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NTC ORLANDO
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STUDY AREA 3 QUARTERLY GROUNDWATER SAMPLING REPORT WITH TRANSMITTAL
LETTER NTC ORLANDO FL
12/30/1999
TETRA TECH



99-A230

December 30, 1999

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

Subject: Study Area 3 Quarterly Groundwater Sampling
Main Base, NTC, Orlando

Dear Ms. Nwokike:

Enclosed are the analytical results from groundwater sampling conducted at SA 3 in October 1999 as part of the Quarterly Groundwater Sampling program. The results for this and previous sampling events are summarized in Table 1. Copies of the construction diagram for new well OLD-03-05 and the field log sheets are attached.

The October 1999 results show that the concentrations of PCE (2.2 µg/L in OLD-03-01, and 1.6 µg/L in OLD-03-05) were below the FDEP Groundwater Cleanup Target Level of 3 µg/L for the second consecutive sampling event. As decided by the Orlando Partnering Team at the December 1999 meeting, this meets the site closure criteria and quarterly sampling at SA 3 will be discontinued. If you have any questions, please call me at (865) 220-4730.

Sincerely,

Steven B. McCoy
Task Order Manager

SBM:ckf

Enclosure

c: Mr. Allan Aikens, CH2M Hill
Mr. Rick Allen, Harding Lawson Associates
Mr. David Grabka, FDEP
Mr. Wayne Hansel, SOUTHNAVFACENGCOM
Ms. Nancy Rodriguez, USEPA Region IV
Mr. Michael Campbell, Tetra Tech NUS
Mr. Mark Perry, Tetra Tech NUS (unbound)
Ms. Debbie Wroblewski, Tetra Tech NUS (Cover letter only)
File/db

GROUNDWATER SAMPLING AT STUDY AREA 3

Trip Dates: July 10, 1999, October 2, 6, 23, & 26, 1999

Site Name: Study Area 3
Main Base, Naval Training Center, Orlando, Florida

TO Manager: Steve McCoy

Field Team: Enoch Barton (well installation 7/10/99, 10/2/99)
Kevin Margetts (10/6/99)
Gary Sparks (10/6/99, 10/23/99, 10/26/99)
Jerry Krieger (10/23/99, 10/26/99)

Prepared by: Enoch Barton

1. PURPOSE

Quarterly groundwater sampling was conducted at Study Area (SA) 3 in October 1999. The fieldwork was performed in accordance with the *Work Plan for Groundwater Sampling* (Tetra Tech NUS, 1999), and the *Project Operations Plan (POP)* (ABB-ES. 1997).

2. ACTIVITIES

In July, 1999, Tetra Tech NUS installed a new well at SA 3. Tetra Tech NUS mobilized to the field in October 1999, to perform quarterly monitoring at SA's 2, 3, 52, and Operable Unit 3. Sampling activities at SA 3 began on October 6, 1999, with a site reconnaissance, a water level survey, and groundwater sampling.

Water Level Survey - Groundwater levels were checked in wells OLD-03-01 and OLD-03-05 on October 6, 1999, at which time OLD-03-01 was dry. The level in well OLD-03-01 was checked again on October 23 & 26, 1999, and was found to contain groundwater on the latter date.

Well Installation - To address low groundwater levels encountered at SA 3 during the second quarter of 1999, a 2-inch monitoring well designated OLD-03-05 was installed on July 10, 1999. The new well is located approximately 6 feet east of OLD-03-01 and is screened from 14 feet to 24 feet below land surface (bls), approximately 7 feet deeper than OLD-03-01 (7-17 feet bls). The well was later developed on October 2, 1999, in conjunction with well development and sampling activities at Building 2273. Soil boring, well construction, and development log sheets are provided in Attachment A.

Sampling - Groundwater sampling of the new well OLD-03-05 was conducted on October 6, 1999. At that time, however, well OLD-03-01 was dry. The well was later checked on October 23, 1999, as part of quarterly

sampling activities, and was found to contain water, but of insufficient volume for sampling. The well was checked again on October 26, 1999, and was found to contain water.

