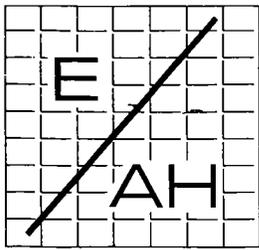


N61165.AR.002894  
CNC CHARLESTON  
5090.3a

LETTER TRANSMITTING SECOND ROUND MONITORING WELL LOGS AND WELL  
DEVELOPMENT LOGS AT SOLID WASTE MANAGEMENT UNIT 39 CNC CHARLESTON SC  
9/10/1996  
ENSAFE/ ALLEN AND HOSHALL



# EnSafe / Allen & Hoshall

a joint venture for professional services

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Nashville, TN 37217  
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4545 Fuller Drive  
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Irving, TX 75038  
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Fax (214) 791-0405

September 10, 1996

**Paul Bergstrand**  
Department of Health and Environmental Control  
Bureau of Solid and Hazardous Waste  
8901 Farrow Road  
Columbia, South Carolina 29203

**RE: Submittal of Second Round Monitoring Well Logs and Well Development  
Logs at SWMU 39**

Dear Mr. Bergstrand:

On behalf of the Caretakers Site Office, EnSafe/Allen & Hoshall is submitting copies of the well construction logs and well development logs for the ten (10) monitoring wells installed in the vicinity of SWMU 39 in Zone A at Naval Base Charleston in accordance with the monitoring well permit (approval number HW-96-0056).

If you have any questions or if we can be of further assistance, please do not hesitate to call.

Sincerely,  
**EnSafe/Allen & Hoshall**  
A Joint Venture in Professional Service

By: **Todd K. Kafka**  
Hydrogeologist

enclosures

cc: **Commander Phil Dalby, Officer In Charge, Caretakers Site Office**  
**Tony Hunt, SOUTHDIV**  
**Lawson Anderson, E/A&H**  
**Project file 2901-08420**

# EnSafe/Allen & Hoshall

# Monitoring Well NBCA03904I

Project: ZONE A - Naval Base Charleston

Coordinates: 2315416.19 E, 381667.85 N

Location: Charleston, SC

Surface Elevation: 9.8 feet msl

Started at 1015 on 9-15-96

TOC Elevation: 9.22 feet msl

Completed at 1230 on 9-15-96

Depth to Groundwater: 1.94 feet TOC Measured: 10/16/96

Drilling Method: Rotasonic (6.5" OD casing, 3.8" ID coring bit)

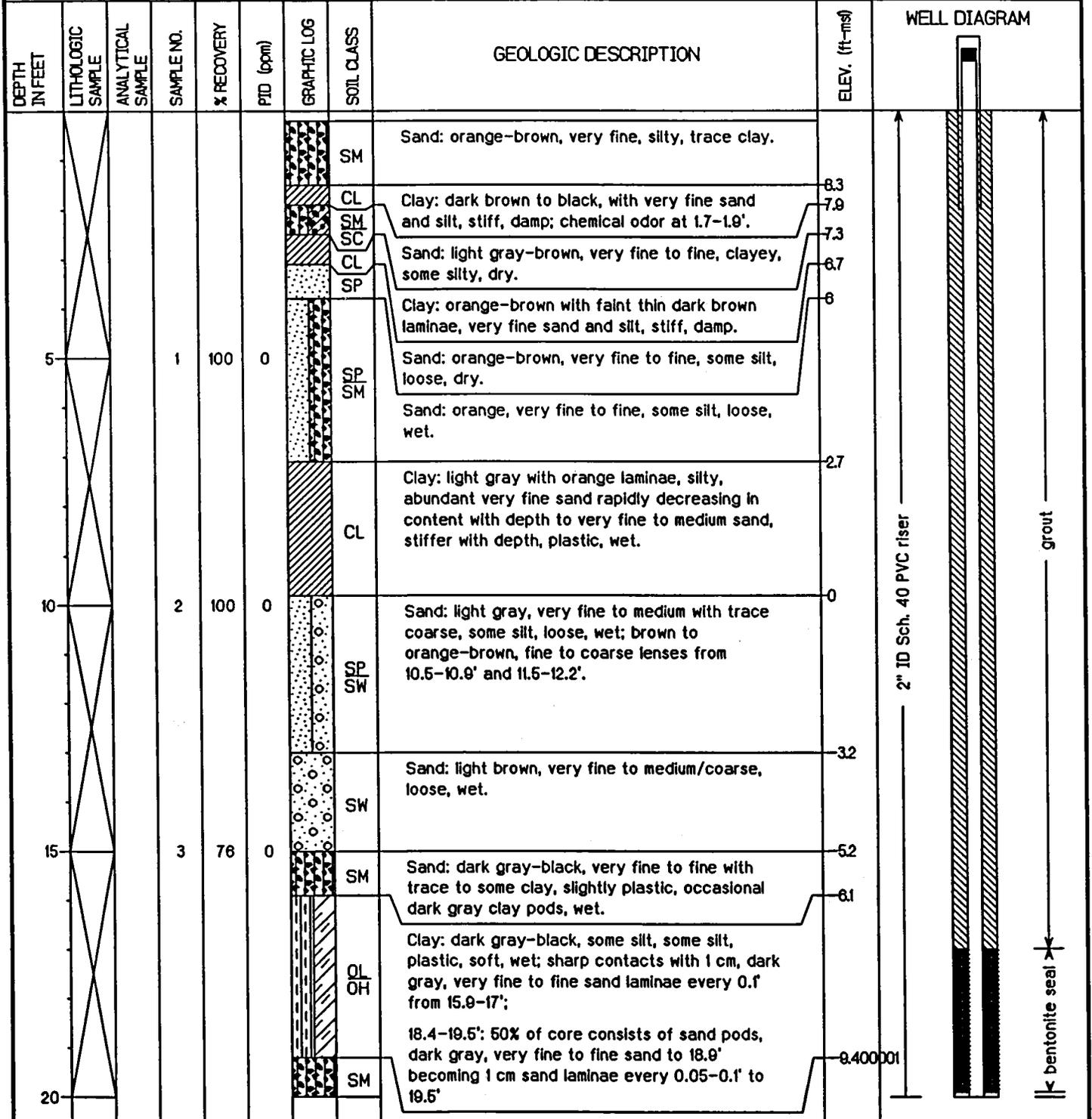
Groundwater Elevation: 7.28 feet msl

Drilling Company: Boart Longyear

Total Well Depth: 31.5 feet bgs

Geologist: P. Bayley

Well Screen: 21.7 to 30.7 feet bgs



# EnSafe/Allen & Hoshall

# Monitoring Well NBCA03904I

Project: ZONE A - Naval Base Charleston	Coordinates: 2315416.19 E, 381667.85 N
Location: Charleston, SC	Surface Elevation: 9.8 feet msl
Started at 1015 on 9-15-96	TOC Elevation: 9.22 feet msl
Completed at 1230 on 9-15-96	Depth to Groundwater: 1.94 feet TOC Measured: 10/16/96
Drilling Method: Rotasonic (6.5" OD casing, 3.8" ID coring bit)	Groundwater Elevation: 7.28 feet msl
Drilling Company: Boart Longyear	Total Well Depth: 31.5 feet bgs
Geologist: P. Bayley	Well Screen: 21.7 to 30.7 feet bgs

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PTD (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
25			4	85	0		SM	Sand: gray, very fine to fine with trace medium, silty to 20.8' then decreasing with depth, loose, wet; 1 cm dark gray clay laminae from 19.8-20.1'.	13.7	
25							SP SM	Sand: gray, very fine to fine trace medium, trace to some silt, loose, wet.	15.2	
30							OL OH	Clay: dark gray-black, some silt, stiff, plastic, wet.  31.3-31.5': dark gray, very fine to fine, silty sand lense with occasional clay pods.	18.6	
35			5	99	0				25.2	
40										

# EnSafe/Allen & Hoshall

# Monitoring Well NBCA03904D

Project: ZONE A - Naval Base Charleston

Coordinates: 2315423.28 E, 381667.73 N

Location: Charleston, SC

Surface Elevation: 9.9 feet msl

Started at 1110 on 11-16-95

TOC Elevation: 9.77 feet msl

Completed at 1320 on 11-16-95

Depth to Groundwater: 7.89 feet TOC Measured: 1-22-96

Drilling Method: Rotasonic (6.5" OD casing, 3.8" ID coring bit)

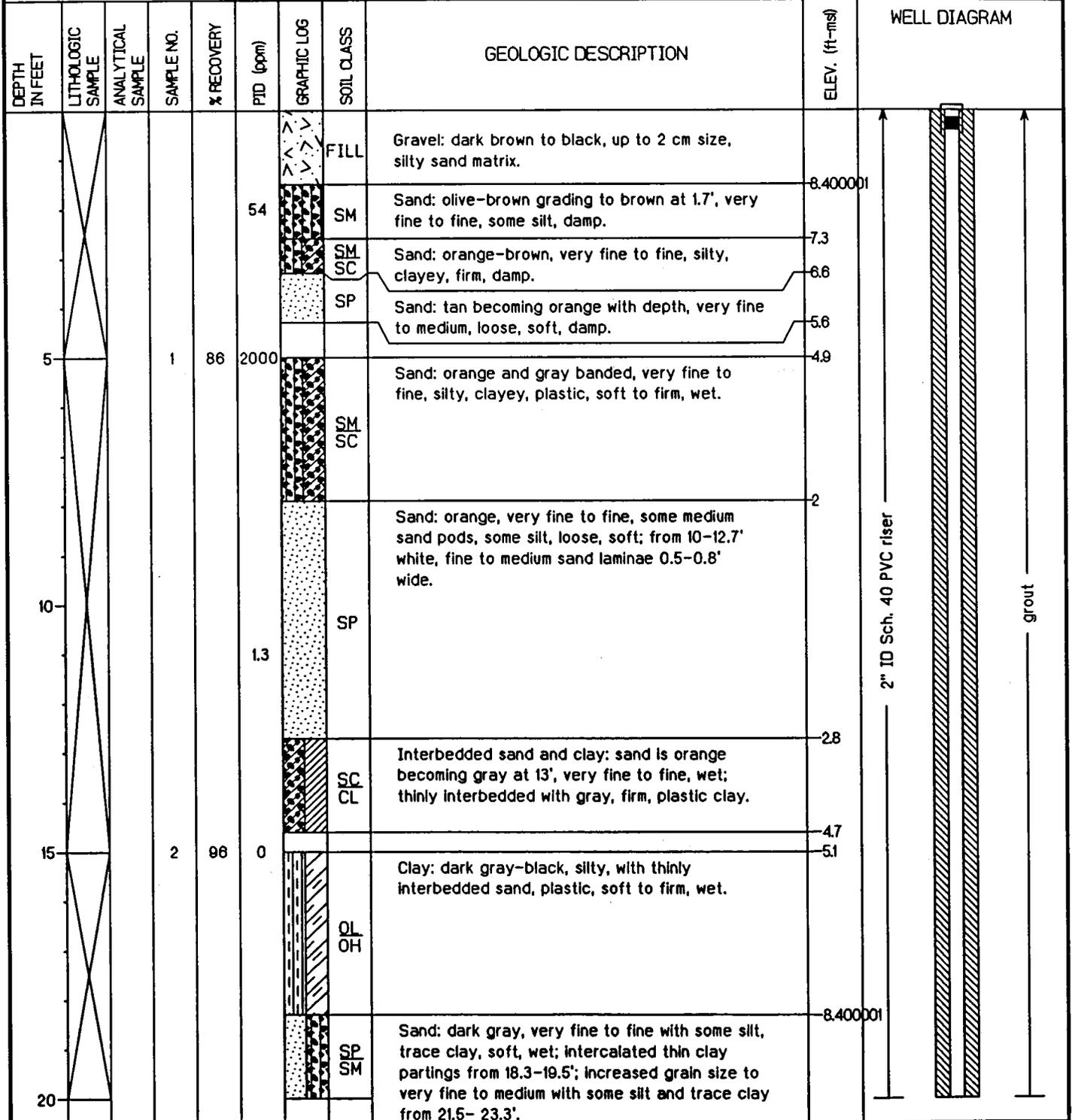
Groundwater Elevation: 188 feet msl

Drilling Company: Alliance Environmental

Total Well Depth: 54.5 feet bgs

Geologist: P. Bayley

Well Screen: 44.6 to 54.0 feet bgs



# EnSafe/Allen & Hoshall

# Monitoring Well NBCA03904D

Project: ZONE A - Naval Base Charleston

Coordinates: 2315423.28 E, 381667.73 N

Location: Charleston, SC

Surface Elevation: 9.9 feet msl

Started at 1110 on 11-16-95

TOC Elevation: 9.77 feet msl

Completed at 1320 on 11-16-95

Depth to Groundwater: 7.89 feet TOC Measured: 1-22-96

Drilling Method: Rotasonic (6.5" OD casing, 3.8" ID coring bit)

