

Explanation

- ▼ Lowest Groundwater Elevation Recorded in the Nearest Groundwater Monitoring Well (MW-16)
- ≡

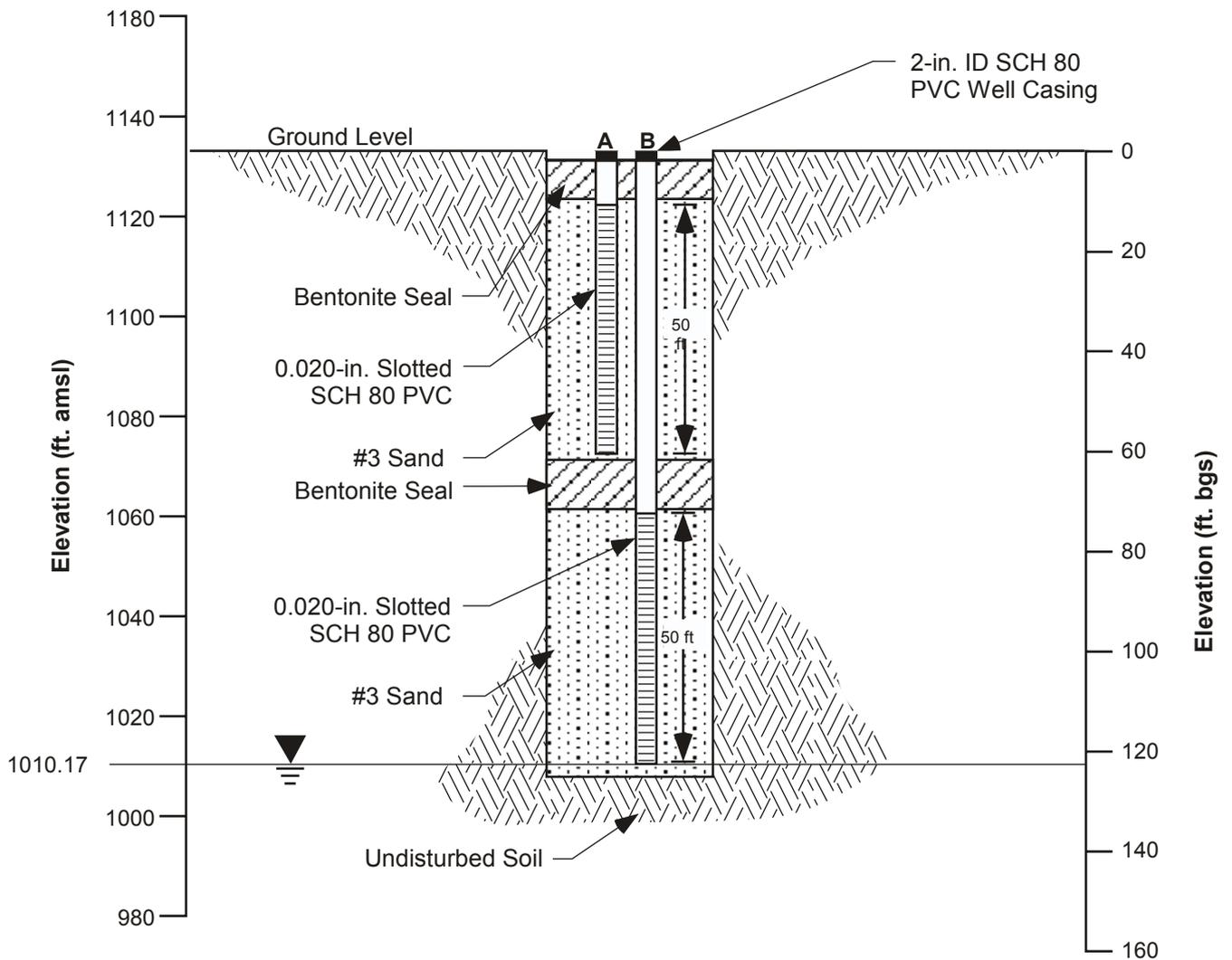
NOT TO SCALE

**PROPOSED SVE WELL  
CONSTRUCTION DETAIL, VE-02  
FIGURE 4**

Jet Propulsion Laboratory  
Pasadena, California



Date: May 2002  
Contract No.: N68711-97-D-8702  
DO No.: 0048



Explanation

- ▼ Lowest Groundwater Elevation Recorded in the Nearest Groundwater Monitoring Well (MW-11)

