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United States Air Force

Soil Vapor Extraction at the
Jet Engine Buildup Shop



Loring Air Force Base

STARTUP REPORT

DRAFT

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May 1999

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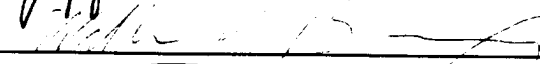

Prepared for:
Department of the Air Force
Air Force Center for Environmental Excellence (AFCEE)
Brooks Air Force Base, Texas 78235-5328

Prepared by:
Bechtel Environmental, Inc.
151 Lafayette Drive
Oak Ridge, Tennessee 37830

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Revision B

Prepared	<u>Jeff N. Sins for Eric Berglund</u>	<u>5/18/99</u>
Approved	<u></u> Bechtel Project Engineer	<u>5/18/99</u> Date
Approved	<u></u> Bechtel Project Manager	<u>5/18/99</u> Date

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ACRONYMS AND INITIALISMS

AEW	air extraction well
AFB	Air Force Base
AFBCA	Air Force Base Conversion Agency
AFCEE	Air Force Center for Environmental Excellence
AIW	air injection well
ARAR	applicable or relevant and appropriate requirements
BEI	Bechtel Environmental, Inc.
bgs	below ground surface
EE/CA	Engineering Evaluation/Cost Analysis
EPA	U.S. Environmental Protection Agency
ES	Entomology Shop
JEBS	Jet Engine Buildup Shop
MP	monitoring point
MDEP	Maine Department of Environmental Protection
PAV	passive air vent
PID	photo ionization detector
PRG	preliminary remediation goal
PVC	polyvinyl chloride
RAWP	Removal Action Work Plan
SVE	soil vapor extraction
TCE	trichloroethene
TVOC	total volatile organic compounds

UNITS OF MEASURE

cfm	cubic feet per minute
in.	inch/inches
in H ₂ O	inches of water
in. Hg	inches of mercury
ft	feet
ft ²	square feet
gal	gallon
kg	kilogram
lbs	pounds
μg	microgram
ppm	parts per million
ppmv	parts per million (volume basis)
rpm	revolutions per minute
scfm	standard cubic feet per minute
yd ³	cubic yard

1.0 INTRODUCTION

The Air Force intends to perform removal actions of contaminated surface and subsurface soil at Loring Air Force Base (AFB) in Limestone, Maine. These removal actions will comply with a Federal Facilities Agreement between Region I U.S. Environmental Protection Agency (EPA), the Maine Department of Environmental Protection (MDEP), and the U.S. Air Force signed on January 30, 1991. Bechtel Environmental, Inc. (BEI) has been contracted by the Air Force Center for Environmental Excellence (AFCEE) as the removal action contractor for Loring AFB under Prime Contract No. F41624-94-D-8072.

This startup report documents the construction and startup (first month of operation) of a Soil Vapor Extraction (SVE) system at the Jet Engine Buildup Shop (JEBS). The SVE system will provide subsurface remediation for the area contaminated with trichloroethene (TCE). The system includes blower/vacuum unit, SVE wells, monitoring points (MPs), and piping.

2.0 SITE BACKGROUND

2.1 SITE DESCRIPTION AND BACKGROUND

Loring AFB is located in Aroostook County in the northeastern corner of Maine about 3 miles from the Canadian border (see Figure 2-1). The base occupies about 9,000 acres near the town of Limestone, Maine. The base was constructed between 1946 and 1953, and improvements were made throughout its operational life. Most recently, the base was part of the Air Combat Command. On September 30, 1994, Loring AFB was officially closed and is now the responsibility of the Air Force Base Conversion Agency (AFBCA). The JEBS site is located west of the flightline in the south-central industrial area of the Base (Figure 2-2).

The geology of the Loring site consists of overburden soils containing glacial till and reworked glacial till that have been used as fill materials. The thickness of the soils is variable between the different operable units but is generally between 10 and 30 ft thick. Bedrock at the site is a well-cemented, highly fractured, weathered limestone of the Carys Mills Formation that generally dips to the west (URS 1995).

Groundwater at the JEBS is present in both the overburden and the bedrock. Groundwater in the overburden is generally unconfined, discontinuous, and often perched. The depth to groundwater in the overburden is generally about 10 to 20 ft below ground surface (bgs). Groundwater flow direction within the overburden appears to be predominantly to the south-southwest. Groundwater in the bedrock primarily occurs in the secondary porosity features such as fractures and bedding planes. Groundwater in the bedrock aquifer is under unconfined to semiconfined conditions and groundwater flow is controlled by fracture orientation, which primarily trends northeast and northwest. Vertical flow in the bedrock aquifer is generally upward (URS 1995).

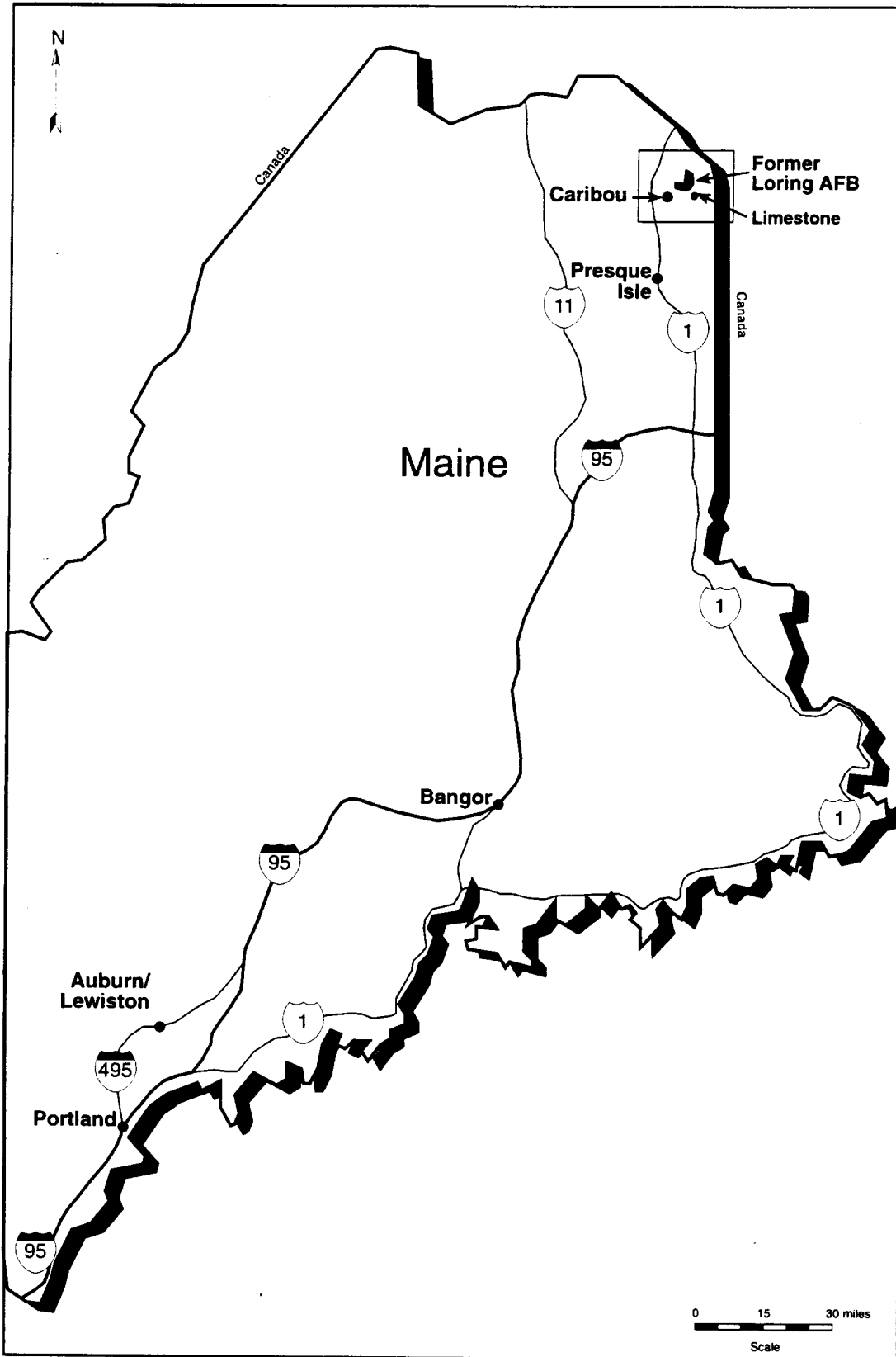
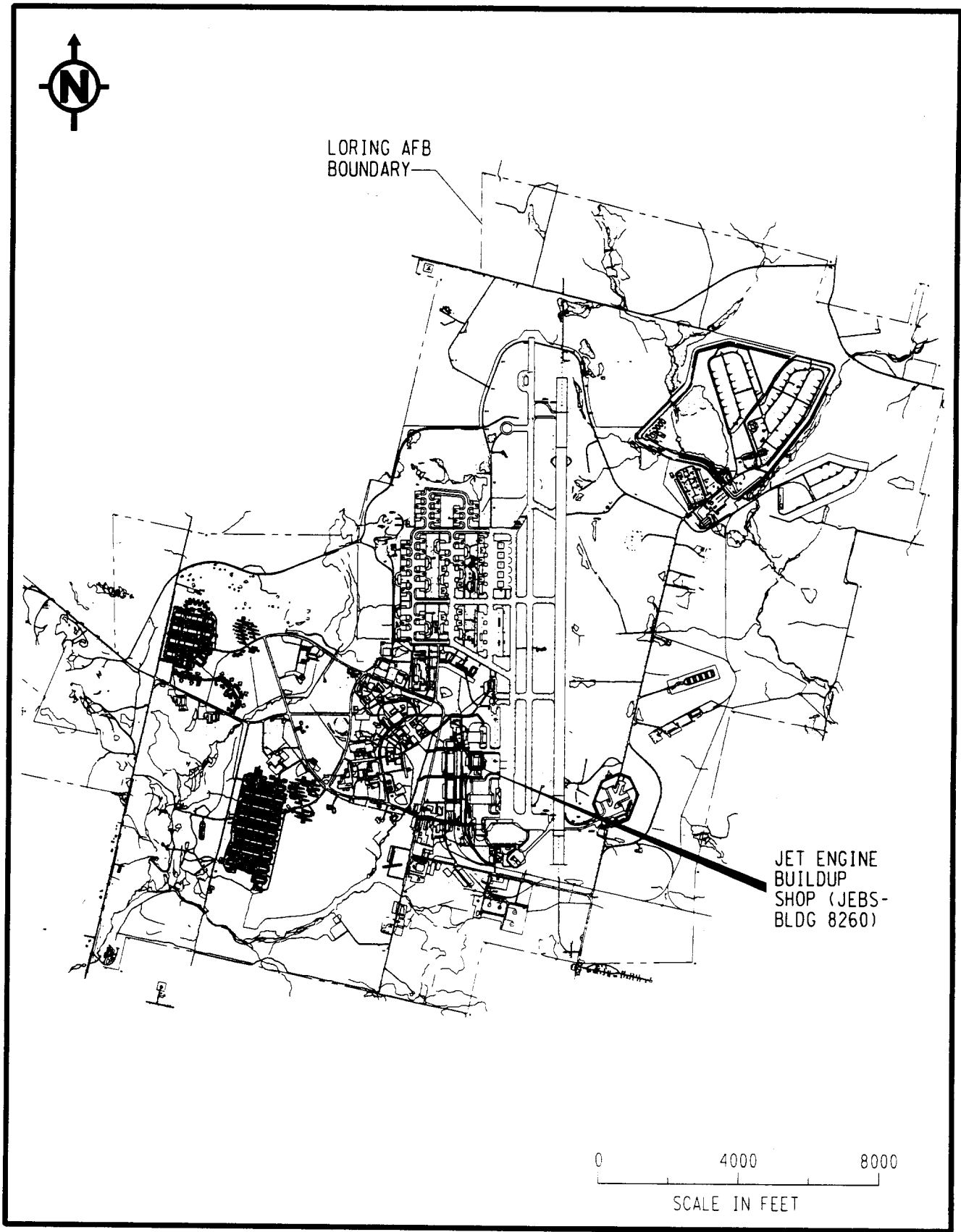


Figure 2-1
Loring Air Force Base Location Map



22784 LORING FIG8-3M.DGN
4/23/98

Figure 2-2
Loring Air Force Base

2.2 NATURE AND EXTENT OF CONTAMINATION

TCE has been detected at the JEBS site at concentrations that may impact groundwater to levels above regulatory criteria [*Engineering Evaluation/Cost Analysis (EE/CA) for JEBS and Building 8710, Bechtel 1998a*]. As the primary contaminant of concern, TCE defines the limits of the removal action. TCE concentrations at the North, South and Southeast JEBS areas are shown on Figure 2-3. The volume of soil to be remediated was calculated in the EE/CA to be 49,665 yd³ and the amount of TCE in that soil was calculated using arithmetic means of soil TCE concentrations to be 819 lbs.

2.3 REGULATORY SETTING

The removal actions being performed at Loring AFB are authorized under the Comprehensive Environmental Response, Compensation, and Liability Act, Section 104. The removal action design is based on the EE/CA. The EE/CA presents a complete discussion of applicable or relevant and appropriate requirements (ARARs) for this removal action. These ARARs were incorporated into the design and planning of the JEBS site action.

2.4 CLEANUP CRITERIA

The EE/CA presented broad removal action objectives that would prevent leachate generated from soil contaminated in excess of the preliminary remediation goal (PRGs) from migrating to groundwater at concentrations greater than ARARs. Specific performance objectives presented in the EE/CA are as follows:

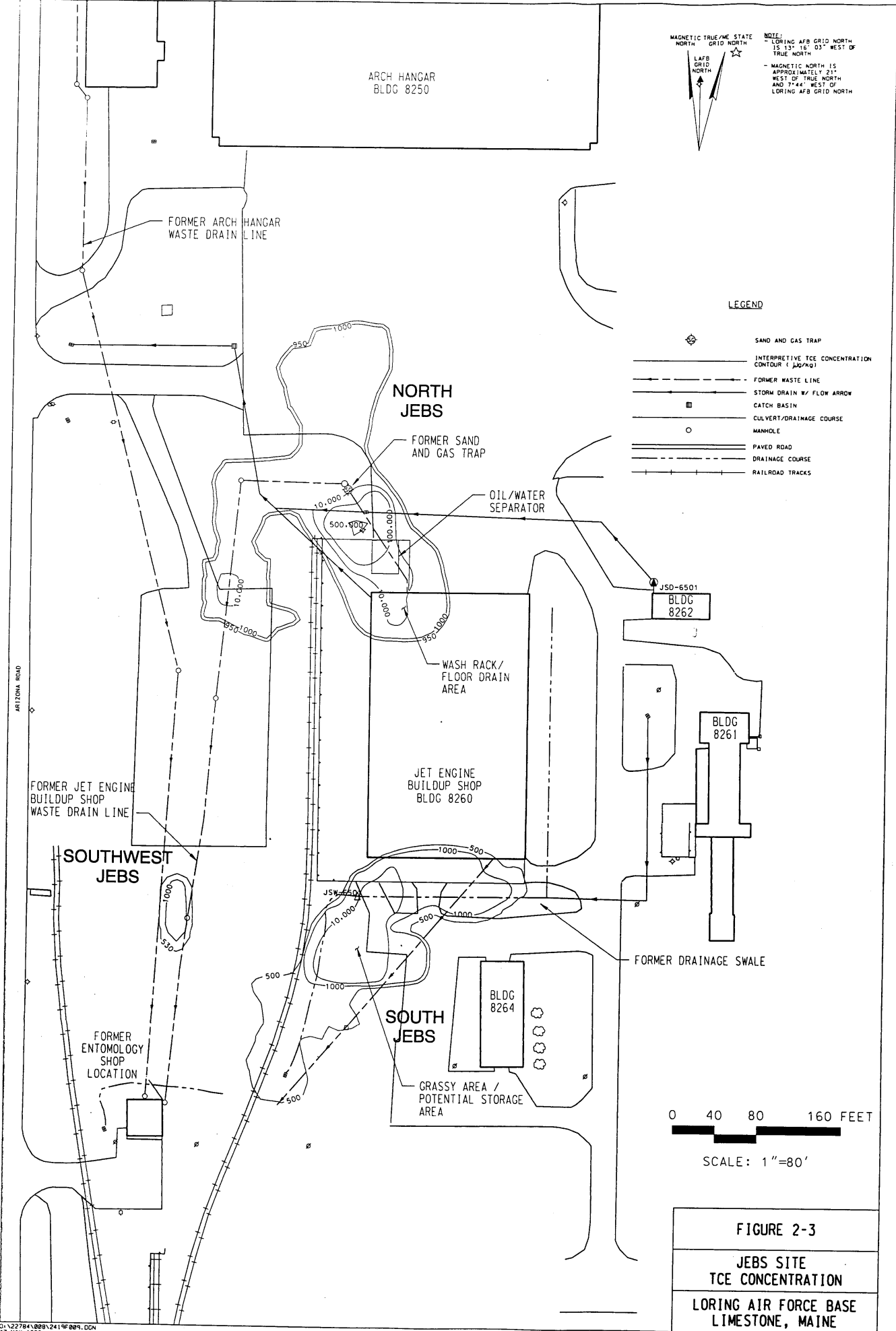
Treat contaminated soil for TCE using an in situ SVE process to an action level of :

- 950 µg/kg at the North JEBS area
- 500 µg/kg at the South JEBS area
- 530 µg/kg at the Southwest JEBS area

3.0 CHRONOLOGY OF EVENTS

The following presents the chronology of events involved in the construction and startup of the JEBS SVE system:

DATE	EVENT
8/27/98	Geoprobe sampling to delineate extent of contamination
8/31-9/14/98	Construct air extraction and passive wells and MPs



MAGNETIC TRUE/ME STATE GRID NORTH
 NORTH GRID NORTH
 LAFB GRID NORTH
 NOTE: LORING AFB GRID NORTH IS 13° 16' 03" WEST OF TRUE NORTH
 - MAGNETIC NORTH IS APPROXIMATELY 21° WEST OF TRUE NORTH AND 7.44° WEST OF LORING AFB GRID NORTH

LEGEND

- SAND AND GAS TRAP
- INTERPRETIVE TCE CONCENTRATION CONTOUR (µg/kg)
- FORMER WASTE LINE
- STORM DRAIN w/ FLOW ARROW
- CATCH BASIN
- CULVERT/DRAINAGE COURSE
- MANHOLE
- PAVED ROAD
- DRAINAGE COURSE
- RAILROAD TRACKS

0 40 80 160 FEET
 SCALE: 1"=80'

FIGURE 2-3
JES SITE
TCE CONCENTRATION
LORING AIR FORCE BASE
LIMESTONE, MAINE

DATE	EVENT
9/4/98	Geoprobe sampling to delineate extent of contamination inside south end of JEBS building
9/26-27/98	Construct well head and service loop manifolds
9/27-10/22/98	Construct piping to connect SVE wells
10/19/98	SVE equipment inspection at subcontractors plant (Appendix C)
10/22/98	Move biovent equipment from Entomology Shop (ES) biovent building to Nose Dock 28 for storage and convert building to JEBS SVE system service building
10/26/98	Process equipment delivered and installed in service building
10/27/98	Hook well head piping to system blower
10/27/98	Electrical hookup of system
10/30/98	Obtain background data total volatile organic compounds (TVOC) from air extraction wells (AEWs)
11/2/98	System startup begins (30 day startup period)
12/2/98	Begin normal operation and maintenance period

4.0 SOIL SAMPLING

Prior to construction, BEI was requested by the Air Force to confirm that the aerial extent of contamination had been determined and that contamination did not extend beneath the south end for the JEBS building. Geoprobe sampling was performed at 10 locations (Figure 4-1) in accordance with *Soil Vapor Extraction at the Jet Engine Buildup Shop, Removal Action Work Plan, Final* (Bechtel 1998b). Borehole logs and headspace results are included in Appendix A. Laboratory analysis results are presented in Table 4-1. No system design changes were indicated by the sampling results from perimeter borings PB-1 to PB-8 since no cleanup levels were exceeded. The detection limits for samples collected from perimeter borings PB-9 and PB-10 are higher than the action level in that area. Those sample locations are within the area of influence of system. No additional action is recommended at this time.

MAGNETIC TRUE/E STATE
 NORTH GRID NORTH
 LAFB
 GRID
 NORTH

NOTE:
 - LORING AFB GRID NORTH
 IS 13° 16' 03" WEST OF
 TRUE NORTH
 - MAGNETIC NORTH IS
 APPROXIMATELY 21°
 WEST OF TRUE NORTH
 AND 7.44" WEST OF
 LORING AFB GRID NORTH

LEGEND

- PRE-STARTUP PERIMETER SOIL BORING
- MONITORING POINT
- FORMER SAND AND GAS TRAP
- AIR EXTRACTION WELL AND IDENTIFICATION NUMBER
- INTERPRETIVE ICE CONCENTRATION CONTOUR (AQ/100)
- FORMER WASTE LINE
- STORM DRAIN W/ FLOW ARROW
- CATCH BASIN
- PASSIVE AIR VENT
- MANHOLE
- PAVED ROAD
- DRAINAGE COURSE
- RAILROAD TRACKS

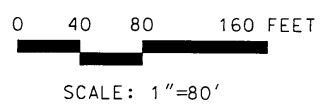
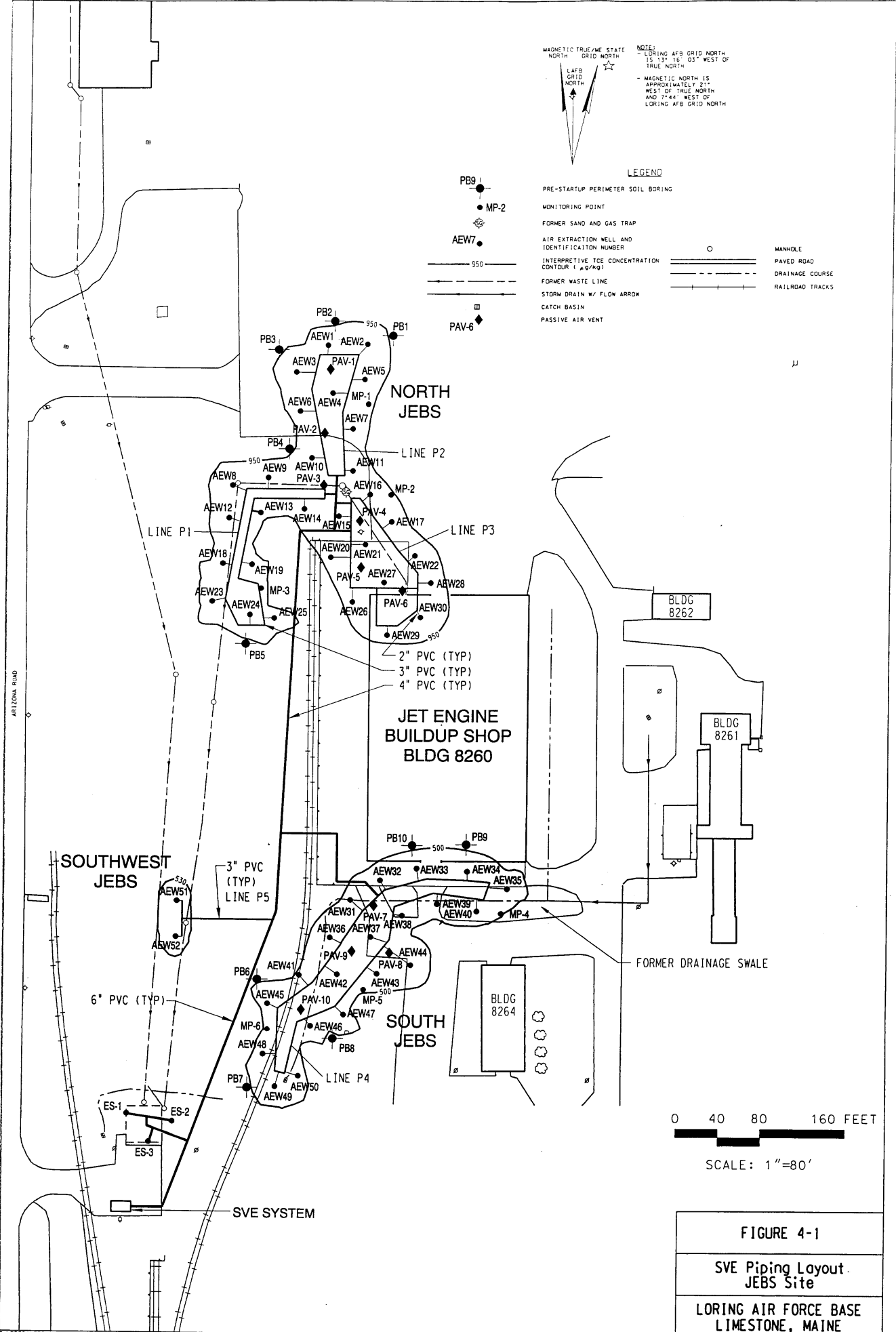


FIGURE 4-1
 SVE Piping Layout
 JEBs Site
 LORING AIR FORCE BASE
 LIMESTONE, MAINE

Table 4-1
JEBS Soil Sampling Analytical Results

BORING	SAMPLE DEPTH (ft)	DETECTION LIMIT ug/kg	TCE CONCENTRATION ug/kg	ACTION LEVEL ug/kg
PB-1	16-17	220	280	950
PB-2	18-20	190	300	950
PB-3	16-18	190	250	950
PB-4	16-17	220	860	950
PB-5	14-16	220	non detect	950
PB-6	14.5-16	200	non detect	500
PB-7	11-12	190	non detect	500
PB-8	12-14	160	non detect	500
PB-9	16-16.5	920	non detect	500
PB-10	11-12.5	950	non detect	500

5.0 SYSTEM INSTALLATION

The SVE system consists of 55 AEWs, 10 passive air vents (PAVs), 12 MPs, piping, and blower/vacuum system. Three of the AEWs are converted biovent air injection wells (AIW) previously installed at the former ES biovent system. These were added to the SVE system to complete cleanup of TCE contamination at this site.

5.1 AIR EXTRACTION WELL AND MONITORING POINT INSTALLATION

The AEWs, PAVs, and MPs were installed by a drilling subcontractor as the initial step in construction of the SVE system. Wellhead units were assembled and installed by the BEI field staff. All activities were supervised by a BEI onsite geologist who recorded the drilling activities and subsurface information in a logbook. Boring logs and well completion reports of each AEW, PAV, and MP installed are provided in Appendix B. Well and MP locations are shown on Figure 4-1.

The AEWs were installed as specified in the *Soil Vapor Extraction at the JEBS Removal Action Work Plan* (Bechtel 1998b). Each well was completed, packed with sand around the screened intervals, sealed with a bentonite plug, and grouted with EZmud/Benseal. Above-grade well completions were installed as specified in the Removal Action Work Plan (RAWP) (Bechtel 1998b).

There were a total of 52 AEWs and 10 PAVs installed over an area of approximately 67,000 ft² to depths of 11.2 to 27.0 ft bgs. Two wells were installed inside the JEBS building. Well completions were all above grade mountings, with a 2-in. polyvinyl chloride (PVC) riser and a PVC screened interval at the bottom of each well.

A total of 12 MPs were installed in 6 locations to depths of 7 to 18 ft bgs (see Table 6-3 for installed depths). All MPs were in clusters of two points at one location. The MPs were constructed of 1/4 in. PVC tubing with a 6-in. wire-wrapped stainless steel, slotted screen. Completions are all below-grade mountings.

Three ES biovent AIWs were converted to SVE wells by manifolding them into the JEBS system. These wells will be used to complete remediation of the ES site. Confirmation sampling at this site showed that a small area of TCE contamination remained (Bechtel 1998c). Because biovent AIWs were designed using a radius of influence of 32 ft and SVE wells used a radius of influence of 25 ft, the coverage of the contaminated area by the three converted wells was checked using a radius of influence of 25 ft. This preliminary evaluation indicates that there may be enough overlapping coverage to complete remediation without adding wells, however, additional flow and pressure data from this area under better operating conditions will be required to make a final judgment (high water table limited flow capacity during the start-up period). Action level at the ES is 540 µg/kg for TCE.

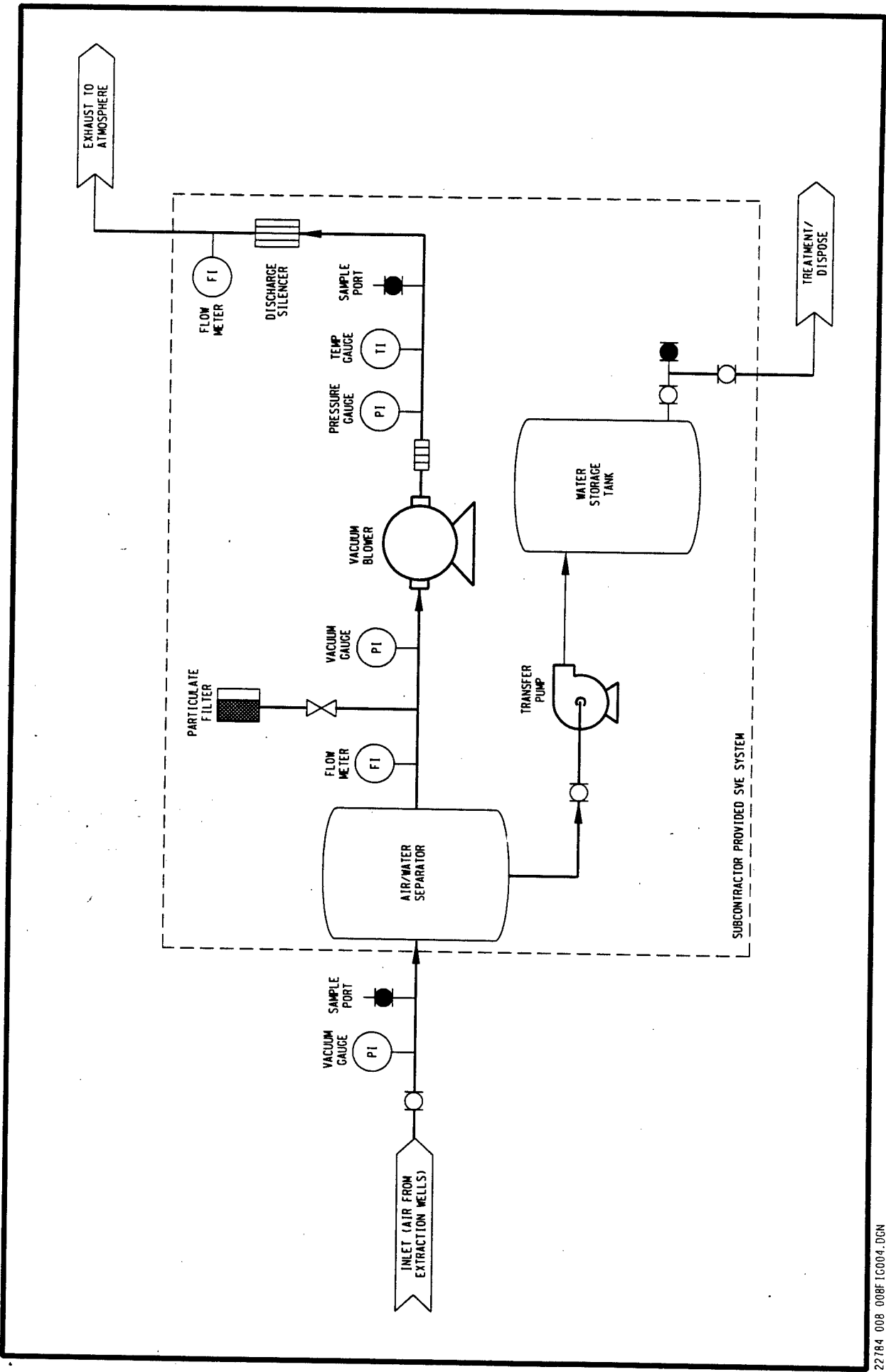


Figure 5-1
 Vapor Extraction Diagram
 Loring Air Force Base

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6.0 STARTUP

6.1 PRE-STARTUP CHECKOUT

Before startup, a complete system check was performed to verify that the blower system was properly connected to the piping system, proper electrical connections had been made, and blowers and motors were properly lubricated.

6.2 PRE-STARTUP TESTING

Before actual operation, the blower system was started to check for air leaks and to ensure that gauges and meters worked properly, and the system delivered the proper flow and vacuum. The system and piping was checked for air leaks with the wells shut off to create maximum vacuum inside the piping.

6.3 BASELINE SAMPLING

Baseline sampling of soil gas was performed before the system was started. Soil gas was sampled at each AEW and analyzed for TVOC using field instrumentation. Each well was purged of one well volume of air before sampling. These data are presented in Table 6-1. Baseline sampling was done to provide data on prestartup soil gas contamination levels. These data will be used for comparison to future data obtained under similar static conditions (equilibrium) of the system being shut down. This will provide an indication of how cleanup is progressing.

6.4 STARTUP

Startup took place between November 2, 1998 and December 2, 1998. Startup activities were performed to assess and maximize the performance of the SVE system and to determine if emissions controls need to be implemented. The following activities were performed during the system startup period:

- Measure AEW flow rates and vacuums and adjust to meet design where possible
- Measure vacuum in the MPs
- Record blower system performance data including flow and vacuum
- Monitor and quantify vapor emissions
- Management of groundwater drawn into the system during normal operation.

6.4.1 Air Extraction Well Data

TVOC data from the AEWs was collected once during the startup period. This data is shown on Table 6-2. These data will be compared to data obtained in a similar manner while the system is running to adjust individual well flows and balance the system. Air extraction well flow and

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Table 6-2
AEW Sampling
Total Volatile Organic Compounds

WELL NUMBER	WELL DEPTH (ft from top of valve)	DEPTH TO TOP OF SCREEN (ft from top of valve)	TVOC (ppm)
			11/9/98
AEW-1	18.85	7.85	off
AEW-2	21.90	7.90	16.8
AEW-3	20.75	7.75	off
AEW-4	22.40	7.90	32.2
AEW-5	18.90	7.90	3.1
AEW-6	20.50	5.00	4.6
AEW-7	23.45	8.45	5.2
AEW-8	20.35	8.35	8.9
AEW-9	22.15	8.15	37.4
AEW-10	23.15	8.15	40.1
AEW-11	23.60	8.60	26.1
AEW-12	22.15	8.15	15.4
AEW-13	20.70	7.70	42.6
AEW-14	23.05	8.05	169
AEW-15	18.00	8.00	1.7
AEW-16	14.00	8.00	2
AEW-17	20.25	7.75	19.1
AEW-18	17.25	8.25	16.9
AEW-19	20.00	8.00	33.6
AEW-20	22.85	7.85	114
AEW-21	18.90	7.90	1.2
AEW-22	17.65	7.65	2.7
AEW-23	18.10	7.60	36.1
AEW-24	11.15	8.15	73.5
AEW-25	15.30	8.30	off
AEW-26	18.00	8.00	5.6
AEW-27	18.70	7.70	9
AEW-28	18.15	7.65	1.2
AEW-29	18.25	8.25	2.4
AEW-30	20.60	8.60	10.4
AEW-31	21.15	7.65	off
AEW-32	20.85	7.85	3.1
AEW-33	20.35	7.85	41.2
AEW-34	18.80	7.80	25.2
AEW-35	20.35	7.85	61.2
AEW-36	18.60	7.60	32.5
AEW-37	23.45	8.45	92.4
AEW-38	22.85	8.85	35
AEW-39	27.00	12.00	45.1
AEW-40	20.70	7.70	36.1
AEW-41	19.65	7.65	49.1
AEW-42	14.85	7.69	21.2
AEW-43	24.20	9.20	61.6
AEW-44	23.00	8.50	3
AEW-45	18.85	7.85	off
AEW-46	19.15	8.15	17
AEW-47	23.15	8.15	3.1
AEW-48	19.06	8.05	off
AEW-49	19.10	7.60	off
AEW-50	18.35	7.85	off
AEW-51	23.75	8.75	10.2
AEW-52	23.40	8.40	off
ES-1(AIW-2)	17.45	12.45	off
ES-2(AIW-3)	14.90	9.90	28.3
ES-3(AIW-7)	17.45	12.45	36.7

Table 6-3
SVE Well Flow and Vacuum Data

WELL NUMBER	WELL DEPTH (ft from tov ¹)	DEPTH TO TOP OF SCREEN (ft from tov ¹)	11/6/98		11/9/98		11/13/98		11/17/98		11/19/98		11/23/98		11/30/98	
			VACUUM (in H ₂ O)	FLOW (scfm)	VACUUM (in H ₂ O)	FLOW (scfm)	VACUUM (in H ₂ O)	FLOW (scfm)	VACUUM (in H ₂ O)	FLOW (scfm)	VACUUM (in H ₂ O)	FLOW (scfm)	VACUUM (in H ₂ O)	FLOW (scfm)	VACUUM (in H ₂ O)	FLOW (scfm)
AEW-1	18.85	7.85	Note ²	0		2.9	0	off-water	0	off-water	0	off-water	0	off-water	0	off-water
AEW-2	21.90	7.90		10.7		9.6	0	off-water	0	off-water	0	off-water	0	off-water	0	off-water
AEW-3	20.75	7.75		0		0	0	off-water	0	off-water	0	off-water	0	off-water	0	off-water
AEW-4	22.40	7.90		12.7		10	0	0.9	0	frozen	0	frozen	0	frozen	0	frozen
AEW-5	18.90	7.90		11.7		9.6	0	2.8	0	frozen	0	frozen	0	frozen	0	frozen
AEW-6	20.50	5.00		8.4		9.5	0	5	0	frozen	0	frozen	0	frozen	0	frozen
AEW-7	23.45	8.45		11.5		12.1	12.7	5	12.7	4.7	13.1	2.5	14.2	2.3	3.8	15.4
AEW-8	20.35	8.35		11		11.5	4.3	5	4.3	29.5	5.8	49	15.3	0.7	34	3.1
AEW-9	22.15	8.15		12.4		13.9	0	6	0	26	13.4	27	13.1	0.69	34	0
AEW-10	23.15	8.15		11.9		10.4	0	5	0	29	13.2	32	15.2	2.2	33	12.6
AEW-11	23.60	8.60		12		8.8	9.4	5	9.4	frozen	10.3	5	15.6	2.3	4.3	13.7
AEW-12	22.15	8.15		10.9		8.9	0	1.1	0	1.3	0	frozen	0	frozen	0	frozen
AEW-13	20.70	7.70		10.3		12.3	0	off-water	0	off-water	0	off-water	0	off-water	0	off-water
AEW-14	23.05	8.05		3.7		5	0	6	0	frozen	3.1	50	7.7	0.19	34	0
AEW-15	18.00	8.00		10.2		11.2	4.9	5	0	off-water	0	off-water	0	off-water	0	off-water
AEW-16	14.00	8.00		3		13	3.3	5.5	11.5	30	44	44	9.8	0	33	11.1
AEW-17	20.25	7.75		10.1		10.6	13.6	4.6	12.6	5	1.6	1.6	10.1	0.94	frozen	0
AEW-18	17.25	8.25		0		0	0	6	0	30	0	off-water	0	frozen	frozen	0
AEW-19	20.00	8.00		9.3		12.7	10.5	2.5	10.4	3.8	10.4	2	10.5	0.7	frozen	0
AEW-20	22.85	7.85		9.2		11.4	11.6	2.6	12.3	5	1.7	1.7	10.8	1	27	16.3
AEW-21	18.90	7.90		10.7		8.9	0	0.02	0	frozen	0	broken	0	broken	broken	0
AEW-22	17.65	7.65		5		11.7	10.2	5.5	8.8	2.7	8.8	0.65	4.2	0.98	frozen	0
AEW-23	18.10	7.60		0		9.5	0	off-water	0	off-water	0	off-water	0	off-water	off-water	0
AEW-24	11.15	8.15		0		3.5	10.9	6	25.3	frozen	43	43	6	0.7	frozen	0
AEW-25	15.30	8.30		0		0	0	off-water	0	off-water	0	off-water	0	off-water	off-water	0
AEW-26	18.00	8.00		0		2.5	7.2	4.5	0	26	3.4	1.7	3.4	1	27	3.6
AEW-27	18.70	7.70		11.3		9.9	8.6	4.5	0	frozen	0	frozen	0	frozen	broken	0
AEW-28	18.15	7.65		11		12.4	0	2.8	0	frozen	0	frozen	0	frozen	frozen	0

**Table 6-4
Monitoring Point Data**

Monitoring Point Number	Depth to Bottom of Screen (ft)	Vacuum (in. of H ₂ O)	
		<u>11-13-98</u>	<u>12-1-98</u>
MP-1-7	7	.08	0
MP-1-17	17	.82	.66
MP-2-7	7	.91	0
MP-2-10	10	.90	.90
MP-3-7	7	.90	.90
MP-3-16	16	.61	.58
MP-4-7	7	0	0
MP-4-16	16	.90	.84
MP-5-7	7	.09	0
MP-5-18	18	1.00	.82
MP-6-7	7	0	0
MP-6-13	13	4.60	4.30

**Table 6-5
System Flow**

Date	Total Influent Flow (scfm) ¹	Total Effluent Flow (scfm) ²
11-6-98	362	860
11-7-98	360	860
11-9-98	360	860
11-18-98	282	860
11-25-98	101	860
11-30-98	215	860
12-2-98	215	860

¹ Total flow calculated from individual well measurements.

² Flow = velocity × cross-section area. Velocity measured with a hot wire anemometer.