Groundwater Elevation: 1.88 feet msl

Drilling Company: Alliance Environmental

Total Well Depth: 54.5 feet bgs

Geologist: P. Bayley

Well Screen: 44.6 to 54.0 feet bgs

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PTD (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
25			3	97	0		SI/S	Sand: gray, very fine to fine/medium, trace to some silt, soft, wet.	14.8 15.1	<p>2" ID Sch. 40 PVC riser</p> <p>grout</p>
30							SI/S			
35			4	90	0		OH/CH	Clay: gray to dark gray with green cast, some silt, plastic, stiff, wet.  Occasional very thin (<1 cm) dark gray, silty sand laminae, with some mica flakes from 35-45'.	23.8	
40										

# EnSafe/Allen & Hoshall

# Monitoring Well NBCA03904D

Project: ZONE A - Naval Base Charleston

Coordinates: 2315423.28 E, 381667.73 N

Location: Charleston, SC

Surface Elevation: 9.9 feet msl

Started at 1110 on 11-16-95

TOC Elevation: 9.77 feet msl

Completed at 1320 on 11-16-95

Depth to Groundwater: 7.89 feet TOC Measured: 1-22-96

Drilling Method: Rotasonic (6.5" OD casing, 3.8" ID coring bit)

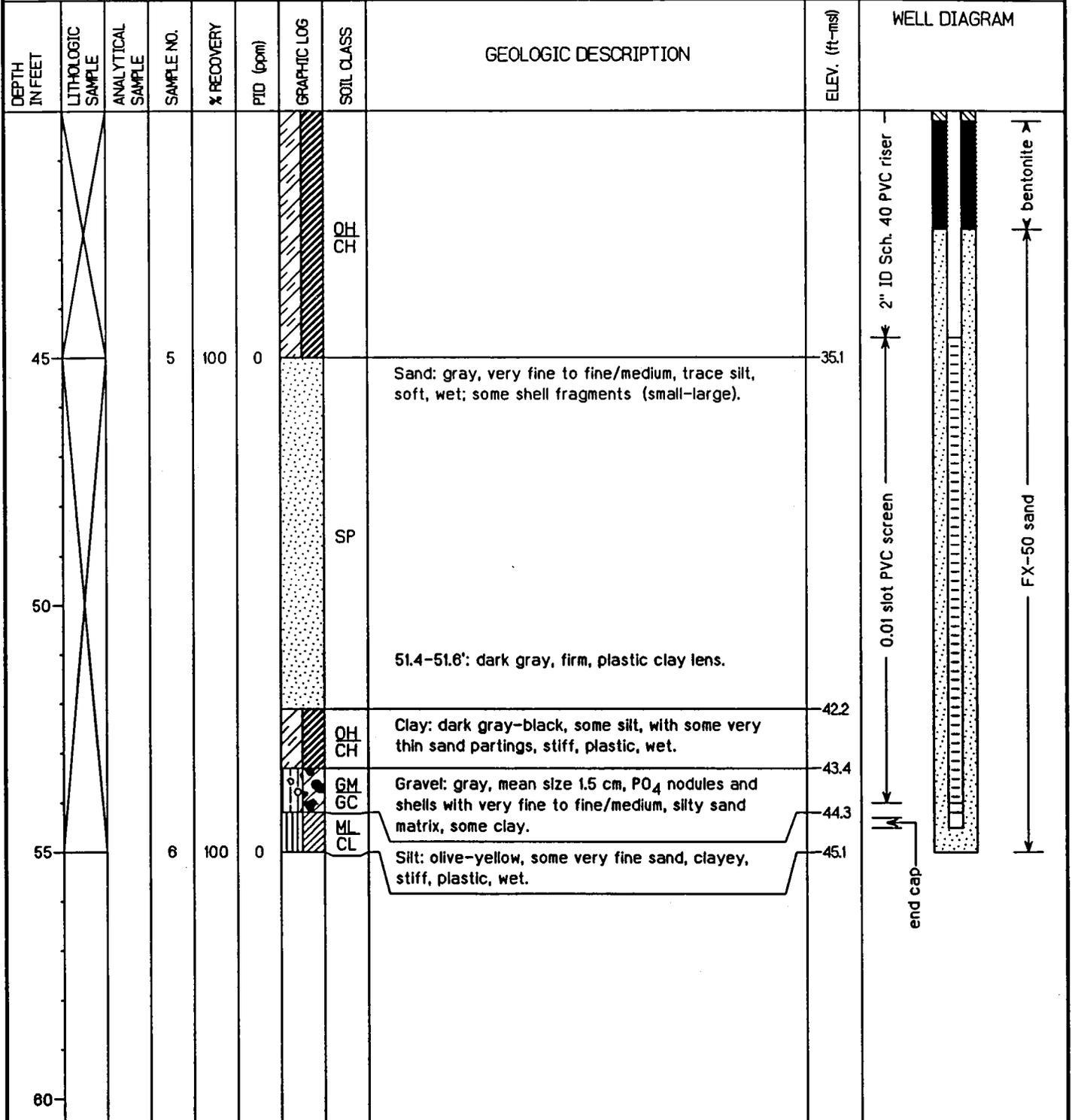
Groundwater Elevation: 188 feet msl

Drilling Company: Alliance Environmental

Total Well Depth: 54.5 feet bgs

Geologist: P. Bayley

Well Screen: 44.6 to 54.0 feet bgs



# EnSafe/Allen & Hoshall

# Monitoring Well NBCA03909D

Project: ZONE A - Naval Base Charleston

Coordinates: 2315131.57 E, 381217.19 N

Location: Charleston, SC

Surface Elevation: 7.0 feet msl

Started at 0900 on 9-17-96

TOC Elevation: 9.38 feet msl

Completed at 1210 on 9-17-96

Depth to Groundwater: 6.75 feet TOC Measured: 9/28/96

Drilling Method: Rotasonic (6.5" OD casing, 3.8" ID coring bit)

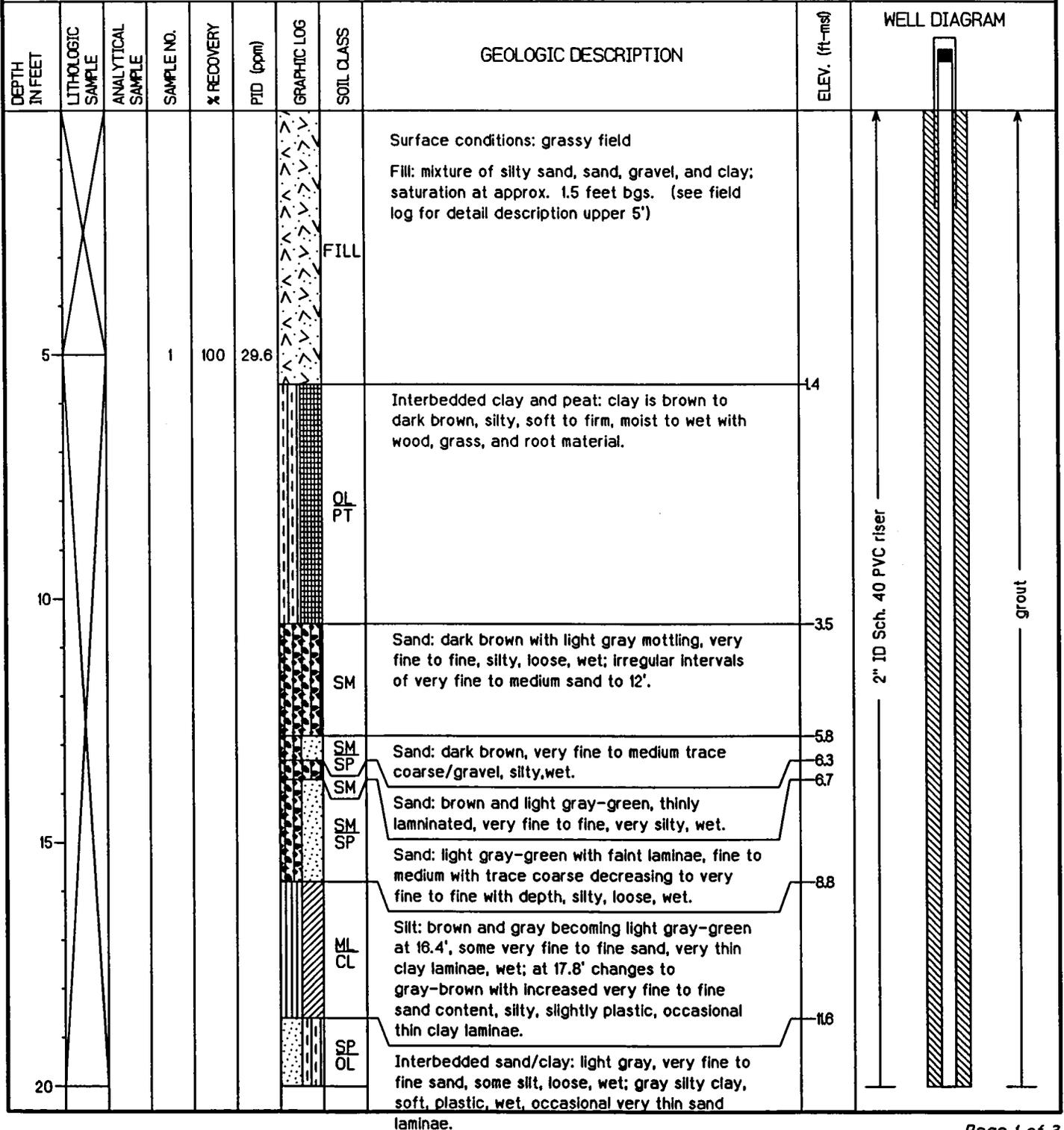
Groundwater Elevation: 2.63 feet msl

Drilling Company: Boart Longyear

Total Well Depth: 46.0 feet bgs

Geologist: P. Bayley

Well Screen: 35.7 to 45.5 feet bgs



# EnSafe/Allen & Hoshall

# Monitoring Well NBCA03909D

Project: ZONE A - Naval Base Charleston

Coordinates: 2315131.57 E, 381217.19 N

Location: Charleston, SC

Surface Elevation: 7.0 feet msl

Started at 0900 on 9-17-96

TOC Elevation: 9.38 feet msl

Completed at 1210 on 9-17-96

Depth to Groundwater: 6.75 feet TOC Measured: 9/28/96

Drilling Method: Rotasonic (6.5" OD casing, 3.8" ID coring bit)

