



April 12, 2010

Mr. Sigfredo Souchet  
Chevron Puerto Rico LLC  
St.1 # 2, 4th Floor, Suite 400  
Guaynabo, Puerto Rico 00968

**RE: REPORT- CANEEL BAY EMERGENCY RESPONSE  
ST. JOHN, USVI  
ERTEC PROJECT: E-104290**

Dear Mr. Souchet:

Enclosed is the Report describing the Emergency Response activities conducted from March 15-19, 2010 at the Caneel Bay Hotel and Resort in St. John, USVI.

If you have questions regarding this matter, please call us at 792-8902.

Cordially yours,

A handwritten signature in black ink, appearing to read "J. Agrelot", written over a horizontal line.

José C. Agrelot, MSCE, PE  
Consulting Engineer

C: Eng. Carlos Fuentes  
Eng. José De La Rosa



**REPORT  
CANEEL BAY EMERGENCY RESPONSE  
ST. JOHN, USVI**

**ERTEC JOB: E-104290**

**Prepared for:**

**PREPARED FOR:  
CHEVRON PUERTO RICO LLC  
ST. 1 # 2, 4TH FLOOR, SUITE 400  
GUAYNABO, PR 00968**

**April 12, 2010**

**Prepared by:**

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**REPORT  
CANEEL BAY EMERGENCY RESPONSE  
ST. JOHN, USVI**

**ERTEC JOB: E-104290**

## **1.0 INTRODUCTION**

On March 15, 2010, Chevron Puerto Rico LLC (Chevron) retained the consulting services of Environmental Resource Technologies P.S.C (ERTEC) to respond to an emergency diesel fuel release at the Caneel Bay Hotel and Resort on the island of St. John that is part of the United State Virgin Islands (USVI). **Figure 1** presents the location of the facility.

The purpose of this emergency response was to confirm the cause of the release and conduct a preliminary evaluation of the extent of the diesel release from the underground line that conveys fuel from an above storage tank to a dispensing unit at site. The initial efforts conducted by ERTEC's personnel included the following:

- Identify potential sensitive receptors in the immediate vicinity;
- Remove soil exhibiting diesel fuel from the trench where the impacted line was found;
- ~~Remove the damaged segment of the line and seal the portion of the line to be used in the future;~~
- Perform a preliminary delineation of the extent of diesel impacts to soil through excavation of test pits;

- Perform field screening of soil samples obtained from the test pits using and OVA and hydrocarbon detector tubes;
- Perform laboratory analysis of soil samples from selected locations; and
- Prepare this report that summarizes the results of the emergency response action.

The following sections include a description of field data collection activities and the laboratory analytical results.

## **2.0 SITE DESCRIPTION**

### **2.1 Site Location**

**Figure 1** shows the general location of Caneel Bay Resort on the St. John, USVI U.S.G.S. topographic quadrangle map. The Site is located at the northwest corner of the island. **Figure 2** is a Google Earth aerial photograph showing the location of the "area of concern" within Caneel Bay Hotel and Resort. This area is located southeast of the beachfront hotel and west of an access road along which are some residences and commercial establishments. **Figure 3** is a diagram of the "area of concern" showing the following features:

- 6,000-gallon capacity above ground (steel) storage tank (AGST) used to store diesel;
- 4,000-gallon steel gasoline AGST;
- Diesel and gasoline dispenser;
- Gasoline and diesel pipelines leading from the AGSTs to the dispenser;
- Power generator building; and
- Location of the ruptured diesel pipeline.

## 2.2 Incident History

On March 5, 2010, a local contractor, RAMVAR, visited the Site to install a grounding rod for the existing 6,000-gallon diesel fuel AGST. As the grounding rod was installed, it punctured the fiberglass diesel fuel line, which is buried at a depth of less than one foot, at the location shown on **Figure 3**. However, according to Eng. Carlos Fuentes of Chevron, the occurrence of the puncture was not known until March 15, 2010 when Caneel Bay personnel visually observed diesel fuel stains on the ground surface. Based on fuel inventory information, it is estimated that approximately 1,000 gallons of diesel fuel was released to the shallow subsurface soil (the depth of the diesel fuel line is approximately one foot). Diesel fuel stains are present on the ground surface at several locations in the "area of concern". The photographs in **Appendix A** show examples of the stained areas. The locations and direction of the photographs are provided on **Figure 4**.

On March 15, 2010, ERTEC was contacted by Chevron to provide emergency response services regarding this release. The response activities are described in this report.

## 3.0 FIELD WORK

### 3.1 Site Reconnaissance

A site reconnaissance was conducted by ERTEC personnel on March 16, 2010. The purpose of this visit was to perform the emergency response measures described in **Section 1: Introduction**. Eng. Carlos Fuentes of Chevron and Mr. Nestor Ramos of RAMVAR were present during the site reconnaissance.

### 3.1.1 Initial Activities

When ERTEC personnel arrived at the site, a survey of the site and immediate surrounding area was conducted to determine if potential sensitive receptors were present and had been impacted by the diesel fuel release. No sensitive receptors were identified.

Ramvar excavated a shallow trench to expose the point of rupture of the diesel fuel line as shown on **Figure 2**. The excavated soil consisted of fill material composed mainly of sandy silt. The line was then cut at a point between the rupture and the diesel AGST and the AGST end of the line was capped. No residual diesel fuel was present in the line. The remaining portion of the line, toward the northwest, was excavated and removed. Impacted soil was excavated and placed on the concrete slab (previously used as a foundation for an AGST that was removed in the past) located adjacent to and southwest of the ruptured line (**Figure 3**). The concrete slab was first lined with polyethylene sheeting, and additional polyethylene sheeting was placed on top of the impacted soil. The open trench was subsequently backfilled with clean sandy silt fill material. The ground surface at the area of rupture line was covered with polyethylene sheeting to prevent migration of residual diesel should a rain event occur.

### 3.1.2 Test Pit Excavation

During March 16, 17 and 18, 2010, ten (10) test pits identified at **Pits C-1** through **C-10** were excavated by RAMVAR under the supervision of ERTEC personnel within the "area of concern" at the locations shown on **Figure 3**. The rationale for the selected test pit locations is detailed below:

- **Pit C-1:** Located on the diesel fuel underground line adjacent to the 4,000-gallon gasoline AGST to evaluate how far diesel has migrated along the line backfill.
- **Pit C-2:** Located at the southeast end of the ruptured portion of the diesel fuel line to evaluate whether diesel has migrated along the line backfill.

- **Pit C-3:** Located at the northwest end of the ruptured portion of the diesel fuel line to evaluate whether diesel has migrated along the line backfill.
- **Pit C-4:** Located north of the northwest end of the ruptured portion of the diesel fuel line to evaluate whether diesel has migrated away from the line.
- **Pit C-5:** Located on the underground electrical line that originates at the power generator building and extends toward the northwest to evaluate whether diesel has been intercepted by and migrated along the backfill of this line. During the excavation of this pit, the line was encountered, and this pit location was abandoned.
- **Pit C-6:** Located northeast of the electrical line to evaluate whether diesel has migrated away from the electrical line backfill.
- **Pit C-7:** Located on the electrical line to evaluate whether diesel has migrated along the backfill of this line.
- **Pit C-8:** Located at the dispenser end of the diesel underground line to evaluate how far diesel may have migrated along the line backfill.
- **Pit C-9:** "Background" sample located northeast of the power generator building.
- **Pit C-10:** "Background" sample located at the northwest corner of the "area of concern".

The test pits were excavated to a depth of two (2) or three (3) feet using a small hydraulic backhoe.

### 3.1.3 Field Screening of Soil Samples

Nine (9) soil samples were collected from the test pits described in **Section 3.1.2** (no sample was collected from **Pit C-5** due to its proximity to the underground power line. The soil samples were screened in the field using two methods: (1) A MiniRAE 2000 organic vapor analyzer with a photo ionization detector (OVA-PID) used to measure organic vapor concentrations in parts per million (ppm) and Detector Tubes (DT) used to measure total petroleum hydrocarbon (TPH) concentrations in parts per million (ppm). Table 1 lists the sampling dates, depths and screening results detected in the field using the above described methods.



### 3.1.4 Soil Sampling for Laboratory Analysis

Eight (8) soil samples were collected from depths of two or three feet for laboratory analysis. The soil samples were identified as samples **S-1** through **S-8**. Samples **S-1** and **S-4** through **S-8** were collected during the excavation of the test pits described in **Section 3.1.2**. Samples **S-2** and **S-3** were collected during the excavation of the ruptured line described in **Section 3.1.1**. The locations of samples collected for laboratory analysis are shown on **Figure 5**. **Table 2** lists the test pits, sampling dates, depths and laboratory analytical results.

The soil samples for laboratory analysis were analyzed by Pace Analytical in St. Rose, Louisiana. Soil samples were analyzed for Total Petroleum Hydrocarbons in the Diesel Range Organics (TPH-DRO) following EPA method 8015B.

## 4.0 FIELD SCREENING AND LABORATORY ANALYTICAL RESULTS

### 4.1 Field Screening Results

The OVA-PID field screening results are provided in **Table 1**. The screening results ranged from 0.0 to 805 ppm. The highest screening result was detected in the sample obtained from pit **C-4** located north of the northwest end of the ruptured diesel fuel line. The four (4) samples collected from Pits **C-6** and **C-8** through **C-10** resulted in 0.0 ppm. The remaining four (4) soil samples screening results ranged from 178 ppm to 541 ppm.

The detector tube (DT) screening results are also provided in **Table 2**. The results ranged from Non Detect (ND) to 1,500 ppm. The highest screening result using the DT was obtained from the soil samples obtained from pits **C-2**, **C-4** and **C-7**. Results of ND were obtained from the same test pits as the 0.0 results for the OVA-PID.

~~The OVA-PID and detector tube results are plotted on **Figure 6**.~~

## 4.2 Laboratory Analytical Results

**Table 2** provides a summary of the soil sample laboratory analytical results in milligrams per kilogram (mg/kg) and the same are depicted on **Figure 5. Appendix B** includes the complete laboratory analytical report signed by a Puerto Rico-licensed chemist.

The soil samples analytical results for TPH-DRO are provided below:

- S-1 8,120 mg/kg;
- S-2 9,600 mg/kg;
- S-3 10,500 mg/kg;
- S-4 351 mg/kg;
- S-5 ND;
- S-6 7,050 mg/kg;
- S-7 17,300 mg/kg; and
- S-8 13 mg/kg.

Five (5) of the detected concentrations exceeded 7,000 mg/kg. Three (3) of these soil samples were collected from the trench where the ruptured segment of the diesel fuel line was found, one soil sample was collected from the diesel fuel line adjacent to the gasoline AGST, and one soil sample was collected from the electrical line trench that begins at the emergency generator building extending to the northwest.

## 5.0 CONCLUSIONS

The following conclusions are based on the preliminary data obtained during the immediate response actions implemented at the Caneel Bay site:

- The source of the impacted soils at the site is the shallow fiberglass line ruptured during the installation of a grounding rod near the 6,000-gallon diesel AGST.