All wells were purged with a peristaltic pump using the low-flow method described in the POP. The purpose of the low-flow purging is to reduce turbidity and the volume of purge water required to obtain representative samples. Purging of the wells consisted of removing groundwater at a rate of approximately 100 ml/min until field parameters, which include temperature, pH, conductivity, turbidity, dissolved oxygen, and oxidation-reduction potential, stabilized. Water levels were monitored every 3 to 5 minutes to ensure that drawdown was less than 0.3 feet.

The use of the low-flow purging method was effective in maintaining low turbidity of the groundwater samples; the turbidity of both samples (03G00113 and OLD-03-05) was less than 10 NTU. Samples were collected with a peristaltic pump using the tube evacuation method. Groundwater sample log sheets are included in Attachment B.

The groundwater samples from SA 3 were analyzed for TCL VOCs using SW 846 Method 8260. All samples were placed in ice-chilled coolers and shipped overnight to Quanterra Environmental Services in North Canton, OH for analysis.

3. PROBLEMS ENCOUNTERED

None to report.

4. RESULTS

Water Level Survey - Water levels, measured in wells OLD-03-01 and OLD-03-05 on October 6, October 23, and October 26, 1999, are listed below.

WELL NO.	10/6/99	10/23/99	10/26/99
OLD-03-01	Dry	Dry	14.32 ft BTOC
OLD-03-05	15.24 ft BTOC	Not Measured	Not Measured

BTOC - Below Top of Casing

Data Validation - All sample analyses were subjected to data validation in accordance with the guidance document *Navy Installation Restoration Laboratory Quality Assurance Guide* (NFESC, 1996). Qualification of the data was performed using the *USEPA Contract Laboratory Program: National Functional Guidelines for Organic 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 1 and 2.

Analytical Results - Historical positive detections are summarized in Table 1 and a complete listing of the validated analytical data for the October 1999 sampling events is included as Table 2. Shaded cells indicate analyte concentrations exceeding the Florida Groundwater Cleanup Target Levels (GCTLs). The October 1999 results show tetrachloroethene (PCE) concentrations in OLD-03-05 and OLD-03-01 to be 1.6 µg/L and 2.2 µg/L, respectively. Thus the PCE concentrations at SA 3 have been below the GCTL of 3 µg/L for two consecutive sampling events.

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.

NFESC (Naval Facilities Engineering Service Center), 1996. *Navy Installation Restoration Laboratory Quality Assurance Guide (Interim Guidance Document)*, February.

Tetra Tech NUS, Inc., 1999. *Work Plan for Groundwater Sampling*. Document No. R4707995, October.

USEPA, 1994. *Contract Laboratory Program Nation Functional Guidelines for Organic Data Review*. EPA/540/R-94/012, Office of Solid Waste and Emergency Response, Washington, D.C., February.

TABLES

No.

- 1 Historical Detections in Groundwater
- 2 Validated Groundwater Analytical Results - October 1999

**TABLE 1
HISTORICAL DETECTIONS IN GROUNDWATER
STUDY AREA 3**

**NAVAL TRAINING CENTER
ORLANDO, FL
PAGE 1 OF 4**

WELL DESIGNATION	OLD-03-01*														
	Florida GCTL	Primary FEDMCL	RBC ^(a) for Tap Water	03G00101	03G00103	03G00104	03G00105	03G00106	03G00107	03G00108	03G00109	03G00110	03G00111	03G00112	03G00113
SAMPLE DATE				10-Nov-94	30-Dec-96	4-Mar-97	10-Apr-97	1-Jul-97	29-Sep-97	2-Feb-98	19-May-98	26-Aug-98	17-Dec-98	23-Feb-09	26-Oct-99
Volatile Organics, ug/L															
Benzene	1 ^(b)	5	0.36 c		1										
Ethylbenzene	30 ^(c)	700	1,300 n		6										
Isopropylbenzene	0.8 ^(d)	ND	ND		2									NA	NA
Methylene chloride	5 ^(b)	5	4.1 c			0.23 J						0.19 J			
Naphthalene	20 ^(d)	ND	1,500 n		15									NA	NA
n-Propylbenzene	ND	ND	ND		4									NA	NA
Tetrachloroethene	3 ^(b)	5	1.1 c	9		5.3	5.9	5.1	3	3	2.1	5.5	3.7	2.9	2.2
Trichlorofluoromethane	2,100 ^(e)	ND	1,300 n											NA	NA
Toluene	40 ^(c)	1,000	750 n		4										
1,1,1-Trichloroethane	200 ^(b)	200	1.6 c	8					0.12 J			0.11 J			
1,3,5-Trimethylbenzene	10 ^(d)	ND	300 n		14									NA	NA
Xylenes (total)	20 ^(c)	10,000	12,000 n		7										
Semivolatile Organics, ug/L															
bis(2-ethylhexyl)phthalate	6 ^(b)	ND	4.8 c	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pesticides/PCBs, ug/L															
Aroclor-1260	0.5 ^(b)	0.5	4.8 c		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics, ug/L															
Aluminum	200 ^(c)	ND	37,000 n	90.1 B	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	2,000 ^(b)	2,000	2,600 n		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	ND	ND	1,000,000	28800	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium ^(f)	100 ^(b)	100	180 n		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	1,000 ^(c)	ND	1,500 n		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	300 ^(c)	ND	11,000 n	8 B	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	15 ^(b)	15	15		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	ND	ND	118,807	1860 B	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	50 ^(c)	ND	840 n	3.2 B	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	100 ^(b)	100	730 n	11.9 B	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	ND	ND	297,016	1130 B	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	160,000 ^(b)	ND	396,022	2200 B	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	49 ^(e)	ND	260 n	2.8 B	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	5,000 ^(c)	ND	11,000 n	3.2 B	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

