

APPENDIX A
Procedure for Soil Sampling with
Methanol Preservation

CORE SAMPLING FOR RESIDUAL NAPL SATURATION

Collection, Presentation, and Analysis Procedures

SOP-CORSAMP-1
March 1, 1998
Revision 4

PURPOSE: Measure total concentration of organic compounds in core samples. Use data to estimate residual NAPL saturation, composition, and component phase distribution.

1.0 SAMPLE CONTAINER PREPARATION

1.1 Materials

- 1.1.1 For samples of sediments without gravel or cobbles:
 - a. 40 mL amber glass vials with teflon-septa
 - b. purge and trap grade methanol below 8⁰C
 - c. 25 mL graduated cylinder
 - d. balance with at least 0.1 gm accuracy and 100 gm capacity
- 1.1.2 For samples of sediments containing gravel or cobbles:
 - a. 4 oz. amber wide mouth jars with teflon-lined caps
 - b. purge and trap grade methanol below 8⁰C
 - c. 50 mL graduated cylinder
 - d. balance with at least 0.1 gm accuracy and 400 gm capacity

1.2 Procedure

- 1.2.1 For samples of sediments without gravel or cobbles (maybe done in the lab):
 - a. Add 15.0 mL methanol to each vial. Seal vial with cap.
 - b. Mark each vial with a unique number. CAUTION: some kinds of ink can be dissolved by methanol!
 - c. Weigh each vial and record.
 - d. Prepare extra vials for QA samples, spillage, and uncertainty of core depths to sample.
- 1.2.2 For samples of sediments containing gravel or cobbles (may be done in the lab):
 - a. Add 50.0 mL methanol to each jar. Seal jar with cap.
 - b. Mark each jar with a unique number. CAUTION: some kinds of ink can be dissolved by methanol!
 - c. Weigh each jar and record.
 - d. Prepare extra jars for QA samples, spillage, and uncertainty of core depths to sample.

2.0 SAMPLE COLLECTION

2.1 Materials

- 2.1.1 For all samples
 - a. soap (e.g., Alconox)
 - b. wipes (e.g., Kimwipes)
 - c. vial or jar labels
 - d. field book
 - e. ball-point pens
 - f. chain-of-custody forms
 - g. transparent packing tape (to cover vial labels and wrap packages)
 - h. lab address, phone number, and contact person
 - I. cooler and packing material
 - j. plastic bags for samples and COCs

- k. FedEx package forms and sleeves
- l. custody seals
- m. box of protective gloves
- n. vials or jars prepared in step 1
- o. balance listed in step I
- 2.1.2 For samples of sediments without gravel or cobbles:
 - a. modified 10 cc plastic syringes (VWR Cat No. BD305462) for use as subcorers (tips cut off at 0 cc mark (by knife) and rubber tip removed from plungers)
 - b. bottle brush for pro-cleaning subcorers
- 2.1.3 For samples of sediments containing gravel or cobbles:
 - a. stainless steel scoops or spoons
- 2.2 Procedure
 - 2.2.1 For all samples:
 - a. Clean subcorers, scoops, or spoons with soap and water and dry.
 - b. Immediately after the split spoon core sampler or sample core liner is opened, use a subcorer, scoop, or spoon to collect about 8 mL (for 40 mL vials) or 25 mL (for 4 oz. jars) of undisturbed core and deliver it to the vial or jar. Do not add sample at a methanol: soil sample volume ratio greater than 1 to ensure that all DNAPL will be extracted into the methanol. Take care not to remove any of the methanol in the vial or jar by splashing or contacting the methanol with the subcorer, scoop, or spoon. Wipe cap threads with Kimwipe to remove grit. Cap.
 - c. Wipe dry the outside of the vials.
 - d. Weigh vials to determine sample masses delivered.
 - e. Complete labels or add labels to vials or jars. Cover with transparent tape to protect labels from methanol.
 - f. Reweigh and record. The lab will be asked to reweigh to check for sample loss.
 - g. Seal each sample container in a separate Zip-lock bag and store cold (below 8⁰C).
- 3.0 EXTRACTION ANALYSIS
 - 3.1 Analyze contaminant concentrations in methanol extract by GC.
 - a. For volatile chlorinated hydrocarbons use SW-846 GC-PID/ELCD Method 8021B (formerly 8010B) or GC-MS Method 8260B (Star Analytical, 1-800-8874179, will do the GO-MS method for \$78/sample). Request analysis for the target analytes only, or if necessary, request all halogenated compounds listed in EPA 8010B. Request reporting limits of no lower than 1.0 mg/L.
 - b. For volatile components of coal tar or petroleum products use SW-846 GC-PID/ELCD Method 8021B or GC-MS Method 8260B.
 - c. For semi-volatile components of coal tar or petroleum products use SW-846 GC-MS Method 8270C.
 - d. For PCBs use SW-846 GC Method 8082 or, with PAHs, GC-MS Method 8275A.
 - 3.2 Request that the lab weigh the sample jar and contents to check for sample loss.
 - 3.3 Request that clods be broken up and samples agitated 24 hours before analysis.
 - 3.4 Ask the lab to report the concentrations as concentrations in methanol (mg/L).
 - 3.5 Request that field-collected QC blanks be analyzed at the beginning of a batch.
 - 3.6 For water content analysis, the Karl-Fisher titration method (approx. \$30/sample) is best. A cheaper method is to measure the density of the extract, but this has not worked in the past, likely because methanol vaporizes so quickly. Densities could probably be measured more precisely by taring a syringe or pycnometer and working in a cold room. This method could provide a cheap way to determine sample water content, which is valuable information for NAPLANAL calculations.

4.0 CALCULATIONS

- 4.1 Use the measurements and Mathcad file CORWATO.MCD to estimate the total mass of contaminants and water in the sample.
- 4.2 Enter the results into NAPLANAL to calculate NAFL residual saturation, composition, and component phase distribution.

**Calculating Sample Concentrations from Methanol Extract Concentrations
Core Samples from the Saturated Zone**

Measurements:

Wet mass of sample: $M_{\text{samp}} := 226.5 \cdot \text{gm}$

Volume methanol added: $V_{\text{meth}} := 96.2 \cdot \text{mL}$

Number of contaminants: $N := 2$

Estimated water content
(vol. water/vol. sample): $f_{\text{wat}} := 0.25$

TCE Conc in extract: $C_{\text{econt}_1} := 1100 \cdot \frac{\text{mg}}{\text{liter}}$

PCE Conc in extract: $C_{\text{econt}_2} := 200 \cdot \frac{\text{mg}}{\text{liter}}$

Constants:

Rock density: $\rho_s := 2.6 \cdot \frac{\text{kg}}{\text{liter}}$

Water density
(at 22-23°C): $\rho_{\text{wat}} 0.998 \cdot \frac{\text{kg}}{\text{liter}}$

Calculations:

Estimated sample
water volume: $V_w := \frac{f_{\text{wat}} \cdot M_{\text{samp}}}{(f_{\text{wat}} - \rho_{\text{wat}} + (1 - f_{\text{wat}}) \cdot \rho_s)}$ $V_w = 25.744 \cdot \text{mL}$

Total masses of contaminants in sample:

TCE: $M_{\text{cont}_1} := C_{\text{econt}_1} \cdot (V_w + V_{\text{meth}})$ $M_{\text{cont}_1} := 134.139 \cdot \text{mg}$

PCE: $M_{\text{cont}_2} := C_{\text{econt}_2} \cdot (V_w + V_{\text{meth}})$ $M_{\text{cont}_2} := 24.389 \cdot \text{mg}$

Total sample concentrations:

TCE: $C_{\text{cont}} := \frac{M_{\text{cont}_1}}{M_{\text{samp}}}$ $C_{\text{cont}_1} = 592.225 \cdot \frac{\text{mg}}{\text{kg}}$

PCE: $C_{\text{cont}_2} := \frac{M_{\text{cont}_2}}{M_{\text{samp}}}$ $C_{\text{cont}_2} = 107.677 \cdot \frac{\text{mg}}{\text{kg}}$

APPENDIX B
Geologic Logs and
Well Construction Details

Location Coordinates of Wells, soil borings, CPT borings and MLS samplers

Location	Northing	Easting	Elevation Ground	TOC
IN01	339435.8315	2496487.07	25.54	25.71
IN02	339444.8916	2496489.85	25.52	25.27
IN03	339453.1307	2496492.71	25.8	25.34
HC01	339427.527	2496483.9	26.85	26.42
HC02	339461.6546	2496495.7	26.17	25.87
EX01	339440.8058	2496472.62	25.63	25.59
EX02	339450.5296	2496475.9	25.66	25.56
EX03	339459.3573	2496479.4	25.98	25.64
EX04	339430.571	2496500.34	25.59	25.65
EX04R	339432.88	2496502.62	25.6	
EX05	339439.9732	2496504.05	25.42	25.22
EX06	339447.4862	2496506.44	25.73	25.45
RW01	339447.2038	2496475.77	25.49	25.24
RW02	339441.6861	2496489.87	25.54	25.35
RW03	339429.4074	2496466.98	26.84	26.49
RW04	339427.0241	2496511.78	26.07	25.78
RW06	339417.9552	2496507.8	26.86	26.46
IW01	339439.3594	2496496.52	25.61	25.24
MW10IW	339451.5	2496487.02	25.8*	NA
WP01AQT	339448.32	2496485	25.6*	NA
WP02AQT	339449.61	2496485.72	25.6*	NA
MLS-1	339439.23	2496477.66	25.6*	
MLS-2	339448.96	2496480.72	25.6*	
MLS-3	339457.37	2496487.02	25.8*	
CPT01	339429.1547	2496573.55	25.79	
CPT02	339442.6893	2496537.93	28.83	
CPT04	339469.7012	2496499.49	25.8	
CPT05	339496.3537	2496424.99	25	
CPT06	339467.986	2496437.42	25.54	
CPT07	339450.2707	2496410.37	25.99	
CPT08	339382.1602	2496399.19	25.73	
CPT09	339361.3396	2496464.64	26.28	
CPT10	339342.0089	2496515.72	26.33	
CPT11	339372.7974	2496436.73	26.13	
CPT12	339454.1104	2496483.59	25.69	
IS01	339435.6666	2496505.83	25.45	
IS02	339434.5729	2496511.08	25.57	
IS03	339429.3495	2496514.01	25.98	
IS04	339379.83	2496471.4		
IS05	339405.9933	2496486.14	26.87	
IS06	339390.05	2496486.31		
IS07	339454.0657	2496469.83	25.74	
IS09	339391.1085	2496486.19	26.8	
IS10	339441.94	2496486.31		
IS11	339447.94	2496484.99		
IS12	339451.8148	2496452.56	26.11	
IS13	339447.94	2496483.18		
IS14	339439.95	2496511.93		
IS15	339457.02	2496492.37		
IS16	339428.05	2496516.91		
IS17	339454.25	2496470		
IS18	339466.8791	2496462.76	25.24	
IS19	339440.57	2496502.33		
IS20	339461.2	2496484.19		
IS21	339431.59	2496501.06		
IS22	339434.43	2496491.13		
IS23	339445.37	2494993.26		
IS24	339441.66	2496499.46		
IS25	339445.43	246485.45		
IS26	339443.58	2496496.18		
IS27	339453.36	2496505.63		
IS28	339401.2763	2496543.85	26.86	
IS29	339428.27	2496476.53		
IS30	339414.46	2496498.38		
IS31	339407.2556	2496533.24	26.83	
IS32	339432.88	2496498.38		

