



JRA	RECEIVED EPC - OID	TGJ
WBC		BTM
RHF	JUL 16 1999	LKS
EJH		MMS
WEH	J. C. LARKIN MANAGER	JLT
FYI		CIRC
LHI	Comments Handle Copy File	Sec Me

# CLOSURE REPORT HARBOR ISLAND STATION PORT ARANSAS, TEXAS

July 7, 1999



9441 W. Sam Houston Pkwy. S.  
Suite 103  
Houston, Texas 77099-1849  
(713) 777-8585  
(713) 777-8584 FAX

---

# CLOSURE REPORT HARBOR ISLAND STATION PORT ARANSAS, TEXAS

Prepared for

Mr. Brian Magruder  
**EXXON PIPELINE COMPANY**  
800 Bell Street  
Houston, Texas 77002

Prepared by

**KEI**

A handwritten signature in black ink that reads "Marshall H. Smith". The signature is written in a cursive style and is positioned above a horizontal line.

Marshall H. Smith, PE  
Senior Engineer

## TABLE OF CONTENTS

---

<b>EXECUTIVE SUMMARY</b>	1
<b>INTRODUCTION</b>	2
Remediation Objective	
<b>SITE INVESTIGATION AND REMEDIATION ACTIVITIES</b>	2
Chronology of Site Investigation and Remediation Activities	
Remediation Procedures	
<b>COMPARISON TO CLOSURE STANDARDS</b>	6
<b>CONCLUSIONS</b>	7
<b>FIGURES</b>	
FIG. 1 - Site Location Map	
FIG. 2 - Site Details – Remediation Areas Map	
<b>TABLES</b>	
TABLE I - Closure Verification Statistics	
TABLE II - Summary of Soil Sampling Data and Statistics	
TABLE III - Summary of Ground Water Monitoring Well Analytical Data	
<b>APPENDICES</b>	
APPENDIX A -RRC Correspondence	

## EXECUTIVE SUMMARY

This report describes the activities conducted to assess and remediate the former Harbor Island Station, located in Port Aransas, Texas. The Harbor Island Station is a former crude oil storage and transfer facility which was operated by Exxon Pipeline Company Inc. (EPC) from the late 1920's until 1993. Operations ceased and decommissioning of the facility was initiated in 1993. EPC sold the site to KOCH Gathering Systems, Inc. in 1995. KOCH subsequently sold the site to the Port of Corpus Christi Authority.

EPC submitted an initial environmental site assessment of the 300 acre site to the Texas Railroad Commission (RRC) by letter dated April 19, 1994. A remediation workplan for the site was prepared and submitted to the RRC by letter dated June 17, 1994. This remediation plan was approved by the RRC with several modifications by letter dated July 15, 1994. A copy of the RRC approval letter is provided in Appendix A. Additional assessment and remediation activities conducted at the site have been coordinated with the RRC with reports submitted to document significant activities.

Several environmental site investigations have been conducted from 1994 to date to define site conditions. Data gathered from these investigations was used to develop site specific remediation goals for the site and to design a site remediation system. The investigations concluded that the environmental impacts at the facility were limited to total petroleum hydrocarbon (TPH) concentrations in soil and light non-aqueous phase liquids (LNAPL) on shallow ground water. Soil and ground water impacts were determined to be confined within the site property boundaries, not impacting any off-site receptors. Assessment of the site consisted of completing more than 650 soil borings, collecting more than 900 soil samples, installing 35 ground water monitoring wells/temporary piezometers and obtaining ground water samples. Remediation goals were established for TPH in soils and removal of LNAPL from ground water. A total of approximately 545,000 cubic yards of impacted soil was remediated and 3,000 barrels of LNAPL recovered.

Remediation activities were conducted to allow closure of the site in accordance with the RRC approved remediation plan. Soils with TPH levels in excess of 10% were excavated and treated in on-site soil treatment areas. When TPH levels were documented to be below 5%, these soils were replaced in the excavations. Areas of soils with TPH levels ranging from 5 to 10% were mixed in-place and treated to enhance biodegradation of the organic constituents. Biological degradation of the hydrocarbon constituents is occurring with hydrocarbon concentrations being below 1% in most samples collected from the site.

A system designed to remove LNAPL from shallow ground water was installed at the site. This system was operated in 3 areas of the site and removed all LNAPL in 2 of the areas. Additional LNAPL recovery was conducted in Area 10 during subsequent soil remediation activities. Remediation activities have achieved the ground water remediation standard by removing all evidence of LNAPL at the site. The only organic constituent detected in the groundwater monitoring wells was ethyl benzene at 0.140 mg/L. The maximum TPH level detected during monitoring well sampling events was 64 mg/L. A summary of ground water analytical data is provided in TABLE III.

Extensive soil sampling and analytical data have documented that TPH concentrations in soil at the site are approaching 1%. A statistical evaluation of the soil analytical data was used to determine whether the closure objective has been achieved. The maximum, minimum, mean and 95% UCL concentration of TPH in soils in each remediation area at the site is presented in TABLE I. Based on available information, the closure objective has been achieved at this site.

## INTRODUCTION

The Harbor Island Station is located along Highway 361 in Port Aransas, Texas and consists of approximately 300 acres. The location of the facility is shown on FIG 1. The facility, shown in FIG 2, was constructed as a crude oil tank farm in the late 1920's and was in operation until 1993. Exxon Pipeline Company Inc. (EPC) has completed investigations of the site to identify areas affected by previous operations and verify remediation of impacted areas.

Significant assessment and remediation activities have been conducted at the site to identify impacted areas, lower TPH levels and enhance microbial degradation of organic constituents. Areas with total petroleum hydrocarbon (TPH) in concentrations above the approved cleanup levels have been remediated and LNAPL has been eliminated from shallow ground water in all areas of the facility.

### Remediation Objective

Clean-up levels for soil and ground water at the site were developed to ensure protection of human health and the environment. The site is intended to remain in industrial use and the standards applied to this site are based on this use. The remediation standards found in RRC State Wide Rule 91 are not applicable to this site, but these guidelines have been generally followed. The remediation objectives included in the Remedial Action Workplan and approved by the RRC by letter dated July 15, 1994 include:

1. Remediate soil with TPH concentrations greater than 10% by excavation and bioremediation in an on-site treatment area. Remediated soils shall be replaced into original excavations when TPH concentrations are below 5%.
2. Remediate surficial soil containing TPH concentrations between 5 and 10% by in-place mixing and tilling to a depth of 2 feet, using soil enhancements as needed to enhance bioremediation. The soil shall be remediated to less than 5% TPH by mixing and bioremediation, followed by limited soil sampling after active remediation to ensure the TPH level in soils is approaching 1%.
3. Remove LNAPL from the shallow ground water to minimize the potential for migration and impact to sensitive receptors. The ground water cleanup level calls for the reduction of LNAPL thickness to 0.01 feet (sheen) or less, followed by sampling for TPH.
4. The location of a soil sample (PBC-6) which contained 1,1,2-trichloroethane (TCE) was investigated and it was determined to be the result of laboratory contamination. A copy of the RRC letter dated October 19, 1994 stating that no further action was required is provided in Appendix A.

## SITE INVESTIGATION AND REMEDIATION ACTIVITIES

Several environmental investigations have been conducted to identify areas of impacted soil and ground water at the site. The assessment activities identified areas of residual TPH present in concentrations up to 20% in the underlying soil. Elevated TPH concentrations were generally confined to the upper 5 feet of soil and diminished with depth. LNAPL was encountered in three areas at the facility. Remediation has been conducted in all areas where impacted soils or ground water were encountered.

For convenience in identifying sample locations and implementing remediation activities, the site was divided into 18 management areas. Two additional management areas were added during subsequent investigations. Soil samples and excavation areas are identified using these area designations. The location of each of these areas are shown on FIG. 2.

## **CHRONOLOGY OF SITE INVESTIGATION AND REMEDIATION ACTIVITIES**

A chronology documenting site investigation and remediation activities is provided below. Detailed reports have been submitted to the RRC after completion of each of the significant activities conducted at the site.

### **Initial Investigation**

This investigation was conducted by KEI during 1994 to document site conditions and identify areas of concern.

- An Electromagnetic (EM) conductivity study was conducted to identify areas of contamination.
- Soil samples were obtained from 450 borings using a hydraulic push probe technology. Locations were probed until ground water was evident. Soil samples were tested to determine the concentration of TPH and BTEX.
- Ground water samples were obtained from 65 boring locations and analyzed for the presence of TPH and BTEX.
- Soil and ground water samples from several locations were tested to determine the concentration of metals and other organic constituents.
- Eight test pits were excavated throughout the site to evaluate subsurface stratigraphy.
- A total of 26 piezometers were installed and sampled to evaluate ground water conditions at the site.
- Soils with TPH levels ranging from 1 to 20% were identified in 18 areas.
- LNAPL was identified in 3 areas at the site.
- During August 1994, an aquifer pump test was conducted at the site.
- The results of this investigation were provided in the Environmental Assessment dated April 15, 1994.

### **Initial Remediation Activities**

Soil remediation activities were conducted by KEI during 1994:

- Approximately 49,000 cubic yards of soil were excavated from areas which had TPH concentrations greater than 10%, transported to the soil treatment areas, treated to reduce TPH levels to < 5%, then returned to the original excavations.
- Approximately 445,000 cubic yards of soil with TPH concentrations >5% but <10% were treated in-situ to reduce TPH levels to < 5%.
- Approximately 195 soil samples were obtained from the soil treatment area to verify soil remediation
- Approximately 250 verification samples were obtained from the excavation areas to document removal and treatment of soils containing > 5% TPH.
- Treated soils were backfilled and the site graded to minimize erosion.
- The remediation activities were documented in the Soil Remediation Report transmitted by letter dated October 4, 1995.

## **LNAPL Removal Activities**

LNAPL recovery trenches were installed by KEI at 3 locations and a system to separate recovered ground water and LNAPL installed:

- The 3 LNAPL recovery trenches and the ground water treatment system were installed in late 1994 and early 1995.
- Pumps located in two of three recovery areas were shut down in February 1995 because no significant volumes of hydrocarbon remained.
- During May 1996 two additional trenches were installed in the third area, Area 10.
- After recovering over 1,000 barrels of LNAPL, the system in Area 10 was removed in late 1997 during soil remediation activities. The soil remediation activities allowed a more aggressive remediation approach (see "Area 10 Remediation" below).

## **Fluor/GTI Investigation**

This investigation was conducted in 1996 by Fluor/GTI on behalf of the Port of Corpus Christi Authority (POCCA) to verify that TPH levels in soil were progressing toward the goal of 1%.

- Fluor/GTI conducted sampling to verify site conditions.
- A total of 83 soil samples were collected from 43 soil borings advanced at the site.
- 5 temporary monitoring wells were installed at the site.
- Ground water samples were obtained from 3 of the 5 existing wells and the 5 temporary wells.
- Selected soil and ground water samples were analyzed for TPH, BTEX, volatile and semi-volatile organic compounds and RCRA metals.
- LNAPL was detected in 2 ground water monitoring wells in Area 10.
- The study concluded that the TPH levels in soils had decreased an average of 27,000 mg/kg across the site.
- A copy of the Verification Sampling Report was provided to the RRC by letter dated September 24, 1996.

## **Area 10 Investigation**

This investigation was conducted by KEI during December 1996 to determine the extent of LNAPL present within Area 10 and to evaluate alternative LNAPL removal methods.

- 26 borings were completed in the area of Tank 945.
- LNAPL was detected in 10 of the 26 borings completed.
- The extent of the LNAPL plume in Area 10 was defined.
- The results of this investigation and a workplan for remediation of Area 10 were submitted to the RRC by fax dated September 30, 1997.

## **Area 10 Remediation**

Remediation activity was conducted by KEI between October and December 1997 in Area 10 to remove LNAPL and impacted soil.

