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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 SUBMARINE BASE  
GROTON, CONNECTICUT

Month: December 1996

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 December 16, 1996, 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 December 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 December 17, 1996, was 0.02 lbs/hour. During the period from November 19, 1996 to December 17, 1996 approximately 21 lbs of hydrocarbons were extracted by the remediation system. The total hydrocarbon mass extracted by the remediation system, as of December 17, 1996, was approximately 1,111 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.

**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 December 17, 1996. The Discharge Monitoring Report (DMR) will be generated pending receipt of the laboratory analytical data.

**Monitoring Well Gauging** - The site monitoring wells were gauged December 17, 1996. Depth to groundwater at the site ranged from 1.60 feet in DM-3 to 7.92 feet in WE-3. Historical well gauging data has been included in **Attachment 5**.

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

**Additional Activities** - A line dewatering test was conducted at the Dolphin Mart site, December 12 and 13, 1996 to determine if system modification was needed to remove water from the lower main trunk line and vapor extraction trenches VET-13 through VET-16. The results of the test indicated that the effectiveness of the air sparge/SVE system would not be significantly enhanced by system modification. The results of the test have been summarized in the report entitled, "Line Dewatering Test Summary Report", prepared by Fluor Daniel GTI, January 1997.

### NEX AIR SPARGE/SVE SYSTEM

**System Status** - The remediation system at the site has been operating since July 31, 1996. As of December 16, 1996, 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 310 scfm (223 scfm from the east system and 87 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 December 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 December 17, 1996, was 0.06 lbs/hour. During the period from November 19, 1996 to December 17, 1996 approximately 83 lbs of hydrocarbons were extracted by the remediation system. The total hydrocarbon mass extracted by the remediation system, as of December 17, 1996, is approximately 781 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.

**Discharge Monitoring Sampling** - Discharge monitoring sampling was completed December 17, 1996. The Discharge Monitoring Report (DMR) will be generated pending 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 gauged December 16, 1996. Depth to groundwater at the site ranged from 3.10 feet in ERM-5 to 7.83 feet in ERM-12. Historical well gauging data has been included in **Attachment 5**.

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

**Additional Activities** - Due to the reduction in the SVE system influent concentrations, start-up of the air sparge system is scheduled for February.

#### **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 has remained deactivated during the month of December, due to a high groundwater table which prohibits system operation.

**Product Recovery** - No light non-aqueous phase liquid (LNAPL) petroleum was recovered during the month of December, 1996. As of December 31, 1996 a total of approximately 4 gallons of LNAPL have been recovered by the system.

**Monitoring Well Gauging** - MW-7 was gauged on December 17, 1996. At that time the the well and road box were flooded due to a high water table elevation and heavy precipitation. Historical gauging data for MW-7 is included in **Attachment 5**.

**Additional Activities** - The passive free product recovery system will be reactivated when groundwater elevation and product thickness allow operation.

**FIGURES**

|  |  |  |  |
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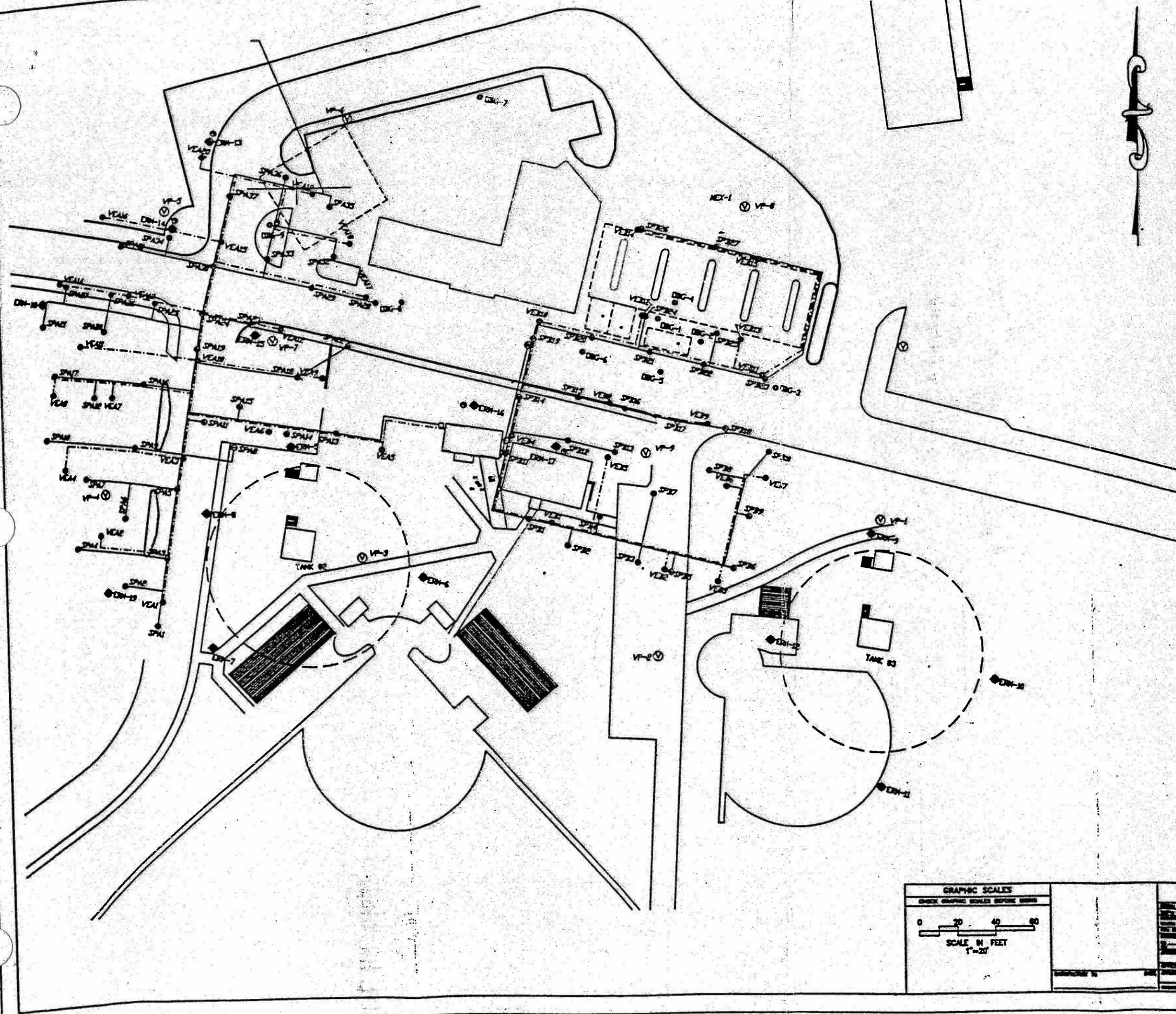
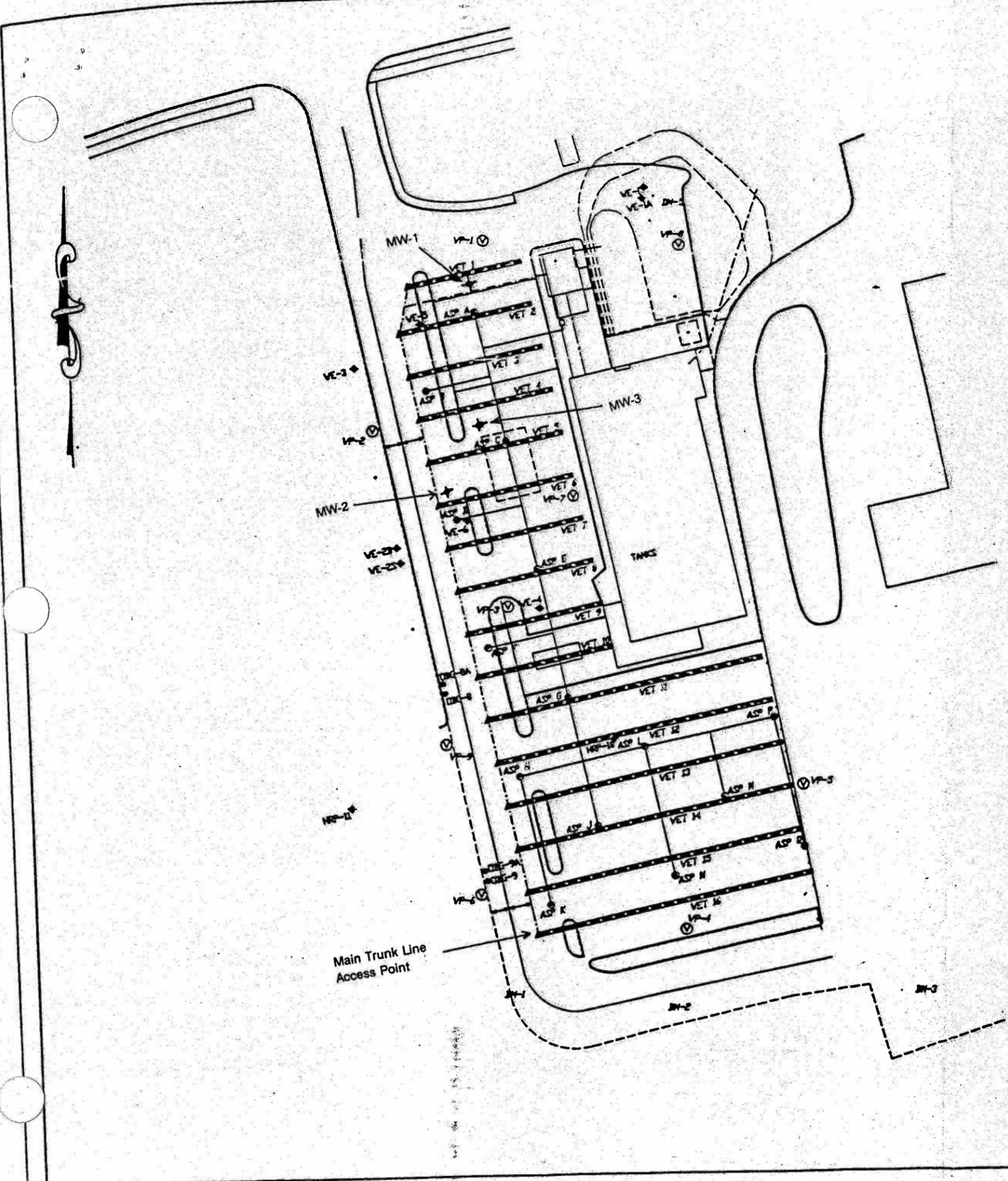


Figure 2

|  |  |  |                  |  |
|--|--|--|------------------|--|
| <p>GRAPHIC SCALES</p> <p>CHECK GRAPHIC SCALES BEFORE USE</p> <p>SCALE IN FEET<br/>1"=20'</p> |  | <p>DEPARTMENT OF THE ENVIRONMENT<br/>NORTHERN DIVISION</p>                                     |                  |  |
|  |  | <p>REMEDIATION OF CONTAMINATED SOIL/GROUND WATER</p> <p>SITE PLAN<br/>WATER EXCHANGE (WEX)</p> |                  |  |
| <p>PROJECT NO. 80091</p>   |  | <p>DATE: 2166439</p>   | <p>SCALE: C1</p> |  |