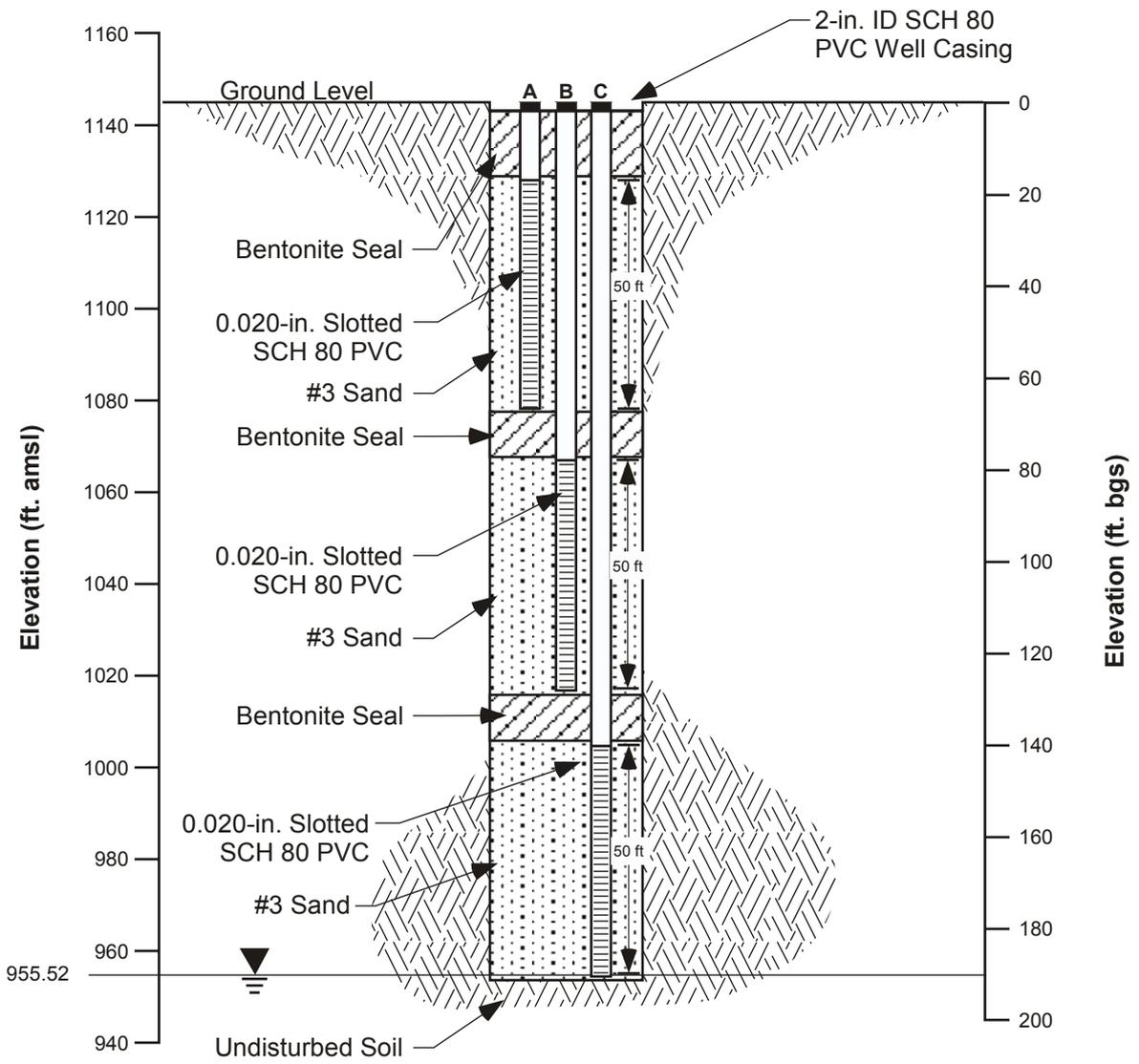
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**PROPOSED SVE WELL  
CONSTRUCTION DETAIL, VE-03  
FIGURE 5**

