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NSB NEW LONDON

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**MONTHLY OPERATIONS SUMMARY
FOR THE NAVAL EXCHANGE (NEX) AND DOLPHIN MART
AIR SPARGING/SOIL VAPOR EXTRACTION SYSTEMS
AND OT-8 PASSIVE FREE PRODUCT RECOVERY SYSTEM**

Delivery Order No. 0014

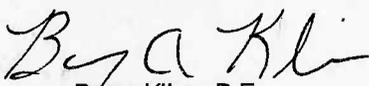
NEW LONDON SUBMARINE BASE
GROTON, CONNECTICUT

Month: February 1997

Prepared By:

Fluor Daniel GTI, Inc.

Prepared by:



Barry Kline, P.E.
Lead Engineer

Foster Wheeler Environmental Corporation

Reviewed by:



Kirti Shah, P.E.
Environmental Site Technical Manager

OPERATIONAL SUMMARY

DOLPHIN MART AIR SPARGE/SVE SYSTEM

System Status - The remediation system at the site has been operating since June 29, 1996. As of February 26, 1997 thirteen (13) horizontal trenches (VET-1, VET-2, VET-3, VET-4, VET-5, VET-6, VET-7, VET-8, VET-9, VET-10, VET-11, VET-12, and VET-17) and seven (7) air sparge points (ASP-A, ASP-B, ASP-C, ASP-D, ASP-E, ASP-F, and ASP-G) were operating. VET-13 through VET-16 are not operating due to flooding of the lower section of the main trunk line. Air sparge points ASP-H through ASP-Q cannot be operated without VET-13 through VET-16 operating. The SVE system is currently extracting subsurface air at a flow rate of approximately 450 scfm. The air sparge system is currently injecting air at a flow rate of approximately 30 scfm. The Hersey air flow meters are currently inoperable, pending repair. A site map has been included as **Figure 1**. The site visit forms for O&M conducted during the month of February, 1997 are included in **Attachment 1**. A weekly break-down of the monthly field activities has been included as **Attachment 2**.

Mass Removal - The total hydrocarbon mass removal rate, based on the SVE system influent sample collected January 27, 1997, was 0.12 lbs/hour. During the period from December 17, 1996 to January 27, 1997 approximately 66 lbs of hydrocarbons were extracted by the remediation system. The total hydrocarbon mass extracted by the remediation system, as of January 27, 1997, was approximately 1,176 lbs. The system database has been included in **Attachment 3**. Mass removal graphs have been included as **Figures 3 and 4**. Based on the hydrocarbon mass removal rate, no exceedance of CTDEP air quality guidelines was observed. *Please note: February influent sampling at the site was delayed due to the delay in activating the air sparge system at the NEX site (off-gas sampling at both sites coincide). Monthly sampling will resume in March, 1997.*

Carbon Usage - A summary of the historical carbon usage at the site has been included as **Attachment 4**. The last carbon change at the site occurred August 27, 1996.

Discharge Monitoring Sampling - Discharge monitoring sampling was completed February 26, 1997. The Discharge Monitoring Report (DMR) will be generated following receipt of the laboratory analytical data.

Monitoring Well Gauging - The site monitoring wells were gauged February 18, 1997. Depth to groundwater at the site ranged from 1.90 feet in DM-3 to 7.95 feet in WE-3. Historical well gauging data has been included in **Attachment 5**.

Monitoring Well Sampling - Monitoring well sampling was completed on February 18, 1997. The next quarterly sampling event is scheduled for May, 1997. The historical groundwater sampling results have been summarized in **Attachment 6**.

Additional Activities - On February 26, 1997, the feasibility of the proposed roadbox modifications were reviewed and tested at the valve vaults for VET-15 and VET-16.

NEX AIR SPARGE/SVE SYSTEM

System Status - The remediation system at the site has been operating since July 31, 1996. As of February 26, 1997, twenty-one (21) horizontal trenches (VEA-13, VEA-14, VEA-15, VEA-16, VEA-18, VEA-20, VEB-1, VEB-2, VEB-3, VEB-4, VEB-5, VEB-6, VEB-7, VEB-8, VEB-9, VEB-10, VEB-11, VEB-12, VEB-13, VEB-14, and VEB-15) were operating. The remainder of the vapor extraction points are not operating due to high groundwater table elevations limiting the well effectiveness. The air sparge system is not currently operating. The SVE system is currently extracting subsurface air at a flow rate of approximately 278 scfm (246 scfm from the east system and 32 scfm from the west system). A site map has been included as **Figure 2**. The site visit forms for O&M conducted during the month of February, 1997 are included in **Attachment 1**. A weekly break-down of the monthly field activities has been included in **Attachment 2**.

Mass Removal - The total hydrocarbon mass removal rate, based on the SVE system influent sample collected January 27, 1997, was 0.04 lbs/hour. During the period from December 17, 1996 to January 27, 1997 approximately 50 lbs of hydrocarbons were extracted by the remediation system. The total hydrocarbon mass extracted by the remediation system, as of January 27, 1997, is approximately 829 lbs. The system database has been included in **Attachment 3**. Mass removal graphs have been included as **Figures 5 and 6**. Based on the hydrocarbon mass removal rate, no exceedance of CTDEP air quality guidelines was observed. *Please note: February influent sampling at the site was delayed due to the delay in activating the air sparge system. Approval from the Navy to replace the air compressor pressure switch and activate the air sparge system is currently pending. Monthly sampling will resume in March, 1997.*

Discharge Monitoring Sampling - Discharge monitoring sampling was completed February 26, 1997. The Discharge Monitoring Report (DMR) will be generated following receipt of the laboratory analytical data.

Carbon Usage - A summary of the historical carbon usage at the site has been included as **Attachment 4**. The carbon units at the site were taken off-line September 4, 1996.

Monitoring Well Gauging - The site monitoring wells were last gauged on February 17, 1997. Depth to groundwater at the site ranged from 3.00 feet in ERM-5 to 7.85 feet in ERM-16. Historical well gauging data has been included in **Attachment 5**.

Monitoring Well Sampling - Monitoring well sampling was completed February 17, 1997. The next quarterly sampling event is scheduled for May, 1997. The historical groundwater sampling results have been summarized in **Attachment 6**.

Additional Activities - Start-up of the air sparge system was attempted on February 18, 1997. Before the sparge system activation can proceed, a pressure switch on the air sparge blower needs to be replaced.

OT-8 PASSIVE FREE PRODUCT RECOVERY SYSTEM

System Status - The OT-8 passive free product recovery system was activated on September 28, 1996. During the month of February, the system remained deactivated due to a high groundwater table which prohibited system operation.

Product Recovery - No light non-aqueous phase liquid (LNAPL) petroleum was recovered during the month of February, 1997. As of January 27, 1997 a total of approximately 4 gallons of LNAPL have been recovered by the system. The fluctuating groundwater table around MW-7 may lead to smearing of the

LNAPL. It is anticipated that during periods of extended lower water table elevations, LNAPL may accumulate within the well and allow recovery to resume. A copy of the well construction log for MW-7 has been included as Attachment 7. *Please note: The screen interval of MW-7 begins at five feet below grade, therefore, product will not accumulate in the well until the water table drops below this level.*

Monitoring Well Gauging - MW-7 was gauged on February 19, 1997. At that time the depth to LNAPL was 2.96 feet below grade and the depth to groundwater was 2.97 feet below grade. Historical gauging data for MW-7 is included in **Attachment 5**.

Additional Activities - No out of scope activities were performed during February 1997.

FIGURES

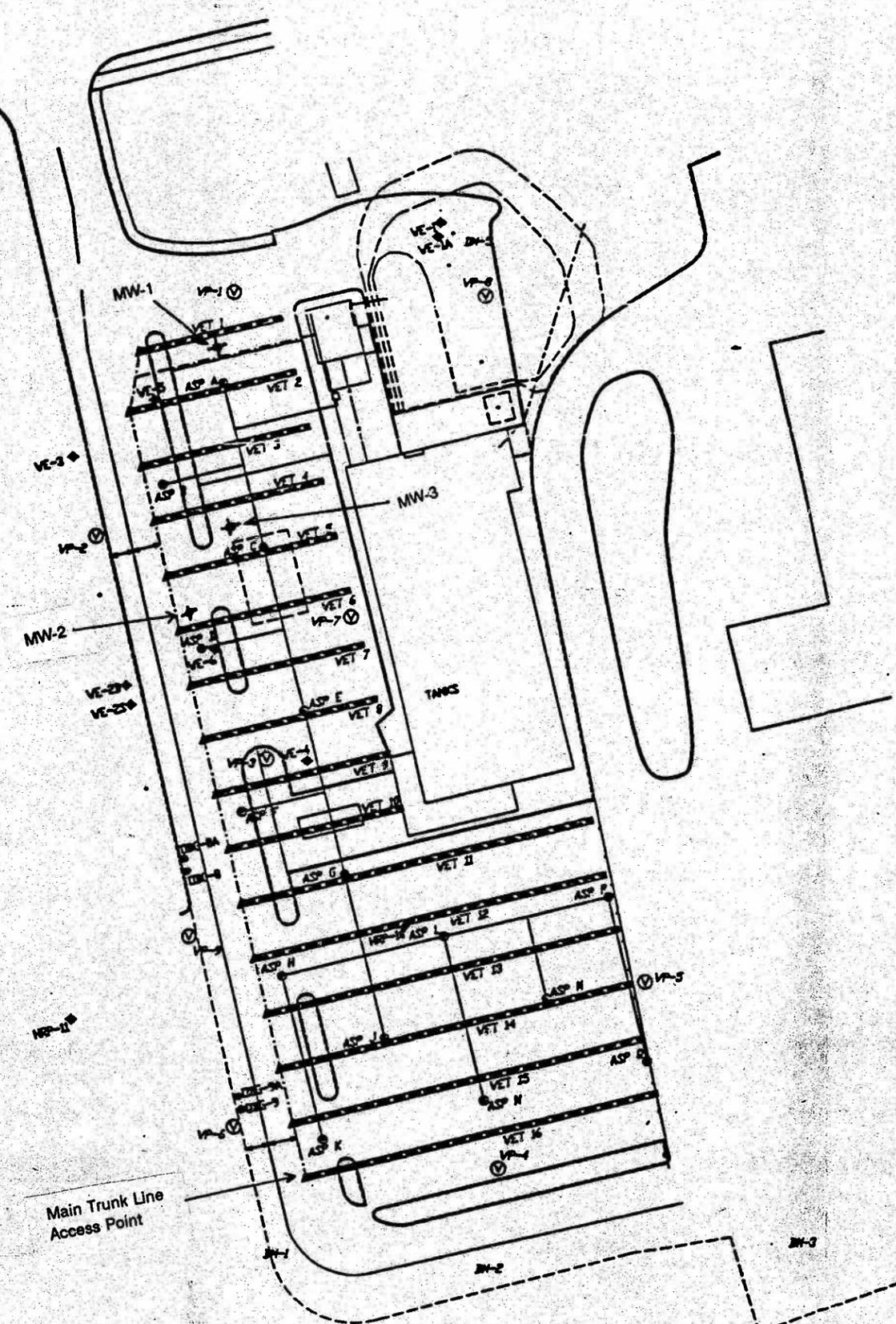


Figure 1

<p>GRAPHIC SCALES</p> <p>CHECK GRAPHIC SCALES BEFORE USE</p> <p>SCALE IN FEET 1"=20'</p>	<p>REMEDIATION OF CONTAMINATED SOIL/GROUND WATER</p> <p>SITE PLAN</p> <p>SOLUTION SHEET</p>	
	<p>F. 80091</p>	<p>2166440</p>