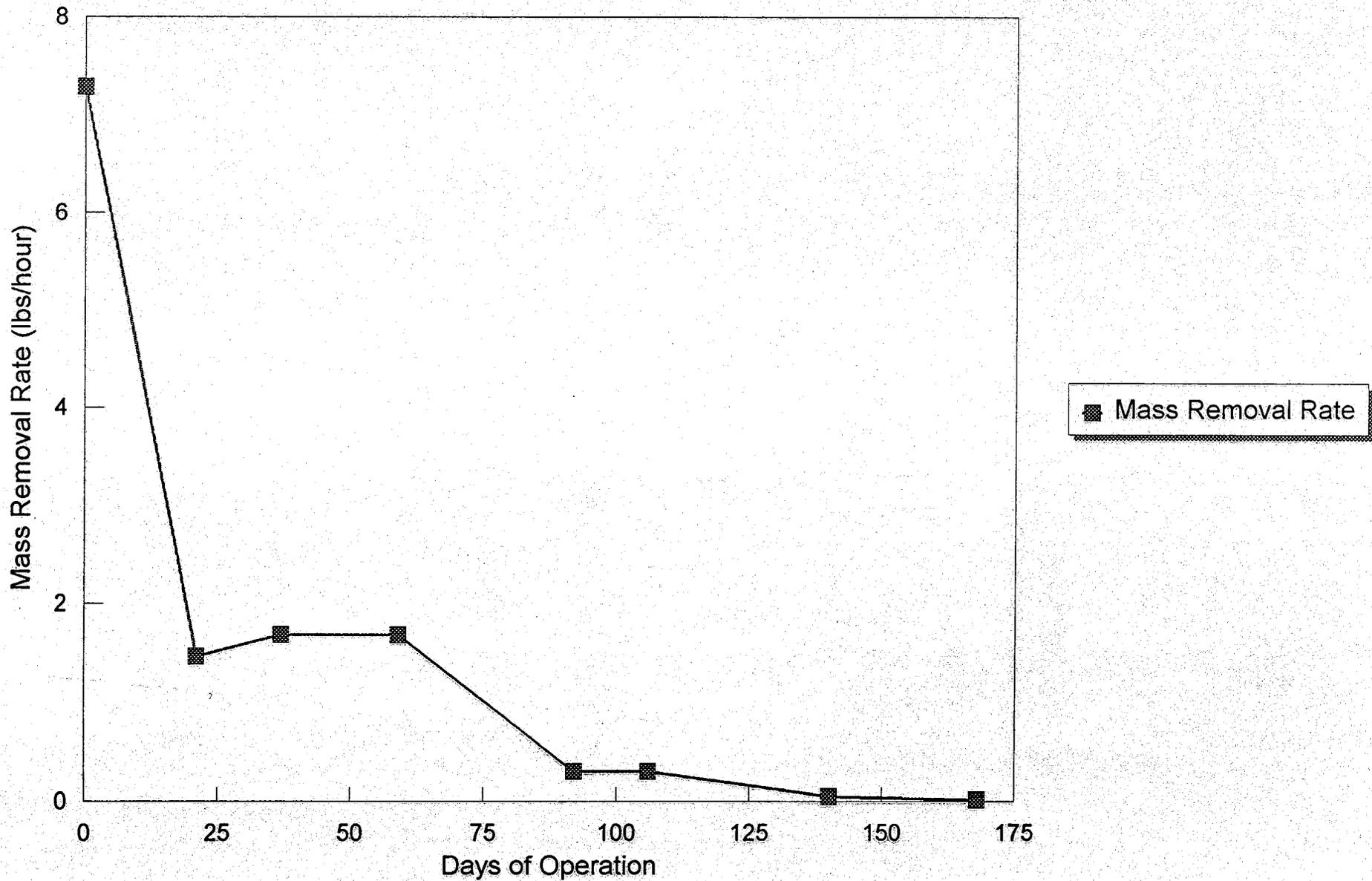


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Figure 1

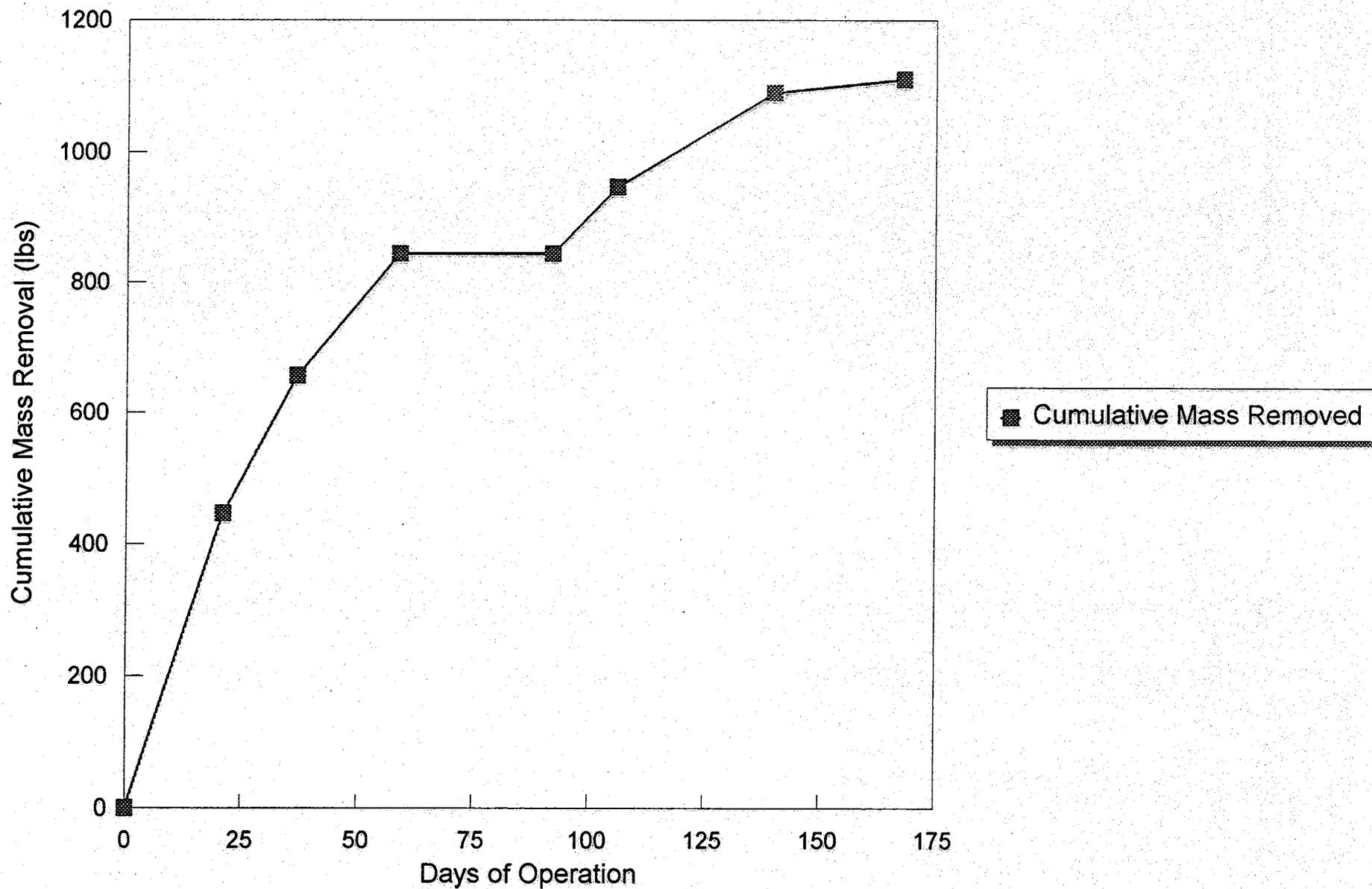
|  |  |                         |  |                         |
|--|--|-------------------------|--|-------------------------|
| <p>GRAPHIC SCALES</p> <p>CHECK GRAPHIC SCALES BEFORE USING</p> <p>SCALE IN FEET<br/>1"=20'</p> | <p>STATE OF CONNECTICUT<br/>DEPARTMENT OF ENVIRONMENT &amp; NATURAL RESOURCES<br/>NORTHERN DIVISION<br/>WATER RESOURCES SECTION<br/>WATER POLLUTION CONTROL DIVISION</p> |                         | <p>PROJECT TITLE<br/>REMEDIATION OF CONTAMINATED SOIL/GROUND WATER</p> |                         |
|  | <p>PROJECT NO.<br/>80091</p>   |                         | <p>PROJECT NAME<br/>2166440</p>  |                         |
| <p>DATE<br/>FEBRUARY 1991</p>  |  | <p>SCALE<br/>1"=20'</p> |  | <p>SHEET NO.<br/>C2</p> |

