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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

NEW LONDON NAVAL SUBMARINE BASE
GROTON, CONNECTICUT

Month: February 1998

Prepared By:


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**Foster Wheeler Environmental Corp.**
Reviewed by:

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**Fluor Daniel GTI, Inc.**
Reviewed by:

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Lead Engineer


grsubbas\wp\gr2.62

## 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 12, 1998, thirteen (13) horizontal vapor extraction 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 and air sparge points ASP-H through ASP-Q are currently not operating due to high groundwater conditions and low dissolved VOC concentrations in their vicinity. The SVE system is currently extracting subsurface air at a flow rate of approximately 295 scfm. The air sparge system is currently injecting air at a flow rate of approximately 23 scfm. A site map has been included as **Figure 1**. The site monitoring forms for O&M conducted during the month of February, 1998 are included in **Attachment 1**. A weekly break-down of the month's field activities has been included as **Attachment 2**.

**Mass Removal** - The total hydrocarbon mass removal rate, based on the SVE system influent sample collected February 12, 1998, was 0.04 lbs/hour. During the period from January 22, 1998 to February 12, 1998 approximately 11 lbs of hydrocarbons were extracted by the remediation system. The total hydrocarbon mass extracted by the remediation system, as of February 12, 1998, was approximately 1,956 lbs. The system database has been included in **Attachment 3**. Mass removal graphs have been included as **Figures 3A, 3B and 4**. Based on the hydrocarbon mass removal rate, no exceedance of CTDEP air quality guidelines was observed.

**Carbon Usage** - No carbon change-out occurred during the month of February, 1998. The last carbon change at the site occurred August 27, 1996.

**Discharge Monitoring Sampling** - Discharge sampling for the system was conducted on February 12, 1998.

**Monitoring Well Gauging** - The site monitoring wells were gauged on February 11,1998 during the quarterly groundwater sampling event. Depth to groundwater at the site ranged from 1.31 feet in OBG-9A to 8.33 feet in WE-3. Historical well gauging data has been included in **Attachment 4**.

**Monitoring Well Sampling** - Monitoring well sampling was conducted on February 12, 1998. The Quarterly Groundwater Sampling Report for the February sampling event will be issued under separate cover. The historical groundwater sampling results have been summarized in **Attachment 5**.

**Additional Activities** -No additional activities were recorded for the month of February, 1998.

## NEX AIR SPARGE/SVE SYSTEM

**System Status** - The remediation system at the site has been operating since July 31, 1996. As of January 22, 1998, all thirty-five (35) soil vapor extraction wells were operating. The SVE system is currently extracting subsurface air at an average flow rate of approximately 324 scfm from the eastern portion of the site. No air is currently being extracted from the western portion of the site due to a high water table. The air sparge system was shut down at the request of base environmental personnel on January 28, 1998. The air sparge system will be reactivated as dewatering of the western portion of the site progresses, and air flow is reestablished. During the period from February 6, 1998 to March 3, 1998, 6,133 gallons of groundwater were extracted by the SVE system, treated and discharged. An estimated 70,000 gallons of water have been discharged by the NEX system as of the end of February, 1998.

A site map has been included as **Figure 2**. The site monitoring forms for O&M conducted during the month of February, 1998 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 February 12, 1998, was 0.10 lbs/hour. During the period from January 22, 1998 to February 12, 1998, an estimated 249 lbs of hydrocarbons were extracted by the remediation system. The total hydrocarbon mass extracted by the remediation system, as of February 12, 1998, is approximately 1,897 lbs. The system database has been included in **Attachment 3**. Mass removal graphs have been included as **Figures 5A, 5B and 6**. Based on the hydrocarbon mass removal rate, no exceedance of CTDEP air quality guidelines was observed.

**Carbon Usage** - No carbon change-out occurred during the month of February, 1998. The last carbon change occurred August 8, 1996.

**Discharge Monitoring Sampling** - Discharge monitoring sampling at the site was conducted on February 12, 1998.

**Monitoring Well Gauging** - The site monitoring wells were gauged on February 12,1998 during the quarterly groundwater sampling event. Depth to groundwater at the site ranged from 2.54 feet in HNU-17 to 8.19 feet in OBG-1. During well gauging, a LNAPL sheen was detected in ERM-11, ERM-14, ERM-16, and OBG-1. Historical well gauging data is included in **Attachment 4**.

**Monitoring Well Sampling** - Monitoring well sampling was conducted on February 12, 1998. The Quarterly Groundwater Sampling Report for the February sampling event will be issued under separate cover. The historical groundwater sampling results have been summarized in **Attachment 5**.

**Additional Activities** - On February 6, 1998 a broken fan blade on the heat exchanger for blowers V-3 and V-4 was replaced.

## OT-8 PASSIVE FREE PRODUCT RECOVERY SYSTEM

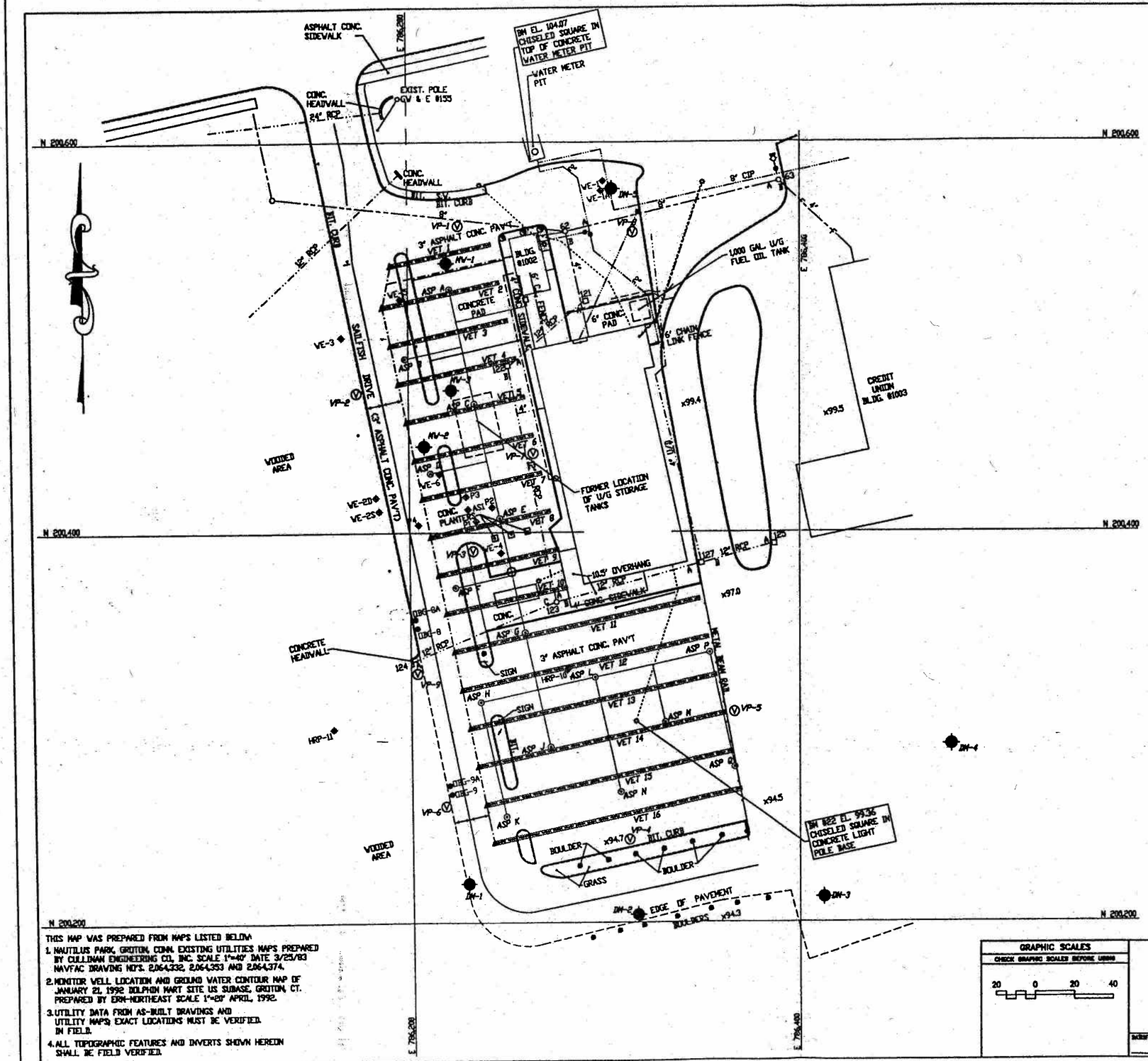
**System Status** - The OT-8 passive free product recovery system was activated on September 28, 1996. The system was active during the month of February 1998.

**Product Recovery** - As of February 11, 1998 a total of approximately 4.25 gallons of LNAPL have been recovered by the system.

**Monitoring Well Gauging** - MW-7 was gauged on February 11, 1998. No measurable floating product was detected. Depth to groundwater was 3.68 feet below grade. Historical gauging data for MW-7 is included in **Attachment 5**. The fluctuating groundwater table around MW-7 may lead to smearing of the LNAPL. A copy of the well construction log for MW-7 has been included as **Attachment 6**. *Please note: The screen interval of MW-7 begins at five feet below grade.*

**Additional Activities** - No additional activities were recorded for the month of February, 1998.

# *FIGURES*




| REVISIONS | | | | |
|---|---|---|---|---|
| LTR | DESCRIPTION | PREPD BY | DATE | APPROVED |
| | | | | |

HIGHEST RECORDED GROUND WATER ELEVATIONS

| WELL NO. | GROUNDWATER ELEVATION |
|---|---|
| VE-1A | 96.84 |
| VE-2S | 94.25 |
| VE-2D | 94.31 |
| VE-3 | 93.93 |
| VE-4 | 94.11 |
| VE-5 | 95.40 |
| VE-6 | 95.41 |
| DBG-8A | 93.70 |
| DBG-9A | 94.80 |
| HRP-10 | 93.5 (ESTIMATED) |
| HRP-11 | 92.5 (ESTIMATED) |

NOTE:
GROUND WATER DATA SHOWN ON PLANS ARE APPROXIMATELY AS SHOWN FOR BIDDING PURPOSES. ACTUAL WELL ELEVATIONS TO BE DETERMINED IN THE FIELD BY THE CONTRACTOR.

SOIL VAPOR EXTRACTION TRENCH PIPE ELEVATIONS - DOLPHIN MART

| TRENCH NO. | INV. ELEV. 6" VAPOR COLLECTION PIPE | INV. ELEV. 2" PIPE @ WEST END OF TRENCH | INV. ELEV. 2" PIPE @ EAST END OF TRENCH |
|---|---|---|---|
| VET 1 | 94.64 | 99.41 | 99.46 |
| VET 2 | 94.64 | 98.80 | 98.85 |
| VET 3 | 94.48 | 98.19 | 98.24 |
| VET 4 | 94.32 | 97.50 | 97.62 |
| VET 5 | 94.16 | 96.78 | 97.30 |
| VET 6 | 94.00 | 96.20 | 97.20 |
| VET 7 | 93.84 | 95.65 | 97.00 |
| VET 8 | 93.68 | 95.13 | 96.80 |
| VET 9 | 93.52 | 94.62 | 96.60 |
| VET 10 | 93.36 | 93.52 | 96.40 |
| VET 11 | 93.20 | 93.37 | 95.80 |
| VET 12 | 93.04 | 93.23 | 95.22 |
| VET 13 | 92.88 | 93.09 | 94.64 |
| VET 14 | 92.72 | 92.95 | 94.04 |
| VET 15 | 92.56 | 92.80 | 93.56 |
| VET 16 | 92.40 | 92.66 | 93.08 |

THIS MAP WAS PREPARED FROM MAPS LISTED BELOW

1. NAUTILUS PARK, GROTON, CONN. EXISTING UTILITIES MAPS PREPARED BY CULLINAN ENGINEERING CO., INC. SCALE 1"=40' DATE 3/25/83 NAVFAC DRAWING NO'S. 2,064,332, 2,064,353 AND 2,064,374.
2. MONITOR WELL LOCATION AND GROUND WATER CONTOUR MAP OF JANUARY 21, 1992 DOLPHIN MART SITE US SUBASE, GROTON, CT. PREPARED BY ERM-NORTHEAST SCALE 1"=20' APRIL, 1992.
3. UTILITY DATA FROM AS-BUILT DRAWINGS AND UTILITY MAPS; EXACT LOCATIONS MUST BE VERIFIED IN FIELD.
4. ALL TOPOGRAPHIC FEATURES AND INVERTS SHOWN HEREON SHALL BE FIELD VERIFIED.

NOTES:

1. SEE SHEET T2 FOR LEGEND, ABBREVIATIONS GENERAL CONSTRUCTION NOTES AND EXISTING MANHOLE AND CATCH BASIN INVERTS.

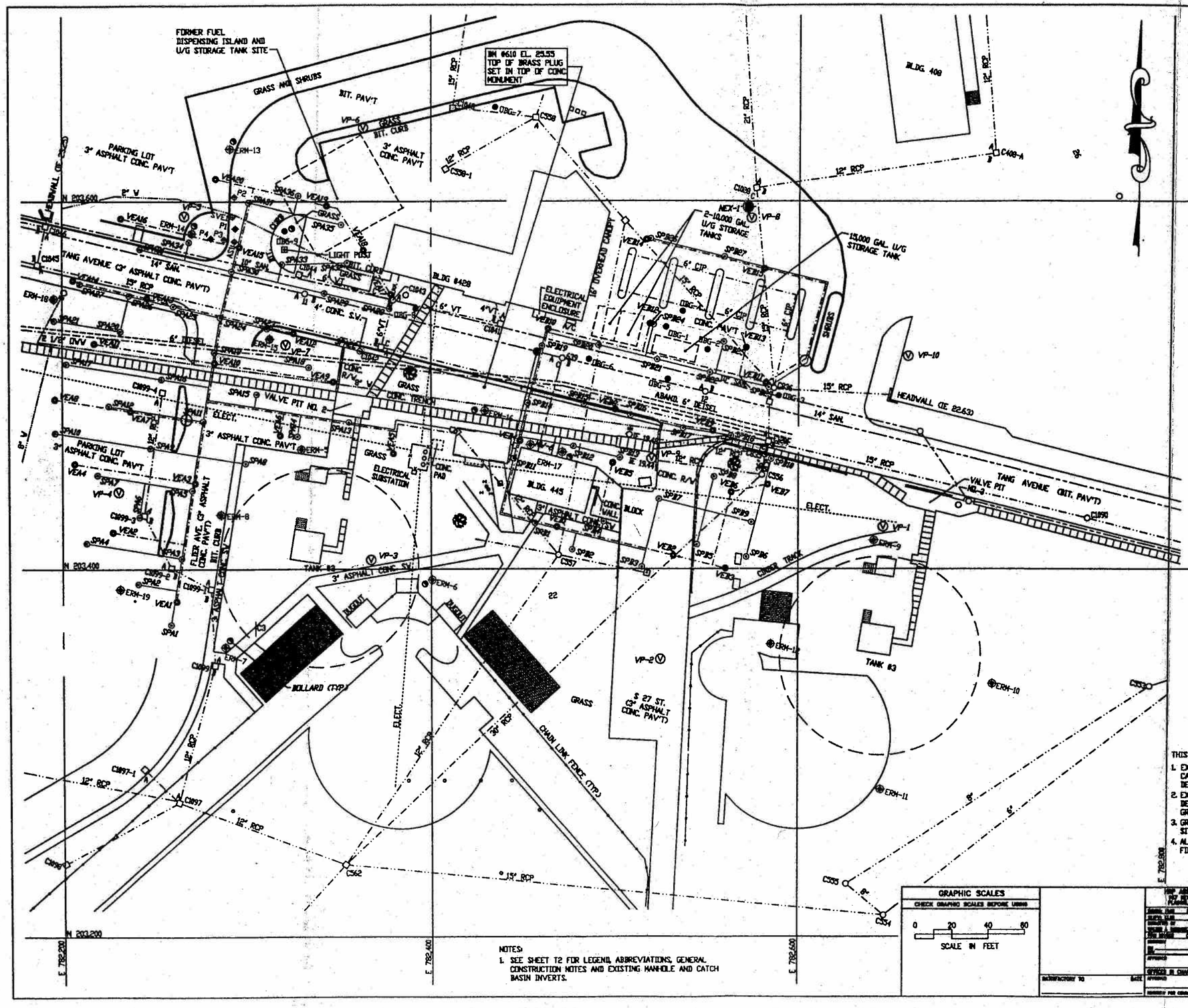
GRAPHIC SCALES
CHECK GRAPHIC SCALES BEFORE USING
20 0 20 40

HMP ASSOCIATES, INC.
1ST AVE. BOROUGH OF
PLANVILLE, NEW JERSEY

DEPARTMENT OF THE NAVY — NAVAL FACILITIES ENGINEERING COMMAND
LOCATION: NORTHERN DIVISION — PENNSYLVANIA
NAVAL SUBMARINE BASE — NEW LONDON, CONNECTICUT
REMEDIATION OF CONTAMINATED SOIL/GROUND WATER
FIGURE 1 - SITE PLAN
DOLPHIN MART

