

**Attachment 10**

**Revision 3, Appendix L, Background Statistics**

**Excerpt from the**

**Assessment Monitoring Report, Closed Collinsville Landfill, Collinsville, IL**

**Tetra Tech, January 2008**

Table 14 (Version 3)  
Background  
Collinsville Landfill

Background Well MW-6*													
Compound	Nov-07	Feb-07	Apr-07	Aug-07	Oct-07	Distribution*	Minimum	Maximum	Average	Variance	Std Dev	99% UCL	95% UCL
<b>List 1</b>													
Temperature of Water (unfiltered F)	60.72	55.8	57.68	67	58.06	Normal	55.8	67	59.85	19.05	4.36	77.77	70.05
Spec Cond. (Unfiltered)	1.42	1.14	1.893	1.294	1.348	Normal	1.14	1.893	1.42	0.08	0.28	2.59	2.08
pH (Unfiltered units)**	6.83	6.97	7.05	6.73	6.71	Normal*	6.71	7.05	6.86	0.02	0.15	7.47	7.21
Elev of GW Surf (ft ref MSL)	532.48	533.2	534.45	533.22	530.62	Normal	530.62	534.45	532.79	1.98	1.41	538.57	536.08
Depth of Water (ft below LS)	31.22	30.5	29.25	30.48	31.19	Normal	29.25	31.22	30.53	0.64	0.80	33.81	32.39
BTM Well Elev (ft ref MSL)	520.75	520.75	520.75	520.75	520.75	NA	520.75	520.75	520.75	0.00	0.00	520.75	520.75
Depth to Water Fr Mea Pt (ft)	33.11	32.39	31.14	32.37	33.08	Normal	31.14	33.11	32.42	0.64	0.80	35.70	34.28
<b>Analytes</b>													
<b>List 2 Unfiltered</b>													
Phenols (Total Recoverable) (ug/L)	<15.0	<15.0	<15.0	<15.0	<15.0	NA	<15.0	<15.0	<15.0	NA	NA	15.0 <sup>c</sup>	NA
Total Organic Carbon (TOC) (mg/L)	3.4	3.6	4.5	3.7	1.3	Normal	1.3	4.5	3.30	1.43	1.19	8.20	6.09
Total Organic Halogens (TOX) (ug/L)	65.7	63.4	<20.0	52.9	50.2	Normal	<20.0	65.7	48.44	505.58	22.49	140.73	100.95
<b>List 3 Inorganic Parameters Unfiltered</b>													
Arsenic (ug/L)	<5.0	<3.0	<5.0	<3.0	<3.0	Nonparametric <sup>c</sup>	<3.0	<5.0	1.9 <sup>d</sup>	NA	NA	5.00 <sup>e</sup>	NA
Barium (ug/L)	123	159	95.4	107	181	Normal	95.4	181	133.08	1292.43	35.95	280.64	217.04
Chloride (mg/L)	65	58	63	62	66	Normal	58	66	62.80	9.70	3.11	75.58	70.07
Iron (ug/L)	140	1920	70.6	57	309	Lognormal <sup>b</sup>	57	1920	201.75	7.56	4.15	69000	5600
Manganese (ug/L)	327	174	151	145	206	Normal	145	327	200.60	5566.30	74.61	506.84	374.85
Sulfate (mg/L)	113	96	122	94	103	Normal	94	122	105.60	139.30	11.80	154.05	133.16
Thallium (ug/L)	<1.0	<1.0	<1.0	1.2	<1.0	Nonparametric <sup>c</sup>	<1.0	1.2	0.64 <sup>d</sup>	NA	NA	1.2 <sup>e</sup>	NA
Total Dissolved Solids (mg/L)	946	906	892	930	948	Normal	892	948	924.40	610.80	24.71	1025.84	982.12
<b>List 3 Organic Parameters Unfiltered</b>													
Sulfide (mg/L)	<0.05	<0.05	<0.05	<0.05	<0.05	NA	<0.05	<0.05	<0.05	NA	NA	NA	NA
Picloram (ug/L)	0.942	<0.20	<0.20	<0.20	<0.20	Nonparametric <sup>c</sup>	<0.20	0.942	0.2684 <sup>d</sup>	NA	NA	NA	NA