* Estimated from nearby well elevations

Table 3.1 Well Construction Details

Well ID	Casing Diameter (in)	Elevation (ft amsl)		Well Depth (ft BGS)	Screen Intervals (ft amsl)		Bentonite Seal Interval (ft amsl)	Sand Pack Interval (ft amsl)
		Ground	TOC		Lower	Upper		
EX01	4	25.63	25.59	19.96	6.1-10.6	NA	16.8-12.8	12.8-5.6
EX02	4	25.56	25.66	21.20	4.9-9.5	NA	14.7-11.8	11.8-4.2
EX03	4	25.64	25.98	19.94	6.5-11.0	NA	15.9-12.9	12.9-6.0
EX04	4	25.65	25.59	21.09	4.9-9.5	NA	14.1-11.8	11.8-4.6
EX04R	4	25.65	25.59	19.70	6.3-10.9	NA	16.9-13.1	13.1-5.6
EX05	4	25.22	25.42	21.75	4.1-8.7	NA	13.9-11.2	11.2-4.4
EX06	4	25.45	25.73	20.41	5.7-10.3	NA	15.5-12.5	12.5-5.2
HC01	2	26.42	26.85	22.71	4.5-9.1	5.9-15	13.9-11.9	11.9-4.9
HC02	2	25.87	26.17	20.40	6.1-10.8	13.9-18.4	12.8-11.8	11.8-6.1
IN01	4	25.71	25.54	22.58	3.5-8.0	14.0-18.0	12.1-10.1	10.1-3.0
IN02	4	25.27	25.52	19.65	6.5-11.0	14.5-18.5	12.6-11.6	11.6-5.5
IN03	4	25.34	25.8	19.96	6.4-10.9	14.4-18.4	12.9-11.9	11.9-5.8
RW01	4	25.49	25.24	20.00	6.2-10.4	NA	16.2-13.2	13.2-5.2
RW02	4	25.54	25.35	20.00	6.4-10.9	NA	16.4-13.4	13.4-5.4
RW03	2	26.49	26.84	21.97	5.2-9.9	15.8-19.7	14.0-12.0	12.0-5.0
RW04	4	25.78	26.07	23.39	3.3-7.8	13.7-18.2	13.2-11.2	11.2-4.1
RW06	2	26.46	26.86	21.07	6.1-10.8	14.2-18.7	13.9-12.4	12.4-6.4
IW01	2	25.61	25.24	18.50	6.9-11.4	NA	20.7-17.7	17.7-6.2
MW10IW	¼" tube	25.8*	25.0*	39.00	-12.9 - -8.4	NA	8.2 - -6.1	-6.1 - -13.34
WP01AQT	¼" tube	25.6*	NA	23.0	2.6-3.6	NA	10.6-4.0	4.0-2.2
WP02AQT	2	25.6*	NA	25.0	0.6-1.6	NA	10.6-2.6	2.6-0.2

*Estimated from nearby wells

ft amsl = feet above mean sea level

DRILLING LOG		DIVISION		INSTALLATION		SHEET	
1. PROJECT		Bldg 25: DNAPL Source, Zone Borings		MCB Camp Lejeune		OF 1 SHEETS	
2. LOCATION (Coordinates or Station)		Bldg 25: UST T25-2 Area		10. SIZE AND TYPE OF BIT		Direct Push	
3. DRILLING AGENCY		Geo Environmental		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)			
4. HOLE NO. (As shown on drawing title and file number)		IR88-1501		12. MANUFACTURER'S DESIGNATION OF DRILL		Geoprobe	
5. NAME OF DRILLER		Rich Melton		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		DISTURBED 1 UNDISTURBED 5	
6. DIRECTION OF HOLE		<input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		14. TOTAL NUMBER CORE BOXES			
7. THICKNESS OF OVERBURDEN				15. ELEVATION GROUND WATER		~ 9 ft bgs	
8. DEPTH DRILLED INTO ROCK				16. DATE HOLE		STARTED 7/25/97 @ 1025 COMPLETED 7/25/97 @	
9. TOTAL DEPTH OF HOLE		19 ft		17. ELEVATION TOP OF HOLE			
				18. TOTAL CORE RECOVERY FOR BORING		%	
				19. SIGNATURE OF INSPECTOR		Geologist: Fred Holmer INTERA	

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
a	b	c	d	e	f	g
			TANK Removal			Geoprobe cont tube 1 1/8 in ID
	2		Backfill: clean f. SAND, tan, moist, loose	85%		HNu 0.5' = 1.6 1.0 = 4.2 1.5 = 3.9 2.0 = 3.5
	4				3	3.5 = 2.9 4.0 = 2.6 4.5 = 2.1
	6		4.5 Contact @ native seds: f. SAND w silt/clay, wet, cohesive, low plast, mottled lt/med gray	75%		5.0 = 56 HS 5.2 = 796 Sample IS01-1 5.5 = 98 strong chemical odor: smells like petrol distillates (Varsol?) Sample 01-1 @ 5.4-5.5
	8				7	7.0 = 196 7.5 = 511
	10		med. gray, wet, loose	85%		HS @ 8.0 = 780 Sample IS01-2 8.5 = 1024 Sample IS01-2 9.0 = 1640 Sample IS01-2 9.0 = 331 Strong chem odor
	12		11.0 f. SAND, decreased silt/clay, wet, cohesive, slight plast, lt gray	100%		10 = 311 HS 10.0 = 1436 Sample IS01-4 10.5 = 96 11 = 117 11.5 = 121 12 = 34 12.5 = 25 mild chem odor
	14		f. SAND w minor fines, wet, cohesive, no plast, lt gray		13	13 = 17 resistant probing layer ~ 14-16' Sample tube split lengthwise 14 = 44
	16		Core samples from ~ 14-19 may be borehole backfilling	60%		trace chem. odor 15 = 13 HS 15.5 = 32 HS 16.0 = 72
	18		Samples from 16-19 of unknown depth (borehole backfilling?) Flowing sands, borehole not staying open between core runs		16	Core samples clogged in sampler, extruded, not represent. samples
			TD = 19'; descriptions to ~ 14' bgs.		19	

DRILLING LOG		DIVISION		INSTALLATION	NOTE NO.
1. PROJECT		10. SIZE AND TYPE OF BIT		MCB Camp Lejeune	SHEET / OF SHEETS
Bldg 25 DNAPL Source Zone Borings		Direct Push			
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)			
N of Bldg 25: T25-1 Area					
3. DRILLING AGENCY		12. MANUFACTURER'S DESIGNATION OF DRILL		Geoprobe	
GeoEnvironmental		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		DISTURBED	UNDISTURBED
4. HOLE NO. (As shown on drawing title and file number)		IRBB-1502			7
5. NAME OF DRILLER		14. TOTAL NUMBER CORE BOXES			
Rich Melton		15. ELEVATION GROUND WATER		~ 9 ft bgs	
6. DIRECTION OF HOLE		16. DATE HOLE		STARTED	COMPLETED
<input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		7/25/97 @ 1430		7/25/97 @ 1510	
7. THICKNESS OF OVERBURDEN		17. ELEVATION TOP OF HOLE			
8. DEPTH DRILLED INTO ROCK		18. TOTAL CORE RECOVERY FOR BORING		%	
9. TOTAL DEPTH OF HOLE		20 ft		19. SIGNATURE OF INSPECTOR	
				Geologist: Fred Holmer INTERA	

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
a	b	c	d	e	f	g
			Tank Removal Backfill: f. SAND, clean, moist, loose			Cont. tube Samples 1 1/2 in ID
	2			80%		HNA 1.5' = 3.1 2.0 = 3.1 2.5 = 2.6 3.0 = 2.8 3.5 = 2.3
	4				4	4.5' = 120 5 = 97 5.5 = 61 6 = 33 6.5 = 158
	6		4.9 Contact Native sed's f. SAND w some silt/clay, moist, cohesive, silt to low, plast, minor peat, organic decay smell, med-dk gray	100%		
	6		6.1 f. SAND w minor silt/clay, wet, cohesive, lt gray, org decay & hydrocarb smell			
	6	NR	6.8 CLAY seam, w some silt, wet, med plast, lt to greenish gray w yellow-orange mottling	7		
	8		7.5 f. SAND w intermittent silt & clay, decreasing w depth, wet, cohesive, lt to med gray strong hydrocarb smell	70%		8' = 394 strong hydrocarb smell HS 8.3 = 1016 8.5 = 1032 HS 8.8 = 1180 Sample ISO2-2, ISO2-3 9 = 909
	10		9.0 f. SAND, trace silt, wet, loose, lt tannish gray, strong hydrocarb smell			9.5 = 115 open to atm
	10		10.5 si-f. SAND, wet, loose, tan to lt gray	90%		11 = 146 11.5 = 68 12 = 27 12.5 = 12
	12		11.9 f. SAND w minor silt, lt to med gray			
	14		14 si-f. SAND		NS	Muck sample; will use discrete sampler
	14				14	Discrete sampler (2' x 1" ID) HNA 14.5' = 2.8 15 = 2.8 15.5 = 2.7 16.3 = Sample ISO2-4 16.5 = 2.0
	16		f. SAND, minor silt			
	16		16 si-cl-f. SAND grading to			
	16		16.6 si-CLAY, wet, soft, med plast, olive gray	100%		17 = 2.0 17.5 = 2.3
	18		17.4 grading to si-cl-f. SAND, low plast.			
	18		18.4 CLAY w peat, med plast, olive to charcoal brn @ 20'	80%		HNA 18.5 = 1.6 19 = 1.6
	20					