- An 84,575 square foot area was excavated to allow treatment of impacted soils and removal of LNAPL.

- Approximately 41,000 cubic yards of soil were blended and treated to meet the remediation objective.
- Approximately 1,950 barrels of LNAPL was recovered from the surface of the water in the excavation.
- 65 soil samples were obtained from the excavation areas to document removal of soils containing > 1% TPH.
- 89 soil samples were obtained from the soil treatment area to verify treatment.
- Treated soils were backfilled and the site graded to minimize erosion.
- The Area 10 Remediation report was transmitted to the RRC by letter dated June 18, 1998.

### **APT Investigation**

This investigation was conducted in March 1998 by Applied Petroleum Technology Ltd. (APT) on behalf of the POCCA to verify that TPH levels in soil were continuing to progress toward the goal of 1%.

- A total of 134 soil samples were collected from 160 locations at the site.
- 5 new and 1 replacement monitoring wells were installed at the site.
- Ground water samples were obtained from the 4 existing wells and the 5 new wells.
- Selected soil and ground water samples were analyzed for TPH, BTEX, volatile and semi-volatile organic compounds and RCRA metals.
- The study identified areas where the TPH levels in soils exceeded 1%.
- LNAPL was not detected in any of the ground water monitoring wells.
- Ground water samples did not contain detectable levels of benzene; ethylbenzene was detected in one sample at 0.140 mg/L and TPH levels were below 64 mg/L in all samples.
- The results of this investigation were presented in the Confirmation Sampling Investigation report.

### **Closure Investigation**

This investigation was conducted by KEI during February 1999 to determine whether areas with soil TPH concentrations greater than 2% remained at the site.

- 26 soil samples were collected at locations identified previously as containing TPH levels in excess of 2%.
- 6 areas were determined to contain soils with TPH levels in excess of 2%.

### **Additional Areas Remediation**

Areas which contained soil TPH concentrations in excess of 2% were remediated during April 1999.

- Approximately 9,500 cubic yards of soil were excavated and blended to meet the remediation standard.
- 53 verification samples were obtained from the excavation areas to document removal of soils containing > 1% TPH.
- 31 soil samples were obtained from the soil treatment areas to verify treatment to <1% TPH.
- Treated soils were backfilled and the site graded to minimize erosion.



- A copy of the Additional Areas Remediation report is being transmitted to the RRC with this report.

## **REMEDIATION PROCEDURES**

Remediation activities conducted at the site included removal of LNAPL and on-site soil treatment by mixing, blending and enhanced bioremediation. A brief description of the procedures used to complete remediation and verify completion are provided below.

### **Soil Excavation**

Areas with soils containing greater than 10% TPH were excavated and transferred to on-site soil treatment areas. Areas with TPH levels greater than 2% were excavated for treatment or treated in place.

### **Soil Treatment**

Soils containing greater than 10% TPH were excavated and transferred to on-site soil treatment areas. Within the soil treatment areas, soils from various areas were mixed to reduce the TPH to less than 5% and nutrients were added to enhance microbial degradation. Soils treated in the treatment areas were tested to ensure a TPH concentration of less than 5% prior to removal from the treatment area and replacement into the original excavation.

### **Soil Mixing Activities**

Soils which contained TPH levels between 5 and 10% were treated in-place to lower TPH levels. Soils were mixed, aerated and treated with nutrients to enhance microbial degradation of the hydrocarbon constituents. The soil treatment activities were conducted in a manner which minimized the runoff of potentially impacted stormwater.

### **Excavation Area Verification Testing**

Soil samples were collected and analyzed from the base and sidewalls of each excavation area to determine if in-place soils met the soil cleanup criteria. Areas which contained soils with TPH concentrations greater than 2% were over excavated and re-sampled until this cleanup level was achieved.

The results of verification samples collected from excavation area base and sidewalls to verify completion of excavation activities are summarized in TABLE II.

### **LNAPL Recovery**

Removal of LNAPL was determined to be necessary in 3 areas of the site. A remediation system designed to remove LNAPL and allow discharge of recovered water was installed. The system eliminated the presence of LNAPL in 2 areas of the site. Over 1,000 barrels of oil was recovered using this system. Additional LNAPL in Area 10 was removed by excavating soils to below the water table and recovering the floating oils from the excavation using vacuum pumps. Approximately 1,950 barrels of oil were recovered in this manner. Total LNAPL recovery from the entire site was over 3,000 barrels. Recovered LNAPL was returned to EPC's crude oil pipeline system at a remote location.

## Site Restoration

Treated soils were used to backfill the excavations and restore natural grade. The excavation areas were graded to restore drainage patterns in the area and minimize the potential for erosion.

## COMPARISON TO CLOSURE STANDARDS

Soil remediation activities at the site have been conducted to ensure that TPH levels in soils are approaching 1% in all areas and that LNAPL has been removed from shallow ground water to a thickness of 0.01 feet or less. Statistical analysis was used to evaluate the data for each area where soil remediation or sampling has been conducted. A summary of the statistical analysis is provided in TABLE I. A summary of the analytical data from samples collected to identify impacted areas and to verify remediation is provided in TABLE II.

The soil analytical data is summarized in a manner which allows the statistical evaluation to be completed only on the most recent samples collected in each remediation area. When an area is remediated or re-sampled, the old data is eliminated from the statistical evaluation but retained in the overall data table. The last column shows only the most recent data collected at a specific location (i.e. old sample locations are included unless remediation or re-sampling has been conducted at that location). The most recent data collected at the site has been subjected to statistical analysis to evaluate whether the soil remediation objective has been achieved. A summary of the statistical evaluation which includes the most recent soil analytical data for a specific sample location is presented in TABLE II.

All of the soil analytical data collected at the site is presented in TABLE II including samples collected prior to and after remediation activities. The table is formatted with the oldest data on the left and the most recent data on the right. A description of the data set entered in each column is provided below with Area 1 used as an illustrative example.

### AREA 1

This column contains data from the preliminary assessment completed by KEI in 1994.

### AREA 1 REM

This column includes the data from the verification sampling conducted upon completion of remediation activities in 1994. For areas where soil remediation activities were not conducted, data from the preliminary assessment is carried over in this column.

### AREA 1 FD

This column contains additional data from sampling conducted by Fluor/GTI in 1996 to determine current TPH levels. This re-sampling allowed previous sampling data to be eliminated from the data set. Data is carried over in a similar manner as described above.

### AREA 1 APT

This column incorporates additional data from sampling conducted by APT in 1998 to determine current TPH levels. This column also contains data obtained by KEI during the Area 10 remediation, the Closure Investigation and carry over data. For many areas, this column contains the final data and statistics.

## AREA 1 FINAL

This column contains data obtained by KEI after completion of remediation activities in areas where TPH levels above 2% were detected as well as carryover data. This column contains the final statistics for those areas where remediation was conducted in 1999.

## **CONCLUSIONS**

The Harbor Island Station has been evaluated to ensure the remediation standards for soils and ground water at the site have been achieved. The remediation standards for the site were determined based on the nature of the contaminants and site specific conditions. The remediation standards were outlined in the July 15, 1994 approval letter from the RRC.

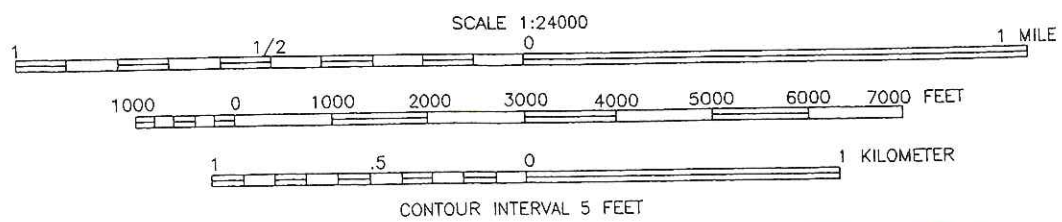
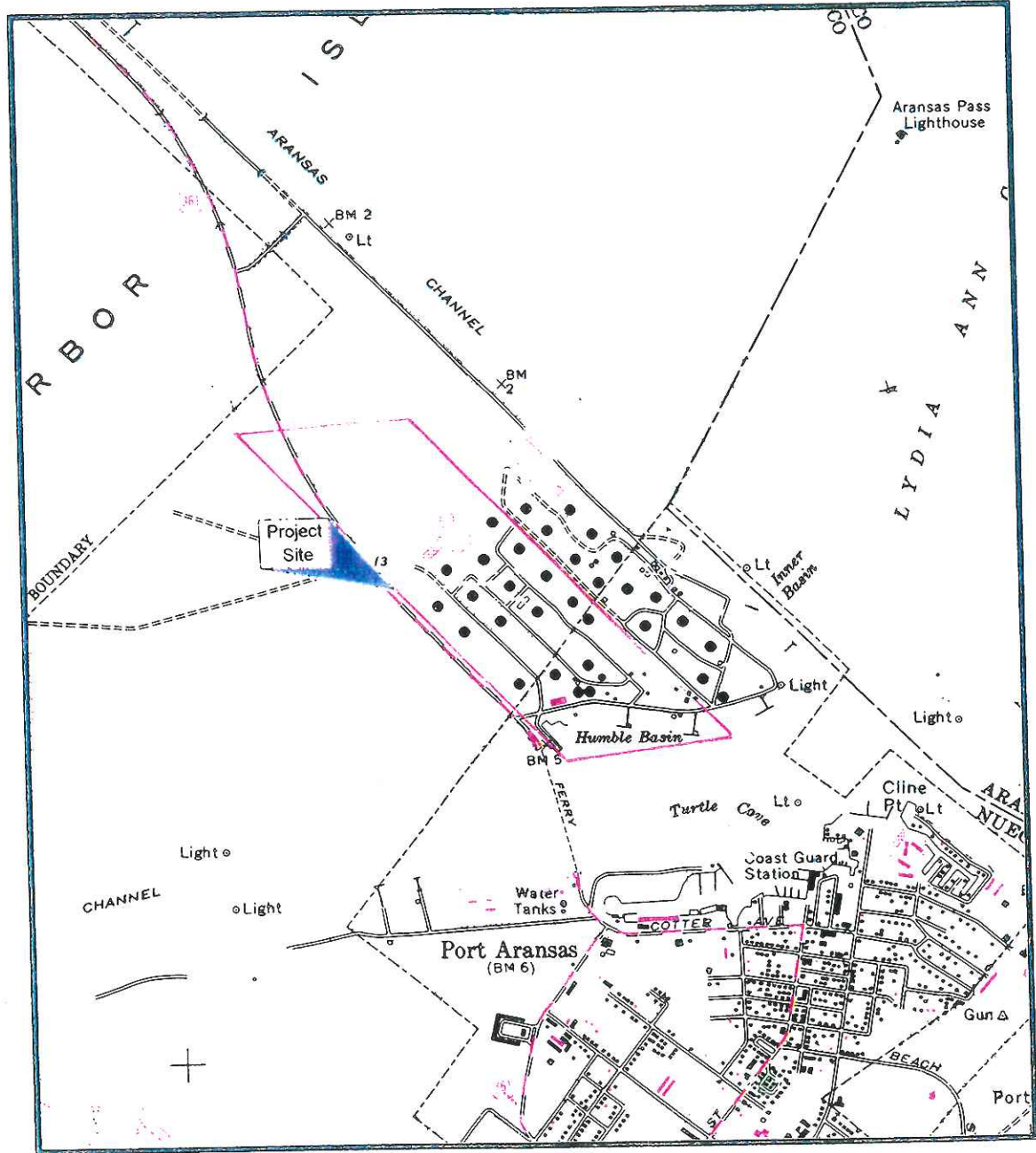
The area of impacted soils at the site was limited to on-site areas. The contaminants in soil consist of weathered/biodegradable long chain hydrocarbons which are not generally mobile in the environment. The concentrations of volatile and semi-volatile organic compounds detected at the site are negligible. No significantly elevated levels of metals and no PCBs were detected during site sampling activities. TPH concentrations in soil at the site are approaching 1% and continue to decrease through natural attenuation of the hydrocarbon constituents.