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

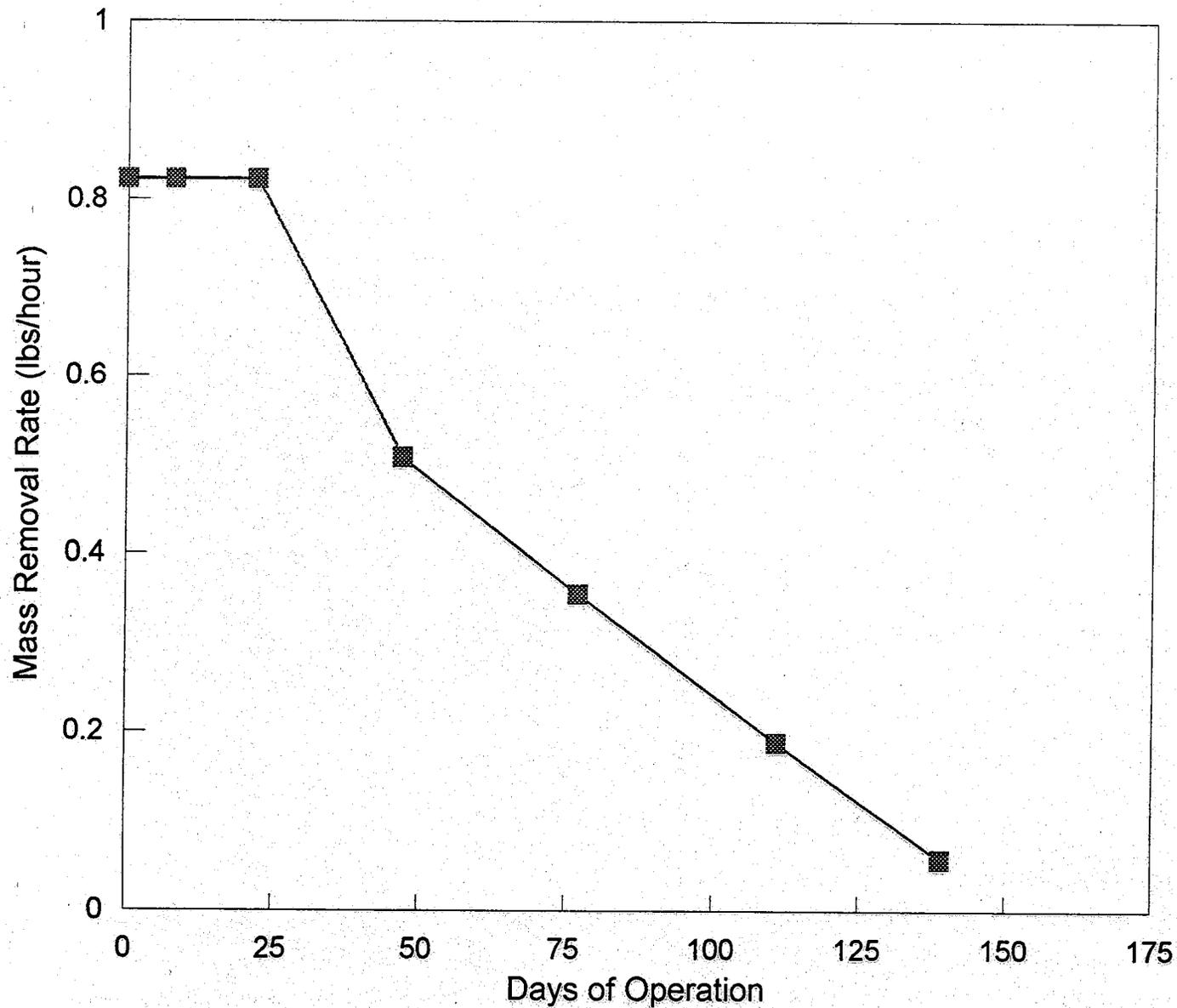


# Figure 4 - Cumulative Mass Removed versus Time

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



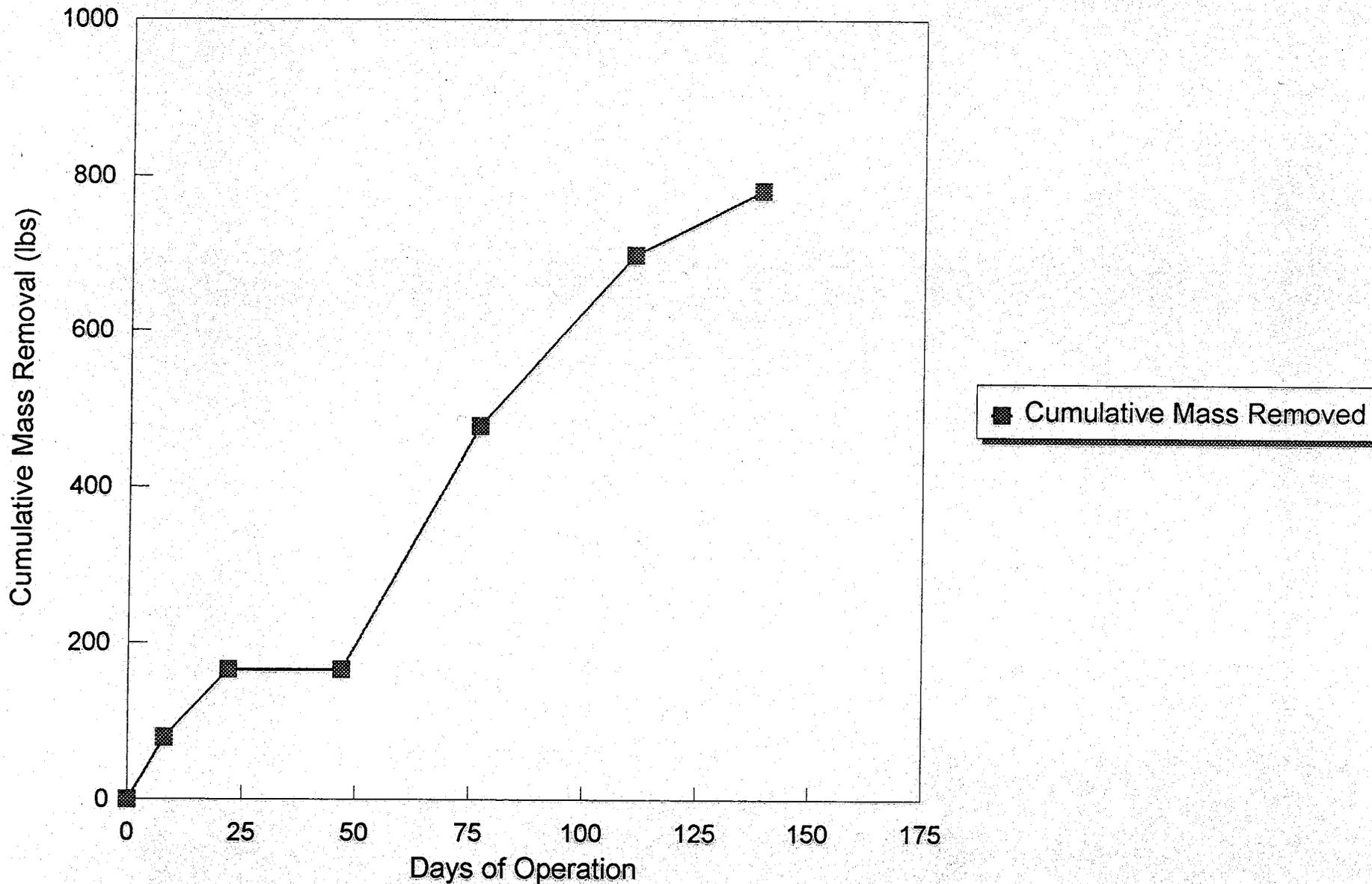
**Figure 5 - Mass Removal Rate**  
NEX Site, New London Naval Submarine Base, Groton, CT



■ Mass Removal Rate

# Figure 6 - Cumulative Mass Removed versus Time

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



**ATTACHMENT 1**

**SITE VISIT FORMS**

NAVAL SUBMARINE BASE GROTON, CT. (NEX SITE)

| Monitoring:   |                      |   |
|---|----------------------|---|
| Component:  | Frequency:           | Record Data for/By:   |
| Carbon Adsorbors:<br>A/B (Inf. / Eff.)<br>C/D (Inf. / Eff.) | Monthly              | Air Sample for:<br>EPA T03 BTEX, MTBE<br>Misc. aromatics/aliphatics   |
| Water Sump:   | Prior to discharging | Flowmeter reading<br>Eff EPA 624+xylenes (2-40ml. Voa/HCL)<br>Eff TPH EPA 418.1 (1-1 lt./H2SO4)<br>Eff Total Lead EPA 239.2 (1-500ml./HN03)<br>PH (Inf./Eff) (Field test)<br>Eff Aquatic Toxicity (Minnows+Water Fleas) |
| Monitoring Wells:<br>ERM-5 - ERM-19                         | Quarterly            | EPA 8010 (3-40ml./HCL)<br>EPA 8020 +MTBE ( " " )<br>TPH 418.1 (2-1lt. )<br>TPH as gasoline, CG/FID hydrocarbon screen ( " " )<br>TPH as Diesel, GC/FID hydrocarbon screen ( " " )                                       |

| OPERATIONAL DATA FORM<br>OT-31MW-7 PRODUCT RECOVERY SYSTEM<br>Naval Submarine Base, Groton, Ct.<br>Project # 87260014<br>Task #140 |                | Date: <u>12-2-96</u><br>Time: <u>11:00</u><br>Technician: <u>J.R. JR./J.B.</u> |
|--|----------------|--|
| Check compressor, pressure should be   | <u>80</u> psi. |  |
| Check air dryer panel, pressure should be  | <u>60</u> psi. |  |
| Drain moisture trap on panel dryer.  |                |  |
| Gauge recovery tank: DTB:  | <u>2.73</u>    | Product Thickness: <u>.05</u>  |
| DTW:   | <u>2.40</u>    | Total Fluid Gallons: <u>10</u>   |
| DTP:   | <u>2.35</u>    | Total Product Gallons: <u>4</u>  |
| Additional comments:<br><u>Dipped Tank with Stich and used water paste on</u><br><u>Stich, put 2 oz's of oil in compressor.</u>    |                |  |
|  |                |  |
|  |                |  |
|  |                |  |
|  |                |  |

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

Date: 12-2-96  
 Time: 10:30  
 Technician: SKJR / J.B.

**AIR COMPRESSOR SYSTEM**

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

**SOIL VAPOR EXTRACTION SYSTEM**

|   |      |   |      |
|---|------|---|------|
| Eastern Flow Rate <u>114-271</u>  | SCFM | Total Flow <u>17566900</u>  | SCFM |
| Western Flow Rate <u>16-196</u>   | SCFM | Total Flow <u>10989197</u>  | SCFM |
| Vacuum Pump V-1<br>Vacuum <u>2.75</u> °Hg<br>Temperature <u>125</u> °F<br>Particulate Filter <u>OK</u><br>Flow Control Valve Setting <u>100%</u><br>Bleed Air Valve Setting <u>50%</u><br>Liquid Level _____  |      | Vacuum Pump V-2<br>Vacuum <u>3</u> °Hg<br>Temperature <u>130</u> °F<br>Particulate Filter <u>OK</u><br>Flow Control Valve Setting <u>100%</u><br>Bleed Air Valve Setting <u>50%</u><br>Liquid Level _____   |      |
| <del>Vacuum Pump V-3<br/>                     Vacuum _____ °Hg<br/>                     Temperature _____ °F<br/>                     Particulate Filter _____<br/>                     Flow Control Valve Setting _____<br/>                     Bleed Air Valve Setting _____<br/>                     Liquid Level _____</del> |      | <del>Vacuum Pump V-4<br/>                     Vacuum _____ °Hg<br/>                     Temperature _____ °F<br/>                     Particulate Filter _____<br/>                     Flow Control Valve Setting _____<br/>                     Bleed Air Valve Setting _____<br/>                     Liquid Level _____</del> |      |

**ACTIVATED CARBON ADSORPTION SYSTEM**

|   |  |   |  |
|---|--|---|--|
| <del>Carbon Adsorber A/B<br/>                     Inf. VOC Level _____ ppm<br/>                     Inf Pressure _____ psi<br/>                     Mid. VOC Level _____ ppm<br/>                     Mid Pressure _____ psi<br/>                     Eff. VOC Level _____ ppm<br/>                     Change out Date _____</del> |  | Carbon Adsorber C/D<br>Inf. VOC Level <u>139</u> ppm<br>Inf Pressure <u>30</u> psi<br>Mid. VOC Level _____ ppm<br>Mid Pressure _____ psi<br>Eff. VOC Level <u>160</u> ppm<br>Change out Date <u>8/22/96</u> |  |
|---|--|---|--|

**WATER TREATMENT**

Flowmeter Reading 1165.5 Gallons

**COMMENTS**

used a pid to take ppm readings. pid calibrated to 100 ppm. Drained water out of influent lines and out of V1 and V2. approximately 5 to 10 gallons of water drained out.

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

Date: 12-2-96

Time: 14:45

Technician: J.K. JR / J.B

**AIR COMPRESSOR SYSTEM**

| Flow Rate   | SCFM | Total Flow   | SCFM |
|---|------|--|------|
| <b>Air Compressor C-1</b><br>Pressure <u>8</u> psi<br>Temperature <u>220</u> °F<br>Flow Control Valve Setting <u>100%</u><br>Bleed Valve <u>50%</u><br>Radiator <input checked="" type="radio"/> ON / OFF |      | <del> <b>Air Compressor C-2</b><br/>           Pressure _____ psi<br/>           Temperature _____ °F<br/>           Flow Control Valve Setting _____<br/>           Bleed Valve _____<br/>           Radiator _____ ON / OFF         </del> |      |

**SOIL VAPOR EXTRACTION SYSTEM**

| Flow Rate  | SCFM | Total Flow   | SCFM |
|--|------|--|------|
| <b>Vacuum Pump V-1</b><br>Vacuum <u>2.5</u> "Hg<br>Temperature <u>136</u> °F<br>Particulate Filter <u>OK</u><br>Flow Control Valve Setting <u>100%</u><br>Bleed Air Valve Setting <u>50%</u><br>Liquid Level _____   |      | <b>Vacuum Pump V-2</b><br>Vacuum <u>1</u> "Hg<br>Temperature <u>134</u> °F<br>Particulate Filter <u>OK</u><br>Flow Control Valve Setting <u>100%</u><br>Bleed Air Valve Setting <u>50%</u><br>Liquid Level _____   |      |
| <del> <b>Vacuum Pump V-3</b><br/>           Vacuum _____ "Hg<br/>           Temperature _____ °F<br/>           Particulate Filter _____<br/>           Flow Control Valve Setting _____<br/>           Bleed Air Valve Setting _____<br/>           Liquid Level _____         </del> |      | <del> <b>Vacuum Pump V-4</b><br/>           Vacuum _____ "Hg<br/>           Temperature _____ °F<br/>           Particulate Filter _____<br/>           Flow Control Valve Setting _____<br/>           Bleed Air Valve Setting _____<br/>           Liquid Level _____         </del> |      |

**ACTIVATED CARBON ADSORPTION SYSTEM**

|  |  |   |  |
|--|--|---|--|
| <del> <b>Carbon Adsorber A/B</b><br/>           Inf. VOC Level _____ ppm<br/>           Inf Pressure _____ psi<br/>           Mid. VOC Level _____ ppm<br/>           Mid Pressure _____ psi<br/>           Eff. VOC Level _____ ppm<br/>           Change out Date _____         </del> |  | <b>Carbon Adsorber C/D</b><br>Inf. VOC Level <u>4.0</u> ppm<br>Inf Pressure <u>6.7</u> psi<br>Mid. VOC Level <u>4.0</u> ppm<br>Mid Pressure <u>1.0</u> psi<br>Eff. VOC Level <u>9.0</u> ppm<br>Change out Date <u>8-22-96</u> |  |
|--|--|---|--|

**WATER TREATMENT**

Flowmeter Reading 673.6 Gallons

**COMMENTS**

Found system down. Turned all switches off, then opened all valve to let the water drain out. Restarted system

OPERATIONAL DATA FORM  
 Air Sparging/Soil Vapor Extraction System  
 DOLPHIN SITE  
 Naval Submarine Base  
 Groton, CT.

