

ENVIRONMENTAL
PROTECTION
97 MAR 31 PM 3:53

March 13, 1997

15,870.004

Ms. Evelyn Navarro
Contracting Officer
Civil Engineering Unit Oakland
U.S. Coast Guard
2000 Embarcadero, Suite 200
Oakland, California 94606-5337

Dear Ms. Navarro:

Summary Report
Subsurface Investigation at Coast Guard Support Center Alameda
Contract DTTCG88-95-D-6AL022
PSN 11-05172
Alameda, California

This letter report summarizes activities performed by AGI Technologies (AGI) and presents the results of laboratory analyses of soil samples collected at the above-referenced site. This work was performed in accordance with your March 22, 1996 request for cost proposal and in accordance with our April 24, 1996 cost proposal.

BACKGROUND

The U.S. Coast Guard (USCG) provided the following background information on the site. The site has been occupied by the USCG and other federal agencies since the early 1930s; by the 1940s, the USCG was the sole occupant. A boiler plant was constructed during the 1940s to supply heat to other newly constructed buildings. The boiler reportedly burned No. 6 fuel oil, likely supplied by a subsurface pipeline.

During the repair of a fire hydrant pipeline in 1993, soil containing elevated concentrations of fuel oil was encountered adjacent to an abandoned pipeline, thought to be the former boiler plant pipeline.

OBJECTIVE AND SCOPE

The objective of our services was to further evaluate the extent of petroleum hydrocarbons associated with the former boiler fuel oil pipeline in subsurface soil at the site. To achieve this objective, we:

- Advanced 22 geoprobe corings to approximately 10 feet below ground surface (bgs).

- Collected samples of soil during coring and submitted 25 selected samples for analytical testing.
- Prepared this summary report documenting field observations, conditions, laboratory analytical results, and conclusions.

SITE SETTING

U.S. Coast Guard Support Center Alameda is located on Coast Guard Island in Alameda, California, as shown on **Figure 1**. The site is bounded by water on all sides, with Brooklyn Basin to the north and east and Fortmann Basin to the south and west. Land surface elevation is approximately 10 feet above sea level, and the surrounding land is generally level.

The focus of this investigation is on the area surrounding the intersection of Eagle Road and McCulloch Drive, as shown on **Figure 2**.

GEOLOGY

Twenty-two soil corings were advanced using a GeoProbe coring rig on October 31, 1996 and January 29, 1997. Coring locations are shown on **Figure 2**. The corings were advanced to depths between 9 and 10 feet bgs. Soil samples were collected continuously from a depth of 2 feet bgs to the total depth of the corings. Samples were classified according to the Unified Soil Classification System, shown on **Plate 1** in **Attachment 1**. Coring logs are presented on **Plates 2** through **12**, also in **Attachment 1**.

Subsurface material encountered beneath the asphalt road surface and approximately 18 inches of base course consisted of 3 to 8 feet of gray to black clay with sand in places and 2 to 5 feet of gray sand to silty sand above the clay in places and below the clay in places.

SOIL SAMPLE COLLECTION AND ANALYSIS

Continuous sampling was performed from a depth of 2 feet bgs to the total depth of the corings. The samples appearing to contain the highest concentration of petroleum hydrocarbons were selected for laboratory analysis and submitted to Sparger Technologies, Inc., of Sacramento, California or Columbia Analytical Services, of Kelso, Washington for chemical analysis. The samples were analyzed for total petroleum hydrocarbons (TPH) quantified as gasoline, diesel, and oil and for benzene, ethylbenzene, toluene, and total xylenes (BETX). The results of the analyses, shown in **Table 1**, indicate concentrations of TPH above detection limits in samples from borings B2, B3, B4, B6, B11, B13, B17, B18, B19, B20, B21 and B22. The locations of samples containing detected concentrations of diesel-range TPH are shown on **Figure 3**. BETX constituents were detected in samples from borings B4, B6, and B11. Copies of the laboratory reports are attached.

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CONCLUSIONS

Based on the results of soil sample analyses, elevated concentrations of TPH in soil likely associated with the former boiler plant pipeline do not extend outside the area immediately adjacent to the former pipeline. In addition, the samples containing detected concentrations of TPH did not contain significant concentrations of BETX, the more volatile and mobile constituents typically associated with petroleum products. In our opinion, no further action regarding the former pipeline in this area is necessary, with the exception of proper handling of impacted soil from this area during future utility repair or excavation work.

LIMITATIONS

This report has been prepared for exclusive use by the U.S. Coast Guard and its consultants for this project only. The analyses, conclusions, and recommendations presented in this report are based on conditions encountered at the time of our study and our experience and professional judgement. AGI cannot be held responsible for the interpretation by others of the data contained herein.

Our services have been performed in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in the area. No other warranty, express or implied, is made.

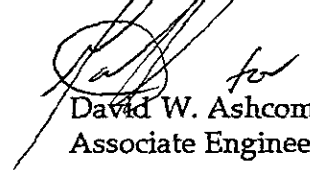
Please call if you have any questions, comments, or require additional information.

Sincerely,

AGI Technologies



Peter P. Barry
Associate Hydrogeologist



David W. Ashcom, P.E.
Associate Engineer

PPB/DWA/tag

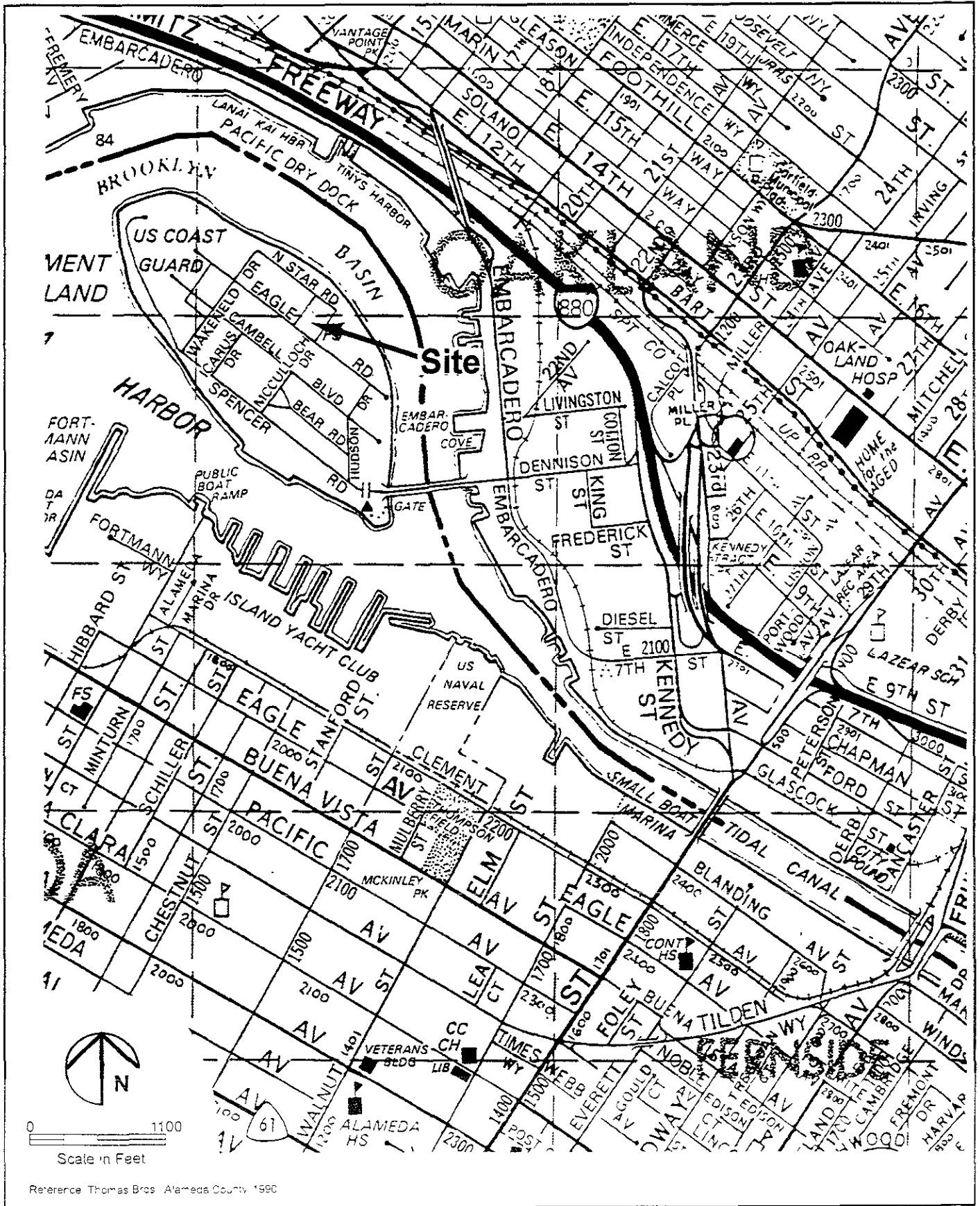
attachments

Table 1
Summary of Chemical Analyses - Soil
 U.S. Coast Guard/Coast Guard Island Alameda
 Alameda, California

Sample ID	Sample Date	EPA Test Method 8020				California TPH Methods		
		Benzene	Ethylbenzene	Toluene	Xylenes	TPH Gasoline	TPH Diesel	TPH Oil
		mg/kg				mg/kg		
B1-3'	10/31/96	ND	ND	ND	ND	ND	ND	ND
B2-5'	10/31/96	ND	ND	ND	ND	ND	1,500	ND
B3-8'	10/31/96	ND	ND	ND	ND	ND	21 ^a	ND
B4-7.5'	10/31/96	ND	0.026	ND	0.1	ND	440 ^b	ND
B5-4'	10/31/96	ND	ND	ND	ND	ND	ND	ND
B6-7.5'	10/31/96	ND	ND	ND	0.1	ND	720 ^c	ND
B8-8.5'	10/31/96	ND	ND	ND	ND	ND	ND	ND
B9-9'	10/31/96	ND	ND	ND	ND	ND	ND	ND
B10-8.5'	10/31/96	ND	ND	ND	ND	ND	ND	ND
B11-4'	10/31/96	ND	ND	ND	0.41	ND	ND	1,400
B12-7'	01/29/97	ND	ND	ND	ND	ND	ND	ND
B13-7'	01/29/97	ND	ND	ND	ND	ND	ND	40
B14-7'	01/29/97	ND	ND	ND	ND	ND	ND	ND
B14-8'	01/29/97	ND	ND	ND	ND	ND	ND	ND
B15-7'	01/29/97	ND	ND	ND	ND	ND	ND	ND
B16-7'	01/29/97	ND	ND	ND	ND	ND	ND	ND
B17-5'	01/29/97	ND	ND	ND	ND	ND	18	132
B18-8'	01/29/97	ND	ND	ND	ND	ND	ND	35
B19-7'	01/29/97	ND	ND	ND	ND	ND	ND	31
B20-7'	01/29/97	ND	ND	ND	ND	ND	ND	26
B21-5.5'	01/29/97	ND	ND	ND	ND	7	470	217
B21-6.5'	01/29/97	ND	ND	ND	ND	ND	14	46
B21-8.5'	01/29/97	ND	ND	ND	ND	122	2,040	894
B22-6'	01/29/97	ND	ND	ND	ND	ND	16	93
B22-8'	01/29/97	ND	ND	ND	ND	ND	ND	ND
Detection Limit		0.005	0.005	0.005	0.005	1.0	1.0	50