Jet Propulsion Laboratory  
Pasadena, California



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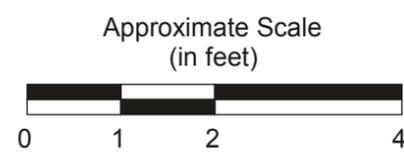
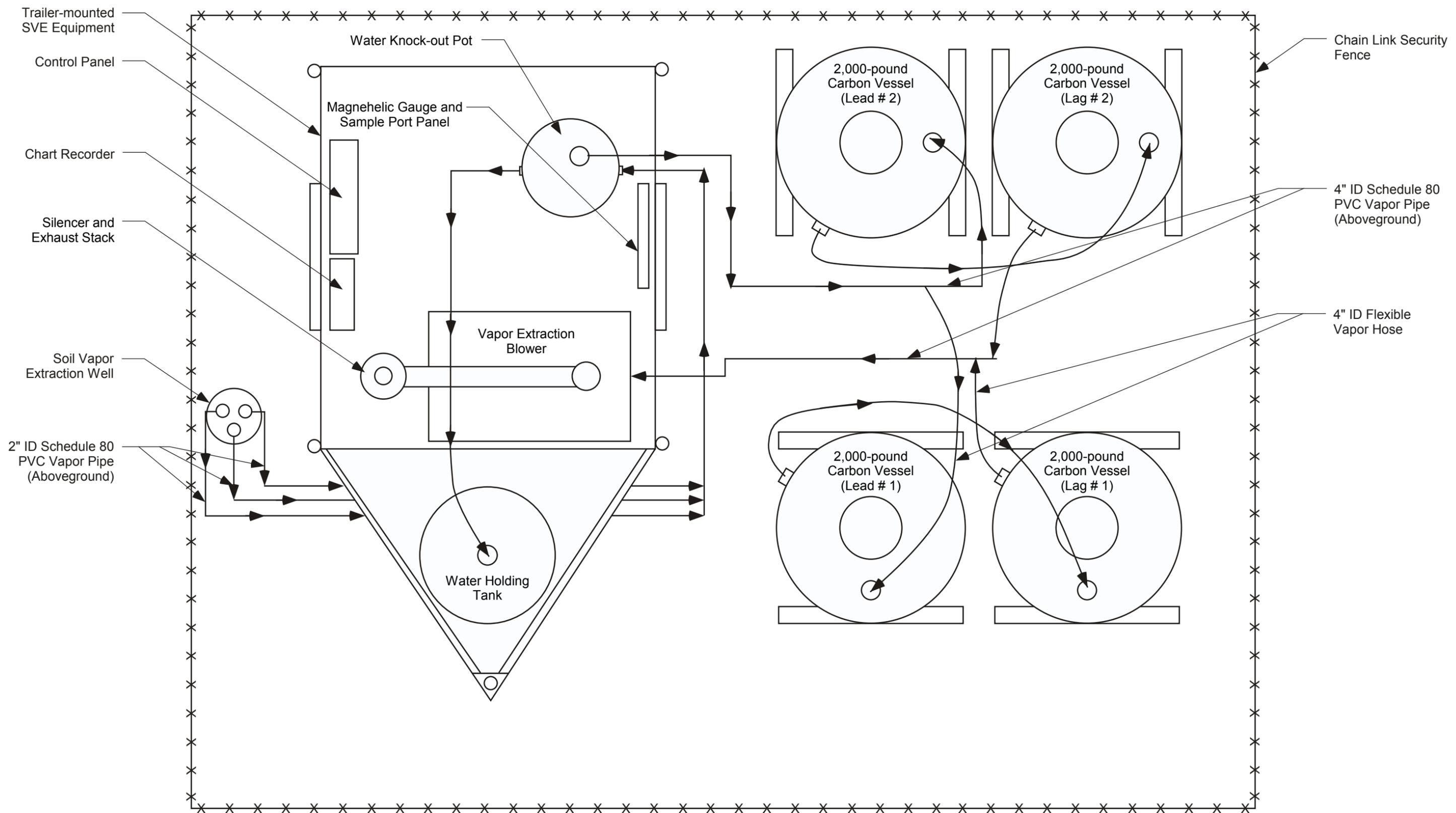


