	524.89
INDENO(1,2,3-c,d)PYRENE	UG/KG	190	33	42	670	206	262	340	4000	412	525	41.19	52.45
												1189	**1304**
Susbruface Soil													
BENZO(a)ANTHRACENE	UG/KG	137	16	55	3400	434	314	350	1600	868	627	86.81	62.74
BENZO(a)PYRENE	UG/KG	137	13	93	2600	415	312	350	1600	830	623	829.69	623.18
BENZO(b)FLUORANTHENE	UG/KG	137	12	57	2600	418	315	350	1600	836	631	83.62	63.08
BENZO(k)FLUORANTHENE	UG/KG	137	11	92	2300	381	305	350	1600	763	609	7.63	6.09
CHRYSENE	UG/KG	137	18	57	3400	406	308	350	1600	811	616	0.81	0.62
DIBENZ(a,h)ANTHRACENE	UG/KG	137	3	160	780	367	293	350	1600	733	586	733.33	585.55
INDENO(1,2,3-c,d)PYRENE	UG/KG	137	8	54	1600	346	296	350	1600	691	592	69.10	59.18
												1811	**1400**

Background Data/Values

CNC

July BCT-2001

Background Data for Inorganic Chemicals

- Are from Samples Collected by Ensafe during RFI
- Samples were collected from grid locations
- Types of Samples available-
  - Surface Soil Samples per zone
  - Subsurface soils samples per zone
  - Groundwater samples per zone - shallow, and deeper

How are Background Data Being Used?

- From sample results a background data-set was developed by Ensafe following RCRA Statistical Guidance
  - Typically UTL95% were calculated per medium, per zone
  - Sometimes 2Xmean is the background value
  - Dropped highest detected value(s), if thought to be an outlier
  - Sample numbers varied from zone to zone (<10 to >100)

Current Use of Background Data

- Initial screening uses existing RFI background values
- When these point estimates are exceeded, then sample value is compared with background range of values for that zone
- If a zone background data set is small, then combined with adjacent zone data, and/or base-wide background values

Additional Background Values

- Currently a set of tables, with range of background values (with highest values included) are used by CH2M-Jones report preparers
- When dataset for a zone is small, then adjacent similar zone background data are combined (e.g., Zones F and G)
- It is likely, all zones have similar background values for inorganic chemicals (combine base-wide data)

Background Values for Organic etc.

- Organic chemicals were analyzed but a value was not developed during RFI
- Ensafe background values were for inorganic chemicals only
- PAHs background values were developed recently
- No pesticide background values were developed
- Newer data collected from Railroad tracks and Zone K for PAHs, As, and Cu.

Background Data Application

- When site sample concentrations are below the Background Reference Concentration (BRC) or the range of background values, then the chemical is not considered a COC
- Range of background values may be the values for the zone
  - Or the values of few adjacent zones combined
  - And/or entire CNC base-wide background values

Table 1: Surface Soil Inorganic Chemical Concentrations in the Background (Grid-based) Samples

CHEM_LABEL	STAT	A	B	C	D	E	F	G	H	I	K
Ag	Detects		6	3	3	2	1		2	1	3
Ag	No. Analyzed	13	15	44	6	36	6	9	97	13	13
Ag	Maximum Detect		1.7	0.060	0.42	0.91	5.0		0.74	1.5	0.88
Ag	Minimum Detect		0.72	0.050	0.26	0.75	5.0		0.55	1.5	0.24
Ag	Mean	0.35	0.72	0.030	0.21	0.16	0.92	0.12	0.31	0.26	0.21
Ag	Std Dev	0.022	0.54	0.0083	0.13	0.17	2.0	0.010	0.39	0.39	0.21
Al	Detects	13	15	44	6	31	6	9	97	13	13
Al	No. Analyzed	13	15	44	6.0	36	6.0	9.0	97	13	13
Al	Maximum Detect	11,800	55,500	9,850	6,510	20,500	19,400	17,800	32,700	27,400	24,700
Al	Minimum Detect	3,640	6,320	2,110	3,560	261	3,610	2,190	1,090	3,470	4,050
Al	Mean	7,468	15,695	4,988	4,312	5,930	8,842	9,302	8,688	13,362	8,371
Al	Std Dev	2,216	13,890	1,876	1,139	5,036	6,698	5,391	6,227	9,544	6,243
As	Detects	16	14	31	6	29	6	9	84	12	13
As	No. Analyzed	16	15	44	6	36	6	9	97	13	13
As	Maximum Detect	30	29	39	7.4	68	30	25	18	20	14
As	Minimum Detect	1.7	1.7	0.40	0.84	0.95	3.0	3.1	0.64	0.46	0.60
As	Mean	7.0	8.1	4.2	2.8	8.5	13	12	6.1	6.6	4.3
As	Std Dev	6.9	8.0	7.4	2.6	14	11	8.1	4.3	5.7	4.7
Ba	Detects	13	15	44	6	31	6	9	85	13	13
Ba	No. Analyzed	13	15	44	6	36	6	9	97	13	13
Ba	Maximum Detect	47	95	193	20	1,980	47	129	73	43	51
Ba	Minimum Detect	6.5	15	4.4	9.7	1.8	13	11	3.6	7.8	6.6
Ba	Mean	23	47	28	15	76	30	51	15	27	18
Ba	Std Dev	9.4	20	33	4.7	327	14	36	11	11	12
Be	Detects	1	13	4	1	27	6	6	85	8	9
Be	No. Analyzed	13	15	44	6	36	6	9	97	13	13
Be	Maximum Detect	0.32	1.7	0.26	0.13	1.6	1.3	1.1	2.4	0.95	0.99
Be	Minimum Detect	0.32	0.28	0.11	0.13	0.13	0.19	0.47	0.040	0.34	0.060
Be	Mean	0.13	0.56	0.095	0.11	0.42	0.53	0.58	0.39	0.46	0.26
Be	Std Dev	0.057	0.42	0.056	0.033	0.39	0.46	0.36	0.31	0.34	0.32
Ca	Detects	13	15	43	6	31	6	9	97	13	13
Ca	No. Analyzed	13	15	44	6	36	6	9	97	13	13
Ca	Maximum Detect	78,900	115,000	85,600	15,500	182,000	27,800	52,300	333,000	59,500	59,000
Ca	Minimum Detect	797	406	484	344	167	2,080	8,920	169	1,670	275
Ca	Mean	17,673	16,822	15,713	4,062	23,015	10,265	23,391	52,482	24,108	12,939

Table 1: Surface Soil Inorganic Chemical Concentrations in the Background (Grid-Based) Samples

Ca	Std Dev	24,601	31,516	19,694	5,673	39,261	9,757	14,051	66,613	18,266	21,761
Cd	Detects	1		6	1	14	4	7	21	5	3
Cd	No. Analyzed	13	15	44	6	36	6	9	97	13	13
Cd	Maximum Detect	2.8		0.65	0.11	1.5	0.22	1.7	1.6	0.61	0.42
Cd	Minimum Detect	2.8		0.16	0.11	0.060	0.12	0.12	0.12	0.13	0.080
Cd	Mean	0.75	0.59	0.089	0.037	0.32	0.13	0.53	0.26	0.28	0.12
Cd	Std Dev	0.62	0.076	0.14	0.036	0.41	0.074	0.53	0.32	0.18	0.12
Co	Detects	5	12	41	6	30	6	9	72	9	7
Co	No. Analyzed	13	15	44	6	36	6	9	97	13	13
Co	Maximum Detect	4.4	11	2.9	17	111	36	6.2	7.9	5.8	4.5
Co	Minimum Detect	1.6	1.4	0.18	0.34	0.35	0.94	1.1	0.49	0.64	0.16
Co	Mean	1.3	3.4	1.0	4.7	6.4	7.5	3.3	2.0	3.0	1.0
Co	Std Dev	1.1	3.2	0.61	6.8	18	14	1.8	1.5	2.1	1.6
Cr	Detects	13	15	44	6	35	6	9	96	13	13
Cr	No. Analyzed	13	15	44	6	36	6	9	97	13	13
Cr	Maximum Detect	34	74	32	9.7	567	35	39	114	54	46
Cr	Minimum Detect	5.7	6.0	2.7	4.5	2.3	6.3	7.0	3.4	7.5	2.8
Cr	Mean	16	24	9.8	6.1	33	17	21	27	29	13
Cr	Std Dev	7.9	20	6.2	1.9	93	12	11	21	17	14
Cr (Hexavalent)	No. Analyzed										4
Cr (Hexavalent)	Mean										0
Cr (Hexavalent)	Std Dev										0.012
Cu	Detects	13	15	43	1	31	6	7	82	13	10
Cu	No. Analyzed	13	15	44	6	36	6	9	97	13	13
Cu	Maximum Detect	71	122	40	116	866	56	431	126	556	95
Cu	Minimum Detect	2.2	3.8	0.81	116	0.47	5.7	23	0.94	2.4	0.90
Cu	Mean	18	31	11	20	60	25	130	12	67	16
Cu	Std Dev	19	33	9.6	47	154	17	154	16	149	28
Fe	Detects	13	15	44	6	31	6	9	97	13	13
Fe	No. Analyzed	13	15	44	6	36	6	9	97	13	13
Fe	Maximum Detect	15,700	48,700	12,000	3,600	30,600	28,200	32,700	38,800	22,700	23,400
Fe	Minimum Detect	1,530	2,630	841	966	1,050	3,570	4,300	695	1,730	1,200
Fe	Mean	7,461	12,682	3,848	2,239	8,710	11,755	14,577	9,484	11,267	7,543
Fe	Std Dev	3,659	14,134	2,229	841	8,885	10,008	8,714	8,629	8,047	7,105
Hg	Detects	4	8	15	1	22	6	8	69	7	3
Hg	No. Analyzed	13	15	44	6	35	6	9	97	13	13
Hg	Maximum Detect	0.30	1.5	0.75	0.060	2.7	0.61	2.0	3.8	0.47	0.52

Table 1: Surface Soil Inorganic Chemical Concentrations in the Background (Grid-Based) Samples

Hg	Minimum Detect	0.12	0.12	0.11	0.060	0.030	0.090	0.060	0.020	0.13	0.17
Hg	Mean	0.10	0.34	0.10	0.026	0.22	0.30	0.55	0.19	0.17	0.093
Hg	Std Dev	0.082	0.47	0.11	0.017	0.47	0.19	0.63	0.48	0.13	0.15
K	Detects	12	13	44		25	4	8	80	9	10
K	No. Analyzed	13	15	44	6	36	6	9	97	13	13
K	Maximum Detect	675	3,570	836		2,620	1,580	1,730	2,960	2,730	2,010
K	Minimum Detect	128	145	65		46	202	280	65	493	42
K	Mean	282	796	258	112	642	595	777	657	1,267	437
K	Std Dev	157	979	188	8.7	606	594	514	632	1,036	647
Mg	Detects	13	15	44	6	31	6	9	97	13	13
Mg	No. Analyzed	13	15	44	6	36	6	9	97	13	13
Mg	Maximum Detect	3,150	6,990	2,390	850	14,800	4,000	5,280	7,650	3,820	4,240
Mg	Minimum Detect	231	226	130	157	31	323	766	131	424	66
Mg	Mean	822	1,767	574	345	2,060	1,504	2,008	2,035	1,956	1,056
Mg	Std Dev	851	2,014	506	260	3,153	1,603	1,409	1,681	1,443	1,502
Mn	Detects	13	15	44	6	31	6	9	97	13	13
Mn	No. Analyzed	13	15	44	6	36	6	9	97	13	13
Mn	Maximum Detect	66	454	101	23	508	436	359	1,200	426	1,050
Mn	Minimum Detect	8.7	27	10	5.0	0.93	32	39	5.3	15	3.2
Mn	Mean	36	213	43	14	100	161	163	146	163	166
Mn	Std Dev	18	134	22	6.2	114	182	114	194	155	301
Na	Detects	13	15	18	1	28	2	5	95	12	10
Na	No. Analyzed	13	15	44	6	36	6	9	97	13	13
Na	Maximum Detect	653	6,670	729	170	28,200	415	1,150	1,660	2,030	2,530
Na	Minimum Detect	195	165	99	170	12	226	394	10	181	111
Na	Mean	290	759	173	101	1,077	202	602	339	621	424
Na	Std Dev	124	1,648	161	46	4,668	133	407	360	552	871
Ni	Detects	11	15	40	6	30	4	9	86	12	9
Ni	No. Analyzed	13	15	44	6	36	6	9	97	13	13
Ni	Maximum Detect	15	29	28	4.7	72	16	27	92	18	16
Ni	Minimum Detect	3.2	3.4	0.54	1.2	0.60	2.4	2.0	0.63	1.5	0.39
Ni	Mean	7.3	12	3.7	2.4	10	6.2	10	9.9	9.7	3.9
Ni	Std Dev	4.6	7.0	4.4	1.4	16	6.0	7.6	13	6.0	5.7
Pb	Detects	13	15	44	6	31	6	9	82	13	13
Pb	No. Analyzed	13	15	44	6	36	6	9	97	13	13
Pb	Maximum Detect	93	310	588	21	400	231	275	172	203	259
Pb	Minimum Detect	4.1	13	2.7	2.2	1.0	49	3.5	1.8	5.0	8.9