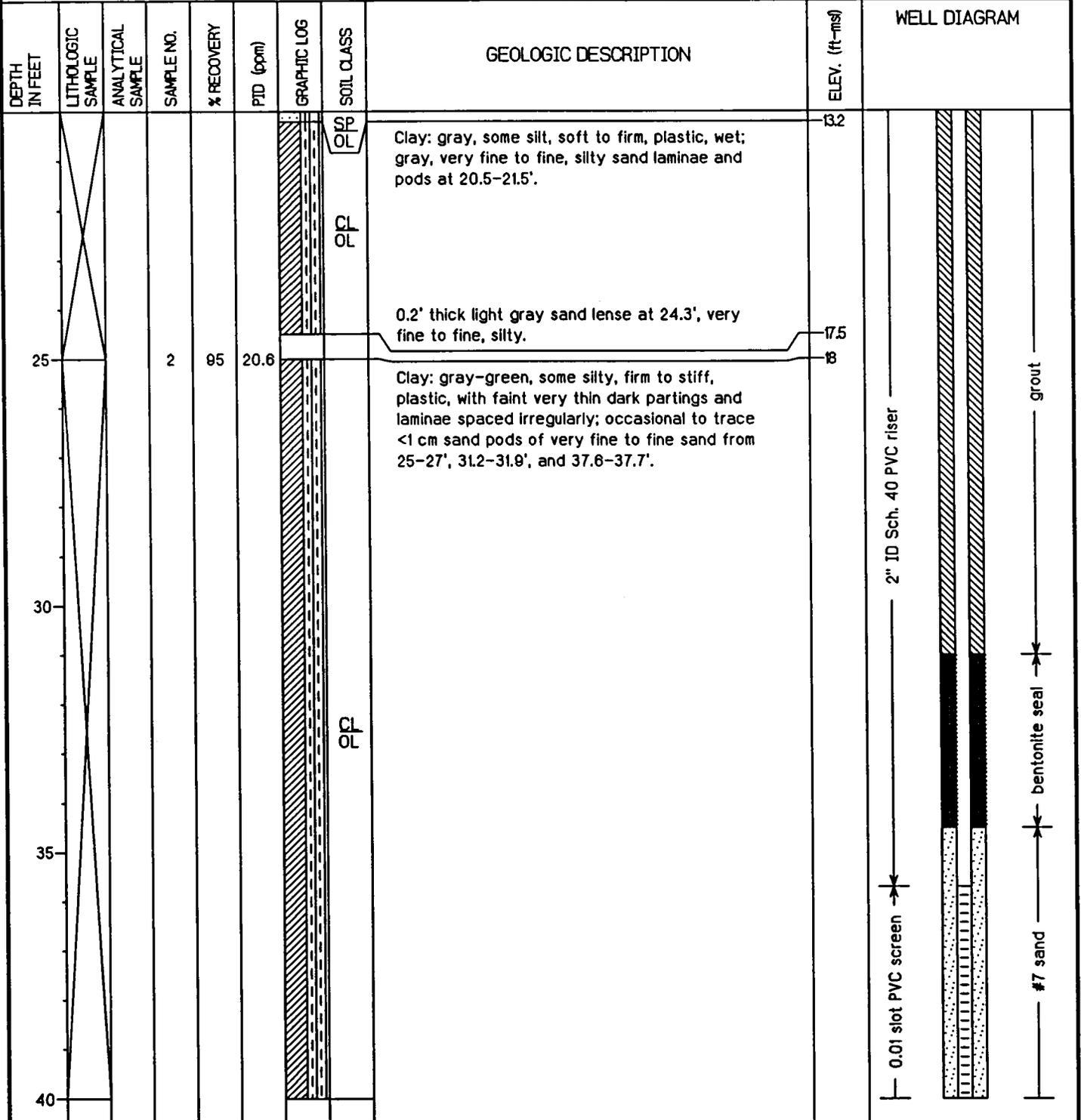
Groundwater Elevation: 2.63 feet msl

Drilling Company: Boart Longyear

Total Well Depth: 46.0 feet bgs

Geologist: P. Bayley

Well Screen: 35.7 to 45.5 feet bgs



# EnSafe/Allen & Hoshall

# Monitoring Well NBCA03909D

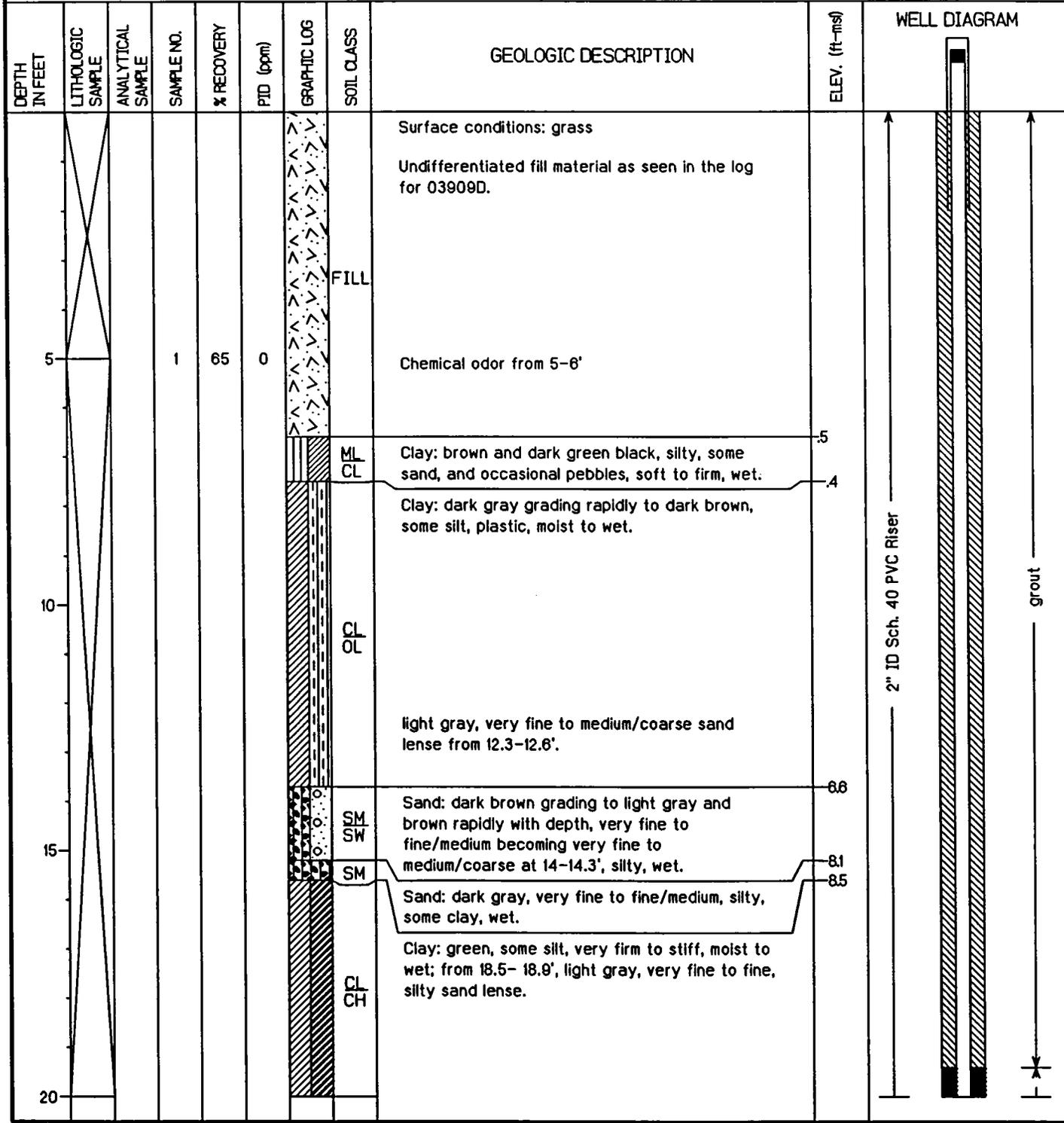
Project: ZONE A - Naval Base Charleston	Coordinates: 231513157 E, 381217.19 N
Location: Charleston, SC	Surface Elevation: 7.0 feet msl
Started at 0900 on 9-17-96	TOC Elevation: 9.38 feet msl
Completed at 1210 on 9-17-96	Depth to Groundwater: 6.75 feet TOC Measured: 9/28/96
Drilling Method: Rotasonic (6.5" OD casing, 3.8" ID coring bit)	Groundwater Elevation: 2.63 feet msl
Drilling Company: Boart Longyear	Total Well Depth: 46.0 feet bgs
Geologist: P. Bayley	Well Screen: 35.7 to 45.5 feet bgs

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PTD (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
45			3	100	0		OL CL	At 41.7', gray, very fine to fine, silty quartz sand laminae becoming very fine to medium with thin clay laminae from 42-43.5'; trace very small shell fragments.	38	
50							CL	Silt: olive-green, clayey, some very fine to fine sand, stiff, plastic, damp; occasional sandy pods and laminae spaced irregularly but increasing in frequency from 54-55', trace effervescent--Ashley Formation.	47.6	
55			4	100	0					
60										

# EnSafe/Allen & Hoshall

# Monitoring Well NBCA03909I

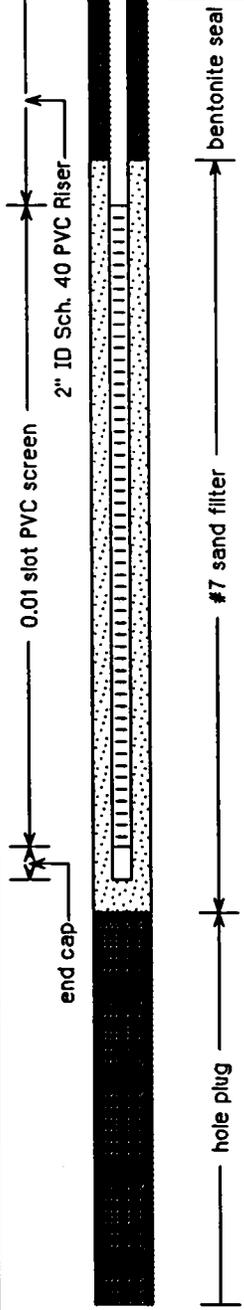
Project: ZONE A - Naval Base Charleston	Coordinates: 2315132.67 E, 381229.06 N
Location: Charleston, SC	Surface Elevation: 7.1 feet msl
Started at 1445 on 9-17-96	TOC Elevation: 9.45 feet msl
Completed at 1730 on 9-17-96	Depth to Groundwater: 5.51 feet TOC Measured: 9/28/96
Drilling Method: Rotasonic (6.5" OD casing, 3.8" ID coring bit)	Groundwater Elevation: 3.94 feet msl
Drilling Company: Boart Longyear	Total Well Depth: 33.5 feet bgs
Geologist: P. Bayley	Well Screen: 23.2 to 33.0 feet bgs