a - Shapiro-Wilk test for normality was used  
 b - Natural log of data was normally distributed, all calculations made on log-normal data.  
 c - Nonparametric distribution, minimum of seven samples required to compute statistics. Maximum concentration used for UCL.  
 d - 1/2 the less than value was used for calculation purposes.  
 e - pH values were used, no conversion to pH units was done.  
 \* - Formulas for calculations were used from "Statistical Analysis of Ground-Water at RCRA Facilities" - April 1989.  
 \*\* - The LCL for pH is 6.25

Table L-1 (Version 3)  
 Groundwater Assessment Monitoring Results Compared to Background Results Calculated for MW-6,  
 November 2006,  
 Closed Collinsville Landfill

Compound	P-14	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	DUP	Class I	99% CL	2xPQL
<b>List 1</b>												
Temperature of Water (Deg. F)	52.88	60.82	58.64	59.49	60.49	60.10	60.72	59.16	-	NA	77.77	NA
Spec Cond. (mS/cm)	0.589	1.813	0.873	0.401	1.819	0.811	1.420	0.780	-	NA	2.59	NA
pH (pH units)	6.67	6.32	7.03	9.56	6.30	8.21	6.83	7.30	-	6.5-9.0	7.47	NA
Elev of GW Surf (ft ref MSL)	490.5	487.97	481.32	531.81	487.60	489.08	532.48	513.58	-	NA	538.57	NA
Depth of Water (ft below LS)	6.62	8.21	13.76	12.64	7.83	7.42	31.22	1.52	-	NA	33.81	NA
BTM Well Elev (ft ref MSL)	485.13	472.20	480.30	521.60	472.00	489.32	520.75	481.21	-	NA	520.75	NA
Depth to Water Fr Mea Pt (ft)	10.80	10.93	14.98	15.79	10.80	7.42	33.11	1.52	-	NA	35.70	NA
<b>Analytes</b>												
<b>List 2 Unfiltered</b>												
Phenols (Total Recoverable) (ug/L)	<15.0	<15.0	<15.0	78.00	<15.0	<15.0	<15.0	<15.0	<15.0	1.0	15.00	30.0
Total Organic Carbon (TOC) (mg/L)	1.7	2.2	1.8	25.1	2.0	<1.0	3.4	<1.0	2.1	NA	8.20	NA
Total Organic Halogens (TOX) (ug/L)	<20.0	57.1	20.5	20.4	56.8	<20.0	65.7	<20.0	77.9	NA	140.73	NA
<b>List 3 Inorganic Parameters Unfiltered</b>												
Arsenic (ug/L)	<25.0	<5.0	22.30	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	50.0	5.00	10.0
Barium (ug/L)	488.0	189.0	349.0	219,000.0	293.0	328.0	123.0	170.0	195.0	2,000.0	280.64	NA
Chloride (mg/L)	26.0	310.0	12.0	7.0	340.0	9.0	65.0	16.0	348.0	200.0	75.56	NA
Iron (ug/L)	16,500.0	112.0	138,000.0	43.6	3,850.0	215.0	140.0	979.0	145.0	5,000.0	69000.00	NA
Manganese (ug/L)	2,060.0	3,370.0	3,860.0	<15.0	7,860.0	1,500.0	327.0	66.1	3,440.0	150.0	506.84	NA
Sulfate (mg/L)	33.00	117.00	159.0	<5.0	139.0	<5.0	113.0	<5.0	136.0	400.0	154.05	NA
Thallium (ug/L)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.0	1.20	2.0
Total Dissolved Solids (mg/L)	424.0	1,520.0	580.0	510.0	1,520.0	512.0 B	946.0 B	518.0 B	1,340.0	1,200.0	1025.84	NA
<b>List 3 Organic Parameters Unfiltered</b>												
Sulfide (mg/L)	0.12	<0.05	1.3 S	0.52	<0.05	<0.05	<0.05	<0.05 S	<0.05	NA	NA	NA
Picloram (ug/L)	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.942	<0.20	<0.20	500.0	0.94	0.4