Table 1: Surface Soil Inorganic Chemical Concentrations in the Background (Grid-Based) Samples

Pb	Mean	36	70	69	9.4	61	91	91	27	57	45
Pb	Std Dev	29	70	111	8.3	101	69	78	30	58	66
Sb	Detects		1	15	1	9	3	5	6		4
Sb	No. Analyzed	13	15	44	6	36	6	9	96	13	13
Sb	Maximum Detect		13	1.4	1.7	7.4	0.71	5.7	2.2		2.2
Sb	Minimum Detect		13	0.26	1.7	0.50	0.50	0.79	1.1		0.48
Sb	Mean	6.0	6.5	0.22	0.46	0.86	0.40	1.4	1.7	1.3	0.42
Sb	Std Dev	0.37	1.9	0.22	0.61	1.3	0.25	1.8	2.1	1.2	0.56
Se	Detects	2	5	25	4	11	4	6	25	9	6
Se	No. Analyzed	13	15	44	6	36	6	9	97	13	13
Se	Maximum Detect	0.88	2.8	1.3	1.0	4.0	0.95	1.4	2.6	1.1	1.1
Se	Minimum Detect	0.70	0.78	0.48	0.40	0.57	0.44	0.45	0.28	0.50	0.46
Se	Mean	0.42	0.82	0.50	0.44	0.59	0.52	0.61	0.41	0.68	0.47
Se	Std Dev	0.17	0.79	0.29	0.31	0.75	0.27	0.39	0.51	0.33	0.27
Sn	Detects		6	33		20	1	4		6	4
Sn	No. Analyzed	13	15	44	6	36	6	9		13	13
Sn	Maximum Detect		14	8.1		45	22	26		7.5	46
Sn	Minimum Detect		8.2	0.70		0.77	22	2.6		0.98	11
Sn	Mean	4.3	6.9	1.4	0.95	6.1	4.7	4.9		1.9	12
Sn	Std Dev	0.27	3.5	1.2	1.2	10	8.3	8.1		2.4	13
Tl	Detects					4		3	7		
Tl	No. Analyzed	13	15	44	6	36	6	9	97	13	13
Tl	Maximum Detect					2.8		0.91	1.1		
Tl	Minimum Detect					0.61		0.55	0.12		
Tl	Mean	0.47	0.48	0.25	0.19	0.44	0.22	0.43	0.24	0.36	0.51
Tl	Std Dev	0.031	0.070	0.031	0.014	0.52	0.063	0.25	0.20	0.044	0.16
V	Detects	13	15	44	6	32	6	9	96	13	13
V	No. Analyzed	13	15	44	6	36	6	9	97	13	13
V	Maximum Detect	28	101	25	9.1	60	60	57	75	53	51
V	Minimum Detect	4.9	6.5	2.7	2.2	1.1	6.8	7.2	4.1	8.5	5.3
V	Mean	16	26	8.8	4.9	15	24	30	24	28	16
V	Std Dev	5.8	28	5.5	2.6	14	22	17	16	17	15
Zn	Detects	13	15	44	4	30	6	8	89	13	5
Zn	No. Analyzed	13	15	44	6	36	6	9	97	13	13
Zn	Maximum Detect	168	266	779	41	855	202	1,650	431	150	145
Zn	Minimum Detect	4.5	18	3.4	6.8	1.9	33	18	5.0	5.9	24
Zn	Mean	75	106	76	13	129	99	414	55	58	35

Table 1: Surface Soil Inorganic Chemical Concentrations in the Background (Grid-Based) Samples

Zn	Std Dev	49	74	128	14	229	60	549	54	44	50

Table 2: Subsurface Soil Inorganic Chemical Concentrations in the Background (Grid-based) Samples

CHEM_ID	STATISTIC	A	B	C	D	E	F	G	H	I	K
AG	Detects	1	7		1				1		2
AG	Samples	12	14	30	6	27	6	7	58	4	10
AG	Maximum	1.0	1.8		0.50				1.7		0.57
AG	Minimum	1.0	1.2		0.50				1.7		0.41
AG	Mean	0.44	0.95	0.029	0.18	0.13	0.13	0.14	0.39	0.16	0.20
AG	StdDev	0.18	0.56	0.0055	0.16	0.021	0.017	0.027	0.48	0.14	0.16
AL	Detects	12	14	30	6	23	6	7	58	4	10
AL	Samples	12	14	30	6.0	27	6.0	7.0	58	4.0	10
AL	Maximum	17,500	55,600	25,400	12,800	29,900	23,500	36,800	45,300	11,700	14,200
AL	Minimum	3,850	1,970	1,450	2,850	1,220	3,300	2,630	798	4,590	3,090
AL	Mean	9,083	12,661	6,481	5,130	7,767	8,550	11,783	11,915	7,428	6,070
AL	StdDev	3,972	14,881	5,358	3,835	7,195	7,482	11,411	10,301	3,022	3,914
AS	Detects	11	10	13	6	22	6	7	54	4	9
AS	Samples	12	14	30	6	27	6	7	58	4	10
AS	Maximum	6.9	34	32	5.8	26	30	36	136	4.4	14
AS	Minimum	1.1	1.2	0.36	0.74	0.83	3.3	1.4	0.78	0.88	0.34
AS	Mean	3.9	6.5	3.3	2.0	7.8	9.1	13	10	3.2	2.2
AS	StdDev	2.2	9.3	6.6	1.9	7.8	10	12	18	1.6	4.1
BA	Detects	12	14	30	6	23	6	7	42	4	10
BA	Samples	12	14	30	6	27	6	7	58	4	10
BA	Maximum	31	65	65	29	91	47	63	60	19	24
BA	Minimum	5.7	12	3.6	7.7	6.1	14	7.7	2.4	9.5	1.8
BA	Mean	16	28	17	15	24	26	32	15	13	5.4
BA	StdDev	7.0	17	13	7.4	19	15	20	13	4.5	6.8
BE	Detects		7	4	3	22	5	6	55	3	7
BE	Samples	12	14	30	6	27	6	7	58	4	10
BE	Maximum		1.7	0.98	0.96	1.6	1.4	2.4	1.6	0.51	0.62
BE	Minimum		0.28	0.24	0.12	0.15	0.22	0.45	0.060	0.33	0.030
BE	Mean	0.13	0.40	0.14	0.37	0.48	0.60	0.82	0.61	0.32	0.12
BE	StdDev	0.013	0.46	0.24	0.41	0.41	0.44	0.73	0.41	0.20	0.19
CA	Detects	12	14	25	6	23	6	7	58	4	3
CA	Samples	12	14	30	6	27	6	7	58	4	10

Table 2: Subsurface Soil Inorganic Chemical Concentrations in the Background (Grid-based) Samples

CA	Maximum	262,000	182,000	40,300	82,400	229,000	11,700	127,000	320,000	63,900	18,200
CA	Minimum	491	279	181	142	323	1,040	6,390	346	528	50
CA	Mean	59,132	17,400	4,636	14,457	20,586	5,547	41,363	58,904	31,505	1,839
CA	StdDev	99,812	48,153	9,188	33,294	45,732	4,720	46,311	79,424	33,479	5,749
CD	Detects			3	2	10	1	6	6	1	
CD	Samples	12	14	30	6	27	6	7	58	4	10
CD	Maximum			0.28	0.76	0.96	0.080	0.52	1.2	0.48	
CD	Minimum			0.13	0.30	0.13	0.080	0.080	0.14	0.48	
CD	Mean	0.64	0.66	0.051	0.19	0.26	0.043	0.24	0.27	0.26	0.062
CD	StdDev	0.064	0.20	0.072	0.30	0.28	0.025	0.17	0.31	0.18	0.043
CO	Detects	2	6	25	5	23	6	7	44	2	5
CO	Samples	12	14	30	6	27	6	7	58	4	10
CO	Maximum	1.7	11	7.1	5.9	15	9.0	15	12	2.2	3.1
CO	Minimum	1.6	1.9	0.14	0.30	0.41	0.94	0.90	0.27	2.1	0.40
CO	Mean	0.92	2.4	1.2	1.4	3.4	3.4	4.1	3.1	1.5	0.59
CO	StdDev	0.35	3.1	1.8	2.2	4.1	2.9	4.9	2.6	0.80	0.93
CR	Detects	12	14	30	6	26	6	7	58	4	10
CR	Samples	12	14	30	6	27	6	7	58	4	10
CR	Maximum	63	76	40	41	75	40	65	95	41	26
CR	Minimum	6.3	2.5	2.0	2.5	1.6	8.7	7.4	2.9	7.6	2.4
CR	Mean	25	20	9.6	11	19	16	28	32	24	6.4
CR	StdDev	20	23	10	15	19	12	19	21	15	7.0
CR6	Samples										1
CR6	Mean										0
CR6	StdDev										
CU	Detects	12	14	23		23	3	5	46	4	4
CU	Samples	12	14	30	6	27	4	7	58	4	10
CU	Maximum	13	47	32		192	55	46	35	12	22
CU	Minimum	1.1	0.80	0.35		1.3	2.5	4.5	0.53	1.2	0.23
CU	Mean	5.3	9.4	4.6	1.1	24	15	16	10	6.1	2.4
CU	StdDev	4.1	15	7.3	1.0	42	27	15	9.0	5.4	7.0
FE	Detects	12	14	30	6	23	6	7	58	4	10
FE	Samples	12	14	30	6	27	6	7	58	4	10
FE	Maximum	37,400	49,100	36,700	11,100	35,800	34,800	58,100	54,300	7,250	17,200

Table 2: Subsurface Soil Inorganic Chemical Concentrations in the Background (Grid-based) Samples