The area of impacted ground water at the site was limited to on-site areas. The shallow ground water at the site is not a usable source of water. All LNAPL has been removed from the ground water to a thickness of 0.01 feet or less. No detectable levels of benzene were observed in ground water samples obtained from the monitoring wells installed at the site.

In summary, the following conclusions are presented with respect to remediation of the former EPC Harbor Island Station site:

- TPH concentrations in soil are below or approaching 1% by weight,
- LNAPL has been removed from shallow ground water to a thickness of 0.01 feet or less,
- Remediation of the Harbor Island Station has been completed in accordance with the Remedial Action Plan approved by the RRC by letter dated July 15, 1994.

PORT ARANSAS QUADRANGLE  
 TEXAS NUECES CO.  
 LAT-27° 50'51" N  
 LONG-97° 03'44" W  
 PHOTOREVISED 1975



SITE LOCATION MAP  
 HARBOR ISLAND STATION PORT ARANSAS, TEXAS

430003  
 1





TABLE I

**CLOSURE VERIFICATION STATISTICS  
HARBOR ISLAND STATION  
PORT ARANSAS, TEXAS**

LOCATION	MAX (mg/kg)	MIN (mg/kg)	MEAN (mg/kg)	STDEV	N	TSTAT	DETECTS	95th UCL (mg/kg)
AREA-1	12,300	18	1,906	2,973	40	1.684	40	2,697
AREA-2	13,080	10	2,844	4,912	9	N/A	8	N/A
AREA 3	17,600	10	3,375	4,742	46	1.6792	43	4,549
AREA 4	10	10	10	N/A	1	N/A	1	N/A
AREA 5	13,200	10	3,786	4,830	25	1.708	20	5,436
AREA 6	3,050	11	560	22	26	1.7058	26	568
AREA 7	19,300	1,230	6,810	7,744	5	N/A	5	N/A
AREA 8	13,220	111	2,881	3,953	10	1.812	10	5,146
AREA 9	14,300	62	1,794	4,055	15	1.753	15	3,629
AREA 10	19,685	10	2,168	4,077	64	1.670	41	3,019
AREA 11	10,900	32	1,662	3,833	14	1.761	14	3,466
AREA 12	2,240	259	843	945	4	N/A	4	N/A
AREA 13	19,000	6	2,303	4,128	133	1.657	116	2,896
AREA 14	14,260	10	3,010	4,110	53	1.675	52	3,956
AREA 15	17,700	10	1,098	3,271	158	1.656	82	1,529
AREA 16	9,300	10	1,014	2,321	20	1.725	12	1,910
AREA 17	11,000	41	4,368	4,590	6	N/A	6	N/A
AREA 18	8,570	10	2,449	3,533	5	N/A	4	N/A
AREA 19	13,900	642	6,838	4,855	5	N/A	5	N/A
OTHER AREAS	6,400	26	964	1,615	41	1.6832	41	1,389

TABLE II

SUMMARY OF SOIL SAMPLING DATA AND STATISTICS  
HARBOR ISLAND STATION  
PORT ARANSAS, TEXAS

SUMMARY STATISTICS  
for  
ALL Locations  
and  
Depths:

AREA 9		AREA 9 REM		AREA 9 FD		AREA 9 APT	
max	57,100	max	36,100	max	36,100	max	14,300
min	67	min	67	min	67	min	62
mean	17,641	mean	11,065	mean	8,423	mean	1,794
stdev	21,856	stdev	14,489	stdev	13,186	stdev	4,055
N	7	N	6	N	8	N	15
tstat	#N/A	tstat	#N/A	tstat	#N/A	tstat	1.753
detect	7	detect	6	detect	8	detect	15
95th UCL	#N/A	95th UCL	#N/A	95th UCL	#N/A	95th UCL	3,629

SOIL DATA:

Sample Location	Depth (feet)	Date	AREA 9		AREA 9 REM		AREA 9 FD		AREA 9 APT	
			Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)
PCS-1		2/18/94	1,330	1,330	1,330	1,330	1,330	1,330	1,330	1,330
CS-7		2/21/94	36,100	36,100	36,100	36,100	36,100	36,100		
CS-7C		2/21/94	20,200	20,200	20,200	20,200	20,200	20,200		
PCS-2		2/18/94	57,100	57,100						
PCS-4		2/18/94	8,430	8,430	8,430	8,430	8,430	8,430	8,430	8,430
PCS-5		2/18/94	67	67	67	67	67	67	67	67
area 9-1	0-2	9/13/94	260	260	260	260	260	260	260	260
9-9-1A	1.5	7/18/96					315	315	315	315
9-9-1B	3	7/18/96					680	680	680	680
APT-9-1	0-2	3/1/98							62	62
9-1	3-5	3/1/98							67	67
9-2	0-2	3/1/98							65	65
9-2	4-6	3/1/98							127	127
9-3	0-2	3/1/98							260	260
9-3	4-6	3/1/98							158	158
9-4	0-2	3/1/98							561	561
9-4	2-4	3/1/98							227	227
CS-7C	3 - 3.5	2/17/99							14,300	14,300

TABLE II

**SUMMARY OF SOIL SAMPLING DATA AND STATISTICS  
HARBOR ISLAND STATION  
PORT ARANSAS, TEXAS**

**SUMMARY STATISTICS**  
for  
**ALL Locations**  
and  
**Depths:**

AREA 1	AREA 1 REM	AREA 1 FD	AREA 1 APT	AREA 1 FINAL
max 101,000	max 97,000	max 97,000	max 97,000	max 12,300
min 24	min 24	min 24	min 24	min 18
mean 26,892	mean 10,545	mean 11,116	mean 8,007	mean 1,793
stdev 38,551	stdev 22,488	stdev 21,943	stdev 18,936	stdev 2,859
N 12	N 26	N 28	N 36	N 44
tstat 1.782	tstat 1.7058	tstat 1.7014	tstat 1.6888	tstat 1.6808
detect 12	detect 26	detect 28	detect 36	detect 44
95th UCL 46,723	95th UCL 18,068	95th UCL 18,172	95th UCL 13,337	95th UCL 2,517

**SOIL DATA:**

Sample Location	Depth (feet)	Date	AREA 1		AREA 1 REM		AREA 1 FD		AREA 1 APT		AREA 1 FINAL	
			Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)
AS-8		2/21/94	53,800	53,800	53,800	53,800	53,800	53,800	53,800	53,800		
AS-8B		2/21/94	24	24	24	24	24	24	24	24	24	24
AS-22A		3/1/94	284	284	284	284	284	284	284	284	284	284
953-3		2/21/94	138	138	138	138	138	138	138	138	138	138
951-3		2/21/94	36	36	36	36	36	36	36	36	36	36
953-2		2/21/94	28,700	28,700								
953-4		2/21/94	41,200	41,200								
AS-23A		3/1/94	230	230	230	230	230	230	230	230	230	230
951-2		2/21/94	101,000	101,000								
953-1		2/21/94	79	79	79	79	79	79	79	79	79	79
AS-24A		3/1/94	209	209	209	209	209	209	209	209	209	209
BS-19		2/28/94	97,000	97,000	97,000	97,000	97,000	97,000	97,000	97,000		
area 1-1	2 to 4	9/1/94			66	66	66	66	66	66	66	66
area 1-2	2 to 4	9/1/94			26	26	26	26	26	26	26	26
area 1-3	2 to 4	9/1/94			28,000	28,000						
area 1-4	2 to 4	9/1/94			33	33	33	33	33	33	33	33
area 1-5	2 to 4	9/1/94			10,600	10,600	10,600	10,600	10,600	10,600	10,600	10,600
area 1-6	2 to 4	9/1/94			853	853	853	853	853	853	853	853
area 1-7	2 to 4	9/1/94			513	513	513	513	513	513	513	513
area 1-8	2 to 4	9/1/94			28,000	28,000	28,000	28,000	28,000	28,000		
area 1-9	3 to 4	9/1/94			37,300	37,300						
area 1-10	3 to 4	9/1/94			2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100
area 1-11	3 to 4	9/1/94			173	173	173	173	173	173	173	173
area 1-12	3 to 4	9/1/94			126	126	126	126	126	126	126	126
area 1-13	3 to 4	9/1/94			100	100	100	100	100	100	100	100
area 1-14	3 to 4	9/1/94			12,300	12,300	12,300	12,300	12,300	12,300	12,300	12,300
area 1-15G	0 to 2	9/14/94			450	450	450	450	450	450	450	450
area 1-16G	0 to 2	9/14/94			1,080	1,080	1,080	1,080	1,080	1,080	1,080	1,080
area 1-17	0-2	9/14/94			640	640	640	640	640	640	640	640
1-1-9A	2	7/17/96					19,700	19,700				
1-1-9B	3.5	7/17/96					13,500	13,500				
1-1-2A	2	7/16/96					42,900	42,900				
1-1-2B	5	7/16/96					26,300	26,300				



TABLE II

**SUMMARY OF SOIL SAMPLING DATA AND STATISTICS  
HARBOR ISLAND STATION  
PORT ARANSAS, TEXAS**

SOIL DATA:			AREA 1		AREA 1 REM		AREA 1 FD		AREA 1 APT		AREA 1 FINAL	
Sample Location	Depth (feet)	Date	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)
APT-1-9	0-2	3/1/98							4,600	4,600	4,600	4,600
APT-1-9	2-4	3/1/98							872	872	872	872
APT-1-3	0-2	3/1/98							3,230	3,230	3,230	3,230
APT-1-3	2-4	3/1/98							8,080	8,080	8,080	8,080
APT-1-8	0-2	3/1/98							4,420	4,420	4,420	4,420
APT-1-8	2-4	3/1/98							3,450	3,450	3,450	3,450
APT-951	0-1	3/1/98							960	960	960	960
APT-951	1-2	3/1/98							175	175	175	175
953	0-1	3/1/98							209	209	209	209
953	2-3	3/1/98							1,305	1,305	1,305	1,305
AS-8	2 - 2.5	2/17/99							< 10.8	< 10.8		
BS-19	5 - 5.5	2/17/99							28,400	28,400		
BS19-B	0-1	4/8/99									21	21
BS19-B2	0-1	4/13/99									18	18
BS19-S	0-1	4/12/99									1,800	1,800
BS19-S2	0-1	4/13/99									375	375
BS19-N	0-1	4/12/99									671	671
BS19-N2	0-1	4/13/99									191	191
BS19-W	0-1	4/12/99									1,550	1,550
BS19-E	0-1	4/13/99									1,400	1,400
1-8-W	0-1	4/2/99									35	35
1-8-E	0-1	4/2/99									7,450	7,450
1-8-S	0-1	4/2/99									3,300	3,300
1-8-N	0-1	4/2/99							23,700	23,700		
1-8-NA	0-1	4/6/99									907	907
1-8-B	0-1	4/2/99									3,800	3,800

TABLE II

SUMMARY OF SOIL SAMPLING DATA AND STATISTICS  
HARBOR ISLAND STATION  
PORT ARANSAS, TEXAS

SUMMARY STATISTICS  
for  
ALL Locations  
and  
Depths:

AREA 2		AREA 2 REM		AREA 2 FD		AREA 2 APT	
max	84,000	max	47,700	max	47,700	max	13,080
min	32,000	min	10	min	10	min	10
mean	54,567	mean	13,344	mean	7,227	mean	2,354
stdev	26,671	stdev	21,124	stdev	17,867	stdev	4,527
N	3	N	6	N	7	N	11
tstat	#N/A	tstat	#N/A	tstat	#N/A	tstat	1.796
detect	3	detect	5	detect	6	detect	10
95th UCL	#N/A	95th UCL	#N/A	95th UCL	#N/A	95th UCL	4,805

SOIL DATA:

Sample Location	Depth (feet)	Date	AREA 2		AREA 2 REM		AREA 2 FD		AREA 2 APT	
			Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)
1798-1		2/21/94	32,000	32,000	32,000	32,000				
BS-26		2/28/94	84,000	84,000						
1354-1		2/21/94	47,700	47,700	47,700	47,700	47,700	47,700		
area 2-1	2 to 4	8/31/94			240	240	240	240	240	240
area 2-2	2 to 4	8/31/94			99	99	99	99	99	99
area 2-3	2 to 4	8/31/94			13	13	13	13	13	13
area 2-4	2 to 4	8/31/94			nd	10	nd	10	nd	10
2-1798-3	1.5	7/18/96					2,340	2,340	2,340	2,340
FD-2-2-5	2	7/18/96					184	184	184	184
APT-1798	0-1	3/1/98							192	192
APT-1798	1-2	3/1/98							9,440	9,440
APT-1798-W	1-2	3/1/98							13,080	13,080
1355	0-1	3/1/98							160	160
1355	1-2	3/1/98							135	135



TABLE II

SUMMARY OF SOIL SAMPLING DATA AND STATISTICS  
HARBOR ISLAND STATION  
PORT ARANSAS, TEXAS

SOIL DATA:			AREA 3		AREA 3 REM		AREA 3 FD		AREA 3 APT		AREA 3 FINAL	
Sample Location	Depth (feet)	Date	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)
3-3-4A	2	7/16/96					5,000	5,000	5,000	5,000	5,000	5,000
3-3-4B	4	7/16/96					147	147	147	147	147	147
3-3-6A	2	7/17/96					2,640	2,640	2,640	2,640	2,640	2,640
3-3-6B	4	7/17/96					234	234	234	234	234	234
3-3-22A	2	7/17/96					6,040	6,040	6,040	6,040	6,040	6,040
3-3-22B	4	7/17/96					303	303	303	303	303	303
3-3-18A	2	7/17/96					2,110	2,110	2,110	2,110	2,110	2,110
3-3-18B	4	7/17/96					2,070	2,070	2,070	2,070	2,070	2,070
3-3-26	3	7/17/96					40,900	40,900				
APT-3-10	0-2	3/1/98							209	209	209	209
APT-3-10	4-6	3/1/98							1,170	1,170	1,170	1,170
APT-3-18	0-2	3/1/98							1,820	1,820	1,820	1,820
APT-3-18	3-5	3/1/98							3,200	3,200	3,200	3,200
APT-3-26	0-2	3/1/98							<25	<25	<25	<25
APT-3-26	3-5	3/1/98							4,920	4,920	4,920	4,920
3-10	5.5 - 6	2/17/99							1,680	1,680		
3-16	5 - 5.5	2/17/99							40,100	40,100		
3-16W		4/6/99									2,650	2,650
3-16-W2		4/8/99									1,900	1,900
3-16-B		4/8/99									71	71
3-16-B2		4/8/99									36	36
3-16-B3		4/8/99									383	383
3-16-B4		4/8/99									411	411
3-16-N		4/8/99									73	73
3-16-E		4/8/99									850	850
3-16-E2		4/8/99									86	86
3-16-S		4/8/99									26	26
3-16-S2		4/8/99									1,150	1,150



TABLE II

SUMMARY OF SOIL SAMPLING DATA AND STATISTICS  
HARBOR ISLAND STATION  
PORT ARANSAS, TEXAS

SUMMARY STATISTICS  
for  
ALL Locations  
and  
Depths:

AREA 5		AREA 5 REM		AREA 5 FD		AREA 5 APT		AREA 5 FINAL	
max	44,100	max	87,300	max	44,100	max	44,100	max	13,020
min	505	min	10	min	10	min	10	min	10
mean	23,835	mean	15,179	mean	11,790	mean	7,858	mean	3,786
stdev	21,959	stdev	24,256	stdev	14,455	stdev	11,221	stdev	4,830
N	3	N	15	N	19	N	23	N	25
tstat	#N/A	tstat	1.753	tstat	1.729	tstat	1.714	tstat	1.708
detect	3	detect	13	detect	17	detect	18	detect	20
95th UCL	#N/A	95th UCL	26,158	95th UCL	17,524	95th UCL	11,868	95th UCL	5,436

SOIL DATA:

Sample Location	Depth (feet)	Date	AREA 5		AREA 5 REM		AREA 5 FD		AREA 5 APT		AREA 5 FINAL	
			Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)
PBS-2B		2/21/94	505	505	505	505	505	505	505	505	505	505
PBS-6		2/16/94	26,900	26,900	26,900	26,900	26,900	26,900	26,900	26,900		
PBS-8		2/16/94	44,100	44,100	44,100	44,100	44,100	44,100	44,100	44,100		
area 5-1	3 to 5	8/30/94			386	386	386	386	386	386	386	386
area 5-2	3 to 5	8/30/94			13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000
area 5-3	3 to 5	8/30/94			32,800	32,800	32,800	32,800				
area 5-4	3 to 5	8/30/94			9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000
area 5-5	3 to 5	8/30/94			87,300	87,300						
area 5-6	3 to 5	8/30/94			6,950	6,950	6,950	6,950	6,950	6,950	6,950	6,950
area 5-7	3 to 5	8/30/94			660	660	660	660	660	660	660	660
area 5-8	3 to 5	8/30/94			630	630	630	630	630	630	630	630
area 5-9	3 to 5	8/30/94			5,300	5,300	5,300	5,300	5,300	5,300	5,300	5,300
area 5-10	3 to 4	8/30/94			nd	10	nd	10	nd	10	nd	10
area 5-11	3 to 4	8/30/94			130	130	130	130	130	130	130	130
area 5-12	3 to 4	8/30/94			nd	10	nd	10	nd	10	nd	10
5-5-5A	2	7/18/96					305	305	305	305	305	305
5-5-5B	5	7/18/96					40,300	40,300				
FD-5-5-3	3	7/18/96					11,300	11,300	11,300	11,300	11,300	11,300
5-5-13A	2	7/18/96					9,730	9,730				
5-5-13B	5	7/18/96					22,000	22,000				
APT-5-5	0-2	3/1/98							830	830	830	830
APT-5-5	2-4	3/1/98							12,990	12,990	12,990	12,990
APT-5-3	0-2	3/1/98							ND	25	ND	25
APT-5-3	3-5	3/1/98							13,020	13,020	13,020	13,020
APT-5-13	0-2	3/1/98							ND	25	ND	25
APT-5-13	3-5	3/1/98							9,340	9,340	9,340	9,340
PBS-6	4.5 - 5	2/17/99							ND	10	ND	10
PBS-8	4.5 - 5	2/17/99							25,300	25,300		
PBS8-B		4/2/99									354	354
PBS8-S		4/2/99									2,650	2,650
PBS8-W		4/2/99									5,050	5,050
PBS8-E		4/2/99									214	214
PBS-8N		4/2/99									1,950	1,950

TABLE II

SUMMARY OF SOIL SAMPLING DATA AND STATISTICS  
HARBOR ISLAND STATION  
PORT ARANSAS, TEXAS

SUMMARY STATISTICS  
for  
ALL Locations  
and  
Depths:

AREA 6		AREA 6 REM		AREA 6 FD		AREA 6 APT		AREA 6 FINAL	
max	29	max	60	max	70,700	max	45,370	max	3,050
min	29	min	29	min	29	min	29	min	11
mean	29	mean	45	mean	23,596	mean	25,102	mean	560
stdev	#DIV/0!	stdev	22	stdev	40,793	stdev	18,228	stdev	22
N	1	N	2	N	3	N	10	N	26
tstat	#N/A	tstat	#N/A	tstat	#N/A	tstat	1.812	tstat	1.7058
detect	1	detect	2	detect	3	detect	10	detect	26
95th UCL	#N/A	95th UCL	#N/A	95th UCL	#N/A	95th UCL	35,547	95th UCL	568

SOIL DATA:			AREA 6		AREA 6 REM		AREA 6 FD		AREA 6 APT		AREA 6 FINAL	
Sample Location	Depth (feet)	Date	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)
952-3		2/15/98	29	29	29	29	29	29	29	29	29	29
area 6-1	0 to 2	9/13/94			60	60	60	60	60	60	60	60
6-952-3	3	7/18/96					70,700	70,700				
6-1	0-1	3/1/98							21,070	21,070		
6-1	1-2	3/1/98							32,530	32,530		
6-2	0-1	3/1/98							45,370	45,370		
6-2	1-2	3/1/98							18,930	18,930		
6-3	1-2	3/1/98							41,130	41,130		
APT-6-1	1.5 - 2	2/17/99							17,400	17,400		
APT-6-2	1.5 - 2	2/17/99							36,800	36,800		
APT-6-3	1.5 - 2	2/17/99							37,700	37,700		
APT6-2S	0-1	4/12/99									< 10.0	< 10.0
APT6-2B	0-1	4/8/99									28	28
APT6-2B2	0-1	4/9/99									29	29
APT6-2B3	0-1	4/12/99									27	27
APT6-2B4	0-1	4/12/99									11	11
APT6-2E	0-1	4/9/99									33	33
APT6-2E2	0-1	4/9/99									2,450	2,450
APT6-2E3	0-1	4/12/99									13	13
APT6-2N	0-1	4/13/99									21	21
APT6-3S	0-1	4/8/99									3,050	3,050
APT6-3W	0-1	4/8/99									564	564
APT6-3W2	0-1	4/9/99									29	29
APT6-3W3	0-1	4/9/99									29	29
APT6-3W4	0-1	4/9/99									51	51
APT6-3W5	0-1	4/9/99									2,400	2,400





TABLE II

SUMMARY OF SOIL SAMPLING DATA AND STATISTICS  
 HARBOR ISLAND STATION  
 PORT ARANSAS, TEXAS

SUMMARY STATISTICS  
 for  
 ALL Locations  
 and  
 Depths:

AREA 7		AREA 7 REM		AREA 7 FD		AREA 7 APT	
max	40,700	max	40,700	max	40,700	max	19,300
min	9,400	min	9,400	min	1,230	min	1,230
mean	25,050	mean	25,050	mean	11,090	mean	6,810
stdev	22,132	stdev	22,132	stdev	16,888	stdev	7,744
N	2	N	2	N	5	N	5
tstat	#N/A	tstat	#N/A	tstat	#N/A	tstat	#N/A
detect	2	detect	2	detect	5	detect	5
95th UCL	#N/A	95th UCL	#N/A	95th UCL	#N/A	95th UCL	#N/A

SOIL DATA:

Sample Location	Depth (feet)	Date	AREA 7		AREA 7 REM		AREA 7 FD		AREA 7 APT	
			Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)
PBS-25		2/16/94	9,400	9,400	9,400	9,400	9,400	9,400	9,400	9,400
PBS-32		2/16/94	40,700	40,700	40,700	40,700	40,700	40,700		
FD-7-PBS-19A	1 - 1.5	7/18/96					1,390	1,390	1,390	1,390
FD-7-PBS-19B	2.5 - 3	7/18/96					2,730	2,730	2,730	2,730
FD-7-PBS-19C	2.5 - 3	7/18/96					1,230	1,230	1,230	1,230
PBS-32	5 - 5.5	2/17/99							19,300	19,300

TABLE II

SUMMARY OF SOIL SAMPLING DATA AND STATISTICS  
HARBOR ISLAND STATION  
PORT ARANSAS, TEXAS

SUMMARY STATISTICS  
for  
ALL Locations  
and  
Depths:

AREA 8		AREA 8 REM		AREA 8 FD		AREA 8 APT	
max	55,800	max	18,900	max	63,400	max	13,220
min	55,800	min	725	min	725	min	111
mean	55,800	mean	6,452	mean	15,670	mean	2,881
stdev	#DIV/0!	stdev	7,393	stdev	22,652	stdev	3,953
N	1	N	7	N	8	N	10
tstat	#N/A	tstat	#N/A	tstat	#N/A	tstat	1.812
detect	1	detect	7	detect	8	detect	10
95th UCL	#N/A	95th UCL	#N/A	95th UCL	#N/A	95th UCL	5,146