DATE	DESCRIPTION	BY	APP'D

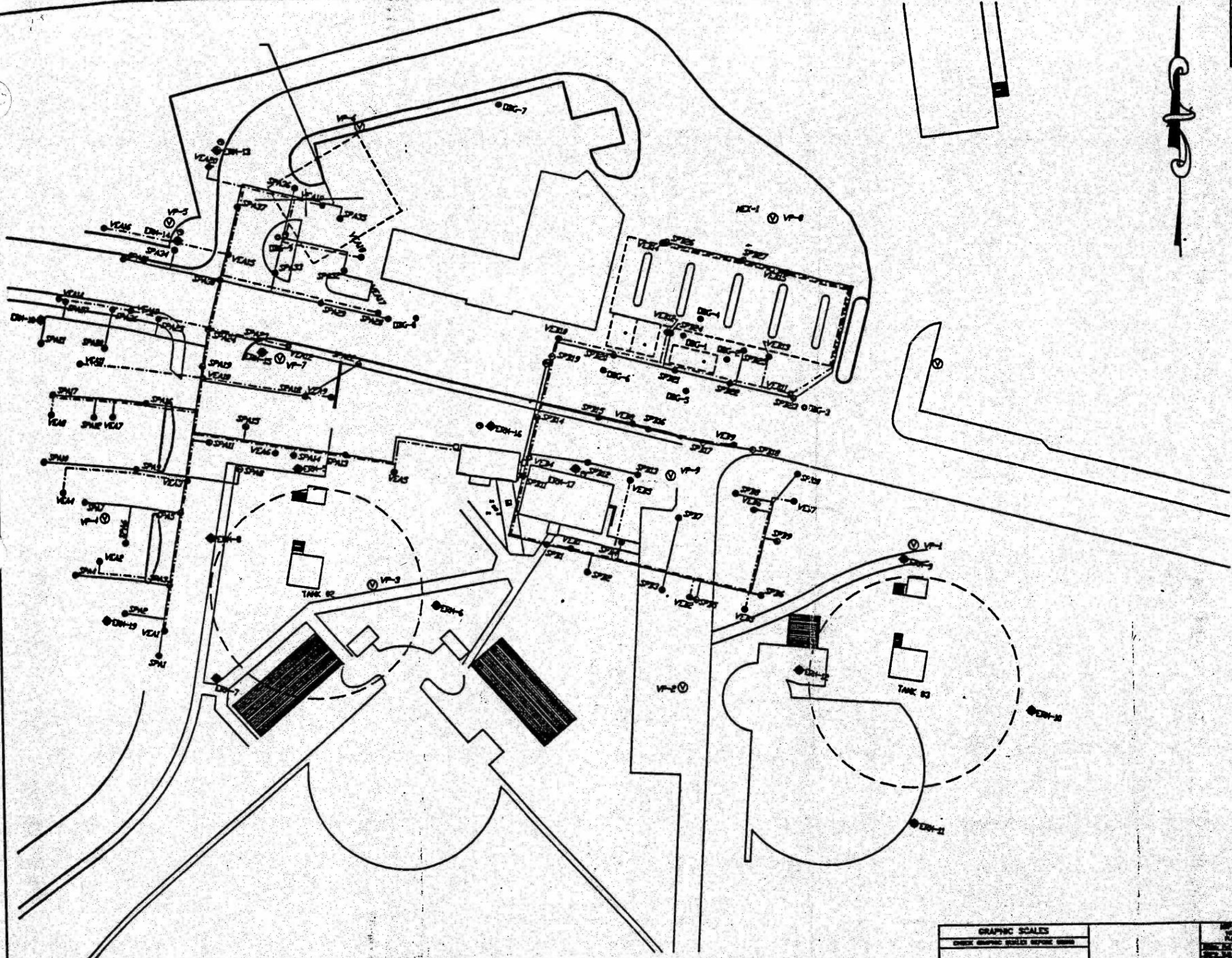


Figure 2

<p>GRAPHIC SCALES</p> <p>CHECK GRAPHIC SCALES BEFORE USING</p> <p>SCALE IN FEET</p> <p>1"=20'</p>	<p>PROJECT NO. 80091</p> <p>DATE 11/11/83</p> <p>SCALE 1"=20'</p>	<p>STATE OF CONNECTICUT DEPARTMENT OF THE ENVIRONMENT NORTHERN DIVISION WATER RESOURCES SECTION</p>		
		<p>PROJECT TITLE REMEDIATION OF CONTAMINATED SOIL/GROUND WATER</p> <p>PROJECT LOCATION SITE PLAN MATERIAL EXCHANGE (MEX)</p> <p>PROJECT NO. 80091</p> <p>PROJECT NO. 2166438</p> <p>PROJECT NO. C1</p>		

Figure 3 - Mass Removal Rate
Dolphin Mart Site, New London Naval Submarine Base, Groton, CT

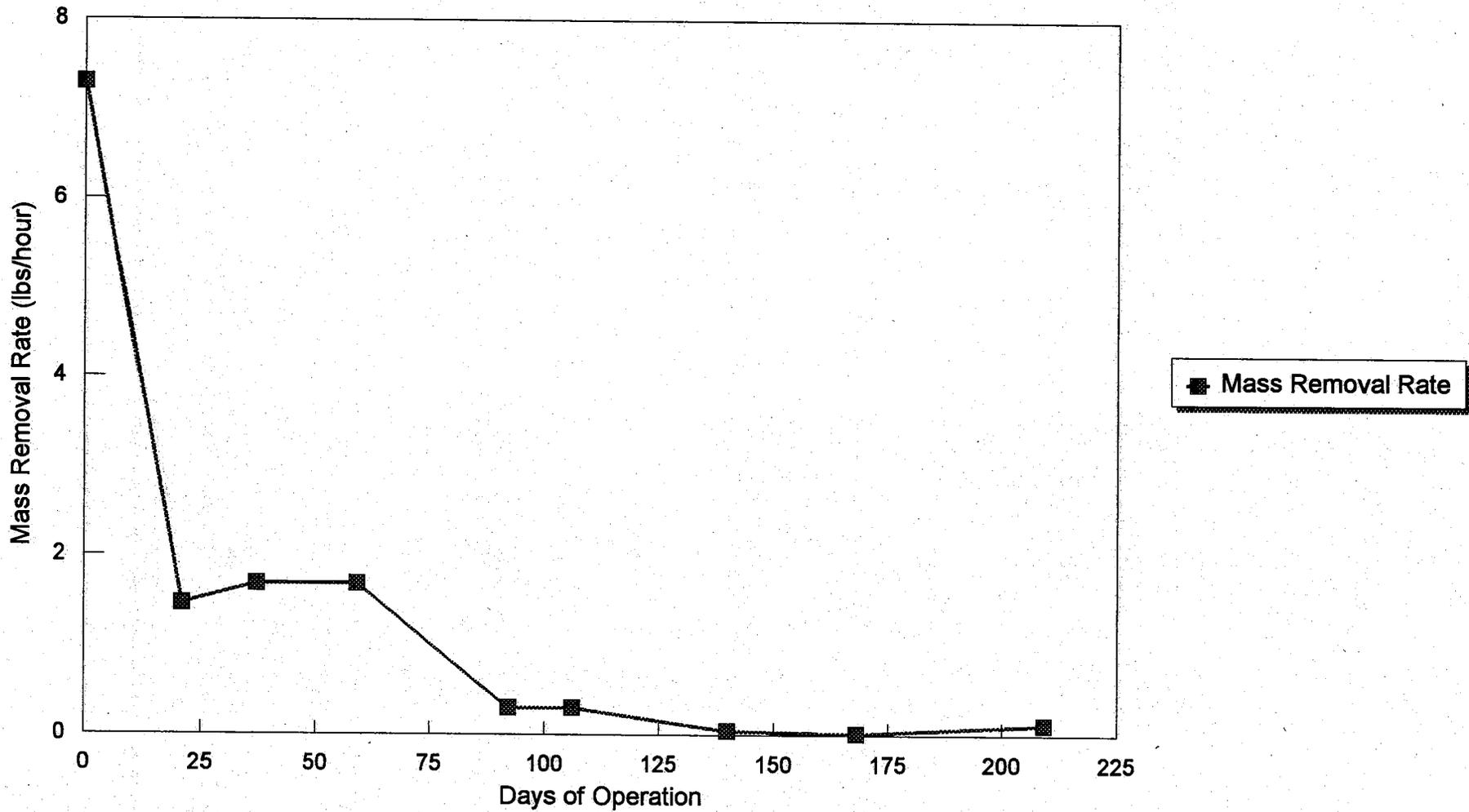


Figure 4 - Cumulative Mass Removed versus Time

Dolphin Mart Site, New London Naval Submarine Base, Groton, CT

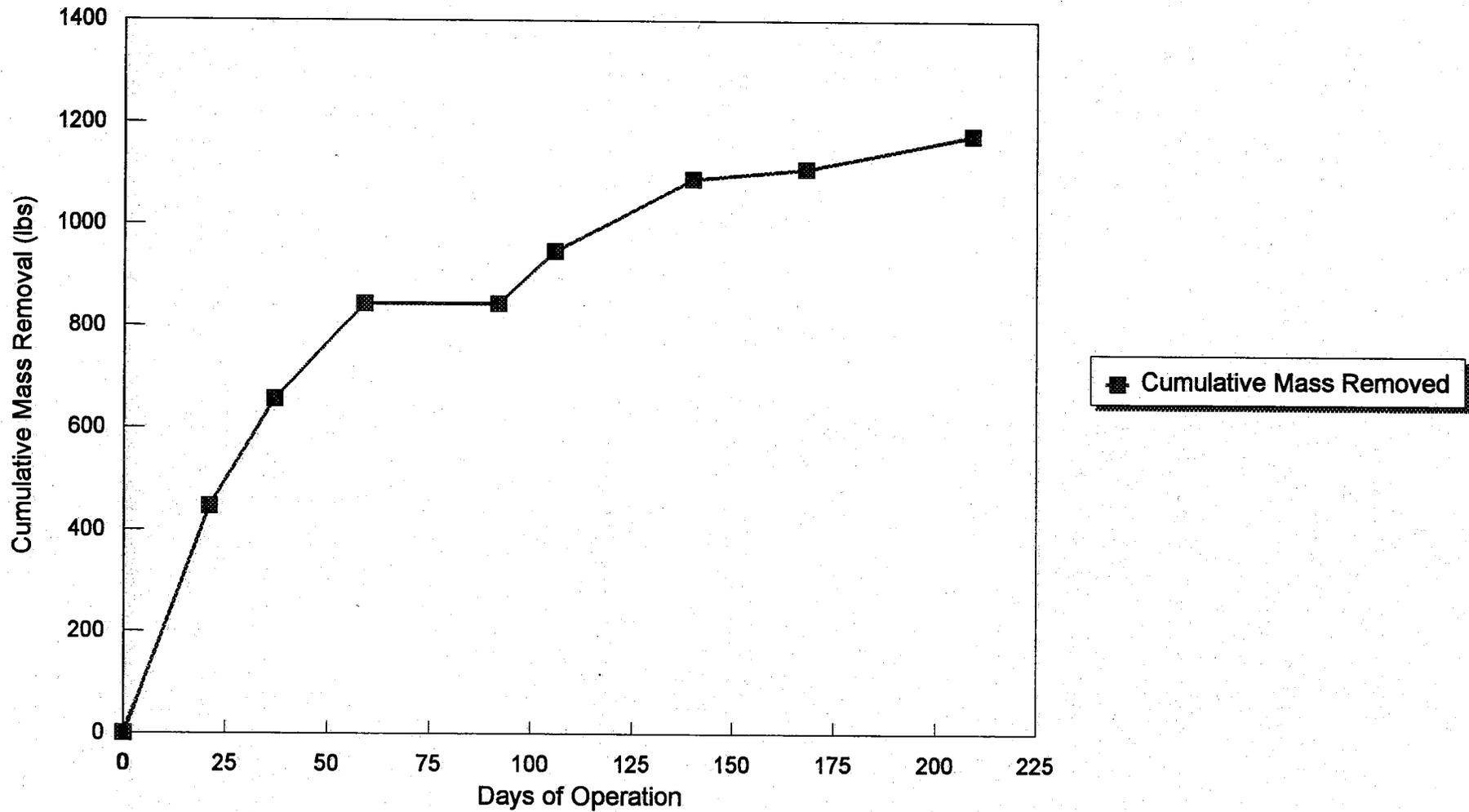


Figure 5 - Mass Removal Rate
NEX Site, New London Naval Submarine Base, Groton, CT