Date: 12/2/96  
 Time: 3:10 / 5:3 14:00  
 Technician: \_\_\_\_\_

AIR SPARGE WELLS  
 75. scfm total  
 916. ft/m at each point PSI

| LOCATION | FLOW (FT/M) | VALVE SETTING | VACUUM (PSI) | COMMENTS |
|----------|-------------|---------------|--------------|----------|
| ASP-A    | NA          | 100           | 9            |          |
| ASP-B    |             | 50            | 6 PSI        |          |
| ASP-C    |             | 50            | 6.5          |          |
| ASP-D    |             | 50            | 4            |          |
| ASP-E    |             | 25            | 4            |          |
| ASP-F    |             | 25            | 4            |          |
| ASP-G    |             | 25            | 6            |          |
| ASP-H    |             | 0             | 0            | closed   |
| ASP-J    |             | 0             | 0            | closed   |
| ASP-K    |             | 0             | 0            | closed   |
| ASP-L    |             | 0             | 0            | closed   |
| ASP-M    |             | 0             | 0            | closed   |
| ASP-N    |             | 0             | 0            | closed   |
| ASP-P    |             | 0             | 0            | closed   |
| ASP-Q    | ↓           | 0             | 0            | closed   |

**OPERATIONAL DATA FORM**  
**Air Sparging/Soil Vapor Extraction System**  
**DOLPHIN SITE**  
**Naval Submarine Base**  
**Groton, CT.**

Date: 12-2-96  
 Time: 12:15  
 Technician: J.R. JOHNSON

**SOIL VAPOR EXTRACTION TRENCHES**  
820.scfm total  
 SET VET-7 through VET-10 +VET-17 AT: 1787. ft/m.  
 VET-11 through VET-16 AT: 3575. ft/m

| LOCATION | FLOW (FT/M) | VALVE SETTING | VACUUM ("H2O) | COMMENTS |
|----------|-------------|---------------|---------------|----------|
| VET-1    |             | 100           | 24            |          |
| VET-2    |             | 100           | 24-26         |          |
| VET-3    |             | 100           | 26            |          |
| VET-4    |             | 100           | 24            |          |
| VET-5    |             | 100           | 24-26         |          |
| VET-6    |             | 100           | 20-24         |          |
| VET-7    |             | 100           | 20            |          |
| VET-8    |             | 100           | 14            |          |
| VET-9    |             | 100           | 12-14         |          |
| VET-10   |             | 100           | 8-12          |          |
| VET-11   |             | 100           | 8             |          |
| VET-12   |             | 100           | 8-12          |          |
| VET-13   |             | 100           | 6             |          |
| VET-14   |             | 0             | 0             | closed   |
| VET-15   |             | 0             | 0             | closed   |
| VET-16   |             | 100           | 0             |          |
| VET-17   |             | 100           | 20            |          |

# TAILGATE MEETING FORM

Name: 87260014

Date: 12-2-96

Project Number: 83001-9999

Presented by: J.K. Jr.

**Check the Topics/Information Reviewed:**

- |  |   |  |
|--|---|--|
| <input checked="" type="checkbox"/> safety glasses, hard hat, safety boots                           | <input checked="" type="checkbox"/> slips, trips, and falls       | <input checked="" type="checkbox"/> daily work scope     |
| <input checked="" type="checkbox"/> site safety plan review and location                             | <input checked="" type="checkbox"/> directions to hospital        | <input type="checkbox"/> emergency protocol              |
| <input type="checkbox"/> equipment and machinery familiarization                                     | <input checked="" type="checkbox"/> anticipated visitors          | <input type="checkbox"/> parking and laydown             |
| <input checked="" type="checkbox"/> employee Right-To-Know/MSDS location                             | <input type="checkbox"/> electrical ground fault                  | <input type="checkbox"/> hot work permits                |
| <input type="checkbox"/> open pits, excavations, and site hazards                                    | <input type="checkbox"/> public safety and fences                 | <input checked="" type="checkbox"/> strains and sprains  |
| <input checked="" type="checkbox"/> vehicle safety and driving/road conditions                       | <input type="checkbox"/> excavator swing and loading              | <input checked="" type="checkbox"/> noise hazards        |
| <input type="checkbox"/> portable tool safety and awareness  | <input checked="" type="checkbox"/> orderly site and housekeeping | <input checked="" type="checkbox"/> no horseplay         |
| <input type="checkbox"/> overhead utility locations and clearance                                    | <input type="checkbox"/> smoking in designated areas              | <input checked="" type="checkbox"/> heat and cold stress |
| <input checked="" type="checkbox"/> first aid, safety, and PPE location                              | <input type="checkbox"/> leather gloves for protection            | <input checked="" type="checkbox"/> backing up hazards   |
| <input type="checkbox"/> sharp object, rebar, and scrap metal hazards                                | <input type="checkbox"/> effects of the night before              | <input checked="" type="checkbox"/> accidents are costly |
| <input checked="" type="checkbox"/> safety is everyone's responsibility                              | <input type="checkbox"/> vibration related injuries               | <input type="checkbox"/> dust and vapor control          |
| <input checked="" type="checkbox"/> latex gloves inner/nitrile gloves outer                          | <input checked="" type="checkbox"/> fire extinguisher locations   | <input type="checkbox"/> refueling procedures            |
| <input type="checkbox"/> excavation/trenching inspections/documentation                              | <input checked="" type="checkbox"/> eye wash station locations    | <input type="checkbox"/> confined space entry            |
| <input type="checkbox"/> full face respirators with proper cartridges                                | <input type="checkbox"/> decontamination procedures               | <input type="checkbox"/> flying debris hazards           |
| <input checked="" type="checkbox"/> upgrade to level 0 at FID/PID ( <u>  </u> eV ) > / 0 ppm         |   |  |
| <input checked="" type="checkbox"/> work stoppage at FID/PID ( <u>  </u> eV ) > 2.5 ppm, % LEL > 10% |   |  |

Discussion/Comments/Follow-up Actions: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

| NAME                    | SIGNATURE          | COMPANY      |
|-------------------------|--------------------|--------------|
| <u>John Kowzun, Jr.</u> | <u>[Signature]</u> | <u>FDGTI</u> |
| <u>John Bartlett</u>    | <u>[Signature]</u> | <u>FDGTI</u> |
| _____                   | _____              | _____        |
| _____                   | _____              | _____        |
| _____                   | _____              | _____        |
| _____                   | _____              | _____        |
| _____                   | _____              | _____        |
| _____                   | _____              | _____        |
| _____                   | _____              | _____        |
| _____                   | _____              | _____        |

- Notes:
- Conduct a daily safety meeting prior to beginning each day's site activities.
  - Complete form by checking off specific topics and/or hazards.
  - Obtain signatures from all GTI staff and GTI subcontractors.
  - Follow-up on any noted items and document resolution of any action items.

**FLUOR DANIEL GTI**   
 Kennedy Business Park II  
 431 (F) Hayden Station Road  
 Windsor, CT 06095 USA

NAVAL SUBMARINE BASE GROTON, CT. (NEX SITE)

| Monitoring:   |                      |   |
|---|----------------------|---|
| Component:  | Frequency:           | Record Data for/By:   |
| Carbon Adsorbors:<br>A/B (Inf. / Eff.)<br>C/D (Inf. / Eff.) | Monthly              | Air Sample for:<br>EPA T03 BTEX, MTBE<br>Misc. aromatics/aliphatics   |
| Water Sump:   | Prior to discharging | Flowmeter reading<br>Eff EPA 624+xylenes (2-40ml. Voa/HCL)<br>Eff TPH EPA 418.1 (1-1lt./H2SO4) HCL<br>Eff Total Lead EPA 239.2 (1-500ml./HN03)<br>PH (Inf./Eff) (Field test)<br><del>Eff Aquatic Toxicity (Minnows+Water Fleas)</del> |
| Monitoring Wells:<br>ERM-5 - ERM-19                         | Quarterly            | EPA 8010 (3-40ml./HCL)<br>EPA 8020 +MTBE (" " )<br>TPH 418.1 (2-1lt. " )<br>TPH as gasoline, CG/FID hydrocarbon screen (" " )<br>TPH as Diesel, GC/FID hydrocarbon screen (" " )  |

|   |   |
|---|---|
| <p>OPERATIONAL DATA FORM<br/>OT-8/MW-7 PRODUCT RECOVERY SYSTEM<br/>Naval Submarine Base, Groton, CT.<br/>Project # 87260014<br/>Task #140</p>   | <p>Date: <u>12-17-96</u><br/>Time: _____<br/>Technician: <u>C. GOULET</u></p> |
| <p>Check compressor, pressure should be <u>80</u> psi.<br/>Check air dryer panel, pressure should be <u>60</u> psi.<br/>Drain moisture trap on panel dryer.</p>   |   |
| <p>Gauge recovery tank: DTB: <u>2.78</u> Product Thickness: _____<br/>DTW: <u>1.29</u> Total Fluid Gallons: <u>0.06'</u><br/>DTP: <u>1.23</u> Total Product Gallons: _____</p>  |   |
| <p>Additional comments:<br/> <u>* WATER TABLE HAS RISEN INTO ROADBOX.</u><br/> <u>* OT-8 SYSTEM SHUT DOWN UNTIL WATER TABLE DROPS.</u><br/> <u>* IN THE AREA OF OT-8 I NOTICED SOME GEOPROBE WELLS AND MARKOUTS, NO ONE AROUND SITE, BUT TRUCK IS FROM</u><br/> <u>* RECOVERY TANK GAUGING:</u><br/> <u>- DTP - 1.23</u><br/> <u>DTW - 1.29</u><br/> <u>DTB - 2.78</u><br/> <u>* - ADDED 2 OZ. TO COMPRESSOR.</u></p> |   |

|  |   |
|--|---|
| <b>OPERATIONAL DATA FORM</b><br>Air Sparging/Soil Vapor Extraction System<br>Naval Exchange<br>Naval Submarine Base -Groton, CT<br>Project #83001-9999 | Date: <u>12-17-96</u><br>Time: _____<br>Technician: <u>C. GUILLET</u> |
|--|---|

**AIR COMPRESSOR SYSTEM**

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

**SOIL VAPOR EXTRACTION SYSTEM**

|  |   |
|--|---|
| Eastern Flow Rate <u>18121741.</u> SCFM  | Total Flow <u>~ 223.</u> SCFM   |
| Western Flow Rate <u>11056466.</u> SCFM  | Total Flow <u>~ 87.</u> SCFM  |
| <del>           Vacuum Pump V-1<br/>           Vacuum <u>1.0</u> "Hg<br/>           Temperature <u>122.0</u> °F<br/>           Particulate Filter <u>OK</u><br/>           Flow Control Valve Setting <u>100%</u><br/>           Bleed Air Valve Setting <u>50%</u><br/>           Liquid Level <u>FULL</u> </del> | <del>           Vacuum Pump V-2<br/>           Vacuum <u>1.0</u> "Hg<br/>           Temperature <u>122.0</u> °F<br/>           Particulate Filter <u>OK</u><br/>           Flow Control Valve Setting <u>100%</u><br/>           Bleed Air Valve Setting <u>50%</u><br/>           Liquid Level <u>OK.</u> </del> |
| <del>           Vacuum Pump V-3<br/>           Vacuum _____ "Hg<br/>           Temperature _____ °F<br/>           Particulate Filter _____<br/>           Flow Control Valve Setting _____<br/>           Bleed Air Valve Setting _____<br/>           Liquid Level _____         </del>                          | <del>           Vacuum Pump V-4<br/>           Vacuum _____ "Hg<br/>           Temperature _____ °F<br/>           Particulate Filter _____<br/>           Flow Control Valve Setting _____<br/>           Bleed Air Valve Setting _____<br/>           Liquid Level _____         </del>                         |

**ACTIVATED CARBON ADSORPTION SYSTEM**

|   |  |
|---|--|
| <del>           Carbon Adsorber A/B<br/>           Inf. VOC Level _____ ppm<br/>           Inf Pressure _____ psi<br/>           Mid. VOC Level _____ ppm<br/>           Mid Pressure _____ psi<br/>           Eff. VOC Level _____ ppm<br/>           Change out Date _____         </del> | Carbon Adsorber C/D<br>Inf. VOC Level <u>5.</u> ppm<br>Inf Pressure <u>10.</u> psi<br>Mid. VOC Level _____ ppm<br>Mid Pressure _____ psi<br>Eff. VOC Level _____ ppm<br>Change out Date <u>BY PASSING UNITS.</u> |
|---|--|

**WATER TREATMENT**

Flowmeter Reading 1171.2 Gallons

**COMMENTS**

\* COLLECTED MONTHLY DMG. SAMPLES (BOTH AIR + WATER.)  
\* FID #1 USED.