Explanation

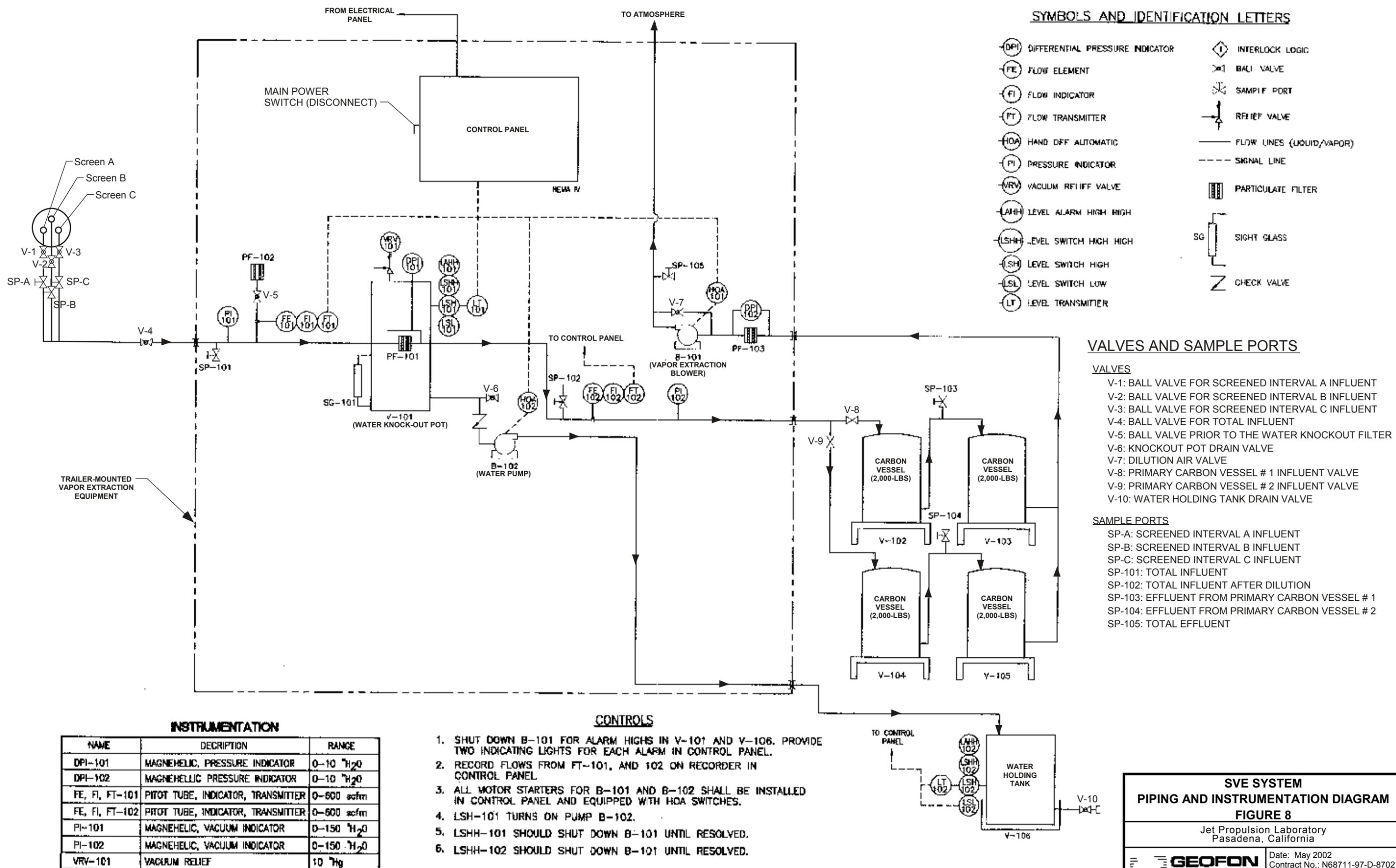
- ▼ Lowest Groundwater Elevation Recorded in the Nearest Groundwater Monitoring Well (MW-13)

NOT TO SCALE

<p><b>PROPOSED SVE WELL CONSTRUCTION DETAIL, VE-04 FIGURE 6</b></p>	
<p>Jet Propulsion Laboratory Pasadena, California</p>	
	<p>Date: May 2002 Contract No.: N68711-97-D-8702 DO No.: 0048</p>



<b>TYPICAL SVE SYSTEM AND PIPING LAYOUT DIAGRAM FIGURE 7</b>	
Jet Propulsion Laboratory Pasadena, California	
	Date: May 2002 Contract No.: N68711-97-D-8702 DO No.: 0048



**SYMBOLS AND IDENTIFICATION LETTERS**

- (DPI) DIFFERENTIAL PRESSURE INDICATOR
- (FE) FLOW ELEMENT
- (FI) FLOW INDICATOR
- (FT) FLOW TRANSMITTER
- (HOA) HAND OFF AUTOMATIC
- (PI) PRESSURE INDICATOR
- (VRV) VACUUM RELIEF VALVE
- (LAHH) LEVEL ALARM HIGH HIGH
- (LSHH) LEVEL SWITCH HIGH HIGH
- (LSH) LEVEL SWITCH HIGH
- (LSL) LEVEL SWITCH LOW
- (LT) LEVEL TRANSMITTER
- (I) INTERLOCK LOGIC
- (BV) BALL VALVE
- (SP) SAMPLE PORT
- (RV) RELIEF VALVE
- (—) FLOW LINES (LIQUID/VAPOR)
- (---) SIGNAL LINE
- (PF) PARTICULATE FILTER
- (SG) SIGHT GLASS
- (Z) CHECK VALVE