**TABLE 1
HISTORICAL DETECTIONS IN GROUNDWATER
STUDY AREA 3**

**NAVAL TRAINING CENTER
ORLANDO, FL
PAGE 2 OF 4**

WELL DESIGNATION	OLD-03-04 *												
	Florida GCTL	Primary FEDMCL	RBC ^(a) for Tap Water	03G00401	03G00403	03G00404	03G00405	03G00408	03G00407	03G00408	03G00409	03G00410	03G00411
SAMPLE ID				10-Nov-94	30-Dec-96	4-Mar-97	10-Apr-97	1-Jul-97	29-Sep-97	2-Feb-98	19-May-98	26-Aug-98	17-Dec-98
SAMPLE DATE													
Volatle Organics, ug/L													
Benzene	1 ^(b)	5	0.36 c										
Ethylbenzene	30 ^(c)	700	1,300 n										
Isopropylbenzene	0.8 ^(d)	ND	ND										
Methylene chloride	5 ^(b)	5	4.1 c										
Naphthalene	20 ^(d)	ND	1,500 n										
n-Propylbenzene	ND	ND	ND										
Tetrachloroethene	3 ^(b)	5	1.1 c	12		0.65	0.88	2.6	6	4	2.7	2.2	1.6 J
Trichlorofluoromethane	2,100 ^(e)	ND	1,300 n				0.2 J						
Toluene	40 ^(c)	1,000	750 n										
1,1,1-Trichloroethane	200 ^(b)	200	1.6 c										
1,3,5-Trimethylbenzene	10 ^(d)	ND	300 n										
Xylenes (total)	20 ^(c)	10,000	12,000 n										
Semivolatile Organics, ug/L													
bis(2-ethylhexyl)phthalate	6 ^(b)	ND	4.8 c	1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pesticides/PCBs, ug/L													
Aroclor-1260	0.5 ^(b)	0.5	4.8 c		NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics, ug/L													
Aluminum	200 ^(c)	ND	37,000 n	292	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	2,000 ^(b)	2,000	2,600 n	0.79 B	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	ND	ND	1,000,000	26100	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium ^(f)	100 ^(b)	100	180 n	2.4 B	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	1,000 ^(c)	ND	1,500 n	15 B	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	300 ^(c)	ND	11,000 n	69.6 B	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	15 ^(b)	15	15		NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	ND	ND	118,807	2390 B	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	50 ^(c)	ND	840 n	1.6 B	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	100 ^(b)	100	730 n		NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	ND	ND	297,016	2140 B	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	160,000 ^(b)	ND	396,022	3040 B	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	49 ^(e)	ND	260 n	3.9 B	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	5,000 ^(c)	ND	11,000 n	2.1 B	NA	NA	NA	NA	NA	NA	NA	NA	NA

