N65928.AR.001126
NTC ORLANDO
5090.3a

GROUNDWATER SAMPLING AT STUDY AREA 18 WITH TRANSMITTAL LETTER NTC ORLANDO FL
1/22/2001
TETRA TECH

TETRA TECH NUS, INC.
800 Oak Ridge Turnpike, A-600 ▪ Oak Ridge, Tennessee 37830
(865) 483-9900 ▪ FAX: (865) 483-2014 ▪ www.tetratech.com

[redacted]
00259

0101-E006

January 22, 2001

Commanding Officer
SOUTHNAVFACENGCOM
ATTN: Ms. Barbara Nwokike, Code 1873
P.O. Box 190010
2155 Eagle Drive
North Charleston, SC 29419-9010

Subject: Groundwater Sampling at Study Area 18
Main Base, NTC, Orlando

Dear Ms. Nwokike:

Enclosed is the report describing the sampling activities performed at Study Area 18 in October 2000. Groundwater elevation contour maps and the results of the sample analyses are presented in the report. Iron, aluminum, and manganese were detected above screening criteria (GCTL and background concentrations).

If you have any questions regarding the report, please contact me at (865) 220-4730.

Sincerely,

Steven B. McCoy, P.E.
Task Order Manager

SBM:tko

Enclosure

c: Mr. Wayne Hansel, SOUTHNAVFACENGCOM (2)
Mr. David Grabka, FDEP
Ms. Nancy Rodriguez, USEPA Region 4
Mr. Steve Tsangaris, CH2M Hill
Mr. Rick Allen, Harding Lawson Associates
Mr. Mike Campbell, Tetra Tech NUS
Mr. Mark Perry, Tetra Tech NUS (unbound)
Ms. Jacque Van Audenhove, Tetra Tech NUS (2)
Ms. Vickie Stitt, Tetra Tech NUS
Ms. Debbie Wroblewski, Tetra Tech NUS (cover letter only)
File/Edb

GROUNDWATER SAMPLING AT STUDY AREA 18

Trip Dates: October 18-26, 2000

Site Name: Study Area 18
McCoy Annex, Naval Training Center, Orlando, Florida

TO Manager: Steve McCoy

Field Team: Bobby Bobo
Cher Morrison

Prepared by: Cher Morrison

1. PURPOSE

Quarterly groundwater sampling was conducted at Study Area (SA) 18 in October 2000. The fieldwork was performed in accordance with the *Work Plan for Groundwater Sampling* (Tetra Tech NUS, 1999a), and the Project Operations Plan (POP) (ABB-ES, 1997).

2. ACTIVITIES

Tetra Tech NUS, Inc. mobilized to the field on October 18, 2000, to perform sampling at SA 2, SA 18, SA 52, and Operable Unit (OU) 3. The fieldwork at SA 18 was performed on October 25, 2000, and included a water level survey and groundwater sampling. Groundwater levels were measured in wells OLD-18-01, OLD-18-02, OLD-18-03, and OLD-18-04. Groundwater elevations for this field event and previous events are summarized in Table 1.

Sampling – Four wells (OLD-18-01, OLD-18-02, OLD-18-03, and OLD-18-04) at SA 18 were purged and sampled on October 25, 2000, using the low-flow method described in the POP. Purging of the wells consisted of removing groundwater with a peristaltic pump at a rate of 80-100 ml/min until field parameters (temperature, pH, conductivity, turbidity, dissolved oxygen, and ORP) had stabilized. Water levels in the wells were continuously monitored to ensure that drawdown was less than 0.3 feet. The groundwater sample log sheets are included in Attachment A.

The turbidity in three of the four wells did not meet the goal of less than 10 NTU. The turbidity readings for the last two sampling events are shown below:

Sample Date	OLD-18-01	OLD-18-02	OLD-18-03	OLD-18-04
05/26/99	25 NTU	8 NTU	26 NTU	8 NTU
10/25/00	9 NTU	15 NTU	22 NTU	15 NTU

The samples were placed on ice in coolers and shipped overnight to Severn-Trent Laboratories in North Canton, Ohio, where the samples were analyzed for Target Analyte List (TAL) metals using SW 846 Method 6010B.

3. PROBLEMS ENCOUNTERED

Other than the problems lowering turbidity in three of the four wells, no problems were encountered at the site during the purging/sampling.

4. RESULTS

Water Level Survey – Groundwater elevation data measured at SA 18 on October 25, 2000, are presented in Table 1 and Figure 1. The data are consistent with the south-southeast groundwater flow direction presented in the previous sampling report (Tetra Tech NUS, 1999).

Data Validation – Qualification of the data was performed using the USEPA Contract Laboratory Program guidelines for inorganic data review (USEPA, 1994). The data validation evaluated data completeness, holding time compliance, calibration compliance, laboratory blank contamination, surrogate spike recovery, matrix spike recovery, blank spike recovery, internal standard response, sample quantitation, and detection limits. Qualifiers resulting from the validation process are shown with the analyte concentrations in Tables 2, 3, and 4.

Analytical Results – Table 2 presents a summary of the groundwater positive detections for SA 18 for the October 2000 sampling event. The historical groundwater data are presented in Table 3. A complete listing of the validated analytical data for October 2000 is included as Table 4. Shaded cells indicate concentrations equal to or greater than Florida Groundwater Cleanup Target Levels (GCTLs). The distribution of contaminants detected above the GCTLs is shown on Figure 2.

Iron exceeded its screening criterion (1227 µg/L) in three of the four wells sampled, with the highest concentration of 10,000 µg/L in well OLD-18-04. Aluminum exceedances occurred in two wells with the highest concentration of 4,620 µg/L measured in OLD-18-01. Manganese also exceeded its screening criterion of 50 µg/L with a concentration of 56.6 µg/L measured in OLD-18-01.

5. REFERENCES

ABB-ES (ABB Environmental Services, Inc.), 1997. *Project Operations Plan for Site Investigations and Remedial Investigations.* Naval Training Center, Orlando, Florida, Unit Identification Code N65928, Navy CLEAN District 1, Contract No. N62467-89-D-0317, August.

Tetra Tech NUS, Inc., 1999. *Groundwater Monitoring Report for Study Area 18.* Document No. R4709991, September 22, 1999.

USEPA, 1994. *Contract Laboratory Program: National Functional Guidelines for Inorganic Data Review.* EPA/540/R-94/013, Office of Solid Waste and Emergency Response, Washington, D.C., February.

FIGURES

No.