**Table 6-6
Emissions Data**

1	2	3	4	5	6	7	8	
Date Sampled	Number of Air Extraction Well In Operation	Effluent Level PID - ppmv	Effluent TCE Concentration - ppmv	System Effluent Flow, acfm	Effluent Temperature, C	Effluent Pressure, atm	Non-ideal volume @ temp. and pressure /m3 per ppmv	mg_TCE TCE Emission, lbs/day
11/9/1998	39	15	33	860	60	1.01	27	5.61
11/13/1998	25	40	96	860	60	1.01	27	5.61
11/25/1998	14	6.5	37	860	60	1.01	27	5.61
12/2/1998	17	5.3	15	860	60	1.01	27	5.61

Notes

Column 1: vapor volatile organic concentration measured at SVE blower discharge by photoionization detector (PID) in parts per million on a volume basis (ppmv)

Column 2: vapor volatile organic concentration measured at SVE blower discharge by analytical laboratory in parts per million on a volume basis (ppmv)

Column 3: SVE effluent flow - measured by hot wire anemometer

Column 4: SVE effluent flow temperature in degrees C

Column 5: SVE effluent pressure in psi

Column 6: molar volume of gas, calculated as follows:

$$\text{Molecular weight of TCE} = 151.5 \times 10^3$$

$$v = \frac{nRT}{P}$$

where:

v = liters of gas per mole @ temperature and pressure

n = number of moles

T = temperature, degrees K

p = pressure, atm

R = 0.0821 L-atm/mol-K

Column 7: Conversion factor for ppmv to mg/m3 as follows:

$$\frac{1 \text{ ppmv}}{\text{TCE}} = \frac{1 \text{ mole TCE}}{10^6 \text{ mole air @ } 333\text{K}; 1.01 \text{ atm}} = \frac{151.5 \times 10^3 \text{ TCE}}{10^6 (\text{Column}_6 \times 10^{-3})}$$

Column 8: pounds per day TCE emitted calculated as follows:

$$\frac{\text{lbs}}{\text{day}} = \text{Column}_3 \left(\frac{\text{ft}^3}{\text{min}} \right) \times \text{Column}_2 (\text{ppmv}) \times \frac{\text{m}^3}{35.31 \text{ ft}^3} \times \text{Column}_7 \left(\frac{\text{mg}}{\text{m}^3} \text{ per ppmv} \right) \times \left(\frac{\text{kg}}{10^6 \text{ mg}} \right) \times 2.2 \frac{\text{lbs}}{\text{kg}} \times 1440 \frac{\text{min}}{\text{day}}$$

Example Calculation (for 11/9/98 data):

1. Molar volume:

$$v = \frac{1 \text{ mol} (0.0821) (333\text{K})}{1.01 \text{ atm}}$$

$$v = 27 \text{ L}$$

2. Convert ppmv to mg/m3:

$$\frac{1 \text{ ppmv}}{\text{TCE}} = \frac{151.5 \times 10^3}{10^6 (27 \times 10^{-3} \text{ m}^3)}$$

$$1 \text{ ppmv} = 5.61 \text{ mg-TCE/m}^3$$

3. Calculate TCE emissions, lbs/day:

$$\frac{\text{lbs}}{\text{day}} = 860 \left(\frac{\text{ft}^3}{\text{min}} \right) \times 33 (\text{ppmv}) \times \frac{\text{m}^3}{35.31 \text{ ft}^3} \times 5.61 \left(\frac{\text{mg}}{\text{m}^3} \text{ per ppmv} \right) \times \left(\frac{\text{kg}}{10^6 \text{ mg}} \right) \times 2.2 \frac{\text{lbs}}{\text{kg}} \times 1440 \frac{\text{min}}{\text{day}}$$

$$\text{lbs/day} = 14.28$$

8.0 RECOMMENDATIONS

1. If the number of wells allowing flow remains at a low level, shut the system down for the rest of the winter months and restart in the spring.
2. When more wells become operational (in the spring), monitor groundwater levels on a more frequent basis to determine if the perched zones can be dried out and maintained relatively dry by the SVE system.
3. Continuing evaluation of the system operation during normal operations.
4. Evaluate the need for a full or partial surface seal during the summer of 1999.
5. Evaluate effluent sampling methods to assure accurate determination of effluent rates and prediction of cleanup times

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- Buscheck, T.E. and T.R. Peargin, 1991. *Summary of a Nation-Wide Extraction System Performance Study. In Proceedings of the 1991 Petroleum Hydrocarbons and Organic Chemicals in Ground Water Prevention, Detection, and Restoration*.
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APPENDIX A

**PRESTARTUP PERIMETER SOIL BORINGS
BOREHOLE LOGS AND HEADSPACE SCREENING**

BOREHOLE LOG

Project Name: Loring AFB		Borehole No.: PBH-1			
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 8/27/98	Date Completed: 8/27/98		
Driller: Patrick St. Peter and Sons		Total Depth (ft): 17			
Equipment: Geoprobe		Depth to Bedrock (ft): 17			
Drilling Method: Drive/Hammer		Hole Diameter (in): 3			
Drilling Fluid: None		Depth to Water (ft): 7			
Completion: Completed as Perimeter Borehole		Logged By: P. Linley	Geo-probe Macro-sampler is 4ft in length		
Depth (ft)	Description	Sample Number	Sample Type	Hnu Reading	Comments
0-0.33ft:	Asphalt	1	Macro-sampler	0	0-2ft: Refusal with geo-probe sampler, relocate approx. 2ft west.
0.33-4ft:	Fill - Sandy Gravel: (GM), White (N9) to dk gry (N3), fine to v coarse, unconsld, poorly sorted, subang to subrd.				
5 4-7ft:	Fill - Sandy Gravel: (GM), As above.	2	Macro-sampler	0	0-2ft: Refusal with geo-probe sampler, relocate approx. 2ft east of original location.
7-8ft:	Gravelly Silty Clay: (CL), Mod yel brn (10YR5/4) to mod brn (5YR3/4), V fine to fine, unconsld, poorly sorted, subang to subrd, wet.				
10 8-10.5ft:	Gravelly Silty Clay: (CL), As above.	3	Macro-sampler	0	Refusal at 10.5ft - no bdrk, relocate approx. 1ft north of borehole location.
10.5-12ft:	Gravelly Silty Clay: (CL), As above.	4	Macro-sampler	0	
12-13ft:	Gravelly Silty Clay: (CL), As above.	5	Macro-sampler	0	
13-13.5ft:	Gravell lens.				
15 13.5-14ft:	Gravelly Clayey Silt: (ML), Mod yel brn (10YR5/4) to Pale yel brn (10YR6/2), V fine to fine, semi-consld, poorly sorted, subang to subrd, moist.				
14-16ft:	Gravelly Silty Clay: (CL), Mod yel brn (10YR5/4), V fine to fine, unconsld, poorly sorted, subang to subrd.	6	Macro-sampler	0	
20 16-17ft:	Gravelly Silty Clay: (CL), As above, gravel fraction increase to 30%.	7	Macro-sampler	0	Sample collected for off-site Laboratory analysis. sample number: LO19123
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BOREHOLE LOG

Project Name: Loring AFB		Borehole No.: AEW-12		
Project Number: 22784		Elevation: TBD		
Location: JEBS		Date Started: 8/31/98	Date Completed: 8/31/98	
Driller: Great Works Drilling		Total Depth (ft):	19	
Equipment: Mobile B59		Depth to Bedrock (ft):	19	
Drilling Method: Hollow Stem Auger		Hole Diameter (in):	8	
Drilling Fluid: None		Depth to Water (ft):	TBD	
Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details		Logged By: P. Linley		

Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
0 5 10 15 20 25 30	0-19ft: Gravelly Clayey Silt: (ML) , Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd, gvl 5-6 inches in diameter. 8ft: Moist. 15-16ft: Cobble zone. 19ft: Bedrock: Limestone.				No samples required to be collected during installation

BOREHOLE LOG

Project Name: <i>Loring AFB</i>					Borehole No.: <i>PBH-3</i>
Project Number: <i>22784</i>		Elevation: <i>TBD</i>			
Location: <i>JEBS</i>		Date Started: <i>8/27/98</i>	Date Completed: <i>8/27/98</i>		
Driller: <i>Patrick St. Peter and Sons</i>		Total Depth (ft): <i>20</i>			
Equipment: <i>Geoprobe</i>		Depth to Bedrock (ft): <i>20</i>			
Drilling Method: <i>Drive/Hammer</i>		Hole Diameter (in): <i>2</i>			
Drilling Fluid: <i>None</i>		Depth to Water (ft): <i>7.5</i>			
Completion: <i>Completed as Perimeter Borehole</i>		Logged By: <i>P. Linley</i>			
Depth (ft)	Description	Sample Number	Sample Type	Hnu Reading	Comments
0	0-0.33ft: Asphalt	1	Macro-sampler	0	The Geo-probe Macro-sampler is 4ft in length.
5	0.33-4ft: Fill - Sandy Gravel: (GM) , White (N9) to dk gry (N3), fine to v coarse, unconsld, poorly sorted, subang to subrd. 4-7.5ft: Fill - Sandy Gravel: (GM) , As above.	2	Macro-sampler	0	
10	7.5-8ft: Gravelly Clayey Silt: (ML) , Olive gry (5Y4/1) to mod yel brn (10YR5/4), v fine to fine, unconsld, poorly sorted, subang to subrd, moist. 8-12ft: Gravelly Clayey Silt: (ML) , As above, moist.	3	Macro-sampler	0	
15	12-16ft: Gravelly Clayey Silt: (ML) , As above, at 15ft - gravel lense 8 inches thick, moist.	4	Macro-sampler	0	
20	16-18ft: Gravelly Clayey Silt: (ML) , As above, moist.	5	Macro-sampler	23	
25	18-20ft: Gravelly Clayey Silt: (ML) , As above, moist.	6	Macro-sampler	22	
30					Sample collected for off-site laboratory analysis Sample number: LO19124

BOREHOLE LOG

Project Name: Loring AFB		Borehole No.: PBH-4			
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 8/27/98	Date Completed: 8/27/98		
Driller: Patrick St. Peter and Sons		Total Depth (ft): 17.5			
Equipment: Geoprobe		Depth to Bedrock (ft): 17.5			
Drilling Method: Drive/Hammer		Hole Diameter (in): 2			
Drilling Fluid: None		Depth to Water (ft): 8			
Completion: Completed as Perimeter Borehole		Logged By: P. Linley			
Depth (ft)	Description	Sample Number	Sample Type	Hnu Reading	Comments
0	0-4ft: Gravelly Clayey Silt: (ML) , Dk yel org (10YR6/6) to dk yel brn (10YR4/2), v fine to fine, unconsld, poorly sorted, subang to subrd.	1	Macro-sampler	0	The Geo-probe Macro-sampler is 4ft in length.
5	4-8ft: Gravelly Clayey Silt: (ML) , Mod brn (5YR4/4-3/4) to olive gry (5Y4/1), As above, gvl to 2 inches in dia., gvl frac 15-20%.	2	Macro-sampler	0	
8	8-10ft: Gravelly Clayey Silt: (ML) , Olive gry (5Y4/1) to lt olive gry (5Y6/1), As above, moist.	3	Macro-sampler	0	
10	10-12ft: Gravelly Clayey Silt: (ML) , As above, 10.5-11.5ft - gravel lense., moist.	4	Macro-sampler	0	
12	12-14ft: Gravelly Clayey Silt: (ML) , As above, moist.	5	Macro-sampler	0	
15	14-15.8ft: Gravelly Clayey Silt: (ML) , As above, moist.	6	Macro-sampler	0	
15.8	15.8-16ft: Gravelly Silty Clay: (CL) , Olive gry (5Y4/1) to lt olive gry (5Y6/1), v fine to fine, poorly sorted, unconsld, subang to subrd, moist.	7	Macro-sampler	0	
16	16-17.5ft: Gravelly Clayey Silt: (ML) , Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld, poorly sorted, subang to subrd, moist.				
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BOREHOLE LOG

Project Name: Loring AFB		Borehole No.: PBH-5		
Project Number: 22784		Elevation: TBD		
Location: JEBS		Date Started: 8/27/98	Date Completed: 8/27/98	
Driller: Patrick St. Peter and Sons		Total Depth (ft):	16	
Equipment: Geoprobe		Depth to Bedrock (ft):	16	
Drilling Method: Drive/Hammer		Hole Diameter (in):	2	
Drilling Fluid: None		Depth to Water (ft):	5	
Completion: Completed as Perimeter Borehole		Logged By: P. Linley		

Depth (ft)	Description	Sample Number	Sample Type	Hnu Reading	Comments
0	0-4ft: Gravelly Clayey Sandy Silt: (ML) , Olive gry (5Y4/1) to lt olive gry (5Y6/1), v fine to coarse, unconsld, poorly sorted, subang to subrd, moist, gvl frac 35+% and up to 2 inches in diameter.	1	Macro-sampler	0	The Geo-probe Macro-sampler is 4ft in length.
5	4-8ft: Gravelly Clayey Silt: (ML) , Lt brn (5YR5/6) to olive gry (5Y4/1) to lt olive gry (5Y6/1), v fine to fine, unconsld, poorly sorted, subang to subrd, wet at 5ft.	2	Macro-sampler	0	
10	8-10ft: Gravelly Clayey Silt: (ML) , As above, moist.	3	Macro-sampler	0	
10	10-12ft: Gravelly Clayey Silt: (ML) , As above, moist.	4	Macro-sampler	0	
15	12-14ft: Gravelly Clayey Silt: (ML) , As above, at 13.5-14ft gvl lense, v moist.	5	Macro-sampler	0	
15	14-16ft: Gravelly Clayey Silt: (ML) , As above, moist.	6	Macro-sampler	0	
20					
25					
30					

BOREHOLE LOG

Project Name: Loring AFB					Borehole No.: PBH-6
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 8/27/98		Date Completed: 8/27/98	
Driller: Patrick St. Peter and Sons		Total Depth (ft):		16	
Equipment: Geoprobe		Depth to Bedrock (ft):		16	
Drilling Method: Drive/Hammer		Hole Diameter (in):		2	
Drilling Fluid: None		Depth to Water (ft):		6	
Completion: Completed as Perimeter Borehole		Logged By: P. Linley			
Depth (ft)	Description	Sample Number	Sample Type	Hnu Reading	Comments
0	0-4ft: Gravelly Clayey Silt: (ML) , Dk yel org (10YR6/6) to mod yel brn (10YR5/4) to lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd, moist.	1	Macro-sampler	0	The Geo-probe Macro-sampler is 4ft in length.
5	4-8ft: Gravelly Clayey Silt: (ML) , Lt olive gry (5Y6/1) to olive gry (5Y4/1), as above, moist.	2	Macro-sampler	0	
8	8-10ft: Gravelly Clayey Silt: (ML) , As above, moist.	3	Macro-sampler	0	
10	10-12ft: Gravelly Clayey Silt: (ML) , As above, moist.	4	Macro-sampler	0	
12	12-14.5ft: Gravelly Clayey Silt: (ML) , As above, moist.	5	Macro-sampler	0	
15	14.5-16ft: Gravelly Silty Clay: (CL) , Olive gry (5Y4/1) to med gry (N5), v fine to fine, unconsld, poorly sorted, subang to subrd, moist.				Sample collected for off-site laboratory analysis. Sample number: LO19115
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BOREHOLE LOG

Project Name: Loring AFB					Borehole No.: PBH-7
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 8/27/98		Date Completed: 8/27/98	
Driller: Patrick St. Peter and Sons		Total Depth (ft): 12			
Equipment: Geoprobe		Depth to Bedrock (ft): TBD			
Drilling Method: Drive/Hammer		Hole Diameter (in): 2			
Drilling Fluid: None		Depth to Water (ft): 4			
Completion: Completed as Perimeter Borehole		Logged By: P. Linley		Borehole flooded with muck - unable to reach bedrock.	
Depth (ft)	Description	Sample Number	Sample Type	Hnu Reading	Comments
0-4ft: Gravelly Clayey Sandy Silt: (ML) , Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to med coarse, unconsld, poorly sorted, subang to subrd, moist to wet - lower 4 inches. 5 4-8ft: Gravelly Clayey Silt: (ML) , Olive gry (5Y4/1) to lt olive gry (5Y6/1), v fine to fine, unconsld, poorly sorted, subang to subrd, wet. 8-9.5ft: Gravelly Silty Clay: (CL) , Olive gry (5Y4/1) to lt olive gry (5Y6/1), v fine to fine, unconsld, poorly sorted, subang to subrd, wet to saturated. 10 9.5-12ft: Gravelly Silty Clay: (CL) , As above, wet/saturated. 15 20 25 30		1 2 3 4	Macro-sampler Macro-sampler Macro-sampler Macro-sampler	0 0 0 0	The Geo-probe Macro-sampler is 4ft in length. Sample collected for off-site laboratory analysis. Sample number: LO19114

BOREHOLE LOG

Project Name: Loring AFB					Borehole No.: PBH-8
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 8/27/98	Date Completed: 8/27/98		
Driller: Patrick St. Peter and Sons		Total Depth (ft):	16.1		
Equipment: Geoprobe		Depth to Bedrock (ft):	16.1		
Drilling Method: Drive/Hammer		Hole Diameter (in):	2		
Drilling Fluid: None		Depth to Water (ft):	7		
Completion: Completed as Perimeter Borehole		Logged By: P. Linley			
Depth (ft)	Description	Sample Number	Sample Type	Hnu Reading	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>	<p>0-4ft: Gravelly Clayey Sandy Silt: (ML), Med yel brn (10YR5/4) to lt olive gry (5Y6/1) to olive gry (5Y4/1), fine to v fine, unconsld, poorly sorted, subang to subrd, moist.</p> <p>4-8ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld subang to subrd, moist.</p> <p>8-12ft: Gravelly Clayey Silt: (ML), As above, moist.</p> <p>12-14ft: Gravelly Clayey Silt: (ML), As above, moist.</p> <p>14-16.1ft: Gravelly Clayey Silt: (ML), As above.</p>	<p>1</p> <p>2</p> <p>3</p> <p>4</p> <p>5</p>	<p>Macro-sampler</p> <p>Macro-sampler</p> <p>Macro-sampler</p> <p>Macro-sampler</p> <p>Macro-sampler</p>	<p>0</p> <p>0</p> <p>0</p> <p>0</p> <p>0</p>	<p>The Geo-probe Macro-sampler is 4ft in length.</p> <p>Sample collected for off-site laboratory analysis.</p> <p>Sample number: LO19114</p>

BOREHOLE LOG

Project Name: Loring AFB		Borehole No.: PBH-9			
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 9/4/98	Date Completed: 9/4/98		
Driller: Patrick St. Peter and Sons		Total Depth (ft):		16.5	
Equipment: Geoprobe		Depth to Bedrock (ft):		16.5	
Drilling Method: Drive/Hammer		Hole Diameter (in):		2	
Drilling Fluid: None		Depth to Water (ft):		TBD	
Completion: Completed as Perimeter Borehole		Logged By: P. Bond			
Depth (ft)	Description	Sample Number	Sample Type	Hnu Reading	Comments
	0-0.5ft: Concrete				The Geo-probe Macro-sampler is 4ft in length.
5	0.5-4ft: Gravelly Sandy Clay: (CL) , Mod olive brn (5Y4/4), gravels to 5cm angular edges, moderate cementation, clay content increases with depth, moist.	1	Macro-sampler	0	
	4-8ft: Gravelly Sandy Clay: (CL) , Olive gry (5Y4/1), moist, low plasticity, v slow dilatence, gravels to 2cm, gravels rounded, no oder.	2	Macro-sample	0	
10	8-12ft: Gravelly Sandy Clay: (CL) , Mod olive brn (5Y4/4), as above.	3	Macro-sample	0	
	12-14ft: Gravelly Sandy Clay: (CL) , As above.	4	Macro-sampler	0	
15	14-16ft: Gravelly Sandy Clay: (CL) , Mod olive brn (5Y4/4), as above.	5	Macro-sampler	0	
20	16-16.5ft: Gravelly Sandy Clay: (CL) , As above.	6	Macro-sampler	22	Sample collected for off-site laboratory analysis: Sample number: LO19091
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BOREHOLE LOG

Project Name: <i>Loring AFB</i>					Borehole No.: <i>PBH-10</i>
Project Number: <i>22784</i>		Elevation: <i>TBD</i>			
Location: <i>JEBS</i>		Date Started: <i>9/4/98</i>		Date Completed: <i>9/4/98</i>	
Driller: <i>Patrick St. Peter and Sons</i>		Total Depth (ft):		<i>12.5</i>	
Equipment: <i>Geoprobe</i>		Depth to Bedrock (ft):		<i>12.5</i>	
Drilling Method: <i>Drive/Hammer</i>		Hole Diameter (in):		<i>2</i>	
Drilling Fluid: <i>None</i>		Depth to Water (ft):		<i>TBD</i>	
Completion: <i>Completed as Perimeter Borehole</i>		Logged By: <i>P. Bond</i>			
Depth (ft)	Description	Sample Number	Sample Type	Hnu Reading	Comments
0-0.5ft:	Concrete				The Geo-probe Macro-sampler is 4ft in length.
0.5-4ft:	Gravelly Sandy Clay: (CL) , Mod olive brn (5Y4/4), gravels to 4cm mostly angular edges, moist, clay content increases with depth, low plasticity, v slow dilatence.	1	Macro-sampler	0	
4-8ft:	Gravelly Sandy Clay: (CL) , Mod olive brn (5Y4/4) intermingled with lt olive gry (5Y5/2), moist, gravels 11cm rounded.	2	Macro-sampler	0	
8-12.5ft:	Gravelly Sandy Clay: (CL) , As above, moist.	3	Macro-sampler	0	Sample collected for off-site laboratory analysis. Sample number: LO19053 and FD/LO19039

H-Nu Survey

Borehole: JEBSD11617 (PB-1) Storage Temp ~ °F

Date: 8.27.98

Depth (ft)	PID Scan Reading (ppm)	PID Headspace Reading (ppm)
<u>0-2</u>	<u>0</u>	
<u>2-4</u>	<u>0</u>	
<u>4-6</u>	<u>0</u>	
<u>6-8</u>	<u>0</u>	
<u>8-10</u>	<u>0</u>	
<u>10-12</u>	<u>0</u>	
<u>12-14</u>	<u>0</u>	
<u>14-16</u>	<u>0</u>	
<u>16-17</u>	<u>0</u>	<u>17</u> <u>LC19123</u>

SAMPLE →

Technician: PROSSIGNOL / G. BERUBE

H-Nu Survey

Borehole: JEBS021820 (PB-2) Storage Temp ~ °F

Date: 8.27.98

Depth (ft)	PID Scan Reading (ppm)	PID Headspace Reading (ppm)
<u>0-2</u>	<u>0</u>	
<u>2-4</u>	<u>0</u>	
<u>4-6</u>	<u>0</u>	
<u>6-8</u>	<u>0</u>	
<u>8-10</u>	<u>0</u>	
<u>10-12</u>	<u>0</u>	
<u>12-14</u>	<u>0</u>	
<u>14-16</u>	<u>0</u>	
<u>16-18</u>	<u>0</u>	
<u>18-20</u>	<u>0</u>	<u>28</u> <u>LO19119</u>
<u> </u>	<u> </u>	
<u> </u>	<u> </u>	
<u> </u>	<u> </u>	
<u> </u>	<u> </u>	

SAMPLE →

Technician: PROSSIGNO - IG. BERUBE

H-Nu Survey

Borehole: JEBS031618 (PB-3) Storage Temp ~ °F.

Date: 827.98

Depth (ft)	PID Scan Reading (ppm)	PID Headspace Reading (ppm)
<u>0-2</u>	<u>0</u>	
<u>2-4</u>	<u>0</u>	
<u>4-6</u>	<u>0</u>	
<u>6-8</u>	<u>0</u>	
<u>8-10</u>	<u>0</u>	
<u>10-12</u>	<u>0</u>	
<u>12-14</u>	<u>0</u>	
<u>14-16</u>	<u>0</u>	
<u>16-18</u>	<u>13</u>	<u>23</u> <u>LO19124</u>
<u>18-20</u>	<u>6</u>	<u>22</u>
<u> </u>	<u> </u>	
<u> </u>	<u> </u>	
<u> </u>	<u> </u>	
<u> </u>	<u> </u>	

Technician: PROSSIGNOL / G. REBUBE

H-Nu Survey

Borehole: JEB5041617 (PB-4) Storage Temp ~ °F

Date: 8.27.98

Depth (ft)	PID Scan Reading (ppm)	PID Headspace Reading (ppm)
<u>0-2</u>	<u>0</u>	
<u>2-4</u>	<u>0</u>	
<u>4-6</u>	<u>0</u>	
<u>6-8</u>	<u>0</u>	
<u>8-10</u>	<u>0</u>	
<u>10-12</u>	<u>0</u>	
<u>12-14</u>	<u>0</u>	
<u>14-16</u>	<u>0</u>	
AMPLE → <u>16-17.5</u>	<u>0</u>	<u>27</u> <u>L019117</u>
<u> </u>	<u> </u>	
<u> </u>	<u> </u>	
<u> </u>	<u> </u>	
<u> </u>	<u> </u>	
<u> </u>	<u> </u>	

Technician: P. ROSSIGNOL / G. BÉRUBÉ

H-Nu Survey

Borehole: JEBS051416 (PB-5) Storage Temp ~ °F

Date: 8.27.98

Depth (ft)	PID Scan Reading (ppm)	PID Headspace Reading (ppm)
<u>0-2</u>	<u>0</u>	
<u>2-4</u>	<u>0</u>	
<u>4-6</u>	<u>0</u>	
<u>6-8</u>	<u>0</u>	
<u>8-10</u>	<u>0</u>	
<u>10-12</u>	<u>0</u>	
<u>12-14</u>	<u>0</u>	
<u>14-16</u>	<u>0</u>	<u>15 L019116</u>

Technician: P. ROSSIGNOL / G. BÉRUBE

H-Nu Survey

Borehole: JEBS061416 (PB-6)

Storage Temp ~ °F

Date: 8.27.98

Depth (ft)	PID Scan Reading (ppm)	PID Headspace Reading (ppm)
<u>0-2</u>	<u>0</u>	
<u>2-4</u>	<u>0</u>	
<u>4-6</u>	<u>0</u>	
<u>6-8</u>	<u>0</u>	
<u>8-10</u>	<u>0</u>	
<u>10-12</u>	<u>0</u>	
<u>12-14</u>	<u>0</u>	
<u>SAMPLE → 14-16</u>	<u>0</u>	<u>6 L019115</u>
<u> </u>	<u> </u>	
<u> </u>	<u> </u>	
<u> </u>	<u> </u>	
<u> </u>	<u> </u>	
<u> </u>	<u> </u>	
<u> </u>	<u> </u>	

Technician: P. ROSSIGNOL / G. BERUBE

H-Nu Survey

Borehole: JEBSO71012 (PB-7) Storage Temp ~ °F

Date: 8 27 95

Depth (ft)	PID Scan Reading (ppm)	PID Headspace Reading (ppm)
<u>0-2</u>	<u>0</u>	
<u>2-4</u>	<u>0</u>	
<u>4-6</u>	<u>0</u>	
<u>6-8</u>	<u>0</u>	
<u>8-10</u>	<u>0</u>	
<u>10-12</u>	<u>0</u>	<u>29 L019114</u>
<u> </u>	<u> </u>	
<u> </u>	<u> </u>	
<u> </u>	<u> </u>	
<u> </u>	<u> </u>	
<u> </u>	<u> </u>	
<u> </u>	<u> </u>	
<u> </u>	<u> </u>	
<u> </u>	<u> </u>	
<u> </u>	<u> </u>	
<u> </u>	<u> </u>	

Technician: P. ROSSIGNOL / G. BÉRUZE

H-Nu Survey

Borehole: JEBS081214 (PB-8) Storage Temp ~ °F

Date: 8.27.98

Depth (ft)	PID Scan Reading (ppm)	PID Headspace Reading (ppm)
<u>0-2</u>	<u>0</u>	
<u>2-4</u>	<u>0</u>	
<u>4-6</u>	<u>0</u>	
<u>6-8</u>	<u>0</u>	
<u>8-10</u>	<u>0</u>	
<u>10-12</u>	<u>0</u>	
<u>12-14</u>	<u>0</u>	<u>25 LO19112</u>
<u> </u>	<u> </u>	
<u> </u>	<u> </u>	
<u> </u>	<u> </u>	
<u> </u>	<u> </u>	
<u> </u>	<u> </u>	
<u> </u>	<u> </u>	
<u> </u>	<u> </u>	
<u> </u>	<u> </u>	

Technician: P. ROSSIGNOL / G. BERUBE

H-Nu Survey

Borehole: FBH-09/JEBS09 (PB-9) Storage Temp ~ °F

Date: 9-4-98

Depth (ft)	PID Scan Reading (ppm)	PID Headspace Reading (ppm)
<u>0-2</u>	<u>0</u>	
<u>2-4</u>	<u>0</u>	
<u>4-6</u>	<u>0</u>	
<u>6-8</u>	<u>0</u>	
<u>8-10</u>	<u>0</u>	
<u>10-12</u>	<u>0</u>	
<u>12-14</u>	<u>0</u>	
<u>14-16</u>	<u>20</u>	<u>22</u> 2019091

Technician: _____

H-Nu Survey

Borehole: JEB510 (PB-10)

Storage Temp ~ °F

Date: 9-4-98

Depth (ft)	PID Scan Reading (ppm)	PID Headspace Reading (ppm)
<u>0-2</u>	<u>0</u>	
<u>2-4</u>	<u>0</u>	
<u>4-6</u>	<u>0</u>	
<u>6-8</u>	<u>0</u>	
<u>8-10</u>	<u>0</u>	
<u>10-12</u>	<u>0</u>	
<u>12-14² PB² 12.5</u>	<u>0</u>	<u>18</u> L019053 L019039

3rd attempt

Technician: _____

APPENDIX B

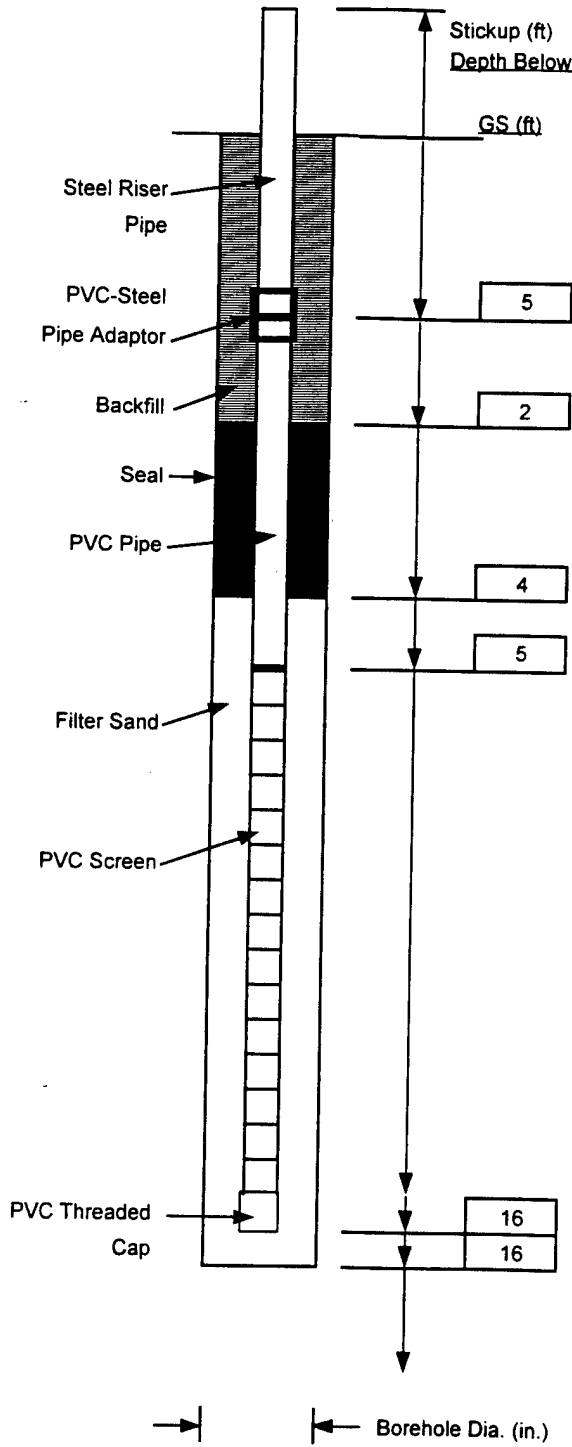
**AIR EXTRACTION WELL, PASSIVE AIR VENT,
MONITORING POINT BORING LOGS
AND
WELL CONSTRUCTION LOGS**

BOREHOLE LOG

Project Name: <i>Loring AFB</i>		Borehole No.: <i>AEW-1</i>			
Project Number: <i>22784</i>		Elevation: <i>TBD</i>			
Location: <i>JEBS</i>		Date Started: <i>9/11/98</i>	Date Completed: <i>9/11/98</i>		
Driller: <i>Great Works Drilling</i>		Total Depth (ft): <i>16</i>			
Equipment: <i>Mobile B59</i>		Depth to Bedrock (ft): <i>16</i>			
Drilling Method: <i>Hollow Stem Auger</i>		Hole Diameter (in): <i>8</i>			
Drilling Fluid: <i>None</i>		Depth to Water (ft): <i>12</i>			
Completion: <i>Completed as a Soil Vapor Extraction Well See Construction Log for details</i>		Logged By: <i>P. Linley</i>			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-0.25ft: Asphalt</div> <div style="margin-bottom: 10px;">0.25-0.75ft: Fill - Gravel</div> <div style="margin-bottom: 10px;">5 0.75-16ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, poorly sorted, unconsld, subang to subrd.</div> <div style="margin-bottom: 10px;">8ft: Moist.</div> <div style="margin-bottom: 10px;">10 12ft: Wet to soupy.</div> <div style="margin-bottom: 10px;">15 16ft: Bedrock: Limestone.</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>					No samples required to be collected during installation

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: AEW-1
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 9/11/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 9/11/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: 12	
Drilling Fluid: None	Elevation: TBD	



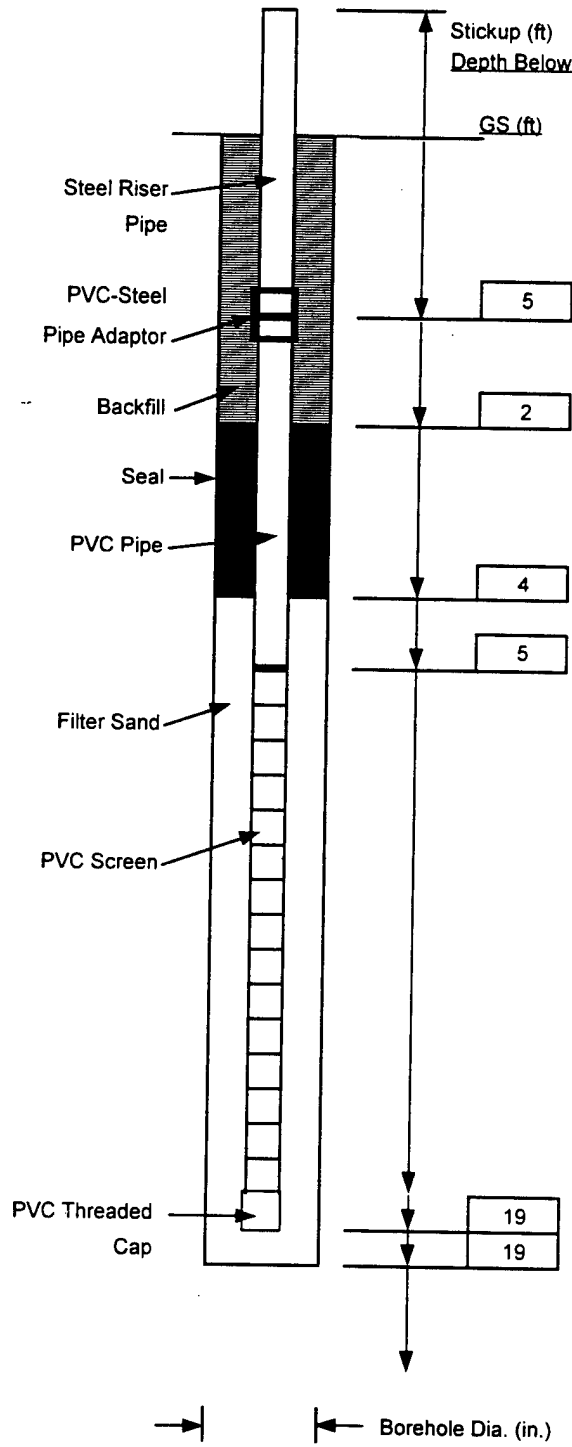
MATERIALS	
Riser Pipe 1	
Type	Schedule 40 Steel
Diameter (in.)	2
Length (ft)	6
Riser Pipe 2	
Type	Schedule 40 PVC
Diameter (in.)	2
Length (ft)	N/A
Backfill	
Type	EZ mud/Benseal
Length (ft)	2
Placement	Pour
Seal	
Type	Bentonite Pellets
Length (ft)	2
Placement	Pour
Filter Pack	
Type	10-20 Silica Sand
Length (ft)	12
Placement	Pour
Amount Placed	200lbs
Screen	
Type	Schedule 40 PVC
Length (ft)	11
Diameter (in.)	2
Slot Size (in.)	0.010
Slot Type	Machine Slotted

BOREHOLE LOG

Project Name: Loring AFB		Borehole No.: AEW-2			
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 9/11/98	Date Completed: 9/11/98		
Driller: Great Works Drilling		Total Depth (ft):	19		
Equipment: Mobile B59		Depth to Bedrock (ft):	19		
Drilling Method: Hollow Stem Auger		Hole Diameter (in):	8		
Drilling Fluid: None		Depth to Water (ft):	TBD		
Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details		Logged By: P. Linley			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-0.25ft: Asphalt</div> <div style="margin-bottom: 10px;">0.25-0.75ft: Fill - Gravel</div> <div style="margin-bottom: 10px;">0.75-19ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, poorly sorted, unconsld, subang to subrd.</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>	<div style="margin-bottom: 10px;">19ft: Bedrock: Limestone.</div>				No samples required to be collected during installation Refusal at 5ft BGL, relocated approx. 6ft south of original location to continue advancement.

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: AEW-2
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 9/11/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 9/11/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	



MATERIALS	
Riser Pipe 1	
Type	Schedule 40 Steel
Diameter (in.)	2
Length (ft)	6
Riser Pipe 2	
Type	Schedule 40 PVC
Diameter (in.)	2
Length (ft)	N/A
Backfill	
Type	EZ mud/Benseal
Length (ft)	2
Placement	Pour
Seal	
Type	Bentonite Pellets
Length (ft)	2
Placement	Pour
Filter Pack	
Type	10-20 Silica Sand
Length (ft)	15
Placement	Pour
Amount Placed	250lbs
Screen	
Type	Schedule 40 PVC
Length (ft)	14
Diameter (in.)	2
Slot Size (in.)	0.010
Slot Type	Machine Slotted

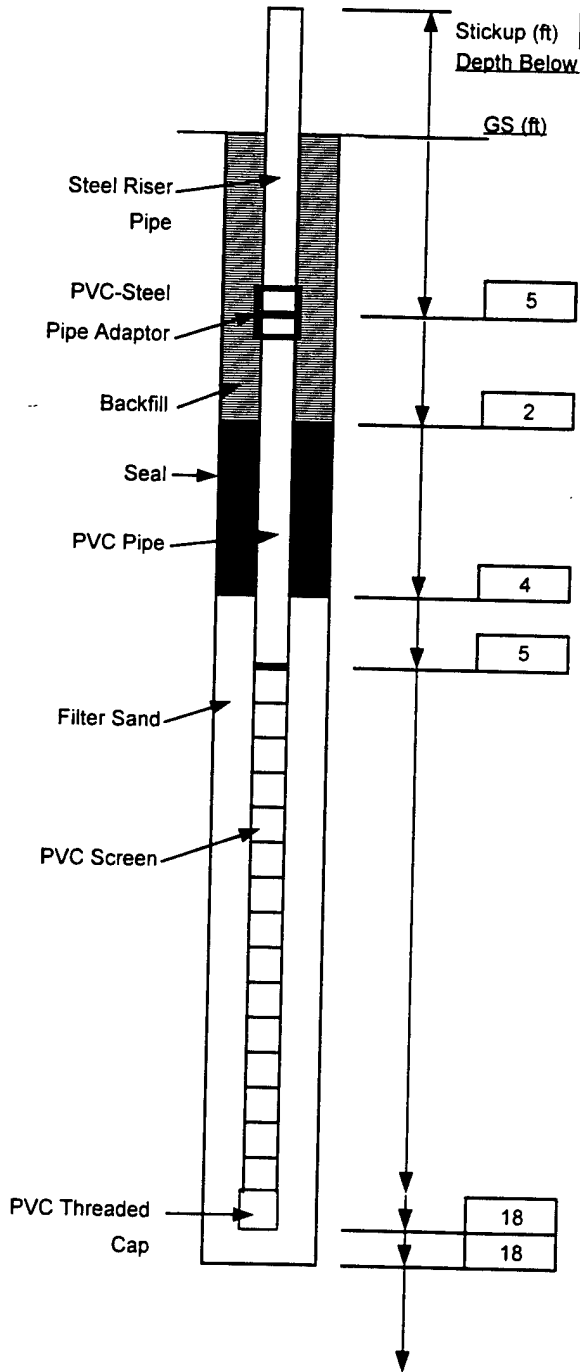
BOREHOLE LOG

Project Name: <i>Loring AFB</i>	Borehole No.: <i>AEW-3</i>
Project Number: <i>22784</i>	Elevation: <i>TBD</i>
Location: <i>JEBS</i>	Date Started: <i>9/11/98</i> Date Completed: <i>9/11/98</i>
Driller: <i>Great Works Drilling</i>	Total Depth (ft): <i>18</i>
Equipment: <i>Mobile B59</i>	Depth to Bedrock (ft): <i>18</i>
Drilling Method: <i>Hollow Stem Auger</i>	Hole Diameter (in): <i>8</i>
Drilling Fluid: <i>None</i>	Depth to Water (ft): <i>TBD</i>
Completion: <i>Completed as a Soil Vapor Extraction Well See Construction Log for details</i>	Logged By: <i>P. Linley</i>

Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-0.25ft: Asphalt</div> <div style="margin-bottom: 10px;">0.25-0.75ft: Fill - Gravel</div> <div style="margin-bottom: 10px;">0.75-18ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, poorly sorted, unconsld, subang to subrd.</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">18ft: Bedrock: Limestone.</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>					<p>No samples required to be collected during installation</p> <p>Refusal at 3ft BGL, (3x), 1st refusal relocated 3ft north of original location, 2nd refusal relocated 6ft east of original location, 3rd refusal relocated 6ft north of original location.</p>

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB		Site: JEBS	Well No.: AEW-3
Drilling Company: Great Works Drilling		Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 9/11/1998	Coordinates: TBD	
Drilling Equipment: Mobile B59	Date Completed: 9/11/1998		
Drilling Method: Hollow Stem Auger	Depth to Water: TBD		
Drilling Fluid: None	Elevation: TBD		



MATERIALS

Riser Pipe 1

Type	Schedule 40 Steel
Diameter (in.)	2
Length (ft)	6

Riser Pipe 2

Type	Schedule 40 PVC
Diameter (in.)	2
Length (ft)	N/A

Backfill

Type	EZ mud/Benseal
Length (ft)	2
Placement	Pour

Seal

Type	Bentonite Pellets
Length (ft)	2
Placement	Pour

Filter Pack

Type	10-20 Silica Sand
Length (ft)	14
Placement	Pour
Amount Placed	275lbs

Screen

Type	Schedule 40 PVC
Length (ft)	13
Diameter (in.)	2
Slot Size (in.)	0.010
Slot Type	Machine Slotted

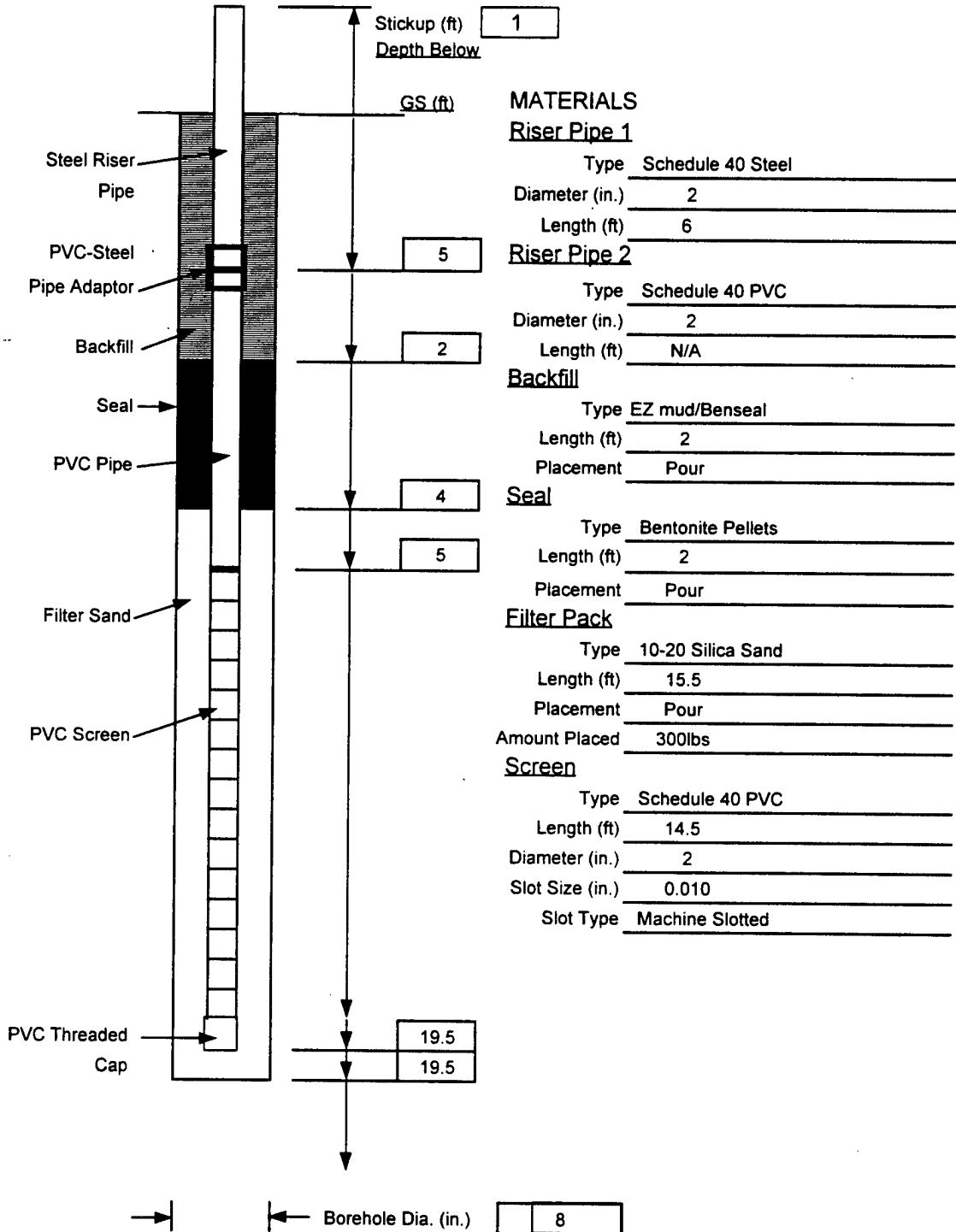
BOREHOLE LOG

Project Name: <i>Loring AFB</i>	Borehole No.: <i>AEW-4</i>
Project Number: <i>22784</i>	Elevation: <i>TBD</i>
Location: <i>JEBS</i>	Date Started: <i>9/11/98</i> Date Completed: <i>9/11/98</i>
Driller: <i>Great Works Drilling</i>	Total Depth (ft): <i>19.5</i>
Equipment: <i>Mobile B59</i>	Depth to Bedrock (ft): <i>19.5</i>
Drilling Method: <i>Hollow Stem Auger</i>	Hole Diameter (in): <i>8</i>
Drilling Fluid: <i>None</i>	Depth to Water (ft): <i>TBD</i>
Completion: <i>Completed as a Soil Vapor Extraction Well</i> <i>See Construction Log for details</i>	Logged By: <i>P. Linley</i>

Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-0.25ft: Asphalt</div> <div style="margin-bottom: 10px;">0.25-0.75ft: Fill - Gravel</div> <div style="margin-bottom: 10px;">0.75-19.5ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, poorly sorted, unconsld, subang to subrd.</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">19.5ft: Bedrock: Limestone.</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>					<p>No samples required to be collected during installation</p> <p>Refusal at 5ft BGL, relocated approx. 4ft east of original location.</p>

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: AEW-4
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 9/11/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 9/11/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	



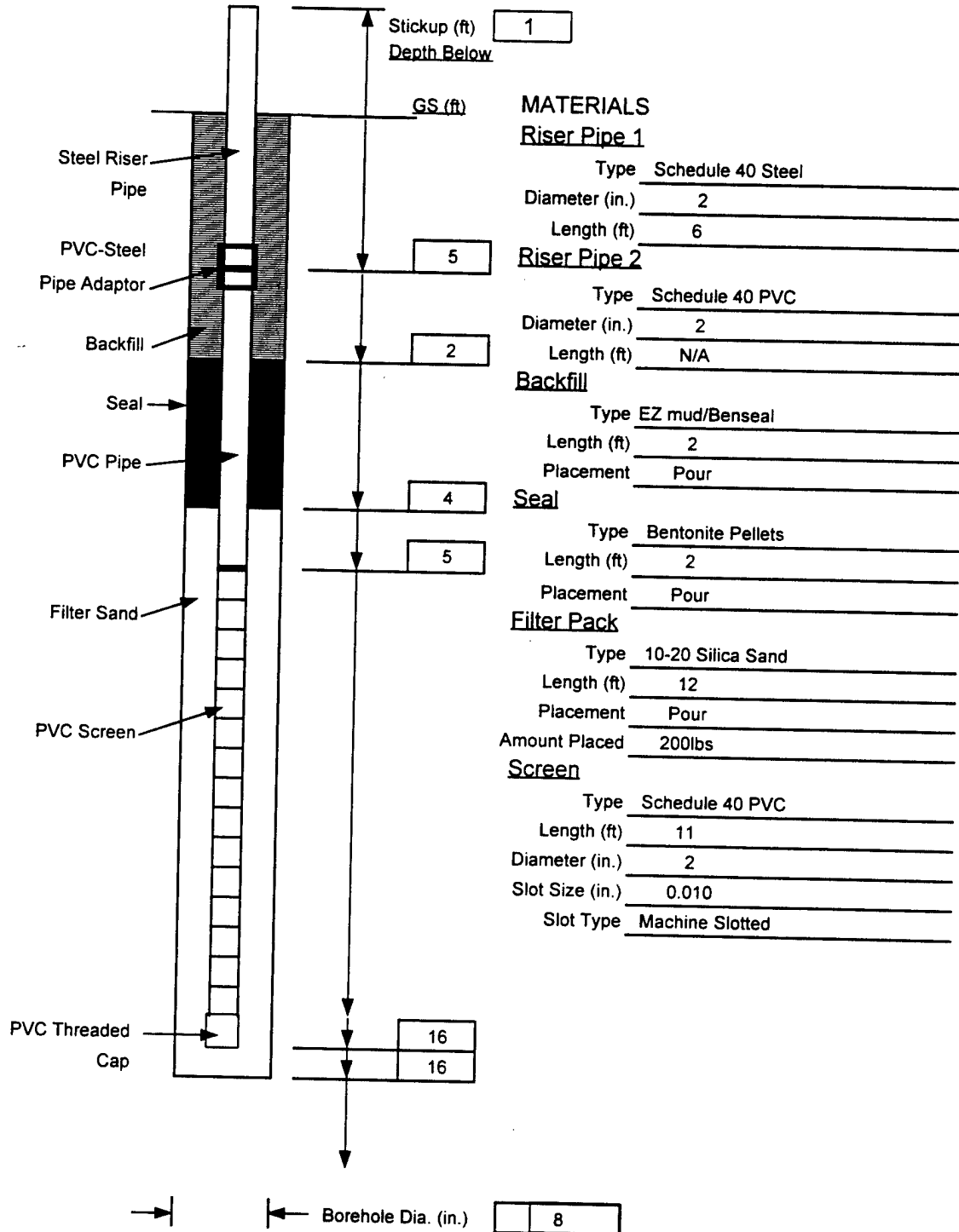
BOREHOLE LOG

Project Name: <i>Loring AFB</i>	Borehole No.: <i>AEW-5</i>
Project Number: <i>22784</i>	Elevation: <i>TBD</i>
Location: <i>JEBS</i>	Date Started: <i>9/11/98</i> Date Completed: <i>9/11/98</i>
Driller: <i>Great Works Drilling</i>	Total Depth (ft): <i>16</i>
Equipment: <i>Mobile B59</i>	Depth to Bedrock (ft): <i>16</i>
Drilling Method: <i>Hollow Stem Auger</i>	Hole Diameter (in): <i>8</i>
Drilling Fluid: <i>None</i>	Depth to Water (ft): <i>TBD</i>
Completion: <i>Completed as a Soil Vapor Extraction Well</i> <i>See Construction Log for details</i>	Logged By: <i>P. Linley</i>

Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-0.25ft: Asphalt</div> <div style="margin-bottom: 10px;">0.25-0.75ft: Fill - Gravel</div> <div style="margin-bottom: 10px;">0.75-16ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, poorly sorted, unconsld, subang to subrd.</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">16ft: Bedrock: Limestone.</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>					<p>No samples required to be collected during installation</p>

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: AEW-5
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 9/11/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 9/11/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	

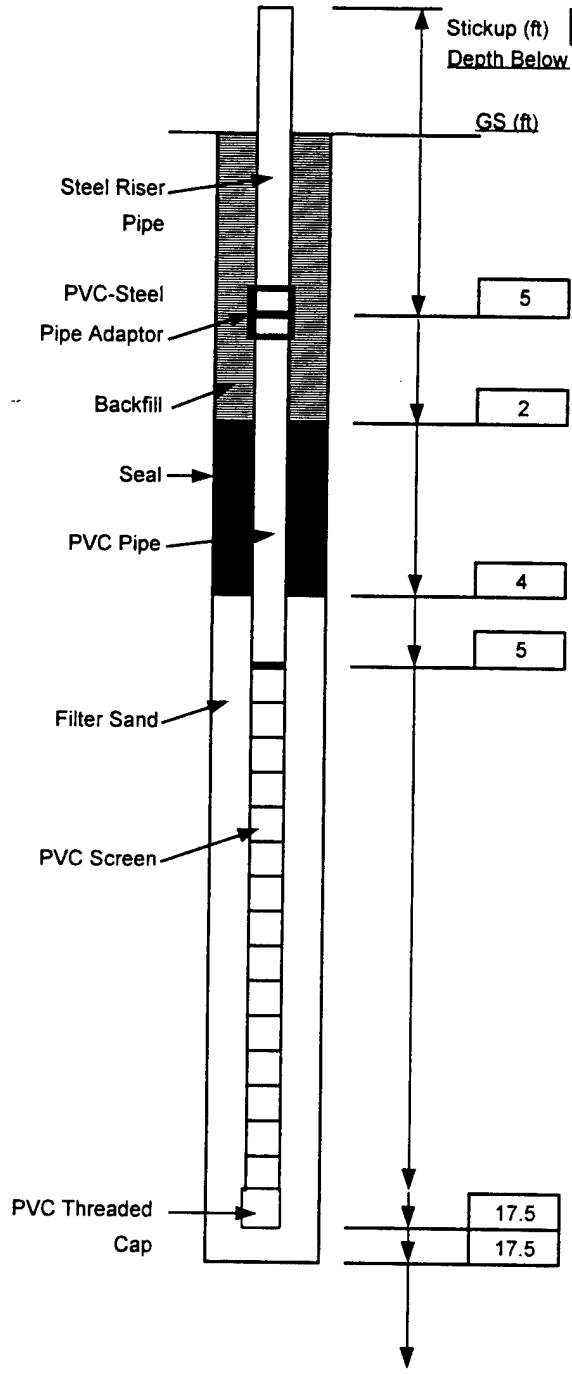


BOREHOLE LOG

Project Name: <i>Loring AFB</i>		Borehole No.: <i>AEW-6</i>			
Project Number: <i>22784</i>		Elevation: <i>TBD</i>			
Location: <i>JEBS</i>		Date Started: <i>9/11/98</i>	Date Completed: <i>9/11/98</i>		
Driller: <i>Great Works Drilling</i>		Total Depth (ft): <i>17.5</i>			
Equipment: <i>Mobile B59</i>		Depth to Bedrock (ft): <i>17.5</i>			
Drilling Method: <i>Hollow Stem Auger</i>		Hole Diameter (in): <i>8</i>			
Drilling Fluid: <i>None</i>		Depth to Water (ft): <i>TBD</i>			
Completion: <i>Completed as a Soil Vapor Extraction Well See Construction Log for details</i>		Logged By: <i>P. Linley</i>			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-0.25ft: Asphalt</div> <div style="margin-bottom: 10px;">0.25-0.75ft: Fill - Gravel</div> <div style="margin-bottom: 10px;">0.75-17.5ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, poorly sorted, unconsld, subang to subrd.</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">17.5ft: Bedrock: Limestone.</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>					No samples required to be collected during installation

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: AEW-6
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 9/11/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 9/11/1998	
Drilling Method: Hollow Stern Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	



MATERIALS	
Riser Pipe 1	
Type	Schedule 40 Steel
Diameter (in.)	2
Length (ft)	6
Riser Pipe 2	
Type	Schedule 40 PVC
Diameter (in.)	2
Length (ft)	N/A
Backfill	
Type	EZ mud/Benseal
Length (ft)	2
Placement	Pour
Seal	
Type	Bentonite Pellets
Length (ft)	2
Placement	Pour
Filter Pack	
Type	10-20 Silica Sand
Length (ft)	13.5
Placement	Pour
Amount Placed	250lbs
Screen	
Type	Schedule 40 PVC
Length (ft)	12.5
Diameter (in.)	2
Slot Size (in.)	0.010
Slot Type	Machine Slotted

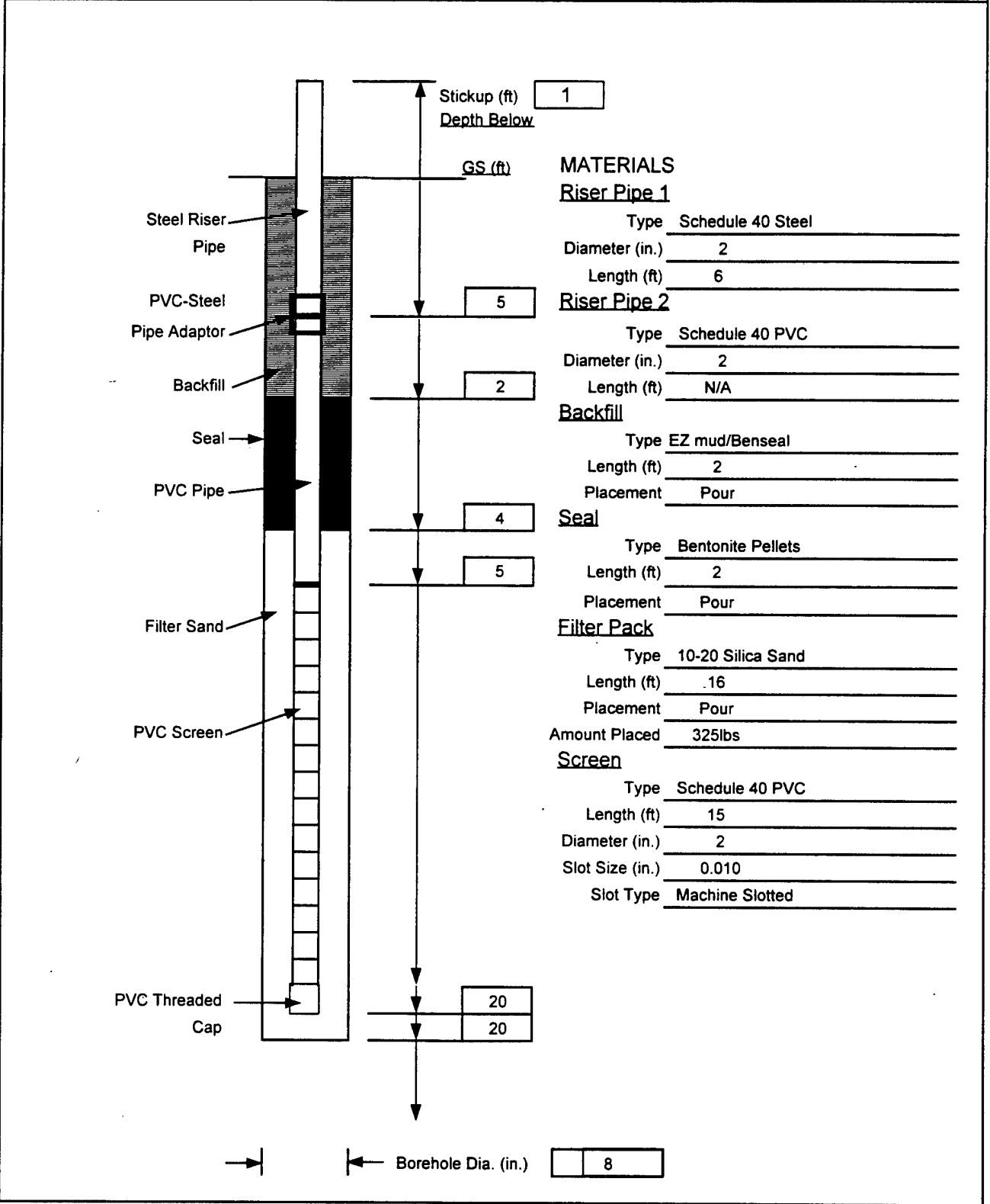
Borehole Dia. (in.) 8

BOREHOLE LOG

Project Name: <i>Loring AFB</i>		Borehole No.: <i>AEW-7</i>			
Project Number: <i>22784</i>		Elevation: <i>TBD</i>			
Location: <i>JEBS</i>		Date Started: <i>9/11/98</i>	Date Completed: <i>9/11/98</i>		
Driller: <i>Great Works Drilling</i>		Total Depth (ft): <i>20</i>			
Equipment: <i>Mobile B59</i>		Depth to Bedrock (ft): <i>20</i>			
Drilling Method: <i>Hollow Stem Auger</i>		Hole Diameter (in): <i>8</i>			
Drilling Fluid: <i>None</i>		Depth to Water (ft): <i>TBD</i>			
Completion: <i>Completed as a Soil Vapor Extraction Well See Construction Log for details</i>		Logged By: <i>P. Linley</i>			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-0.25ft: Asphalt</div> <div style="margin-bottom: 10px;">0.25-0.75ft: Fill - Gravel</div> <div style="margin-bottom: 10px;">0.75-17.5ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, poorly sorted, unconsld, subang to subrd.</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>	<div style="margin-bottom: 10px;">20ft: Bedrock: Limestone.</div>				<div style="margin-bottom: 10px;">No samples required to be collected during installation</div>

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: AEW-7
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 9/11/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 9/11/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	

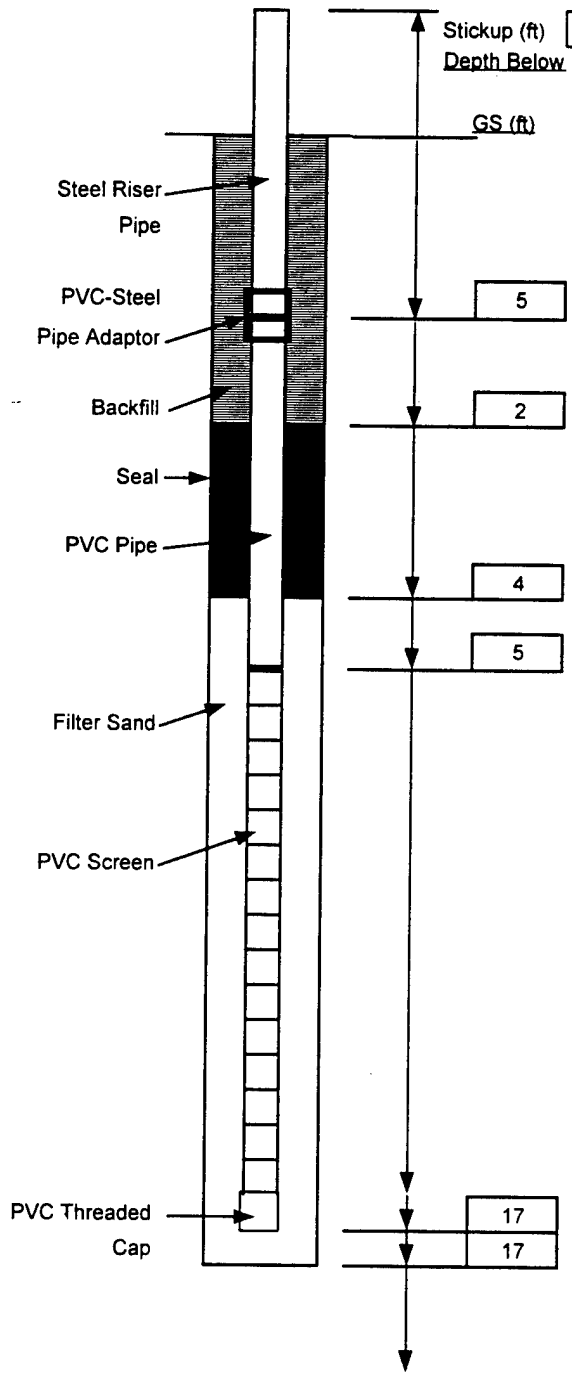


BOREHOLE LOG

Project Name: <i>Loring AFB</i>					Borehole No.: <i>AEW-8</i>
Project Number: <i>22784</i>		Elevation: <i>TBD</i>			
Location: <i>JEBS</i>		Date Started: <i>8/31/98</i>		Date Completed: <i>8/31/98</i>	
Driller: <i>Great Works Drilling</i>		Total Depth (ft):		<i>17</i>	
Equipment: <i>Mobile B59</i>		Depth to Bedrock (ft):		<i>17</i>	
Drilling Method: <i>Hollow Stem Auger</i>		Hole Diameter (in):		<i>8</i>	
Drilling Fluid: <i>None</i>		Depth to Water (ft):		<i>TBD</i>	
Completion: <i>Completed as a Soil Vapor Extraction Well</i> <i>See Construction Log for details</i>		Logged By: <i>P. Linley</i>			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>	<p>0-17ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd, gvl 4-6 inches in diameter.</p> <p>17ft: Bedrock: Limestone.</p>				<p>No samples required to be collected during installation</p>

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: AEW-8
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 8/31/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 8/31/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	



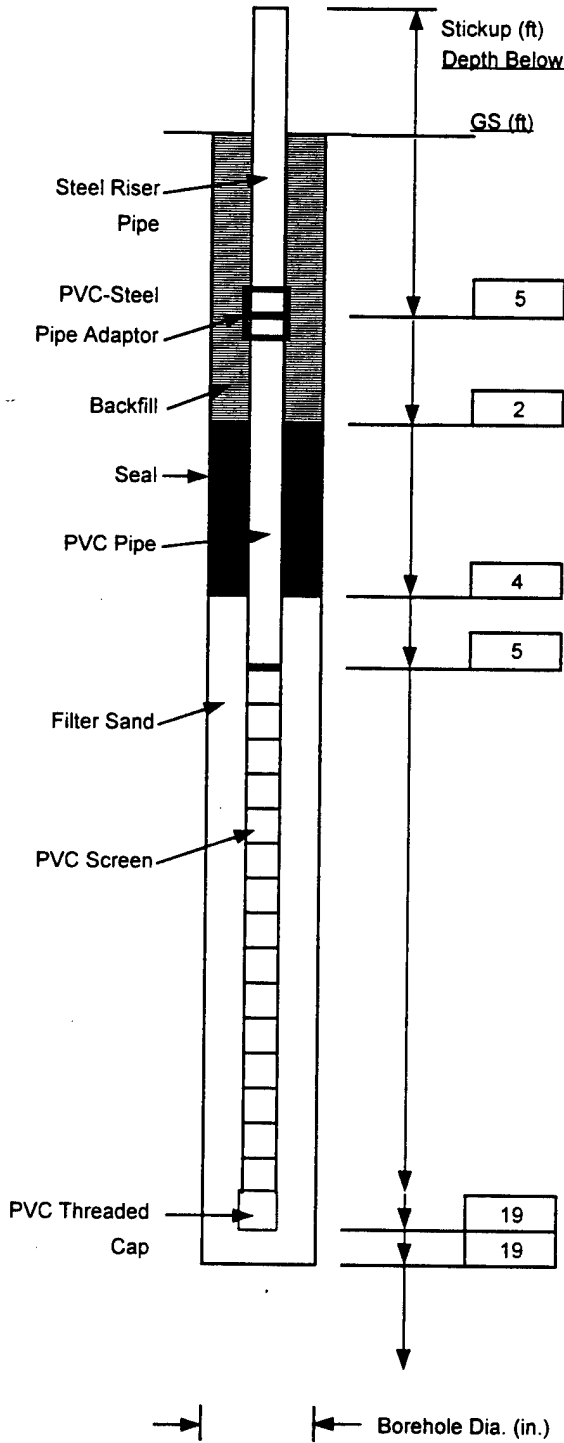
MATERIALS	
Riser Pipe 1	
Type	Schedule 40 Steel
Diameter (in.)	2
Length (ft)	6
Riser Pipe 2	
Type	Schedule 40 PVC
Diameter (in.)	2
Length (ft)	N/A
Backfill	
Type	EZ mud/Benseal
Length (ft)	2
Placement	Pour
Seal	
Type	Bentonite Pellets
Length (ft)	2
Placement	Pour
Filter Pack	
Type	10-20 Silica Sand
Length (ft)	13
Placement	Pour
Amount Placed	300lbs
Screen	
Type	Schedule 40 PVC
Length (ft)	12
Diameter (in.)	2
Slot Size (in.)	0.010
Slot Type	Machine Slotted

BOREHOLE LOG

Project Name: Loring AFB					Borehole No.: AEW-9
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 8/31/98	Date Completed: 8/31/98		
Driller: Great Works Drilling		Total Depth (ft):		19	
Equipment: Mobile B59		Depth to Bedrock (ft):		19	
Drilling Method: Hollow Stem Auger		Hole Diameter (in):		8	
Drilling Fluid: None		Depth to Water (ft):		TBD	
Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details		Logged By: P. Linley			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-19ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd.</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>	<div style="margin-bottom: 10px;">19ft: Bedrock: Limestone.</div>				No samples required to be collected during installation

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: AEW-9
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 8/31/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 8/31/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	



MATERIALS

Riser Pipe 1

Type	Schedule 40 Steel
Diameter (in.)	2
Length (ft)	6

Riser Pipe 2

Type	Schedule 40 PVC
Diameter (in.)	2
Length (ft)	N/A

Backfill

Type	EZ mud/Benseal
Length (ft)	2
Placement	Pour

Seal

Type	Bentonite Pellets
Length (ft)	2
Placement	Pour

Filter Pack

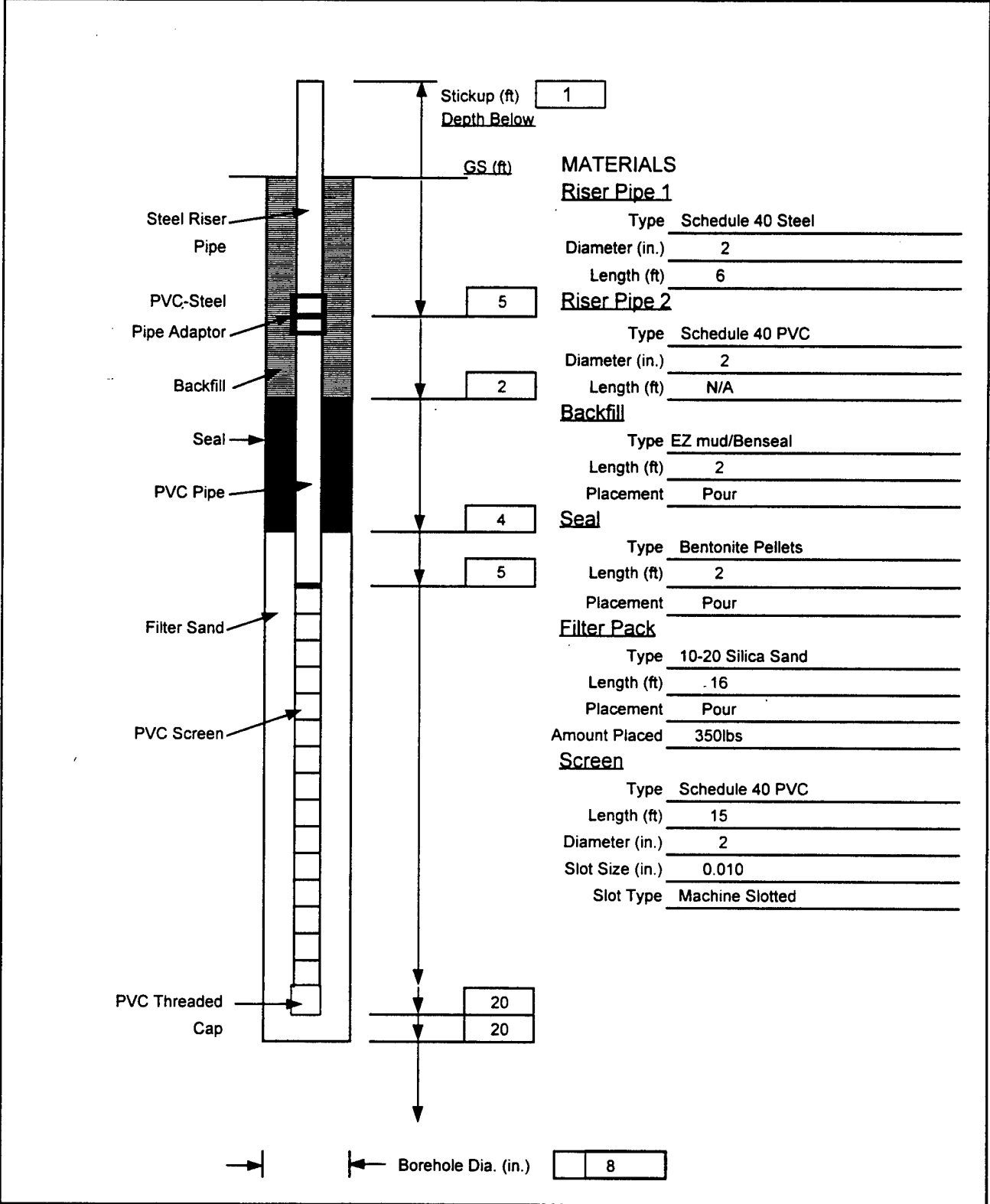
Type	10-20 Silica Sand
Length (ft)	20
Placement	Pour
Amount Placed	325lbs

Screen

Type	Schedule 40 PVC
Length (ft)	14
Diameter (in.)	2
Slot Size (in.)	0.010
Slot Type	Machine Slotted

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: AEW-10
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 8/31/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 8/31/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	

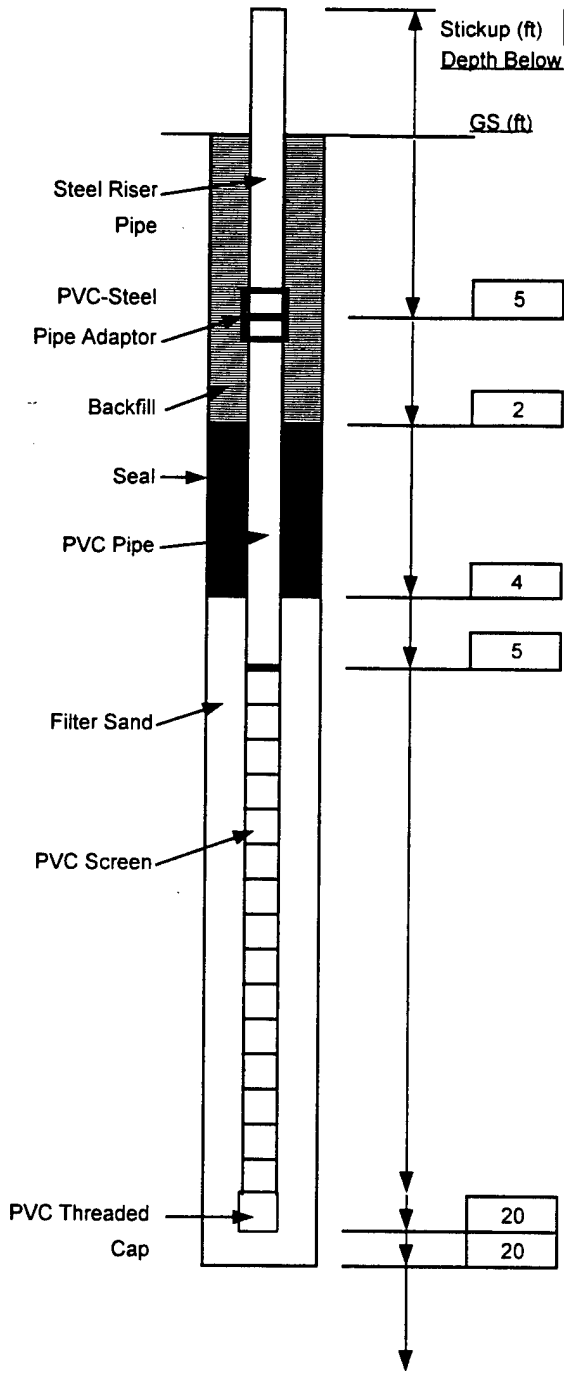


BOREHOLE LOG

Project Name: Loring AFB					Borehole No.: AEW-11
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 8/31/98		Date Completed: 8/31/98	
Driller: Great Works Drilling		Total Depth (ft):		20	
Equipment: Mobile B59		Depth to Bedrock (ft):		20	
Drilling Method: Hollow Stem Auger		Hole Diameter (in):		8	
Drilling Fluid: None		Depth to Water (ft):		TBD	
Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details		Logged By: P. Linley			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0</div> <div style="margin-bottom: 10px;">1</div> <div style="margin-bottom: 10px;">2</div> <div style="margin-bottom: 10px;">3</div> <div style="margin-bottom: 10px;">4</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">6</div> <div style="margin-bottom: 10px;">7</div> <div style="margin-bottom: 10px;">8</div> <div style="margin-bottom: 10px;">9</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">11</div> <div style="margin-bottom: 10px;">12</div> <div style="margin-bottom: 10px;">13</div> <div style="margin-bottom: 10px;">14</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">16</div> <div style="margin-bottom: 10px;">17</div> <div style="margin-bottom: 10px;">18</div> <div style="margin-bottom: 10px;">19</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">21</div> <div style="margin-bottom: 10px;">22</div> <div style="margin-bottom: 10px;">23</div> <div style="margin-bottom: 10px;">24</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">26</div> <div style="margin-bottom: 10px;">27</div> <div style="margin-bottom: 10px;">28</div> <div style="margin-bottom: 10px;">29</div> <div style="margin-bottom: 10px;">30</div> </div>	<p>0-20ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd, gvl to 3 inches in diameter, moist.</p> <p>20ft: Bedrock: Limestone.</p>				<p>No samples required to be collected during installation</p>

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: AEW-11
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 8/31/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 8/31/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	



MATERIALS	
Riser Pipe 1	
Type	Schedule 40 Steel
Diameter (in.)	2
Length (ft)	6
Riser Pipe 2	
Type	Schedule 40 PVC
Diameter (in.)	2
Length (ft)	N/A
Backfill	
Type	EZ mud/Benseal
Length (ft)	2
Placement	Pour
Seal	
Type	Bentonite Pellets
Length (ft)	2
Placement	Pour
Filter Pack	
Type	10-20 Silica Sand
Length (ft)	16
Placement	Pour
Amount Placed	400lbs
Screen	
Type	Schedule 40 PVC
Length (ft)	15
Diameter (in.)	2
Slot Size (in.)	0.010
Slot Type	Machine Slotted

Borehole Dia. (in.) 8

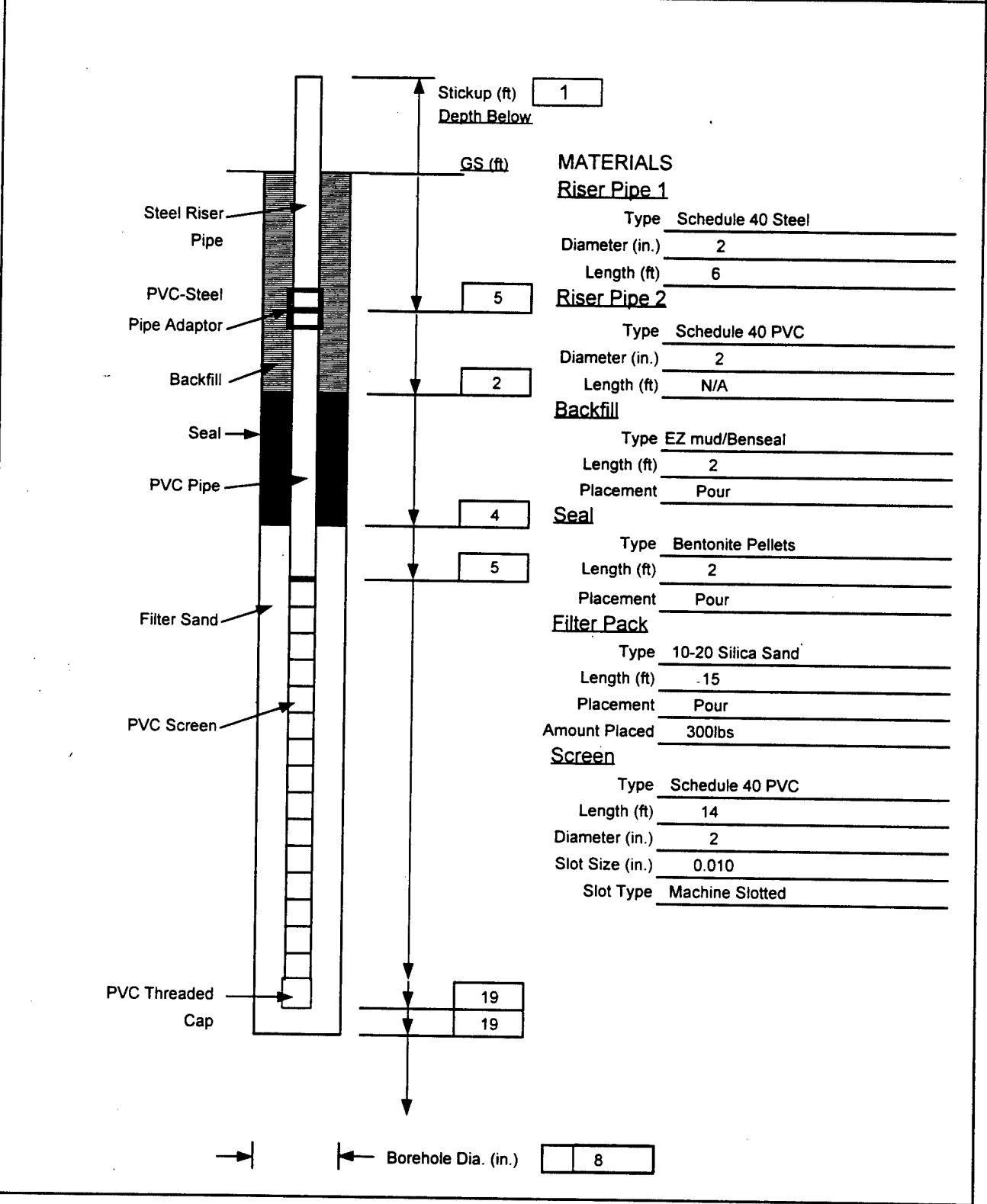
BOREHOLE LOG

Project Name: Loring AFB	Borehole No.: AEW-12
Project Number: 22784	Elevation: TBD
Location: JEBS	Date Started: 8/31/98 Date Completed: 8/31/98
Driller: Great Works Drilling	Total Depth (ft): 19
Equipment: Mobile B59	Depth to Bedrock (ft): 19
Drilling Method: Hollow Stem Auger	Hole Diameter (in): 8
Drilling Fluid: None	Depth to Water (ft): TBD
Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details	Logged By: P. Linley

Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-19ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd, gvl 5-6 inches in diameter.</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">8ft: Moist.</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15-16ft: Cobble zone.</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">19ft: Bedrock: Limestone.</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>					No samples required to be collected during installation

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: AEW-12
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 8/31/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 8/31/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	



MATERIALS	
Riser Pipe 1	
Type	Schedule 40 Steel
Diameter (in.)	2
Length (ft)	6
Riser Pipe 2	
Type	Schedule 40 PVC
Diameter (in.)	2
Length (ft)	N/A
Backfill	
Type	EZ mud/Benseal
Length (ft)	2
Placement	Pour
Seal	
Type	Bentonite Pellets
Length (ft)	2
Placement	Pour
Filter Pack	
Type	10-20 Silica Sand
Length (ft)	.15
Placement	Pour
Amount Placed	300lbs
Screen	
Type	Schedule 40 PVC
Length (ft)	14
Diameter (in.)	2
Slot Size (in.)	0.010
Slot Type	Machine Slotted

BOREHOLE LOG

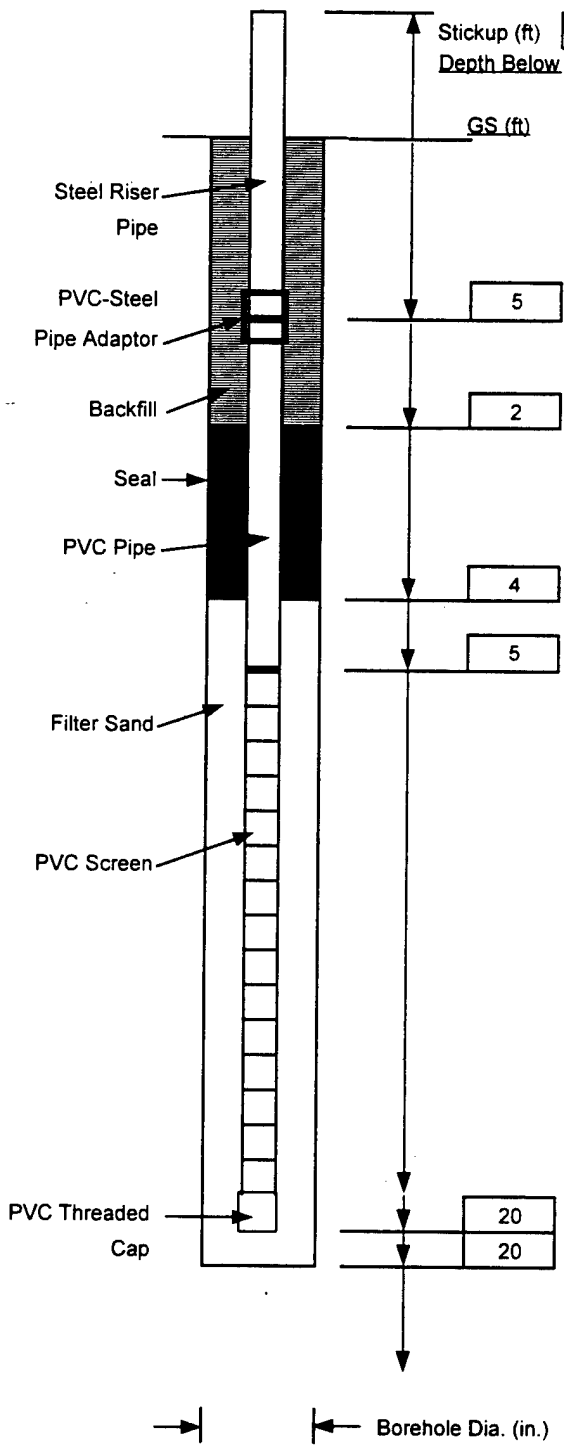
Project Name: Loring AFB		Borehole No.: AEW-13			
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 8/31/98	Date Completed: 8/31/98		
Driller: Great Works Drilling		Total Depth (ft): 18			
Equipment: Mobile B59		Depth to Bedrock (ft): 18			
Drilling Method: Hollow Stem Auger		Hole Diameter (in): 8			
Drilling Fluid: None		Depth to Water (ft): TBD			
Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details		Logged By: P. Linley			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-18ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd.</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">9ft: Moist.</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">11ft: V moist.</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">15ft: Moist.</div> <div style="margin-bottom: 10px;">18ft: Bedrock: Limestone.</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>					No samples required to be collected during installation

BOREHOLE LOG

Project Name: Loring AFB		Borehole No.: AEW-25			
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 9/1/98	Date Completed: 9/1/98		
Driller: Great Works Drilling		Total Depth (ft):		12	
Equipment: Mobile B59		Depth to Bedrock (ft):		12	
Drilling Method: Hollow Stem Auger		Hole Diameter (in):		8	
Drilling Fluid: None		Depth to Water (ft):		TBD	
Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details		Logged By: P. Linley			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-12ft: Gravelly clayey silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd, gvl to 6 inches in diameter.</div> <div style="margin-bottom: 10px;">5 5-5.5ft: Cobble zone.</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">12ft: Bedrock: Limestone.</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>					No samples required to be collected during installation

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: AEW-14
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 8/31/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 8/31/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	

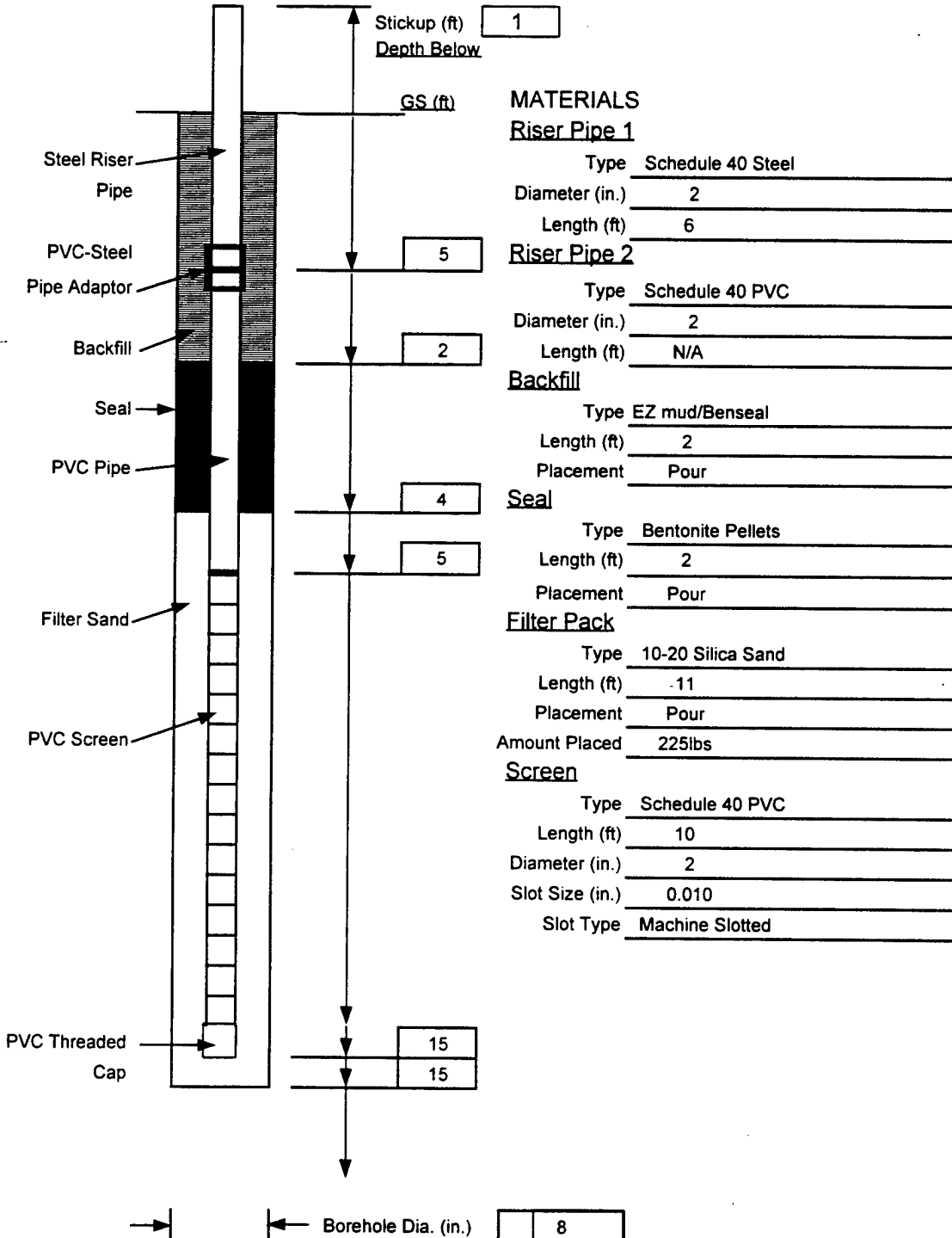


MATERIALS

Riser Pipe 1	
Type	Schedule 40 Steel
Diameter (in.)	2
Length (ft)	6
Riser Pipe 2	
Type	Schedule 40 PVC
Diameter (in.)	2
Length (ft)	N/A
Backfill	
Type	EZ mud/Benseal
Length (ft)	2
Placement	Pour
Seal	
Type	Bentonite Pellets
Length (ft)	2
Placement	Pour
Filter Pack	
Type	10-20 Silica Sand
Length (ft)	.16
Placement	Pour
Amount Placed	400lbs
Screen	
Type	Schedule 40 PVC
Length (ft)	15
Diameter (in.)	2
Slot Size (in.)	0.010
Slot Type	Machine Slotted

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: AEW-15
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 8/31/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 8/31/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	

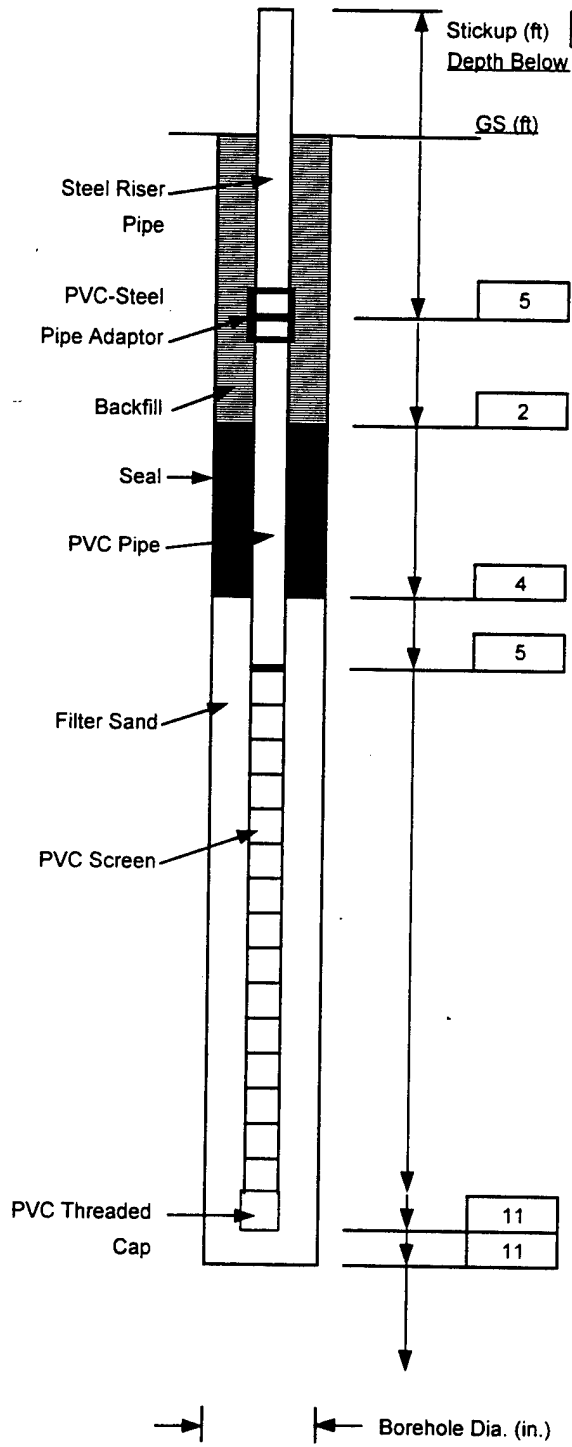


BOREHOLE LOG

Project Name: Loring AFB					Borehole No.: AEW-16
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 8/31/98		Date Completed: 8/31/98	
Driller: Great Works Drilling		Total Depth (ft):		11	
Equipment: Mobile B59		Depth to Bedrock (ft):		11	
Drilling Method: Hollow Stem Auger		Hole Diameter (in):		8	
Drilling Fluid: None		Depth to Water (ft):		TBD	
Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details		Logged By: P. Linley			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>	<p>0-11ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd, gvl 3-4 inches in diameter.</p> <p>11ft: Bedrock: Limestone.</p>				<p>No samples required to be collected during installation</p>

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: AEW-16
Q	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 8/31/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 8/31/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	



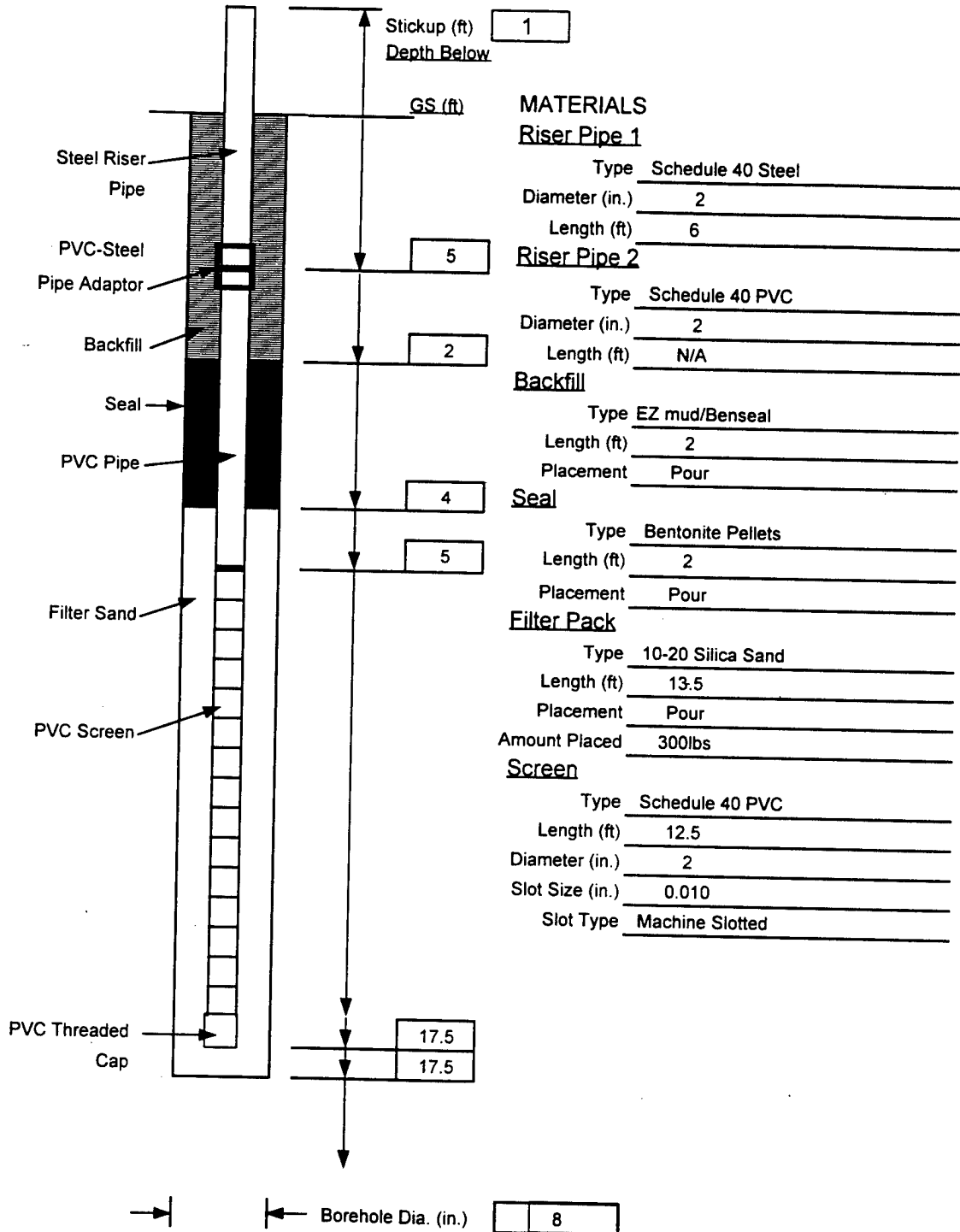
MATERIALS	
Riser Pipe 1	
Type	Schedule 40 Steel
Diameter (in.)	2
Length (ft)	6
Riser Pipe 2	
Type	Schedule 40 PVC
Diameter (in.)	2
Length (ft)	N/A
Backfill	
Type	EZ mud/Benseal
Length (ft)	2
Placement	Pour
Seal	
Type	Bentonite Pellets
Length (ft)	2
Placement	Pour
Filter Pack	
Type	10-20 Silica Sand
Length (ft)	.7
Placement	Pour
Amount Placed	175lbs
Screen	
Type	Schedule 40 PVC
Length (ft)	6
Diameter (in.)	2
Slot Size (in.)	0.010
Slot Type	Machine Slotted