**TABLE 1
HISTORICAL DETECTIONS IN GROUNDWATER
STUDY AREA 3**

**NAVAL TRAINING CENTER
ORLANDO, FL
PAGE 3 OF 4**

WELL DESIGNATION				OLD-03-05 *
SAMPLE ID	Florida GCTL	Primary FEDMCL	RBC ^(a) for Tap Water	03G00513
SAMPLE DATE				6-Oct-99
Volatile Organics, ug/L				
Benzene	1 ^(b)	5	0.36 c	
Ethylbenzene	30 ^(c)	700	1,300 n	
Isopropylbenzene	0.8 ^(d)	ND	ND	NA
Methylene chloride	5 ^(b)	5	4.1 c	
Naphthalene	20 ^(d)	ND	1,500 n	NA
n-Propylbenzene	ND	ND	ND	NA
Tetrachloroethene	3 ^(b)	5	1.1 c	1.6
Trichlorofluoromethane	2,100 ^(e)	ND	1,300 n	NA
Toluene	40 ^(c)	1,000	750 n	0.18 J
1,1,1-Trichloroethane	200 ^(b)	200	1.6 c	
1,3,5-Trimethylbenzene	10 ^(d)	ND	300 n	NA
Xylenes (total)	20 ^(c)	10,000	12,000 n	
Semivolatile Organics, ug/L				
bis(2-ethylhexyl)phthalate	6 ^(b)	ND	4.8 c	NA
Pesticides/PCBs, ug/L				
Aroclor-1260	0.5 ^(b)	0.5	4.8 c	NA
Inorganics, ug/L				
Aluminum	200 ^(c)	ND	37,000 n	NA
Barium	2,000 ^(b)	2,000	2,600 n	NA
Calcium	ND	ND	1,000,000	NA
Chromium ^(f)	100 ^(b)	100	180 n	NA
Copper	1,000 ^(c)	ND	1,500 n	NA
Iron	300 ^(c)	ND	11,000 n	NA
Lead	15 ^(b)	15	15	NA
Magnesium	ND	ND	118,807	NA
Manganese	50 ^(c)	ND	840 n	NA
Nickel	100 ^(b)	100	730 n	NA
Potassium	ND	ND	297,016	NA
Sodium	160,000 ^(b)	ND	396,022	NA
Vanadium	49 ^(e)	ND	260 n	NA
Zinc	5,000 ^(c)	ND	11,000 n	NA

**TABLE 1
HISTORICAL DETECTIONS IN GROUNDWATER
STUDY AREA 3**

**NAVAL TRAINING CENTER
ORLANDO, FL
PAGE 4 OF 4**

NOTES:

* Groundwater sampling sequence number 02 for these two wells (i.e., 03G00102, 03G00402) are non-existent due to a sample numbering error.

^(a) RBC = Risk-Based Concentration Table, USEPA Region III, May 1996, R.L. Smith. RBC for chromium is based on chromium VI. RBC for lead is not available, value is treatment technology action limit for lead in drinking water distribution system identified in Drinking Water Standards and Health Advisories (USEPA, 1996). Essential nutrients (calcium, magnesium, potassium, and sodium) screening values were derived based on recommended daily allowances (RDAs).

^(b) Primary Standard

^(c) Secondary Standard

^(d) Organoleptic

^(e) Minimum Criteria

^(f) Chromium VI

n = noncarcinogenic pathway

c = carcinogenic pathway

ND = Not determined

NA = Not analyzed

ID = Identifier

USEPA = U.S. Environmental Protection Agency

GCTL = Florida Department of Environmental Protection, Groundwater Cleanup Target Levels, May 1999.

FEDMCL = Federal Maximum Contaminant Levels, Primary Drinking Water Regulations and Health Advisories, October 1996.

"B" qualifier indicates reported concentration is between the instrument detection limit (IDL) and the contract required detection limit (CRDL).

"J" qualifier indicates reported concentration is an estimated quantity.

µg/L = micrograms per liter.

Shaded numbers indicate exceedance of groundwater guidance and background (inorganics only).

Blank space indicates analyte/compound was not detected at the reporting limit.