- Shallow soil [depth of up to three (3) feet] has been impacted by the diesel fuel released from the ruptured fuel line.
- The highest concentrations of TPH-DRO detected by laboratory analysis of shallow (2-3 feet deep) soil samples are located along the ruptured trench segment of the diesel fuel line, along the diesel fuel line down gradient of the ruptured segment, and along the electric line trench located down gradient of the ruptured segment.
- Diesel fuel appears to have migrated along the diesel fuel line trench backfill adjacent to the AGST concrete pad toward the northwest from the rupture, and along the diesel fuel line trench backfill toward the northeast from the rupture line and subsequently toward the direction of the dispenser.
- Diesel fuel appears to have been intercepted by the electric line trench backfill and has migrated toward the northwest along this line trench.
- No impacted potential sensitive receptors appear to be present in the immediate vicinity of the release.

## 6.0 LIMITATIONS

This report was prepared by ERTEC for and is intended for the exclusive use of the Client (Chevron Puerto Rico LLC). The report's contents may not be relied upon by any party other than the Client without the express written permission of ERTEC.

The report's findings are based on conditions that existed at the time of ERTEC's site visits and should not be relied upon to precisely represent conditions at any other time.

The conclusions included in this report are based on: ERTEC's observation of existing site conditions; our interpretation of site history and site usage information provided by the Client; and the results of a program of subsurface exploration, sample screening, and chemical testing. The concentrations of contaminants ERTEC measured may not be representative of conditions between locations sampled. Be aware that conditions may change at any sampled or un-sampled locations as a function of time in response to natural conditions, chemical reactions, and/or other events.

Conclusions about site conditions under no circumstances comprise a warranty that conditions in all areas within the site and beneath structures are of the same quality as those sampled. Recognize, too, that contamination may exist in forms not indicated by the exploration ERTEC conducted.

The scope of service ERTEC implemented was based, in part, on rules and regulations that ERTEC understood to be current or expected at the time ERTEC developed its proposal. Changes in regulations, interpretations, and/or enforcement policies may occur at any time and such changes could affect the extent of remediation required.

**FIGURES**

**REPORT  
CANEEL BAY EMERGENCY RESPONSE  
ST. JOHN, USVI  
ERTEC JOB: E-104290**

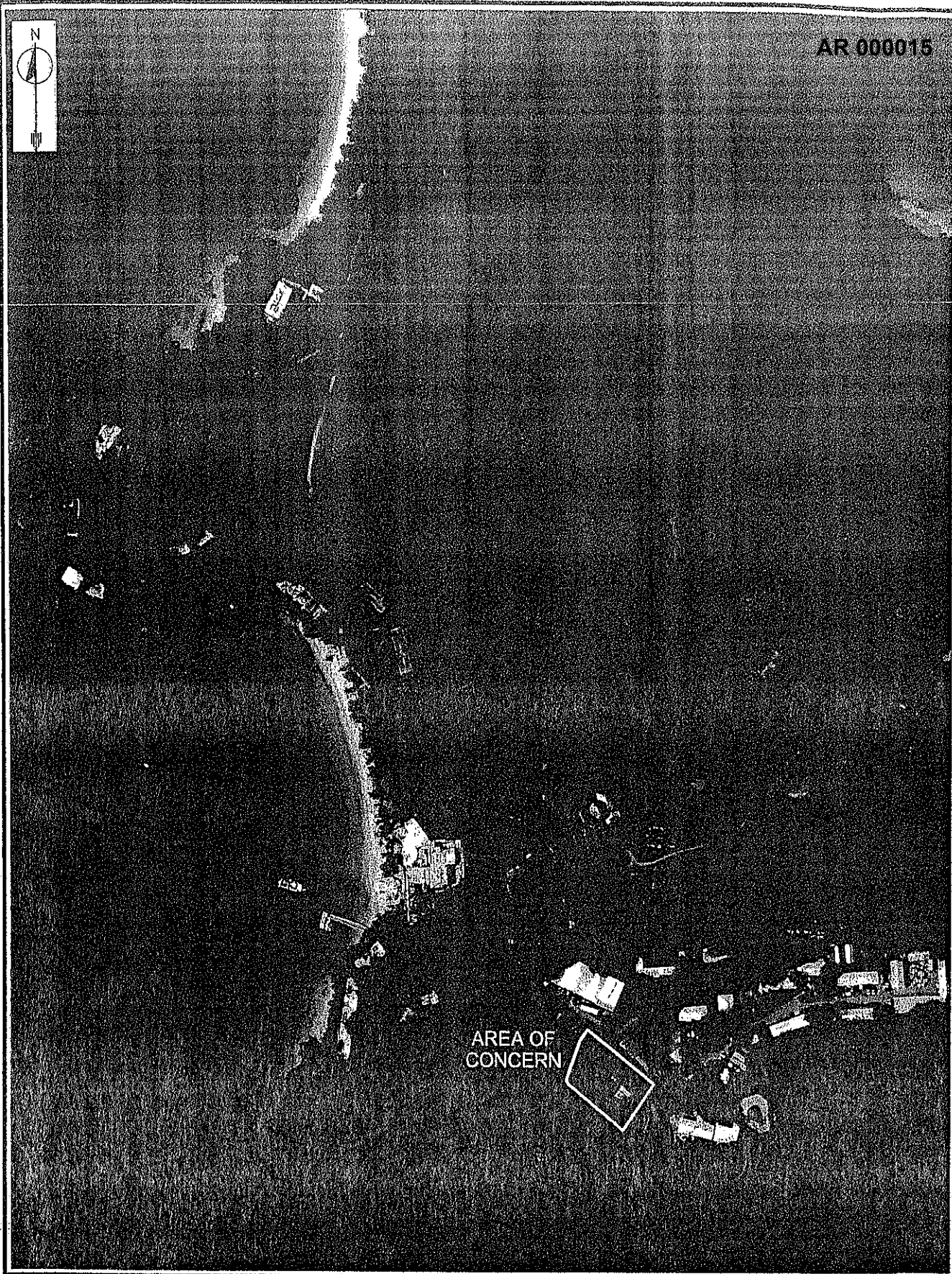
FIGURE 1 - SITE LOCATION MAP  
EMERGENCY RESPONSE  
TEXACO INDUSTRIAL - CANEEL BAY  
ST. JOHN USVI







AR 000015



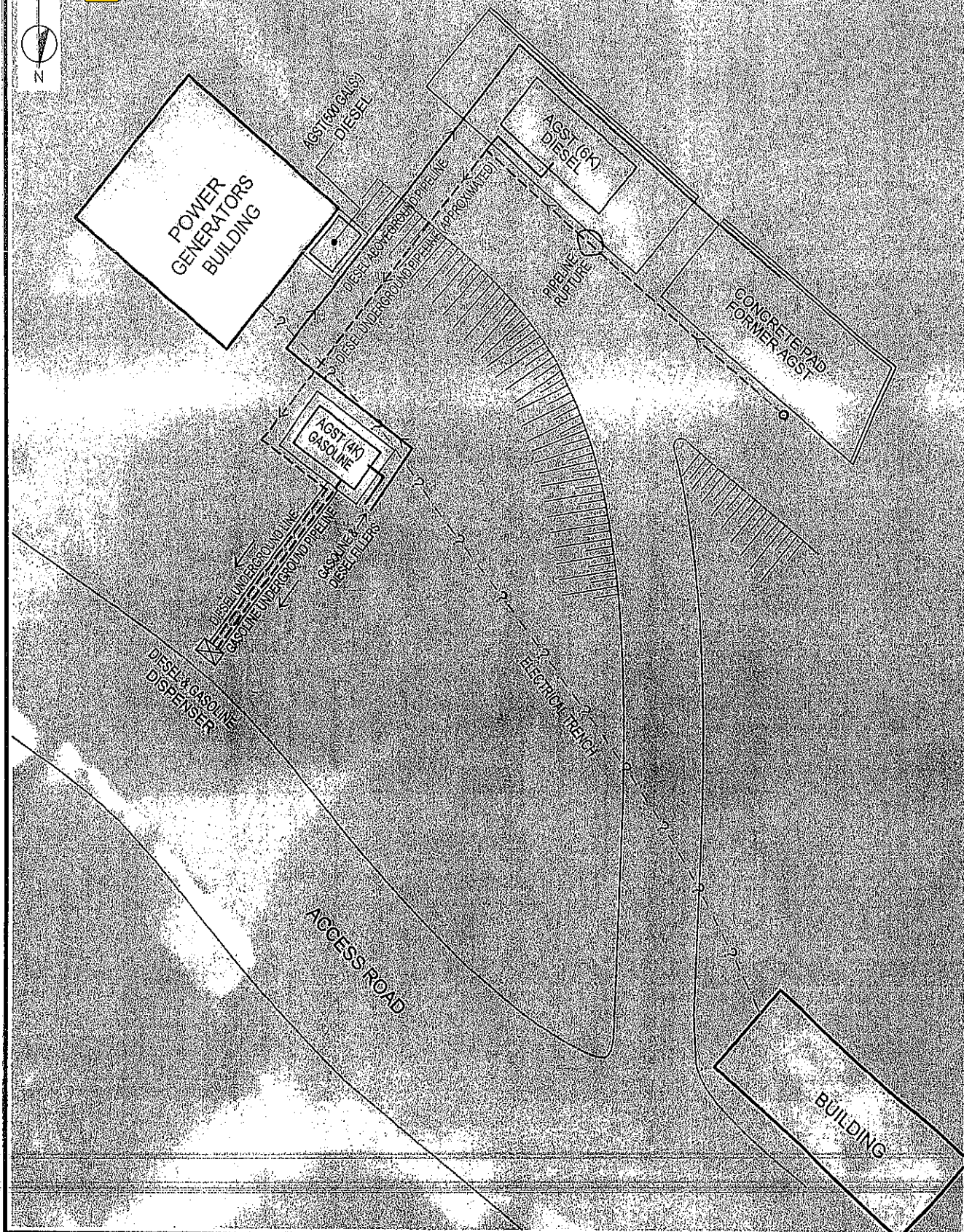
AREA OF  
CONCERN

|                |
|----------------|
| SCALE: nts     |
| REV: DC        |
| FILE: FIG 2    |
| DIB. POR: EDH  |
| JOB: E-10-4290 |

FIGURE 2 - AERIAL PHOTO (2006) SHOWING THE AREA OF CONCERN  
EMERGENCY RESPONSE  
TEXACO INDUSTRIAL - CANEEL BAY  
ST. JOHN USVI



