

June 9, 2011

**Florida Department of Environmental Protection**

Southwest District

13051 North Telecom Parkway

Temple Terrace, Florida 33637-0926

Attention: *Mr. Robert Sellers, CHMM  
Environmental Specialist III*

Subject: **Response to April 5, 2011 FDEP Comments  
Countryside Executive Golf Course**  
2506 Countryside Blvd.  
Clearwater, Florida  
*HSA Project Number 601-5982-00*

Dear Mr. Sellers:

**HSA Engineers & Scientists (HSA)**, on behalf of Executive Corporation of Clearwater, Inc., respectfully submits this response to the Florida Department of Environmental Protection (FDEP) April 5, 2011, correspondence that provided comments to the June, 2010, *Remedial Action Plan* and Response to the Department's Comments dated January 2011 prepared by HSA for the above-referenced site. For ease of review, the Department's comments are presented below, followed by HSA's responses.

*Comment 1: The response to comment 9 states that Monitoring wells MW-22, MW-23, MW-25, MW-26, DW-2, DW-3 and DW-4 are proposed as point of compliance wells and shall not exceed the applicable default Groundwater Cleanup Target Level (GCTL) of 10 µg/L for arsenic is present in MW-23 at a concentration of 14.7 µg/L. This well should be resampled and, if arsenic concentrations continue to exceed the GCTL of 10 µg/L for arsenic, additional delineation may be necessary.*

Response: On May 26, 2011 HSA conducted groundwater sampling at existing monitoring well MW-23 per your request. Monitoring well MW-23 was sampled and analyzed for the presence of arsenic by EPA Method 6010. Prior to sampling, depth to water measurements were gathered to determine groundwater elevations at all accessible monitoring wells. A summary of groundwater elevation data is included as **Table 1**. Groundwater analytical data is summarized in **Table 2**.

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Current groundwater elevation data indicate a general decrease in depth to water since the last sampling in December (resulting in a higher groundwater table). Based on the most recent data, groundwater flow is generally towards the north-northwest across the site with some variations within the southern portion of the site due to the presence of ditches and/or ponds. The horizontal hydraulic gradients were measured between monitoring wells MW-23 and MW-16 at in southern part of the site and between monitoring wells MW-10 and MW-16 at the eastern part and estimated at 0.048 feet per foot (ft/ft) and 0.011 ft/ft, respectively. A groundwater elevation contour map for the shallow zone is included as **Figure 1**. The current groundwater flow direction is generally consistent with historical observations.

Prior to collecting the groundwater sample, the monitoring well was purged in accordance with the FDEP Standard Operating Procedures (DEP-SOP001/01) for Groundwater Sampling (FS 2200). A peristaltic pump equipped with polyethylene and silicone tubing was used to purge the monitoring well. During the purging, field parameters including pH, temperature, dissolved oxygen, specific conductance and turbidity were measured until the parameter stabilized. The stability parameter limits were the following: temperature +/- 0.2 degrees Celsius (°C); pH +/- 0.2 standard units (SU); specific conductance +/- 5.0% of reading; dissolved oxygen (DO) +/- 0.2 milligrams per liter (mg/L) or 10% (whichever is greater); and turbidity +/- 5 Nephelometric Turbidity Units (NTUs) or 10% (whichever is greater), preferably less than 20 NTUs. A completed groundwater sampling data sheet is included in **Appendix A**.

The samples were collected in accordance with the Florida Department of Environmental Protection Standard Operating Procedures (SOPs) protocol and submitted to PEL Laboratories, Inc. for analysis for the presence of arsenic using EPA Method 6010. The groundwater analytical data did not indicated the presence of arsenic at detectable levels at monitoring well MW-23. Groundwater analytical results are summarized in **Table 3** and **Figure 2**. The complete laboratory analytical report and chain-of-custody (COC) are provided in **Appendix B**.

*Comment 2: The action levels noted in response to comment 9 are not acceptable. Action Levels pursuant to Rule 62-780.690(8)(e), F.A.C. shall be the GCTLs for any well that was previously non-detect, or had concentrations less than the GCTLs; for wells that currently exceed the GCTLs, the action levels shall be an increase in concentration of 50% or more from the current concentration reported of the Natural Attenuation Default Concentration (NADC), whichever is lower. For*



*MW-14, which had arsenic at a concentration of 17.4 µg/L, an action level of 100% is acceptable.*

Response: Acknowledged. Monitoring wells MW-3, MW-5, MW-13, and MW-14 are proposed contaminant plume wells with the following action levels.

<u>Location</u>	<u>Concentration Level</u>	<u>Action Level</u>
MW-3	50%	82.5 µg/L
MW-5	50%	45.3 µg/L
MW-13	50%	52.1 µg/L
MW-14	100%	34.8 µg/L
MW-10	GCTL	10 µg/L
MW-20	GCTL	10 µg/L
MW-21	GCTL	10 µg/L

*Comment 3: Monitoring points located beyond the compliance boundary lines must not exceed applicable GCTLs and the point of compliance boundary lines must not extend beyond approved limits due to any changes in arsenic concentrations.*

Response: Acknowledged. Monitoring wells MW-23, MW-25, MW-26, DW-2, DW-3, and DW-4 are proposed as the point of compliance wells and shall not exceed the applicable default GCTL of 10 µg/L. As discussed above, the monitoring well MW-23 recently sampled, does not exhibit a concentration of arsenic at detectable levels. Temporary Point of Compliance (TPOC) wells and the compliance boundary lines are included in the attached **Figure 2**.

*Comment 4: Isoconcentration contour lines should be reconstructed for MW-14 and MW-23 to show lines of compliance interpolated proportionately between known monitoring well concentrations. Include all groundwater results as less than the reported Method Detection Limits (<MDLs). Please note that Point of Compliance (POC) boundary lines must be accurately drawn since these compliance lines will be used to determine which properties must be included in the TPOC publication.*

Response: Acknowledged. The revised groundwater analytical map includes the isoconcentration contour lines reconstructed accordingly and included as a **Figure 2**. Although, isoconcentration contour lines were interpolated proportionally between known monitoring wells MW-13 and MW-17, based on the groundwater flow direction, the contaminant plume in vicinity of monitoring well MW-13 less likely to be present beyond the boundary to the south.



flow direction, the contaminant plume in vicinity of monitoring well MW-13 less likely to be present beyond the boundary to the south.

We trust that the above responses are adequate to provide the Department information required to approve the RAP. If you have any questions during your review of these responses, please feel free to contact me at (813) 971-3882.

Sincerely,  
**HSA Engineers & Scientists**


A handwritten signature in blue ink, appearing to read "B. Moore".


Brian Moore, P.E.  
Environmental Program Manager



## CERTIFICATION

In accordance with Chapter 471, Florida Statutes, I hereby certify that, to the best of my knowledge, all engineering plans, specifications, and calculations included herein are in accordance with standard and appropriate engineering practices.