Notes

- a) Sample was reanalyzed following extraction and compositing, result was 43 mg/kg.
 - b) Sample was reanalyzed following extraction and compositing, result was 1,200 mg/kg
 - c) Sample was reanalyzed following extraction and compositing, result was 270 mg/kg
- mg/kg - milligrams per kilogram, equivalent to parts per million.
 ND - Compound not detected at or above detection limit

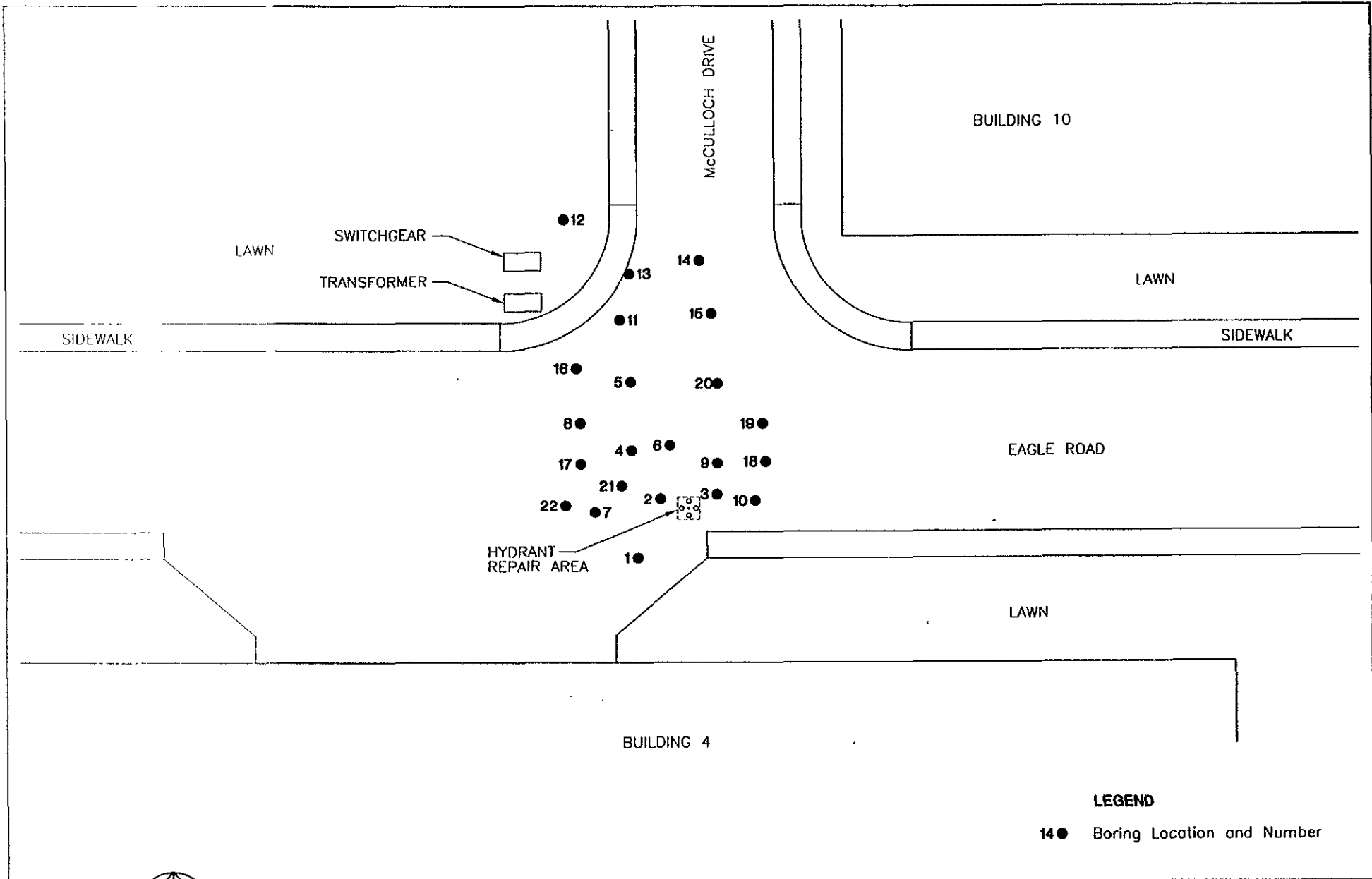


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TECHNOLOGIES

Vicinity Map
U S Coast Guard/Coast Guard Island
Alameda, California

FIGURE
1

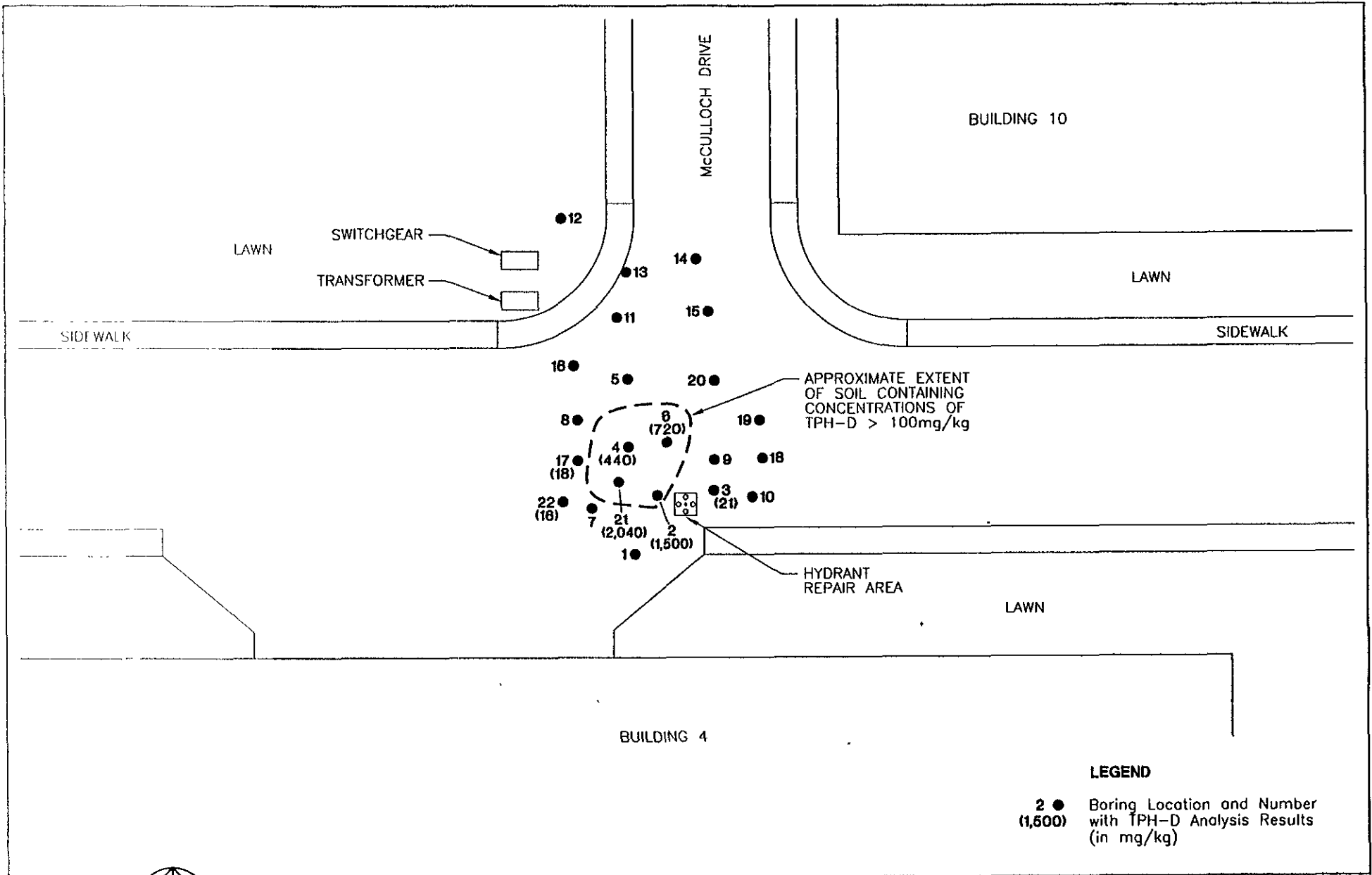
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LEGEND

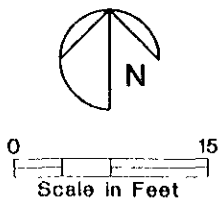
14 ● Boring Location and Number

	Site Plan		FIGURE	
	US Coast Guard/Coast Guard Island Alameda Alameda, California		2	
PROJECT NO.	DRAWN	DATE	APPROVED	REVISED
15,870 004	CEC	06 Feb 97	<i>MBS</i>	DATE
870004s1.dwg				



LEGEND

2 ● Boring Location and Number with TPH-D Analysis Results (in mg/kg)



AGI
TECHNOLOGIES

TPH-D Concentration Contour Diagram

US Coast Guard/Coast Guard Island Alameda
Alameda, California

FIGURE

3

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












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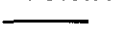
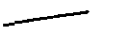


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DATE

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS					TYPICAL NAMES	
COARSE GRAINED SOILS More than half is larger than No. 200 Sieve	GRAVELS More than half coarse fraction is larger than No. 4 sieve size	Clean gravels with little or no fines	GW		Well graded gravels, gravel-sand mixtures	
				GP		Poorly graded gravels, gravel-sand mixtures
		Gravels with over 12% fines	GM		Silty Gravels, poorly graded gravel-sand-silt mixtures	
			GC		Clayey gravels, poorly graded gravel-sand-clay mixtures	
	SANDS More than half coarse fraction is smaller than No. 4 sieve size	Clean sands with little or no fines	SW		Well graded sands, gravelly sands	
			SP		Poorly graded sands, gravelly sands	
		Sands with over 12% fines	SM		Silty sand, poorly graded sand-silt mixtures	
			SC		Clayey sands, poorly graded sand-clay mixtures	
FINE GRAINED SOILS More than half is smaller than No. 200 Sieve	SILTS AND CLAYS Liquid limit less than 50		ML		Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity	
			CL		Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays	
			OL		Organic clays and organic silty clays of low plasticity	
	SILTS AND CLAYS Liquid limit greater than 50		MH		Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts	
			CH		Inorganic clays of high plasticity, fat clays	
			OH		Organic clays of medium to high plasticity, organic silts	
HIGHLY ORGANIC SOILS			PT		Peat and other highly organic soils	