**VALVES AND SAMPLE PORTS**

- VALVES**
- V-1: BALL VALVE FOR SCREENED INTERVAL A INFLUENT
  - V-2: BALL VALVE FOR SCREENED INTERVAL B INFLUENT
  - V-3: BALL VALVE FOR SCREENED INTERVAL C INFLUENT
  - V-4: BALL VALVE FOR TOTAL INFLUENT
  - V-5: BALL VALVE PRIOR TO THE WATER KNOCKOUT FILTER
  - V-6: KNOCKOUT POT DRAIN VALVE
  - V-7: DILUTION AIR VALVE
  - V-8: PRIMARY CARBON VESSEL # 1 INFLUENT VALVE
  - V-9: PRIMARY CARBON VESSEL # 2 INFLUENT VALVE
  - V-10: WATER HOLDING TANK DRAIN VALVE
- SAMPLE PORTS**
- SP-A: SCREENED INTERVAL A INFLUENT
  - SP-B: SCREENED INTERVAL B INFLUENT
  - SP-C: SCREENED INTERVAL C INFLUENT
  - SP-101: TOTAL INFLUENT
  - SP-102: TOTAL INFLUENT AFTER DILUTION
  - SP-103: EFFLUENT FROM PRIMARY CARBON VESSEL # 1
  - SP-104: EFFLUENT FROM PRIMARY CARBON VESSEL # 2
  - SP-105: TOTAL EFFLUENT

**INSTRUMENTATION**

NAME	DESCRIPTION	RANGE
DPI-101	MAGNEHELIC, PRESSURE INDICATOR	0-10 H <sub>2</sub> O
DPI-102	MAGNEHELIC PRESSURE INDICATOR	0-10 H <sub>2</sub> O
FE, FI, FT-101	PITOT TUBE, INDICATOR, TRANSMITTER	0-600 scfm
FE, FI, FT-102	PITOT TUBE, INDICATOR, TRANSMITTER	0-600 scfm
PI-101	MAGNEHELIC, VACUUM INDICATOR	0-150 H <sub>2</sub> O
PI-102	MAGNEHELIC, VACUUM INDICATOR	0-150 H <sub>2</sub> O
VRV-101	VACUUM RELIEF	10 Hg

**CONTROLS**

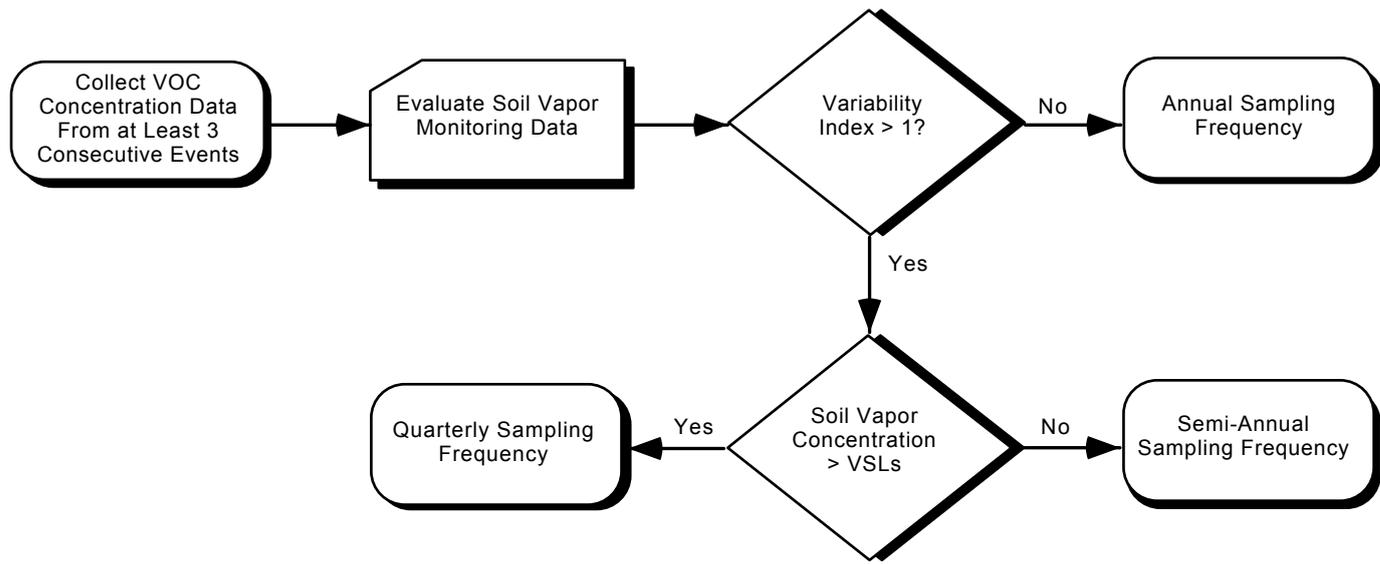
1. SHUT DOWN B-101 FOR ALARM HIGHS IN V-101 AND V-106. PROVIDE TWO INDICATING LIGHTS FOR EACH ALARM IN CONTROL PANEL.
2. RECORD FLOWS FROM FT-101, AND 102 ON RECORDER IN CONTROL PANEL.
3. ALL MOTOR STARTERS FOR B-101 AND B-102 SHALL BE INSTALLED IN CONTROL PANEL AND EQUIPPED WITH HOA SWITCHES.
4. LSH-101 TURNS ON PUMP B-102.
5. LSHH-101 SHOULD SHUT DOWN B-101 UNTIL RESOLVED.
6. LSHH-102 SHOULD SHUT DOWN B-101 UNTIL RESOLVED.