| SIZE | CODE IDENT. NO. | NAVFAC DRAWING NO. | DWG. NO. REV. |
|---|---|---|---|
| F | 80091 | 2166440 | C2-1 |

CONTR. CONTR. NO. N62472-88-C-0892
SPEC. NO. 84-88-0892 | SHEET 6 OF 34




| REVISIONS | | | | |
|---|---|---|---|---|
| LTR | DESCRIPTION | PREP'D BY | DATE | APPROVED |
| | | | | |

**HIGHEST RECORDED GROUND WATER ELEVATION**

| WELL NO. | GROUND WATER EL. | WELL NO. | GROUND WATER EL. |
|---|---|---|---|
| DBG-1 | 16.73 | ERH-18 | 16.97 |
| DBG-2 | 17.09 | ERH-19 | 16.06 |
| DBG-4 | 16.63 | ERH-1 | 17.09 |
| DBG-5 | 16.85 | ERH-2 | 16.31 |
| DBG-6 | 16.76 | ERH-3 | 14.76 |
| DBG-7 | 18.40 | ERH-4 | 16.86 |
| DBG-8 | 17.96 | ERH-5 | 17.78 |
| DBG-9 | 17.63 | ERH-6 | 16.79 |
| ERH-10 | 18.69 | ERH-7 | 15.81 |
| ERH-11 | 17.84 | ERH-8 | 17.14 |
| ERH-12 | 16.69 | ERH-9 | 17.00 |
| ERH-13 | 17.58 | | |
| ERH-14 | 17.46 | | |
| ERH-15 | 17.59 | | |
| ERH-16 | 17.71 | | |
| ERH-17 | 16.91 | | |

NOTE:
GROUND WATER DATA SHOWN ON PLANS ARE APPROXIMATELY AS SHOWN FOR BIDDING PURPOSES. ACTUAL WELL ELEVATIONS TO BE DETERMINED IN FIELD BY CONTRACTOR.

THIS MAP WAS PREPARED FROM MAPS LISTED BELOW:

1. EXISTING TOPOGRAPHY FROM MAP BY JAMES S. MINGES & ASSOCIATES, CARLSON & SVEATT FARMINGTON, CT & NEW YORK, N.Y. DATED 31 DEC. 1974.
2. EXISTING UTILITIES FROM 40 SCALE UTILITY MAPS SUPPLIED BY THE DEPARTMENT OF PUBLIC WORKS, NAVAL SUBMARINE BASE, NEW LONDON, GROTON, CT.
3. GROUND WATER ANALYTICAL RESULTS, JANUARY, 1992 NEX STATION SITE US SUBBASE, GROTON, CT PREPARED FOR ERH-PNC.
4. ALL TOPOGRAPHIC FEATURES AND INVERTS SHOWN HEREIN SHALL BE FIELD VERIFIED.

NOTES:
1. SEE SHEET T2 FOR LEGEND, ABBREVIATIONS, GENERAL CONSTRUCTION NOTES AND EXISTING MANHOLE AND CATCH BASIN INVERTS.

GRAPHIC SCALES
CHECK GRAPHIC SCALES BEFORE USING
0 20 40 60
SCALE IN FEET

NAVY ASSOCIATES, INC.
ARCHITECTS & ENGINEERS
ALBANY, NY

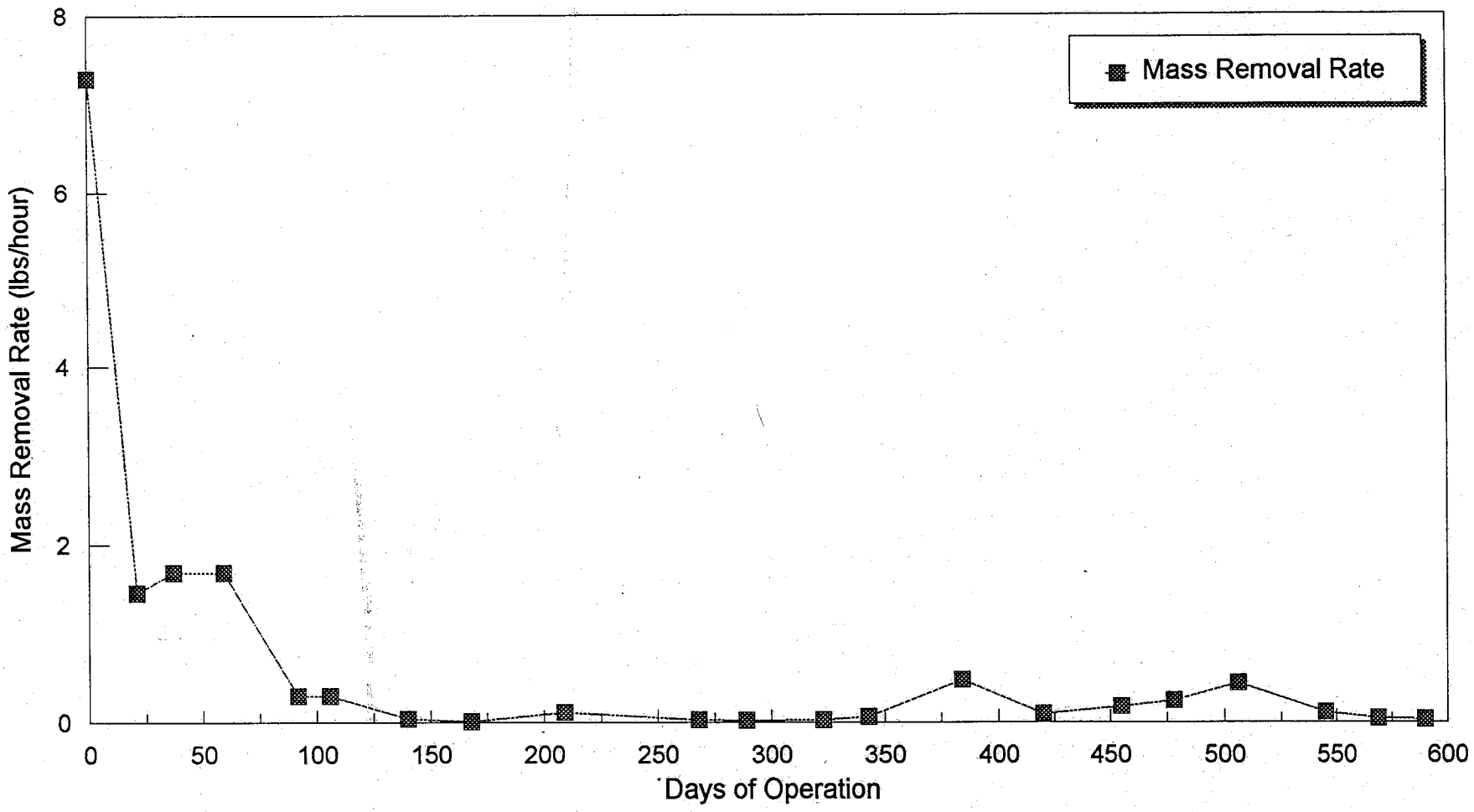
DEPARTMENT OF THE NAVY — NAVAL FACILITIES ENGINEERING COMMAND
LANTDIV — NORTHERN DIVISION — PHILADELPHIA PENNSYLVANIA
NAVAL SUBMARINE BASE — NEW LONDON, CONNECTICUT
REMEDIATION OF CONTAMINATED SOIL/GROUND WATER
FIGURE 2 - SITE PLAN
NAVAL EXCHANGE (NEX)

| SIZE | CODE IDENT. NO. | TERRITORIAL DESIGNATION NO. | DWG. NO. REV. |
|---|---|---|---|
| F | 80091 | 2166439 | C1-1 |

CONTRACT CONTROL NO. N62472-88-D-0000
SPEC. NO. 84-88-0000 SHEET 4 OF 84

# Figure 3A- Mass Removal Rate

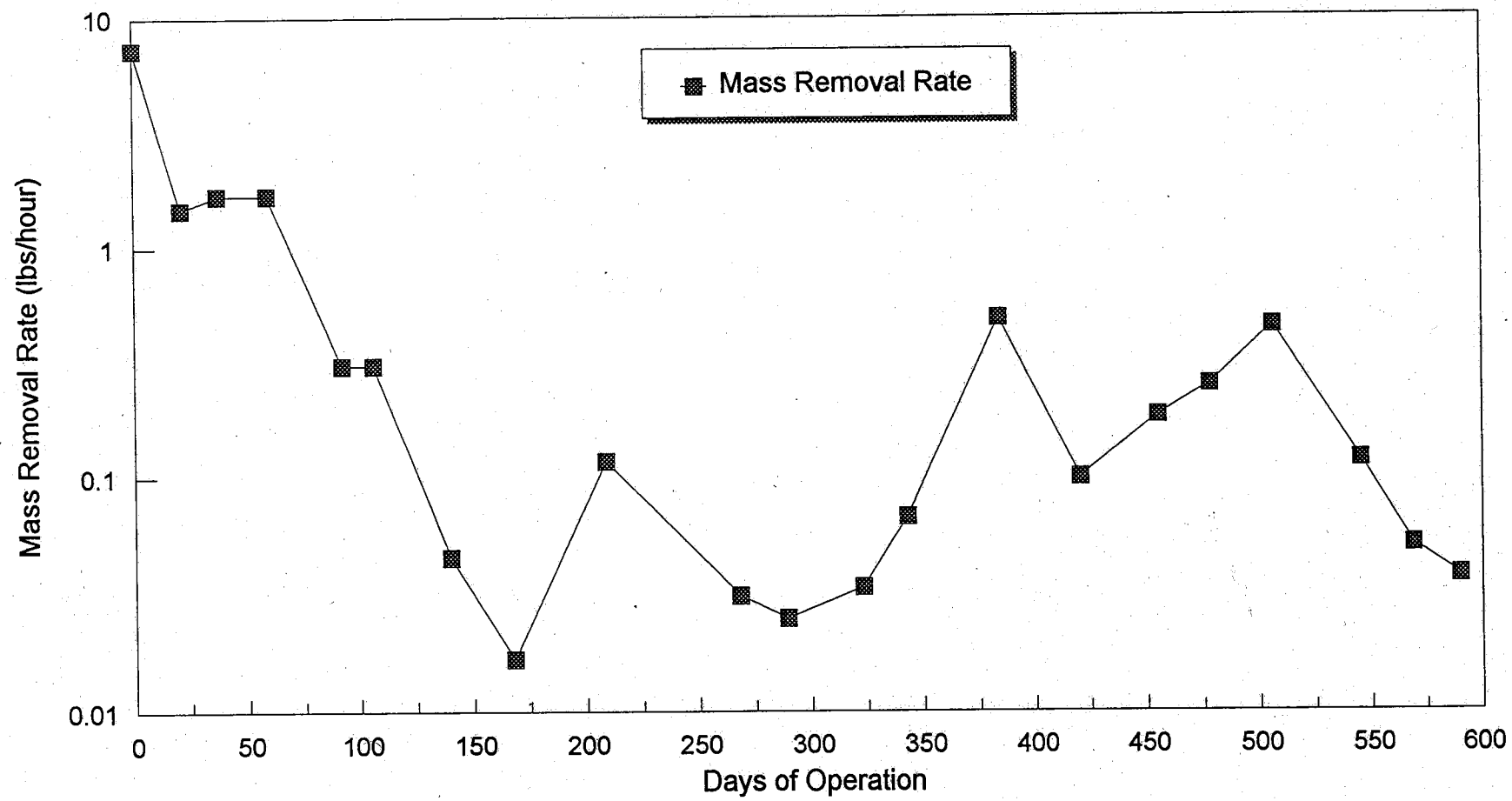
Dolphin Mart Site, New London Naval Submarine Base, Groton, CT