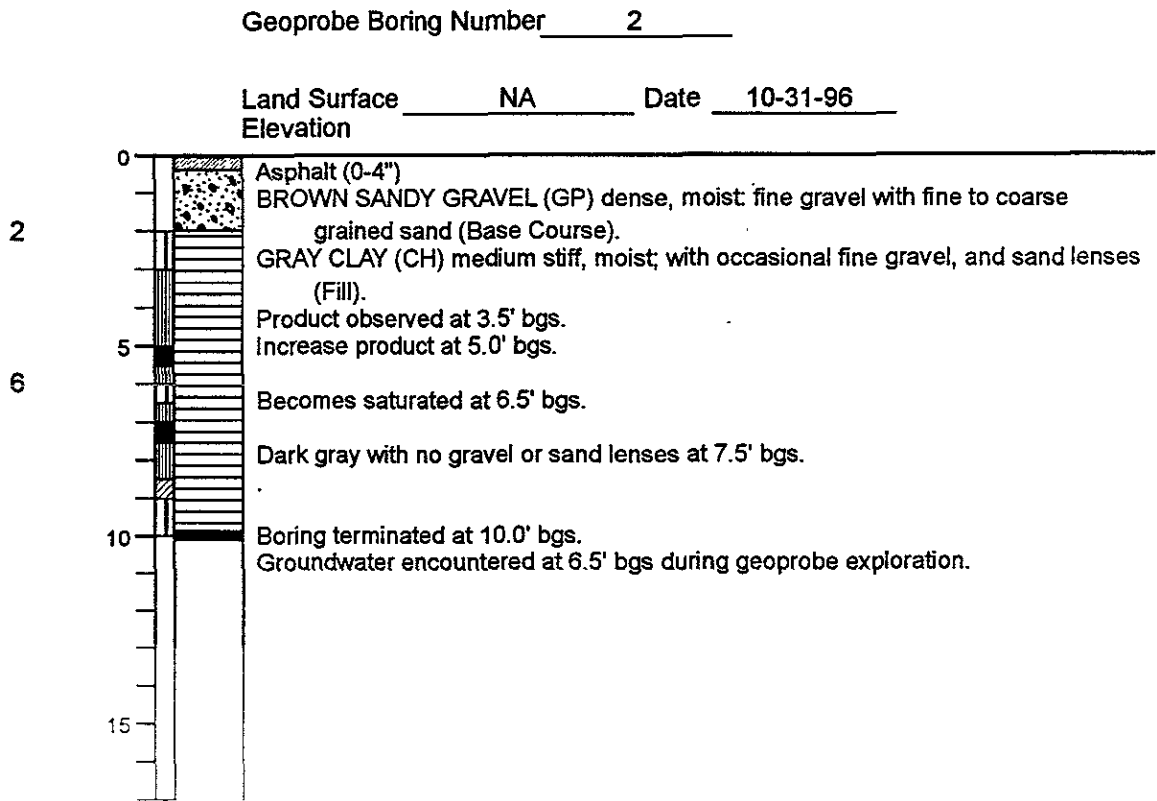
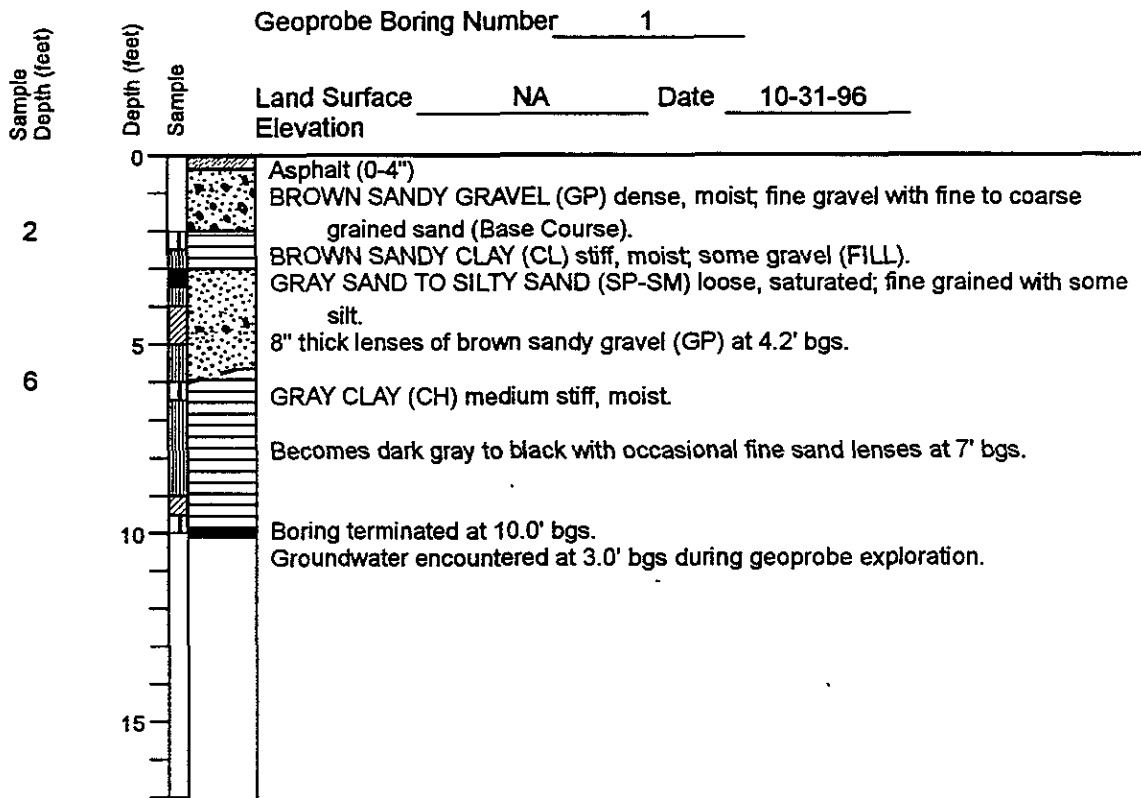
SAMPLE <input type="checkbox"/> "Undisturbed" <input checked="" type="checkbox"/> Bulk/Grab <input type="checkbox"/> Not Recovered <input checked="" type="checkbox"/> Recovered, Not Retained	CONTACT BETWEEN UNITS  Well Defined Change  Gradational Change  Obscure Change  End of Exploration	PHYSICAL PROPERTY TESTS Consol - Consolidation LL - Liquid Limit PL - Plastic Limit Gs - Specific Gravity SA - Size Analysis TxS - Triaxial Shear TxP - Triaxial Permeability Perm - Permeability Po - Porosity MD - Moisture/Density DS - Direct Shear VS - Vane Shear Comp - Compaction UU - Unconsolidated, Undrained CU - Consolidated, Undrained CD - Consolidated, Drained
BLOWS PER FOOT Hammer is 140 pounds with 30-inch drop, unless otherwise noted S - SPT Sampler (2.0-Inch O.D.) T - Thin Wall Sampler (2.8-Inch Sample) H - Split Barrel Sampler (2.4-Inch Sample)		
MOISTURE DESCRIPTION Dry - Considerably less than optimum for compaction Moist - Near optimum moisture content Wet - Over optimum moisture content Saturated - Below water table, in capillary zone or in perched groundwater		