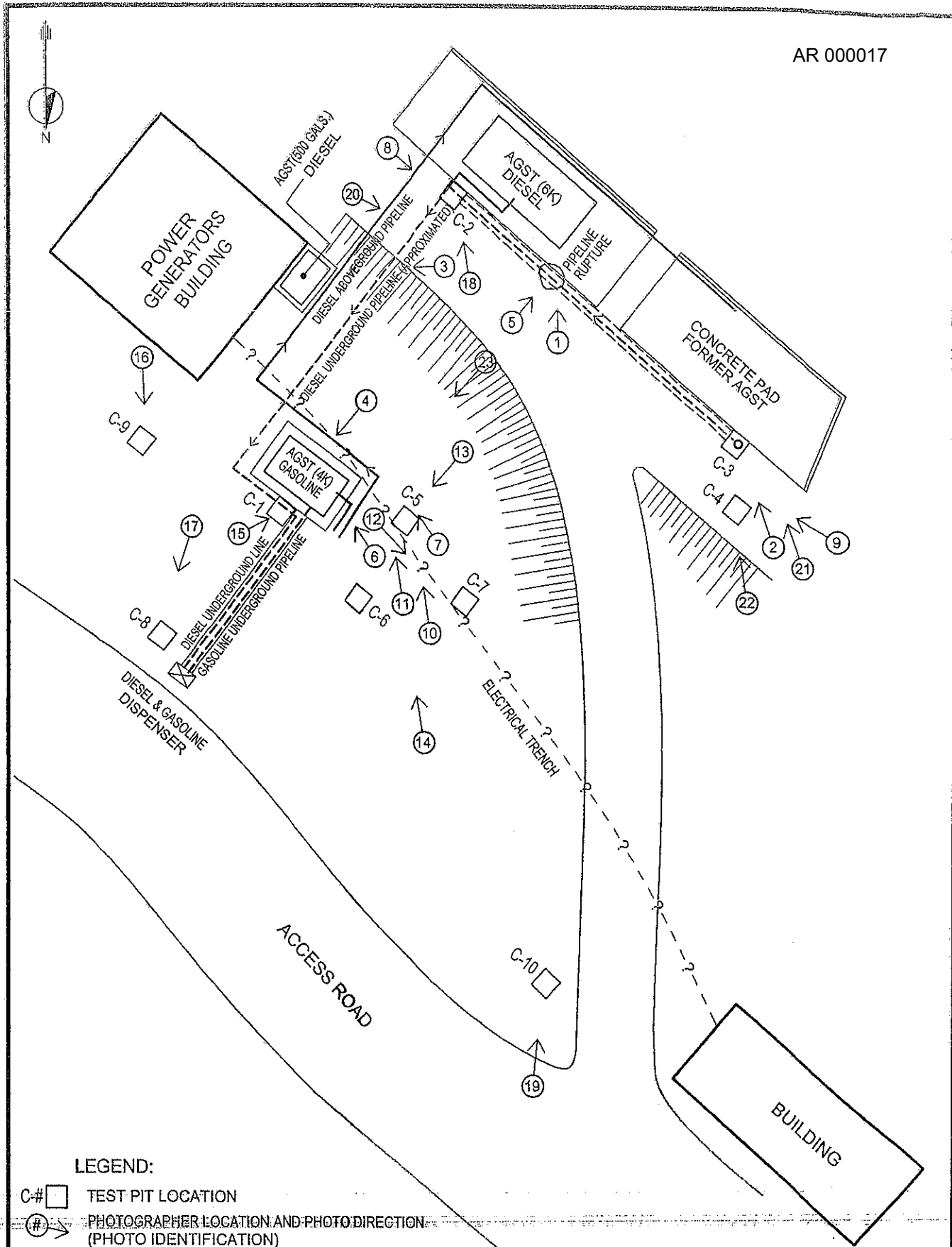




|                |
|----------------|
| SCALE: nts     |
| REV.: UF       |
| FILE: FIG 3    |
| DIB. POR: EDH  |
| JOB: E-10-4290 |

FIGURE 3 - SITE LAYOUT (AREA OF CONCERN)  
EMERGENCY RESPONSE  
TEXACO INDUSTRIAL - CANEEL BAY  
ST. JOHN USVI





SCALE: nts

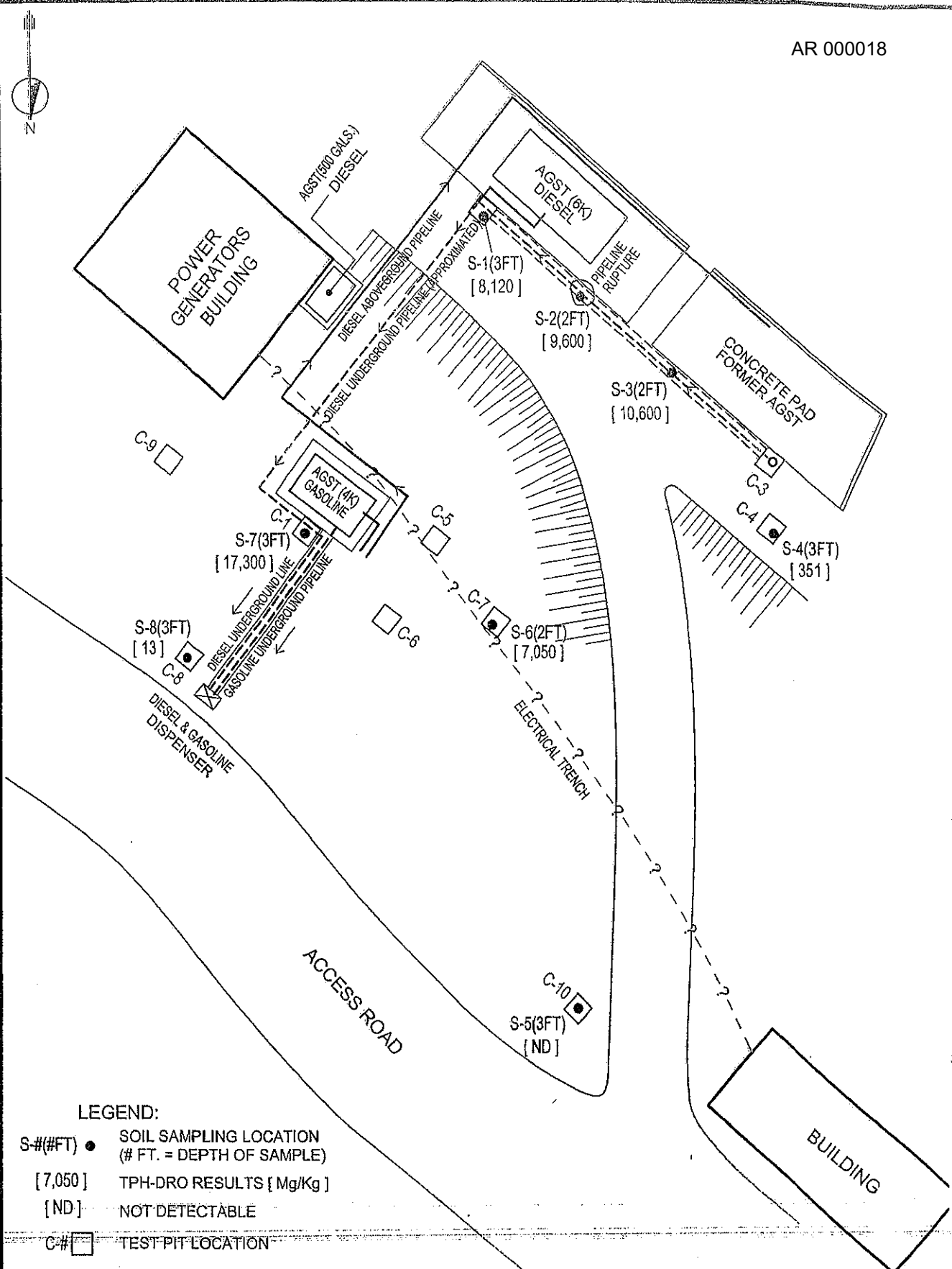
REV.: UF / DC

FILE: FIG 4

DIB. POR: EDH

JOB: E-10-4290

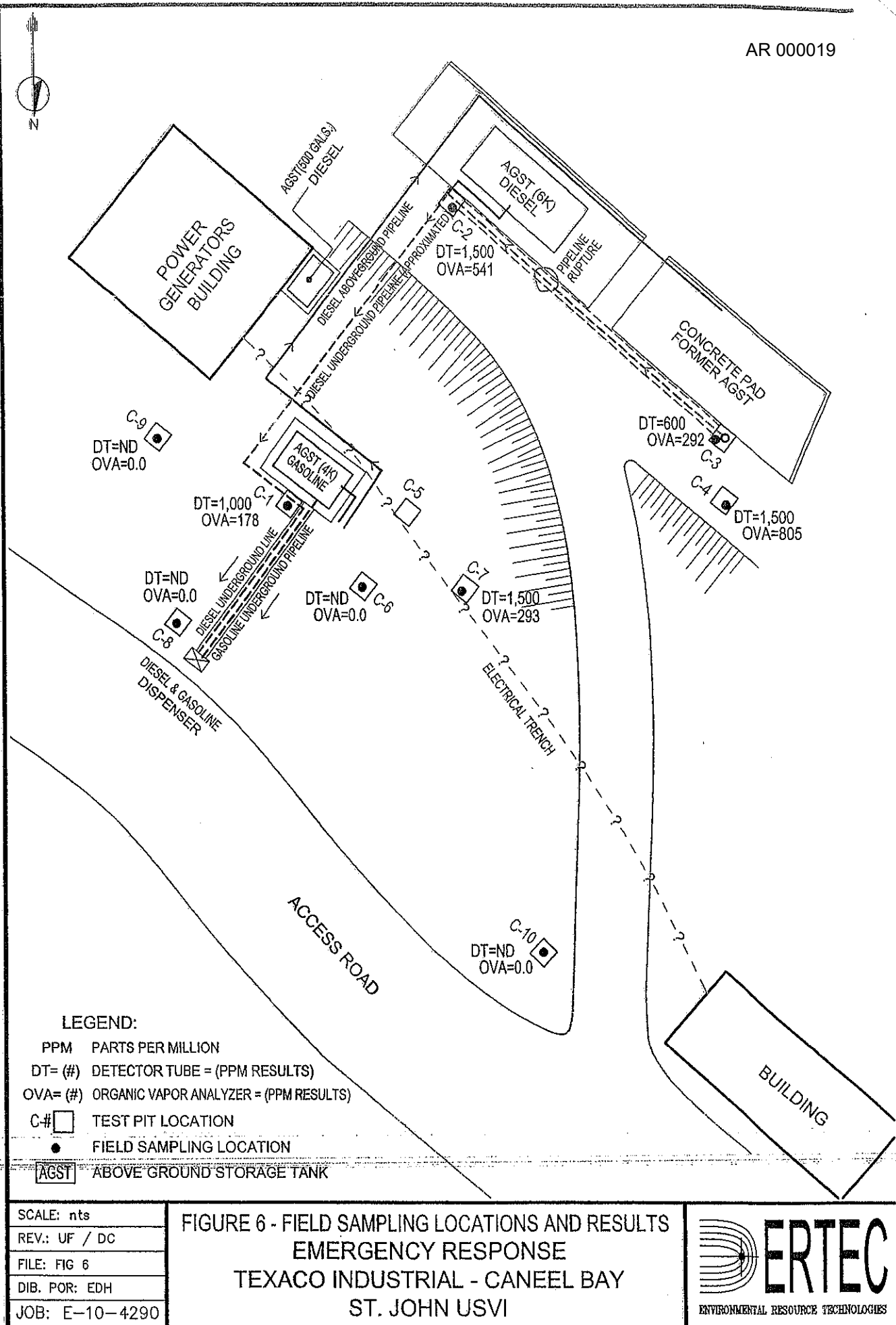
**FIGURE 4 - PHOTO ANALYSIS (AREA OF CONCERN)**  
**EMERGENCY RESPONSE**  
**TEXACO INDUSTRIAL - CANEEL BAY**  
**ST. JOHN USVI**