# EnSafe/Allen & Hoshall

# Monitoring Well NBCA03909I

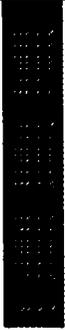
Project: ZONE A - Naval Base Charleston	Coordinates: 2315132.67 E, 381229.06 N
Location: Charleston, SC	Surface Elevation: 7.1 feet msl
Started at 1445 on 9-17-96	TOC Elevation: 9.45 feet msl
Completed at 1730 on 9-17-96	Depth to Groundwater: 5.51 feet TOC Measured: 9/28/96
Drilling Method: Rotasonic (6.5" OD casing, 3.8" ID coring bit)	Groundwater Elevation: 3.94 feet msl
Drilling Company: Boart Longyear	Total Well Depth: 33.5 feet bgs
Geologist: P. Bayley	Well Screen: 23.2 to 33.0 feet bgs

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PTD (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
25			2	95	5-6		OF	Clay: gray green as above; very thin sand partings from 25-26.3', 28.4-29.6', and 31.7-32.5'; sharp planar contact into sand laminae at 41.6'.	75	 <p>2" ID Sch. 40 PVC Riser</p> <p>0.01 slot PVC screen</p> <p>#7 sand filter</p> <p>end cap</p> <p>hole plug</p> <p> Bentonite seal</p>
30							OF		79	
35										
40										

# EnSafe/Allen & Hoshall

# Monitoring Well NBCA03909I

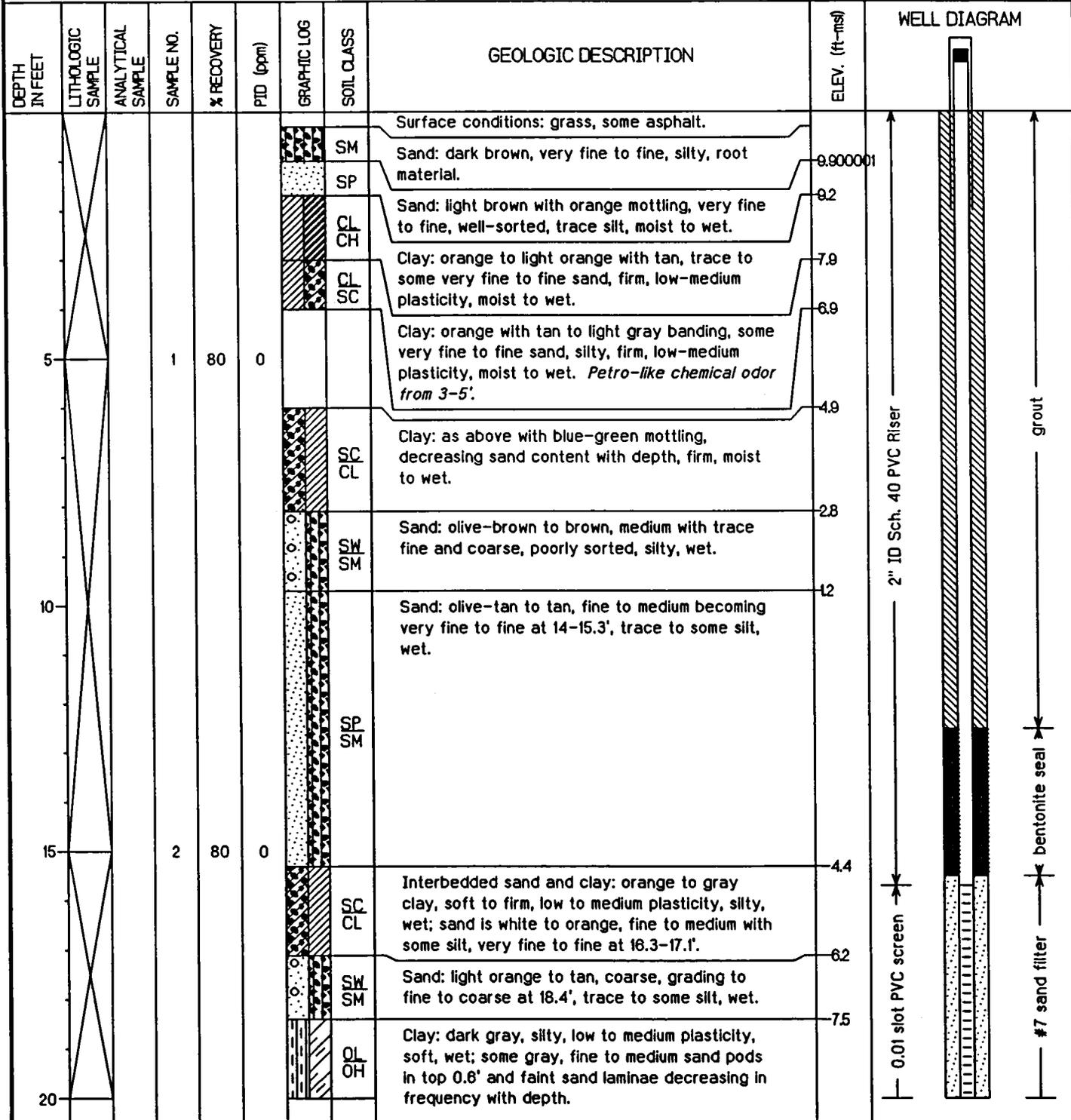
Project: ZONE A - Naval Base Charleston	Coordinates: 2315132.67 E, 381229.06 N
Location: Charleston, SC	Surface Elevation: 7.1 feet msl
Started at 1445 on 9-17-96	TOC Elevation: 9.45 feet msl
Completed at 1730 on 9-17-96	Depth to Groundwater: 5.51 feet TOC Measured: 9/28/96
Drilling Method: Rotasonic (6.5" OD casing, 3.8" ID coring bit)	Groundwater Elevation: 3.94 feet msl
Drilling Company: Boart Longyear	Total Well Depth: 33.5 feet bgs
Geologist: P. Bayley	Well Screen: 23.2 to 33.0 feet bgs

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PTD (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
45			3	95	0		SP			 <p style="text-align: center;">hole plug</p>
							SP	Sand: light gray, very fine to fine with trace medium, loose, wet; 1 cm clayey laminae at 42.1'.	34.8	
							OF	Clay: dark gray-green, some silt, firm to stiff, plastic, moist to wet; from 42.7-43.3' sand laminae from 1-2 cm in size decreasing in frequency and size with depth.	35.5 37.4	
50										
55										
60										

# EnSafe/Allen & Hoshall

# Monitoring Well NBCA03910I

Project: ZONE A - Naval Base Charleston	Coordinates: 2315145.17 E, 381438.55 N
Location: Charleston, SC	Surface Elevation: 10.9 feet msl
Started at 1410 on 9-16-96	TOC Elevation: 13.49 feet msl
Completed at 1645 on 9-16-96	Depth to Groundwater: 7.67 feet TOC Measured: 9/28/96
Drilling Method: Rotasonic (6.5" OD casing, 3.8" ID coring bit)	Groundwater Elevation: 5.82 feet msl
Drilling Company: Boart Longyear	Total Well Depth: 26.0 feet bgs
Geologist: T. Kafka	Well Screen: 15.7 to 25.4 feet bgs



# EnSafe/Allen & Hoshall

# Monitoring Well NBCA03910I

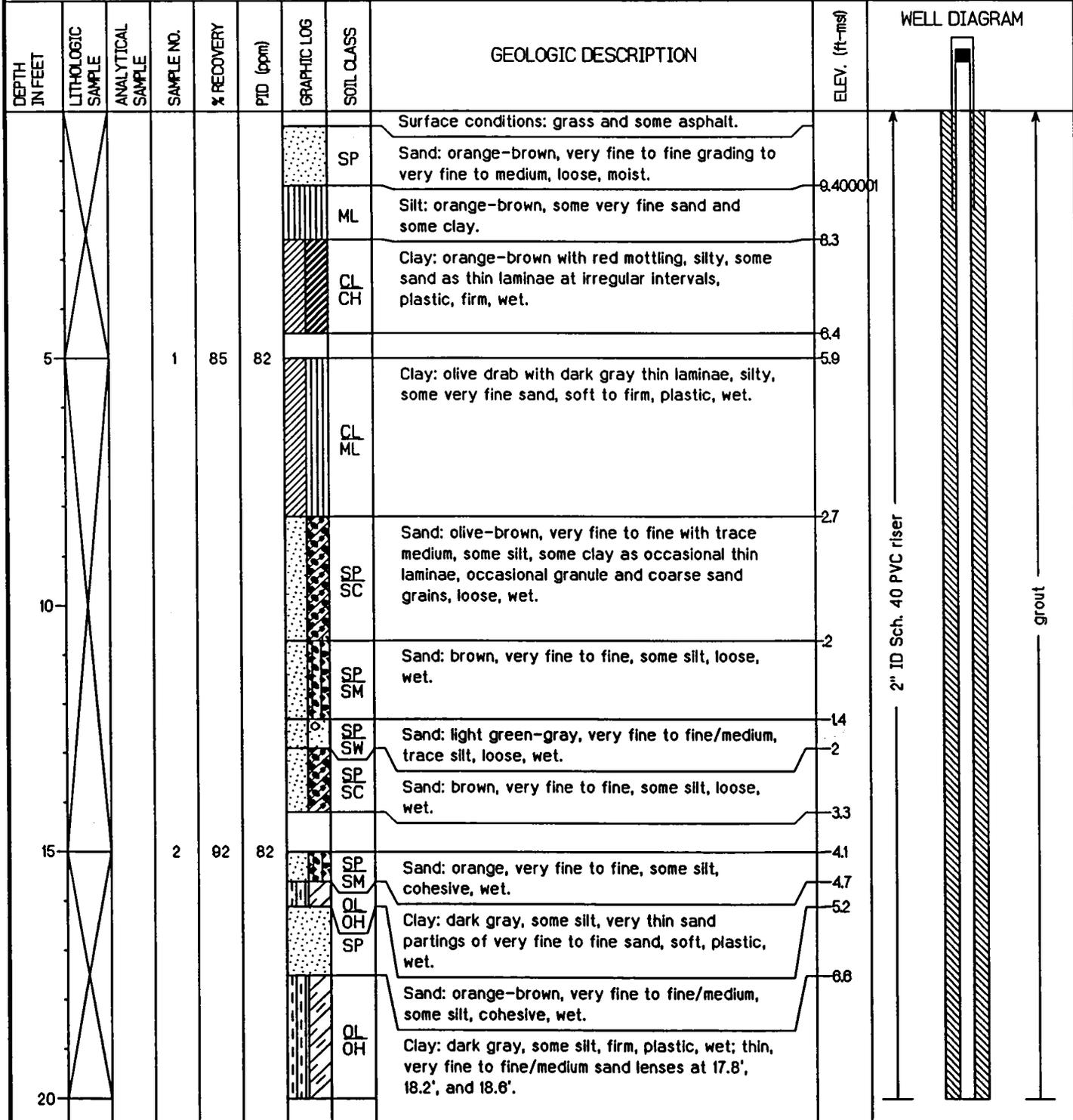
Project: <i>ZONE A - Naval Base Charleston</i>	Coordinates: <i>2315145.17 E, 381438.55 N</i>
Location: <i>Charleston, SC</i>	Surface Elevation: <i>10.9 feet msl</i>
Started at <i>1410 on 9-16-96</i>	TOC Elevation: <i>13.49 feet msl</i>
Completed at <i>1645 on 9-16-96</i>	Depth to Groundwater: <i>7.67 feet TOC</i> Measured: <i>9/28/96</i>
Drilling Method: <i>Rotasonic (6.5" OD casing, 3.8" ID coring bit)</i>	Groundwater Elevation: <i>5.82 feet msl</i>
Drilling Company: <i>Boart Longyear</i>	Total Well Depth: <i>26.0 feet bgs</i>
Geologist: <i>T. Kafka</i>	Well Screen: <i>15.7 to 25.4 feet bgs</i>