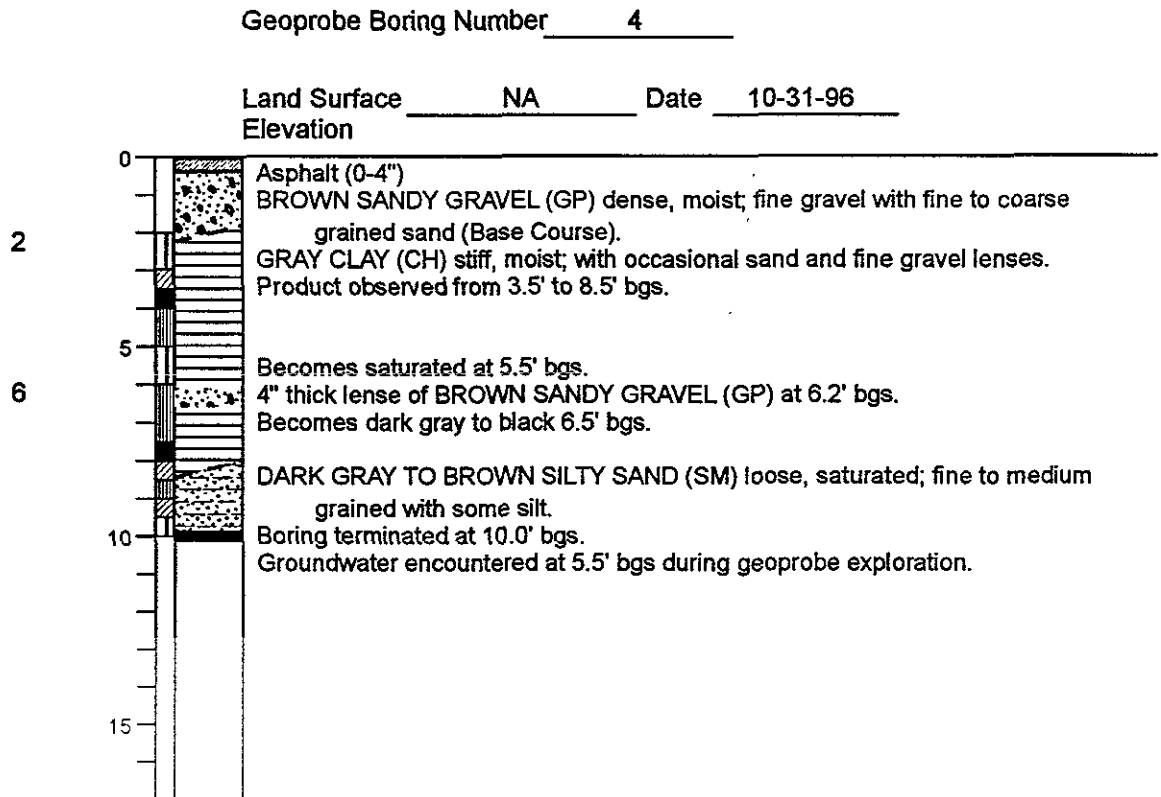
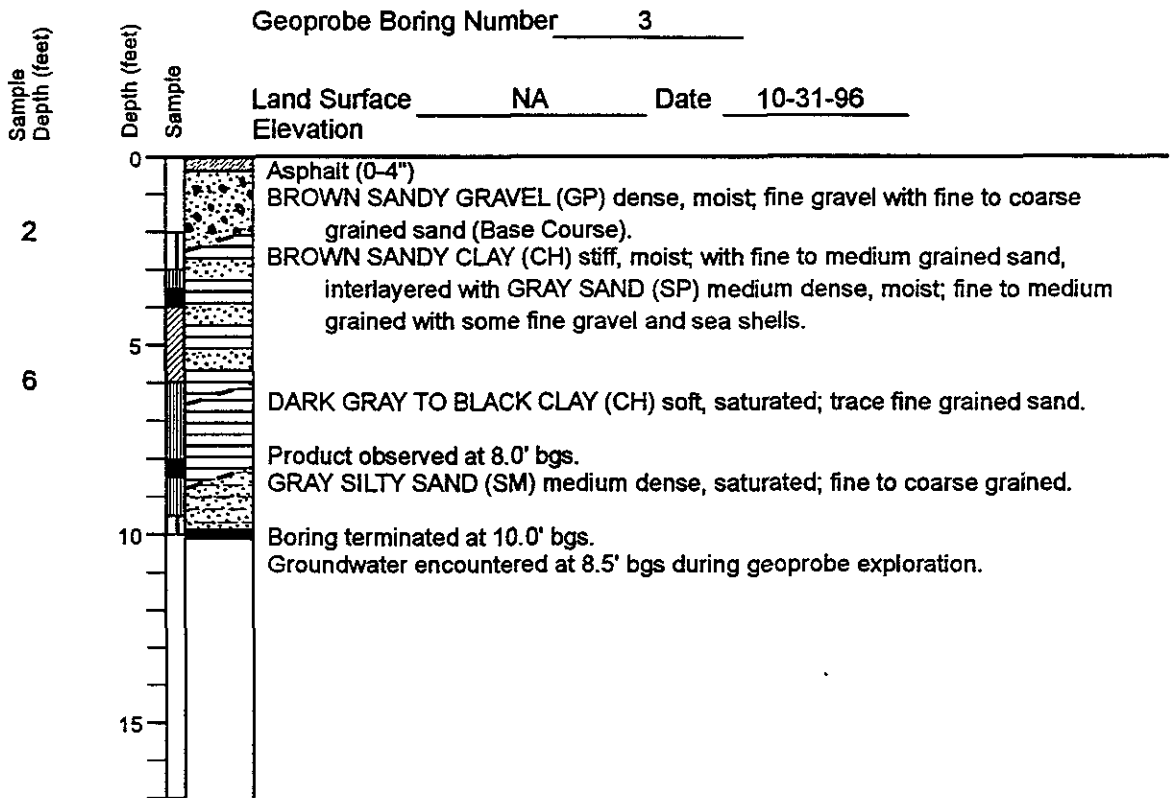


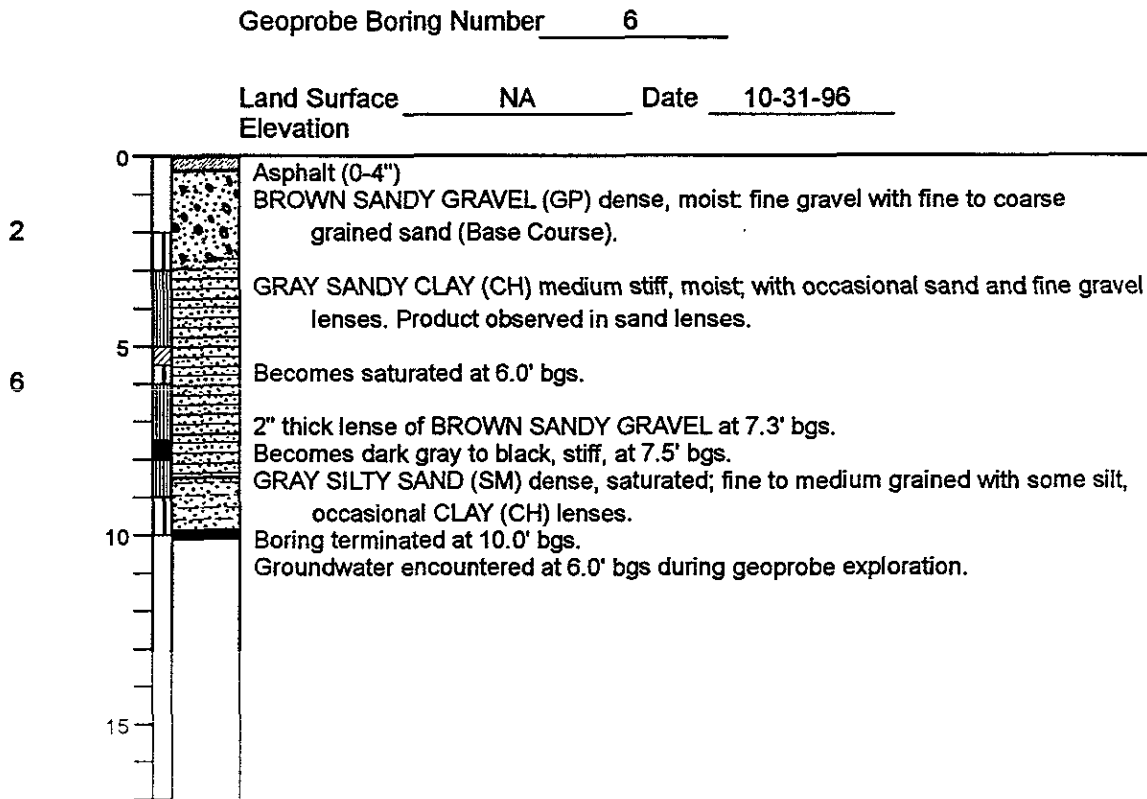
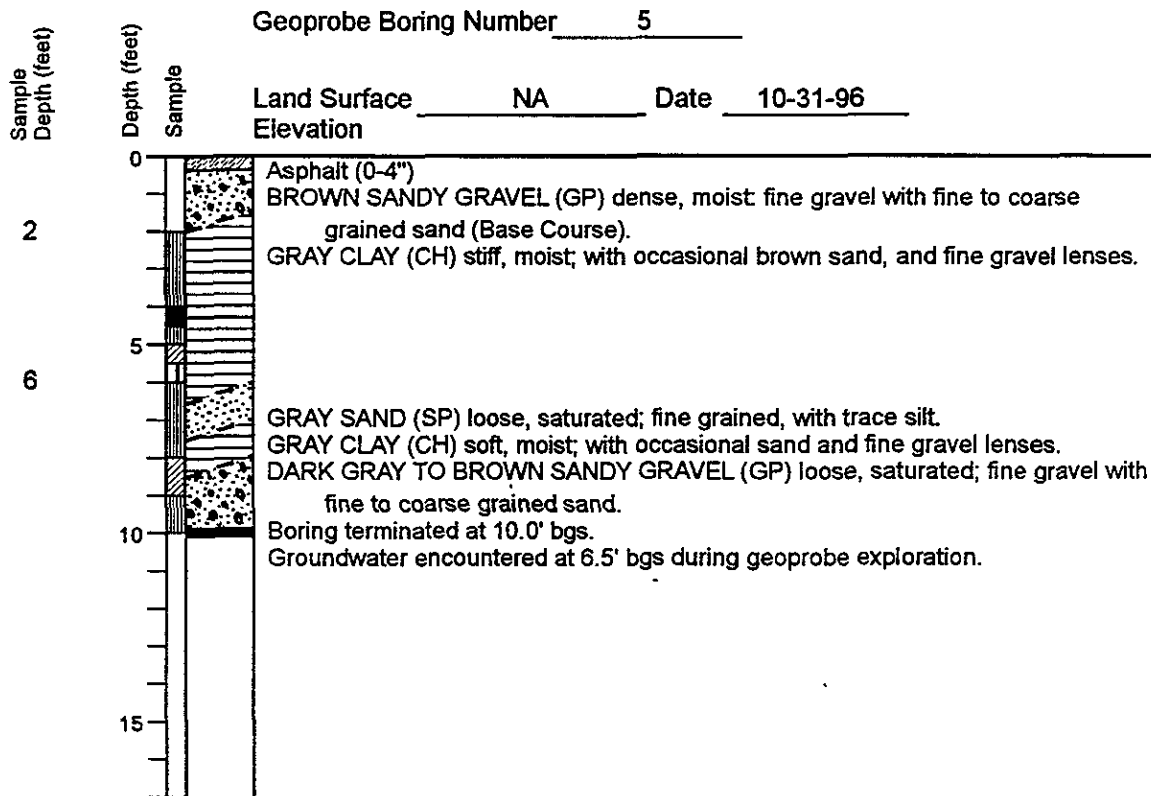
Soil Classification/Legend