TABLE 2
VALIDATED GROUNDWATER RESULTS - OCTOBER 1999
STUDY AREA 3

NAVAL TRAINING CENTER
ORLANDO, FL
PAGE 1 OF 1

Well Designation	Screening Criteria ^(a)		OLD-03-01	OLD-03-05
Sample ID	CAS Number	Florida GCTL ^(b)	NTC03G00113	NTC03G00513
Lab ID			A9J270191007	A9J070133007
Sample Date			10/26/99	10/6/99
Volatiles (µg/L)				
1,1,1-TRICHLOROETHANE	71-55-6	200	1 U	1 U
1,1,2,2-TETRACHLOROETHANE	79-34-5	0.2	1 U	1 U
1,1,2-TRICHLOROETHANE	79-00-5	5	1 U	1 U
1,1-DICHLOROETHANE	75-34-3	70	1 U	1 U
1,1-DICHLOROETHENE	75-35-4	7	1 U	1 U
1,2-DICHLOROETHANE	107-06-2	3	1 U	1 U
1,2-DICHLOROPROPANE	78-87-5	5	1 U	1 U
2-BUTANONE	78-93-3	4200	10 UR	10 UR
2-HEXANONE	591-78-6	280	10 UJ	10 U
4-METHYL-2-PENTANONE	108-10-1	560	10 U	10 U
ACETONE	67-64-1	700	10 UR	10 UR
BENZENE	71-43-2	1	1 U	1 U
BROMODICHLOROMETHANE	75-27-4	0.6	1 U	1 U
BROMOFORM	75-25-2	4.4	1 U	1 UR
BROMOMETHANE	74-83-9	9.8	1 U	1 UJ
CARBON DISULFIDE	75-15-0	700	1 U	1 U
CARBON TETRACHLORIDE	56-23-5	3	1 U	1 UJ
CHLOROBENZENE	108-90-7	100	1 U	1 U
CHLOROETHANE	75-00-3	12	1 U	1 UJ
CHLOROFORM	67-66-3	5.7	1 U	1 U
CHLOROMETHANE	74-87-3	2.7	1 U	1 U
CIS-1,2-DICHLOROETHENE	156-59-2	70	1 U	1 U
CIS-1,3-DICHLOROPROPENE	10061-01-5	*	1 U	1 UJ
DIBROMOCHLOROMETHANE	124-48-1	0.4	1 U	1 UJ
ETHYLBENZENE	100-41-4	30	1 U	1 U
METHYLENE CHLORIDE	75-09-2	5	1 U	1 U
STYRENE	100-42-5	100	1 U	1 U
TETRACHLOROETHENE	127-18-4	3	2.2	1.6
TOLUENE	108-88-3	40	1 U	0.18J
TRANS-1,2-DICHLOROETHENE	156-60-5	100	1 U	1 U
TRANS-1,3-DICHLOROPROPENE	10061-02-6	*	1 U	1 UJ
TRICHLOROETHENE	79-01-6	3	1 U	1 U
VINYL CHLORIDE	75-01-4	1	1 U	1 U
XYLENES, TOTAL	1330-20-7	20	1 U	1 U

Notes:

* indicates that the GCTL is not available

"J" qualifier indicates an estimated value.

"R" qualifier indicates result rejected.

"U" qualifier indicates analyte not detected.

Values in shaded cells exceed screening criteria.

^(a) For an organic analyte, the screening criterion is the GCTL.

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

ATTACHMENT A

SOIL BORING, WELL CONSTRUCTION, and DEVELOPMENT LOG SHEETS



BORING LOG

PROJECT NAME: NTC Orlando BORING NUMBER: OLD-03-05
 PROJECT NUMBER: 7457 DATE: 10-Sep-99
 DRILLING COMPANY: Groundwater Protection Inc. GEOLOGIST: Skip Barton
 DRILLING RIG: Diedrich D-25 DRILLER: Jeff Ziegler

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows/ 6" or ROD (%)	Sample Recovery/ Sample Length	Time	Lithology Change (Depth/Ft.) or Screened Level	MATERIAL DESCRIPTION			U S C S *	Remarks	PID/FID Reading (ppm)			
						Soil Density/ Consistency or Rock Hardness	Color	Material Classification			Sample	Sampler BZ	Borehole**	Driller BZ**
CUTTINGS	0			1200		loose	lt.	SAND, medium-grained	SP	dry	0	0	0	0
CUTTINGS	4													
	4											0	0	0
CUTTINGS	8													
	8						tan		SAND, fine- to medium-grained, trace silt		dry			
CUTTINGS	13													
	13											0	0	0
CUTTINGS	18													
	18						dk.		same lithology		moist			
CUTTINGS	23													
	23						br							
CUTTINGS														
							vdk.		SILTY SAND, fine- to medium-grained, no odor		saturated	0	0	0
CUTTINGS														
							blk							
				1227										

* When rock coring, enter rock brokenness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated response is read.

