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NTC ORLANDO
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LETTER REGARDING DEEP MONITORING AND SENTINEL WELL CLUSTER PLACEMENT
NTC ORLANDO FL
10/3/1997
ABB ENVIRONMENTAL



03.04.02.0007

00177

Document No.:02530.600

October 3, 1997
Commanding Officer
SOUTHNAVFACENG
ATTN: Mr. Wayne Hansel, Code 1873
2155 Eagle Drive
N. Charleston, SC 29406

Subject: Deep Monitoring and Sentinel Well Cluster Placement
Study Area 2, Herndon Annex
Naval Training Center (NTC), Orlando, Florida
CTO #107, Contract No. N62467-89-D-0317

Dear Mr. Hansel:

Based on the findings from the additional site screening events conducted under the letter workplan dated June 17, 1997 at the Study Area (2), Herndon Annex, and on recommendations at the September 10 and 11, 1997 Orlando Partnering Team (OPT) meeting, ABB Environmental Services, Inc. (ABB-ES) is proposing the installation and sampling of a deep monitoring well and a sentinel well cluster. The purposes of these monitoring wells are to confirm benzene contamination in groundwater in the area of Nancy Lee Avenue and install a sentinel well cluster downgradient from and beyond the leading edge of the benzene plume. This document is intended to serve as the Workplan for these field activities.

SUMMARY OF CURRENT FINDINGS

The following tasks have been completed in accordance with the June 17, 1997 letter workplan for SA 2.

- Three deep monitoring wells have been installed on Herndon Annex property. These and all other existing monitoring wells on the site have been sampled for volatile organic compounds (VOCs) and natural attenuation parameters.
- Three clusters consisting of shallow and deep piezometers have been installed in the Lake Barton Village residential area; two piezometers have been sampled for VOCs.
- Groundwater at 12 direct push technology (DPT) locations on the Herndon Annex, and 12 DPT locations in the Lake Barton Village area were sampled for VOCs (at four discrete depth intervals between the water table and the top of the Hawthorn Group for most locations).
- Four temporary wells screened at the water table have been installed and sampled for VOCs along the northern half of the east edge of the Herndon Annex property.
- Four drive-points were installed in the drainage ditch and sampled for VOCs.

The analytical results showed exceedences of Florida maximum contaminant levels for benzene, 1,2-dichloroethane (1,2-DCA), trichloroethane (TCE), and tetrachloroethene (PCE) in groundwater, generally at depths exceeding 40 ft. Bls. Exceedences of Florida secondary drinking water standards for ethylbenzene and xylenes were also detected in groundwater.

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ABB Environmental Services Inc.

1080 Woodcock Road, Suite 100
St. Paul Building
Orlando, Florida 32803

Telephone (407) 895-8845
Fax (407) 896-6150

The most significant contaminant is benzene, which was detected at up to 138 $\mu\text{g}/\ell$ samples at a depth of about 52 feet and 83 $\mu\text{g}/\ell$ in monitoring well OLD-02-13 at a depth of about 48 feet. The areal extent of benzene contamination can be inferred from Figure 1. Exceedances of other contamination were of a much smaller areal extent. As can be seen in Figure 1, benzene has been detected primarily in the southeastern quadrant of the Annex, and eastward into the Lake Barton Village residential area. Table 1 lists all analytical detections in DPT, drive-point, and temporary well data. Table 2 lists all groundwater monitoring well analytical detections.

The completion of an irrigation well survey within the vicinity of Nancy Lee Avenue as specified in the June 17, 1997 letter workplan has not yet been completed.

TECHNICAL APPROACH

All work to be conducted in this field event will be in accordance with the USEPA Environmental Investigations Standard Operating Procedures and Quality Assurance Manual (May, 1996) and the Project Operations Plan for Site Investigations and Remedial Investigations (ABB-ES, August, 1997). This approach also includes comments and recommendations from the OPT meeting held on September 10 and 11, 1997.

Groundwater Monitoring and Sampling. In order to confirm DPT analytical results in the Lake Barton Village residential area, a new deep monitoring well will be installed. In addition, a sentinel well cluster will be installed downgradient from and beyond the leading edge of the benzene plume. These new monitoring wells are to be sampled for low-level VOCs by EPA Method 524.2.