BOREHOLE LOG

Project Name: Loring AFB		Borehole No.: AEW-17			
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 9/10/98	Date Completed: 9/10/98		
Driller: Great Works Drilling		Total Depth (ft): 17.5			
Equipment: Mobile B59		Depth to Bedrock (ft): 17.5			
Drilling Method: Hollow Stem Auger		Hole Diameter (in): 8			
Drilling Fluid: None		Depth to Water (ft): TBD			
Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details		Logged By: P. Linley			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-0.25ft: Asphalt</div> <div style="margin-bottom: 10px;">0.25-0.75ft: Fill - Gravel</div> <div style="margin-bottom: 10px;">0.75-17.5ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld, poorly sorted, subang to subrd.</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">17.5ft: Bedrock: Limestone.</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>					No samples required to be collected during installation

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB		Site: JEBS		Well No.: AEW-17	
Drilling Company: Great Works Drilling		Project No.: 22748		Logged By: P. Linley	
Driller: D. Bolstridge		Date Started: 9/10/1998		Coordinates: TBD	
Drilling Equipment: Mobile B59		Date Completed: 9/10/1998			
Drilling Method: Hollow Stem Auger		Depth to Water: TBD			
Drilling Fluid: None		Elevation: TBD			

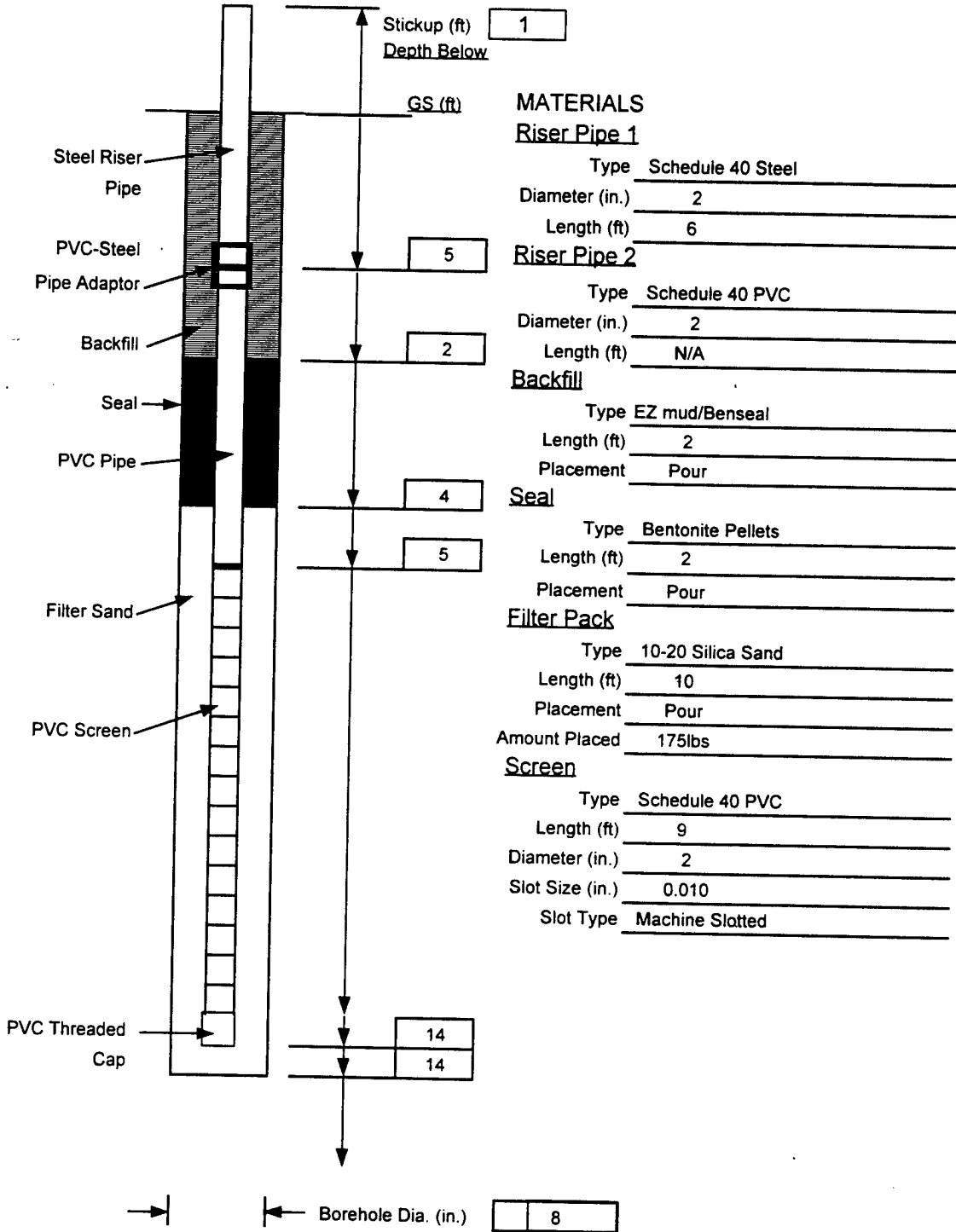


BOREHOLE LOG

Project Name: Loring AFB					Borehole No.: AEW-18
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 9/1/98		Date Completed: 9/1/98	
Driller: Great Works Drilling		Total Depth (ft):		14	
Equipment: Mobile B59		Depth to Bedrock (ft):		14	
Drilling Method: Hollow Stem Auger		Hole Diameter (in):		8	
Drilling Fluid: None		Depth to Water (ft):		TBD	
Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details		Logged By: P. Linley			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-14ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd, gvl 4-5 inches in diameter.</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">6ft: Moist.</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">14ft: Bedrock: Limestone.</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>					No samples required to be collected during installation

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: AEW-18
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 9/1/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 9/1/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	

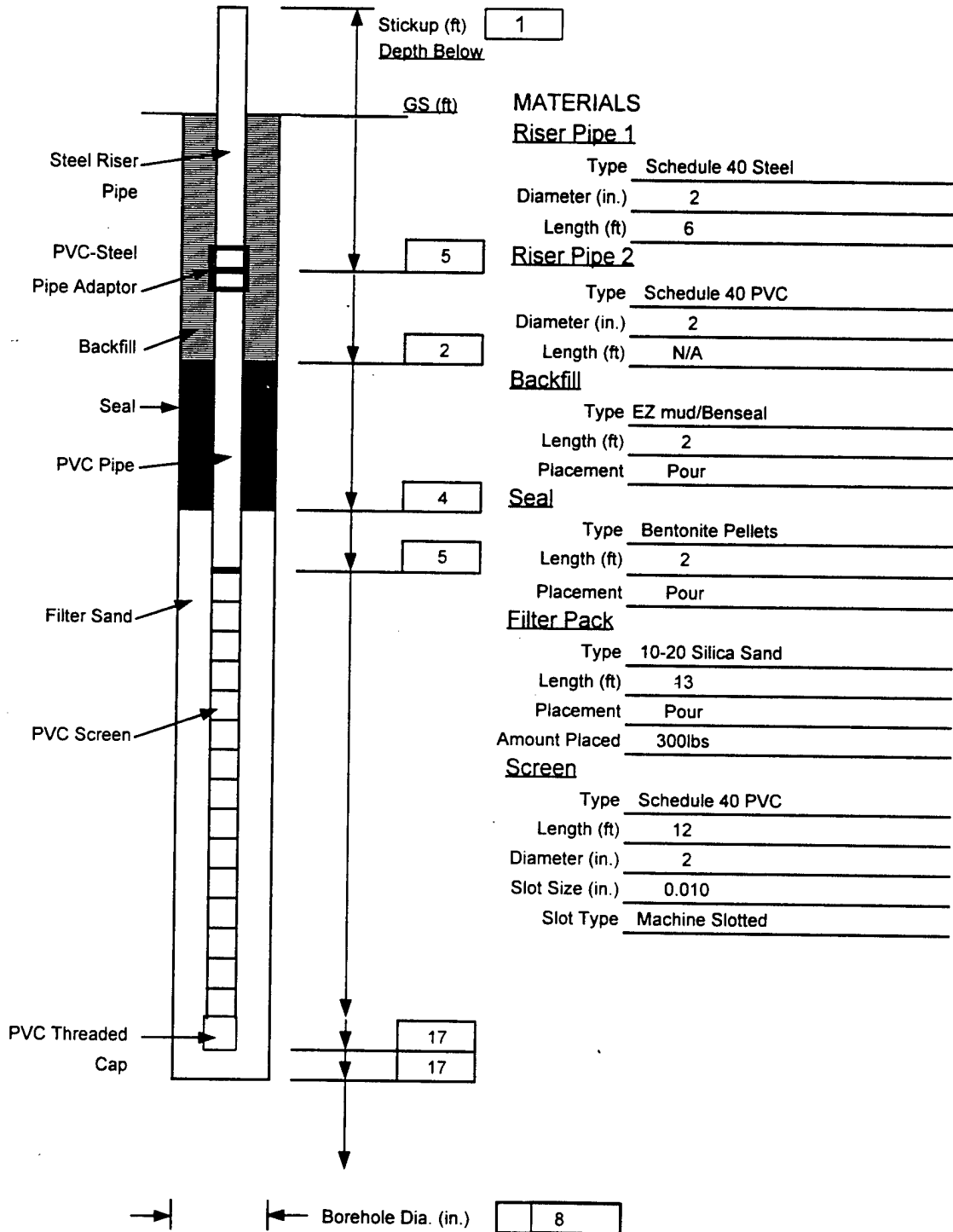


BOREHOLE LOG

Project Name: Loring AFB					Borehole No.: AEW-19
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 9/1/98		Date Completed: 9/1/98	
Driller: Great Works Drilling		Total Depth (ft):		17	
Equipment: Mobile B59		Depth to Bedrock (ft):		17	
Drilling Method: Hollow Stem Auger		Hole Diameter (in):		8	
Drilling Fluid: None		Depth to Water (ft):		TBD	
Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details		Logged By: P. Linley			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>	<p>0-17ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd, gvl 4-5 inches in diameter.</p> <p>6-7ft: Cobble zone.</p> <p>17ft: Bedrock: Limestone.</p>				<p>No samples required to be collected during installation</p>

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: AEW-19
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 9/1/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 9/1/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	



BOREHOLE LOG

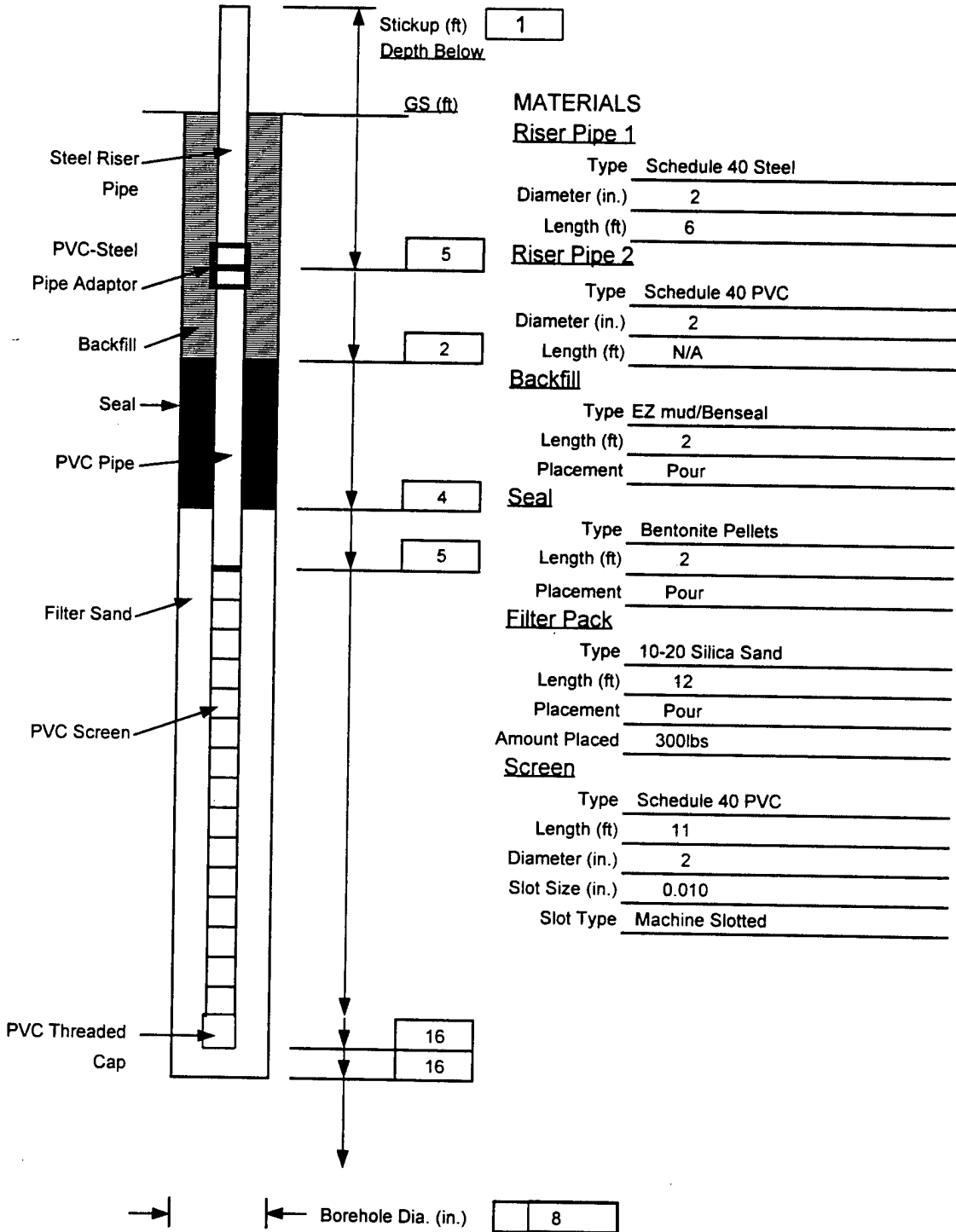
Project Name: <i>Loring AFB</i>		Borehole No.: <i>AEW-20</i>			
Project Number: <i>22784</i>		Elevation: <i>TBD</i>			
Location: <i>JEBS</i>		Date Started: <i>9/1/98</i>	Date Completed: <i>9/1/98</i>		
Driller: <i>Great Works Drilling</i>		Total Depth (ft): <i>20</i>			
Equipment: <i>Mobile B59</i>		Depth to Bedrock (ft): <i>20</i>			
Drilling Method: <i>Hollow Stem Auger</i>		Hole Diameter (in): <i>8</i>			
Drilling Fluid: <i>None</i>		Depth to Water (ft): <i>TBD</i>			
Completion: <i>Completed as a Soil Vapor Extraction Well See Construction Log for details</i>		Logged By: <i>P. Linley</i>			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-0.5ft: Concrete</div> <div style="margin-bottom: 10px;">0.5-1ft: Fill - Gravel</div> <div style="margin-bottom: 10px;">1-20ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd.</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">7ft: Moist.</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">10ft: Clay fraction increase to approx. 20%.</div> <div style="margin-bottom: 10px;">11ft: Clay fraction decrease to <10%.</div> <div style="margin-bottom: 10px;">12ft: V moist.</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">20ft: Bedrock: Limestone.</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>					No samples required to be collected during installation

BOREHOLE LOG

Project Name: Loring AFB		Borehole No.: AEW-21			
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 9/1/98	Date Completed: 9/1/98		
Driller: Great Works Drilling		Total Depth (ft):	16		
Equipment: Mobile B59		Depth to Bedrock (ft):	16		
Drilling Method: Hollow Stem Auger		Hole Diameter (in):	8		
Drilling Fluid: None		Depth to Water (ft):	12		
Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details		Logged By: P. Linley			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
0-0.5ft: Concrete 0.5-1ft: Fill - Gravel 1-8ft: Clayey silty gravel: (GP), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to coarse, unconsld, poorly sorted, subang to subrd. 5 8-16ft: Gravelly clayey silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld subang to subrd, v moist to wet, gvl 2-3 inches in diameter. 10 11-11.5ft: Cobble zone. 12ft: water, soupy cuttings. 15 16ft: Bedrock: Limestone. 20 25 30					No samples required to be collected during installation

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: AEW-21
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 9/1/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 9/1/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	

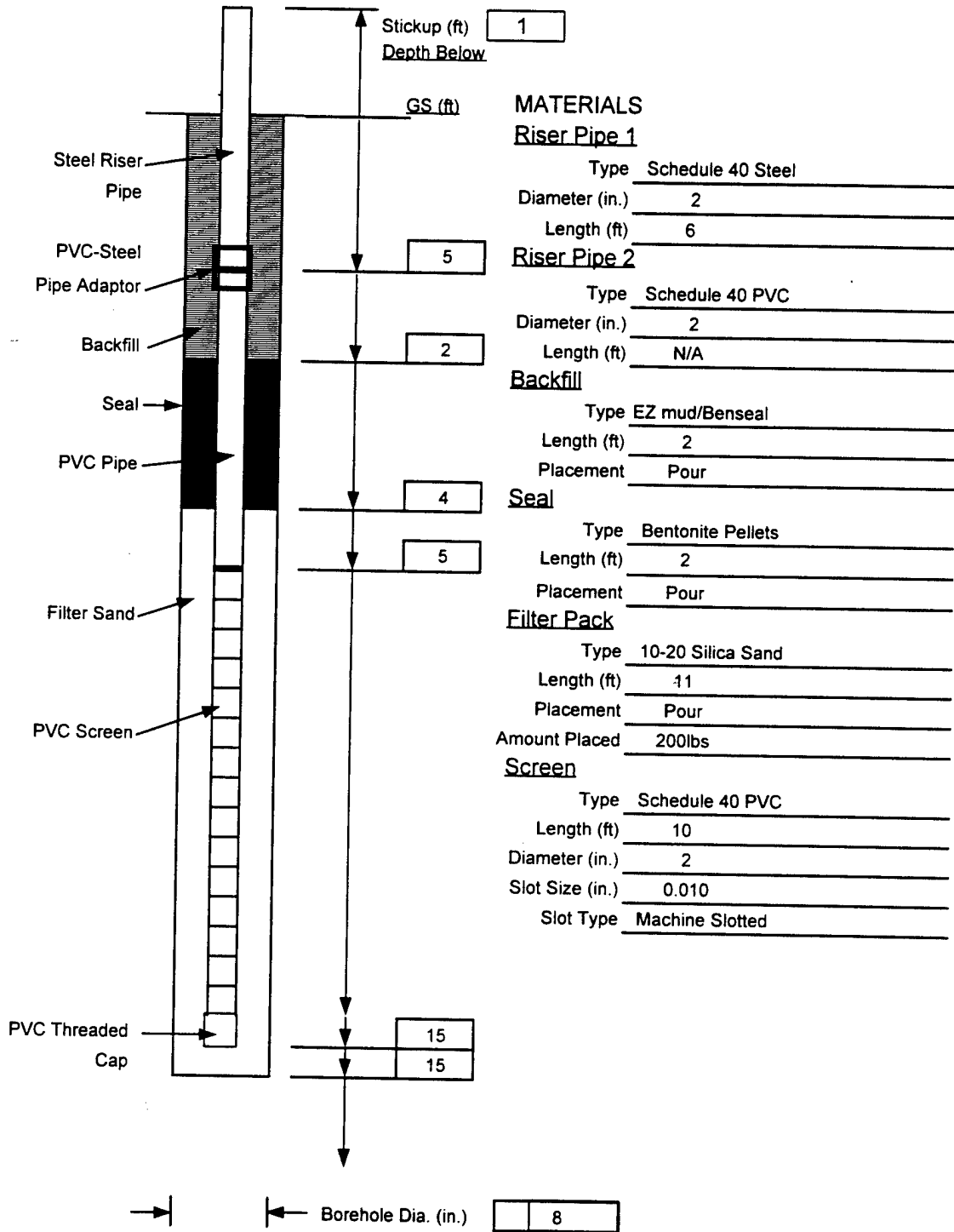


BOREHOLE LOG

Project Name: Loring AFB		Borehole No.: AEW-22			
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 9/10/98	Date Completed: 9/10/98		
Driller: Great Works Drilling		Total Depth (ft):	15		
Equipment: Mobile B59		Depth to Bedrock (ft):	15		
Drilling Method: Hollow Stem Auger		Hole Diameter (in):	8		
Drilling Fluid: None		Depth to Water (ft):	TBD		
Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details		Logged By: P. Linley			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-0.25ft: Asphalt</div> <div style="margin-bottom: 10px;">0.25-1ft: Fill - Gravel</div> <div style="margin-bottom: 10px;">1-15ft: Gravelly clayey silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd.</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>	<div style="margin-bottom: 10px;">15ft: Bedrock: Limestone.</div>				No samples required to be collected during installation

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: AEW-22
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 9/10/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 9/10/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	

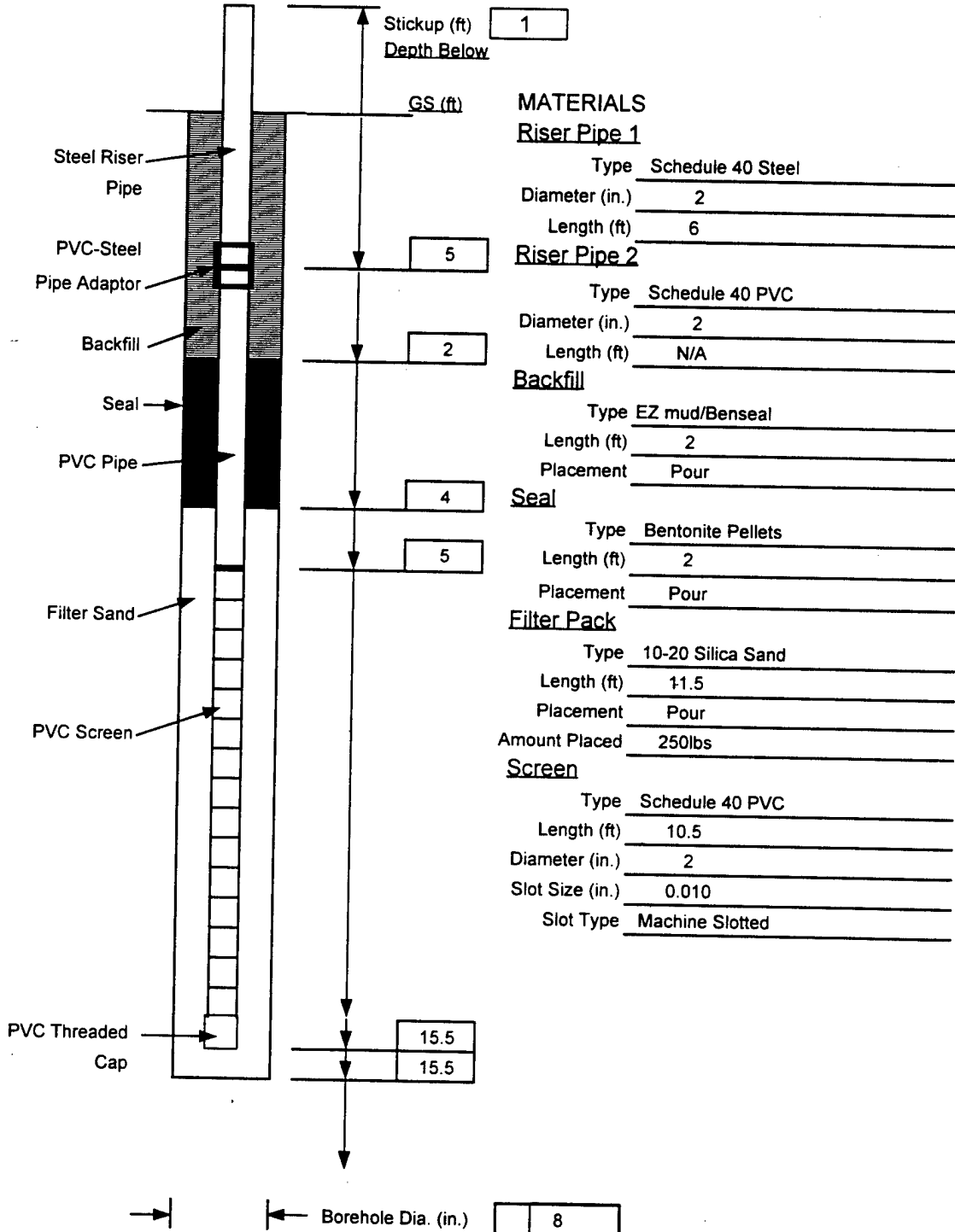


BOREHOLE LOG

Project Name: Loring AFB		Borehole No.: AEW-23			
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 9/1/98	Date Completed: 9/1/98		
Driller: Great Works Drilling		Total Depth (ft): 15			
Equipment: Mobile B59		Depth to Bedrock (ft): 15			
Drilling Method: Hollow Stem Auger		Hole Diameter (in): 8			
Drilling Fluid: None		Depth to Water (ft): TBD			
Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details		Logged By: P. Linley			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-15.5ft: Gravelly clayey silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd.</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>	<div style="margin-bottom: 10px;">15.5ft: Bedrock: Limestone.</div>				No samples required to be collected during installation

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB		Site: JEBS		Well No.: AEW-23	
Drilling Company: Great Works Drilling		Project No.: 22748		Logged By: P. Linley	
Driller: D. Bolstridge		Date Started: 9/1/1998		Coordinates: TBD	
Drilling Equipment: Mobile B59		Date Completed: 9/1/1998			
Drilling Method: Hollow Stem Auger		Depth to Water: TBD			
Drilling Fluid: None		Elevation: TBD			

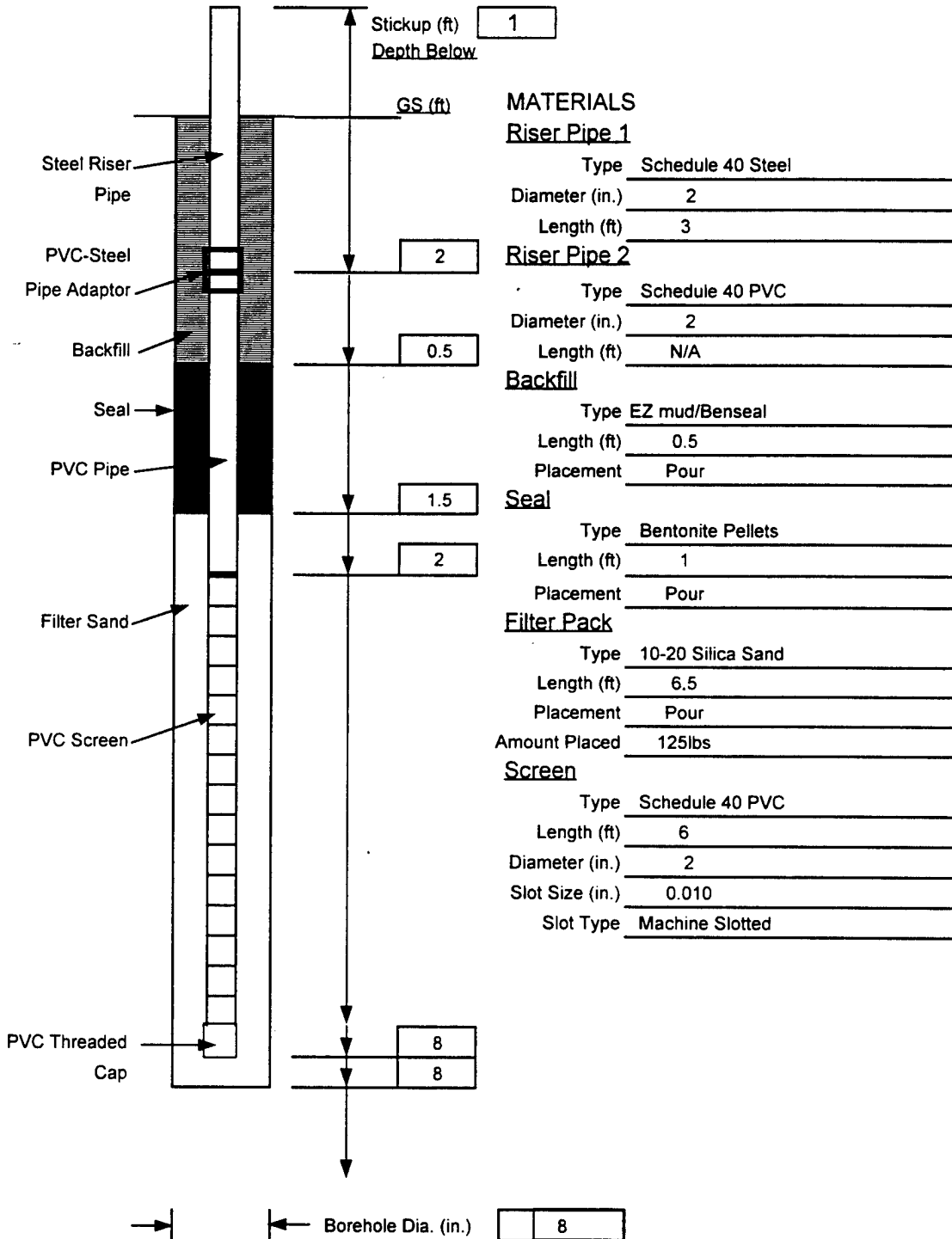


BOREHOLE LOG

Project Name: Loring AFB					Borehole No.: AEW-24
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 9/1/98		Date Completed: 9/1/98	
Driller: Great Works Drilling		Total Depth (ft):		8	
Equipment: Mobile B59		Depth to Bedrock (ft):		8	
Drilling Method: Hollow Stem Auger		Hole Diameter (in):		8	
Drilling Fluid: None		Depth to Water (ft):		TBD	
Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details		Logged By: P. Linley			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-8ft: Gravelly clayey silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd.</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">7ft: Cobble zone.</div> <div style="margin-bottom: 10px;">8ft: Bedrock: Limestone.</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>					<p>No samples required to be collected during installation</p> <p>Auger refusal at 7ft, relocated approximately 4ft west of original location.</p>

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: AEW-24
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 9/1/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 9/1/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	

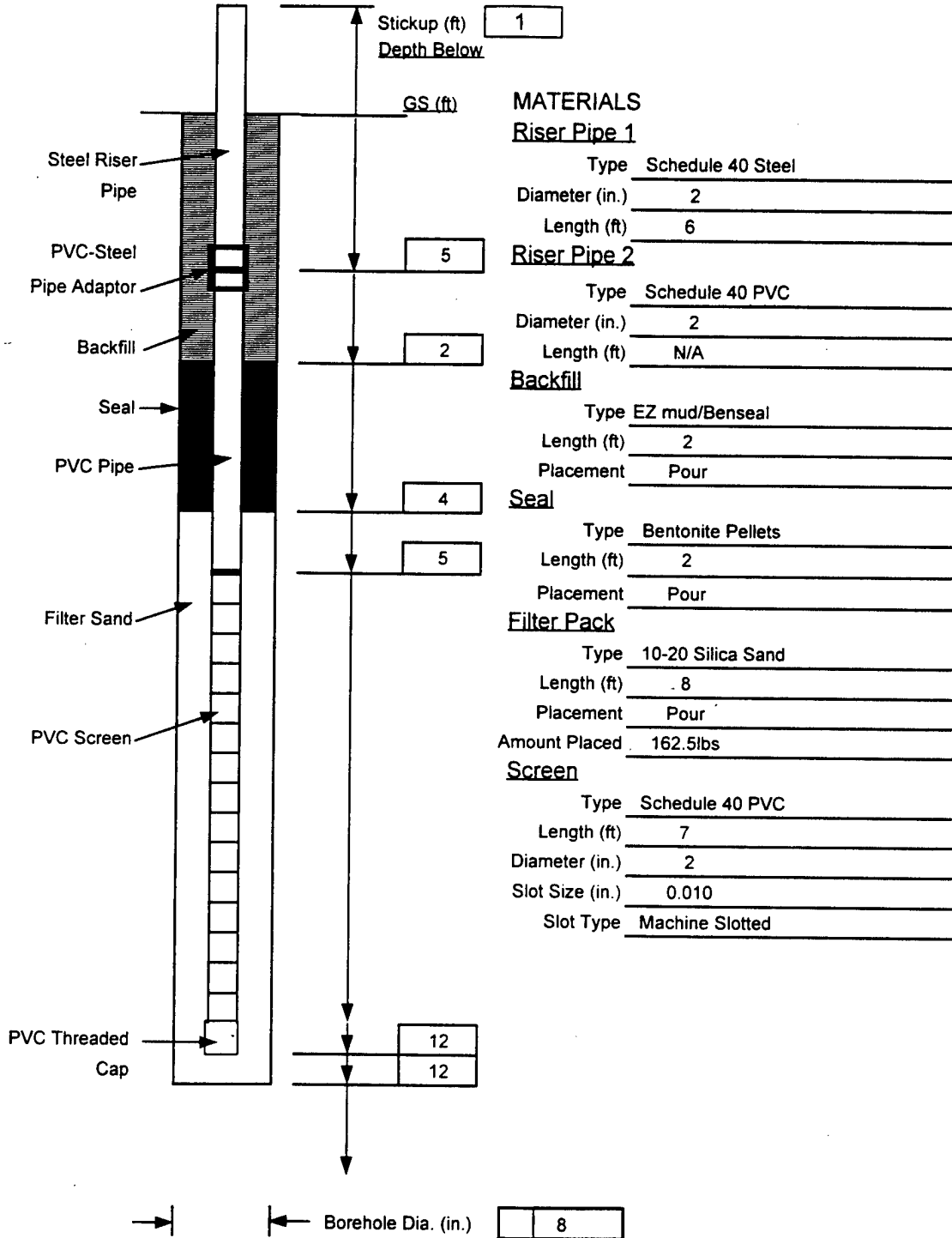


BOREHOLE LOG

Project Name: Loring AFB		Borehole No.: AEW-25			
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 9/1/98	Date Completed: 9/1/98		
Driller: Great Works Drilling		Total Depth (ft): 12			
Equipment: Mobile B59		Depth to Bedrock (ft): 12			
Drilling Method: Hollow Stem Auger		Hole Diameter (in): 8			
Drilling Fluid: None		Depth to Water (ft): TBD			
Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details		Logged By: P. Linley			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-12ft: Gravelly clayey silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd, gvl to 6 inches in diameter.</div> <div style="margin-bottom: 10px;">5 5-5.5ft: Cobble zone.</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">12ft: Bedrock: Limestone.</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>					No samples required to be collected during installation

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: AEW-25
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 9/1/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 9/1/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	



BOREHOLE LOG

Project Name: <i>Loring AFB</i>					Borehole No.: <i>AEW-26</i>
Project Number: <i>22784</i>		Elevation: <i>TBD</i>			
Location: <i>JEBS</i>		Date Started: <i>9/1/98</i>		Date Completed: <i>9/1/98</i>	
Driller: <i>Great Works Drilling</i>		Total Depth (ft):		<i>15</i>	
Equipment: <i>Mobile B59</i>		Depth to Bedrock (ft):		<i>15</i>	
Drilling Method: <i>Hollow Stem Auger</i>		Hole Diameter (in):		<i>8</i>	
Drilling Fluid: <i>None</i>		Depth to Water (ft):		<i>TBD</i>	
Completion: <i>Completed as a Soil Vapor Extraction Well</i> <i>See Construction Log for details</i>		Logged By: <i>P. Linley</i>			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-0.5ft: Concrete</div> <div style="margin-bottom: 10px;">0.5-1ft: Fill - Gravel</div> <div style="margin-bottom: 10px;">1-15ft: Gravelly clayey silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd.</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>	<div style="margin-bottom: 10px;">15ft: Bedrock: Limestone.</div>				<div style="margin-bottom: 10px;">No samples required to be collected during installation</div>

BOREHOLE LOG

Project Name: Loring AFB		Borehole No.: AEW-39		
Project Number: 22784		Elevation: TBD		
Location: JEBS		Date Started: 9/3/98	Date Completed: 9/3/98	
Driller: Great Works Drilling		Total Depth (ft): 24		
Equipment: Mobile B59		Depth to Bedrock (ft): 24		
Drilling Method: Hollow Stem Auger		Hole Diameter (in): 8		
Drilling Fluid: None		Depth to Water (ft): TBD		
Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details		Logged By: P. Linley		

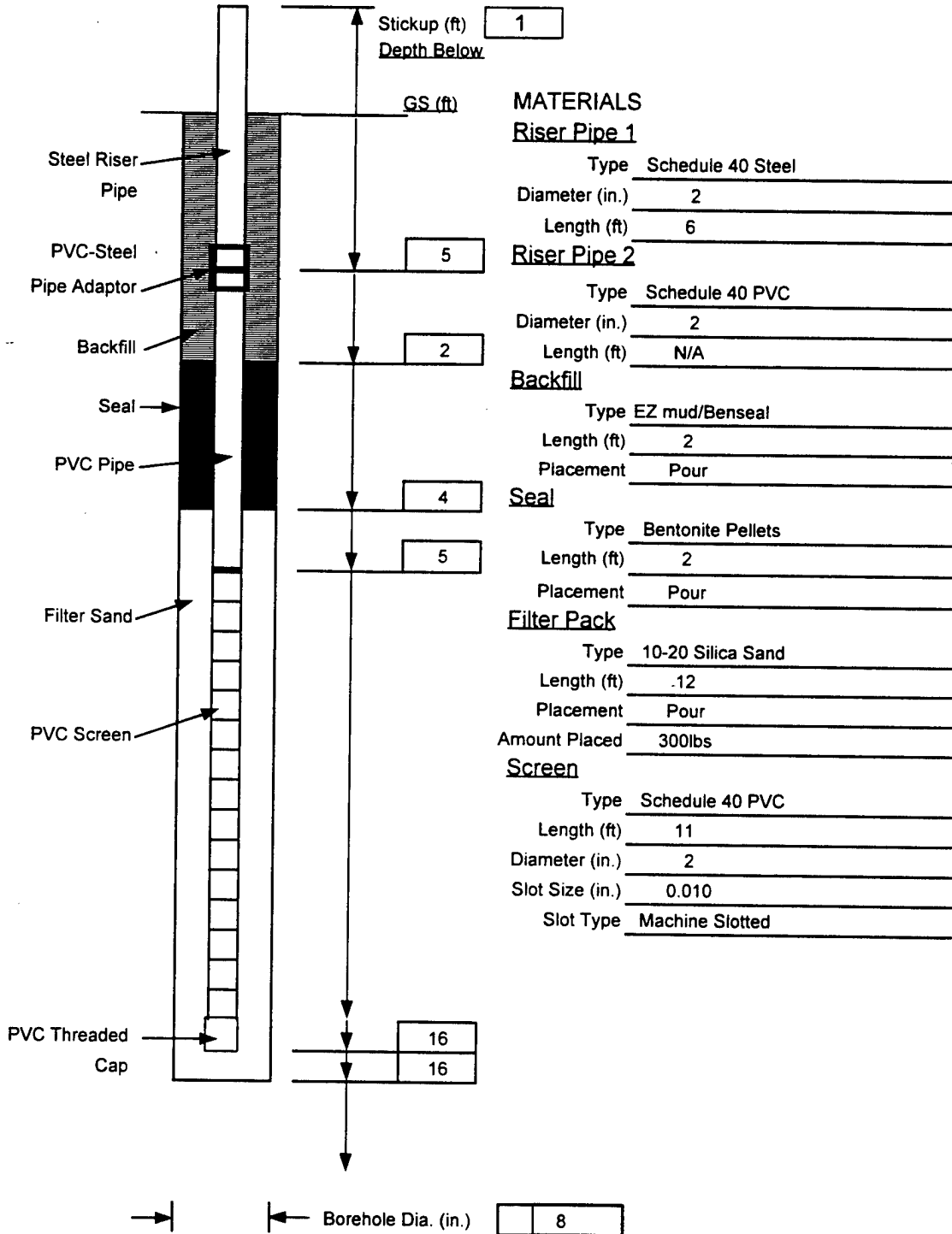
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-0.25ft: Asphalt</div> <div style="margin-bottom: 10px;">0.25-0.75ft: Fill - Gravel</div> <div style="margin-bottom: 10px;">0.75-24ft: Gravelly clayey silt: (ML), Lt olive gry (5Y6/4) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd.</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">24ft: Bedrock: Limestone.</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>					No samples required to be collected during installation

BOREHOLE LOG

Project Name: <i>Loring AFB</i>					Borehole No.: <i>AEW-27</i>
Project Number: <i>22784</i>		Elevation: <i>TBD</i>			
Location: <i>JEBS</i>		Date Started: <i>9/10/98</i>	Date Completed: <i>9/10/98</i>		
Driller: <i>Great Works Drilling</i>		Total Depth (ft): <i>16</i>			
Equipment: <i>Mobile B59</i>		Depth to Bedrock (ft): <i>16</i>			
Drilling Method: <i>Hollow Stem Auger</i>		Hole Diameter (in): <i>8</i>			
Drilling Fluid: <i>None</i>		Depth to Water (ft): <i>TBD</i>			
Completion: <i>Completed as a Soil Vapor Extraction Well</i> <i>See Construction Log for details</i>		Logged By: <i>P. Linley</i>			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-0.6ft: Concrete</div> <div style="margin-bottom: 10px;">0.6-8ft: Fill - Gravel</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">8-16ft: Gravelly clayey silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsolid poorly sorted, subang to subrd.</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">16ft: Bedrock: Limestone.</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>					No samples required to be collected during installation

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: AEW-27
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 9/10/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 9/10/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	

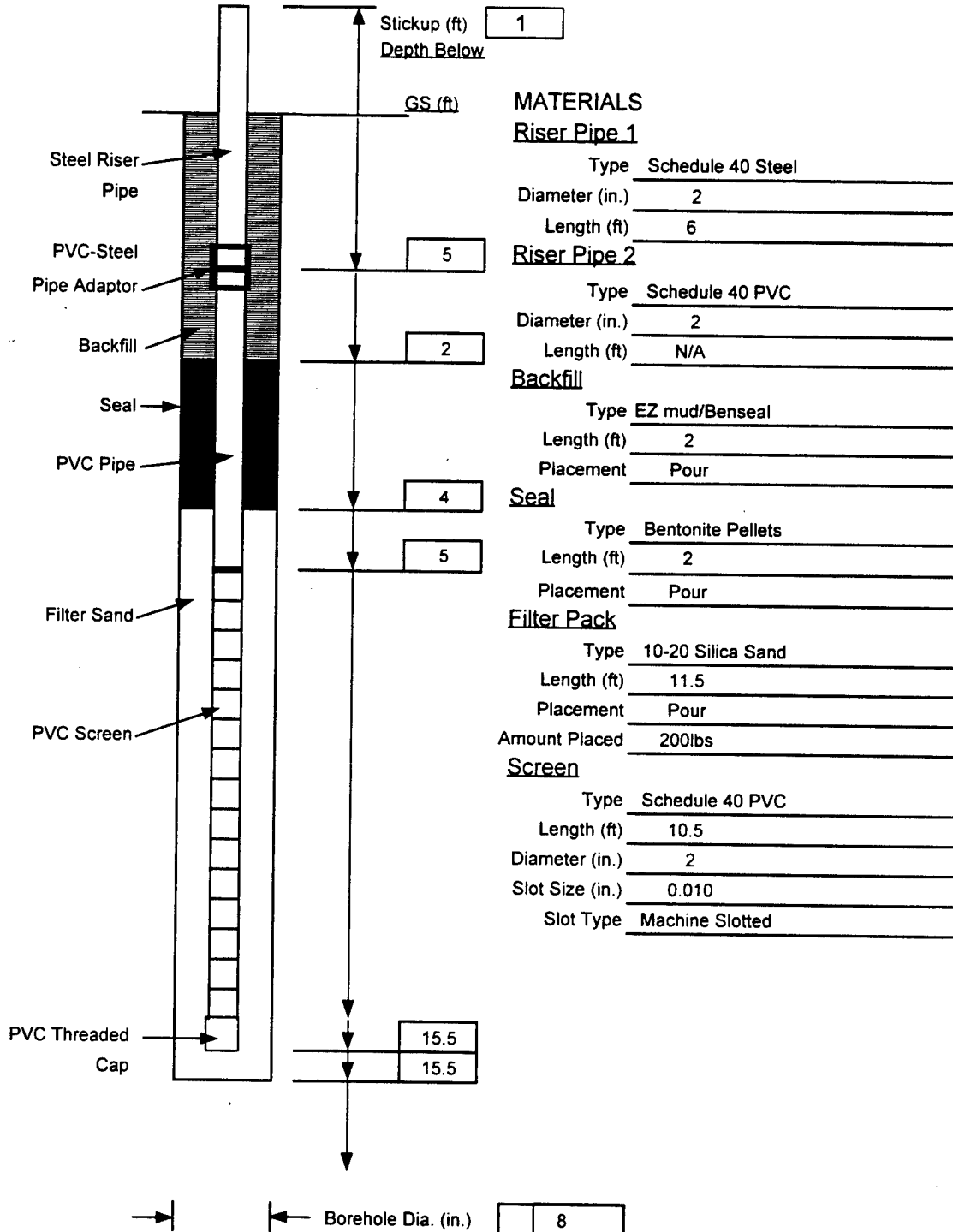


BOREHOLE LOG

Project Name: Loring AFB					Borehole No.: AEW-28
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 9/10/98		Date Completed: 9/10/98	
Driller: Great Works Drilling		Total Depth (ft):		15.5	
Equipment: Mobile B59		Depth to Bedrock (ft):		15.5	
Drilling Method: Hollow Stem Auger		Hole Diameter (in):		8	
Drilling Fluid: None		Depth to Water (ft):		TBD	
Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details		Logged By: P. Linley			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-0.25ft: Asphalt</div> <div style="margin-bottom: 10px;">0.25-1: Fill - Gravel</div> <div style="margin-bottom: 10px;">1-15.5ft: Gravelly clayey silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd.</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>	<div style="margin-bottom: 10px;">15.5ft: Bedrock: Limestone.</div>				<div style="margin-bottom: 10px;">No samples required to be collected during installation</div>

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: AEW-28
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 9/10/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 9/10/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	