MASSREM.WK4

# Figure 3B- Mass Removal Rate

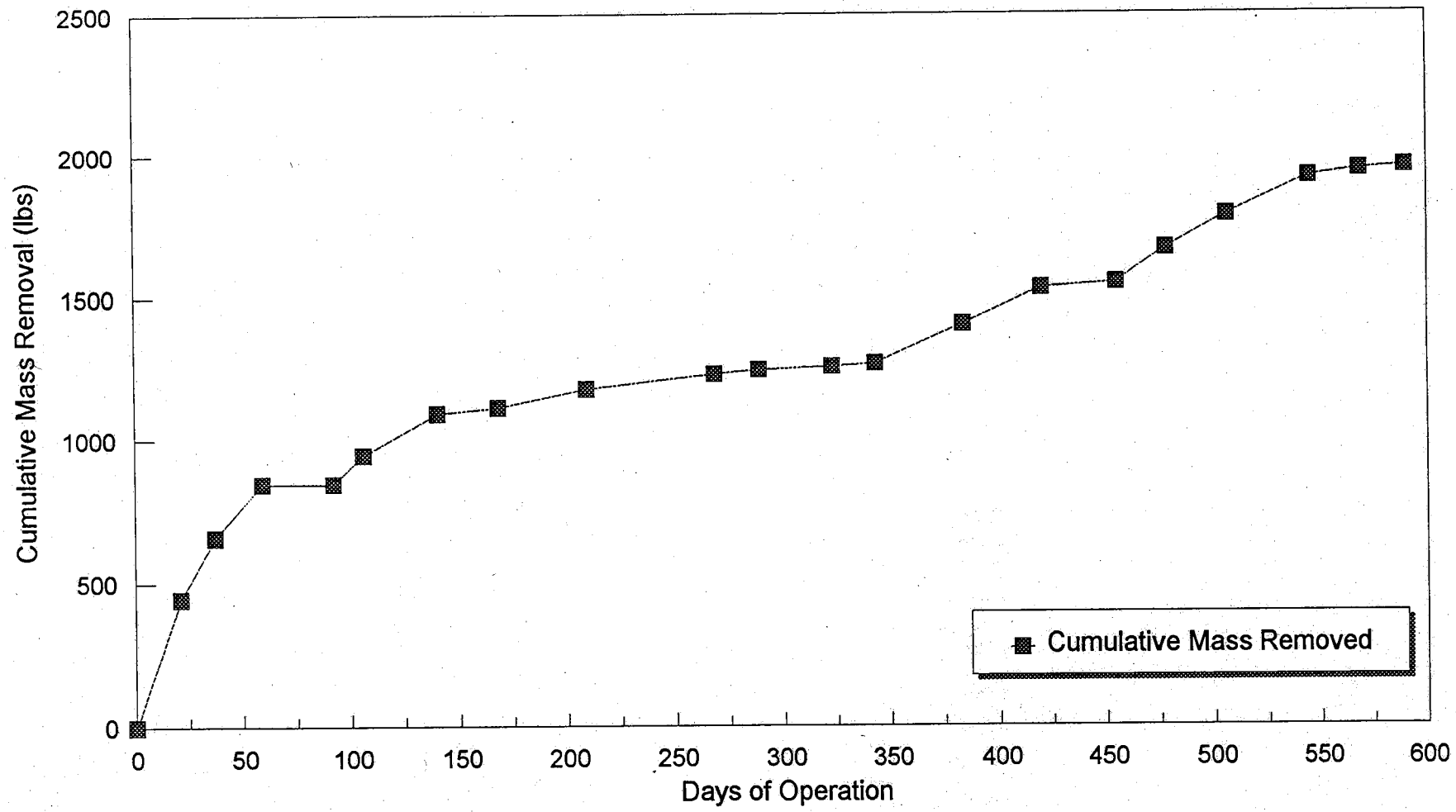
Dolphin Mart Site, New London Naval Submarine Base, Groton, CT




MASSREM.WK4

# Figure 4 - Cumulative Mass Removed versus Time

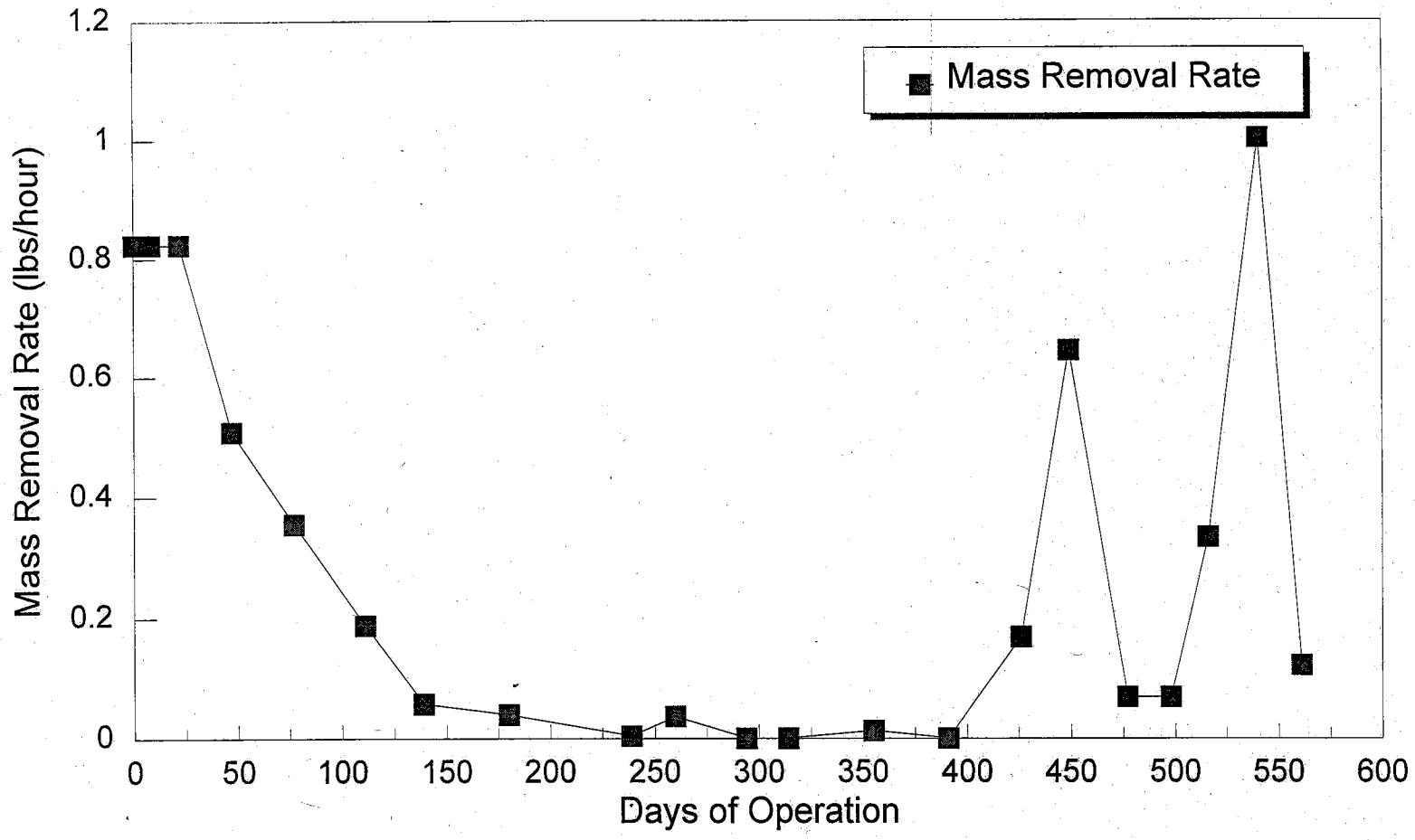
Dolphin Mart Site, New London Naval Submarine Base, Groton, CT




MASSREM.WK4

# Figure 5A - Mass Removal Rate

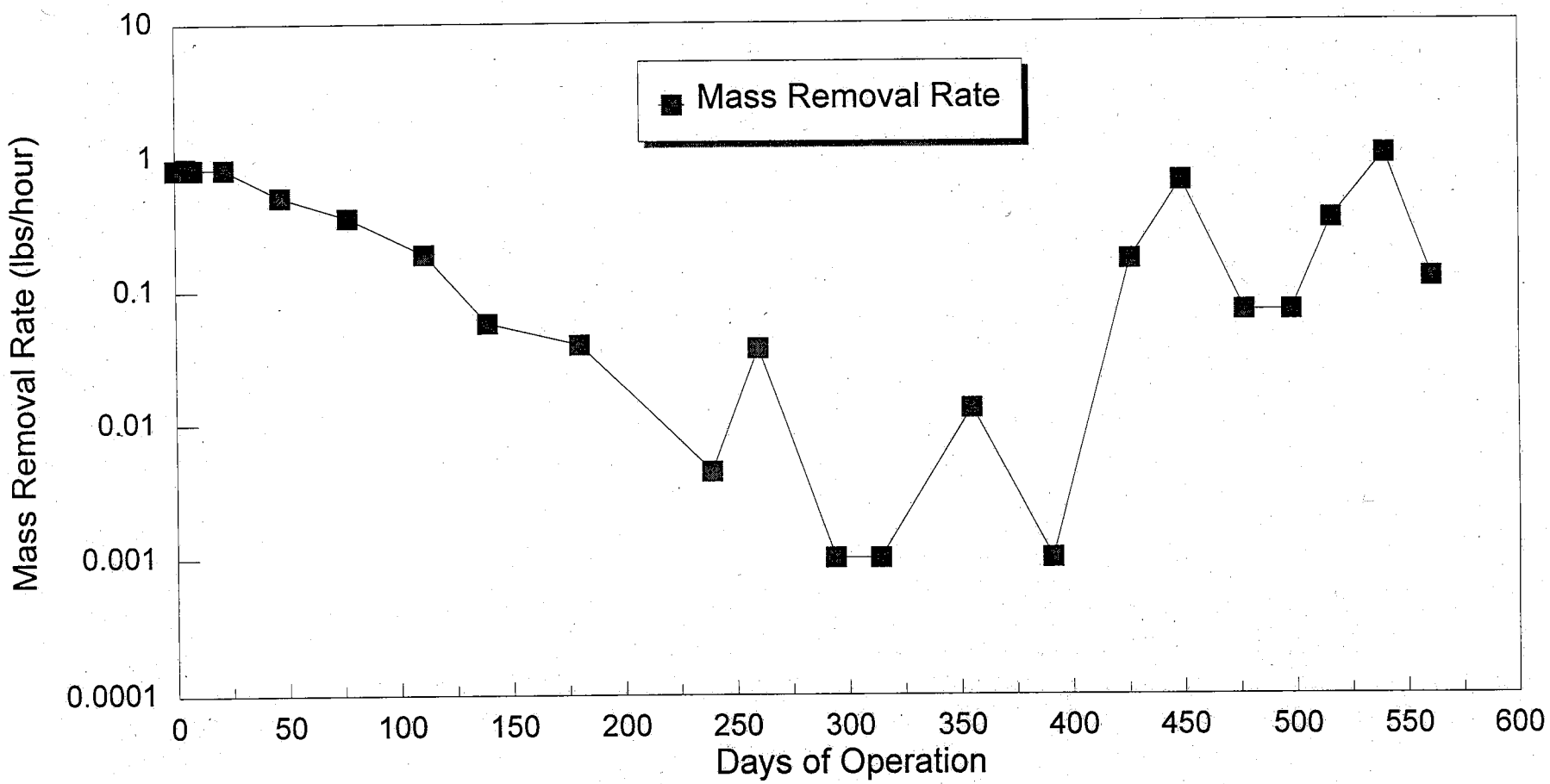
NEX Site, New London Naval Submarine Base, Groton, CT




MASSREM.WK4

# Figure 5B - Mass Removal Rate

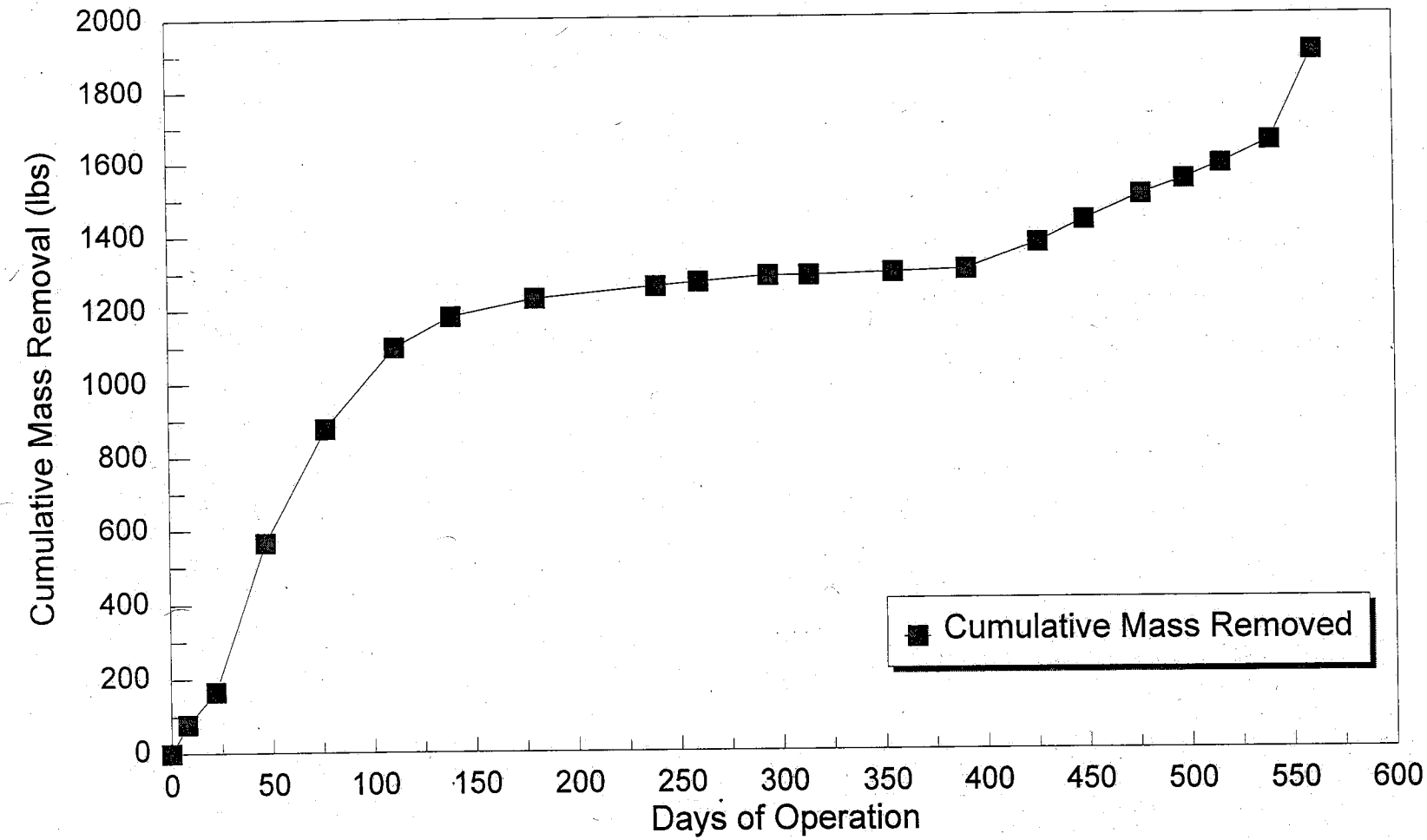
NEX Site, New London Naval Submarine Base, Groton, CT