The deep monitoring well (OLD-02-15C) will be screened from 40 to 45 feet bls and will be positioned near the location of 02Q11403, on Nancy Lee Avenue just south of the Bobby Street intersection. The sentinel well cluster will be located near 02Q12901 on Wren Street just west of the Slover Avenue intersection. The cluster should consist of shallow, intermediate, and deep monitoring wells. The shallow well (OLD-02-16A) would be screened to bracket the water table at 10 to 20 feet bls, the intermediate well (OLD-02-17B) would be screened from 30 to 35 feet bls, and the deep well (OLD-02-18C) would be screened from 40 to 45 feet bls. The recommended locations for these monitoring wells are depicted in Figure 2.

The well locations shown on Figure 2 are recommendations. We would like to discuss these locations and the need for a well cluster with the OPT as soon as possible. We suggest a conference call on October 13, 1997. Should you have any questions or comments regarding this letter workplan please call me or Bob Burns at (407) 895-8845.

Very Truly Yours,
ABB ENVIRONMENTAL SERVICES, INC.


John P. Kaiser
Installation Manager


Bob Burns
Environmental Engineer

cc: Nancy Rodriguez, EPA
Barbara Nwokike, SDIV
Bob Cohose, BEI
Steve McCoy, Brown & Root
Rick Allen, ABB-ES

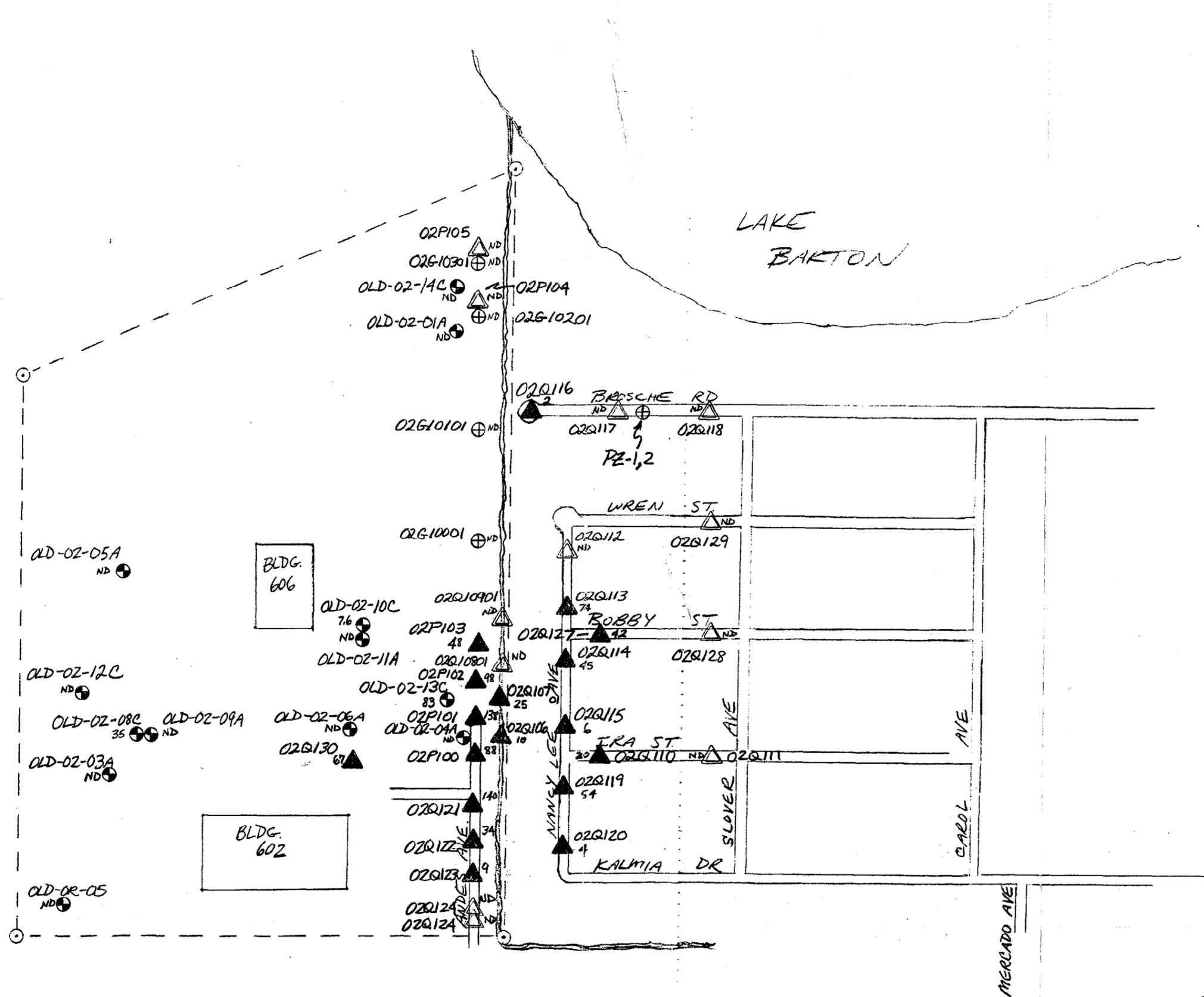
John Mitchell, FDEP
Lt. G. Whipple, NTC, Orlando