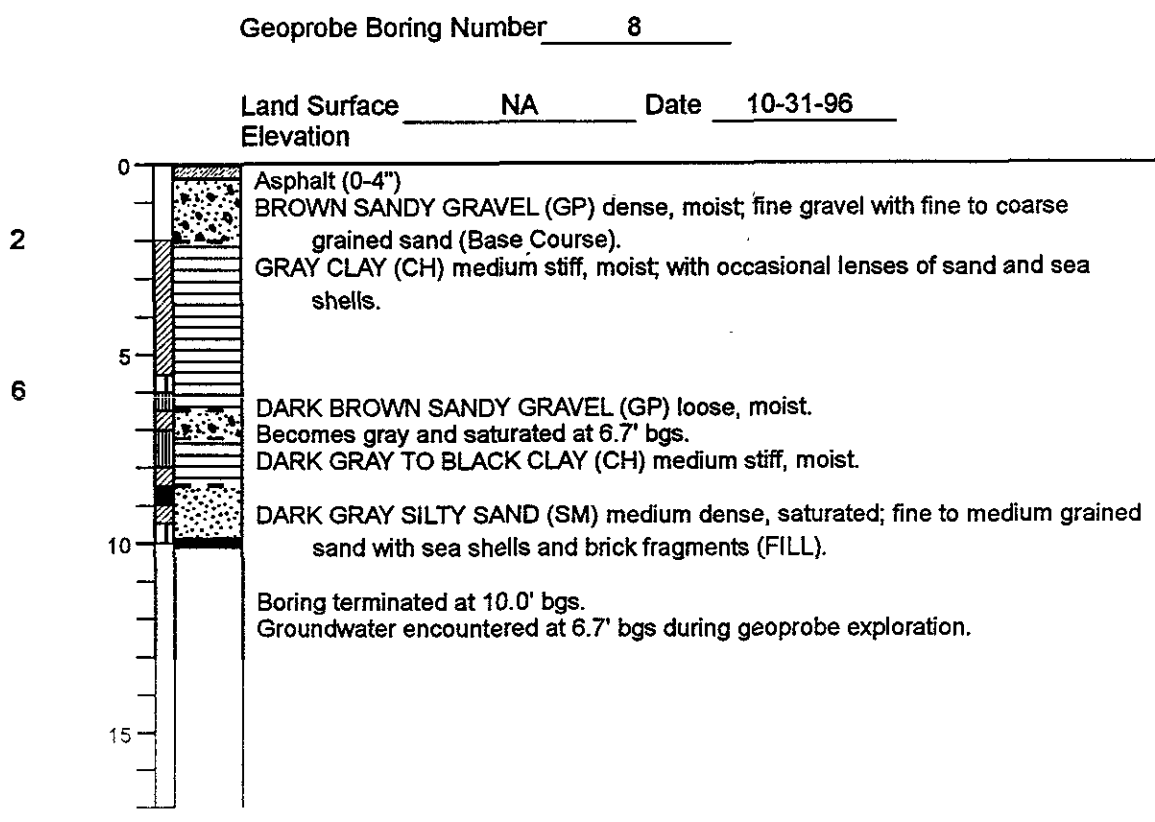
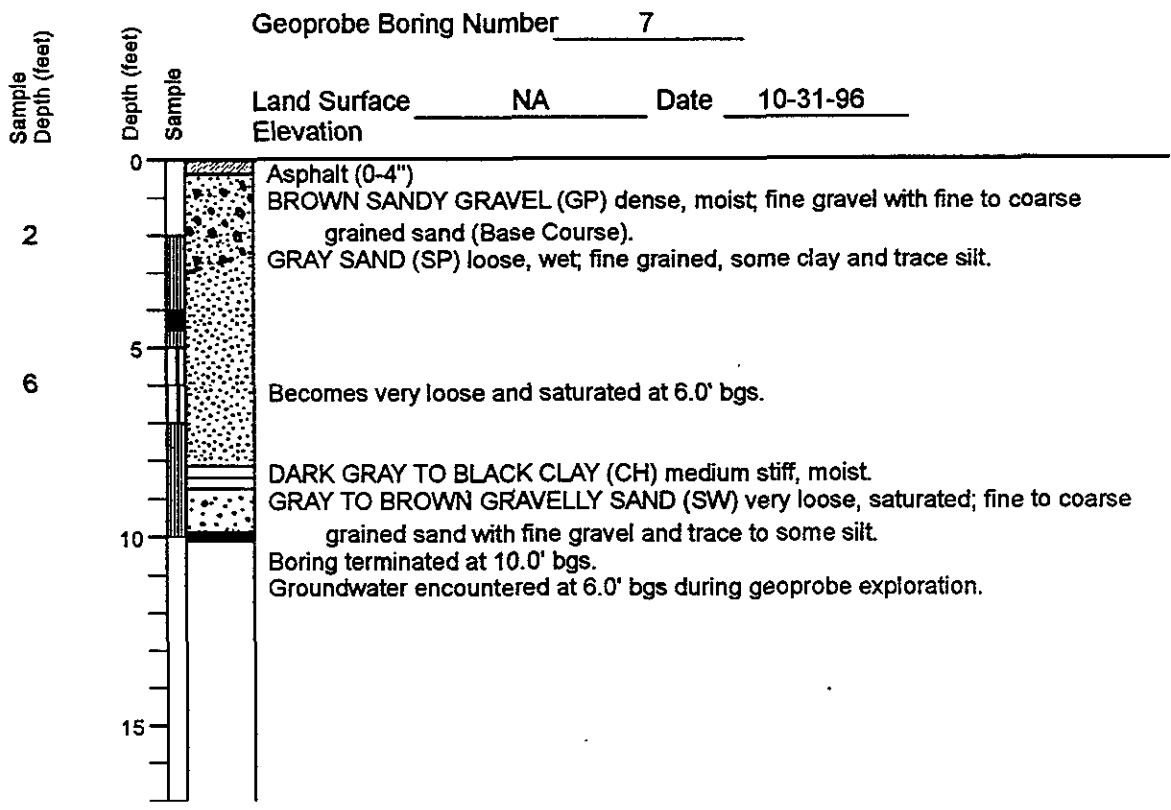
USCG/Coast Guard Island Alameda
Alameda, California

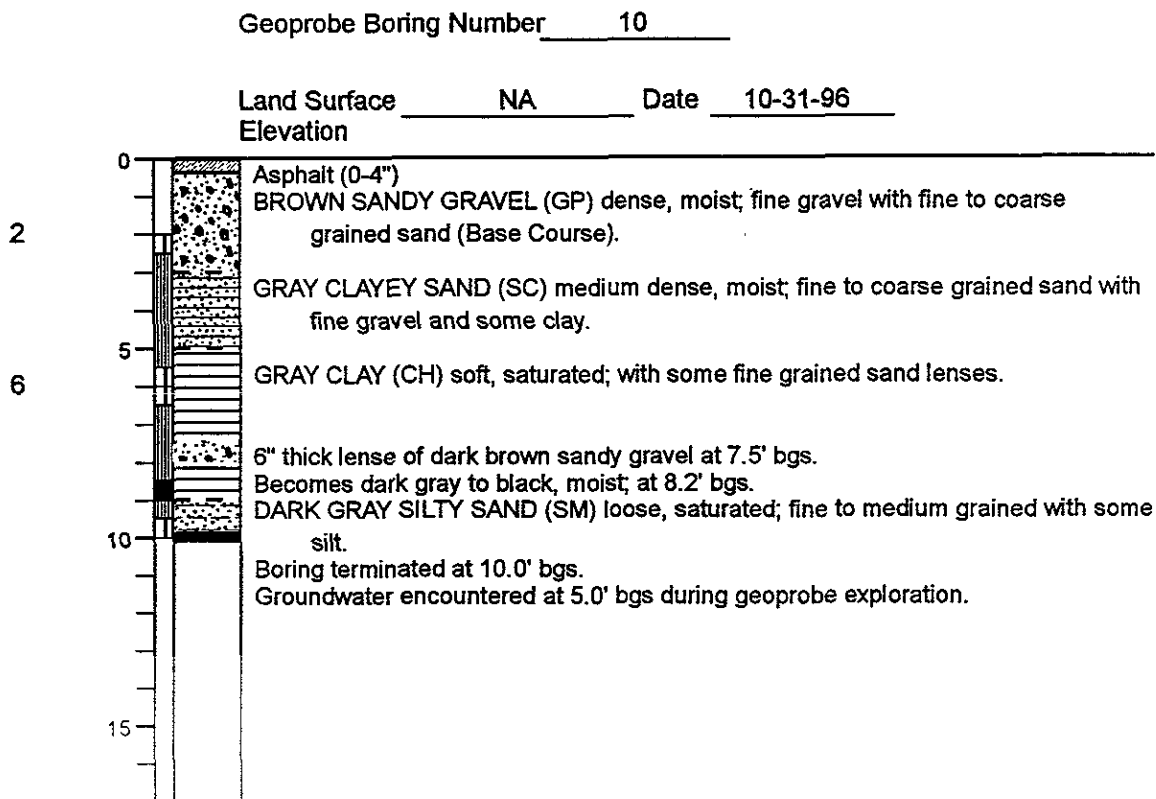
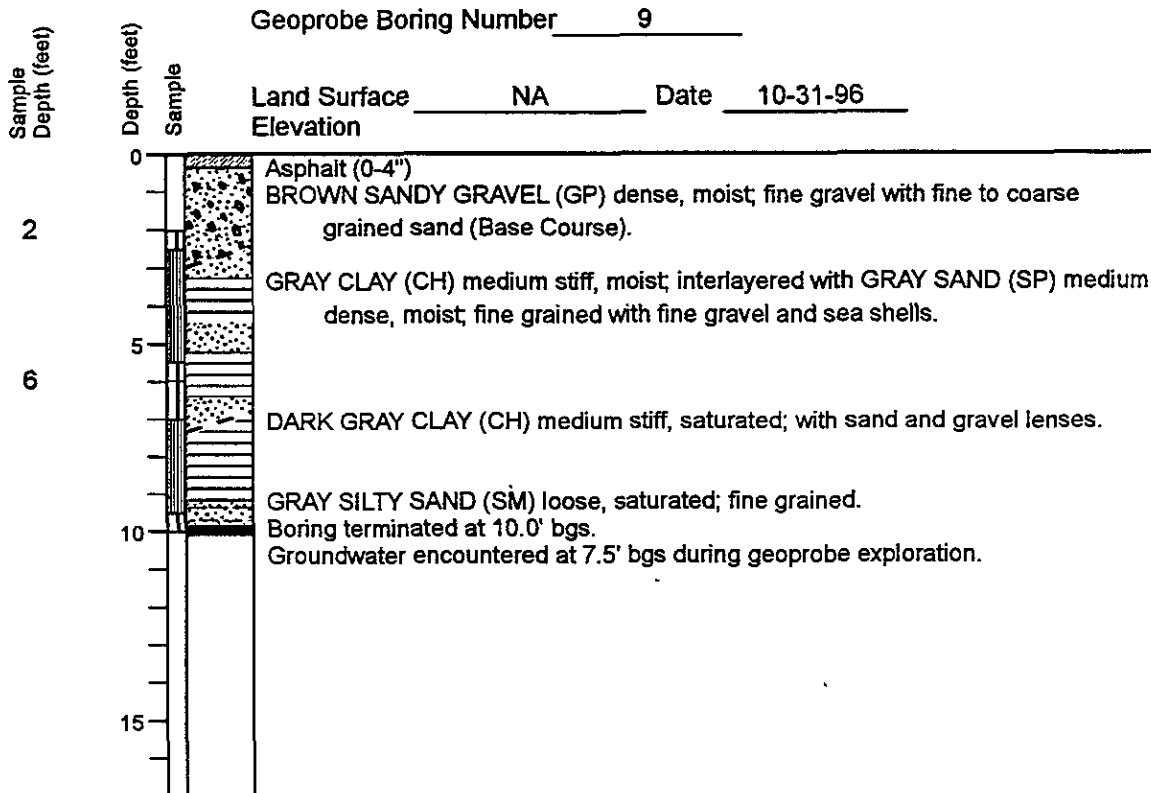
PLATE
1