**NOTES:**

All units are as noted

DUP represents duplicate collected from MW-1.

*99% Lower Confidence limit for pH = 6.25*

**Bolded where the concentration exceeds Class I groundwater quality standards.**

*Shaded where exceeds the 99% CL...*

*italicized where exceeds 2xPQL.*

<: Compound not detected at or above detection limit. Value shown is the detection limit of the compound for the analytical process.

B: Analyte detected in the associated Method Blank.

S: Spike recovery outside the accepted recovery limits.

Q: QC criteria failed or noncompliant CCV.

ref: reference

MSL: Mean Sea Level

LS: Land Surface

Fr Meas Pt: From Measuring Point

PQL = Practical Quantitation Limit

CL = Confidence Limit - Background Upper Confidence Limit is 99%. The lower confidence limit for pH is 6.23.

Table L-2 (Version 3)  
 Groundwater Assessment Monitoring Results Calculated for Background Concentrations Calculated for MW-6,  
 February 2007,  
 Closed Collinsville Landfill

Compound	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	DUP	Class I	99% CL	2xPQL
<b>List 1</b>											
Temperature of Water (Deg. F)	55.80	50.52	49.15	54.52	55.80	55.80	55.80	--	NA	77.77	NA
Spec Cond. (mS/cm)	1.894	0.716	0.442	1.183	0.859	1.147	0.782	--	NA	2.59	NA
pH (pH units)	6.33	6.64	11.37	6.47	7.09	6.97	7.14	--	6.5-9.0	7.47 <sup>^</sup>	NA
Elev of GW Surf (ft ref MSL)	489.92	486.32	537.30	489.63	490.68	533.20	515.05	--	NA	538.57	NA
Depth of Water (ft below LS)	6.26	8.76	7.15	5.80	5.82	30.50	0.05	--	NA	33.81	NA
BTM Well Elev (ft ref MSL)	472.20	480.30	521.60	472.00	469.32	520.75	481.21	--	NA	520.75	NA
Depth to Water Fr. Mea Pt (ft)	8.98	9.98	10.30	8.77	5.82	32.39	0.05	--	NA	35.70	NA
<b>Analytes</b>											
<b>List 2 Unfiltered</b>											
Phenols (Total Recoverable) (ug/L)	<15.0	<15.0	<15.0	<15.0	<15.0	<15.0	<15.0	<15.0	1.0	15.00	30.0
Total Organic Carbon (TOC) (mg/L)	1.2	2.0	2.5	4.8	1.6	3.6	1.4	1.4	NA	8.20	NA
Total Organic Halogens (TOX) (ug/L)	130.0	<20.0	<20.0	38.0	<20.0	63.4	<20.0	122.0	NA	140.73	NA
<b>List 3 Inorganic Parameters Unfiltered</b>											
Arsenic (ug/L)	<3.0	<3.0	<3.0	11.4	<3.0	<3.0	<3.0	<3.0	50.0	5.00	10.0
Barium (ug/L)	202.0	78.2	243,000.0	376.0	394.0	159	202.0	202.0	2,000.0	280.64	NA
Chloride (mg/L)	333.0	24.0	4.0	75.0	11.0	58.0	15.0	284.0	200.0	75.58	NA
Iron (ug/L)	598.0	149.0	<40.0	15,500.0	479.0	1,920.0	851.0	603.0	5,000.0	6900.00	NA
Manganese (ug/L)	3,450.0	23.4	<15.0	20,600.0	1,160.0	174.0	69.1	3,470.0	150.0	506.84	NA
Sulfate (mg/L)	104.0	150.0	<5.0	79.0	<5.0	96.0	<5.0	105.0	400.0	154.05	NA
Thallium (ug/L)	<1.0 S	<1.0	<1.0	<1.0	<1.0S	<1.0	<1.0	<1.0	2.0	1.20	2.0
Total Dissolved Solids (mg/L)	1,470.0	542.0	790.0	920.0	532.0	906.0	500.0	1,430.0	1,200.0	1025.84	NA
<b>List 3 Organic Parameters Unfiltered</b>											
Sulfide (mg/L)	<0.05	<0.05	0.53 S	0.11 S	<0.05	<0.05	<0.05 S	<0.05	NA	NA	NA
Picloram (ug/L)	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	500.0	0.94	0.4