PROJECT **FIGURE 1**
NTC ORLANDO
HERNDON ANNEX
SITE MAP
 FLORIDA PRIMARY AND
 SECONDARY DRINKING
 WATER EXCEEDENCES
 IN GROUNDWATER

COMP. BY
B. BURNS
 CHK. BY
 DATE
9-9-97

JOB NO.
08545.10
 PROJECT

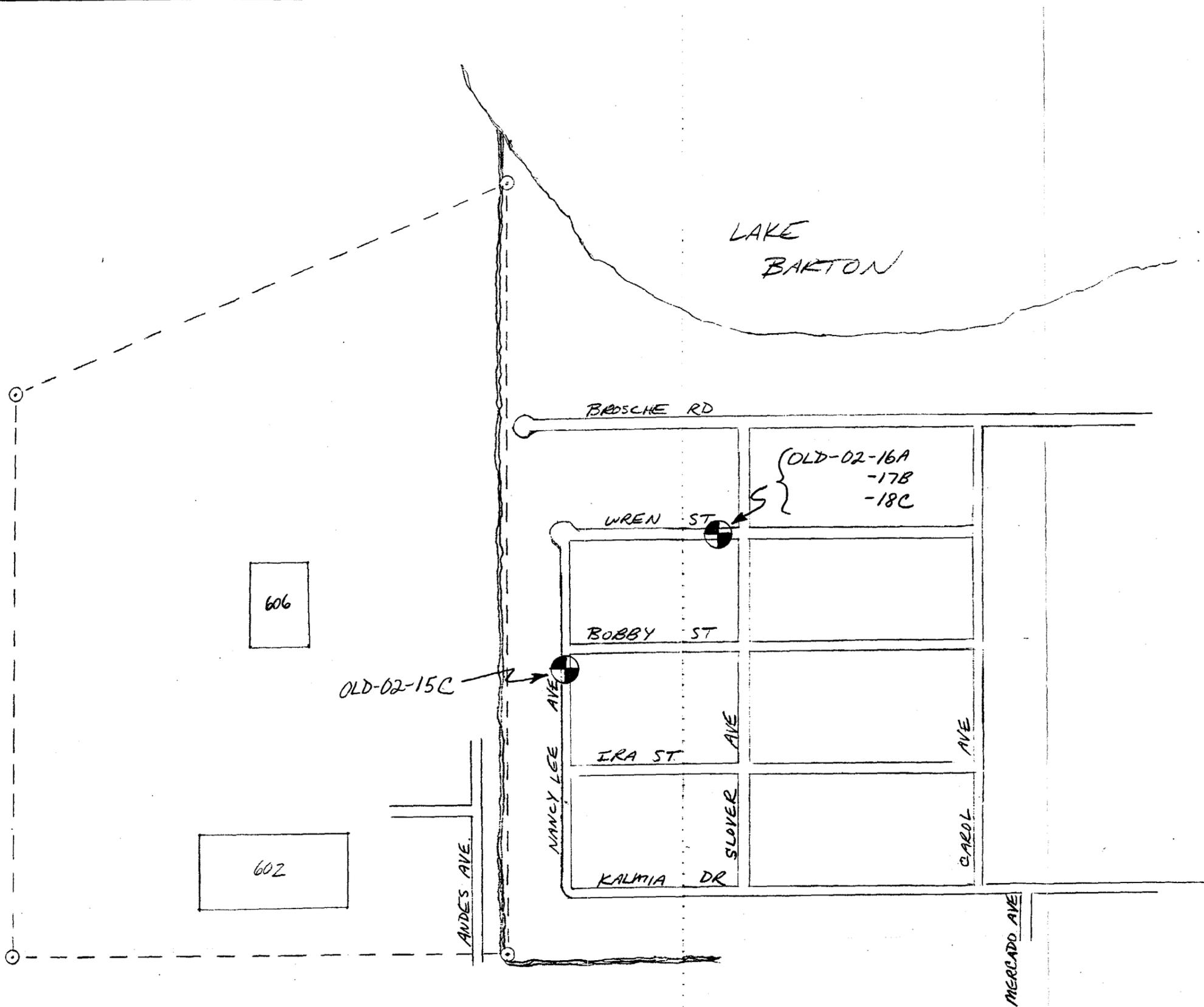
COMP. BY
 JOB NO.
 CHK. BY
 DATE



SCALE
 1" = 300'