DRILLING LOG		DIVISION	INSTALLATION	SHEET
			MCB Camp Lejeune	OF 1 SHEETS
1. PROJECT			10. SIZE AND TYPE OF BIT	
Bldg 25 DNAPL Source Zone Borings			Direct Push	
2. LOCATION (Coordinates or Station)			11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
N-side Bldg 25 @ former AST/PCE (5 ft west of Air Comp)				
3. DRILLING AGENCY			12. MANUFACTURER'S DESIGNATION OF DRILL	
Geo Environmental			Geoprobe	
4. HOLE NO. (As shown on drawing title and file number)			13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	
IR88-1503			DISTURBED	
5. NAME OF DRILLER			UNDISTURBED	
Rich Melton			4	
6. DIRECTION OF HOLE			14. TOTAL NUMBER CORE BOXES	
<input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.			15. ELEVATION GROUND WATER	
			~ 9 ft bgs	
7. THICKNESS OF OVERBURDEN			16. DATE HOLE	
			STARTED 7-25-97 @ 1654 COMPLETED 7-25-97 @ 1725	
8. DEPTH DRILLED INTO ROCK			17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE			18. TOTAL CORE RECOVERY FOR BORING %	
16'				
			19. SIGNATURE OF INSPECTOR	
			Geologist: Fred Holmer INTERA	

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
a	b	c	d	e	f	g
			Soil Zone/orig bldg constr backfill.			HNu
			f. SAND in minor silt, color alternating lt brn to dk brn to charcoal brn (3.2-3.5)			1' = 92 ppm
				100%		1.5 = 66
	2					2 = 210 mild sweet
						2.5 = 400
						HS 2.8 = 191 Sample IS03-1
						3 = 309
			2.B Native sed contact			3.5 = 10
			f. SAND in some silt/clay, moist, cohesive, friable to silt plast, lt brn-gray			
	4			4		4.5 = 153 mild sweet
			5.4 Si-CLAY, moist, firm, low plast, lt gray	100%		5 = 40 smell
						5.5 = 51
						HS 5.7 = 26 Sample IS03-2
						6 = 82
	6		6.0 f. SAND, minor fines, moist, friable, mottled			HS 6.1 = 12
			yel-orange in tan matrix			6.5 = 14
						7.5 = 211 mild sweet
						HS 7.6 = 10B smell
						8 = 23 Sample IS03-3
						8.5 = 11
				TD.		9 = 14
						10 = 6
						10.5 = 2.8
						11 = 2.4
				100%		11.5 = 3.0
			11.5 grading to med gray (texture as above)			12 = 2.4
	12					12.5 = 2.6
						13 =
						14 = 2.2
						14.5 = 1.6
						15 = 1.9
						15.5 = 2.1
	16		as above to TD @ 16.0			
	18					

DRILLING LOG		DIVISION		INSTALLATION <i>MCB Camp Lejeune</i>		SHEET 1 OF 1 SHEETS	
1. PROJECT <i>Bldg 25 DNAPL Source Zone Borings</i>				10. SIZE AND TYPE OF BIT <i>Direct Push</i>			
2. LOCATION (Coordinates or Station) <i>~6' W of TW04 (S-side Bldg 25)</i>				11. DATUM FOR ELEVATION SHOWN (TBM or MSL)			
3. DRILLING AGENCY <i>Geo Environmental</i>				12. MANUFACTURER'S DESIGNATION OF DRILL <i>Geoprobe</i>			
4. HOLE NO. (As shown on drawing title and file number) <i>IR88-1S04</i>				13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		DISTURBED UNDISTURBED	
5. NAME OF DRILLER <i>Rich Melton</i>				14. TOTAL NUMBER CORE BOXES			
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.				15. ELEVATION GROUND WATER <i>~9.5 ft bgs</i>		16. DATE HOLE STARTED <i>7.26.97 @ 0740</i> COMPLETED <i>7.26.97 @ 0815</i>	
7. THICKNESS OF OVERBURDEN				17. ELEVATION TOP OF HOLE			
8. DEPTH DRILLED INTO ROCK				18. TOTAL CORE RECOVERY FOR BORING %			
9. TOTAL DEPTH OF HOLE <i>13 ft</i>				19. SIGNATURE OF INSPECTOR <i>Geologist: Fred Holmer INTERA</i>			

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
a	b	c	d	e	f	g
			<i>Grass, soil zone, f. SAND w silt, moist, cohesive, friable, gray brn</i>			<i>HNa Backgrnd = 1.5</i>
	2		<i>si-v.f. SAND</i>	<i>95%</i>		<i>1.0' = 1.5 ppa</i>
	4					<i>1.5 1.3</i>
	6		<i>5.1 Sediments sat'd to ~7.0 ft bgs, then unsat'd (recharge pulse from recent rains)</i>	<i>90%</i>		<i>2 1.7</i>
	6.1		<i>6.1 si-CLAY w f. sand, moist cohesive, low plast, lt brn</i>			<i>2.5 1.7</i>
	6.5		<i>6.5 si-v.f. SAND, moist firm, cohesive, friable, tan w yel-orange mottling</i>			<i>3 1.6</i>
	8					<i>3.5 1.6</i>
	10		<i>9.1 sat'd</i>	<i>80%</i>		<i>5 = 1.5</i>
	10		<i>7.24.97TWL = 9.36 btoc @ MWO2 (~20 ft from boring)</i>			<i>5.5 = 1.5</i>
	12		<i>11.0 grading to f. to v.f. SAND, clean, wet, stiff, cohesive, tan</i>	<i>80%</i>		<i>6 = 1.5</i>
	12		<i>TD = 13</i>			<i>6.5 = 1.5</i>
	14					<i>8.5 = 2.7</i>
						<i>9 1.9</i>
						<i>9.5 2.7</i>
						<i>11 = 9.2</i>
						<i>11.25 34</i>
						<i>11.5 11</i>
						<i>12 107 sample</i>
						<i>12-12.2 22 ISQA-1</i>
						<i>12.5 22</i>

DRILLING LOG		DIVISION	INSTALLATION MCB Camp Lejeune	SHEET 1 OF 1 SHEETS
1. PROJECT Bldg 25 DNAPL Source Zone Borings		10. SIZE AND TYPE OF BIT Direct Push		
2. LOCATION (Coordinates or Station) Inside Bldg 25, ~13' from S of N-wall		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)		
3. DRILLING AGENCY Geoprobe		12. MANUFACTURER'S DESIGNATION OF DRILL Geoprobe		
4. HOLE NO. (As shown on drawing title and file number) IRBB-1505		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED	UNDISTURBED
5. NAME OF DRILLER Rich Melton		14. TOTAL NUMBER CORE BOXES		
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER ~ 9-9.5 ft bgs	16. DATE HOLE	STARTED 7-26-97 @ 0915
7. THICKNESS OF OVERBURDEN		17. ELEVATION TOP OF HOLE	COMPLETED 7-26-97 @ 1026	
8. DEPTH DRILLED INTO ROCK		18. TOTAL CORE RECOVERY FOR BORING %		
9. TOTAL DEPTH OF HOLE 20 ft		19. SIGNATURE OF INSPECTOR Geologist: Fred Holzman INTERA		

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
5.94			0-.35 Conc	.4		Cont tube samples 1 1/2 ID (43 mm) HNu
			.35 construction backfill; f. SAND, moist, loose, tan to lt brn			1.0 = 240 ppm
	2		2.1 Native soil zone contact f. SAND w/ silt/clay, lt brn w charcoal mottling, loose	70%		1.5 445 strong hydrocarb smell 2 609
	4		as above, grading to buff color			2.5 861 2.8 1005 3 760
	4		4.5 cl-SILT, moist, cohesive, friable mottled lt gray-brn & yellow-orange w ↑ f. sand fraction	95%		4.5 = 308 strong hydrocarb smell 5 844
	6		6.1 si-CLAY, moist, firm, low-med plast, lt gray/brn & yel-org grading @ 6.5 cl-SILT, slt plast			5.5 945 5.8 1179 6 1051
	8	NR	7.0 SILT/v.f. SAND, moist cohesive, friable, some clay clasts, buff color			6.5 653
	8		increasing v.f. sand content	100%		7.5 = 947 strong hydrocarb smell 8 887 8.4 1225 8.5 945
	10		v.f. SAND/SILT, clean (no clay) darker (lt gray) w depth			10.2 938 10.5 = 621 11 371
	12			90%		11.5 154 12 100 12.5 101
	14		as above			13.5 = 39 14 89 14.5 60 15 49 15.5 36
	16			90		16.5 = 73 17 = 52 17.5 = 45
	18		18.2 grading to cl-SILT wet, cohesive, med-gray			18.5 = 30
	18		19.3 grading to si-CLAY, wet cohesive, low-med plast, med-gray TD=20' bgs	100		19 11 19.5 9.3 20 9.9

DRILLING LOG	DIVISION	INSTALLATION	SHEET
		MCB Camp Lejeune	OF 1 SHEETS
1. PROJECT		10. SIZE AND TYPE OF BIT	
Bldg 25 DNAPL Source Zone Borings		Direct Push	
LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
SW Corner Bldg 25 (outside v5' s of Bldg)			
3. DRILLING AGENCY		12. MANUFACTURER'S DESIGNATION OF DRILL	
GeoEnvironmental		Geoprobe	
4. HOLE NO. (As shown on drawing title and file number)		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	
IR88-IS06		DISTURBED UNDISTURBED 5	
5. NAME OF DRILLER		14. TOTAL NUMBER CORE BOXES	
Rich Melton			
6. DIRECTION OF HOLE		15. ELEVATION GROUND WATER	
<input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		~ 9.5 ft bgs	
7. THICKNESS OF OVERBURDEN		16. DATE HOLE	
		STARTED COMPLETED 7.26.97 @ 14.12 7.26.97 @	
8. DEPTH DRILLED INTO ROCK		17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE		18. TOTAL CORE RECOVERY FOR BORING	
14 ft		%	
		19. SIGNATURE OF INSPECTOR	
		Geologist: Fred Holzner INTERA	

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
a	b	c	d	e	f	g
			Soil horizon: v.f. SAND, moist, cohesive, friable, dk brn			Geoprobe cont tube 1 1/16" ID HNU
	2			100%		1.0 = 3.6
						1.5 = 3.3
	2.6		grading to unweathered sed.			2 = 3
			si-v.f. SAND, moist, cohesive friable, tan to mottled yel-orange			2.5 = 3
	4			100%		3 = 2.8
						3.5 = 2.7
	4			100%		4.5 = 2.9
						5 = 2.5
	6					5.5 = 2.4
						6 = 2.5
	6					6.5 = 2.5
			as above			7.5 = 100
	8					8 = 130
						8.5 = 5.4
	8		wet	80%		9 = 12.6 strong hydrocarbon smell
						9.3 = 405
	10					9.5 = 61 Sample IS06-1
						10.1' = 3.6 (bkgrnd)
	10					10.5 = "
						11 = "
	10					11.5 = "
						12 = "
	12			100%		12.1 = 7.5
						12.5 = 6.6 (Bkgrnd)
	12			100%		13 = 6.4
						13.5 = 6.5
	14					TD = 14' bgs
	16					
	18					