**SVE SYSTEM  
PIPING AND INSTRUMENTATION DIAGRAM  
FIGURE 8**

Jet Propulsion Laboratory  
Pasadena, California

**GEOFON**

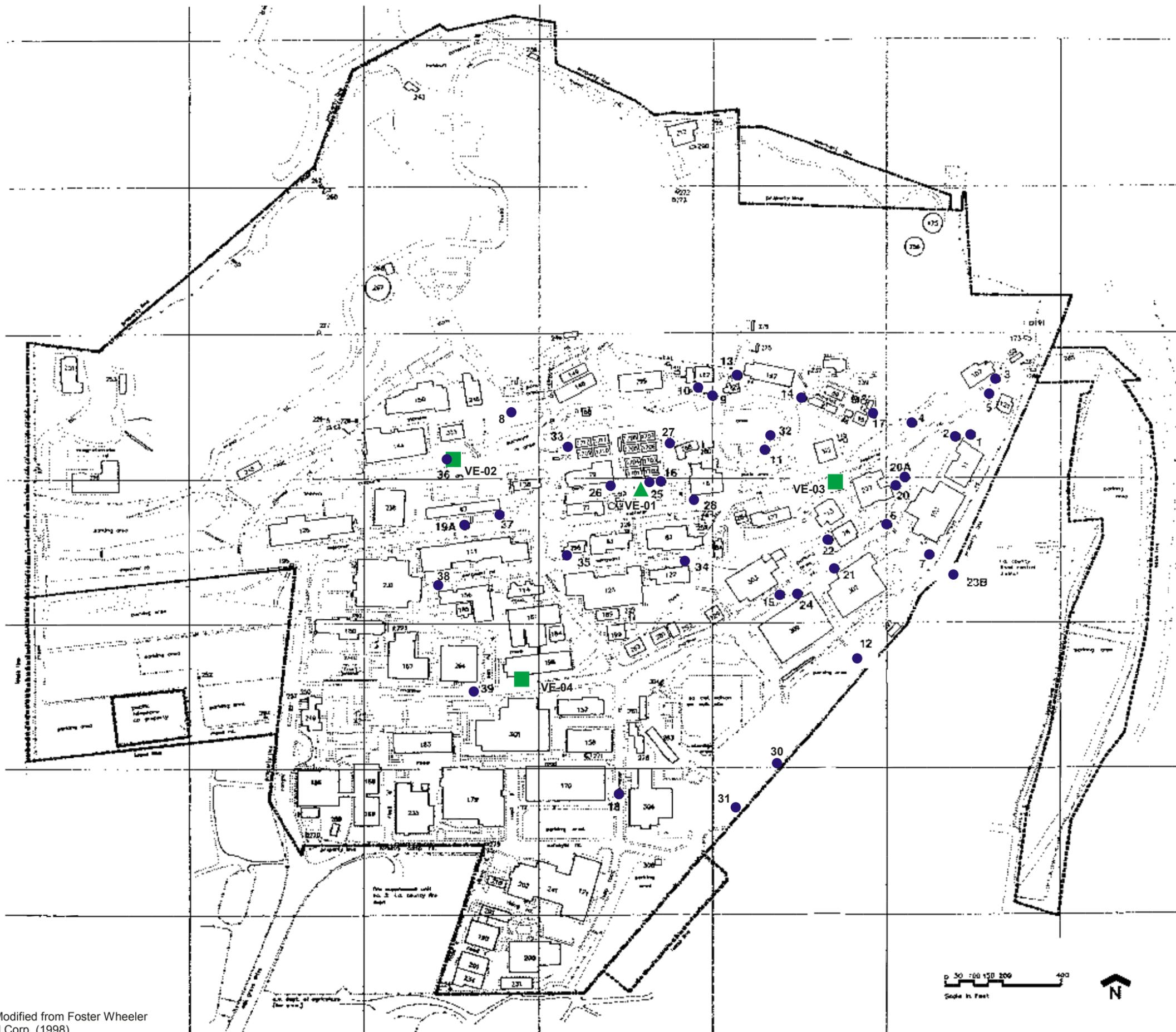
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**Variability Index**