1 Groundwater Elevation Map – October 25, 2000

2 Groundwater Exceedances – October 2000

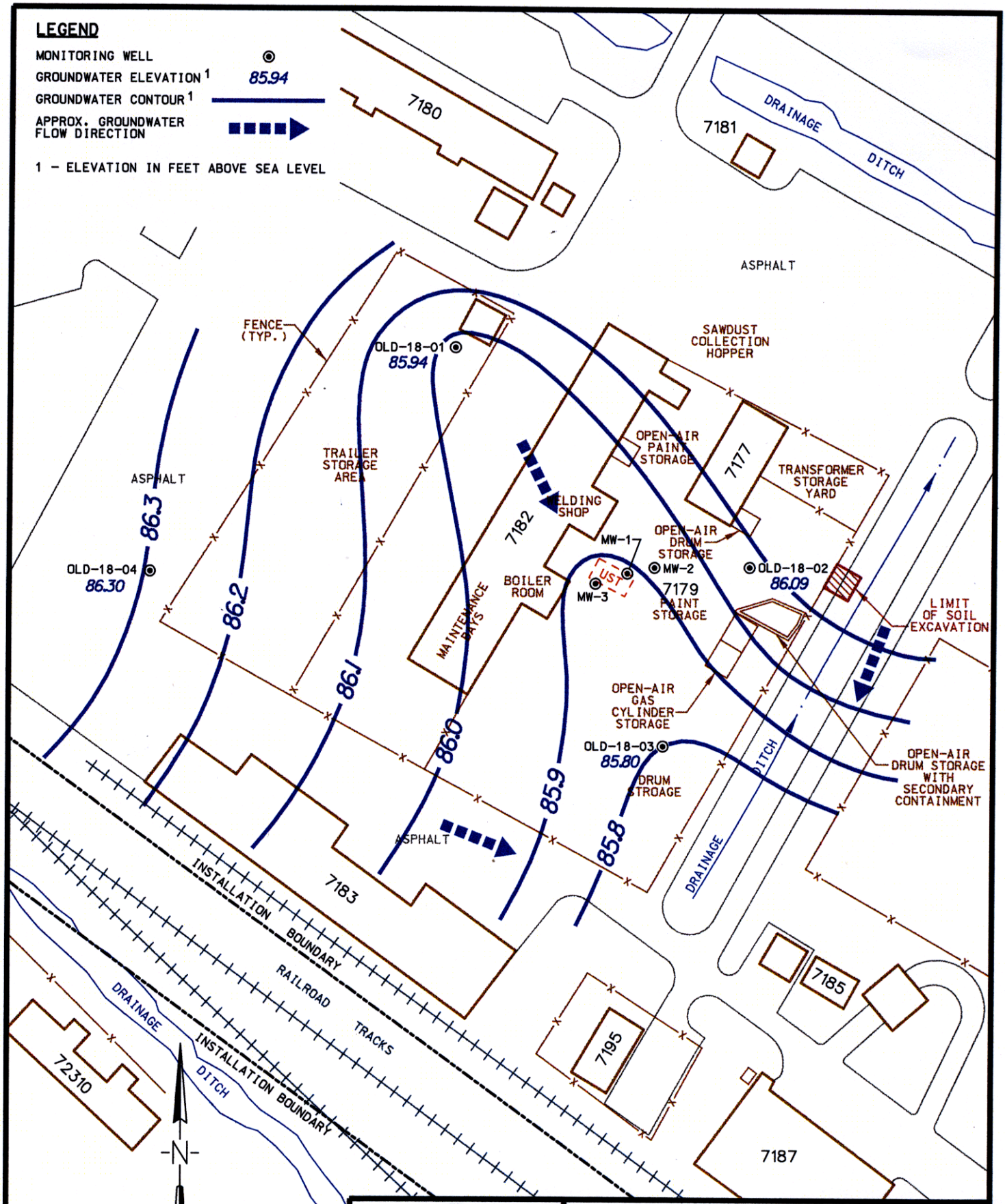
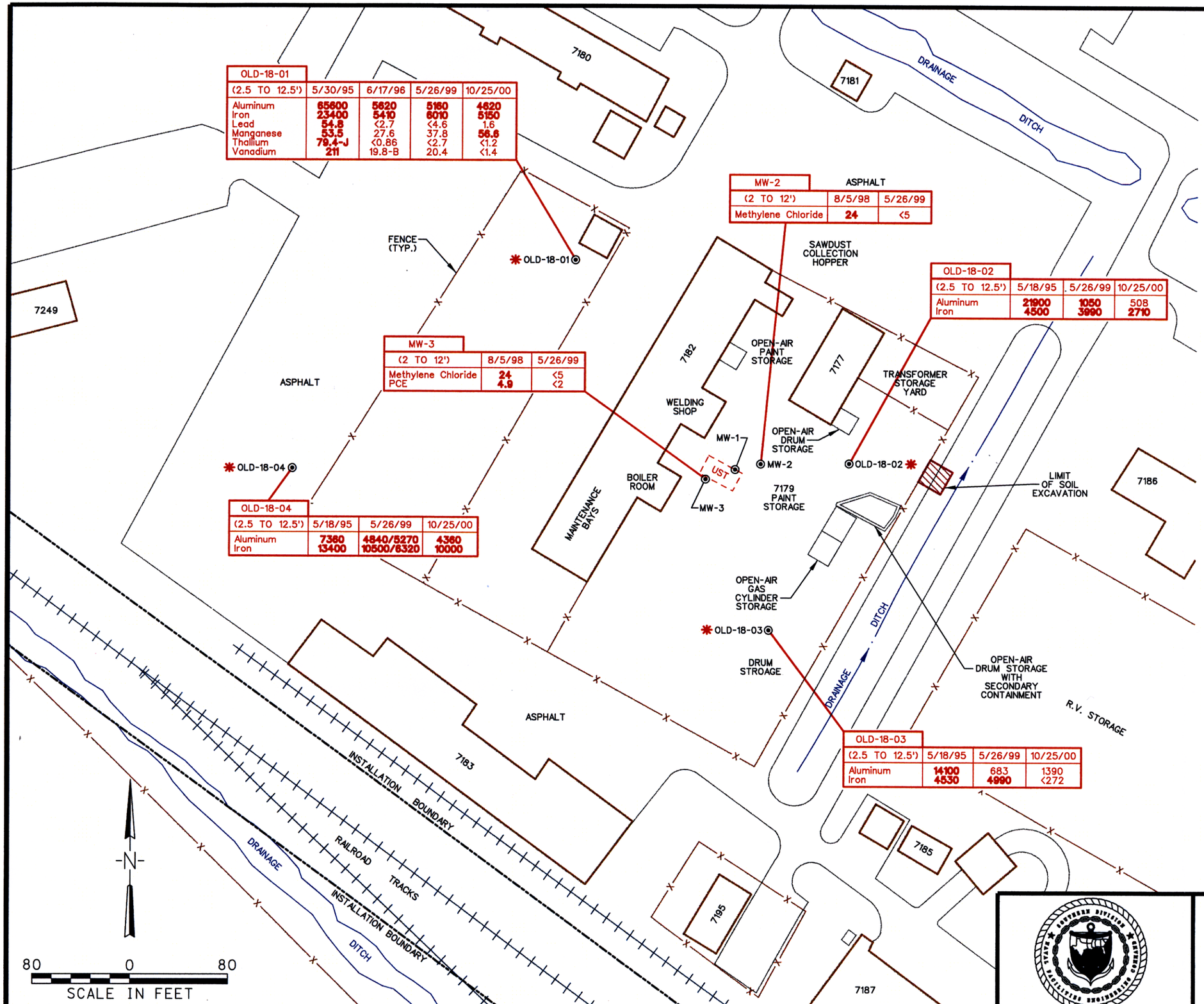