OPERATIONAL DATA FORM  
 Air Sparging/Soil Vapor Extraction System  
 NEX Site  
 Naval Submarine Base  
 Groton, CT.

Date: 12-17-96  
 Time:  
 Technician: C. GUILLET  
J. KONZUN

SOIL VAPOR EXTRACTION WELLS  
 West side: 480. scfm total East side: 360. scfm total  
 Target setting at each point: 1100. ft/m

| LOCATION | FLOW (FTM)                  | VALVE SETTING | VACUUM ("H2O) | COMMENTS    |             |
|----------|-----------------------------|---------------|---------------|-------------|-------------|
| VEA-1    | CLOSED.                     |               |               |             |             |
| VEA-2    |                             |               |               |             |             |
| VEA-3    |                             |               |               |             |             |
| VEA-4    |                             |               |               |             |             |
| VEA-5    |                             |               |               |             |             |
| VEA-6    |                             |               |               |             |             |
| VEA-7    |                             |               |               |             |             |
| VEA-8    |                             |               |               |             |             |
| VEA-9    |                             |               |               |             |             |
| VEA-10   |                             |               |               |             |             |
| VEA-11   |                             | ↓             |               |             |             |
| VEA-12   |                             | RUN OFF.      |               |             | RB. REPLACE |
| VEA-13   | -0.                         | 100%          | 31."          |             |             |
| VEA-14   | -0.                         | 100%          | 5."           |             |             |
| VEA-15   | -0.                         | 100%          |               |             |             |
| VEA-16   | -0.                         | 100%          | 12."          |             |             |
| VEA-17   | VEHICLE OVER POINT.         |               |               | RB. REPLACE |             |
| VEA-18   | 150.                        | 100%          | 11."          | RB REPLACE  |             |
| VEA-19   | UNABLE TO ACCESS ENCLOSURE. |               |               |             |             |
| VEA-20   | 25.                         | 100%          | 8."           |             |             |
| VEB-1    | 150.                        | 100%          | 6."           |             |             |
| VEB-2    | 75.                         | 100%          | 9"            |             |             |
| VEB-3    | -0.                         | 100%          | 4."           |             |             |
| VEB-4    | RUN OFF.                    |               |               |             |             |

**OPERATIONAL DATA FORM**  
 Air Sparging/Soil Vapor Extraction System  
 NEX Site  
 Naval Submarine Base  
 Groton, CT.

Date: 12-17-96  
 Time:  
 Technician: C. GOVLET  
J. KONZUN.

SOIL VAPOR EXTRACTION WELLS  
 West side: 480 scfm total East side: 360 scfm Total  
 Target setting at each point: 1100 Ft/m

| LOCATION | FLOW (FT/M)       | VALVE SETTING | VACUUM ("H2O) | COMMENTS    |
|----------|-------------------|---------------|---------------|-------------|
| VEB-5    | 350.              | 100%          | 5"            |             |
| VEB-6    | 60.               | 100%          | 5"            |             |
| VEB-7    | 40.               | 100%          | 10"           |             |
| VEB-8    | 200               | 50%           | 15"           |             |
| VEB-9    | 225.              | 100%          | 10"           | RB. REPLACE |
| VEB-10   | 200.              | 50%           | 9"            |             |
| VEB-11   | 2000.             | 50%           | 8"            |             |
| VEB-12   | + 6000            | 50%           | 11"           | RB REPLACE  |
| VEB-13   | 6000 <sup>+</sup> | 100%          | 7"            | RB REPLACE  |
| VEB-14   | 6000 <sup>+</sup> | 100%          | 11"           |             |
| VEB-15   | 6000 <sup>+</sup> | 100%          | 32"           |             |



# PH MEASUREMENT FIELD LOG

|  |  |  |
|--|--|--|
| DATE:  | SITE: <i>Groton Naval Base Nex site</i>      |  |
| INITIALS:  | ADDRESS: <i>Groton CT</i>                    |  |
| Job #: <i>83001 9999</i>                                       |  |  |
| SAMPLE ID: <i>EFFLUENT</i>                                     | pH 7 OK? <input checked="" type="checkbox"/> | pH 4 OK? <input checked="" type="checkbox"/> |
|  | pH   | TEMP.  |
| READING 1  | <i>6.7</i>                                   |  |
| READING 2  | <i>6.8</i>                                   |  |
| READING 3  | <i>6.8</i>                                   |  |
| READING 4  | <i>6.7</i>                                   |  |
| SAMPLE ID: <i>INF.</i>   | pH 7 OK? <input checked="" type="checkbox"/> | pH 4 OK? <input checked="" type="checkbox"/> |
|  | pH   | TEMP.  |
| READING 1  | <i>6.7</i>                                   |  |
| READING 2  | <i>6.7</i>                                   |  |
| READING 3  | <i>6.8</i>                                   |  |
| READING 4  | <i>6.7</i>                                   |  |
| SAMPLE ID:   | pH 7 OK?                                     | pH 4 OK?                                     |
|  | pH   | TEMP.  |
| READING 1  |  |  |
| READING 2  |  |  |
| READING 3  |  |  |
| READING 4  |  |  |
| NOTES: <i>Please complete 4 pH readings for each discharge</i> |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

NAVAL SUBMARINE BASE GROTON, CT. (NEX SITE)

| <b>Monitoring</b>  |                   |   |
|--|-------------------|---|
| <b>Component:</b>  | <b>Frequency:</b> | <b>Record Data for :</b>  |
| Air Compressors:<br>C-1<br>C-2                                   | Weekly            | Flowrate<br>Pressure<br>Temperature<br>Flow control setting<br>Bypass control setting<br>Radiator                                     |
| Air Sparge Wells:<br>SPA-1 - SPA-37<br>SPB-1 - SPB-27            | Monthly           | Flow<br>Valve settings % open<br>Pressure   |
| Carbon Adsorbers:<br>A/B<br>C/D                                  | Weekly            | Pressure<br>Influent VOC Con.<br>Middle VOC Con.<br>Effluent VOC Con.<br>Date carbon was changed out.                                 |
| Vacuum Pumps:<br>V-1<br>V-2<br>V-3<br>V-4                        | Weekly            | Pressure temperature<br>Check Particle Filters<br>Flow Control Valve setting<br>Bleed Valve Control Setting<br>Condensate Trap Levels |
| Soil Vapor Extraction Wells:<br>VEA-1 - VEA-20<br>VEB-1 - VEB-15 | Bi-Monthly        | Flow<br>Valve Setting<br>Vacuum<br>VOC Conc. By PID   |
| Monitoring Wells:<br>ERM-5 - ERM-19                              | Monthly           | Depth to Groundwater<br>Depth to Liquid Phase(if present)   |
| Complete MW-7 system check                                       | Weekly            | Gauge recovery drum<br>Check compressor oil level<br>Drain condensation from compressor dryer   |
| Vapor Monitoring Wells:<br>VP-1 - VP-9                           | Monthly           | Vacuum<br>VOC Conc. By PID  |

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

Date: 12-17-96  
 Time: \_\_\_\_\_  
 Technician: C. GOULET.

AIR COMPRESSOR SYSTEM

| Flow Rate                  | NA  | SCFM | Total Flow                            | SCFM                |
|----------------------------|---|------|---------------------------------------|---------------------|
| Air Compressor C-1         |   |      | <del>Air Compressor C-2</del>         |                     |
| Pressure                   | <u>10.</u>  | psi  | <del>Pressure</del>                   | <del>psi</del>      |
| Temperature                | <u>180</u>  | °F   | <del>Temperature</del>                | <del>°F</del>       |
| Flow Control Valve Setting | <u>100%</u>   |      | <del>Flow Control Valve Setting</del> |                     |
| Bleed Valve                | <u>20%</u>  |      | <del>Bleed Valve</del>                |                     |
| Radiator                   | <input checked="" type="radio"/> ON <input type="radio"/> OFF |      | <del>Radiator</del>                   | <del>ON / OFF</del> |

SOIL VAPOR EXTRACTION SYSTEM

| Flow Rate                             | NA                          | SCFM           | Total Flow                            | NA                          | SCFM           |
|---------------------------------------|-----------------------------|----------------|---------------------------------------|-----------------------------|----------------|
| Vacuum Pump V-1                       |                             |                | Vacuum Pump V-2                       |                             |                |
| Vacuum                                | <u>1.5</u>                  | "Hg            | Vacuum                                | <u>1.0</u>                  | "Hg            |
| Temperature                           | <u>80.</u>                  | °F             | Temperature                           | <u>80.</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% OPEN</u>             |                | Bleed Air Valve Setting               | <u>25% OPEN</u>             |                |
| Liquid Level                          | <u>CONTINUOUSLY DRAINED</u> |                | Liquid Level                          | <u>CONTINUOUSLY DRAINED</u> |                |
| <del>Vacuum Pump V-3</del>            |                             |                | <del>Vacuum Pump V-4</del>            |                             |                |
| <del>Vacuum</del>                     |                             | <del>"Hg</del> | <del>Vacuum</del>                     |                             | <del>"Hg</del> |
| <del>Temperature</del>                |                             | <del>°F</del>  | <del>Temperature</del>                |                             | <del>°F</del>  |
| <del>Particulate Filter</del>         |                             |                | <del>Particulate Filter</del>         |                             |                |
| <del>Flow Control Valve Setting</del> |                             |                | <del>Flow Control Valve Setting</del> |                             |                |
| <del>Bleed Air Valve Setting</del>    |                             |                | <del>Bleed Air Valve Setting</del>    |                             |                |
| <del>Liquid Level</del>               |                             |                | <del>Liquid Level</del>               |                             |                |

ACTIVATED CARBON ADSORPTION SYSTEM

|                                |           |                |                     |            |     |
|--------------------------------|-----------|----------------|---------------------|------------|-----|
| <del>Carbon Adsorber A/B</del> |           |                | Carbon Adsorber C/D |            |     |
| <del>Inf. VOC Level</del>      |           | <del>ppm</del> | Inf. VOC Level      | <u>13.</u> | ppm |
| <del>Inf Pressure</del>        | <u>70</u> | psi            | Inf Pressure        | <u>70.</u> | psi |
| <del>Mid. VOC Level</del>      |           | <del>ppm</del> | Mid. VOC Level      | <u>8.</u>  | ppm |
| <del>Mid Pressure</del>        |           | <del>psi</del> | Mid Pressure        |            | psi |
| <del>Eff. VOC Level</del>      |           | <del>ppm</del> | Eff. VOC Level      | <u>2.</u>  | ppm |
| <del>Change out Date</del>     |           |                | Change out Date     |            |     |

WATER TREATMENT

Flowmeter Reading 1987.7 Gallons

COMMENTS

\* COLLECTED AIR + WATER SAMPLES.  
 \* FID # 1 USED.

# PH MEASUREMENT FIELD LOG

|   |  |  |
|---|--|--|
| DATE:   | SITE: Groton Naval Base <del>NEX site</del>  |  |
| INITIALS:   | ADDRESS: Groton CT                           |  |
| Job #: 83001 9999                                       | DOLPHIN SITE.                                |  |
| SAMPLE ID: EFFLUENT                                     | pH 7 OK? <input checked="" type="checkbox"/> | pH 4 OK? <input checked="" type="checkbox"/> |
|   | pH   | TEMP.  |
| READING 1   | 6.8  |  |
| READING 2   | 6.8  |  |
| READING 3   | 7.0  |  |
| READING 4   | 7.1  |  |
| SAMPLE ID: INF.   | pH 7 OK? <input checked="" type="checkbox"/> | pH 4 OK? <input checked="" type="checkbox"/> |
|   | pH   | TEMP.  |
| READING 1   | 6.8  |  |
| READING 2   | 6.9  |  |
| READING 3   | 6.8  |  |
| READING 4   | 6.9  |  |
| SAMPLE ID:  | pH 7 OK?                                     | pH 4 OK?                                     |
|   | pH   | TEMP.  |
| READING 1   |  |  |
| READING 2   |  |  |
| READING 3   |  |  |
| READING 4   |  |  |
| NOTES: Please complete 4 pH readings for each discharge |  |  |
|   |  |  |
|   |  |  |
|   |  |  |



**OPERATIONAL DATA FORM**  
**Air Sparging/Soil Vapor Extraction System**  
**DOLPHIN SITE**  
**Naval Submarine Base**  
**Groton, CT.**

Date: 12-17-96  
 Time: \_\_\_\_\_  
 Technician: \_\_\_\_\_

**SOIL VAPOR EXTRACTION TRENCHES**

820 scfm total

SET VET-7 through VET-10 +VET-17 AT: 1787 ft/m.