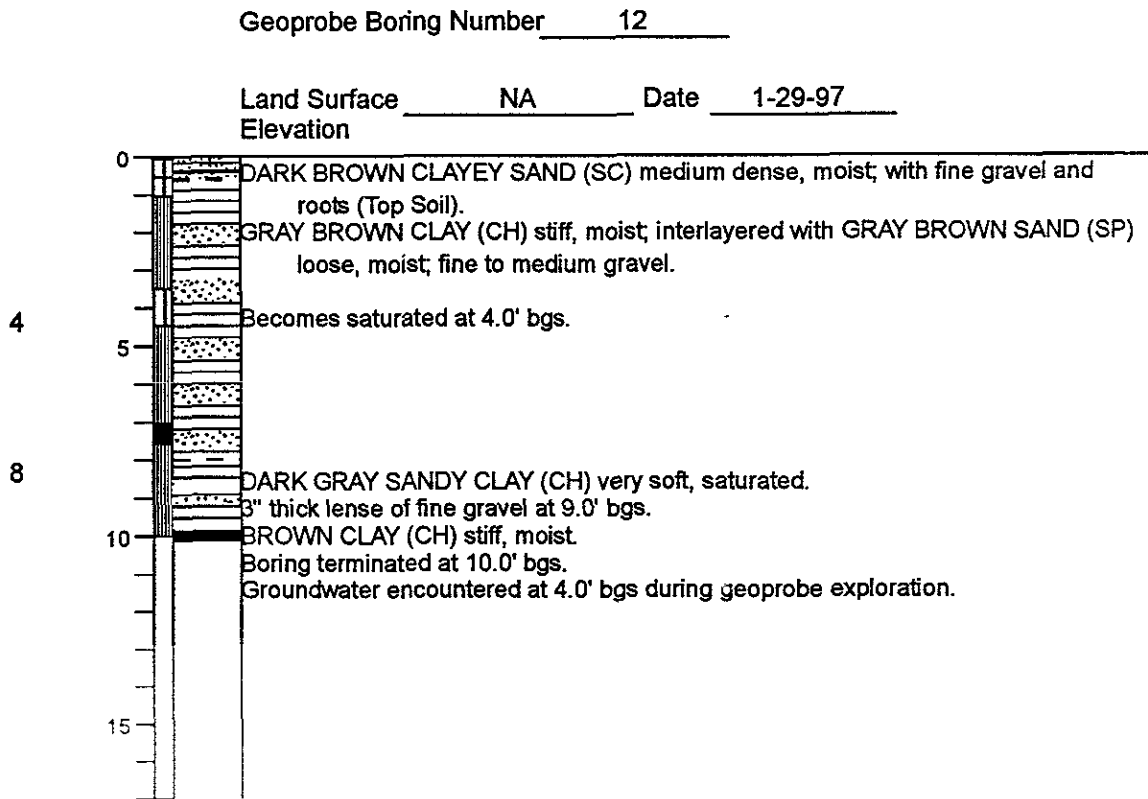
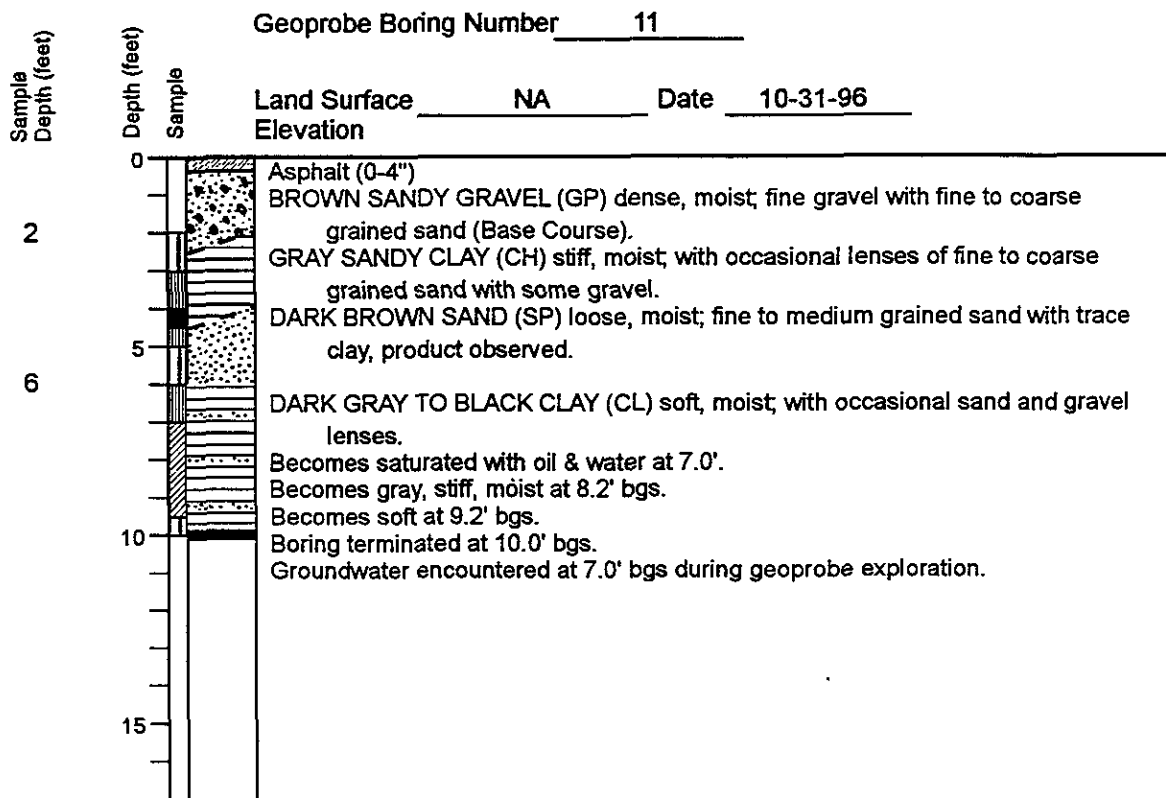


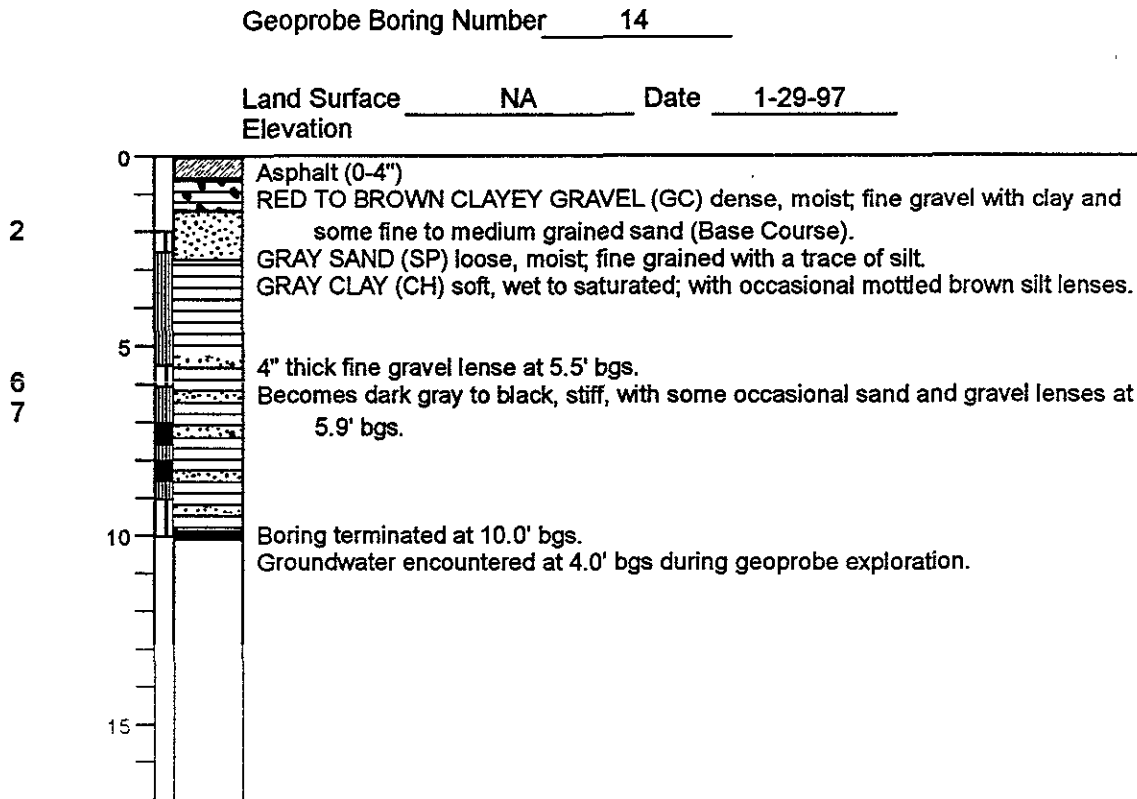
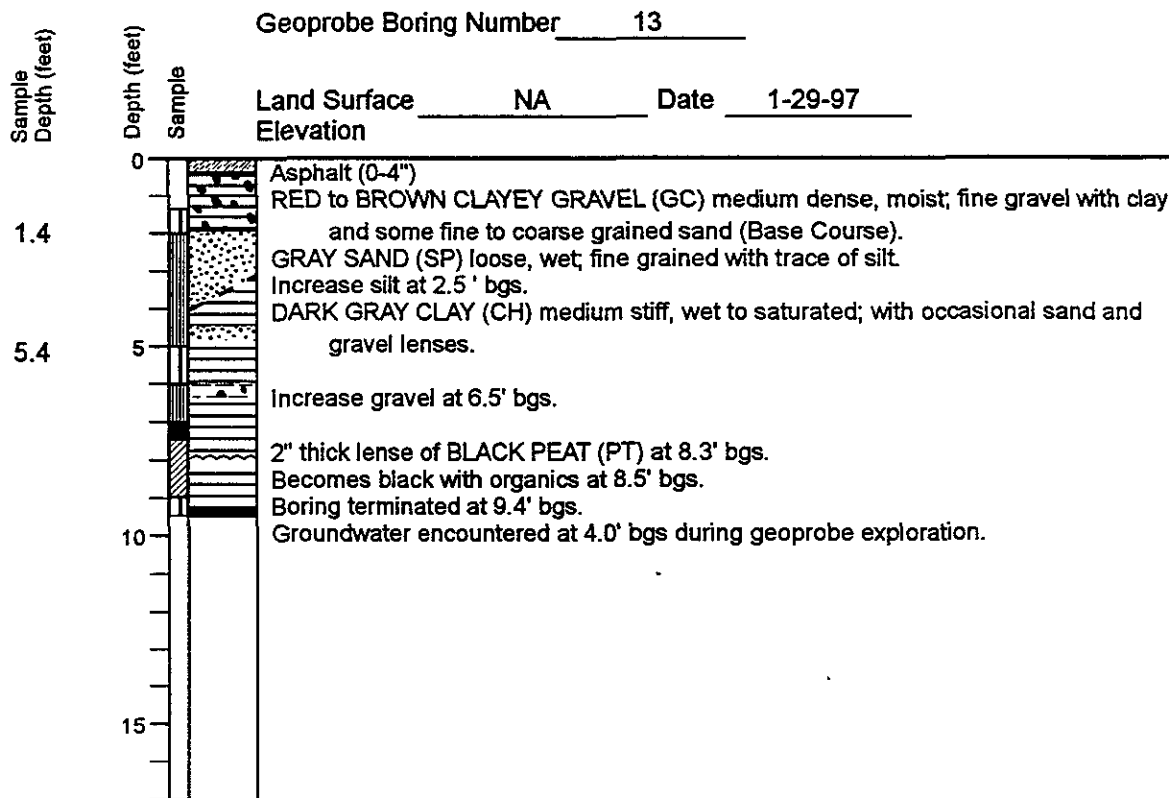