SOIL DATA:			AREA 8		AREA 8 REM		AREA 8 FD		AREA 8 APT	
Sample Location	Depth (feet)	Date	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)
1351-1		2/21/94	55,800	55,800						
area 8-1	0-2	12/9/94			4,310	4,310	4,310	4,310	4,310	4,310
area 8-2	0-2	12/9/94			2,840	2,840	2,840	2,840	2,840	2,840
area 8-3	0-2	12/9/94			767	767	767	767	767	767
area 8-4	0-2	12/9/94			18,900	18,900				
area 8-5	0-2	12/9/94			2,520	2,520	2,520	2,520	2,520	2,520
area 8-6	0-2	12/9/94			725	725	725	725	725	725
area 8-7	0-2	12/9/94			15,100	15,100	15,100	15,100		
8-8-4A	1.5	7/18/96					63,400	63,400		
8-8-4B	3	7/18/96					35,700	35,700		
APT-8-4	0-2	3/1/98							275	275
APT-8-4	2-3	3/1/98							3,825	3,825
APT-8-7	0-2	3/1/98							219	219
APT-8-7	3-5	3/1/98							111	111
APT- 8-7-A	0-2	3/1/98							13,220	13,220

TABLE II

SUMMARY OF SOIL SAMPLING DATA AND STATISTICS  
HARBOR ISLAND STATION  
PORT ARANSAS, TEXAS

SUMMARY STATISTICS  
for  
ALL Locations  
and  
Depths:

AREA 10		AREA 10 REM		AREA 10 FD		AREA 10 APT	
max	74,400	max	60,900	max	60,900	max	19,685
min	2,660	min	10	min	10	min	10
mean	34,831	mean	13,348	mean	14,472	mean	2,168
stdev	28,957	stdev	16,198	stdev	16,428	stdev	4,077
N	9	N	44	N	49	N	64
tstat	#N/A	tstat	1.6808	tstat	1.6768	tstat	1.6694
detect	9	detect	43	detect	48	detect	41
95th UCL	#N/A	95th UCL	17,453	95th UCL	18,408	95th UCL	3,019

SOIL DATA:

Sample Location	Depth (feet)	Date	AREA 10		AREA 10 REM		AREA 10 FD		AREA 10 APT	
			Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)
PBS-38		2/21/94	3,660	3,660	3,660	3,660	3,660	3,660	3,660	3,660
PBS-34B		2/21/94	60,900	60,900	60,900	60,900	60,900	60,900	60,900	60,900
PCC-1A		2/21/94	6,260	6,260	6,260	6,260	6,260	6,260	6,260	6,260
PCC-2		2/21/94	23,400	23,400						
PCC-7		2/25/94	70,000	70,000						
PCC-4		2/21/94	24,500	24,500						
PCC-5A		2/21/94	47,700	47,700						
PCC-6		2/17/94	74,400	74,400						
PCC-5		2/17/94	2,660	2,660	2,660	2,660	2,660	2,660	2,660	2,660
area 10-1	0-2	9/13/94			680	680	680	680	680	680
area 10-2	0-2	9/13/94			1,900	1,900	1,900	1,900	1,900	1,900
area 10-3	0-2	9/13/94			nd	10	nd	10	nd	10
area 10-4	0-2	9/13/94			340	340	340	340	340	340
area 10-5	0-2	9/13/94			2,100	2,100	2,100	2,100	2,100	2,100
area 10-6	0-2	9/13/94			49,300	49,300				
area 10-7	0-2	9/13/94			2,600	2,600	2,600	2,600		
area 10-8	0-2	9/13/94			26	26	26	26	26	26
area 10-9	0-2	9/13/94			12,200	12,200	12,200	12,200		
area 10-10	0-2	9/13/94			1,460	1,460	1,460	1,460	1,460	1,460
area 10-11	0-2	9/13/94			70	70	70	70	70	70
area 10-12	0-2	9/13/94			18,100	18,100	18,100	18,100		
area 10-13	0-2	9/13/94			16,300	16,300	16,300	16,300		
area 10-14	0-2	9/13/94			6,900	6,900	6,900	6,900	6,900	6,900
area 10-15	0-2	9/13/94			9,800	9,800	9,800	9,800		
area 10-16	0-2	9/13/94			41,800	41,800				
area 10-17	0-2	9/13/94			9,300	9,300	9,300	9,300		
area 10-18	0-2	9/13/94			390	390	390	390		
area 10-19	0-2	9/13/94			11,200	11,200	11,200	11,200		
area 10-20	0-2	9/13/94			36,300	36,300	36,300	36,300	36,300	
area 10-21	0-2	9/13/94			35,500	35,500	35,500	35,500		
area 10-22	0-2	9/13/94			46,600	46,600				
area 10-23	0-2	9/13/94			26,100	26,100	26,100	26,100		
area 10-24	0-2	9/13/94			13,800	13,800	13,800	13,800		
area 10-25	0-2	9/13/94			42,400	42,400	42,400	42,400		
area 10-26	0-2	9/13/94			19,500	19,500	19,500	19,500		







TABLE II

SUMMARY OF SOIL SAMPLING DATA AND STATISTICS  
 HARBOR ISLAND STATION  
 PORT ARANSAS, TEXAS

SUMMARY STATISTICS  
 for  
 ALL Locations  
 and  
 Depths:

AREA 12		AREA 12 REM		AREA 12 FD		AREA 12 APT	
max	2,240	max	2,240	max	2,240	max	2,240
min	600	min	600	min	259	min	259
mean	1,420	mean	1,420	mean	843	mean	843
stdev	1,160	stdev	1,160	stdev	945	stdev	945
N	2	N	2	N	4	N	4
tstat	#N/A	tstat	#N/A	tstat	#N/A	tstat	#N/A
detect	2	detect	2	detect	4	detect	4
95th UCL	#N/A	95th UCL	#N/A	95th UCL	#N/A	95th UCL	#N/A

SOIL DATA:

Sample Location	Depth (feet)	Date	AREA 12		AREA 12 REM		AREA 12 FD		AREA 12 APT	
			Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)
PCS-17A		2/25/94	600	600	600	600	600	600	600	600
PDS-5		2/18/94	2,240	2,240	2,240	2,240	2,240	2,240	2,240	2,240
12-12-2A	2	7/18/96					273	273	273	273
12-12-2B	4.5	7/18/96					259	259	259	259





TABLE II

SUMMARY OF SOIL SAMPLING DATA AND STATISTICS  
HARBOR ISLAND STATION  
PORT ARANSAS, TEXAS

SOIL DATA:			AREA 13		AREA 13 REM		AREA 13 FD		AREA 13 APT	
Sample Location	Depth (feet)	Date	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)
area 13C-8	6	10/19/94			2,200	2,200	2,200	2,200	2,200	2,200
area 13C-9	6	10/19/94			6,700	6,700	6,700	6,700	6,700	6,700
area 13C-10	7	10/19/94			12,000	12,000	12,000	12,000	12,000	12,000
area 13D-2	7.5-8	9/15/94			60	60	60	60	60	60
area 13D-3	7.5-8	9/15/94			80	80	80	80	80	80
area 13D-4	7.5-8	9/15/94			40	40	40	40	40	40
area 13D-5	7.5-8	9/15/94			210	210	210	210	210	210
area 13D-7	4	9/23/94			103	103	103	103	103	103
area 13D-8	6	10/14/94			90	90	90	90	90	90
area 13D-9	6	10/14/94			80	80	80	80	80	80
area 13D-10	6	10/14/94			nd	10	nd	10	nd	6
area 13D-11	6	10/14/94			160	160	160	160	160	160
area 13D-12	6	10/17/94			140	140	140	140	140	140
area 13D-13	6	10/17/94			80	80	80	80	80	80
area 13D-14	6	10/17/94			430	430	430	430	430	430
area 13D-15	6	10/17/94			170	170	170	170	170	170
area 13E-2	6	9/29/94			220	220	220	220	220	220
area 13E-3	6	9/29/94			170	170	170	170	170	170
area 13E-5	6	9/29/94			220	220	220	220	220	220
area 13E-6	6	9/24/94			1,800	1,800	1,800	1,800	1,800	1,800
area 13E-8	5.5	10/4/94			150	150	150	150	150	150
area 13E-9	5.5	10/4/94			220	220	220	220	220	220
area 13E-10	5.5	10/4/94			190	190	190	190	190	190
area 13E-11	5.5	10/4/94			24,000	24,000	24,000	24,000		
area 13E-12	7	10/11/94			nd	10	nd	10	nd	6
area 13E-13	6	10/11/94			140	140	140	140	140	140
area 13E-14	6	10/11/94			370	370	370	370	370	370
area 13E-15	5.5	10/11/94			12,000	12,000	12,000	12,000	12,000	12,000
area 13F-4	5.5	10/5/94			100	100	100	100	100	100
area 13F-6	5.5	10/5/94			290	290	290	290	290	290
13F-6-F1	5 to 6	10/4/94			160	160	160	160	160	160
area 13F-7	6	10/5/94			350	350	350	350	350	350
area 13F-8	5.5	10/5/94			590	590	590	590	590	590
area 13F-9	6	10/5/94			320	320	320	320	320	320
area 13F-11	5.5	10/5/94			410	410	410	410	410	410
area 13F-12	5.5	10/5/94			110	110	110	110	110	110
area 13F-13	5.5	10/5/94			370	370	370	370	370	370
area 13F-14	5.5	10/5/94			370	370	370	370	370	370
area 13F-15	5.5	10/5/94			1,090	1,090	1,090	1,090	1,090	1,090
13F16R	5	10/31/94			4,100	4,100	4,100	4,100	4,100	4,100
area 13F-17	5.5	10/7/94			31,000	31,000				
area 13F-18	6	10/28/94			30	30	30	30	30	30
area 13F-19	6.5	10/28/94			3,900	3,900	3,900	3,900	3,900	3,900
13F-20	4.5	10/28/94			3,100	3,100	3,100	3,100	3,100	3,100
area 13G-1	5.5	10/7/94			170	170	170	170	170	170
area 13G-2	6	10/7/94			160	160	160	160	160	160
area 13G-3	5.5	10/10/94			100	100	100	100	100	100
area 13G-7	5.5	10/10/94			nd	10	nd	10	nd	6

