

D.E.R.
JUN 29 1992
SOUTHWEST DISTRICT
TAMPA

**PRELIMINARY CONTAMINATION
ASSESSMENT REPORT
HOWCO ENVIRONMENTAL SERVICES, INC.**

JUNE 1992

Jonathan E. Hull 6-23-92
Jonathan E. Hull, P.G. No. 658
Project Manager

Prepared for:

Carlton, Fields, Ward, Emmanuel, Smith & Cutler, P.A.
One Harbour Place, 5th Floor
Tampa, Florida 33601

Prepared by:

Environmental Resources Management-South, Inc.
9501 Princess Palm Avenue, Suite 100
Tampa, Florida 33619
(813) 622-8727



TABLE OF CONTENTS

		<u>Page</u>
1.0	INTRODUCTION	
1.1	Site Location and Facility Description	1-1
1.2	Site Background and History	1-2
1.3	Preliminary Contamination Assessment Objectives	1-5
2.0	SITE INVESTIGATION	
2.1	August 15, 1991 Activities	2-1
2.2	August 26, 1991 Activities	2-2
2.3	October 9 and 10, 1991 Activities	2-3
2.4	November 16, 1991 Activities	2-3
2.5	December 18 - 20, 1991 Activities	2-3
3.0	INVESTIGATION RESULTS	
3.1	August 15, 1991 Investigation Results	3-1
3.2	August 26, 1991 Investigation Results	3-2
3.3	October 9 and 10, 1991 Investigation Results	3-2
3.4	November 16, 1991 Investigation Results	3-3
3.5	December 18 - 20, 1991 Investigation Results	3-3
4.0	CONCLUSIONS	
4.1	Operation Audit	4-1
4.2	EPA Sampling and Analysis	4-1
4.3	Preliminary Contamination Assessment	4-2
4.4	Ground Water Quality	4-2
5.0	RECOMMENDATIONS	



TABLE OF CONTENTS - Continued

APPENDICES

APPENDIX A	Test Pit Location Map - Areas 1 and 2
APPENDIX B	Composite Soil Sampling Designations for December 1991 Samples
APPENDIX C	Cross Section of Area 1
APPENDIX D	Laboratory Reports



D. E. R.
JUN 29 1992
SOUTHWEST DISTRICT
TAMPA

SECTION 1.0
INTRODUCTION



SECTION 1.0 INTRODUCTION

1.1 SITE LOCATION AND FACILITY DESCRIPTION

HOWCO Environmental Services, Inc. is an oil reclamation facility located in St. Petersburg, Florida. The site location and layout are shown in Figures 1-1 and 1-2, respectively. HOWCO accepts different types of non-hazardous petroleum-contaminated soils, sludges, and liquids which are directed through an oil recovery recycling process. All oil recovered from the process is recycled and reused. Table 1-1 summarizes the 11 main waste streams accepted by HOWCO.

Once material is received at the plant, it goes to one of three locations: soil and solids go to the soil processing area; oily liquids go to the liquid cooker; and petroleum-contaminated water goes to the onsite wastewater treatment plant. These areas are shown in Figure 1-2 along with the locations of processed soil, tankers containing liquids and sludges waiting to be processed, and the drum accumulation center (material waiting for processing).

The liquid cooker uses heat and emulsifiers to help separate oil from the water. The oil product is sold to permitted burn facilities, and the water is directed to the onsite wastewater treatment plant where it is processed and tested for chemical oxygen demand, pH, and phenols prior to being released to the St. Petersburg Wastewater Treatment Plant.

Stormwater is collected in a centrally located concrete swale as shown on Figure 1-2. Stormwater which collects in the swale flows to the east for treatment in the onsite waste water treatment plant (WWTP). Stormwater is treated with wastewater generated during the recycling procedure, processed, tested for compliance with applicable requirements, and then discharged to the St. Petersburg Wastewater Treatment Facility.



Figure 1-2
Site Layout
Howco Facility
St. Petersburg, Florida

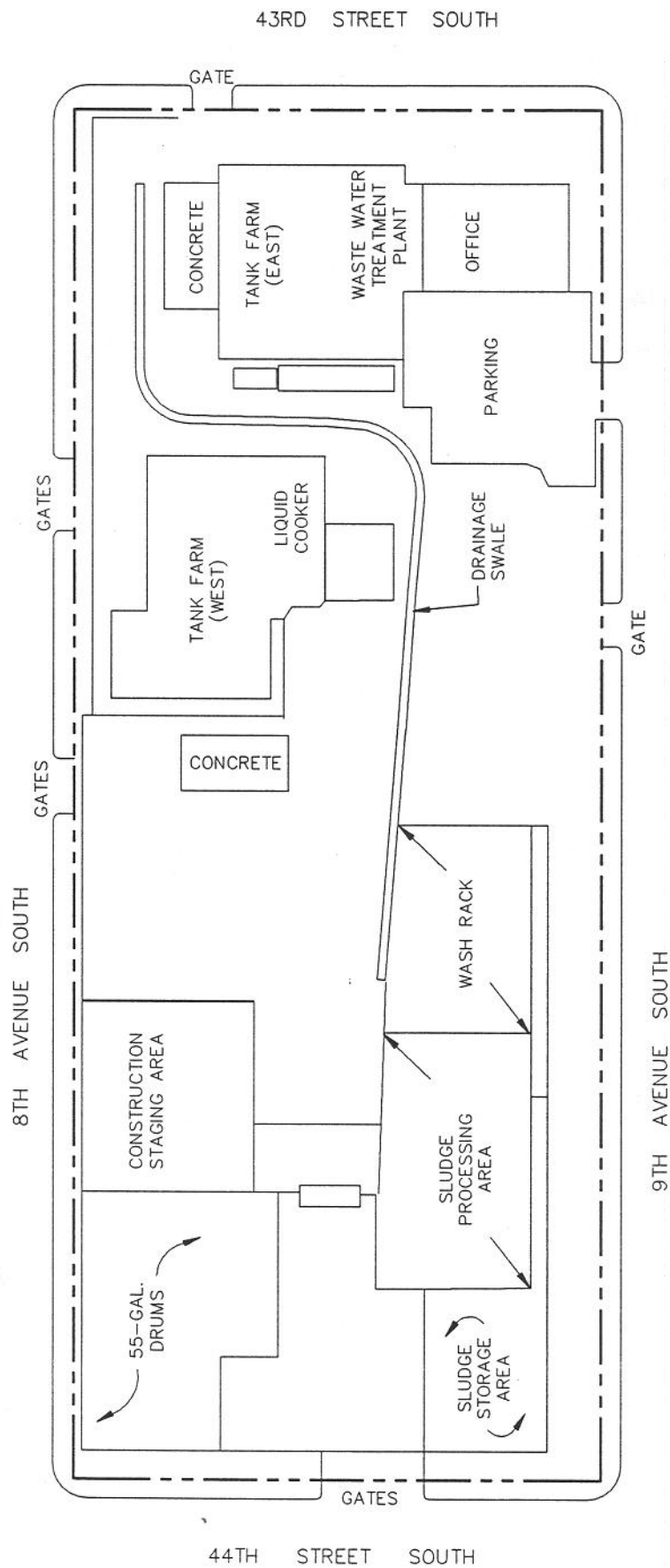


TABLE 1-1

**WASTE STREAMS* ACCEPTED BY HOWCO
ST. PETERSBURG, FLORIDA
MARCH 1991**

1. Oil/water separators--sludge and liquid.
2. Water removed from USTs and terminals.
3. Used oil.
4. Soil cuttings from UST removals/excavations/assessments.
5. Used ethylene glycol (not recycled by HOWCO).
6. Stormwater from terminals.
7. Ground water from recovery wells.
8. Tank cleanings--any petroleum tank.
9. Ship bilges--limited to petroleum and petroleum contaminated water.
10. Water from an aluminum refinisher.
11. Citrus sludge.

* All waste streams accepted by HOWCO are non-hazardous, except for D018 petroleum-contaminated water which is processed through the onsite wastewater treatment plant.

1.2 SITE BACKGROUND AND HISTORY

Operational/Environmental Audit

At HOWCO's request, ERM performed an operational/environmental audit of the facility during August-December 1991. Specific tasks accomplished included:

- Reviewing historical aerial photographs to identify past site activities and land uses having potentially adverse environmental impacts;
- Interviewing former owners and longstanding company employees to identify historical used-oil handling practices/procedures;
- Reviewing of title documents to identify past owners who may have been engaged in industrial activities using potentially hazardous materials;
- Reviewing the storage and handling of waste and materials, employee training procedures, and environmental compliance documentation;
- Performing a facility walk-through on August 23, 1991 to identify practices and procedures the facility has initiated in order to minimize the potential for environmental impacts; and
- Contacting federal and state regulatory agencies to determine environmental concerns and review correspondence.

Aerial Photograph/Personnel Interviews

The following descriptive history of site development and operations is based on aerial photographs and interviews with existing and former HOWCO personnel. Copies of aerial photographs for the facility were obtained from the Pinellas County Department

of Transportation for the years 1951, 1957, 1961, 1965, 1967, 1968, 1971, 1973, 1975, 1977, 1979, 1984, 1987, and 1990. A chronological review of the aerials was performed and integrated with supplemental commentary by facility personnel.

The site was purchased by Mr. Art Hagan in 1973. Until approximately 1975, no active site use or development occurred. Until 1975, as shown on aerial photos, the site was covered with grass, trees, and bare soil. Some petroleum storage product activities, trucks, and paving equipment appeared in 1975. Until around 1977, the facility accepted used oils, stored in drums and tanks, and sold it for road construction. Until approximately 1977, the City of St. Petersburg dumped street sweepings on the northwestern portion of the property.

The facility was expanded in 1980 to process more oil. In 1986, the existing tanks and oil cooker were retrofitted with concrete slabs, and the water treatment plant was added. In 1988, the wash rack was moved from the current parking lot to its present location, additional concrete slabs were added, and sludge handling began. During this same time period, a concrete containment structure was built in the southern portion of the site for a wash rack, and sludge processing areas. A soil berm was constructed in the north part of the site.

Mr. Tim Hagan purchased the site in 1989.

Title Search

A title search on the property was performed August 20, 1991 by the Tampa Bay Branch of Attorneys' Title Insurance Fund, Inc., Orlando, Florida. A chain of warranty deeds dating back to August 30, 1940 provide no recognizable names of individuals associated with industrial activities or hazardous materials other than Mr. Art Hagan or HOWCO.

Regulatory Agency Concerns

The Florida Department of Environmental Regulation (FDER) conducted an inspection of the facility in April 1990 and issued a warning notice (WN90-0033HW52SWD) to HOWCO on April 12, 1990, alleging violations concerning manifest recordkeeping, entry control to the facility, inadequate training records, inadequate inspection records, etc. HOWCO responded to the notice, and subsequent correspondence and telephone conversations with FDER indicate that the agency has no violations against HOWCO, but will continue to negotiate a settlement for past violations. A consent order has been submitted to FDER by HOWCO for review and comment. These alleged past violations are based primarily on alleged non-compliance with RCRA regulations that HOWCO does not believe apply to used oil recyclers. HOWCO agreed to perform a preliminary contamination assessment in conjunction with FDER's inspection of the facility.