FE	Minimum	2,550	1,470	726	916	924	7,850	3,110	1,210	3,730	560
FE	Mean	10,153	11,667	5,639	3,134	9,424	12,998	17,913	14,463	5,640	4,015
FE	StdDev	9,895	14,104	8,348	3,920	9,205	10,715	18,571	13,586	1,708	5,634
HG	Detects		3	6	1	19	2	6	33		1
HG	Samples	12	14	30	6	27	6	7	58	4	10
HG	Maximum		2.0	8.5	0.050	0.90	0.57	0.37	1.3		0.20
HG	Minimum		0.18	0.14	0.050	0.040	0.040	0.050	0.020		0.20
HG	Mean	0.064	0.26	0.36	0.025	0.15	0.11	0.16	0.17	0.066	0.042
HG	StdDev	0.0070	0.53	1.5	0.012	0.20	0.22	0.12	0.29	0.0063	0.056
K	Detects	9	9	30	1	17	6	6	49	3	3
K	Samples	12	14	30	6	27	6	7	58	4	10
K	Maximum	1,470	4,720	2,460	1,240	3,440	1,800	3,790	2,800	2,230	1,430
K	Minimum	248	176	41	1,240	106	195	670	60	930	64
K	Mean	487	760	346	302	923	775	1,450	1,031	1,143	175
K	StdDev	445	1,284	616	460	823	620	1,172	765	884	442
MG	Detects	12	14	30	6	23	6	7	58	4	10
MG	Samples	12	14	30	6	27	6	7	58	4	10
MG	Maximum	10,200	9,070	3,940	5,290	9,140	4,240	7,040	12,700	3,990	2,960
MG	Minimum	245	147	62	102	77	399	1,040	80	196	28
MG	Mean	2,468	1,872	590	1,067	1,571	1,353	3,187	3,237	2,164	369
MG	StdDev	3,629	2,755	1,013	2,070	2,057	1,445	1,908	2,557	1,837	913
MN	Detects	12	14	30	6	23	6	7	58	4	10
MN	Samples	12	14	30	6	27	6	7	58	4	10
MN	Maximum	91	744	520	51	625	1,120	409	966	55	355
MN	Minimum	7.5	8.6	3.2	4.6	14.9	22	20	5.6	8.6	1.4
MN	Mean	26	129	54	15	103	234	146	204	40	38
MN	StdDev	23	192	125	18	146	435	141	240	22	111
NA	Detects	12	14	12	1	20	3	5	56	3	3
NA	Samples	12	14	30	6	27	6	7	58	4	10
NA	Maximum	1,550	12,600	2,160	1,179	1,430	624	3,890	2,110	1,770	2,430
NA	Minimum	195	159	107	179	21	289	1,070	111	226	9.9
NA	Mean	591	1,280	175	224	356	308	1,825	579	802	248
NA	StdDev	526	3,286	384	319	415	251	1,368	492	794	767
NI	Detects	8	9	20	6	22	4	7	49	3	9

Table 2: Subsurface Soil Inorganic Chemical Concentrations in the Background (Grid-based) Samples

NI	Samples	12	14	30	6	27	6	7	58	4	10
NI	Maximum	35	25	13	12	20	13	22	78	16	7.2
NI	Minimum	3.4	4.6	0.60	0.84	0.85	3.3	1.9	0.74	3.5	0.23
NI	Mean	9.2	8.3	2.3	3.4	6.4	4.4	9.2	11	8.1	1.8
NI	StdDev	11	7.6	2.9	4.3	6.0	4.5	6.9	12	7.0	2.3
PB	Detects	12	14	30	6	23	6	7	45	4	10
PB	Samples	12	14	30	6	27	6	7	58	4	10
PB	Maximum	26	145	95	9.2	322	123	76	39	7.2	18
PB	Minimum	2.4	1.4	1.9	1.4	1.8	4.3	2.4	2.1	3.1	2.1
PB	Mean	8.3	21	14	3.9	46	26	33	15	4.8	4.6
PB	StdDev	6.6	41	19	3.3	69	48	23	12	1.7	4.8
SB	Detects		1	3		7			4		
SB	Samples	12	14	30	6	27	6	7	58	4	10
SB	Maximum		23	0.92		1.6			19		
SB	Minimum		23	0.22		0.52			1.5		
SB	Mean	6.5	7.7	0.16	0.22	0.73	0.21	0.21	2.5	1.4	0.18
SB	StdDev	0.66	4.7	0.17	0.055	0.71	0.039	0.037	3.7	1.3	0.026
SE	Detects	9	4	11	4	6	3	5	22	4	1
SE	Samples	12	14	30	6	27	6	7	58	4	10
SE	Maximum	2.6	3.8	2.9	1.9	2.4	1.7	1.0	3.9	1.4	0.51
SE	Minimum	0.75	0.72	0.49	0.34	0.59	0.40	0.54	0.36	0.59	0.51
SE	Mean	0.95	0.87	0.55	0.73	0.51	0.62	0.63	0.63	1.0	0.26
SE	StdDev	0.61	1.0	0.61	0.69	0.51	0.59	0.28	0.73	0.35	0.095
SN	Detects	1	2	16		11		3			
SN	Samples	12	14	30	6	27	6	7		4	10
SN	Maximum	9.2	20	2.0		24		2.9			
SN	Minimum	9.2	8.2	0.64		2.8		1.1			
SN	Mean	5.1	6.0	0.97	0.59	4.1	0.99	1.5		0.52	5.2
SN	StdDev	1.4	4.3	0.50	0.19	5.1	0.64	0.92		0.060	0.89
TL	Detects			1	1		4	1	9		
TL	Samples	12	14	30	6	27	6	7	58	4	10
TL	Maximum			0.93	0.68		1.2	1.0	1.9		
TL	Minimum			0.93	0.68		0.40	1.0	0.36		
TL	Mean	0.51	0.53	0.29	0.28	0.31	0.62	0.48	0.32	0.36	0.47

Table 2: Subsurface Soil Inorganic Chemical Concentrations in the Background (Grid-based) Samples

TL	StdDev	0.058	0.16	0.13	0.20	0.065	0.38	0.28	0.34	0.038	0.17
V	Detects	12	12	30	6	24	6	7	58	4	10
V	Samples	12	14	30	6	27	6	7	58	4	10
V	Maximum	49	102	57	29	71	72	112	103	24	29
V	Minimum	5.5	3.3	15	19	1.6	12	5.9	2.7	11	2.7
V	Mean	23	22	11	7.6	20	25	36	31	17	8.2
V	StdDev	14	29	15	10	20	23	35	24	5.6	8.3
ZN	Detects	12	14	30	5	23	5	6	51	4	1
ZN	Samples	12	14	30	6	27	6	7	58	4	10
ZN	Maximum	66	238	168	40	438	195	198	233	29	58
ZN	Minimum	6.0	3.7	1.3	10	5.8	9.3	20	1.8	4.7	58
ZN	Mean	26	47	30	15	82	42	73	48	17	7.0
ZN	StdDev	20	76	42	13	103	75	64	42	11	18

Background Groundwater Concentrations from Grid Wells by Zone and Chemical

Zone	Aquifer	CASNumber	ParamName	Wells	Samples	Detects	NonDetects	Max NonDetect	Min Detect	Max Detect	Mean Detect	Adj Tap Water RBC	Number of Wells Exceeding RBC		
													Max of Detects	Mean of Detects	Max NonDetect
A	SHALLOW	7429905	ALUMINUM	3	12	9	3	4.9E+02	6.6E+01	5.2E+03	1.4E+03	3.7E+03	1		
A	SHALLOW	7440360	ANTIMONY	3	10	1	9	5.1E+01	4.0E+00	4.0E+00	4.0E+00	1.5E+00	1	1	2
A	SHALLOW	7440382	ARSENIC	3	12	5	7	2.0E+01	2.6E+00	6.8E+01	1.5E+01	4.5E-02	3	3	
A	SHALLOW	7440393	BARIUM	3	12	9	3	7.6E+01	2.1E+01	1.0E+02	5.2E+01	2.6E+02			
A	SHALLOW	7440417	BERYLLIUM	3	12		12	1.0E+00				7.3E+00			
A	SHALLOW	7440439	CADMIUM	3	12	1	11	5.0E+00	1.2E+00	1.2E+00	1.2E+00	1.8E+00			2
A	SHALLOW	7440702	CALCIUM	3	12	12			4.3E+04	1.5E+05	9.4E+04				
A	SHALLOW	7440473	CHROMIUM, TOTAL	3	12	4	8	6.0E+00	5.0E+00	9.6E+00	7.0E+00	1.1E+01			
A	SHALLOW	7440484	COBALT	3	12	1	11	7.0E+00	1.0E+01	1.0E+01	1.0E+01	2.2E+02			
A	SHALLOW	7440508	COPPER	3	10	4	6	7.1E+00	3.4E+00	1.0E+01	7.7E+00	1.5E+02			
A	SHALLOW	7439896	IRON	3	12	12			7.3E+03	7.2E+04	1.7E+04	1.1E+03	3	3	
A	SHALLOW	7439921	LEAD	3	10	3	7	3.0E+00	1.8E+00	3.2E+00	2.5E+00	1.5E+02			
A	SHALLOW	7439954	MAGNESIUM	3	12	12			1.6E+04	9.2E+04	4.0E+04				
A	SHALLOW	7439965	MANGANESE	3	12	12			8.0E+01	5.8E+02	2.1E+02	7.3E+01	3	3	
A	SHALLOW	7439976	MERCURY	3	12		12	2.0E-01				1.1E+00			
A	SHALLOW	7440020	NICKEL	3	12	1	11	1.4E+01	9.4E+00	9.4E+00	9.4E+00	7.3E+01			
A	SHALLOW	7440097	POTASSIUM	3	12	12			4.1E+03	3.7E+04	1.9E+04				
A	SHALLOW	7782492	SELENIUM	3	10		10	3.0E+00				1.8E+01			
A	SHALLOW	7440224	SILVER	3	12	1	11	7.0E+00	1.3E+00	1.3E+00	1.3E+00	1.8E+01			
A	SHALLOW	7440280	THALLIUM	3	8		8	4.0E+00				2.6E-01			3
A	SHALLOW	7440315	TIN	3	9		9	5.5E+01				2.2E+03			
A	SHALLOW	7440622	VANADIUM	3	12	5	7	7.0E+00	1.3E+00	1.4E+01	8.1E+00	2.6E+01			
A	SHALLOW	7440666	ZINC	3	10	3	7	1.7E+01	7.5E+00	8.9E+01	4.2E+01	1.1E+03			
A	DEEP	7429905	ALUMINUM	3	12	6	6	5.5E+01	4.9E+01	1.6E+03	6.5E+02	3.7E+03			
A	DEEP	7440360	ANTIMONY	3	10	1	9	2.6E+02	7.1E+00	7.1E+00	7.1E+00	1.5E+00	1	1	2
A	DEEP	7440382	ARSENIC	3	11	3	8	2.1E+01	4.0E+00	1.1E+01	7.7E+00	4.5E-02	1	1	2
A	DEEP	7440393	BARIUM	3	12	9	3	1.7E+02	3.6E+01	1.8E+02	9.3E+01	2.6E+02			
A	DEEP	7440417	BERYLLIUM	3	12	1	11	5.6E+00	3.3E+00	3.3E+00	3.3E+00	7.3E+00			
A	DEEP	7440439	CADMIUM	3	12		12	1.1E+01				1.8E+00			3
A	DEEP	7440702	CALCIUM	3	12	12			4.5E+04	5.2E+05	2.3E+05				
A	DEEP	7440473	CHROMIUM, TOTAL	3	12	3	9	6.0E+00	1.6E+00	1.4E+02	6.4E+01	1.1E+01	2	2	
A	DEEP	7440484	COBALT	3	12	4	8	3.3E+01	1.0E+01	2.9E+01	1.9E+01	2.2E+02			
A	DEEP	7440508	COPPER	3	11	6	5	7.0E+00	5.7E+00	4.5E+02	8.2E+01	1.5E+02	1	1	
A	DEEP	7439896	IRON	3	12	9	3	5.8E+02	1.9E+02	2.3E+04	9.7E+03	1.1E+03	2	2	
A	DEEP	7439921	LEAD	3	8	1	7	1.5E+01	1.9E+01	1.9E+01	1.9E+01	1.5E+02			
A	DEEP	7439954	MAGNESIUM	3	12	12			9.3E+04	1.6E+06	7.0E+05				
A	DEEP	7439965	MANGANESE	3	12	12			1.8E+02	2.7E+03	1.4E+03	7.3E+01	3	3	
A	DEEP	7439976	MERCURY	3	12		12	2.0E-01				1.1E+00			
A	DEEP	7440020	NICKEL	3	12	2	10	1.6E+01	2.0E+01	7.4E+01	4.7E+01	7.3E+01	1	1	
A	DEEP	7440097	POTASSIUM	3	12	12			2.4E+04	6.1E+05	2.1E+05				
A	DEEP	7782492	SELENIUM	3	10		10	1.1E+02				1.8E+01			2
A	DEEP	7440224	SILVER	3	12	3	9	5.0E+01	6.0E+00	3.1E+01	1.3E+01	1.8E+01	1	1	1
A	DEEP	7440280	THALLIUM	3	9	3	6	3.1E+01	1.7E+01	1.6E+02	6.8E+01	2.6E-01	1	1	2
A	DEEP	7440315	TIN	3	9	2	7	5.5E+01	8.2E+01	1.1E+02	9.6E+01	2.2E+03			
A	DEEP	7440622	VANADIUM	3	12	1	11	2.2E+01	9.9E+00	9.9E+00	9.9E+00	2.6E+01			
A	DEEP	7440666	ZINC	3	11	4	7	1.6E+01	6.0E+00	1.4E+03	2.7E+02	1.1E+03	1		
B	SHALLOW	7429905	ALUMINUM	4	16	10	6	2.5E+02	8.7E+01	2.8E+03	5.8E+02	3.7E+03			
B	SHALLOW	7440360	ANTIMONY	4	16		16	5.1E+01				1.5E+00			4
B	SHALLOW	7440382	ARSENIC	4	16	4	12	2.1E+01	7.6E+00	1.6E+01	1.0E+01	4.5E-02	3	3	1
B	SHALLOW	7440393	BARIUM	4	16	13	3	6.7E+01	1.8E+01	9.0E+01	4.4E+01	2.6E+02			
B	SHALLOW	7440417	BERYLLIUM	4	16	1	15	1.0E+00	4.8E+00	4.8E+00	4.8E+00	7.3E+00			
B	SHALLOW	7440439	CADMIUM	4	16		16	5.0E+00				1.8E+00			4
B	SHALLOW	7440702	CALCIUM	4	16	16			1.2E+04	4.7E+05	2.0E+05				
B	SHALLOW	7440473	CHROMIUM, TOTAL	4	16	3	13	1.1E+01	7.7E+00	1.3E+02	4.9E+01	1.1E+01	2	2	
B	SHALLOW	7440484	COBALT	4	16	1	15	7.0E+00	7.5E+01	7.5E+01	7.5E+01	2.2E+02			
B	SHALLOW	7440508	COPPER	4	16	2	14	9.9E+00	6.6E+00	1.1E+02	5.6E+01	1.5E+02			
B	SHALLOW	7439896	IRON	4	16	16			2.3E+02	1.9E+04	4.8E+03	1.1E+03	4	4	
B	SHALLOW	7439921	LEAD	4	16	1	15	3.0E+01	7.3E+00	7.3E+00	7.3E+00	1.5E+02			
B	SHALLOW	7439954	MAGNESIUM	4	16	16			6.7E+03	1.0E+06	2.6E+05				
B	SHALLOW	7439965	MANGANESE	4	16	16			2.1E+01	3.4E+03	1.1E+03	7.3E+01	3	3	