SCALE: nts  
 REV.: UF  
 FILE: FIG 5  
 DIB. POR: EDH  
 JOB: E-10-4290

FIGURE 5 - ANALYTICAL SAMPLING LOCATION & RESULTS FOR TPH-DRO  
 EMERGENCY RESPONSE  
 TEXACO INDUSTRIAL - CANEEL BAY  
 ST. JOHN USVI







**TABLES**

**REPORT  
CANEEL BAY EMERGENCY RESPONSE  
ST. JOHN, USVI  
ERTEC JOB: E-104290**

**TABLE 1**  
**FIELD SCREENING RESULTS**  
**CANEEL BAY EMERGENCY RESPONSE**  
**ST. JOHN, USVI**  
**PROJECT NUMBER: E-104290**

| Test Pit Identification | Sampling Date | Sample Depth <sup>1</sup> | TPH Detector Tube Reading (ppm) | OVA-PID Reading (ppm) |
|-------------------------|---------------|---------------------------|---------------------------------|-----------------------|
| C-1                     | 03/16/10      | 2                         | 1000                            | 178                   |
| C-2                     | 03/17/10      | 3                         | 1500                            | 541                   |
| C-3                     | 03/17/10      | 3                         | 600                             | 292                   |
| C-4                     | 03/17/10      | 3                         | 1500                            | 805                   |
| C-5                     | 03/18/10      | 3                         | NA                              | NA                    |
| C-6                     | 03/18/10      | 3                         | ND                              | 0.0                   |
| C-7                     | 03/18/10      | 2                         | 1500                            | 293                   |
| C-8                     | 03/18/10      | 3                         | ND                              | 0.0                   |
| C-9                     | 03/18/10      | 3                         | ND                              | 0.0                   |
| C-10                    | 03/18/10      | 3                         | ND                              | 0.0                   |

ppm: parts per million

<sup>1/</sup>: Sample depth in feet from ground surface

NA: Not analyzed

ND: Not detected

TPH: Total petroleum hydrocarbons

TABLE 2

RESULTS OF CHEMICAL ANALYSIS FOR TPH IN SOIL  
CANEEL BAY EMERGENCY RESPONSE  
ST. JOHN, USVI  
PROJECT NUMBER: E-104290

| Sample ID                       | Test Pits | Sample Depth (ft.) <sup>1</sup> | Sampling Date | TPH- Diesel | Detection Limit |
|---------------------------------|-----------|---------------------------------|---------------|-------------|-----------------|
| Soil Samples - (mg/kg)          |           |                                 |               |             |                 |
| S-1                             | C-2       | 3                               | 03/17/10      | 8,120       | 98.40           |
| S-2                             | Note 1    | 2                               | 03/16/10      | 9,600       | 197.00          |
| S-3                             | Note 1    | 2                               | 03/16/10      | 10,600      | 196.00          |
| S-4                             | C-4       | 3                               | 03/17/10      | 351         | 9.43            |
| S-5                             | C-10      | 3                               | 03/18/10      | ND          | 9.82            |
| S-6                             | C-7       | 2                               | 03/18/10      | 7,050       | 98.00           |
| S-7                             | C-1       | 3                               | 03/18/10      | 17,300      | 193.00          |
| S-8                             | C-8       | 3                               | 03/18/10      | 13          | 9.82            |
| Duplicate Sample - (mg/kg)      |           |                                 |               |             |                 |
| S-A <sup>2</sup>                | Note 1    | 2                               | 03/16/10      | 79,980      | 93.1            |
| Quality Control Blanks - (mg/L) |           |                                 |               |             |                 |
| EB031810                        | ---       | NA                              | 03/18/10      | ND          | 0.5000          |
| FB031810                        | ---       | NA                              | 03/18/10      | ND          | 0.5000          |

## Legend

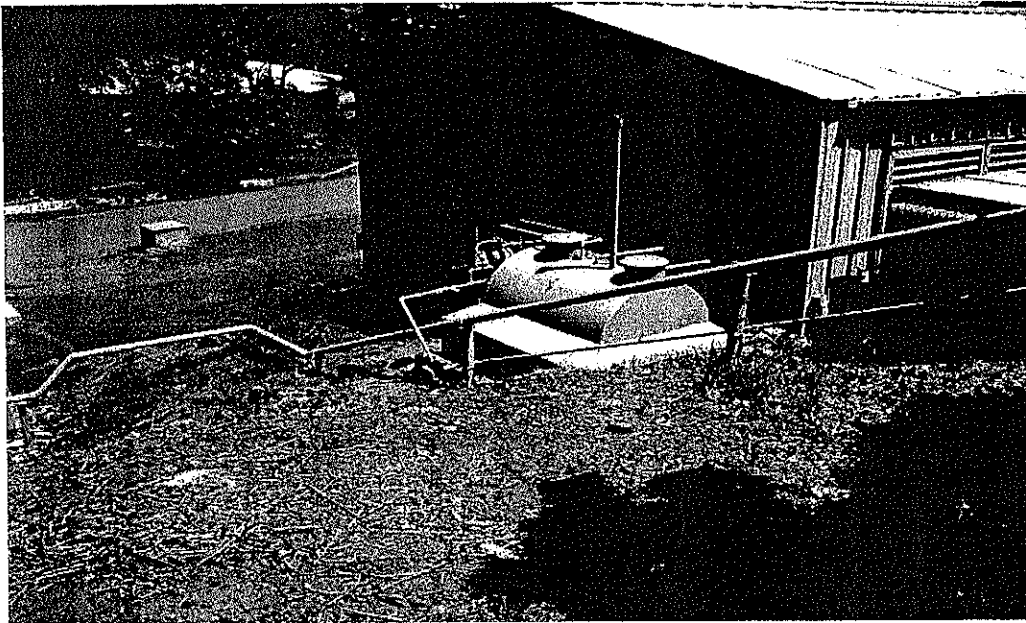
EB: Equipment blank  
FB: Field blank  
mg/kg: milligrams per kilogram  
NA: Not applicable  
ND: Not detected

Note 1:

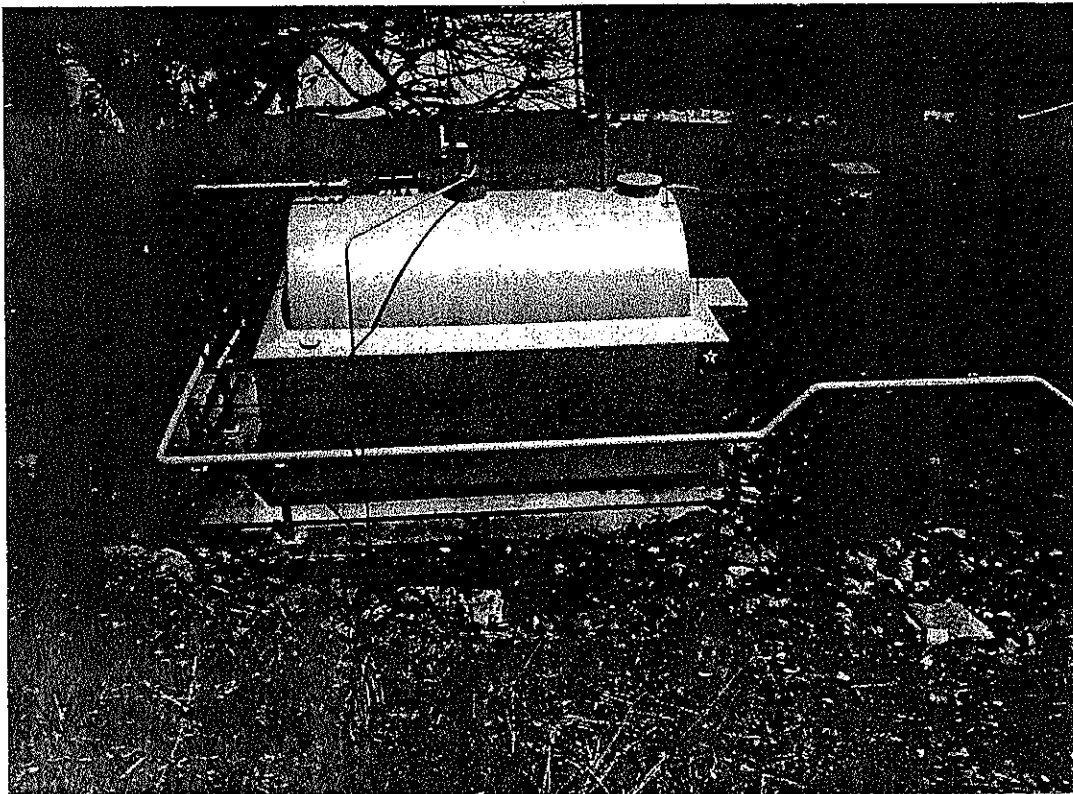
TPH: Total petroleum hydrocarbons  
mg/L: milligrams per liter  
<sup>1/2</sup>: Duplicate of Sample S-3  
<sup>1/1</sup>: Measured from the ground surface







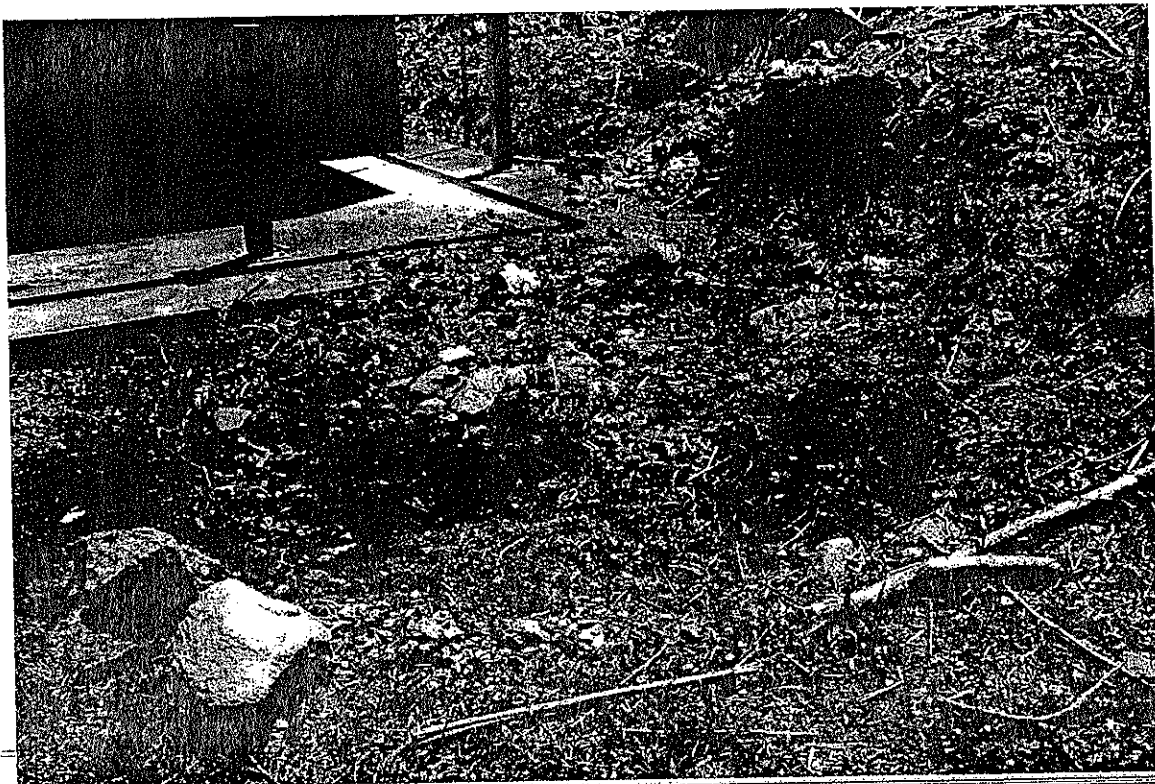
**Photo 3- 500 Gallons AGST for Generator Use, Observe Aerial Steel Pipe used as Remote Filler for 6,000 Gallons Diesel Tank**