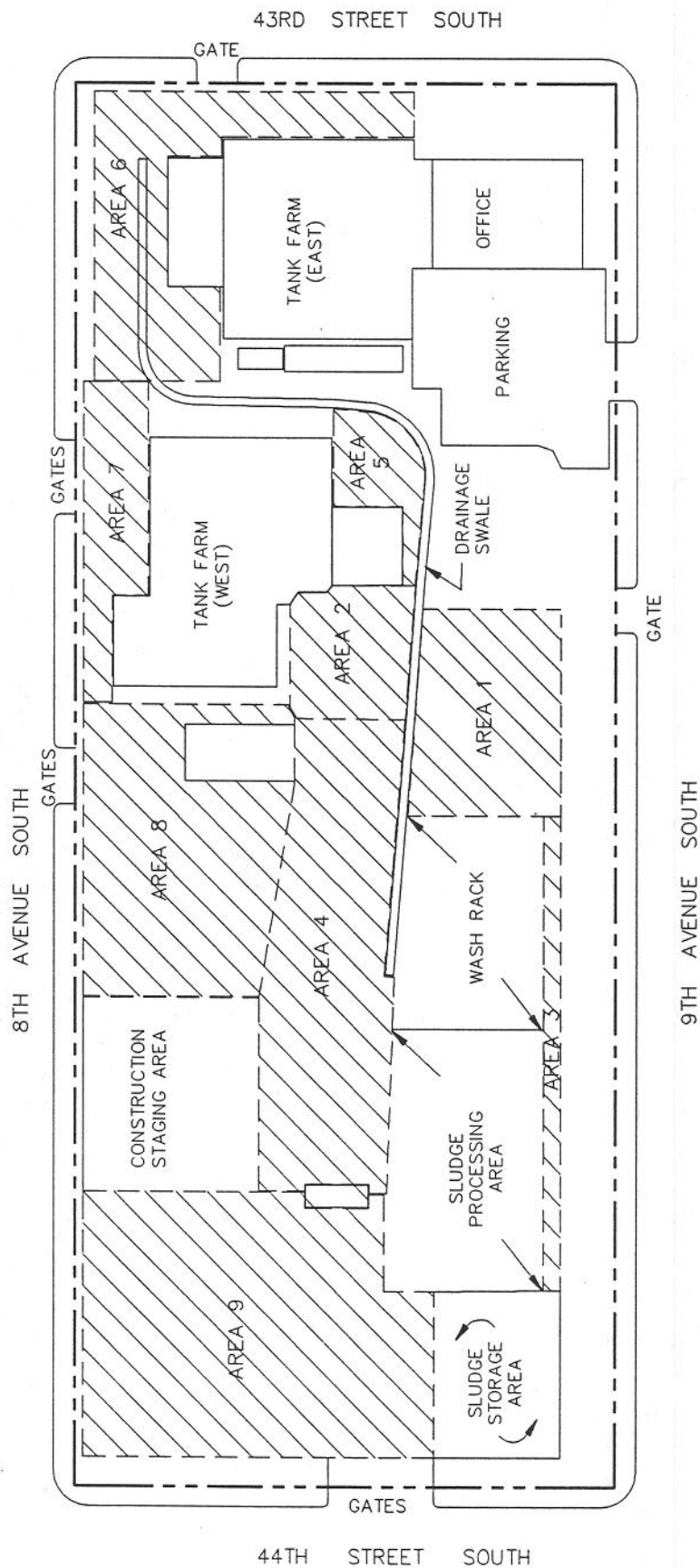
Based on the results of the operational/environmental audit, ERM recommended corrective measures and a strategy to identify areas of petroleum-impacted soil at the site. The strategy included collecting soil samples from selected locations using backhoe test pits and hand-augered borings for field screening. These locations, designated Areas 1 through 9, are shown on Figure 1-3.

EPA Sampling and Analysis

On March 13, 1991, representatives from the U.S. Environmental Protection Agency (EPA) Region IV collected samples of certain materials stored in rolloff bins on the site. The rolloff bins contained a mixture of dirt remaining from the processing of oil/water emulsion, primarily from oil/water separators and filter press cake from the wastewater treatment plant. Historically, these materials have been tested and disposed.

Samples of material were reportedly collected by EPA personnel from five of the approximately 8 feet by 20 feet by 4 feet deep rolloff bins located in the storage area. The samples were collected at depths of approximately 18 inches, 24 inches, and also

Figure 1-3
Areas Identified for Soil Assessment
Howco Facility
St. Petersburg, Florida



from the bottom of the bins, and analyzed for Toxicity Characteristic Leaching Procedure (TCLP) metals and volatile organic compounds by the EPA laboratory in Athens, Georgia.

Analytical results indicate that TCLP standards were not exceeded. EPA has not pursued the matter any further.

1.3 PRELIMINARY CONTAMINATION ASSESSMENT OBJECTIVES

As described in Section 1.2, HOWCO agreed to conduct a preliminary contamination assessment at the facility. The objectives of this preliminary contamination assessment were to:

- Identify petroleum-impacted soils, if any;
- Assess the areal and vertical extent of excessively contaminated soils as defined in Chapter 17-770 FAC, if any;
- Assess the necessity for initial remedial actions; and
- Evaluate the feasibility of soil remediation using thermal treatment.

Ground water quality and ground water flow direction assessments were not conducted during the preliminary contamination assessment. The areal and vertical extent of ground water quality impacts, if any, and the direction of ground water flow will be assessed during a contamination assessment to be completed in April 1992. Proposed monitoring well locations for the contamination assessment are provided in Section 5.0 of this report.

SECTION 2.0
SITE INVESTIGATION



SECTION 2.0

SITE INVESTIGATION

Based on the results of the operational audit at the facility described in Section 1.2, ERM personnel conducted soil sampling to identify areas of petroleum-impacted soil, assess the extent of excessively-contaminated soil, assess the need for initial remedial action (IRA), and assess the feasibility of remediating soil using thermal treatment. Assessment activities were conducted in Areas 1 through 9 on August 15, 1991, August 26, 1991, October 9 and 10, 1991, and November 16, 1991 as shown on Figure 2-1, and December 18-20, 1991 as shown on Figure 2-2. The assessment activities completed on these dates are described in detail below.

2.1 AUGUST 15, 1991 ACTIVITIES

On August 15, 1991, two areas at the site were investigated: Areas 1 and 2. In each area (Figure 2-1), soil was examined for staining and odor, and then screened using an Organic Vapor Analyzer (OVA) with a Flame Ionization Detector (FID) to identify petroleum-impacted soil and to define the limits of excessively-contaminated soil as defined in Chapter 17-770.200(2), Florida Administrative Code (FAC).

In Area 1, eight test pits were excavated using a backhoe to identify the vertical and horizontal extent of excessively-contaminated soil. As each hole was excavated, ERM personnel examined the soil for obvious signs of staining or odor. If staining or a petroleum-like odor was detected, the excavation was advanced until the vertical extent of the staining and odor was identified.

Soil samples were then collected from the bottom of the excavation and screened using the OVA to determine the organic vapor concentration in the soil. If OVA values exceeded 50 parts per million (ppm) (the assumed lower limit for excessively-contaminated soil), the excavation was advanced vertically in one-foot intervals, and

Figure 2-1
Boring And Test Pit Locations
August 1991, October 1991 and November 1991
Howco Facility
St. Petersburg, Florida

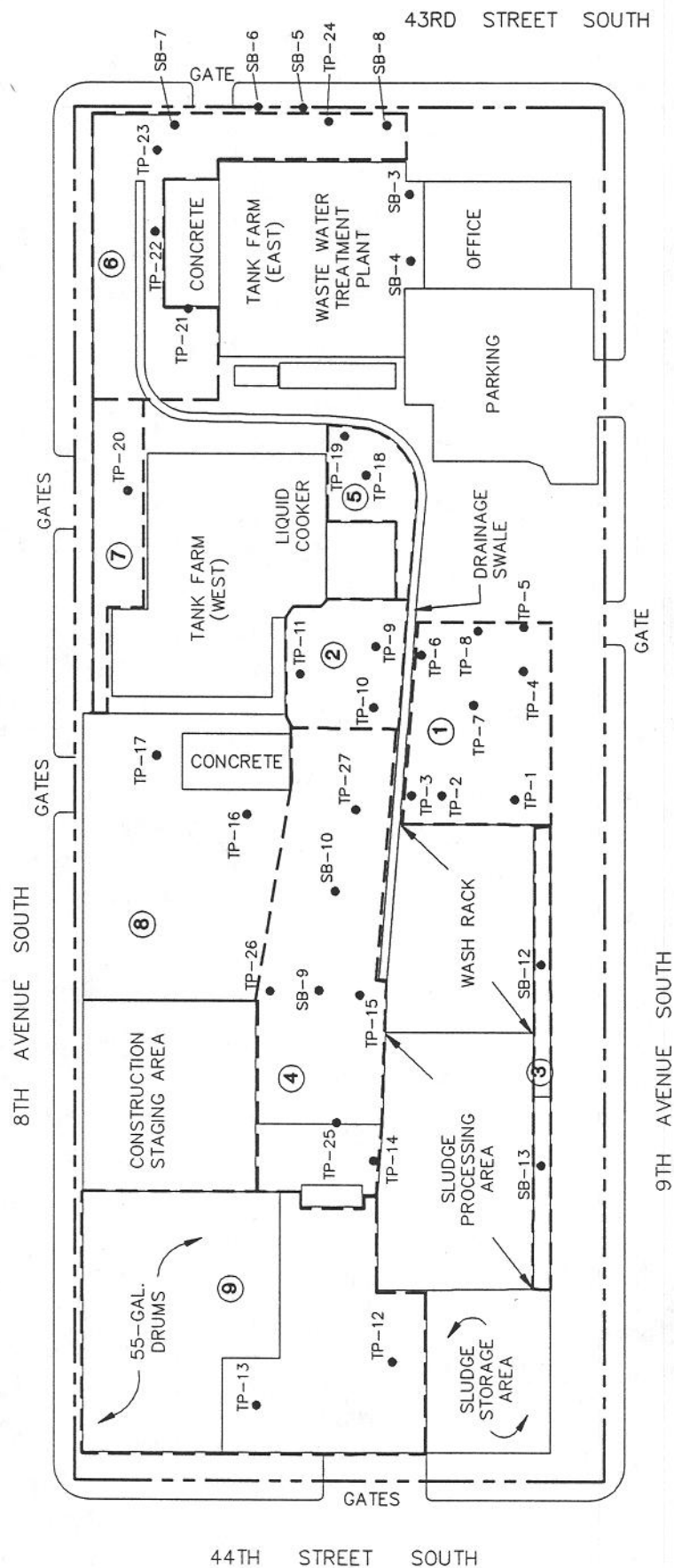
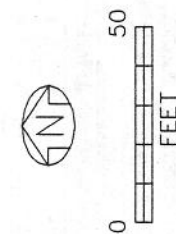
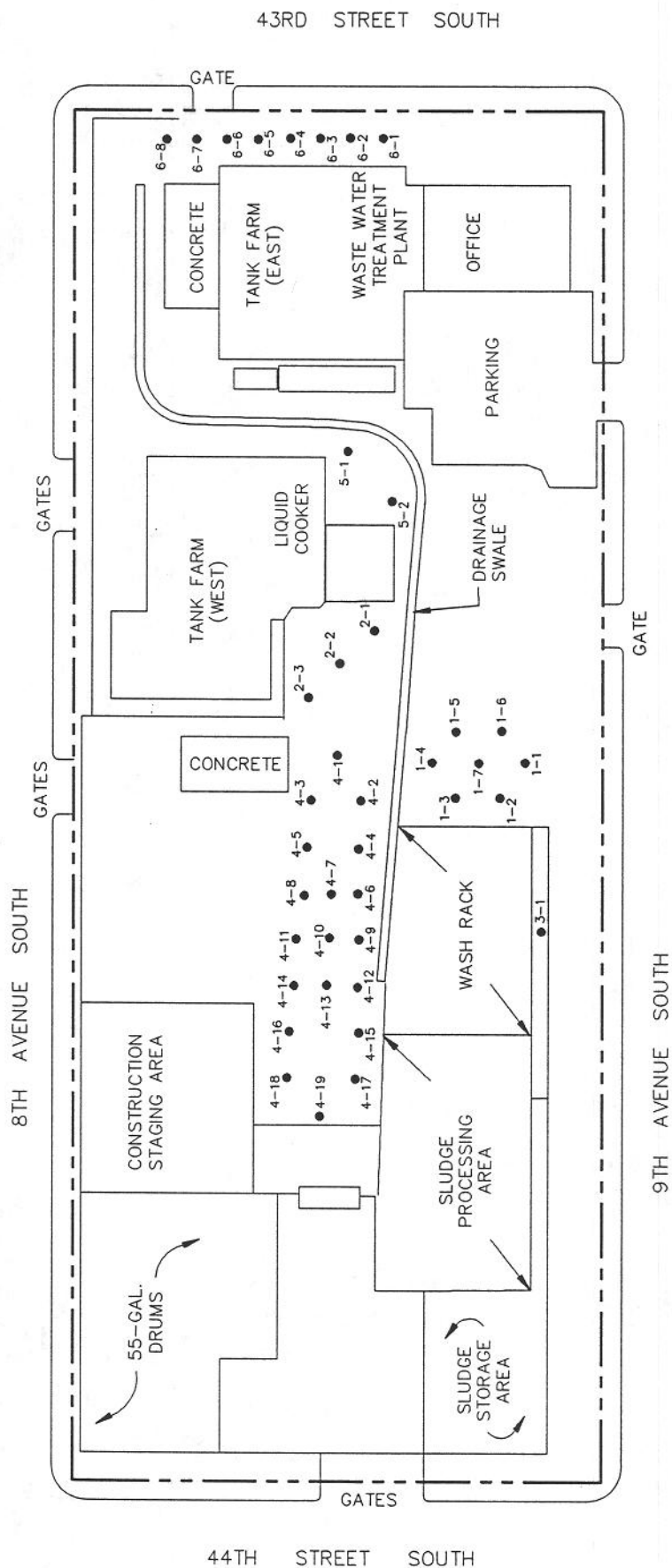


Figure 2-2
Soil Boring Locations - December 1991
Howco Facility
St. Petersburg, Florida



LEGEND
 • SOIL BORING

samples screened using the OVA, until the extent of excessively-contaminated soil was identified.