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PTD (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
25			3	94	0		OP HF		25	
30										
35										
40										

# EnSafe/Allen & Hoshall

# Monitoring Well NBCA03910D

Project: ZONE A - Naval Base Charleston	Coordinates: 2315155.12 E, 381438.55 N
Location: Charleston, SC	Surface Elevation: 10.9 feet msl
Started at 0930 on 9-18-96	TOC Elevation: 13.35 feet msl
Completed at 1130 on 9-18-96	Depth to Groundwater: 9.68 feet TOC Measured: 9/28/96
Drilling Method: Rotasonic (6.5" OD casing, 3.8" ID coring bit)	Groundwater Elevation: 3.67 feet msl
Drilling Company: Boart Longyear	Total Well Depth: 41.5 feet bgs
Geologist: P. Bayley	Well Screen: 36.7 to 40.7 feet bgs



# EnSafe/Allen & Hoshall

# Monitoring Well NBCA03910D

Project: ZONE A - Naval Base Charleston

Coordinates: 2315155.12 E, 381438.55 N

Location: Charleston, SC

Surface Elevation: 10.9 feet msl

Started at 0930 on 9-18-96

TOC Elevation: 13.35 feet msl

Completed at 1130 on 9-18-96

Depth to Groundwater: 9.68 feet TOC Measured: 9/28/96

Drilling Method: Rotasonic (6.5" OD casing, 3.8" ID coring bit)

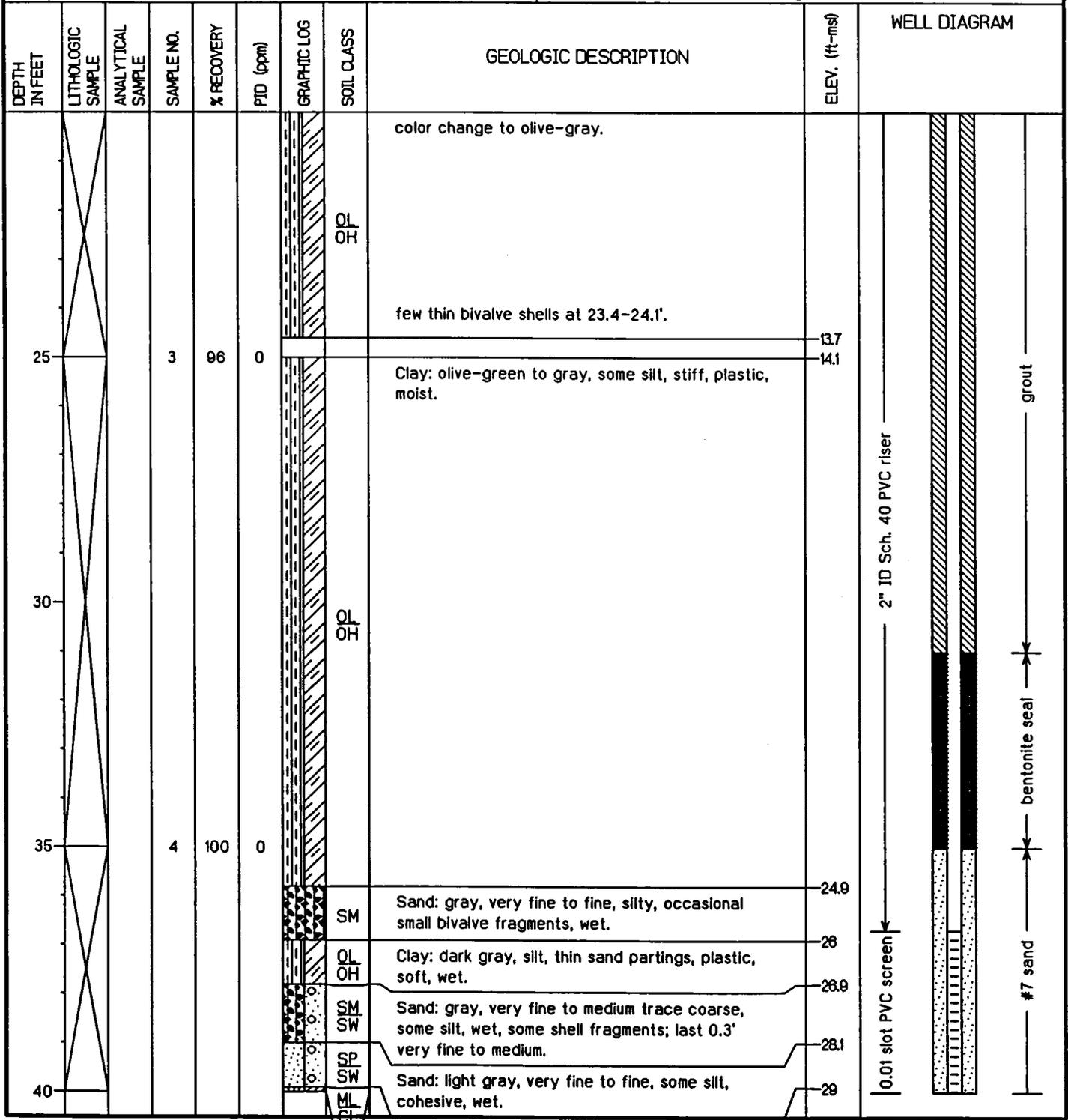
Groundwater Elevation: 3.67 feet msl

Drilling Company: Boart Longyear

Total Well Depth: 415 feet bgs

Geologist: P. Bayley

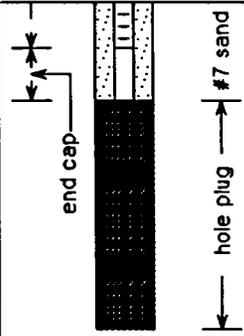
Well Screen: 36.7 to 40.7 feet bgs



# EnSafe/Allen & Hoshall

# Monitoring Well NBCA03910D

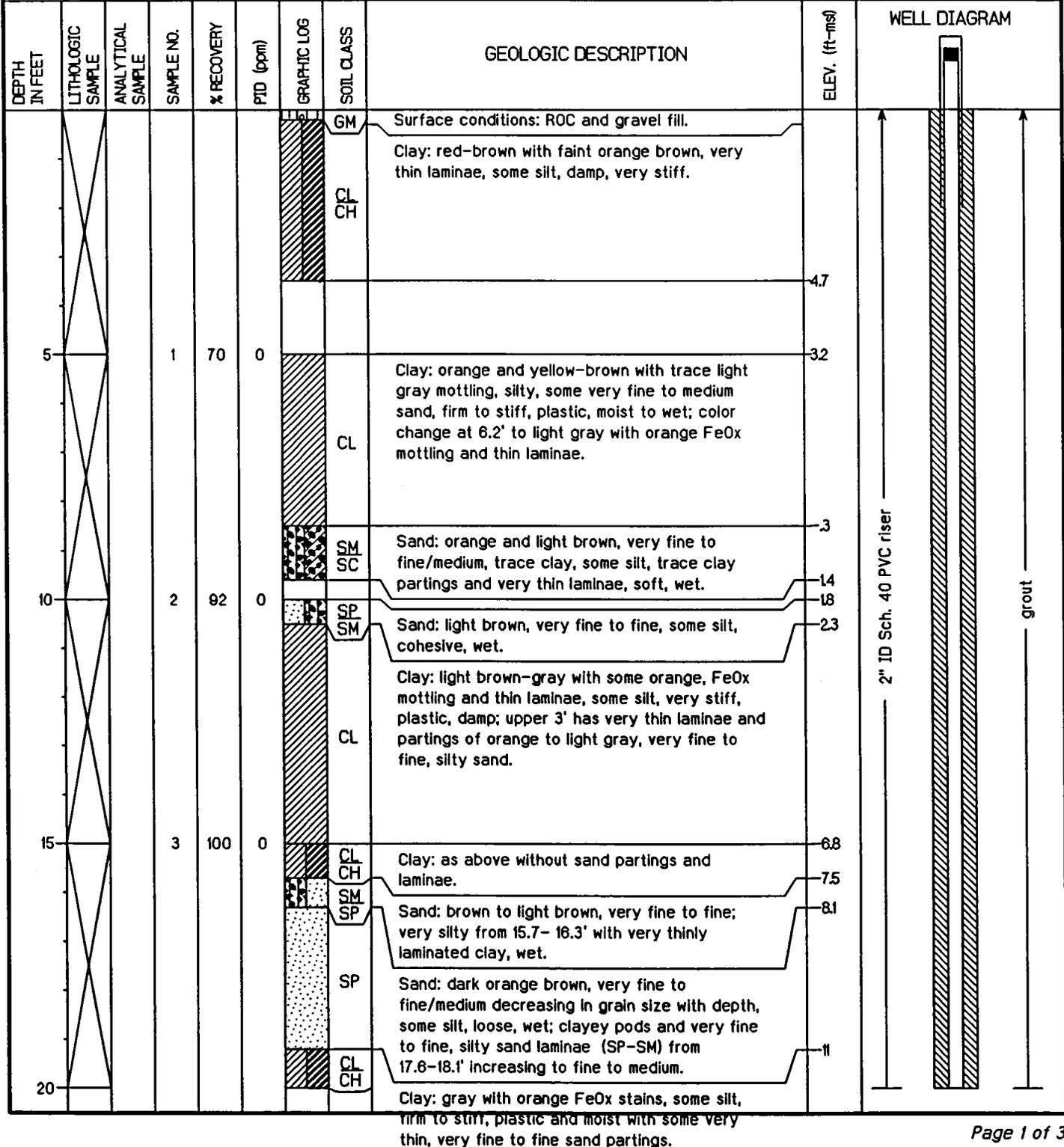
Project: <i>ZONE A - Naval Base Charleston</i>	Coordinates: <i>2315155.12 E, 381438.55 N</i>
Location: <i>Charleston, SC</i>	Surface Elevation: <i>10.9 feet msl</i>
Started at <i>0930 on 9-18-96</i>	TOC Elevation: <i>13.35 feet msl</i>
Completed at <i>1130 on 9-18-96</i>	Depth to Groundwater: <i>9.68 feet TOC</i> Measured: <i>9/28/96</i>
Drilling Method: <i>Rotasonic (6.5" OD casing, 3.8" ID coring bit)</i>	Groundwater Elevation: <i>3.67 feet msl</i>
Drilling Company: <i>Boart Longyear</i>	Total Well Depth: <i>41.5 feet bgs</i>
Geologist: <i>P. Bayley</i>	Well Screen: <i>36.7 to 40.7 feet bgs</i>