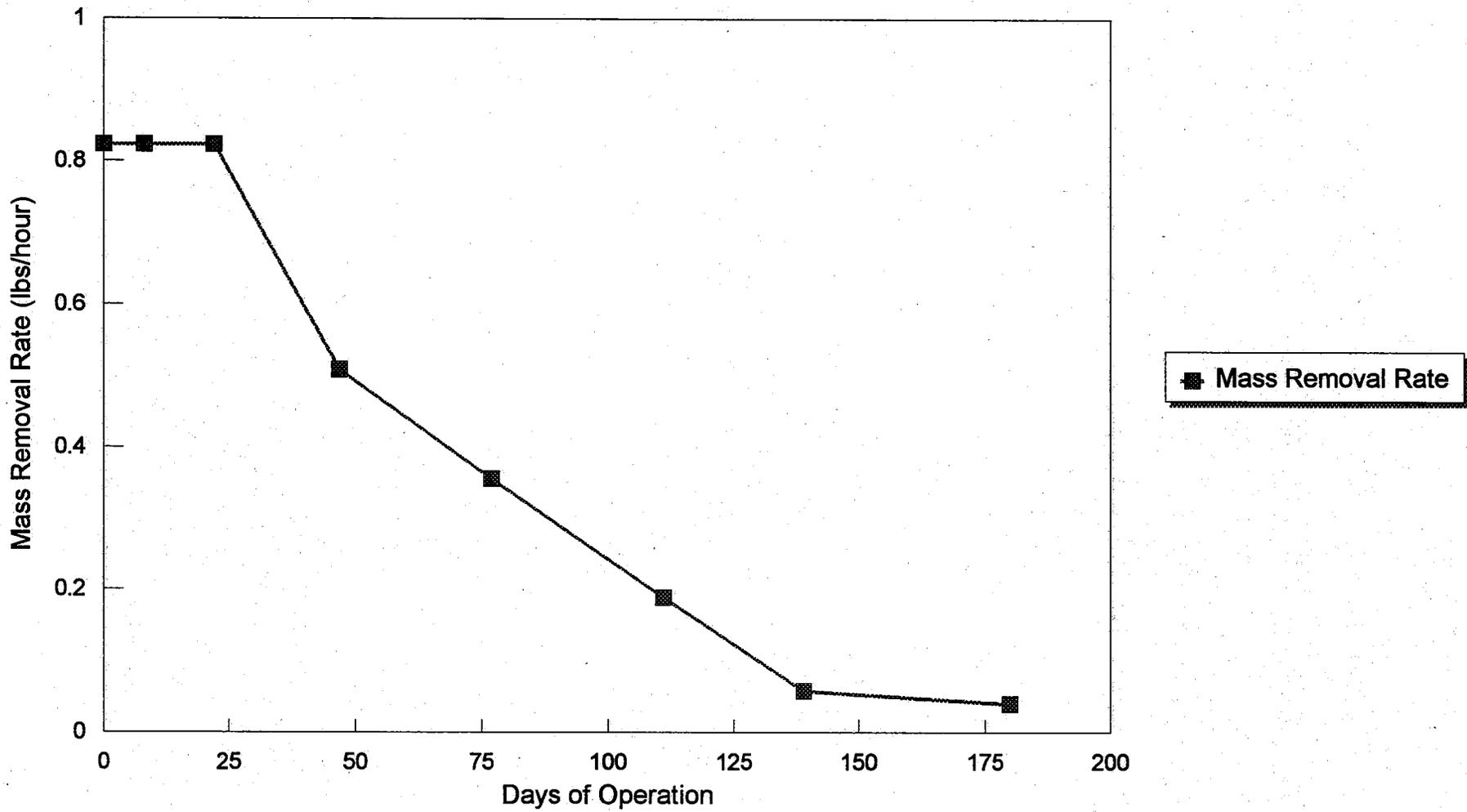
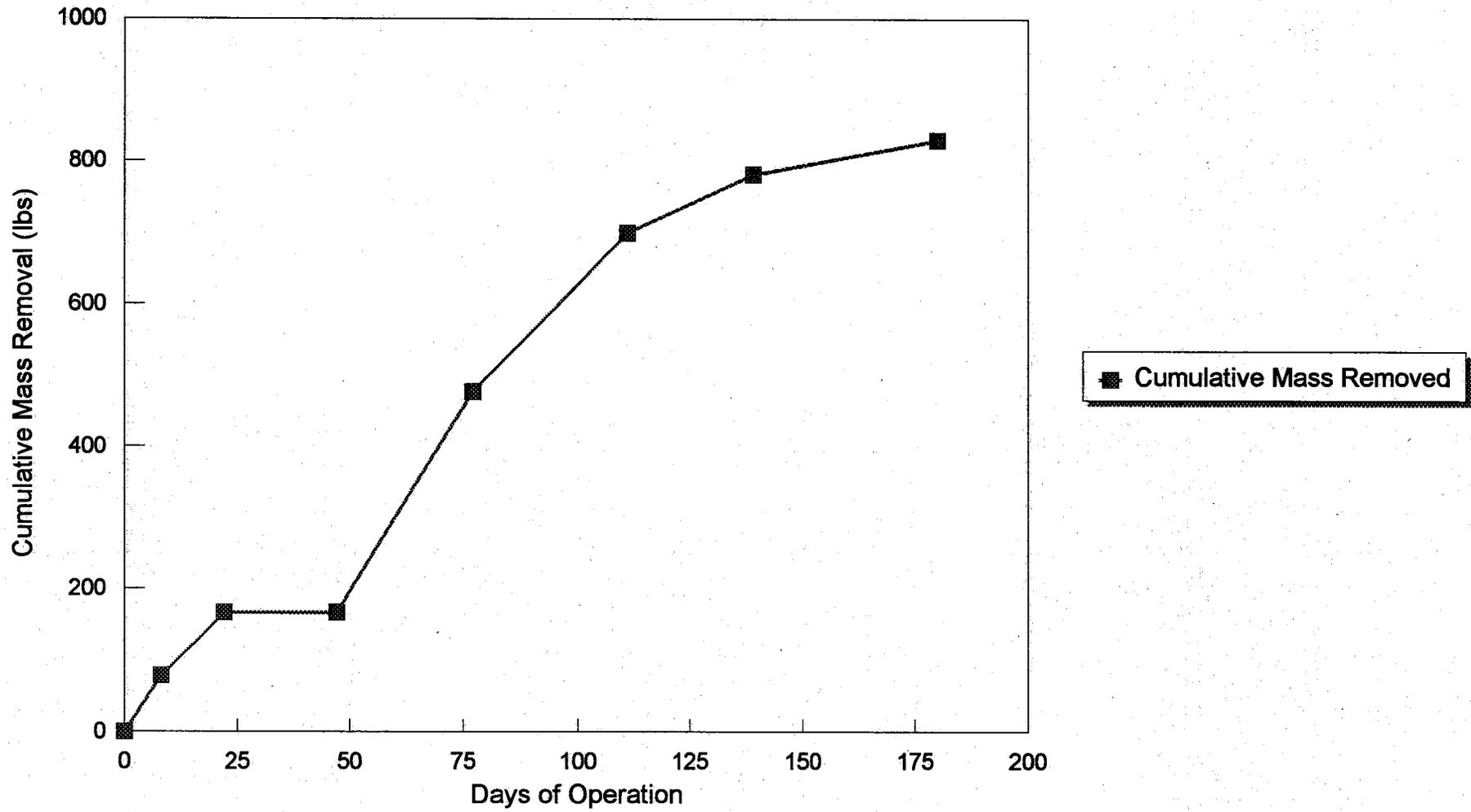


Figure 6 - Cumulative Mass Removed versus Time

NEX Site, New London Naval Submarine Base, Groton, CT



ATTACHMENT 1
SITE VISIT FORMS

OPERATIONAL DATA FORM
Air Sparging/Soil Vapor Extraction System
Dolphin Mart
Naval Submarine Base -Groton, CT
Project #83001-9999

Date: 2/19/97
 Time: 13:45
 Technician: WCD/JK JR.

AIR COMPRESSOR SYSTEM

Flow Rate	SCFM	Total Flow	SCFM
Air Compressor C-1		Air Compressor C-2	
Pressure <u>7.5</u> psi		Pressure _____ psi	
Temperature <u>214</u> °F		Temperature _____ °F	
Flow Control Valve Setting <u>100</u> %		Flow Control Valve Setting _____	
Bleed Valve <u>50</u> %		Bleed Valve _____	
Radiator <u>ON</u> / OFF		Radiator _____ ON / OFF	

SOIL VAPOR EXTRACTION SYSTEM

Flow Rate	SCFM	Total Flow	SCFM
Vacuum Pump V-1		Vacuum Pump V-2	
Vacuum <u>-5</u> °Hg		Vacuum <u>2.5</u> °Hg	
Temperature <u>144</u> °F		Temperature <u>144</u> °F	
Particulate Filter <u>OK</u>		Particulate Filter <u>OK</u>	
Flow Control Valve Setting <u>100</u> %		Flow Control Valve Setting <u>100</u> %	
Bleed Air Valve Setting <u>25</u> %		Bleed Air Valve Setting <u>50</u> %	
Liquid Level _____		Liquid Level _____	
Vacuum Pump V-3		Vacuum Pump V-4	
Vacuum _____ °Hg		Vacuum _____ °Hg	
Temperature _____ °F		Temperature _____ °F	
Particulate Filter _____		Particulate Filter _____	
Flow Control Valve Setting _____		Flow Control Valve Setting _____	
Bleed Air Valve Setting _____		Bleed Air Valve Setting _____	
Liquid Level _____		Liquid Level _____	

ACTIVATED CARBON ADSORPTION SYSTEM

Carbon Adsorber A/B		Carbon Adsorber C/D	
Inf. VOC Level _____ ppm		Inf. VOC Level <u>2.6</u> ppm	
Inf Pressure _____ psi		Inf Pressure <u>1.0</u> psi	
Mid. VOC Level _____ ppm		Mid. VOC Level <u>2.2</u> ppm	
Mid Pressure _____ psi		Mid Pressure <u>1.0</u> psi	
Eff. VOC Level _____ ppm		Eff. VOC Level <u>1.1</u> ppm	
Change out Date _____		Change out Date <u>8-22-96</u>	

WATER TREATMENT

Flowmeter Reading 2751.8 Gallons

COMMENTS

Influent pH 4.80 Temp 15.3 °C DO 10.23
 Effluent pH 6.56 Temp 11.8 °C DO 10.32

OPERATIONAL DATA FORM
Air Sparging/Soil Vapor Extraction System
Naval Exchange
Naval Submarine Base -Groton, CT
Project #83001-9999

Date: 2/19/97
 Time: 17:30
 Technician: WED/J.K.JR.