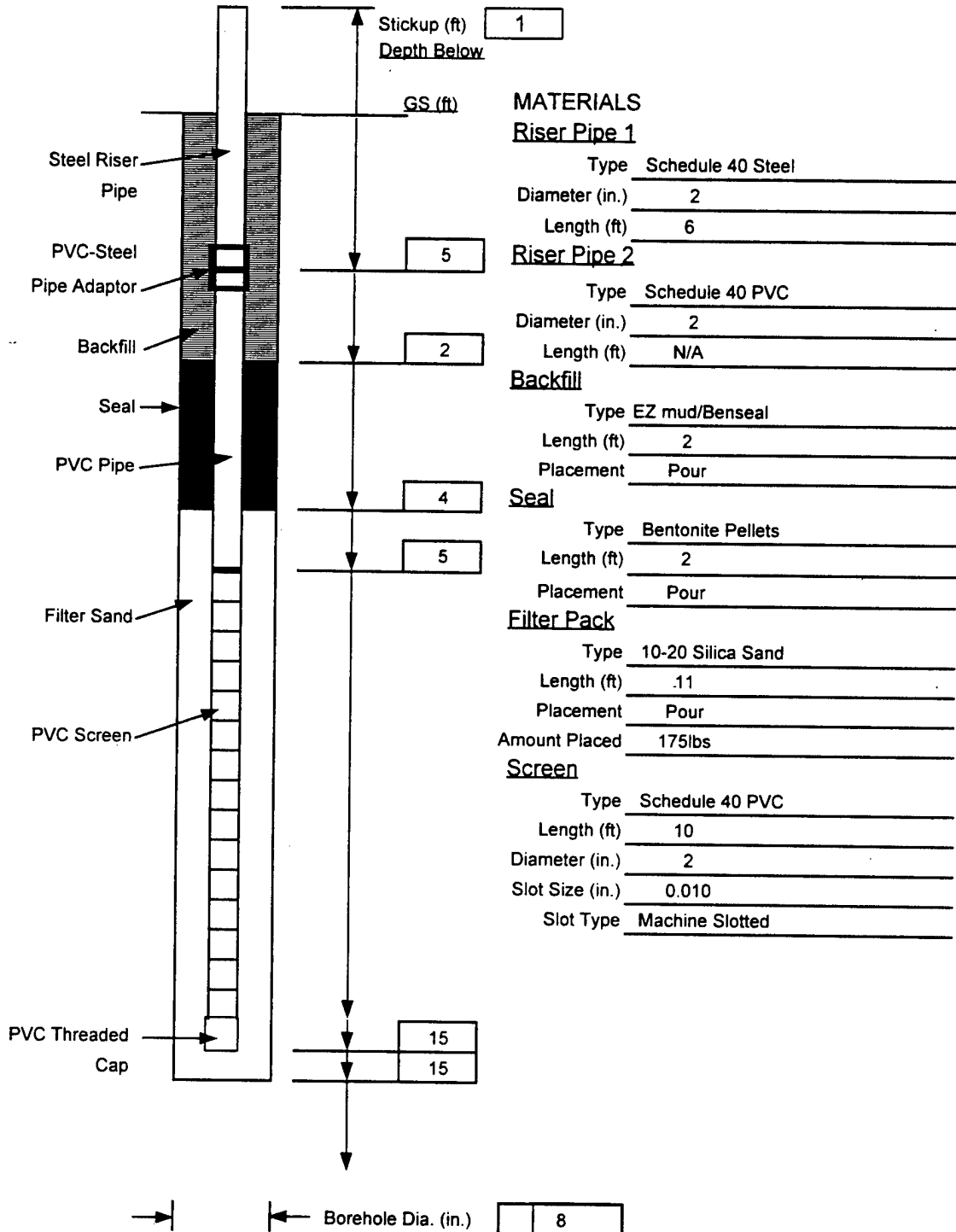


BOREHOLE LOG

Project Name: Loring AFB		Borehole No.: AEW-29			
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 9/4/98	Date Completed: 9/4/98		
Driller: Great Works Drilling		Total Depth (ft):		15	
Equipment: Mobile B59		Depth to Bedrock (ft):		15	
Drilling Method: Hollow Stem Auger		Hole Diameter (in):		8	
Drilling Fluid: None		Depth to Water (ft):		TBD	
Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details		Logged By: P. Linley			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-1ft: Concrete</div> <div style="margin-bottom: 10px;">1-13ft: Fill - Gravel</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">13-15ft: Gravelly clayey silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsol poorly sorted, subang to subrd.</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>	<div style="margin-bottom: 10px;">15ft: Bedrock: Limestone.</div>				No samples required to be collected during installation

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: AEW-29
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 9/4/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 9/4/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	

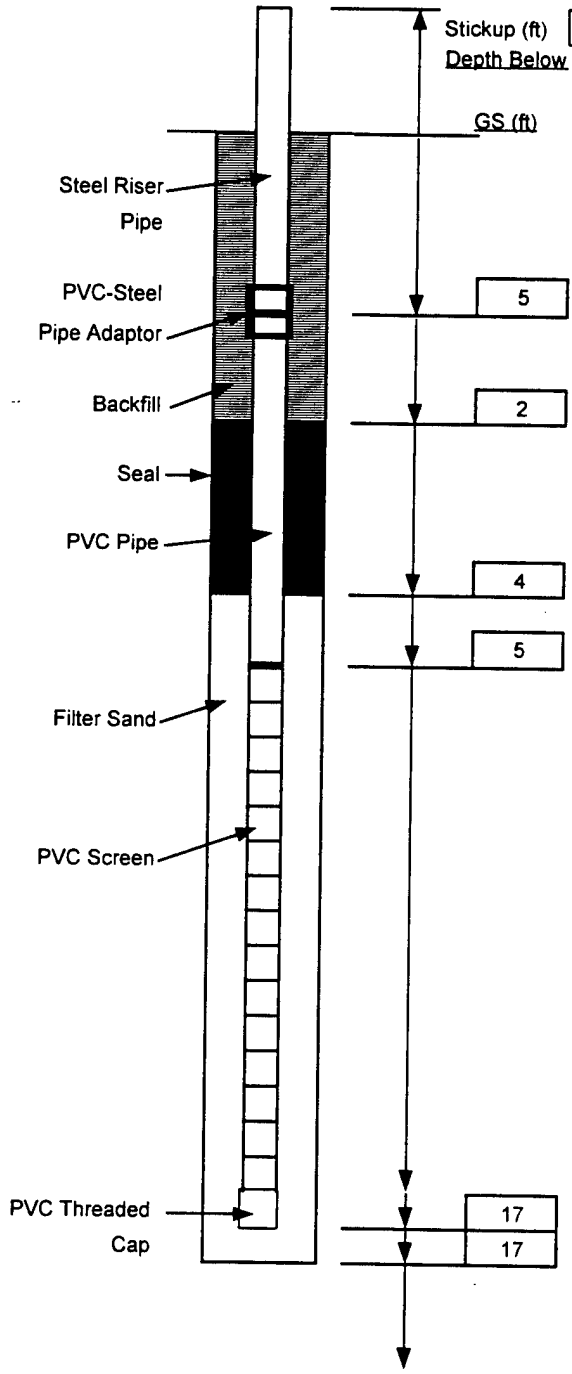


BOREHOLE LOG

Project Name: Loring AFB					Borehole No.: AEW-30
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 9/4/98		Date Completed: 9/4/98	
Driller: Great Works Drilling		Total Depth (ft):		17	
Equipment: Mobile B59		Depth to Bedrock (ft):		17	
Drilling Method: Hollow Stem Auger		Hole Diameter (in):		8	
Drilling Fluid: None		Depth to Water (ft):		TBD	
Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details		Logged By: P. Linley			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-1ft: Concrete</div> <div style="margin-bottom: 10px;">1-6ft: Fill - Gravel</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">6-17ft: Gravelly clayey silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd.</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">17ft: Bedrock: Limestone.</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>					No samples required to be collected during installation

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: AEW-30
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 9/4/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 9/4/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	



MATERIALS	
Riser Pipe 1	
Type	Schedule 40 Steel
Diameter (in.)	2
Length (ft)	6
Riser Pipe 2	
Type	Schedule 40 PVC
Diameter (in.)	2
Length (ft)	N/A
Backfill	
Type	EZ mud/Benseal
Length (ft)	2
Placement	Pour
Seal	
Type	Bentonite Pellets
Length (ft)	2
Placement	Pour
Filter Pack	
Type	10-20 Silica Sand
Length (ft)	13
Placement	Pour
Amount Placed	200lbs
Screen	
Type	Schedule 40 PVC
Length (ft)	12
Diameter (in.)	2
Slot Size (in.)	0.010
Slot Type	Machine Slotted

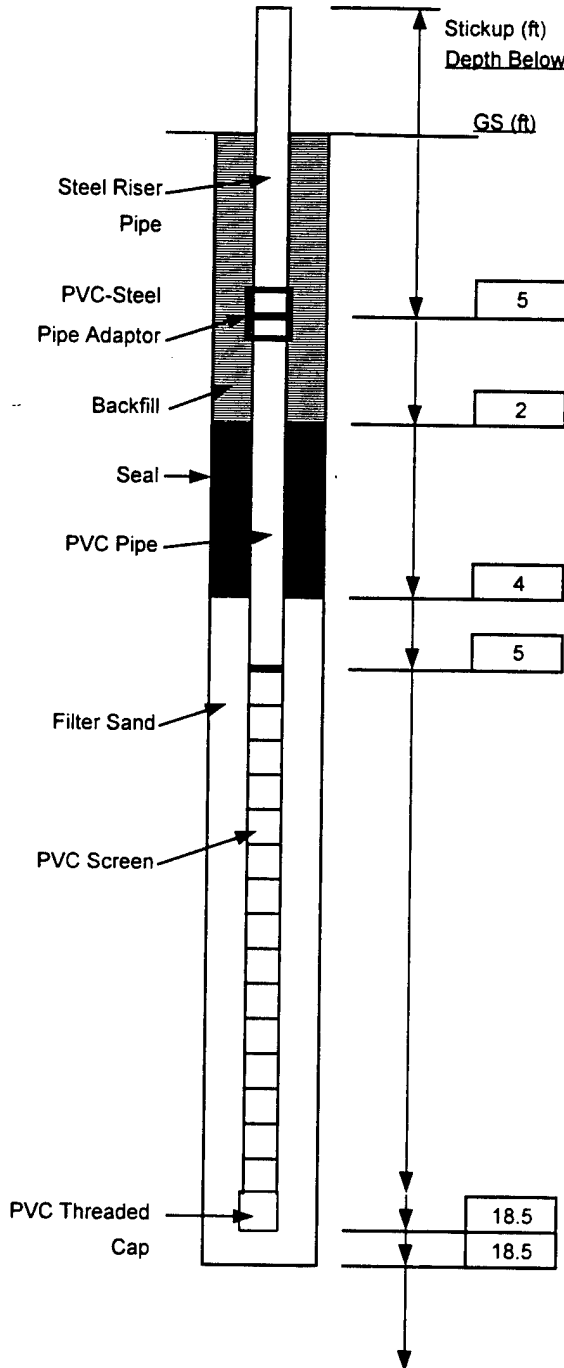
Borehole Dia. (in.) 8

BOREHOLE LOG

Project Name: Loring AFB		Borehole No.: AEW-31			
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 9/3/98	Date Completed: 9/3/98		
Driller: Great Works Drilling		Total Depth (ft): 18.5			
Equipment: Mobile B59		Depth to Bedrock (ft): 18.5			
Drilling Method: Hollow Stem Auger		Hole Diameter (in): 8			
Drilling Fluid: None		Depth to Water (ft): TBD			
Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details		Logged By: P. Linley			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 20px;">5</div> <div style="margin-bottom: 20px;">10</div> <div style="margin-bottom: 20px;">15</div> <div style="margin-bottom: 20px;">20</div> <div style="margin-bottom: 20px;">25</div> <div style="margin-bottom: 20px;">30</div> </div>	<p>0-18.5ft: Gravelly clayey silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd.</p> <p>18.5ft: Bedrock: Limestone.</p>				<p>No samples required to be collected during installation Relocated approximately 10ft east of original location to allow for rig access.</p>

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: AEW-31
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 9/3/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 9/3/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	



MATERIALS

Riser Pipe 1	
Type	Schedule 40 Steel
Diameter (in.)	2
Length (ft)	6
Riser Pipe 2	
Type	Schedule 40 PVC
Diameter (in.)	2
Length (ft)	N/A
Backfill	
Type	EZ mud/Benseal
Length (ft)	2
Placement	Pour
Seal	
Type	Bentonite Pellets
Length (ft)	2
Placement	Pour
Filter Pack	
Type	10-20 Silica Sand
Length (ft)	14.5
Placement	Pour
Amount Placed	300lbs
Screen	
Type	Schedule 40 PVC
Length (ft)	13.5
Diameter (in.)	2
Slot Size (in.)	0.010
Slot Type	Machine Slotted

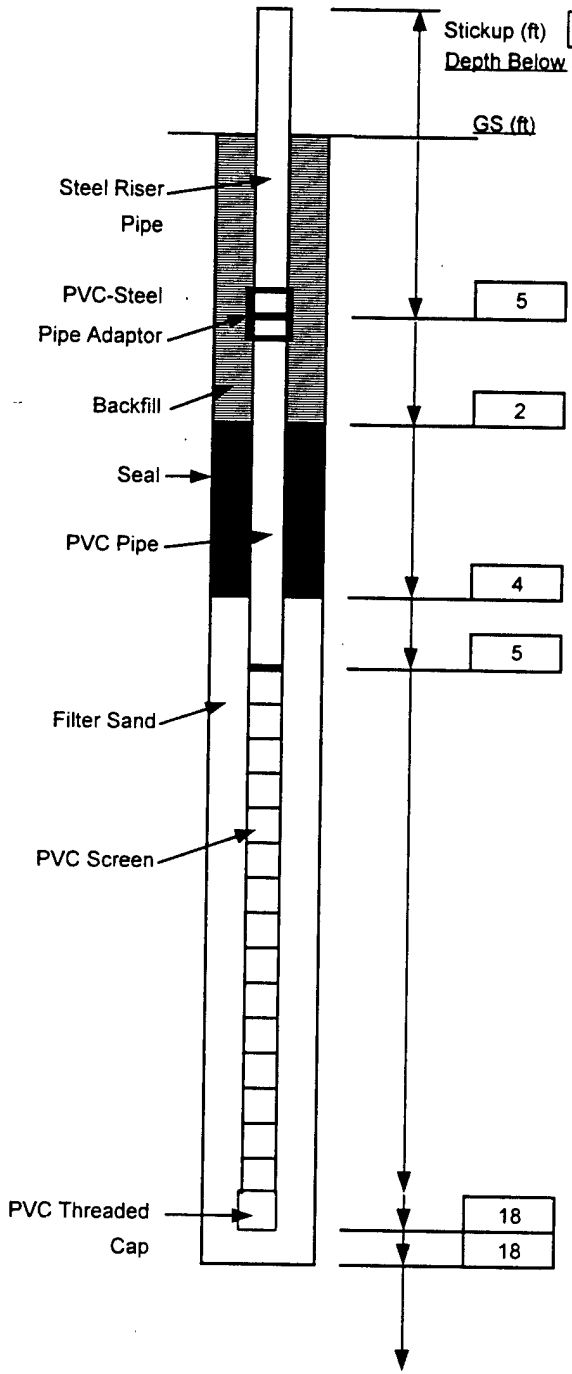
Borehole Dia. (in.) 8

BOREHOLE LOG

Project Name: Loring AFB		Borehole No.: AEW-32			
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 9/3/98	Date Completed: 9/3/98		
Driller: Great Works Drilling		Total Depth (ft): 18			
Equipment: Mobile B59		Depth to Bedrock (ft): 18			
Drilling Method: Hollow Stem Auger		Hole Diameter (in): 8			
Drilling Fluid: None		Depth to Water (ft): TBD			
Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details		Logged By: P. Linley			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-0.5ft: Concrete</div> <div style="margin-bottom: 10px;">0.5-1ft: Fill - Gravel</div> <div style="margin-bottom: 10px;">1-18ft: Gravelly clayey silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd.</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">18ft: Bedrock: Limestone.</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>					No samples required to be collected during installation

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB		Site: JEBS	Well No.: AEW-32
Drilling Company: Great Works Drilling		Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge		Date Started: 9/3/1998	Coordinates: TBD
Drilling Equipment: Mobile B59		Date Completed: 9/3/1998	
Drilling Method: Hollow Stem Auger		Depth to Water: TBD	
Drilling Fluid: None		Elevation: TBD	



MATERIALS	
Riser Pipe 1	
Type	Schedule 40 Steel
Diameter (in.)	2
Length (ft)	6
Riser Pipe 2	
Type	Schedule 40 PVC
Diameter (in.)	2
Length (ft)	N/A
Backfill	
Type	EZ mud/Benseal
Length (ft)	2
Placement	Pour
Seal	
Type	Bentonite Pellets
Length (ft)	2
Placement	Pour
Filter Pack	
Type	10-20 Silica Sand
Length (ft)	14
Placement	Pour
Amount Placed	250lbs
Screen	
Type	Schedule 40 PVC
Length (ft)	13
Diameter (in.)	2
Slot Size (in.)	0.010
Slot Type	Machine Slotted

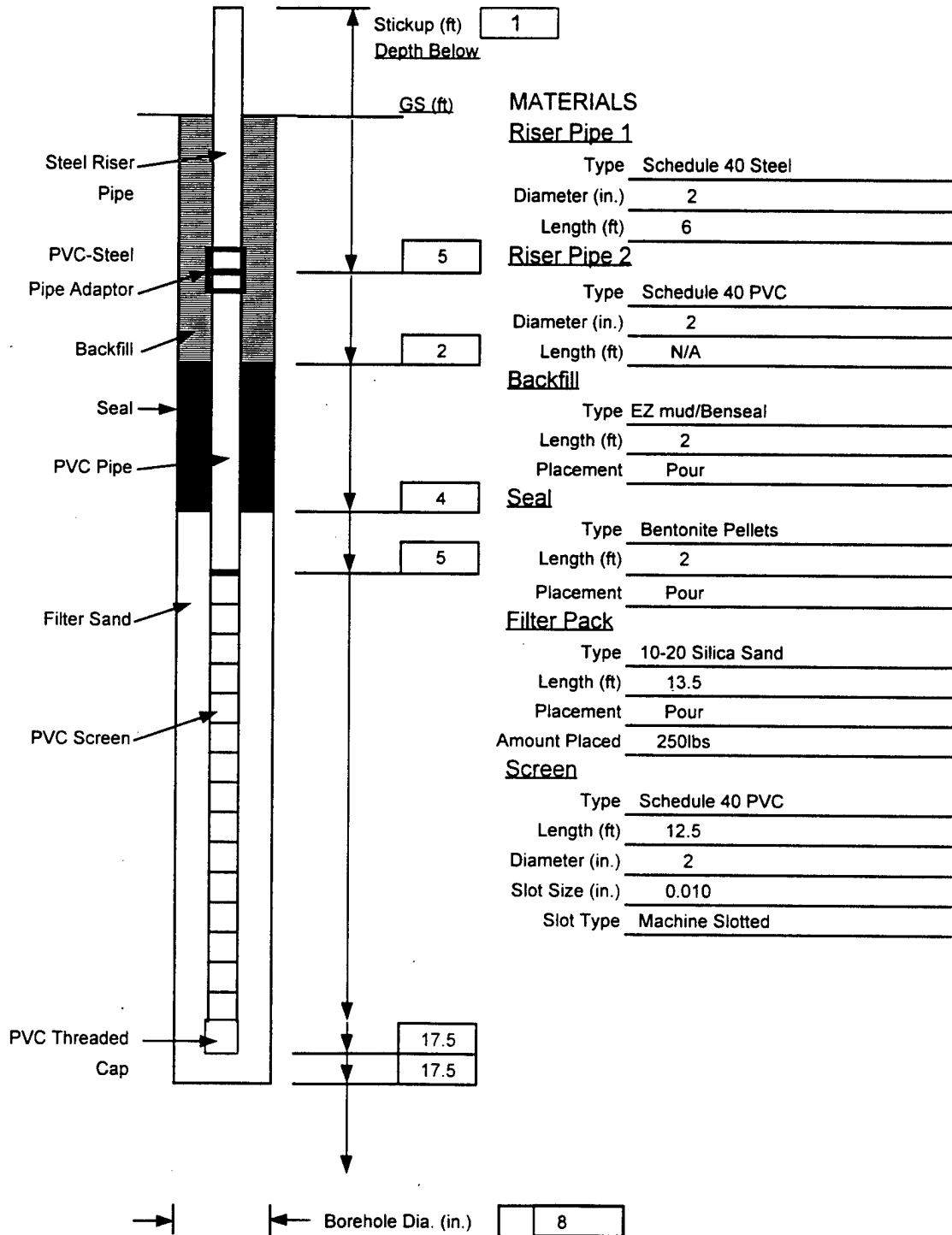
Borehole Dia. (in.) 8

BOREHOLE LOG

Project Name: Loring AFB		Borehole No.: AEW-33			
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 9/3/98	Date Completed: 9/3/98		
Driller: Great Works Drilling		Total Depth (ft):		18.5	
Equipment: Mobile B59		Depth to Bedrock (ft):		18.5	
Drilling Method: Hollow Stem Auger		Hole Diameter (in):		8	
Drilling Fluid: None		Depth to Water (ft):		TBD	
Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details		Logged By: P. Linley			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-0.5ft: Concrete</div> <div style="margin-bottom: 10px;">0.5-1ft: Fill - Gravel</div> <div style="margin-bottom: 10px;">1-18.5ft: Gravelly clayey silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd.</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">18.5ft: Bedrock: Limestone.</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>					No samples required to be collected during installation

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: AEW-33
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 9/3/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 9/3/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	

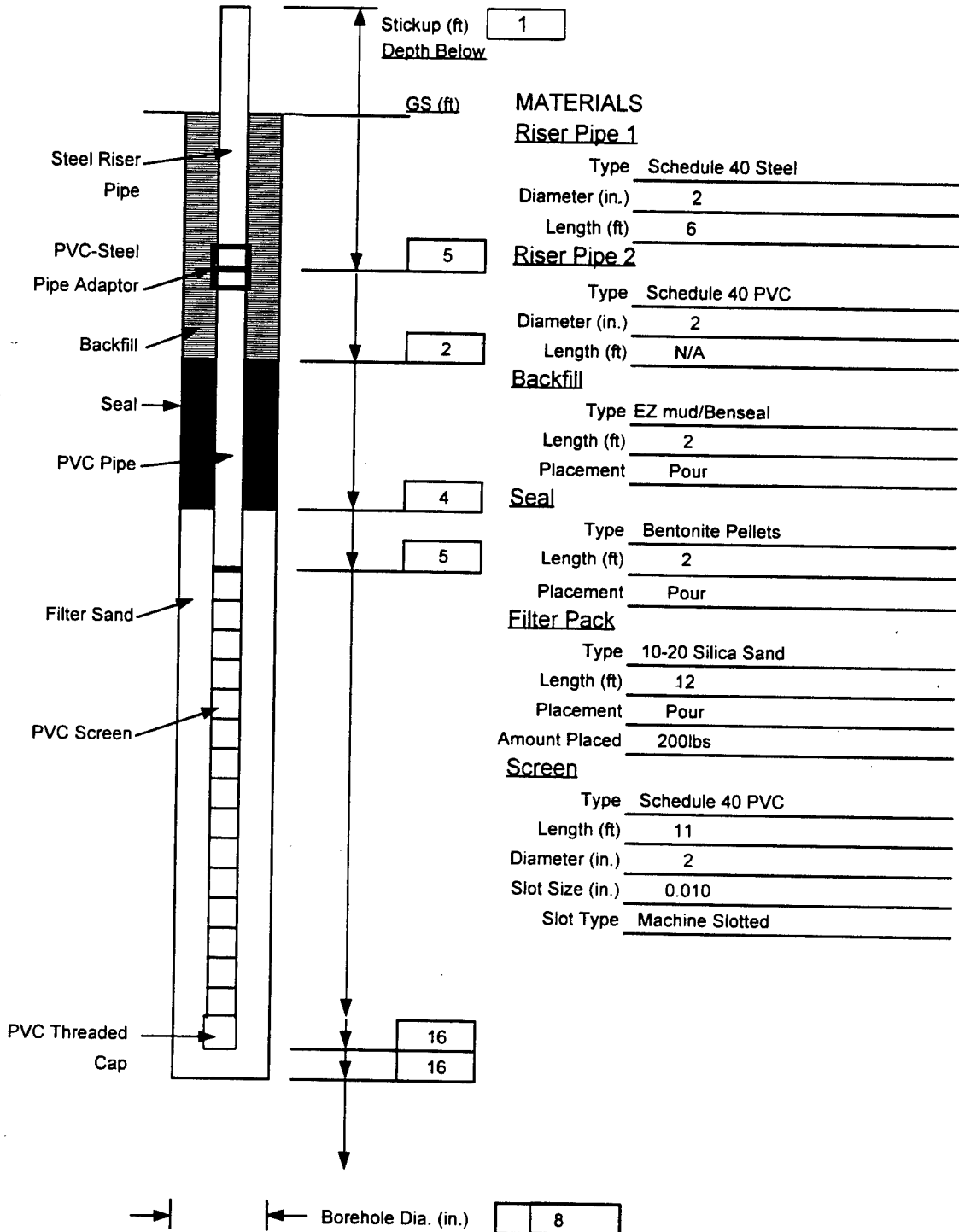


BOREHOLE LOG

Project Name: Loring AFB					Borehole No.: AEW-34
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 9/3/98		Date Completed: 9/3/98	
Driller: Great Works Drilling		Total Depth (ft):		16	
Equipment: Mobile B59		Depth to Bedrock (ft):		16	
Drilling Method: Hollow Stem Auger		Hole Diameter (in):		8	
Drilling Fluid: None		Depth to Water (ft):		TBD	
Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details		Logged By: P. Linley			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-1ft: Concrete</div> <div style="margin-bottom: 10px;">1-2ft: Fill - Gravel</div> <div style="margin-bottom: 10px;">2-16ft: Gravelly clayey silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd.</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">16ft: Bedrock: Limestone.</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>					No samples required to be collected during installation

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: AEW-34
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 9/3/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 9/3/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	

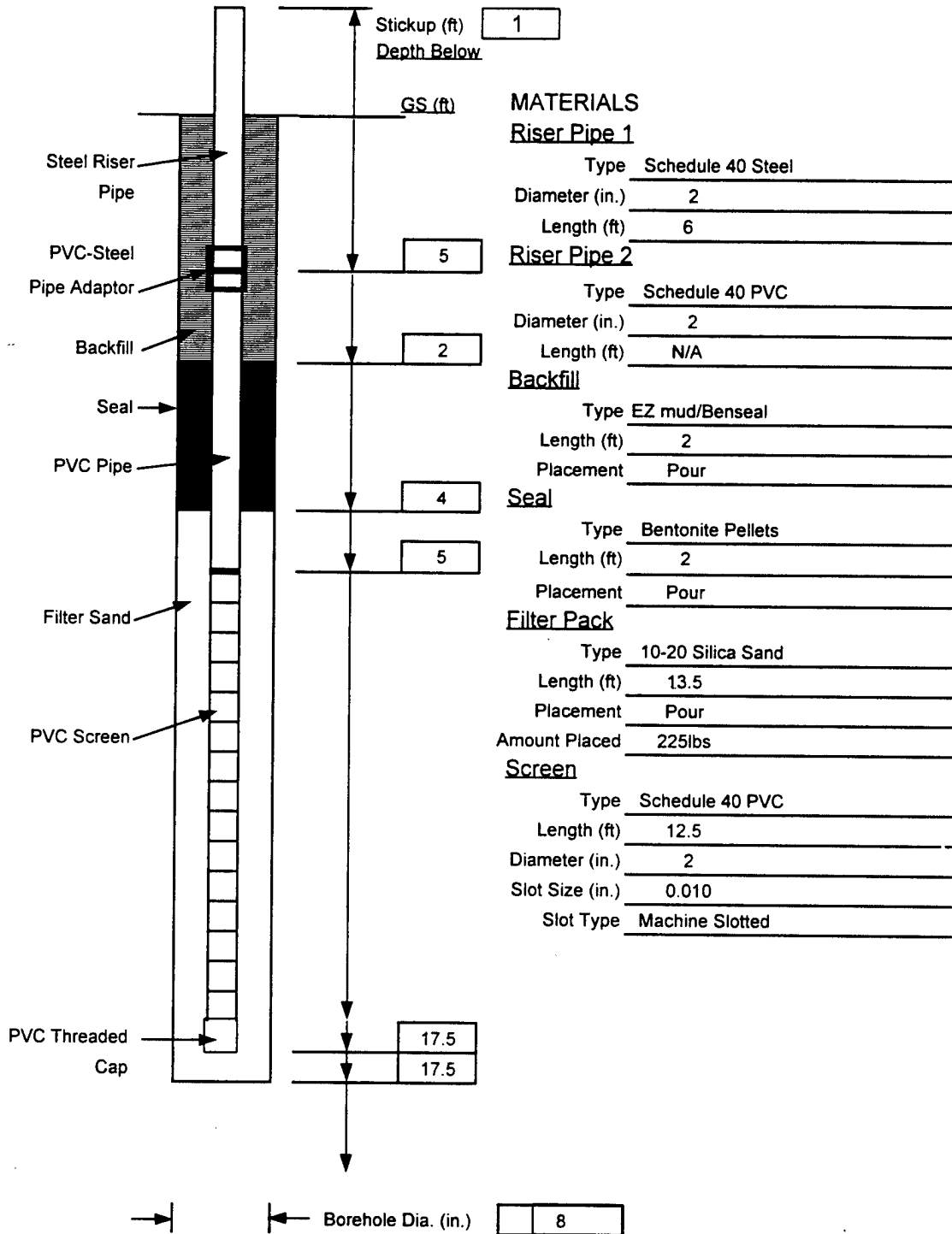


BOREHOLE LOG

Project Name: Loring AFB		Borehole No.: AEW-35			
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 9/3/98	Date Completed: 9/3/98		
Driller: Great Works Drilling		Total Depth (ft):		17.5	
Equipment: Mobile B59		Depth to Bedrock (ft):		17.5	
Drilling Method: Hollow Stem Auger		Hole Diameter (in):		8	
Drilling Fluid: None		Depth to Water (ft):		TBD	
Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details		Logged By: P. Linley			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-17.5ft: Gravelly clayey silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd.</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">17.5ft: Bedrock: Limestone.</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>					No samples required to be collected during installation

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: AEW-35
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 9/3/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 9/3/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	

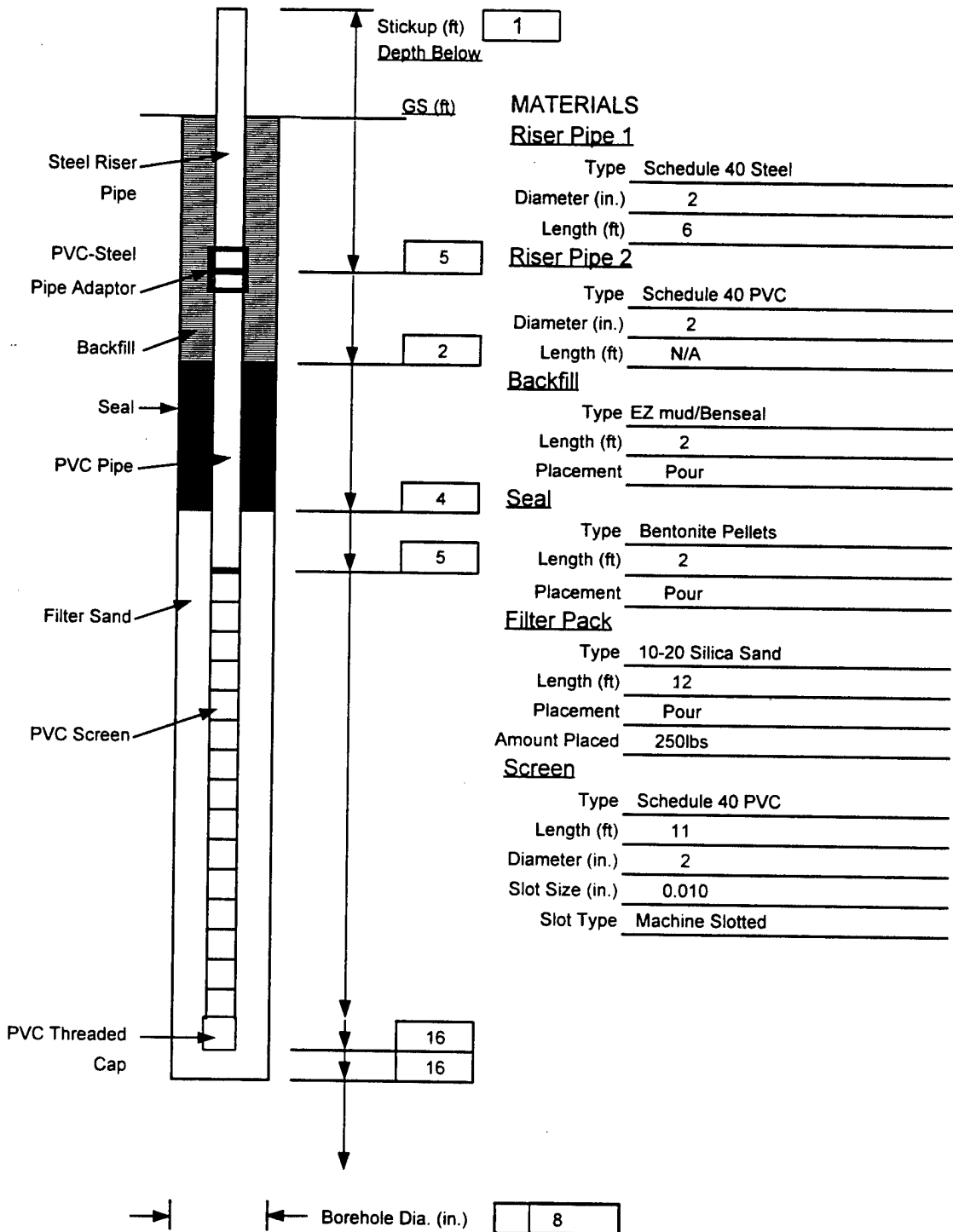


BOREHOLE LOG

Project Name: Loring AFB				Borehole No.: AEW-36	
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 9/9/98		Date Completed: 9/9/98	
Driller: Great Works Drilling		Total Depth (ft): 16			
Equipment: Mobile B59		Depth to Bedrock (ft): 16			
Drilling Method: Hollow Stem Auger		Hole Diameter (in): 8			
Drilling Fluid: None		Depth to Water (ft): TBD			
Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details		Logged By: P. Linley			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-16ft: Gravelly clayey silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd.</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">16ft: Bedrock: Limestone.</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>					No samples required to be collected during installation

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: AEW-36
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 9/9/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 9/9/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	

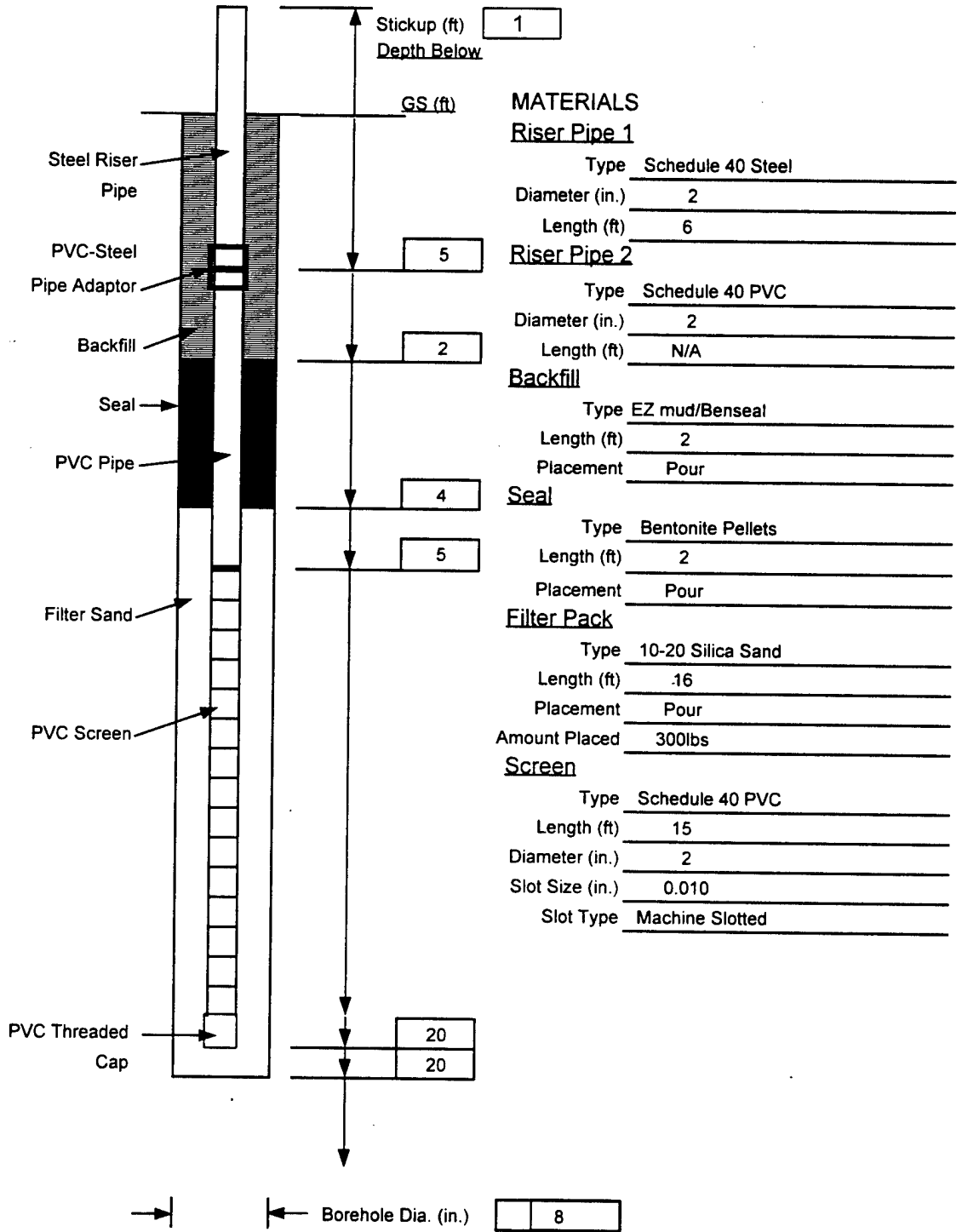


BOREHOLE LOG

Project Name: Loring AFB		Borehole No.: AEW-37			
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 9/2/98	Date Completed: 9/2/98		
Driller: Great Works Drilling		Total Depth (ft): 20			
Equipment: Mobile B59		Depth to Bedrock (ft): 20			
Drilling Method: Hollow Stem Auger		Hole Diameter (in): 8			
Drilling Fluid: None		Depth to Water (ft): TBD			
Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details		Logged By: P. Linley			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>	<p>0-20ft: Gravelly clayey silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd.</p> <p>20ft: Bedrock: Limestone.</p>				<p>No samples required to be collected during installation</p>

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB		Site: JEBS		Well No.: AEW-37	
Drilling Company: Great Works Drilling		Project No.: 22748		Logged By: P. Linley	
Driller: D. Bolstridge		Date Started: 9/2/1998		Coordinates: TBD	
Drilling Equipment: Mobile B59		Date Completed: 9/2/1998			
Drilling Method: Hollow Stem Auger		Depth to Water: TBD			
Drilling Fluid: None		Elevation: TBD			

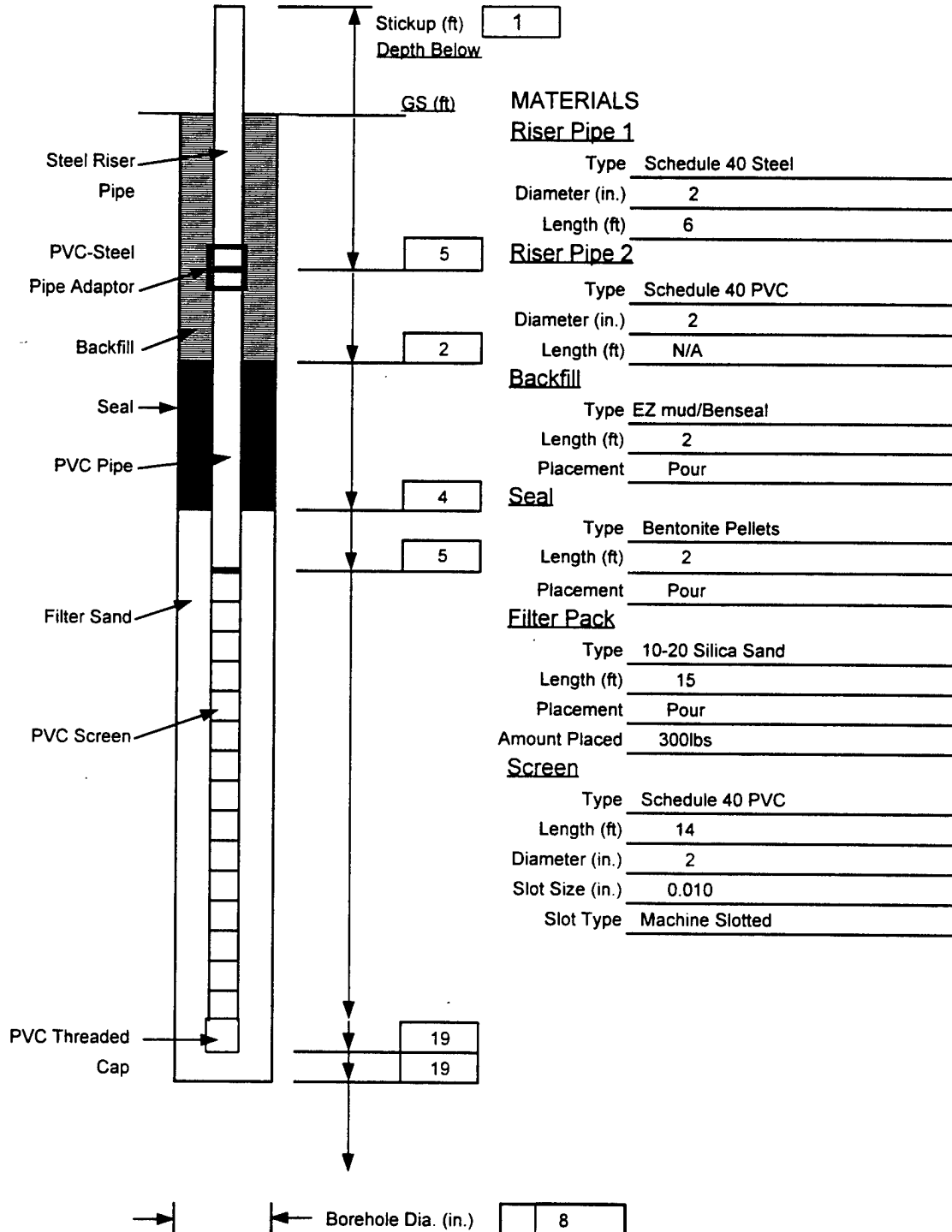


BOREHOLE LOG

Project Name: Loring AFB		Borehole No.: AEW-38			
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 9/2/98	Date Completed: 9/2/98		
Driller: Great Works Drilling		Total Depth (ft): 19			
Equipment: Mobile B59		Depth to Bedrock (ft): 19			
Drilling Method: Hollow Stem Auger		Hole Diameter (in): 8			
Drilling Fluid: None		Depth to Water (ft): TBD			
Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details		Logged By: P. Linley			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-19ft: Gravelly clayey silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd.</div> <div style="margin-bottom: 10px;">5ft: Moist.</div> <div style="margin-bottom: 10px;">19ft: Bedrock: Limestone.</div> </div>					No samples required to be collected during installation

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: AEW-38
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 9/2/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 9/2/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	

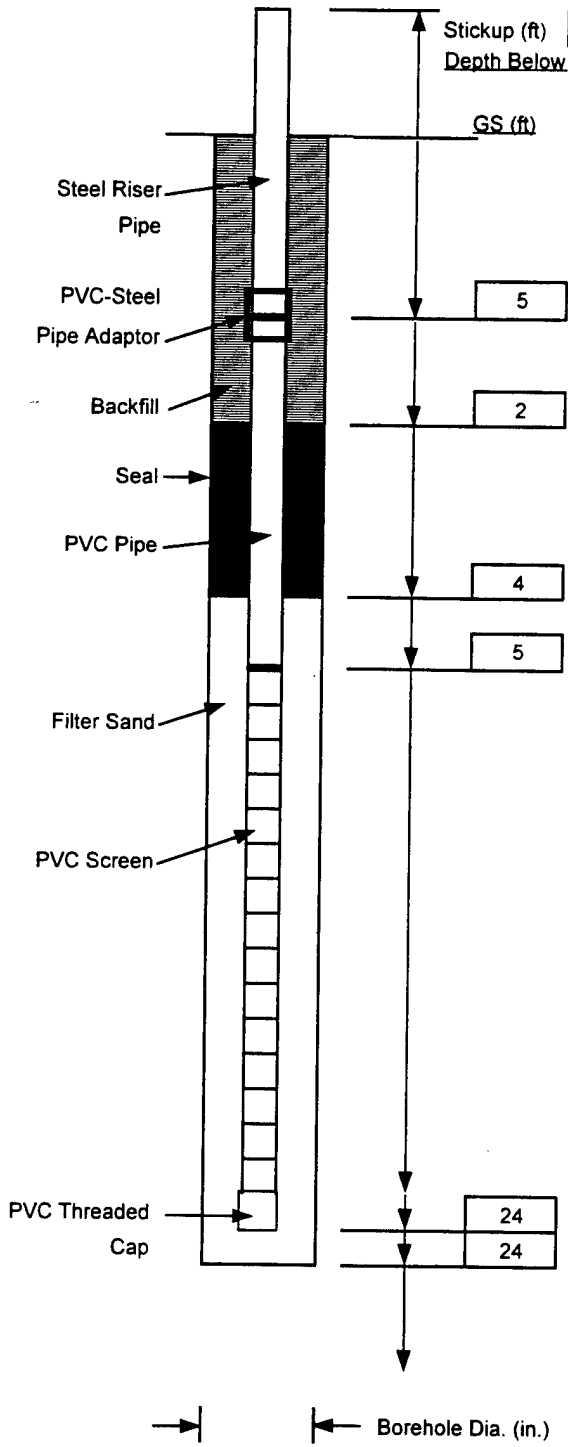


BOREHOLE LOG

Project Name: Loring AFB		Borehole No.: AEW-39			
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 9/3/98	Date Completed: 9/3/98		
Driller: Great Works Drilling		Total Depth (ft): 24			
Equipment: Mobile B59		Depth to Bedrock (ft): 24			
Drilling Method: Hollow Stem Auger		Hole Diameter (in): 8			
Drilling Fluid: None		Depth to Water (ft): TBD			
Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details		Logged By: P. Linley			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-0.25ft: Asphalt</div> <div style="margin-bottom: 10px;">0.25-0.75ft: Fill - Gravel</div> <div style="margin-bottom: 10px;">0.75-24ft: Gravelly clayey silt: (ML), Lt olive gry (5Y6/4) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd.</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">24ft: Bedrock: Limestone.</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>					No samples required to be collected during installation

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: AEW-39
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 9/3/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 9/3/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	