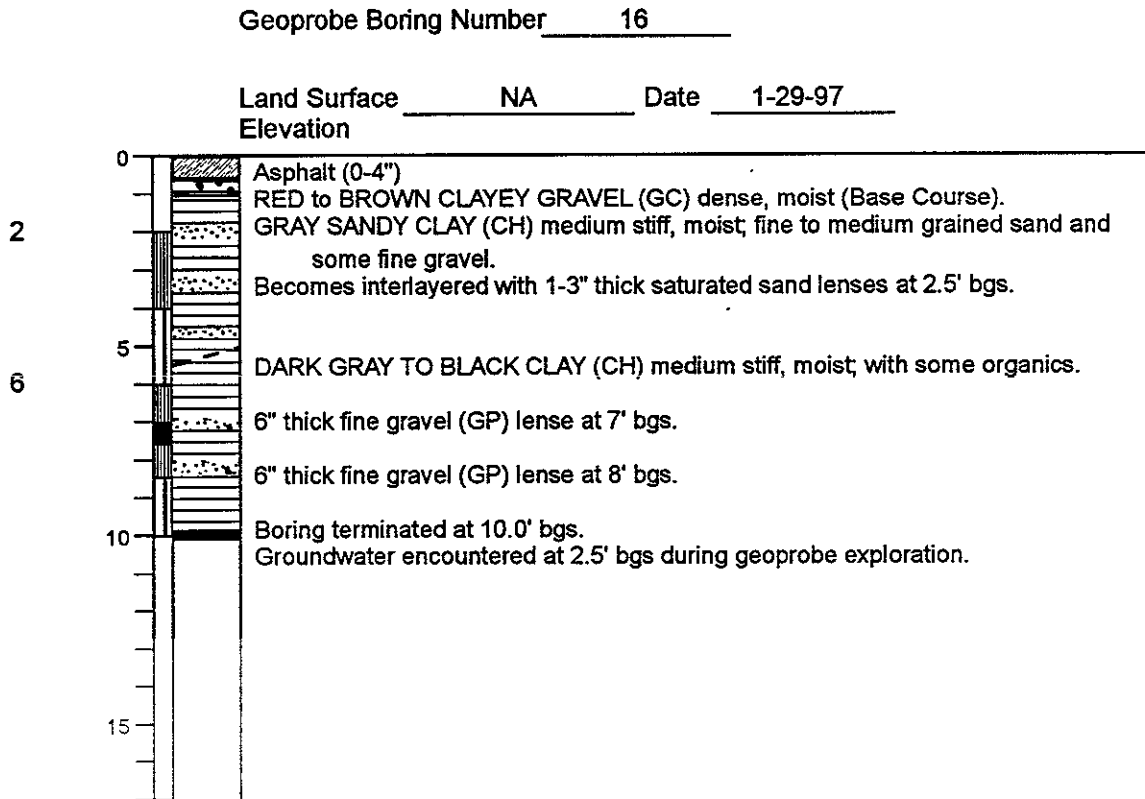
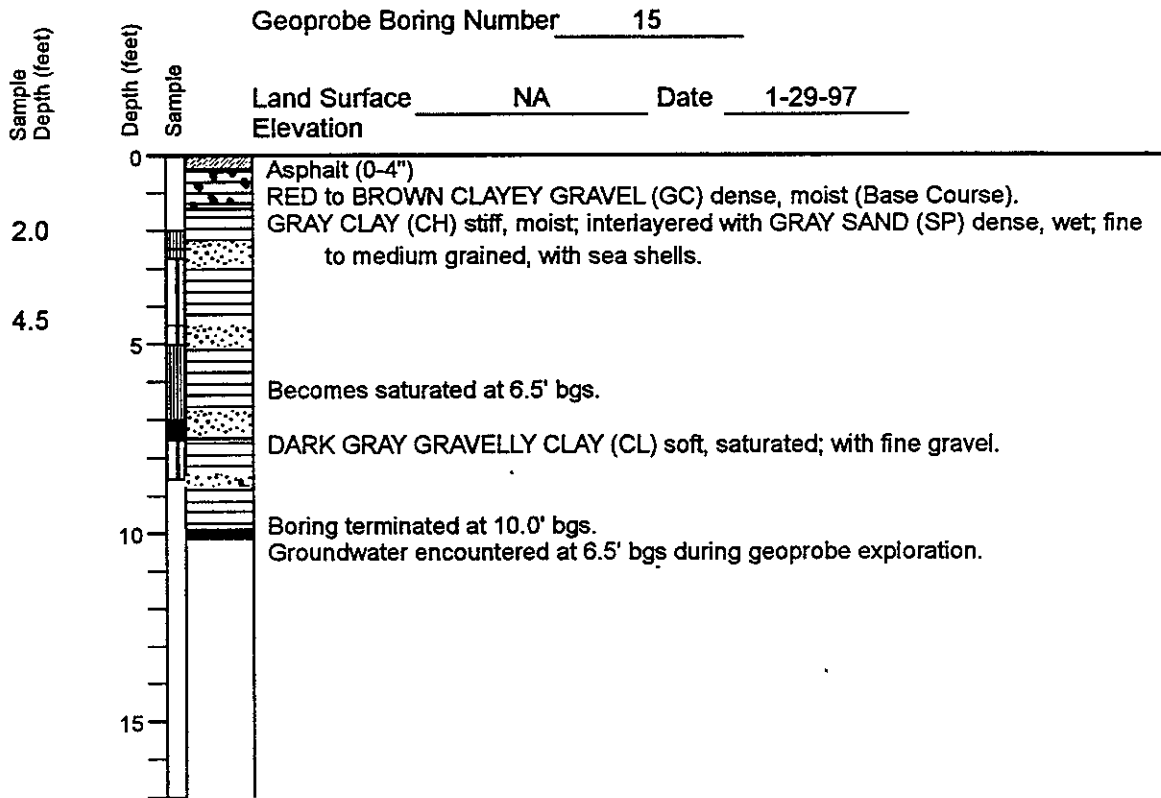


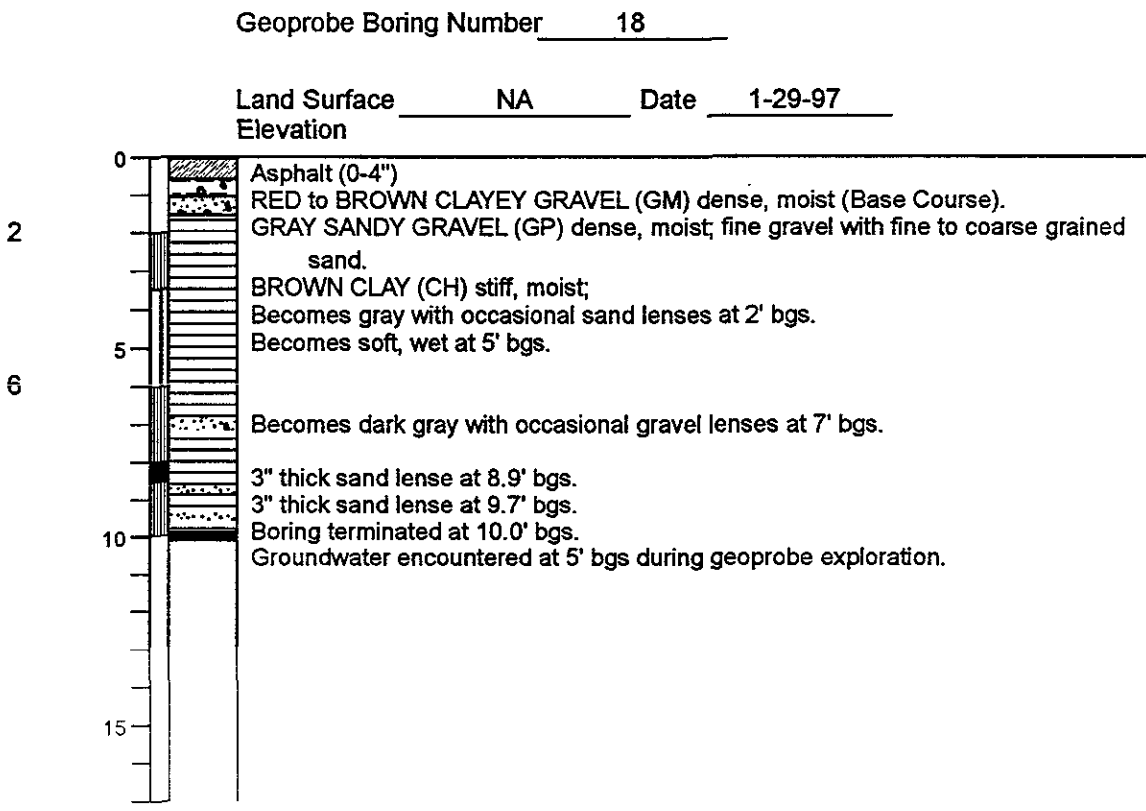
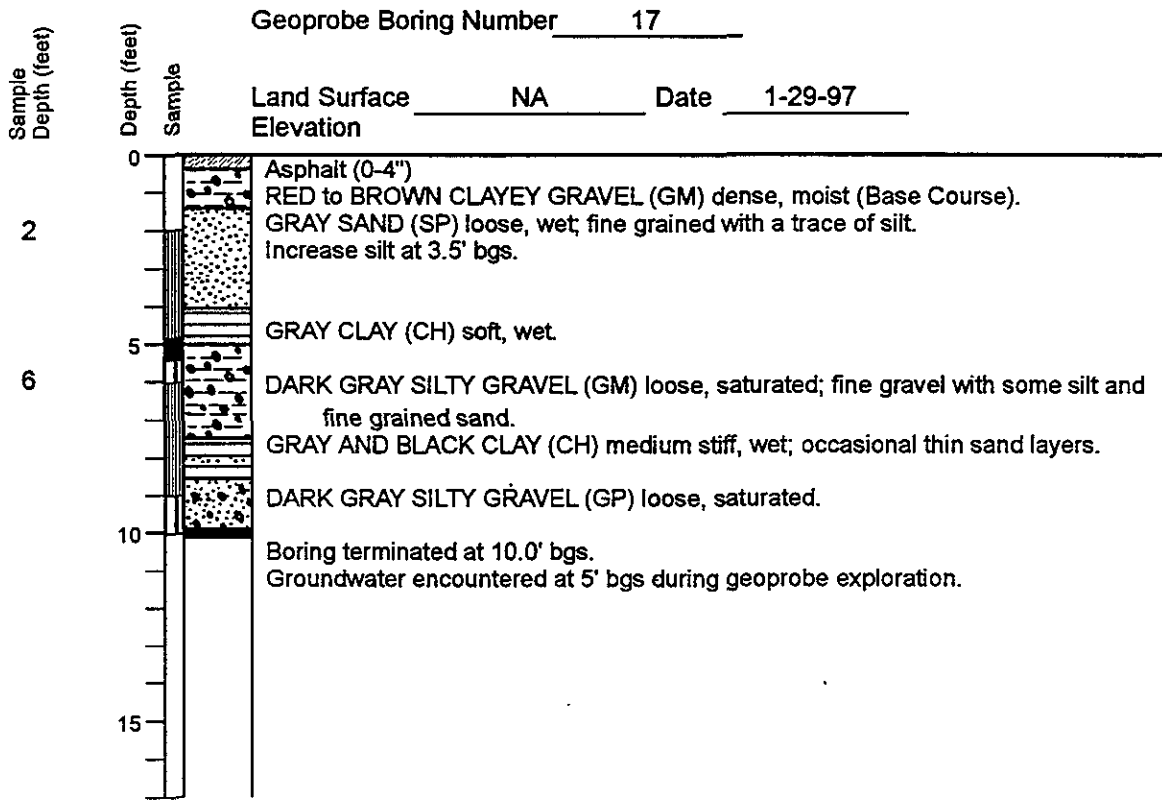