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PTD (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
45			4	100	0		CL	Silt: olive-brown, clayey, trace very fine sand, occasional shell fragments, effervescent with HCl, stiff, plastic, moist--Ashley Fm.	34.1	
50										
55										
60										

# EnSafe/Allen & Hoshall

# Monitoring Well NBCA03913D

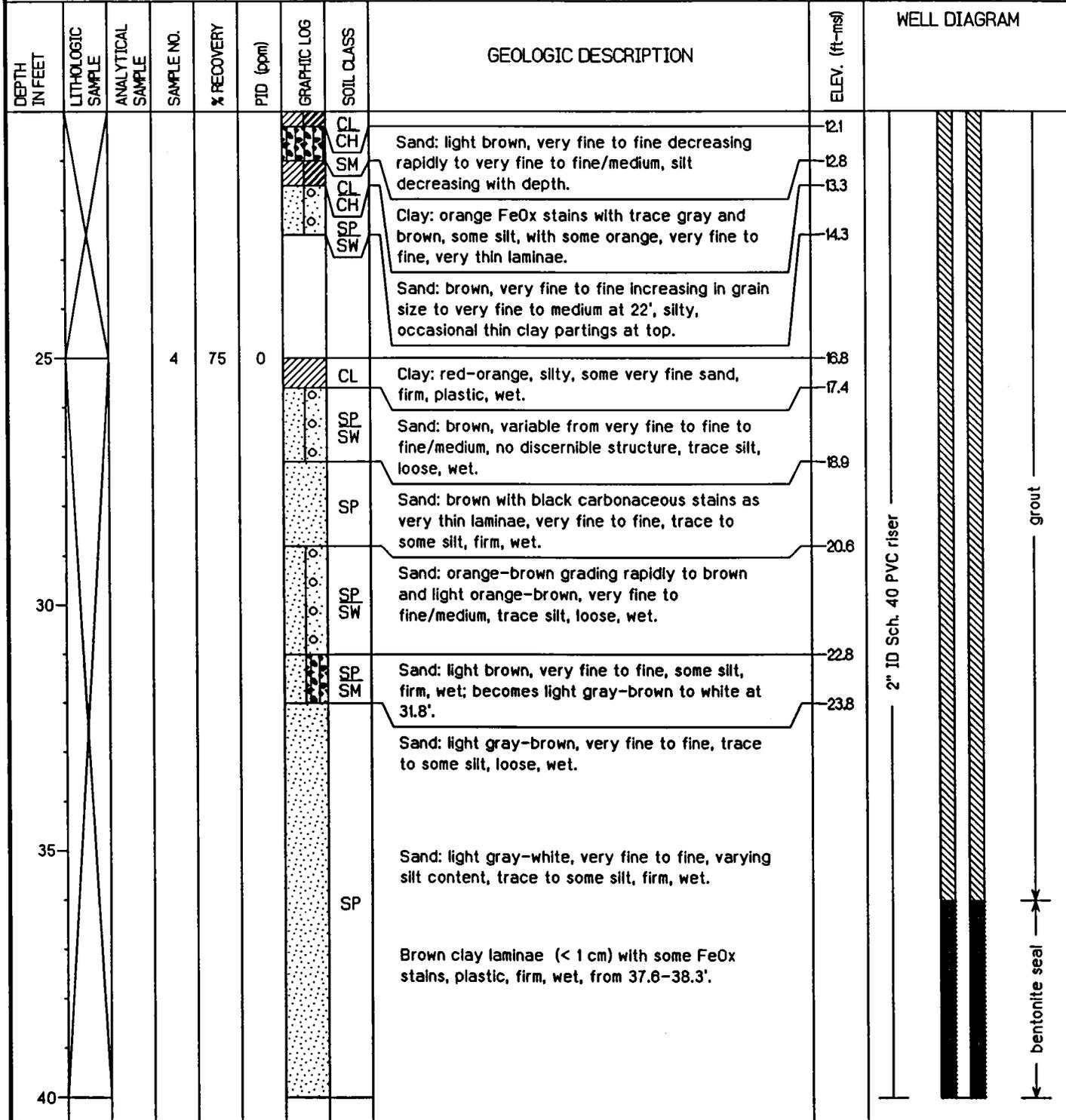
Project: ZONE A - Naval Base Charleston	Coordinates: 2315504.92 E, 381173.16 N
Location: Charleston, SC	Surface Elevation: 8.2 feet msl
Started at 0900 on 9-18-96	TOC Elevation: 10.41 feet msl
Completed at 1300 on 9-18-96	Depth to Groundwater: 7.97 feet TOC Measured: 9/29/96
Drilling Method: Rotasonic (6.5" OD casing, 3.8" ID coring bit)	Groundwater Elevation: 2.44 feet msl
Drilling Company: Boart Longyear	Total Well Depth: 52.0 feet bgs
Geologist: P. Bayley	Well Screen: 41.7 to 51.5 feet bgs



# EnSafe/Allen & Hoshall

# Monitoring Well NBCA03913D

Project: ZONE A - Naval Base Charleston	Coordinates: 2315504.92 E, 381173.16 N
Location: Charleston, SC	Surface Elevation: 8.2 feet msl
Started at 0900 on 9-18-96	TOC Elevation: 10.41 feet msl
Completed at 1300 on 9-18-96	Depth to Groundwater: 7.97 feet TOC Measured: 9/29/96
Drilling Method: Rotasonic (6.5" OD casing, 3.8" ID coring bit)	Groundwater Elevation: 2.44 feet msl
Drilling Company: Boart Longyear	Total Well Depth: 52.0 feet bgs
Geologist: P. Bayley	Well Screen: 41.7 to 51.5 feet bgs



# EnSafe/Allen & Hoshall

# Monitoring Well NBCA03913D

Project: ZONE A - Naval Base Charleston	Coordinates: 2315504.92 E, 381173.16 N
Location: Charleston, SC	Surface Elevation: 8.2 feet msl
Started at 0900 on 9-18-96	TOC Elevation: 10.41 feet msl
Completed at 1300 on 9-18-96	Depth to Groundwater: 7.97 feet TOC Measured: 9/29/96
Drilling Method: Rotasonic (6.5" OD casing, 3.8" ID coring bit)	Groundwater Elevation: 2.44 feet msl
Drilling Company: Boart Longyear	Total Well Depth: 52.0 feet bgs
Geologist: P. Bayley	Well Screen: 41.7 to 51.5 feet bgs

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PTD (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
							SP		32.4	
45			5	78	0		SW	Sand: light brown, very fine to medium trace coarse, shell fragments comprise 50-60% matrix.	36.8	
							SP SW	Sand: brown, very fine to fine trace medium with some shell fragments	38.6	
50							GM GC	Gravel: dark gray, granule to 3 cm dia., grain supported with matrix or clayey silt with some phosphatic sand.	40.9	
							ML CL	Silt: olive green-brown, clayey, trace sand from very fine to very coarse, medium plasticity, stiff, effervescent with HCl--Ashley Fm.	42.8	
55			6	89	0				46.8	
60										

# EnSafe/Allen & Hoshall

# Monitoring Well NBCA03913I

Project: ZONE A - Naval Base Charleston

Coordinates: 2315503.15 E, 381182.56 N

Location: Charleston, SC

Surface Elevation: 8.1 feet msl

Started at 1500 on 9-18-96

TOC Elevation: 10.50 feet msl

Completed at 1640 on 9-18-96

Depth to Groundwater: 8.01 feet TOC Measured: 9/29/96

Drilling Method: Rotasonic (6.5" OD casing, 3.8" ID coring bit)

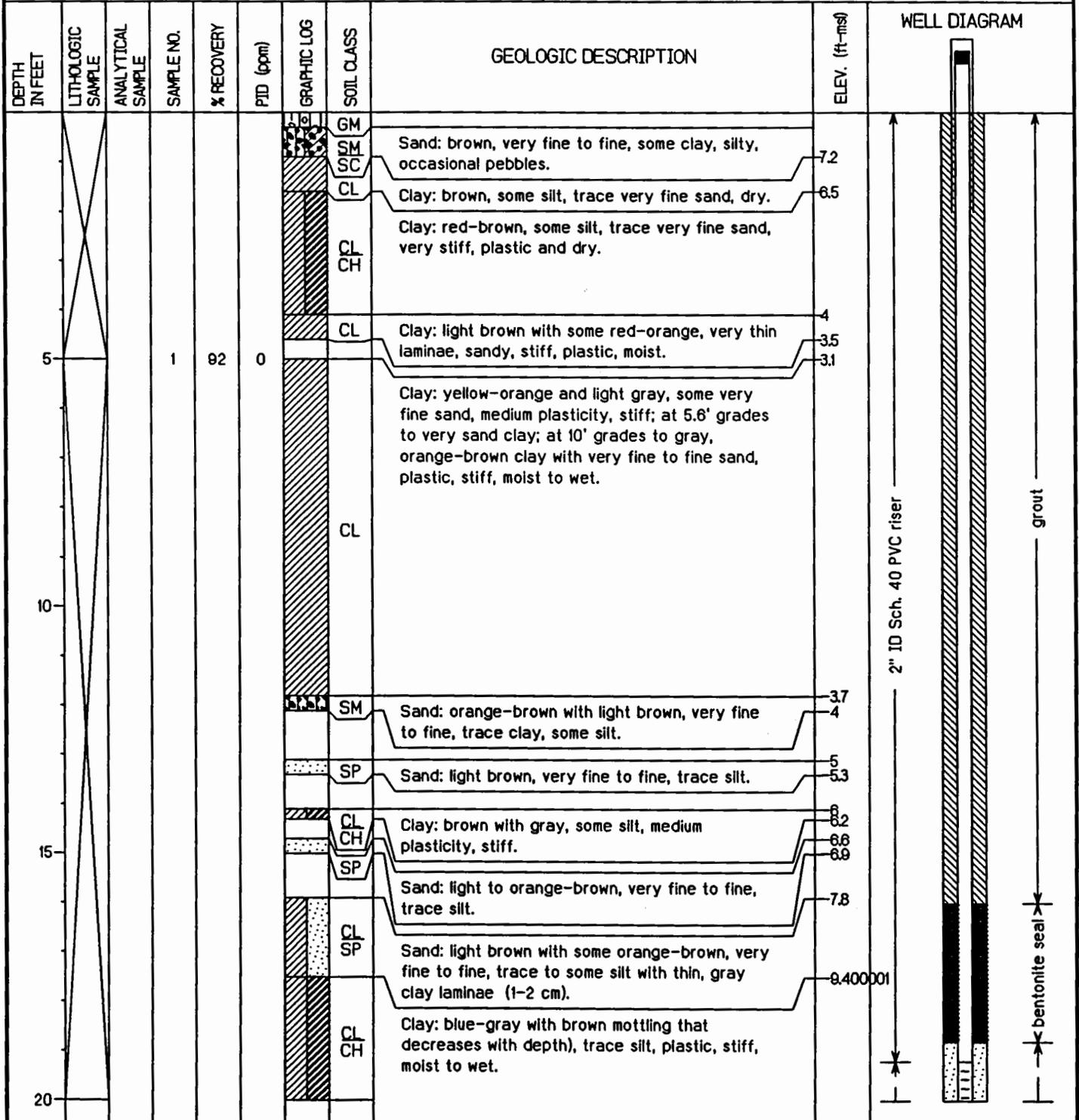
Groundwater Elevation: 2.49 feet msl

Drilling Company: Boart Longyear

Total Well Depth: 24.0 feet bgs

Geologist: P. Bayley

Well Screen: 19 to 23.2 feet bgs



# EnSafe/Allen & Hoshall

# Monitoring Well NBCA03913I

Project: ZONE A - Naval Base Charleston

Coordinates: 2315503.15 E, 381192.56 N

Location: Charleston, SC

Surface Elevation: 8.1 feet msl

Started at 1500 on 9-18-96

TOC Elevation: 10.50 feet msl

Completed at 1640 on 9-18-96

Depth to Groundwater: 8.01 feet TOC Measured: 9/29/96

Drilling Method: Rotasonic (6.5" OD casing, 3.8" ID coring bit)