TABLE II

**SUMMARY OF SOIL SAMPLING DATA AND STATISTICS  
HARBOR ISLAND STATION  
PORT ARANSAS, TEXAS**

SOIL DATA:			AREA 13		AREA 13 REM		AREA 13 FD		AREA 13 APT	
Sample Location	Depth (feet)	Date	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)
area 13G-13	5.5-6	10/14/94			310	310	310	310	310	310
area 13G-14	5.5	10/14/94			110	110	110	110	110	110
area 13G-15	6	10/17/94			140	140	140	140	140	140
area 13G-16	6	10/18/94			120	120	120	120	120	120
area 13G-17	6	10/18/94			120	120	120	120	120	120
area 13G-18	6	10/18/94			3,200	3,200	3,200	3,200	3,200	3,200
area 13G-19	6	10/18/94			19,000	19,000	19,000	19,000	19,000	19,000
area 13G-20	6	10/18/94			24,000	24,000				
area 13G-21	4.5	10/21/94			3,700	3,700	3,700	3,700	3,700	3,700
area 13G-22	4.5	10/21/94			9,400	9,400	9,400	9,400	9,400	9,400
area 13G-23	4.5	10/21/94			12,000	12,000	12,000	12,000	12,000	12,000
area 13G-24	4.5	10/21/94			440	440	440	440	440	440
area 13G-25	4.5	10/21/94			30	30	30	30	30	30
area 13G-26	4.5	10/21/94			640	640	640	640	640	640
area 13G-27	4.5	10/21/94			nd	10	nd	10	nd	6
area 13G-28	4.5	10/21/94			13,800	13,800	13,800	13,800	13,800	13,800
area 13G-29	4.5	10/21/94			310	310	310	310	310	310
area 13G-31	4.5	10/25/94			5,900	5,900	5,900	5,900	5,900	5,900
area 13G-32	4.5	10/25/94			12,600	12,600	12,600	12,600	12,600	12,600
area 13G-33	4.5	10/25/94			12,000	12,000	12,000	12,000	12,000	12,000
area 13G-34	4.5-5	10/25/94			33,000	33,000				
area 13G-35	5	10/25/94			19,000	19,000	19,000	19,000	19,000	19,000
area 13G-36	5	10/25/94			7,600	7,600	7,600	7,600	7,600	7,600
area 13G-37	6	10/25/94			nd	10	nd	10	nd	6
area 13G-38	6	10/25/94			8,500	8,500	8,500	8,500	8,500	8,500
area 13G-39	6.5	10/25/94			20	20	20	20	20	20
area 13G-40	6.5	10/25/94			1,900	1,900	1,900	1,900	1,900	1,900
area 13G-41	3	10/25/94			11,000	11,000	11,000	11,000	11,000	11,000
area 13G-42	4	10/26/94			190	190	190	190	190	190
area 13G-43	5	10/26/94			8,200	8,200	8,200	8,200	8,200	8,200
area 13G-44	5.5	10/26/94			21,700	21,700	21,700	21,700		
area 13G-45	6	10/27/94			20	20	20	20	20	20
area 13G-46	3.5	10/27/94			9,900	9,900	9,900	9,900	9,900	9,900
area 13G-48	3.5	10/27/94			36,000	36,000				
area 13G-49	4	10/27/94			12,000	12,000	12,000	12,000	12,000	12,000
area 13H-1	6	10/27/94			nd	10	nd	10	nd	6
area 13H-2	4.5	10/27/94			nd	10	nd	10	nd	6
area 13H-3	6	10/27/94			25	25	25	25	25	25
area 13H-4	6.5	10/27/94			nd	10	nd	10	nd	6
area 13H-5	6.5	10/27/94			nd	10	nd	10	nd	6
area 13H-6	7	10/27/94			nd	10	nd	10	nd	6
area 13H-7	8.5	10/27/94			nd	10	nd	10	nd	6
area 13H-8	8	10/27/94			6,700	6,700	6,700	6,700	6,700	6,700
area 13H-9	9	10/28/94			35	35	35	35	35	35
13-F-17A	2	7/18/96					10,600	10,600	10,600	10,600
13-F-17B	5.5	7/18/96					1,990	1,990	1,990	1,990
13-G-20A	2	7/18/96					5,100	5,100	5,100	5,100

TABLE II

**SUMMARY OF SOIL SAMPLING DATA AND STATISTICS  
HARBOR ISLAND STATION  
PORT ARANSAS, TEXAS**

SOIL DATA:			AREA 13		AREA 13 REM		AREA 13 FD		AREA 13 APT	
Sample Location	Depth (feet)	Date	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)
13-G-20B	6	7/18/96					11,300	11,300	11,300	11,300
13-G-34A	2	7/18/96					8,380	8,380	8,380	8,380
13-G-34B	5	7/18/96					375	375	375	375
13-G-34C	5	7/18/96					4,270	4,270	4,270	4,270
13-G-48A	2	7/18/96					6,210	6,210	6,210	6,210
13-G-48B	3.5	7/18/96					3,110	3,110	3,110	3,110
APT-13E-11	0-2	3/1/98							249	249
13E-11	4-6	3/1/98							2,590	2,590
13F-17	0-2	3/1/98							222	222
13F-17	2-4	3/1/98							843	843
13G-20	0-2	3/1/98							843	843
13G-20	4-6	3/1/98							2,560	2,560
13G-34	0-2	3/1/98							350	350
13G-34	4-6	3/1/98							955	955
13G-48	0-1	3/1/98							337	337
13G-48	1-2	3/1/98							169	169
13-G-44	3.5 - 4	2/17/99							2,440	2,440



TABLE II

**SUMMARY OF SOIL SAMPLING DATA AND STATISTICS  
HARBOR ISLAND STATION  
PORT ARANSAS, TEXAS**

SOIL DATA:			AREA 14		AREA 14 REM		AREA 14 FD		AREA 14 APT	
Sample Location	Depth (feet)	Date	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)
area 14-27	0-2	12/9/94			657	657	657	657	657	657
area 14-28	0-2	12/9/94			326	326	326	326	326	326
area 14-29	0-2	12/9/94			13,900	13,900	13,900	13,900	13,900	13,900
area 14-30	0-2	12/9/94			11,200	11,200	11,200	11,200	11,200	11,200
14-14-19A	1.5	7/16/96					853	853	853	853
14-14-19B	4	7/16/96					532	532	532	532
14-14-19C	6	7/16/96					594	594	594	594
14-14-20A	1.5	7/18/96					849	849	849	849
14-14-20B	4	7/18/96					3,890	3,890	3,890	3,890
14-14-7A	1.5	7/18/96					3,880	3,880	3,880	3,880
14-14-7B	4	7/18/96					5,040	5,040	5,040	5,040
14-6	0-2	3/1/98							1,310	1,310
14-6	4-6	3/1/98							270	270
14-7	0-2	3/1/98							575	575
14-7	4-6	3/1/98							61	61
14-19	0-1	3/1/98							8,639	8,639
14-19	4-6	3/1/98							13,410	13,410
14-20	0-2	3/1/98							120	120
14-20	2-4	3/1/98							14,260	14,260
14-31	0-1	3/1/98							258	258
14-31	1-2	3/1/98							1,340	1,340
14-32	0-1	3/1/98							4,410	4,410
14-32	1-2	3/1/98							8,030	8,030

TABLE II

**SUMMARY OF SOIL SAMPLING DATA AND STATISTICS  
HARBOR ISLAND STATION  
PORT ARANSAS, TEXAS**

*SUMMARY STATISTICS  
for  
ALL Locations  
and  
Depths:*

AREA 15		AREA 15 REM		AREA 15 FD		AREA 15 APT	
max	202,000	max	64,000	max	54,100	max	17,700
min	14	min	10	min	10	min	10
mean	106,023	mean	2,505	mean	1,876	mean	1,098
stdev	73,297	stdev	8,546	stdev	5,972	stdev	3,271
N	5	N	146	N	158	N	158
tstat	#N/A	tstat	1.656	tstat	1.656	tstat	1.656
detect	5	detect	72	detect	84	detect	82
95th UCL	#N/A	95th UCL	3,677	95th UCL	2,662	95th UCL	1,529

**SOIL DATA:**

Sample Location	Depth (feet)	Date	AREA 15		AREA 15 REM		AREA 15 FD		AREA 15 APT	
			Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)
1356-3		2/21/94	14	14	14	14	14	14	14	14
DS-16A		3/1/94	134,000	134,000						
DS-15A		3/1/94	104,000	104,000						
DS-15		2/21/94	202,000	202,000						
DS-14A		3/1/94	90,100	90,100						
area 15-1		9/12/94			64,000	64,000				
area 15-2		9/12/94			nd	10	nd	10	nd	10
area 15-3		9/12/94			65	65	65	65	65	65
area 15-5	4.5	11/1/94			nd	10	nd	10	nd	10
area 15-6	3.5	11/1/94			nd	10	nd	10	nd	10
area 15-7	4.5	11/1/94			nd	10	nd	10	nd	10
area 15-8	3.5	11/1/94			nd	10	nd	10	nd	10
area 15-9	4	11/1/94			nd	10	nd	10	nd	10
area 15-10	3.5	11/1/94			nd	10	nd	10	nd	10
area 15-11	4	11/1/94			nd	10	nd	10	nd	10
area 15-12	4	11/1/94			nd	10	nd	10	nd	10
area 15-13	5.5	11/1/94			nd	10	nd	10	nd	10
area 15-14	5	11/1/94			nd	10	nd	10	nd	10
area 15-15	5.5	11/1/94			nd	10	nd	10	nd	10
area 15-16	6	11/1/94			nd	10	nd	10	nd	10
area 15-17	5	11/1/94			nd	10	nd	10	nd	10
area 15-18	5	11/2/94			530	530	530	530	530	530
area 15-19	4 to 5	11/2/94			nd	10	nd	10	nd	10
area 15-20	6	11/2/94			nd	10	nd	10	nd	10
area 15-21R	3	12/15/94			237	237	237	237	237	237
area 15-22	6.5	11/2/94			nd	10	nd	10	nd	10
area 15-23	6.5	11/2/94			nd	10	nd	10	nd	10
area 15-24	5.5	11/2/94			nd	10	nd	10	nd	10
area 15-25	5.5	11/2/94			60	60	60	60	60	60
area 15-26	6	11/2/94			nd	10	nd	10	nd	10
area 15-27	6.5	11/2/94			140	140	140	140	140	140
area 15-28	6	11/2/94			40	40	40	40	40	40
area 15-29	6.5	11/2/94			20	20	20	20	20	20
area 15-30	6.5	11/2/94			nd	10	nd	10	nd	10
area 15-31	6.5	11/2/94			20	20	20	20	20	20

TABLE II

SUMMARY OF SOIL SAMPLING DATA AND STATISTICS  
HARBOR ISLAND STATION  
PORT ARANSAS, TEXAS

SOIL DATA:			AREA 15		AREA 15 REM		AREA 15 FD		AREA 15 APT	
Sample Location	Depth (feet)	Date	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)
area 15-32	5.5	11/3/94			60	60	60	60	60	60
area 15-33	6	11/3/94			30	30	30	30	30	30
area 15-34	5.5	11/3/94			nd	10	nd	10	nd	10
area 15-35	6	11/3/94			nd	10	nd	10	nd	10
area 15-36	5.5	11/3/94			50	50	50	50	50	50
area 15-37	6	11/3/94			110	110	110	110	110	110
area 15-38	7	11/3/94			110	110	110	110	110	110
area 15-39	6.5	11/3/94			30	30	30	30	30	30
area 15-40	7	11/3/94			nd	10	nd	10	nd	10
area 15-41	7	11/3/94			nd	10	nd	10	nd	10
area 15-42	7	11/3/94			530	530	530	530	530	530
area 15-43	6.5	11/3/94			nd	10	nd	10	nd	10
area 15-44	6	11/3/94			nd	10	nd	10	nd	10
area 15-45	6	11/3/94			120	120	120	120	120	120
area 15-46	6	11/3/94			nd	10	nd	10	nd	10
area 15-47	7.5	11/3/94			110	110	110	110	110	110
area 15-48	7.5	11/4/94			40	40	40	40	40	40
area 15-49	7	11/4/94			40	40	40	40	40	40
area 15-50	7.5	11/4/94			nd	10	nd	10	nd	10
area 15-51	7.5	11/4/94			nd	10	nd	10	nd	10
area 15-52	7.5	11/4/94			2,200	2,200	2,200	2,200	2,200	2,200
area 15-53	7 to 8	11/4/94			600	600	600	600	600	600
area 15A-1	4 to 6	9/14/94			60	60	60	60	60	60
area 15A-5	5.5	11/8/94			nd	10	nd	10	nd	10
area 15A-6	6	11/8/94			nd	10	nd	10	nd	10
area 15A-7	5.5	11/8/94			nd	10	nd	10	nd	10
area 15A-8	5.5	11/8/94			nd	10	nd	10	nd	10
area 15A-9	5.5	11/8/94			240	240	240	240	240	240
area 15A-10	5.5	11/9/94			20	20	20	20	20	20
area 15A-11	5.5	11/9/94			1,600	1,600	1,600	1,600	1,600	1,600
area 15A-12	5.5	11/9/94			30	30	30	30	30	30
area 15B-4	5.5	11/8/94			95	95	95	95	95	95
area 15B-5	5.5	11/8/94			105	105	105	105	105	105
area 15B-6	5.5	11/8/94			170	170	170	170	170	170
area 15B-7	5	11/8/94			170	170	170	170	170	170
area 15B-8	5.5	11/8/94			175	175	175	175	175	175
area 15B-9	5.5	11/8/94			205	205	205	205	205	205
area 15B-10	5	11/8/94			1,760	1,760	1,760	1,760	1,760	1,760
area 15B-11	6.5	11/8/94			15,000	15,000	15,000	15,000	15,000	15,000
area 15B-12	6.5	11/8/94			205	205	205	205	205	205
area 15B-13	5.5	11/8/94			9,100	9,100	9,100	9,100	9,100	9,100
area 15B-14	5.5	11/8/94			185	185	185	185	185	185
area 15B-15	5.5	11/9/94			nd	10	nd	10	nd	10
area 15B-16	6	11/9/94			nd	10	nd	10	nd	10
area 15B-17	6	11/9/94			20	20	20	20	20	20
area 15B-18	6	11/9/94			nd	10	nd	10	nd	10
area 15B-19	5	11/9/94			nd	10	nd	10	nd	10
area 15B-20	5	11/9/94			20	20	20	20	20	20