DRILLING LOG		DIVISION	INSTALLATION <i>MCB Camp Lejeune</i>	SHEET 1 OF 1 SHEETS
1. PROJECT <i>Bldg 25 DNAPL</i>			10. SIZE AND TYPE OF BIT <i>Direct Push</i>	
2. LOCATION (Coordinates or Station) <i>N-side Bldg 25 @ Tank T25-4</i>			11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY <i>Geo Environmental</i>			12. MANUFACTURER'S DESIGNATION OF DRILL <i>Geoprobe</i>	
4. HOLE NO. (As shown on drawing title and file number) <i>IR88-1507</i>			13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	
5. NAME OF DRILLER <i>Rich Melton</i>			14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.			15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN			16. DATE HOLE STARTED <i>7-26-97 @ 1555</i> COMPLETED <i>7-26-97 @</i>	
8. DEPTH DRILLED INTO ROCK			17. ELEVATION TOP OF HOLE <i>~ 9-9.5 ft bgs</i>	
9. TOTAL DEPTH OF HOLE <i>20 ft</i>			18. TOTAL CORE RECOVERY FOR BORING %	
			19. SIGNATURE OF INSPECTOR <i>Geologist: Fred Holmer INTERA</i>	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			0.0 Tank yard backfill f-v.f. SAND, clean, moist, loose tan.			Geoprobe Cont tube 1 1/8" ID HNu
	2			75%		1.0' = 4.0 (bkgrd)
						1.5 = 3.6
						2 = 3.4
						2.5 = 3.5
						3 = 3.3
						3.5 = 3.6
	4			4		
			4.7 Contact w native sed: SILT w clay & f. sand, moist cohesive, friable, med-gray	70%		4.5' = 3.1
			5.5 grading to cl-SILT, trace f. sand, minor peat, moist, cohesive, silt plast, organic decay odor, dk gray			5 = 138
	6	NR				HS 5.3 - 83 Sample IS07-1
						5.5 = 20
						6 = 112
	8		cl-SILT / cl-f. SAND moist cohesive, friable, silt plast, occasional plant fibers & clay clasts, med-dk gray w mottled yel-orange	90%		7.5' = 4
						8 = 29
						8.5 = 171 strong hyd-carb small
						HS 8.8 - 477 Sample IS07-2
			9.2 f-v.f. SAND. w silt,			9 = 53
			9.8 si-f. SAND, wet, firm, cohesive, olive gray			9.5 = 79
	10			10		10' = 47
						10.5 = 37
						HS 10.8 - 195 Sample IS07-3
				100%		11 = 44
						11.5 = 32
						12 = 11
						12.5 = 9
						13 = 13
						13 = 113(?) probably backfill from above
						13.5 = 153(?)
				50%(?)		14 = 90(?)
						14.5 = 14
						15 = 14
						15.5 = 10
	16			16	1" ID sampler	16.5' = 12
						17 = 13
				100%		17.5 = 16
						18 = 77
	18		17.8, grading to SILT w clay & v.f. sand, wet, firm	18	1" ID sample	18 = 81
						18.5 = 701 Sample IS07-4
			19 si-sa-CLAY w plant matter, soft, olive-gray	50%		19 = 219
			TD push = 20'; TD recovery ~ 19'			

DRILLING LOG		DIVISION		INSTALLATION		SHEET	
1. PROJECT		Bldg 25 DNAPL Source Zone Borings		10. SIZE AND TYPE OF BIT		Direct Push	
2. LOCATION (Coordinates or Station)		N-side of Bldg 25, ~ 20' west of tank T25-4		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)			
3. DRILLING AGENCY				12. MANUFACTURER'S DESIGNATION OF DRILL		Geoprobe	
4. HOLE NO. (As shown on drawing title and file number)		IR88-150B		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		DISTURBED UNDISTURBED	
5. NAME OF DRILLER		Rich Melton		14. TOTAL NUMBER CORE BOXES			
6. DIRECTION OF HOLE		<input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER		~ 9-9.5 ft bgs	
7. THICKNESS OF OVERBURDEN				16. DATE HOLE		STARTED COMPLETED	
8. DEPTH DRILLED INTO ROCK				17. ELEVATION TOP OF HOLE		7-27-97 @ 0728 7-27-97 @	
9. TOTAL DEPTH OF HOLE		21 ft		18. TOTAL CORE RECOVERY FOR BORING		%	
				19. SIGNATURE OF INSPECTOR		Geologist: Fred Hofman INTERA	

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
a	b	c	d	e	f	g
			0.0 Backfill f. SAND, tan			Geoprobe cont. tube sampler
			.8 Native soil contact si-cl-f. SAND, wet, soft, minor peat matter, dk gray-brn low plast	80%		1 1/4" ID HNu 0.5' = 54 ppm
	2					1 33
			2.6 grading to f. SAND w/ fines, moist, cohesive, firm friable, lt brn			1.5 48
						2 23
	4					2.5 280
						3 234
			6.4 grading to cl-f. SAND, wet, cohesive, low plast, med gray-brn			4.5 604 strong hydrocarb smell
			7.2 grading to f. SAND w/ fines, moist to wet, cohesive, lt gray, soft to med firm			5 523
	4			95%		5.5 350
			6.4 grading to cl-f. SAND, wet, cohesive, low plast, med gray-brn			6 516
	6					6.5 381
			7.2 grading to f. SAND w/ fines, moist to wet, cohesive, lt gray, soft to med firm	100	8-10 dropped out	7 340
			8-10 Sample interval uncertain			7.5 442
	8					8 166
				50%	1" ID discrete sampler (collected ~ 1' N of orig boring)	Looks like 7-8' interval Bottom 1/2 dropped out of sample tube
			si-f. SAND, wet, cohesive firm, lt gray			440
			10.8 grading to f. SAND, minor fines, lt gray brn			340
			grading to med gray some clay content, slt plast			83
	10			10		10' = 56
			f. SAND w/ silt, minor clay			10.5 41
				100		11 32
	12					11.5 28
			grading to med gray some clay content, slt plast			12 23
						12.5 24
	14					13 81
			17.0 grading to si-cl-f. SAND			13.5 13
				100		14 15
			grading to si-cl-v.f. SAND silt plast			14.5
						15 52
	16			95%		15.5 13
						16 12
			grading to si-cl-v.f. SAND silt plast			17 NS
	18					HS 17.5 - 829 strong solvent (sweet)
						17.5 870 (sweet)
						18 534
						HS 18.5 - 875
						18.5 683 DNAPL(?) fluid inclusion
						19 871
			19.0 grading to si-CLAY, wet, soft med plast, med gray, to TD = 21' bgs			2.54 (Bkgnd 200)
						19.5 871 (" 165)
						20 230 (" 230)
						20.5 174
						21 156

DRILLING LOG		DIVISION	INSTALLATION <i>MCB Camp Lejeune</i>	SHEET / OF 1 SHEETS
1. PROJECT <i>Bldg 25 DNAPL Source Zone Borings</i>		10. SIZE AND TYPE OF BIT <i>Direct Push</i>		
LOCATION (Coordinates or Station) <i>Inside Bldg 25: ~ 25ft S of N-wall</i>		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)		
3. DRILLING AGENCY <i>GeoEnvironmental</i>		12. MANUFACTURER'S DESIGNATION OF DRILL <i>Geoprobe</i>		
4. HOLE NO. (As shown on drawing title and file number) <i>IR88-1509</i>		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED	UNDISTURBED <i>B</i>
5. NAME OF DRILLER <i>Rich Melton</i>		14. TOTAL NUMBER CORE BOXES		
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER <i>~ 9-9.5 ft bgs</i>		
7. THICKNESS OF OVERBURDEN		16. DATE HOLE	STARTED <i>7-27-97 @ 1040</i>	COMPLETED <i>7-27-97 @</i>
8. DEPTH DRILLED INTO ROCK		17. ELEVATION TOP OF HOLE		
9. TOTAL DEPTH OF HOLE <i>21 ft</i>		18. TOTAL CORE RECOVERY FOR BORING %		
		19. SIGNATURE OF INSPECTOR <i>Geologist: Fred Halpern INTERA</i>		

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			0. - .4 Conc floor		CONC.	
			.4 Construction backfill f. SAND, moist, loose, tan to lt brn			HNu .5' = 134 1 151 1.5 174 2 220
	2		2.3 Contact with native sed si-f. SAND, firm, cohesive friable, lt gray-brn	70%		2.5 15
	4			4		4.5' = 176 5 81
	6		6.4 si-v.f. SAND, moist, cohesive, mottled lt gray & yel-orange	95%		5.5 206 6 160 6.5 15
	8			8		7' = 518 strong hydrocarbon 7.5 367 smell 8 370
	10	NR	as above, lt gray, wet	100%		8.5 470
	12			10		10' = 44 10.5 181 11 21 <i>Sample 1509-1</i>
	14		13.5 as above, grading to yel-orange	70%		11.5 29 12 36
	16			13		13' = 62 13.5 33
	18		as above, grading to med gray	90%		14 9 <i>Sample 1509-2</i> 14.5 41 moderate solvent 15 105 smell 15 55 15.5 6 } after 16' = 6 HNu malfcn 16.5 2.5 & repair 17 10
	20		increasing fines, slt plast	17		17 7
	22		as above, grading to med gray	as above		17.5 2
	24	NR	as above	50%		18
	26		19.1 si-CLAY w minor v.f. sand, wet, med plast, med gray (to TD = 21' bgs)	19		19' = 3 17.5 1.3 20 1.5
	28			bottom		20.5 3.4 21 1.7

DRILLING LOG		DIVISION		INSTALLATION <i>MCB Camp Lejeune</i>		SHEET 1 OF 1 SHEETS	
1. PROJECT <i>Bldg 25 DNAPL Source Zone Borings</i>				10. SIZE AND TYPE OF BIT <i>Direct Push</i>			
LOCATION (Coordinates or Station) <i>N-side Bldg 25: ~ 10' W-SW of Tank T25-A</i>				11. DATUM FOR ELEVATION SHOWN (TBM or MSL)			
3. DRILLING AGENCY <i>GeoEnvironmental</i>				12. MANUFACTURER'S DESIGNATION OF DRILL <i>Geoprobe</i>			
4. HOLE NO. (As shown on drawing title and file number) <i>IR88-1510</i>				13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		DISTURBED	UNDISTURBED <i>8</i>
5. NAME OF DRILLER <i>Rich Melton</i>				14. TOTAL NUMBER CORE BOXES			
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.				16. DATE HOLE		STARTED <i>7-27-97 @ 1454</i>	COMPLETED <i>7-27-97</i>
7. THICKNESS OF OVERBURDEN				17. ELEVATION TOP OF HOLE			
8. DEPTH DRILLED INTO ROCK				18. TOTAL CORE RECOVERY FOR BORING %			
9. TOTAL DEPTH OF HOLE <i>21</i>				19. SIGNATURE OF INSPECTOR <i>Geologist: Fred Hohner INTERA</i>			

