PLEASE PRINT

State of Wisconsin Substance Release Notification Form 04-16-188912

24-Hour Emergency Hotline Number: 1-800-943-0003 **Form 4400-91 Rev. 11-95**

Date and Mil. Time of Incident 5-18 or 19-98 3:00am	Date and Mil. Time Reported 5-18, 19-98 3:00am

Person Reporting Richard Lawney, Supervisor	Telephone # (715) 398-3533
Representing Agency, Firm, or Citizen Murphy Oil	
Responsible Party Murphy Oil	
Contact Name	Telephone # ( )
Address Stinson Ave	City, State, Zip Code Superior, WI 54880

Substance Involved Naphthalene	Amount & Units Released 150 gals	Amt. Recovered	Is this a 304 (11004 42 USC) spill? ☐ Yes ☐ No ☐ Unknown

☐ Solid ☐ Semisolid ☑ Liquid ☐ Gas Color _____ Odor _____

Exact Location (inc. address, facility name, mileage, bldg. #, etc.) Tank 29 at Murphy Refinery

City Superior	County Douglas	Lat/long
DNR Region	___¼___¼sec___T___NR___(E/W)	Weather Cond.

Cause of Incident Over fill due to bad guage ~~tank 29~~

Spilled Substance Impact To:
Check (✓) all that apply
- ☐ Air ☐ Potential
- ☑ Soil ☐ Potential
- ☐ Groundwater ☐ Potential
- ☐ Surface Water ☐ Potential
  Name: _____
- ☐ Storm Sewer ☐ Potential
- ☐ Sanitary Sewer ☐ Potential
- ☐ Concrete/Asphalt ☐ Potential
- ☐ Private Well ☐ Potential
- ☐ Contained/Recovered
- ☐ Other: _____

Spill Source:
- ☐ Transportation Accident, Fuel Supply Tank Spill
- ☐ Transportation Accident, Load Spill
- ☐ Industrial Facility ☐ Paper Mill ☐ Chemical Co.
- ☐ Ag Coop/Facility/Food Factory/Facility
- ☐ Gas/Service Station/Garage/Auto Dealer, Repair Shop
- ☐ Pipeline, Terminal, Tank Farm, Oil Jobber/Wholesaler
- ☐ Public Property (city, state, church, school, etc.)
- ☐ Utility Co., Power Generating/Transfer Facility
- ☐ Private Property (home/farm)
- ☐ Construction, Excavation, Wrecking, Quarry, Mine
- ☐ Airport Facility ☐ Railroad Facility
- ☑ Other Refinery

Action Taken By Spiller
- ☐ No Action Taken
- ☐ No Action Needed
- ☐ Monitor
- ☑ Cleanup Method: Vaccumed liquids
- ☐ Waste Destination: _____
- ☐ Containment
- ☐ Contractor Hired
  Name: _____
- ☐ Other: _____

Injuries? ☐ Yes ☑ No If yes, how many? ____ Has an evacuation occurred? ☐ Yes ☑ No Potential? ☐ Yes ☑ No

Are there any resource damages? ☐ Yes ☐ No What kinds? _____

Other Agencies Notified (✓ first column if notified); Check (✓) both columns if on scene

☐	☐	Fire Department/Hazmat	☑ ☐	Local DNR	☐ ☐ EPA
☐	☐	Local Law Enforcement	☐ ☐	Div. Emer. Gov.	☐ ☐ Nat'l Resp. Ctr. 800-442-8802
☐	☐	LEPC or Local Emer. Gov.	☐ ☐	DATCP 608-224-4500	☐ ☐ Chemtrec 800-424-9300
☐	☐	Regional Response Team	☐ ☐	DHSS 608-266-2830	☐ ☐ Other_____

Incident Commander, if known: _____
Phone: _____

Prepared By: (Print) Steve LaValley (Sign) Date: 5-19-98 Rpt'd to DATCP? ☐ Yes ☑ No

Person Notified: Region Notified: Time: Date:

Invstgtd By: (Print) Steve LaValley (Sign) Date: 5-19-98 Site Closed? ☐ Yes ☑ No

Spill Coordinator Signoff: [signature] Date: Transferred to ERP? ☐ No ☒ Yes; Case # _____ NFA Letter Sent? ☐ Yes ☑ No

Spill Packet Sent? ☐ Yes ☑ No

State of Wisconsin Substance Release Report (Con't)
Form 4400-91 Rev. 11-95

Date and Military Time of Incident	Responsible Party

Additional Comments:

Vaccumed up sent to API Separator #1 according to J. Kowitz on tuesday. Phone message stated that zeinth cleaned area up. I informed J. Kowitz that Napthalene is a listed waste and that any soils are listed hazardous waste. A phone message was left on answering machine at DNR office in Superior presumably at time of spill.

04-16-188912

NATIONAL RESPONSE CENTER - STATE*FAX

** GOVERNMENT USE ONLY ** GOVERNMENT USE ONLY ** GOVERNMENT USE ONLY **
DO NOT RELEASE this information to the public without permission from the National Response Center (G-OPF), U.S. Coast Guard Headquarters, Washington DC 20593-0001 (202)267-2675.

From: National Response Center
USCG HQ Washington, D.C.
1-800-424-8802

To:
WI DEPT NAT RES BUREAU OF LAW ENF
Incident Report # 437514

INCIDENT DESCRIPTION

*Report taken by MASON at 05:30 on 19-MAY-98
Incident Type: FIXED Container Type: Above Ground
Tank Capacity: 55000 BBL(S)
Incident Cause: EQUIPMENT FAILURE
Affected Area: SOIL
The incident occurred on 19-MAY-98 at 03:30 local time.
Affected Medium: LAND

SUSPECTED RESPONSIBLE PARTY

Name: RICHARD LOWNEY
Organization: MURPHY OIL REFINERY
Address: 2400 STINSON AVE
SUPERIOR, WI 54880
Day Phone: (715)3983533
Type of Organization: PRIVATE ENTERPRISE

INCIDENT LOCATION

2400 STINSON AVE
TANK 29
SUPERIOR, WI 54880

County: DOUGLAS

RELEASED MATERIAL(S)

CHRIS Code: NSV Official Material Name: NAPHTHA: SOLVENT
Also Known As: NAPHTHA
Qty Released: 150 GAL(S) Qty in Water: 0 NON(S)

SOURCE/CAUSE OF INCIDENT

ABOVE GROUND STORAGE TANK OVERFLOWED DUE TO A FAULTY GUAGE

DAMAGE

Injuries:	Fatalities:	Evacuations:	Damages:	Air Close:	Road Close:
				N	N

REMEDIAL ACTIONS

ISOLATED THE TANK / LOWERING THE LEVEL IN TANK / CONTRACTOR WILL CONDUCT THE CLEAN-UP

NOTIFICATIONS BY CALLER

EPA: STATE: Y CG: Y OTHER: DESC: DNR MSO DULUTH

NOTIFICATIONS BY NRC

ATSDR MN ATTN: LARRY SOUTHER	(612)2150918
ATSDR WI ATTN: JAMES DREW	(608)2662663
MSO DULUTH	(218)7205286
NOAA 1ST CLASS BB RPTS FOR WI	(206)5266344
MN DEM ATTN: M. KAM	(612)6495451
WI DEPT NAT RES BUREAU OF LAW ENF	(608)2662598

NATIONAL RESPONSE CENTER - STATE*FAX

** GOVERNMENT USE ONLY ** GOVERNMENT USE ONLY ** GOVERNMENT USE ONLY **

ADDITIONAL INFORMATION

AREA OF IMPACT: 300 SQUARE FEET WEATHER: OVERCAST WIND: NW 5-10MPH
TEMP: 65F

*** END INCIDENT REPORT # 437514 ***

PLEASE VISIT OUR WEB SITE
http://www.nrc.uscg.mil

MURPHY
OIL USA, INC.

SUPERIOR REFINERY
P O BOX 2066
SUPERIOR WISCONSIN 54880

July 2, 1998

Mr. James A. Hosch
Wisconsin Department of Natural Resources
1705 Tower Ave.
Superior, Wisconsin 54880

Re: Naphtha Release
Tank 29 Area

Dear Mr. Hosch,

This letter is to provide additional information on the site clean-up for the release of Naphtha that occurred **May 19, 1998** at approximately 0330 hours. Verbal notification of the release was provided the WDNR on the date of the release. As reported in the notification, the release was a result of an over fill of the tank due to a plugged gauge tube. This tube is used to hand gauge the tank level. The tank was being hand gauged because the float gauge had failed during April, resulting in a previously reported spill in the same area.

At the time the spill occurred, the soil was generally dry. The material leaked into the dike containment area of Tank 29. The amount of material spilled was estimated to be approximately 150 gallons. At no time was there any danger of the material moving off site.

The tank is located on the refinery property which is at 2400 Stinson Ave., Superior, WI. The map coordinates for the refinery are NW¼, NW¼, Sect. 36, T 49N, R 14N.

Clean-up activities commenced immediately after discovery of the release. The location of the spilled material was inside the diked area of the tank. All pooled materials in the area of the spill were removed with a vacuum truck and reintroduced into the refinery processing equipment by way of the #1 API separator. This allows the oil to be recovered through the refinery's slop oil system and any water from the area to be processed through the refinery's waste water treatment plant.

The amount of soil removed is approximately 440 yards. The recovered soil is being stored in the contaminated soil storage building until arrangements for the ultimate disposition of the soil are made. Presently, disposal at a local asphalt plant in an asphalt roaster has been applied for from the WDNR.

The site remediation is still active at this time. Analytical results of soil sampling that was

done to determine any levels of residual contamination are under evaluation at this time to determine what additional measures may be necessary.

Since this site is still active, I will notify you in the future of additional remedial activities or other actions that may be taken to complete the disposition of this site.

Please contact me at (715)398-3533 if you have any questions or comments in this regard.