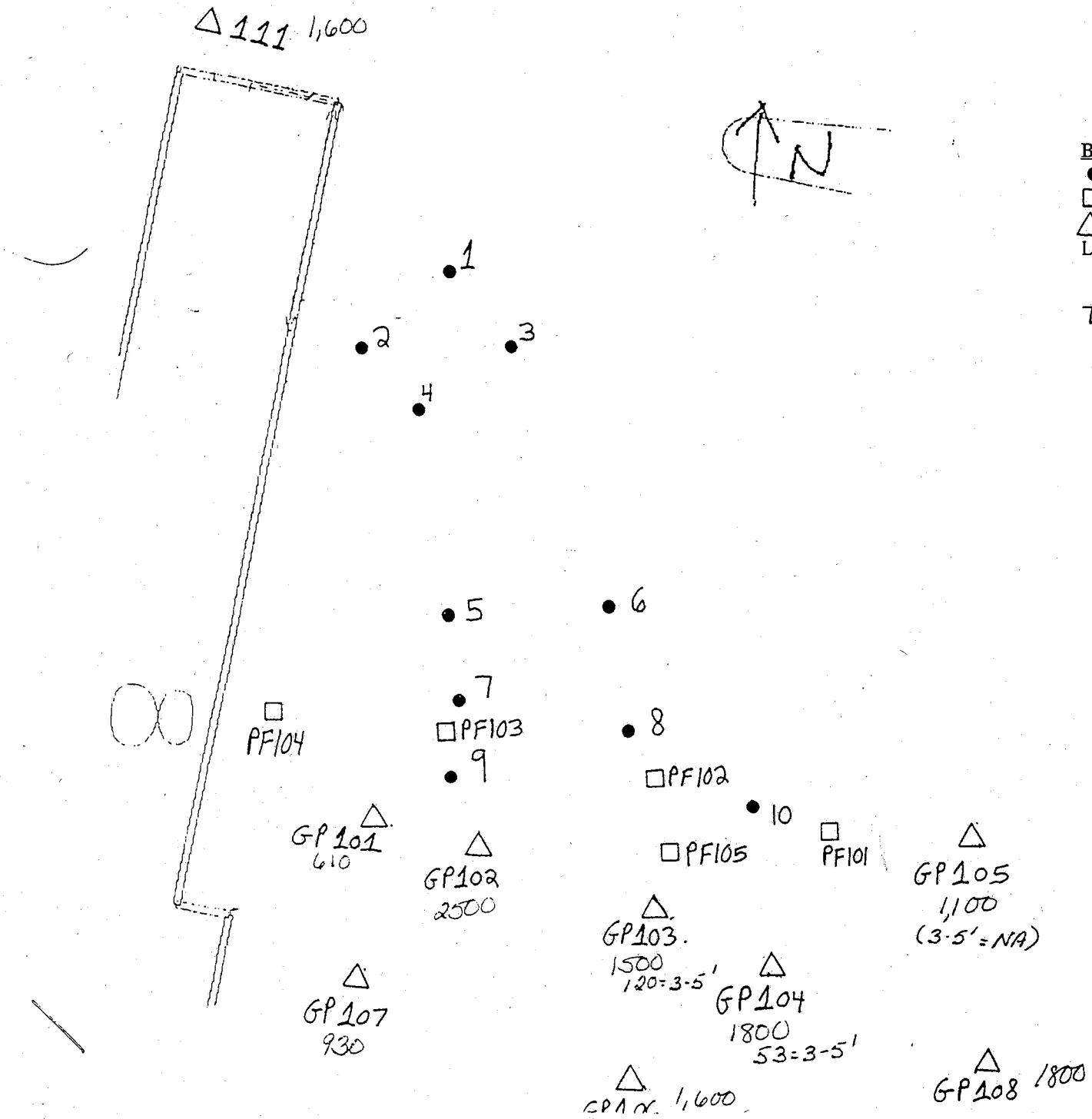

MASSREM.WK4

# Figure 6 - Cumulative Mass Removed versus Time

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




MASSREM.WK4




**BUILDING #08**

● - Historical Sampling Location
□ - PetroFlag Sampling Location - 12/9/97
△ - GeoProbe Sampling Location -12/15&16/97
Locations are approximate, 1inch = approx. 20 feet

TPH IR Conc for 1-3'
3-5' interval was ND unless otherwise noted

# 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: 2-12-98
Time: 17:00
Technician: J.K.JR.

## AIR COMPRESSOR SYSTEM

Flow Rate 23 SCFM | Total Flow 2106792 SCFM

| Air Compressor C-1 | | Air Compressor C-2 | |
|---|---|---|---|
| Pressure | 7.5 psi | Pressure | NA psi |
| Temperature | 187 °F | Temperature | °F |
| Flow Control Valve Setting | 100 | Flow Control Valve Setting | |
| Bleed Valve | 50 | Bleed Valve | |
| Radiator | (ON) / OFF | Radiator | ON / (OFF) |

## SOIL VAPOR EXTRACTION SYSTEM

Flow Rate 1500 FPM ~~SCFM~~ (use anemometer in hole in pipe near Hersey flowmeter)

| Vacuum Pump V-1 | | Vacuum Pump V-2 | |
|---|---|---|---|
| Vacuum | NA "Hg | Vacuum | 3 "Hg |
| Temperature | °F | Temperature | 108 °F |
| Particulate Filter | | Particulate Filter | OK |
| Flow Control Valve Setting | | Flow Control Valve Setting | 100 |
| Bleed Air Valve Setting | | Bleed Air Valve Setting | 25 |
| Liquid Level | | Liquid Level | 0 |

| Vacuum Pump V-3 | | Vacuum Pump V-4 | |
|---|---|---|---|
| Vacuum | NA "Hg | Vacuum | NA "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 | |
|---|---|---|---|
| Pressure | NA psi | Pressure | 30 psi |
| Inf. VOC Level | ppm | Inf. VOC Level | 44 ppm |
| Mid. VOC Level | ppm | Mid. VOC Level | 37 ppm |
| Eff. VOC Level | ppm | Eff. VOC Level | 36 ppm |
| Change out Date | NA | Change out Date | 8-22-96 |

## WATER TREATMENT

Flowmeter Reading 3920.1 Gallons

## COMMENTS

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

Date: 2-12-98
Time: 9:30
Technician: J.K.J.R.

## AIR COMPRESSOR SYSTEM

| | | | | | |
|---|---|---|---|---|---|
| Flow Rate | 50 | SCFM | Total Flow | 2221550 | SCFM |

| Air Compressor C-1 | | | Air Compressor C-2 | | |
|---|---|---|---|---|---|
| Pressure | NA | psi | Pressure | NA | psi |
| Temperature | ~~104~~ | °F | Temperature | | °F |
| Flow Control Valve Setting | | | Flow Control Valve Setting | | |
| Bleed Valve | | | Bleed Valve | | |
| Radiator | ~~ON~~/OFF | | Radiator | ON/OFF | |

## SOIL VAPOR EXTRACTION SYSTEM

| | | | | | |
|---|---|---|---|---|---|
| Eastern Flow Rate | 305 - 342 | SCFM | Total Flow | 75702980 | SCFM |
| Western Flow Rate | 0 | SCFM | Total Flow | 23182676 | SCFM |

| Vacuum Pump V-1 | | | Vacuum Pump V-2 | | |
|---|---|---|---|---|---|
| Vacuum | 10 | "Hg | Vacuum | 7.5 | "Hg |
| Temperature | ~~124~~ 150 | °F | Temperature | 162 | °F |
| Particulate Filter | ok | | Particulate Filter | ok | |
| Flow Control Valve Setting | 100 | | Flow Control Valve Setting | 100 | |
| Bleed Air Valve Setting | 25 | | Bleed Air Valve Setting | 25 | |
| Liquid Level | 0 | | Liquid Level | 0 | |

| Vacuum Pump V-3 | | | Vacuum Pump V-4 | | |
|---|---|---|---|---|---|
| Vacuum | 10.5 | "Hg | Vacuum | NA | "Hg |
| Temperature | 190 | °F | Temperature | | °F |
| Particulate Filter | ok | | Particulate Filter | | |
| Flow Control Valve Setting | 100 | | Flow Control Valve Setting | | |
| Bleed Air Valve Setting | 25 | | Bleed Air Valve Setting | | |
| Liquid Level | 0 | | Liquid Level | | |

## ACTIVATED CARBON ADSORPTION SYSTEM

| Carbon Adsorber A/B | | | Carbon Adsorber C/D | | |
|---|---|---|---|---|---|
| Pressure | 10 | psi | Pressure | | psi |
| Inf. VOC Level | 36.2 | ppm | Inf. VOC Level | 37.6 | ppm |
| Mid. VOC Level | 8.8 | ppm | Mid. VOC Level | 37.6 | ppm |
| Eff. VOC Level | 4.9 | ppm | Eff. VOC Level | 37.6 | ppm |
| Change out Date | NA | | Change out Date | 8-22-96 | |

## WATER TREATMENT

Flowmeter Reading _____ Gallons (prior to discharge) Flowmeter Reading _____ Gallons (after discharge)

## COMMENTS

* FILL IN ALL SPACES WITH THE APPROPRIATE READING OR "NA".

| OPERATIONAL DATA FORM<br>OT-8 / MW -7 PRODUCT RECOVERY SYSTEM<br>Naval Submarine Base, Groton, Ct.<br>Project # 87260014.04<br>Task #04 | Date: 2.11.98<br>Time:<br>Technician: CO/JKC |
|---|---|

Check Air Compressor, pressure should be at 80 psi.
Check Air Dryer Panel, pressure should be at 60 psi.
Drain Moisture trap on Panel Dryer.

Gauge OT-8 Recovery Tank:
DTB 2.81
DTP 2.70
DTW 0

Gauge Product ~~Well~~ Holding Tank:
Bailed
DTB 2.76
DTP 2.71
DTW 0

Gauge MW-7:
DTB ~~DTP~~ 9.55
DTW 3.68
DTP 0

Comments:

C:\FSM\PROJECTS\GROTON\FORM1.01

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

Date: 7.9.98
Time: 9:45
Technician: WCD

## AIR COMPRESSOR SYSTEM

Flow Rate _____ SCFM | Total Flow _____ SCFM

| Air Compressor C-1 | | Air Compressor C-2 | |
|---|---|---|---|
| Pressure | 11 psi | Pressure | psi |
| Temperature | 135 °F | Temperature | °F |
| Flow Control Valve Setting | NA | Flow Control Valve Setting | |
| Bleed Valve | 25 | Bleed Valve | |
| Radiator | (ON) OFF | Radiator | ON / OFF |

## SOIL VAPOR EXTRACTION SYSTEM

Flow Rate (1168 FPM) SCFM (use anemometer in hole in pipe near Hersey flowmeter)

| Vacuum Pump V-1 | | Vacuum Pump V-2 | |
|---|---|---|---|
| Vacuum | 50 "Hg | Vacuum | 65 "Hg |
| Temperature | 130 °F | Temperature | 130 °F |
| Particulate Filter | Cleaned | Particulate Filter | Cleaned |
| Flow Control Valve Setting | 100 | Flow Control Valve Setting | 100 |
| Bleed Air Valve Setting | 30 | Bleed Air Valve Setting | 30 |
| Liquid Level | NA | Liquid Level | NA |

| 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 | |
|---|---|---|---|
| Pressure | psi | Pressure | psi |
| Inf. VOC Level | ppm | Inf. VOC Level | ppm |
| Mid. VOC Level | ppm | Mid. VOC Level | ppm |
| Eff. VOC Level | ppm | Eff. VOC Level | ppm |
| Change out Date | | Change out Date | |

## WATER TREATMENT

Flowmeter Reading 3698.8 Gallons

## COMMENTS

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

Date: 2.9.98
Time: 10:~~39~~
Technician: WCD

## 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 | ON / OFF | | Radiator | ON / OFF | |

## SOIL VAPOR EXTRACTION SYSTEM

| | | | | | |
|---|---|---|---|---|---|
| Eastern Flow Rate | 47 | SCFM | Total Flow | 74832996 | SCFM |
| Western Flow Rate | 0 | SCFM | Total Flow | 23121919 | SCFM |
| **Vacuum Pump V-1** | | | **Vacuum Pump V-2** | | |
| Vacuum | 16 ~~5~~ | "Hg | Vacuum | | "Hg |
| Temperature | 110 | °F | Temperature | | °F |
| Particulate Filter | | | Particulate Filter | | |
| Flow Control Valve Setting | 100 | | Flow Control Valve Setting | | |
| Bleed Air Valve Setting | 25 | | Bleed Air Valve Setting | | |
| 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** | | |
| Pressure | | psi | Pressure | | psi |
| Inf. VOC Level | 6.1 | ppm | Inf. VOC Level | | ppm |
| Mid. VOC Level | 4.9 | ppm | Mid. VOC Level | | ppm |
| Eff. VOC Level | 2.1 | ppm | Eff. VOC Level | | ppm |
| Change out Date | | | Change out Date | | |

## WATER TREATMENT

Flowmeter Reading — Gallons (prior to discharge)  Flowmeter Reading 68084.6 Gallons (after discharge)

## COMMENTS

* FILL IN ALL SPACES WITH THE APPROPRIATE READING OR "NA".

# *ATTACHMENT 2*

# *MONTHLY FIELD ACTIVITY SUMMARY*

**Field Activity Summary**
**February 1998**

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

| Week Ending | Site | Period | Field Activities | Comments |
|---|---|---|---|---|
| 2/6/98 | Dolphin Mart | Monthly Monitoring | Conducted system monitoring and maintenance. | SVE blower V-2 and air compressor AC-1 down. |
| | NEX | | Conducted system monitoring and maintenance. Replaced fan blade on heat exchanger. | |
| 2/13/98 | Dolphin Mart | Monthly Monitoring | Conducted monthly system monitoring, quarterly groundwater sampling, effluent off-gas sampling, and discharge monitoring sampling. | SVE Blower V-2 down and air compressor AC-1 down due to high water/low air flow. |
| | NEX | | Conducted monthly system monitoring, quarterly groundwater sampling, effluent off-gas sampling, and discharge monitoring sampling. | No air flow from west side of system. |
| | OT-8 | | Conducted monthly system monitoring, including gauging OT-8 system drum, MW-7, and bailed product drum. | |