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			Tank tank backfill f. v.f. SAND, clean, tan			Geoprobe cont tube sampler HNu - DL 101 0.5 = .8 (Bkgnd)
	2			75%	1	.8
			3-4' interval dropped out of tube upon retrieval		1.5	1
	4	NR	si-v.f. SAND, moist, cohesive soft, lt tan-gray		2	.9
					2.5	1
	6	NR	6.1 si-CLAY, moist, med plast, lt gray	85%	4.5'	3.1
			si-v.f. SAND, moist, cohesive, buff color w/ yel-orange		5	.4
	8			100%	5.5	1.1
			8.1 as above, grading to lt gray & wet		6	2.3
	10		as above		6.5	.7
					7	7' = 4.1
	12	NR	11.1-13: sampled dropped out out of tube upon retrieval.	35%	7.5	18
			as above, lt gray & bright yellow-orange pockets, wet		8	34
	14		13.8 grading to med-gray	100	8.5	19
					9	0.6
	16		v.f. SAND, minor silt		9.5	.7
					10	10' = 4
	18	NR	17.7 grading to cl-SILT, low plast med gray	90%	10.5	217
			Sample dropped out upon retrieval		11	73
			si-CLAY, decreasing silt w/ depth, soft, med plast, med-dk gray		13	13' = 3.3
	20		20.3 organic CLAY (fine peat layers) w/ solvent smell, only organic decay/H ₂ S smell, to TD = 21' bgs		13.5	1.0 HNu?!
					14	1.0
					14.5	1.0 mod solvent smell
					15	15.4 Sample IS10-1
					15	HNu out of order
					16	Sample tubes noticeably cool upon retrieval, with strong solvent smell
					17	Sample tube noted cool. Fluid inclusions of DNAPL(?) associated with sporadic peat (plant fibers) @ 17.2-17.4, & trapped droplets @ 17.6-17.8'
					19	Strong solvent smell @ 19.0, decreasing to none @ ~ 19.5

16.1-16.4
Sample
IS10-2

17.2
Sample
IS10-3

17.75
Sample
IS10-4

DRILLING LOG	DIVISION	INSTALLATION	SHEET
1. PROJECT Bldg 25 DNAPL Source Zone Borings		MCB Camp Lejeune	OF 1 SHEETS
2. LOCATION (Coordinates or Station) N-side Bldg 25, ~16' W of Tank T25-4		10. SIZE AND TYPE OF BIT Direct Push	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
3. DRILLING AGENCY GeoEnvironmental		12. MANUFACTURER'S DESIGNATION OF DRILL Geoprobe	
4. HOLE NO. (As shown on drawing title and file number) IR88-1511		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED UNDISTURBED 6
5. NAME OF DRILLER Rich Melton		14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER ~9-9.5 ft bgs	16. DATE HOLE STARTED 7-27-97 @ 1728 COMPLETED 7-27-97
7. THICKNESS OF OVERBURDEN		17. ELEVATION TOP OF HOLE	
8. DEPTH DRILLED INTO ROCK		18. TOTAL CORE RECOVERY FOR BORING %	
9. TOTAL DEPTH OF HOLE 18 ft		19. SIGNATURE OF INSPECTOR Geologist: Fred Holman INTERA	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	0		Mixed tank tank backfill & native sediments, disturbed thru-out f. to v.f. SAND			HNu 0.5' = 7.7 (bkgrnd)
	2			75		1 7.2 1.5 6.4 2 6.8 2.5 6.4
	3	NR	see below			
	4	NR	Core sample dropped out upon retrieval (Geoprobe needs to develop catcher baskets to prevent this)	4		
	6			07%		
	7		cl- f. to v.f. SAND, wet, soft, low plast, occasional gray clay clasts in dk-gray brn matrix	7		7.5' = 6.4
	8			70%		8 8.7 moderate hydrocarb & organic 8.5 7.0 9 2.7 decay smell
	10		Core tube stuck in barrel due to flowing sands; had to destroy tube: misc disturbed core described: f. to v.f. SAND, wet, cohesive, lt to med gray	10		strong hydrocarb smell
	12			30%		
	13		No sample collected	13		
	14		si- f.-v.f. SAND, wet, cohesive, med gray	14		14' = 5 14.5 4 (bkgrnd)
	15			100%	1" ID discrete sampler	15 4 no solvent smell 15.5 4
	16		16.0 grading to cl-SILT, wet soft, low plast, med gray	16		16 4
	16.4		16.4 grading to si-CLAY, wet, soft low-med plast, med gray (to TD=18 bgs) sparse plant fibers	70%	as above	16.5 43 mild solvent smell 17 18
	18			18		17.5 17 organic decay smell

DRILLING LOG			DIVISION	INSTALLATION	SHEET 01	
1. PROJECT 364 HP25 DNAPL Source Zone Borings				Camp Lejeune, NC	01/1 SHEETS	
2. DRILLING AGENCY PARRATT-WOLFE INC				10. SIZE AND TYPE OF BIT		
4. HOLE NO. (As shown on drawing title and file number) IR88-1512				11. DATUM FOR ELEVATION SHOWN (TBM or MSL)		
5. NAME OF DRILLER ARNOLD CHAPEL				12. MANUFACTURER'S DESIGNATION OF DRILL CMESS adapted for hollow stem augers		
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.				13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED UNDISTURBED	
7. THICKNESS OF OVERBURDEN NA				14. TOTAL NUMBER CORE BOXES		
8. DEPTH DRILLED INTO ROCK NA				15. ELEVATION GROUND WATER		
9. TOTAL DEPTH OF HOLE 19 feet				16. DATE HOLE STARTED 8/19/97 COMPLETED 8/19/97		
17. ELEVATION TOP OF HOLE				18. TOTAL CORE RECOVERY FOR BORING 78 %		
19. SIGNATURE OF INSPECTOR John T. Londergan				INVERA		
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE No. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			SANDY LOAM, brown, dry			HNU (ppm)
	2		CLAY CONTENT INCREASES			
	4				1.8 -16.0 -39.0 -49.8 -77.0 -45.0	RECOVERED 3' out of a 4' push
	6					
	8		FINE SAND, moist, lt. brown		-1.0 -0.8 -4.8 -1.6 -1.0 -1.2	RECOVERED 3' out of a 4' push
	10					
	12		VERY FINE SAND, moist lt. gray/brown color		-7.4 -31.6 -1.1 -0.8 -0.7 -0.7	RECOVERED 3' out of a 4' push
	14					
	16				-6.7	IS12-03 PCE 1515
	18		silty clay, gray, soft		-2.3 -2.7 -1.2 -1.3 -0.8 -0.7	IS12-01 PCE RECOVERED 3.5' out of a 4' push
	20		silty clay, gray, soft			IR88-1512-08 162-165
						IS12-02 PCE 17-172

DRILLING LOG		DIVISION	INSTALLATION <i>Camp Lejeune, NC</i>	SHEET <i>01</i> OF <i>01</i> SHEETS
1. PROJECT <i>Bldg HAZARDOUS SOURCE ZONE BORING</i>		10. SIZE AND TYPE OF BIT		
LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)		
3. DRILLING AGENCY <i>FARRATT-WOLFF INC.</i>		12. MANUFACTURER'S DESIGNATION OF DRILL <i>CMESS adapted for hollow stem casing</i>		
4. HOLE NO. (As shown on drawing title and file number) <i>IR88-1513</i>		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED	UNDISTURBED
5. NAME OF DRILLER <i>ARNOLD CHAPEL</i>		14. TOTAL NUMBER CORE BOXES		
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		16. DATE HOLE	STARTED <i>8/19/97</i>	COMPLETED <i>8/19/97</i>
7. THICKNESS OF OVERBURDEN <i>NA</i>		17. ELEVATION TOP OF HOLE		
8. DEPTH DRILLED INTO ROCK <i>NA</i>		18. TOTAL CORE RECOVERY FOR BORING <i>75</i> %		
9. TOTAL DEPTH OF HOLE <i>19 FEET</i>		19. SIGNATURE OF INSPECTOR <i>John T. Londergan - INTERA</i>		

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	2		<i>VERY FINE SAND, Lt. brown, dry</i>			<i>ANDU (gpm)</i>
	3				<i>-1.2</i>	
	4				<i>-0.8</i>	
	5				<i>-1.1</i>	
	6				<i>-1.5</i>	
	7		<i>Hydrocarbon odor</i>		<i>-5.2</i>	
	8				<i>-30.0</i>	
	9					
	10				<i>-6.8</i>	
	11				<i>-19.5</i>	
	12				<i>-93.0</i>	<i>1513-04</i>
	13				<i>-71.0</i>	<i>TPH 8.5</i>
	14				<i>-6.3</i>	<i>NOT SUBMITTED TO LABORATORY</i>
	15				<i>-2.6</i>	
	16				<i>-7.9</i>	
	17				<i>-1.4</i>	
	18				<i>-1.5</i>	
	19		<i>VERY FINE SAND, Lt. gray with Hydrocarbon odor</i>		<i>-1.1</i>	
	20				<i>-1.0</i>	
	21				<i>-0.7</i>	
	22				<i>-0.7</i>	
	23				<i>-1.0</i>	
	24				<i>-4.8</i>	
	25				<i>-4.0</i>	<i>1513-1 PCE 17.0</i>
	26				<i>-6.6</i>	<i>1513-2 PCE 17.5</i>
	27				<i>-15.9</i>	<i>1513-09 FOC 17.5-17.7</i>
	28				<i>-148.0</i>	
	29				<i>-182.0</i>	
	30				<i>-106.0</i>	<i>1513-3 PCE 18.0</i>
	31				<i>-124.0</i>	<i>1513-08 TPH 18.0-18.5</i>
	32		<i>Silty clay, soft, dk gray, moist</i>			