Sincerely,

Mark H. Miller

Mark H. Miller
Manager, Safety and Environmental Control

cc: J. Kowitz
J. Britt
K. Melnyk

MURPHY
OIL USA, INC.

131 SOUTH ROBERTSON STREET
P O BOX 57237
NEW ORLEANS LA 70157-7237
(504) 561-2811
FAX (504) 561-2661

September 1, 1998

James Hosch
State of Wisconsin
Department of Natural Resources
1705 Tower Avenue
Superior, Wisconsin 54880

Dear Mr. Hosch,

Thank-you for you letter dated August 25, 1998. I believe that we can address your concerns stated in the letter. Your first two paragraphs discuss the need for a full VOC scan in some cases. You focus on a spill which occurred at Tank 29. There has been a misunderstanding that the compound naphthalene had been spilled. Our written reports and numerous conversations with WDNR staff, including a letter to Randal Falstad as recent as August 28th, documented that the spill at Tank 29 was a mixture we commonly call naphtha.[1] As we use the name, naphtha is nothing more than a gasoline stream. Naphthalene is a specific compound which is natural to crude oil, just like, and in similar concentrations to benzene or cyclo-hexane.[2] Murphy Oil does not manufacture or store Naphthalene. We have just finished removing additional soil from the tank 29 area and have sent samples out for GRO/PVOCs and PAHs remaining in the clay. We will inform you of the results when we have received them.

All this said, our sampling plan has addressed your concerns. Naphthalene is one of the compounds picked up in a PAH scan. Our data, from Phase II of our investigation plan, includes

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[1]Naphtha is another name for a natural (or also call straight run) gasoline. Crude oil is fractionated into several streams, from lightest to heaviest; non-condenseable gas, LPG (propane and butane) light straight run gasoline (or light naphtha), heavy straight run gasoline (or naphtha), kerosene, diesel and reduced crude (or vacuum charge). The names in parentheses are not different streams, only different names for the same mixtures. In the old days naphtha was the only component that made up gasoline. The industry found that if they added lead (TEL) it would improve it's ability to burn in a combustion engine. As the industry added conversion technology (Fluid Catalytic Cracking Units etc.) other blend stocks were added. Although reforming had been around for many years, it became very important in the 1970's as the EPA began to phase out leaded gasoline. The Naphtha (or straight run gasoline) stream which was spilled from Tank 29 is feed to the reformer unit.

[2] Naphthalene has a boiling point of 218 °C or 424 °F. This compares to a maximum distillation endpoint on Naphtha (or straight run gasoline) of 395 °F. Although there could be some Naphthalene in gasoline (or Naphtha), it is more likely to be found in kerosene. Kerosene has a maximum specification for total Naphthalenes (ASTM - D1840) of 3 vol.%. Naphthalene is just one compound in the soup we call gasoline and kerosene.

a PAH scan at two depths in the soil. We will, in the next two weeks, issue a report for the first two phases of our investigations and recommendations for the next phase. Phase III includes recommendations on location and groundwater monitoring wells and analysis of the groundwater. It is out intent, as provided in WDNR guidance to submit the first water samples for a full VOC scan.

We also appreciate your responding to our questions about lead and cadmium. Having received you clarification, we have submitted retained samples for all locations with gasoline spills (leaded or not) for lead analysis. We are asking for a rush analysis so that data can be in our report in two weeks. As it is consistent with WDNR guidance, we will also have the first round of groundwater samples (in Phase III) analyzed for lead.

Your "spill list" includes a February 26, 1993 spill with the notation "Under Road see Chris". We believe that this case concerned some contamination found under the road during the closure of a UST. This spill was closed out on February 10, 1998 in a letter from Christopher Saari. This is the only spill that I am aware of listed as "unknown petroleum. Therefore, based on the WDNR guidance and your letter, I would assume that cadmium is not an issue. Let me know if you view anything differently than shown above so we can accommodate your expectations. If you have any further questions, don't hesitate to call (504-561-2281).

Sincerely,

R. Lee Vail, Coordinator of
Environmental Affairs

cc: Mark Stokstad - Rhinelander (WDNR)
Howard S. Druckenmiller (WDNR)
Linda Meyer (WDNR)
Mark Giesfeldt (WDNR)
Mick Michaelsen (WDNR)
Dennis Kugle (Eder)
Rick Lewandowski (DeWitt Ross & Stevens)
Jim Kowitz
Kevin Melnyk

eder associates
A division of Gannett Fleming
ENGINEERS AND PLANNERS

GANNETT FLEMING, INC.
8025 Excelsior Drive
Madison, WI 53717-1900
Fax: (608) 831-3337
Office: (608) 836-1500

September 17, 1998
File #34265.003/367-18.3

Mr. James Hosch
Wisconsin Department of Natural Resources
1705 Tower Avenue
Superior, WI 54880

Re: Tank 29 Soil Excavation Results and Request for Site Closure

Dear Mr. Hosch:

Enclosed is a September 1998 report, *Tank 29 Excavations #1 and #2 Sampling Report*, which was prepared for Murphy Oil USA, Inc. by Twin Ports Testing. This report documents the excavation of soils containing straight-run gasoline (naphtha) from the diked area of Tank 29 at Murphy's Superior refinery.

The naphtha release occurred in May 1998 and totaled about 175 gallons. Soil was excavated in two phases: the first in May and the second in August 1998. Approximately 1,150 cubic yards of soil were excavated and transported to Lakehead Blacktop and Materials in Superior for thermal treatment.

The lateral extent of affected soils was determined by field-screening and visual observation. Confirmation samples for laboratory analysis were collected at the base of the first phase of excavation in May. Based on these analytical results, additional soil was excavated in August 1998, and confirmation samples were again collected from the base of the excavation. Six confirmation samples were collected after the second phase of excavation, and the results for these samples are provided in Table 4 of the enclosed report.

Only one of the six samples contained gasoline range organics (GRO) above the NR 720 generic residual contaminant level (RCL) of 250 mg/kg. Ethyl benzene, toluene, and xylene concentrations were all below the NR 720 generic RCLs. Although the benzene concentrations were above the NR 720 generic RCL, the highest concentration was only 1.0 mg/kg, well below the site-specific RCL we arrived at through our initial modeling effort. It should also be noted that benzene concentrations in the soil removed during the second excavation in August were all below 1.0 mg/kg. These data suggest that further soil removal will not result in any significant environmental benefit.

Continued . . .

As the information in the report shows, soil has been excavated from the affected area to the extent practicable. The presence of Tank 29, the tank berms, and the interior access road makes further excavation impractical. The excavation extended to 7 feet below grade in some areas, and the entire final excavation extended to at least 4 feet below grade in all areas.

As you know, we are modeling conditions at the Murphy site in order to develop a site-specific RCL for benzene. We believe the modeling will show that a benzene RCL well above the NR 720 generic RCL is applicable at this site. This being the case, we are submitting this letter and the attached report as our formal request for closure of the Tank 29 site, understanding that the WDNR cannot issue a closure letter until a site-specific benzene RCL has been established.

If you have any questions about the report, please contact Lee Vail at Murphy Oil.

Sincerely,

GANNETT FLEMING, INC.

Dennis F. Kugle
Vice President

DFK/ckh
Enc.

cc w/o enc: L. Vail (Murphy/New Orleans)
L. Lundmark (Murphy/Superior)
K. Melnyk (Murphy/El Dorado)
J. Kowitz (Murphy/Superior)
R. Lewandowski (DeWitt, Ross & Stevens)
M. Stokstad (WDNR/Rhinelander)
H. S. Druckenmiller (WDNR/Madison)
M. Michaelsen (WDNR/Spooner)
S. Senger (COMM/Madison)

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

WISCONSIN
DEPT. OF NATURAL RESOURCES

Tommy G. Thompson, Governor
George E. Meyer, Secretary
William H. Smith, Regional Director

1705 Tower Avenue
Superior, Wisconsin 54880
Telephone 715-392-7988
FAX 715-392-7993

October 1, 1998

Mr. R. Lee Vail
Environmental Affairs Manufacturing Department
P.O. Box 61780
New Orleans, LA 70161-1780

Subject: Tank 29 Soil Excavation Results and Request for Site Closure
Murphy Oil USA, Inc., Superior, Wisconsin

Dear Lee:

This letter is in response to the Tank 29 Soil Excavation Results and Request for Site Closure dated September 17, 1998, submitted on your behalf by Dennis Kugle of Eder Associates. This letter is to provide comments regarding the submittal, and to inform you that the investigation report is not complete. Results of analysis of soil sample R-29 indicates residual contaminants above the 250 parts-per-million standard for GRO contamination for low conductivity soils at a depth of 7 feet. Furthermore, results from screening and analysis do not indicate that the horizontal extent of contamination has been defined. Screening should have been performed, and representative samples from the side walls of the excavation should have been collected.

Section NR 720.07, Wis. Adm. Code, requires responsible parties to determine the residual contaminant levels or a performance standard for each exposure or migration pathway of concern for each soil contaminant of concern at a site or facility in accordance with ss. NR 720.09 to NR720.19, Wis. Adm. Code. Because of the naphthalene concentrations reported in the results of samples R-25, R-28, and R-29 , a site specific residual contaminant level must be calculated for naphthalene, a performance standard must be proposed or further remediation must be conducted.

Sincerely,

NORTHERN REGION

James A. Hosch
Hydrogeologist/Spills Coordinator

cc: Mark Stokstad - Rhinelander
Howard S. Druckenmiller - AD/5
Linda Meyer - LS/5
Mark Giesfeldt - RR/3

TANK 29
EXCAVATIONS #1 AND #2
SAMPLING REPORT
MURPHY OIL U.S.A.
SUPERIOR, WISCONSIN
SEPTEMBER, 1998

MURPHY OIL USA, INC.
2407 STINSON AVENUE
SUPERIOR, WISCONSIN 54880

ATTN: MR. WILLIAM GUSTAFSON

INTRODUCTION

This report summarizes the results of soil sampling conducted by Twin Ports Testing, Inc. (TPT) during remedial excavation activities at Tank 29. The purpose of the sampling was to investigate the extent of soil contamination associated with a release of straight-run gasoline (naphtha) from Tank 29 in May of 1998.