# *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 | Air Sparge Flowrate (scfm) | Extraction Flowrate (scfm) | Influent Concentration BTEX (ppmv) | Removal Rate BTEX (lb/hr) | Influent Concentration MTBE (mg/m3) | 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 Concentratio TVPH (mg/m3) | Influent Concentration TVPH (ppmv) | Removal Rate TVPH (lb/hr) | Total Mass Removal Rate (lbs/hr) | Period Mass Removed (lbs) | Cumulative Mass Removed (lbs) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 07/02/96 | 25 | 450 | 24.00 | 0.187 | NA | 33.00 | 0.232 | 1000.00 | 6.876 | 0.00 | 0.000 | — | — | 0.000 | 7.295 | 0.00 | 0.00 | |
| 07/23/96 | 20 | 449 | 11.40 | 0.091 | NA | 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 | 32 | 454 | 18.00 | 0.142 | NA | — | 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 | 0 | 450 | 18.00 | 0.142 | NA | — | 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 | 30 | 448 | 2.30 | 0.019 | NA | 0.00 | 0.000 | — | 0.000 | — | 0.000 | NA | 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 | 30 | 450 | 2.30 | 0.019 | NA | 0.00 | 0.000 | — | 0.000 | — | 0.000 | NA | 36.00 | 0.287 | 0.306 | 102.81 | 946.74 | system reactivated 10/2/96 |
| 11/19/96 | 30 | 450 | 0.38 | 0.003 | 0.00 | 0.00 | 0.000 | — | 0.000 | — | 0.000 | 22.00 | 5.29 | 0.042 | 0.045 | 143.33 | 1090.06 | |
| 12/17/96 | 30 | 450 | 0.12 | 0.001 | 0.00 | 0.00 | 0.000 | — | 0.000 | — | 0.000 | 8.20 | 1.97 | 0.016 | 0.017 | 20.84 | 1110.90 | |
| 01/27/97 | 30 | 450 | 1.35 | 0.011 | 0.00 | 0.00 | 0.000 | — | 0.000 | — | 0.000 | 55.00 | 13.23 | 0.106 | 0.117 | 65.56 | 1176.46 | |
| 03/27/97 | 30 | 450 | 0.00 | 0.000 | NA | 0.00 | 0.000 | — | 0.000 | — | 0.000 | 0.00 | 3.90 | 0.031 | 0.031 | 104.53 | 1228.73 | assume 50% up-time, blowers shutting down due to influent water |
| 04/17/97 | 30 | 450 | 0.00 | 0.000 | NA | 0.00 | 0.000 | — | 0.000 | — | 0.000 | 13.00 | 3.13 | 0.025 | 0.025 | 14.13 | 1242.86 | |
| 05/21/97 | 15 | 329 | 0.00 | 0.000 | NA | 0.00 | 0.000 | — | 0.000 | — | 0.000 | 24.00 | 5.77 | 0.034 | 0.034 | 11.96 | 1254.82 | assume 50% up-time, blowers shutting down due to influent water |
| 06/10/97 | 15 | 329 | 0.25 | 0.002 | NA | 0.00 | 0.000 | — | 0.000 | — | 0.000 | 47.00 | 11.31 | 0.066 | 0.067 | 12.14 | 1266.96 | assume 50% up-time, blowers shutting down due to influent water |
| 07/21/97 | 15 | 329 | 1.89 | 0.011 | NA | 0.00 | 0.000 | — | 0.000 | — | 0.000 | 340.00 | 81.79 | 0.477 | 0.488 | 136.76 | 1403.71 | assume 50% up-time, blowers shutting down due to influent water |
| 08/26/97 | 15 | 482 | 0.73 | 0.007 | 0.00 | 0.00 | 0.000 | — | 0.000 | — | 0.000 | 45.00 | 10.82 | 0.092 | 0.099 | 126.91 | 1530.63 | assume 50% up-time, blowers shutting down due to influent water |
| 09/30/97 | 15 | 482 | 0.34 | 0.003 | 0.00 | 0.00 | 0.000 | — | 0.000 | — | 0.000 | 88.00 | 21.17 | 0.181 | 0.184 | 17.84 | 1548.46 | assume ~15% up-time, blowers shutting down due to influent water |
| 10/23/97 | 14 | 589 | 0.00 | 0.000 | 0.00 | 0.00 | 0.000 | — | 0.000 | — | 0.000 | 100.00 | 24.06 | 0.251 | 0.251 | 120.10 | 1668.56 | |
| 11/20/97 | 32 | 590 | 0.00 | 0.000 | 20.00 | 5.45 | 0.050 | — | 0.000 | — | 0.000 | 160.00 | 38.49 | 0.403 | 0.453 | 118.28 | 1786.84 | assume 50% up-time, blowers shutting down due to influent water |
| 12/29/97 | 28 | 590 | 0.45 | 0.005 | 0.00 | 0.00 | 0.000 | — | 0.000 | — | 0.000 | 45.00 | 10.82 | 0.113 | 0.118 | 133.65 | 1920.49 | assume 50% up-time, blowers shutting down due to influent water |
| 01/22/98 | 27 | 471 | 0.32 | 0.003 | 0.00 | 0.00 | 0.000 | — | 0.000 | — | 0.000 | 24.00 | 5.77 | 0.048 | 0.051 | 24.38 | 1944.87 | assume 50% up-time, blowers shutting down due to influent water |
| 02/12/98 | 23 | 295 | 0.23 | 0.001 | 0.00 | 0.00 | 0.000 | — | 0.000 | — | 0.000 | 29.00 | 6.98 | 0.036 | 0.038 | 11.19 | 1956.06 | assume 50% up-time, blowers shutting down due to influent water |

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 4/17/97, 6/10/97 and 7/21/97 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 NEI/GTEL
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 | Air Sparge Flowrate (scfm) | Extraction Flowrate (total) (scfm) | Extraction Flowrate (cfm) | Influent Concentration BTEX (ppmv) | Removal Rate BTEX (lb/hr) | Influent Concentration MTBE (mg/m3) | 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 (mg/m3) | 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 | NA* | 253 | 288.00 | 1.80 | 0.013 | NA | — | 0.000 | 130.00 | 0.810 | 0.00 | 0.000 | — | — | 0.000 | 0.823 | 0.00 | 0.00 | |
| 08/08/96 | NA* | 270 | 307.35 | 1.80 | 0.013 | NA | — | 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 |
| 08/22/96 | NA* | 270 | 307.35 | 1.80 | 0.013 | NA | — | 0.000 | 130.00 | 0.810 | 0.00 | 0.000 | — | — | 0.000 | 0.823 | 88.09 | 166.30 | 24-hour per day system operation began 8/8 |
| 09/16/96 | NA* | 320 | 364.27 | 2.70 | 0.021 | NA | 0.00 | 0.000 | — | 0.000 | — | 0.000 | — | 61.00 | 0.487 | 0.508 | 399.38 | 565.68 | |
| 10/16/96 | NA* | 320 | 364.27 | 2.50 | 0.020 | NA | 0.00 | 0.000 | — | 0.000 | — | 0.000 | — | 42.00 | 0.335 | 0.355 | 310.76 | 876.44 | |
| 11/19/96 | NA* | 324 | 368.83 | 0.95 | 0.008 | 0.00 | 0.00 | 0.000 | — | 0.000 | — | 0.000 | 94.00 | 22.61 | 0.180 | 0.188 | 221.67 | 1098.10 | |
| 12/17/96 | NA* | 310 | 352.89 | 0.18 | 0.001 | 0.24 | 0.07 | 0.000 | — | 0.000 | — | 0.000 | 29.00 | 6.98 | 0.056 | 0.058 | 82.54 | 1180.65 | |
| 01/27/97 | NA* | 321 | 365.41 | 0.14 | 0.001 | 0.00 | 0.00 | 0.000 | — | 0.000 | — | 0.000 | 20.00 | 4.81 | 0.038 | 0.040 | 47.78 | 1228.42 | |
| 03/27/97 | NA** | 384 | 437.13 | 0.00 | 0.000 | NA | 0.00 | 0.000 | — | 0.000 | — | 0.000 | — | 0.55 | 0.004 | 0.004 | 31.10 | 1259.52 | |
| 04/17/97 | NA** | 721 | 820.75 | 0.00 | 0.000 | 0.00 | 0.00 | 0.000 | — | 0.000 | — | 0.000 | 12.00 | 2.89 | 0.037 | 0.037 | 10.40 | 1269.92 | |
| 05/21/97 | 6*** | 360 | 409.81 | 0.00 | 0.000 | 0.00 | 0.00 | 0.000 | — | 0.000 | — | 0.000 | 0.00 | 0.00 | 0.000 | 0.00 | 15.46 | 1285.39 | |
| 06/10/97 | 2*** | 300 | 341.51 | 0.00 | 0.000 | 0.00 | 0.00 | 0.000 | — | 0.000 | — | 0.000 | 0.00 | 0.00 | 0.000 | 0.00 | 0.48 | 1285.87 | |
| 07/21/97 | 36*** | 358 | 407.53 | 0.00 | 0.000 | 0.00 | 0.00 | 0.000 | — | 0.000 | — | 0.000 | 8.50 | 2.04 | 0.013 | 0.013 | 6.88 | 1292.74 | |
| 08/26/97 | 28*** | 223 | 253.28 | 0.00 | 0.000 | 0.00 | 0.00 | 0.000 | — | 0.000 | — | 0.000 | 0.00 | 0.00 | 0.000 | 0.00 | 6.04 | 1298.78 | One blower down due to high water level in moisture trap. |
| 09/30/97 | 27*** | 221 | 251.58 | 2.37 | 0.016 | 22.00 | 6.00 | 0.021 | — | 0.000 | — | 0.000 | 140.00 | 33.68 | 0.132 | 0.169 | 71.24 | 1370.01 | One blower down due to high water level in moisture trap. |
| 10/23/97 | 47*** | 322 | 366.55 | 2.47 | 0.016 | 62.50 | 17.05 | 0.086 | — | 0.000 | — | 0.000 | 395.00 | 95.02 | 0.542 | 0.644 | 60.92 | 1430.93 | Two blowers down due to high water level in moisture trap. |
| 11/20/97 | 47*** | 213 | 242.47 | 0.50 | 0.004 | 4.10 | 1.12 | 0.004 | — | 0.000 | — | 0.000 | 68.00 | 16.36 | 0.062 | 0.069 | 70.19 | 1501.12 | One blower down due to high water level in moisture trap. |
| 12/11/97 | 47 | 213 | 242.47 | 0.50 | 0.004 | 4.10 | 1.12 | 0.004 | — | 0.000 | — | 0.000 | 68.00 | 16.36 | 0.062 | 0.069 | 41.42 | 1542.54 | |
| 12/29/97 | 47 | 520 | 591.37 | 0.78 | 0.006 | 8.00 | 2.18 | 0.018 | — | 0.000 | — | 0.000 | 140.00 | 33.68 | 0.310 | 0.334 | 42.40 | 1584.93 | |
| 01/22/98 | 53 | 479 | 544.70 | 2.46 | 0.019 | 16.50 | 4.50 | 0.034 | — | 0.000 | — | 0.000 | 465.00 | 111.86 | 0.949 | 1.002 | 62.99 | 1647.92 | |
| 02/12/98 | NA**** | 324 | 368.26 | 0.77 | 0.006 | 3.85 | 1.05 | 0.005 | — | 0.000 | — | 0.000 | 67.50 | 16.24 | 0.093 | 0.104 | 248.62 | 1896.55 | |

Notes:
* Air sparge compressor not activated due to elevated SVE influent concentrations.
** Air sparge compressor not activated due to improperly sized pressure switch.
*** Air sparge compressor activated, but high water levels in the moisture separators cause frequent compressor shut-down.
**** Air sparge compressor deactivated on 1/28/98 due to lack of vapor recovery from western portion of site.
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 Mitkem Laboratory. Prior to 9/16/96 air analysis performed by NEI/GTEL
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) System modificatons to allow continuous dewatering were conducted on December 11, 1997.
The data for this date was assumed to be the same as November that for November 20, 1997.
Flow rates for this date have been interpolated from 11/20/97 and 12/29/97 data.

# *ATTACHMENT 4*

# *HISTORICAL WELL GAUGING DATA*

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

| Date | Depth to Water (ft) Well ID | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | DM-1 | DM-2 | DM-3 | DM-4 | DM-5 | HRP-10 | HRP-11 | MW-1 | MW-2 | MW-3 | OBG8A | OBG9A | WE-1 | WE-1A | WE-2D | WE-2S | WE-3 | WE-4 | WE-5 | WE-6 |
| 07/02/96 | 6.37 | NG | NG | NG | NG | 4.65 | NG | 4.65 | 3.55 | 3.12 | NG | 0.82 | DRY | DRY | 6.56 | 6.78 | 8.67 | 4.24 | 4.80 | 3.40 |
| 07/03/96 | NG | NG | NG | NG | NG | 5.19 | NG | 4.63 | 2.86 | 0.00 | NG | 0.89 | NG | NG | 6.35 | 6.58 | 8.69 | 6.38 | 4.33 | 2.30 |
| 07/12/96 | NG | NG | NG | NG | NG | 5.81 | NG | 5.01 | 3.82 | 1.95 | NG | 1.85 | NG | NG | 6.83 | 6.96 | 8.93 | 6.38 | 4.98 | 3.60 |
| 07/16/96 | NG | NG | NG | NG | NG | 4.33 | NG | 4.55 | 2.89 | 0.74 | NG | 0.69 | NG | NG | 6.24 | 6.47 | 8.50 | 6.27 | 4.08 | 2.76 |
| 07/17/96 | NG | NG | NG | NG | NG | 2.73 | NG | 4.94 | 1.63 | 2.79 | NG | 0.00 | NG | NG | 5.88 | 6.30 | 8.62 | 6.47 | 3.62 | 1.72 |
| 07/19/96 | NG | NG | NG | NG | NG | 4.38 | NG | 5.21 | 0.61 | 0.00 | NG | 0.00 | NG | NG | 5.53 | 6.18 | 8.45 | NG | 3.19 | 1.08 |
| 07/22/96 | NG | NG | NG | NG | NG | 4.54 | NG | 4.82 | 1.95 | 1.17 | NG | 0.00 | NG | NG | 6.42 | 6.45 | 8.64 | 3.68 | 3.73 | 1.96 |
| 07/23/96 | NG | NG | NG | NG | NG | 4.55 | NG | 4.75 | 3.33 | 0.00 | NG | 0.20 | NG | NG | 6.33 | 6.70 | 8.72 | 8.72 | 4.49 | 2.40 |
| 07/24/96 | NG | NG | NG | NG | NG | 4.33 | NG | 5.22 | 1.18 | 0.00 | NG | 0.00 | NG | NG | 5.67 | 6.31 | 8.45 | 3.38 | 3.33 | 1.49 |
| 07/25/96 | NG | NG | NG | NG | NG | 4.46 | NG | 5.31 | NG | NG | NG | 0.16 | NG | NG | NG | NG | NG | NG | NG | 2.12 |
| 07/26/96 | NG | NG | NG | NG | NG | 4.43 | NG | 4.79 | NG | NG | NG | 0.00 | NG | NG | NG | NG | NG | NG | NG | 2.95 |
| 08/01/96 | NG | NG | NG | NG | NG | 3.93 | NG | 4.96 | 2.20 | 1.28 | NG | NG | NG | NG | 6.09 | 6.39 | 8.55 | 3.22 | 4.06 | 1.15 |
| 08/02/96 | NG | NG | NG | NG | NG | 4.08 | NG | 5.24 | 1.82 | 1.31 | NG | 0.00 | NG | NG | 5.73 | 6.30 | 8.56 | 2.96 | 3.76 | 0.86 |
| 08/05/96 | NG | NG | NG | NG | NG | 4.35 | NG | 5.08 | NG | 1.08 | NG | 0.00 | NG | NG | NG | NG | NG | NG | NG | 1.28 |
| 09/04/96 | NG | NG | NG | NG | NG | 5.43 | NG | 6.07 | 4.59 | DRY | NG | NG | NG | NG | 7.51 | 7.39 | 9.73 | 5.11 | 6.23 | 4.59 |
| 10/02/96 | NG | NG | NG | NG | NG | 3.53 | NG | 5.43 | NG | 3.86 | NG | NG | NG | NG | 5.82 | 6.41 | 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 | NG | NG | NG | NG | NG | 2.43 |
| 11/19/96 | 1.90 | NG | 2.06 | 2.68 | 5.37 | 4.15 | NG | 3.85 | 3.00 | DRY | NG | NG | NG | NG | 5.89 | 6.46 | 8.32 | 3.53 | 3.87 | 2.90 |
| 12/17/96 | 2.53 | NG | 1.60 | NG | 3.67 | NG | NG | 3.85 | 2.17 | NG | NG | NG | NG | NG | NG | 6.10 | 7.92 | 2.17 | 2.96 | 2.10 |
| 01/27/97 | 1.91 | NG | 1.89 | NG | 4.26 | 3.29 | NG | 2.53 | 2.13 | NG | NG | NG | NG | NG | 5.73 | 6.24 | 7.94 | 3.08 | 3.26 | 1.53 |
| 02/18/97 | 1.93 | NG | 1.90 | 2.04 | NG | 4.04 | NG | 2.98 | 2.56 | 2.28 | NG | NG | NG | NG | 5.84 | 6.32 | 7.95 | 3.49 | 3.21 | 2.55 |
| 03/27/97 | 1.89 | 2.27 | 1.86 | 2.41 | 4.60 | 4.04 | 3.21 | 2.91 | 1.86 | 1.27 | NG | NG | 5.03 | DRY | 5.45 | 6.21 | 8.08 | 1.66 | 3.51 | 1.15 |
| 04/17/97 | NG | NG | NG | NG | NG | 5.25 | NG | 3.48 | 1.94 | 1.39 | NG | NG | NG | NG | NG | NG | NG | 3.00 | 3.18 | 1.30 |
| 05/21/97 | 2.04 | 2.39 | 2.08 | 3.08 | 5.19 | 4.11 | 3.43 | 3.14 | 2.93 | 2.44 | NG | NG | DRY | DRY | 6.11 | NG | 8.20 | 3.73 | 4.07 | 2.84 |
| 08/27/97 | NG | NG | NG | NG | NG | 5.01 | 4.10 | 3.60 | 4.28 | DRY | NG | 2.46 | NG | NG | 7.03 | NG | 9.54 | 4.69 | 5.77 | 4.07 |
| 11/21/97 | 2.26 | 3.20 | 2.56 | 3.33 | 6.83 | 4.43 | 3.77 | 5.33 | 3.84 | 3.06 | 2.26 | 0.95 | DRY | DRY | 6.66 | 6.97 | 8.86 | 7.53 | 5.29 | 3.56 |
| 02/11/98 | 1.79 | 2.63 | 1.61 | 1.84 | 3.87 | 3.64 | 3.08 | 3.23 | 1.34 | 1.88 | 1.47 | 1.31 | NG | NG | 5.49 | 6.29 | 8.33 | 2.14 | 2.87 | 1.35 |