**NOTES:**

All units are as noted  
 ^99% Lower Confidence limit for pH = 6.25  
 DUP represents duplicate collected from MW-1.  
 Bolded where the concentration exceeds Class I groundwater quality standards.  
 Shaded where exceeds the 99% CL.  
 Italicized where exceeds 2xPQL.  
 <: Compound not detected at or above detection limit. Value shown is the detection limit of the compound for the analytical process.  
 -: Not tested  
 S: Spike recovery outside the accepted recovery limits.  
 PQL = Practical Quantitation Limit  
 CL = Confidence Limit - Background Upper Confidence Limit is 99%. The lower confidence limit for pH is 6.23.  
 ref: reference  
 MSL: Mean Sea Level  
 LS: Land Surface  
 Fr Meas Pt: From Measuring Point

Table L-3 (Version 3)  
Groundwater Assessment Monitoring Results Compared to Background Results Calculated for MW-6,  
April 2007,  
Closed Collinsville Landfill

Compound	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	DUP	Class I	99% CL	2xPQL
<b>List 1</b>											
Temperature of Water (Deg. F)	57.68	55.09	57.62	56.00	59.1	69.17	55.98		NA	77.77	NA
Spec Cond. (mS/cm)	1.893	0.547	0.453	1.072	1.893	1.893	1.893		NA	2.59	NA
pH (pH units)	7.05	6.99	7.02	6.99	7.03	7.00	7.03		6.5-9.0	7.47 <sup>A</sup>	NA
Elev of GW Surf (ft ref MSL)	490.93	489.82	540.38	489.68	490.40	534.45	515.05		NA	538.57	NA
Depth of Water (ft below LS)	6.15	5.26	4.07	5.75	6.10	29.25	0.05		NA	33.81	NA
BTM Well Elev (ft ref MSL)	472.20	480.30	521.60	472.00	469.32	520.75	481.21		NA	520.75	NA
Depth to Water Fr Mea Pt (ft)	8.87	6.48	7.22	8.72	6.10	31.14	0.05		NA	35.70	NA
<b>Analytes</b>											
<b>List 2 Unfiltered</b>											
Phenols (Total Recoverable) (ug/L)	<15.0	<15.0	<15.0	<15.0	<15.0	<15.0	<15.0	<15.0	1.0	15.00	30.0
Total Organic Carbon (TOC) (mg/L)	1.6	1.2	2.0	4.6	<1.0	4.5	<1.0	1.7	NA	8.20	NA
Total Organic Halogens (TOX) (ug/L)	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	29.9	NA	140.73	NA
<b>List 3 Inorganic Parameters Unfiltered</b>											
Arsenic (ug/L)	<5.0	<5.0	<5.0	29.7 S	<3.0	<5.0	<3.0	<5.0	50.0	5.00	10.0
Barium (ug/L)	208.0	71.1	261,000.0	342.0	377.0	95.4	196.0	211.0	2,000.0	280.64	NA
Chloride (mg/L)	405.0	18.0	6.0	109.0	11.0	63.0	15.0	399.0	200.0	75.58	NA
Iron (ug/L)	134.00	<40.0	<40.0	17,500.00	193.00	70.60	729.00	272.00	5,000.0	69000.00	NA
Manganese (ug/L)	4,090.0	<15.0	<15.0	20,300.0	1,390.0	151.0	72.9	4,190.0	150.0	506.84	NA
Sulfate (mg/L)	140.0	133.0	<5.0	80.0	20.0	122.0	6.0	126.0	400.0	154.05	NA
Thallium (ug/L)	<1.0	<1.0	<1.0	<1.0	1.1	<1.0	<1.0	<1.0	2.0	1.20	2.0
Total Dissolved Solids (mg/L)	1,540.0	444.0	592.0	896.0 H	520.0	892.0	494.0	1,460.0 H	1,200.0	1025.84	NA
<b>List 3 Organic Parameters Unfiltered</b>											
Sulfide (mg/L)	<0.05	<0.05	0.75	0.13	<0.05	<0.05	<0.05	<0.05 R	NA	NA	NA
Pictoram (ug/L)	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	500.0	0.94	0.4