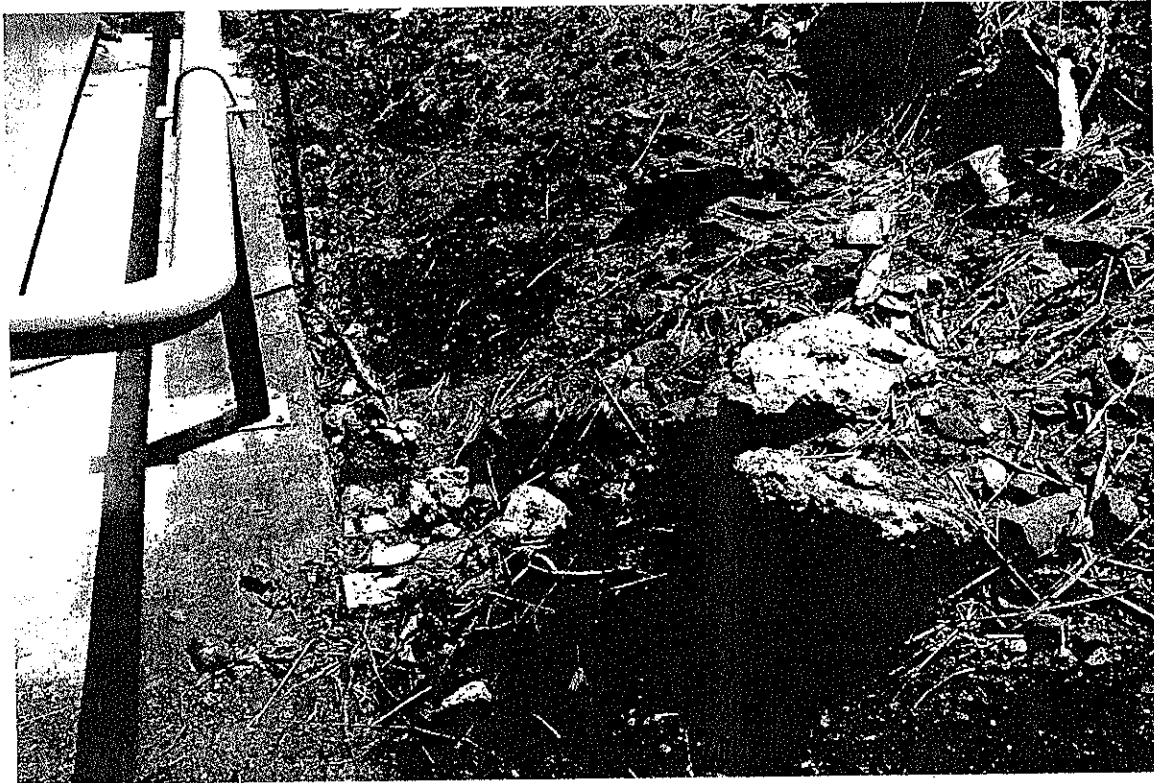
**Photo 4- 4,000 Gallons Gasoline AGST, Observe Diesel Stains in Soil West and North of Tank.**



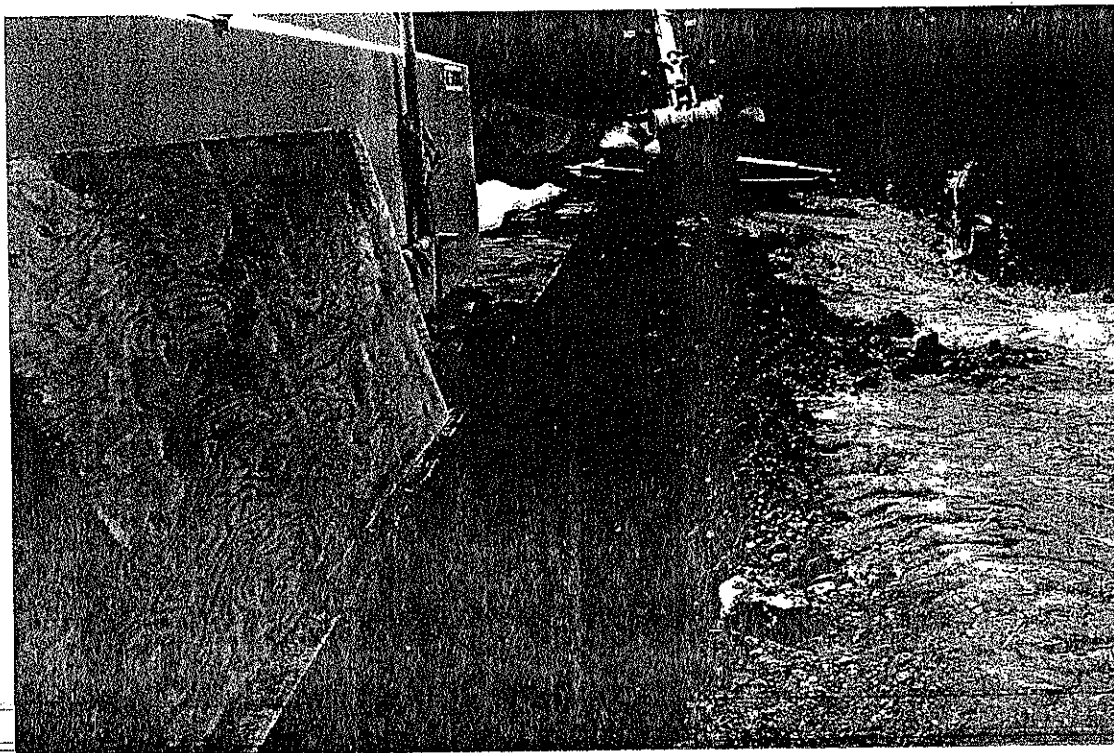
**Photo 5- Perforated Diesel Fuel Pipe (Fiberglass) and Ground Rod**



**Photo 6- Stained Soil with Diesel Fuel, located North of Gasline AGST**



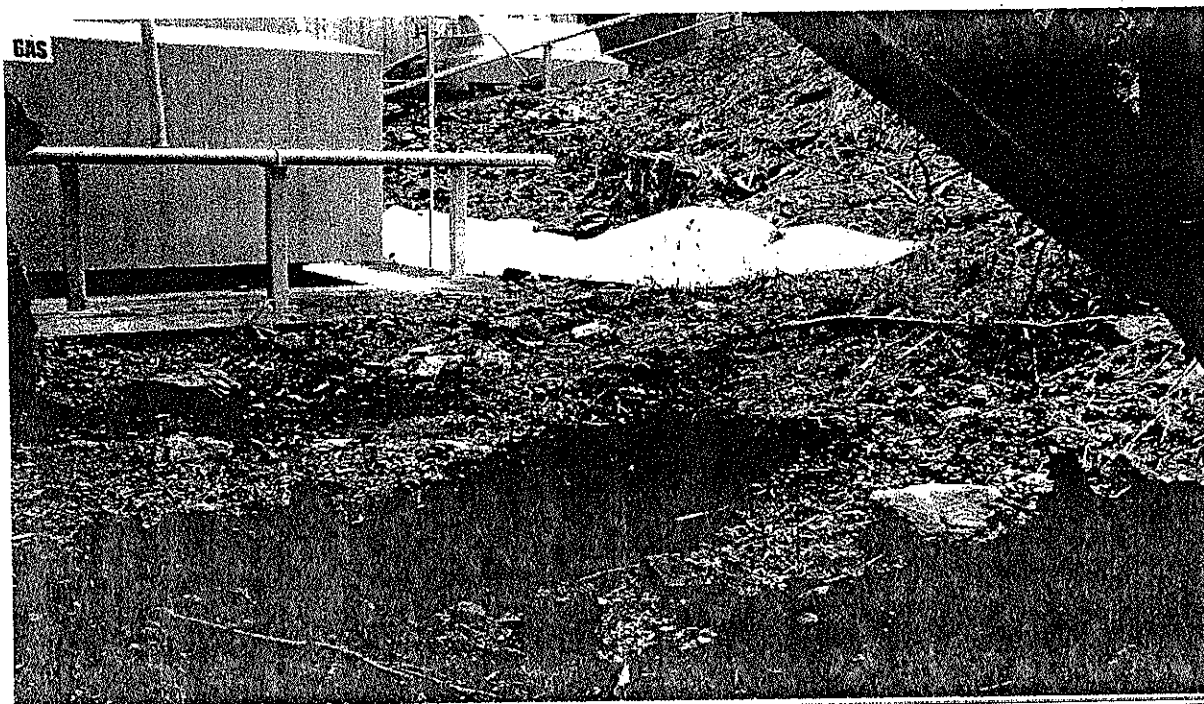
**Photo 7- Stained Soil with Diesel Fuel, located West of Gasoline AGST**