TPT was authorized by Mr. William Gustafson of Murphy Oil USA, Inc. to investigate the extent of soil contamination associated with the above referenced release. TPT's scope of services for the project included:

- Directing the excavation of petroleum-impacted soil .
- Collecting soil samples from the excavation for field screening.
- Collecting soil samples from the excavation for laboratory analysis.
- Preparing and submitting an application to thermally treat the petroleum contaminated soil removed from the excavation.
- Preparing a report documenting the results of the excavation.

BACKGROUND INFORMATION

Site Information

Tank 29 is located at Murphy Oil USA Refinery, 2407 Stinson Avenue in Superior, Wisconsin (Figure 1). The release was caused by an overfill of the tank. The volume of the release was estimated to be approximately 175 gallons.

Regional Geology

The site lies in Quaternary age glaciolacustrine deposits consisting of primarily red clay commonly more than 250 feet thick that locally contains small amounts of silt and sand in thin discontinuous layers. Bedrock beneath the glacial deposits is Precambrian in age, and consists predominantly of sandstone, shales, and conglomerate (United States Geological Survey (USGS) Hydrologic Investigation Atlas HA-524).

EXCAVATION CHRONOLOGY AND SCOPE OF WORK

1ST Excavation

The first excavation took place on May 21 and 22, 1998. Excavation of petroleum impacted soil was performed by J&D Enterprises, Inc. of Duluth, Minnesota. Excavated soil was transported to Lakehead Blacktop and Materials in Superior, Wisconsin for thermal treatment. Laboratory analysis of soil samples was conducted by EnChem, Inc. of Superior, Wisconsin. A TPT

environmental scientist directed the excavation, including collection of soil samples for field-screening and laboratory analysis.

Soil samples were visually examined for apparent signs of petroleum impact and classified according to ASTM D2488 (Standard Practice for Description and Identification of Soils, Visual Manual Procedure). The samples were logged in a field notebook and a field map showing site structures and sample locations was developed. Refinery north was used as project north. Soil samples were field-screened for volatile organic compounds (VOCs) using a Thermo Environmental Instruments Model 580B portable photoionization detector (PID) equipped with a 10.6eV lamp.

Soils samples were collected in accordance with *Soil Sampling Requirements for LUST Site Investigations and Excavations,* WDNR Publ-SW-127-91. Soil samples for laboratory analysis were analyzed for gasoline range organics (GRO), benzene, toluene, ethylbenzene, xylenes (o,m,p), 1,2,4 trimethylbenzene and 1,3,5 trimethylbenzene (PVOCs) and naphthalene. In addition to the laboratory analysis samples, three soil samples were collected from the excavation using Shelby Tubes and analyzed for porosity, permeability and bulk density.

On June 10, 1998, three soil samples were collected from the excavation for laboratory analysis of total organic carbon (TOC). One sample was collected from each of the Shelby Tube locations.

On July 20, 1998, one soil sample was collected from the excavation for analysis of RCRA metals.

2nd Excavation

The second excavation took place on August 20 to 27, 1998. Excavation of petroleum impacted soil was performed by J&D Enterprises, Inc. of Duluth, Minnesota. Excavated soil was transported to Lakehead Blacktop and Materials in Superior, Wisconsin for thermal treatment. Laboratory analysis of soil samples was conducted by Commonweath Technologies, Inc. of Baraboo, Wisconsin. A TPT environmental scientist directed the excavation, including collection of soil samples for field-screening and laboratory analysis.

Soil samples were visually examined for apparent signs of petroleum impact and classified according to ASTM D2488 (Standard Practice for Description and Identification of Soils, Visual Manual Procedure). The samples were logged in a field notebook and a field map showing site structures and sample locations was developed. Refinery north was used as project north. Soil samples were field-screened for volatile organic compounds (VOCs) using a Thermo Environmental Instruments Model 580B portable PID equipped with a 10.6eV lamp.

Soils samples were collected in accordance with *Soil Sampling Requirements for LUST Site Investigations and Excavations,* WDNR Publ-SW-127-91. Soil samples were selectively analyzed for GRO, PVOCs, and polynuclear aromatic hydrocarbons (PAHs).

RESULTS

1st Excavation

The dimensions of the excavation were approximately 150 feet in length by 80 feet in width at the north end of the excavation tapering to 20 feet in width at the southern end. The depth of the excavation was approximately 3 feet. Approximately 440 cubic yards (yd^3) of petroleum impacted soil were removed from the site.

A total of eighteen (18) soil samples (S-1 through S-17, and B-12) throughout the excavation were field screened to investigate the extent of petroleum impact. See Figure 2 and Table 1 for locations and results of field screening.

A total of fifteen (15) soil samples (B-1 through B-12, Shelby #1, Shelby #2 and Shelby #3) were collected from the excavation for selected laboratory analysis. See Figure 3, Table 2, and Appendix A for locations and results of chemical analysis of soil samples.

The results of the 1st excavation are not indicative of remaining soil because the 2nd excavation encompassed the same area, but at a greater depth.

Form 4400-120 was submitted to WDNR on June 26, 1998 for thermal treatment approval (Appendix B). Soil samples B-3 and B-11 were used for the emissions calculations.

2nd Excavation

The dimensions of the second excavation were approximately 150 feet in length by 45 feet in width at the north end of the excavation tapering to 20 feet in width at the southern end (Figure 4). The depth of the excavation was approximately 4 feet in the north end grading down to 7 feet in the south end. Approximately 710 yd^3 of petroleum impacted soil were removed from the site.

A total of twenty-seven (27) soil samples (R-1 through R-31, not including R-11, R-12, R-27, and R-30) throughout the excavation were field screened to investigate the extent of petroleum impact. Additional material was removed from the excavation before soil samples for laboratory analysis were collected. See Figure 4 and Table 3 for locations and results of field screening.

A total of six (6) soil samples (R-24 through R-31 not including R-27 and R-30) were collected from the final extent of the excavation for laboratory analysis. See Figure 5, Table 4, and Appendix C, for locations and results of field screening.

The depth of a soil sample in a given area does not necessarily reflect the total depth of the excavation at that point. For the total depth of the excavation, please see the description above.

Form 4400-120 was not submitted to WDNR for the second excavation at the time this report was prepared.

LIMITATIONS OF INVESTIGATION AND REPORT

We have based the results of this report in part on the data obtained from the excavation field activities and chemical analysis of the collected soil samples. The exact nature and extent of geologic variations and levels of contamination at the site may not be evident.

Conclusions and/or recommendations contained herein are based on the applicable standards of our profession at the time this report was prepared. This warranty is in lieu of all other warranties either expressed or implied.

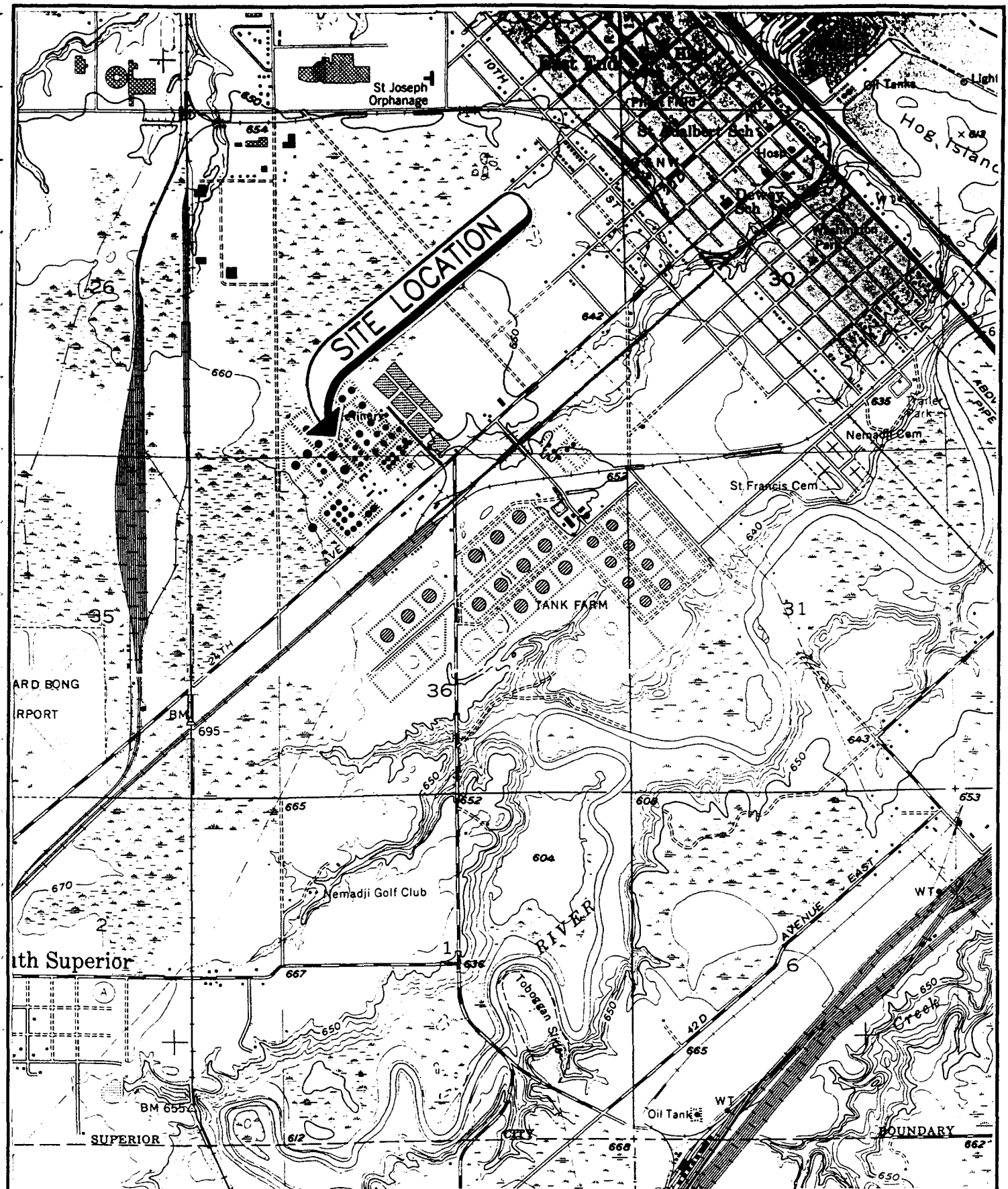
If you have any questions or need any additional information, please feel free to contact me at (715) 392-7114.