  
Brian Moore, P.E.  
Florida Registration No. 64017  
Environmental Program Manager





## TABLES

**Table 1**  
**Summary of Groundwater Elevation Data**  
**Countryside Executive Golf Course, Clearwater, Florida**  
**HSA Project Number 601-5982-00**

Well ID	TOC Elevation	Depth to Water	Water Elevation
<b>6/7/2006</b>			
DW-1	100	6.65	93.35
TW-1	103.52	8.51	95.01
TW-2	104.58	9.18	95.4
TW-3	102.66	6.92	95.74
TW-4	102.77	7.74	95.03
TW-10	100.56	6.81	93.75
TW-11	100.48	7.74	92.74
TW-12	102.92	8.32	94.6
MW-1R	105.78	5.08	100.7
Pond A	-	-	93.62
<b>10/12/2006</b>			
DW-1	100	6.71	93.29
TW-1	103.52	6.56	96.96
TW-2	104.58	7.23	97.35
TW-3	102.66	4.36	98.3
TW-4	102.77	5.81	96.96
TW-6	105.45	7.29	98.16
TW-7	106.05	9.16	96.89
TW-9	NM	8.61	--
TW-10	100.56	4.86	95.7
TW-11	100.48	5.22	95.26
TW-12	102.92	6.37	96.55
TW-14	105.5	8.06	97.44
TW-15	106.21	8.45	97.76
MW-1	105.78	9.01	96.77
MW-2	106.82	9.51	97.31
MW-3	103.44	6.27	97.17
MW-4	102.94	6.41	96.53
Pond A	--	--	96.31
Pond B	--	--	97.25
<b>10/30/2006</b>			
TW-1	103.52	7.04	96.48
TW-2	104.58	4.05	100.53
TW-3	102.66	5.7	96.96
TW-4	102.77	6.75	96.02
TW-5	NM	7.52	--
TW-6	105.45	7.8	97.65
TW-7	106.05	10.27	95.78
TW-8	NM	8.59	--
TW-10	100.56	7.3	93.26
TW-11	100.48	6.74	93.74
TW-12	102.92	6.96	95.96
TW-13	NM	5.42	--
TW-14	105.5	8.8	96.7
TW-15	106.21	9.05	97.16
TW-16	NM	8	--
TW-17	NM	2.32	--
MW-1	105.78	4.58	101.2
MW-2	106.82	10.33	96.49
MW-3	103.44	6.94	96.5
MW-4	102.94	7.04	95.9

**Table 1**  
**Summary of Groundwater Elevation Data**  
**Countryside Executive Golf Course, Clearwater, Florida**  
**HSA Project Number 601-5982-00**

Well ID	TOC Elevation	Depth to Water	Water Elevation
<b>11/29/2006</b>			
DW-1	100	3.18	96.82
TW-1	103.52	7.41	96.11
TW-2	104.58	7.26	97.32
TW-3	102.66	8.45	94.21
TW-4	102.77	6.41	96.36
TW-5	NM	6.86	
TW-6	105.45	7.42	98.03
TW-7	106.05	7.24	98.81
TW-10	100.56	7.3	93.26
TW-11	100.48	3.51	96.97
TW-12	102.92	6.76	96.16
TW-13	NM	6.34	--
TW-14	105.5	7.85	97.65
TW-15	106.21	9.12	97.09
TW-16	NM	7.24	--
TW-17	NM	7.24	--
TW-18	NM	6.31	--
TW-19	NM	6.71	--
MW-1	105.78	9.58	96.2
MW-2	106.82	10.33	96.49
MW-3	103.44	6.94	96.5
MW-4	102.94	7.04	95.9
MW-20	NM	NM	--
Pond A	--	--	95.75
Pond B	--	--	96.3
<b>9/30/2008**</b>			
MW-5	74.34	4.98	69.36
MW-6	75.9	4.73	71.17
MW-7	75.37	DRY	dry
MW-8	76.18	6.45	69.73
MW-9	76.04	5.87	70.17
MW-10	80.85	9.63	71.22
MW-11	76.53	5.56	70.97
MW-12	79.48	7.7	71.78
MW-13	76.29	4.03	72.26
Staff Guage 1 (Pond 2)	69.96	--	NM
Staff Guage 2 (Ditch)	69.87	--	NM
Staff Guage 3 (Pond 1)	71.94	--	NM
<b>11/7/2008</b>			
MW-3	74.34	6.87	67.47
MW-5	74.34	7.97	66.37
MW-6	75.9	7.71	68.19
MW-7	75.37	6.86	68.51
MW-8	76.18	9.41	66.77
MW-9	76.04	8.81	67.23
MW-10	80.85	13.08	67.77
MW-11	76.53	8.47	68.06
MW-12	79.48	10.59	68.89
MW-13	76.29	6.78	69.51
Staff Guage 1 (Pond 2)	69.96	3.65	67.61
Staff Guage 2 (Ditch)	69.87	4.04	67.91
Staff Guage 3 (Pond 1)	71.94	3.58	69.52



**Table 1**  
**Summary of Groundwater Elevation Data**  
**Countryside Executive Golf Course, Clearwater, Florida**  
**HSA Project Number 601-5982-00**

Well ID	TOC Elevation	Depth to Water	Water Elevation
<b>12/12/2008</b>			
MW-3	74.34	7.72	66.62
MW-5	74.34	8.31	66.03
MW-6	75.9	8.47	67.43
MW-7	75.37	7.97	67.4
MW-8	76.18	9.56	66.62
MW-9	76.04	8.93	67.11
MW-10	80.85	13.21	67.64
MW-11	76.53	8.63	67.9
MW-12	79.48	10.69	68.79
MW-13	76.29	7.12	69.17
MW-14	70.65	4.22	66.43
MW-15	73.15	6.07	67.08
MW-16	77.17	6.46	70.71
MW-17	75.34	3.75	71.59
MW-18	75.03	6.98	68.05
MW-19	74.54	8.2	66.34
MW-20	73.52	7.98	65.54
MW-21	73.77	7.41	66.36
MW-22	79.41	11.73	67.68
MW-23	76.31	7.7	68.61
Staff Gauge 1 (Pond 2)	69.96	DRY	--
Staff Gauge 2 (Ditch)	69.87	3.98	67.85
Staff Gauge 3 (Pond 1)	71.94	DRY	--
<b>12/17/2008</b>			
MW-3	74.34	7.86	66.48
MW-5	74.34	8.12	66.22
MW-6	75.9	8.43	67.47
MW-7	75.37	8.16	67.21
MW-8	76.18	9.57	66.61
MW-9	76.04	9.00	67.04
MW-10	80.85	13.31	67.54
MW-11	76.53	8.77	67.76
MW-12	79.48	10.74	68.74
MW-13	76.29	7.14	69.15
MW-14	70.65	4.33	66.32
MW-15	73.15	6.16	66.99
MW-16	77.17	6.52	70.65
MW-17	75.34	3.80	71.54
MW-18	75.03	6.98	68.05
MW-19	74.54	8.25	66.29
MW-20	73.52	6.97	66.55
MW-21	73.77	6.12	67.65
MW-22	79.41	11.83	67.58
MW-23	76.31	7.83	68.48
Staff Gauge 1 (Pond 2)	69.96	DRY	--
Staff Gauge 2 (Ditch)	69.87	3.89	67.76
Staff Gauge 3 (Pond 1)	71.94	DRY	--