Background Groundwater Concentrations from Grid Wells by Zone and Chemical

Zone	Aquifer	CASNumber	ParamName	Wells	Samples	Detects	NonDetects	Max NonDetect	Min Detect	Max Detect	Mean Detect	Adj Tap Water RBC	Number of Wells Exceeding RBC: Max of Detects	Mean of Detects	Max NonDetect
B	SHALLOW	7439976	MERCURY	4	16		16	2.0E-01				1.1E+00			
B	SHALLOW	7440020	NICKEL	4	16	2	14	1.4E+01	1.7E+01	5.6E+01	3.6E+01	7.3E+01			
B	SHALLOW	7440097	POTASSIUM	4	16	15	1	1.4E+03	1.3E+03	5.2E+05	1.0E+05				
B	SHALLOW	7782492	SELENIUM	4	16		16	2.1E+01				1.8E+01			1
B	SHALLOW	7440224	SILVER	4	16	1	15	7.0E+00	1.1E+02	1.1E+02	1.1E+02	1.8E+01	1	1	
B	SHALLOW	7440280	THALLIUM	4	16	1	15	4.0E+01	3.4E+00	3.4E+00	3.4E+00	2.6E-01	1	1	3
B	SHALLOW	7440315	TIN	4	12	1	11	5.5E+01	4.6E+01	4.6E+01	4.6E+01	2.2E+03			
B	SHALLOW	7440622	VANADIUM	4	16	4	12	7.0E+00	3.6E+00	1.3E+01	7.5E+00	2.6E+01			
B	SHALLOW	7440666	ZINC	4	16	3	13	4.8E+01	5.9E+00	1.7E+01	1.0E+01	1.1E+03			
B	DEEP	7429905	ALUMINUM	2	8	2	6	1.6E+02	5.7E+01	1.9E+03	9.8E+02	3.7E+03			
B	DEEP	7440360	ANTIMONY	2	8		8	5.1E+01				1.5E+00			2
B	DEEP	7440382	ARSENIC	2	8		8	2.1E+01				4.5E-02			2
B	DEEP	7440393	BARIUM	2	8	6	2	1.4E+02	7.0E+00	1.5E+02	7.0E+01	2.6E+02			
B	DEEP	7440417	BERYLLIUM	2	8	1	7	1.0E+00	5.4E+00	5.4E+00	5.4E+00	7.3E+00			
B	DEEP	7440439	CADMIUM	2	8		8	5.0E+00				1.8E+00			2
B	DEEP	7440702	CALCIUM	2	8	8			4.9E+04	3.8E+05	1.9E+05				
B	DEEP	7440473	CHROMIUM, TOTAL	2	8	1	7	6.0E+00	1.0E+02	1.0E+02	1.0E+02	1.1E+01	1	1	
B	DEEP	7440484	COBALT	2	8	1	7	7.0E+00	6.9E+01	6.9E+01	6.9E+01	2.2E+02			
B	DEEP	7440508	COPPER	2	8	2	6	7.0E+00	6.2E+00	8.8E+01	4.7E+01	1.5E+02			
B	DEEP	7439896	IRON	2	8	4	4	1.2E+02	3.2E+01	1.8E+02	7.5E+01	1.1E+03			
B	DEEP	7439921	LEAD	2	8	1	7	1.5E+01	3.4E+00	3.4E+00	3.4E+00	1.5E+02			
B	DEEP	7439954	MAGNESIUM	2	8	8			4.9E+03	4.3E+05	2.0E+05				
B	DEEP	7439965	MANGANESE	2	8	8			3.2E+01	8.9E+02	3.6E+02	7.3E+01	1	1	
B	DEEP	7439976	MERCURY	2	8		8	2.0E-01				1.1E+00			
B	DEEP	7440020	NICKEL	2	8	3	5	1.4E+01	1.4E+01	4.7E+01	2.3E+01	7.3E+01			
B	DEEP	7440097	POTASSIUM	2	8	8			2.3E+03	2.0E+05	6.9E+04				
B	DEEP	7782492	SELENIUM	2	8		8	2.1E+01				1.8E+01			1
B	DEEP	7440224	SILVER	2	8	1	7	7.0E+00	1.4E+02	1.4E+02	1.4E+02	1.8E+01	1	1	
B	DEEP	7440280	THALLIUM	2	8		8	4.0E+01				2.6E-01			2
B	DEEP	7440315	TIN	2	6		6	5.5E+01				2.2E+03			
B	DEEP	7440622	VANADIUM	2	8	1	7	7.0E+00	5.4E+00	5.4E+00	5.4E+00	2.6E+01			
B	DEEP	7440666	ZINC	2	8	1	7	4.5E+01	9.1E+00	9.1E+00	9.1E+00	1.1E+03			
C	SHALLOW	7429905	ALUMINUM	2	8	5	3	3.2E+02	6.4E+01	6.2E+02	2.5E+02	3.7E+03			
C	SHALLOW	7440360	ANTIMONY	2	8		8	1.3E+01				1.5E+00			2
C	SHALLOW	7440382	ARSENIC	2	8	3	5	1.5E+01	3.2E+00	5.6E+00	4.6E+00	4.5E-02	2	2	
C	SHALLOW	7440393	BARIUM	2	8	5	3	1.3E+01	4.6E+00	1.6E+01	9.7E+00	2.6E+02			
C	SHALLOW	7440417	BERYLLIUM	2	8	1	7	3.0E-01	3.6E-01	3.6E-01	3.6E-01	7.3E+00			
C	SHALLOW	7440439	CADMIUM	2	8		8	5.0E-01				1.8E+00			
C	SHALLOW	7440702	CALCIUM	2	8	8			2.6E+04	1.5E+05	8.2E+04				
C	SHALLOW	7440473	CHROMIUM, TOTAL	2	8	1	7	2.2E+00	2.1E+00	2.1E+00	2.1E+00	1.1E+01			
C	SHALLOW	7440484	COBALT	2	8	1	7	5.2E+00	1.6E+00	1.6E+00	1.6E+00	2.2E+02			
C	SHALLOW	7440508	COPPER	2	8		8	4.5E+00				1.5E+02			
C	SHALLOW	7439896	IRON	2	8	8			2.9E+02	4.7E+03	1.7E+03	1.1E+03	1	1	
C	SHALLOW	7439921	LEAD	2	8	2	6	9.1E+00	2.7E+00	4.4E+00	3.6E+00	1.5E+02			
C	SHALLOW	7439954	MAGNESIUM	2	8	7	1	7.6E+02	7.0E+02	9.3E+03	4.6E+03				
C	SHALLOW	7439965	MANGANESE	2	8	7	1	2.3E+01	1.8E+01	7.9E+02	3.1E+02	7.3E+01	1	1	
C	SHALLOW	7439976	MERCURY	2	8		8	2.0E-01				1.1E+00			
C	SHALLOW	7440020	NICKEL	2	8	2	6	1.2E+01	1.6E+00	5.0E+00	3.3E+00	7.3E+01			
C	SHALLOW	7440097	POTASSIUM	2	8	3	5	6.7E+03	5.6E+02	6.4E+03	3.2E+03				
C	SHALLOW	7782492	SELENIUM	2	8		8	4.4E+00				1.8E+01			
C	SHALLOW	7440224	SILVER	2	8		8	1.7E+00				1.8E+01			
C	SHALLOW	7440280	THALLIUM	2	8		8	4.5E+00				2.6E-01			2
C	SHALLOW	7440315	TIN	2	8		8	5.6E+01				2.2E+03			
C	SHALLOW	7440622	VANADIUM	2	8	2	6	3.4E+00	1.4E+00	1.9E+00	1.7E+00	2.6E+01			
C	SHALLOW	7440666	ZINC	2	8	4	4	2.0E+01	5.6E+00	1.5E+01	1.1E+01	1.1E+03			
C	DEEP	7429905	ALUMINUM	2	8	1	7	5.4E+01	1.8E+01	1.8E+01	1.8E+01	3.7E+03			
C	DEEP	7440360	ANTIMONY	2	8		8	1.3E+01				1.5E+00			2
C	DEEP	7440382	ARSENIC	2	8		8	3.2E+00				4.5E-02			2
C	DEEP	7440393	BARIUM	2	8	4	4	5.7E+01	1.2E+01	7.0E+01	3.7E+01	2.6E+02			
C	DEEP	7440417	BERYLLIUM	2	8	1	7	3.0E-01	3.3E-01	3.3E-01	3.3E-01	7.3E+00			