Sincerely,

TWIN PORTS TESTING, INC.

Irvin Mossberger, Hydrogeologist

Brian E. McVean, P.E.
Environmental Department Manager

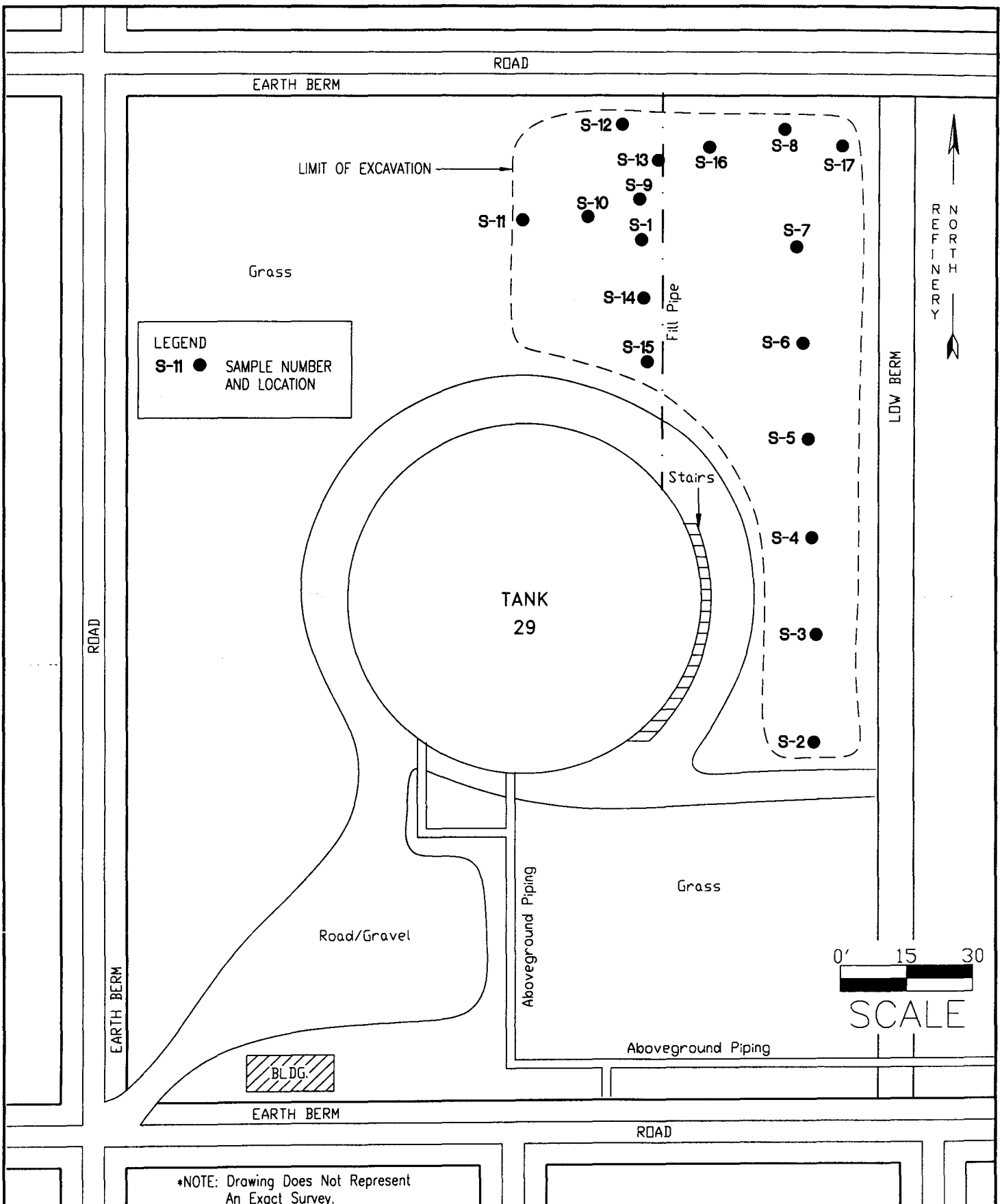


Twin Ports Testing

SITE LOCATION MAP

MURPHY OIL USA, INC.
SUPERIOR, WISCONSIN

DRAWN BY	MMR
CHECKED BY	IGM
APPR BY	BEM
DATE	12/97
TPT NO.	786-97E
FIGURE	1



Twin Ports Testing

SOILVAPR.DWG

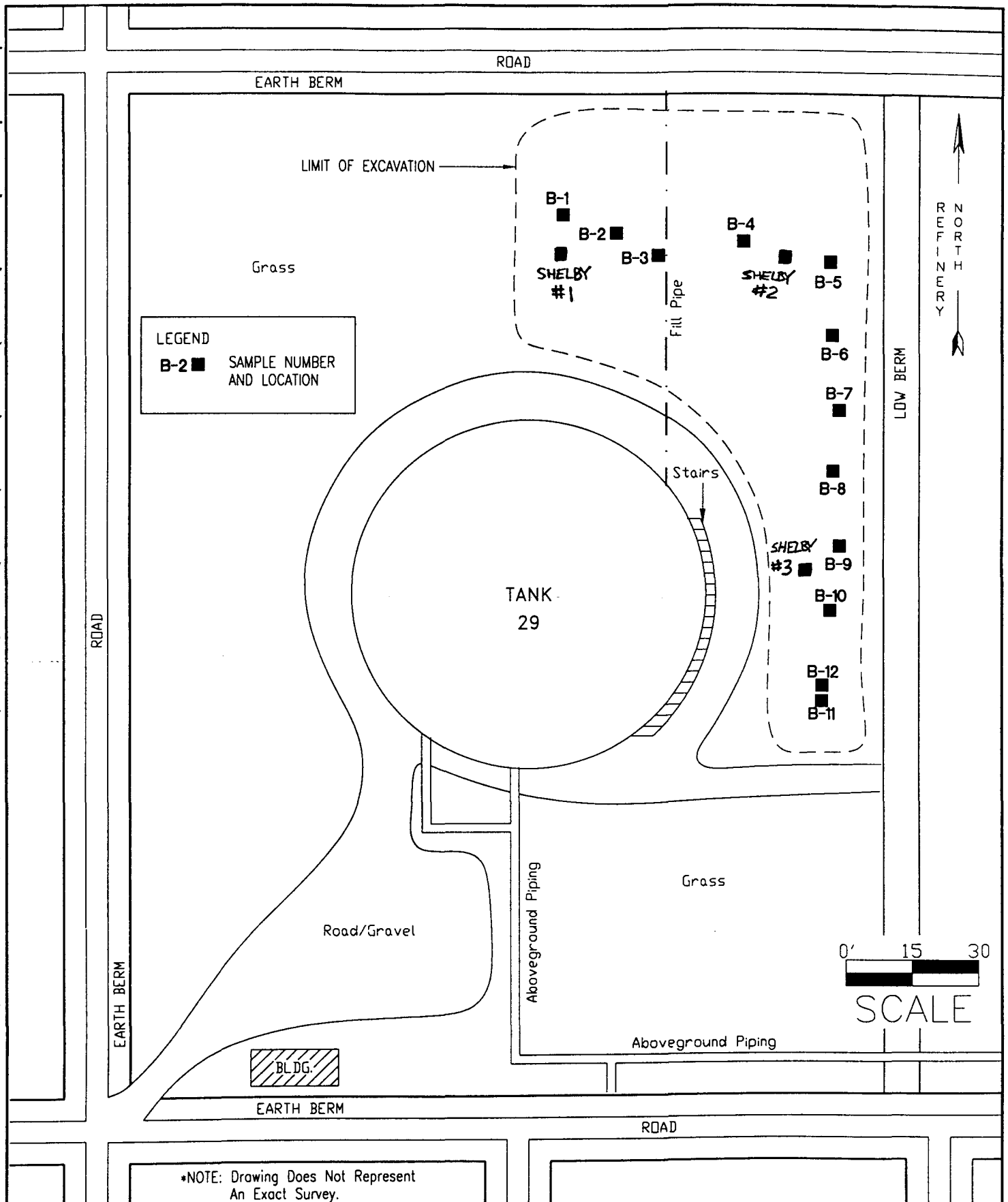
SITE MAP – MURPHY OIL TANK #29

EXCAVATION #1 (5/21-22/98) – SOIL VAPOR SAMPLE LOCATIONS

MURPHY OIL USA, INC.