**Table 1**  
**Summary of Groundwater Elevation Data**  
**Countryside Executive Golf Course, Clearwater, Florida**  
**HSA Project Number 601-5982-00**

Well ID	TOC Elevation	Depth to Water	Water Elevation
<b>7/6/2009</b>			
MW-IRR	74.42	5.19	
MW-3	74.34	4.1	70.24
MW-5	74.34	5.31	69.03
MW-6	75.9	4.69	71.21
MW-7	75.37	4.09	71.28
MW-8	76.18	9.73	66.45
MW-9	76.04	8.88	67.16
MW-10	80.85	12.69	68.16
MW-11	76.53	8.06	68.47
MW-12	79.48	10.96	68.52
MW-13	76.29	4.93	71.36
MW-14	70.65	2.4	68.25
MW-15	73.15	5.61	67.54
MW-16	77.17	5.34	71.83
MW-17	75.34	2.39	72.95
MW-18	75.03	4.96	70.07
MW-19	74.54	4.45	70.09
MW-20	73.52	5.2	68.32
MW-21	73.77	5.44	68.33
MW-22	79.41	11.76	67.65
MW-23	76.31	4.52	71.79
MW-24	74.73	4.89	69.84
MW-25	73.76	4.2	69.56
Staff Guage 1 (Pond 2)	69.96	4.2	68.16
Staff Guage 2 (Ditch)	69.87	3.66	67.53
Staff Guage 3 (Pond 1)	71.94	bent	--
<b>10/20/2009</b>			
MW-IRR	74.42	7.94	66.48
MW-3	74.34	5.44	68.9
MW-5	74.34	7.25	67.09
MW-6	75.9	7.14	68.76
MW-7	75.37	5.89	69.48
MW-8	76.18	10.09	66.09
MW-9	76.04	9.43	66.61
MW-10	80.85	13.73	67.12
MW-11	76.53	9.29	67.24
MW-12	79.48	11.58	67.9
MW-13	76.29	7.42	68.87
MW-14	70.65	3.54	67.11
MW-15	73.15	6.51	66.64
MW-16	77.17	6.4	70.77
MW-17	75.34	3.74	71.6
MW-18	75.03	7.08	67.95
MW-19	74.54	7.21	67.33
MW-20	73.52	6.33	67.19
MW-21	73.77	6.59	67.18
MW-22	79.41	12.42	66.99
MW-23	76.1	7.55	68.55
MW-24	74.73	7	67.73
MW-25	73.76	6.05	67.71
MW-26	70.51	3.58	66.93
MW-27	71.11	4.25	66.86
MW-28	70.18	3.41	66.77
DW-2	71.06	3.16	67.9
DW-3	72.36	4.01	68.35
DW-4	71.3	6.51	64.79
Staff Guage 1 (Pond 2)	69.96	3.83	67.79
Staff Guage 2 (Ditch)	69.87	3.57	67.44
Staff Guage 3 (Pond 1)	71.94	bent	--

**Table 1**  
**Summary of Groundwater Elevation Data**  
**Countryside Executive Golf Course, Clearwater, Florida**  
**HSA Project Number 601-5982-00**

Well ID	TOC Elevation	Depth to Water	Water Elevation
<b>11/5/2009</b>			
MW-1RR	74.42	8.4	66.02
MW-3	74.34	6.39	67.95
MW-5	74.34	7.91	66.43
MW-6	75.9	7.9	68
MW-7	75.37	7.08	68.29
MW-8	76.18	10.18	66
MW-9	76.04	9.55	66.49
MW-10	80.85	13.84	67.01
MW-11	76.53	9.52	67.01
MW-12	79.48	11.67	67.81
MW-13	76.29	7.81	68.48
MW-14	70.65	3.92	66.73
MW-15	73.15	6.66	66.49
MW-16	77.17	6.53	70.64
MW-17	75.34	4.00	71.34
MW-18	75.03	7.58	67.45
MW-19	74.54	7.89	66.65
MW-20	73.52	6.72	66.8
MW-21	73.77	7.05	66.72
MW-22	79.41	12.53	66.88
MW-23	76.1	8.08	68.02
MW-24	74.73	7.61	67.12
MW-25	73.76	6.62	67.14
MW-26	70.51	3.73	66.78
MW-27	71.11	4.24	66.87
MW-28	70.18	3.49	66.69
DW-2	71.06	3.88	67.18
DW-3	72.36	3.79	68.57
DW-4	71.3	6.65	64.65
Staff Gauge 1 (Pond 2)	69.96	3.4	67.36
Staff Gauge 2 (Ditch)	69.87	3.59	67.46
Staff Gauge 3 (Pond 1)	71.94	dry	--
<b>12/9/2010</b>			
MW-1RR	74.42		
MW-3	74.34	10.24	64.1
MW-5	74.34	8.06	66.28
MW-6	75.9	5.52	70.38
MW-7	75.37	8.64	66.73
MW-8	76.18	10.22	65.96
MW-9	76.04	9.50	66.54
MW-10	80.85	13.89	66.96
MW-11	76.53	12.8	63.73
MW-12	79.48	11.71	67.77
MW-13	76.29	8.05	68.24
MW-14	70.65	7.66	62.99
MW-15	73.15	NM	NM
MW-16	77.17	6.9	70.27
MW-17	75.34	NM	NM
MW-18	75.03	8.2	66.83
MW-19	74.54	8.81	65.73
MW-20	73.52	7.39	66.13
MW-21	73.77	7.84	65.93
MW-22	79.41	12.53	66.88
MW-23	76.1	8.2	67.9
MW-24	74.73	8.8	65.93
MW-25	73.76	7.8	65.96
MW-26	70.51	4.6	65.91
MW-27	71.11	Destroyed	Destroyed
MW-28	70.18	4.20	65.98
DW-2	71.06	12.71	58.35
DW-3	72.36	4.81	67.55
DW-4	71.3	6.16	65.14

**Table 1**  
**Summary of Groundwater Elevation Data**  
**Countryside Executive Golf Course, Clearwater, Florida**  
**HSA Project Number 601-5982-00**