Background Groundwater Concentrations from Grid Wells by Zone and Chemical

Zone	Aquifer	CASNumber	ParamName	Wells	Samples	Detects	NonDetects	Max NonDetect	Min Detect	Max Detect	Mean Detect	Adj Tap Water RBC	Number of Wells Exceeding RBC: Max of Detects	Mean of Detects	Max NonDetect
C	DEEP	7440439	CADMIUM	2	8		8	5.0E-01				1.8E+00			
C	DEEP	7440702	CALCIUM	2	8	8			4.5E+04	1.8E+05	1.0E+05				
C	DEEP	7440473	CHROMIUM, TOTAL	2	8		8	2.2E+00				1.1E+01			
C	DEEP	7440484	COBALT	2	8		8	5.2E+00				2.2E+02			
C	DEEP	7440508	COPPER	2	8		8	3.9E+00				1.5E+02			
C	DEEP	7439896	IRON	2	8	8			2.1E+02	7.9E+02	4.2E+02	1.1E+03			
C	DEEP	7439921	LEAD	2	8		8	3.6E+00				1.5E+02			
C	DEEP	7439954	MAGNESIUM	2	8	8			1.4E+03	2.2E+04	1.1E+04				
C	DEEP	7439965	MANGANESE	2	8	8			3.5E+01	1.2E+02	7.3E+01	7.3E+01	1	1	
C	DEEP	7439976	MERCURY	2	8		8	2.0E-01				1.1E+00			
C	DEEP	7440020	NICKEL	2	8		8	7.9E+00				7.3E+01			
C	DEEP	7440097	POTASSIUM	2	8	4	4	8.2E+03	9.2E+02	1.1E+04	5.8E+03				
C	DEEP	7782492	SELENIUM	2	8		8	4.4E+00				1.8E+01			
C	DEEP	7440224	SILVER	2	8		8	1.2E+00				1.8E+01			
C	DEEP	7440280	THALLIUM	2	8		8	4.5E+00				2.6E-01			2
C	DEEP	7440315	TIN	2	8		8	5.6E+01				2.2E+03			
C	DEEP	7440622	VANADIUM	2	8	1	7	3.4E+00	4.3E-01	4.3E-01	4.3E-01	2.6E+01			
C	DEEP	7440666	ZINC	2	8		8	4.0E+01				1.1E+03			
D	SHALLOW	7429905	ALUMINUM	1	4	4			2.6E+02	7.1E+02	4.8E+02	3.7E+03			
D	SHALLOW	7440360	ANTIMONY	1	4		4	5.8E+00				1.5E+00			1
D	SHALLOW	7440382	ARSENIC	1	4	4			2.2E+00	4.0E+00	3.2E+00	4.5E-02	1	1	
D	SHALLOW	7440393	BARIUM	1	4	4			4.4E+00	1.1E+01	7.2E+00	2.6E+02			
D	SHALLOW	7440417	BERYLLIUM	1	4	2	2	2.0E-01	2.0E-01	4.0E-01	3.0E-01	7.3E+00			
D	SHALLOW	7440439	CADMIUM	1	4		4	5.0E-01				1.8E+00			
D	SHALLOW	7440702	CALCIUM	1	4	4			1.2E+04	2.3E+04	1.7E+04				
D	SHALLOW	7440473	CHROMIUM, TOTAL	1	4	3	1	1.0E+00	1.3E+00	2.2E+00	1.8E+00	1.1E+01			
D	SHALLOW	7440484	COBALT	1	4		4	9.0E-01				2.2E+02			
D	SHALLOW	7440508	COPPER	1	4	1	3	3.9E+00	4.3E+00	4.3E+00	4.3E+00	1.5E+02			
D	SHALLOW	7439896	IRON	1	4	4			2.1E+02	2.3E+03	8.1E+02	1.1E+03	1		
D	SHALLOW	7439921	LEAD	1	4	1	3	9.7E-01	1.9E+00	1.9E+00	1.9E+00	1.5E+02			
D	SHALLOW	7439954	MAGNESIUM	1	4	4			1.4E+03	1.7E+03	1.5E+03				
D	SHALLOW	7439965	MANGANESE	1	4	3	1	1.8E+00	1.7E+00	1.5E+01	7.6E+00	7.3E+01			
D	SHALLOW	7439976	MERCURY	1	4		4	1.0E-01				1.1E+00			
D	SHALLOW	7440020	NICKEL	1	4	2	2	2.2E+00	1.7E+00	1.7E+00	1.7E+00	7.3E+01			
D	SHALLOW	7440097	POTASSIUM	1	4	4			2.2E+03	3.0E+03	2.5E+03				
D	SHALLOW	7782492	SELENIUM	1	4	1	3	3.4E+00	4.5E+00	4.5E+00	4.5E+00	1.8E+01			
D	SHALLOW	7440224	SILVER	1	4		4	3.5E+00				1.8E+01			
D	SHALLOW	7440280	THALLIUM	1	4		4	5.0E+00				2.6E-01			1
D	SHALLOW	7440315	TIN	1	4		4	1.5E+01				2.2E+03			
D	SHALLOW	7440622	VANADIUM	1	4	4			3.6E+00	8.4E+00	5.9E+00	2.6E+01			
D	SHALLOW	7440666	ZINC	1	4	1	3	2.4E+01	1.4E+01	1.4E+01	1.4E+01	1.1E+03			
D	DEEP	7429905	ALUMINUM	1	4		4	1.9E+01				3.7E+03			
D	DEEP	7440360	ANTIMONY	1	4		4	2.6E+00				1.5E+00			1
D	DEEP	7440382	ARSENIC	1	4	4			3.0E+00	5.6E+00	4.1E+00	4.5E-02	1	1	
D	DEEP	7440393	BARIUM	1	4	4			1.3E+01	1.6E+01	1.4E+01	2.6E+02			
D	DEEP	7440417	BERYLLIUM	1	4		4	3.0E-01				7.3E+00			
D	DEEP	7440439	CADMIUM	1	4		4	5.0E-01				1.8E+00			
D	DEEP	7440702	CALCIUM	1	4	4			5.1E+04	5.5E+04	5.3E+04				
D	DEEP	7440473	CHROMIUM, TOTAL	1	4		4	1.0E+00				1.1E+01			
D	DEEP	7440484	COBALT	1	4		4	1.0E+00				2.2E+02			
D	DEEP	7440508	COPPER	1	4		4	1.4E+00				1.5E+02			
D	DEEP	7439896	IRON	1	4	4			3.8E+02	5.5E+02	4.7E+02	1.1E+03			
D	DEEP	7439921	LEAD	1	4		4	1.7E+00				1.5E+02			
D	DEEP	7439954	MAGNESIUM	1	4	4			3.3E+03	3.5E+03	3.4E+03				
D	DEEP	7439965	MANGANESE	1	4	4			1.3E+02	1.6E+02	1.4E+02	7.3E+01	1	1	
D	DEEP	7439976	MERCURY	1	4		4	1.2E-01				1.1E+00			
D	DEEP	7440020	NICKEL	1	4		4	1.3E+00				7.3E+01			
D	DEEP	7440097	POTASSIUM	1	4	3	1	1.6E+03	1.1E+03	1.3E+03	1.2E+03				
D	DEEP	7782492	SELENIUM	1	4		4	3.4E+00				1.8E+01			
D	DEEP	7440224	SILVER	1	4		4	2.9E+00				1.8E+01			