If no odor or staining was identified in an excavation, a soil sample was collected near ground surface for OVA screening. If the sample contained organic vapor concentrations above 50 ppm, the hole was advanced until the extent of excessively-contaminated soil was identified as described above. If organic vapor concentrations were less than 50 ppm, the excavation was considered to be outside the areal limits of excessively-contaminated soil. Appendix A contains a diagram of Area 1 showing the locations of backhoe test pits excavated on August 15, 1991, and a description of the material identified in each test pit. The results of the assessment of Area 1 are discussed in Section 3.0.

In Area 2, three backhoe test pits were excavated. The extent of excessively-contaminated soil was identified using the procedures described for Area 1. Appendix A contains a diagram of Area 2 showing the location of the backhoe test pits excavated on August 15, 1991. The results of the assessment of Area 2 are discussed in Section 3.0.

2.2 AUGUST 26, 1991 ACTIVITIES

Based on the results of the August 15, 1991 activities, thermal treatment was considered as a potential remedial alternative for excessively-contaminated soil. On August 26, 1991, ERM personnel collected one soil sample from Area 1 and one sample from Area 2 for laboratory analysis of the constituents listed in Chapter 17-775; 410 FAC. The two samples were composited into a single sample, placed in sample bottles, and submitted to Savannah Laboratories and Environmental Services, Inc. (SL) in Savannah, Georgia for analysis. The samples were analyzed for polychlorinated biphenyls (PCBs) using EPA Method 8080, Total Recoverable Petroleum Hydrocarbons (TRPH) using EPA Method 418.1, purgeable aromatics using EPA Method 8020, purgeable halocarbons

using EPA Method 8010, total halogens, and eight metals using TCLP procedures. On October 15, 1991, SL was instructed to analyze a remaining portion of the composite sample for total metals (total of eight metals). The results of the analyses are presented in Section 3.0.

2.3 OCTOBER 9 AND 10, 1991 ACTIVITIES

Seven additional areas (Areas 3 through 9) were investigated at the site (Figure 2-1) on October 9 and 10, 1991, according to the methods described for Areas 1 and 2. During October activities, soil samples were collected from 16 backhoe test pits and during excavation of 10 borings using a hand auger. A total of 41 samples were collected for screening using an OVA during the two days of field investigation activities. The purpose of the investigation was assess the horizontal and vertical extent of petroleum-impacted and excessively-contaminated soil in areas 3 through 9.

2.4 NOVEMBER 16, 1991 ACTIVITIES

Two additional soil samples were collected from Areas 1 and 2, composited into one sample, and analyzed for total lead to confirm the results of the October 1991 samples. The results are presented in Section 3.0.

2.5 DECEMBER 18 - 20, 1991 ACTIVITIES

Based on the lead concentrations detected in samples collected during October and November, 1991, additional soil samples were collected for analysis. On December 18 through 20, 1991, 120 soil samples were collected from 40 locations at the site (Figure 2-1). The samples were collected from 3 depths at each of the 40 locations in accordance with the FDER QA Standard Operating Procedures Manual for Soil Thermal Treatment Facilities, dated November 1991. A breakdown of the sample numbers and depths, and resulting composite designations are included in Appendix B. The 120 samples were composited into 10 samples (COMP-1 through COMP-10) according to the

manual and submitted for analysis of total lead. The calculation used to estimate the number of composite samples needed is also included in Appendix B. Based on the results of the total lead analyses, samples with lead concentrations below 77 mg/kg (COMP-1, COMP-2, COMP-3, and COMP-4) were analyzed for TRPH using EPA Method 418.1, purgeable aromatics and purgeable halocarbons using EPA Methods 8020 and 8010, respectively. Two composite samples containing lead concentrations above 77 mg/kg, COMP-7 and COMP-10, were also analyzed for TRPH, purgeable aromatics, and purgeable halocarbons, so that data would be available to evaluate alternative treatment methods for soil containing lead above permitted levels for thermal treatment facilities. The results of the analyses are presented in Section 3.0.

SECTION 3.0
INVESTIGATION RESULTS



SECTION 3.0

INVESTIGATION RESULTS

As described in Section 2.0, investigations were conducted at the site on August 15, 1991, August 26, 1991, October 9 and 10, 1991, November 16, 1991, and December 18 through 20, 1991, to identify areas of impacted soil, assess the extent of excessively-contaminated soil, assess the need for initial remedial action (IRA), and assess the feasibility of remediating soil using thermal treatment. The results of the investigations are presented in this section.

3.1 AUGUST 15, 1991 INVESTIGATION RESULTS

A shell material was observed over much of Area 1 from ground surface to approximately 1.5 feet bgs. The top six inches was observed to be stained in isolated areas. The shell material in all of Area 1 from six inches to approximately 1.5 feet bgs was observed to be stained and had a petroleum-like odor, indicating shell layers may have been laid at different times. Below the shell material, a grey sandy soil was observed to a depth of approximately 5.5 feet bgs. In test pits S-1, S-2, S-4, and S-7 (see the sketch for Area 1 in Appendix A), the grey sandy soil was stained and had a petroleum-like odor. Appendix C contains a cross-section through Area 1 showing the features identified and OVA readings detected in test pits S-1, S-7, and S-8.

Three test pits were excavated in Area 2. The same shell material identified in Area 1 was present over Area 2. The shell material in all three test pits was stained; therefore, the horizontal extent of excessively-contaminated soil is assumed to cover the area from Area 4 to Area 5, and from the concrete swale bordering Area 2, to the bermed area to the north.

Based on the information obtained during the investigation on August 15, 1991, the volume of excessively-contaminated soil (soil with an OVA concentration of 50 ppm or

greater) in Areas 1 and 2 was calculated to be approximately 574 cubic yards (cy) and 255 cy, respectively.

3.2 AUGUST 26, 1991 INVESTIGATION RESULTS

On August 26, 1991, soil samples were collected from Areas 1 and 2. The samples were composited and submitted to SL for analysis of the parameters described in Section 2.0 to assess the feasibility of remediating soil using thermal treatment. The laboratory report is presented in Appendix D and the detected parameters are listed in Table 3-1.

A portion of the sample was reanalyzed to determine the total concentrations of eight metals. The results are presented in Table 3-2. The sample contained lead at a concentration of 170 mg/kg, which exceeds the posttreatment standard (clean soil) for soil as listed in Chapter 17-775.400(4), FAC. Since the concentrations of metals are not reduced during thermal treatment, the posttreatment standard for metals would likely be exceeded if the pretreatment concentration is higher than the posttreatment standard.

3.3 OCTOBER 9 AND 10, 1991 INVESTIGATION RESULTS

On October 9 and 10, 1991, 41 soil samples were collected from 16 test pits and 10 hand-augered soil borings in Areas 3 through 9. The samples were screened using the OVA. OVA results are presented in Table 3-3.

Based on the information obtained during the investigation on October 9 and 10, 1991, excessively-contaminated soil was not detected in Areas 7 through 9. The volume of excessively-contaminated soil (soil with an OVA concentration of 50 ppm or greater) in Areas 3, 4, 5, and 6, was calculated and is listed below.

- | | |
|--------------------|-------------------|
| ■ Area 3 - 46 cy | ■ Area 5 - 133 cy |
| ■ Area 4 - 1435 cy | ■ Area 6 - 593 cy |

TABLE 3-1

ANALYTICAL RESULTS
SOIL SAMPLES COLLECTED FROM AREAS 1 AND 2 - AUGUST 1991
HOWCO
ST. PETERSBURG, FLORIDA

PARAMETERS	UNITS	CONCENTRATION
Barium* (TCLP)	mg/l	0.097/0.085
Lead* (TCLP)	mg/l	0.45/0.41
Ethylbenzene	$\mu\text{g/l,dw}$	110
Toluene	$\mu\text{g/l,dw}$	19
Trichloroethene	$\mu\text{g/l,dw}$	9.8
Xylene	$\mu\text{g/l,dw}$	160
TRPH	mg/kg,dw	15,000
Total halogens	mg/l,dw	820

Note:

* = First result is corrected, second is analytical for matrix spike.

dw = Dry weight

TABLE 3-2

TOTAL METALS RESULTS
SOIL SAMPLES COLLECTED FROM AREAS 1 AND 2 - AUGUST 1991
HOWCO
ST. PETERSBURG, FLORIDA

PARAMETER	UNIT	CONCENTRATION	17-775.410(4), FAC STANDARD
Arsenic	mg/kg	< 1.0	55
Barium	mg/kg	4.9	2750
Cadmium	mg/kg	< 0.50	55
Chromium	mg/kg	2.4	275
Lead	mg/kg	170	77
Mercury	mg/kg	0.026	17
Selenium	mg/kg	< 1.0	165
Silver	mg/kg	< 1.0	165

mg/kg = milligrams per kilogram

TABLE 3-3

**ORGANIC VAPOR CONCENTRATIONS
OCTOBER 9 AND 10, 1991
HOWCO
ST. PETERSBURG, FLORIDA**

Boring/Depth	Organic Vapor Concentration (PPM)			Comment
	Unfiltered	Filtered	Difference	
TP-1, 3'	0	0	0	No odor
TP-2, 3'	30	0	30	Slight odor
TP-3, 2'	30	0	30	Slight odor
TP-3, 4'	80	55	25	Slight odor
TP-4, 2'	60	40	20	Slight odor
TP-4, 4'	200	72	128	Strong odor
TP-5, 1.5'	0	0	0	No odor
TP-5, 5'	2	0	0	No odor
TP-6, 2'	0	0	0	No odor
TP-6, 6'	0	0	0	No odor
SB-1, 1.5'	650	400	250	Strong odor
SB-1, 3'	2	0	2	No odor
SB-2, 2'	0.2	0	0.2	No odor
SB-2, 4'	0.2	0	0.2	No odor
SB-3, 2'	0	0	0	No odor
SB-3, 3'	0	0	0	No odor
SB-4, 1'	0	0	0	No odor
SB-4, 3'	0	0	0	No odor
TP-7, 2'	110	35	75	Slight odor
TP-7, 4'	45	25	20	Slight odor
TP-9, 1'	1.2	0	1.2	No odor
TP-9, 3'	1.8	0	1.8	No odor



TABLE 3-3 (Continued)
ORGANIC VAPOR CONCENTRATIONS
OCTOBER 9 AND 10, 1991
HOWCO
ST. PETERSBURG, FLORIDA

Boring/Depth	Organic Vapor Concentration (PPM)			Comment
	Unfiltered	Filtered	Difference	
TP-10, 1'	0	0	0	No odor
TP-10, 3'	0	0	0	No odor
TP-11, 1'	0	0	0	No odor
TP-11, 3'	0	0	0	No odor
TP-12, 1'	0	0	0	No odor
TP-12, 3'	0	0	0	No odor
TP-13, 1.5'	510	50	460	Strong odor
TP-13, 5'	600	150	450	Strong odor
SB-5, 3'	950	70	8	Strong odor
SB-5, 7'	> 1,000	80	> 1,000	Strong odor
SB-6, 7'	> 1,000	80	> 1,000	Strong odor
SB-7, 3'	0	0	0	No odor
SB-8, 3'	0	0	0	No odor
SB-9, 4'	380	160	220	Strong odor
SB-9, 6'	180	60	120	Slight odor
TP-14, 3'	7	4	3	No odor
TP-15, 3'	20	3	17	No odor
SB-10, 3'	380	160	220	No odor
TP-16, 2'	150	55	95	Slight odor

The total volume of excessively-contaminated soil in Areas 1 through 6 at the site is, therefore, estimated to be 3,035 cy, as shown on Figure 3-1. Assuming 110 pounds per cubic foot of soil the total weight of soil to be remediated is approximately 4510 tons.

3.4 NOVEMBER 16, 1991 INVESTIGATION RESULTS

Two soil samples were collected from Areas 1 and 2, composited into one sample and analyzed for total lead to confirm the concentration detected in the sample collected in August, 1991 (170 mg/kg). The result of the analyses indicates the soil sample contained total lead at a concentration of 15 mg/kg which is less than the permitted maximum concentration for thermal treatment units.

3.5 DECEMBER 18 - 20, 1991 INVESTIGATION RESULTS

To sort out the conflicting lead data obtained during August and November, 1991, ten composite samples, COMP-1 through COMP-10, were collected from the site at the locations shown on Figure 2-2, for analysis of total lead. The total lead result for each sample is listed below.

■ COMP-1	15.2 mg/kg	■ COMP-6	456 mg/kg
■ COMP-2	3.22 mg/kg	■ COMP-7	367 mg/kg
■ COMP-3	10.8 mg/kg	■ COMP-8	549 mg/kg
■ COMP-4	14.6 mg/kg	■ COMP-9	489 mg/kg
■ COMP-5	405 mg/kg	■ COMP-10	549 mg/kg

Samples COMP-1, COMP-2, COMP-3, COMP-4, COMP-7, and COMP-10 were then analyzed for TRPH, purgeable aromatics, and purgeable halocarbons. The laboratory report for these analyses is included in Appendix D.