AIR COMPRESSOR SYSTEM

Flow Rate	SCFM	Total Flow	SCFM
Air Compressor C-1		Air Compressor C-2	
Pressure _____ psi		Pressure _____ psi	
Temperature _____ °F		Temperature <u>77.5</u> °F	
Flow Control Valve Setting _____		Flow Control Valve Setting _____	
Bleed Valve _____		Bleed Valve _____	
Radiator <u>ON / OFF</u>		Radiator <u>ON / OFF</u>	

SOIL VAPOR EXTRACTION SYSTEM

Eastern Flow Rate	SCFM	Total Flow	SCFM
Western Flow Rate	SCFM	Total Flow	SCFM
Vacuum Pump V-1		Vacuum Pump V-2	
Vacuum <u>3.5</u> *Hg		Vacuum <u>1</u> *Hg	
Temperature <u>110</u> °F		Temperature <u>110</u> °F	
Particulate Filter <u>OK</u>		Particulate Filter <u>OK</u>	
Flow Control Valve Setting <u>100 %</u>		Flow Control Valve Setting <u>100 %</u>	
Bleed Air Valve Setting <u>50 %</u>		Bleed Air Valve Setting <u>50 %</u>	
Liquid Level _____		Liquid Level _____	
Vacuum Pump V-3		Vacuum Pump V-4	
Vacuum <u>3.5</u> *Hg		Vacuum <u>2.5</u> *Hg	
Temperature <u>122</u> °F		Temperature <u>130</u> °F	
Particulate Filter <u>OK</u>		Particulate Filter <u>OK</u>	
Flow Control Valve Setting <u>100 %</u>		Flow Control Valve Setting <u>100 %</u>	
Bleed Air Valve Setting _____		Bleed Air Valve Setting <u>50 %</u>	
Liquid Level _____		Liquid Level _____	

ACTIVATED CARBON ADSORPTION SYSTEM

Carbon Adsorber A/B		Carbon Adsorber C/D	
Inf. VOC Level <u>0</u> ppm		Inf. VOC Level <u>0</u> ppm	
Inf Pressure _____ psi		Inf Pressure _____ psi	
Mid. VOC Level <u>0</u> ppm		Mid. VOC Level _____ ppm	
Mid Pressure _____ psi		Mid Pressure _____ psi	
Eff. VOC Level <u>0</u> ppm		Eff. VOC Level <u>0</u> ppm	
Change out Date _____		Change out Date <u>8-22-96</u>	

WATER TREATMENT

Flowmeter Reading 1490.3 Gallons

COMMENTS

Vacuum Gauge broken on V-1

grsubbaswplgr1.11

Influent	ph	Temp	D.O.
	<u>7.40</u>	<u>13.9°C</u>	<u>11.91</u>
Effluent	<u>8.06</u>	<u>14.0°C</u>	<u>11.48</u>

OPERATIONAL DATA FORM
Air Sparging/Soil Vapor Extraction System
Naval Exchange
Naval Submarine Base -Groton, CT
Project #83001-9999

Date: 2-18-97
 Time: _____
 Technician: BAK/CSG

AIR COMPRESSOR SYSTEM

Flow Rate	SCFM	Total Flow	SCFM
Air Compressor C-1		Air Compressor C-2	
Pressure _____ psi		Pressure _____ psi	
Temperature _____ °F		Temperature _____ °F	
Flow Control Valve Setting _____		Flow Control Valve Setting _____	
Bleed Valve _____		Bleed Valve _____	
Radiator <u>ON / OFF</u>		Radiator <u>ON / OFF</u>	

SOIL VAPOR EXTRACTION SYSTEM

Eastern Flow Rate <u>171/320</u>	SCFM	Total Flow <u>25297010</u>	SCFM
Western Flow Rate <u>0/64</u>	SCFM	Total Flow <u>11525244</u>	SCFM
Vacuum Pump V-1		Vacuum Pump V-2	
Vacuum <u>1 1/2</u> °Hg		Vacuum <u>1 1/2</u> °Hg	
Temperature <u>120</u> °F		Temperature <u>122</u> °F	
Particulate Filter <u>OK</u>		Particulate Filter <u>OK</u>	
Flow Control Valve Setting <u>100%</u>		Flow Control Valve Setting <u>100%</u>	
Bleed Air Valve Setting <u>50%</u>		Bleed Air Valve Setting <u>50%</u>	
Liquid Level <u>DRY</u>		Liquid Level <u>DRY</u>	
Vacuum Pump V-3		Vacuum Pump V-4	
Vacuum _____ °Hg		Vacuum _____ °Hg	
Temperature _____ °F		Temperature _____ °F	
Particulate Filter _____		Particulate Filter _____	
Flow Control Valve Setting _____		Flow Control Valve Setting _____	
Bleed Air Valve Setting _____		Bleed Air Valve Setting _____	
Liquid Level _____		Liquid Level _____	

ACTIVATED CARBON ADSORPTION SYSTEM

Carbon Adsorber A/B		Carbon Adsorber C/D	
Inf. VOC Level _____ ppm		Inf. VOC Level <u>22/18</u> ppm	
Inf Pressure _____ psi		Inf Pressure _____ psi	
Mid. VOC Level _____ ppm		Mid. VOC Level _____ ppm	
Mid Pressure _____ psi		Mid Pressure _____ psi	
Eff. VOC Level _____ ppm		Eff. VOC Level _____ ppm	
Change out Date _____		Change out Date <u>NO GAC IN-LINE</u>	

WATER TREATMENT

Flowmeter Reading 1361.1 Gallons @ 10:15 AM

COMMENTS

VOC LEVELS 9:40 AM

OPERATIONAL DATA FORM
Air Sparging/Soil Vapor Extraction System
Naval Exchange
Naval Submarine Base -Groton, CT
Project #83001-9999

Date: 2/17/97
 Time: 16:30
 Technician: WCD / J.K.J.R.

AIR COMPRESSOR SYSTEM

Flow Rate	SCFM	Total Flow	SCFM
Air Compressor C-1 Pressure _____ psi Temperature _____ °F Flow Control Valve Setting _____ Bleed Valve _____ Radiator <u>ON / OFF</u>		Air Compressor C-2 Pressure _____ psi Temperature _____ °F Flow Control Valve Setting _____ Bleed Valve _____ Radiator <u>ON / OFF</u>	

SOIL VAPOR EXTRACTION SYSTEM

Eastern Flow Rate <u>2528321</u> SCFM	Total Flow <u>25283096</u> SCFM
Western Flow Rate <u>0-85</u> SCFM	Total Flow <u>11523182</u> SCFM
Vacuum Pump V-1 Vacuum <u>1.0</u> °Hg Temperature <u>110</u> °F Particulate Filter <u>OK</u> Flow Control Valve Setting <u>100%</u> Bleed Air Valve Setting <u>50%</u> Liquid Level _____	Vacuum Pump V-2 Vacuum <u>1.5-1.0</u> °Hg Temperature <u>110</u> °F Particulate Filter <u>OK</u> Flow Control Valve Setting <u>100%</u> Bleed Air Valve Setting <u>50%</u> Liquid Level _____
Vacuum Pump V-3 Vacuum _____ °Hg Temperature _____ °F Particulate Filter _____ Flow Control Valve Setting _____ Bleed Air Valve Setting _____ Liquid Level _____	Vacuum Pump V-4 Vacuum _____ °Hg Temperature _____ °F Particulate Filter _____ Flow Control Valve Setting _____ Bleed Air Valve Setting _____ Liquid Level _____

ACTIVATED CARBON ADSORPTION SYSTEM

Carbon Adsorber A/B Inf. VOC Level _____ ppm Inf Pressure _____ psi Mid. VOC Level _____ ppm Mid Pressure _____ psi Eff. VOC Level _____ ppm Change out Date _____	Carbon Adsorber C/D Inf. VOC Level _____ ppm Inf Pressure _____ psi Mid. VOC Level _____ ppm Mid Pressure _____ psi Eff. VOC Level _____ ppm Change out Date <u>8-22-96</u>
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WATER TREATMENT

Flowmeter Reading 1279.3 Gallons

COMMENTS

Effluent 2.2 60 psi influent.

OPERATIONAL DATA FORM
Air Sparging/Soil Vapor Extraction System
Dolphin Mart
Naval Submarine Base - Groton, CT
Project #83001-9999

Date: 2-13-97
 Time: _____
 Technician: CSC - WCD

AIR COMPRESSOR SYSTEM

Flow Rate	<u>15.</u>	SCFM	Total Flow	<u>45503</u>	SCFM
Air Compressor C-1			Air Compressor C-2		
Pressure	<u>12.</u>	psi	Pressure	_____	psi
Temperature	<u>144.</u>	°F	Temperature	_____	°F
Flow Control Valve Setting	<u>100</u>		Flow Control Valve Setting	_____	
Bleed Valve	<u>50</u>		Bleed Valve	_____	
Radiator	<u>ON</u> OFF		Radiator	ON / OFF	

SOIL VAPOR EXTRACTION SYSTEM

Flow Rate	<u>NA</u>	SCFM	Total Flow	<u>NA</u>	SCFM
Vacuum Pump V-1			Vacuum Pump V-2		
Vacuum	<u>-0</u>	°Hg	Vacuum	<u>1 1/2</u>	°Hg
Temperature	<u>118</u>	°F	Temperature	<u>117</u>	°F
Particulate Filter	<u>OK</u>		Particulate Filter	<u>OK</u>	
Flow Control Valve Setting	<u>100-70</u>		Flow Control Valve Setting	<u>100-70</u>	
Bleed Air Valve Setting	<u>50-70</u>		Bleed Air Valve Setting	<u>50-70</u>	
Liquid Level	<u>DRY</u>		Liquid Level	<u>DRY</u>	
Vacuum Pump V-3			Vacuum Pump V-4		
Vacuum	_____	°Hg	Vacuum	_____	°Hg
Temperature	_____	°F	Temperature	_____	°F
Particulate Filter	_____		Particulate Filter	_____	
Flow Control Valve Setting	_____		Flow Control Valve Setting	_____	
Bleed Air Valve Setting	_____		Bleed Air Valve Setting	_____	
Liquid Level	_____		Liquid Level	_____	

ACTIVATED CARBON ADSORPTION SYSTEM

Carbon Adsorber A/B			Carbon Adsorber C/D		
Inf. VOC Level	_____	ppm	Inf. VOC Level	<u>2.4</u>	ppm
Inf. Pressure	_____	psi	Inf. Pressure	<u>10.5</u>	psi
Mid. VOC Level	_____	ppm	Mid. VOC Level	<u>.6</u>	ppm
Mid. Pressure	_____	psi	Mid. Pressure	<u>10.5</u>	psi
Eff. VOC Level	_____	ppm	Eff. VOC Level	<u>0.0</u>	ppm
Change out Date	_____		Change out Date	_____	

WATER TREATMENT

Flowmeter Reading 2451.7 Gallons

COMMENTS

#1 OVA USED.