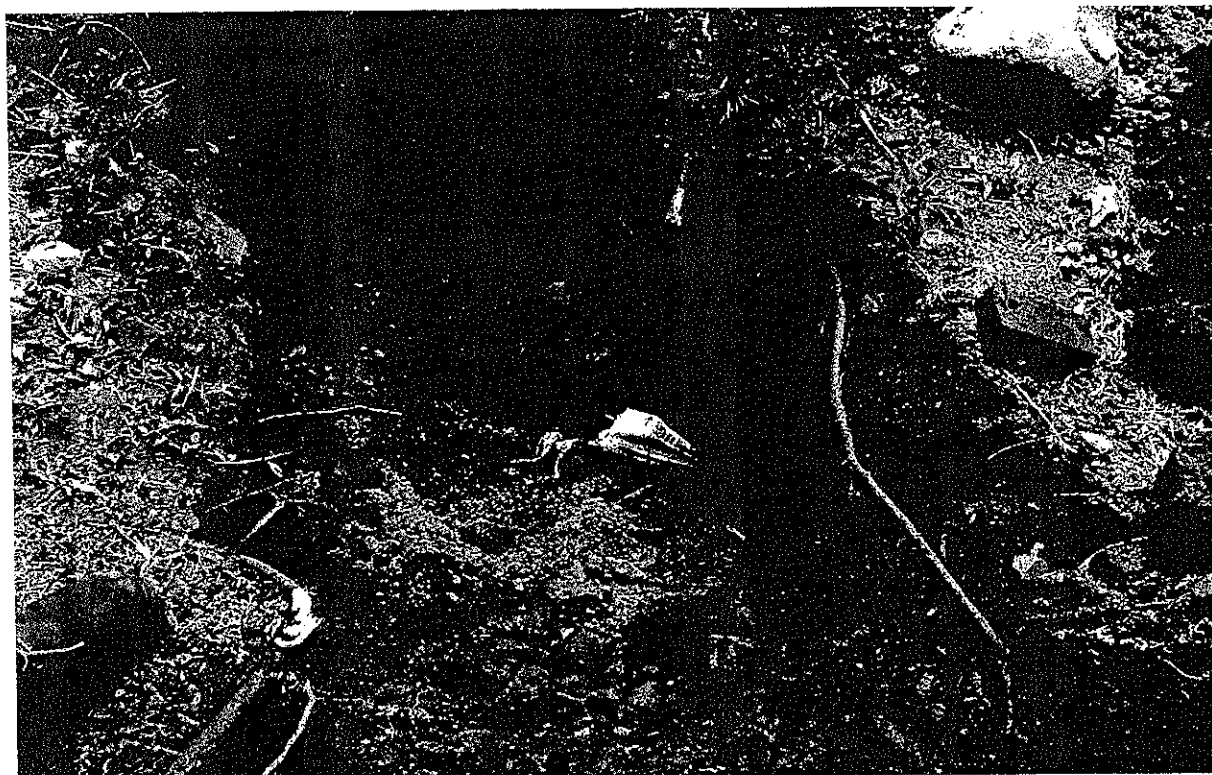
**Photo 8- Trench Located East of 6,000 Gallons Diesel AGST. Former Location of Perforated Fiberglass Pipe**



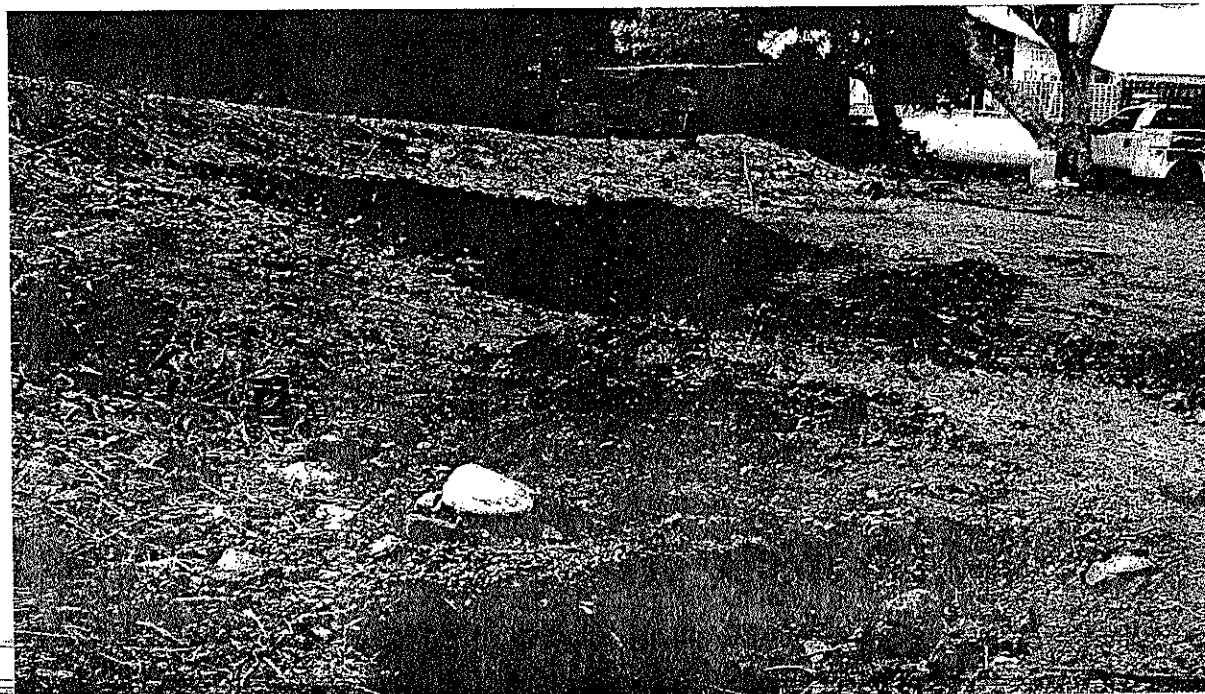
**Photo 9- Test Pits (C-3) and (C-4) Location North-east of 6,000 Gallons Diesel AGST**



**Photo 10- Test Pit (C-5) Located North of 4,000 Gallons Gasoline AGST, Near Diesel Stains (See Drawing)**

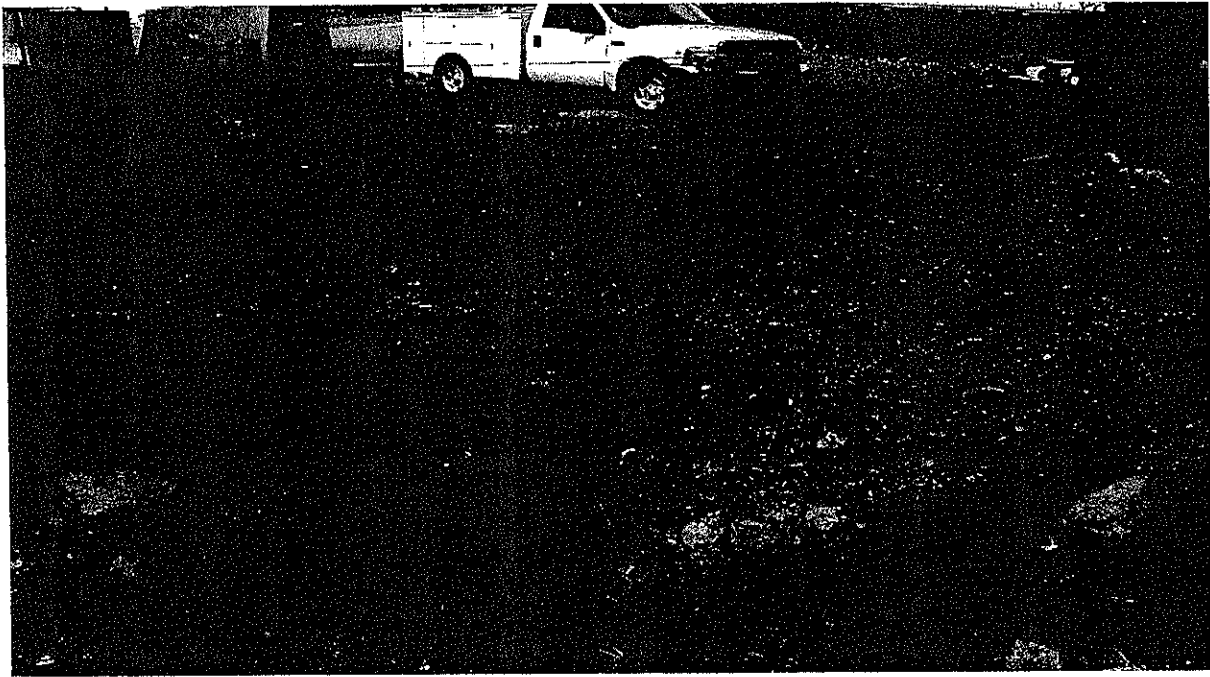


**Photo 11- Test Pit (C-5) Located North of 4,000 Gallons Gasoline AGST, Near Diesel Stains, Observe Caution Tape and Sand at Bottom of test pit indicating the presence of Electrical Line**