DRILLING LOG		DIVISION	INSTALLATION <i>MCB Camp Lejeune</i>	SHEET 1 OF 1 SHEETS
1. PROJECT <i>Geoprobe soil sampling @ Bldg 25</i>		10. SIZE AND TYPE OF BIT <i>1" & 1 3/4" ID core barrel</i>		
LOCATION (Coordinates or Station) <i>N-side of Bldg 25</i>		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)		
3. DRILLING AGENCY <i>FUGRO</i>		12. MANUFACTURER'S DESIGNATION OF DRILL <i>Geoprobe</i>		
4. HOLE NO. (As shown on drawing title and file number) <i>IR88-1314</i>		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED	UNDISTURBED
5. NAME OF DRILLER <i>Frank Ward</i>		14. TOTAL NUMBER CORE BOXES		
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER <i>~ 8 ft BGS</i>		
7. THICKNESS OF OVERBURDEN		16. DATE HOLE		
8. DEPTH DRILLED INTO ROCK		STARTED <i>11-18-97 @ 0912</i> COMPLETED <i>11-18-97 @ 1450</i>		
9. TOTAL DEPTH OF HOLE <i>22 ft</i>		17. ELEVATION TOP OF HOLE		
		18. TOTAL CORE RECOVERY FOR BORING %		
		19. SIGNATURE OF INSPECTOR <i>Fred Hohmer DE&S Geologist</i>		

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			0.0 Grass, v.f. SAND, moist, cohesive, loose, tan			4 in
			1.5 si-CLAY, tan-brn, low plast			18
			1.6 SILT w v.f. sand, moist, friable, charcoal-brn grading to dk brn			78
	2		2.0 SILT w clay & v.f. sand, moist s/t plast, grey-brn			74
			2.8 SILT w clay & v.f. sand, moist s/t plast, grey-brn			24
				3		20
						19
						8
	4					13
			5.1 Si-CLAY, wet, low plast	80%		9
						5
		NR				3
	6		6.0 CL-SILT w v.f. sand, s/t plast, moist grading to wet @ ~ 7.0, gray		6	4
						2
			7.7 SILT w minor clay, wet, cohesive, tan to buff, trace v.f. sand	100		1
	8					1
			8.4 si-CLAY, wet, low plast, tan-gray			0
			8.5 v.f. SAND, trace fines, wet, cohesive, lt gray w tan & yellow org mottling		9	0
						0
	10		10.4 grading to cl-si-v.f. sand, wet, s/t plast, med-gray cohesive	85%		1
			10.8 v.f. SAND, wet, loose, gray			2
						1
	12	NR				1
			12.0 si-v.f. SAND, wet, cohesive med-gray		12	0
			13.1 thin cl-si-v.f. SAND, s/t plast, seam.			1
			13.2 f-v.f. SAND, trace fines, wet cohesive,	70%		0
	14					0
			grading to v.f. SAND			0
					15	0
	16			50%		0
						2
		NR				1
	18		18.0 CLAY, v. soft, med plast gray		18	3
			20.1 grading to CLAY w seam, soft, med plast, gray-brn to TD @ 22'	100		0
						0
						0
						0
						0

DRILLING LOG		DIVISION	INSTALLATION <i>MCB Camp Lejeune</i>	SHEET 1 OF 1 SHEETS
1. PROJECT <i>Geoprobe soil sampling Bldg 25</i>		10. SIZE AND TYPE OF BIT <i>1" & 3/4" ID core barrel</i>		
2. LOCATION (Coordinates or Station) <i>N-side of Bldg 25</i>		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)		
3. DRILLING AGENCY <i>FUGRO</i>		12. MANUFACTURER'S DESIGNATION OF DRILL <i>Geoprobe</i>		
4. HOLE NO. (As shown on drawing title and file number) <i>IRBB-IS15</i>		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED	UNDISTURBED <i>7</i>
5. NAME OF DRILLER <i>Frank Ward</i>		14. TOTAL NUMBER CORE BOXES		
6. DIRECTION OF HOLE <input type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER <i>~ 8 ft BGS</i>	16. DATE HOLE	STARTED <i>11-18-97@1500</i> COMPLETED <i>11-18-97@1730</i>
7. THICKNESS OF OVERBURDEN		17. ELEVATION TOP OF HOLE		
8. DEPTH DRILLED INTO ROCK		18. TOTAL CORE RECOVERY FOR BORING %		
9. TOTAL DEPTH OF HOLE <i>22 ft</i>		19. SIGNATURE OF INSPECTOR <i>Fred Holmer DE&S Geologist</i>		

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	Hnu
			0 Appears to be mixed backfill from tank removal area: clean f. sand w native soil: si-f. sand w clay			Core samples collected in 1-1/16" ID core tubes	0
	2			70%			0
	3						2
	4			50%			1
	6		6.4 CLAY, soft, wet, med plast, yel-org & gray 6.6 si-v.f. SAND, moist, cohesive buff	85			0
	8					IS15-01 8-9'	2
	9		9.5 grading to SILT w v.f. sand, wet, cohesive, gray w intermittent zones of SILT w clay & v.f sand	85%			4
	10						6
	12						13
	14			80			3
	15						2
	16	NR		0			4
	18		18.0 SILT, wet, cohesive, gray	18			0
	19.0		19.0 CLAY, wet, soft, med plast gray	90%		IS15-02 @ 19' above clay contact	8
	19.9		19.9 CLAY w peat, low-med plast gray-brn				25

DRILLING LOG		DIVISION		INSTALLATION <i>MCB Camp Lejeune</i>		SHEET 1 OF 1 SHEETS	
1. PROJECT <i>Geoprobe soil sampling @ Bldg 25</i>				10. SIZE AND TYPE OF BIT <i>1" & 1 3/4" ID core barrel</i>			
2. LOCATION (Coordinates or Station) <i>5 ft N of Bldg 25</i>				11. DATUM FOR ELEVATION SHOWN (TBM or MSL)			
3. DRILLING AGENCY <i>FUGRO</i>				12. MANUFACTURER'S DESIGNATION OF DRILL <i>Geoprobe</i>			
4. HOLE NO. (As shown on drawing title and file number) <i>IR88-1S16</i>				13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		DISTURBED UNDISTURBED <i>2</i>	
5. NAME OF DRILLER <i>Frank Ward</i>				14. TOTAL NUMBER CORE BOXES			
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.				15. ELEVATION GROUND WATER		16. DATE HOLE STARTED <i>11-19-97</i> COMPLETED <i>11-19-97</i>	
7. THICKNESS OF OVERBURDEN				17. ELEVATION TOP OF HOLE			
8. DEPTH DRILLED INTO ROCK				18. TOTAL CORE RECOVERY FOR BORING %			
9. TOTAL DEPTH OF HOLE <i>20 ft</i>				19. SIGNATURE OF INSPECTOR <i>Fred Hohma DE & S Geologist</i>			

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	2					<i>IS16 is located 1 ft E of IS03</i>
	4					
	6					
	8		<i>8.0 si-v.f. SAND, wet, cohesive, tan</i>	<i>75%</i>		<i>IS16-01 8-9'</i>
	10					
	12					
	14					
	16		<i>16.0 si-v.f. SAND, wet, cohesive, firm, gray to loose</i>			
	18		<i>17.5 grading to SILT w v.f. sand, wet, soft, cohesive,</i>	<i>100%</i>		<i>Strong solvent smell</i>
			<i>18.6 grading to si-CLAY, wet, v. soft, low plast</i>			<i>IS16-02 @ 18.5'</i>
	20					

DRILLING LOG		DIVISION		INSTALLATION	SHEET 1
1. PROJECT		MCB Camp Lejeune		OF 1 SHEETS	
Geoprobe Soil Sampling @ Bldg 25		10. SIZE AND TYPE OF BIT		1/2" & 3/4" ID core barrel	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)			
3. DRILLING AGENCY		12. MANUFACTURER'S DESIGNATION OF DRILL		Geoprobe	
FUGRO		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		DISTURBED UNDISTURBED	
4. HOLE NO. (As shown on drawing title and file number)		IR88-IS17		2	
5. NAME OF DRILLER		14. TOTAL NUMBER CORE BOXES			
Frank Ward		15. ELEVATION GROUND WATER		~ 8 ft BGS	
6. DIRECTION OF HOLE		16. DATE HOLE		STARTED COMPLETED	
<input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		11-19-97 @ 1015		11-19-97 @ 1150	
7. THICKNESS OF OVERBURDEN		17. ELEVATION TOP OF HOLE			
8. DEPTH DRILLED INTO ROCK		18. TOTAL CORE RECOVERY FOR BORING		%	
9. TOTAL DEPTH OF HOLE		21 ft		19. SIGNATURE OF INSPECTOR	
				Fred Holmer DE&S Geologist	

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
a	b	c	d	e	f	g
	2					
	4					
	6					
	8		8.0 si-vif. SAND, wet, loose, lt. gray	80%	8	4nu Strong hydrocarb smell IS17-01 8-9'
	10				10	280 160 70 80
	12					
	14					
	16					
	17		17.0 SILT w/ clay & v.f. sand, firm, wet, cohesive, silt plast, gray		17	4nu 220
	18		18.5 grading to si-CLAY w/ v.f. sand & peat, wet, v. soft, low plast gray	100%		Strong solvent odor IS17-02 @ 18.0' - > 400
	19					100 190
	20		19.8 CLAY w/ peat, soft to firm, low plast, peat decreasing w/ depth			40 80

DRILLING LOG		DIVISION		INSTALLATION MCB Camp Lejeune	SHEET 1 OF 1 SHEETS
1. PROJECT Geoprobe Soil Sampling @ Bldg 25		10. SIZE AND TYPE OF BIT 1" & 1 3/4" ID core barrel		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
2. LOCATION (Coordinates or Station) ~12 ft N of well TW-3		12. MANUFACTURER'S DESIGNATION OF DRILL Geoprobe		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	
3. DRILLING AGENCY FUGRO		14. TOTAL NUMBER CORE BOXES		15. ELEVATION GROUND WATER ~ 8 ft BGS	
4. HOLE NO. (As shown on drawing title and file number) IR88-IS18		16. DATE HOLE STARTED 11-19-97 @ 1400 COMPLETED 11-19-97		17. ELEVATION TOP OF HOLE	
5. NAME OF DRILLER Frank Ward		18. TOTAL CORE RECOVERY FOR BORING		19. SIGNATURE OF INSPECTOR Fred Holzner DE&S Geologist	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		7. THICKNESS OF OVERBURDEN		8. DEPTH DRILLED INTO ROCK	
9. TOTAL DEPTH OF HOLE 21 ft					