Background Groundwater Concentrations from Grid Wells by Zone and Chemical

Zone	Aquifer	CASNumber	ParamName	Wells	Samples	Detects	NonDetects	Max NonDetect	Min Detect	Max Detect	Mean Detect	Adj Tap Water RBC	Number of Wells Exceeding RBC		
													Max of Detects	Mean of Detects	Max NonDetect
D	DEEP	7440280	THALLIUM	1	4		4	5.0E+00				2.6E-01			1
D	DEEP	7440315	TIN	1	4		4	1.4E+01				2.2E+03			
D	DEEP	7440622	VANADIUM	1	4		4	1.1E+00				2.6E+01			
D	DEEP	7440666	ZINC	1	4		4	3.0E+01				1.1E+03			
E	SHALLOW	7429905	ALUMINUM	32	124	96	28	1.6E+02	1.9E+01	1.6E+04	7.2E+02	3.7E+03	4	1	
E	SHALLOW	7440360	ANTIMONY	32	124	6	118	3.0E+01	2.1E+00	4.9E+00	3.3E+00	1.5E+00	5	5	27
E	SHALLOW	7440382	ARSENIC	32	124	67	57	1.7E+01	2.6E+00	3.2E+02	2.4E+01	4.5E-02	27	27	5
E	SHALLOW	7440393	BARIUM	32	124	99	25	1.5E+02	5.9E+00	4.0E+02	5.7E+01	2.6E+02	1	1	
E	SHALLOW	7440417	BERYLLIUM	32	124	21	103	1.3E+00	2.6E-01	8.5E-01	3.8E-01	7.3E+00			
E	SHALLOW	7440439	CADMIUM	32	124	1	123	2.2E+00	1.4E+00	1.4E+00	1.4E+00	1.8E+00			7
E	SHALLOW	7440702	CALCIUM	32	124	120	4	1.2E+05	1.2E+03	2.6E+05	9.0E+04				
E	SHALLOW	7440473	CHROMIUM, TOTAL	32	124	34	90	5.6E+00	8.4E-01	3.1E+01	4.5E+00	1.1E+01	5	2	
E	SHALLOW	7440484	COBALT	32	124	17	107	5.2E+00	9.1E-01	4.4E+01	4.7E+00	2.2E+02			
E	SHALLOW	7440508	COPPER	32	124	16	108	1.2E+01	8.7E-01	8.1E+00	2.8E+00	1.5E+02			
E	SHALLOW	7439896	IRON	32	124	120	4	8.5E+02	1.4E+02	7.7E+04	8.5E+03	1.1E+03	30	28	
E	SHALLOW	7439921	LEAD	32	124	22	102	8.5E+00	1.5E+00	4.7E+01	6.1E+00	1.5E+02			
E	SHALLOW	7439954	MAGNESIUM	32	124	120	4	2.5E+05	7.9E+02	1.2E+06	7.7E+04				
E	SHALLOW	7439965	MANGANESE	32	124	115	9	1.1E+03	2.0E+00	2.7E+03	4.0E+02	7.3E+01	23	22	
E	SHALLOW	7439976	MERCURY	32	124	9	115	8.6E-01	1.1E-01	6.1E-01	2.8E-01	1.3E+00			
E	SHALLOW	7440020	NICKEL	32	124	44	80	1.7E+01	8.9E-01	1.7E+01	3.6E+00	7.3E+01			
E	SHALLOW	7440097	POTASSIUM	32	124	111	13	1.2E+05	1.3E+03	2.9E+05	3.5E+04				
E	SHALLOW	7782492	SELENIUM	32	124	5	119	6.3E+00	3.4E+00	5.2E+00	4.5E+00	1.8E+01			
E	SHALLOW	7440224	SILVER	32	124	2	122	1.1E+01	1.6E+00	4.2E+00	2.9E+00	1.8E+01			
E	SHALLOW	7440280	THALLIUM	32	124	13	111	9.1E+00	3.2E+00	5.8E+00	4.3E+00	2.6E-01	10	10	22
E	SHALLOW	7440315	TIN	32	124	7	117	3.3E+01	3.0E+00	9.7E+00	4.2E+00	2.2E+03			
E	SHALLOW	7440622	VANADIUM	32	124	83	41	5.7E+00	6.3E-01	2.6E+01	3.8E+00	2.6E+01	1		
E	SHALLOW	7440666	ZINC	32	124	22	102	7.0E+01	4.6E+00	1.4E+02	1.8E+01	1.1E+03			
E	DEEP	7429905	ALUMINUM	30	120	21	99	5.5E+01	1.9E+01	4.6E+02	9.2E+01	3.7E+03			
E	DEEP	7440360	ANTIMONY	30	122	3	119	2.1E+01	2.8E+00	6.8E+00	4.7E+00	1.5E+00	3	3	27
E	DEEP	7440382	ARSENIC	30	122	60	62	1.4E+01	2.6E+00	1.3E+02	1.3E+01	4.5E-02	24	24	6
E	DEEP	7440393	BARIUM	30	120	100	20	2.7E+02	1.2E+01	3.2E+02	8.6E+01	2.6E+02	1	1	
E	DEEP	7440417	BERYLLIUM	30	122	30	92	1.9E+00	2.3E-01	1.3E+00	5.6E-01	7.3E+00			
E	DEEP	7440439	CADMIUM	30	120	2	118	2.2E+00	6.1E-01	6.1E-01	6.1E-01	1.8E+00			4
E	DEEP	7440702	CALCIUM	30	120	119	1	3.6E+05	4.4E+04	3.9E+05	1.6E+05				
E	DEEP	7440473	CHROMIUM, TOTAL	30	122	27	95	6.5E+00	8.1E-01	2.7E+01	3.4E+00	1.1E+01	2	1	
E	DEEP	7440484	COBALT	30	120	24	96	5.2E+00	1.1E+00	1.4E+01	3.5E+00	2.2E+02			
E	DEEP	7440508	COPPER	30	120	9	111	2.5E+01	6.0E-01	5.7E+00	2.4E+00	1.5E+02			
E	DEEP	7439896	IRON	30	120	100	20	3.2E+02	1.9E+01	2.6E+04	3.0E+03	1.1E+03	16	15	
E	DEEP	7439921	LEAD	30	122	2	120	3.5E+00	2.1E+00	3.0E+00	2.6E+00	1.5E+02			
E	DEEP	7439954	MAGNESIUM	30	120	119	1	2.5E+05	3.2E+03	1.4E+06	3.0E+05				
E	DEEP	7439965	MANGANESE	30	120	118	2	8.7E+02	1.3E+00	1.7E+03	2.8E+02	7.3E+01	26	26	
E	DEEP	7439976	MERCURY	30	122	10	112	2.9E-01	1.1E-01	2.0E-01	1.5E-01	1.1E+00			
E	DEEP	7440020	NICKEL	30	120	52	68	6.3E+00	8.3E-01	4.6E+01	5.3E+00	7.3E+01			
E	DEEP	7440097	POTASSIUM	30	120	115	5	8.0E+04	1.7E+03	3.5E+05	8.7E+04				
E	DEEP	7782492	SELENIUM	30	120	2	118	5.0E+00	3.2E+00	3.6E+00	3.4E+00	1.8E+01			
E	DEEP	7440224	SILVER	30	120	2	118	5.7E+00	2.0E+00	2.7E+00	2.4E+00	1.8E+01			
E	DEEP	7440280	THALLIUM	30	122	17	105	8.4E+00	2.7E+00	7.4E+00	4.7E+00	2.6E-01	14	14	16
E	DEEP	7440315	TIN	30	120	4	116	2.7E+01	2.7E+00	3.3E+00	2.9E+00	2.2E+03			
E	DEEP	7440622	VANADIUM	30	120	39	81	3.5E+00	5.2E-01	7.7E+00	2.6E+00	2.6E+01			
E	DEEP	7440666	ZINC	30	120	12	108	7.4E+01	4.4E+00	2.1E+01	1.0E+01	1.1E+03			
F	SHALLOW	7429905	ALUMINUM	2	6	6			2.0E+01	4.7E+02	1.6E+02	3.7E+03			
F	SHALLOW	7440360	ANTIMONY	2	6		6	4.0E+00				1.5E+00			2
F	SHALLOW	7440382	ARSENIC	2	6	6			3.3E+00	1.2E+01	8.2E+00	4.5E-02	2	2	
F	SHALLOW	7440393	BARIUM	2	6	5	1	7.9E+01	2.9E+01	8.3E+01	5.8E+01	2.6E+02			
F	SHALLOW	7440417	BERYLLIUM	2	6	1	5	1.0E+00	3.7E-01	3.7E-01	3.7E-01	7.3E+00			
F	SHALLOW	7440439	CADMIUM	2	6	2	4	1.0E+00	6.4E-01	4.4E+00	2.5E+00	1.8E+00	1	1	
F	SHALLOW	7440702	CALCIUM	2	6	6			3.0E+04	2.3E+05	1.3E+05				
F	SHALLOW	7440473	CHROMIUM, TOTAL	2	6	1	5	1.0E+00	2.7E+00	2.7E+00	2.7E+00	1.1E+01			
F	SHALLOW	7440484	COBALT	2	6	4	2	2.0E+00	7.5E+00	1.0E+01	9.0E+00	2.2E+02			
F	SHALLOW	7440508	COPPER	2	6		6	7.0E+00				1.5E+02			

Background Groundwater Concentrations from Grid Wells by Zone and Chemical

Zone	Aquifer	CASNumber	ParamName	Wells	Samples	Detects	NonDetects	Max NonDetect	Min Detect	Max Detect	Mean Detect	Adj Tap Water RBC	Number of Wells Exceeding RBC: Max of Detects	Mean of Detects	Max NonDetect
F	SHALLOW	7439896	IRON	2	6	6			8.6E+03	6.2E+04	3.3E+04	1.1E+03	2	2	
F	SHALLOW	7439921	LEAD	2	6		6	3.0E+00				1.5E+02			
F	SHALLOW	7439954	MAGNESIUM	2	6	6			3.5E+04	1.5E+05	8.7E+04				
F	SHALLOW	7439965	MANGANESE	2	6	6			9.8E+02	2.6E+03	1.7E+03	7.3E+01	2	2	
F	SHALLOW	7439976	MERCURY	2	6	1	5	2.3E-01	1.7E-01	1.7E-01	1.7E-01	1.1E+00			
F	SHALLOW	7440020	NICKEL	2	6	4	2	4.6E+00	1.9E+00	4.8E+00	3.0E+00	7.3E+01			
F	SHALLOW	7440097	POTASSIUM	2	6	5	1	8.0E+04	8.8E+03	7.6E+04	4.3E+04				
F	SHALLOW	7782492	SELENIUM	2	6		6	5.4E+00				1.8E+01			
F	SHALLOW	7440224	SILVER	2	6		6	2.3E+00				1.8E+01			
F	SHALLOW	7440280	THALLIUM	2	6	1	5	5.0E+00	4.8E+00	4.8E+00	4.8E+00	2.6E-01	1	1	1
F	SHALLOW	7440315	TIN	2	6		6	2.0E+01				2.2E+03			
F	SHALLOW	7440622	VANADIUM	2	6	1	5	2.3E+00	1.2E+00	1.2E+00	1.2E+00	2.6E+01			
F	SHALLOW	7440666	ZINC	2	6		6	3.2E+01				1.1E+03			
F	DEEP	7429905	ALUMINUM	2	6	1	5	2.5E+01	1.3E+02	1.3E+02	1.3E+02	3.7E+03			
F	DEEP	7440360	ANTIMONY	2	6		6	4.0E+00				1.5E+00			2
F	DEEP	7440382	ARSENIC	2	6	6			6.6E+00	7.8E+01	4.0E+01	4.5E-02	2	2	
F	DEEP	7440393	BARIUM	2	6	5	1	8.9E+01	9.6E+01	1.4E+02	1.1E+02	2.6E+02			
F	DEEP	7440417	BERYLLIUM	2	6	1	5	1.2E+00	2.3E-01	2.3E-01	2.3E-01	7.3E+00			
F	DEEP	7440439	CADMIUM	2	6	2	4	1.0E+00	4.6E-01	5.4E-01	5.0E-01	1.8E+00			
F	DEEP	7440702	CALCIUM	2	6	6			1.8E+05	3.3E+05	2.5E+05				
F	DEEP	7440473	CHROMIUM, TOTAL	2	6	1	5	1.7E+00	9.6E-01	9.6E-01	9.6E-01	1.1E+01			
F	DEEP	7440484	COBALT	2	6	6			1.0E+01	6.1E+01	3.3E+01	2.2E+02			
F	DEEP	7440508	COPPER	2	6		6	2.3E+00				1.5E+02			
F	DEEP	7439896	IRON	2	6	6			3.1E+02	1.4E+04	6.9E+03	1.1E+03	2	1	
F	DEEP	7439921	LEAD	2	6		6	3.0E+00				1.5E+02			
F	DEEP	7439954	MAGNESIUM	2	6	6			2.2E+04	7.9E+05	4.0E+05				
F	DEEP	7439965	MANGANESE	2	6	6			5.9E+02	4.8E+03	2.6E+03	7.3E+01	2	2	
F	DEEP	7439976	MERCURY	2	6	1	5	2.0E-01	3.2E-01	3.2E-01	3.2E-01	1.1E+00			
F	DEEP	7440020	NICKEL	2	6	6			2.2E+01	4.2E+01	3.1E+01	7.3E+01			
F	DEEP	7440097	POTASSIUM	2	6	6			5.9E+03	1.8E+05	7.7E+04				
F	DEEP	7782492	SELENIUM	2	6		6	5.0E+00				1.8E+01			
F	DEEP	7440224	SILVER	2	6	1	5	2.2E+00	2.7E+00	2.7E+00	2.7E+00	1.8E+01			
F	DEEP	7440280	THALLIUM	2	6	2	4	5.0E+00	5.9E+00	6.6E+00	6.3E+00	2.6E-01	1	1	1
F	DEEP	7440315	TIN	2	6		6	2.0E+01				2.2E+03			
F	DEEP	7440622	VANADIUM	2	6	1	5	1.1E+00	1.2E+00	1.2E+00	1.2E+00	2.6E+01			
F	DEEP	7440666	ZINC	2	6		6	1.3E+01				1.1E+03			
G	SHALLOW	7429905	ALUMINUM	2	9	7	2	8.1E+00	1.4E+02	1.8E+03	5.1E+02	3.7E+03			
G	SHALLOW	7440360	ANTIMONY	2	9	4	5	4.3E+00	3.2E+00	5.8E+00	4.3E+00	1.5E+00	2	2	
G	SHALLOW	7440382	ARSENIC	2	9	9			7.8E+00	1.7E+02	7.1E+01	4.5E-02	2	2	
G	SHALLOW	7440393	BARIUM	2	9	9			1.4E+01	9.4E+02	3.9E+02	2.6E+02	1	1	
G	SHALLOW	7440417	BERYLLIUM	2	9		9	1.2E+00				7.3E+00			
G	SHALLOW	7440439	CADMIUM	2	9	2	7	5.0E-01	4.0E-01	1.5E+00	9.5E-01	1.8E+00			
G	SHALLOW	7440702	CALCIUM	2	9	9			8.6E+04	2.9E+05	1.4E+05				
G	SHALLOW	7440473	CHROMIUM, TOTAL	2	9	6	3	2.3E+00	1.6E+00	1.4E+01	3.5E+00	1.1E+01	1		
G	SHALLOW	7440484	COBALT	2	9	4	5	9.0E-01	1.2E+00	8.3E+00	4.9E+00	2.2E+02			
G	SHALLOW	7440508	COPPER	2	9	5	4	1.4E+00	1.2E+01	8.7E+01	3.4E+01	1.5E+02			
G	SHALLOW	7439896	IRON	2	9	9			2.0E+03	3.6E+04	1.6E+04	1.1E+03	2	2	
G	SHALLOW	7439921	LEAD	2	9	5	4	1.7E+00	5.6E+00	5.2E+01	1.9E+01	1.5E+02			
G	SHALLOW	7439954	MAGNESIUM	2	9	9			7.0E+04	5.3E+05	1.8E+05				
G	SHALLOW	7439965	MANGANESE	2	9	9			1.5E+02	8.0E+03	2.1E+03	7.3E+01	2	2	
G	SHALLOW	7439976	MERCURY	2	9	2	7	1.6E-01	1.4E-01	1.7E-01	1.6E-01	1.1E+00			
G	SHALLOW	7440020	NICKEL	2	9	8	1	7.0E-01	1.2E+00	2.0E+01	6.3E+00	7.3E+01			
G	SHALLOW	7440097	POTASSIUM	2	9	9			1.5E+04	1.8E+05	6.9E+04				
G	SHALLOW	7782492	SELENIUM	2	9	2	7	3.4E+00	3.9E+00	4.1E+00	4.0E+00	1.8E+01			
G	SHALLOW	7440224	SILVER	2	9	1	8	1.2E+00	1.7E+00	1.7E+00	1.7E+00	1.8E+01			
G	SHALLOW	7440280	THALLIUM	2	9		9	8.1E+00				2.6E-01			2
G	SHALLOW	7440315	TIN	2	9	1	8	1.4E+01	3.4E+00	3.4E+00	3.4E+00	2.2E+03			
G	SHALLOW	7440622	VANADIUM	2	9	8	1	1.1E+00	2.7E+00	3.0E+01	9.8E+00	2.6E+01	1		
G	SHALLOW	7440666	ZINC	2	9	6	3	8.7E+00	1.8E+01	1.2E+02	5.0E+01	1.1E+03			
G	DEEP	7429905	ALUMINUM	2	8	3	5	2.3E+01	2.0E+01	1.5E+02	8.9E+01	3.7E+03			