OPERATIONAL DATA FORM
Air Sparging/Soil Vapor Extraction System
Dolphin Mart
Naval Submarine Base -Groton, CT
Project #83001-9999

Date: 2/10/97
 Time: 2:15
 Technician: W. Burnham

AIR COMPRESSOR SYSTEM

Flow Rate	NA	SCFM	Total Flow	NA	SCFM
Air Compressor C-1			Air Compressor C-2		
Pressure	<u>0</u>	psi	Pressure	<u> </u>	psi
Temperature	<u>0</u>	F	Temperature	<u> </u>	F
Flow Control Valve Setting	<u>100% open</u>		Flow Control Valve Setting	<u> </u>	
Bleed Valve	<u>50% open</u>		Bleed Valve	<u> </u>	
Radiator	<u>ON/OFF</u>		Radiator	<u> </u>	ON/OFF

SOIL VAPOR EXTRACTION SYSTEM

Flow Rate	0	SCFM	Total Flow		SCFM
Vacuum Pump V-1			Vacuum Pump V-2		
Vacuum	<u>18</u>	Hg H ₂ O	Vacuum	<u>22</u>	Hg H ₂ O
Temperature	<u>114</u>	F	Temperature	<u>98</u>	F
Particulate Filter	<u>open 90 OK</u>		Particulate Filter	<u>OK</u>	
Flow Control Valve Setting	<u>open 100%</u>		Flow Control Valve Setting	<u>100% open</u>	
Bleed Air Valve Setting	<u>20% open</u>		Bleed Air Valve Setting	<u>40% open</u>	
Liquid Level	<u> </u>		Liquid Level	<u> </u>	
Vacuum Pump V-3 run light on e panel			Vacuum Pump V-4		
Vacuum	<u> </u>	Hg	Vacuum	<u> </u>	Hg
Temperature	<u> </u>	F	Temperature	<u> </u>	F
Particulate Filter	<u> </u>		Particulate Filter	<u> </u>	
Flow Control Valve Setting	<u> </u>		Flow Control Valve Setting	<u> </u>	
Bleed Air Valve Setting	<u> </u>		Bleed Air Valve Setting	<u> </u>	
Liquid Level	<u> </u>		Liquid Level	<u> </u>	

ACTIVATED CARBON ADSORPTION SYSTEM

Carbon Adsorber A/B			Carbon Adsorber C/D		
Inf. VOC Level	<u> </u>	ppm	Inf. VOC Level	<u>17.5</u>	ppm
Inf. Pressure	<u> </u>	psi	Inf. Pressure	<u> </u>	psi
Mid. VOC Level	<u> </u>	ppm	Mid. VOC Level	<u>4.1</u>	ppm
Mid. Pressure	<u> </u>	psi	Mid. Pressure	<u>0</u>	psi
Eff. VOC Level	<u> </u>	ppm	Eff. VOC Level	<u>3.5</u>	ppm
Change out Date	<u> </u>		Change out Date	<u> </u>	

WATER TREATMENT

Flowmeter Reading Gallons

COMMENTS

Microtip calibrated to 97.2 ppm with 98 ppm isobutylene standard

ATTACHMENT 2

MONTHLY FIELD ACTIVITY SUMMARY

Field Activity Summary

February 1997

**New London Naval Submarine Base
Groton, Connecticut**

Week Ending	Site	Period	Field Activities¹	Comments
2/07/97	Dolphin Mart	Bi-monthly Monitoring	No field activities	SVE/air sparge system operating normally.
	NEX			SVE system operating normally.
	OT-8			Product recovery system inactive due to high water table.
2/14/97	Dolphin Mart	Bi-monthly Monitoring	Conducted system monitoring Conducted system maintenance	Air sparge system found deactivated. (Reactivated 2/13/97). Replaced sump cover.
	NEX		No field activities	SVE system operating normally.
	OT-8		No field activities	Product recovery system deactivated due to high water table.
2/21/97	Dolphin Mart	Bi-monthly Monitoring	Conducted quarterly groundwater sampling. Conducted system monitoring.	SVE/air sparge system operating normally.
	NEX		Conducted quarterly groundwater sampling. Conducted system monitoring.	SVE system operating normally. Attempted to activate air sparge system.
	OT-8		Conducted system monitoring.	Product recovery system deactivated due to high water table.

Field Activity Summary

February 1997

**New London Naval Submarine Base
Groton, Connecticut**

Week Ending	Site	Period	Field Activities¹	Comments
2/28/97	Dolphin Mart	Bi-monthly Monitoring	System maintenance. Attempted to modify valve vaults VET-15 and VET-16. Conducted DMR sampling.	SVE/air sparge system operating normally.
	NEX		Conducted DMR sampling	SVE system operating normally.
	OT-8		No field activities	Product recovery system deactivated due to high water table.

Note: ¹ Bi-monthly operation and maintenance tasks include well gauging and system monitoring.

ATTACHMENT 3

AIR SPARGE/SVE SYSTEM DATABASES

**SYSTEM MONITORING DATA
SOIL VAPOR EXTRACTION/AIR SPARGE SYSTEM**

New London Naval Submarine Base
Dolphin Mart Site
Groton, CT

Date	Day of Operation	Air Sparge Flowrate (scfm)	Extraction Flowrate (scfm)	Extraction Flowrate (cfm)	Influent Concentration BTEX (ppmv)	Removal Rate BTEX (lb/hr)	Influent Concentration MTBE (ppmv)	Removal Rate MTBE (lb/hr)	Influent Concentration Aliphatics (ppmv)	Removal Rate Aliphatics (lb/hr)	Influent Concentration Aromatics (ppmv)	Removal Rate Aromatics (lb/hr)	Influent Concentration TVPH (ppmv)	Removal Rate TVPH (lb/hr)	Total Mass Removal Rate (lb/hr)	Period Mass Removed (lbs)	Cumulative Mass Removed (lbs)	Comments
07/02/96	0	25	450	512.26	24.00	0.187	33.00	0.232	1000.00	6.876	0.00	0.000	—	0.000	7.295	0.00	0.00	
07/23/96	21	20	449	511.12	11.40	0.091	0.00	0.000	200.00	1.375	0.00	0.000	—	0.000	1.467	446.86	446.86	system operated approx. 102 hrs between 7/2 and 7/23
08/08/96	37	32	454	516.81	18.00	0.142	—	0.000	210.00	1.444	12.00	0.102	—	0.000	1.687	209.75	656.61	system operated approx. 133 hrs between 7/23 and 8/8
08/30/96	59	0	450	512.26	18.00	0.142	—	0.000	210.00	1.444	12.00	0.102	—	0.000	1.687	187.31	843.92	system operated approx. 111 hrs between 8/8 and 8/30
10/02/96	92	30	448	509.98	2.30	0.019	0.00	0.000	—	0.000	—	0.000	36.00	0.287	0.306	0.00	843.92	system not in operation from 8/30 to 10/2 due to flow meter problem
10/16/96	106	30	450	512.26	2.30	0.019	0.00	0.000	—	0.000	—	0.000	36.00	0.287	0.306	102.81	946.74	system reactivated 10/2/96
11/19/96	140	30	450	512.26	0.38	0.003	0.00	0.000	—	0.000	—	0.000	5.29	0.042	0.045	143.33	1090.06	
12/17/96	168	30	450	512.26	0.12	0.001	0.00	0.000	—	0.000	—	0.000	1.97	0.016	0.017	20.84	1110.90	
01/27/97	209	30	450	512.26	1.35	0.011	0.00	0.000	—	0.000	—	0.000	13.23	0.106	0.117	65.56	1176.46	

- Notes:
- 1) Aliphatics are weighted using a response factor of hexane. (MW = 86.2)
 - 2) Aromatics are weighted using a response factor of o-xylene. (MW=106.16)
 - 3) Analytical data for 8/30/96 is assumed based on results of sampling conducted 8/8/96. System was deactivated 8/30/96 due to flow meter failure.
 - 4) Flow rate of 10/16/96 through 1/27/97 is assumed. Air flow meter not in operation.
 - 5) Analytical data for 10/2 is assumed based on data from 10/16/96.
 - 6) Beginning 10/16/96 lab analysis was performed by Mitkem Laboratory. Prior to 10/16/96 air analysis performed by NEIGTEL.
 - 7) Mitkem results report total volatile petroleum hydrocarbons, not misc. aromatics and aliphatics. Total Volatile Petroleum Hydrocarbons are weighted to molecular weight of 100.
 - 8) Laboratory results from 11/19/96 to present are reported in mg/m3.

**SYSTEM MONITORING DATA
SOIL VAPOR EXTRACTION/AIR SPARGE SYSTEM**

New London Naval Submarine Base
NEX Site
Groton, CT

Date	Day of Operation	Air Sparge Flowrate (scfm)	Extraction Flowrate (east side) (scfm)	Extraction Flowrate (west side) (scfm)	Extraction Flowrate (total) (scfm)	Extraction Flowrate (cfm)	Influent Concentration BTEX (ppmv)	Removal Rate BTEX (lb/hr)	Influent Concentration MTBE (ppmv)	Removal Rate MTBE (lb/hr)	Influent Concentration Aliphatics (ppmv)	Removal Rate Aliphatics (lb/hr)	Influent Concentration Aromatics (ppmv)	Removal Rate Aromatics (lb/hr)	Influent Concentration TVPH (ppmv)	Removal Rate TVPH (lb/hr)	Total Mass Removal Rate (lbs/hr)	Period Mass Removed (lbs)	Cumulative Mass Removed (lbs)	Comments
07/31/96	0	0	54	199	253	288.00	1.80	0.013	---	0.000	130.00	0.810	0.00	0.000	---	0.000	0.823	0.00	0.00	
08/08/96	8	0	85	185	270	307.35	1.80	0.013	---	0.000	130.00	0.810	0.00	0.000	---	0.000	0.823	78.21	78.21	System operated approx. 92 hrs between 7/31 and 8/8 24-hour per day system operation began 8/8
08/22/96	22	0	85	185	270	307.35	1.80	0.013	---	0.000	130.00	0.810	0.00	0.000	---	0.000	0.823	88.09	166.30	
09/16/96	47	0	188	134	320	364.27	2.70	0.021	0.00	0.000	---	0.000	---	61.00	0.487	0.508	0.00	166.30		
10/16/96	77	0	188	134	320	364.27	2.50	0.020	0.00	0.000	---	0.000	---	42.00	0.335	0.355	310.78	477.08		
11/19/96	111	0	192	132	324	368.83	0.95	0.008	0.00	0.000	---	0.000	---	22.61	0.180	0.188	221.67	698.72		
12/17/96	139	0	223	87	310	352.88	0.18	0.001	0.07	0.000	---	0.000	---	6.98	0.056	0.058	82.54	781.27		
01/27/97	180	0	252	69	321	365.41	0.14	0.001	0.00	0.000	---	0.000	---	4.81	0.038	0.040	47.78	829.04		

- Notes:
- 1) Aliphatics are weighted using a response factor of hexane. (MW = 86.2)
 - 2) Aromatics are weighted using a response factor of o-xylene. (MW=106.16)
 - 3) Analytical data for 7/31/96 is assumed based on results of sampling conducted 8/8/96.
 - 4) Analytical data for 8/22/96 is assumed based on results of sampling conducted 8/8/96.
 - 5) Air flow rate from 10/16/96 assumed for 9/16/96, due to a broken flow meter
 - 6) Beginning 9/16/96 lab analysis was performed by Mitek Laboratory. Prior to 9/16/96 air analysis performed by NEI/GTEL
 - 7) Mitek results report total volatile petroleum hydrocarbons, not misc. aromatics and aliphatics.
Total Volatile Petroleum Hydrocarbons are weighted to molecular weight of 100.
 - 8) Laboratory results for 11/19/96 to present are reported in mg/m3.