Notes: WE-2D, WE-2S, and WE-3 are covered by stand pipes.
NG = Not Gauged

grsubbas\123\190.wk4

**Wel[illegible]g Data**
**[illegible]ite**
**New London Naval Submarine Base**
**Groton, Connecticut**

| Date | Depth to Water/Depth to Product (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 | NEX-1 | OBG-1 | OBG-2 | OBG-4 | OBG-6 | OBG-7 | OBG-8 | OBG-9 | MW-4 | MW-6 |
| 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 | NG | NG | NG | NG | NG | NG | NG | NG | NG | NG |
| 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 | NG | NG | NG | NG | NG | NG | NG | NG | NG | NG |
| 11/18/96 | 3.72 | 4.64 | 4.93 | NG | NG | NG | 6.36 | 8.09 | 7.13 | 7.10/6.91 | 4.03 | 8.43 | 5.53 | NG | 5.19 | NG | NG | NG | NG | NG | NG | NG | NG | NG | NG |
| 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 | NG | NG | NG | NG | NG | NG | NG | NG | NG | NG |
| 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 | NG | NG | NG | NG | NG | NG | NG | NG | NG | NG |
| 03/27/97 | 2.89 | 4.28 | 4.19 | NG | NG | NG | 5.19 | 7.63 | 5.98 | 5.82 | NG | 7.79 | 4.87 | NG | 4.06 | 5.81 | 8.12 | 7.95 | 7.75 | 7.95 | 5.61 | NG | 5.54 | 4.91 | 4.49 |
| 04/15/97 | NG | NG | NG | NG | NG | NG | NG | NG | 5.86 | 5.7 | 3.39 | 7.84 | 4.84 | NG | NG | 5.74 | NG | 7.92 | 7.75 | NG | NG | NG | 5.54 | NG | NG |
| 04/17/97 | 2.73 | NG | NG | NG | NG | NG | NG | NG | NG | 5.66 | 3.31 | NG | 4.67 | NG | 3.91 | NG | NG | 7.91 | 7.78 | NG | NG | NG | 5.58 | NG | NG |
| 04/24/97 | NG | NG | NG | NG | NG | NG | NG | NG | NG | NG | NG | NG | NG | NG | NG | NG | NG | NG | 7.74 | NG | NG | NG | NG | NG | NG |
| 05/21/97 | NG | 4.72 | 4.61 | NG | NG | NG | 6.27 | 7.81/7.80 | 6.15 | 6.04/5.99 | NG | 8.16 | 5.26 | NG | 4.46 | 5.80 | 7.98 | 7.81 | 7.64 | NG | 5.79 | 5.60 | 5.84/5.31 | NG | 4.85 |
| 08/28/97 | NG | 5.29 | 6.49 | NG | NG | NG | 7.65 | NG | 7.24 | 7.24/7.01 | NG | sheen/8.63 | 5.77 | NG | 5.41 | 6.15 | 8.22 | 8.03 | 7.9 | NG | 6.49 | NG | 6.56/6.45 | NG | 5.34 |
| 11/20/97 | 4.35 | 5.24 | 5.35 | NG | NG | NG | 6.89 | 8.23 | 7.84 | 7.63 | 4.46 | 8.77 | 5.77 | NG | 5.79 | 6.45 | 8.43 | 8.23 | 8.07 | NG | 7.09 | NG | 7.06 | NG | 5.33 |
| 02/12/98 | 3.59 | 4.68 | 4.71 | NG | NG | NG | 5.04 | 7.99 | 6.71 | 6.59 | 3.54 | 8.18 | 5.14 | NG | 4.44 | 5.28 | 8.19 | 8.01 | 7.84 | NG | 5.84 | NG | NG | NG | 4.92 |

Notes: NG = Not Gauged

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**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 |
| 03/27/97 | 3.30 | 3.99 | 0.69 | UNK* | 4.00 |
| 04/17/97 | 3.12 | 3.34 | 0.22 | 0.00 | 4.00 |
| 05/21/97 | 4.09 | 5.07 | 0.98 | 0.25 | 4.25 |
| 06/10/97 | sheen | 4.64 | sheen | 0.00 | 4.25 |
| 07/21/97 | 5.43 | 5.55 | 0.12 | 0.00 | 4.25 |
| 08/04/97 | 5.62 | 5.73 | 0.11 | 0.00 | 4.25 |
| 08/26/97 | 5.28 | 5.31 | 0.03 | 0.00 | 4.25 |
| 10/09/97 | 6.14 | 6.75 | 0.61 | 0.00 | 4.25 |
| 10/23/97 | 6.38 | 6.75 | 0.37 | 0.00 | 4.25 |
| 11/20/97 | 4.73 | 4.74 | 0.01 | 0.00 | 4.25 |
| 01/20/98 | NA | 3.29 | 0.00 | 0.00 | 4.25 |
| 02/11/98 | NA | 3.68 | 0.00 | 0.00 | 4.25 |

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
* Product was recovered, but the volume was insufficient to fill the product piping and discharge into the recovery drum.

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# ATTACHMENT 5

# HISTORICAL GROUNDWATER SAMPLING RESULTS

# Table 1
## Historical Groundwater Sampling Results
## Dolphin Mart - March 1995 - February 1998
## Naval Submarine Base, Groton, CT

(analytical results in µg/l)


| Compound | | 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 | | | | | |
| Remediation Standard | | 1.0 | 1,000 | 700 | 630 | 100 | 500 | NA | NA | NA |
| Well | Date | | | | | | | | | |
| 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 |
| | 5/97 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | <500 | <500 |
| | 8/97 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 11/97 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | NS | NS |
| | 2/98 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | NS | NS |

Notes: NS = Not sampled (NS results have been shaded)
Bold numbers indicate an exceedance of State of CT Clean-up Standards
B = Analyte detected in method blank, D = Analyte concentration was obtained from a diluted analysis, E = Analyte concentration exceeded the calibration range
DRO=Diesel Range Organics, GRO=Gasoline Range Organics

# Table 1
## Historical Groundwater Sampling Results
## Dolphin Mart - March 1995 - February 1998
## Naval Submarine Base, Groton, CT

(analytical results in µg/l)


| Compound | | 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 | | | | | |
| Remedialton Standard | | 1.0 | 1,000 | 700 | 630 | 100 | 500 | NA | NA | NA |
| Well | Date | | | | | | | | | |
| 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 |
| | 5/97 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | <500 | <500 |
| | 8/97 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 11/97 | <1.0 | <1.0 | <1.0 | <1.0 | 8 | <500 | 8 | NS | NS |
| | 2/98 | <1.0 | <1.0 | <1.0 | <1.0 | 5 | <500 | 5 | NS | NS |

Notes: NS = Not sampled (NS results have been shaded)
Bold numbers indicate an exceedance of State of CT Clean-up Standards
B = Analyte detected in method blank, D = Analyte concentration was obtained from a diluted analysis, E = Analyte concentration exceeded the calibration range
DRO=Diesel Range Organics, GRO=Gasoline Range Organics

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# Table 1
## Historical Groundwater Sampling Results
## Dolphin Mart - March 1995 - February 1998
## Naval Submarine Base, Groton, CT

(analytical results in µg/l)


| Compound | | 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 | | | | | |
| Remediation Standard | | 1.0 | 1,000 | 700 | 530 | 100 | 500 | NA | NA | NA |
| Well | Date | | | | | | | | | |
| 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 |
| | 5/97 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | <500 | <500 |
| | 8/97 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 11/97 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | NS | NS |
| | 2/98 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | NS | NS |

Notes: NS = Not sampled (NS results have been shaded)
Bold numbers indicate an exceedance of State of CT Clean-up Standards
**B** = Analyte detected in method blank, **D** = Analyte concentration was obtained from a diluted analysis, **E** = Analyte concentration exceeded the calibration range
**DRO**=Diesel Range Organics, **GRO**=Gasoline Range Organics

# Table 1
## Historical Groundwater Sampling Results
## Dolphin Mart - March 1995 - February 1998
## Naval Submarine Base, Groton, CT

(analytical results in µg/l)


| Compound | | 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 | | | | | |
| Remediation Standard | | 1.0 | 1,000 | 700 | 630 | 100 | 500 | NA | NA | NA |
| Well | Date | | | | | | | | | |
| 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 |
| | 5/97 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | <500 | <500 |
| | 8/97 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 11/97 | **2** | <1.0 | <1.0 | <1.0 | 3 | <500 | 5 | NS | NS |
| | 2/98 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | **800** | <1.0 | NS | NS |

Notes: NS = Not sampled (NS results have been shaded)
Bold numbers indicate an exceedance of State of CT Clean-up Standards
B = Analyte detected in method blank, D = Analyte concentration was obtained from a diluted analysis, E = Analyte concentration exceeded the calibration range
DRO=Diesel Range Organics, GRO=Gasoline Range Organics

# Table 1
## Historical Groundwater Sampling Results
## Dolphin Mart - March 1995 - February 1998
## Naval Submarine Base, Groton, CT

(analytical results in µg/l)


| Compound | | 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 | | | | | |
| Remediation Standard | | 1.0 | 1,000 | 700 | 630 | 100 | 500 | NA | NA | NA |
| Well | Date | | | | | | | | | |
| 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 |
| | 5/97 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | <500 | <500 |
| | 8/97 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 11/97 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | NS | NS |
| | 2/98 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | **700** | <1.0 | NS | NS |

Notes: NS = Not sampled (NS results have been shaded)
Bold numbers indicate an exceedance of State of CT Clean-up Standards
B = Analyte detected in method blank, D = Analyte concentration was obtained from a diluted analysis, E = Analyte concentration exceeded the calibration range
DRO=Diesel Range Organics, GRO=Gasoline Range Organics

# Table 1
## Historical Groundwater Sampling Results
## Dolphin Mart - March 1995 - February 1998
## Naval Submarine Base, Groton, CT

(analytical results in µg/l)


| Compound | | 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 | | | | | |
| Remediation Standard | | 1.0 | 1,000 | 700 | 630 | 100 | 500 | NA | NA | NA |
| Well | Date | | | | | | | | | |
| 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 |
| | 5/97 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | <500 | <500 |
| | 8/97 | <1.0 | <1.0 | <1.0 | <1.0 | 3.0 | **800** | 3.0 | <500 | <500 |
| | 11/97 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | NS | NS |
| | 2/98 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | **700** | <1.0 | NS | NS |

Notes: NS = Not sampled (NS results have been shaded)
Bold numbers indicate an exceedance of State of CT Clean-up Standards
B = Analyte detected in method blank, D = Analyte concentration was obtained from a diluted analysis, E = Analyte concentration exceeded the calibration range
DRO=Diesel Range Organics, GRO=Gasoline Range Organics

# Table 1
## Historical Groundwater Sampling Results
## Dolphin Mart - March 1995 - February 1998
## Naval Submarine Base, Groton, CT

(analytical results in µg/l)


| Compound | | 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 | | | | | |
| Remediation Standard | | 1.0 | 1,000 | 700 | 530 | 100 | 500 | NA | NA | NA |
| Well | Date | | | | | | | | | |
| 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 |
| | 5/97 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | <500 | <500 |
| | 8/97 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | <500 | <500 |
| | 11/97 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | NS | NS |
| | 2/98 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | 500 | <1.0 | NS | NS |
| MW-1 | 11/96 | **3** | <1.0 | 5 | <1.0 | <1.0 | <1,000 | 11 | 1,000 | <500 |
| | 2/97 | <1.0 | <1.0 | 4 | <1.0 | <1.0 | <500 | 4 | <500 | 600 |
| | 5/97 | <1.0 | <1.0 | 4 | <1.0 | <1.0 | <500 | 6 | 700 | 760 |
| | 8/97 | <1.0 | <1.0 | 16 | 2B | <1.0 | **1,000** | 18 | 800 | 600 |
| | 11/97 | **2** | <1.0 | 9 | <1.0 | <1.0 | <500 | 11 | NS | NS |
| | 2/98 | <1.0 | 1 | 4 | <1.0 | <1.0 | **800** | 5 | NS | NS |