SUPERIOR, WISCONSIN

DRAWN BY	PJB
CHECKED BY	IGM
APPR BY	BEM
DATE	09/03/98
TPT NO.	828-98E
FIGURE	2

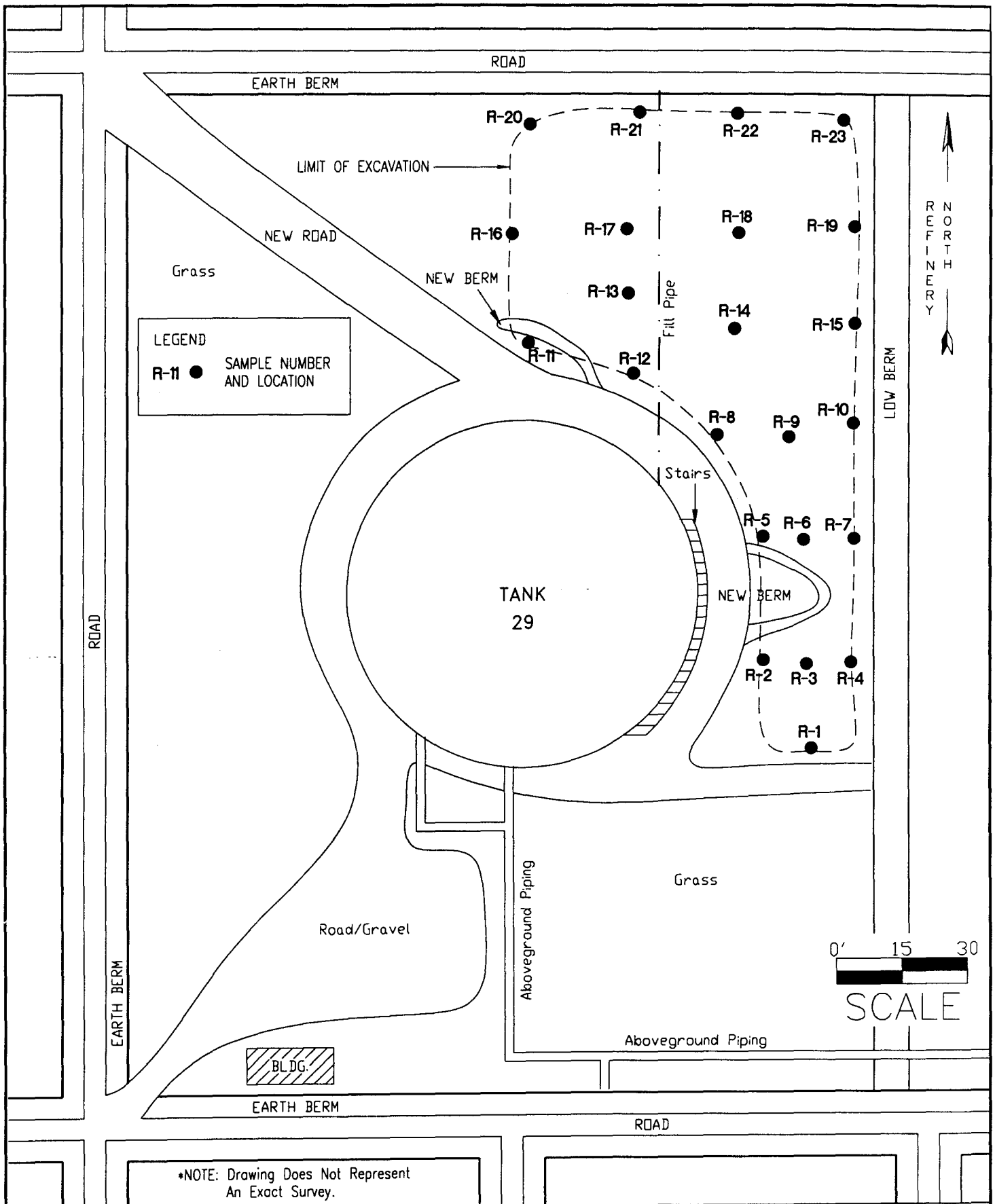


Twin Ports Testing

CHEMANAL.DWG

SITE MAP – MURPHY OIL TANK #29
EXCAVATION #1 (5/21-22/98) – CHEMICAL ANALYSIS SAMPLE LOCATION
MURPHY OIL USA, INC.
SUPERIOR, WISCONSIN

DRAWN BY	PJB
CHECKED BY	IGM
APPR BY	BEM
DATE	09/03/98
TPT NO.	828-98E
FIGURE	3

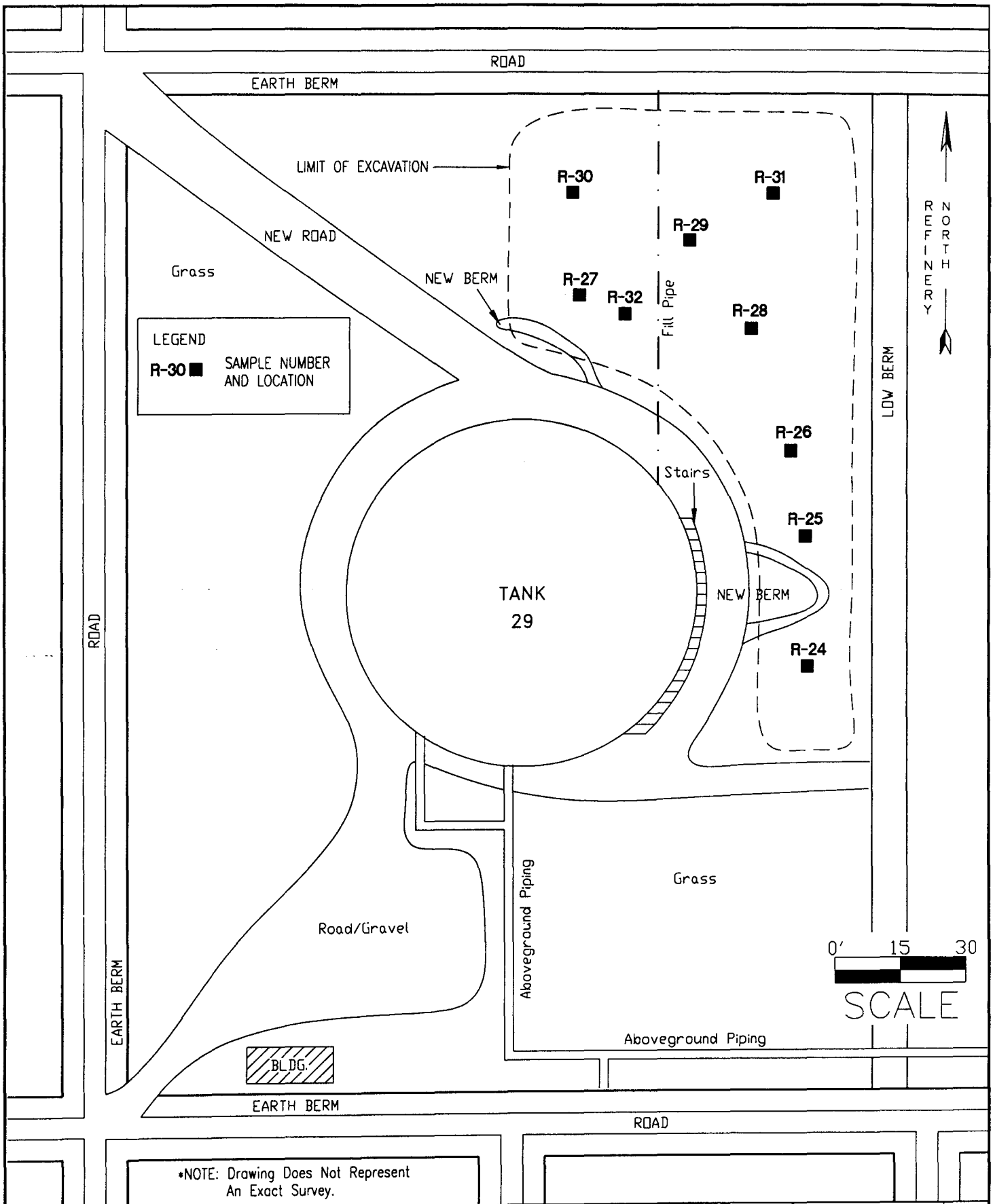


Twin Ports Testing

SOILVAP2.DWG

SITE MAP – MURPHY OIL TANK #29
EXCAVATION #2 (8/20-27/98) – SOIL VAPOR SAMPLE LOCATIONS
MURPHY OIL USA, INC.
SUPERIOR, WISCONSIN

DRAWN BY	PJB
CHECKED BY	IGM
APPR BY	BEM
DATE	09/03/98
TPT NO.	828-98E
FIGURE	4



Twin Ports Testing

CHEMANA2.DWG

SITE MAP – MURPHY OIL TANK #29
EXCAVATION #2 (8/20-27/98) – CHEMICAL ANALYSIS SAMPLE LOCATIONS
MURPHY OIL USA, INC.
SUPERIOR, WISCONSIN

DRAWN BY	PJB
CHECKED BY	IGM
APPR BY	BEM
DATE	09/03/98
TPT NO.	828-98E
FIGURE	5

TABLE 1
SOIL VAPOR SCREENING RESULTS
MURPHY OIL U.S.A.
1ST EXCAVATION
TANK 29

Sample ID	Depth (feet)	Soil Type	Soil Moisture	PID Reading (ppm)
S-1	0.0	topsoil	M	>2,000
S-2	1.5	clay, brown	M	424
S-3	1.5	clay, brown	M	485
S-4	1.5	clay, brown	M	220
S-5	1.5	clay, brown	M	194
S-6	1.5	clay, brown	M	155
S-7	1.5	clay, brown	M	207
S-8	1.5	clay, brown	M	185
S-9	0.5	clay, brown-black	M	7
S-10	0.5	clay, brown-black	M/W	33
S-11	0.5	clay, brown-black	M/W	834
S-12	0.5	clay, brown-black	M/W	0
S-13	2.0	clay, brown	M	194
S-14	2.0	clay, brown	M	238
S-15	2.0	clay, brown	M	181
S-16	2.0	clay, brown	M	268
S-17	2.0	clay, brown	M	216
B-12 (L)	2.0	clay, brown	M/W	53

PID = photoionization detector
ppm = parts per million
L = chemical analysis sample
D = dry
M = moist
W = wet