Drilling Area
Background (ppm): 0

marks: _____

Converted to Well? Yes X No _____

Well I.D. #: OLD-03-05



WELL COMPLETION FORM

JOB NAME: NTC Orlando - SA 3

JOB NUMBER: 7457 PROJECT MANAGER: Skip Barton

LOGGED BY: Skip Barton EDITED BY:

WELL NAME: OLD-03-05 DATE: 10-Sep-99

DRILLING COMPANY: Groundwater Protection

EQUIPMENT: 3.25 INCH HOLLOW STEM AUGER DRILLER: Jeff Ziegler

INCH ROTARY WASH HOURS DRILLED: 0.5

GALLONS OF WATER USED DURING DRILLING: NA

METHOD OF DECONTAMINATION PRIOR TO DRILLING: steam pressure wash

DEVELOPMENT METHOD OF DEVELOPMENT: submersible pump

BEGAN DATE: 10/2/99 TIME: 1045

YEILD:	TIME:	DATE:
GPM	FROM TO	
YEILD:	TIME:	DATE:
GPM	FROM TO	
YEILD:	TIME:	DATE:
GPM	FROM TO	

TOTAL WATER REMOVED DURING DEVELOPMENT: 145 GALLONS

DESCRIPTION OF TURBIDITY AT END OF DEVELOPMENT: CLEAR SLIGHTLY CLOUDY

ODOR OF WATER: none MOD. TURBID VERY MUDDY

WATER DISCHARGED TO: GROUND SURFACE TANK TRUCK

STORM SEWERS STORAGE TANK

DRUMS OTHER

MATERIALS USED

6-50 lb SACKS OF 20/30 SAND

1.5-94 lb SACKS OF portland CEMENT

15 GALLONS OF GROUT USED

SACKS POWDERED BENTONITE

POUNDS OF BENTONITE PELLETS

14 FEET OF 2 INCH PVC BLANK CASING

10 FEET OF 2 INCH PVC SLOTTED SCREEN

NA YARDS3 CEMENT-SAND (REDI-MIX) ORDERED

NA YARDS3 CEMENT-SAND (REDI-MIX) USED

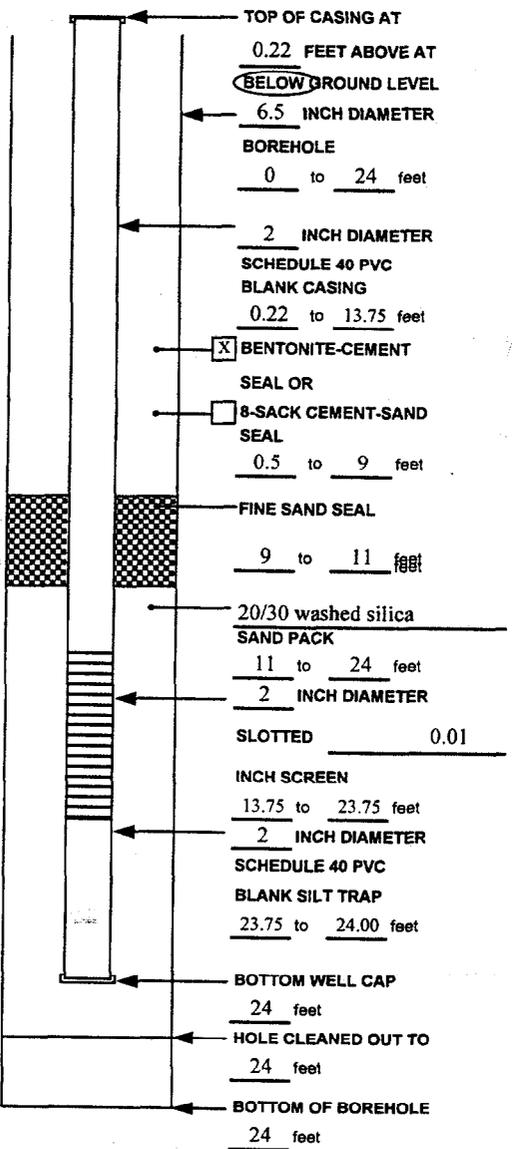
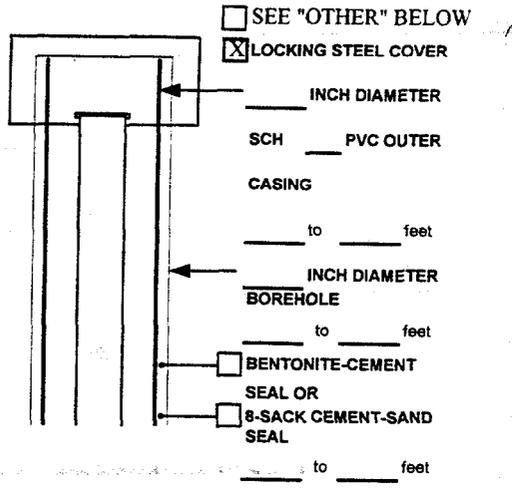
CONCRETE PUMPER USED? NO YES