Well ID	TOC Elevation	Depth to Water	Water Elevation
5/26/2011			
MW-1RR	74.42	8.35	66.07
MW-3	74.34	7.44	66.9
MW-5	74.34	8	66.34
MW-6	75.9	7.79	68.11
MW-7	75.37	5.6	69.77
MW-8	76.18	10.31	65.87
MW-9	76.04	9.55	66.49
MW-10	80.85	13.92	66.93
MW-11	76.53	12.54	63.99
MW-12	79.48	11.65	67.83
MW-13	76.29	7.93	68.36
MW-14	70.65	4.16	66.49
MW-15	73.15	6.8	66.35
MW-16	77.17	6.75	70.42
MW-17	75.34	4.00	71.34
MW-18	75.03	7.82	67.21
MW-19	74.54	8.45	66.09
MW-20	73.52	7	66.52
MW-21	73.77	7.55	66.22
MW-22	79.41	9.62	69.79
MW-23	76.1	8.15	67.95
MW-24	74.73	8.1	66.63
MW-25	73.76	7.1	66.66
MW-26	70.51	4.02	66.49
MW-27	71.11	4.64	66.47
MW-28	70.18	3.62	66.56
DW-2	71.06	3.19	67.87
DW-3	72.36	3.83	68.53
DW-4	71.3	9.96	61.34

**Notes:**

TOC-top of casing                      NM- Not Measured

NM- Not Measured

\*\* Monitor wells were surveyed to NAVD 88 by Florida Design Consultants, Inc., October 2008

<b>Table 2</b> <b>Summary of Groundwater and Surface Water Analytical Data</b> <b>Countryside Executive Golf Course, Clearwater, Florida</b> <b>HSA Project Number 601-5982-00</b>		
Point ID	Sample Date	Arsenic (µg/l)
	GCTL	10
	NADSC	100
	FSWC	50
TW-1	08/27/04	470
	10/07/04	620
	11/16/04	180
	10/30/06	37
	11/29/06	34
	monitor well missing/destroyed	
TW-2	10/06/04	15
	11/16/04	8.2 I
	10/30/06	<4.8
	11/30/06	15.7
	monitor well missing/destroyed	
TW-3	10/06/04	100
	11/15/04	23
	10/31/06	13
	11/30/06	12.3
	monitor well missing/destroyed	
TW-4	10/06/04	87
	11/15/04	75
	10/30/06	72
	11/29/06	360
	monitor well missing/destroyed	
TW-5	10/07/04	330
	11/16/04	540
	10/30/06	700
	11/29/06	661
	monitor well missing/destroyed	
TW-6	10/07/04	8.4
	10/30/06	15 I
	11/29/06	11.2
	monitor well missing/destroyed	
TW-7	10/07/04	14
	01/13/05	<2.8
	10/30/06	14 I
	11/30/06	12.4
	monitor well missing/destroyed	
TW-8	11/15/04	3.5 I
	10/31/06	21
	monitor well missing/destroyed	
TW-9	11/15/04	4.4 I
TW-10	monitor well missing/destroyed	
	11/15/04	<2.8
	10/30/06	46
TW-11	monitor well missing/destroyed	
	11/15/04	13
	10/31/06	<4.8
	11/29/06	4.3 I
TW-12	monitor well missing/destroyed	
	11/15/04	12
	06/13/06	5.44
	10/31/06	17 I
	11/30/06	9.85
TW-13	monitor well missing/destroyed	
	11/16/04	12
	10/31/06	12 I
	11/30/06	12.8
TW-14	monitor well missing/destroyed	
	06/13/06	<5
	10/30/06	58
	11/30/06	19
	monitor well missing/destroyed	

<b>Table 2</b> <b>Summary of Groundwater and Surface Water Analytical Data</b> <b>Countryside Executive Golf Course, Clearwater, Florida</b> <b>HSA Project Number 601-5982-00</b>		
Point ID	Sample Date	Arsenic (µg/l)
	GCTL	10
	NADSC	100
	FSWC	50
TW-15	06/13/06	<5
	10/30/06	<4.8
	11/30/06	<1.8
	monitor well missing/destroyed	
TW-16	06/13/06	<5
	10/30/06	<4.8
	11/28/06	<1.8
	monitor well missing/destroyed	
TW-17	11/28/06	<1.8
	monitor well missing/destroyed	
TW-18	10/30/06	<4.8
	11/28/06	<1.8
	monitor well missing/destroyed	
TW-19	11/28/06	<1.8
monitor well missing/destroyed		
TW-20	12/21/06	<1.8
monitor well missing/destroyed		
DW-1	07/14/05	17.6
	08/01/05	12.4
	08/26/05	15.2
	11/07/05	<2.8
	11/30/06	9.9
	monitor well missing/destroyed	
MW-1	08/26/05	46.9
	monitor well missing/destroyed	
MW-1R	06/05/06	<5
	10/30/06	38
	11/29/06	<1.8
	monitor well missing/destroyed	
MW-1RR	03/16/09	<4.8
MW-2	08/26/05	119
	11/07/05	130
	05/30/06	37.3
	06/13/06	79.8
	10/30/06	400
	11/29/06	14.1
	monitor well missing/destroyed	
MW-3	08/26/05	159
	11/07/05	5.4
	10/30/06	24
	11/29/06	<1.8
	11/07/08	35.6
	12/08/08	47
	12/10/10	55
MW-4	08/26/05	87
	11/07/05	<2.8
	10/30/06	85
	11/29/06	2.07 I
	monitor well missing/destroyed	
MW-5	09/30/08	33.8
	11/07/08	8.67 I
	12/10/10	30.2
MW-6	09/30/08	<331
	11/07/08	4.23
MW-7	09/30/08	DRY
	12/10/10	5.49 I
	12/08/08	5 I

<b>Table 2</b> <b>Summary of Groundwater and Surface Water Analytical Data</b> <b>Countryside Executive Golf Course, Clearwater, Florida</b> <b>HSA Project Number 601-5982-00</b>		
Point ID	Sample Date	Arsenic (µg/l)
	GCTL	10
	NADSC	100
	FSWC	50
MW-8	09/29/08	<b>29.7</b>
	11/07/08	6.62 I
	12/09/10	<3.31
MW-9	09/29/08	<b>32.4</b>
	12/08/08	<4.8
	12/09/10	5.69 I
MW-10	09/29/08	<b>17.7</b>
	11/07/08	5.28 I
	12/09/10	3.55 I
MW-11	09/29/08	<b>21.7</b>
	12/08/08	<4.8
	12/10/10	3.94 I
MW-12	09/30/08	<3.31
	12/10/10	<3.31
MW-13	09/29/08	<b>58.6</b>
	11/07/08	<b>55.2</b>
	12/08/08	<b>73</b>
	12/10/10	<b>34.7</b>
MW-14	12/08/08	8.1 I / 10.5
	10/15/09	<b>17 I</b>
	10/21/09	<b>20 / 16 I</b>
	12/10/10	<b>17.4</b>
MW-15	12/15/08	<4.8
MW-16	12/10/08	<4.8
MW-17	12/15/08	<4.8
MW-18	12/12/08	<4.8
MW-19	12/12/08	<4.8
	12/10/10	9.57 I
MW-20	12/12/08	<4.8
	12/09/10	8.55 I
MW-21	12/12/08	<4.8
MW-22	12/12/08	<4.8
MW-23	12/12/08	<4.8
	12/10/10	<b>14.7</b>
	05/26/11	<3.31
MW-24	03/16/09	<4.8
MW-25	03/16/09	<4.8
	12/10/10	8.25 I
MW-26	11/03/09	<4.8
	12/10/10	<3.31
MW-27	11/03/09	<4.8
MW-28	11/03/09	<4.8
	12/10/10	<3.31
DW-2	10/15/09	<4.8
	12/09/10	<3.31
DW-3	10/15/09	5.7 I
	12/10/10	<3.31
DW-4	11/03/09	<4.8
	12/10/10	<3.31
<b>Offsite Irrigation Well (Village of the Green)</b>		
Irrigation 3	11/07/08	<b>14.3</b>
<b>Surface Water Samples</b>		
Surface Water	5/30/2006	<b>152</b>
	06/13/06	49
	07/06/09	49
<b>On-Site Irrigation Wells (Countryside)</b>		
Well 1	05/31/06	<5
Well 2	05/31/06	3.94 I

**Notes:**

Units given in micrograms per liter (µg/l).