Background Groundwater Concentrations from Grid Wells by Zone and Chemical

Zone	Aquifer	CASNumber	ParamName	Wells	Samples	Detects	NonDetects	Max NonDetect	Min Detect	Max Detect	Mean Detect	Adj Tap Water RBC	Number of Wells Exceeding RBC		
													Max of Detects	Mean of Detects	Max NonDetect
G	DEEP	7440360	ANTIMONY	2	8	1	7	2.2E+00	4.9E+00	4.9E+00	4.9E+00	1.5E+00	1	1	1
G	DEEP	7440382	ARSENIC	2	8	5	3	2.1E+00	2.5E+00	5.8E+01	2.9E+01	4.5E-02	2	2	
G	DEEP	7440393	BARIUM	2	8	7	1	1.2E+00	6.5E+01	2.2E+02	1.5E+02	2.6E+02			
G	DEEP	7440417	BERYLLIUM	2	8	1	7	1.4E+00	3.3E-01	3.3E-01	3.3E-01	7.3E+00			
G	DEEP	7440439	CADMIUM	2	8	2	6	5.0E-01	3.4E-01	3.3E+00	1.8E+00	1.8E+00	1	1	
G	DEEP	7440702	CALCIUM	2	8	8			7.9E+02	3.4E+05	1.8E+05				
G	DEEP	7440473	CHROMIUM, TOTAL	2	8	5	3	1.0E+00	1.3E+00	8.1E+00	3.8E+00	1.1E+01			
G	DEEP	7440484	COBALT	2	8	4	4	9.0E-01	1.9E+00	9.5E+00	5.6E+00	2.2E+02			
G	DEEP	7440508	COPPER	2	8	1	7	3.7E+00	1.6E+00	1.6E+00	1.6E+00	1.5E+02			
G	DEEP	7439896	IRON	2	8	8			3.8E+01	1.7E+04	7.6E+03	1.1E+03	2	2	
G	DEEP	7439921	LEAD	2	8		8	1.7E+00				1.5E+02			
G	DEEP	7439954	MAGNESIUM	2	8	8			2.3E+02	6.2E+05	3.4E+05				
G	DEEP	7439965	MANGANESE	2	8	8			2.1E+01	9.0E+03	3.3E+03	7.3E+01	2	2	
G	DEEP	7439976	MERCURY	2	8	2	6	3.1E-01	1.4E-01	1.8E-01	1.6E-01	1.1E+00			
G	DEEP	7440020	NICKEL	2	8	6	2	8.0E-01	7.7E-01	2.1E+01	1.2E+01	7.3E+01			
G	DEEP	7440097	POTASSIUM	2	8	7	1	5.6E+02	1.5E+04	2.0E+05	1.0E+05				
G	DEEP	7782492	SELENIUM	2	8	1	7	3.4E+00	3.5E+00	3.5E+00	3.5E+00	1.8E+01			
G	DEEP	7440224	SILVER	2	8	1	7	1.2E+00	4.2E+00	4.2E+00	4.2E+00	1.8E+01			
G	DEEP	7440280	THALLIUM	2	8		8	7.7E+00				2.6E-01			2
G	DEEP	7440315	TIN	2	8		8	1.4E+01				2.2E+03			
G	DEEP	7440622	VANADIUM	2	8		8	1.1E+00				2.6E+01			
G	DEEP	7440666	ZINC	2	8	2	6	3.1E+01	6.3E+00	5.1E+01	2.9E+01	1.1E+03			
H	SHALLOW	7429905	ALUMINUM	11	45	6	39	1.6E+03	5.7E+01	1.1E+03	2.7E+02	3.7E+03			
H	SHALLOW	7440360	ANTIMONY	11	49		49	1.1E+02				1.5E+00			11
H	SHALLOW	7440382	ARSENIC	11	53	30	23	3.6E+01	8.0E-01	5.0E+01	1.2E+01	4.5E-02	10	10	1
H	SHALLOW	7440393	BARIUM	11	45	15	30	8.3E+01	2.9E+00	1.2E+02	2.4E+01	2.6E+02			
H	SHALLOW	7440417	BERYLLIUM	11	51	1	50	2.1E+00	9.8E-01	9.8E-01	9.8E-01	7.3E+00			
H	SHALLOW	7440439	CADMIUM	11	45	1	44	1.5E+01	4.6E+00	4.6E+00	4.6E+00	1.8E+00	1	1	10
H	SHALLOW	7440702	CALCIUM	11	45	45			8.5E+03	7.2E+05	2.1E+05				
H	SHALLOW	7440473	CHROMIUM, TOTAL	11	49	3	46	3.0E+01	1.7E+00	5.8E+00	3.5E+00	1.1E+01			
H	SHALLOW	7440484	COBALT	11	45	3	42	1.7E+01	9.7E-01	2.9E+00	2.1E+00	2.2E+02			
H	SHALLOW	7440508	COPPER	11	45	2	43	2.3E+01	6.9E-01	3.5E+00	2.1E+00	1.5E+02			
H	SHALLOW	7439896	IRON	11	45	42	3	7.9E+02	3.2E+02	2.9E+04	9.1E+03	1.1E+03	10	9	
H	SHALLOW	7439921	LEAD	11	49	8	41	6.0E+00	1.1E+00	3.2E+00	2.2E+00	1.5E+02			
H	SHALLOW	7439954	MAGNESIUM	11	45	45			1.0E+04	1.1E+06	2.0E+05				
H	SHALLOW	7439965	MANGANESE	11	45	41	4	1.8E+01	1.7E+01	4.6E+03	9.1E+02	7.3E+01	9	9	
H	SHALLOW	7439976	MERCURY	11	49	2	47	5.0E-01	1.2E-01	1.3E-01	1.3E-01	1.1E+00			
H	SHALLOW	7440020	NICKEL	11	45	4	41	7.2E+01	9.7E-01	3.6E+01	1.1E+01	7.3E+01			
H	SHALLOW	7440097	POTASSIUM	11	45	44	1	7.4E+03	5.0E+03	3.0E+05	6.5E+04				
H	SHALLOW	7782492	SELENIUM	11	45	7	38	4.6E+01	1.1E+00	5.0E+00	1.8E+00	1.8E+01			1
H	SHALLOW	7440224	SILVER	11	45	1	44	2.4E+01	1.4E+00	1.4E+00	1.4E+00	1.8E+01			1
H	SHALLOW	7440280	THALLIUM	11	49	8	41	5.0E+01	1.9E+00	1.1E+02	1.4E+01	2.6E-01	5	5	6
H	SHALLOW	7440315	TIN	11	12	4	8	3.0E+01	2.8E+00	4.0E+00	3.3E+00	2.2E+03			
H	SHALLOW	7440622	VANADIUM	11	45	5	40	2.2E+01	1.8E+00	7.7E+00	6.0E+00	2.6E+01			
H	SHALLOW	7440666	ZINC	11	45	4	41	4.4E+01	6.6E+00	1.2E+02	3.7E+01	1.1E+03			
H	DEEP	7429905	ALUMINUM	11	44	10	34	2.9E+02	1.6E+01	3.6E+03	8.3E+02	3.7E+03			
H	DEEP	7440360	ANTIMONY	11	48	2	46	1.6E+01	1.2E+01	1.2E+01	1.2E+01	1.5E+00	2	2	9
H	DEEP	7440382	ARSENIC	11	52	12	40	3.6E+01	1.6E+00	8.2E+00	2.9E+00	4.5E-02	9	9	2
H	DEEP	7440393	BARIUM	11	44	15	29	1.2E+02	3.0E+01	8.7E+02	1.7E+02	2.6E+02	1	1	
H	DEEP	7440417	BERYLLIUM	11	50	5	45	1.1E+00	7.1E-01	1.0E+00	8.7E-01	7.3E+00			
H	DEEP	7440439	CADMIUM	11	44	15	29	2.1E+00	1.5E+00	6.2E+00	4.3E+00	1.8E+00	11	11	
H	DEEP	7440702	CALCIUM	11	44	44			7.7E+03	2.3E+05	1.4E+05				
H	DEEP	7440473	CHROMIUM, TOTAL	11	48	16	32	1.2E+01	7.6E-01	1.2E+01	3.8E+00	1.1E+01	1	1	
H	DEEP	7440484	COBALT	11	44	5	39	1.0E+01	1.0E+00	3.0E+00	1.9E+00	2.2E+02			
H	DEEP	7440508	COPPER	11	44	3	41	2.2E+01	6.6E-01	1.2E+02	3.5E+01	1.5E+02			
H	DEEP	7439896	IRON	11	44	36	8	2.7E+02	2.9E+02	7.2E+03	3.0E+03	1.1E+03	7	6	
H	DEEP	7439921	LEAD	11	48	9	39	2.7E+00	1.2E+00	5.9E+00	2.8E+00	1.5E+02			
H	DEEP	7439954	MAGNESIUM	11	44	44			1.3E+03	1.2E+06	8.2E+05				
H	DEEP	7439965	MANGANESE	11	44	39	5	2.1E+01	3.2E+00	8.2E+02	2.9E+02	7.3E+01	9	9	
H	DEEP	7439976	MERCURY	11	48	5	43	1.0E-01	1.0E-01	1.7E-01	1.2E-01	1.1E+00			