Since metals concentrations are not reduced during thermal treatment, thermal treatment units are permitted to treat soil containing lead at concentrations less than the post-

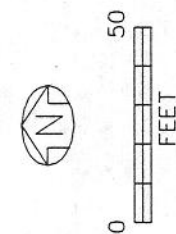
treatment standard of 77 mg/kg. Only soil samples COMP-1 through COMP-4 met the lead criteria for thermal treatment. COMP-1 through COMP-4 were collected from Areas 1, 3, and 6, which are estimated as having a total of 1213 cubic yards of excessively-contaminated soil.



Only soil samples COMP-1 through COMP-4 met the lead criteria for thermal treatment. COMP-1 through COMP-4 were collected from Areas 1, 3, and 6, which are estimated as having a total of 1213 cubic yards of excessively-contaminated soil.



Figure 3-1



LEGEND

SECTION 4.0
CONCLUSIONS



SECTION 4.0 CONCLUSIONS

4.1 OPERATION AUDIT

The results of the August 23, 1991 operational audit conducted by ERM indicate the facility was in compliance with waste oil regulations established in 40 CFR 266, Part E. With few exceptions, ERM found engineering controls, entry controls, and the general and emergency management practices at the facility to be adequate. In addition, HOWCO was in compliance with the training and most recordkeeping requirements of RCRA and the Occupational Safety and Health Administration (OSHA). ERM recommended revisions to the documentation procedures to bring HOWCO into compliance with these regulations. HOWCO is currently operating an exempt oil recycling facility under FDER and EPA regulations. However, EPA's final rule regarding used oil regulation may affect HOWCO's status under RCRA. ERM also recommended operational changes to the facility to improve stormwater and wastewater handling procedures.

4.2 EPA SAMPLING AND ANALYSIS

On March 13, 1991, representatives from USEPA Region IV collected samples of filter press sludge and dirt from the oil/dirt emulsion recycling process from roll-off bins located onsite.

Samples of filter press material were reportedly collected by EPA personnel from five of the approximately 8 feet by 20 feet by 4 feet deep rolloff bins located in the storage area. The samples were collected at depths of approximately 18 inches, 24 inches, and also from the bottom of the bins, and analyzed for TCLP metals and volatile organic compounds by the EPA laboratory in Athens, Georgia.



Analytical results indicate that TCLP standards were not exceeded. Each of the samples contained nine to ten organic compounds; however, the TCLP for organics was not completed because the analytical scans were reportedly too low. EPA has not pursued the matter any further.

4.3 PRELIMINARY CONTAMINATION ASSESSMENT

The results of the preliminary contamination assessment indicate that Area 1 through 6 at the site contain excessively-contaminated soil (Figure 3-1). The total volume of excessively-contaminated soil from Areas 1 through 6 at the site is estimated to be 3,035 cy. Assuming 110 pounds per cubic foot of soil, approximately 4510 tons could be remediated during IRA; however, FDER typically limits soil IRA to 1500 cy.

The preburn soil analyses conducted at the site in October, November, and December 1991, indicate the petroleum-impacted soil may contain isolated areas with total lead levels above 17-775, FAC maximum permitted levels for thermal treatment. COMP-1 through COMP-4 were collected from Areas 1, 3, and 6, and contained total lead concentrations below permitted maximum limits. The total volume of excessively-contaminated soil in Areas 1, 3, and 6 are estimated at 1,213 cy.

4.4 GROUND WATER

Ground water quality and the ground water flow direction were not assessed during the preliminary contamination assessment. These parameters will be evaluated during the contamination assessment.

SECTION 5.0
RECOMMENDATIONS

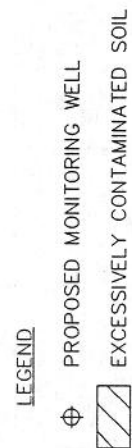
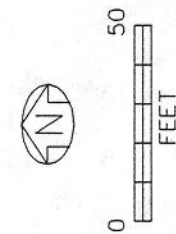
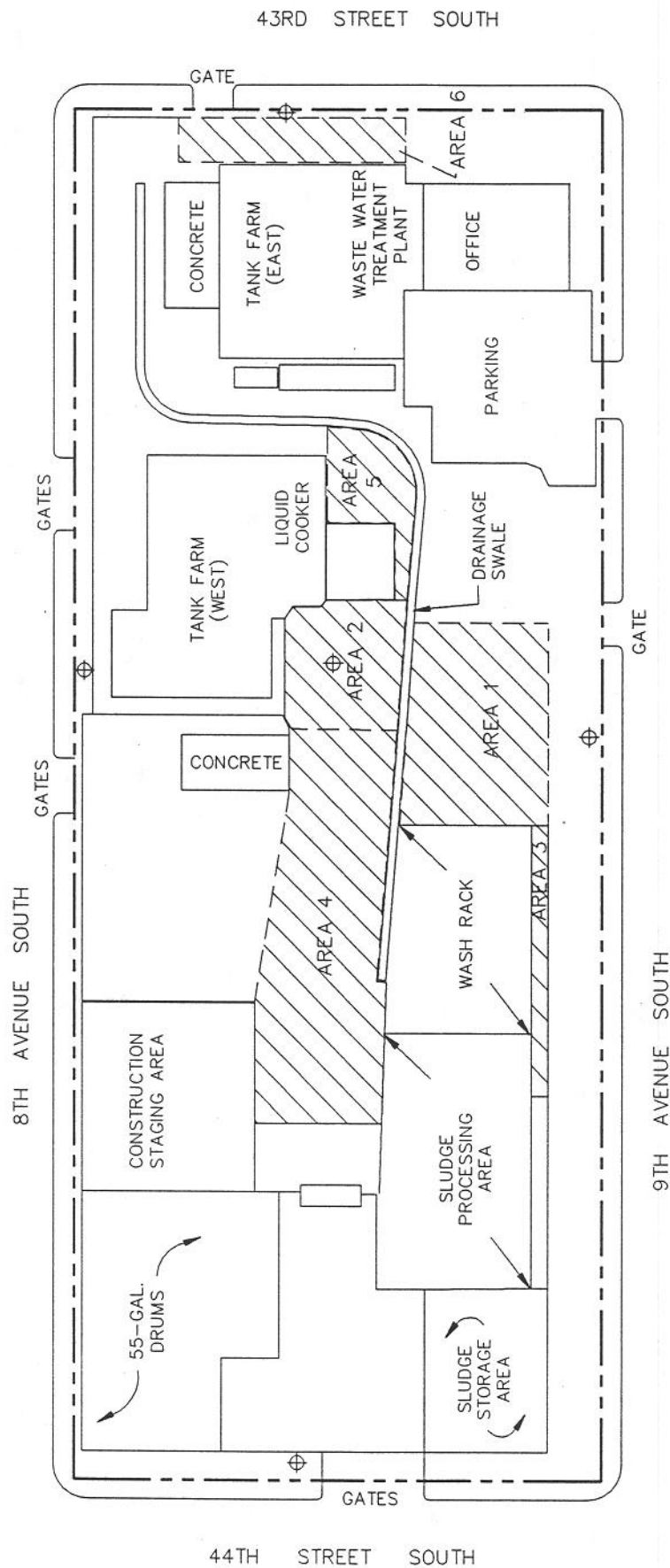


SECTION 5.0 RECOMMENDATIONS

Based on the results of the preliminary contamination assessment at HOWCO presented in this PCAR, ERM has prepared the following recommendations.

- Evaluate IRA alternatives for the approximately 3,035 cy of excessively-contaminated soil identified during the soil assessment. Options considered should include thermal treatment, both onsite and offsite; stabilization/solidification; bioremediation; and soil washing.
- Treat excessively-contaminated soil to reduce the concentration of petroleum constituents released to ground water.
- Complete a contamination assessment (CA) at the site. The CA will be conducted in accordance with the Consent Order executed by HOWCO and FDER.

Figure 5-1
Proposed Monitoring Well Locations
Howco Facility
St. Petersburg, Florida



APPENDIX A
TEST PIT LOCATION MAP
AREAS 1 AND 2





ERM-South, Inc.

Environmental Resources Management

Project Howco

W.O. No. 14412.03

Sheet 1 of 7

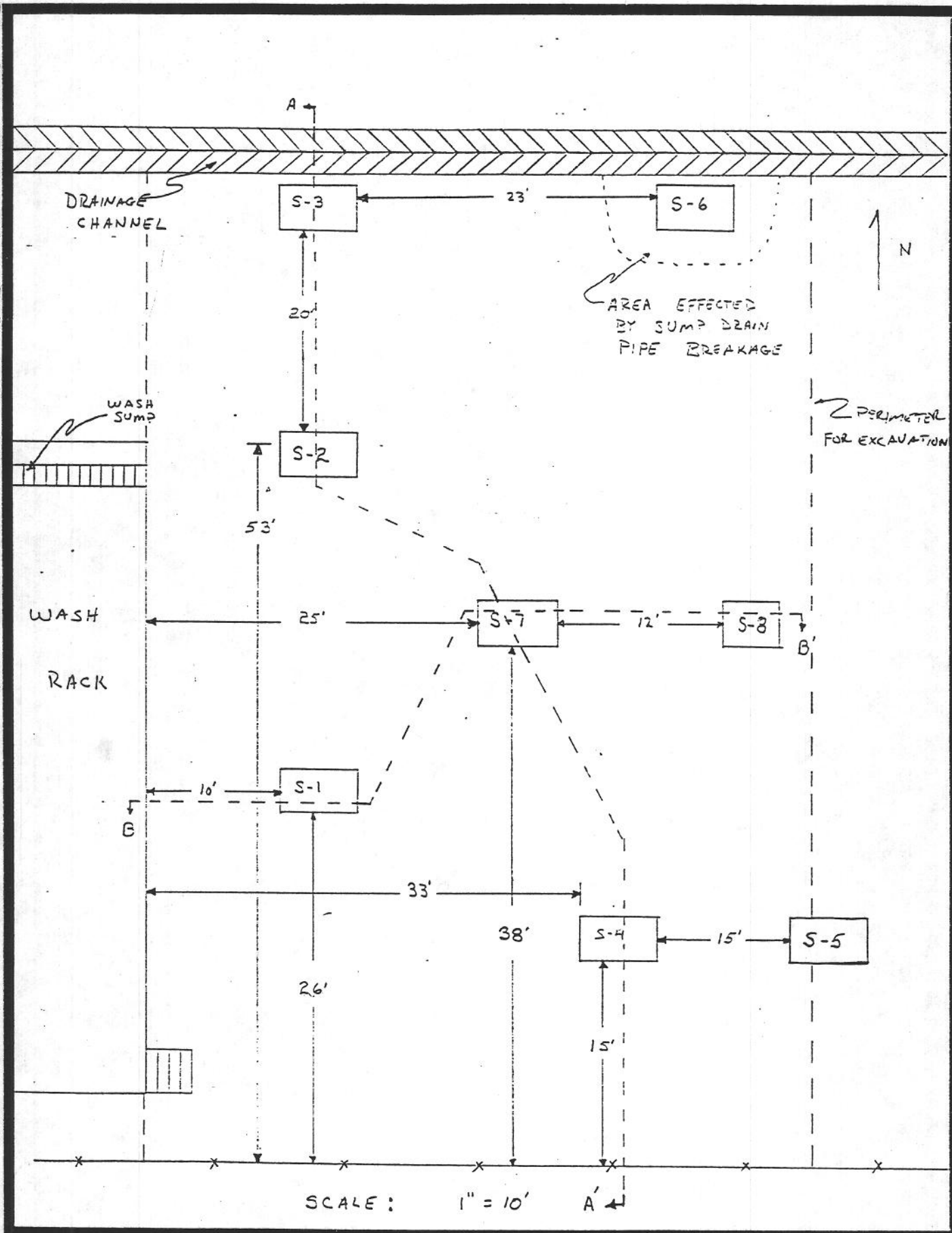
Subject SITE MAP OF AREA 1
(FORMER ASPHALT COOKER AREA)

By MSH

Date 8/16/91

Chkd by

Date



DETAILED DESCRIPTION OF TEST PITS IN AREA 1

Test Pit S-1

S-1 was constructed to a depth of 3.5 feet. The material from 6 inches to 1.5 feet was a dark brown stained shell material with a strong petroleum odor and from 1.5 feet to 3.0 feet a light brown stained grey sandy soil with a slight petroleum odor. Two soil samples were collected at 2.0 feet and 3.5 feet and analyzed with an OVA/FID. The OVA readings were 90 PPM and zero PPM, respectively.

Test Pit S-2

S-2 was constructed to a depth of 4.0 feet. The material from 6 inches to 2.0 feet was a dark brown stained shell material with a strong petroleum odor and from 2.0 feet to 3.5 feet a light brown stained grey sandy soil with a slight petroleum odor. A soil sample was collected at 4.0 feet and analyzed with an OVA/FID. The OVA reading was 28 PPM.

Test Pit S-3

S-3 was constructed to a depth of 4.0 feet. The material from 6 inches to 1.5 feet was a dark brown stained shell material with a slight petroleum odor and from 1.5 feet to 4.0 feet a grey sandy soil with a slight petroleum odor and no apparent staining. Two soil samples were collected at 1.0 and 2.0 feet and analyzed with an OVA/FID. The OVA readings were 190 PPM and 41 PPM, respectively.