MATERIALS

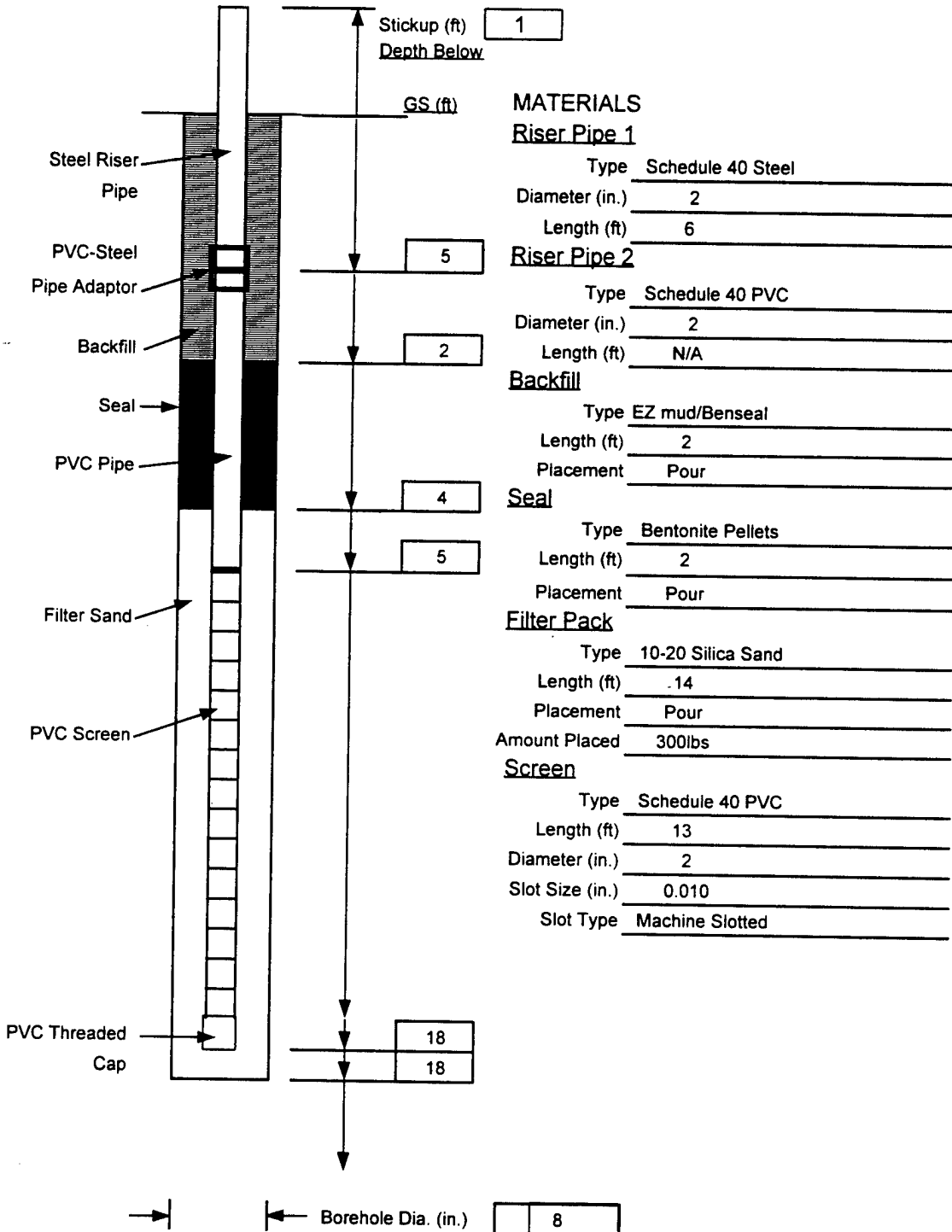
Riser Pipe 1	
Type	Schedule 40 Steel
Diameter (in.)	2
Length (ft)	6
Riser Pipe 2	
Type	Schedule 40 PVC
Diameter (in.)	2
Length (ft)	N/A
Backfill	
Type	EZ mud/Benseal
Length (ft)	2
Placement	Pour
Seal	
Type	Bentonite Pellets
Length (ft)	2
Placement	Pour
Filter Pack	
Type	10-20 Silica Sand
Length (ft)	16
Placement	Pour
Amount Placed	.350lbs
Screen	
Type	Schedule 40 PVC
Length (ft)	15
Diameter (in.)	2
Slot Size (in.)	0.010
Slot Type	Machine Slotted

BOREHOLE LOG

Project Name: Loring AFB					Borehole No.: AEW-40
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 9/9/98		Date Completed: 9/9/98	
Driller: Great Works Drilling		Total Depth (ft):		18	
Equipment: Mobile B59		Depth to Bedrock (ft):		18	
Drilling Method: Hollow Stem Auger		Hole Diameter (in):		8	
Drilling Fluid: None		Depth to Water (ft):		TBD	
Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details		Logged By: P. Linley			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
0-18ft: Gravelly clayey silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd. 5 8ft: V moist to wet. 10 12ft: Clay fraction increase to 15%. 15 18ft: Bedrock: Limestone. 20 25 30					No samples required to be collected during installation

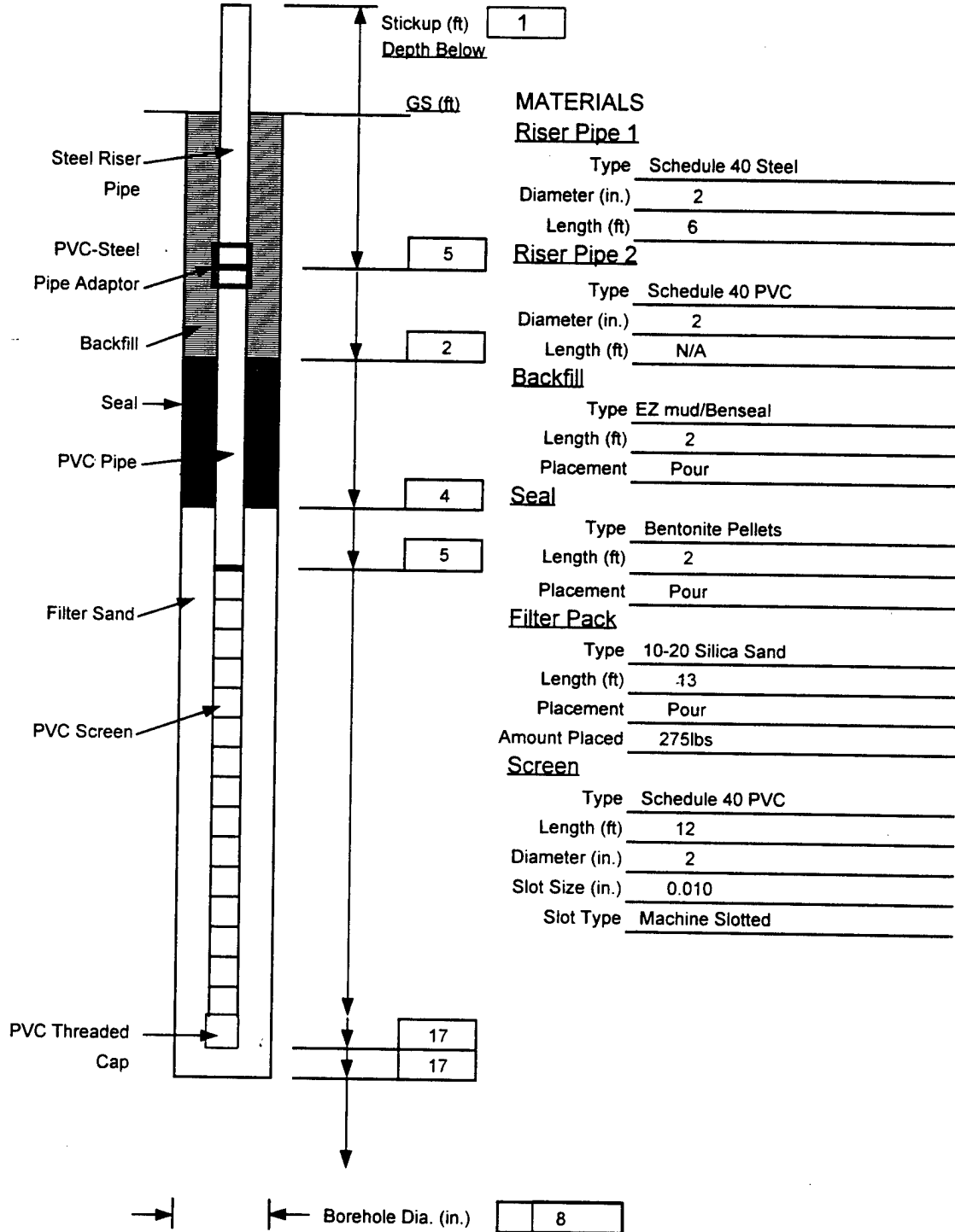
SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: AEW-40
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 9/9/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 9/9/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	



SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: AEW-41
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 9/12/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 9/12/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	

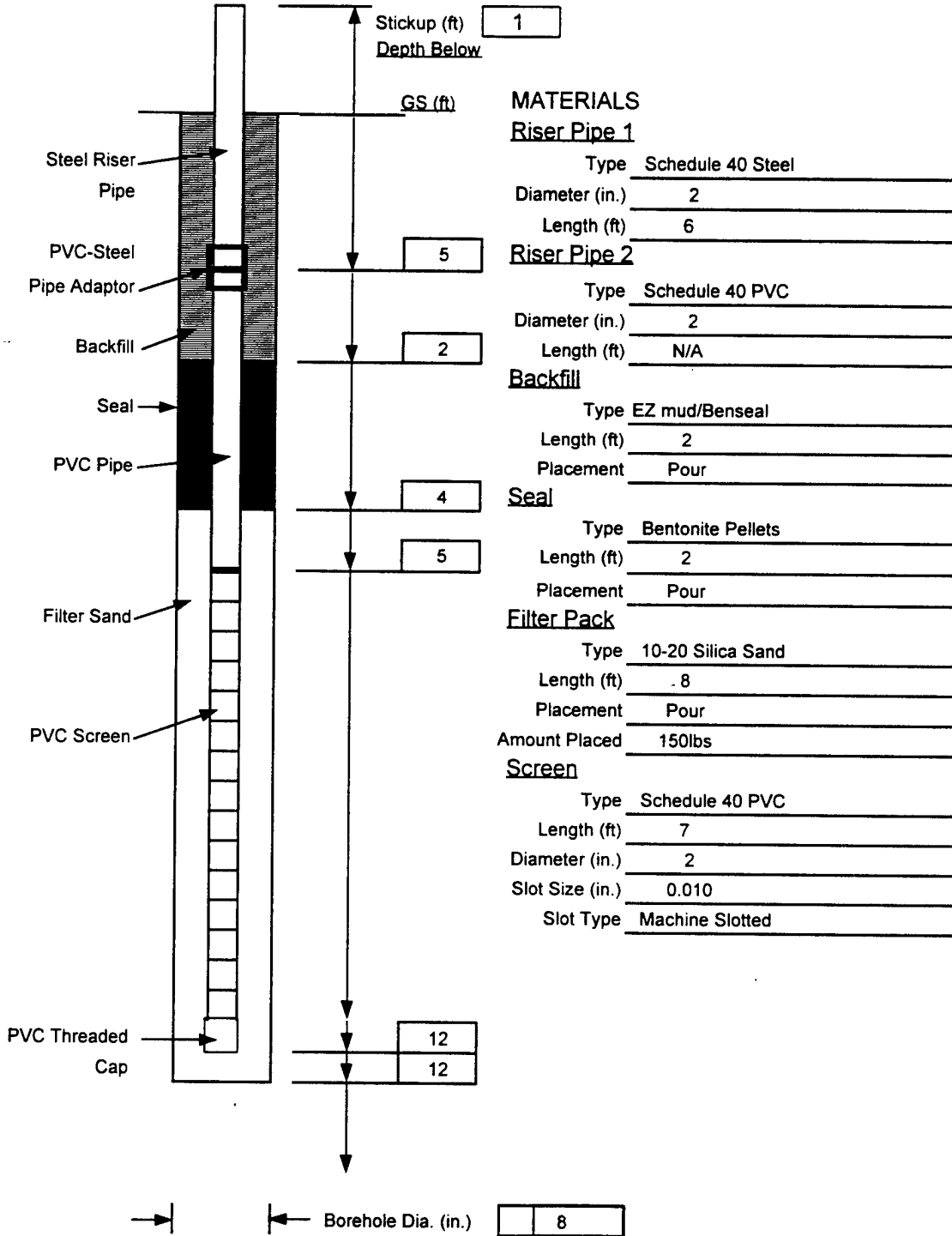


BOREHOLE LOG

Project Name: Loring AFB		Borehole No.: AEW-42			
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 9/11/98	Date Completed: 9/11/98		
Driller: Great Works Drilling		Total Depth (ft): 12			
Equipment: Mobile B59		Depth to Bedrock (ft): 12			
Drilling Method: Hollow Stem Auger		Hole Diameter (in): 8			
Drilling Fluid: None		Depth to Water (ft): TBD			
Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details		Logged By: P. Bond			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-12ft: Gravelly silt/clay w/sand: (ML), olive gry (5Y4/1), gravels, 1cm mostly rounded, Larger ones mostly angular, moist to dry soils, w/depth color becomes intermingled w/mod olive brn (5Y4/4).</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">12ft: Bedrock: Limestone.</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>					No samples required to be collected during installation

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: AEW-42
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Bond
Driller: D. Bolstridge	Date Started: 9/11/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 9/11/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	

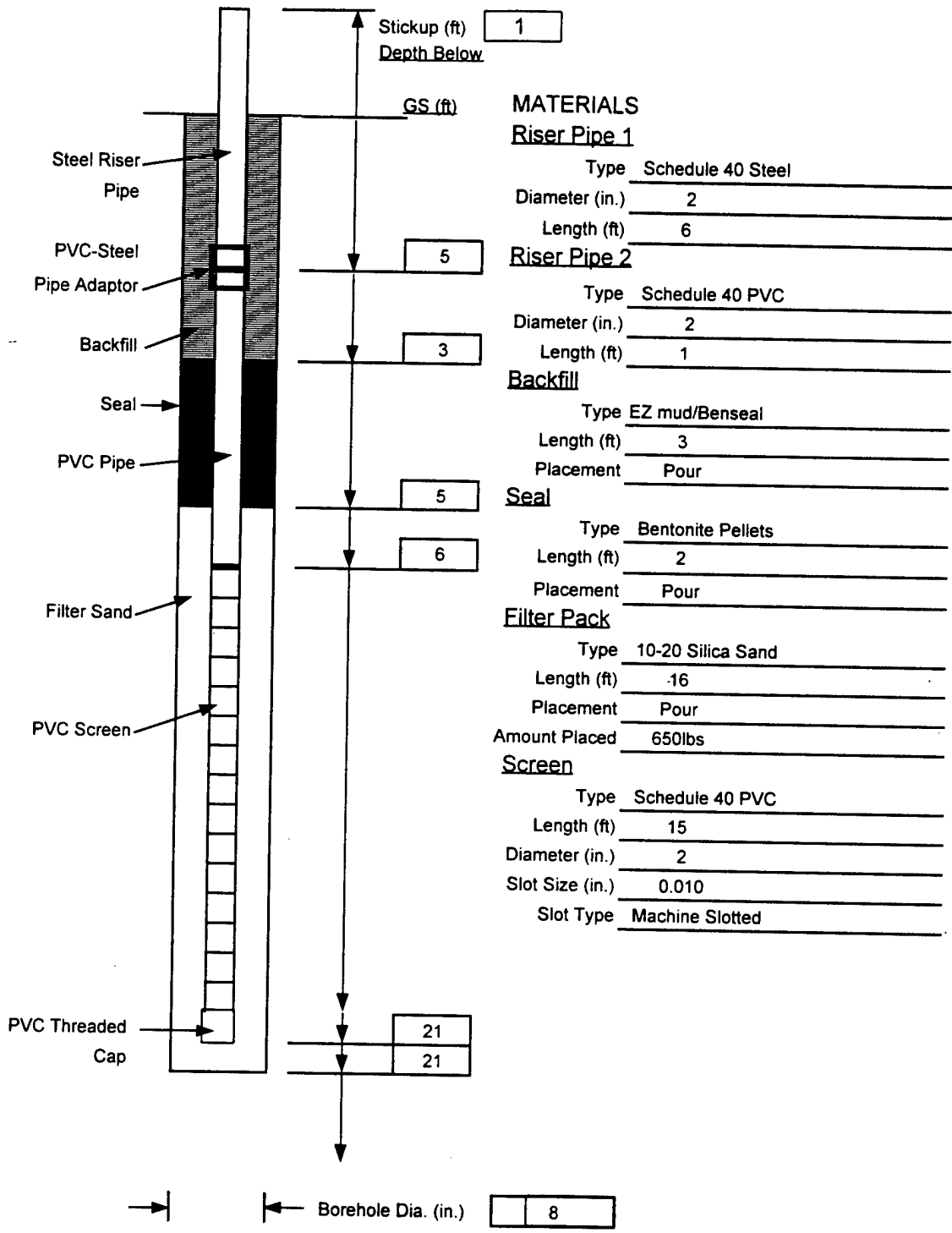


BOREHOLE LOG

Project Name: <i>Loring AFB</i>					Borehole No.: <i>AEW-43</i>
Project Number: <i>22784</i>		Elevation: <i>TBD</i>			
Location: <i>JEBS</i>		Date Started: <i>9/2/98</i>	Date Completed: <i>9/2/98</i>		
Driller: <i>Great Works Drilling</i>		Total Depth (ft):		<i>21</i>	
Equipment: <i>Mobile B59</i>		Depth to Bedrock (ft):		<i>21</i>	
Drilling Method: <i>Hollow Stem Auger</i>		Hole Diameter (in):		<i>8</i>	
Drilling Fluid: <i>None</i>		Depth to Water (ft):		<i>TBD</i>	
Completion: <i>Completed as a Soil Vapor Extraction Well See Construction Log for details</i>		Logged By: <i>P. Linley</i>			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>	<p>0-21ft: Gravelly clayey silt: (<i>ML</i>), Lt olive gry (<i>5Y6/1</i>) to olive gry (<i>5Y4/1</i>), v fine to fine, unconsld poorly sorted, subang to subrd.</p> <p>21ft: Bedrock: Limestone.</p>				<p>No samples required to be collected during installation</p>

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: AEW-43
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 9/12/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 9/12/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	

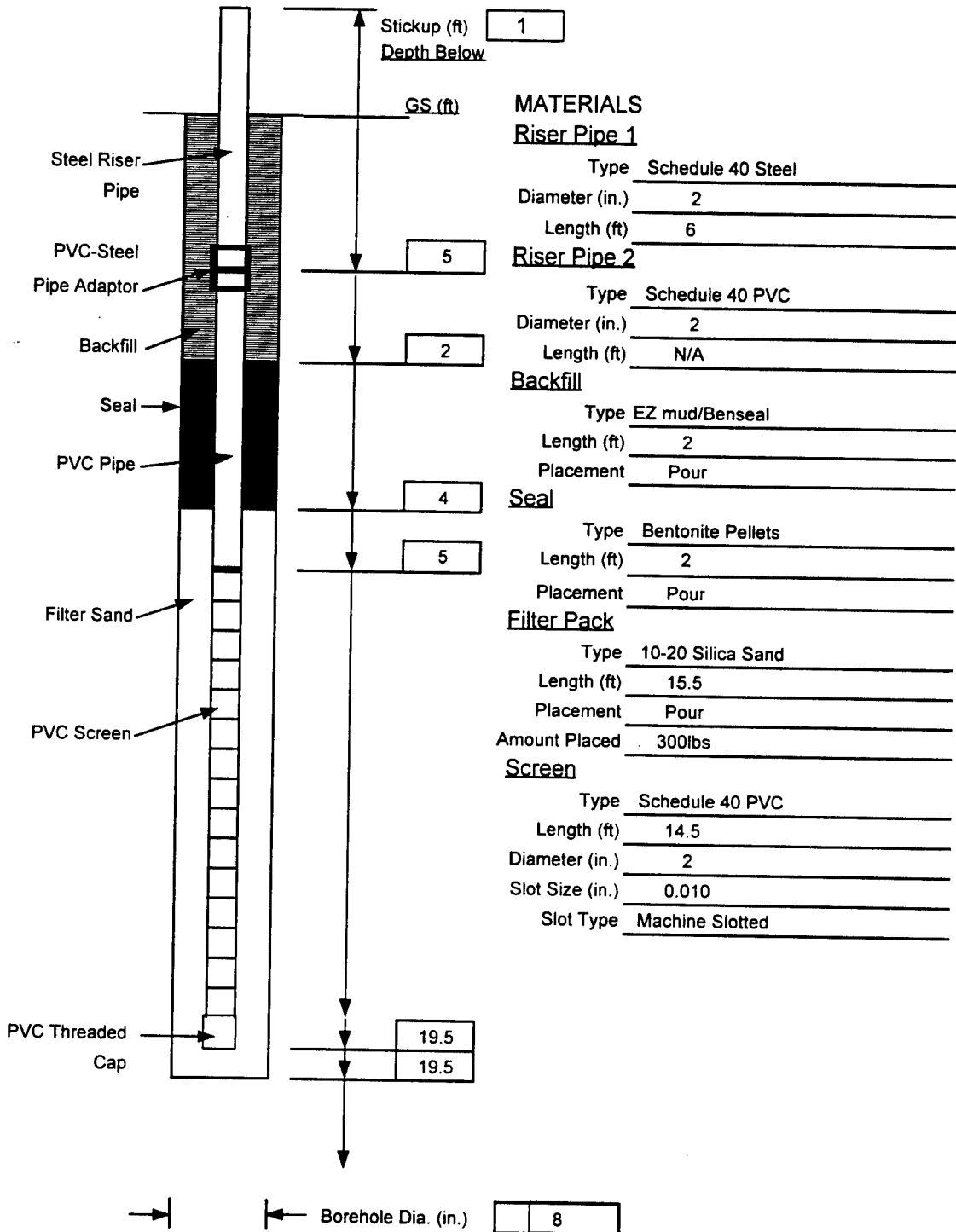


BOREHOLE LOG

Project Name: Loring AFB					Borehole No.: AEW-44
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 9/9/98		Date Completed: 9/9/98	
Driller: Great Works Drilling		Total Depth (ft):		19.5	
Equipment: Mobile B59		Depth to Bedrock (ft):		19.5	
Drilling Method: Hollow Stem Auger		Hole Diameter (in):		8	
Drilling Fluid: None		Depth to Water (ft):		18	
Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details		Logged By: P. Linley			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-0.25ft: Asphalt</div> <div style="margin-bottom: 10px;">0.25-0.75ft: Fill - Gravel</div> <div style="margin-bottom: 10px;">0.75-19.5ft: Gravelly clayey silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, poorly sorted, unconsld, subang to subrd, moist.</div> <div style="margin-bottom: 10px;">3ft: Moist to v moist.</div> <div style="margin-bottom: 10px;">18ft: Wet - soupy cuttings.</div> <div style="margin-bottom: 10px;">19.5ft: Bedrock: Limestone.</div> </div>					No samples required to be collected during installation

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: AEW-44
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 9/9/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 9/9/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: 18	
Drilling Fluid: None	Elevation: TBD	

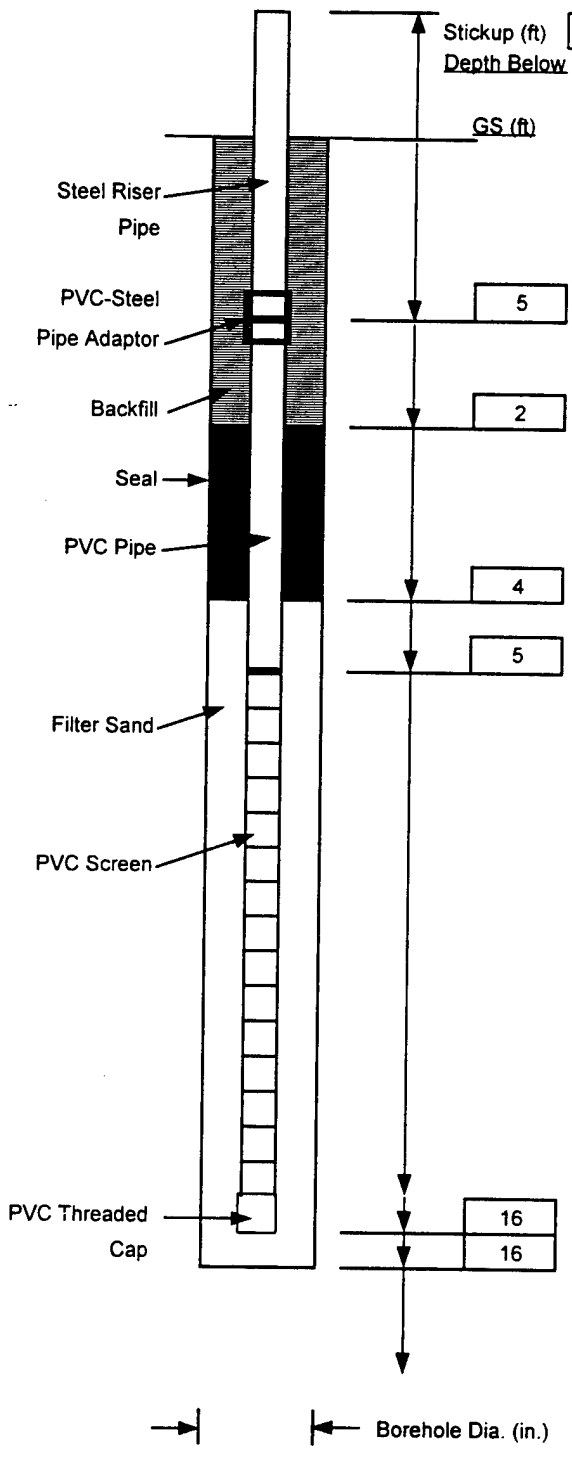


BOREHOLE LOG

Project Name: Loring AFB		Borehole No.: AEW-45			
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 9/12/98	Date Completed: 9/12/98		
Driller: Great Works Drilling		Total Depth (ft): 16			
Equipment: Mobile B59		Depth to Bedrock (ft): 16			
Drilling Method: Hollow Stem Auger		Hole Diameter (in): 8			
Drilling Fluid: None		Depth to Water (ft): TBD			
Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details		Logged By: P. Linley			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-16ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd.</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">16ft: Bedrock: Limestone.</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>					No samples required to be collected during installation

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: AEW-45
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 9/12/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 9/12/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	



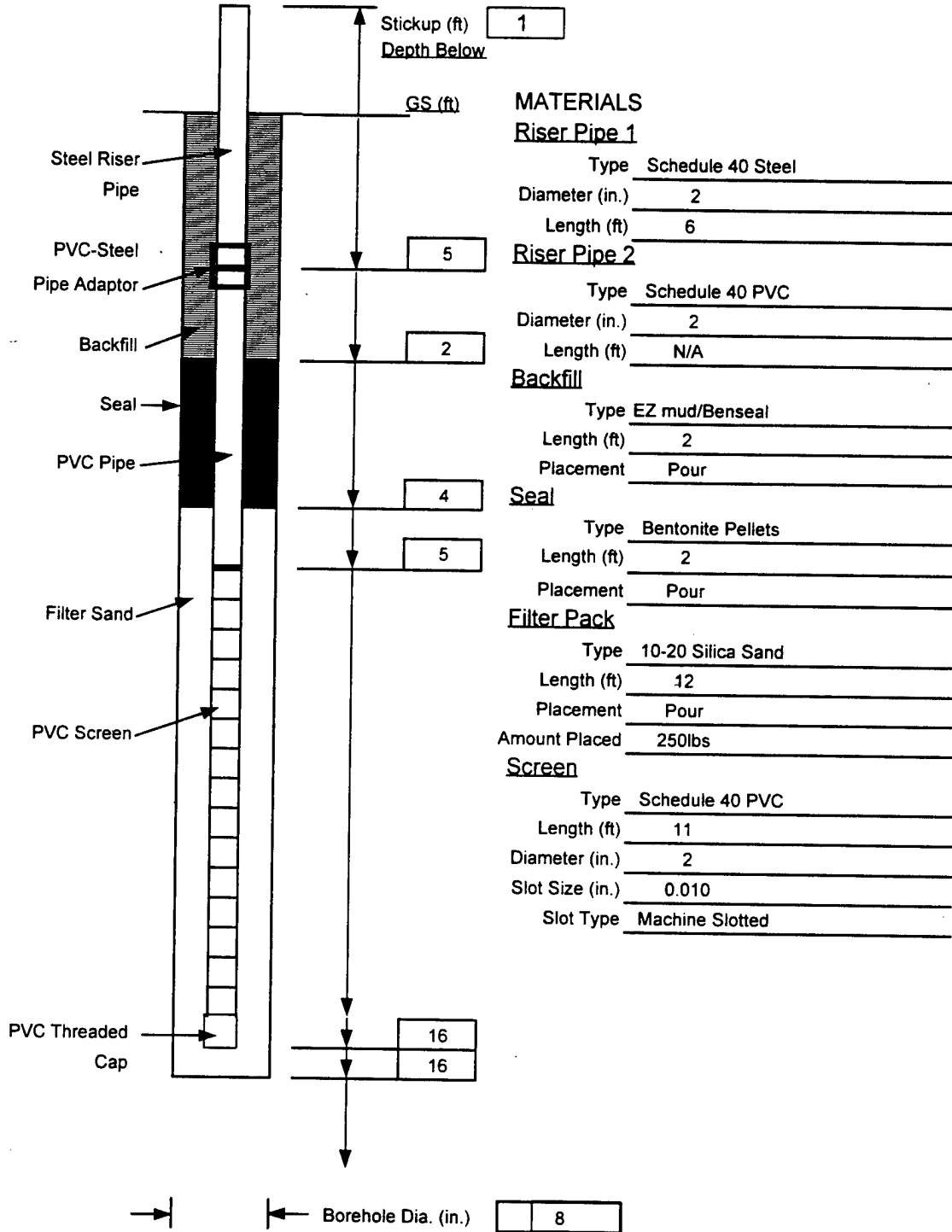
MATERIALS	
Riser Pipe 1	
Type	Schedule 40 Steel
Diameter (in.)	2
Length (ft)	6
Riser Pipe 2	
Type	Schedule 40 PVC
Diameter (in.)	2
Length (ft)	N/A
Backfill	
Type	EZ mud/Benseal
Length (ft)	2
Placement	Pour
Seal	
Type	Bentonite Pellets
Length (ft)	2
Placement	Pour
Filter Pack	
Type	10-20 Silica Sand
Length (ft)	12
Placement	Pour
Amount Placed	250lbs
Screen	
Type	Schedule 40 PVC
Length (ft)	11
Diameter (in.)	2
Slot Size (in.)	0.010
Slot Type	Machine Slotted

BOREHOLE LOG

Project Name: <i>Loring AFB</i>		Borehole No.: <i>AEW-46</i>			
Project Number: <i>22784</i>		Elevation: <i>TBD</i>			
Location: <i>JEBS</i>		Date Started: <i>9/10/98</i>	Date Completed: <i>9/10/98</i>		
Driller: <i>Great Works Drilling</i>		Total Depth (ft): <i>16</i>			
Equipment: <i>Mobile B59</i>		Depth to Bedrock (ft): <i>16</i>			
Drilling Method: <i>Hollow Stem Auger</i>		Hole Diameter (in): <i>8</i>			
Drilling Fluid: <i>None</i>		Depth to Water (ft): <i>TBD</i>			
Completion: <i>Completed as a Soil Vapor Extraction Well</i> <i>See Construction Log for details</i>		Logged By: <i>P. Linley</i>			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-16ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd.</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">16ft: Bedrock: Limestone.</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>					No samples required to be collected during installation

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB		Site: JEBS		Well No.: AEW-46	
Drilling Company: Great Works Drilling		Project No.: 22748		Logged By: P. Linley	
Driller: D. Bolstridge		Date Started: 9/10/1998		Coordinates: TBD	
Drilling Equipment: Mobile B59		Date Completed: 9/10/1998			
Drilling Method: Hollow Stem Auger		Depth to Water: TBD			
Drilling Fluid: None		Elevation: TBD			

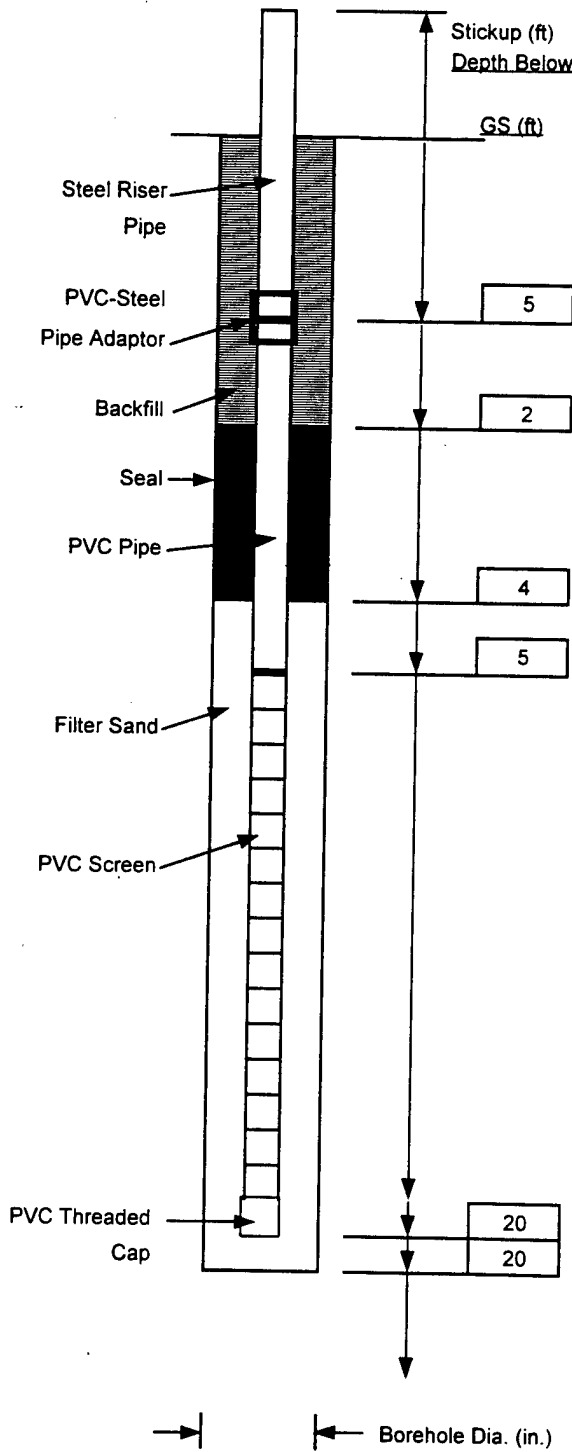


BOREHOLE LOG

Project Name: Loring AFB		Borehole No.: AEW-47			
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 9/2/98	Date Completed: 9/2/98		
Driller: Great Works Drilling		Total Depth (ft): 20			
Equipment: Mobile B59		Depth to Bedrock (ft): 20			
Drilling Method: Hollow Stem Auger		Hole Diameter (in): 8			
Drilling Fluid: None		Depth to Water (ft): TBD			
Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details		Logged By: P. Linley			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-20ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd, moist.</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">7-7.5ft: Cobble zone.</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>	<div style="margin-bottom: 10px;">20ft: Bedrock: Limestone.</div>				No samples required to be collected during installation

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: AEW-47
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 9/2/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 9/2/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	



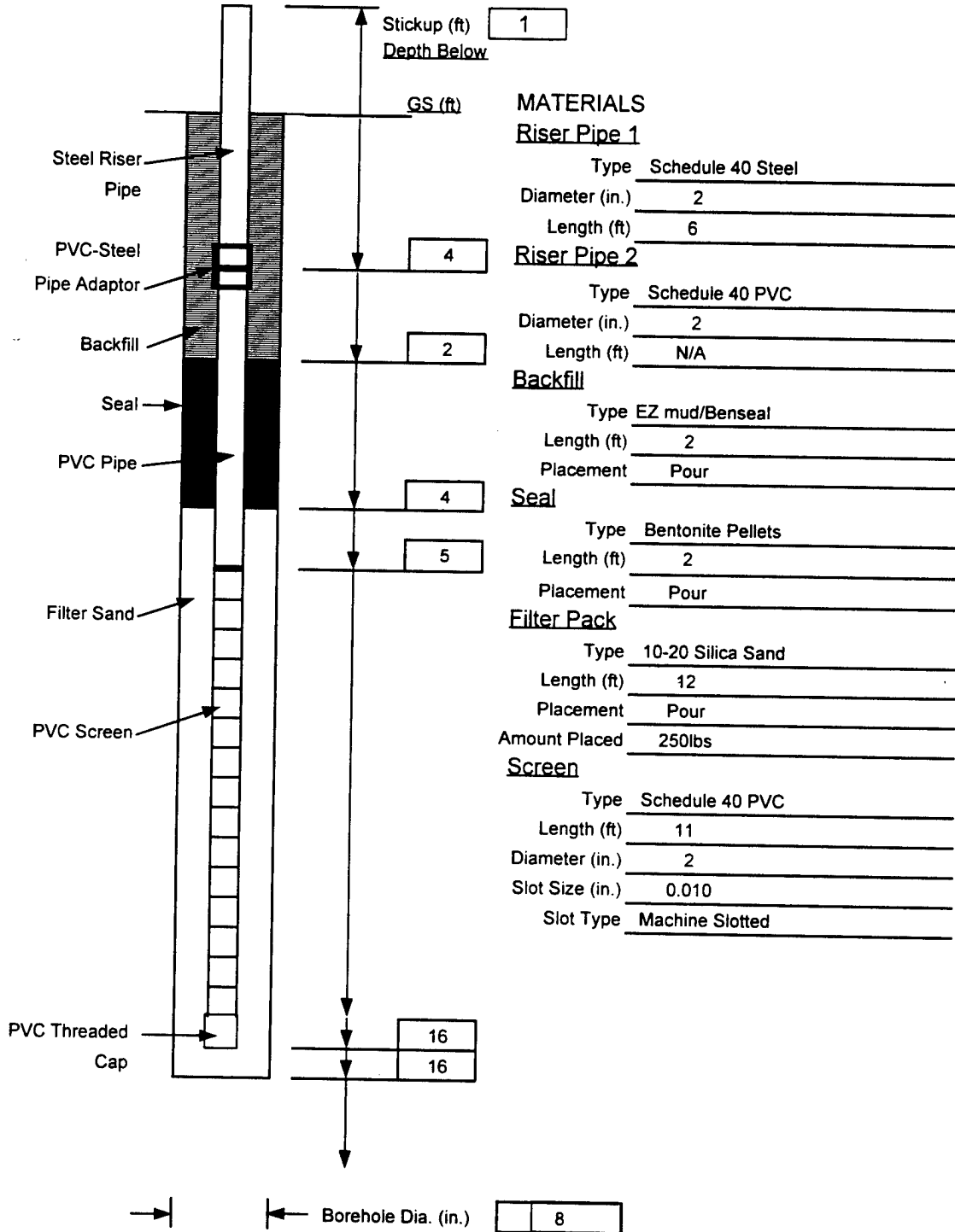
MATERIALS	
Riser Pipe 1	
Type	Schedule 40 Steel
Diameter (in.)	2
Length (ft)	6
Riser Pipe 2	
Type	Schedule 40 PVC
Diameter (in.)	2
Length (ft)	N/A
Backfill	
Type	EZ mud/Benseal
Length (ft)	2
Placement	Pour
Seal	
Type	Bentonite Pellets
Length (ft)	2
Placement	Pour
Filter Pack	
Type	10-20 Silica Sand
Length (ft)	16
Placement	Pour
Amount Placed	300lbs
Screen	
Type	Schedule 40 PVC
Length (ft)	15
Diameter (in.)	2
Slot Size (in.)	0.010
Slot Type	Machine Slotted

BOREHOLE LOG

Project Name: Loring AFB		Borehole No.: AEW-48			
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 9/12/98	Date Completed: 9/12/98		
Driller: Great Works Drilling		Total Depth (ft):		16	
Equipment: Mobile B59		Depth to Bedrock (ft):		16	
Drilling Method: Hollow Stem Auger		Hole Diameter (in):		8	
Drilling Fluid: None		Depth to Water (ft):		TBD	
Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details		Logged By: P. Linley			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>	<p>0-16ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd.</p> <p>16ft: Bedrock: Limestone.</p>				No samples required to be collected during installation

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: AEW-48
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 9/12/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 9/12/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	

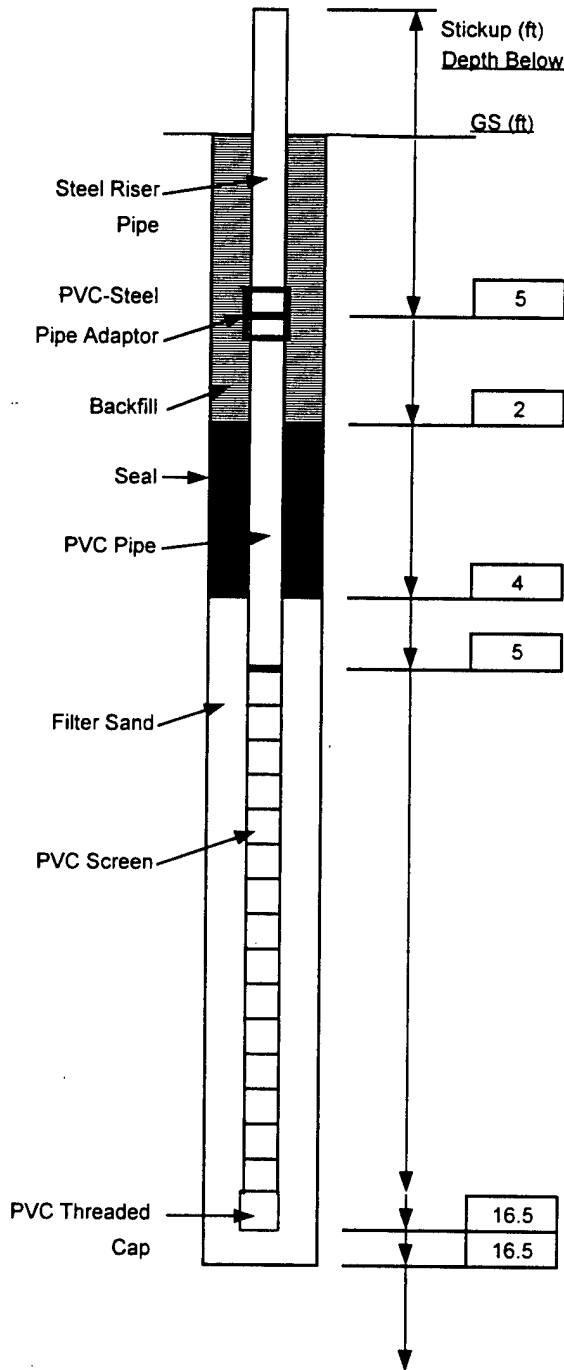


BOREHOLE LOG

Project Name: <i>Loring AFB</i>					Borehole No.: <i>AEW-49</i>
Project Number: <i>22784</i>		Elevation: <i>TBD</i>			
Location: <i>JEBS</i>		Date Started: <i>9/10/98</i>		Date Completed: <i>9/10/98</i>	
Driller: <i>Great Works Drilling</i>		Total Depth (ft): <i>16.5</i>			
Equipment: <i>Mobile B59</i>		Depth to Bedrock (ft): <i>16.5</i>			
Drilling Method: <i>Hollow Stem Auger</i>		Hole Diameter (in): <i>8</i>			
Drilling Fluid: <i>None</i>		Depth to Water (ft): <i>3</i>			
Completion: <i>Completed as Soil Vapor Extraction Well</i> <i>See Construction Log for details</i>		Logged By: <i>P. Linley</i>			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-10ft: Fill - Gravel: Moist.</div> <div style="margin-bottom: 10px;">3ft: Wet.</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>	<div style="margin-bottom: 10px;">10-16.5ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd.</div> <div style="margin-bottom: 10px;">16.5ft: Bedrock: Limestone.</div>				<div style="margin-bottom: 10px;">No samples required to be collected during installation</div>

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: AEW-49
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 9/10/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 9/10/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	



MATERIALS

Riser Pipe 1

Type	Schedule 40 Steel
Diameter (in.)	2
Length (ft)	6

Riser Pipe 2

Type	Schedule 40 PVC
Diameter (in.)	2
Length (ft)	N/A

Backfill

Type	EZ mud/Benseal
Length (ft)	2
Placement	Pour

Seal

Type	Bentonite Pellets
Length (ft)	2
Placement	Pour

Filter Pack

Type	10-20 Silica Sand
Length (ft)	12.5
Placement	Pour
Amount Placed	250lbs

Screen

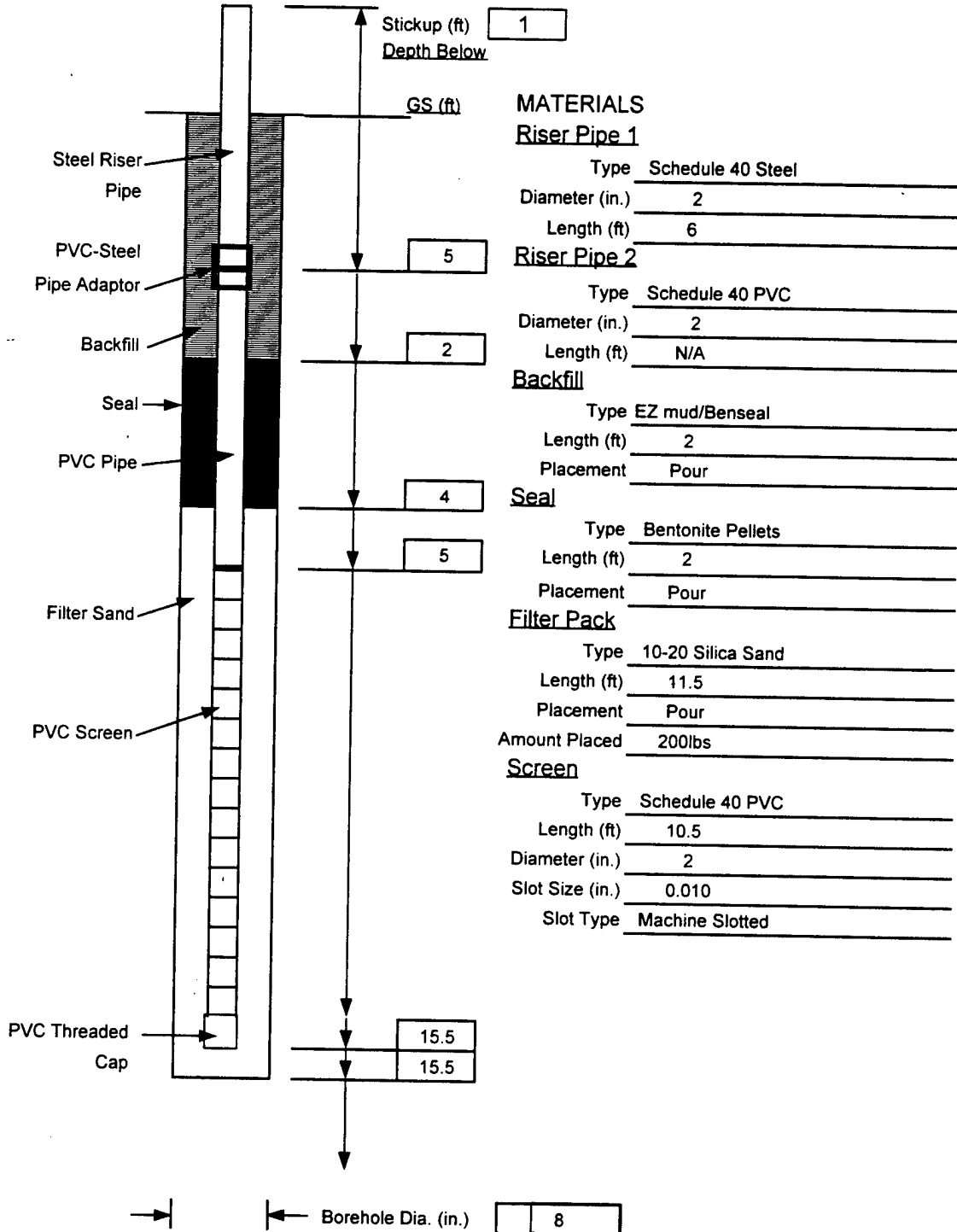
Type	Schedule 40 PVC
Length (ft)	11.5
Diameter (in.)	2
Slot Size (in.)	0.010
Slot Type	Machine Slotted