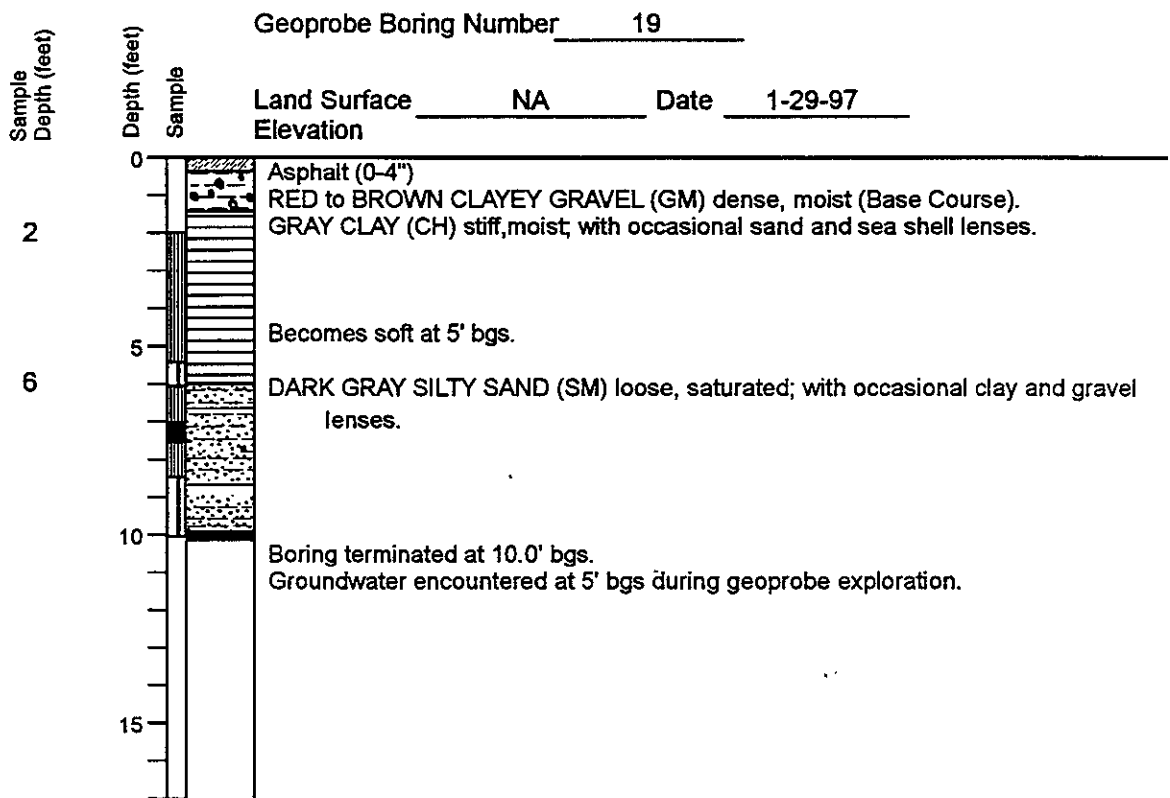






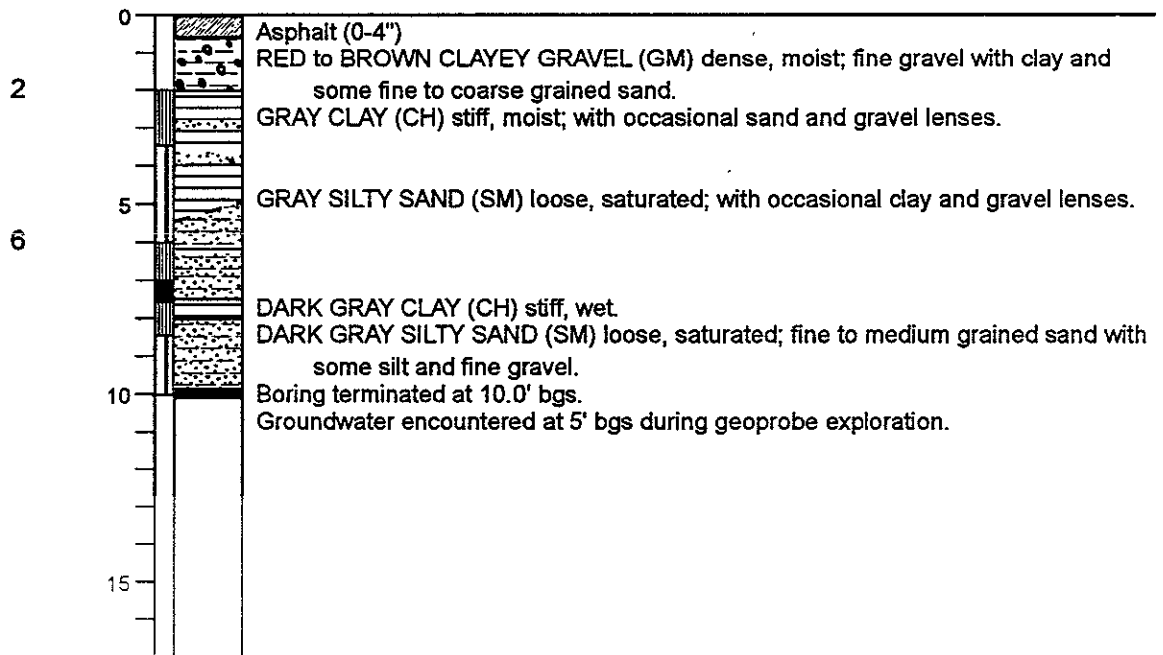






Geoprobe Boring Number 20

Land Surface NA Date 1-29-97
Elevation _____

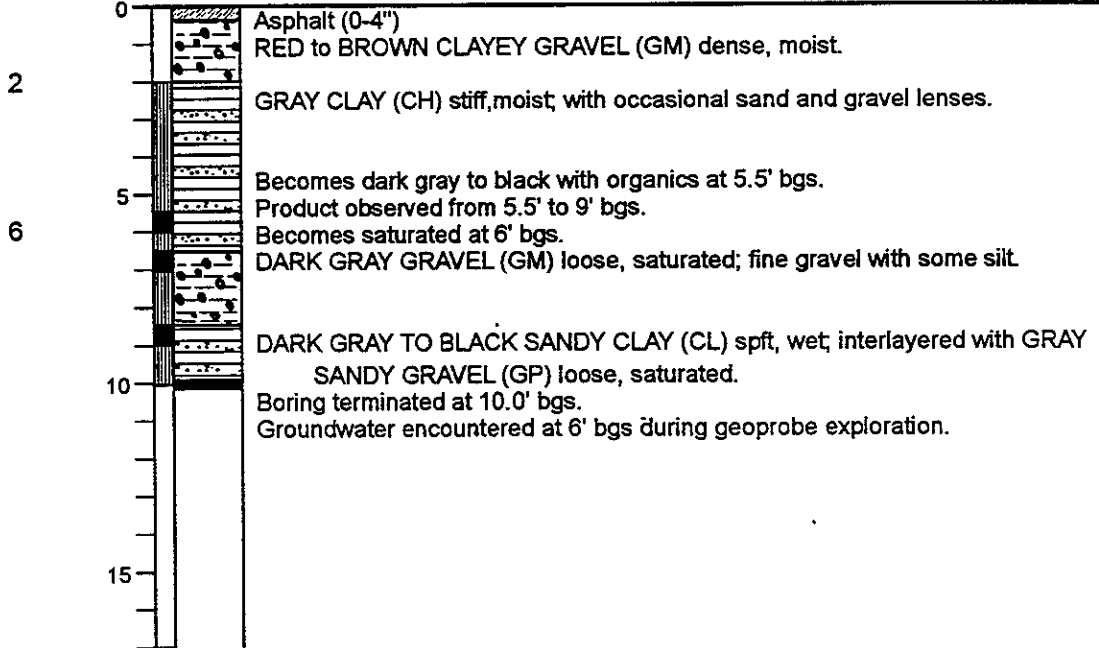


Sample
Depth (feet)

Depth (feet)
Sample

Geoprobe Boring Number 21

Land Surface NA Date 1-29-97
Elevation



Geoprobe Boring Number 22

Land Surface NA Date 1-29-97
Elevation