TABLE II

**SUMMARY OF SOIL SAMPLING DATA AND STATISTICS  
HARBOR ISLAND STATION  
PORT ARANSAS, TEXAS**

SOIL DATA:			AREA 15		AREA 15 REM		AREA 15 FD		AREA 15 APT	
Sample Location	Depth (feet)	Date	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)
area 15B-21	6	11/9/94			23,000	23,000				
area 15B-22	5.5	11/9/94			60	60	60	60	60	60
area 15B-23	5.5	11/9/94			12,800	12,800	12,800	12,800	12,800	12,800
area 15B-24	6.5	11/9/94			11,000	11,000	11,000	11,000	11,000	11,000
area 15B-25	5.5	11/9/94			14,600	14,600	14,600	14,600	14,600	14,600
area 15B-26	5.5	11/9/94			3,400	3,400	3,400	3,400	3,400	3,400
area 15B-27	5	11/9/94			11,500	11,500	11,500	11,500	11,500	11,500
area 15C-1	4 to 6	9/14/94			120	120	120	120	120	120
area 15C-3	5	11/14/94			60	60	60	60	60	60
area 15C-4	5	11/14/94			5,300	5,300	5,300	5,300	5,300	5,300
area 15C-5	6	11/14/94			220	220	220	220	220	220
area 15C-6	5.5	11/15/94			30,800	30,800				
area 15C-7	4.5	11/15/94			800	800	800	800	800	800
area 15C-8	5	11/15/94			20	20	20	20	20	20
area 15C-9	6	11/15/94			50	50	50	50	50	50
area 15C-10	6	11/15/94			6,900	6,900	6,900	6,900	6,900	6,900
area 15C-11	5	11/17/94			nd	10	nd	10	nd	10
area 15C-12	5	11/17/94			nd	10	nd	10	nd	10
area 15C-13	5	11/17/94			nd	10	nd	10	nd	10
area 15C-14	5.5	11/17/94			nd	10	nd	10	nd	10
area 15C-15	5	11/17/94			nd	10	nd	10	nd	10
area 15C-16	5.5	11/17/94			nd	10	nd	10	nd	10
area 15C-17	5	11/17/94			nd	10	nd	10	nd	10
area 15D-3	5.5	11/30/94			nd	10	nd	10	nd	10
area 15D-4	5.5	11/30/94			nd	10	nd	10	nd	10
area 15D-5	5.5	11/30/94			nd	10	nd	10	nd	10
area 15D-6	6	11/30/94			nd	10	nd	10	nd	10
area 15D-7	5.5	11/30/94			nd	10	nd	10	nd	10
area 15D-8	5.5	11/30/94			nd	10	nd	10	nd	10
area 15D-9	5.5	11/30/94			187	187	187	187	187	187
area 15D-10	5	11/30/94			nd	10	nd	10	nd	10
area 15D-11	5	11/30/94			38,000	38,000				
area 15D-12	5	11/30/94			36,600	36,600				
area 15D-13	5	11/30/94			4,730	4,730	4,730	4,730	4,730	4,730
area 15D-14	5	11/30/94			nd	10	nd	10	nd	10
area 15D-15	5	11/30/94			29,000	29,000	29,000	29,000		
area 15D-16	4.5	11/30/94			35,300	35,300				
area 15D-17	5	11/30/94			nd	10	nd	10	nd	10
area 15E-1	5.5	11/30/94			nd	10	nd	10	nd	10
area 15E-2	5.5	11/30/94			nd	10	nd	10	nd	10
area 15E-3	5.5	11/30/94			nd	10	nd	10	nd	10
area 15E-4	5	11/30/94			nd	10	nd	10	nd	10
area 15E-5	5.5	11/30/94			24	24	24	24	24	24
area 15E-6	5	11/30/94			nd	10	nd	10	nd	10
area 15E-7	5.5	11/30/94			31	31	31	31	31	31
area 15E-8	4	12/1/94			nd	10	nd	10	nd	10
area 15E-9	4	12/1/94			nd	10	nd	10	nd	10
area 15E-10	4	12/1/94			470	470	470	470	470	470







TABLE II

SUMMARY OF SOIL SAMPLING DATA AND STATISTICS  
 HARBOR ISLAND STATION  
 PORT ARANSAS, TEXAS

SUMMARY STATISTICS  
 for  
 ALL Locations  
 and  
 Depths:

AREA 17		AREA 17 REM		AREA 17 FD		AREA 17 APT	
max	47,700	max	47,700	max	47,700	max	11,000
min	19,600	min	19,600	min	41	min	41
mean	33,650	mean	33,650	mean	16,854	mean	4,368
stdev	19,870	stdev	19,870	stdev	22,533	stdev	4,590
N	2	N	2	N	4	N	6
tstat	#N/A	tstat	#N/A	tstat	#N/A	tstat	#N/A
detect	2	detect	2	detect	4	detect	6
95th UCL	#N/A	95th UCL	#N/A	95th UCL	#N/A	95th UCL	#N/A

SOIL DATA:

Sample Location	Depth (feet)	Date	AREA 17		AREA 17 REM		AREA 17 FD		AREA 17 APT	
			Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)
1354-1		2/21/94	47,700	47,700	47,700	47,700	47,700	47,700		
1353-2		2/21/94	19,600	19,600	19,600	19,600	19,600	19,600		
FD-17-1354-4A	1.5 - 2	2/21/94					41	41	41	41
FD-17-1354-4-B	4.5 - 5	2/21/94					75	75	75	75
1353	0-1	3/1/98							8,835	8,835
1353	1-2	3/1/98							3,890	3,890
1354-1	1 - 1.5	2/17/99							2,365	2,365
1353-2	2.5 - 3	2/17/99							11,000	11,000



TABLE II

SUMMARY OF SOIL SAMPLING DATA AND STATISTICS  
HARBOR ISLAND STATION  
PORT ARANSAS, TEXAS

SUMMARY STATISTICS  
for  
ALL Locations  
and  
Depths:

AREA 19		AREA 19 REM		AREA 19 FD		AREA 19 APT	
max	0	max	32,400	max	13,900	max	13,900
min	0	min	8,510	min	642	min	642
mean	#DIV/0!	mean	21,403	mean	6,347	mean	6,838
stdev	#DIV/0!	stdev	11,997	stdev	4,566	stdev	4,855
N	0	N	4	N	6	N	5
tstat	#N/A	tstat	#N/A	tstat	#N/A	tstat	#N/A
detect	0	detect	4	detect	6	detect	5
95th UCL	#DIV/0!	95th UCL	#N/A	95th UCL	#N/A	95th UCL	#N/A

SOIL DATA:

Sample Location	Depth (feet)	Date	AREA 19		AREA 19 REM		AREA 19 FD		AREA 19 APT	
			Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)
area 19-1	0-2	12/9/94			30,800	30,800				
area 19-2	0-2	12/9/94			13,900	13,900	13,900	13,900	13,900	13,900
area 19-3	0-2	12/9/94			32,400	32,400				
area 19-4	0-2	12/9/94			8,510	8,510	8,510	8,510	8,510	8,510
19-19-1A	2	7/18/96					642	642	642	642
19-19-1B	4	7/18/96					5,480	5,480	5,480	5,480
19-19-3A	2	7/18/96					6,240	6,240		
19-19-3B	4	7/18/96					3,310	3,310		
19-3	0-2	3/1/98							<25	<25
19-3	3-5	3/1/98							5,660	5,660

TABLE II

SUMMARY OF SOIL SAMPLING DATA AND STATISTICS  
HARBOR ISLAND STATION  
PORT ARANSAS, TEXAS

SUMMARY STATISTICS  
for  
ALL Locations  
and  
Depths:

OTHER AREAS		FINAL	
max	28,240	max	6,400
min	26	min	26
mean	1,627	mean	964
stdev	4,556	stdev	1,615
N	41	N	41
tstat	1.6832	tstat	1.6832
detect	41	detect	41
95th UCL	2,825	95th UCL	1,389

SOIL DATA:			OTHER AREAS		FINAL	
Sample Location	Depth (feet)	Date	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)
PtF	0-2	3/1/98	2,830	2,830	2,830	2,830
PtF	3-5	3/1/98	6,400	6,400	6,400	6,400
20-1	0-2	3/1/98	486	486	486	486
20-1	3-5	3/1/98	102	102	102	102
20-2	0-2	3/1/98	989	989	989	989
20-2	3-5	3/1/98	35	35	35	35
20-3	0-2	3/1/98	6,250	6,250	6,250	6,250
20-3	3-5	3/1/98	3,550	3,550	3,550	3,550
20-4	0-2	3/1/98	43	43	43	43
20-4	3-5	3/1/98	<25	<25	<25	<25
Substa-1		3/1/98	<25	<25	<25	<25
MPA	0-1	3/1/98	498	498	498	498
MPA	0-2	3/1/98	137	137	137	137
LF-1	0-2	3/1/98	569	569	569	569
LF-1	3-5	3/1/98	<25	<25	<25	<25
LF-2	0-2	3/1/98	<25	<25	<25	<25
LF-2	3-5	3/1/98	<25	<25	<25	<25
LF-3	0-2	3/1/98	100	100	100	100
LF-3	3-5	3/1/98	<25	<25	<25	<25
LF-4	0-2	3/1/98	<25	<25	<25	<25
LF-4	4-6	3/1/98	<25	<25	<25	<25
LF-5	0-2	3/1/98	<25	<25	<25	<25
LF-5	4-6	3/1/98	<25	<25	<25	<25
TSP-1	Composite	3/1/98	<25	<25	<25	<25

TABLE II

**SUMMARY OF SOIL SAMPLING DATA AND STATISTICS  
HARBOR ISLAND STATION  
PORT ARANSAS, TEXAS**

SOIL DATA:			OTHER AREAS		FINAL	
Sample Location	Depth (feet)	Date	Lab Results (mg/kg)	Calculated Results (mg/kg)	Lab Results (mg/kg)	Calculated Results (mg/kg)
946	0-1	3/1/98	<25	<25	<25	<25
946	1-2	3/1/98	297	297	297	297
954	0-1	3/1/98	522	522	522	522
954	1-2	3/1/98	<25	<25	<25	<25
1359	0-1	3/1/98	51	51	51	51
1359	1-2	3/1/98	<25	<25	<25	<25
1799	0-2	3/1/98	1,260	1,260	1,260	1,260
1799	2-4	3/1/98	178	178	178	178
1799C	0-1	3/1/98	102	102	102	102
1799C	2-3	3/1/98	232	232	232	232
1953	0-1	3/1/98	997	997	997	997
1953	1-2	3/1/98	490	490	490	490
PG-1	0-2	3/1/98	930	930	930	930
PG-1	2-4	3/1/98	4,700	4,700	4,700	4,700
PG-2	0-2	3/1/98	<25	<25	<25	<25
PG-2	4-6	3/1/98	37	37	37	37
PG-3	0-2	3/1/98	26	26	26	26
PG-3	4-6	3/1/98	40	40	40	40
PG-4	0-2	3/1/98	118	118	118	118
PG-4	4-6	3/1/98	100	100	100	100
PG-5	0-2	3/1/98	525	525	525	525
PG-5	4-6	3/1/98	223	223	223	223
13-W	0-2	3/1/98	3,380	3,380	3,380	3,380
13-W	3-5	3/1/98	60	60	60	60
306	0-2	3/1/98	367	367	367	367
306	4-6	3/1/98	337	337	337	337
363	0-2	3/1/98	81	81	81	81
363	4-6	3/1/98	394	394	394	394
BWP	1	3/1/98	28,240	28,240		
BWP	2	3/1/98	114	114	114	114
BWP	3	3/1/98	459	459	459	459
BWP	4	3/1/98	459	459	459	459
BWP	1	2/17/99			1,060	1,060