VET-11 through VET-16 AT: 3575 ft/m

| LOCATION | FLOW (FT/M)       | VALVE SETTING | VACUUM ("H <sub>2</sub> O) | COMMENTS     |
|----------|-------------------|---------------|----------------------------|--------------|
| VET-1    | 6000 <sup>+</sup> | 50%           | 9"                         |              |
| VET-2    | 300.              | 50%           | 8"                         |              |
| VET-3    | 200.              | 100%          | 10"                        |              |
| VET-4    | 150.              | 50%           | 6"                         |              |
| VET-5    | 6000 <sup>+</sup> | 100%          | 10"                        |              |
| VET-6    | 6000 <sup>+</sup> | 100%          | 10"                        |              |
| VET-7    | 6000 <sup>+</sup> | 100%          | 10"                        |              |
| VET-8    | NA                | NA            | NA                         | WATER RUNOFF |
| VET-9    | 6000 <sup>+</sup> | 50%           | 3"                         |              |
| VET-10   | 200-300.          | 100%          | 0"                         |              |
| VET-11   | - 0.              | 100%          | 0"                         |              |
| VET-12   | - 0.              | 100%          | 0"                         |              |
| VET-13   | CLOSED            | -             | -                          |              |
| VET-14   | CLOSED            | -             | -                          |              |
| VET-15   | CLOSED            | -             | -                          |              |
| VET-16   | CLOSED            | -             | -                          |              |
| VET-17   | 6000 <sup>+</sup> | 100%          | 10"                        |              |

NAVAL SUBMARINE BASE GROTON, CT. (DOLPHIN SITE)

| Monitoring:   |                      |  |
|---|----------------------|--|
| Component:  | Frequency:           | Record Data for/By:  |
| Carbon Adsorbors:<br>A/B (Inf. / Eff.)<br>C/D (Inf. / Eff.)                               | Monthly              | Air Sample for:<br>EPA TO3 BTEX+MTBE<br>Misc. Aliphatics+Aromatics   |
| Water Sump:   | Prior to discharging | Flowmeter reading<br>Eff-EPA 624+MTBE+xylene (2-40ml/HCL)<br>Eff/Inf-TPH 418.1 (1-1lt./H2SO4)<br>Eff-Total Lead 239.2 (1-250ml/HNO3)<br>Eff/Inf EPA 335.1<br>Amenable Cyanide (1-500ml/NAOH)<br>Eff/Inf-EPA 8020 (2-40ml/HCL)<br>Eff/Inf-EPA 6010 Total Metals<br>-arsenic (1-250ml/HCL)<br>-barium HNO3<br>-boron<br>-chromium (+6)<br>-chromium (total)<br>-magnesium<br>-manganese<br>-copper<br>-zinc<br>-cadmium<br>-lead<br>-tin<br>-silver<br>-mercury<br>-nickel<br>Eff/Inf-EPA 160.2 TSS (1-500ml/none)<br>Eff/Inf-EPA 340.2 Fluoride (1-500ml/none,<br>usually combined with EPA160.2TSS<br>analysis)<br>Eff/Inf-PH (Field test) |
| Monitoring Wells:<br>MW-1 - MW-3<br>WE- 2, 3, 4, 5, 6, 2S, 2B<br>HRP-10, DM-1, 2, 3, 4, 5 | Quarterly            | EPA 8010 (3-40ml)<br>EPA 8020 BTEX/MTBE only (3-40ml/HCL)<br>TPH as gasoline<br>TPH as Diesel<br>TPH 418.1 (2-1lt/H2SO4)<br>PH (Field test)  |

NAVAL SUBMARINE BASE GROTON, CT. (DOLPHIN SITE)

| <b>Monitoring</b>  |                   |   |
|--|-------------------|---|
| <b>Component:</b>  | <b>Frequency:</b> | <b>Record Data for :</b>  |
| Air Compressors:<br>C-1<br>C-2   | Weekly            | Flowrate<br>Pressure<br>Temperature<br>Flow control setting<br>Bypass control setting<br>Radiator                                     |
| Air Sparge Wells:<br>ASP-a - ASP-Q   | Monthly           | Flow<br>Valve settings % open<br>Pressure   |
| Carbon Adsorbers:<br>A/B<br>C/D  | Weekly            | Pressure<br>Influent VOC Con.<br>Middle VOC Con.<br>Effluent VOC Con.<br>Date carbon was changed out.                                 |
| Vacuum Pumps:<br>V-1<br>V-2<br>V-3<br>V-4  | Weekly            | Pressure temperature<br>Check Particle Filters<br>Flow Control Valve setting<br>Bleed Valve Control Setting<br>Condensate Trap Levels |
| Soil Vapor Extraction Wells:<br>VET-1 - VET-17   | Bi-Monthly        | Flow<br>Valve Setting<br>Vacuum<br>VOC Conc. By PID   |
| Monitoring Wells:<br>MW-1 - MW-3<br>WE-3, 4, 5, 6, 2S, 2D,<br>HRP-10, DM-1, 2, 3, 4, 5 | Monthly           | Depth to Groundwater<br>Depth to Liquid Phase(if present)   |
| Vapor Monitoring Wells:<br>VP-1 - VP-9   | Monthly           | Vacuum<br>VOC Conc. By PID  |





175 Metro Center Boulevard • Warwick, Rhode Island 02886-1755  
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 1232 East Broadway Road, Suite 210 • Tempe, Arizona 85282  
 (602) 303-9535 • Fax (602) 921-2883

# CHAIN-OF-CUSTODY RECORD

|   |                        |   |                         |                                 |
|---|------------------------|---|-------------------------|---------------------------------|
| REPORT TO                                 |                        | INVOICE TO                                  |                         | LAB REFERENCE #:                |
| COMPANY <b>FLUOR DANIEL GTI</b>           | PHONE <b>860688151</b> | COMPANY <b>FOSTER WHEELER.</b>              | PHONE <b>2157024030</b> |                                 |
| NAME <b>BARRY KLINE</b>                   | FAX <b>8606888239</b>  | NAME <b>KIRTSHAH</b>                        | FAX <b>2157024047</b>   |                                 |
| ADDRESS <b>431 (F) HAYDEN STATION RD.</b> |                        | ADDRESS <b>ONE OXFORD VALLEY, SUITE 200</b> |                         | TURNAROUND TIME:<br><b>STD.</b> |
| CITY/ST/ZIP <b>WINDSOR, CT. 06095</b>     |                        | CITY/ST/ZIP <b>LANGHORN, PA. 19047</b>      |                         |                                 |

|   |                                      |               |                    |
|---|--------------------------------------|---------------|--------------------|
| CLIENT PROJECT NAME:<br><b>83001-9999 / DOLPHIN MAR</b> | CLIENT PROJECT #:<br><b>87260014</b> | CLIENT P.O.#: | REQUESTED ANALYSES |
|---|--------------------------------------|---------------|--------------------|

| SAMPLE IDENTIFICATION | DATE/TIME SAMPLED | COMPOSITE | GRAB | WATER | SOIL | OTHER | LAB ID | # OF CONTAINERS | REQUESTED ANALYSES |                     |           |           |          |          |          |           |             |  | COMMENTS |  |  |  |  |  |  |  |
|-----------------------|-------------------|-----------|------|-------|------|-------|--------|-----------------|--------------------|---------------------|-----------|-----------|----------|----------|----------|-----------|-------------|--|----------|--|--|--|--|--|--|--|
|                       |                   |           |      |       |      |       |        |                 | TPH 918.1          | EPA 624 MPPE XLENES | EPA 239.2 | EPA 335.1 | EPA 8020 | EPA 6010 | EPA 1602 | EPA 310.5 | CHROMIUM +6 |  |          |  |  |  |  |  |  |  |
| WATER <b>Sump</b>     |                   |           |      |       |      |       |        |                 |                    |                     |           |           |          |          |          |           |             |  |          |  |  |  |  |  |  |  |
| INF. / DM             | 12/17/96 11:20    |           | X    | X     |      |       |        | 1               | X                  |                     |           |           |          |          |          |           |             |  |          |  |  |  |  |  |  |  |
| EFF. / DM             | '                 |           |      |       |      |       |        | 1               | X                  |                     |           |           |          |          |          |           |             |  |          |  |  |  |  |  |  |  |
| EFF. / DM             | '                 |           |      |       |      |       |        | 2               |                    | X                   |           |           |          |          |          |           |             |  |          |  |  |  |  |  |  |  |
| EFF. / DM             | '                 |           |      |       |      |       |        | 1               |                    |                     | X         |           |          |          |          |           |             |  |          |  |  |  |  |  |  |  |
| INF. / DM             | '                 |           |      |       |      |       |        | 1               |                    |                     |           | X         |          |          |          |           |             |  |          |  |  |  |  |  |  |  |
| EFF. / DM             | '                 |           |      |       |      |       |        | 1               |                    |                     |           | X         |          |          |          |           |             |  |          |  |  |  |  |  |  |  |
| INF. / DM             | '                 |           |      |       |      |       |        | 2               |                    |                     |           |           | X        |          |          |           |             |  |          |  |  |  |  |  |  |  |
| EFF. / DM             | '                 |           |      |       |      |       |        | 2               |                    |                     |           |           | X        |          |          |           |             |  |          |  |  |  |  |  |  |  |
| INF. / DM             | '                 |           |      |       |      |       |        | 1               |                    |                     |           |           |          | X        |          |           |             |  |          |  |  |  |  |  |  |  |
| EFF. / DM             | '                 |           |      |       |      |       |        | 1               |                    |                     |           |           |          | X        |          |           |             |  |          |  |  |  |  |  |  |  |
| INF. / DM             | '                 |           |      |       |      |       |        | 1               |                    |                     |           |           |          |          | X        |           |             |  |          |  |  |  |  |  |  |  |
| EFF. / DM             | '                 |           |      |       |      |       |        | 1               |                    |                     |           |           |          |          | X        |           |             |  |          |  |  |  |  |  |  |  |

| 1st | RELINQUISHED BY     | DATE/TIME        | ACCEPTED BY | DATE/TIME | ADDITIONAL REMARKS: | COOLER TEMP: |
|-----|---------------------|------------------|-------------|-----------|---------------------|--------------|
| 1st | <i>Craig Kaulob</i> | 12/17/96 1:50 PM |             | /         |                     |              |
| 2nd |                     | /                |             | /         |                     |              |
| 3rd |                     | /                |             | /         |                     |              |