TABLE 2
LABORATORY ANALYTICAL RESULTS
MURPHY OIL U.S.A.
1ST EXCAVATION
TANK 29

Parameter	B-1	B-2	B-3	B-4	B-5	B-6	B-7	B-8	B-9	B-10	B-11	B-12	Shelby #1	Shelby #2	Shelby #3
Date Sampled	5/22/98	5/22/98	5/22/98	5/22/98	5/22/98	5/22/98	5/22/98	5/22/98	5/22/98	5/22/98	5/22/98	7/20/98	5/22/98	5/22/98	5/22/98
GRO (mg/kg)	8.1	32	160	210	250	43	230	140	390	550	900	n/a	n/a	n/a	n/a
Benzene (ug/kg)	<	<	200	190	110	87	100	87	150	<130	600	n/a	n/a	n/a	n/a
Toluene (ug/kg)	<	<	<	<	<	<	<	<	<25	<130	<250	n/a	n/a	n/a	n/a
Ethylbenzene (ug/kg)	<25	<25	310	990	790	230	720	470	1100	1900	5100	n/a	n/a	n/a	n/a
Xylenes o,m,p (ug/kg)	<25	157	1981	1525	2210	290	1976	1468	4580	7900	18000	n/a	n/a	n/a	n/a
1,2,4 Trimethylbenzene (ug/kg)	54	540	6500	9100	7700	1800	6200	5200	11000	18000	34000	n/a	n/a	n/a	n/a
1,3,5 Trimethylbenzene (ug/kg)	<25	270	1600	2400	2300	470	1900	1600	3600	6200	12000	n/a	n/a	n/a	n/a
MTBE (ug/kg)	<25	<25	<25	<25	<25	<25	<25	<25	<25	<130	<250	n/a	n/a	n/a	n/a
Naphthalene (ug/kg)	990	2700	8600	9800	10000	3000	7700	6800	15000	22000	36000	n/a	n/a	n/a	n/a
RCRA Metals															
Arsenic (mg/kg)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<6.49	n/a	n/a	n/a
Barium (mg/kg)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	227	n/a	n/a	n/a
Cadmium (mg/kg)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.721	n/a	n/a	n/a
Chromium (mg/kg)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	56.4	n/a	n/a	n/a
Lead (mg/kg)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	16.9	n/a	n/a	n/a
Mercury (mg/kg)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0289*	n/a	n/a	n/a
Selenium (mg/kg)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	42.8	n/a	n/a	n/a
Silver (mg/kg)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.361	n/a	n/a	n/a
Physical Characteristics															
TOC (mg/kg)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	7800	1400	2600
Porosity	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.452	0.486	0.466
Permeability (cm/sec)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1.8×10^{-8}	2.5×10^{-6}	2.4×10^{-8}
Bulk Density (wet) (lbs/ft^3)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	120.6	116.3	117.2

n/a = not analyzed
ug/kg = micrograms per kilogram or parts per billion
mg/kg = milligrams per kilogram or parts per million
cm/sec = centimeters per second
lbs/ft^3 = pounds per cubic foot

< = below laboratory detection limits
* = see individual laboratory for notes concerning results

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TABLE 3
SOIL VAPOR SCREENING RESULTS
MURPHY OIL U.S.A.
2ND EXCAVATION
TANK 29

Sample ID	Depth (feet)	Soil Type	Soil Moisture	PID Reading (ppm)
R-1	2.0	clay, red-brown	M	184
R-2	2.0	clay, red-brown	M	240
R-3	4.0	clay, red-brown	M	53
R-4	2.0	clay, red-brown	M	116
R-5	2.0	clay, red-brown, some gravel	M/W	29
R-6	4.0	clay, red-brown	M	84
R-7	2.0	clay, red-brown	M	62
R-8	2.0	clay, red-brown, some gravel	M/W	189
R-9	4.0	clay, red-brown	M	37
R-10	2.0	clay, red-brown	M	75
R-11	--	uncollectable due to water	--	--
R-12	--	uncollectable due to water	--	--
R-13	3.5	clay, red-brown	M	0
R-14	4.0	clay, red-brown	M	79
R-15	2.0	clay, red-brown	M	98
R-16	2.5	clay, red-brown	M	8.4
R-17	3.5	clay, red-brown	M	25
R-18	3.5	clay, red-brown	M	42
R-19	2.0	clay, red-brown	M	105
R-20	2.5	clay, red-brown, trace gravel	M	16
R-21	2.5	clay, red-brown, trace gravel	M	67
R-22	2.0	clay, red-brown	M	34
R-23	2.0	clay, red-brown	M	101
R-24 (L)	7.0	clay, red-brown	M	16.8
R-25 (L)	6.0	clay, red-brown	M	33.6
R-26 (L)	5.0	clay, red-brown	M	8.4
R-27	--	uncollectable due to water	--	--
R-28 (L)	5.0	clay, red-brown	M	0
R-29 (L)	4.0	clay, red-brown	M	12.6
R-30	--	uncollectable due to water	--	--
R-31 (L)	6.0	clay, red-brown	M	21
R-32	--	uncollectable due to water	--	--
SP-1 (L)	--	clay, red-brown	M	183
SP-2 (L)	--	clay, red-brown	M	115
SP-3 (L)	--	clay, red-brown	M	188
SP-4 (L)	--	clay, red-brown	M	104

PID = photoionization detector
ppm = parts per million
L = laboratory analysis sample
D = dry
M = moist
W = wet

TABLE 4
LABORATORY ANALYTICAL RESULTS
MURPHY OIL U.S.A.
2ND EXCAVATION
TANK 29

Parameter	R-24	R-25	R-26	R-28	R-29	R-31	SP-1	SP-2	SP-3	SP-4	
	7'	6'	5'	5'	4'	6'					
Date Sampled	5/22/98	5/22/98	5/22/98	5/22/98	5/22/98	5/22/98	5/22/98	5/22/98	5/22/98	5/22/98	
GRO (mg/kg)	20*	37*	42*	65*	350*	36*	450*	300*	1100*	380*	250
Benzene (ug/kg)	1000	100	<120*	76	<500*	36*	<250*	<25	<1000*	<250*	5.5
Toluene (ug/kg)	110	59	<120	67	<500	<25	610	230	<1000	<250	1500
Ethylbenzene (ug/kg)	1200*	290*	500*	280*	2200*	110*	1000*	270	<1000	<250	2900
Xylenes o,m,p (ug/kg)	2080	1000	840	545	2900	224	3500	1520	5400	1740	4100
1,2,4 Trimethylbenzene (ug/kg)	1200	1700	1600	1700	9600	260	7100	4200*	18000	4500	
1,3,5 Trimethylbenzene (ug/kg)	440	590	660	840	2300	150	4000	2900	11000	3800	
MTBE (ug/kg)	<25	<25	<120	<25	<500	<25	<250	<25	<1000	<25	
PAH Compounds											
1-Methyl Naphthalene (mg/kg)	n/a	2.6	n/a	0.96	1.3	n/a	n/a	n/a	n/a	n/a	
2-Methyl Naphthalene (mg/kg)	n/a	4	n/a	1.6	2.1	n/a	n/a	n/a	n/a	n/a	
Acenaphthene (mg/kg)	n/a	<0.048	n/a	<0.048	<0.048	n/a	n/a	n/a	n/a	n/a	
Acenaphthylene (mg/kg)	n/a	<0.051	n/a	<0.051	<0.051	n/a	n/a	n/a	n/a	n/a	
Anthracene (mg/kg)	n/a	<0.023	n/a	<0.023	<0.023	n/a	n/a	n/a	n/a	n/a	
Benzo(a)anthracene (mg/kg)	n/a	<0.002	n/a	<0.002	<0.002	n/a	n/a	n/a	n/a	n/a	
Benzo(a)pyrene (mg/kg)	n/a	<0.0015	n/a	<0.0015	<0.0015	n/a	n/a	n/a	n/a	n/a	
Benzo(b)flouranthene (mg/kg)	n/a	0.0024*	n/a	0.0058	0.0061	n/a	n/a	n/a	n/a	n/a	
Benzo(g,h,i)perylene (mg/kg)	n/a	<0.0041	n/a	<0.0041	<0.0041	n/a	n/a	n/a	n/a	n/a	
Benzo(k)fluoranthene (mg/kg)	n/a	<0.0015	n/a	<0.0015	<0.0015	n/a	n/a	n/a	n/a	n/a	
Chrysene (mg/kg)	n/a	<0.092	n/a	<0.092	<0.092	n/a	n/a	n/a	n/a	n/a	
Dibenzo(a,h)anthracene (mg/kg)	n/a	<0.23	n/a	<0.23	<0.23	n/a	n/a	n/a	n/a	n/a	
Fluoranthene (mg/kg)	n/a	<0.0049	n/a	<0.0049	<0.0049	n/a	n/a	n/a	n/a	n/a	
Fluorene (mg/kg)	n/a	<0.0086	n/a	<0.0086	<0.0086	n/a	n/a	n/a	n/a	n/a	
Indeno(1,2,3-cd)pyrene (mg/kg)	n/a	<0.0094	n/a	<0.0094	<0.0094	n/a	n/a	n/a	n/a	n/a	
Naphthalene (mg/kg)	n/a	0.97	n/a	0.44	0.66	n/a	n/a	n/a	n/a	n/a	
Phenanthrene (mg/kg)	n/a	0.22	n/a	0.08	0.11	n/a	n/a	n/a	n/a	n/a	
Pyrene (mg/kg)	n/a	<0.0062	n/a	<0.0062	<0.0062	n/a	n/a	n/a	n/a	n/a	

n/a = not analyzed
ug/kg = micrograms per kilogram or parts per billion
mg/kg = milligrams per kilogram or parts per million

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* = see individual laboratory report for notes concerning results

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Green Bay, WI 54302
920-469-2436 • Fax: 920-469-8827
1-800-7-ENCHEM

- Analytical Report -

Project Name : TANK 29, #2

Project Number : 828-98E

WI DNR LAB ID : 816079330

Client: TWIN PORTS TESTING

Report Date : 6/1/98

Sample No.	Field ID	Collection Date	Sample No.	Field ID	Collection Date
780170-001	B-1	5/22/98			
780170-002	B-2	5/22/98			
780170-003	B-3	5/22/98			
780170-004	B-4	5/22/98			
780170-005	B-5	5/22/98			
780170-006	B-6	5/22/98			
780170-007	B-7	5/22/98			
780170-008	B-8	5/22/98			
780170-009	B-9	5/22/98			
780170-010	B-10	5/22/98			
780170-011	B-11	5/22/98			

The "Q" flag is present when a parameter has been detected below the LOQ. This indicates the results are qualified due to the uncertainty of the parameter concentration between the LOD and the LOQ.