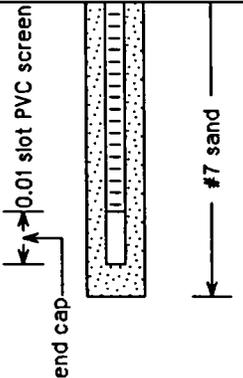
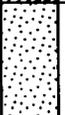
Groundwater Elevation: 2.49 feet msl

Drilling Company: Boart Longyear

Total Well Depth: 24.0 feet bgs

Geologist: P. Bayley

Well Screen: 19 to 23.2 feet bgs

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PTD (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
25			2	85	0		CLP		14	
							SP	Sand: orange-brown, very fine to fine, trace silt, loose, wet.	15.8	
							SP SCL	Clay: brown, some silt, stiff, plastic, wet; very fine to fine sand from 24.3-24.4'.	16.3	

# EnSafe/Allen & Hoshall

# Monitoring Well NBCA039013

Project: ZONE A - Naval Base Charleston

Coordinates: 2315501.86 E, 381191.99 N

Location: Charleston, SC

Surface Elevation: 8.4 feet msl

Started at 1550 on 1-06-97

TOC Elevation: 10.65 feet msl

Completed at 0905 on 1-07-97

Depth to Groundwater: 6.98 feet TOC Measured: 1/22/97

Drilling Method: 4.25" ID (7.5" OD) HSA with split spoon

Groundwater Elevation: 3.67 feet msl

Drilling Company: Alliance Environmental

Total Well Depth: 13.5 feet bgs

Geologist: T. Kafka

Well Screen: 3.5 to 13.0 feet bgs

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PTD (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
								Surface conditions: gravel.		
5			1	50	20		CL SC	Sand: rust-orange w/ lt gray mottling; very fine to fine; with firm, low to medium plasticity clay; moist.	5.4 4.6	
10			2	10	0			Rust-brown, silty sand coating spoon.		
15			3	75	0		CL SC SM	Clay: lt gray w/ rust-brown mottling; firm; medium plasticity; some very fine to fine sand w/ trace medium in rust-brown mottles; moist. Sand: tan to lt gray; very fine to fine; trace to some silt; some lenses of lt gray, soft to firm, low-medium plasticity clay irregularly spaced and 3-10 mm wide.	2.8 3.1 3.8	
20										

# EnSafe/Allen & Hoshall

# Monitoring Well NBCA039014

Project: ZONE A - Naval Base Charleston

Coordinates: 2315137.68 E, 381643.28 N

Location: Charleston, SC

Surface Elevation: 13.9 feet msl

Started at 1500 on 1-07-97

TOC Elevation: 13.64 feet msl

Completed at 1550 on 1-07-97

Depth to Groundwater: 6.86 feet TOC Measured: 1/22/97

Drilling Method: 4.25" ID (7.5" OD) HSA with split spoon

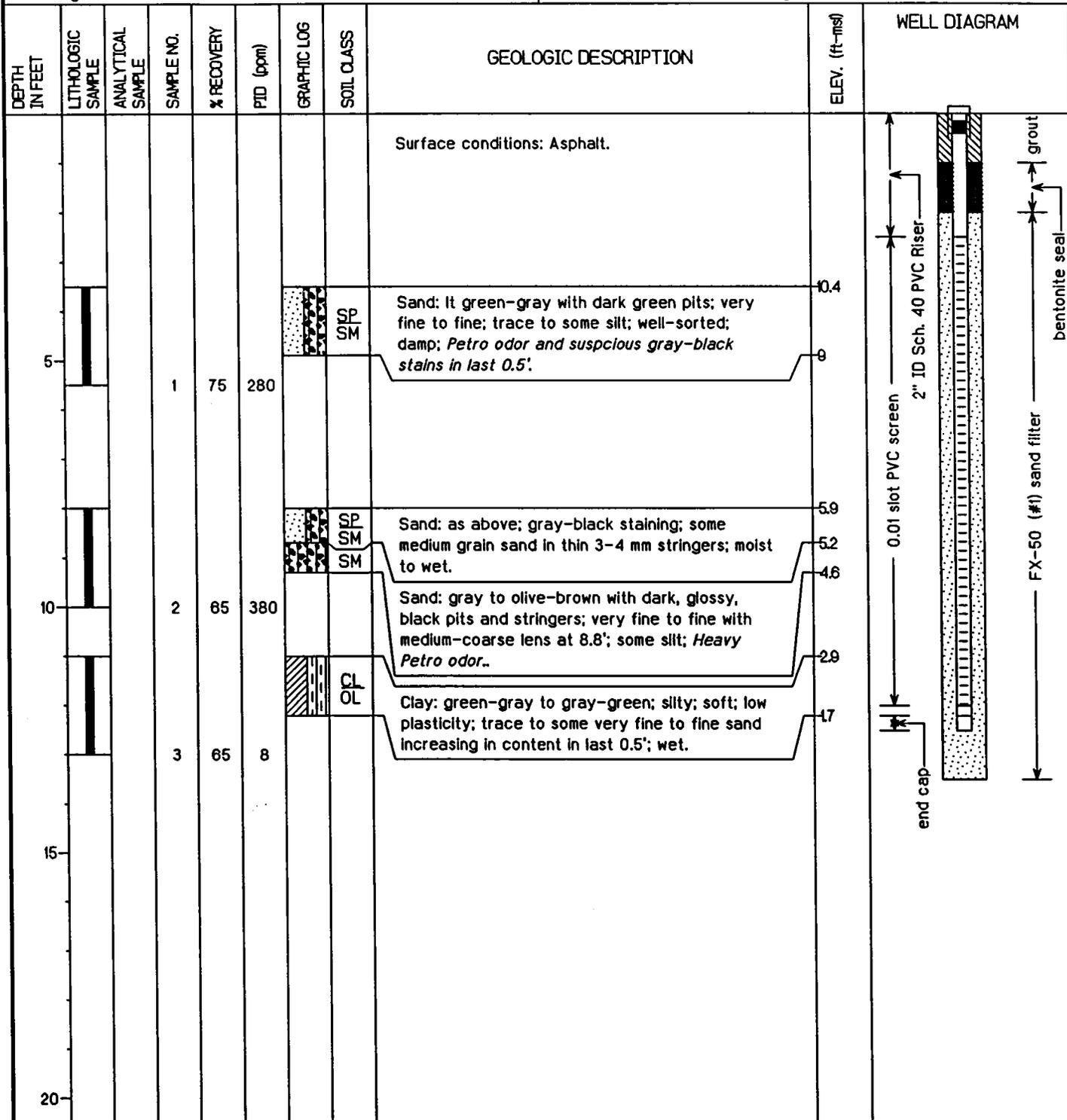
Groundwater Elevation: 6.78 feet msl

Drilling Company: Alliance Environmental

Total Well Depth: 12.5 feet bgs

Geologist: T. Kafka

Well Screen: 2.5 to 12.0 feet bgs



# EnSafe/Allen & Hoshall

# Monitoring Well NBCA039015

Project: ZONE A - Naval Base Charleston

Coordinates: 2314512.80 E, 380981.55 N

Location: Charleston, SC

Surface Elevation: 7.0 feet msl

Started at 1300 on 1-07-97

TOC Elevation: 6.37 feet msl

Completed at 1430 on 1-07-97

Depth to Groundwater: 3.98 feet TOC Measured: 1/22/97

Drilling Method: 4.25" ID (7.5" OD) HSA with split spoon

Groundwater Elevation: 2.39 feet msl

Drilling Company: Alliance Environmental

Total Well Depth: 14.5 feet bgs

Geologist: T. Kafka

Well Screen: 4.5 to 14.0 feet bgs

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PTD (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
								Surface conditions: grassy. 2'x2'x3' Vault-type flush mount well completion.		
5			1	75	0	GP SP	Sand/Gravel: black; very fine to fine sand intermixed with gravel & asphalt; dry; roadfill?	3.5 2.4		
						SP SM	Sand: medium brown; very fine to fine; moderately well-sorted; some silt; moist.	2		
10			2	75	0	SM	Sand: as above with increased silt content; wet; occasional clay lenses in last 0.2'.	1 1.8		
						WOOD SM	Wood: brown-black; marshy; in very fine to fine with trace medium to coarse sandy matrix.	2.2 2.5		
							Sand: as above with black silty staining and laminae.			
15			3	25	0	SP	Sand: medium gray to brown-gray; very fine to fine; saturated.	6 6.5		
20							2'x2'x3' vault-type pad used for flush mount completion.			