Test Pit S-4

S-4 was constructed to a depth of 4.0 feet. The material from 6 inches to 2.0 feet was a dark brown stained shell material with a strong petroleum odor and from 1.5 feet to 4.0 feet a grey sandy soil with a slight petroleum odor and no apparent staining. A soil sample was collected at 2.0 feet and analyzed with an OVA/FID. The OVA reading was 41 PPM.

Test Pit S-5

S-5 was constructed to a depth of 2.0 feet. The material from 6 inches to 1.5 feet was a dark brown stained shell material with a strong petroleum odor and from 1.5 feet to 2.0 feet a grey sandy soil with a slight petroleum odor and no apparent staining. A soil sample was collected at 2.0 feet and analyzed with an OVA/FID. The OVA reading was 32 PPM.

Test Pit S-6

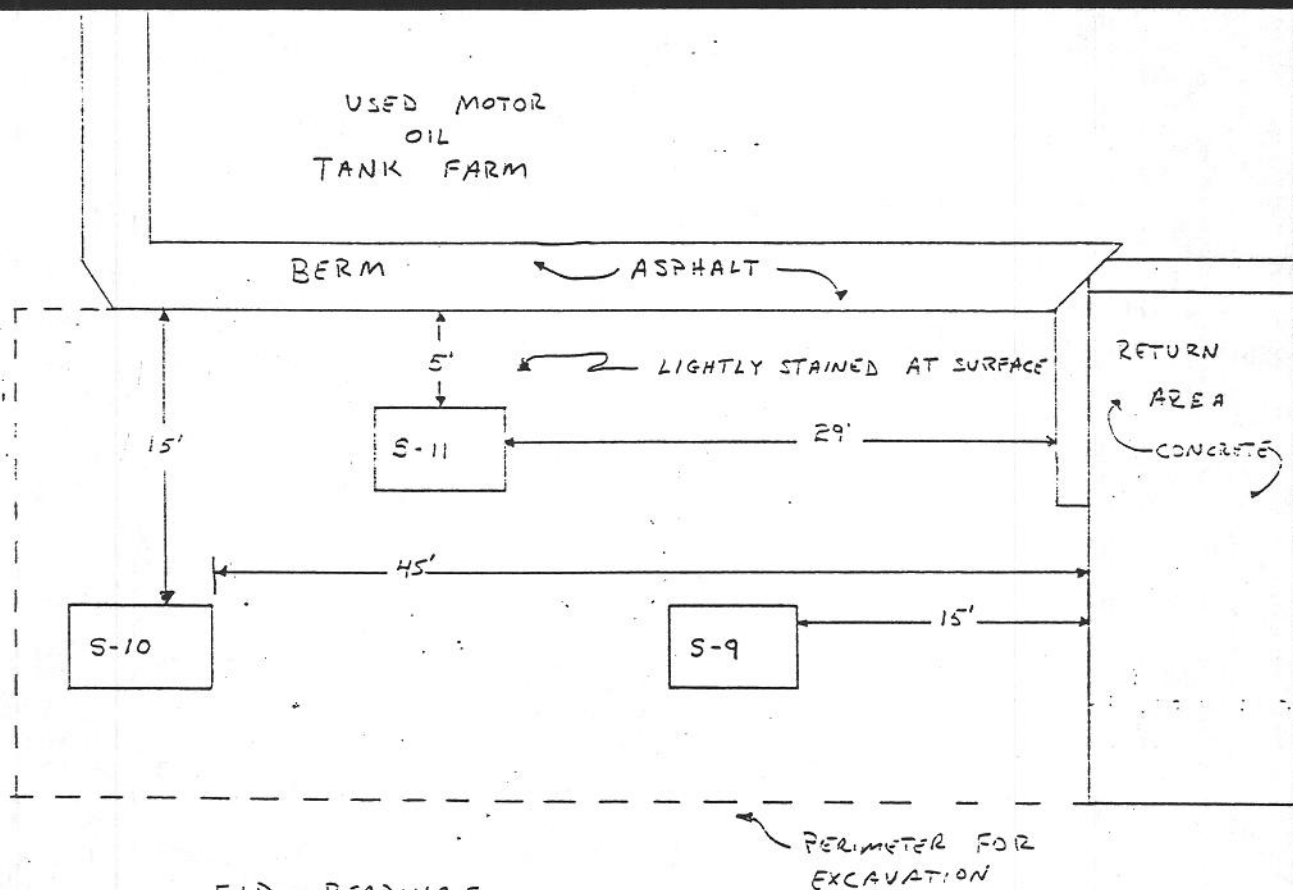
During the construction of S-6 a drain line from the wash rack sump was severed. Approximately 65 to 70 gallons of oily water was discharged into the test pit. A sample from this area was not collected. Within fifteen minutes a vacuum truck was present and removed the oily water from the test pit.

Test Pit S-7

S-7 was constructed to a depth of 5.5 feet. The material from 6 inches to 1.5 feet was a dark brown stained shell material with a strong petroleum odor, from 1.5 feet to 4.5 feet a grey sandy soil with a strong petroleum odor and heavy staining and from 4.5 feet to 5.5 feet a dark brown silty material. A soil sample was collected at 5.5 feet and was analyzed with an OVA/FID. The OVA reading was 250 PPM.

**ERM-South, Inc.**

Environmental Resources Management

Project Howco
Subject Site Map Area 2W.O. No. 1441203 Sheet 2 of 7
By MSH Date 8/16/91
Chkd by _____ Date _____FID READINGS

<u>LOCATION</u>	<u>PPM</u>	<u>COMMENT</u>
S-9, @ 5'	24	TAKEN BELOW STAINED AREA
S-10 @ 7'	(1) UNK	STRONG PETROLEUM ODOR
S-11 @ 4'	14	TAKEN FROM SOIL DIRECTLY BELOW STAINED AREA
S-9 @ 3'	140	SLIGHT ODOR
S-10 @ 4.5'	150	STRONG ODOR
S-11 @ 2'	100	STRONG ODOR

NOTE: (1) GREATER THAN 1000 PPM ON FILTERED AND UNFILTERED READINGS WITH OVA/FID

APPENDIX B

**COMPOSITE SOIL SAMPLING DESIGNATIONS FOR
DECEMBER 1991 SAMPLES**



**ERM-South, Inc.**

Environmental Resources Management

Project HowcoW.O. No. 14412.0Sheet of Subject By Date Chkd by Date

		# of COMPOSITE SAMPLES	# OF LOCATIONS	# OF SUBSAMPLES
AREA 1 :	574 (18.9%) CY		7	21
AREA 2 :	255 (8.4%) CY		3	9
AREA 3 :	46 (1.5%) CY		1	3
AREA 4 :	1435 (47.3%) CY		19	57
AREA 5 :	133 (4.4%) CY		2	6
AREA 6 :	593 (19.5%) CY		8	24
	3036 CY	10	40	120

MUST COLLECT 6 samples for the FIRST
1500 CY and ONE sample FOR EACH
ADDITIONAL 500 CY

∴ NEED TO COLLECT $6 + 4 = 10$ COMPOSITE
SAMPLES FOR 3036 CY

EACH COMPOSITE SAMPLE IS COMPRISED OF
12 SUBSAMPLES OBTAINED FROM 3 depths
AT 4 LOCATIONS

**ERM-South, Inc.**

Environmental Resources Management

Project _____

W.O. No. _____

Sheet _____

of _____

Subject _____

By _____

Date _____

Chkd by _____

Date _____

AREA 1 Sample COLLECTION:

7 TOTAL LOCATIONS IN AREA 1

SUB-SAMPLE NO.	DEPTH (ft)	COMP #	DATE COLLECTED
1-1 a	1.0	COMP-1	12/18/91
1-1 b	1.5		
1-1 c	2.0		
1-2 a	1.0		
1-2 b	2.0		
1-2 c	3.0		
1-3 a	1.0		
1-3 b	2.0		
1-3 c	3.0		
1-4 a	1.0	COMP-2	12/18/91
1-4 b	3.0		
1-4 c	5.0		
1-5 a	1.0		
1-5 b	2.0		
1-5 c	3.0		
1-6 a	1.0		
1-6 b	2.0		
1-6 c	3.0		
1-7 a	1.0		
1-7 b	4.0		
1-7 c	7.0		

AREA 3 SAMPLE COLLECTION:

SUB-SAMPLE NO.	LOCATION IN AREA 3	DEPTH (ft)	COMP #	DATE COLLECTED
3-1 a		1.0	COMP-1	12/18/91
3-1 b		1.5		
3-1 c		2.0		

**ERM-South, Inc.**

Environmental Resources Management

Project _____

W.O. No. _____

Sheet _____

of _____

Subject _____

By _____

Date _____

Chkd by _____

Date _____

AREA 6 SAMPLE COLLECTION:

8 LOCATIONS IN AREA 6

SUB-SAMPLE NO.	DEPTH (ft)	COMP #	DATE COLLECTED
6-1 a	2.0	COMP-3	12/18/91
6-1 b	4.0		
6-1 c	6.0		
6-2 a	2.0		
6-2 b	4.0		
6-2 c	6.0		
6-3 a	2.0		
6-3 b	4.0		
6-3 c	6.0		
6-4 a	2.0		
6-4 b	4.0		
6-4 c	6.0		
6-5 a	2.0	COMP-4	12/19/91
6-5 b	4.0		
6-5 c	6.0		
6-6 a	2.0		
6-6 b	4.0		
6-6 c	6.0		
6-7 a	2.0		
6-7 b	4.0		
6-7 c	6.0		
6-8 a	2.0		
6-8 b	4.0		
6-8 c	6.0		

**ERM-South, Inc.**

Environmental Resources Management

Project _____

W.O. No. _____

Sheet _____ of _____

Subject _____

By _____

Date _____

Chkd by _____

Date _____

AREA 2 SAMPLE COLLECTION:

3 LOCATIONS IN AREA 2

SUB-SAMPLE NO.	DEPTH (ft.)	COMP #	DATE COLLECTED
2-1 a	1.0	COMP-5	12/19/91
2-1 b	3.0	↓	↓
2-1 c	5.0	↓	↓
2-2 a	1.0	↓	↓
2-2 b	3.0	↓	↓
2-2 c	5.0	↓	↓
2-3 a	1.0	COMP-6	12/19/91
2-3 b	3.0	↓	↓
2-3 c	5.0	↓	↓

AREA 5 SAMPLE COLLECTION:

2 LOCATIONS IN AREA 5

SUB-SAMPLE NO.	DEPTH (ft.)	COMP #	DATE COLLECTED
5-1 a	1.0	COMP-5	12/19/91
5-1 b	1.5	↓	↓
5-1 c	2.0	↓	↓
5-2 a	1.0	↓	↓
5-2 b	1.5	↓	↓
5-2 c	2.0	↓	↓



**ERM-South, Inc.**

Environmental Resources Management

Project _____

W.O. No. _____

Sheet _____ of _____

Subject _____

By _____

Date _____

Chkd by _____

Date _____

AREA 4 SAMPLE COLLECTION:

19 LOCATIONS IN AREA 4

SUB SAMPLE NO.	DEPTH (ft)	COMP #	DATE COLLECTED
4-1 a	1.0	COMP-6 ↓	12/19/91 ↓
4-1 b	1.5		
4-1 c	2.0		
4-2 a	1.0		
4-2 b	1.5		
4-2 c	2.0		
4-3 a	1.0		
4-3 b	1.5		
4-3 c	2.0		
4-4 a	1.0	COMP-7 ↓	12/19/91 ↓
4-4 b	1.5		
4-4 c	2.0		
4-5 a	1.0		
4-5 b	1.5		
4-5 c	2.0		
4-6 a	1.0		
4-6 b	2.0		
4-6 c	3.0		
4-7 a	1.0		
4-7 b	2.0		
4-7 c	3.0		
4-8 a	1.0	COMP-8 ↓	12/20/91 ↓
4-8 b	2.0		
4-8 c	3.0		
4-9 a	1.0		
4-9 b	3.0		
4-9 c	5.0		
4-10 a	1.0		
4-10 b	3.0		
4-10 c	5.0		

Project _____ W.O. No. _____ Sheet _____ of _____
Subject _____ By _____ Date _____
Chkd by _____ Date _____

AREA 4 SAMPLE COLLECTION (CONT.):