Soil VOC detects are corrected for the total solids, unless otherwise noted.

I certify that the data contained in this Final Report has been generated and reviewed in accordance with approved methods and Laboratory Standard Operating Procedure. Exceptions, if any, are discussed in the accompanying sample narrative. Release of this final report is authorized by Laboratory management, as is verified by the following signature.

Thomas P. Hartke — 6-1-98

Approval Signature — Date

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Lab#:	TestGroupID:	Comment:
780170-001	GRO-S-ME	Sample exhibits hydrocarbon pattern resembling diesel fuel or extremely weathered gasoline.
780170-002	GRO-S-ME	Sample exhibits hydrocarbon pattern resembling diesel fuel or extremely weathered gasoline.
780170-003	GRO-S-ME	Sample exhibits hydrocarbon pattern resembling diesel fuel or extremely weathered gasoline.
780170-004	GRO-S-ME	Sample exhibits hydrocarbon pattern resembling diesel fuel or extremely weathered gasoline.
780170-005	GRO-S-ME	Sample exhibits hydrocarbon pattern resembling diesel fuel or extremely weathered gasoline.
780170-006	GRO-S-ME	Sample exhibits hydrocarbon pattern resembling diesel fuel or extremely weathered gasoline.
780170-007	GRO-S-ME	Sample exhibits hydrocarbon pattern resembling diesel fuel or extremely weathered gasoline.
780170-008	GRO-S-ME	Sample exhibits hydrocarbon pattern resembling diesel fuel or extremely weathered gasoline.
780170-009	GRO-S-ME	Sample exhibits hydrocarbon pattern resembling diesel fuel or extremely weathered gasoline.
780170-010	GRO-S-ME	Sample exhibits hydrocarbon pattern resembling diesel fuel or extremely weathered gasoline.
780170-011	GRO-S-ME	Sample exhibits hydrocarbon pattern resembling diesel fuel or extremely weathered gasoline.

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- Analytical Report -

Project Name : TANK 29, #2
Project Number : 828-98E
Field ID : B-1
Lab Sample Number : 780170-001
WI DNR LAB ID : 816079330

Client : TWIN PORTS TESTING
Report Date : 5/29/98
Collection Date : 5/22/98
Matrix Type : SOIL

Inorganic Results

Test	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method	Analyst
Solids, percent	70.1				%		5/27/98	SM2540G	SM2540G	DJB

Organic Results

GASOLINE RANGE ORGANICS - SOIL/METHANOL Prep Method: Wi Mod GRO Prep Date: 5/28/98 Analyst: KIG

Analyte	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Analysis Method
Gasoline Range Organics	8.1			3.6	mg/kg		5/29/98	WI Mod GRO
Blank Spike	109				%Recov		5/29/98	WI Mod GRO
Blank Spike Duplicate	111				%Recov		5/29/98	WI Mod GRO
GRO blank	< 2.5			2.5	mg/kg		5/29/98	WI Mod GRO

Organic Results

PVOC + NAPHT - METHANOL PRESERVED SOIL Prep Method: SW846 5030 Prep Date: 5/28/98 Analyst: KIG

Analyte	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Analysis Method
a,a,a-Trifluorotoluene	107				%Recov		5/29/98	SW846 8020
Benzene	< 25	25	60		ug/kg		5/29/98	SW846 8020
Ethylbenzene	< 25	25	60		ug/kg		5/29/98	SW846 8020
Methyl-tert-butyl-ether	< 25	25	60		ug/kg		5/29/98	SW846 8020
Naphthalene	990	36	86		ug/kg		5/29/98	SW846 8020
Toluene	< 25	25	60		ug/kg		5/29/98	SW846 8020
1,3,5-Trimethylbenzene	< 25	25	60		ug/kg		5/29/98	SW846 8020
1,2,4-Trimethylbenzene	54	36	86		ug/kg	Q	5/29/98	SW846 8020
Xylenes, -m, -p	< 25	25	60		ug/kg		5/29/98	SW846 8020
Xylene, -o	< 25	25	60		ug/kg		5/29/98	SW846 8020

All soil results are reported on a dry weight basis unless otherwise noted.

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- Analytical Report -

Project Name : TANK 29, #2
Project Number : 828-98E
Field ID : B-2
Lab Sample Number : 780170-002
WI DNR LAB ID : 816079330

Client : TWIN PORTS TESTING
Report Date : 5/29/98
Collection Date : 5/22/98
Matrix Type : SOIL

Inorganic Results

Test	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method	Analyst
Solids, percent	71.2				%		5/27/98	SM2540G	SM2540G	DJB

Organic Results

GASOLINE RANGE ORGANICS - SOIL/METHANOL Prep Method: Wi Mod GRO Prep Date: 5/28/98 Analyst: KIG

Analyte	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Analysis Method
Gasoline Range Organics	32			3.5	mg/kg		5/29/98	WI Mod GRO
Blank Spike	109				%Recov		5/29/98	WI Mod GRO
Blank Spike Duplicate	111				%Recov		5/29/98	WI Mod GRO
GRO blank	< 2.5			2.5	mg/kg		5/29/98	WI Mod GRO

Organic Results

PVOC + NAPHT - METHANOL PRESERVED SOIL Prep Method: SW846 5030 Prep Date: 5/28/98 Analyst: KIG

Analyte	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Analysis Method
a,a,a-Trifluorotoluene	108				%Recov		5/29/98	SW846 8020
Benzene	< 25	25	60		ug/kg		5/29/98	SW846 8020
Ethylbenzene	< 25	25	60		ug/kg		5/29/98	SW846 8020
Methyl-tert-butyl-ether	< 25	25	60		ug/kg		5/29/98	SW846 8020
Naphthalene	2700	35	84		ug/kg		5/29/98	SW846 8020
Toluene	< 25	25	60		ug/kg		5/29/98	SW846 8020
1,3,5-Trimethylbenzene	270	35	84		ug/kg		5/29/98	SW846 8020
1,2,4-Trimethylbenzene	540	35	84		ug/kg		5/29/98	SW846 8020
Xylenes, -m, -p	120	35	84		ug/kg		5/29/98	SW846 8020
Xylene, -o	37	35	84		ug/kg	Q	5/29/98	SW846 8020

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- Analytical Report -

Project Name : TANK 29, #2
Project Number : 828-98E
Field ID : B-3
Lab Sample Number : 780170-003
WI DNR LAB ID : 816079330

Client : TWIN PORTS TESTING
Report Date : 5/29/98
Collection Date : 5/22/98
Matrix Type : SOIL

Inorganic Results

Test	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method	Analyst
Solids, percent	57.2				%		5/27/98	SM2540G	SM2540G	DJB

Organic Results

GASOLINE RANGE ORGANICS - SOIL/METHANOL Prep Method: Wi Mod GRO Prep Date: 5/28/98 Analyst: KIG

Analyte	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Analysis Method
Gasoline Range Organics	160			4.4	mg/kg		5/29/98	WI Mod GRO
Blank Spike	109				%Recov		5/29/98	WI Mod GRO
Blank Spike Duplicate	111				%Recov		5/29/98	WI Mod GRO
GRO blank	< 2.5			2.5	mg/kg		5/29/98	WI Mod GRO

Organic Results

PVOC + NAPHT - METHANOL PRESERVED SOIL Prep Method: SW846 5030 Prep Date: 5/28/98 Analyst: KIG

Analyte	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Analysis Method
a,a,a-Trifluorotoluene	106				%Recov		5/29/98	SW846 8020
Benzene	200	44	110		ug/kg		5/29/98	SW846 8020
Ethylbenzene	310	44	110		ug/kg		5/29/98	SW846 8020
Methyl-tert-butyl-ether	< 25	25	60		ug/kg		5/29/98	SW846 8020
Naphthalene	8600	44	110		ug/kg		5/29/98	SW846 8020
Toluene	< 25	25	60		ug/kg		5/29/98	SW846 8020
1,3,5-Trimethylbenzene	1600	44	110		ug/kg		5/29/98	SW846 8020
1,2,4-Trimethylbenzene	6500	44	110		ug/kg		5/29/98	SW846 8020
Xylenes, -m, -p	1900	44	110		ug/kg		5/29/98	SW846 8020
Xylene, -o	81	44	110		ug/kg	Q	5/29/98	SW846 8020

All soil results are reported on a dry weight basis unless otherwise noted.