**Photo 12- Test Pit (C-7) Located North of 4,000 Gallons Gasoline AGST and Sixteen Feet from Test Pit (C-5) south**

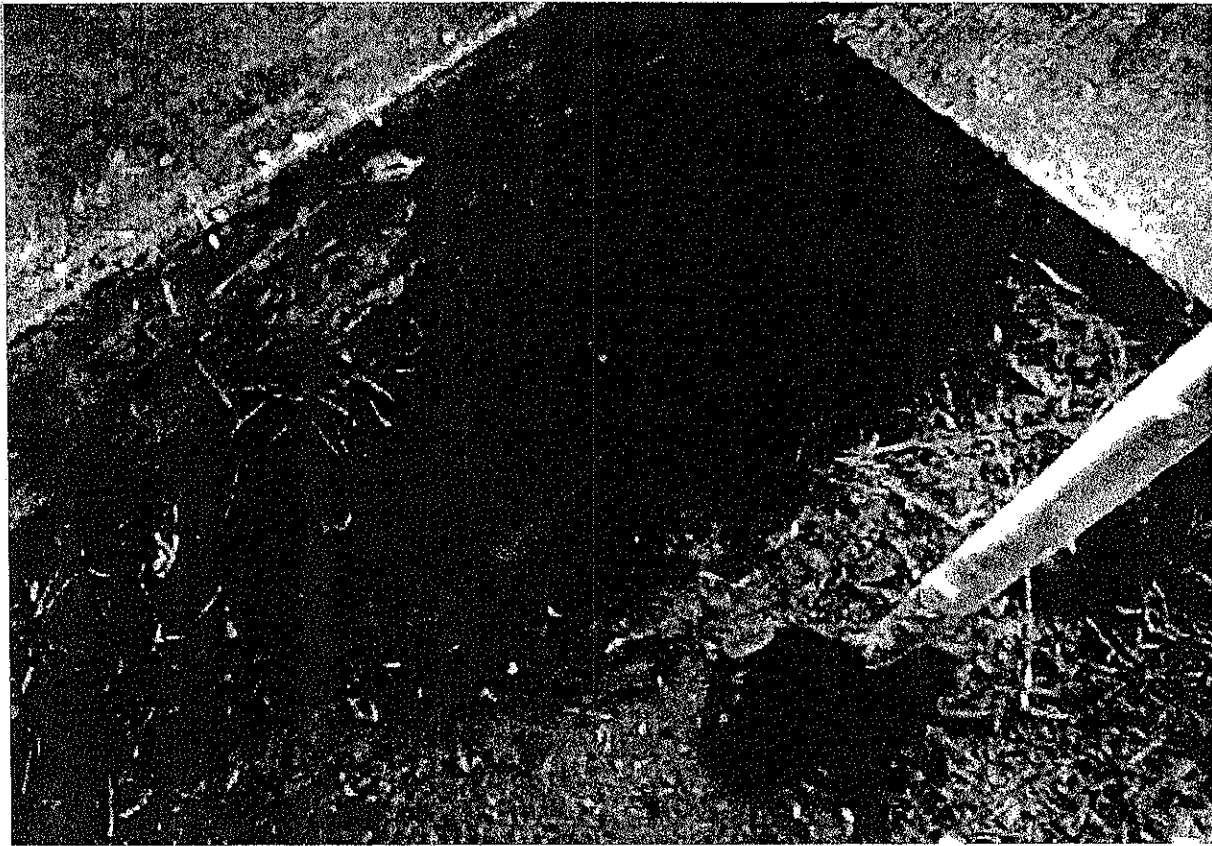




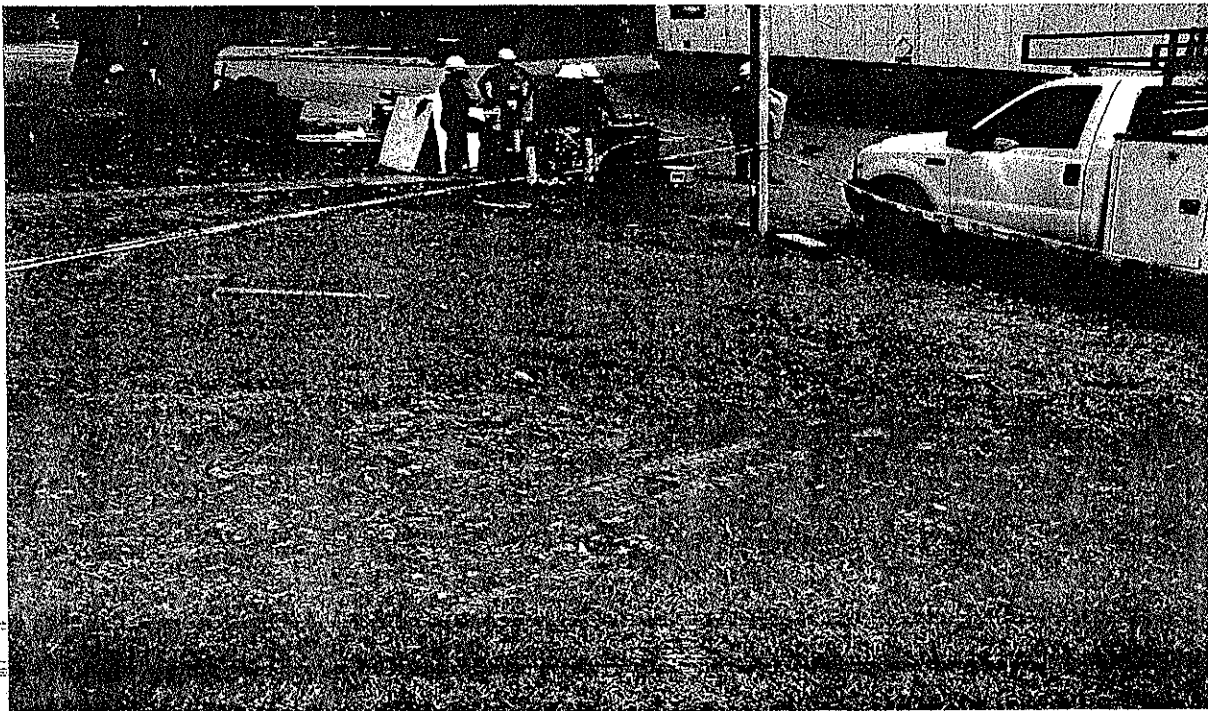
**Photo 13- Test Pit (C-6) Located North-east of 4,000 Gallons Gasoline AGST and  
Ten Feet East from Test Pit (C-5)**



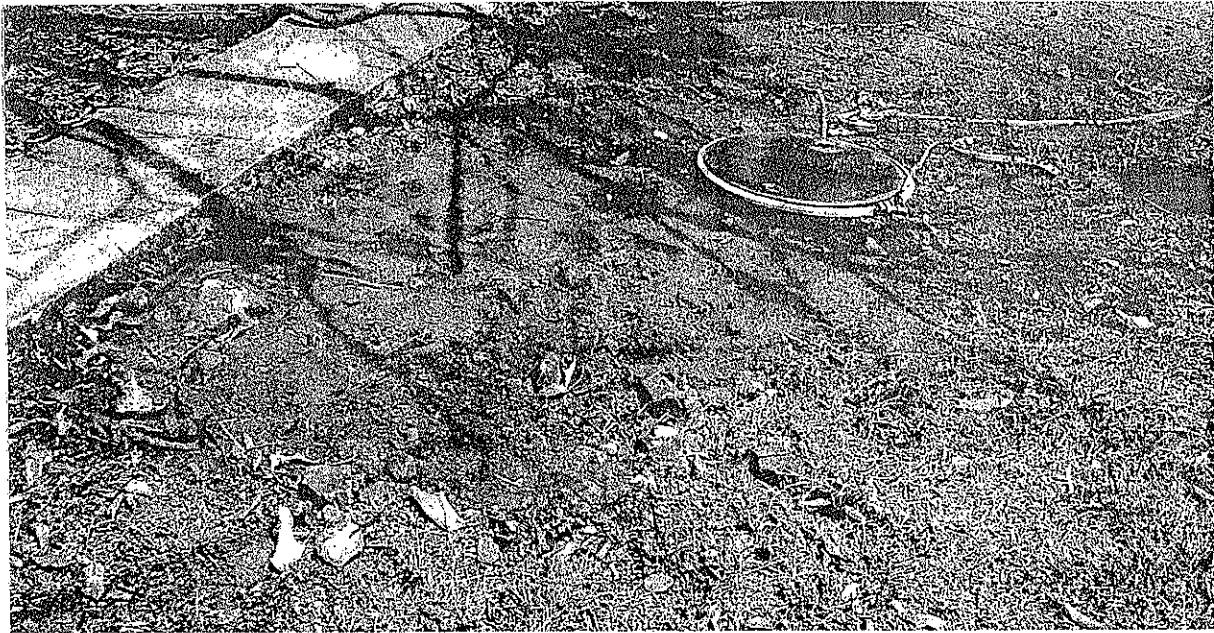
**Photo 14- Test Pits location C-5, C-6 and C-7**



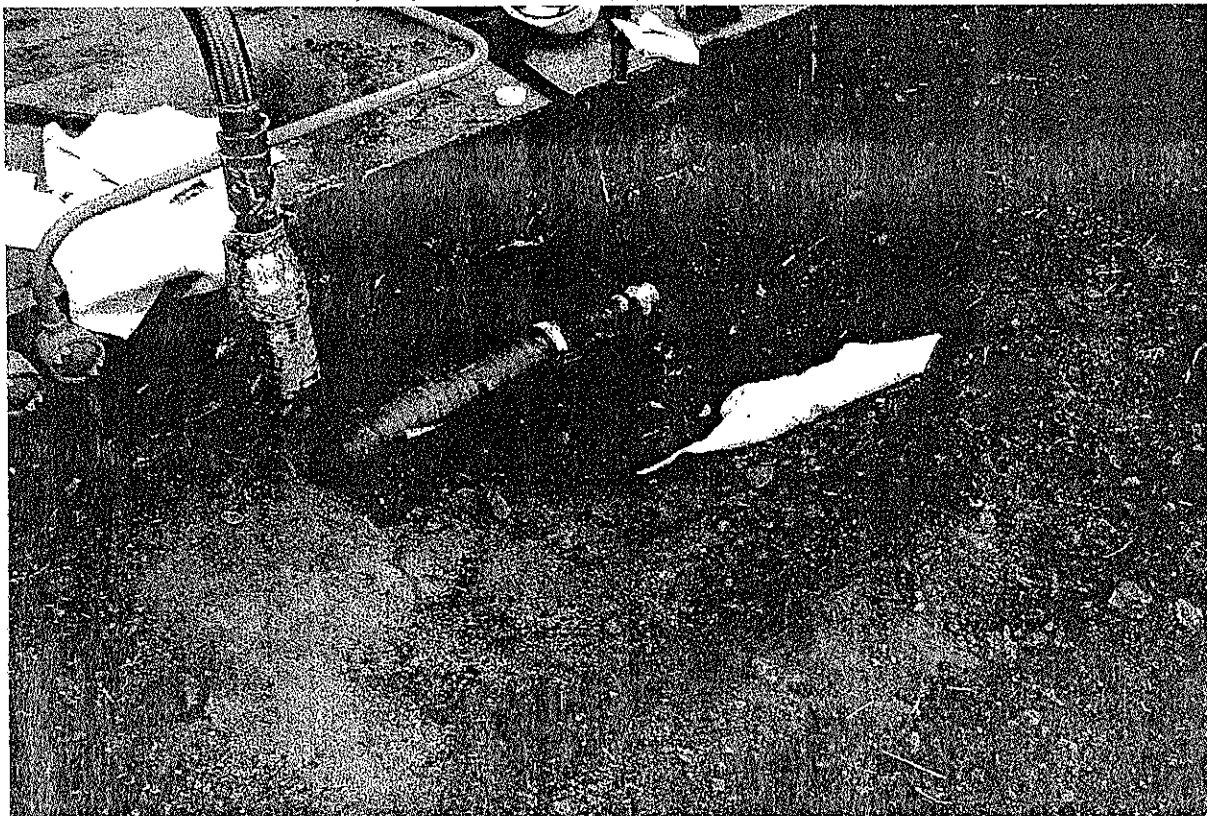
**Photo 15- Test Pit (C-1) Located East 4,000 gallons Gasoline AGST**