SUB-SAMPLE NO.	DEPTH (ft.)	COMP #	DATE COLLECTED
4-11 a	1.0	COMP-8	12/20/91
4-11 b	3.0	↓	↓
4-11 c	5.0	↓	↓
4-12 a	2.0	COMP-9	12/20/91
4-12 b	4.0	↓	↓
4-12 c	6.0	↓	↓
4-13 a	2.0	↓	↓
4-13 b	4.0	↓	↓
4-13 c	6.0	↓	↓
4-14 a	2.0	↓	↓
4-14 b	4.0	↓	↓
4-14 c	6.0	↓	↓
4-15 a	1.0	↓	↓
4-15 b	3.0	↓	↓
4-15 c	5.0	↓	↓
4-16 a	1.0	COMP-10	12/20/91
4-16 b	3.0	↓	↓
4-16 c	5.0	↓	↓
4-17 a	1.0	↓	↓
4-17 b	2.0	↓	↓
4-17 c	3.0	↓	↓
4-18 a	1.0	↓	↓
4-18 b	2.0	↓	↓
4-18 c	3.0	↓	↓
4-19 a	1.0	↓	↓
4-19 b	2.0	↓	↓
4-19 c	3.0	↓	↓



APPENDIX C
CROSS SECTION OF AREA 1



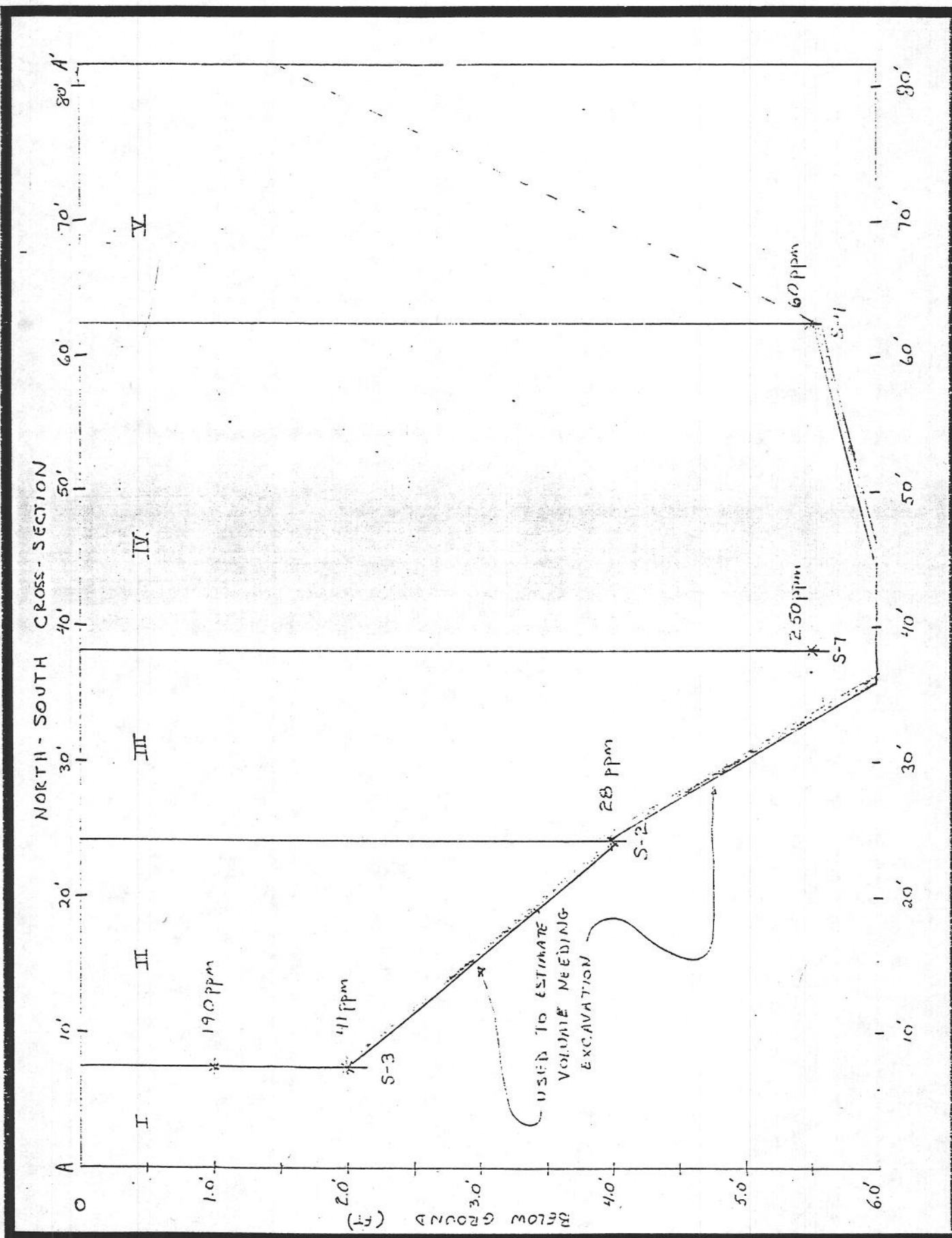


ERM-South, Inc.

Environmental Resources Management

Project Hawco
Subject North-South Cross-Section
A-A'

W.O. No. 14413.03 Sheet 3 of 7
By MSI Date 8/16/91
Chkd by _____ Date _____





ERM-South, Inc.

Environmental Resources Management

Project Howco

W.O. No. 14412.03

Sheet 4 of 7

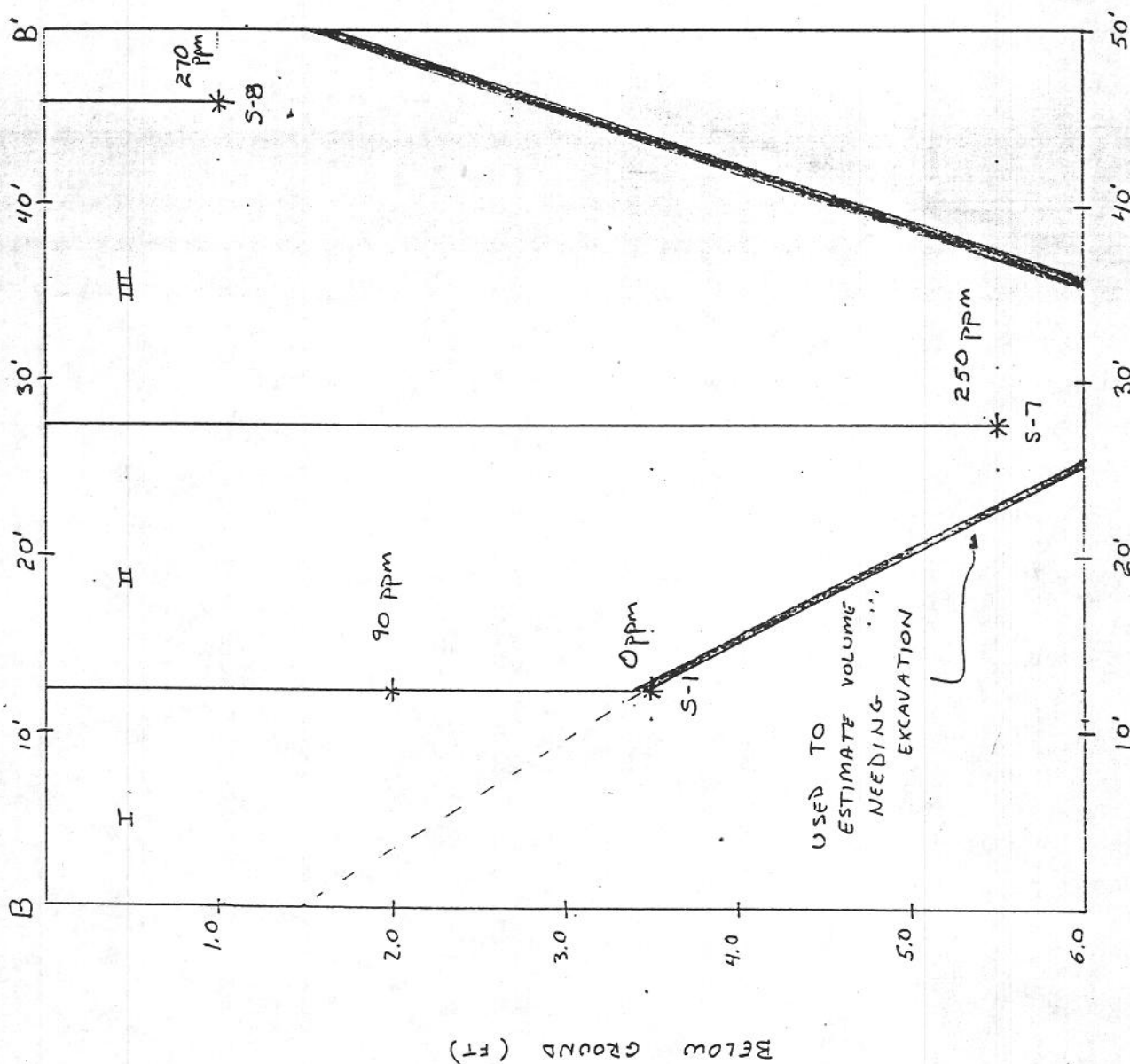
Subject EAST-WEST CROSS-SECTION B-B'

By MSH

Date 8/16/91

Chkd by

Date





ERM-South, Inc.

Environmental Resources Management

Project

Howco

W.O. No. 14412.03

Sheet 5 of 7

Subject

Area 1 Volume Calculation

By MSH

Date 8/17/91

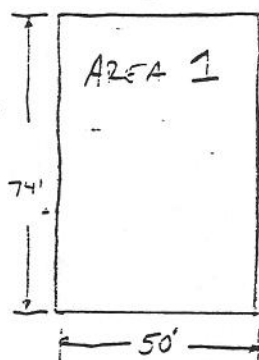
Chkd by

Date

OBJECTIVE: DETERMINE THE VOLUME OF SOIL NEEDED
TO BE EXCAVATED FROM AREA 1.

ASSUMPTIONS: 1) CROSS-SECTION (N-S and E-W) WILL BE AVERAGED
TO DETERMINE VOLUME FOR EXCAVATION
2) ONLY AREAS OBSERVED ARE CALCULATED
IN TOTAL VOLUME (74' x 50')

TOTAL AREA FOR EXCAVATION (AREA 1)



FROM FIGURE 3 CROSS-SECTIONAL AREA

ASSUMPTION: CROSS-SECTION IS THE AVERAGE AREA OF
CONTAMINATED SOIL OVER AREA 1

N-S CROSS-SECTION AREA:

$$\text{Area}_I = (7.5 \text{ ft}) \left(\frac{2 + 1.5 \text{ ft}}{2} \right) = 13.13 \text{ ft}^2$$

$$\text{Area}_{II} = (17 \text{ ft}) \left(\frac{2 + 4 \text{ ft}}{2} \right) = 51 \text{ ft}^2$$

$$\text{Area}_{III} = (14 \text{ ft}) \left(\frac{4 + 6 \text{ ft}}{2} \right) = 70 \text{ ft}^2$$

$$\text{Area}_{IV} = (24 \text{ ft}) \left(\frac{6 + 5.5 \text{ ft}}{2} \right) = 138 \text{ ft}^2$$

$$\text{Area}_V = (19 \text{ ft}) \left(\frac{5.5 + 1.5 \text{ ft}}{2} \right) = 66.5 \text{ ft}^2$$

ROMAN NUMERALS CORRESPOND
TO AREAS IN FIGURE 3

$$\text{TOTAL X-SECT} = 338.63 \text{ ft}^2$$



Project

HowCO

W.O. No. 14412.03

Sheet 6 of 7

Subject

AREA 1 Volume Calc. (CONT.)

By MSH

Date 8/17/91

Chkd by

Date

THE N-S CROSS-SECTION IS THE AREA EFFECTED
ACROSS A LENGTH OF 50 ft.

VOLUME OF SOIL : (USING N-S X-SECTION)

$$(338.63 \text{ ft}^2)(50 \text{ ft}) = 16,931.5 \text{ ft}^3$$

$$\text{VOL.} = \frac{16,931.5 \text{ ft}^3}{27 \text{ ft}^3} \text{ C.Y.} = 627 \text{ C.Y.}$$

E-W CROSS-SECTION AREA: (Figure 4)

$$\text{Area I} = (13 \text{ ft}) \left(\frac{1.5 + 3.5}{2} \text{ ft} \right) = 32.5 \text{ ft}^2$$

$$\text{Area II} = (15 \text{ ft}) \left(\frac{3.5 + 6}{2} \text{ ft} \right) = 71.25 \text{ ft}^2$$

$$\text{Area III} = (23 \text{ ft}) \left(\frac{6.0 + 1.5}{2} \text{ ft} \right) = 86.25 \text{ ft}^2$$

ROMAN NUMERALS CORRESPOND
TO AREAS IN FIGURE 4

$$\text{TOTAL X-SECT} = 190 \text{ ft}^2$$

THE E-W CROSS-SECTION IS THE AREA EFFECTED
ACROSS A LENGTH OF 74 FEET

VOLUME OF SOIL : (USING E-W X-SECTION)

$$(190 \text{ ft}^2)(74 \text{ ft}) = 14060 \text{ ft}^3$$

$$\text{VOL.} = \frac{14060 \text{ ft}^3}{27 \text{ ft}^3} \text{ C.Y.} = 521 \text{ C.Y.}$$

CONCLUSION:

$$\text{AVE} = \frac{521 + 627}{2} = 574 \text{ C.Y.}$$

APPROXIMATELY 574 CY OF SOIL NEEDS
TO BE REMOVED



Project

Howco

W.O. No. 1412.03

Sheet 7 of 7

Subject

Area 2 Volume Calculation

By MSH

Date 2/17/01

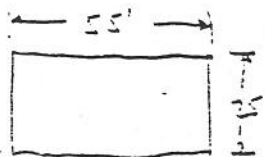
Chkd by

Date

OBJECTIVE: DETERMINE VOLUME OF SOIL NEEDED
TO BE EXCAVATED FROM AREA 2.