TABLE III

SUMMARY OF GROUND WATER ANALYTICAL DATA  
HARBOR ISLAND STATION  
PORT ARANSAS, TEXAS

SAMPLE LOCATION	SAMPLE DATE	BTEX METHOD	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL-BENZENE (mg/L)	XYLENES (mg/L)	TOTAL BTEX (mg/L)	TPH 418.1 (mg/L)
AREA 1								
MW-1 (a)	7/16/96	8020	4.8	4.8	5.8	17.0	32.4	83
MW-1	7/16/96	8060	< 0.010	< 0.010	< 0.010	< 0.010	< 0.040	NS
MW-1	3/20/98	8260B	< 0.005	< 0.005	< 0.005	< 0.005	< 0.020	5.0
AREA 3								
MW-2 (a)	7/16/96	8020	1.1	0.9	1.1	3.2	6.3	54.0
MW-2	3/20/98	NT	NT	NT	NT	NT	NT	< 1.0
AREA 5								
MW-6	3/20/98	8260B	< 0.005	< 0.005	< 0.005	< 0.005	< 0.020	64.0
AREA 6								
MW-7	3/20/98	8260B	< 0.005	< 0.005	0.140	< 0.005	0.140	20.0
AREA 10								
MW-3 (a)	7/16/96	8020	1.2	1.4	1.2	3.2	7.0	104.0
MW-3R	3/20/98	8260B	< 0.005	< 0.005	< 0.005	< 0.005	< 0.020	39.0
AREA 13								
MW-8	3/20/98	8260B	< 0.005	< 0.005	< 0.005	< 0.005	< 0.020	2.0
AREA 14								
MW-4 (a)	7/16/96	8020	1.4	< 1.0	1.4	3.9	6.7	220.0
MW-4	7/16/96	8060	< 0.010	< 0.010	< 0.010	< 0.010	< 0.040	---
MW-4	3/20/98	8260B	< 0.005	< 0.005	< 0.005	< 0.005	< 0.020	4.0
AREA 15								
MW-5 (a)	7/16/96	8020	1.1	1.0	1.1	3.1	6.3	122.0
MW-5	3/20/98	NA	NT	NT	NT	NT	NT	< 1
OTHER AREAS								
MW-9	3/20/98	NA	NT	NT	NT	NT	NT	< 1.0
MW-10	3/20/98	NA	NT	NT	NT	NT	NT	2.0

(a) - Sample results believed to be corrupt based on 8260 analysis and subsequent testing

ND - Not detected at method detection limit

NT - Not tested

NA - Not applicable



TABLE III

SUMMARY OF GROUND WATER ANALYTICAL DATA  
HARBOR ISLAND STATION  
PORT ARANSAS, TEXAS

WELL NUMBER	SAMPLE DATE	SILVER (mg/L)	ARSENIC (mg/L)	BARIUM (mg/L)	CADMIUM (mg/L)	CHROMIUM (mg/L)	MERCURY (mg/L)	LEAD (mg/L)	SELENIUM (mg/L)	VOLATILES (mg/L)	SEMI-VOLATILES (mg/L)
MW-1	07/16/96	< 0.2	< 0.1	0.28	< 0.1	< 0.5	< 0.002	< 1.0	< 0.1	ND	ND
	03/20/98	NT	NT	NT	NT	NT	NT	NT	NT	ND	ND
MW-2	07/16/96	< 0.2	< 0.1	0.20	< 0.1	< 0.5	< 0.002	< 1.0	< 0.1	NT	NT
	03/20/98	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
MW-3 MW-3R	07/16/96	< 0.2	< 0.1	0.37	< 0.1	< 0.5	< 0.002	< 1.0	< 0.1	NT	NT
	03/20/98	NT	NT	NT	NT	NT	NT	NT	NT	ND	ND
MW-4	07/16/96	< 0.2	< 0.1	0.20	< 0.1	< 0.5	< 0.002	< 1.0	< 0.1	ND	ND
	03/20/98	NT	NT	NT	NT	NT	NT	NT	NT	ND	ND
MW-5	07/16/96	< 0.2	< 0.1	0.34	< 0.1	< 0.5	< 0.002	< 1.0	< 0.1	NT	NT
	03/20/98	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
MW-6	03/20/98	NT	NT	NT	NT	NT	NT	NT	NT	ND	ND
MW-7	03/20/98	NT	NT	NT	NT	NT	NT	NT	NT	(b)	ND
MW-8	03/20/98	NT	NT	NT	NT	NT	NT	NT	NT	ND	ND
MW-9	03/20/98	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
MW-10	03/20/98	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT

ND - Not detected at method detection limit

NT - Not tested

(b) All VOCs non-detect with the exception of ethyl benzene - see summary of BTEX and TPH data

RAILROAD COMMISSION OF TEXAS  
OIL AND GAS DIVISION

JAMES E. (JIM) NUGENT, Chairman  
MARY SCOTT NABERS, Commissioner  
BARRY WILLIAMSON, Commissioner



DAVID M. GARLICK  
Director  
LORI WROTENBERY  
Director of  
Environmental Services  
(512) 463-6790  
Fax (512) 463-6780

1 N. CONGRESS

P. O. BOX 12967

AUSTIN, TEXAS 78711-2967

July 15, 1994

Brian T. Magruder  
Exxon Pipeline Company  
P. O. Box 1215  
La Porte, TX 77572-1215

Re: Environmental Investigation Report and Remedial Action Plan  
EPC Harbor Island Station  
Nueces County  
Port Aransas, Texas

Dear Mr. Magruder:

We have completed our review of the referenced assessment dated April 15, 1994, and the remediation proposal dated June 8, 1994.

Analytical results from soil samples taken at the site revealed eighteen (18) areas of soil total petroleum hydrocarbon (TPH) concentrations ranging from 1% to 20% by weight, with the higher concentrations generally near former or current storage tank locations.

A few of the soil samples indicated elevated lead levels near Tank #951 (220 mg/kg), Tank #952 (190 mg/kg), Tank #1351 (212 mg/kg), and Tank #1356 (261 mg/kg). However, all samples fell below the TCLP level for lead and it is our understanding that the future use of this property will be restricted.

1,1,2-Trichloroethane (TCE) was identified in one soil sample (PBC-6) near a former tank location at a depth of 4 feet with a concentration of 14 ppm. As we discussed today, additional investigation and/or cleanup requirements may be necessary. Please contact me next week so that we may discuss this issue further.

Groundwater was encountered at depths of less than five (5) feet below ground surface, with a general flow direction towards the ship channel. The ground water from this shallow, unconfined aquifer is unsuitable as a water supply. A phase separated hydrocarbon (PSH) layer was encountered at three locations contained within the site. Four areas with dissolved phase hydrocarbons were also discovered, with TPH levels as high as 40 ppm.

You have proposed a staged remedial action plan for contaminated soil. Soil with TPH concentrations greater than 10%

Exxon Pipeline Corp.  
Harbor Island Storage Facility  
Page 2

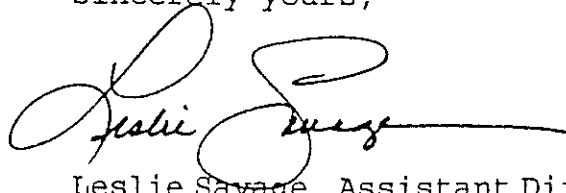
by weight will be remediated by excavation and bioremediation in an on-site treatment area to a TPH level of less than 5%, then placed back into the original excavations. Surficial soil containing TPH concentrations between 5% and 10% will be remediated by in-place mixing and tilling to a depth of 2 feet, using soil enhancements as needed to a level less than 5% TPH by weight. This proposal is acceptable with two slight modifications. First, precautions must be taken during remediation to preclude any discharge of oil from rainwater runoff. Second, please submit a schedule for limited soil sampling at some date after active remediation to ensure that bioremediation is continuing at such a rate that the TPH level in the soil after active remediation is approaching 1% by weight. It is my understanding that the higher level of TPH has been chosen because of indications of good conditions for bioremediation at this site.

Your proposal to remove floating hydrocarbons from the shallow ground water using a trench system is also acceptable. You have proposed to operate the groundwater treatment system until the remaining PSH layer reaches a thickness of 0.01 feet or less. When this level has been reached, we request that you sample and analyze the remaining ground water for TPH.

It is our understanding that you will be submitting a site closure plan for our review.

Please call me at (512)463-7308 if you have any questions.

Sincerely yours,



Leslie Savage, Assistant Director for  
Waste Management

LLS/lis

cc: Charles Ross, Director  
Regulatory Enforcement

Fermin Munoz, Director  
Corpus Christi District Office

✓ KEI  
12502 Exchange Drive, Suite 440  
Stafford, TX 77477  
Attention: Alan Berryhill, P.G.

RAILROAD COMMISSION OF TEXAS  
OIL AND GAS DIVISION

MES E. (JIM) NUGENT, Chairman  
MARY SCOTT NABERS, Commissioner  
BARRY WILLIAMSON, Commissioner



DAVID M. GARLICK  
Director  
LORI WROTENBERY  
Director of  
Environmental Services  
(512) 463-6790  
Fax (512) 463-6780

1791 N. CONGRESS

P. O. BOX 12967

AUSTIN, TEXAS 78711-2967

October 19, 1994

Brian T. Magruder  
Exxon Pipeline Company  
P. O. Box 1215  
La Porte, TX 77572-1215

10 24 1994

Re: Environmental Investigation and Remedial Action  
EPC Harbor Island Station, Port Aransas  
Nueces County, Texas

Dear Mr. Magruder:

This letter is in response to your letters dated September 7, 1994, requesting a minor permit, and October 3, 1994, forwarding KEI's investigation results relating to TCE.

I have reviewed and hereby approve your request to dispose of approximately 22 cubic yards of solids generated during cleaning of crude oil storage tanks at the referenced facility. This authorization is granted based on our understanding that the laboratory analysis was performed on a representative sample of the solids to be disposed of and that the solids will be placed in the on-site treatment area approved by this office by letter dated July 15, 1994.

In our letter to you dated July 15, 1994, we requested that you perform additional investigation into the 1,1,2-Trichloroethane (TCE) that was identified in one soil sample (PBC-6) near a former tank location at a depth of 4 feet with a concentration of 14 ppm. We have reviewed the investigation report prepared for you by KEI Consultants, Inc. We agree that the TCE encountered in the initial soil sample may represent lab contamination and that no further action on this matter is necessary.

Please call me at (512)463-7308 if you have any questions.

Sincerely yours,

A handwritten signature in cursive script, appearing to read "Leslie Savage".

Leslie Savage, Assistant Director for  
Waste Management

cc: ✓ KEI  
12502 Exchange Drive, Suite 440  
Stafford, TX 77477  
Attention: Alan Berryhill, P.G.

Charles Ross  
Fermin Munoz