NAME NA

WELL COVER USED: LOCKING STEEL COVER

CHRISTY BOX

OTHER 8-inch, bolt-down, drive-over man hole cover



NOT TO SCALE

ADDITIONAL INFORMATION:

No bentonite seal used, 2 ft fine sand seal used.

ATTACHMENT B
GROUNDWATER SAMPLE LOG SHEETS
October 1999

Date 10/26/99

GROUNDWATER PURGING AND SAMPLING LOG

Project Site Name: NTC Orlando
 Project No.: CTO 0024

Sample ID No.: NTC0360113
 Sample Location: OLD0301
 Sampled By: JK/GS
 C.O.C. No.:

- Domestic Well Data
- Monitoring Well Data
- Other Well Type:

PURGING DATA										
Casing Size (in.)	Gals/Fl 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
1	0.041	0730	6.89	140	24.95	5.01	7.26	102.1	14.33	100
2	0.163	0735	6.71	142	23.84	6.10	6.47	113.0	14.33	100
3	0.367	0740	6.69	140	23.81	8.32	6.63	117.9	14.33	100
4	0.653	0745	6.69	139	24.03	8.96	6.63	119.2	14.33	100
5	1.020	0750	6.69	138	23.93	9.09	6.64	121.9	14.33	100
6	1.469	0755	6.68	137	23.93	8.27	6.71	124.0	14.33	100
8	2.611	0800	6.68	138	24.03	8.15	6.69	124.5	14.33	100
10	4.080	0805	6.68	138	24.02	7.72	6.69	124.9	14.33	100
Well Casing Diameter: <u>2"</u>										
Total Well Depth (TD): <u>170</u>										
Static Water Level (WL): <u>14.33</u>										
One Casing Volume (gal): <u>1.65</u>										
[3.78gals/L]										
Start Purge (hrs): <u>0730</u>										
End Purge (hrs): <u>0805</u>										
Total Purge Time (min): <u>35</u>										
Total Vol. Purged (gal): <u>3.5L</u>										
<u>page 10/26/99</u>										

SAMPLE PARAMETERS										
Date:	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	
<u>10/26/99</u>	<u>Clear</u>	<u>6.68</u>	<u>138</u>	<u>24.02</u>	<u>7.72</u>	<u>6.69</u>	<u>124.9</u>	<u>14.33</u>	<u>100</u>	

SAMPLE COLLECTION INFORMATION			
Analysis	Preservative	Container Requirements	Collected
Gross Alpha/Gross Beta/Total Uranium/Radium 226	HNO3 (pH < 2)	1 - 1 gal plastic cubitainer	
<u>TCL U&AS</u>	<u>HCL</u>	<u>3 - 40 ML VIALS</u>	<input checked="" type="checkbox"/>

ADDITIONAL INFORMATION

OVA Reading (ppm): 0.0 PPM

Method:
 Peristaltic Pump
 Centrifugal Pump
 Bladder Pump
 Tube Evacuation
 Vacuum Jug Assembly
 Bailor

Tubing Type:
 Polyethylene
 Teflon
 Teflon-lined Polyethylene

Circle if Applicable:
 MS/MSD Duplicate ID No.

Signature(s): JK/GS