<sup>A</sup>99% Lower Confidence limit for pH = 6.25

All units are as noted

DUP represents duplicate collected from MW-1.

**Bolded where the concentration exceeds Class I groundwater quality standards.**

*Shaded where exceeds the 99% CL.*

*Italicized where exceeds 2xPQL.*

<: Compound not detected at or above detection limit. Value shown is the detection limit of the compound for the analytical process.

--: Not tested

S: Spike recovery outside the accepted recovery limits.

H: Holding time exceeded.

R: RPD outside accepted recovery limits.

PQL = Practical Quantitation Limit

CL = Confidence Limit - Background Upper Confidence Limit is 99%. The lower confidence limit for pH is 6.23.

ref. reference

MSL: Mean Sea Level

LS: Land Surface

Fr Meas Pt: From Measuring Point

Table L-4 (Version 3)  
 Groundwater Assessment Monitoring Results Compared to Background Concentrations Calculated for MW-6,  
 August 2007,  
 Closed Collinsville Landfill

Compound	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	DUP	Class I	99% CL	2xPQL
<b>List 1</b>											
Temperature of Water (Deg. F)	61.97		61.63	61.23	63.0	67.0	61.09		NA	77.77	NA
Spec Cond. (mS/cm)	1.921		0.408	1.959	0.737	1.294	0.678		NA	2.59	NA
pH (pH units)	6.59		9.68	6.36	7.05	6.73	7.52		6.5-9.0	7.47 <sup>A</sup>	NA
Elev of GW Surf (ft ref MSL)	486.27		534.21	485.71	488.26	533.22	513.27		NA	538.57	NA
Depth of Water (ft below LS)	9.91		10.24	9.72	8.24	30.48	1.83		NA	33.81	NA
BTM Well Elev (ft ref MSL)	472.20		521.60	472.00	469.32	520.75	481.21		NA	520.75	NA
Depth to Water Fr Mea Pt (ft)	12.63		13.39	12.69	8.24	32.37	1.83		NA	35.70	NA
<b>Analytes</b>											
<b>List 2 Unfiltered</b>											
Phenols (Total Recoverable) (ug/L)	<15.0		25.0	<15.0	<15.0	<15.0	<15.0	<15.0	1.0	15.00	30.0
Total Organic Carbon (TOC) (mg/L)	2.1		12.5	2.1	<1.0	3.7	1.2	2.1	NA	8.20	NA
Total Organic Halogens (TOX) (ug/L)	91.5		20.8	70.6	<20.0	52.9	<20.0	92.0	NA	140.73	NA
<b>List 3 Inorganic Parameters Unfiltered</b>											
Arsenic (ug/L)	<3.0		<3.0	9.2	<3.0	<3.0	<3.0	<3.0	50.0	5.00	10.0
Barium (ug/L)	202.0		248,000.0 S	309.0	356.0	107.0	199.0	200.0	2,000.0	280.64	NA
Chloride (mg/L)	305.0		8.0	289.0	10.0	62.0	15.0	300.0	200.0	75.58	NA
Iron (ug/L)	386.0		<40.0	5,070.0	<40.0	57.0	589.0	400.0	5,000.0	69,000.00	NA
Manganese (ug/L)	3,490.0		46.6	8,900.0	1,180.0	145.0	47.0	3,360.0	150.0	506.84	NA
Sulfate (mg/L)	119.0		<5.0	113.0	20.0	94.0	6.0	118.0	400.0	154.05	NA
Thallium (ug/L)	<1.0		<1.0	<1.0	<1.0	1.2	<1.0	<1.0	2.0	1.20	2.0
Total Dissolved Solids (mg/L)	1,460.0		678.0	1,530.0	510.0	930.0	494.0	1,470.0	1,200.0	1025.84	NA
<b>List 3 Organic Parameters Unfiltered</b>											
Sulfide (mg/L)	<0.05		1.6	<0.05	<0.05	<0.05	<0.05	<0.05	NA	NA	NA
Picloram (ug/L)	<0.20		<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	500.0	0.94	0.4