FIGURE 1
GROUNDWATER ELEVATION MAP ON OCTOBER 25, 2000
STUDY AREA 18

NAVAL TRAINING CENTER
ORLANDO, FLORIDA

n8-5x11v.dgn

CAD FILE NO./DATE: 7457M070.dgn/1-19-01



OLD-18-01 (2.5 TO 12.5')	5/30/95	6/17/96	5/26/99	10/25/00
Aluminum	**65800**	**5620**	**5160**	**4620**
Iron	**23400**	**5410**	**6010**	**5150**
Lead	**54.8**	<2.7	<4.6	1.6
Manganese	**53.5**	27.6	37.8	**56.6**
Thallium	**79.4-J**	<0.86	<2.7	<1.2
Vanadium	**211**	19.8-B	20.4	<1.4

MW-2 (2 TO 12')	8/5/98	5/26/99
Methylene Chloride	**24**	<5

MW-3 (2 TO 12')	8/5/98	5/26/99
Methylene Chloride	**24**	<5
PCE	**4.9**	<2

OLD-18-02 (2.5 TO 12.5')	5/18/95	5/26/99	10/25/00
Aluminum	**21900**	**1050**	508
Iron	**4500**	**3990**	**2710**

OLD-18-04 (2.5 TO 12.5')	5/18/95	5/26/99	10/25/00
Aluminum	**7360**	**4840/5270**	**4360**
Iron	**13400**	**10500/6320**	**10000**

OLD-18-03 (2.5 TO 12.5')	5/18/95	5/26/99	10/25/00
Aluminum	**14100**	683	1390
Iron	**4530**	**4990**	<272

LEGEND

MONITORING WELL ⊙

ASTERISK INDICATES WELL SAMPLED ✱OLD-18-04

WELL ID — SCREEN INTERVAL — SAMPLE COLLECTION DATE

OLD-18-04 (2.5 TO 12.5')	5/18/95	5/26/99	10/25/00
Aluminum	**7360**	**4840/5270**	**4360**
Iron	**13400**	**10500/6320**	**10000**

ANALYTE — ANALYTE CONCENTRATION[1,2] — DUPLICATE SAMPLE

INDICATES CONCENTRATION IS BETWEEN INSTRUMENT DETECTION LIMIT AND THE CONTRACT-REQUIRED DETECTION LIMIT — B

ESTIMATED VALUE — J

1-GROUNDWATER CONCENTRATIONS IN MICROGRAMS PER LITER (ug/L)

2-BOLD CONCENTRATION INDICATES EXCEEDANCE

NOTE:

DATA ARE SHOWN FOR LOCATIONS WITH PAST OR CURRENT EXCEEDANCES.

SCREENING CRITERIA

ANALYTE	GCTL[1]	BGSV[1]
Aluminum	200	4067
Iron	300	1227
Lead	15	4
Manganese	50	17
Methylene Chloride	5	-
Thallium	2	3.8
Vanadium	49	20.6
PCE	3	-

GCTL=GROUNDWATER CLEANUP TARGET LEVEL
BGSV=BACKGROUND SCREENING VALUE
PCE=TETRACHLOROETHENE

FIGURE 2

GROUNDWATER EXCEEDANCES
OCTOBER 2000
STUDY AREA 18 - MAIN BASE

NAVAL TRAINING CENTER
ORLANDO, FLORIDA

n11x17b.dgn

CAD FILE NO./DATE: 7457M069.dgn/1-16-01

TABLES

No.

1 Water-Level Elevations Summary – Study Area 18

2 Positive Detections in Groundwater – October 2000

3 Historical Detections In Groundwater – Study Area 18

4 Validated Groundwater Analytical Results – October 2000

TABLE 1

WATER-LEVEL ELEVATIONS SUMMARY
STUDY AREA 18

NAVAL TRAINING CENTER, ORLANDO
ORLANDO, FLORIDA

Well	Screen Interval (BGS)	TOC Elevation (AMSL)	5/30/95		6/17/96		7/13/98	
			Depth to Water (BTOC)	Groundwater Elevation (AMSL)	Depth to Water (BTOC)	Groundwater Elevation (AMSL)	Depth to Water (BTOC)	Groundwater Elevation (AMSL)
OLD-18-01	2.5 - 12.5	90.79	6.01	84.78	4.64	86.15	NM	-
OLD-18-02	2.5 - 12.5	90.59	NM	-	NM	-	NM	-
OLD-18-03	2.5 - 12.5	91.24	NM	-	NM	-	NM	-
OLD-18-04	2.5 - 12.5	90.11	4.11	86.00	NM	-	NM	-
MW-1	2 - 12	95.02*	not installed		not installed		4.43	90.59*
MW-2	2 - 12	94.81*	not installed		not installed		4.26	90.55*
MW-3	2 - 12	95.38*	not installed		not installed		4.77	90.61*

Well	8/5/98				10/25/00	
	Depth to Water (BTOC)	Groundwater Elevation (AMSL)	Depth to Water (BTOC)	Groundwater Elevation (AMSL)	Depth to Water (BTOC)	Groundwater Elevation (AMSL)
OLD-18-01	NM	-	5.24	85.55	4.85	85.94
OLD-18-02	NM	-	5.15	85.44	4.50	86.09
OLD-18-03	NM	-	6.22	85.02	5.44	85.80
OLD-18-04	NM	-	4.50	85.61	3.81	86.30
MW-1	4.36	90.66*	5.65	89.37*	NM	-
MW-2	4.20	90.61*	5.30	89.51*	NM	-
MW-3	4.70	90.68*	5.09	90.29*	NM	-

Notes:
All measurements are in units of feet.
AMSL - Above mean sea level
BGS - Below ground surface
BTOC - Below top of casing
NM - Not measured
TOC - Top of casing
All wells are Type II wells, 2 inches in diameter.
*Top of Casing relative to an arbitrary datum. Not comparable to the elevations for the other monitoring wells.