- KEY**
- HERNDON ANNEX PROPERTY COVER
 - - - HERNDON ANNEX PROPERTY LINES
 - ~ APPROXIMATE EDGE OF LAKE BARTON
 - DRAINAGE DITCH
 - ⊕ TEMP. WELL OR PIEZOMETER
 - ⊙ MONITORING WELL
 - △ DPT LOCATION WITH CONTAMINATION BELOW PRIMARY AND SECONDARY DRINKING WATER STDS.
 - ▲ DPT LOCATION WITH CONTAMINATION ABOVE FL PRIMARY AND SECONDARY DRINKING WATER STDS.
 - △ DPT LOCATION WITHOUT CONTAMINATION
 - ND NON-DETECTION
 - 2.18 BENZENE CONCENTRATION IN PARTS PER BILLION (ug/L) AT RESPECTIVE LOCATION
 - Q100 DPT LOCATION NUMBER
 - G100 TEMP WELL LOCATION NUMBER
 - OLD-02-12 MONITORING WELL NUMBER

PROJECT FIGURE 2 NTC ORLANDO HERNDON ANNEX SITE MAP	COMP. BY B. BURNS	JOB NO. 08545.10	PROJECT	COMP. BY	JOB NO.
	CHK. BY	DATE 9-9-97		CHK. BY	DATE



SCALE
1" = 300'

KEY

- HERNDON ANNEX PROPERTY CORNER
- HERNDON ANNEX PROPERTY LINES
- ~ APPROXIMATE EDGE OF LAKE BARTON
- DRAINAGE DITCH
- ⊕ MONITORING WELL