Variability Index =  $\frac{\text{Concentration Range Over the Past 3 or 4 Events}}{\text{Median Concentration}}$

<b>VAPOR SAMPLING FREQUENCY FLOW CHART FIGURE 9</b>	
Jet Propulsion Laboratory Pasadena, California	
	Date: May 2002 Contract No.: N68711-97-D-8702 DO No.: 0048

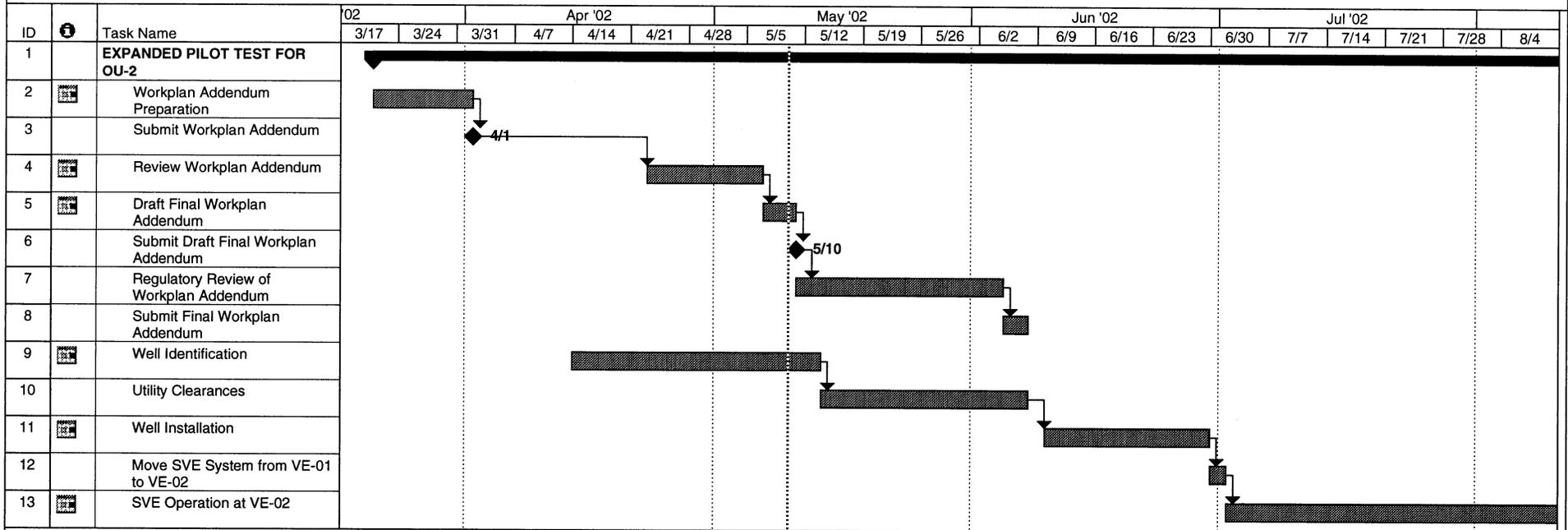


- EXPLANATION**
- <sup>1</sup> APPROXIMATE LOCATION OF SOIL VAPOR MONITORING WELL INSTALLED DURING RI INVESTIGATION
  - ▲ VE-01 APPROXIMATE LOCATION OF EXISTING SOIL VAPOR EXTRACTION WELL
  - VE-02 PROPOSED LOCATION OF ADDITIONAL SOIL VAPOR EXTRACTION WELLS