BOREHOLE LOG

Project Name: Loring AFB		Borehole No.: AEW-50			
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 9/11/98	Date Completed: 9/11/98		
Driller: Great Works Drilling		Total Depth (ft):		15.5	
Equipment: Mobile B59		Depth to Bedrock (ft):		15.5	
Drilling Method: Hollow Stem Auger		Hole Diameter (in):		8	
Drilling Fluid: None		Depth to Water (ft):		TBD	
Completion: Completed as Soil Vapor Extraction Well See Construction Log for details		Logged By: P. Bond			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>	<p>0-15.5ft: Gravelly silty clay w/sand: (ML), Lt olive brn (5Y5/6), gravels to 4cm, mostly rounded edges.</p> <p>15.5ft: Bedrock: Limestone.</p>				No samples required to be collected during installation

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: AEW-50
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Bond
Driller: D. Bolstridge	Date Started: 9/11/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 9/11/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	

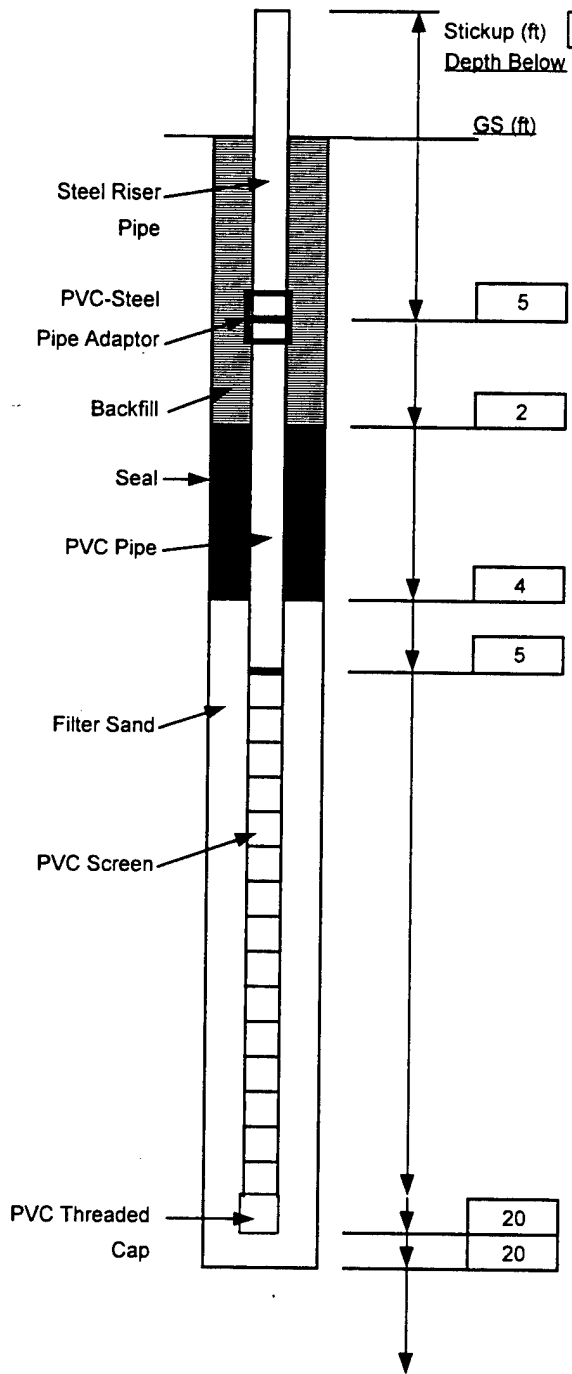


BOREHOLE LOG

Project Name: <i>Loring AFB</i>					Borehole No.: <i>AEW-51</i>
Project Number: <i>22784</i>		Elevation: <i>TBD</i>			
Location: <i>JEBS</i>		Date Started: <i>9/1/98</i>	Date Completed: <i>9/1/98</i>		
Driller: <i>Great Works Drilling</i>		Total Depth (ft):		<i>20</i>	
Equipment: <i>Mobile B59</i>		Depth to Bedrock (ft):		<i>20</i>	
Drilling Method: <i>Hollow Stem Auger</i>		Hole Diameter (in):		<i>8</i>	
Drilling Fluid: <i>None</i>		Depth to Water (ft):		<i>TBD</i>	
Completion: <i>Completed as Soil Vapor Extraction Well</i> <i>See Construction Log for details</i>		Logged By: <i>P. Linley</i>			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-20ft: Gravelly clayey silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd.</div> <div style="margin-bottom: 10px;">5ft: Moist.</div> <div style="margin-bottom: 10px;">8ft: V moist.</div> <div style="margin-bottom: 10px;">10ft: </div> <div style="margin-bottom: 10px;">15ft: </div> <div style="margin-bottom: 10px;">20ft: Bedrock: Limestone.</div> <div style="margin-bottom: 10px;">25ft: </div> <div style="margin-bottom: 10px;">30ft: </div> </div>					No samples required to be collected during installation

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: AEW-51
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 9/1/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 9/1/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	



MATERIALS	
Riser Pipe 1	
Type	Schedule 40 Steel
Diameter (in.)	2
Length (ft)	6
Riser Pipe 2	
Type	Schedule 40 PVC
Diameter (in.)	2
Length (ft)	N/A
Backfill	
Type	EZ mud/Benseal
Length (ft)	2
Placement	Pour
Seal	
Type	Bentonite Pellets
Length (ft)	2
Placement	Pour
Filter Pack	
Type	10-20 Silica Sand
Length (ft)	16
Placement	Pour
Amount Placed	325lbs
Screen	
Type	Schedule 40 PVC
Length (ft)	15
Diameter (in.)	2
Slot Size (in.)	0.010
Slot Type	Machine Slotted

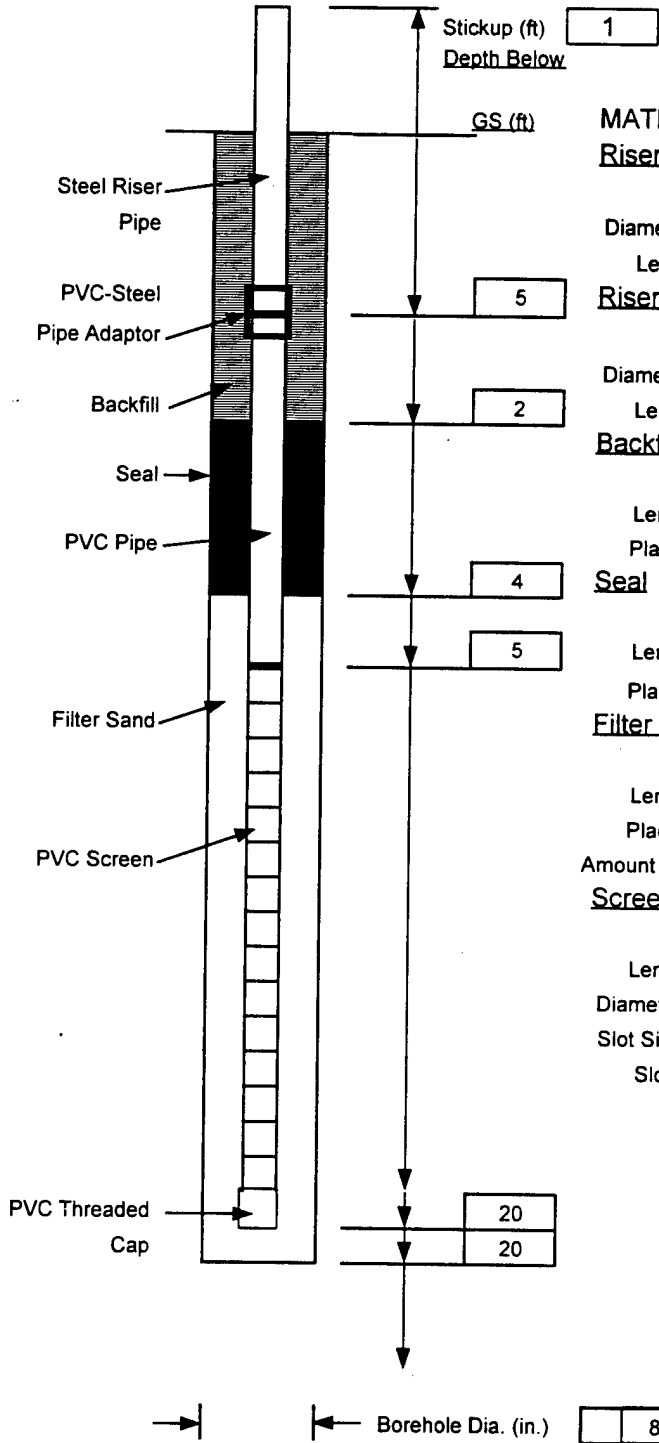
Borehole Dia. (in.) 8

BOREHOLE LOG

Project Name: <i>Loring AFB</i>					Borehole No.: <i>AEW-52</i>
Project Number: <i>22784</i>		Elevation: <i>TBD</i>			
Location: <i>JEBS</i>		Date Started: <i>9/1/98</i>		Date Completed: <i>9/1/98</i>	
Driller: <i>Great Works Drilling</i>		Total Depth (ft): <i>20</i>			
Equipment: <i>Mobile B59</i>		Depth to Bedrock (ft): <i>20</i>			
Drilling Method: <i>Hollow Stem Auger</i>		Hole Diameter (in): <i>8</i>			
Drilling Fluid: <i>None</i>		Depth to Water (ft): <i>TBD</i>			
Completion: <i>Completed as Soil Vapor Extraction Well</i> <i>See Construction Log for details</i>		Logged By: <i>P. Linley</i>			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-20ft: Gravelly silty clay w/sand: (ML), Lt olive brn (5Y5/6), gravels to 4cm, mostly rounded edges.</div> <div style="margin-bottom: 10px;">4-6ft: Cobble zone.</div> <div style="margin-bottom: 10px;">8-8.5ft: Cobble zone.</div> <div style="margin-bottom: 10px;">20ft: Bedrock: Limestone.</div> </div>					No samples required to be collected during installation

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: AEW-52
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 9/1/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 9/1/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	



MATERIALS

Riser Pipe 1

Type	Schedule 40 Steel
Diameter (in.)	2
Length (ft)	6

Riser Pipe 2

Type	Schedule 40 PVC
Diameter (in.)	2
Length (ft)	N/A

Backfill

Type	EZ mud/Benseal
Length (ft)	2
Placement	Pour

Seal

Type	Bentonite Pellets
Length (ft)	2
Placement	Pour

Filter Pack

Type	10-20 Silica Sand
Length (ft)	16
Placement	Pour
Amount Placed	275lbs

Screen

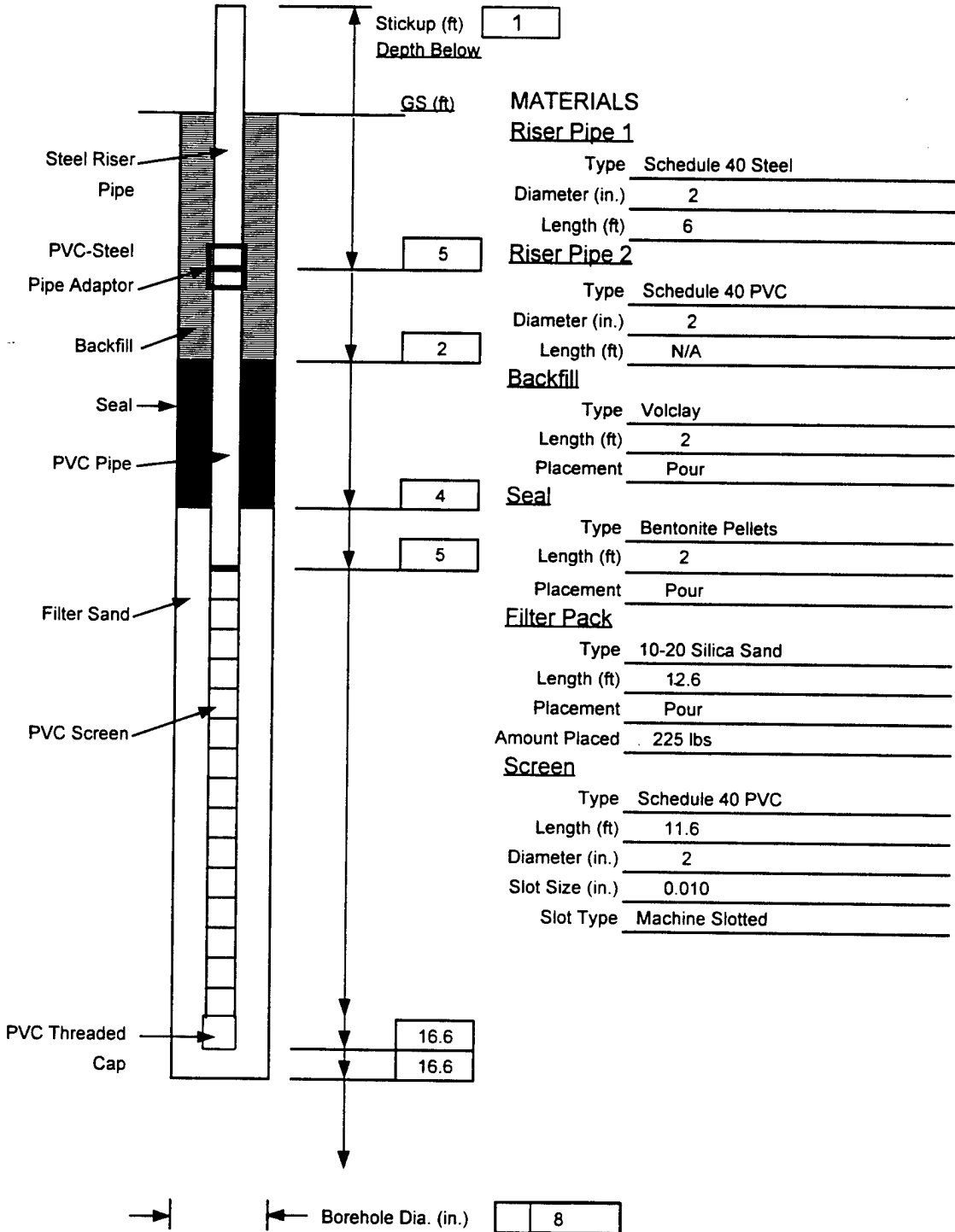
Type	Schedule 40 PVC
Length (ft)	15
Diameter (in.)	2
Slot Size (in.)	0.010
Slot Type	Machine Slotted

BOREHOLE LOG

Project Name: <i>Loring AFB</i>					Borehole No.: <i>PAV-1</i>
Project Number: <i>22784</i>		Elevation: <i>TBD</i>			
Location: <i>JEBS</i>		Date Started: <i>9/11/98</i>	Date Completed: <i>9/11/98</i>		
Driller: <i>Great Works Drilling</i>		Total Depth (ft):		<i>15.6</i>	
Equipment: <i>Mobile B59</i>		Depth to Bedrock (ft):		<i>15.6</i>	
Drilling Method: <i>Hollow Stem Auger</i>		Hole Diameter (in):		<i>8</i>	
Drilling Fluid: <i>None</i>		Depth to Water (ft):		<i>TBD</i>	
Completion: <i>Completed as a Passive Air Vent</i> <i>See Construction Log for details</i>		Logged By: <i>P. Linley</i>			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-0.25ft: Asphalt</div> <div style="margin-bottom: 10px;">0.25-0.75ft: Fill - Gravel</div> <div style="margin-bottom: 10px;">0.75-15.6ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld, poorly sorted, subang to subrd.</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">15.6ft: Bedrock: Limestone.</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>					No samples required for collection. Auger refusal at 3ft BGL, relocated approx. 3ft south southeast of original location.

BIOVENTING WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: PAV-1
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 9/11/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 9/11/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	

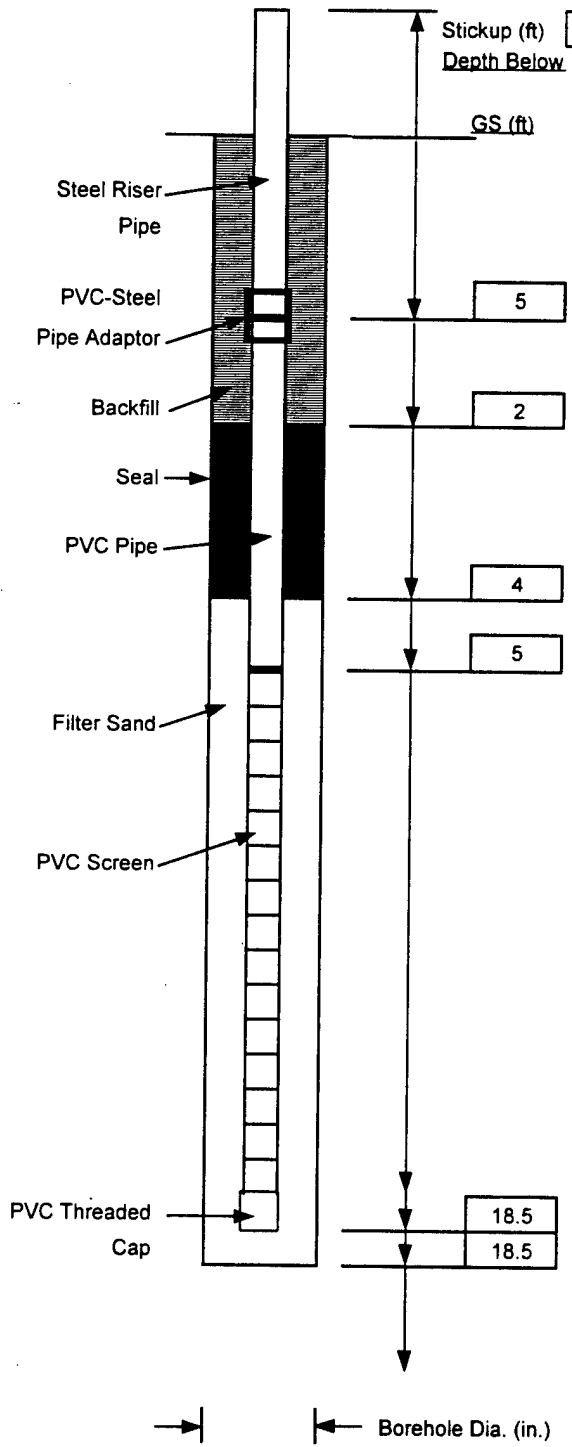


BOREHOLE LOG

Project Name: Loring AFB					Borehole No.: PAV-2
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 9/11/98		Date Completed: 9/11/98	
Driller: Great Works Drilling		Total Depth (ft):		18.5	
Equipment: Mobile B59		Depth to Bedrock (ft):		18.5	
Drilling Method: Hollow Stem Auger		Hole Diameter (in):		8	
Drilling Fluid: None		Depth to Water (ft):		TBD	
Completion: Completed as a Passive Air Vent See Construction Log for details		Logged By: P. Linley			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-0.25ft: Asphalt</div> <div style="margin-bottom: 10px;">0.25-0.75ft: Fill - Gravel</div> <div style="margin-bottom: 10px;">0.75-18.5ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld, poorly sorted, subang to subrd.</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">18.5ft: Bedrock: Limestone.</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>					No samples required for collection.

BIOVENTING WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: PAV-2
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 9/11/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 9/11/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	



MATERIALS	
Riser Pipe 1	
Type	Schedule 40 Steel
Diameter (in.)	2
Length (ft)	6
Riser Pipe 2	
Type	Schedule 40 PVC
Diameter (in.)	2
Length (ft)	N/A
Backfill	
Type	Volclay
Length (ft)	2
Placement	Pour
Seal	
Type	Bentonite Pellets
Length (ft)	2
Placement	Pour
Filter Pack	
Type	10-20 Silica Sand
Length (ft)	14.5
Placement	Pour
Amount Placed	300 lbs
Screen	
Type	Schedule 40 PVC
Length (ft)	13.5
Diameter (in.)	2
Slot Size (in.)	0.010
Slot Type	Machine Slotted

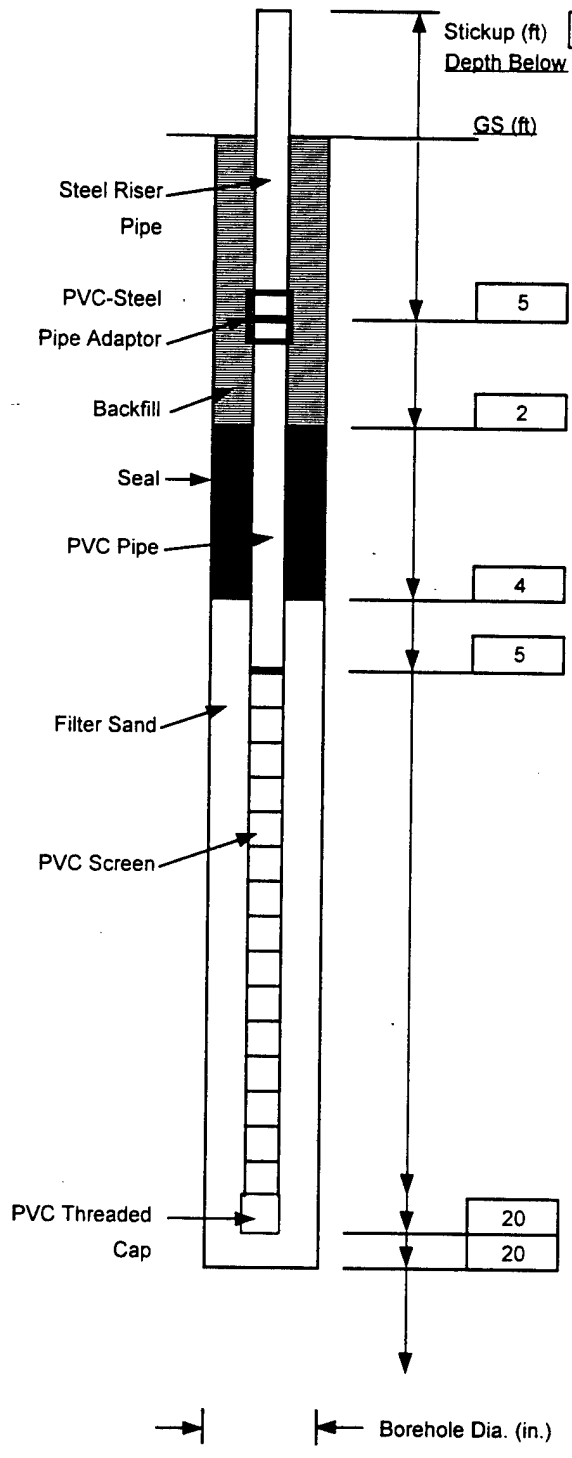
BOREHOLE LOG

Project Name: <i>Loring AFB</i>		Borehole No.: <i>PAV-3</i>	
Project Number: <i>22784</i>		Elevation: <i>TBD</i>	
Location: <i>JEBS</i>		Date Started: <i>8/31/98</i>	Date Completed: <i>8/31/98</i>
Driller: <i>Great Works Drilling</i>		Total Depth (ft): <i>20</i>	
Equipment: <i>Mobile B59</i>		Depth to Bedrock (ft): <i>20</i>	
Drilling Method: <i>Hollow Stem Auger</i>		Hole Diameter (in): <i>8</i>	
Drilling Fluid: <i>None</i>		Depth to Water (ft): <i>TBD</i>	
Completion: <i>Completed as a Passive Air Vent</i> <i>See Construction Log for details</i>		Logged By: <i>P. Linley</i>	

Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>	<p>0-20ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd, gvl 4-5 inches in diameter.</p> <p>8ft: Clay fraction increase to 20%.</p> <p>9ft: Clay fraction decrease to 10%.</p> <p>18ft: Clay fraction increase to 20%, moist to v moist.</p> <p>20ft: Bedrock: Limestone.</p>				<p>No samples required for collection.</p>

BIOVENTING WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: PAV-3
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 8/31/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 8/31/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	



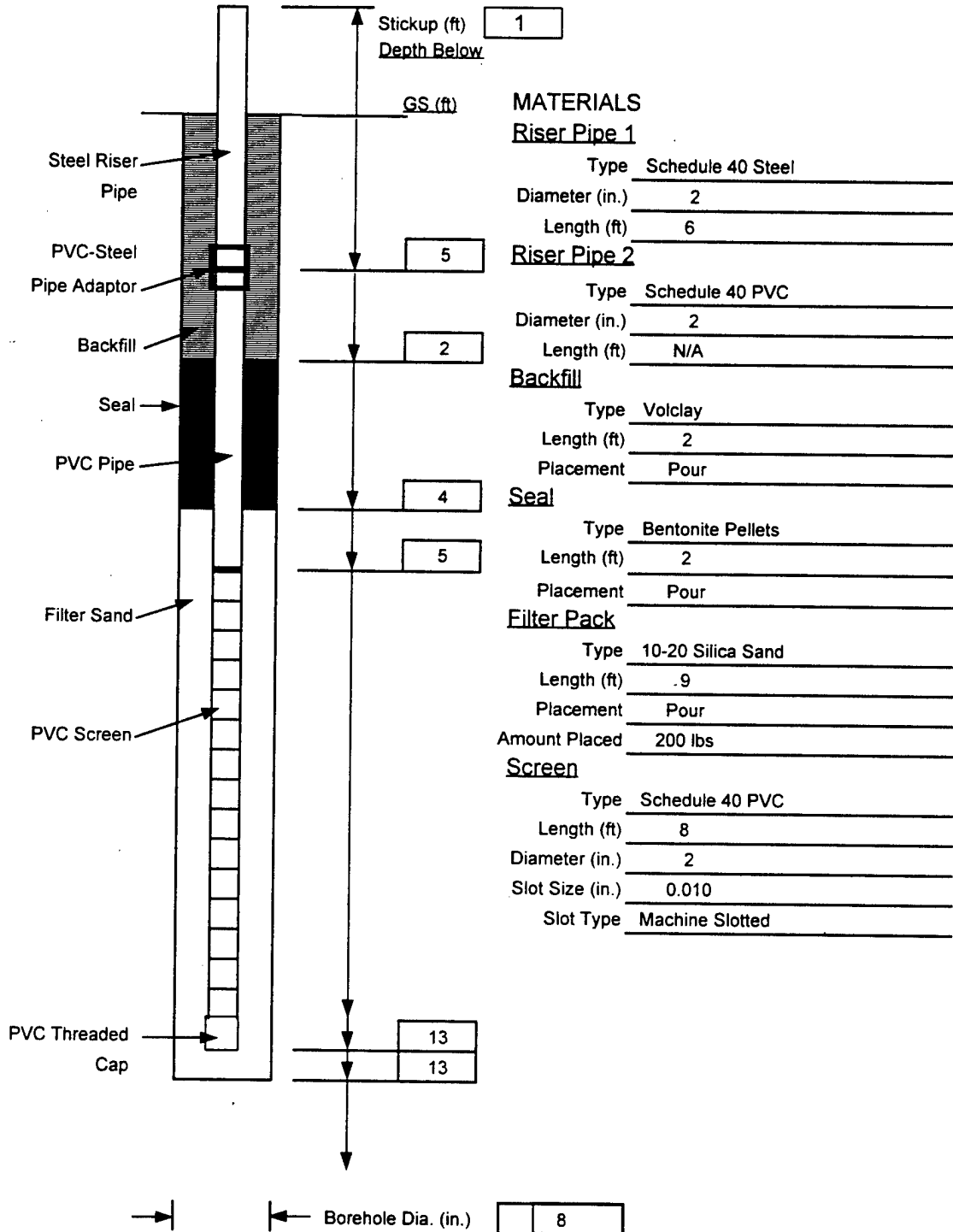
MATERIALS	
Riser Pipe 1	
Type	Schedule 40 Steel
Diameter (in.)	2
Length (ft)	6
Riser Pipe 2	
Type	Schedule 40 PVC
Diameter (in.)	2
Length (ft)	N/A
Backfill	
Type	Volclay
Length (ft)	2
Placement	Pour
Seal	
Type	Bentonite Pellets
Length (ft)	2
Placement	Pour
Filter Pack	
Type	10-20 Silica Sand
Length (ft)	.16
Placement	Pour
Amount Placed	650 lbs
Screen	
Type	Schedule 40 PVC
Length (ft)	15
Diameter (in.)	2
Slot Size (in.)	0.010
Slot Type	Machine Slotted

BOREHOLE LOG

Project Name: <i>Loring AFB</i>		Borehole No.: <i>PAV-4</i>			
Project Number: <i>22784</i>		Elevation: <i>TBD</i>			
Location: <i>JEBS</i>		Date Started: <i>8/31/98</i>	Date Completed: <i>8/31/98</i>		
Driller: <i>Great Works Drilling</i>		Total Depth (ft): <i>13</i>			
Equipment: <i>Mobile B59</i>		Depth to Bedrock (ft): <i>13</i>			
Drilling Method: <i>Hollow Stem Auger</i>		Hole Diameter (in): <i>8</i>			
Drilling Fluid: <i>None</i>		Depth to Water (ft): <i>8</i>			
Completion: <i>Completed as a Passive Air Vent</i> <i>See Construction Log for details</i>		Logged By: <i>P. Linley</i>			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 5px;">0-13ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd, grl to 3-4 inches in diameter.</div> <div style="margin-bottom: 5px;">5</div> <div style="margin-bottom: 5px;">6ft: -v moist, cobble zone.</div> <div style="margin-bottom: 5px;">8ft: Wet - Soupy, septic oder.</div> <div style="margin-bottom: 5px;">10</div> <div style="margin-bottom: 5px;">13ft: Bedrock: Limestone.</div> <div style="margin-bottom: 5px;">15</div> <div style="margin-bottom: 5px;">20</div> <div style="margin-bottom: 5px;">25</div> <div style="margin-bottom: 5px;">30</div> </div>					No samples required for collection.

BIOVENTING WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: PAV-4
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 8/31/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 8/31/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: 8	
Drilling Fluid: None	Elevation: TBD	

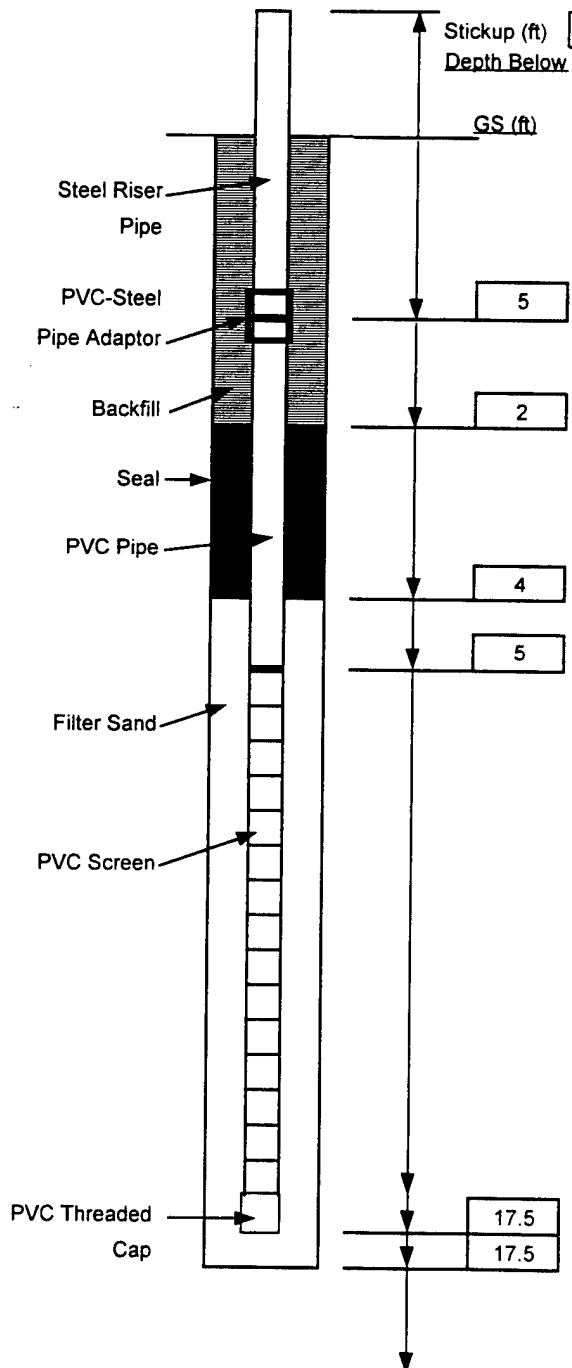


BOREHOLE LOG

Project Name: <i>Loring AFB</i>		Borehole No.: <i>PAV-5</i>			
Project Number: <i>22784</i>		Elevation: <i>TBD</i>			
Location: <i>JEBS</i>		Date Started: <i>9/1/98</i>	Date Completed: <i>9/1/98</i>		
Driller: <i>Great Works Drilling</i>		Total Depth (ft): <i>17.5</i>			
Equipment: <i>Mobile B59</i>		Depth to Bedrock (ft): <i>17.5</i>			
Drilling Method: <i>Hollow Stem Auger</i>		Hole Diameter (in): <i>8</i>			
Drilling Fluid: <i>None</i>		Depth to Water (ft): <i>TBD</i>			
Completion: <i>Completed as a Passive Air Vent</i> <i>See Construction Log for details</i>		Logged By: <i>P. Linley</i>			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-0.5ft: Concrete</div> <div style="margin-bottom: 10px;">0.5-1ft: Fill</div> <div style="margin-bottom: 10px;">1-17.5ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd.</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">17.5ft: Bedrock: Limestone.</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>					No samples required for collection.

BIOVENTING WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: PAV-5
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 9/1/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 9/1/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	



MATERIALS

Riser Pipe 1

Type	Schedule 40 Steel
Diameter (in.)	2
Length (ft)	6

Riser Pipe 2

Type	Schedule 40 PVC
Diameter (in.)	2
Length (ft)	N/A

Backfill

Type	Volclay
Length (ft)	2
Placement	Pour

Seal

Type	Bentonite Pellets
Length (ft)	2
Placement	Pour

Filter Pack

Type	10-20 Silica Sand
Length (ft)	13.5
Placement	Pour
Amount Placed	250 lbs

Screen

Type	Schedule 40 PVC
Length (ft)	12.5
Diameter (in.)	2
Slot Size (in.)	0.010
Slot Type	Machine Slotted

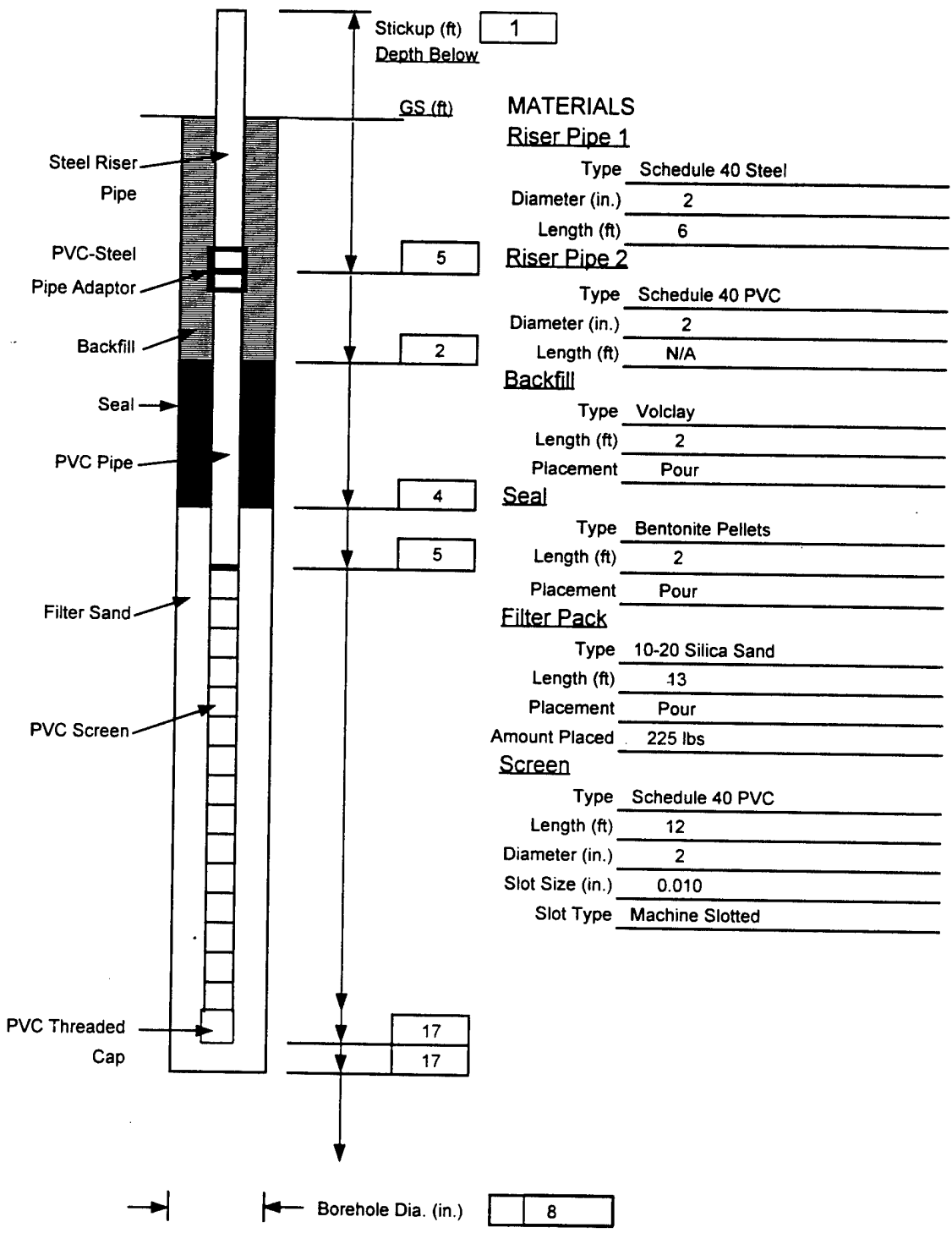
Borehole Dia. (in.) 8

BOREHOLE LOG

Project Name: Loring AFB					Borehole No.: PAV-6
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 9/10/98		Date Completed: 9/10/98	
Driller: Great Works Drilling		Total Depth (ft):		17	
Equipment: Mobile B59		Depth to Bedrock (ft):		17	
Drilling Method: Hollow Stem Auger		Hole Diameter (in):		8	
Drilling Fluid: None		Depth to Water (ft):		TBD	
Completion: Completed as a Passive Air Vent See Construction Log for details		Logged By: P. Linley			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-1ft: Concrete</div> <div style="margin-bottom: 10px;">1-2ft: Fill - Gravel</div> <div style="margin-bottom: 10px;">2-17ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd.</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">17ft: Bedrock: Limestone.</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>					No samples required for collection.

BIOVENTING WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: PAV-6
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 9/10/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 9/10/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	



MATERIALS

Riser Pipe 1

Type	Schedule 40 Steel
Diameter (in.)	2
Length (ft)	6

Riser Pipe 2

Type	Schedule 40 PVC
Diameter (in.)	2
Length (ft)	N/A

Backfill

Type	Volclay
Length (ft)	2
Placement	Pour

Seal

Type	Bentonite Pellets
Length (ft)	2
Placement	Pour

Filter Pack

Type	10-20 Silica Sand
Length (ft)	13
Placement	Pour
Amount Placed	225 lbs

Screen

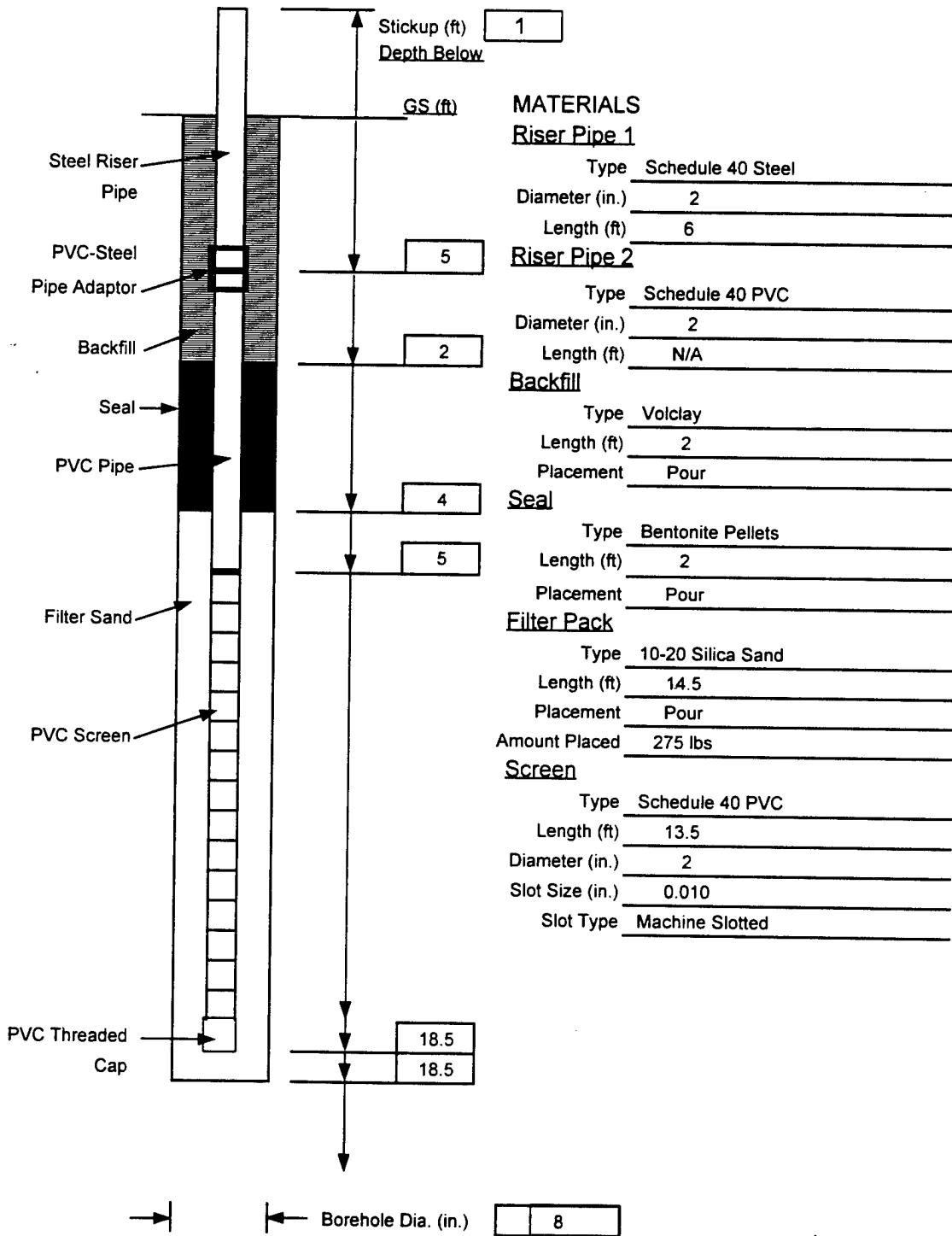
Type	Schedule 40 PVC
Length (ft)	12
Diameter (in.)	2
Slot Size (in.)	0.010
Slot Type	Machine Slotted

BOREHOLE LOG

Project Name: Loring AFB		Borehole No.: PAV-7			
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 9/2/98	Date Completed: 9/2/98		
Driller: Great Works Drilling		Total Depth (ft):		18.5	
Equipment: Mobile B59		Depth to Bedrock (ft):		18.5	
Drilling Method: Hollow Stem Auger		Hole Diameter (in):		8	
Drilling Fluid: None		Depth to Water (ft):		TBD	
Completion: Completed as a Passive Air Vent See Construction Log for details		Logged By: P. Linley			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
0-0.25ft: Asphalt 0.25-0.75ft: Fill - Gravel 0.75-18.5ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid, poorly sorted, subang to subrd, moist. 5 10 15 18.5ft: Bedrock: Limestone. 20 25 30					No samples required for collection.

BIOVENTING WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: PAV-7
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 9/2/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 9/2/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	



BOREHOLE LOG

Project Name: <i>Loring AFB</i>		Borehole No.: <i>PAV-8</i>			
Project Number: <i>22784</i>		Elevation: <i>TBD</i>			
Location: <i>JEBS</i>		Date Started: <i>9/2/98</i>	Date Completed: <i>9/2/98</i>		
Driller: <i>Great Works Drilling</i>		Total Depth (ft): <i>17.5</i>			
Equipment: <i>Mobile B59</i>		Depth to Bedrock (ft): <i>17.5</i>			
Drilling Method: <i>Hollow Stem Auger</i>		Hole Diameter (in): <i>8</i>			
Drilling Fluid: <i>None</i>		Depth to Water (ft): <i>TBD</i>			
Completion: <i>Completed as a Passive Air Vent</i> <i>See Construction Log for details</i>		Logged By: <i>P. Linley</i>			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-0.25ft: Asphalt</div> <div style="margin-bottom: 10px;">0.25-0.75ft: Fill - Gravel</div> <div style="margin-bottom: 10px;">0.75-17.5ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld, poorly sorted, subang to subrd.</div> <div style="margin-bottom: 10px;">7ft: moist.</div> <div style="margin-bottom: 10px;">17.5ft: Bedrock: Limestone.</div> </div>					No samples required for collection.

**REQUEST FOR INFORMATION
(RFI)**

PROJECT NAME: AFCEE - Loring

JOB NO. 22784-006

RFI NO: 292

LOCATION: Limestone, Maine

PAGE 1 OF 1

TO: John Mueller

OF: AFCEE/ERB-L

REFERENCE DRAWING: N/A

SPECIFICATION: N/A

LOCATION: Jet Engine Buildup Shop SVE System

INFORMATION REQUESTED: Install no surface seal at JEBS SVE System well field until it can be determined if necessary to do so. Frozen ground during the winter season will provide a natural surface seal. Well performance, as measured by vacuum and flow, will be recorded during this period and compared to data recorded at startup and during and after spring thaw. Differences in well performance measured during frozen ground conditions (natural surface seal) and unfrozen ground conditions (no surface seal) will indicate if a well is short-circuiting to the surface. Wells that indicate short-circuiting will be provided with a area specific surface seal.

REASON REQUESTED:

Cost savings by significantly reducing the total area of surface seal needed.