Notes: NS = Not sampled (NS results have been shaded)
Bold numbers indicate an exceedance of State of CT Clean-up Standards
**B** = Analyte detected in method blank, **D** = Analyte concentration was obtained from a diluted analysis, **E** = Analyte concentration exceeded the calibration range
**DRO**=Diesel Range Organics, **GRO**=Gasoline Range Organics

# Table 1
## Historical Groundwater Sampling Results
## Dolphin Mart - March 1995 - February 1998
## Naval Submarine Base, Groton, CT

(analytical results in µg/l)


| Compound | | 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 | | | | | |
| Remediation Standard | | 1.0 | 1,000 | 700 | 630 | 100 | 500 | NA | NA | NA |
| Well | Date | | | | | | | | | |
| 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 |
| | 5/97 | <1.0 | <1.0 | 3 | <1.0 | <1.0 | <500 | 3 | 500 | 580 |
| | 8/97 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | <500 | <500 |
| | 11/97 | **2** | <1.0 | 3 | 1 | 3 | <500 | 9 | NS | NS |
| | 2/98 | **2** | 1 | 6 | <1.0 | <1.0 | **700** | 9 | NS | NS |
| MW-3 | 2/97 | **36** | 23 | 72 | 500 | 5 | **2,000** | 645 B | 3,300 | 1,600 |
| | 5/97 | **60** | 38 | 69 | **730D** | <1.0 | **5,000** | 897D | 7,900 | <500 |
| | 8/97 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 11/97 | <1.0 | 2 | 3 | 56 | <1.0 | <500 | 61 | NS | NS |
| | 2/98 | <1.0 | <1.0 | <1.0 | 1.0 | <1.0 | **21,000** | 1.0 | NS | NS |

Notes: NS = Not sampled (NS results have been shaded)
Bold numbers indicate an exceedance of State of CT Clean-up Standards
**B** = Analyte detected in method blank, **D** = Analyte concentration was obtained from a diluted analysis, **E** = Analyte concentration exceeded the calibration range
**DRO**=Diesel Range Organics, **GRO**=Gasoline Range Organics

# Table 1
## Historical Groundwater Sampling Results
## Dolphin Mart - March 1995 - February 1998
## Naval Submarine Base, Groton, CT

(analytical results in µg/l)


| Compound | | 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 | | | | | |
| Remediation Standard | | 1.0 | 1,000 | 700 | 530 | 100 | 500 | NA | NA | NA |
| Well | Date | | | | | | | | | |
| 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 |
| | 5/97 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 8/97 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 11/97 | **3** | 25 | 5 | 5 | <1.0 | <500 | 38 | NS | NS |
| | 2/98 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | **9,300** | <1.0 | NS | NS |

Notes: NS = Not sampled (NS results have been shaded)
Bold numbers indicate an exceedance of State of CT Clean-up Standards
**B** = Analyte detected in method blank, **D** = Analyte concentration was obtained from a diluted analysis, **E** = Analyte concentration exceeded the calibration range
**DRO**=Diesel Range Organics, **GRO**=Gasoline Range Organics

# Table 1
## Historical Groundwater Sampling Results
## Dolphin Mart - March 1995 - February 1998
## Naval Submarine Base, Groton, CT

(analytical results in µg/l)


| Compound | | 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 | | | | | |
| Remediation Standard | | 1.0 | 1,000 | 700 | 630 | 100 | 500 | NA | NA | NA |
| Well | Date | | | | | | | | | |
| OBG-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 |
| | 5/97 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | **3,000** | <1.0 | <500 | <500 |
| | 8/97 | <1.0 | <1.0 | <1.0 | <1.0 | 3.0 | **11,000** | 3.0 | 2,200 | <500 |
| | 11/97 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | NS | NS |
| | 2/98 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | **3,100** | <1.0 | NS | NS |
| WE-2D(B) | 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 |
| | 5/97 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | <500 | <500 |
| | 8/97 | <1.0 | <1.0 | <1.0 | <1.0 | 4.0 | **11,000** | 4.0 | <500 | <500 |
| | 11/97 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | NS | NS |
| | 2/98 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | **1,000** | <1.0 | NS | NS |

Notes: NS = Not sampled (NS results have been shaded)
Bold numbers indicate an exceedance of State of CT Clean-up Standards
**B** = Analyte detected in method blank, **D** = Analyte concentration was obtained from a diluted analysis, **E** = Analyte concentration exceeded the calibration range
**DRO**=Diesel Range Organics, **GRO**=Gasoline Range Organics

# Table 1
## Historical Groundwater Sampling Results
## Dolphin Mart - March 1995 - February 1998
## Naval Submarine Base, Groton, CT

(analytical results in µg/l)


| Compound | | 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 | | | | | |
| Remediation Standard | | 1.0 | 1,000 | 700 | 530 | 100 | 500 | NA | NA | NA |
| Well | Date | | | | | | | | | |
| 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 |
| | 5/97 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 8/97 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 11/97 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | NS | NS |
| | 2/98 | **4** | <1.0 | <1.0 | 15 | 7 | <500 | 26 | NS | NS |

Notes: NS = Not sampled (NS results have been shaded)
Bold numbers indicate an exceedance of State of CT Clean-up Standards
B = Analyte detected in method blank, D = Analyte concentration was obtained from a diluted analysis, E = Analyte concentration exceeded the calibration range
DRO=Diesel Range Organics, GRO=Gasoline Range Organics

# Table 1
## Historical Groundwater Sampling Results
## Dolphin Mart - March 1995 - February 1998
## Naval Submarine Base, Groton, CT

(analytical results in µg/l)


| Compound | | 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 | | | | | |
| Remediation Standard | | 1.0 | 1,000 | 700 | 630 | 100 | 500 | NA | NA | NA |
| Well | Date | | | | | | | | | |
| 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 |
| | 5/97 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | <500 | <500 |
| | 8/97 | <1.0 | <1.0 | <1.0 | <1.0 | **220** | **3,000** | 220 | <500 | <500 |
| | 11/97 | <1.0 | <1.0 | <1.0 | <1.0 | 38 | <500 | 38 | NS | NS |
| | 2/98 | **2** | <1.0 | <1.0 | <1.0 | **160D** | <500 | 162 | NS | NS |

Notes: NS = Not sampled (NS results have been shaded)
Bold numbers indicate an exceedance of State of CT Clean-up Standards
**B** = Analyte detected in method blank, **D** = Analyte concentration was obtained from a diluted analysis, **E** = Analyte concentration exceeded the calibration range
**DRO**=Diesel Range Organics, **GRO**=Gasoline Range Organics

# Table 1
## Historical Groundwater Sampling Results
## Dolphin Mart - March 1995 - February 1998
## Naval Submarine Base, Groton, CT

(analytical results in µg/l)


| Compound | | 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 | | | | | |
| Remediation Standard | | 1.0 | 1,000 | 700 | 630 | 100 | 500 | NA | NA | NA |
| Well | Date | | | | | | | | | |
| 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 |
| | 5/97 | **13** | <1.0 | 13 | <1.0 | 19 | <500 | 45 | 700 | 540 |
| | 8/97 | **7.0** | <1.0 | 19 | 3B | 3B | **700** | 44 | <500 | <500 |
| | 11/97 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | NS | NS |
| | 2/98 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | **1,300** | <1.0 | NS | NS |
| 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 |
| | 5/97 | **370** | 190 | **840** | **3,900D** | <1.0 | **4,000** | 5,300 | 11,000 | 16,000 |
| | 8/97 | **210D** | <1.0 | 210D | 470DB | 63D | **5,000** | 953 | 3,900 | 2,500 |
| | 11/97 | **11** | <1.0 | 2 | 6 | 27 | **1,100** | 46 | NS | NS |
| | 2/98 | **11** | <1.0 | 10 | 14 | 3 | **1,800** | 38 | NS | NS |

Notes: NS = Not sampled (NS results have been shaded)
Bold numbers indicate an exceedance of State of CT Clean-up Standards
B = Analyte detected in method blank, D = Analyte concentration was obtained from a diluted analysis, E = Analyte concentration exceeded the calibration range
DRO=Diesel Range Organics, GRO=Gasoline Range Organics

# Table 1
## Historical Groundwater Sampling Results
## Dolphin Mart - March 1995 - February 1998
## Naval Submarine Base, Groton, CT

(analytical results in µg/l)


| Compound | | 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 | | | | | |
| Remediation Standard | | 1.0 | 1,000 | 700 | 630 | 100 | 500 | NA | NA | NA |
| Well | Date | | | | | | | | | |
| 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 |
| | 5/97 | **3** | 1.0 | 12 | <1.0 | <1.0 | <500 | 15 | 1,200 | 1,200 |
| | 8/97 | <1.0 | 1.0 | <1.0 | 28 | <1.0 | **1,000** | 29 | <500 | <500 |
| | 11/97 | **2** | <1.0 | 3 | 2 | 4 | <500 | 11 | NS | NS |
| | 2/98 | **2** | <1.0 | 5 | 3 | 4 | 500 | 14 | NS | NS |

Notes: NS = Not sampled (NS results have been shaded)
Bold numbers indicate an exceedance of State of CT Clean-up Standards
**B** = Analyte detected in method blank, **D** = Analyte concentration was obtained from a diluted analysis, **E** = Analyte concentration exceeded the calibration range
**DRO**=Diesel Range Organics, **GRO**=Gasoline Range Organics

# Table 2
## Historical Groundwater Sampling Results
## NEX - March 1995 - February 1998
## Naval Submarine Base, Groton, CT

(analytical results in µg/l)


| Compound | | BTEX | | | | MTBE | TPH (By EPA Method 418.1) | Total Volatiles (by EPA Method 8010/8020) | DRO | GRO |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Benzene | Toluene | Ethylbenzene | Xylenes | | | | | |
| Remediation Standard | | 215 | 23,500 | 21,300 | 50,000 | 50,000 | NA | NA | NA | NA |
| Well | Date | | | | | | | | | |
| 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 |
| | 5/97 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 8/97 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 11/97 | **730** | 250 | 870 | 620 | <10 | 2,300 | 2,470 | NS | NS |
| | 2/98 | **310** | 460 | 300 | 710 | <10 | 5,400 | 1,780 | NS | NS |

Notes: NS = Not sampled (NS results have been shaded)
Bold numbers indicate an exceedance of State of CT Clean-up Standards
D = Analyte concentration was obtained from a diluted analysis, B = Analyte detected in method blank, E = Analyte concentration exceeded the calibration range
DRO=Diesel Range Organics, GRO=Gasoline Range Organics
L P = Liquid-phase petroleum present; well could not be sampled

# Table 2
## Historical Groundwater Sampling Results
## NEX - March 1995 - February 1998
## Naval Submarine Base, Groton, CT

(analytical results in µg/l)


| Compound | | BTEX | | | | MTBE | TPH (By EPA Method 418.1) | Total Volatiles (by EPA Method 8010/8020) | DRO | GRO |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Benzene | Toluene | Ethylbenzene | Xylenes | | | | | |
| Remediation Standard | | 215 | 23,500 | 21,300 | 60,000 | 50,000 | NA | NA | NA | NA |
| Well | Date | | | | | | | | | |
| 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 |
| | 5/97 | **430D** | 21 | 640D | 2,300D | <1.0 | 1,000 | 3,391D | 1,500 | 6,700 |
| | 8/97 | **470** | 90 | 650 | 2,000 | <1.0 | 2,000 | 3,210 | 3,500 | 6,200 |
| | 11/97 | **250D** | 23 | 260D | 530D | <1.0 | <500 | 1,063 | NS | NS |
| | 2/98 | 97D | 13 | 110D | 240D | <1.0 | <500 | 460 | NS | NS |

Notes: NS = Not sampled (NS results have been shaded)
Bold numbers indicate an exceedance of State of CT Clean-up Standards
D = Analyte concentration was obtained from a diluted analysis, B = Analyte detected in method blank, E = Analyte concentration exceeded the calibration range
DRO=Diesel Range Organics, GRO=Gasoline Range Organics
L P = Liquid-phase petroleum present; well could not be sampled

# Table 2
## Historical Groundwater Sampling Results
## NEX - March 1995 - February 1998
## Naval Submarine Base, Groton, CT

(analytical results in µg/l)


| Compound | | BTEX | | | | MTBE | TPH (By EPA Method 418.1) | Total Volatiles (by EPA Method 8010/8020) | DRO | GRO |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Benzene | Toluene | Ethylbenzene | Xylenes | | | | | |
| Remediation Standard | | 215 | 23,500 | 21,300 | 50,000 | 50,000 | NA | NA | NA | NA |
| Well | Date | | | | | | | | | |
| 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 |
| | 5/97 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | <500 | <500 |
| | 8/97 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | <500 | <500 |
| | 11/97 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | NS | NS |
| | 2/98 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | NS | NS |

Notes: NS = Not sampled (NS results have been shaded)
Bold numbers indicate an exceedance of State of CT Clean-up Standards
**D** = Analyte concentration was obtained from a diluted analysis, **B** = Analyte detected in method blank, **E** = Analyte concentration exceeded the calibration range
DRO=Diesel Range Organics, GRO=Gasoline Range Organics
L P = Liquid-phase petroleum present; well could not be sampled

# Table 2
## Historical Groundwater Sampling Results
## NEX - March 1995 - February 1998
## Naval Submarine Base, Groton, CT

(analytical results in µg/l)


| Compound | | BTEX | | | | MTBE | TPH (By EPA Method 418.1) | Total Volatiles (by EPA Method 8010/8020) | DRO | GRO |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Benzene | Toluene | Ethylbenzene | Xylenes | | | | | |
| Remediation Standard | | 215 | 23,500 | 21,300 | 50,000 | 50,000 | NA | NA | NA | NA |
| Well | Date | | | | | | | | | |
| ERM-8 (destroyed) | 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 |
| | 5/97 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 8/97 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 11/97 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 2/98 | NS | NS | NS | NS | NS | NS | NS | NS | NS |

Notes: NS = Not sampled (NS results have been shaded)
Bold numbers indicate an exceedance of State of CT Clean-up Standards
D = Analyte concentration was obtained from a diluted analysis, B = Analyte detected in method blank, E = Analyte concentration exceeded the calibration range
DRO=Diesel Range Organics, GRO=Gasoline Range Organics
L P = Liquid-phase petroleum present; well could not be sampled

# Table 2
## Historical Groundwater Sampling Results
## NEX - March 1995 - February 1998
## Naval Submarine Base, Groton, CT

(analytical results in µg/l)


| Compound | | BTEX | | | | MTBE | TPH (By EPA Method 418.1) | Total Volatiles (by EPA Method 8010/8020) | DRO | GRO |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Benzene | Toluene | Ethylbenzene | Xylenes | | | | | |
| Remediation Standard | | 215 | 23,500 | 21,300 | 50,000 | 50,000 | NA | NA | NA | NA |
| Well | Date | | | | | | | | | |
| 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 |
| | 5/97 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 8/97 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 11/97 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 2/98 | 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 |
| | 5/97 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | <500 | <500 |
| | 8/97 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | <500 | <500 |
| | 11/97 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | NS | NS |
| | 2/98 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | NS | NS |