TABLE 2

POSITIVE DETECTIONS IN GROUNDWATER - OCTOBER 2000
STUDY AREA 18

NAVAL TRAINING CENTER
ORLANDO, FLORIDA

WELL DESIGNATION	CAS NUMBER	Screening Criteria [a]		OLD-18-01	OLD-18-02	OLD-18-03	OLD-18-04
SAMPLE ID		Florida GCTL [b]	NTC BGSV [c]	NTC18G00111	NTC18G00211	NTC18G00311	NTC18G00411
LAB ID				A0J280105008	A0J280105005	A0J280105006	A0J280105007
SAMPLE DATE				10/25/2000	10/25/2000	10/25/2000	10/25/2000
INORGANICS (µg/L)							
ALUMINUM	7429-90-5	200	4067	4620	508	1390	4360
ANTIMONY	7440-36-0	6	4.1			5.4	
ARSENIC	7440-38-2	50	5		11.7		5.6
BARIUM	7440-39-3	2000	31.4	87.1	100	19.2	153
CALCIUM	7440-70-2	*	36,830	19,300	11,700	30,400	9900
CHROMIUM	7440-47-3	100	7.8	16.7	2.6	2	21.5
COBALT	7440-48-4	420	*				2.5
COPPER	7440-50-8	1000	5.4	4.9			10.6
IRON	7439-89-6	300	1227	5150	2710		10,000
LEAD	7439-92-1	15	4	1.6			3.7
MAGNESIUM	7439-95-4	*	4560	3750	3550	2920	4320
MANGANESE	7439-96-5	50	17	56.6	11.8	7.6	31.1
NICKEL	7440-02-0	100	*	7.9			12
POTASSIUM	7440-09-7	*	5400	6650	1160	2870	6970
SODIUM	7440-23-5	160,000	18,222	15,200	7230	8340	25,400
VANADIUM	7440-28-0	49	20.6	14.9	2.8	11.3	19.8
ZINC	7440-66-6	5000	4	22.1			

Notes:

*Indicates that the screening value is not available

Empty cells indicate non detects

"J" qualifier indicates an estimated value.

NA Not analyzed.

Only chemicals detected in at least one sample are shown.

Values in shaded cells are equal to or exceed the screening criteria.

[a]For an organic analyte, the screening criterion is the GCTL; for an inorganic analyte with an established GCTL and BGSV, the screening criterion is the greater of the GCTL or the BGSV. Analytes with no GCTL are not considered to have exceedances.

[b]Groundwater Cleanup Target Level (Development fo Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., May 26, 1999).

[c]Background Screening Value (Background Sampling Report for NTC, Orlando, Florida; ABB Environmental Services, August 1995) for inorganics only.