175 Metro Center Boulevard • Warwick, Rhode Island 02886-1755  
(401) 732-3400 • Fax (401) 732-3499

1232 East Broadway Road, Suite 210 • Tempe, Arizona 85282  
(602) 303-9535 • Fax (602) 921-2883

# CHAIN-OF-CUSTODY RECORD

| REPORT TO  |                                  |           |                                      |                         |             |               | INVOICE TO                                  |                       |                                     |                     |                         |  |  | LAB REFERENCE #:                |          |  |              |  |
|--|----------------------------------|-----------|--------------------------------------|-------------------------|-------------|---------------|---|-----------------------|-------------------------------------|---------------------|-------------------------|--|--|---------------------------------|----------|--|--------------|--|
| COMPANY <b>FLOR DANIEL GTI</b>                           |                                  |           |                                      | PHONE <b>8606881151</b> |             |               | COMPANY <b>FOSTER WHEELER</b>               |                       |                                     |                     | PHONE <b>2157024072</b> |  |  |                                 |          |  |              |  |
| NAME <b>BARRY KLINE</b>                                  |                                  |           |                                      | FAX <b>860688239</b>    |             |               | NAME <b>KIRTI SHAH</b>                      |                       |                                     |                     | FAX <b>2157024047</b>   |  |  |                                 |          |  |              |  |
| ADDRESS <b>431 (F) HAYDEN STATION RD.</b>                |                                  |           |                                      |                         |             |               | ADDRESS <b>ONE OXFORD VALLEY, SUITE 200</b> |                       |                                     |                     |                         |  |  | TURNAROUND TIME:<br><b>STD.</b> |          |  |              |  |
| CITY/ST/ZIP <b>WINDSOR, CT. 06095</b>                    |                                  |           |                                      |                         |             |               | CITY/ST/ZIP <b>LANGHORNE, PA. 19047</b>     |                       |                                     |                     |                         |  |  |                                 |          |  |              |  |
| CLIENT PROJECT NAME:<br><b>83001-9999 / DOUPHIN MART</b> |                                  |           | CLIENT PROJECT #:<br><b>87260014</b> |                         |             | CLIENT P.O.#: |   | REQUESTED ANALYSES    |                                     |                     |                         |  |  |                                 | COMMENTS |  |              |  |
| SAMPLE IDENTIFICATION                                    | DATE/TIME SAMPLED                | COMPOSITE | GRAB                                 | WATER                   | SOIL        | OTHER         | LAB ID                                      | # OF CONTAINERS       | /                                   |                     |                         |  |  |                                 |          |  |              |  |
| <b>INF. C/P EDM</b>                                      | <b>12/11/96 11:52</b>            |           | <b>X</b>                             |                         |             | <b>X</b>      |   | <b>1</b>              | <b>ERR TO 3 BTEL MTR</b>            |                     |                         |  |  |                                 |          |  |              |  |
| <b>EFF. C/P EDM</b>                                      | <b>↓ ↓</b>                       |           | <b>X</b>                             |                         |             | <b>X</b>      |   | <b>1</b>              | <b>MISC. AROMATICS + ALIPHATICS</b> |                     |                         |  |  |                                 |          |  |              |  |
|  |                                  |           |                                      |                         |             |               |   |                       |                                     |                     |                         |  |  |                                 |          |  |              |  |
|  |                                  |           |                                      |                         |             |               |   |                       |                                     |                     |                         |  |  |                                 |          |  |              |  |
|  |                                  |           |                                      |                         |             |               |   |                       |                                     |                     |                         |  |  |                                 |          |  |              |  |
|  |                                  |           |                                      |                         |             |               |   |                       |                                     |                     |                         |  |  |                                 |          |  |              |  |
|  |                                  |           |                                      |                         |             |               |   |                       |                                     |                     |                         |  |  |                                 |          |  |              |  |
|  |                                  |           |                                      |                         |             |               |   |                       |                                     |                     |                         |  |  |                                 |          |  |              |  |
|  |                                  |           |                                      |                         |             |               |   |                       |                                     |                     |                         |  |  |                                 |          |  |              |  |
|  |                                  |           |                                      |                         |             |               |   |                       |                                     |                     |                         |  |  |                                 |          |  |              |  |
|  |                                  |           |                                      |                         |             |               |   |                       |                                     |                     |                         |  |  |                                 |          |  |              |  |
|  |                                  |           |                                      |                         |             |               |   |                       |                                     |                     |                         |  |  |                                 |          |  |              |  |
|  |                                  |           |                                      |                         |             |               |   |                       |                                     |                     |                         |  |  |                                 |          |  |              |  |
|  |                                  |           |                                      |                         |             |               |   |                       |                                     |                     |                         |  |  |                                 |          |  |              |  |
|  |                                  |           |                                      |                         |             |               |   |                       |                                     |                     |                         |  |  |                                 |          |  |              |  |
|  |                                  |           |                                      |                         |             |               |   |                       |                                     |                     |                         |  |  |                                 |          |  |              |  |
|  |                                  |           |                                      |                         |             |               |   |                       |                                     |                     |                         |  |  |                                 |          |  |              |  |
| 1st  | RELINQUISHED BY<br><b>Chauth</b> |           | DATE/TIME<br><b>12/17/96 5:00 PM</b> |                         | ACCEPTED BY |               |   | DATE/TIME<br><b>/</b> |                                     | ADDITIONAL REMARKS: |                         |  |  |                                 |          |  | COOLER TEMP: |  |
| 2nd  |                                  |           |                                      |                         |             |               |   |                       |                                     |                     |                         |  |  |                                 |          |  |              |  |
| 3rd  |                                  |           |                                      |                         |             |               |   |                       |                                     |                     |                         |  |  |                                 |          |  |              |  |
|  |                                  |           |                                      |                         |             |               |   |                       |                                     |                     |                         |  |  |                                 |          |  |              |  |

# TAILGATE MEETING FORM

Project Name: NAVAL SUB BASE

Date: 12-17-96

Project Number: \_\_\_\_\_

Presented by: C. GOWLET

**Check the Topics/Information Reviewed:**

- |   |  |   |
|---|--|---|
| <input checked="" type="checkbox"/> safety glasses, hard hat, safety boots<br><input type="checkbox"/> site safety plan review and location<br><input type="checkbox"/> equipment and machinery familiarization<br><input type="checkbox"/> employee Flight-To-Know/MSDS location<br><input checked="" type="checkbox"/> open pits, excavations, and <u>site hazards</u><br><input checked="" type="checkbox"/> vehicle safety and driving/road conditions<br><input type="checkbox"/> portable tool safety and awareness<br><input type="checkbox"/> overhead utility locations and clearance<br><input type="checkbox"/> first aid, safety, and PPE location<br><input type="checkbox"/> sharp object, rebar, and scrap metal hazards<br><input type="checkbox"/> safety is everyone's responsibility<br><input type="checkbox"/> latex gloves inner/nitrile gloves outer<br><input type="checkbox"/> excavation/trenching inspections/documentation<br><input type="checkbox"/> full face respirators with proper cartridges<br><input type="checkbox"/> upgrade to level c at: FID/PID (___ eV) > ___ ppm<br><input type="checkbox"/> work stoppage at: FID/PID (___ eV) > ___ ppm, % LEL > 10% | <input type="checkbox"/> slips, trips, and falls<br><input type="checkbox"/> directions to hospital<br><input type="checkbox"/> anticipated visitors<br><input type="checkbox"/> electrical ground fault<br><input type="checkbox"/> public safety and fences<br><input type="checkbox"/> excavator swing and loading<br><input type="checkbox"/> orderly site and housekeeping<br><input type="checkbox"/> smoking in designated areas<br><input type="checkbox"/> leather gloves for protection<br><input type="checkbox"/> effects of the night before<br><input type="checkbox"/> vibration related injuries<br><input type="checkbox"/> fire extinguisher locations<br><input type="checkbox"/> eye wash station locations<br><input type="checkbox"/> decontamination procedures | <input checked="" type="checkbox"/> daily work scope<br><input type="checkbox"/> emergency protocol<br><input type="checkbox"/> parking and laydown<br><input type="checkbox"/> hot work permits<br><input type="checkbox"/> strains and sprains<br><input type="checkbox"/> noise hazards<br><input type="checkbox"/> no horseplay<br><input type="checkbox"/> heat and cold stress<br><input type="checkbox"/> backing up hazards<br><input type="checkbox"/> accidents are costly<br><input type="checkbox"/> dust and vapor control<br><input type="checkbox"/> refueling procedures<br><input type="checkbox"/> confined space entry<br><input type="checkbox"/> flying debris hazards |
|---|--|---|

Discussion/Comments/Follow-up Actions: VEHICLE HAZARDS DURING ROAD WORK.

**NAME**

**SIGNATURE**

**COMPANY**

CRAIG GOWLET  
John Kowzun, Jr

*Craig Gowlet*  
*John Kowzun, Jr*

FLUOR DANIEL GTI  
F.D.G. TX

**Actions:**

- Conduct a daily safety meeting prior to beginning each day's site activities.
- Complete form by checking off specific topics and/or hazards.
- Obtain signatures from all GTI staff and GTI subcontractors.
- Follow-up on any noted items and document resolution of any action items.

**FLUOR DANIEL GTI** 

Kennedy Business Park II  
431 (F) Hayden Station Road  
Windsor, CT 06095 USA

**ATTACHMENT 2**

**MONTHLY FIELD ACTIVITY SUMMARY**

**Field Activity Summary  
December, 1996  
New London Naval Submarine Base  
Groton, Connecticut**

| <b>Week Ending</b> | <b>Site</b>  | <b>Period</b>         | <b>Field Activities<sup>1</sup></b>  | <b>Comments</b>   |
|--------------------|--------------|-----------------------|--|---|
| 12/6/96            | Dolphin Mart | Bi-monthly Monitoring | Conducted monthly system monitoring.   | SVE/air sparge system operating normally.                 |
|                    | NEX          |                       | Conducted monthly system monitoring.   | SVE system operating normally.                            |
|                    | OT-8         |                       | Conducted bi-monthly system monitoring.  | Product recovery system inactive due to high water table. |
| 12/13/96           | Dolphin Mart | Bi-monthly Monitoring | Conducted Line Dewatering Test.  | SVE/air sparge system operating normally.                 |
|                    | NEX          |                       | No field activity.   | SVE system operating normally.                            |
|                    | OT-8         |                       | No field activity.   | Product recovery system inactive due to high water table. |
| 12/20/96           | Dolphin Mart | Bi-monthly Monitoring | Completed DMR sampling event. Collected SVE system air sampling event. Conducted bi-monthly system monitoring.   | SVE/air sparge system operating normally.                 |
|                    | NEX          |                       | Completed quarterly groundwater sampling event. Completed DMR sampling event. Collected SVE system air sampling event. Conducted bi-monthly system monitoring. | SVE system operating normally.                            |
|                    | OT-8         |                       | Conducted bi-monthly system monitoring.  | Product recovery system inactive due to high water table. |
| 12/27/96           | 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. |

Note: <sup>1</sup> 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/SPARGE SYSTEM

New London Naval Submarine Base  
Dolphin Mart Site  
Groton, CT

| Date     | Day of Operation | Air Sparge 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 (lbs/hr) | Period Mass Removed (lbs) | Cumulative Mass Removed (lbs) | Comments  |
|----------|------------------|----------------------------|---------------------------|------------------------------------|---------------------------|------------------------------------|---------------------------|--|---------------------------------|---|--------------------------------|------------------------------------|---------------------------|----------------------------------|---------------------------|-------------------------------|---|
| 07/02/96 | 0                | 25                         | 512.26                    | 24.00                              | 0.19                      | 33.00                              | 0.23                      | 1000.00                                  | 6.88                            | 0.00                                    | 0.00                           | —                                  | 0.00                      | 7.30                             | 0.00                      | 0.00                          |   |
| 07/23/96 | 21               | 20                         | 511.12                    | 11.40                              | 0.09                      | 0.00                               | 0.00                      | 200.00                                   | 1.38                            | 0.00                                    | 0.00                           | —                                  | 0.00                      | 1.47                             | 446.86                    | 446.86                        | system operated approx. 102 hrs between 7/2 and 7/23                |
| 08/08/96 | 37               | 32                         | 516.81                    | 18.00                              | 0.14                      | —                                  | 0.00                      | 210.00                                   | 1.44                            | 12.00                                   | 0.10                           | —                                  | 0.00                      | 1.69                             | 209.75                    | 656.61                        | system operated approx. 133 hrs between 7/23 and 8/8                |
| 08/30/96 | 59               | 0                          | 512.26                    | 18.00                              | 0.14                      | —                                  | 0.00                      | 210.00                                   | 1.44                            | 12.00                                   | 0.10                           | —                                  | 0.00                      | 1.69                             | 187.31                    | 843.92                        | system operated approx. 111 hrs between 8/8 and 8/30                |
| 10/02/96 | 92               | 30                         | 509.98                    | 2.30                               | 0.02                      | 0.00                               | 0.00                      | —  | 0.00                            | —                                       | 0.00                           | 36.00                              | 0.29                      | 0.31                             | 0.00                      | 843.92                        | system not in operation from 8/30 to 10/2 due to flow meter problem |
| 10/16/96 | 106              | 30                         | 512.26                    | 2.30                               | 0.02                      | 0.00                               | 0.00                      | —  | 0.00                            | —                                       | 0.00                           | 36.00                              | 0.29                      | 0.31                             | 102.81                    | 946.74                        | system reactivated 10/2/96  |
| 11/19/96 | 140              | 30                         | 512.26                    | 0.38                               | 0.003                     | 0.00                               | 0.00                      | —  | 0.00                            | —                                       | 0.00                           | 5.29                               | 0.04                      | 0.05                             | 143.33                    | 1090.06                       |   |
| 12/17/96 | 168              | 30                         | 512.26                    | 0.12                               | 0.001                     | 0.00                               | 0.00                      | —  | 0.00                            | —                                       | 0.00                           | 1.97                               | 0.02                      | 0.02                             | 20.84                     | 1110.90                       |   |

- 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 12/17/96 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 for 11/19/96 and 12/17/96 are reported in mg/m3.