Notes: NS = Not sampled (NS results have been shaded)
Bold numbers indicate an exceedance of State of CT Clean-up Standards
D = Analyte concentration was obtained from a diluted analysis, B = Analyte detected in method blank, E = Analyte concentration exceeded the calibration range
DRO=Diesel Range Organics, GRO=Gasoline Range Organics
L P = Liquid-phase petroleum present; well could not be sampled

# Table 2
## Historical Groundwater Sampling Results
## NEX - March 1995 - February 1998
## Naval Submarine Base, Groton, CT

(analytical results in µg/l)


| Compound | | BTEX | | | | MTBE | TPH (By EPA Method 418.1) | Total Volatiles (by EPA Method 8010/8020) | DRO | GRO |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Benzene | Toluene | Ethylbenzene | Xylenes | | | | | |
| Remediation Standard | | 215 | 23,500 | 21,300 | 50,000 | 50,000 | NA | NA | NA | NA |
| Well | Date | | | | | | | | | |
| 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 |
| | 5/97 | LP | LP | LP | LP | LP | LP | LP | LP | LP |
| | 8/97 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 11/97 | <1.0 | <1.0 | <1.0 | 4 | <1.0 | 7,100 | 4 | NS | NS |
| | 2/98 | <1.0 | <1.0 | <1.0 | 1 | <1.0 | 23,000 | 1 | NS | NS |

Notes: NS = Not sampled (NS results have been shaded)
Bold numbers indicate an exceedance of State of CT Clean-up Standards
D = Analyte concentration was obtained from a diluted analysis, B = Analyte detected in method blank, E = Analyte concentration exceeded the calibration range
DRO=Diesel Range Organics, GRO=Gasoline Range Organics
L P = Liquid-phase petroleum present; well could not be sampled

# Table 2
## Historical Groundwater Sampling Results
## NEX - March 1995 - February 1998
## Naval Submarine Base, Groton, CT

(analytical results in µg/l)


| Compound | | BTEX | | | | MTBE | TPH (By EPA Method 418.1) | Total Volatiles (by EPA Method 8010/8020) | DRO | GRO |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Benzene | Toluene | Ethylbenzene | Xylenes | | | | | |
| Remediation Standard | | 215 | 23,500 | 21,300 | 60,000 | 50,000 | NA | NA | NA | NA |
| Well | Date | | | | | | | | | |
| 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 |
| | 5/97 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | <500 | <500 |
| | 8/97 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | <500 | <500 |
| | 11/97 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | NS | NS |
| | 2/98 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | NS | NS |

Notes: NS = Not sampled (NS results have been shaded)
Bold numbers indicate an exceedance of State of CT Clean-up Standards
**D** = Analyte concentration was obtained from a diluted analysis, **B** = Analyte detected in method blank, **E** = Analyte concentration exceeded the calibration range
**DRO**=Diesel Range Organics, **GRO**=Gasoline Range Organics
L P = Liquid-phase petroleum present; well could not be sampled

# Table 2
## Historical Groundwater Sampling Results
## NEX - March 1995 - February 1998
## Naval Submarine Base, Groton, CT

(analytical results in µg/l)


| Compound | | BTEX | | | | MTBE | TPH (By EPA Method 418.1) | Total Volatiles (by EPA Method 8010/8020) | DRO | GRO |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Benzene | Toluene | Ethylbenzene | Xylenes | | | | | |
| Remediation Standard | | 215 | 23,500 | 21,300 | 50,000 | 50,000 | NA | NA | NA | NA |
| Well | Date | | | | | | | | | |
| 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 |
| | 5/97 | LP | LP | LP | LP | LP | LP | LP | LP | LP |
| | 8/97 | LP | LP | LP | LP | LP | LP | LP | LP | LP |
| | 11/97 | 40 | 2,300D | 700D | 2,500D | <1.0 | 4,600 | 5,540 | NS | NS |
| | 2/98 | <1.0 | 930 | 210 | 2,800 | <1.0 | 28,000 | 3,940 | NS | NS |

Notes: NS = Not sampled (NS results have been shaded)
Bold numbers indicate an exceedance of State of CT Clean-up Standards
D = Analyte concentration was obtained from a diluted analysis, B = Analyte detected in method blank, E = Analyte concentration exceeded the calibration range
DRO=Diesel Range Organics, GRO=Gasoline Range Organics
L P = Liquid-phase petroleum present; well could not be sampled

# Table 2
## Historical Groundwater Sampling Results
## NEX - March 1995 - February 1998
## Naval Submarine Base, Groton, CT

(analytical results in µg/l)


| Compound | | BTEX | | | | MTBE | TPH (By EPA Method 418.1) | Total Volatiles (by EPA Method 8010/8020) | DRO | GRO |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Benzene | Toluene | Ethylbenzene | Xylenes | | | | | |
| Remediation Standard | | 215 | 23,500 | 21,300 | 60,000 | 50,000 | NA | NA | NA | NA |
| Well | Date | | | | | | | | | |
| 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 |
| | 5/97 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 8/97 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 11/97 | 210 | 630 | 240 | 120 | <10 | <500 | 1,200 | NS | NS |
| | 2/98 | 8 | 9 | 4 | 25 | <1.0 | 600 | 46 | NS | NS |

Notes: NS = Not sampled (NS results have been shaded)
Bold numbers indicate an exceedance of State of CT Clean-up Standards
D = Analyte concentration was obtained from a diluted analysis, B = Analyte detected in method blank, E = Analyte concentration exceeded the calibration range
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# Table 2
## Historical Groundwater Sampling Results
## NEX - March 1995 - February 1998
## Naval Submarine Base, Groton, CT

(analytical results in µg/l)


| Compound | | BTEX | | | | MTBE | TPH (By EPA Method 418.1) | Total Volatiles (by EPA Method 8010/8020) | DRO | GRO |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Benzene | Toluene | Ethylbenzene | Xylenes | | | | | |
| Remediation Standard | | 215 | 23,500 | 21,300 | 50,000 | 50,000 | NA | NA | NA | NA |
| Well | Date | | | | | | | | | |
| 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 |
| | 5/97 | 34 | <1.0 | 20 | 42 | 11 | 26,000 | 107 | 60,000 | 2,000 |
| | 8/97 | LP | LP | LP | LP | LP | LP | LP | LP | LP |
| | 11/97 | 5 | <1.0 | 7 | 30 | <1.0 | 15,000 | 42 | NS | NS |
| | 2/98 | 8 | <1.0 | 3 | 15 | 6 | 25,000 | 32 | NS | NS |
| 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 |
| | 5/97 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | 1,500 | <500 |
| | 8/97 | 12 | <1.0 | <1.0 | <1.0 | <1.0 | 1,000 | 12 | 1,000 | 500 |
| | 11/97 | 2 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | 2 | NS | NS |
| | 2/98 | 3 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | 3 | NS | NS |

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|---|---|---|---|---|---|---|---|---|---|---|
| | | Benzene | Toluene | Ethylbenzene | Xylenes | | | | | |
| Remediation Standard | | 215 | 23,500 | 21,300 | 60,000 | 50,000 | NA | NA | NA | NA |
| Well | Date | | | | | | | | | |
| 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 |
| | 5/97 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | <500 | <500 |
| | 8/97 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | <500 | <500 |
| | 11/97 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | NS | NS |
| | 2/98 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | NS | NS |
| MW-4 | 2/97 | 29 | 1 | <1.0 | 3 | <1.0 | NS | 33 | NS | NS |
| | 5/97 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 8/97 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 11/97 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 2/98 | NS | NS | NS | NS | NS | NS | NS | NS | NS |

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(analytical results in µg/l)


| Compound | | BTEX | | | | MTBE | TPH (By EPA Method 418.1) | Total Volatiles (by EPA Method 8010/8020) | DRO | GRO |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Benzene | Toluene | Ethylbenzene | Xylenes | | | | | |
| Remediation Standard | | 215 | 23,500 | 21,300 | 50,000 | 50,000 | NA | NA | NA | NA |
| Well | Date | | | | | | | | | |
| MW-6 | 2/97 | <1.0 | 9 | <1.0 | <1.0 | <1.0 | NS | 9 | NS | NS |
| | 5/97 | 18 | <1.0 | 2 | 8.0 | <1.0 | <500 | 28 | <500 | <500 |
| | 8/97 | 35D | 1.0 | <1.0 | 8.0 | <1.0 | <500 | 46 | <500 | <500 |
| | 11/97 | 6 | <1.0 | <1.0 | 3 | <1.0 | <500 | 9 | NS | NS |
| | 2/98 | 8 | <1.0 | <1.0 | 3 | <1.0 | <500 | 11 | NS | NS |
| 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 |
| | 5/97 | 2 | 11 | 4 | 34 | <1.0 | <500 | 57 | <500 | <500 |
| | 8/97 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | 3.0 | <500 | <500 |
| | 11/97 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | NS | NS |
| | 2/98 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | NS | NS |

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|---|---|---|---|---|---|---|---|---|---|---|
| | | Benzene | Toluene | Ethylbenzene | Xylenes | | | | | |
| Remediation Standard | | 215 | 23,500 | 21,300 | 50,000 | 50,000 | NA | NA | NA | NA |
| Well | Date | | | | | | | | | |
| OBG-1 | 5/97 | **480** | 3,300D | 1,100D | 10,000D | 540 | 110,000 | 15,420 | 260,000 | 49,000 |
| | 8/97 | **1,600** | 6,200 | 1,700 | 12,000 | 810 | 220,000 | **22,310** | 580,000 | 56,000 |
| | 11/97 | **1,600** | 8,800 | 2,300 | 16,000 | 38,000 | 21,000 | 66,700 | NS | NS |
| | 2/98 | **1,400** | 7,100D | 2,200 | 15,000D | 24,000D | 160,000 | 49,700 | NS | NS |
| OBG-2 | 5/97 | 77 | 280 | 530 | 9,800D | 290 | 87,000 | 10,977 | 120,000 | 44,000 |
| | 8/97 | **470** | 410 | 1,100 | 11,000 | 830 | 180,000 | 13,990 | 99,000 | 75,000 |
| | 11/97 | **370** | 380 | 960 | 9,200 | 40,000 | 23,000 | 50,910 | NS | NS |
| | 2/98 | **410** | 340 | 680 | 7,900 | 26,000D | 120,000 | 35,330 | NS | NS |
| OBG-4 | 2/97 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | NS | <1.0 | NS | NS |
| | 5/97 | <1.0 | <1.0 | <1.0 | 2 | <1.0 | 6,000 | 2 | 3,100 | <500 |
| | 8/97 | <1.0 | <1.0 | <1.0 | <1.0 | 4.0 | 1,000 | 4.0 | 3,500 | <500 |
| | 11/97 | <1.0 | 3 | <1.0 | 7 | 8 | NS | 18 | NS | NS |
| | 2/98 | NS | NS | NS | NS | NS | NS | NS | NS | NS |

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|---|---|---|---|---|---|---|---|---|---|---|
| | | Benzene | Toluene | Ethylbenzene | Xylenes | | | | | |
| Remediation Standard | | 215 | 23,500 | 21,300 | 60,000 | 50,000 | NA | NA | NA | NA |
| Well | Date | | | | | | | | | |
| OBG-7 | 5/97 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | <500 | <500 |
| | 8/97 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | <500 | <500 |
| | 11/97 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | NS | NS |
| | 2/98 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | NS | NS |
| OBG-8 | 5/97 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <500 | <1.0 | <500 | <500 |
| | 8/97 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 11/97 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 2/98 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| OBG-9 | 5/97 | LP | LP | LP | LP | LP | LP | LP | LP | LP |
| | 8/97 | LP | LP | LP | LP | LP | LP | LP | LP | LP |
| | 11/97 | **490** | 4,800 | 2,100 | 16,000 | <200 | 24,000 | 23,390 | NS | NS |
| | 2/98 | NS | NS | NS | NS | NS | NS | NS | NS | NS |

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# *ATTACHMENT 6*

# *MW-7 WELL CONSTRUCTION LOG*

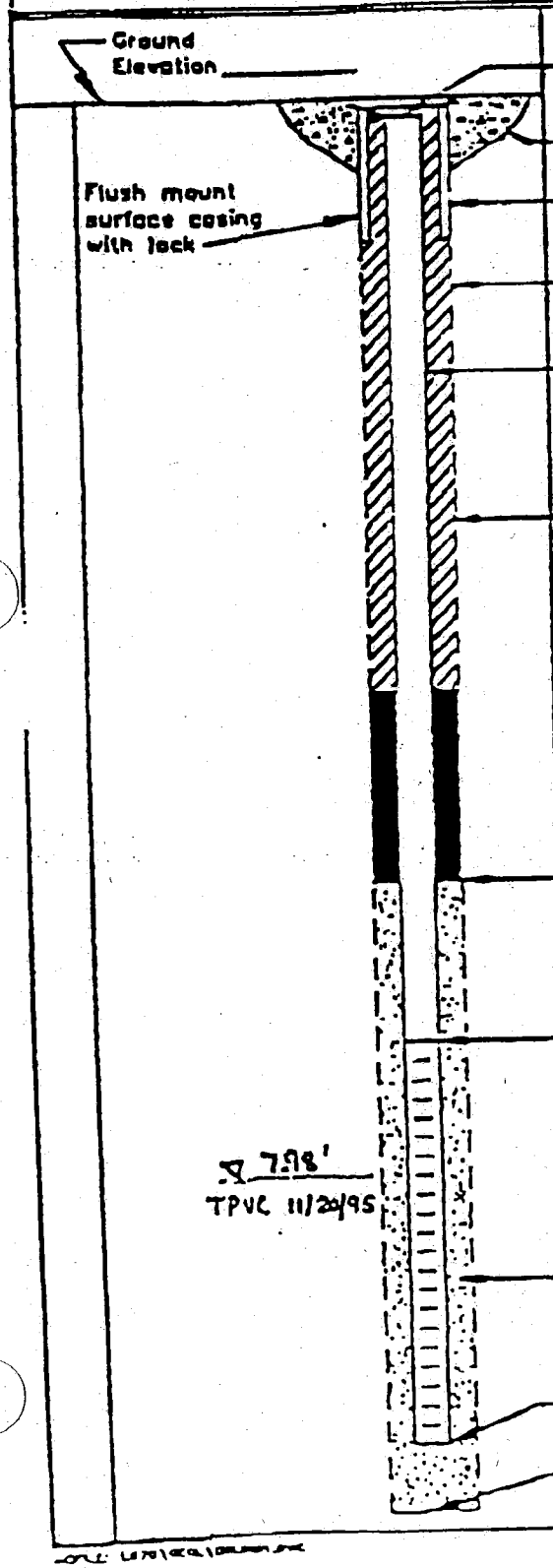
# MONITORING WELL SHEET

TANK FARM WELLS

PROJECT NSB NLON
PROJECT NO. 4626
ELEVATION
FIELD GEOLOGIST CONTI

LOCATION GROTON, CT.
BORING HNUS-07
DATE 10-3-95

DRILLER SOILTEST, INC
DRILLING METHOD HSA
DEVELOPMENT METHOD PUMP




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