**Photo 16- Test Pit (C-9) Location, Twelve Feet East Power Generator Building**



**Photo 17- Test Pit (C-8) Location, Eighteen Feet East from Test Pit (C-1)**

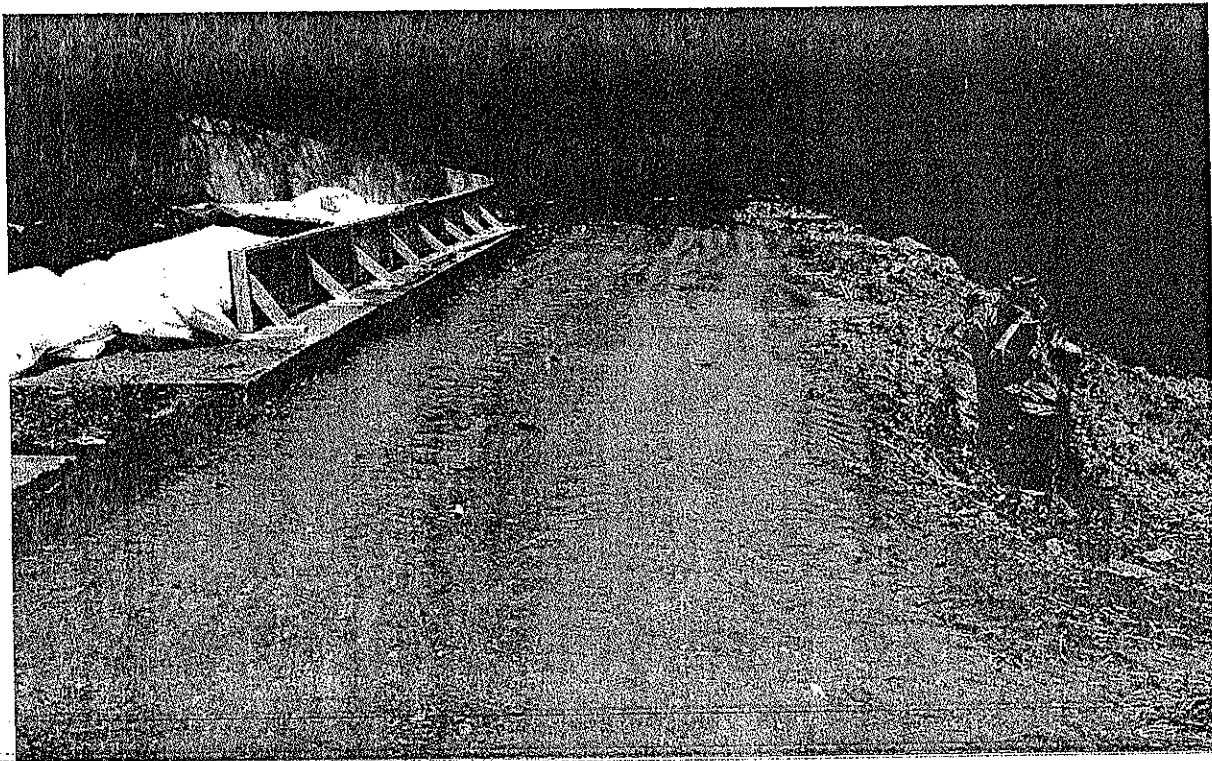


**Photo 18- Test Pit (C-2) Located East 6,000 Gallons Diesel AGST, Observe  
Former Fiberglass Pipe Capped.**

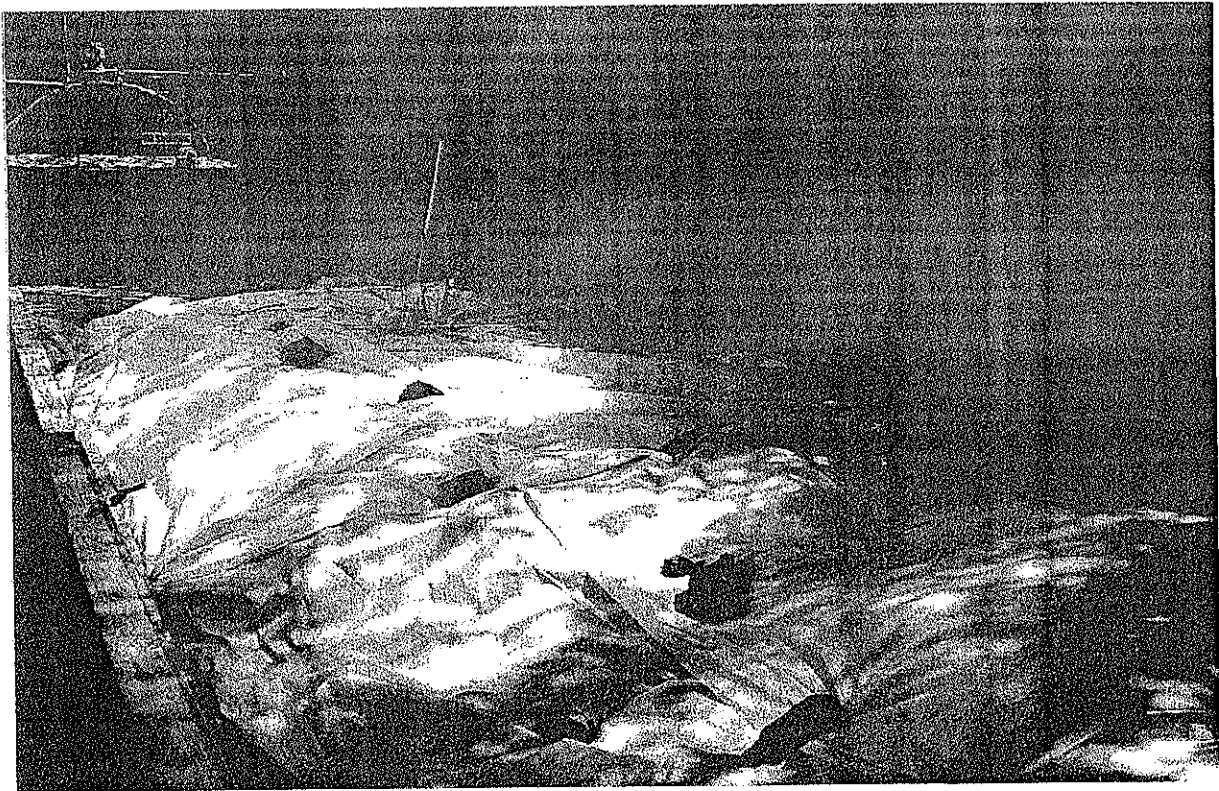




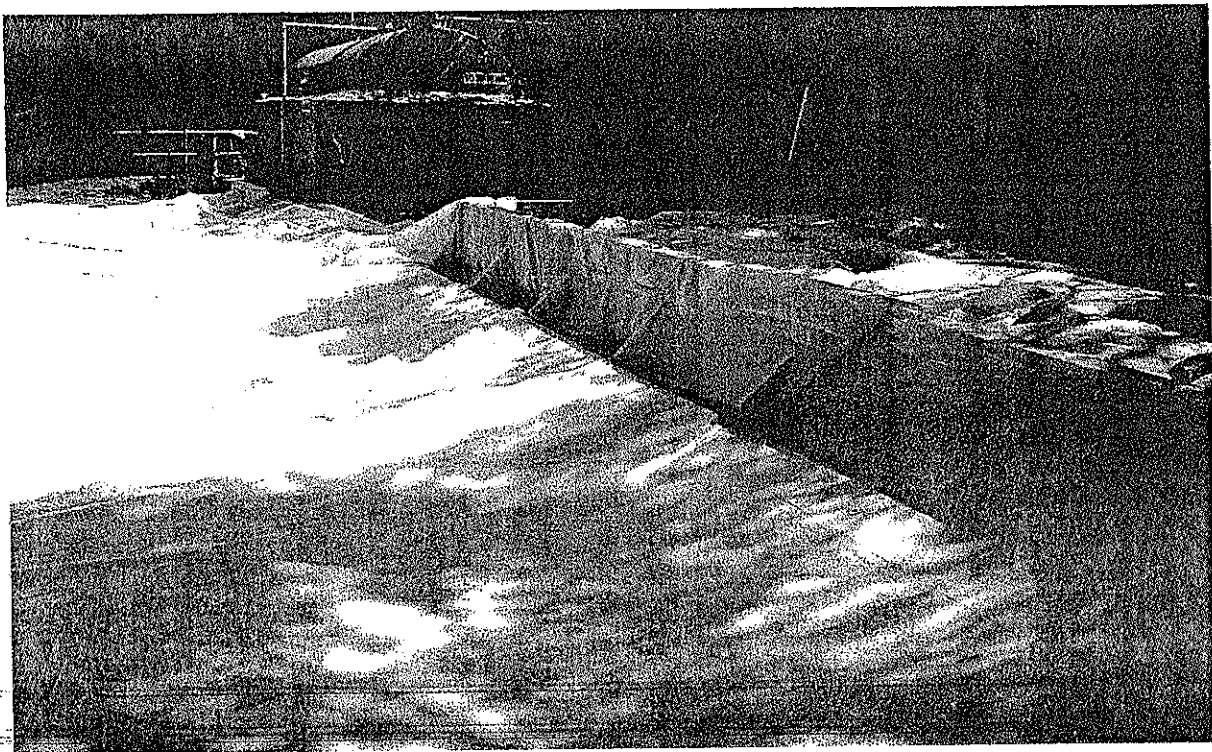
**Photo 19- Test Pit (C-10) Located Ninety Feet North from Test Pit (C-8)**



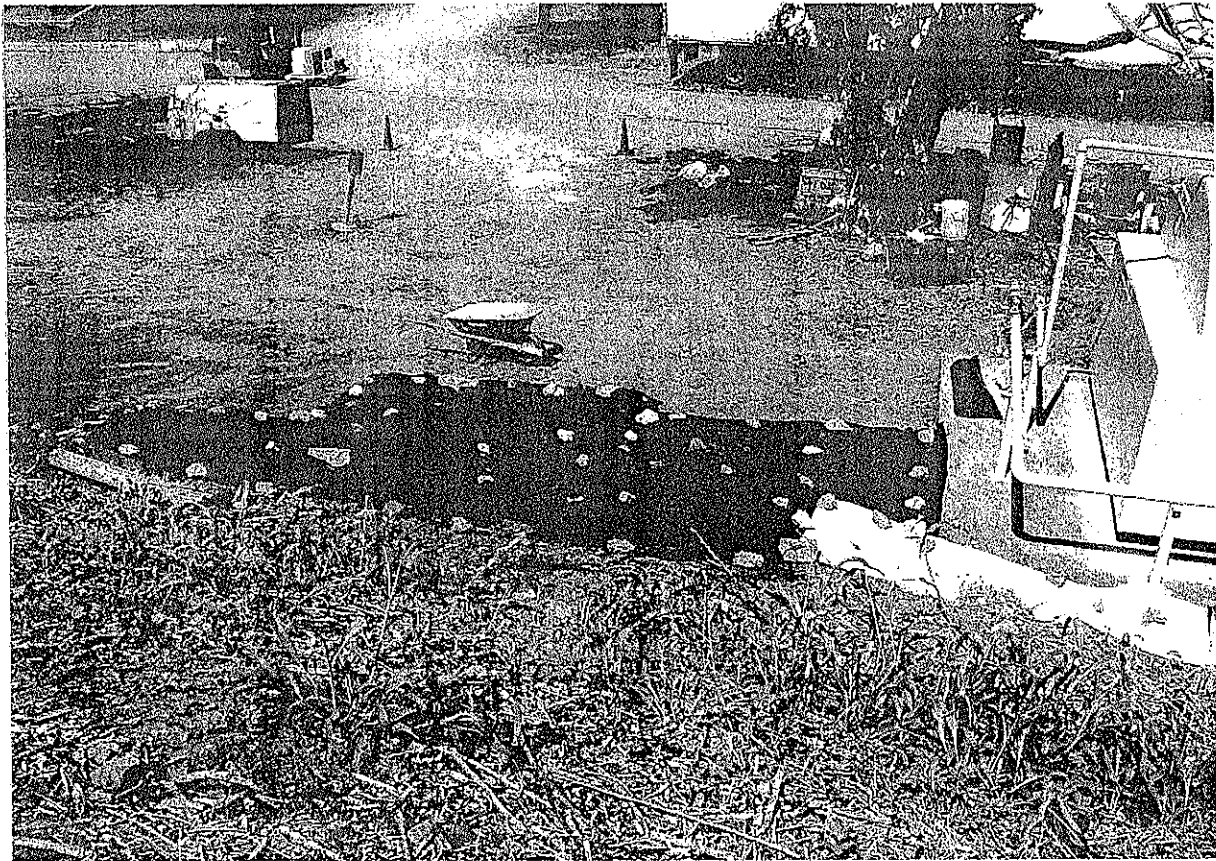
**Photo 20- Former Trench Located East of 6,000 Gallons Diesel AGST. Observe  
Removed Soil Pile in Wood and Concrete Dike.**



**Photo 21- Removed Soil Pile Covered with polyethylene liner**



**Photo 22- Former Trench Located East of 6,000 Gallons Diesel AGST and Formers  
Test Pits C-2, C-3 and C-4 Covered with polyethylene liner**



**Photo 23- Diesel Stained Areas near Gasoline AGST and Formers Test Pits C-5, C-6 and C-7 Covered with polyethylene liner**