Assumption: 1) DEPTH = 5.0 FEET OVER ALL OF
AREA 2 (AVERAGE OF 5.0 FEET, ISOLATED AREAS MAY BE
3 FEET DEEPER)
2) ONLY AREAS OBSERVED ARE CALCULATED
IN TOTAL VOLUME (55' X 25')

TOTAL AREA FOR EXCAVATION (AREA 2)



$$\begin{aligned} \text{Volume} &= L \times W \times D \\ &= (55 \text{ ft}) (25 \text{ ft}) (5 \text{ ft}) = 6875 \text{ ft}^3 \\ &= \frac{6875 \text{ ft}^3}{27 \text{ ft}^3} \bigg| \text{C.Y.} = 255 \text{ C.Y.} \end{aligned}$$

CONCLUSION: APPROXIMATELY 255 C.Y. OF SOIL
NEED EXCAVATION. ONLY AREAS
OBSERVED ARE IN TOTAL CALCULATION.

APPENDIX D
LABORATORY REPORTS



September 16, 1991

file
14412.03

Project No. 14412.03

MEMORANDUM

To: Project File, 14112.03

Copy: Paul Gruber
Robin Fornino
Sri Rao

From: Michael S. Helfrich *MSH*

RE: Laboratory Results from Composite Soil Samples Collected at HOWCO Oil Recovery Plant, St. Petersburg, Florida

On August 26, 1991, I travelled to HOWCO in St. Petersburg to collect a composite soil sample of two areas previously identified as petroleum contaminated (Field Memorandum dated August 16, 1991). The samples were collected and sent to Savannah Laboratories for analysis of PCB, TRPH, TCLP-RCRA metals, EPA Methods 8010 and 8020, and total halogens. The laboratory results were received September 11, 1991. The follow were detected:

Petroleum Hydrocarbons	15,000	mg/kg, dw
*Barium (TCLP)	0.097/0.085	mg/l
*Lead (TCLP)	0.45/0.41	mg/l
Ethylbenzene	110	ug/l, dw
Toluene	19	ug/l, dw
Trichloroethene	9.8	ug/l, dw
Xylene	160	ug/l, dw
Total halogens	820	mg/l, dw

Note:

* = First result is corrected, second is analytical for matrix spike.
dw = dry weight

Enclosed

Chain of Custody
Laboratory Results
Field Notes

REC'D SEP 11 1991

SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

6712 Benjamin Road • Suite 100 • Tampa, FL 33634 • (813) 885-7427 • Fax (813) 885-7049

LOG NO: B1-34070

Received: 27 AUG 91

Mr. Mike Helfrich
ERM-South Inc.
9501 Princess Palm Avenue
Tampa, FL 33619

Project: 14412.03

REPORT OF RESULTS

Page 1

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
34070-1	Composite Soil (corrected/analytical)	Client
PARAMETER	34070-1	
PCB in soil		
PCB-1016, mg/kg dw	<80	
PCB-1221, mg/kg dw	<80	
PCB-1232, mg/kg dw	<80	
PCB-1242, mg/kg dw	<80	
PCB-1248, mg/kg dw	<80	
PCB-1254, mg/kg dw	<80	
PCB-1260, mg/kg dw	<80	
Petroleum Hydrocarbons , mg/kg dw	15000	
Metals in TCLP		
Arsenic (TCLP), mg/l	<0.20	
Barium (TCLP), mg/l	0.097/.085	
Cadmium (TCLP), mg/l	<0.010	
Chromium (TCLP), mg/l	<0.050	
Lead (TCLP), mg/l	0.45/0.41	
Selenium (TCLP), mg/l	<0.20	
Silver (TCLP), mg/l	<0.010	
Mercury (TCLP), mg/l	<0.020	

SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

6712 Benjamin Road • Suite 100 • Tampa, FL 33634 • (813) 885-7427 • Fax (813) 885-7049

LOG NO: B1-34070

Received: 27 AUG 91

Mr. Mike Helfrich
ERM-South Inc.
9501 Princess Palm Avenue
Tampa, FL 33619

Project: 14412.03

REPORT OF RESULTS

Page 2

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
B4070-1	Composite Soil (corrected/analytical)	Client
PARAMETER	34070-1	
Volatile Organics		
Benzyl chloride, ug/kg dw	<5.6	
Bromobenzene, ug/kg dw	<5.6	
Bromodichloromethane, ug/kg dw	<5.6	
Benzene, ug/kg dw	<5.6	
Bromoform, ug/kg dw	<28	
Bromomethane, ug/kg dw	<5.6	
Carbon tetrachloride, ug/kg dw	<5.6	
Chlorobenzene, ug/kg dw	<5.6	
Chloroethane, ug/kg dw	<5.6	
Chloroform, ug/kg dw	<5.6	
1-Chlorohexane, ug/kg dw	<5.6	
2-Chloroethylvinyl ether, ug/kg dw	<56	
Chloromethane, ug/kg dw	<5.6	
Chlorotoluene, ug/kg dw	<5.6	
Dibromochloromethane, ug/kg dw	<5.6	
Dibromomethane, ug/kg dw	<5.6	
1,2-Dichlorobenzene, ug/kg dw	<5.6	
1,3-Dichlorobenzene, ug/kg dw	<5.6	
1,4-Dichlorobenzene, ug/kg dw	<5.6	
Dichlorodifluoromethane, ug/kg dw	<5.6	
1,1-Dichloroethane, ug/kg dw	<5.6	
1,2-Dichloroethane, ug/kg dw	<5.6	
1,1-Dichloroethene, ug/kg dw	<5.6	

SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

6712 Benjamin Road • Suite 100 • Tampa, FL 33634 • (813) 885-7427 • Fax (813) 885-7049

LOG NO: B1-34070

Received: 27 AUG 91

Mr. Mike Helfrich
ERM-South Inc.
9501 Princess Palm Avenue
Tampa, FL 33619

Project: 14412.03

REPORT OF RESULTS

Page 3

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
34070-1	Composite Soil (corrected/analytical)	Client

PARAMETER	34070-1
1,2-Dichloropropane, ug/kg dw	<5.6
1,3-Dichloropropylene, ug/kg dw	<5.6
Ethylbenzene, ug/kg dw	110
Methylene chloride, ug/kg dw	<5.6
1,1,2,2-Tetrachloroethane, ug/kg dw	<5.6
1,1,1,2-Tetrachloroethane, ug/kg dw	<5.6
Tetrachloroethene, ug/kg dw	<5.6
Toluene, ug/kg dw	19
1,1,1-Trichloroethane, ug/kg dw	<5.6
1,1,2-Trichloroethane, ug/kg dw	<5.6
Trichloroethene, ug/kg dw	9.8
Trichlorofluoromethane, ug/kg dw	<5.6
1,2,3-Trichloropropane, ug/kg dw	<5.6
Vinyl Chloride, ug/kg dw	<5.6
Xylenes, ug/kg dw	160
Total halogens, mg/kg dw	820
Percent Solids, %	93 %

SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

6712 Benjamin Road • Suite 100 • Tampa, FL 33634 • (813) 885-7427 • Fax (813) 885-7049

LOG NO: B1-34070

Received: 27 AUG 91

Mr. Mike Helfrich
ERM-South Inc.
9501 Princess Palm Avenue
Tampa, FL 33619

Project: 14412.03

REPORT OF RESULTS

Page 4

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
34070-2	Composite Soil Matrix Spike	Client
PARAMETER	34070-2	
Metals in TCLP		
Arsenic (TCLP), %	102 %	
Barium (TCLP), %	88 %	
Cadmium (TCLP), %	103 %	
Chromium (TCLP), %	98 %	
Lead (TCLP), %	92 %	
Selenium (TCLP), %	104 %	
Silver (TCLP), %	110 %	
Mercury (TCLP), %	87 %	

SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

6712 Benjamin Road • Suite 100 • Tampa, FL 33634 • (813) 885-7427 • Fax (813) 885-7049

LOG NO: B1-34070

Received: 27 AUG 91

Mr. Mike Helfrich
ERM-South Inc.
9501 Princess Palm Avenue
Tampa, FL 33619

Project: 14412.03

REPORT OF RESULTS

Page 5

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID	SAMPLED BY
34070-3	Method Blank	Client
34070-4	Accuracy (% Recovery)	
34070-5	Precision (% RPD)	

PARAMETER	34070-3	34070-4	34070-5
PCB in soil			
PCB-1016, mg/kg dw	<80	---	---
PCB-1221, mg/kg dw	<80	---	---
PCB-1232, mg/kg dw	<80	---	---
PCB-1242, mg/kg dw	<80	---	---
PCB-1248, mg/kg dw	<80	86 %	0 %
PCB-1254, mg/kg dw	<80	---	---
PCB-1260, mg/kg dw	<80	---	---
Petroleum Hydrocarbons , mg/kg dw	<10	90 %	1.2 %

SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

6712 Benjamin Road • Suite 100 • Tampa, FL 33634 • (813) 885-7427 • Fax (813) 885-7049

LOG NO: B1-34070

Received: 27 AUG 91

Mr. Mike Helfrich
ERM-South Inc.
9501 Princess Palm Avenue
Tampa, FL 33619

Project: 14412.03

REPORT OF RESULTS

Page 6

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID	SAMPLED BY		
34070-3	Method Blank	Client		
34070-4	Accuracy (% Recovery)			
34070-5	Precision (% RPD)			
PARAMETER	34070-3	34070-4	34070-5	
Volatile Organics				
Benzyl chloride, ug/kg dw	<5.0	---	---	
Bromobenzene, ug/kg dw	<5.0	---	---	
Bromodichloromethane, ug/kg dw	<5.0	---	---	
Benzene, ug/kg dw	<5.0	105 %	1.9 %	
Bromoform, ug/kg dw	<25	---	---	
Bromomethane, ug/kg dw	<5.0	---	---	
Carbon tetrachloride, ug/kg dw	<5.0	---	---	
Chlorobenzene, ug/kg dw	<5.0	97 %	6.2 %	
Chloroethane, ug/kg dw	<5.0	---	---	
Chloroform, ug/kg dw	<5.0	---	---	
1-Chlorohexane, ug/kg dw	<5.0	---	---	
2-Chloroethylvinyl ether, ug/kg dw	<50	---	---	
Chloromethane, ug/kg dw	<5.0	---	---	
Chlorotoluene, ug/kg dw	<5.0	---	---	
Dibromochloromethane, ug/kg dw	<5.0	---	---	
Dibromomethane, ug/kg dw	<5.0	---	---	
1,2-Dichlorobenzene, ug/kg dw	<5.0	---	---	
1,3-Dichlorobenzene, ug/kg dw	<5.0	---	---	
1,4-Dichlorobenzene, ug/kg dw	<5.0	---	---	
Dichlorodifluoromethane, ug/kg dw	<5.0	---	---	
1,1-Dichloroethane, ug/kg dw	<5.0	---	---	

SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

6712 Benjamin Road • Suite 100 • Tampa, FL 33634 • (813) 885-7427 • Fax (813) 885-7049

LOG NO: B1-34070

Received: 27 AUG 91

Mr. Mike Helfrich
ERM-South Inc.
9501 Princess Palm Avenue
Tampa, FL 33619

Project: 14412.03

REPORT OF RESULTS

Page 7

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID	SAMPLED BY
34070-3	Method Blank	Client
34070-4	Accuracy (% Recovery)	
34070-5	Precision (% RPD)	

PARAMETER	34070-3	34070-4	34070-5
1,2-Dichloroethane, ug/kg dw	<5.0	---	---
1,1-Dichloroethene, ug/kg dw	<5.0	115 %	21 %
1,2-Dichloropropane, ug/kg dw	<5.0	---	---
1,3-Dichloropropylene, ug/kg dw	<5.0	---	---
Ethylbenzene, ug/kg dw	<5.0	---	---
Methylene chloride, ug/kg dw	<5.0	---	---
1,1,2,2-Tetrachloroethane, ug/kg dw	<5.0	---	---
1,1,1,2-Tetrachloroethane, ug/kg dw	<5.0	---	---
Tetrachloroethene, ug/kg dw	<5.0	---	---
Toluene, ug/kg dw	<5.0	105 %	3.8 %
1,1,1-Trichloroethane, ug/kg dw	<5.0	---	---
1,1,2-Trichloroethane, ug/kg dw	<5.0	---	---
Trichloroethene, ug/kg dw	<5.0	115 %	17 %
Trichlorofluoromethane, ug/kg dw	<5.0	---	---
1,2,3-Trichloropropane, ug/kg dw	<5.0	---	---
Vinyl Chloride, ug/kg dw	<5.0	---	---
Xylenes, ug/kg dw	<5.0	---	---
Total halogens, mg/kg	<100	114 %	2.6 %