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
8	8		8.0 f. to v.f. SAND, wet, loose to cohesive, firm, lt gray	100%		Hnu
10	10					6
17	17		17.0 si-v.f. SAND, wet, firm, cohesive, gray			2
18	18		18.0 grading to CI-SILT w f. sand & peat particles, silt plast.			2
18.8	18.8		18.8 grading to si-CLAY w f sand & peat particles, wet, soft, med gray low plast	100%		0
19.6	19.6		19.6 grading to CLAY w peat, minor silt & f. sand, soft-firm, low plast			

DRILLING LOG		DIVISION	INSTALLATION <i>MCB Camp Lejeune</i>	SHEET 1 OF 1 SHEETS
1. PROJECT <i>Geoprobe Soil Sampling @ Bldg 25</i>		10. SIZE AND TYPE OF BIT <i>1" x 1 3/4" ID core barrel</i>		
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)		
3. DRILLING AGENCY <i>FUGRO</i>		12. MANUFACTURER'S DESIGNATION OF DRILL <i>Geoprobe</i>		
4. HOLE NO. (As shown on drawing title and file number) <i>IR88-IS19</i>		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED	UNDISTURBED
5. NAME OF DRILLER <i>Frank Ward</i>		14. TOTAL NUMBER CORE BOXES		
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER <i>~ 8 ft BGS</i>		
7. THICKNESS OF OVERBURDEN		16. DATE HOLE		
8. DEPTH DRILLED INTO ROCK		17. ELEVATION TOP OF HOLE		
9. TOTAL DEPTH OF HOLE <i>21 ft</i>		18. TOTAL CORE RECOVERY FOR BORING %		
		19. SIGNATURE OF INSPECTOR <i>Fred Holzner DE&S Geologist</i>		

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
8			8.0 si-f. SAND, wet, gray		8	Hnu 40
8.7			8.7 si-cl-v.f. SAND w peat	80%		Strong hydrocarb Smell IS19-01 @ 8-9'
280						280
170						170
250						250
17			17.0 si-f. SAND, wet firm,		17	Hnu 12
18.2			18.2 grading to cl-SILT w v.f. sand & peat particles, wet, silt plast	100%		3
18.9			18.9 grading to si-CLAY w v.f. sand & peat particles, wet, low plast, soft			.5
19.5			19.5 grading to CLAY w minor silt, peat particles, v. soft, low-med plast			.5
20						.5

DRILLING LOG		DIVISION	INSTALLATION <i>MCB Camp Lejeune</i>	NOTE NO.	SHEET 1 OF 1 SHEETS
1. PROJECT <i>Geoprobe Soil Sampling @ Bldg 25</i>		10. SIZE AND TYPE OF BIT <i>1" x 1 3/4" ID core barrel</i>		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
2. LOCATION (Coordinates or Station)		12. MANUFACTURER'S DESIGNATION OF DRILL <i>Geoprobe</i>			
3. DRILLING AGENCY <i>FUGRO</i>		4. HOLE NO. (As shown on drawing title and file number) <i>IR88-IS20</i>		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN DISTURBED: _____ UNDISTURBED: <i>2</i>	
5. NAME OF DRILLER <i>Frank Ward</i>		14. TOTAL NUMBER CORE BOXES		15. ELEVATION GROUND WATER <i>~ 8 ft BGS</i>	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		16. DATE HOLE STARTED: <i>11-19-97 @ 1630</i> COMPLETED: <i>11-19-97</i>		17. ELEVATION TOP OF HOLE	
7. THICKNESS OF OVERBURDEN		18. TOTAL CORE RECOVERY FOR BORING _____ %		19. SIGNATURE OF INSPECTOR <i>Fred Holman DE & S Geologist</i>	
8. DEPTH DRILLED INTO ROCK		9. TOTAL DEPTH OF HOLE <i>21 ft</i>			

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
8	8		8.0 si-v.f. SAND, wet, firm, lt gray lt brn tan-gray	100%		Hnu 4 11 125 25 3
17	17		17.0 si-v.f. SAND, wet, firm,	100%		Hnu 38 10 52 20 ?
17.0	17.0		grading to cl-SILT, wet, slt pbsr			
17.4	17.4		grading to CLAY, wet, soft, low plast. w/ peat particles			

DRILLING LOG		DIVISION	INSTALLATION <i>MCB Camp Lejeune</i>	SHEET (OF 1 SHEETS
1. PROJECT <i>Geoprobe Soil Sampling at Bldg 25</i>			10. SIZE AND TYPE OF BIT <i>1" x 1 3/4" ID core barrel</i>	
2. LOCATION (Coordinates or Station)			11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY <i>FUGRO</i>			12. MANUFACTURER'S DESIGNATION OF DRILL <i>Geoprobe</i>	
4. HOLE NO. (As shown on drawing title and file number) <i>IR88-IS22</i>			13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED UNDISTURBED <i>3</i>
5. NAME OF DRILLER <i>Frank Ward</i>			14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.			15. ELEVATION GROUND WATER <i>~ 8 ft BGS</i>	
7. THICKNESS OF OVERBURDEN			16. DATE HOLE STARTED <i>11-20-97 @ 1140</i> COMPLETED <i>11-20-97</i>	
8. DEPTH DRILLED INTO ROCK			17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE <i>22 ft</i>			18. TOTAL CORE RECOVERY FOR BORING %	
			19. SIGNATURE OF INSPECTOR <i>Fred Holman DE & S Geologist</i>	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
8			8.0 f. to v.f. SAND, minor silt, wet, cohesive, lt. gray to buff	100%	IS22-01 8-9'	Hnu 400 400 360 360 425
16			16.0 f. to v.f. SAND, wet, firm, lt gray			Hnu Strong solvent odor 420 380 340
17.5			17.5 grading to si-cl-f. SAND, wet firm to silt soft, silt plast			220
18.4			18.4 grading to cl-SILT w v.f. sand, wet, soft, low plast, med gray	100%	Perm Test Core Hnu 400	420 440
19.2			19.2 grading to si-CLAY, wet, soft, low plast, med-dk gray		90	260
21.0			21.0 grading to CLAY w silt & peat particles, peat increasing to depth, low plast, brown, solvent smell		340	160

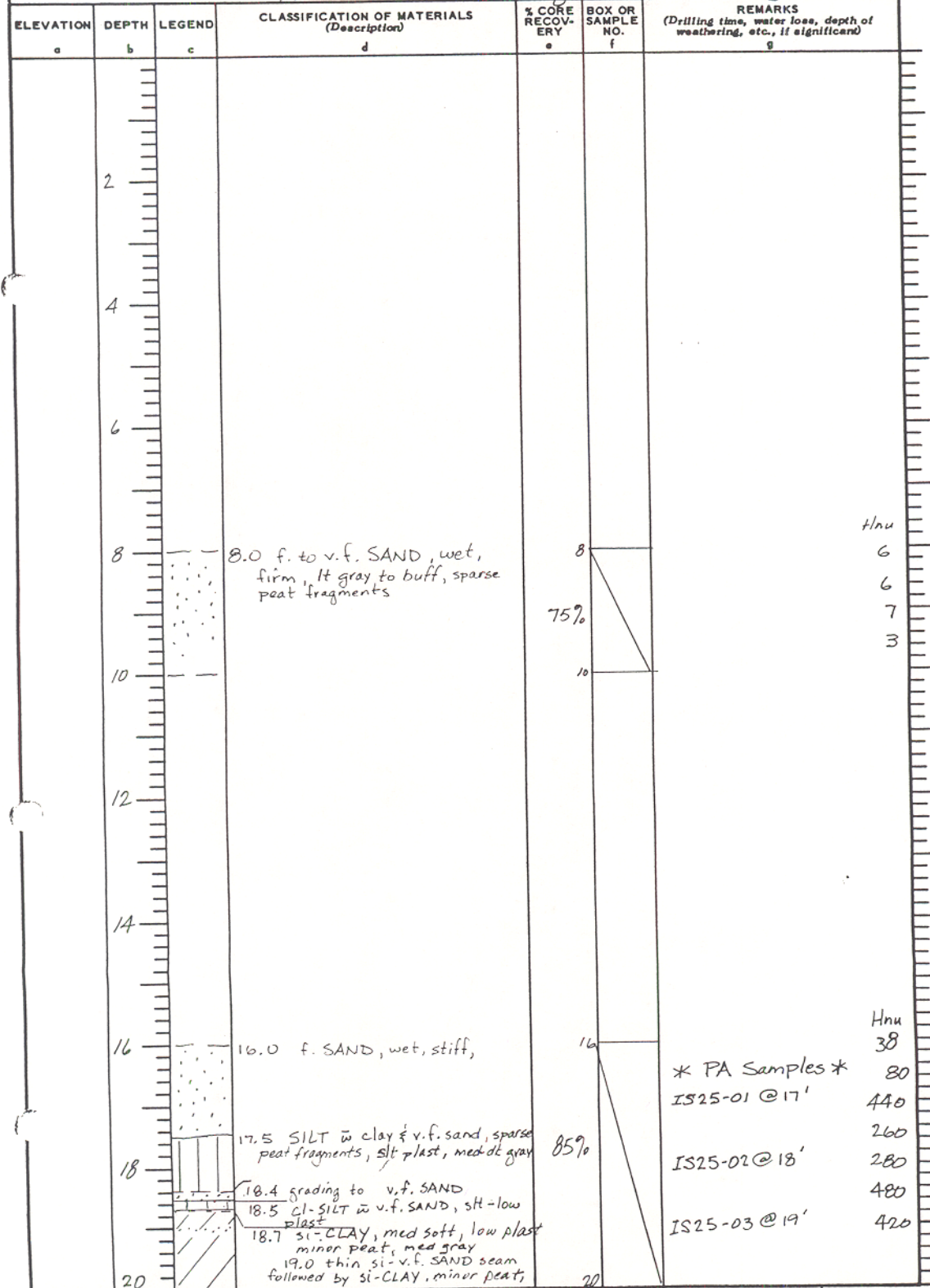
DRILLING LOG		DIVISION	INSTALLATION <i>MCB Camp Lejeune</i>	OF 1 SHEETS
1. PROJECT <i>Geoprobe Soil Sampling @ Bldg 25</i>		10. SIZE AND TYPE OF BIT <i>1 3/4" ID core barrel</i>		
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)		
3. DRILLING AGENCY <i>FUGRO</i>		12. MANUFACTURER'S DESIGNATION OF DRILL <i>Geoprobe</i>		
4. HOLE NO. (As shown on drawing title and file number) <i>IR88-1523</i>		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED	UNDISTURBED
5. NAME OF DRILLER <i>Frank Ward</i>		14. TOTAL NUMBER CORE BOXES		
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER <i>~ 8 ft BGS</i>	16. DATE HOLE	
7. THICKNESS OF OVERBURDEN		STARTED <i>11-21-97</i>	COMPLETED <i>11-21-97</i>	
8. DEPTH DRILLED INTO ROCK		17. ELEVATION TOP OF HOLE		
9. TOTAL DEPTH OF HOLE <i>21 ft</i>		18. TOTAL CORE RECOVERY FOR BORING %		
		19. SIGNATURE OF INSPECTOR <i>Fred Hohner DE&S Geologist</i>		