Background Groundwater Concentrations from Grid Wells by Zone and Chemical

Zone	Aquifer	CASNumber	ParamName	Wells	Samples	Detects	NonDetects	Max NonDetect	Min Detect	Max Detect	Mean Detect	Adj Tap Water RBC	Number of Wells Exceeding RBC		
													Max of Detects	Mean of Detects	Max NonDetect
H	DEEP	7440020	NICKEL	11	44	4	40	4.6E+01	1.9E+00	1.3E+01	5.5E+00	7.3E+01			
H	DEEP	7440097	POTASSIUM	11	44	44			9.1E+03	3.8E+05	2.2E+05				
H	DEEP	7782492	SELENIUM	11	44	5	39	4.6E+01	9.0E-01	1.4E+00	1.0E+00	1.8E+01			
H	DEEP	7440224	SILVER	11	44	2	42	3.4E+00	1.3E+00	2.2E+00	1.8E+00	1.8E+01			
H	DEEP	7440280	THALLIUM	11	48	3	45	5.0E+01	5.6E+00	5.9E+00	5.8E+00	2.6E-01	3	3	8
H	DEEP	7440315	TIN	11	11	5	6	2.7E+00	2.7E+00	4.0E+00	3.5E+00	2.2E+03			
H	DEEP	7440622	VANADIUM	11	44	12	32	1.4E+01	1.0E+00	9.0E+00	5.6E+00	2.6E+01			
H	DEEP	7440666	ZINC	11	44	5	39	5.8E+01	6.2E+01	1.2E+03	2.5E+02	1.1E+03	1		
I	SHALLOW	7429905	ALUMINUM	19	81	25	56	1.5E+02	2.5E+01	1.6E+03	2.2E+02	3.7E+03			
I	SHALLOW	7440360	ANTIMONY	19	83	6	77	3.0E+01	3.1E+00	6.1E+00	4.4E+00	1.5E+00	6	6	13
I	SHALLOW	7440382	ARSENIC	19	83	38	45	1.8E+01	2.9E+00	6.6E+01	1.3E+01	4.5E-02	14	14	5
I	SHALLOW	7440393	BARIUM	19	81	69	12	1.1E+02	2.5E+00	2.8E+02	5.3E+01	2.6E+02	1		
I	SHALLOW	7440417	BERYLLIUM	19	81	10	71	1.4E+00	3.2E-01	1.2E+00	8.2E-01	7.3E+00			
I	SHALLOW	7440439	CADMIUM	19	81	3	78	4.0E+00	5.2E-01	2.3E+00	1.2E+00	1.8E+00	1	1	8
I	SHALLOW	7440702	CALCIUM	19	81	81			3.9E+04	9.8E+05	2.7E+05				
I	SHALLOW	7440473	CHROMIUM, TOTAL	19	81	35	46	5.0E+00	9.0E-01	2.4E+01	5.3E+00	1.1E+01	5	3	
I	SHALLOW	7440484	COBALT	19	81	8	73	6.3E+00	6.6E-01	4.2E+00	1.3E+00	2.2E+02			
I	SHALLOW	7440508	COPPER	19	81	9	72	1.0E+01	1.2E+00	5.2E+00	2.1E+00	1.5E+02			
I	SHALLOW	7439896	IRON	19	81	77	4	1.0E+02	4.9E+01	3.2E+04	6.4E+03	1.1E+03	17	16	
I	SHALLOW	7439921	LEAD	19	83	22	61	8.6E+00	1.9E+00	1.6E+01	5.0E+00	1.5E+02			
I	SHALLOW	7439954	MAGNESIUM	19	81	81			8.6E+03	1.4E+06	3.3E+05				
I	SHALLOW	7439965	MANGANESE	19	81	80	1	3.6E+00	2.3E+01	4.9E+03	8.0E+02	7.3E+01	18	17	
I	SHALLOW	7439976	MERCURY	19	81	2	79	2.0E-01	1.2E-01	1.1E+00	6.1E-01	1.1E+00	1	1	
I	SHALLOW	7440020	NICKEL	19	81	40	41	1.3E+01	1.0E+00	1.6E+01	3.7E+00	7.3E+01			
I	SHALLOW	7440097	POTASSIUM	19	81	80	1	1.6E+05	7.1E+03	5.5E+05	1.2E+05				
I	SHALLOW	7782492	SELENIUM	19	81	1	80	6.1E+00	2.7E+01	2.7E+01	2.7E+01	1.8E+01	1	1	
I	SHALLOW	7440224	SILVER	19	81	1	80	5.0E+00	1.3E+00	1.3E+00	1.3E+00	1.8E+01			
I	SHALLOW	7440280	THALLIUM	19	83	9	74	9.0E+00	2.8E+00	7.5E+00	4.9E+00	2.6E-01	8	8	11
I	SHALLOW	7440315	TIN	19	81	4	77	1.0E+03	2.7E+00	3.3E+00	3.1E+00	2.2E+03			
I	SHALLOW	7440622	VANADIUM	19	81	41	40	2.3E+01	6.7E-01	1.9E+01	3.8E+00	2.6E+01			
I	SHALLOW	7440666	ZINC	19	81	30	51	1.1E+01	4.1E+00	3.2E+02	2.2E+01	1.1E+03			
I	DEEP	7429905	ALUMINUM	19	81	11	70	5.5E+02	2.9E+01	2.4E+02	8.2E+01	3.7E+03			
I	DEEP	7440360	ANTIMONY	19	87	6	81	3.0E+01	3.5E+00	9.2E+00	5.8E+00	1.5E+00	5	5	14
I	DEEP	7440382	ARSENIC	19	87	15	72	8.4E+00	2.1E+00	2.5E+01	7.5E+00	4.5E-02	10	10	9
I	DEEP	7440393	BARIUM	19	81	72	9	1.8E+02	2.8E+01	9.4E+02	1.4E+02	2.6E+02	3	1	
I	DEEP	7440417	BERYLLIUM	19	85	14	71	2.8E+00	8.3E-01	1.2E+00	1.0E+00	7.3E+00			
I	DEEP	7440439	CADMIUM	19	81	7	74	4.0E+00	3.0E-01	2.5E+00	1.1E+00	1.8E+00	3	2	6
I	DEEP	7440702	CALCIUM	19	81	81			7.9E+04	1.0E+06	2.2E+05				
I	DEEP	7440473	CHROMIUM, TOTAL	19	85	34	51	6.6E+00	8.3E-01	5.0E+01	4.3E+00	1.1E+01	3	1	
I	DEEP	7440484	COBALT	19	81	9	72	5.0E+00	6.6E-01	3.6E+00	1.6E+00	2.2E+02			
I	DEEP	7440508	COPPER	19	81	7	74	1.0E+01	8.2E-01	1.5E+01	3.4E+00	1.5E+02			
I	DEEP	7439896	IRON	19	81	50	31	1.6E+02	3.4E+01	1.2E+04	1.9E+03	1.1E+03	8	8	
I	DEEP	7439921	LEAD	19	87	9	78	8.5E+00	2.2E+00	5.1E+01	1.4E+01	1.5E+02			
I	DEEP	7439954	MAGNESIUM	19	81	81			8.6E+03	1.5E+06	8.6E+05				
I	DEEP	7439965	MANGANESE	19	81	63	18	9.2E+00	4.2E-01	6.9E+02	1.2E+02	7.3E+01	13	12	
I	DEEP	7439976	MERCURY	19	85	3	82	3.2E-01	2.1E-01	1.9E+00	8.0E-01	1.1E+00	1	1	
I	DEEP	7440020	NICKEL	19	81	18	63	2.2E+01	8.7E-01	4.5E+02	4.1E+01	7.3E+01	1	1	
I	DEEP	7440097	POTASSIUM	19	81	81			2.0E+03	5.0E+05	2.9E+05				
I	DEEP	7782492	SELENIUM	19	81	1	80	1.4E+01	5.9E+00	5.9E+00	5.9E+00	1.8E+01			
I	DEEP	7440224	SILVER	19	81		81	7.6E+00				1.8E+01			
I	DEEP	7440280	THALLIUM	19	87	16	71	9.0E+00	3.1E+00	1.5E+01	6.1E+00	2.6E-01	12	12	7
I	DEEP	7440315	TIN	19	81	11	70	1.0E+03	3.1E+00	3.7E+02	1.7E+02	2.2E+03			
I	DEEP	7440622	VANADIUM	19	81	32	49	1.4E+01	9.5E-01	1.9E+01	4.2E+00	2.6E+01			
I	DEEP	7440666	ZINC	19	81	13	68	4.0E+01	7.4E+00	1.2E+02	2.6E+01	1.1E+03			
K	SHALLOW	7429905	ALUMINUM	7	17	5	12	1.1E+03	2.3E+02	4.6E+04	1.3E+04	3.7E+03	2	2	
K	SHALLOW	7440360	ANTIMONY	7	19		19	5.0E+00				1.5E+00			7
K	SHALLOW	7440382	ARSENIC	7	19	6	13	3.3E+00	4.6E+00	9.4E+00	6.7E+00	4.5E-02	1	1	6
K	SHALLOW	7440393	BARIUM	7	17	16	1	8.5E+00	6.2E+00	1.2E+02	3.9E+01	2.6E+02			
K	SHALLOW	7440417	BERYLLIUM	7	19	3	16	5.6E-01	1.9E-01	4.0E-01	3.0E-01	7.3E+00			
K	SHALLOW	7440439	CADMIUM	7	17	1	16	1.0E+00	3.6E-01	3.6E-01	3.6E-01	1.8E+00			

Background Groundwater Concentrations from Grid Wells by Zone and Chemical

Zone	Aquifer	CASNumber	ParamName	Wells	Samples	Detects	NonDetects	Max NonDetect	Min Detect	Max Detect	Mean Detect	Adj Tap Water RBC	Number of Wells Exceeding RBC		
													Max of Detects	Mean of Detects	Max NonDetect
K	SHALLOW	7440702	CALCIUM	7	17	16	1	2.2E+03	1.6E+03	4.9E+05	7.1E+04				
K	SHALLOW	7440473	CHROMIUM, TOTAL	7	19	5	14	5.1E+00	7.8E-01	2.5E+01	9.3E+00	1.1E+01	1	1	
K	SHALLOW	7440484	COBALT	7	17	2	15	1.7E+00	1.5E+00	2.3E+00	1.9E+00	2.2E+02			
K	SHALLOW	7440508	COPPER	7	17	7	10	2.1E+01	9.8E-01	2.6E+01	7.3E+00	1.5E+02			
K	SHALLOW	7439896	IRON	7	17	14	3	1.7E+02	6.4E+01	7.2E+03	3.1E+03	1.1E+03	6	5	
K	SHALLOW	7439921	LEAD	7	19	4	15	2.1E+00	1.9E+00	2.6E+01	1.3E+01	1.5E+02			
K	SHALLOW	7439954	MAGNESIUM	7	17	16	1	1.3E+02	1.3E+02	3.3E+05	3.9E+04				
K	SHALLOW	7439965	MANGANESE	7	17	13	4	4.6E+00	1.3E+00	9.8E+02	1.2E+02	7.3E+01	1	1	
K	SHALLOW	7439976	MERCURY	7	19		19	2.0E-01				1.1E+00			
K	SHALLOW	7440020	NICKEL	7	17	6	11	6.2E+00	2.3E+00	1.8E+01	7.0E+00	7.3E+01			
K	SHALLOW	7440097	POTASSIUM	7	17	13	4	9.3E+02	4.2E+02	1.0E+05	1.3E+04				
K	SHALLOW	7782492	SELENIUM	7	17		17	3.6E+00				1.8E+01			
K	SHALLOW	7440224	SILVER	7	17		17	3.2E+00				1.8E+01			
K	SHALLOW	7440280	THALLIUM	7	19		19	5.2E+01				2.6E-01			7
K	SHALLOW	7440315	TIN	7	17	3	14	8.8E+01	4.0E+01	2.0E+02	8.2E+01	2.2E+03			
K	SHALLOW	7440622	VANADIUM	7	17	8	9	9.0E-01	7.6E-01	2.6E+01	9.2E+00	2.6E+01	1	1	
K	SHALLOW	7440666	ZINC	7	17	4	13	6.9E+01	1.4E+01	2.0E+02	6.6E+01	1.1E+03			