# EnSafe/Allen & Hoshall

# Monitoring Well NBCA043001

Project: ZONE A - Naval Base Charleston

Coordinates: 2315605.49 E, 380170.38 N

Location: Charleston, SC

Surface Elevation: 6.4 feet msl

Started at 0930 on 1-10-97

TOC Elevation: 6.19 feet msl

Completed at 1055 on 1-10-97

Depth to Groundwater: 5.22 feet TOC Measured: 1/22/97

Drilling Method: 4.25" ID (7.5" OD) HSA with split spoon

Groundwater Elevation: 0.97 feet msl

Drilling Company: Alliance Environmental

Total Well Depth: 12.5 feet bgs

Geologist: T. Kafka

Well Screen: 2.5 to 12.0 feet bgs

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PTD (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
								Surface conditions: asphalt		
5			1	60	18	WOOD		Wood: dark brown to tan; peaty.	3.4	
						SM		Sand: medium gray to dark brown; very fine to fine; silty; some small, soft clayey pods of low plasticity; wet.	2.9 2.2	
10			2	75	52	SC		Sand: green-gray to blue-green; very fine to fine with trace medium; soft, low plasticity clay with trace to some silt; orange-green to olive staining (silty); moist to wet.	1.6 2.7	
15			3	100	1.3	SP		Sand: olive-brown; very fine to fine; trace to some silt; wet.	4.6 6.6	
20										

# EnSafe/Allen & Hoshall

# Monitoring Well NBCA03914D

Project: ZONE A - Naval Base Charleston

Coordinates: 2315147.98 E, 381638.85 N

Location: Charleston, SC

Surface Elevation: 13.7 feet msl

Started at 1030 on 1-09-97

TOC Elevation: 13.44 feet msl

Completed at 1230 on 1-14-97

Depth to Groundwater: 5.93 feet TOC Measured: 1/22/97

Drilling Method: Mud Rotary (6" OD cutting bit)

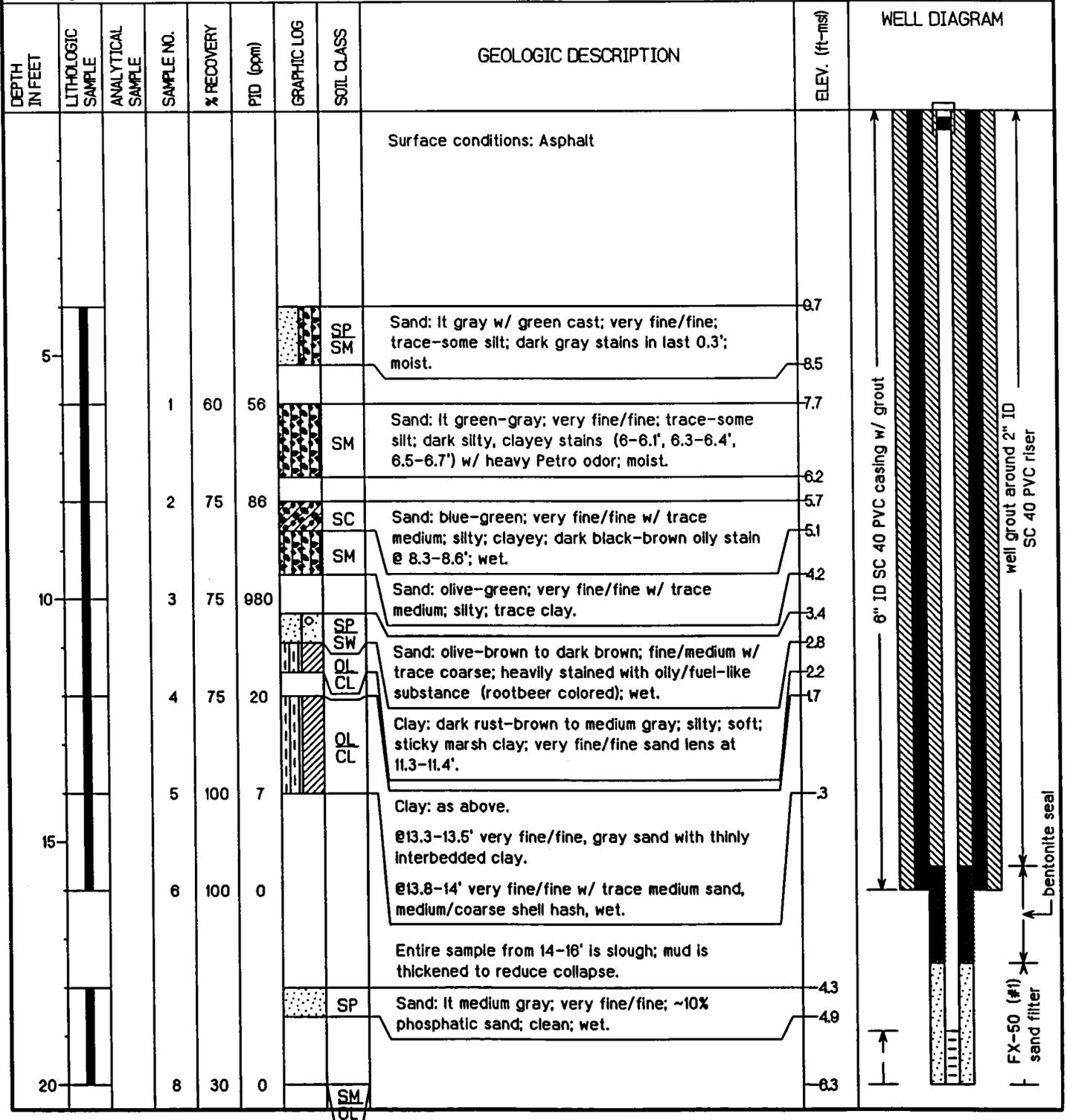
Groundwater Elevation: 7.51 feet msl

Drilling Company: Alliance Environmental

Total Well Depth: 24.2 feet bgs

Geologist: T. Kafka

Well Screen: 18.9 to 23.7 feet bgs



# EnSafe/Allen & Hoshall

# Monitoring Well NBCA03914D

Project: ZONE A - Naval Base Charleston

Coordinates: 2315147.98 E, 381638.85 N

Location: Charleston, SC

Surface Elevation: 13.7 feet msl

Started at 1030 on 1-09-97

TOC Elevation: 13.44 feet msl

Completed at 1230 on 1-14-97

Depth to Groundwater: 5.93 feet TOC Measured: 1/22/97

Drilling Method: Mud Rotary (6" OD cutting bit)

Groundwater Elevation: 7.51 feet msl

Drilling Company: Alliance Environmental

Total Well Depth: 24.2 feet bgs

Geologist: T. Kafka

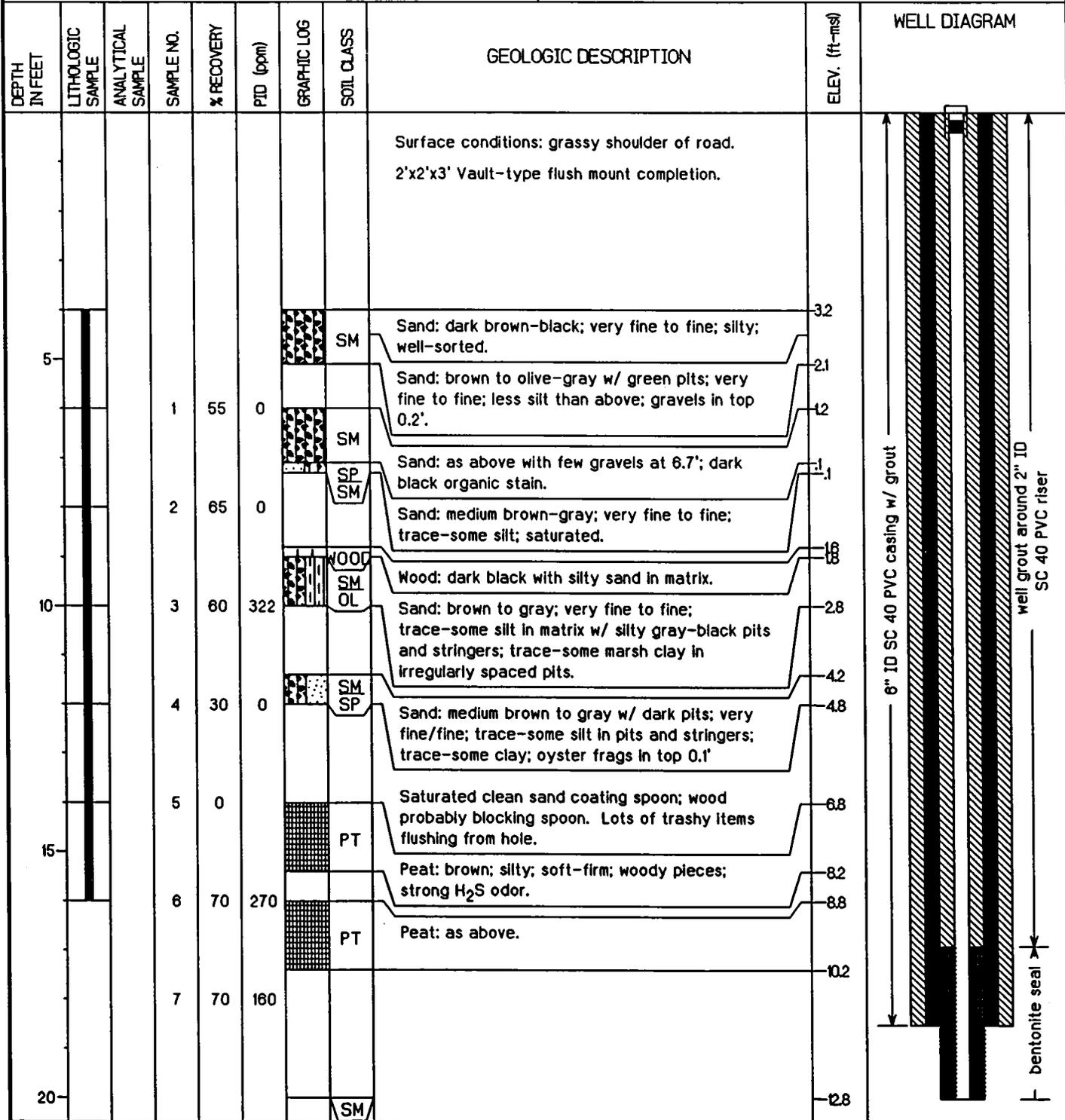
Well Screen: 18.9 to 23.7 feet bgs

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)	WELL DIAGRAM
25			9	75	0		SM	Sand: dark gray; very fine to fine w/ trace-some medium to coarse; silty; frequent clay stringers (<0.1' wide) of silty, soft, low-medium plasticity marsh clay; fine to coarse shell hash (~15% matrix) in last 0.3'.	7.2 7.8 8.3	<p>WELL DIAGRAM</p> <p>&lt; 0.01 slot PVC screen</p> <p>FX-50 (#1) sand filter</p> <p>end cap</p>
25			10	75	0		CL	Sand: lt tan; very fine to fine; ~75% phosphatic sand in matrix; dense; moist.	8.8	
25							Silt: olive brown; firm to stiff; clayey; some very fine/fine sand in matrix; @22-22.1' lag deposit of coarse shell hash and PO <sub>4</sub> gravel; phosphatic sand in pockets/pits in silt at 22.2-22.4' and 22.5-22.7'; moist; Ashley Formation.			

# EnSafe/Allen & Hoshall

# Monitoring Well NBCA03915D

Project: ZONE A - Naval Base Charleston	Coordinates: 2314512.71 E, 380990.32 N
Location: Charleston, SC	Surface Elevation: 7.2 feet msl
Started at 1030 on 1-08-97	TOC Elevation: 6.55 feet msl
Completed at 0930 on 1-14-97	Depth to Groundwater: 6.31 feet TOC Measured: 1/22/97
Drilling Method: Mud Rotary (6" OD cutting bit)	Groundwater Elevation: 0.24 feet msl
Drilling Company: Alliance Environmental	Total Well Depth: 34.1 feet bgs
Geologist: T. Kafka	Well Screen: 24.1 to 33.6 feet bgs



# EnSafe/Allen & Hoshall

# Monitoring Well NBCA03915D

Project: ZONE A - Naval Base Charleston	Coordinates: 2314512.71 E, 380990.32 N
Location: Charleston, SC	Surface Elevation: 7.2 feet msl
Started at 1030 on 1-08-97	TOC Elevation: 6.55 feet msl
Completed at 0930 on 1-14-97	Depth to Groundwater: 6.31 feet TOC Measured: 1/22/97
Drilling Method: Mud Rotary (6" OD cutting bit)	Groundwater Elevation: 0.24 feet msl
Drilling Company: Alliance Environmental	Total Well Depth: 34.1 feet bgs
Geologist: T. Kafka	Well Screen: 24.1 to 33.6 feet bgs