GCTL - Groundwater Cleanup Target Level, set forth in Chapter 62-777, FAC

NADSC - Natural Attenuation Default Source Concentration, set forth in Chapter 62-777, FAC

FSWC - Fresh Surface Water Criteria, set forth in Chapter 62-777, FAC

I - Analyte detected below the quantitation limits.

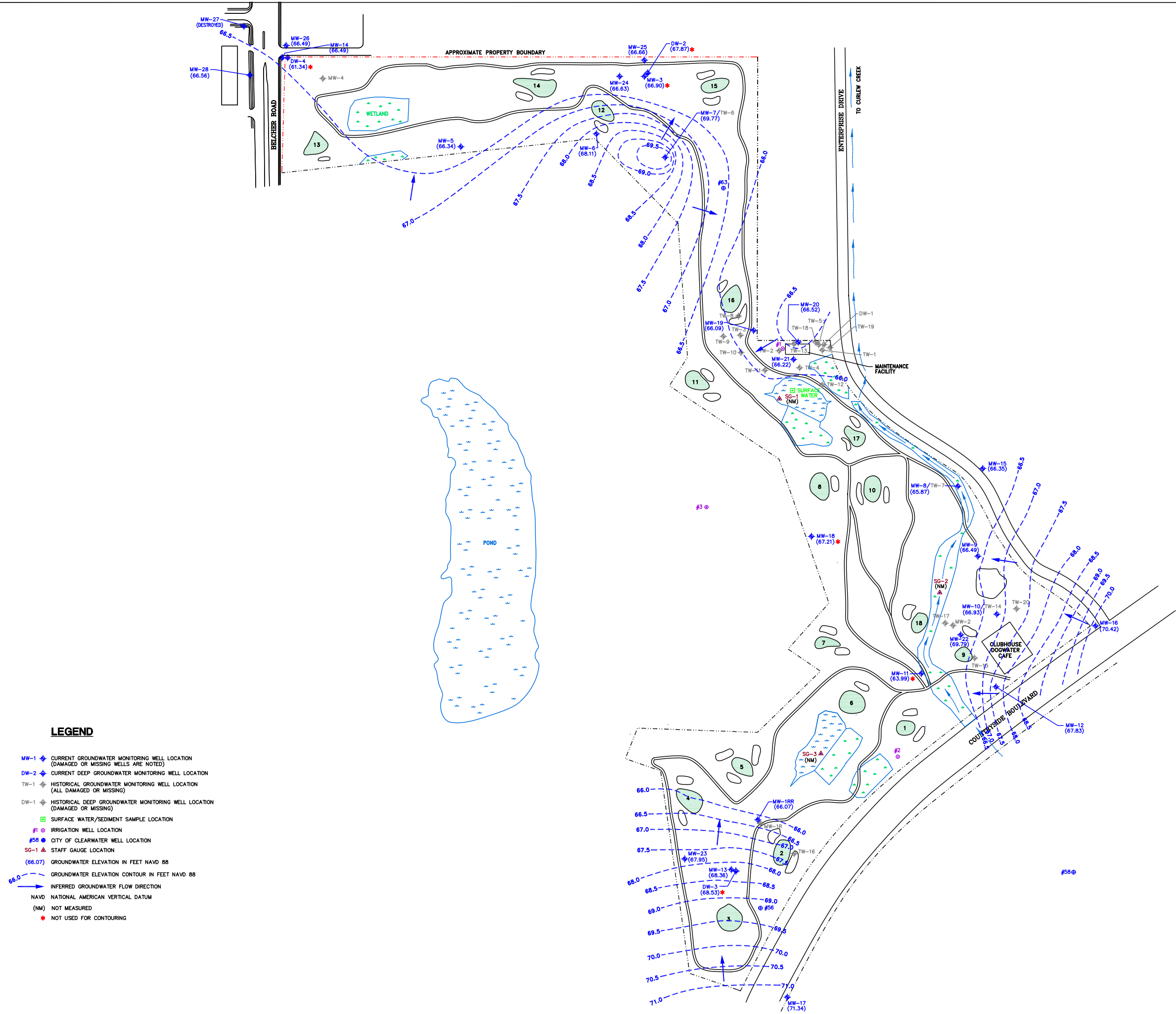
**Red** indicates result exceeds GCTL or FSWC

**Blue** indicates result exceeds NADSC



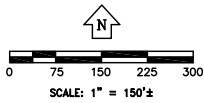
## FIGURES





LEGEND

- MW-1 ◆ CURRENT GROUNDWATER MONITORING WELL LOCATION (DAMAGED OR MISSING WELLS ARE NOTED)
- DW-2 ◆ CURRENT DEEP GROUNDWATER MONITORING WELL LOCATION
- TW-1 ◆ HISTORICAL GROUNDWATER MONITORING WELL LOCATION (ALL DAMAGED OR MISSING)
- DW-1 ◆ HISTORICAL DEEP GROUNDWATER MONITORING WELL LOCATION (DAMAGED OR MISSING)
- SURFACE WATER/SEDIMENT SAMPLE LOCATION
- #1 ○ IRRIGATION WELL LOCATION
- #58 ● CITY OF CLEARWATER WELL LOCATION
- SG-1 ▲ STAFF GAUGE LOCATION
- (66.07) GROUNDWATER ELEVATION IN FEET NAVD 88
- GROUNDWATER ELEVATION CONTOUR IN FEET NAVD 88
- INFERRED GROUNDWATER FLOW DIRECTION
- NAVD NATIONAL AMERICAN VERTICAL DATUM
- (NM) NOT MEASURED
- \* NOT USED FOR CONTOURING



DESIGNED	N/A	JOB NO. 601598200
DRAWN	SBW	DATE: 6/9/11
CHECKED	BM	CAD NO. 598200-01

SHEET TITLE  
GROUNDWATER  
ELEVATION  
CONTOUR MAP  
UPPER SHALLOW  
ZONE  
(5/26/11)