REQUESTED BY: Eric Berglund

REPLY REQUIRED BY: 9/15/98

9-Sep-98

DATE

BEI

CONTRACTOR

**INFORMATION TO
CONTRACTOR**

TO: Eric Berglund

FROM: John Mueller

OF: BEI

OF: AFCEE

REQUESTED INFORMATION:

Approved per the attached email from AFBCA, Denis St. Peter.

9-14-98

DATE


AFCEE/ERB-L

CC: Dorothy Allen, Byron Best, Ken Barry, Carl Dirnbauer, Ed Trujillo

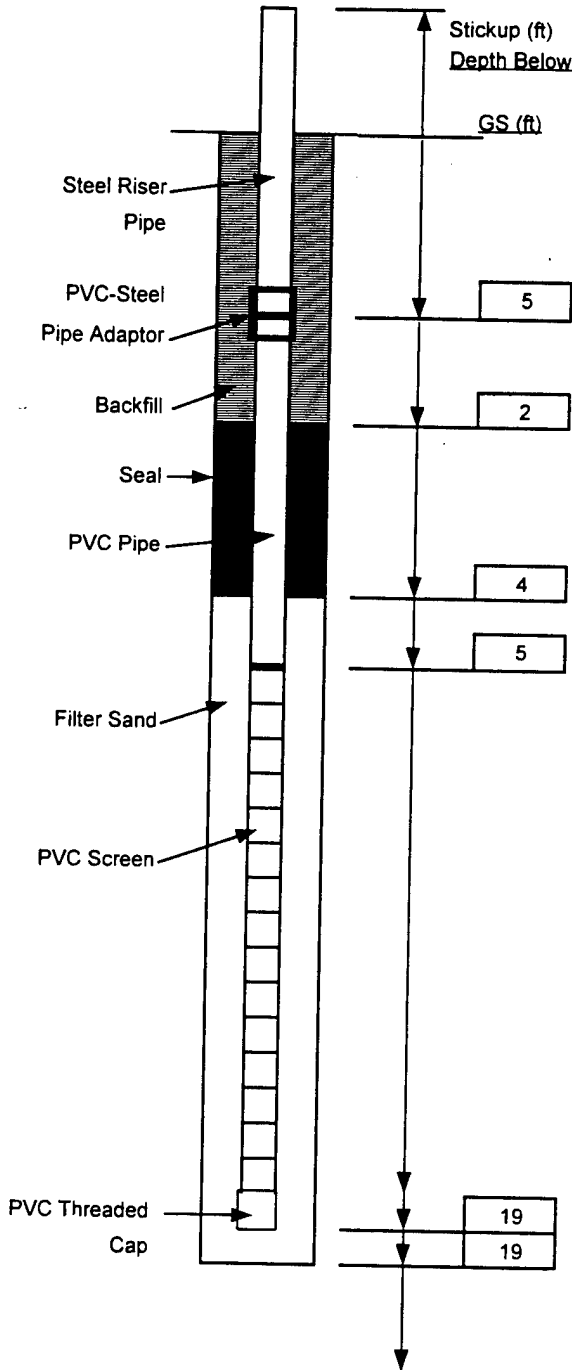
Denis St. Peter

BOREHOLE LOG

Project Name: <i>Loring AFB</i>		Borehole No.: <i>PAV-9</i>			
Project Number: <i>22784</i>		Elevation: <i>TBD</i>			
Location: <i>JEBS</i>		Date Started: <i>9/2/98</i>	Date Completed: <i>9/2/98</i>		
Driller: <i>Great Works Drilling</i>		Total Depth (ft): <i>19</i>			
Equipment: <i>Mobile B59</i>		Depth to Bedrock (ft): <i>19</i>			
Drilling Method: <i>Hollow Stem Auger</i>		Hole Diameter (in): <i>8</i>			
Drilling Fluid: <i>None</i>		Depth to Water (ft): <i>TBD</i>			
Completion: <i>Completed as a Passive Air Vent See Construction Log for details</i>		Logged By: <i>P. Linley</i>	Relocated approx. 1.5ft east of original location for rig access.		
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-19ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd.</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">19ft: Bedrock: Limestone.</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>					No samples required for collection.

BIOVENTING WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: PAV-9
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 9/2/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 9/2/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	



MATERIALS

Riser Pipe 1

Type	Schedule 40 Steel
Diameter (in.)	2
Length (ft)	6

Riser Pipe 2

Type	Schedule 40 PVC
Diameter (in.)	2
Length (ft)	N/A

Backfill

Type	Volclay
Length (ft)	2
Placement	Pour

Seal

Type	Bentonite Pellets
Length (ft)	2
Placement	Pour

Filter Pack

Type	10-20 Silica Sand
Length (ft)	15
Placement	Pour
Amount Placed	275 lbs

Screen

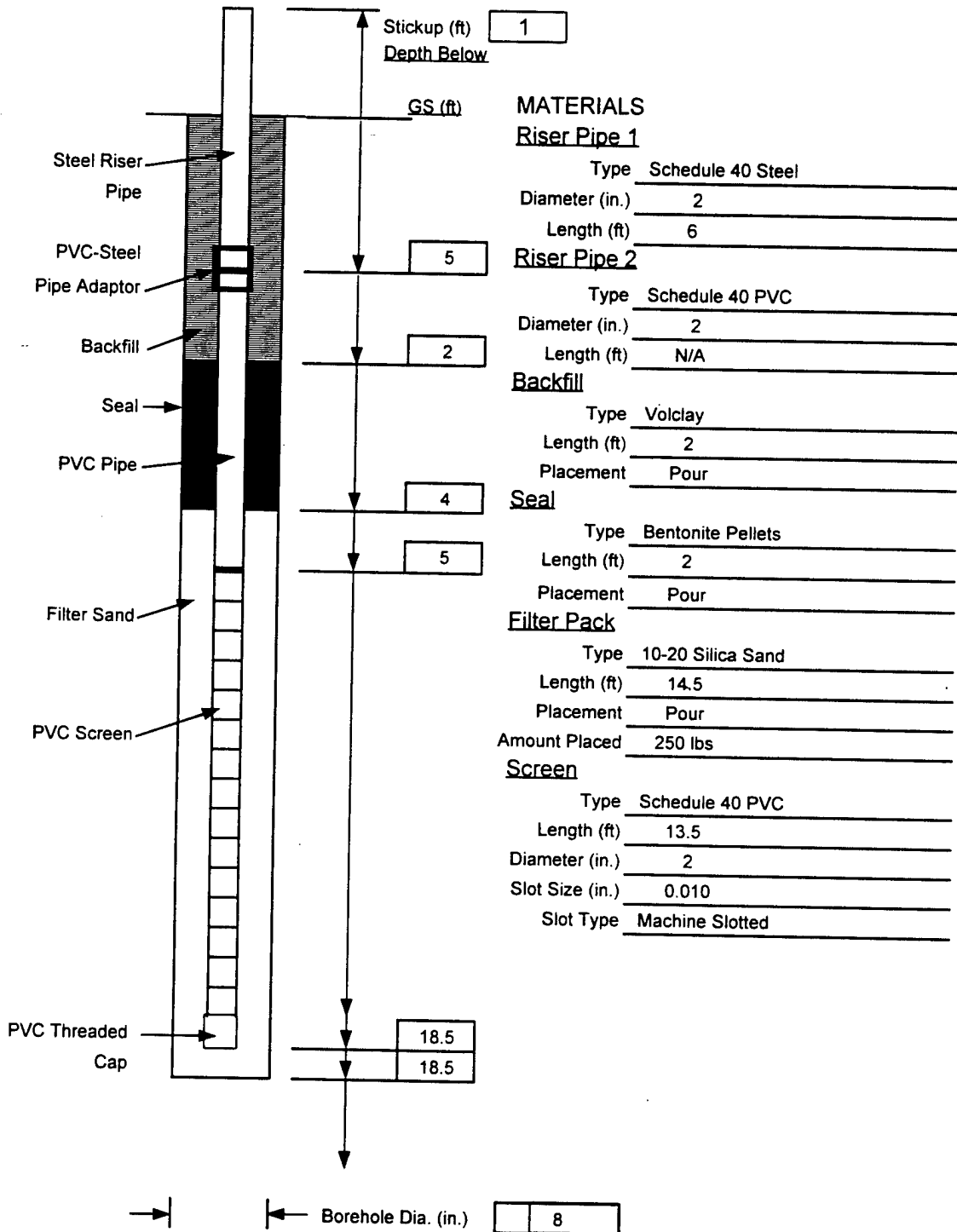
Type	Schedule 40 PVC
Length (ft)	14
Diameter (in.)	2
Slot Size (in.)	0.010
Slot Type	Machine Slotted

BOREHOLE LOG

Project Name: Loring AFB		Borehole No.: PAV-10			
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 9/10/98	Date Completed: 9/10/98		
Driller: Great Works Drilling		Total Depth (ft):		18.5	
Equipment: Mobile B59		Depth to Bedrock (ft):		18.5	
Drilling Method: Hollow Stem Auger		Hole Diameter (in):		8	
Drilling Fluid: None		Depth to Water (ft):		TBD	
Completion: Completed as a Passive Air Vent See Construction Log for details		Logged By: P. Linley			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-18.5ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd, moist.</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">18.5ft: Bedrock: Limestone.</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>					No samples required for collection.

BIOVENTING WELL CONSTRUCTION LOG

Loring AFB	Site: JEBS	Well No.: PAV-10
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: P. Linley
Driller: D. Bolstridge	Date Started: 9/10/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 9/10/1998	
Drilling Method: Hollow Stem Auger	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	

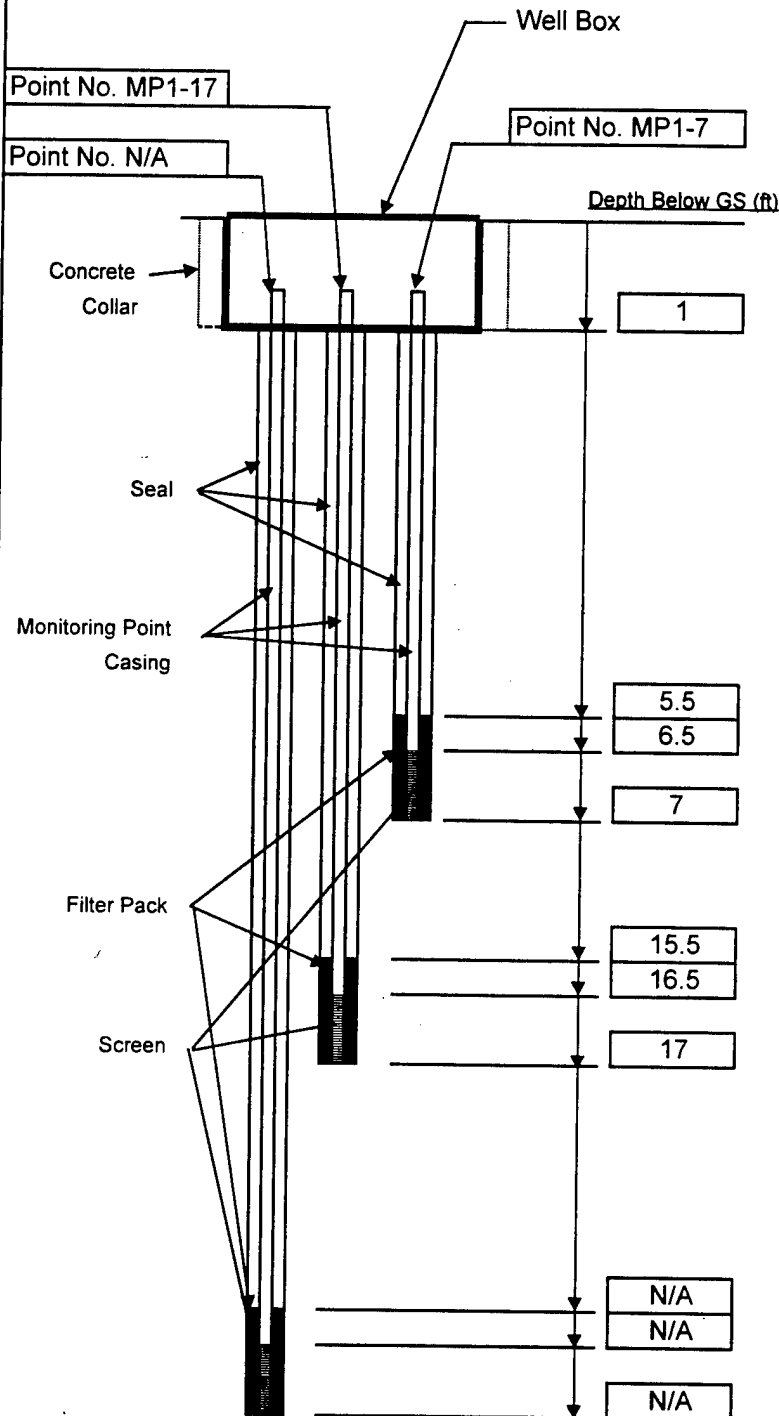


BOREHOLE LOG

Project Name: Loring AFB					Borehole No.: MP-1
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 9/11/98		Date Completed: 9/11/98	
Driller: Great Works Drilling		Total Depth (ft): 17			
Equipment: Mobile B59		Depth to Bedrock (ft): None			
Drilling Method: Hollow Stem Auger		Hole Diameter (in): 3			
Drilling Fluid: None		Depth to Water (ft): TBD			
Completion: Completed as SVE Monitoring Point See Construction Log for details		Logged By: E. Berglund			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-17ft: Gravelly clayey silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd, moist.</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>					No samples required.

SVE MONITORING POINT CONSTRUCTION LOG

Loring AFB	Site: JEBS	Point Location No. MP-1
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: E. Berglund
Driller: D. Bolstridge	Date Started: #####	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: #####	
Drilling Method: Driven Point	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	



MATERIALS

Monitoring Point Casing

Type Polyethylene

Diameter (in.) 1/4

Seal

Type Bentonite Granules

Placement To surface

Filter Pack

Type 10-20 Silica sand

Placement 1.5

Screen

Type Double woven stainless steel

Diameter (in.) 1/4

Borehole

Diameter (in.) 3

Concrete Collar

Outer Diameter (in.) N/A

Well Box

Material Steel

Diameter (in.) 12

Depth (in.) 12

SPECIFIC POINT INFORMATION

Point Number MP-1-7

Screen Length (ft) 0.5

Point Number MP-1-17

Screen Length (ft) 0.5

Point Number N/A

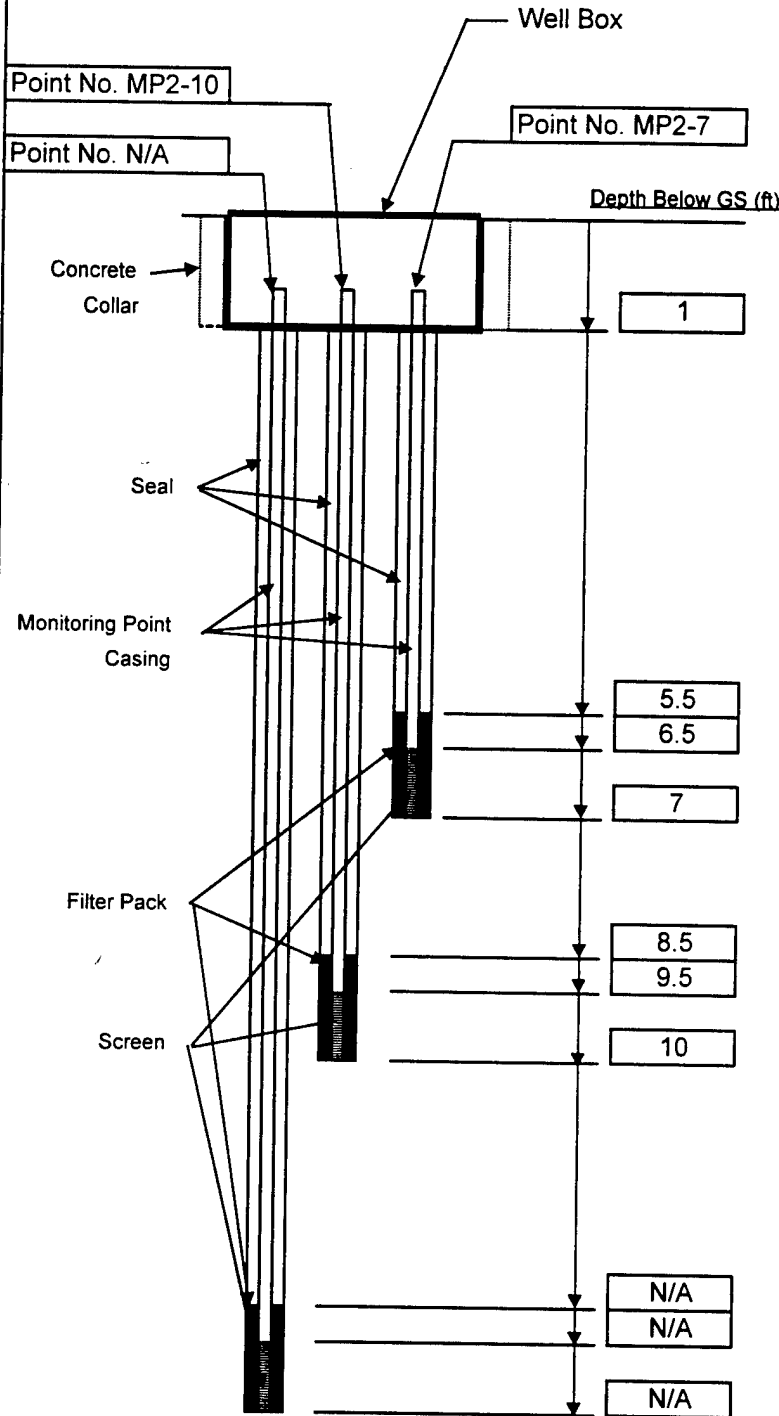
Screen Length (ft)

BOREHOLE LOG

Project Name: Loring AFB					Borehole No.: MP-2
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 9/11/98		Date Completed: 9/11/98	
Driller: Great Works Drilling		Total Depth (ft):		10	
Equipment: Mobile B59		Depth to Bedrock (ft):		None	
Drilling Method: Hollow Stem Auger		Hole Diameter (in):		3	
Drilling Fluid: None		Depth to Water (ft):		TBD	
Completion: Completed as SVE Monitoring Point See Construction Log for details		Logged By: E. Berglund			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-10ft: Gravelly clayey silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd, moist.</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>					No samples required.

SVE MONITORING POINT CONSTRUCTION LOG

Loring AFB	Site: JEBS	Point Location No. MP-2
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: E. Berglund
Driller: D. Bolstridge	Date Started: #####	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: #####	
Drilling Method: Driven Point	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	



MATERIALS

Monitoring Point Casing

Type Polyethylene

Diameter (in.) 1/4

Seal

Type Bentonite Granules

Placement To surface

Filter Pack

Type 10-20 Silica sand

Placement 1.5

Screen

Type Double woven stainless steel

Diameter (in.) 1/4

Borehole

Diameter (in.) 3

Concrete Collar

Outer Diameter (in.) N/A

Well Box

Material Steel

Diameter (in.) 12

Depth (in.) 12

SPECIFIC POINT INFORMATION

Point Number MP-2-7

Screen Length (ft) 0.5

Point Number MP-2-10

Screen Length (ft) 0.5

Point Number N/A

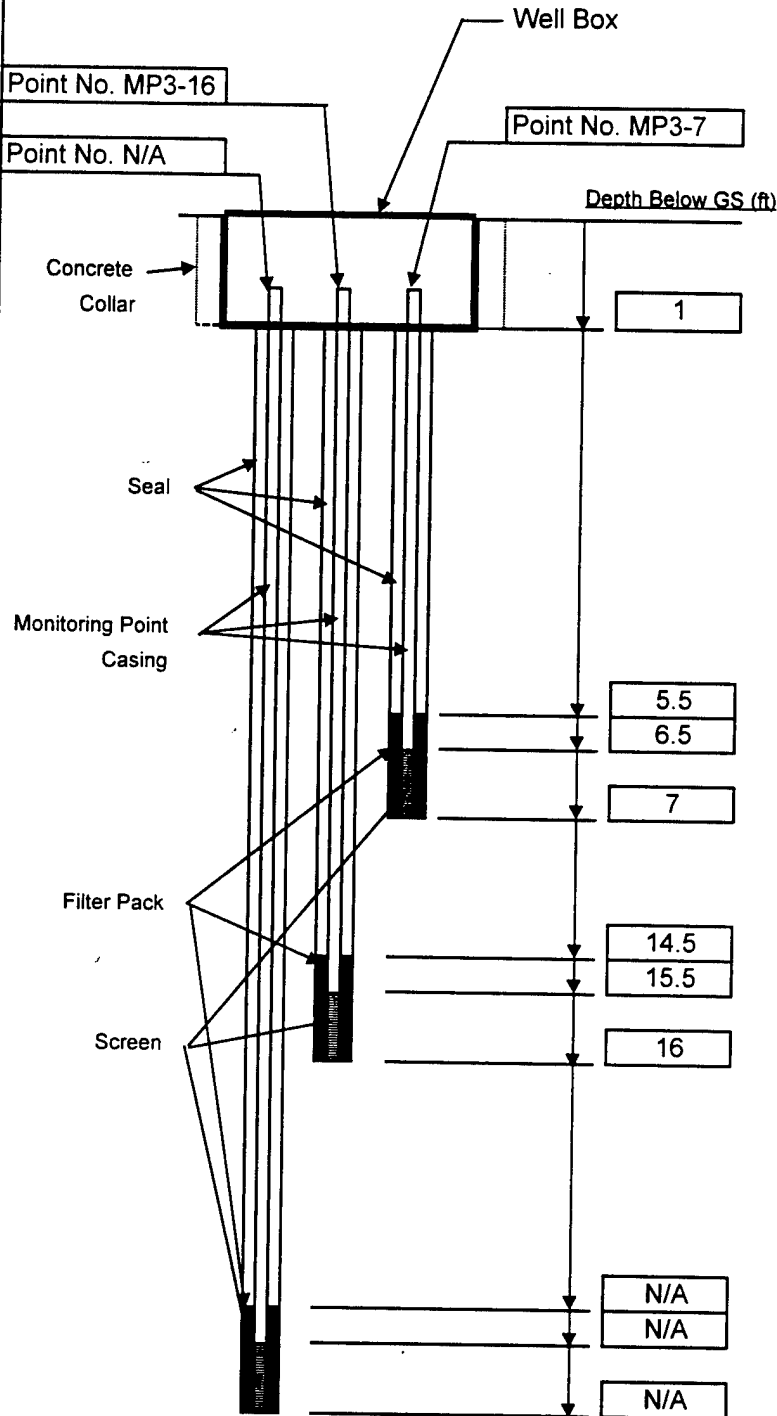
Screen Length (ft) _____

BOREHOLE LOG

Project Name: <i>Loring AFB</i>		Borehole No.: <i>MP-3</i>			
Project Number: <i>22784</i>		Elevation: <i>TBD</i>			
Location: <i>JEBS</i>		Date Started: <i>9/11/98</i>	Date Completed: <i>9/11/98</i>		
Driller: <i>Great Works Drilling</i>		Total Depth (ft): <i>16</i>			
Equipment: <i>Mobile B59</i>		Depth to Bedrock (ft): <i>None</i>			
Drilling Method: <i>Hollow Stem Auger</i>		Hole Diameter (in): <i>3</i>			
Drilling Fluid: <i>None</i>		Depth to Water (ft): <i>TBD</i>			
Completion: <i>Completed as SVE Monitoring Point</i> <i>See Construction Log for details</i>		Logged By: <i>E. Berglund</i>			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-16ft: Gravelly clayey silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd, moist.</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>					No samples required.

SVE MONITORING POINT CONSTRUCTION LOG

Loring AFB		Site: JEBS		Point Location No. MP-3	
Drilling Company: Great Works Drilling		Project No.: 22748		Logged By: E. Berglund	
Driller: D. Bolstridge		Date Started: #####		Coordinates: TBD	
Drilling Equipment: Mobile B59		Date Completed: #####			
Drilling Method: Driven Point		Depth to Water: TBD			
Drilling Fluid: None		Elevation: TBD			



MATERIALS

Monitoring Point Casing

Type Polyethylene

Diameter (in.) 1/4

Seal

Type Bentonite Granules

Placement To surface

Filter Pack

Type 10-20 Silica sand

Placement 1.5

Screen

Type Double woven stainless steel

Diameter (in.) 1/4

Borehole

Diameter (in.) 3

Concrete Collar

Outer Diameter (in.) N/A

Well Box

Material Steel

Diameter (in.) 12

Depth (in.) 12

SPECIFIC POINT INFORMATION

Point Number MP-3-7

Screen Length (ft) 0.5

Point Number MP-3-16

Screen Length (ft) 0.5

Point Number N/A

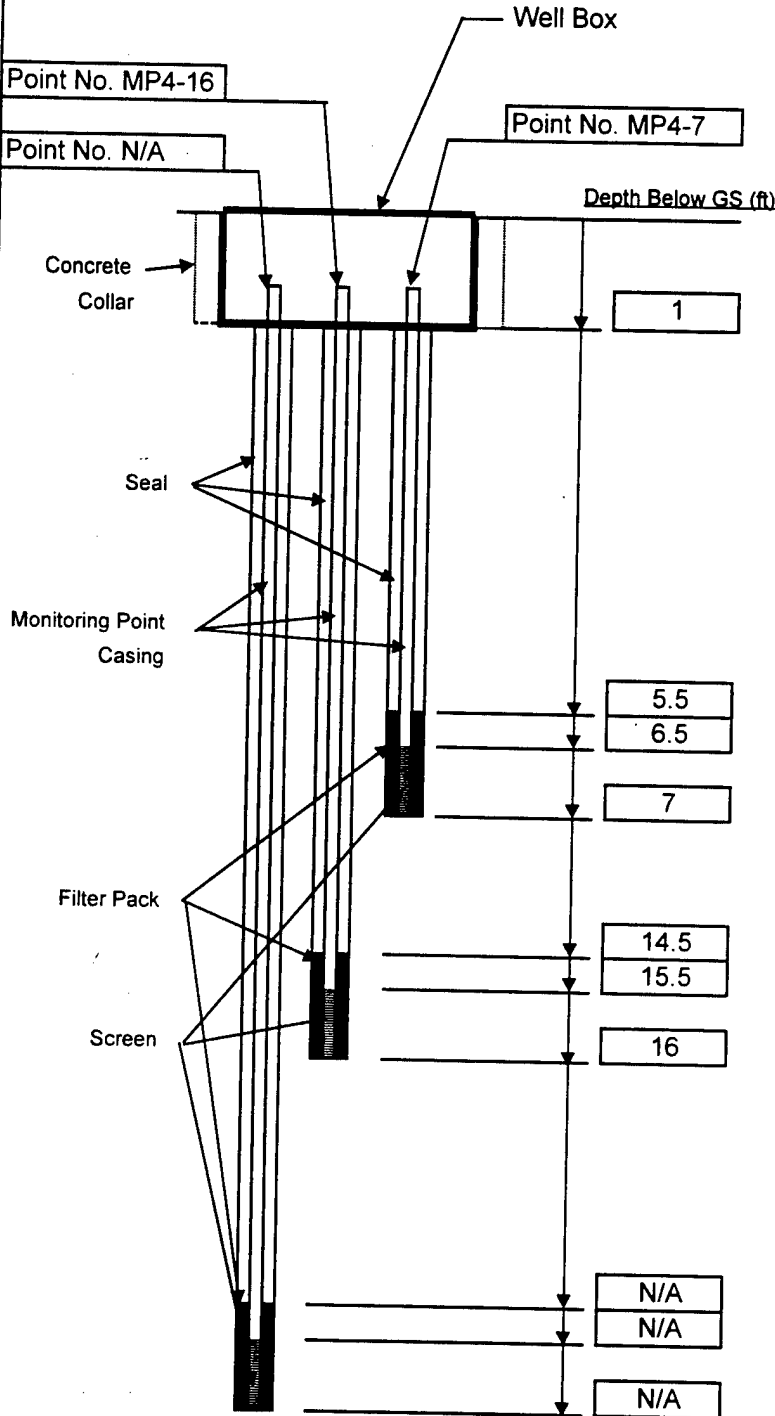
Screen Length (ft)

BOREHOLE LOG

Project Name: <i>Loring AFB</i>		Borehole No.: <i>MP-4</i>			
Project Number: <i>22784</i>		Elevation: <i>TBD</i>			
Location: <i>JEBS</i>		Date Started: <i>9/11/98</i>	Date Completed: <i>9/11/98</i>		
Driller: <i>Great Works Drilling</i>		Total Depth (ft): <i>16</i>			
Equipment: <i>Mobile B59</i>		Depth to Bedrock (ft): <i>None</i>			
Drilling Method: <i>Hollow Stem Auger</i>		Hole Diameter (in): <i>3</i>			
Drilling Fluid: <i>None</i>		Depth to Water (ft): <i>TBD</i>			
Completion: <i>Completed as SVE Monitoring Point</i> <i>See Construction Log for details</i>		Logged By: <i>E. Berglund</i>			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-16ft: Gravelly clayey silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd, moist.</div> <div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 5px;">5</div> <div style="margin-bottom: 5px;">10</div> <div style="margin-bottom: 5px;">15</div> <div style="margin-bottom: 5px;">20</div> <div style="margin-bottom: 5px;">25</div> <div style="margin-bottom: 5px;">30</div> </div> </div>					No samples required.

SVE MONITORING POINT CONSTRUCTION LOG

Loring AFB	Site: JEBS	Point Location No. MP-4
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: E. Berglund
Driller: D. Bolstridge	Date Started: #####	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: #####	
Drilling Method: Driven Point	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	



MATERIALS

Monitoring Point Casing

Type	Polyethylene
Diameter (in.)	1/4

Seal

Type	Bentonite Granules
Placement	To surface

Filter Pack

Type	10-20 Silica sand
Placement	1.5

Screen

Type	Double woven stainless steel
Diameter (in.)	1/4

Borehole

Diameter (in.)	3
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Concrete Collar

Outer Diameter (in.)	N/A
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Well Box

Material	Steel
Diameter (in.)	12
Depth (in.)	12

SPECIFIC POINT INFORMATION

<u>Point Number</u>	MP-4-7
Screen Length (ft)	0.5

<u>Point Number</u>	MP-4-16
Screen Length (ft)	0.5

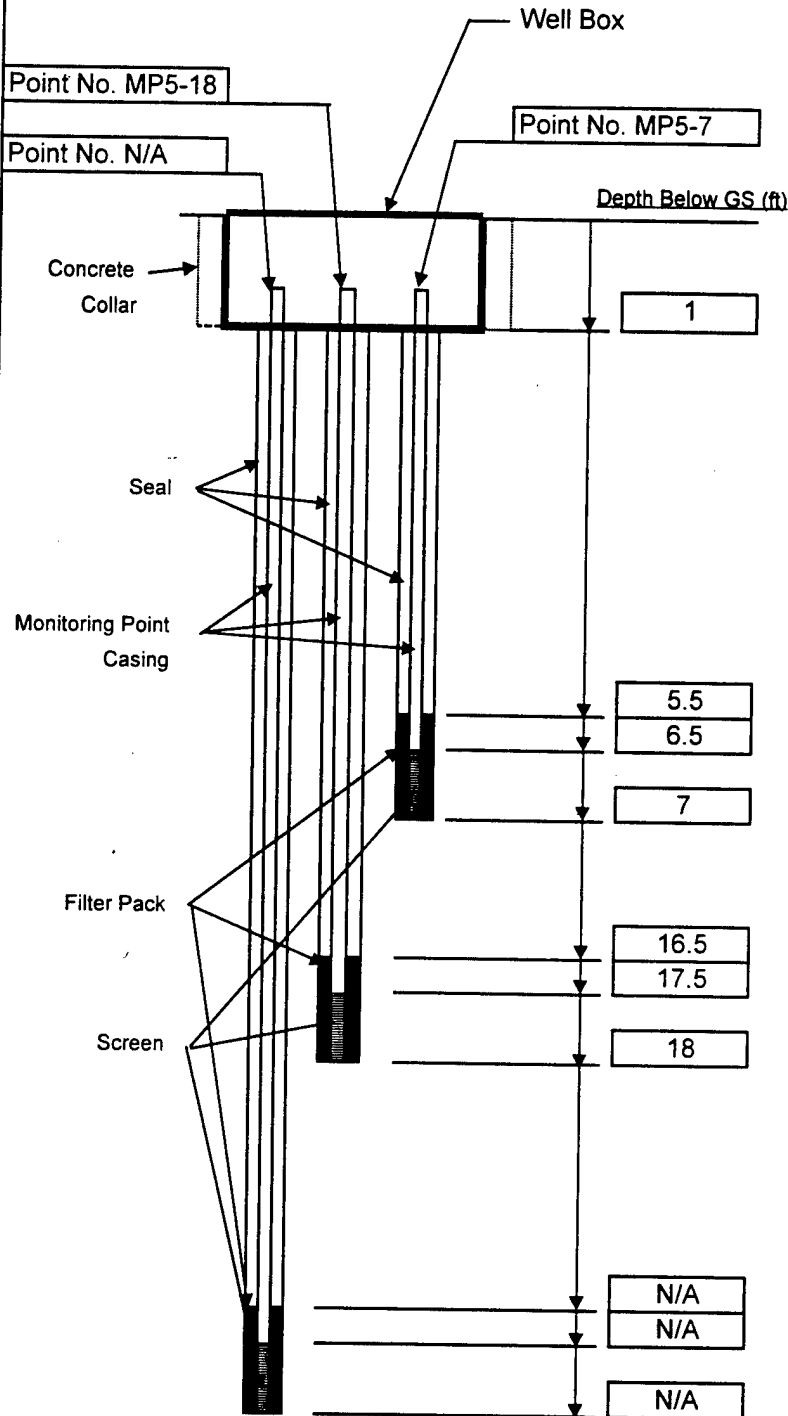
<u>Point Number</u>	N/A
Screen Length (ft)	

BOREHOLE LOG

Project Name: Loring AFB		Borehole No.: MP-5			
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 9/11/98	Date Completed: 9/11/98		
Driller: Great Works Drilling		Total Depth (ft): 18			
Equipment: Mobile B59		Depth to Bedrock (ft): None			
Drilling Method: Hollow Stem Auger		Hole Diameter (in): 3			
Drilling Fluid: None		Depth to Water (ft): TBD			
Completion: Completed as SVE Monitoring Point See Construction Log for details		Logged By: E. Berglund			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-18ft: Gravelly clayey silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd, moist.</div> <div style="margin-bottom: 10px;">5</div> <div style="margin-bottom: 10px;">10</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">20</div> <div style="margin-bottom: 10px;">25</div> <div style="margin-bottom: 10px;">30</div> </div>					No samples required.

SVE MONITORING POINT CONSTRUCTION LOG

Loring AFB	Site: JEBS	Point Location No. MP-5
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: E. Berglund
Driller: D. Bolstridge	Date Started: 9/11/1998	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: 9/11/1998	
Drilling Method: Driven Point	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	



MATERIALS

Monitoring Point Casing

Type	Polyethylene
Diameter (in.)	1/4

Seal

Type	Bentonite Granules
Placement	To surface

Filter Pack

Type	10-20 Silica sand
Placement	1.5

Screen

Type	Double woven stainless steel
Diameter (in.)	1/4

Borehole

Diameter (in.)	3
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Concrete Collar

Outer Diameter (in.)	N/A
----------------------	-----

Well Box

Material	Steel
Diameter (in.)	12
Depth (in.)	12

SPECIFIC POINT INFORMATION

<u>Point Number</u>	MP-5-7
Screen Length (ft)	0.5

<u>Point Number</u>	MP-5-18
Screen Length (ft)	0.5

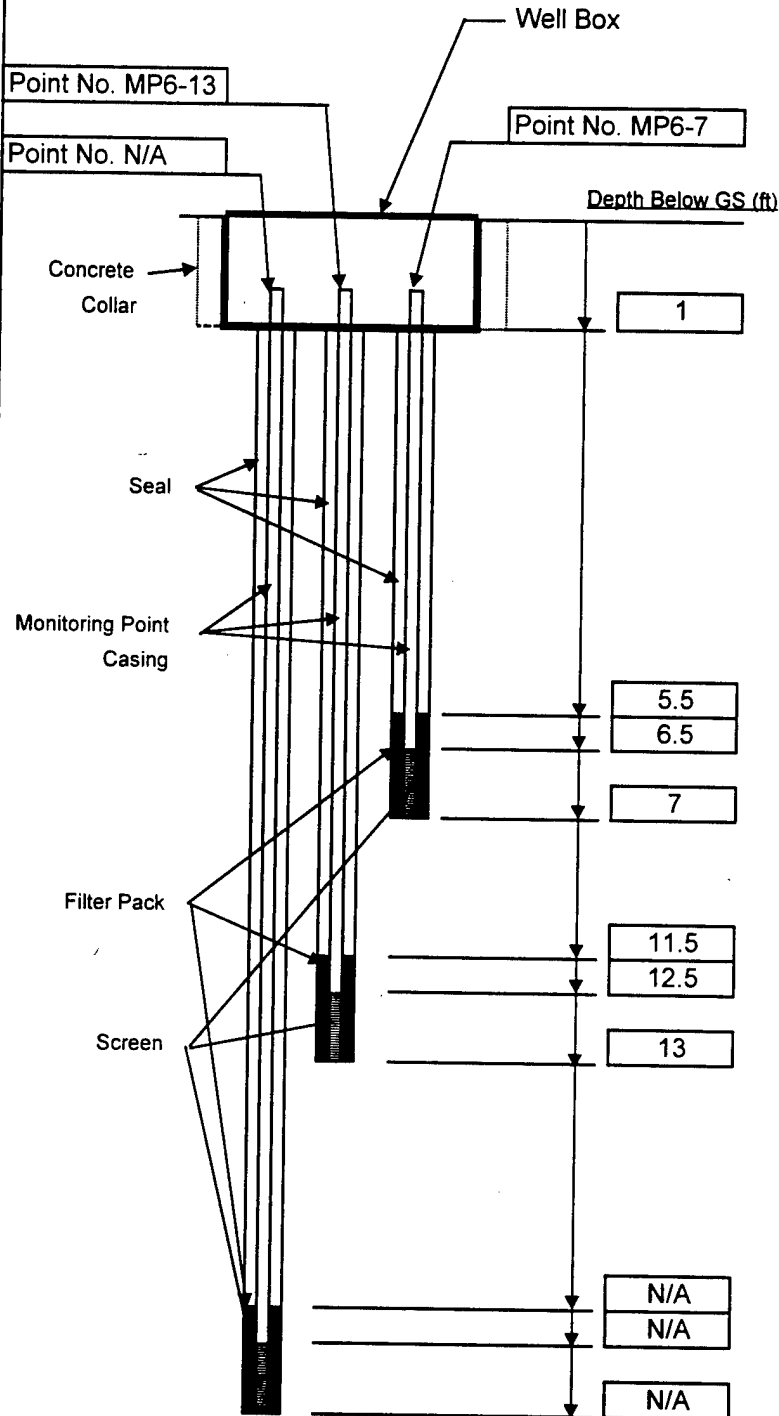
<u>Point Number</u>	N/A
Screen Length (ft)	

BOREHOLE LOG

Project Name: Loring AFB		Borehole No.: MP-6			
Project Number: 22784		Elevation: TBD			
Location: JEBS		Date Started: 9/11/98	Date Completed: 9/11/98		
Driller: Great Works Drilling		Total Depth (ft): 13			
Equipment: Mobile B59		Depth to Bedrock (ft): None			
Drilling Method: Hollow Stem Auger		Hole Diameter (in): 3			
Drilling Fluid: None		Depth to Water (ft): TBD			
Completion: Completed as SVE Monitoring Point See Construction Log for details		Logged By: E. Berglund			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">0-13ft: Gravelly clayey silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd, moist.</div> <div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 5px;">5</div> <div style="margin-bottom: 5px;">10</div> <div style="margin-bottom: 5px;">15</div> <div style="margin-bottom: 5px;">20</div> <div style="margin-bottom: 5px;">25</div> <div style="margin-bottom: 5px;">30</div> </div> </div>					No samples required.

SVE MONITORING POINT CONSTRUCTION LOG

Loring AFB	Site: JEBS	Point Location No. MP-6
Drilling Company: Great Works Drilling	Project No.: 22748	Logged By: E. Berglund
Driller: D. Bolstridge	Date Started: #####	Coordinates: TBD
Drilling Equipment: Mobile B59	Date Completed: #####	
Drilling Method: Driven Point	Depth to Water: TBD	
Drilling Fluid: None	Elevation: TBD	



MATERIALS

Monitoring Point Casing

Type	Polyethylene
Diameter (in.)	1/4

Seal

Type	Bentonite Granules
Placement	To surface

Filter Pack

Type	10-20 Silica sand
Placement	1.5

Screen

Type	Double woven stainless steel
Diameter (in.)	1/4

Borehole

Diameter (in.)	3
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Concrete Collar

Outer Diameter (in.)	N/A
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Well Box

Material	Steel
Diameter (in.)	12
Depth (in.)	12

SPECIFIC POINT INFORMATION

<u>Point Number</u>	MP-6-7
Screen Length (ft)	0.5

<u>Point Number</u>	MP-6-13
Screen Length (ft)	0.5

<u>Point Number</u>	N/A
Screen Length (ft)	

APPENDIX C
SVE EQUIPMENT INSPECTION



007865

Interoffice Memorandum

To Distribution
Subject SVE Equipment Inspection - Air Components

File No.
Date October 19, 1998
From David Wagner DMW
Of AFCEE

Copies to At Ext. 2190

A site visit was conducted at Air Components (Grand Rapids, MI) to inspect the soil vapor extraction skid that will be installed at Loring Air Force Base. Del Stambach, of Air Components, was the contact that provided the inspection tour. The following is a summary of the visit/equipment inspection:

1. The equipment was checked against the design figures and equipment cut sheets that had been previously provided as submittals. The equipment layout and material correlated to the information provided.
2. The Erdco flowmeter was found to be absent on the skid. The expected shipping date for this item is November 4, 1998. The skid can be operated without this item.
3. The equipment was operated to check for excessive noise/vibration, etc., and was found to operate satisfactorily.
4. The system vacuum was observed to be 0.5 psig with no resistance on the blower.
5. The system was tested at 12-in Hg and the motor amperage was observed to be 72 amps.
6. The level switches in the air/water separator were tested to ensure transfer pump operation. The switches and transfer pump operated as designed.
7. The control panel was visually inspected and found to be of professional construction.
8. The 250-gallon water storage tank was inspected and found to be in vertical configuration. The tank is approximately 8-ft high, with a loading hook attached at the top.

In general, the equipment was found to be professionally designed and of quality construction. The only outstanding equipment issue is the lack of the Erdco flowmeters. The equipment is still operational without these items, and it is my recommendation that the equipment be shipped to the Loring site as soon as possible. The vendor thought that shipment on October 19-20 was a reasonable date.

APPENDIX D

REQUEST FOR INFORMATION No. 292

**REQUEST FOR INFORMATION
(RFI)**

PROJECT NAME: AFCEE - Loring

JOB NO. 22784-006

RFI NO: 292

LOCATION: Limestone, Maine

PAGE 1 OF 1

TO: John Mueller

OF: AFCEE/ERB-L

REFERENCE DRAWING: N/A


SPECIFICATION: N/A

LOCATION: Jet Engine Buildup Shop SVE System

INFORMATION REQUESTED: Install no surface seal at JEBS SVE System well field until it can be determined if necessary to do so. Frozen ground during the winter season will provide a natural surface seal. Well performance, as measured by vacuum and flow, will be recorded during this period and compared to data recorded at startup and during and after spring thaw. Differences in well performance measured during frozen ground conditions (natural surface seal) and unfrozen ground conditions (no surface seal) will indicate if a well is short-circuiting to the surface. Wells that indicate short-circuiting will be provided with a area specific surface seal.

REASON REQUESTED:

Cost savings by significantly reducing the total area of surface seal needed.

REQUESTED BY: Eric Berglund 

REPLY REQUIRED BY: 9/15/98

9-Sep-98

DATE

BEI

CONTRACTOR

**INFORMATION TO
CONTRACTOR**

TO:

FROM:

OF:

OF:

REQUESTED INFORMATION:

DATEAFCEE/ERB-L

CC: Dorothy Allen, Byron Best, Ken Barry, Carl Dirnbauer, Ed Trujillo
Denis St. Peter

Dub, Andrea

From: dpeter@afbda1.hq.af.mil
Sent: Wednesday, September 09, 1998 4:13 PM
To: aadub@bechtel.com; John.Mueller@hqafcee.brooks.af.mil
Cc: cadirnba@bechtel.com; extrujil@bechtel.com
Subject: re: Open RFI's

Thanks for the reminder. I agree with the following RFIs:

RFI 288 - Approval to proceed excavating/stockpiling barrier soil from misc areas for use on Landfill 3

RFI 289 - Approval to mix tub grinder by products and place in LF 3 per sediment placement plan

RFI 290 - Approval for revised area of excavation FTF, Bldg 8710 and

VMB

RFI 292 - Approval to not install surface seal at JEBS

Original Text

From: "Dub, Andrea" <aadub@bechtel.com>, on 9/9/98 1:12 PM:

To: Denis St Peter@Loring@AFBDA.OLM

Denis, I think the RFI's listed below may belong to you. Could you advise as to the status and if they are not in your area, please advise as to whom I should contact. thank you - Andrea

RFI 288 - Approval to proceed excavating/stockpiling barrier soil from misc areas for use on Landfill 3

RFI 289 - Approval to mix tub grinder by products and place in LF 3 per sediment placement plan

RFI 290 - Approval for revised area of excavation FTF, Bldg 8710 and

VMB

RFI 292 - Approval to not install surface seal at JEBS

**REQUEST FOR INFORMATION
(RFI)**

PROJECT NAME: AFCEE - Loring

JOB NO. 22784-006

RFI NO: 292

LOCATION: Limestone, Maine

PAGE 1 OF 1

TO: John Mueller

OF: AFCEE/ERB-L

REFERENCE DRAWING: N/A

SPECIFICATION: N/A

LOCATION: Jet Engine Buildup Shop SVE System

INFORMATION REQUESTED: Install no surface seal at JEBS SVE System well field until it can be determined if necessary to do so. Frozen ground during the winter season will provide a natural surface seal. Well performance, as measured by vacuum and flow, will be recorded during this period and compared to data recorded at startup and during and after spring thaw. Differences in well performance measured during frozen ground conditions (natural surface seal) and unfrozen ground conditions (no surface seal) will indicate if a well is short-circuiting to the surface. Wells that indicate short-circuiting will be provided with a area specific surface seal.

REASON REQUESTED:
Cost savings by significantly reducing the total area of surface seal needed.

REQUESTED BY: Eric Berglund

REPLY REQUIRED BY: 9/15/98

9-Sep-98
DATE

BEI
CONTRACTOR

**INFORMATION TO
CONTRACTOR**

TO: Eric Berglund

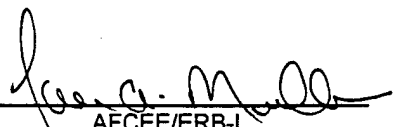
FROM: John Mueller

OF: BEI

OF: AFCEE

REQUESTED INFORMATION:
Approved per the attached email from AFBCA, Denis St. Peter.

9-14-98
DATE


AFCEE/ERB-L

CC: Dorothy Allen, Byron Best, Ken Barry, Carl Dirnbauer, Ed Trujillo
Denis St. Peter