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TABLE 3

HISTORICAL GROUNDWATER DETECTIONS
STUDY AREA 18

NAVAL TRAINING CENTER
ORLANDO, FLORIDA

Well Designation	Screening Criteria		OLD-18-01				OLD-18-02			OLD-18-03			OLD-18-04			
Sample ID			18G00101	18G00102	NTC18G00110	NTC18G00111	18G00201	NTC18G00210	NTC18G00211	18G00301	NTC18G00310	NTC18G00311	18G00401	NTC18G00410	NTC18G00410-D	NTC18G00411
Lab ID	Florida		G7705002	MB169003	F4206-4	A0J280105008	G7607007	F4206-5	A0J280105005	G7607008	F4206-6	A0J280105006	G7607009	F4206-7	F4206-7	A0J280105007
Sample Date	GCTL[b]	NTC BGSV[c]	5/30/1995	6/17/1996	5/26/1999	10/25/2000	5/18/1995	5/26/1999	10/25/2000	5/18/1995	5/26/1999	10/25/2000	5/18/1995	5/26/1999	5/26/1999	10/25/2000
VOLATILE ORGANICS (µg/L)			NA	NA	NA	NA		NA	NA		NA	NA		NA		NA
CIS-1,2-DICHLOROETHENE	70														2.3	
CIS/TRANS-1,2-DICHLOROETHENE	63															
METHYLENE CHLORIDE	5															
TETRACHLOROETHENE	3														0.74 J	
TRICHLOROETHENE	3															
XYLENE (TOTAL)	20						0.3J						1			
SEMIVOLATILE ORGANICS (µg/L)				NA	NA	NA		NA	NA		NA	NA		NA	NA	NA
ACENAPHTHENE	210						2J									
BIS(2-ETHYLHEXYL)PHTHALATE	6						1						2			
1-METHYLNAPHTHALENE	20															
2-METHYLNAPHTHALENE	20															
NAPHTHALENE	20						12									
PHENANTHRENE	210															
INORGANICS (µg/L)																
ALUMINUM	200	4067	65,600	5620	5160	4620	21,900	1050	508	14,100	683	1390	7360	4840	5270	4360
ALUMINUM (dissolved)	200	4067		5530 J	4990	NA		572	NA		272	NA		3850	5450	NA
ANTIMONY	6	4.1										5.4				
ARSENIC	50	5	14.6 J	3 BJ	3.4		33.4	24.6	11.7				6.2 J	6.6	4.2	5.6
ARSENIC (dissolved)	50	5		3.3 BJ	4	NA		18	NA			NA		6.9		NA
BARIUM	2000	31.4	590 J	71.1 B	82.8	87.1	159 B	70.8	100	74.4 B	27.1	19.2	208	164	87	153
BARIUM (dissolved)	2000	31.4		68.7 B	84.3	NA		67	NA		25.4	NA		158	86.3	NA
BERYLLIUM	4	*	3.6 B	0.57 B			0.36 B			0.32 B			1.5 B			
BERYLLIUM (dissolved)	4	*		0.48 B		NA			NA			NA				NA
CADMIUM	5	5.6		3.8 B												
CALCIUM	*	36,830	14,300	7760	9800	19,300	6490	6480	11,700	1660 B	18,500	30,400	5130	7660	10,400	9900
CALCIUM (dissolved)	*	36,830		7790	10,300	NA		6310	NA		18,000	NA		7850	10,600	NA
CHROMIUM	100	7.8	95.6	21.8	20.8	16.7	27.5		2.6			2	27.8	25.6	21.9	21.5
CHROMIUM (dissolved)	100	7.8		20.1	21.5	NA			NA			NA		21.9	23.6	NA
COBALT	420	*	8.3 J	3 B			3.4 B			3.3 B			3.6 B			2.5
COPPER	1000	5.4	27.6	11.8 B		4.9	4.8 B							7.1		10.6
IRON	300	1227	23,400	5410	6010	5150	4500	3990	2710	4530	4990		13,400	10,500	6320	10,000
IRON (dissolved)	300	1227		5250	6120	NA		3650	NA		4590	NA		10,200	6380	NA
LEAD	15	4	54.8			1.6	12			3.9			5.1			3.7
MAGNESIUM	*	4560	9950	3020 B	3110	3750	2370 B	2170	3550	2760 B	3580	2920	5610	3990	3280	4320
MAGNESIUM (dissolved)	*	4560		3000 B	3230	NA		2100	NA		3470	NA		3970	3300	NA
MANGANESE	50	17	53.5	27.6	37.8	56.6	20.3	10.4	11.8	14.8 B	14.3	7.6	19.6	22.9	39.8	31.1
MANGANESE (dissolved)	50	17		27.5	40.9	NA		14.5	NA		14.6	NA		27	41.1	NA
MERCURY	2	0.12	0.68	0.12 B				0.28								
MERCURY (dissolved)	2	0.12		0.09 B		NA			NA			NA				NA
NICKEL	100	*	76	13.8 B		7.9										12
NICKEL (dissolved)	100	*		10.6 B		NA			NA			NA				NA
POTASSIUM	*	5400	7190	9470	5780	6650	1200 B	797	1160	1060 B	1020	2870	3040 B	4310	5940	6970
POTASSIUM (dissolved)	*	5400		9680	5770	NA		759	NA		940	NA		4630	5740	NA
SELENIUM	50	9.7	8.5													
SODIUM	160,000	18,222	30,000	31,700 J	14,400	15,200	10,000	6300	7230	9620	8120	8340	28,900	25,500	15,200	25,400
SODIUM (dissolved)	160,000	18,222		32,000 J	15,000	NA		6020	NA		7730	NA		25,600	15,100	NA
THALLIUM	2	3.8	79.4 J													
VANADIUM	49	20.6	211	19.8 B	20.4	14.9	22.4 B		2.8	18.1 B	24.2	11.3	38.4 B	20.9	22	19.8
VANADIUM (dissolved)	49	20.6		17.7 B	22.2	NA			NA		19.8	NA		19.4	23.6	NA
ZINC	5000	4	20.1			22.1									37.4	
ZINC (dissolved)	5000	4			38.4	NA			NA			NA				NA

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TABLE 3

HISTORICAL GROUNDWATER DETECTIONS
STUDY AREA 18

NAVAL TRAINING CENTER
ORLANDO, FLORIDA

Well Designation	Screening Criteria		MW-1		MW-2		MW-3	
Sample ID			081GM101	NTC18GMW110	081GM201	NTC18GMW210	081GM301	NTC18GMW310
Lab ID	Florida		S884722-3	F4206-1	S884722-4	F4206-2	S884722-5	F4206-3
Sample Date	GCTL[b]	NTC BGSV[c]	8/5/1998	5/25/1999	8/5/1998	5/25/1999	8/5/1998	5/25/1999
VOLATILE ORGANICS (µg/L)								
CIS-1,2-DICHLOROETHENE	70					2.7		
CIS/TRANS-1,2-DICHLOROETHENE	63		24		49			
METHYLENE CHLORIDE	5				24		28	
TETRACHLOROETHENE	3					0.81 J	4.9	
TRICHLOROETHENE	3					0.44 J		0.71 J
XYLENE (TOTAL)	20							
SEMIVOLATILE ORGANICS (µg/L)				NA		NA		NA
ACENAPHTHENE	210		1.1 X					
BIS(2-ETHYLHEXYL)PHTHALATE	6							
1-METHYLNAPHTHALENE	20		4.5					
2-METHYLNAPHTHALENE	20		4.6					
NAPHTHALENE	20		5.4		1.6			
PHENANTHRENE	210		0.35					
INORGANICS (µg/L)			NA	NA	NA	NA	NA	NA
ALUMINUM	200	4067						
ALUMINUM (dissolved)	200	4067						
ANTIMONY	6	4.1						
ARSENIC	50	5						
ARSENIC (dissolved)	50	5						
BARIUM	2000	31.4						
BARIUM (dissolved)	2000	31.4						
BERYLLIUM	4	*						
BERYLLIUM (dissolved)	4	*						
CADMIUM	5	5.6						
CALCIUM	*	36,830						
CALCIUM (dissolved)	*	36,830						
CHROMIUM	100	7.8						
CHROMIUM (dissolved)	100	7.8						
COBALT	420	*						
COPPER	1000	5.4						
IRON	300	1227						
IRON (dissolved)	300	1227						
LEAD	15	4						
MAGNESIUM	*	4560						
MAGNESIUM (dissolved)	*	4560						
MANGANESE	50	17						
MANGANESE (dissolved)	50	17						
MERCURY	2	0.12						
MERCURY (dissolved)	2	0.12						
NICKEL	100	*						
NICKEL (dissolved)	100	*						
POTASSIUM	*	5400						
POTASSIUM (dissolved)	*	5400						
SELENIUM	50	9.7						
SODIUM	160,000	18,222						
SODIUM (dissolved)	160,000	18,222						
THALLIUM	2	3.8						
VANADIUM	49	20.6						
VANADIUM (dissolved)	49	20.6						
ZINC	5000	4						
ZINC (dissolved)	5000	4						

TABLE 3

HISTORICAL GROUNDWATER DETECTIONS
STUDY AREA 18

NAVAL TRAINING CENTER
ORLANDO, FLORIDA

Notes:
* The screening value is not available
B: Concentrations between instrument detection limit and reporting limit.
D: The reported value is from a dilution
J: Estimated concentration
x: Less than 40% relative percent difference, lower value reported.
Empty cells indicate non-detects.
NA: Not analyzed.
Only chemicals detected in at least one sample are shown.
Values in shaded cells equal to or exceed the screening criteria
[a] For an organic analyte, the screening criterion is the GCTL; for an inorganic analyte with an established GCTL and BGSV, the screening criterion is the greater of the GCTL or the BGSV.
[b] Groundwater Cleanup Target Level (Development of Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F. A. C., May 26, 1999).
[c] Background Screening Value (Background Sampling Report for NTC, Orlando, Florida; ABB Environmental Services, August 1995) for inorganics only.