**LEGEND**

MW-1 ◆ CURRENT GROUNDWATER MONITORING WELL LOCATION  
(DAMAGED OR MISSING WELLS ARE NOTED)

TW-1 ◆ HISTORICAL GROUNDWATER MONITORING WELL LOCATION  
(ALL DAMAGED OR MISSING)

DW-1 ◆ HISTORICAL DEEP GROUNDWATER MONITORING WELL LOCATION  
(DAMAGED OR MISSING)

□ SURFACE WATER/SEDIMENT SAMPLE LOCATION

#1 ○ IRRIGATION WELL LOCATION

#58 ● CITY OF CLEARWATER WELL LOCATION

12/9/10 SAMPLE DATE  
<3.31 ARSENIC CONCENTRATION IN MICROGRAMS PER LITER (ug/L)

55 YELLOW SHADING DENOTES VALUES WHICH EXCEED THE 10 ug/L GCTL

661 BLUE SHADING DENOTES VALUES WHICH EXCEED THE 100 ug/L NADSC

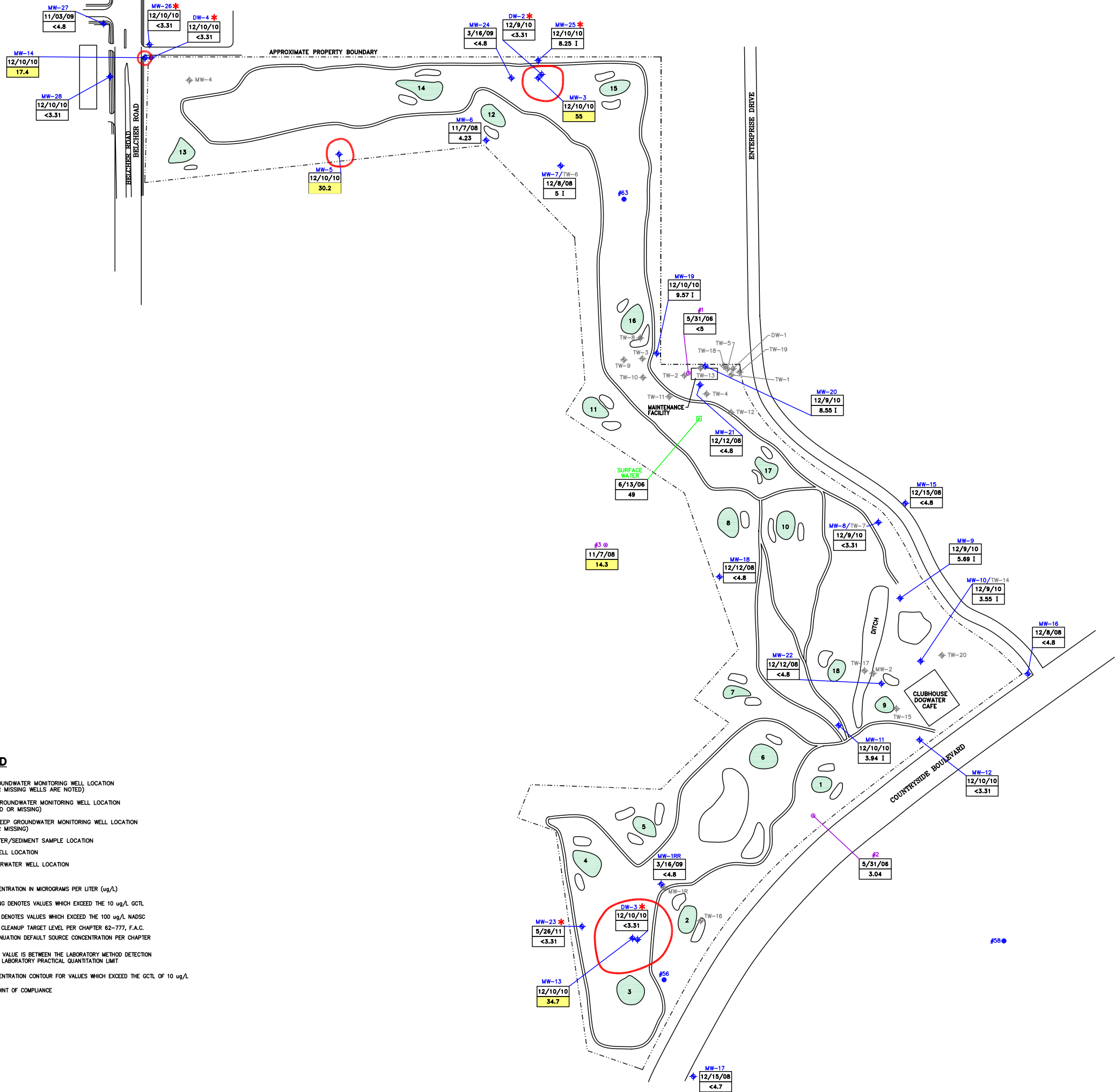
GCTL GROUNDWATER CLEANUP TARGET LEVEL PER CHAPTER 62-777, F.A.C.

NADSC NATURAL ATTENUATION DEFAULT SOURCE CONCENTRATION PER CHAPTER 62-777, F.A.C.

I THE REPORTED VALUE IS BETWEEN THE LABORATORY METHOD DETECTION LIMIT AND THE LABORATORY PRACTICAL QUANTITATION LIMIT

ARSENIC CONCENTRATION CONTOUR FOR VALUES WHICH EXCEED THE GCTL OF 10 ug/L

\* TEMPORARY POINT OF COMPLIANCE



DESIGNED	JOB NO. 601598200
DRAWN	N/A
CHECKED	DATE: 6/9/11
	CAD NO. 398200-02



## **APPENDIX A**

### **Completed Groundwater Sampling Data Sheet**

## PURGING DATA

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY  
(only fill out if applicable)

= ( 13 feet - 8.15 feet ) X 0.16 gallons/foot = 0.776 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME									
(only fill out if applicable)									
=	gallons + (	gallons/foot X	feet) +	gallons =	gallons				

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 10.15	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 10.15	PURGING INITIATED AT: 2:00	PURGING ENDED AT: 2:21	TOTAL VOLUME PURGED (gallons): 1.05
---	---	-------------------------------	---------------------------	--

[illegible]

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88  
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0008; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

**PURGING EQUIPMENT CODES:** B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

## SAMPLING DATA

PUMP OR TUBING DEPTH IN WELL (feet): 10-15	TUBING MATERIAL CODE: PE	FIELD-FILTERED: Y <input checked="" type="checkbox"/> Filtration Equipment Type:	FILTER SIZE: _____ µm
---	-----------------------------	---	-----------------------

FIELD DECONTAMINATION:	PUMP	Y	N	TUBING	Y	N (replaced)	DUPLICATE:	Y	N
------------------------	------	---	---	--------	---	--------------	------------	---	---

[illegible]

REMARKS:

**MATERIAL CODES:** AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

**SAMPLING EQUIPMENT CODES:** APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump;  
RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

**pH:**  $\pm 0.2$  units **Temperature:**  $\pm 0.2$  °C **Specific Conductance:**  $\pm 5\%$  **Dissolved Oxygen:** all readings  $\leq 20\%$  saturation (see Table FS 2200-2); optionally,  $+0.2$  mg/L or  $+10\%$  (whichever is greater) **Turbidity:** all readings  $< 20$  NTU; optionally  $+5$  NTU or  $+10\%$  (whichever is greater)

Revision Date: February 12, 2009



## **APPENDIX B**

### **Complete Laboratory Analytical Results**



*SPECTRUM ANALYTICAL, INC.*

*Featuring  
HANIBAL TECHNOLOGY  
Florida Division*



Florida # E84207  
Texas # T104704408-10-2  
South Carolina # 96011001  
North Dakota # R-178



California # 07253CA  
Louisiana # 02025  
Kansas # E-10385  
Arkansas # 10-039-0

---

**- CERTIFICATE OF ANALYSIS -**

**Report Date:** 06/06/2011

**To:** Brian Moore  
HSA Engineers & Scientists  
4019 E Fowler Ave.  
Tampa, FL 33617

Work 813-971-3882  
FAX

---

**PROJECT ID:** Countryside Golf Course/601-5982-00  
**WORK ORDER:** 3503031  
**DATE RECEIVED:** Thursday, May 26, 2011

Project Notes:

(†): Short Hold Time Analysis Date

Samples reported on dry weight basis

All test results in this report pertain only to the samples as submitted.

Spectrum Analytical, Inc. FL Division Contact: Mark Gudnason / extension: 242  
8405 Benjamin Road, Suite A • Tampa, Florida 33634  
813-888-9507 • FAX: 813-889-7128  
Website: [www.pelab.com](http://www.pelab.com)

**Spectrum Analytical, Inc. FL Division**  
**featuring Hanibal Technology**

**DATA QUALIFIER CODES**

State of Florida, Department of Environmental Protection and  
Department of Health Rehabilitative Services / NELAC

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- I** The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J** Estimated value; value not accurate. This code shall be used in the following instances:
1. Surrogate recovery limits have been exceeded.
  2. No known quality control criteria exists for the component.
  3. The reported value did not meet the established quality control criteria for either precision or accuracy but falls within the NELAC marginal exceedance range.
  - 3M. The reported value did not meet the established quality control criteria for either precision or accuracy and falls beyond the NELAC range for marginal exceedances.
  - 3R. The RPD for the LCSD exceeds the laboratory established control limits.
  4. The sample matrix interfered with the ability to make an accurate determination.
  5. The data is questionable because of improper laboratory or field protocols (e.g. composite sample was collected instead of a grab sample).
- L** Off-scale high. Actual value is known to be greater than the value given. To be used when the concentration of the analyte is above the acceptable limit for quantitation (exceeds the linear range of the highest calibration standard) and the calibration curve is known to exhibit a negative deflection.
- Q** Sample held beyond acceptable holding time. This code shall be used if the value is derived from a sample that was prepared or analyzed after the approved holding time restrictions for the sample preparation or analysis.
- U** Indicates that the compound was analyzed for but not detected above the method detection limit (MDL).
- V** Indicates that the analyte was detected in both the sample and the associated method blank. Note: The value in the blank shall not be subtracted from associated samples.
- Y** The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
-

## **CASE NARRATIVE METALS**

**Spectrum Analytical Inc. Lab Reference No./SDG: 3503031**

**Client: HSA**

### **I. RECEIPT**

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

### **II. HOLDING TIMES**

**A. Sample Preparation:** All holding times were met.

**B. Sample Analysis:** All holding times were met.

### **III. METHOD**

Analyses were performed according to the Spectrum Analytical Inc. Standard Operating Procedures and EPA Method 6010B for ICP metals.

### **IV. PREPARATION**

Water samples were prepared according to PEL Laboratory's Standard Operating Procedures and EPA Method 3010A.

### **V. ANALYSIS**

#### **A. Calibration:**

All acceptance criteria were met.

#### **B. Blanks:**

##### **1. Calibration Blanks:**

All acceptance criteria were met.

##### **2. Method Blanks:**

All acceptance criteria were met.

#### **C. Spikes:**

##### **1. Laboratory Control Spikes (LCS):**

All acceptance criteria were met

##### **2. Post Digestion Spike:**

All acceptance criteria were met.

##### **3. Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):**



**CASE NARRATIVE  
METALS**

**Spectrum Analytical Inc. Lab Reference No./SDG: 3503031**

**Client: HSA**

No spikes requested by client.

**D. Duplicate:**

No sample duplicates are reported with this method. (Spike duplicates are referenced above in section C. Spikes.)

**E. Serial Dilution:**

All acceptance criteria were met.


**F. ICP Interference Check Samples:**

All acceptance criteria were met.

**G. Samples:**

Sample analysis proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and Spectrum Analytical Inc., both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature:   
Name: Troy L. Roberts Title: Inorg. Manager

**SIGNED:**

**DATE: 06/06/2011**

**CASE NARRATIVE  
METALS  
DISSOLVED**

**Spectrum Analytical Inc. Lab Reference No./SDG: 3503031**

**Client: HSA**

**I. RECEIPT**

Exceptions encountered upon receipt are addressed in the Sample Receipt Confirmation Report, included with the Chain-of-Custody documentation, or communication included in the addendum with this package.

**II. HOLDING TIMES**

**A. Sample Preparation:** All holding times were met.

**B. Sample Analysis:** All holding times were met.

**III. METHOD**

Analyses were performed according to the Spectrum Analytical Inc. Standard Operating Procedures and EPA Method 6010B for ICP metals.

**IV. PREPARATION**

Water samples were prepared according to PEL Laboratory's Standard Operating Procedures and EPA Method 3010A.

**V. ANALYSIS**

**A. Calibration:**

All acceptance criteria were met.

**B. Blanks:**

**1. Calibration Blanks:**

All acceptance criteria were met.

**2. Method Blanks:**

All acceptance criteria were met.

**C. Spikes:**

**1. Laboratory Control Spikes (LCS):**

An LCS/LCSD set was analyzed.

All percent recovery and relative percent difference (RPD) criteria were met.

**2. Post Digestion Spike:**

All acceptance criteria were met.

**3. Matrix Spike/Matrix Spike Duplicate Samples (MS/SD):**

**CASE NARRATIVE  
METALS  
DISSOLVED**

**Spectrum Analytical Inc. Lab Reference No./SDG: 3503031**

**Client: HSA**

No spikes requested by client.

**D. Duplicate:**

No sample duplicates are reported with this method. (Spike duplicates are referenced above in section C. Spikes.)

**E. Serial Dilution:**

All acceptance criteria were met.


**F. ICP Interference Check Samples:**

All acceptance criteria were met.