<sup>A</sup>99% Lower Confidence limit for pH = 6.25

All units are as noted

DUP represents duplicate collected from MW-1.

**Bolded where the concentration exceeds Class I groundwater quality standards.**

*Shaded where exceeds the 99% CL.*

*italicized where exceeds 2xPQL.*

<: Compound not detected at or above detection limit. Value shown is the detection limit of the compound for the analytical process.

--: Sample not collected due to dry conditions.

S: Spike recovery outside the accepted recovery limits.

PQL = Practical Quantitation Limit

CL = Confidence Limit - Background Upper Confidence Limit is 99%. The lower confidence limit for pH is 6.23.

ref: reference

MSL: Mean Sea Level

LS: Land Surface

Fr Meas Pt: From Measuring Point

Table L-5 (Version 3)  
 Groundwater Assessment Monitoring Results Compared to Background Concentrations Calculated for MW-6,  
 October 2007,  
 Closed Collinsville Landfill

Compound	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	DUP	Class I	99% CL	2xPQL
<b>List 1</b>											
Temperature of Water (Deg. F)	60.15		60.87	59.83	61.2	58.1	59.54		NA	77.77	NA
Spec Cond. (mS/cm)	1.960		0.649	1.930	0.875	1.348	0.810		NA	2.59	NA
pH (pH units)	6.34		9.56	6.16**	7.17	6.71	7.25		6.5-9.0	7.47 <sup>A</sup>	NA
Elev of GW Surf (ft ref MSL)	486.30		532.20	485.66	488.34	530.62	512.40		NA	538.57	NA
Depth of Water (ft below LS)	9.88		12.05	9.77	8.16	31.19	2.70		NA	33.81	NA
BTM Well Elev (ft ref MSL)	472.20		521.60	472.00	469.32	520.75	481.21		NA	520.75	NA
Depth to Water Fr Mea Pt (ft)	12.60		15.20	12.74	8.16	33.08	2.70		NA	35.70	NA
<b>Analytes</b>											
<b>List 2 Unfiltered</b>											
Phenols (Total Recoverable) (ug/L)	<15.0		39.0	<15.0	<15.0	<15.0	<15.0	<15.0	1.0	15.00	30.0
Total Organic Carbon (TOC) (mg/L)	2.5		21.1	2.3	<1.0	1.3	<1.0	2.4	NA	8.20	NA
Total Organic Halogens (TOX) (ug/L)	182.0		<20.0	78.6	<20.0	50.2	<20.0	84.4	NA	140.73	NA
<b>List 3 Inorganic Parameters Unfiltered</b>											
Arsenic (ug/L)	<3.0		<3.0	7.6	<3.0	<3.0	<3.0	<3.0	50.0	5.00	10.0
Barium (ug/L)	221.0		309,000.0	265.0	366.0	181.0	208.0	214.0	2,000.0	280.64	NA
Chloride (mg/L)	329.0		8.0	353.0	10.0	66.0	13.0	347.0	200.0	75,558	NA
Iron (ug/L)	2,840.00		471.00	3,940.00	55.0	309.0	691.0	2,720.0	5,000.0	690,000.00	NA
Manganese (ug/L)	4,820.0		44.1	6,750.0	1,350.0	206.0	59.9	4,660.0	150.0	506.84	NA
Sulfate (mg/L)	135.00		<5.0	140.0	14.0	103.0	<5.0	139.0	400.0	154.05	NA
Thallium (ug/L)	<1.0		<1.0	1.7	<1.0	<1.0	<1.0	<1.0	2.0	1.20	2.0
Total Dissolved Solids (mg/L)	1,540.0		664.0	1,580.0	524.0	948.0	532.0	1,580.0	1,200.0	1025.84	NA
<b>List 3 Organic Parameters Unfiltered</b>											
Sulfide (mg/L)	<0.05 S		1.2	<0.05 S	<0.05	<0.05	<0.05	<0.05 S	NA	NA	NA
Picloram (ug/L)	<0.20		<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	500.0	0.94	0.4