TABLE 1

	DEPTH	DEPTH	1,2,4-Trimethylbenzene	1,2-Dichlorobenzene	1,2-Dichloropropane	1,3,5-Trimethylbenzene	Acetone	Benzene	Chloroethane	1,1,2,2-Tetrachloroethane	Ethylbenzene	Isopropylbenzene	m- and p-Xylene	Methylene chloride	n-Propylbenzene	Naphthalene	o-Xylene	1,3-Propylbenzene	1,4-Butylbenzene	Tetrachloroethene	Toluene	Trichloroethene
FDEP (pr)			3	5				1	70	700	10000T	10000T	10000T			20T				3	1000	3
FDEP (sec)										30	20T										40	
2012401	55	58	9.38	ND	ND	6.24	ND	ND	ND	ND	2.82	ND	ND	0.94	3.11	ND	ND	ND	ND	ND	ND	ND
02G10001	5.5	10.5	ND	ND	ND	ND	ND	0.54	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
02P10001	30	33	1.7	ND	ND	0.66	ND	76.4	ND	8.69	10.6	3.98	32	ND	ND	18	ND	ND	ND	ND	1.71	3.2
02P10002	40	43	1.7	8.61	ND	0.54	ND	152	ND	17.1	33.8	16.6	120	ND	ND	55	ND	ND	ND	ND	3.33	6.62
02P10003	50	53	10.7	ND	ND	7.81	ND	85.4	ND	7.13	5.56	12.8	5.5	ND	1.41	ND	0.5	ND	ND	ND	ND	1.52
02P10101	30	33	ND	1.67	ND	ND	ND	24.9	ND	0.94	1.41	ND	6.1	ND	ND	2.4	ND	ND	ND	ND	ND	0.52
02P10102	40	43	ND	3.57	ND	ND	ND	88.6	ND	5.13	5.8	1.84	27	ND	ND	0.86	12	ND	ND	ND	0.65	ND
02P10103	45	48	1.62	7.5	ND	0.56	ND	138	ND	13.6	18.6	11.5	54	ND	ND	2.94	23	ND	ND	ND	1.4	ND
02P10104	50	53	2.87	2.75	ND	1.14	ND	27.8	ND	3.1	1.83	3.78	2.5	ND	ND	ND	ND	ND	ND	ND	ND	0.71
02P10202	37	40	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.58	ND	ND	ND	ND	ND	ND	ND	ND
02P10203	43	46	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.62	ND
02P10204	50	53	ND	6.05	ND	1.62	ND	98.2	ND	5.28	8.88	0.85	ND	ND	ND	0.67	ND	ND	ND	ND	ND	1.4
02P10301	30	33	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.91	ND	ND	ND	ND	ND	ND
02P10302	37	40	ND	ND	ND	ND	ND	5.09	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
02P10303	43	46	ND	1.64	ND	0.91	ND	31.4	ND	1.14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
02P10304	49	52	ND	2.14	ND	0.61	ND	47.9	ND	1.46	1.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
02Q10601	1	4	ND	ND	ND	ND	ND	10.4	ND	1.49	ND	ND	ND	0.82	ND	ND	ND	ND	ND	ND	ND	ND
02Q10701	1	4	ND	ND	ND	ND	ND	25.2	ND	3.14	ND	ND	ND	0.85	ND	ND	ND	ND	ND	ND	ND	ND
02Q10801	1	4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.96	ND	ND	ND	ND	ND	ND	ND	ND
02Q10901	1	4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.01	ND	ND	ND	ND	ND	ND	ND	ND
02Q11001	20	25	1.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
02Q11002	50	55	ND	1.05	ND	ND	ND	20.3	ND	0.83	ND	0.78	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
02Q11201	21	24	ND	ND	ND	ND	ND	45.3	ND	3.06	1.08	ND	2.7	ND	ND	0.95	ND	ND	ND	ND	ND	ND
02Q11203	40	43	ND	ND	ND	ND	ND	0.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
02Q11301	20	23	ND	ND	ND	ND	ND	2.26	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
02Q11302	30	33	ND	ND	ND	ND	ND	18.3	ND	ND	0.68	ND	3.1	ND	ND	1.3	ND	ND	ND	ND	ND	ND
02Q11303	40	43	ND	3.81	ND	ND	ND	86.3	ND	2.9	0.7	ND	2.2	ND	ND	0.7	ND	ND	ND	ND	ND	ND
02Q11304	50	53	ND	ND	ND	ND	ND	74.3	ND	3.85	ND	0.69	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
02Q11403	40	43	ND	ND	ND	ND	ND	44.7	ND	0.54	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
02Q11404	47	50	ND	ND	ND	ND	ND	11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.65	ND
02Q11504	50	53	ND	ND	ND	ND	ND	6.23	ND	ND	ND	ND	1.7	ND	ND	ND	ND	ND	ND	ND	ND	ND
02Q11603	40	43	ND	ND	ND	ND	ND	2.19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
02Q11901	20	23	ND	ND	ND	ND	ND	0.56	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
02Q11902	30	33	ND	0.91	ND	ND	ND	19.6	ND	1.17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
02Q11903	40	43	ND	2.32	ND	ND	ND	50.1	ND	2.31	2.45	ND	4.8	ND	ND	ND	ND	ND	ND	ND	ND	ND
2Q11903	40	43	ND	2.05	ND	ND	ND	54.5	ND	1.78	1.18	ND	2.1	ND	ND	ND	ND	ND	ND	ND	ND	ND
02Q11904	50	53	ND	1.09	ND	ND	ND	18.1	ND	0.56	ND	ND	0.6	ND	ND	ND	ND	ND	ND	ND	ND	ND
02Q12001	17	20	1.48	ND	ND	ND	ND	4.09	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.59
02Q12002	27	30	ND	ND	ND	ND	ND	1.59	ND	1.16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.63
02Q12003	42	45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.54	ND	ND