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	2					
	4					
	6					
	8					
	10					
	12					
	14					
	16					
	17.0		17.0 v.f. SAND, wet, firm, gray		17	* PA Samples * Hnu 40
	18.3		18.3 grading to SILT w v.f. sand & clay, wet, firm, slt plast	95%		IS23-01 @ 17.5' -> 160 VOA
	19.0		19.0 grading to si-CLAY w peat particles, wet, v. soft, low-med plast med-dk gray			IS23-02 @ 18.25' -> 240 VOA
	20.2		20.2 as above grading to gray-brn w increasing peat fragments, low plast			IS23-03 @ 19.0' 320 VOA
	20.5					IS23-04: 19.5-19.9 70 Kv/Cap P
	20.4					IS23-05: 20.0-20.4 24 Kv/Cap P

DRILLING LOG		DIVISION		INSTALLATION <i>MCB Camp Lejeune</i>		OF 1 SHEETS	
1. PROJECT <i>Geoprobe Soil Sampling @ Bldg 25</i>				10. SIZE AND TYPE OF BIT <i>1 3/4" ID core barrel</i>			
2. LOCATION (Coordinates or Station)				11. DATUM FOR ELEVATION SHOWN (TBM or MSL)			
3. DRILLING AGENCY <i>FUGRO</i>				12. MANUFACTURER'S DESIGNATION OF DRILL <i>Geoprobe</i>			
4. HOLE NO. (As shown on drawing title and file number) <i>IR88-IS24</i>				13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		DISTURBED	
5. NAME OF DRILLER <i>Frank Ward</i>				14. TOTAL NUMBER CORE BOXES			
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.				15. ELEVATION GROUND WATER <i>~ 8 ft BGS</i>		16. DATE HOLE	
7. THICKNESS OF OVERBURDEN				STARTED <i>11-20-97 @ 1600</i>		COMPLETED <i>11-20-97</i>	
8. DEPTH DRILLED INTO ROCK				17. ELEVATION TOP OF HOLE			
9. TOTAL DEPTH OF HOLE <i>20 ft</i>				18. TOTAL CORE RECOVERY FOR BORING %			
				19. SIGNATURE OF INSPECTOR <i>Fred Hogner DE&S Geologist</i>			

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
a	b	c	d	e	f	g
	2					
	4					
	6					
	8					
	10					
	12					
	14					
	16					
	17.5		<i>~ 17.5 si-v.f. SAND, wet, firm</i>			
	18.0		<i>~ 18.0 grading to cl-SILT</i>			
	19.0		<i>~ 19.0 grading to si-CLAY, wet, v. soft, w peat fragments v. soft, low-med plast</i>			
	20					
						<i>No Performance Assessment VOC samples collected here due to difficult sampling & poor recovery</i>
						<i>Difficulty collecting core: 1st attempt recovered ~25% 2nd " " ~40% → strong solvent smell</i>
						<i>Estimate recovered core is from ~ 17.5-19.0 ft based on nearby logs IS07 & IW01</i>
						<i>Hnu 420</i>
						<i>440</i>
						<i>360</i>
						<i>250</i>

DRILLING LOG		DIVISION	INSTALLATION <i>MCB Camp Lejeune</i>	SHEET OF 1 SHEETS
1. PROJECT <i>Geoprobe Soil Sampling @ Bldg 25</i>		10. SIZE AND TYPE OF BIT /" # <i>1 3/4" ID core barrel</i>		
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)		
3. DRILLING AGENCY <i>FUGRO</i>		12. MANUFACTURER'S DESIGNATION OF DRILL <i>Geoprobe</i>		
4. HOLE NO. (As shown on drawing title and file number) <i>IR00-IS25</i>		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED	UNDISTURBED <i>2</i>
5. NAME OF DRILLER <i>Frank Ward</i>		14. TOTAL NUMBER CORE BOXES		
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER <i>~ 8 ft BGS</i>		
7. THICKNESS OF OVERBURDEN		16. DATE HOLE		
8. DEPTH DRILLED INTO ROCK		17. ELEVATION TOP OF HOLE		
9. TOTAL DEPTH OF HOLE <i>20 ft</i>		18. TOTAL CORE RECOVERY FOR BORING %		
		19. SIGNATURE OF INSPECTOR <i>Fred Hohmer DE&S Geologist</i>		



Hnu
6
6
7
3


Hnu
38
80
440
260
280
480
420

* PA Samples *
IS25-01 @ 17'
IS25-02 @ 18'
IS25-03 @ 19'

DRILLING LOG		DIVISION		INSTALLATION <i>MCB Camp Lejeune</i>	SHEET 1 OF 1 SHEETS
1. PROJECT <i>Geoprobe Soil Sampling at Bldg 25</i>			10. SIZE AND TYPE OF BIT <i>1 3/4" ID core barrel</i>		
2. LOCATION (Coordinates or Station)			11. DATUM FOR ELEVATION SHOWN (TBM or MSL)		
3. DRILLING AGENCY <i>FUGRO</i>			12. MANUFACTURER'S DESIGNATION OF DRILL <i>Geoprobe</i>		
4. HOLE NO. (As shown on drawing title and file number) <i>IR88-1S26</i>			13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		DISTURBED UNDISTURBED
5. NAME OF DRILLER <i>Frank Ward</i>			14. TOTAL NUMBER CORE BOXES		
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.			15. ELEVATION GROUND WATER <i>~ 8 ft BGS</i>		
7. THICKNESS OF OVERBURDEN			16. DATE HOLE		STARTED COMPLETED
8. DEPTH DRILLED INTO ROCK			<i>11-21-97 @ 1000</i>		<i>11-21-97</i>
9. TOTAL DEPTH OF HOLE <i>20 ft</i>			17. ELEVATION TOP OF HOLE		
			18. TOTAL CORE RECOVERY FOR BORING %		
			19. SIGNATURE OF INSPECTOR <i>Fred Hohner DE&S Geologist</i>		

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
a	b	c	d	e	f	g
	2					
	4					
	6					
	8					
	10					
	12					
	14					
	16		16.0 f. SAND, wet, firm, sparse peat fragments, gray		16	* PA Samples * H _{nu} 13
	17.2		17.2 si-v.f. SAND, wet, stiff, sparse peat fragments			IS26-01 @ 17.0' → 60
	17.7		17.7 grading to ci-SILT, wet, silt plast, sparse peat fragments, med-soft	80%		IS26-02 @ 17.75' → 130
	18.3		18.3 grading to si-CLAY, wet, soft, low plast, sparse peat frags			IS26-03 @ 18.5' → 60
	20	NR			20	62

DRILLING LOG		DIVISION	INSTALLATION <i>MCB Camp Lejeune</i>	SHEET 1 OF 1 SHEETS
1. PROJECT <i>Geoprobe Soil Sampling at Bldg 25</i>		10. SIZE AND TYPE OF BIT <i>1" ID core barrel</i>		
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)		
3. DRILLING AGENCY <i>FUGRO</i>		12. MANUFACTURER'S DESIGNATION OF DRILL <i>Geoprobe</i>		
4. HOLE NO. (As shown on drawing title and file number) <i>IRBB-IS27</i>		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED	UNDISTURBED
5. NAME OF DRILLER <i>Frank Ward</i>		14. TOTAL NUMBER CORE BOXES		
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER <i>~ 8 ft BGS</i>	STARTED <i>11-21-97 @ 1035</i>	COMPLETED <i>11-21-97</i>
7. THICKNESS OF OVERBURDEN		17. ELEVATION TOP OF HOLE		
8. DEPTH DRILLED INTO ROCK		18. TOTAL CORE RECOVERY FOR BORING %		
9. TOTAL DEPTH OF HOLE <i>10 ft</i>		19. SIGNATURE OF INSPECTOR <i>Fred Holman DE&S Geologist</i>		

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
a	b	c	d	e	f	g
	2					
	4					
	6					
	8		8.0 f. to v.f. SAND w intermittent si-cl-f. SAND layers, wet, firm, grading from brn to yel-orange to lt gray	65%	IS27-01 @ 8-9'	Varsol Sample
	10	NR				

Hnu
1
0
1.5

DRILLING LOG		DIVISION		INSTALLATION <i>MCB Camp Lejeune</i>	SHEET 1 OF 1 SHEETS
1. PROJECT <i>Geoprobe Soil Sampling inside Bldg 25</i>			10. SIZE AND TYPE OF BIT <i>1" & 1 3/4" ID core barrel</i>		
2. LOCATION (Coordinates or Station)			11. DATUM FOR ELEVATION SHOWN (TBM or MSL)		
3. DRILLING AGENCY <i>FUGRO</i>			12. MANUFACTURER'S DESIGNATION OF DRILL <i>Geoprobe</i>		
4. HOLE NO. (As shown on drawing title and file number) <i>IR88-IS28</i>			13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		DISTURBED UNDISTURBED <i>3</i>
5. NAME OF DRILLER <i>Frank Ward</i>			14. TOTAL NUMBER CORE BOXES		
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.			15. ELEVATION GROUND WATER <i>~ 8 ft BGS</i>		
7. THICKNESS OF OVERBURDEN			16. DATE HOLE		STARTED COMPLETED <i>11-21-97 @ A35</i> <i>11-22-97 @ 0815</i>
8. DEPTH DRILLED INTO ROCK			17. ELEVATION TOP OF HOLE		
9. TOTAL DEPTH OF HOLE <i>20</i>			18. TOTAL CORE RECOVERY FOR BORING %		
			19. SIGNATURE OF INSPECTOR <i>Fred Holzner DE & S Geologist</i>		

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	2					
	4					
	6					
	8		8.0 f. to v.f. SAND, wet, firm, tan to buff color	80%	1	Hnu 1
	10				1	1
	12					No VOC sample collected since no contacts were observed between sand to silt to clay, & no evidence of contam.
	14		cl-SILT, med-firm, gray, low plast, sparse peat	40%		Peen recovery: 1.5 ft from somewhere between 14-18 ft PID malfunction but no evidence of contamination, only mild organic decay smell
	16					
	18		18.0 CLAY, wet, soft, low-med plast, sparse peat, med-gray 18.7 grading to peaty-CLAY, soft-firm, low plast, grayish-brn	100%		Hnu malfunction, but no evidence of contam, mild organic decay odor only.
	20				20	