**G. Samples:**

Sample analysis proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and Spectrum Analytical Inc., both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as, verified by the following signature.

Signature: 

Name: Troy L. Roberts Title: Inorg. Manager

**SIGNED:**

**DATE: 06/06/2011**

**- CERTIFICATE OF ANALYSIS -**



**FLDOH #E84207**

**To:** Brian Moore  
HSA Engineers & Scientists

**WORK ORDER:** 3503031

**PROJECT ID:** Countryside Golf Course/601-5982-00

**Lab# :** 350303101

**Collection Information:**

**Client ID :** MW-23

**Sample Date:** 5/26/2011 2:25:00 PM

**Matrix :** W

Parameter	Method	Results	Analysis Date	Prep Date	Units	MDL	RL	Dilution Factor
Arsenic	6010	3.31 U	06/03/2011 16:38	05/31/2011 11:30	UG/L	3.31	10	1
Arsenic	6010 DISS DISS	3.31 U	06/03/2011 19:50	05/31/2011 11:30	UG/L	3.31	10	1

- CERTIFICATE OF ANALYSIS -



FLDOH #E84207

**To:** Brian Moore  
HSA Engineers & Scientists

**WORK ORDER:** 3503031

**PROJECT ID:** Countryside Golf Course/601-5982-00

## QC SUMMARY

**METHOD:** 6010

**Method Blank :** 86713MB

**Matrix :** WQ

**Associated Lab Samples :** 350303101 86713MB 86714LCS

Parameter	Results	Analysis Date	Prep Date	Units	RL	Dilution Factor
Arsenic	U	6/3/2011	5/31/2011	UG/L	3.31	1

**LABORATORY CONTROL SAMPLE:** 86714LCS

**Matrix :** WQ

PARAMETER	UNITS	SPIKE CONC	LCS RESULT	SPIKE % REC	% REC LIMITS	RPD	RPD LIMIT
Arsenic	ug/L	500	477	95.4	(80-120)		

**- CERTIFICATE OF ANALYSIS -**



**FLDOH #E84207**

**To:** Brian Moore  
HSA Engineers & Scientists

**WORK ORDER:** 3503031

**PROJECT ID:** Countryside Golf Course/601-5982-00

**METHOD:** 6010 DISS DISS

**Method Blank :** 86718MB

**Matrix :** WQ

**Associated Lab Samples :** 350303101 86718MB 86719LCS 86720LCSD

Parameter	Results	Analysis Date	Prep Date	Units	RL	Dilution Factor
Arsenic	U	6/3/2011	5/31/2011	UG/L	3.31	1

**LABORATORY CONTROL SAMPLE:** 86719LCS **Matrix :** WQ

PARAMETER	UNITS	SPIKE CONC	LCS RESULT	SPIKE % REC	% REC LIMITS	RPD	RPD LIMIT
Arsenic	ug/L	500	447	89.4	(80-120)		

**LABORATORY CONTROL SAMPLE:** 86720LCSD **Matrix :** WQ

PARAMETER	UNITS	SPIKE CONC	LCS RESULT	SPIKE % REC	% REC LIMITS	RPD	RPD LIMIT
Arsenic	ug/L	500	428	85.6	(80-120)	4.3	20

- CERTIFICATE OF ANALYSIS -



FLDOH #E84207

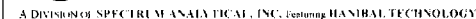
**To:** Brian Moore  
HSA Engineers & Scientists

**WORK ORDER:** 3503031

**PROJECT ID:** Countryside Golf Course/601-5982-00

---

Brian C. Spann      Laboratory Manager  
or  
Mark Gudnason      Technical Director



3503031

**Special Handling:**  
TAT- Indicate Date Needed: Standard

- All TATs subject to laboratory approval.  
Min. 24-hour notification needed for rushes.
- Samples disposed of after 60 days unless otherwise instructed.

Project No.: 601-5982-00  
Site Name: Countryside Golf Course  
Location: Clearwater State: FL  
Sampler(s): Joe Orfanides

P.O. No.: 601-5982 RQN:

List preservative code below:

Notes:

Containers:

Analyses:

OA/OC Reporting Level

☐ Level I      ☐ Level II  
☐ Level III    ☐ Level IV  
☐ Other

State specific reporting standards:

G=Grab    C=Composite

Type

## Matrix

# of VOA Vials

# of Amber Glas

# of Clear Glass

# of Plastic

✓ Argent Gold

✓ Arsenic 6610

Lab Id:	Sample Id:	Date:	Time:
-01	MW-23	5-26-11	1425

☐ E-mail to \_\_\_\_\_

EDD Format pH < 2 6010 pH > 2 6010 D

Relinquished by:

Received by:

Date:

Time:

Condition upon receipt: ☒ Iced ☐ Ambient ☒ °C 4.7



# SAMPLE RECEIPT CONFIRMATION SHEET

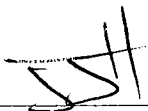
## Client Information

SDG:	3503031	Req:	1310
Client:	HSA	Project:	Generic
Level:	1	Date Rec'd:	5/26/2011 3:40:00 PM
Rec'd via:	Client	Due Date:	6/2/2011

## Sample Verification

Samples/Cooler Secure?	<input type="text" value="Yes"/>	All Samples on COC accounted For?	<input type="text" value="Yes"/>
Temperature of Samples(Celsius)	<input type="text" value="4.7C"/>	All Samples Rec'd Intact?	<input type="text" value="Yes"/>
pH Verified?	<input type="text" value="Yes"/>	Sample Vol. Sufficient For Analysis	<input type="text" value="Yes"/>
pH WNL?	<input type="text" value="Yes"/>	Samples Rec'd W/I Hold Time?	<input type="text" value="Yes"/>
Soil Origin (Domestic/Foreign):	<input type="text"/>	Are All Samples to be Analyzed?	<input type="text" value="Yes"/>
Site Location/Project on COC?	<input type="text" value="Yes"/>	Correct Sample Containers?	<input type="text" value="Yes"/>
Client Project # on COC?	<input type="text" value="Yes"/>	COC Comments written on COC?	<input type="text" value="Yes"/>
Project Mgr. Indicated on COC?	<input type="text" value="Yes"/>	Samplers Initials on COC?	<input type="text" value="Yes"/>
COC relinquished/Dated by Client?	<input type="text" value="Yes"/>	Sample Date/Time Indicated?	<input type="text" value="Yes"/>
COC Received/Dated by PEL?	<input type="text" value="Yes"/>	TAT Requested:	<input type="text" value="STD"/>
Specific Subcontract Indicated?	<input type="text" value="No"/>	Client Requests Verbal Results?	<input type="text" value="No"/>
Samples Received By	<input type="text" value="Client"/>	Client Requests Faxed Results?	<input type="text" value="No"/>
PEL to Conduct ALL Analyses?	<input type="text" value="Yes"/>		
Radioactivity Check?	<input type="text" value="No"/>		
COC Present?	<input type="text" value="Yes"/>		

PEER REVIEW



**End Of Report**