02Q12004	49	52	ND	ND	ND	ND	ND	1.98	ND	ND	ND	1.4	0.5	ND	ND	0.62	ND	ND	ND	ND	ND	0.6
02Q12101	25	28	ND	ND	ND	ND	ND	6.06	ND	0.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
02Q12102	32	35	0.8	1.24	ND	ND	ND	29.3	ND	2.85	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.55	0.63
02Q12103	41	44	14.3	3.17	ND	5.12	ND	140	ND	19.5	24	20.8	77	ND	1.4	ND	37	ND	ND	ND	2.52	4.98
02Q12104	50	53	5.6	1.45	ND	5.38	ND	75.2	ND	7.36	3.45	7.97	7.5	ND	1.07	ND	3.2	ND	ND	ND	ND	0.85
02Q12201	17	20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.72	ND	ND	ND	ND	ND	ND	ND	ND	ND
02Q12203	43	46	2.23	1.62	ND	7.06	ND	34	ND	2.06	ND	ND	ND	ND	3.06	ND	ND	ND	ND	0.71	ND	3.82
02Q12302	27	30	1.74	ND	ND	0.64	ND	0.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
02Q12303	27	30	ND	ND	ND	18.6	ND	3.18	ND	2.09	2.37	2.08	ND	ND	1.68	3.44	ND	ND	ND	3.08	ND	4.44
02Q12304	37	40	58.4	ND	ND	32.9	ND	3.77	ND	2.01	3.08	14.8	ND	ND	4.79	17.3	0.61	ND	0.8	2.42	ND	2.37
02Q12401	47	50	9.81	ND	ND	6.81	ND	ND	ND	ND	3.15	ND	ND	1.09	2.67	ND	ND	0.63	ND	ND	ND	ND
02Q12702	55	58	ND	ND	ND	ND	ND	0.62	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
02Q12703	30	33	ND	3.94	ND	ND	ND	110	ND	9.2	0.59	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
02Q12704	40	43	ND	1.96	ND	ND	ND	41.7	ND	2.15	0.5	ND	0.68	ND	ND	ND	ND	ND	ND	ND	ND	ND
02Q12803	50	53	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.62	ND	11.6	ND	ND	ND	ND	ND	ND	ND
02Q12804	33	36	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.09	ND	ND	ND	ND	ND	ND	ND
02Q12903	41	44	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.52	ND	ND	ND	ND	ND	ND	ND	ND	ND
02Q12904	40	43	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.59	ND	ND	ND	ND	ND	ND	ND	ND	ND
02Q13001	53	56	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	26.7	ND	0.92	ND	ND	ND	0.81	ND
02Q13002	20	23	ND	ND	ND	ND	ND	3.31	ND	ND	ND	ND	ND	ND	5.46	ND	ND	ND	ND	ND	ND	ND
02Q13003	32	35	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.96	0.57	ND	ND	ND	ND	ND	ND	ND	ND	ND
02Q13004	32	35	ND	3.24	ND	4.79	ND	87	ND	2.94	0.95	ND	ND	ND	ND	ND	ND	0.6	2.09	1.5	ND	ND
02R10301			ND	ND	1.04	ND	ND	ND	ND	ND	ND	ND	ND	0.68	ND	ND	ND	ND	ND	ND	ND	ND
02T10001			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.53	ND	ND	ND	ND	ND	ND	ND	ND
02T10201			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.11	ND	ND	ND	ND	ND	ND	ND	ND
02T12400			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.52	ND	ND	ND	ND	ND	ND	ND	ND
02T12601			ND	ND	1.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
02T12901			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.55	ND	ND	ND	ND	ND	ND	ND	ND
02Q1220	30	33	4.37	ND	ND	1.92	ND	15.1	ND	1.32	ND	ND	ND	0.63	ND	ND	ND	ND	ND	0.92	ND	1.17

T - Total trimethylbenzenes, Total xylenes
 Shaded cells indicate Florida Primary Drinking Water Standard exceedences

TABLE 2

SAMPLE ID	BENZENE	CHLOROFORM	CHLOROMETHANE	CIS-1,2-DICHLOROETHENE	ETHYLBENZENE	ISOPROPYLBENZENE	M-AND-P-XYLENE	METHYLENE CHLORIDE	N-PROPYLBENZENE	NAPHTHALENE	O-XYLENE	TOLUENE	TRICHLOROETHENE	1,2-DICHLOROETHANE	1,2-DICHLOROPROPANE	1,2,4-TRIMETHYLBENZENE	1,3,5-TRIMETHYLBENZENE
02G00102	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
02G00402	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
02G00502	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
02G00602	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
02G00802	15	ND	ND	0.83	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.9
02G00802D	35	ND	ND	0.87	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.9
02G00902	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
02G01002	7.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.73
02G01102	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
02G01201	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
02G01301	83	ND	ND	4.1	1.9	ND	ND	ND	ND	ND	ND	ND	0.98	ND	ND	ND	1.2
02G01401	ND	0.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
02G01401D	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ORG00502	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Highlighted cells are FL Primary Drinking Water Standard exceedences