ATTACHMENT 4

HISTORICAL CARBON USAGE SUMMARY

Carbon Breakthrough Matrix
Dolphin Mart and NEX Site

Groton Naval Submarine Base
Groton, CT

Carbon Breakthrough (#)	Sample Date	Sample Time	Influent Conc. (ppmv, PID/FID)	Effluent Conc. (ppmv, PID/FID)	Influent Conc. (ppmv, PGC)	Effluent Conc. (ppmv, PGC)	SVE System Flow Rate (scfm)	Air Sparge System Flow Rate (scfm)	Estimated Breakthrough Time (hours)	Comments
2	7-2-96	17:05	66	8.1	230	50	452	25		Dolphin Mart Site
	7-3-96	8:50	375	289	380	320	448	33		
									15.75	
3	7-11-96	15:10	204.8	0	274	0.0	449	25		Dolphin Mart Site
	7-12-96	7:30	534	268	318	206	450	37		
									16.33	
4	7-12-96	9:55	588	15	NS	NS	450	30		Dolphin Mart Site. System deactivated 7/12/96 15:55 for weekend.
	7-15-96	18:10	366	0.0	NS	NS	449	16		
	7-16-96	9:30	149	77	250	88	442	24		
									21.33	
5	7-19-96	11:30	105	0	NS	NS	440	16		Approx. 1 hour test-only on 7/19/96.
	7-22-96	10:30	142	0	NS	NS	445	15		
	7-23-96	11:20	215	75	NS	NS	449	20		
									25.83	
6	7/24/96	9:45	96	0	NS	NS	450	16		Dolphin Mart Site. System down up to 8 hrs on 7/19/96 for electrical work.
	7/25/96	17:45	84.6	0	NS	NS	446	17		
	7/26/96	11:45	275	192	NS	NS	442	21		
									40	

Carbon Breakthrough Matrix
Dolphin Mart and NEX Site

Groton Naval Submarine Base
Groton, CT

Carbon Breakthrough (#)	Sample Date	Sample Time	Influent Conc. (ppmv, PID/FID)	Effluent Conc. (ppmv, PID/FID)	Influent Conc. (ppmv, PGC)	Effluent Conc. (ppmv, PGC)	SVE System Flow Rate (scfm)	Air Sparge System Flow Rate (scfm)	Estimated Breakthrough Time (hours)	Comments
7	8/1/96	6:20	83.9	0	NS	NS	447.7	20		Dolphin Mart Site. Carbon loading test shut down for weekend 8/2/96.
	8/2/96	15:30	68	0	NS	NS	451	33		
	8/5/96	16:00	102	0	NS	NS	456	29		
	8/6/96	17:45	77.8	5.2	NS	NS	450	33		
	8/7/96	20:00	100.3	12.0	NS	NS	452	22		
	8/8/96	9:15	122.6	74.2	NS	NS	453.5	32		
8	8/1/96	6:50	6.6	4.5	NS	NS	116	0		NEX Site. A/B Carbon Units.
	8/2/96	15:00	33	7.2	NS	NS	68.5	0		
	8/5/96	15:45	0	0	NS	NS	166	0		
	8/6/96	17:10	3.1	4.0	NS	NS	137	0		
	8/7/96	17:00	2.0	3.3	NS	NS	158	0		
	8/8/96	9:45	2.3	3.5	NS	NS	135	0		
	8/12/96	14:00	65.4	47.6	NS	NS	262	0		
									290	

Carbon Breakthrough Matrix
Dolphin Mart and NEX Site

Groton Naval Submarine Base
Groton, CT

Carbon Breakthrough (#)	Sample Date	Sample Time	Influent Conc. (ppmv, PID/FID)	Effluent Conc. (ppmv, PID/FID)	Influent Conc. (ppmv, PGC)	Effluent Conc. (ppmv, PGC)	SVE System Flow Rate (scfm)	Air Sparge System Flow Rate (scfm)	Estimated Breakthrough Time (hours)	Comments
9	8/1/96	6:50	44	8	NS	NS	116	0		NEX Site. C/D Carbon Units.
	8/2/96	15:00	46.5	9.1	NS	NS	68.5	0		
	8/5/96	15:45	100	15.8	NS	NS	166	0		
	8/6/96	17:10	60	24.0	NS	NS	137	0		
	8/7/96	17:00	50.6	34	NS	NS	158	0		
	8/8/96	9:45	54.4	44	NS	NS	135	0		
									189	
10	8/22/96	12:00	120	0.0	NS	NS	448	30		Dolphin Mart Site. C/D Carbon Units
	8/24/96	12:30	141	55	NS	NS	445	35		
									116	

Carbon Breakthrough Matrix
Dolphin Mart and NEX Site

Groton Naval Submarine Base
Groton, CT

Carbon Breakthrough (#)	Sample Date	Sample Time	Influent Conc. (ppmv, PID/FID)	Effluent Conc. (ppmv, PID/FID)	Influent Conc. (ppmv, PGC)	Effluent Conc. (ppmv, PGC)	SVE System Flow Rate (scfm)	Air Sparge System Flow Rate (scfm)	Estimated Breakthrough Time (hours)	Comments
11	8/22/96	16:00	29	0.0	NS	NS	232	0		NEX Site. C/D Carbon Units. Carbon units taken off-line 9/4/96.
	8/27/96	9:20	36	12	NS	NS	228	0		
	8/30/96	14:40	26	24	NS	NS	108	0		
	9/4/96	16:00	49	NA	NS	NS	330	0		
	9/10/96	10:30	52.6	52.6	NS	NS	243	0		
	9/16/96	14:00	35	35	NS	NS	320	0		
	9/27/96	13:00	42.7	42.7	NS	NS	60	0		
	10/2/96	10:00	17	17	NS	NS	84	0		
	10/8/96	12:00	33.7	33.7	NS	NS	413	0		
	10/10/96	12:50	22.3	22.3	NS	NS	282	0		
	10/16/96	13:30	23.8	23.8	NS	NS	259	0		
	10/21/96	14:40	14.6	14.6	NS	NS	281	0		
	10/25/96	15:05	49.9	49.9	NS	NS	173	0		
	10/28/96	12:30	65.0	65.0	NS	NS	350	0		
	11/8/96	17:15	26.3	26.3	NS	NS	342	0		
	11/19/96	14:40	8.7	8.7	NS	NS	324	0		
	12/2/96	10:30	160	160	NS	NS	299	0		
	12/17/96	NA	5.0	5.0	NS	NS	310	0		
	1/13/97	14:20	8.2	8.2	NS	NS	322	0		
	1/27/97	17:10	15.0	15.0	NS	NS	322	0		
2/17/97	16:30	2.2	2.2	NS	NS	288	0			

Carbon Breakthrough Matrix
Dolphin Mart and NEX Site

Groton Naval Submarine Base
Groton, CT

Carbon Breakthrough (#)	Sample Date	Sample Time	Influent Conc. (ppmv, PID/FID)	Effluent Conc. (ppmv, PID/FID)	Influent Conc. (ppmv, PGC)	Effluent Conc. (ppmv, PGC)	SVE System Flow Rate (scfm)	Air Sparge System Flow Rate (scfm)	Estimated Breakthrough Time (hours)	Comments
11 con'd	2/19/97	17:30	0.0	0.0	NS	NS	NS	NS		
									NA	

Carbon Breakthrough Matrix
Dolphin Mart and NEX Site

Groton Naval Submarine Base
Groton, CT

Carbon Breakthrough (#)	Sample Date	Sample Time	Influent Conc. (ppmv, PID/FID)	Effluent Conc. (ppmv, PID/FID)	Influent Conc. (ppmv, PGC)	Effluent Conc. (ppmv, PGC)	SVE System Flow Rate (scfm)	Air Sparge System Flow Rate (scfm)	Estimated Breakthrough Time (hours)	Comments
12	8/27/96	12:45	68	1.0	NS	NS	450	32		Dolphin Mart Site. C/D Carbon Units. Units still in service.
	10/2/96	12:50	47.5	13.7	NS	NS	458	30		
	10/8/96	13:10	27	6.5	NS	NS	467	28		
	10/16/96	13:00	18	5.4	NS	NS	NS	NS		
	10/25/96	16:00	23.1	27.5	NS	NS	NS	NS		
	10/28/96	11:30	27.3	13.3	NS	NS	NS	NS		
	11/8/96	11:10	10.3	5.6	NS	NS	NS	NS		
	11/19/96	14:10	2.5	0.0	NS	NS	NS	NS		
	12/2/96	14:15	4.0	9.0	NS	NS	NS	NS		
	12/17/96	NA	13.0	2.0	NS	NS	NS	NS		
	12/30/96	NA	12.0	12.0	NS	NS	NS	NS		
	1/13/97	13:50	5.0	5.0	NS	NS	NS	NS		
	1/27/97	15:00	12.0	8.0	NS	NS	NS	NS		
	2/13/97	NA	2.4	0.0	NS	NS	NS	15		
	2/19/97	13:45	2.6	1.1	NS	NS	NS	NS		
									NA	

Notes: 1 The initial carbon breakthrough (not included in this table) occurred during OHM's start-up activities.
 ppmv = parts per million by volume
 PID = photoionization detector
 FID = flame ionization detector
 PGC = portable gas chromatograph
 NS = not sampled

ATTACHMENT 5

HISTORICAL WELL GAUGING DATA

**Well Gauging Data
Dolphin Mart Site
New London Naval Submarine Base
Groton, Connecticut**

Date	Depth to Water (ft)														
	Well ID														
	DM-1	DM-2	DM-3	DM-4	DM-5	HRP-10	MW-1	MW-2	MW-3	WE-2S	WE-2D	WE-3	WE-4	WE-5	WE-6
07/02/96	6.37	NG	NG	NG	NG	4.65	4.65	3.55	3.12	6.78	6.56	8.67	4.24	4.80	3.40
07/03/96	NG	NG	NG	NG	NG	5.19	4.63	2.86	0.00	6.58	6.35	8.69	6.38	4.33	2.30
07/12/96	NG	NG	NG	NG	NG	5.81	5.01	3.82	1.95	6.96	6.83	8.93	6.38	4.98	3.60
07/16/96	NG	NG	NG	NG	NG	4.33	4.55	2.89	0.74	6.47	6.24	8.5	6.27	4.08	2.76
07/17/96	NG	NG	NG	NG	NG	2.73	4.94	1.63	2.79	6.3	5.88	8.62	6.47	3.62	1.72
07/19/96	NG	NG	NG	NG	NG	4.38	5.21	0.61	0.00	6.18	5.53	8.45	NG	3.19	1.08
07/22/96	NG	NG	NG	NG	NG	4.54	4.82	1.95	1.17	6.45	6.42	8.64	3.68	3.73	1.96
07/23/96	NG	NG	NG	NG	NG	4.55	4.75	3.33	0.00	6.7	6.33	8.72	8.72	4.49	2.40
07/24/96	NG	NG	NG	NG	NG	4.33	5.22	1.18	0.00	6.31	5.67	8.45	3.38	3.33	1.49
07/25/96	NG	NG	NG	NG	NG	4.46	5.31	NG	NG	NG	NG	NG	NG	NG	2.12
07/26/96	NG	NG	NG	NG	NG	4.43	4.79	NG	NG	NG	NG	NG	NG	NG	2.95
08/01/96	NG	NG	NG	NG	NG	3.93	4.96	2.2	1.28	6.39	6.09	8.55	3.22	4.06	1.15
08/02/96	NG	NG	NG	NG	NG	4.08	5.24	1.82	1.31	6.3	5.73	8.56	2.96	3.76	0.86
08/05/96	NG	NG	NG	NG	NG	4.35	5.08	NG	1.08	NG	NG	NG	NG	NG	1.28
09/04/96	NG	NG	NG	NG	NG	5.43	6.07	4.59	DRY	7.39	7.51	9.73	5.11	6.23	4.59
10/02/96	NG	NG	NG	NG	NG	3.53	5.43	NG	3.86	6.41	5.82	8.41	3.11	3.96	1.60
10/21/96	NG	NG	NG	NG	NG	3.98	NG	NG	NG	NG	NG	NG	NG	NG	2.43
11/19/96	1.90	NG	2.06	2.68	5.37	4.15	3.85	3.00	DRY	6.46	5.89	8.32	3.53	3.87	2.90
12/17/96	2.53	NG	1.60	NG	3.67	NG	2.53	2.17	NG	6.10	NG	7.92	2.17	2.96	2.10
01/27/97	1.91	NG	1.89	NG	4.26	3.29	2.98	2.13	NG	6.24	5.73	7.94	3.08	3.26	1.53
02/18/97	1.93	NG	1.90	2.04	NG	4.04	2.91	2.56	2.28	6.32	5.84	7.95	3.49	3.21	2.55

Notes:

NG = Not Gauged
(1) Depth to Product/Depth to Water

Well Gauging Data
 NEX Site
 New London Naval Submarine Base
 Groton, Connecticut

Date	Depth to Water (ft)														
	Well ID														
	ERM-5	ERM-6	ERM-7	ERM-8	ERM-9	ERM-10	ERM-11	ERM-12	ERM-13	ERM-14	ERM-15	ERM-16	ERM-17	ERM-18	ERM-19
09/16/96	3.82	5.14	5.27	NG	NG	NG	NG	8.38	7.01	6.89	4.30	8.51	5.62	3.65	5.28
10/16/96	NG	4.82	4.75	NG	NG	NG	6.4	8.13	7.15	6.92	3.94	8.49	5.56	3.96	5.17
11/18/96	3.72	4.64	4.93	NG	NG	NG	6.36	8.09	7.13	6.91/7.10 (1)	4.03	8.43	5.53	NG	5.19
12/16/96	3.10	4.08	4.21	NG	NG	NG	5.02	7.83	6.55	6.35	NG	7.8	3.73	NG	4.23
02/17/97	3.00	4.34	4.29	NG	NG	NG	4.89	7.65	6.03	5.89	NG	7.85	4.53	NG	4.18