SOIL VAPOR EXTRACTION 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) | 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  |
|----------|------------------|----------------------------|--|--|------------------------------------|---------------------------|---------------------------|------------------------------------|---------------------------|--|---------------------------------|---|--------------------------------|------------------------------------|---------------------------|---------------------------------|---------------------------|-------------------------------|---|
| 07/31/96 | 0                | 0                          | 54                                     | 199                                    | 253                                | 288.00                    | 0.01                      | —                                  | 0.00                      | 130.00                                   | 0.81                            | 0.00                                    | 0.00                           | —                                  | 0.00                      | 0.82                            | 0.00                      | 0.00                          |   |
| 08/08/96 | 8                | 0                          | 85                                     | 185                                    | 270                                | 307.35                    | 0.04                      | —                                  | 0.00                      | 130.00                                   | 0.81                            | 0.00                                    | 0.00                           | —                                  | 0.00                      | 0.82                            | 78.21                     | 78.21                         | system operated approx. 82 hrs between 7/31 and 8/8<br>24-hour per day system operation began 8/8 |
| 08/22/96 | 22               | 0                          | 85                                     | 185                                    | 270                                | 307.35                    | 0.01                      | —                                  | 130.00                    | 0.81                                     | 0.00                            | 0.00                                    | —                              | 0.00                               | 0.82                      | 88.09                           | 166.30                    |                               |   |
| 09/16/96 | 47               | 0                          | 186                                    | 134                                    | 320                                | 364.27                    | 0.02                      | 0.00                               | 0.00                      | —  | 0.00                            | —                                       | 0.00                           | 61.00                              | 0.49                      | 0.51                            | 0.00                      | 166.30                        |   |
| 10/16/96 | 77               | 0                          | 186                                    | 134                                    | 320                                | 364.27                    | 0.02                      | 0.00                               | 0.00                      | —  | 0.00                            | —                                       | 0.00                           | 42.00                              | 0.34                      | 0.36                            | 310.76                    | 477.06                        |   |
| 11/19/96 | 111              | 0                          | 192                                    | 132                                    | 324                                | 368.83                    | 0.01                      | 0.00                               | 0.00                      | —  | 0.00                            | —                                       | 0.00                           | 22.61                              | 0.18                      | 0.19                            | 221.67                    | 698.72                        |   |
| 12/17/96 | 139              | 0                          | 223                                    | 87                                     | 310                                | 352.89                    | 0.001                     | 0.07                               | 0.00                      | —  | 0.00                            | —                                       | 0.00                           | 6.98                               | 0.06                      | 0.06                            | 82.54                     | 781.27                        |   |

- 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 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) Laboratory results for 11/19/96 and 12/17/96 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 (#) <sup>1</sup> | 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                                 | 15.75                               | Dolphin Mart Site  |
|                                      | 7-3-96      | 8:50        | 375                            | 289                            | 380                        | 320                        | 448                         | 33                                 |                                     |  |
|                                      |             |             |                                |                                |                            |                            |                             |                                    |                                     |  |
| 3                                    | 7-11-96     | 15:10       | 204.8                          | 0                              | 274                        | 0.0                        | 449                         | 25                                 | 16.33                               | Dolphin Mart Site  |
|                                      | 7-12-96     | 7:30        | 534                            | 268                            | 318                        | 206                        | 450                         | 37                                 |                                     |  |
|                                      |             |             |                                |                                |                            |                            |                             |                                    |                                     |  |
| 4                                    | 7-12-96     | 9:55        | 588                            | 15                             | NS                         | NS                         | 450                         | 30                                 | 21.33                               | 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                                 |                                     |  |
| 5                                    | 7-19-96     | 11:30       | 105                            | 0                              | NS                         | NS                         | 440                         | 16                                 | 25.83                               | 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                                 |                                     |  |
| 6                                    | 7/24/96     | 9:45        | 96                             | 0                              | NS                         | NS                         | 450                         | 16                                 | 40                                  | 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                                 |                                     |  |

Carbon Breakthrough Matrix  
Dolphin Mart and NEX Site

Groton Naval Submarine Base  
Groton, CT

| Carbon Breakthrough (#) <sup>1</sup> | 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                                 | 48                                  | 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                                  | 290                                 | 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                                  |                                     |  |
| 9                                    | 8/1/96      | 6:50        | 44                             | 8                              | NS                         | NS                         | 116                         | 0                                  | 189                                 | 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                                  |                                     |  |

Carbon Breakthrough Matrix  
Dolphin Mart and NEX Site

Groton Naval Submarine Base  
Groton, CT

| Carbon Breakthrough (#) <sup>1</sup> | 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  |
|--------------------------------------|-------------|-------------|--------------------------------|--------------------------------|----------------------------|----------------------------|-----------------------------|------------------------------------|-------------------------------------|---|
| 10                                   | 8/22/96     | 12:00       | 120                            | 0.0                            | NS                         | NS                         | 448                         | 30                                 | 116                                 | Dolphin Mart Site. C/D Carbon Units                             |
|                                      | 8/24/96     | 12:30       | 141                            | 55                             | NS                         | NS                         | 445                         | 35                                 |                                     |   |
|                                      |             |             |                                |                                |                            |                            |                             |                                    |                                     |   |
| 11                                   | 8/22/96     | 16:00       | 29                             | 0.0                            | NS                         | NS                         | 232                         | 0                                  | NA                                  | 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                           |                                    |                                     |   |

Carbon Breakthrough Matrix  
Dolphin Mart and NEX Site

Groton Naval Submarine Base  
Groton, CT

| Carbon Breakthrough (#) <sup>1</sup> | 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                                 |                                     |  |
|                                      |             |             |                                |                                |                            |                            |                             | 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 |

Notes:

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

Well Gauging Data  
 NEX S  
 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   |

Notes:

NG = Not Gauged

(1) Depth to Product/Depth to Water

Grsubbas123\Gr168.wk4

Well Gauging L  
 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) | Total 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                            |

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 4

| Well | Date  | BTEX    |         |              |         | MTBE | TPH<br>(By EPA Method<br>418.1) | Total Volatiles<br>(by EPA Method<br>8010/8020) | DRO<br>(by EPA Method<br>8100M) | GRO<br>(by EPA Method<br>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                            |
| 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                              |
| 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                            |
| 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                            |

Notes: NS = Not sampled (NS results have been placed in grey)  
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 1**  
**Historical Groundwater Sampling Results**  
**Dolphin Mart - March 1995/November 1996**  
**Naval Submarine Base, Groton, Ct.**

(analytical results in µg/l)  
page 2 of 4

| Well | Date  | BTEX    |         |              |         | MTBE | TPH<br>(By EPA Method<br>418.1) | Total Volatiles<br>(by EPA Method<br>8010/8020) | DRO<br>(by EPA Method<br>8100M) | GRO<br>(by EPA Method<br>8015M) |
|------|-------|---------|---------|--------------|---------|------|---------------------------------|---|---------------------------------|---------------------------------|
|      |       | Benzene | Toluene | Ethylbenzene | Xylenes |      |                                 |   |                                 |                                 |
| 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                            |
| 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                              |
| 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       | 100          | 2       | 19   | <1,000                          | 166   | 1,100                           | 500                             |

Notes: NS = Not sampled (NS results have been placed in grey)  
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 1**  
**Historical Groundwater Sampling Results**  
**Dolphin Mart - March 1995/November 1996**  
**Naval Submarine Base, Groton, Ct.**

(analytical results in µg/l)  
 page 3 of 4

| Well   | Date  | BTEX    |         |              |         | MTBE | TPH<br>(By EPA Method<br>418.1) | Total Volatiles<br>(by EPA Method<br>8010/8020) | DRO<br>(by EPA Method<br>8100M) | GRO<br>(by EPA Method<br>8015M) |
|--------|-------|---------|---------|--------------|---------|------|---------------------------------|---|---------------------------------|---------------------------------|
|        |       | Benzene | Toluene | Ethylbenzene | Xylenes |      |                                 |   |                                 |                                 |
| 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                            |
| 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                            |
| 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                              |
| 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                              |

Notes: NS = Not sampled (NS results have been placed in grey)  
 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 1**  
**Historical Groundwater Sampling Results**  
**Dolphin Mart - March 1995/November 1996**  
**Naval Submarine Base, Groton, Ct.**

(analytical results in µg/l)  
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| Well   | Date  | BTEX    |         |              |         | MTBE   | TPH<br>(By EPA Method<br>418.1) | Total Volatiles<br>(by EPA Method<br>8010/8020) | DRO<br>(by EPA Method<br>8100M) | GRO<br>(by EPA Method<br>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                              |
| MW-1   | 11/96 | 3       | <1.0    | 5            | <1.0    | <1,000 | 11                              | 1,000   | <500                            |                                 |
| MW-2   | 11/96 | 4       | <1.0    | 14           | <1.0    | 4      | <1,000                          | 28  | 1,200                           | <500                            |
| WE-5   | 11/96 | 240D    | 410D    | 720D         | 4,300E  | 27     | 9,000                           | 5,697   | 12,000                          | 8,900                           |
| WE-6   | 11/96 | 5       | 210D    | 71D          | 630D    | <1.0   | <1,000                          | 916   | 2,000                           | 1,400                           |
| WE-2B  | 11/96 | 1       | <1.0    | <1.0         | <1.0    | <1.0   | <1,000                          | 3   | <500                            | <500                            |

Notes: NS = Not sampled (NS results have been placed in grey)  
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 3

| Well  | Date  | BTEX    |         |              |         | MTBE | TPH<br>(By EPA Method<br>418.1) | Total Volatiles<br>(by EPA Method<br>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    |
| 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 |
| 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 |
| 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  |

Notes: NS = Not sampled (NS results have been placed in grey)  
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The trip blank contained a total 8010/8020 concentration of 10 µg/l  
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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 2 of 3

| Well   | Date  | BTEX    |         |              |         | MTBE | TPH<br>(By EPA Method<br>418.1) | Total Volatiles<br>(by EPA Method<br>8010/8020) | DRO   | GRO   |
|--------|-------|---------|---------|--------------|---------|------|---------------------------------|---|-------|-------|
|        |       | Benzene | Toluene | Ethylbenzene | Xylenes |      |                                 |   |       |       |
| 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    |
| 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    |
| ERM-11 | 11/96 | <1.0    | <1.0    | <1.0         | <1.0    | <1.0 | <1,000                          | 3   | <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 |
| 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  |

Notes: NS = Not sampled (NS results have been placed in grey)  
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The trip blank contained a total 8010/8020 concentration of 10 µg/l  
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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 3 of 3

| Well   | Date  | BTEX    |         |              |         | MTBE | TPH<br>(By EPA Method<br>418.1) | Total Volatiles<br>(by EPA Method<br>8010/8020) | DRO    | GRO    |
|--------|-------|---------|---------|--------------|---------|------|---------------------------------|---|--------|--------|
|        |       | Benzene | Toluene | Ethylbenzene | Xylenes |      |                                 |   |        |        |
| 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 |
| ERM-15 | 11/96 | 280     | 760     | 330          | 1,100   | <40  | 1,000                           | 2,517   | 2,300  | 4,500  |
| ERM-16 | 11/96 | 37      | <2.0    | 13           | 16      | 30   | <1,000                          | 68  | 4,400  | 2,000  |
| ERM-17 | 11/96 | 10      | <1.0    | <1.0         | <1.0    | 9    | <1,000                          | 11  | 600    | 600    |
| ERM-19 | 11/96 | <1.0    | <1.0    | <1.0         | <1.0    | <1.0 | <1,000                          | 1   | <500   | <500   |

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