TABLE 4

VALIDATED GROUNDWATER ANALYTICAL RESULTS - OCTOBER 2000
STUDY AREA 18

NAVAL TRAINING CENTER
ORLANDO, FLORIDA

WELL DESIGNATION	CAS NUMBER	Screening Criteria [a]		OLD-18-01	OLD-18-02	OLD-18-03	OLD-18-04
SAMPLE ID		Florida GCTL [b]	NTC BGSV [c]	NTC18G00110	NTC18G00210	NTC18G00310	NTC18G00410
LAB ID				A0J280105008	A0J280105005	A0J280105006	A0J280105007
SAMPLE DATE				10/25/2000	10/25/2000	10/25/2000	10/25/2000
INORGANICS (µg/L)							
ALUMINUM	7429-90-5	200	4067	**4620**	508	1390	**4360**
ANTIMONY	7440-36-0	6	4.1	4.3 U	4.3 U	5.4	4.3 U
ARSENIC	7440-38-2	50	5	3.6 U	11.7	3.6 U	5.6
BARIUM	7440-39-3	2000	31.4	87.1	100	19.2	153
BERYLLIUM	7440-41-7	4	*	0.64 U	0.28 U	0.26 U	1.2 U
CADMIUM	7440-43-9	5	5.6	0.4 U	0.4 U	0.4 U	0.4 U
CALCIUM	7440-70-2	*	36,830	19,300	11,700	30,400	9900
CHROMIUM	7440-47-3	100	7.8	16.7	2.6	2	21.5
COBALT	7440-48-4	420	*	2.2 U	2.2 U	2.2 U	2.5
COPPER	7440-50-8	1000	5.4	4.9	1.9 U	1.9 U	10.6
IRON	7439-89-6	300	1227	**5150**	**2710**	272 U	**10,000**
LEAD	7439-92-1	15	4	1.6	1.3 U	1.3 U	3.7
MAGNESIUM	7439-95-4	*	4560	3750	3550	2920	4320
MANGANESE	7439-96-5	50	17	**56.6**	11.8	7.6	31.1
MERCURY	7439-97-6	2	0.12	0.1 U	0.1 U	0.1 U	0.1 U
NICKEL	7440-02-0	100	*	7.9	1.9 U	1.9 U	12
POTASSIUM	7440-09-7	*	5400	6650	1160	2870	6970
SELENIUM	7782-49-2	50	9.7	4.3 U	4.3 U	4.3 U	4.3 U
SILVER	7440-22-4	100	*	3.1 U	3.1 U	3.1 U	3.1 U
SODIUM	7440-23-5	160,000	18,222	15,200	7230	8340	25,400
THALLIUM	7440-28-0	2	3.8	1.2 UJ	1.2 U	1.2 U	2.4 UJ
VANADIUM	7440-62-2	49	20.6	14.9	2.8	11.3	19.8
ZINC	7440-66-6	5000	4	22.1	0.6 U	4.7 U	3.5 U

Notes:

*Indicates that the screening value is not available.

"J" qualifier indicates an estimated value.

"U" qualifier indicates a non-detect.

"R" qualifier indicates a rejected value.

NA Not analyzed.

Values in shaded cells are equal to or exceed the screening criteria.

[a]For an organic analyte, the screening criterion is the GCTL; for an inorganic analyte with an established GCTL and BGSV, the screening criterion is the greater of the GCTL or the BGSV. Analytes with no GCTL are not considered to have exceedances.

[b]Groundwater Cleanup Target Level (Development fo Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., May 26, 1999).

[c]Background Screening Value (Background Sampling Report for NTC Orlando, Florida; ABB Environmental Services, August 1995) for inorganics only.

ATTACHMENT A

GROUNDWATER SAMPLE LOG SHEETS

Tetra Tech NUS, Inc.

GROUNDWATER LEVEL MEASUREMENT SHEET SA 18

Project Name: NTC Orlando **Project No.:** #7457
Location: SA18 McCoy Annex **Personnel:** B. Bobo & C. Morrison
Weather Conditions: Sunny 79°F **Measuring Device:** Water Level Indicator
Tidally Influenced: Yes ___ No ___ **Remarks:**

Well or Piezometer Number	Date	Time	Elevation of Reference Point (feet)*	Total Well Depth (feet)*	Water Level Indicator Reading (feet)*	Thickness of Free Product (feet)*	Groundwater Elevation (feet)*	Comments
OLD-18-01	10/25/00	1130			4.85			
OLD-18-02	↓	↓			4.50			
OLD-18-03	↓	↓			5.44			
OLD-18-04	↓	1210			3.81			

Date 10/25/00

Groundwater Purging and Sampling Log

Tetra Tech NUS

Project Site Name: NTC Orlando
Project No.: 7457/

Sample Location: OLD-18-01

[ ] Domestic Well Data

Flow-Thru Cell
Make\Model: HORIBA U-22

Sample ID No.: NTC18G-00110

[X] Monitoring Well Data

Serial Nos.: 90120414

Sampled By: C. Morrison

[ ] Other Well Type:

C-O-C No.:

PURGING DATA

Casing Size (in.)	Gals. / Liters per ft. of Water	Time Hr:Min	pH pH units	S.C. mS/cm	Temp. °C	Turbidity NTU	DO mg/L	ORP mV	DTW ft BTOC	Flow Rate ml/min
0.5	0.01 / 0.038	1454	5.41	0.322	32.18	9.7	2.35	5	4.89	100
1	0.041 / 0.155	1459	5.39	0.326	32.24	9.15	1.76	-1		
2	0.163 / 0.617	1504	5.38	0.327	32.84	9.30	1.45	-3		
4	0.653 / 2.47	1509	5.39	0.330	33.07	8.14	1.21	-3		
6	1.469 / 5.56	1514	5.39	0.332	33.22	8.82	1.28	-9		
8	2.611 / 9.88	1519	5.38	0.332	32.49	8.88	0.99	-9		
10	4.08 / 15.44	1522	5.37	0.333	32.50	9.01	0.95	-9		
	[1 gal. = 3.785 L]	1525	5.37	0.333	32.97	9.04	0.89	-7		