Notes:

NG = Not Gauged

(1) Depth to Product/Depth to Water

**MW-7 Well Gauging Data
OT-8 Site
New London Naval Submarine Base
Groton, Connecticut**

Date	Depth to Product (feet)	Depth to Water (feet)	LNAPL Thickness (feet)	LNAPL Recovered (gallons)	Cumulative LNAPL Recovered (gallons)
09/26/96	4.26	6.02	1.76	0.00	0.00
10/02/96	NS	NS	0.00	4.00	4.00
10/08/96	NS	NS	0.00	0.00	4.00
10/16/96	NS	NS	0.00	0.00	4.00
10/21/96	1.65	1.66	0.01	0.00	4.00
10/25/96	3.06	3.18	0.12	0.00	4.00
10/28/96	3.46	3.55	0.09	0.00	4.00
12/17/96	NA	0.00	0.00	0.00	4.00
01/13/97	7.76	7.86	0.10	0.00	4.00
01/27/97	NA	0.00	0.00	0.00	4.00
02/19/97	2.96	2.97	0.01	0.00	4.00

Notes: Gauging on 10/02/96 and 10/16/96 was with a clear bailer, to visually confirm product thickness.
The well and vault were flooded on 12/17/96
NA = Not Applicable
NG = Not Gauged

ATTACHMENT 6

HISTORICAL GROUNDWATER SAMPLING RESULTS

Table 1
Historical Groundwater Sampling Results
Dolphin Mart - March 1995/November 1996
Naval Submarine Base, Groton, Ct.

(analytical results in µg/l)
page 1 of 6

Well	Date	BTEX				MTBE	TPH (By EPA Method 418.1)	Total Volatiles (by EPA Method 8010/8020)	DRO (by EPA Method 8100M)	GRO (by EPA Method 8015M)
		Benzene	Toluene	Ethylbenzene	Xylenes					
DM-1	3/95	<1.0	<1.0	<1.0	<1.0	<2.0	<473	NS	NS	NS
	5/96	<1.0	<1.0	<1.0	<1.0	4.0	<473	NS	NS	NS
	11/96	<1.0	<1.0	<1.0	<1.0	<1.0	<1,000	5	1,000	<500
	2/97	NS	NS	NS	NS	NS	NS	NS	NS	NS
DM-2	3/95	<1.0	<1.0	<1.0	<1.0	<2.0	<473	NS	NS	NS
	5/96	<1.0	<1.0	<1.0	<1.0	4.0	<473	NS	NS	NS
	11/96	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/97	NS	NS	NS	NS	NS	NS	NS	NS	NS

Notes: NS = Not sampled (NS results have been placed in grey)
B = Analyte detected in method blank
D = Analyte concentration was obtained from a diluted analysis
E = Analyte concentration exceeded the calibration range
The trip blank contained a total 8010/8020 concentration of 10 µg/l
The method blanks contained total 8010/8020 concentrations of 8 µg/l and 1 µg/l
DRO=Diesel Range Organics
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Table 1
Historical Groundwater Sampling Results
Dolphin Mart - March 1995/November 1996
Naval Submarine Base, Groton, Ct.

(analytical results in µg/l)
page 2 of 6

Well	Date	BTEX				MTBE	TPH (By EPA Method 418.1)	Total Volatiles (by EPA Method 8010/8020)	DRO (by EPA Method 8100M)	GRO (by EPA Method 8015M)
		Benzene	Toluene	Ethylbenzene	Xylenes					
DM-3	3/95	<1.0	<1.0	<1.0	<1.0	7.90	<473	NS	NS	NS
	5/96	<1.0	<1.0	<1.0	<1.0	<2.0	<473	NS	NS	NS
	11/96	<1.0	<1.0	<1.0	<1.0	<1.0	<1,000	7	<500	<500
	2/97	NS	NS	NS	NS	NS	NS	NS	NS	NS
DM-4	3/95	<1.0	<1.0	<1.0	<1.0	<2.0	<473	NS	NS	NS
	5/96	<1.0	<1.0	<1.0	<1.0	<2.0	<473	NS	NS	NS
	11/96	<1.0	<1.0	<1.0	<1.0	<1.0	<1,000	5	600	<500
	2/97	NS	NS	NS	NS	NS	NS	NS	NS	NS
DM-5	3/95	<1.0	<1.0	<1.0	<1.0	<2.0	<473	NS	NS	NS
	5/96	<1.0	<1.0	<1.0	<1.0	<2.0	<473	NS	NS	NS
	11/96	<1.0	<1.0	<1.0	<1.0	<1.0	<1,000	6	<500	<500
	2/97	NS	NS	NS	NS	NS	NS	NS	NS	NS

Notes: NS = Not sampled (NS results have been placed in grey)
B = Analyte detected in method blank
D = Analyte concentration was obtained from a diluted analysis
E = Analyte concentration exceeded the calibration range
The trip blank contained a total 8010/8020 concentration of 10 µg/l
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Table 1
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Dolphin Mart - March 1995/November 1996
Naval Submarine Base, Groton, Ct.

(analytical results in µg/l)
page 3 of 6

Well	Date	BTEX				MTBE	TPH (By EPA Method 418.1)	Total Volatiles (by EPA Method 8010/8020)	DRO (by EPA Method 8100M)	GRO (by EPA Method 8015M)
		Benzene	Toluene	Ethylbenzene	Xylenes					
WE-3	3/95	<1.0	<1.0	<1.0	<1.0	8.70	<473	NS	NS	NS
	5/96	2.0	<1.0	<1.0	<1.0	14.0	<473	NS	NS	NS
	11/96	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/97	<1.0	<1.0	<1.0	<1.0	6	<500	6	<500	<500
WE-4	3/95	267	29.8	392	712	<40	5,180	NS	NS	NS
	5/96	160	16	301	617	<40	3,680	NS	NS	NS
	11/96	41	1.0	100	2	19	<1,000	166	1,100	500
	2/97	21	<1	27	1	17	<500	66	500	700
WE-2S	3/95	37.9	24.2	60.3	126.4	21.3	725	NS	NS	NS
	5/96	50	22	101	144	<10	1,570	NS	NS	NS
	11/96	7	<1.0	9	4	14	<1,000	34	<500	<500
	2/97	5	<1.0	14	3	10	<500	32	500	600

Notes: NS = Not sampled (NS results have been placed in grey)
B = Analyte detected in method blank
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The trip blank contained a total 8010/8020 concentration of 10 µg/l
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Table 1
Historical Groundwater Sampling Results
Dolphin Mart - March 1995/November 1996
Naval Submarine Base, Groton, Ct.

(analytical results in µg/l)
page 4 of 6

Well	Date	BTEX				MTBE	TPH (By EPA Method 418.1)	Total Volatiles (by EPA Method 8010/8020)	DRO (by EPA Method 8100M)	GRO (by EPA Method 8015M)
		Benzene	Toluene	Ethylbenzene	Xylenes					
HRP-10	3/95	304	35.2	257	1140	<50	6,080	NS	NS	NS
	5/96	125	21	54	329	<20	1,740	NS	NS	NS
	11/96	9	<1.0	65	<1.0	7	<1,000	81	600	<500
	2/97	<1.0	<1.0	<1.0	<1.0	3	<500	3	<500	<500
HRP-11	3/95	<1.0	<1.0	<1.0	<1.0	<2.0	<473	NS	NS	NS
	5/96	1.0	<1.0	<1.0	3.0	<2.0	<473	NS	NS	NS
	11/96	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/97	NS	NS	NS	NS	NS	NS	NS	NS	NS
OBG-8A	3/95	72	24.6	25.9	62.4	9.29	<473	NS	NS	NS
	5/96	12.0	<1.0	9.0	4.0	<2.0	<473	NS	NS	NS
	11/96	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/97	NS	NS	NS	NS	NS	NS	NS	NS	NS

Notes: NS = Not sampled (NS results have been placed in grey)
B = Analyte detected in method blank
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The trip blank contained a total 8010/8020 concentration of 10 µg/l
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Table 1
Historical Groundwater Sampling Results
Dolphin Mart - March 1995/November 1996
Naval Submarine Base, Groton, Ct.

(analytical results in µg/l)
page 5 of 6

Well	Date	BTEX				MTBE	TPH (By EPA Method 418.1)	Total Volatiles (by EPA Method 8010/8020)	DRO (by EPA Method 8100M)	GRO (by EPA Method 8015M)
		Benzene	Toluene	Ethylbenzene	Xylenes					
OGB-9A	3/95	<1.0	<1.0	<1.0	<1.0	<2.0	<473	NS	NS	NS
	5/96	<1.0	<1.0	<1.0	<1.0	<2.0	<473	NS	NS	NS
	11/96	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/97	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-1	11/96	3	<1.0	5	<1.0	<1,000	11	1,000	<500	
	2/97	<1.0	<1.0	4	<1.0	<500	4	<500	600	
MW-2	11/96	4	<1.0	14	<1.0	4	<1,000	28	1,200	<500
	2/97	<1.0	<1.0	<1.0	<1.0	<1.0	1,000	1 B	1,200	1,200
MW-3	2/97	36	23	72	500	5	2,000	645 B	3,300	1,600
WE-5	11/96	240D	410D	720D	4,300E	27	9,000	5,697	12,000	8,900
	2/97	42D	10	89D	490D	6	2,000	637	2,000	1,200

Notes: NS = Not sampled (NS results have been placed in grey)
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E = Analyte concentration exceeded the calibration range
The trip blank contained a total 8010/8020 concentration of 10 µg/l
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Table 1
Historical Groundwater Sampling Results
Dolphin Mart - March 1995/November 1996
Naval Submarine Base, Groton, Ct.

(analytical results in µg/l)
page 6 of 6

Well	Date	BTEX				MTBE	TPH (By EPA Method 418.1)	Total Volatiles (by EPA Method 8010/8020)	DRO (by EPA Method 8100M)	GRO (by EPA Method 8015M)
		Benzene	Toluene	Ethylbenzene	Xylenes					
WE-6	11/96	5	210D	71D	630D	<1.0	<1,000	916	2,000	1,400
	2/97	3	4	8	12	2	<500	29	800	700
WE-2B	11/96	1	<1.0	<1.0	<1.0	<1.0	<1,000	3	<500	<500
	2/97	2	<1.0	<1.0	<1.0	3	<500	5	<500	<500

Notes: NS = Not sampled (NS results have been placed in grey)
B = Analyte detected in method blank
D = Analyte concentration was obtained from a diluted analysis
E = Analyte concentration exceeded the calibration range
The trip blank contained a total 8010/8020 concentration of 10 µg/l
The method blanks contained total 8010/8020 concentrations of 8 µg/l and 1 µg/l
DRO=Diesel Range Organics
GRO=Gasoline Range Organics

Table 2
Historical Groundwater Sampling Results
NEX - March 1995/November 1996
Naval Submarine Base, Groton, Ct.