Method: EPA SW-846

HRS Certification #'s:81291,87279,E81005,E87052


Kathy Sheffield

SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

REC'D OCT 29 1991

12 Benjamin Road • Suite 100 • Tampa, FL 33634 • (813) 885-7427 • Fax (813) 885-7049

LOG NO: B1-35621

Received: 15 OCT 91

Mr. Mike Helfrich
ERM-South Inc.
9501 Princess Palm Avenue
Tampa, FL 33619

Project: 14412.03

REPORT OF RESULTS

Page 1

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
35621-1	Composite Soil	Client
PARAMETER	35621-1	
Arsenic, mg/kg dw	<1.0	
Barium, mg/kg dw	4.9	
Cadmium, mg/kg dw	<0.50	
Chromium, mg/kg dw	2.4	
Lead, mg/kg dw	170	
Mercury, mg/kg dw	0.026	
Selenium, mg/kg dw	<1.0	
Silver, mg/kg dw	<1.0	
Percent Solids, %	93 %	

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

6712 Benjamin Road • Suite 100 • Tampa FL 33634 • (813) 885-7427 • Fax (813) 885-7049

LOG NO: B1-35740

Received: 18 NOV 91

Mr. Michael Helfrich
ERM-South Inc.
9501 Princess Palm Avenue
Tampa, FL 33619

Project: 14412.03
Sampled By: Client

REPORT OF RESULTS

Page 1

LOG NO	SAMPLE DESCRIPTION ,	SOLID OR SEMISOLID SAMPLES	DATE SAMPLED
35740-1	Comp		11-16-91
PARAMETER		35740-1	
Lead, mg/kg dw		15	
Percent Solids, %		87 %	

ENVIROPACT, INC.

11300 43rd Street North
Clearwater, Florida 34622-4900
(813) 573-9663 Fax No. (813) 572-4915

REC'D DEC 31 1991

4412.05

ERM_00045295

Attn: MICHAEL HELFRICH

ERM

9501 PRINCESS PALM AVE. #100
TAMPA, FLORIDA 33619

Page 1

24 Dec 1991

Report T1-12-138-01

LAB ID. 84271,E84060

Sample Description:

CLEARWATER, FLORIDA

PROJECT NUMBER: 14412.05

SAMPLE ID.: COMP - 1

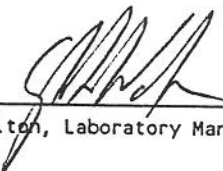
COLLECTED: 12/18/91

RECEIVED: 12/20/91

COLLECTED BY: YOUR REP

Parameter	Result	Units	Method	Det. Limit	Extracted	Analyzed	Analyst
Lead, Total	15.2	mg/kg	3050/7420	2.0		12/23/91	KB

**** BDL INDICATES ANALYTE IS BELOW DETECTABLE LEVELS
ALL ANALYSIS PERFORMED BY EPA, ASTM, OR STANDARD METHODS


Steven L. Walton, Laboratory Manager



ERM_00045295

Attn: MICHAEL HELFRICH

ERM

9501 PRINCESS PALM AVE. #100

TAMPA, FLORIDA 33619

Page 2

24 Dec 1991

Report T1-12-138-02

LAB ID. 84271,E84060

Sample Description:

CLEARWATER, FLORIDA

PROJECT NUMBER: 14412.05

SAMPLE ID.: COMP - 2

COLLECTED: 12/18/91

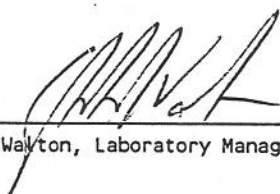
RECEIVED: 12/20/91

COLLECTED BY: YOUR REP

Parameter	Result	Units	Method	Det. Limit	Extracted	Analyzed	Analyst
Lead, Total	3.22	mg/kg	3050/7420	2.0		12/23/91	KB

**** BDL INDICATES ANALYTE IS BELOW DETECTABLE LEVELS

ALL ANALYSIS PERFORMED BY EPA, ASTM, OR STANDARD METHODS


Steven L. Walton, Laboratory Manager

ERM_00045295
Attn: MICHAEL HELFRICH

ERM
9501 PRINCESS PALM AVE. #100
TAMPA, FLORIDA 33619

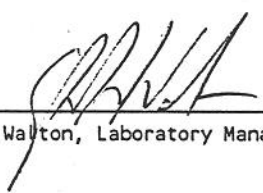
Page 3
24 Dec 1991
Report T1-12-138-03
LAB ID. 84271,E84060

Sample Description:
CLEARWATER, FLORIDA
PROJECT NUMBER: 14412.05

SAMPLE ID.: COMP - 3
COLLECTED: 12/18/91
RECEIVED: 12/20/91
COLLECTED BY: YOUR REP

Parameter	Result	Units	Method	Det. Limit	Extracted	Analyzed	Analyst
Lead, Total	10.8	mg/kg	3050/7420	2.0		12/23/91	KB

**** BDL INDICATES ANALYTE IS BELOW DETECTABLE LEVELS
ALL ANALYSIS PERFORMED BY EPA, ASTM, OR STANDARD METHODS


Steven L. Walton, Laboratory Manager

ERM_00045295
Attn: MICHAEL HELFRICH

ERM
9501 PRINCESS PALM AVE. #100
TAMPA, FLORIDA 33619

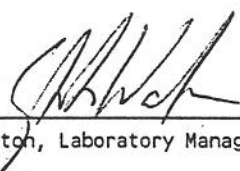
Page 4
24 Dec 1991
Report T1-12-138-04
LAB ID. 84271,E84060

Sample Description:
CLEARWATER, FLORIDA
PROJECT NUMBER: 14412.05

SAMPLE ID.: COMP - 4
COLLECTED: 12/19/91
RECEIVED: 12/20/91
COLLECTED BY: YOUR REP

Parameter	Result	Units	Method	Det. Limit	Extracted	Analyzed	Analyst
Lead, Total	14.6	mg/kg	3050/7420	2.0		12/23/91	KB

**** BDL INDICATES ANALYTE IS BELOW DETECTABLE LEVELS
ALL ANALYSIS PERFORMED BY EPA, ASTM, OR STANDARD METHODS



Steven L. Walton, Laboratory Manager

ERM_00045295

Attn: MICHAEL HELFRICH

ERM

9501 PRINCESS PALM AVE. #100
TAMPA, FLORIDA 33619

Page 5

24 Dec 1991

Report T1-12-138-05

LAB ID. 84271,E84060

Sample Description:

CLEARWATER, FLORIDA

PROJECT NUMBER: 14412.05

SAMPLE ID.: COMP - 5

COLLECTED: 12/19/91

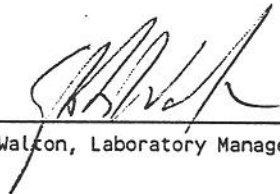
RECEIVED: 12/20/91

COLLECTED BY: YOUR REP

Parameter	Result	Units	Method	Det. Limit	Extracted	Analyzed	Analyst
Lead, Total	405	mg/kg	3050/7420	2.0		12/23/91	KB

**** BDL INDICATES ANALYTE IS BELOW DETECTABLE LEVELS

ALL ANALYSIS PERFORMED BY EPA, ASTM, OR STANDARD METHODS


Steven L. Watson, Laboratory Manager

ERM_00045295
Attn: MICHAEL HELFRICH

ERM
9501 PRINCESS PALM AVE. #100
TAMPA, FLORIDA 33619

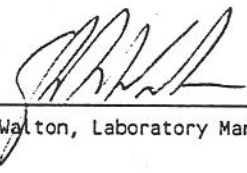
Page 6
24 Dec 1991
Report T1-12-138-06
LAB ID. 84271,E84060

Sample Description:
CLEARWATER, FLORIDA
PROJECT NUMBER: 14412.05

SAMPLE ID.: COMP - 6
COLLECTED: 12/19/91
RECEIVED: 12/20/91
COLLECTED BY: YOUR REP

Parameter	Result	Units	Method	Det. Limit	Extracted	Analyzed	Analyst
Lead, Total	456	mg/kg	3050/7420	2.0		12/23/91	KB

**** BDL INDICATES ANALYTE IS BELOW DETECTABLE LEVELS
ALL ANALYSIS PERFORMED BY EPA, ASTM, OR STANDARD METHODS


Steven L. Walton, Laboratory Manager

ERM_00045295
Attn: MICHAEL HELFRICH

ERM
9501 PRINCESS PALM AVE. #100
TAMPA, FLORIDA 33619

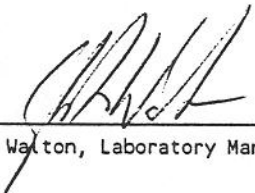
Sample Description:
CLEARWATER, FLORIDA
PROJECT NUMBER: 14412.05

Page 7
24 Dec 1991
Report T1-12-138-07
LAB ID. 84271,E84060

SAMPLE ID.: COMP - 7
COLLECTED: 12/19/91
RECEIVED: 12/20/91
COLLECTED BY: YOUR REP

Parameter	Result	Units	Method	Det. Limit	Extracted	Analyzed	Analyst
Lead, Total	367	mg/kg	3050/7420	2.0		12/23/91	KB

**** BDL INDICATES ANALYTE IS BELOW DETECTABLE LEVELS
ALL ANALYSIS PERFORMED BY EPA, ASTM, OR STANDARD METHODS


Steven L. Walton, Laboratory Manager

ERM_00045295

Attn: MICHAEL HELFRICH

ERM

9501 PRINCESS PALM AVE. #100
TAMPA, FLORIDA 33619

Page 8

24 Dec 1991

Report T1-12-138-08

LAB ID. 84271,E84060

Sample Description:

CLEARWATER, FLORIDA

PROJECT NUMBER: 14412.05

SAMPLE ID.: COMP - 8

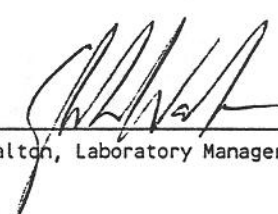
COLLECTED: 12/20/91

RECEIVED: 12/20/91

COLLECTED BY: YOUR REP

Parameter	Result	Units	Method	Det. Limit	Extracted	Analyzed	Analyst
Lead, Total	549	mg/kg	3050/7420	2.0		12/23/91	KB

**** BDL INDICATES ANALYTE IS BELOW DETECTABLE LEVELS
ALL ANALYSIS PERFORMED BY EPA, ASTM, OR STANDARD METHODS


Steven L. Walton, Laboratory Manager

ERM_00045295

Attn: MICHAEL HELFRICH

ERM

9501 PRINCESS PALM AVE. #100
TAMPA, FLORIDA 33619

Page 9

24 Dec 1991

Report T1-12-138-09

LAB ID. 84271,E84060

Sample Description:

CLEARWATER, FLORIDA

PROJECT NUMBER: 14412.05

SAMPLE ID.: COMP - 9

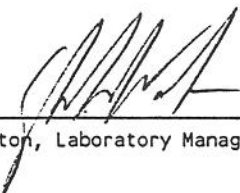
COLLECTED: 12/20/91

RECEIVED: 12/20/91

COLLECTED BY: YOUR REP

Parameter	Result	Units	Method	Det. Limit	Extracted	Analyzed	Analyst
Lead, Total	489	mg/kg	3050/7420	2.0		12/23/91	KB

**** BDL INDICATES ANALYTE IS BELOW DETECTABLE LEVELS
ALL ANALYSIS PERFORMED BY EPA, ASTM, OR STANDARD METHODS


Steven L. Walton, Laboratory Manager

ERM_00045295
Attn: MICHAEL HELFRICH

ERM
9501 PRINCESS PALM AVE. #100
TAMPA, FLORIDA 33619


Page 10
24 Dec 1991
Report T1-12-138-10
LAB ID. 84271,E84060

Sample Description:
CLEARWATER, FLORIDA
PROJECT NUMBER: 14412.05

SAMPLE ID.: COMP - 10
COLLECTED: 12/20/91
RECEIVED: 12/20/91
COLLECTED BY: YOUR REP

Parameter	Result	Units	Method	Det. Limit	Extracted	Analyzed	Analyst
Lead, Total	549	mg/kg	3050/7420	2.0		12/23/91	KB

**** BDL INDICATES ANALYTE IS BELOW DETECTABLE LEVELS
ALL ANALYSIS PERFORMED BY EPA, ASTM, OR STANDARD METHODS


Steven L. Walton, Laboratory Manager