NOTES:  
 All units are as noted  
 DUP represents duplicate collected from MW-1.  
 Bolded where the concentration exceeds Class I groundwater quality standards.  
 Shaded where exceeds the 99% CL.  
 Italicized where exceeds 2xPQL.  
 <: Compound not detected at or above detection limit. Value shown is the detection limit of the compound for the analytical process.  
 -: Sample not collected due to dry conditions.  
 S: Spike recovery outside the accepted recovery limits.  
 PQL = Practical Quantitation Limit  
 \*\* Lower CL calculated, the upper CL for pH is 6.23  
 ref. reference  
 MSL: Mean Sea Level  
 LS: Land Surface  
 Fr Meas Pt: From Measuring Point

## **Statistical Formulas**

The Shapiro-Wilk test for Normality

$$W = \frac{(\sum_{i=1}^n a_i x_{(i)})}{\sum_{i=1}^n (x_i - \bar{x})^2}$$

The above is the test statistic where:

- n = number of samples
- i = ith order statistic
- x = individual sample
- $\bar{x}$  = average
- a = a derived constant

The data are sorted in ascending order, then the W statistic is calculated. The obtained value is then compared to a table of the W statistics. If the calculated value is greater than the table value, the the data has a normal distribution. If the data is not normally distributed, then the W statistic is re-calculated using the natural log on the data points. This result is then compared to the W statistic table. Again, if the calculated value is larger than the table value, then the data is lognormally distributed, however if the calculated value is less than the table value, then the data should be treated as paranormal.

Spreadsheet example appears below:

Sample	Concentration	Qualifier	Conc. Used	In
1	57		57	4.04305
2	70.6		70.6	4.25703
3	140		140	4.94164
4	309		309	5.73334
5	1920		1920	7.56008
Minimum			57	4.04305
Maximum			1920	7.56008
Average			499.32	5.30402
Standard Deviation			800.486	1.42228
Count			5	5
Calculated W			0.654	0.896
Shapiro Wilk W			0.762	0.762
Distribution			Not Normal	Lognormal

Note: In values calculated automatically and only used when necessary.

UCL = Average + 3.747\*Standard Deviation\*Square root of 1+1/count

$$99\%UCL = \bar{x} + 3.747 * Stddev * \sqrt{1 + 1/n}$$

Example: Barium

$$99\%UCL = 133.08 + 3.747*35.95*SQRT(1+1/5) = 280.64$$