(analytical results in µg/l)
page 1 of 5

Well	Date	BTEX				MTBE	TPH (By EPA Method 418.1)	Total Volatiles (by EPA Method 8010/8020)	DRO	GRO
		Benzene	Toluene	Ethylbenzene	Xylenes					
NEX-1	3/95	<1.0	<1.0	<1.0	<1.0	<2.0	NS	7	35	<143
	5/96	<1.0	<1.0	<1.0	<1.0	<2.0	NS	8	<122	<143
	11/96	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/97	NS	NS	NS	NS	NS	NS	NS	NS	NS
ERM-5	3/95	967	431	390	1,340	<100	NS	3,295.1	430	8,250
	5/96	112	6	34	28	<10	NS	196	159	554
	11/96	370D	14	33	61D	<1.0	3,000	480	1,100	1,600
	2/97	1,100	1,100	580	1,600	<50	3,000	4,440 B	3,900	9,100
ERM-6	5/96	15	<1.0	<1.0	<1.0	<2.0	NS	35	63	<473
	11/96	610	230	770	2,400E	<40	5,000	4,054	500	7,800
	2/97	430D	21	300	1,000D	<10	2,000	1,763 B	2,200	4,800

Notes: NS = Not sampled (NS results have been placed in grey)
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B = Analyte detected in method blank
E = Analyte concentration exceeded the calibration range
The trip blank contained a total 8010/8020 concentration of 10 µg/l
The method blanks contained total 8010/8020 concentrations of 8 µg/l and 1 µg/l
DRO=Diesel Range Organics
GRO=Gasoline Range Organics

Table 2
Historical Groundwater Sampling Results
NEX - March 1995/November 1996
Naval Submarine Base, Groton, Ct.

(analytical results in µg/l)
page 2 of 5

Well	Date	BTEX				MTBE	TPH (By EPA Method 410.1)	Total Volatiles (by EPA Method 8010/8020)	DRO	GRO
		Benzene	Toluene	Ethylbenzene	Xylenes					
ERM-7	5/96	5	<1.0	<1.0	<1.0	<2.0	NS	8	38	<473
	11/96	<1.0	<1.0	<1.0	<1.0	<1.0	<1,000	4	<500	<500
	2/97	<1.0	<1.0	<1.0	<1.0	<1.0	<500	1	<500	<500
ERM-8	3/95	109	11.5	272	157	<50	NS	665.4	464	2,350
	5/96	NS	NS	NS	NS	NS	NS	NS	NS	NS
	11/96	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/97	NS	NS	NS	NS	NS	NS	NS	NS	NS

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B = Analyte detected in method blank
E = Analyte concentration exceeded the calibration range
The trip blank contained a total 8010/8020 concentration of 10 µg/l
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Historical Groundwater Sampling Results
NEX - March 1995/November 1996
Naval Submarine Base, Groton, Ct.

(analytical results in µg/l)
page 3 of 5

Well	Date	BTEX				MTBE	TPH (By EPA Method 418.1)	Total Volatiles (by EPA Method 8010/8020)	DRO	GRO
		Benzene	Toluene	Ethylbenzene	Xylenes					
ERM-9	5/96	<1.0	<1.0	<1.0	<1.0	2	NS	4	3,310	<473
	11/96	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/97	NS	NS	NS	NS	NS	NS	NS	NS	NS
ERM-11	11/96	<1.0	<1.0	<1.0	<1.0	<1.0	<1,000	3	<500	<500
	2/97	<1.0	<1.0	<1.0	<1.0	<1.0	<500	2	<500	<500
ERM-12	3/95	<1.0	<1.0	<1.0	<1.0	<2.0	NS	1	27	<473
	5/96	1	2	7	14	<2.0	NS	61	4,300	1,390
	11/96	<1.0	2	<1.0	9	<1.0	3,000	16	7,300	6,700
	2/97	<1.0	1	2	9	<1.0	15,000	13	4,800	1,300

Notes: NS = Not sampled (NS results have been placed in grey)
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B = Analyte detected in method blank
E = Analyte concentration exceeded the calibration range
The trip blank contained a total 8010/8020 concentration of 10 µg/l
The method blanks contained total 8010/8020 concentrations of 8 µg/l and 1 µg/l
DRO=Diesel Range Organics
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Table 2
Historical Groundwater Sampling Results
NEX - March 1995/November 1996
Naval Submarine Base, Groton, Ct.

(analytical results in µg/l)
page 4 of 5

Well	Date	BTEX				MTBE	TPH (By EPA Method 418.1)	Total Volatiles (by EPA Method 8010/8020)	DRO	GRO
		Benzene	Toluene	Ethylbenzene	Xylenes					
ERM-13	3/95	<1.0	<1.0	<1.0	<1.0	<2.0	NS	534	50	<473
	5/96	<1.0	<1.0	<1.0	<1.0	<2.0	NS	9	<100	<473
	11/96	<1.0	<1.0	<1.0	<1.0	<1.0	<1,000	2	<500	<500
	2/97	<1.0	<1.0	<1.0	<1.0	<1.0	<500	<1.0	<500	<500
ERM-14	3/95	292	4,880	8,190	6,020	<2.0	NS	19,995	4,840	3,670
	5/96	305	5,670	1,250	8,350	<2.0	NS	22,543	7,290	3,890
	11/96	270	8,300D	1,700D	11,000D	<25	7,000	21,270	12,000	30,000
	2/97	140	4,500D	980	7,100	<100	60,000	12,840	20,000	20,000
ERM-15	11/96	280	760	330	1,100	<40	1,000	2,517	2,300	4,500
	2/97	NS	NS	NS	NS	NS	NS	NS	NS	NS

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Table 2
Historical Groundwater Sampling Results
NEX - March 1995/November 1996
Naval Submarine Base, Groton, Ct.

(analytical results in µg/l)
page 5 of 5

Well	Date	BTEX				MTBE	TPH (By EPA Method 418.1)	Total Volatiles (by EPA Method 8010/8020)	DRO	GRO
		Benzene	Toluene	Ethylbenzene	Xylenes					
ERM-16	11/96	37	<2.0	13	16	30	<1,000	68	4,400	2,000
	2/97	56D	<1.0	16	34	27	6,000	136	11,000	1,400
ERM-17	11/96	10	<1.0	<1.0	<1.0	9	<1,000	11	600	600
	2/97	<1.0	<1.0	<1.0	<1.0	<1.0	1,000	<1.0	500	<500
ERM-19	11/96	<1.0	<1.0	<1.0	<1.0	<1.0	<1,000	1	<500	<500
	2/97	<1.0	<1.0	<1.0	<1.0	<1.0	<500	<1.0	<500	<500
MW-4	2/97	29	1	<1.0	3	<1.0	NS	33	NS	NS
MW-6	2/97	<1.0	9	<1.0	<1.0	<1.0	NS	9	NS	NS
OBG-4	2/97	<1.0	<1.0	<1.0	<1.0	<1.0	NS	<1.0	NS	NS

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ATTACHMENT 7

MW-7 WELL CONSTRUCTION LOG

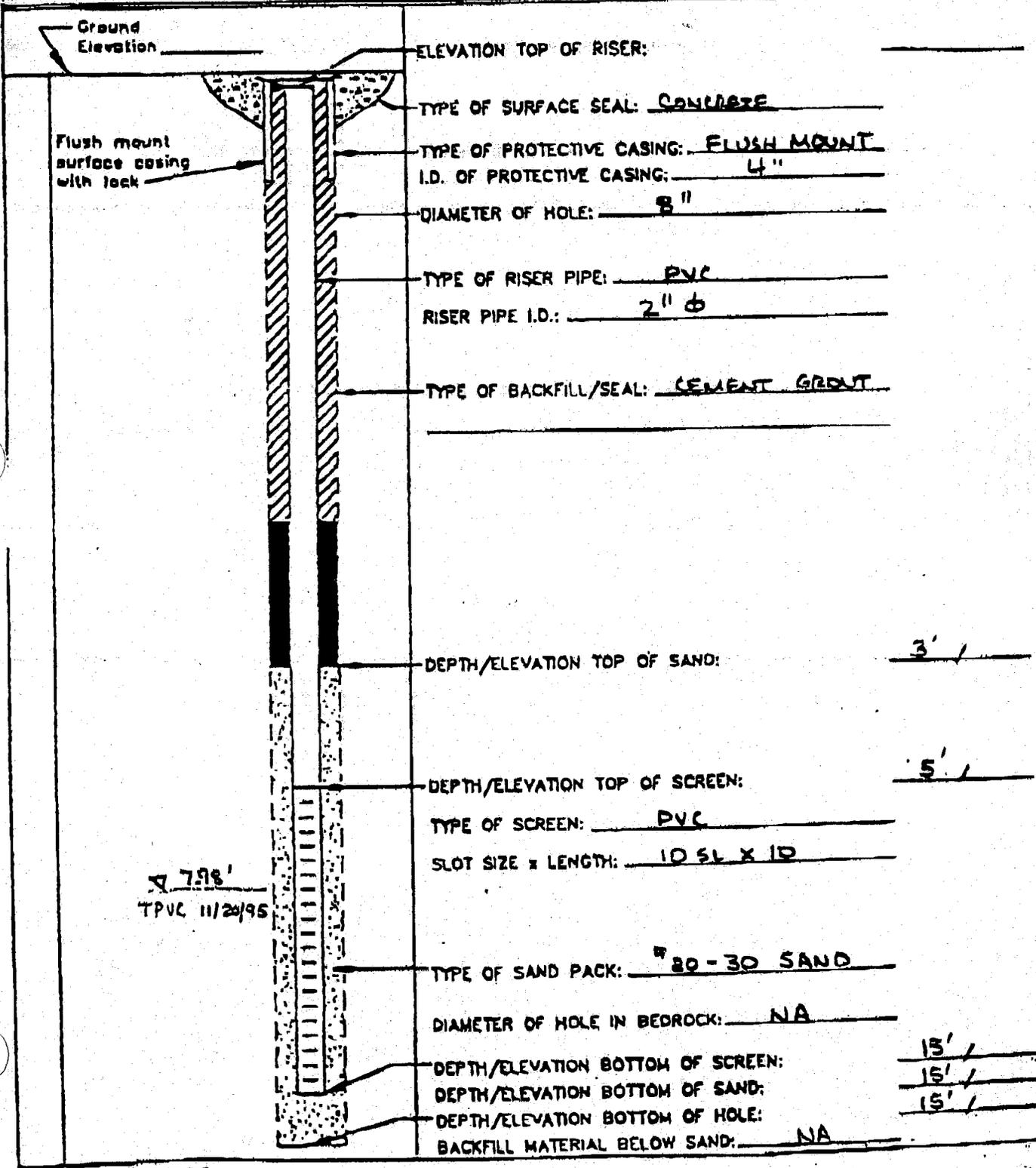


MONITORING WELL SHEET

TANK FARM WELLS

PROJECT NSB NLON LOCATION GROTON, CT.
 PROJECT NO. 4626 BORING HJUS-07
 ELEVATION _____ DATE 10-3-95
 FIELD GEOLOGIST CONTI

DRILLER SOILTEST, INC
 DRILLING METHOD HSA
 DEVELOPMENT METHOD PUMP



Ground Elevation

Flush mount surface casing with lock

ELEVATION TOP OF RISER: _____

TYPE OF SURFACE SEAL: CONCRETE

TYPE OF PROTECTIVE CASING: FLUSH MOUNT

I.D. OF PROTECTIVE CASING: 4"

DIAMETER OF HOLE: 8"

TYPE OF RISER PIPE: PVC

RISER PIPE I.D.: 2" ϕ

TYPE OF BACKFILL/SEAL: CEMENT GROUT

DEPTH/ELEVATION TOP OF SAND: 3' /

DEPTH/ELEVATION TOP OF SCREEN: 5' /

TYPE OF SCREEN: PVC

SLOT SIZE x LENGTH: 10 SL x 10

TYPE OF SAND PACK: 20-30 SAND

DIAMETER OF HOLE IN BEDROCK: NA

DEPTH/ELEVATION BOTTOM OF SCREEN: 15' /

DEPTH/ELEVATION BOTTOM OF SAND: 15' /

DEPTH/ELEVATION BOTTOM OF HOLE: 15' /

BACKFILL MATERIAL BELOW SAND: NA

7.78'
TPVC 11/24/95