<b>SOIL VAPOR MONITORING WELL LOCATION MAP</b>	
<b>FIGURE 10</b>	
Jet Propulsion Laboratory Pasadena, California	
	Date: May 2002 Contract No.: N68711-97-D-8702 DO No.: 0048

Note: Figure Modified from Foster Wheeler Environmental Corp. (1998)

**FIGURE 11  
PROPOSED SCHEDULE  
Expanded Pilot Test for OU-2  
NASA Jet Propulsion Laboratory, Pasadena, CA**



Project: NASA JPL OU-2 Date: Fri 5/10/02	Task	[Task Bar]	Milestone	[Milestone Diamond]	Rolled Up Split	[Dotted Line]	External Tasks	[External Task Bar]
	Split	[Dotted Line]	Summary	[Summary Bar]	Rolled Up Milestone	[Diamond]	Project Summary	[Project Summary Bar]
	Progress	[Solid Bar]	Rolled Up Task	[Rolled Up Task Bar]	Rolled Up Progress	[Solid Bar]		

**FIGURE 11  
PROPOSED SCHEDULE  
Expanded Pilot Test for OU-2  
NASA Jet Propulsion Laboratory, Pasadena, CA**

ID	Task Name	Aug '02			Sep '02				Oct '02				Nov '02				Dec '02					
		8/11	8/18	8/25	9/1	9/8	9/15	9/22	9/29	10/6	10/13	10/20	10/27	11/3	11/10	11/17	11/24	12/1	12/8	12/15	12/22	12/29
1	<b>EXPANDED PILOT TEST FOR OU-2</b>																					
2	Workplan Addendum Preparation																					
3	Submit Workplan Addendum																					
4	Review Workplan Addendum																					
5	Draft Final Workplan Addendum																					
6	Submit Draft Final Workplan Addendum																					
7	Regulatory Review of Workplan Addendum																					
8	Submit Final Workplan Addendum																					
9	Well Identification																					
10	Utility Clearances																					
11	Well Installation																					
12	Move SVE System from VE-01 to VE-02																					
13	SVE Operation at VE-02																					

Project: NASA JPL OU-2 Date: Fri 5/10/02	Task		Milestone		Rolled Up Split		External Tasks	
	Split		Summary		Rolled Up Milestone		Project Summary	
	Progress		Rolled Up Task		Rolled Up Progress			

## TABLES

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**TABLE 1****Soil Vapor Screening Levels**

<b>Description</b>	<b>Soil Vapor Screening Level, µg/L</b>					
	20 ft	40 ft	60 ft	80 ft	100 ft	> 150 ft
Carbon Tetrachloride	0.2	0.4	1.0	1.6	2.2	3.7
1,1-Dichloroethylene	15	27	72	117	162	274
Freon 113™	1.1x10 <sup>3</sup>	2.1x10 <sup>3</sup>	5.6x10 <sup>3</sup>	9.0x10 <sup>3</sup>	1.3x10 <sup>4</sup>	2.1x10 <sup>4</sup>
Trichloroethylene	0.7	1.4	3.6	5.8	8.0	14

**Note:** Calculation of vapor screening levels is based on the attenuation factor method presented in Appendix A of the Los Angeles Regional Water Quality Control Board (RWQCB) *Interim Site Assessment and Cleanup Guidebook* (1996).

**TABLE 2****Summary of Soil Vapor Sampling Frequency**

<b>Monitoring Point</b>	<b>Sampling Frequency</b>
VP-1, VP-2 and VP-3	Annual
VP-4	Quarterly at 20 to 56 ft bgs, else plugged
VP-5 through VP-12	Annual
VP-13	All levels plugged
VP-14	Annual
VP-15	Annual
VP-16	All levels plugged
VP-17	Semiannual at 36 ft bgs, else plugged
VP-18, VP-19A, VP-20A, VP-20, VP-21, VP-22, VP-23B, and VP-24	Soil vapor wells plugged or not found
VP-25	Annual
VP-26	Semiannual
VP-27	Semiannual
VP-28	Annual
VP-29	Soil vapor well not found
VP-30	Annual
VP-31	Annual
VP-32	Quarterly at 155 feet bgs, else Annual
VP-33	Quarterly at 85 to 120 feet bgs, else Annual
VP-34	Quarterly at 118 feet bgs, else Annual
VP-35	Semiannual
VP-36	Quarterly at 35 to 55 feet bgs, else Semiannual
VP-37	Quarterly at 185 feet bgs, else Semiannual
VP-38	Semiannual
VP-39	Semiannual

**Note:** Based on the sampling frequency protocol presented in Figure 9.