PID Reading (ppm): 0

Well Casing Diameter: 2"
Total Well Depth: 12.5'
Static Water Level: 4.85'
Tube Intake Depth: 10.5'

Start Purge (hr): 1444
End Purge (hr): 1525
Total Purge Time (min): 41
Total Vol. Purged: 4100 mL

WATER QUALITY SAMPLE PARAMETERS

	Color Description	pH pH units	S.C. mS/cm	Temp. °C	Turbidity NTU	DO mg/L	ORP mV	DTW ft BTOC	Flow Rate ml/min
Date: 10/25/00									
Time: 1535		5.37	0.333	32.97	9.04	0.89	-7	4.89	100

ANALYSES INFORMATION

Analysis		Preservative	Container Requirements			Collected
TCL VOCs	8260B	HCl	3	40 ml	glass vials	
SVOCs/PAHs	8270C/8310	None	2	1-liter	amber glass	
Pesticides	8081A	None	1	1-liter	amber glass	
Herbicides	8151	None	1	1-liter	amber glass	
X-tra Organic	8XXX	None	1 or 2	1-liter	amber glass	
TAL Metals	6000/7000	HNO_3		1-liter	HDPE	1
			Total 1			

ADDITIONAL INFORMATION

Comments:

Method:
[X] Peristaltic Pump
[ ] Centrifugal Pump
[ ] Bladder Pump
[ ] Tube Evacuation
[ ] Vacuum Jug Assembly
[ ] Bailer

Tubing Type:
[ ] Polyethylene
[ ] Teflon
[X] Teflon-lined Polyethylene

QA\QC SAMPLES

MS/MSD: N/A

Duplicate ID No.: N/A

Signature(s): Chris Morrison

Groundwater Purging and Sampling Log

Tetra Tech NUS

Date 10/25/00

Project Site Name: NTC Orlando
Project No.: 7457/

Sample Location: 18-02.

[ ] Domestic Well Data

[X] Monitoring Well Data

[ ] Other Well Type:

Flow-Thru Cell
Make\Model: HORIBA U-22
Serial Nos.: 9282040 / 928026

Sample ID No.: NTC186002.10

Sampled By: BRB

C-O-C No.:

PURGING DATA

Casing Size (in.)	Gals. / Liters per ft. of Water	Time Hr:Min	pH pH units	S.C. mS/cm	Temp. °C	Turbidity NTU	DO mg/L	ORP mV	DTW ft BTOC	Flow Rate ml/min
0.5	0.01 / 0.038	1300	5.02	0.176	30.15	61	2.47	-97	4.59	100
1	0.041 / 0.155	1305	5.02	0.176	30.12	50	2.03	-100	4.58	↓
2	0.163 / 0.617	1310	5.02	0.174	30.14	37	1.31	-106	4.58	↓
4	0.653 / 2.47	1320	5.01	0.172	30.39	34	1.04	-107	4.58	↓
6	1.469 / 5.56	1325	4.98	0.171	30.39	30	0.75	-104	4.58	80
8	2.611 / 9.88	1330	4.97	0.170	30.21	21	0.76	-105	4.58	↓
10	4.08 / 15.44	1335	4.96	0.168	30.18	21	0.60	-103	4.58	↓
	[1 gal. = 3.785 L]	1340	4.97	0.168	30.12	21	0.77	-101	4.58	↓
		1345	4.95	0.168	29.93	21	0.68	-102	4.58	↓
PID Reading (ppm): 0		1350	4.90	0.167	30.01	21	0.70	-104	4.58	↓
		1355	4.90	0.166	30.05	18	0.60	-103	4.58	↓
		1400	4.88	0.166	30.30	16	0.59	-101	4.58	↓
Well Casing Diameter: 2"		1405	4.87	0.166	30.33	15	0.56	-100	4.58	↓
Total Well Depth:		1410	4.87	0.165	30.30	15	0.58	-100	4.58	↓
Static Water Level:										
Tube Intake Depth:										
Start Purge (hr): 1255										
End Purge (hr): 1410										
Total Purge Time (min): 75										
Total Vol. Purged: 6000 ml										

WATER QUALITY SAMPLE PARAMETERS

	Color Description	pH pH units	S.C. mS/cm	Temp. °C	Turbidity NTU	DO mg/L	ORP mV	DTW ft BTOC	Flow Rate ml/min
Date: 10/25/00									
Time: 1410	clear	4.87	0.165	30.30	15	0.58	-100	4.58	80

ANALYSES INFORMATION

Analysis		Preservative	Container Requirements			Collected
TCL VOCs	8260B	HCl	3	40 ml	glass vials	
SVOCs/PAHs	8270C/8310	None	2	1-liter	amber glass	N/A
Pesticides	8081A	None	1	1-liter	amber glass	
Herbicides	8151	None	1	1-liter	amber glass	
X-tra Organic	8XXX	None	1 or 2	1-liter	amber glass	
TAL Metals	6000/7000	HNO_3	1	1-liter	HDPE	X

ADDITIONAL INFORMATION

Comments:

Method:
- [X] Peristaltic Pump
- [ ] Centrifugal Pump
- [ ] Bladder Pump
- [ ] Tube Evacuation
- [ ] Vacuum Jug Assembly
- [ ] Bailer

Tubing Type:
- [ ] Polyethylene
- [ ] Teflon
- [X] Teflon-lined Polyethylene

QA\QC SAMPLES

MS/MSD: N/A

Duplicate ID No.: N/A

Signature(s):

Date 10/25/00

Groundwater Purging and Sampling Log

Tetra Tech NUS

Project Site Name: NTC Orlando
Project No.: 7457/

Sample Location: OLD-18-03
Sample ID No.: NTC18G0031Ø ~~NTC18G0031G~~

[ ] Domestic Well Data

[X] Monitoring Well Data

[ ] Other Well Type:

Flow-Thru Cell
Make\Model: HORIBA U-22
Serial Nos.: 9012044

Sampled By: C. Morrisa

C-O-C No.:

PURGING DATA

Casing Size (in.)	Gals. / Liters per ft. of Water	Time Hr:Min	pH pH units	S.C. mS/cm	Temp. °C	Turbidity NTU	DO mg/L	ORP mV	DTW ft BTOC	Flow Rate ml/min
0.5	0.01 / 0.038	1312	5.78	0.259	28.50	35	3.10	119	5.47	100
1	0.041 / 0.155	1317	5.77	0.255	28.07	33	2.88	127		
2	0.163 / 0.617	1322	5.76	0.255	28.41	31	2.59	128		
4	0.653 / 2.47	1327	5.76	0.254	28.41	28	2.48	127		
6	1.469 / 5.56	1332	5.75	0.254	28.46	26	2.41	128		
8	2.611 / 9.88	1337	5.75	0.247	27.91	26	2.43	126		
10	4.08 / 15.44	1342	5.75	0.247	28.25	24	2.42	123		
	[1 gal. = 3.785 L]	1347	5.75	0.247	28.32	24	2.42	122		
		1352	5.73	0.247	28.36	24	2.39	125		
PID Reading (ppm): 0		1357	5.72	0.248	28.41	23	2.32	125		
		1402	5.72	0.248	28.59	23	2.22	124		
		1407	5.71	0.249	28.68	22	2.17	124		
Well Casing Diameter: 2"		1410	5.71	0.250	28.75	22	2.16	125	✓	✓
Total Well Depth: ~~5~~ 13.0'										
Static Water Level: 5.47'										
Tube Intake Depth: 10.0'										
Start Purge (hr): 1302										
End Purge (hr): 1410										
Total Purge Time (min): 68										
Total Vol. Purged: 6800 mL										

WATER QUALITY SAMPLE PARAMETERS

	Color Description	pH pH units	S.C. mS/cm	Temp. °C	Turbidity NTU	DO mg/L	ORP mV	DTW ft BTOC	Flow Rate ml/min
Date: 10/25/00									
Time: 1415		5.71	0.250	28.75	22	2.16	125	5.47	100

ANALYSES INFORMATION

Analysis		Preservative	Container Requirements			Collected
TCL VOCs	8260B	HCl	3	40 ml	glass vials	
SVOCs/PAHs	8270C/8310	None	2	1-liter	amber glass	
Pesticides	8081A	None	1	1-liter	amber glass	
Herbicides	8151	None	1	1-liter	amber glass	
X-tra Organic	8XXX	None	1 or 2	1-liter	amber glass	
TAL Metals	6000/7000	HNO_3	1	1-liter	HDPE	1
			Total 1			

ADDITIONAL INFORMATION

Comments:

Method:
- [X] Peristaltic Pump
- [ ] Centrifugal Pump
- [ ] Bladder Pump
- [ ] Tube Evacuation
- [ ] Vacuum Jug Assembly
- [ ] Bailer

Tubing Type:
- [ ] Polyethylene
- [ ] Teflon
- [X] Teflon-lined Polyethylene

QA\QC SAMPLES

MS/MSD: N/A

Duplicate ID No.: N/A

Signature(s): Chris Morrisa

Groundwater Purging and Sampling Log

Tetra Tech NUS

Date 10/25/00

Project Site Name: NTC Orlando
Project No.: 7457/

Sample Location: 18-04

[ ] Domestic Well Data

[X] Monitoring Well Data

[ ] Other Well Type:

Flow-Thru Cell
Make\Model: HORIBA U-22
Serial Nos.: 9282040 P / 928026 M

Sample ID No.: NTC18G00410

Sampled By: BSB

C-O-C No.:

PURGING DATA

Casing Size (in.)	Gals. / Liters per ft. of Water	Time Hr:Min	pH pH units	S.C. mS/cm	Temp. °C	Turbidity NTU	DO mg/L	ORP mV	DTW ft BTOC	Flow Rate ml/min
0.5	0.01 / 0.038	1440	5.20	0.328	29.75	15	1.78	-16	3.95	100
1	0.041 / 0.155	1445	5.14	0.329	29.83	16	1.21	-11	3.99	100
2	0.163 / 0.617	1450	5.11	0.328	29.77	16	0.85	-8	4.02	100
4	0.653 / 2.47	1455	5.09	0.329	29.38	16	0.71	-15	4.02	80
6	1.469 / 5.56	1500	5.08	0.329	29.14	15	0.72	-20	4.03	80
8	2.611 / 9.88	1505	5.08	0.333	29.46	15	0.70	2	4.04	80
10	4.08 / 15.44	1510	5.06	0.333	29.82	15	0.61	3	4.05	80
	[1 gal. = 3.785 L]	1515	5.05	0.333	29.74	15	0.58	-2	4.06	80
		1520	5.05	0.332	29.74	15	0.58	-3	4.07	80
PID Reading (ppm): 0		1525	5.04	0.332	29.72	15	0.59	-4	4.07	80
		1530	5.04	0.332	29.73	15	0.58	-4	4.07	80

Well Casing Diameter: 2"
Total Well Depth: 12.59
Static Water Level: 3.81
Tube Intake Depth: 10.5

Start Purge (hr): 1435
End Purge (hr): 1530
Total Purge Time (min): 55
Total Vol. Purged: 5200 mL

WATER QUALITY SAMPLE PARAMETERS

	Color Description	pH pH units	S.C. mS/cm	Temp. °C	Turbidity NTU	DO mg/L	ORP mV	DTW ft BTOC	Flow Rate ml/min
Date: 10/25/00									
Time: 1530	Clear	5.04	0.332	29.73	15	0.58	-4	4.07	80

ANALYSES INFORMATION

Analysis		Preservative	Container Requirements			Collected
TCL VOCs	8260B	HCl	3	40 ml	glass vials	
SVOCs/PAHs	8270C/8310	None	2	1-liter	amber glass	N/A
Pesticides	8081A	None	1	1-liter	amber glass	
Herbicides	8151	None	1	1-liter	amber glass	
X-tra Organic	8XXX	None	1 or 2	1-liter	amber glass	
TAL Metals	6000/7000	HNO_3	1	1-liter	HDPE	X

ADDITIONAL INFORMATION

Comments:

Method:
- [X] Peristaltic Pump
- [ ] Centrifugal Pump
- [ ] Bladder Pump
- [ ] Tube Evacuation
- [ ] Vacuum Jug Assembly
- [ ] Bailer

Tubing Type:
- [ ] Polyethylene
- [ ] Teflon
- [X] Teflon-lined Polyethylene

QA\QC SAMPLES

MS/MSD: N/A

Duplicate ID No.: N/A

Signature(s):