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- Analytical Report -

Project Name : TANK 29, #2
Project Number : 828-98E
Field ID : B-4
Lab Sample Number : 780170-004
WI DNR LAB ID : 816079330

Client : TWIN PORTS TESTING
Report Date : 6/1/98
Collection Date : 5/22/98
Matrix Type : SOIL

Inorganic Results

Test	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method	Analyst
Solids, percent	69.0				%		5/27/98	SM2540G	SM2540G	DJB

Organic Results

GASOLINE RANGE ORGANICS - SOIL/METHANOL Prep Method: Wi Mod GRO Prep Date: 5/28/98 Analyst: KIG

Analyte	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Analysis Method
Gasoline Range Organics	210			9.1	mg/kg		5/29/98	WI Mod GRO
Blank Spike	109				%Recov		5/29/98	WI Mod GRO
Blank Spike Duplicate	111				%Recov		5/29/98	WI Mod GRO
GRO blank	< 2.5			2.5	mg/kg		5/29/98	WI Mod GRO

Organic Results

PVOC + NAPHT - METHANOL PRESERVED SOIL Prep Method: SW846 5030 Prep Date: 5/28/98 Analyst: KIG

Analyte	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Analysis Method
a,a,a-Trifluorotoluene	105				%Recov		5/29/98	SW846 8020
Benzene	190	36	86		ug/kg		5/29/98	SW846 8020
Ethylbenzene	990	36	86		ug/kg		5/29/98	SW846 8020
Methyl-tert-butyl-ether	< 25	25	60		ug/kg		5/29/98	SW846 8020
Naphthalene	9800	36	86		ug/kg		5/29/98	SW846 8020
Toluene	< 25	25	60		ug/kg		5/29/98	SW846 8020
1,3,5-Trimethylbenzene	2400	36	86		ug/kg		5/29/98	SW846 8020
1,2,4-Trimethylbenzene	9100	36	86		ug/kg		5/29/98	SW846 8020
Xylenes, -m, -p	1500	36	86		ug/kg		5/29/98	SW846 8020
Xylene, -o	< 25	25	60		ug/kg		5/29/98	SW846 8020

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- Analytical Report -

Project Name : TANK 29, #2
Project Number : 828-98E
Field ID : B-5
Lab Sample Number : 780170-005
WI DNR LAB ID : 816079330

Client : TWIN PORTS TESTING
Report Date : 6/1/98
Collection Date : 5/22/98
Matrix Type : SOIL

Inorganic Results

Test	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method	Analyst
Solids, percent	71.8				%		5/27/98	SM2540G	SM2540G	DJB

Organic Results

GASOLINE RANGE ORGANICS - SOIL/METHANOL Prep Method: Wi Mod GRO Prep Date: 5/28/98 Analyst: KIG

Analyte	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Analysis Method
Gasoline Range Organics	250			8.7	mg/kg		5/29/98	WI Mod GRO
Blank Spike	109				%Recov		5/29/98	WI Mod GRO
Blank Spike Duplicate	111				%Recov		5/29/98	WI Mod GRO
GRO blank	< 2.5			2.5	mg/kg		5/29/98	WI Mod GRO

Organic Results

PVOC + NAPHT - METHANOL PRESERVED SOIL Prep Method: SW846 5030 Prep Date: 5/28/98 Analyst: KIG

Analyte	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Analysis Method
a,a,a-Trifluorotoluene	106				%Recov		5/29/98	SW846 8020
Benzene	110	35	84		ug/kg		5/29/98	SW846 8020
Ethylbenzene	790	35	84		ug/kg		5/29/98	SW846 8020
Methyl-tert-butyl-ether	< 25	25	60		ug/kg		5/29/98	SW846 8020
Naphthalene	10000	35	84		ug/kg		5/29/98	SW846 8020
Toluene	< 25	25	60		ug/kg		5/29/98	SW846 8020
1,3,5-Trimethylbenzene	2300	35	84		ug/kg		5/29/98	SW846 8020
1,2,4-Trimethylbenzene	7700	35	84		ug/kg		5/29/98	SW846 8020
Xylenes, -m, -p	2100	35	84		ug/kg		5/29/98	SW846 8020
Xylene, -o	110	35	84		ug/kg		5/29/98	SW846 8020

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- Analytical Report -

Project Name : TANK 29, #2
Project Number : 828-98E
Field ID : B-6
Lab Sample Number : 780170-006
WI DNR LAB ID : 816079330

Client : TWIN PORTS TESTING
Report Date : 5/29/98
Collection Date : 5/22/98
Matrix Type : SOIL

Inorganic Results

Test	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method	Analyst
Solids, percent	62.3				%		5/27/98	SM2540G	SM2540G	DJB

Organic Results

GASOLINE RANGE ORGANICS - SOIL/METHANOL Prep Method: Wi Mod GRO Prep Date: 5/28/98 Analyst: KIG

Analyte	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Analysis Method
Gasoline Range Organics	43			4.0	mg/kg		5/29/98	WI Mod GRO
Blank Spike	109				%Recov		5/29/98	WI Mod GRO
Blank Spike Duplicate	111				%Recov		5/29/98	WI Mod GRO
GRO blank	< 2.5			2.5	mg/kg		5/29/98	WI Mod GRO

Organic Results

PVOC + NAPHT - METHANOL PRESERVED SOIL Prep Method: SW846 5030 Prep Date: 5/28/98 Analyst: KIG

Analyte	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Analysis Method
a,a,a-Trifluorotoluene	106				%Recov		5/29/98	SW846 8020
Benzene	87	40	96		ug/kg	Q	5/29/98	SW846 8020
Ethylbenzene	230	40	96		ug/kg		5/29/98	SW846 8020
Methyl-tert-butyl-ether	< 25	25	60		ug/kg		5/29/98	SW846 8020
Naphthalene	3000	40	96		ug/kg		5/29/98	SW846 8020
Toluene	< 25	25	60		ug/kg		5/29/98	SW846 8020
1,3,5-Trimethylbenzene	470	40	96		ug/kg		5/29/98	SW846 8020
1,2,4-Trimethylbenzene	1800	40	96		ug/kg		5/29/98	SW846 8020
Xylenes, -m, -p	290	40	96		ug/kg		5/29/98	SW846 8020
Xylene, -o	< 25	25	60		ug/kg		5/29/98	SW846 8020

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- Analytical Report -

Project Name : TANK 29, #2
Project Number : 828-98E
Field ID : B-7
Lab Sample Number : 780170-007
WI DNR LAB ID : 816079330

Client : TWIN PORTS TESTING
Report Date : 6/1/98
Collection Date : 5/22/98
Matrix Type : SOIL

Inorganic Results

Test	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method	Analyst
Solids, percent	67.6				%		5/27/98	SM2540G	SM2540G	DJB

Organic Results

GASOLINE RANGE ORGANICS - SOIL/METHANOL Prep Method: Wi Mod GRO Prep Date: 5/28/98 Analyst: KIG

Analyte	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Analysis Method
Gasoline Range Organics	230			7.4	mg/kg		5/29/98	WI Mod GRO
Blank Spike	109				%Recov		5/29/98	WI Mod GRO
Blank Spike Duplicate	111				%Recov		5/29/98	WI Mod GRO
GRO blank	< 2.5			2.5	mg/kg		5/29/98	WI Mod GRO

Organic Results

PVOC + NAPHT - METHANOL PRESERVED SOIL Prep Method: SW846 5030 Prep Date: 5/28/98 Analyst: KIG

Analyte	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Analysis Method
a,a,a-Trifluorotoluene	103				%Recov		5/29/98	SW846 8020
Benzene	100	37	89		ug/kg		5/29/98	SW846 8020
Ethylbenzene	720	37	89		ug/kg		5/29/98	SW846 8020
Methyl-tert-butyl-ether	< 25	25	60		ug/kg		5/29/98	SW846 8020
Naphthalene	7700	37	89		ug/kg		5/29/98	SW846 8020
Toluene	< 25	25	60		ug/kg		5/29/98	SW846 8020
1,3,5-Trimethylbenzene	1900	37	89		ug/kg		5/29/98	SW846 8020
1,2,4-Trimethylbenzene	6200	37	89		ug/kg		5/29/98	SW846 8020
Xylenes, -m, -p	1900	37	89		ug/kg		5/29/98	SW846 8020
Xylene, -o	76	37	89		ug/kg	Q	5/29/98	SW846 8020

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- Analytical Report -

Project Name : TANK 29, #2
Project Number : 828-98E
Field ID : B-8
Lab Sample Number : 780170-008
WI DNR LAB ID : 816079330

Client : TWIN PORTS TESTING
Report Date : 5/29/98
Collection Date : 5/22/98
Matrix Type : SOIL

Inorganic Results

Test	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method	Analyst
Solids, percent	73.8				%		5/27/98	SM2540G	SM2540G	DJB

Organic Results

GASOLINE RANGE ORGANICS - SOIL/METHANOL Prep Method: Wi Mod GRO Prep Date: 5/28/98 Analyst: KIG

Analyte	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Analysis Method
Gasoline Range Organics	140			3.4	mg/kg		5/29/98	WI Mod GRO
Blank Spike	109				%Recov		5/29/98	WI Mod GRO
Blank Spike Duplicate	111				%Recov		5/29/98	WI Mod GRO
GRO blank	< 2.5			2.5	mg/kg		5/29/98	WI Mod GRO

Organic Results

PVOC + NAPHT - METHANOL PRESERVED SOIL Prep Method: SW846 5030 Prep Date: 5/28/98 Analyst: KIG

Analyte	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Analysis Method
a,a,a-Trifluorotoluene	105				%Recov		5/29/98	SW846 8020
Benzene	87	34	82		ug/kg		5/29/98	SW846 8020
Ethylbenzene	470	34	82		ug/kg		5/29/98	SW846 8020
Methyl-tert-butyl-ether	< 25	25	60		ug/kg		5/29/98	SW846 8020
Naphthalene	6800	34	82		ug/kg		5/29/98	SW846 8020
Toluene	< 25	25	60		ug/kg		5/29/98	SW846 8020
1,3,5-Trimethylbenzene	1600	34	82		ug/kg		5/29/98	SW846 8020
1,2,4-Trimethylbenzene	5200	34	82		ug/kg		5/29/98	SW846 8020
Xylenes, -m, -p	1400	34	82		ug/kg		5/29/98	SW846 8020
Xylene, -o	68	34	82		ug/kg	Q	5/29/98	SW846 8020

All soil results are reported on a dry weight basis unless otherwise noted.

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- Analytical Report -

Project Name : TANK 29, #2
Project Number : 828-98E
Field ID : B-9
Lab Sample Number : 780170-009
WI DNR LAB ID : 816079330

Client : TWIN PORTS TESTING
Report Date : 6/1/98
Collection Date : 5/22/98
Matrix Type : SOIL

Inorganic Results

Test	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method	Analyst
Solids, percent	69.4				%		5/27/98	SM2540G	SM2540G	DJB

Organic Results

GASOLINE RANGE ORGANICS - SOIL/METHANOL Prep Method: Wi Mod GRO Prep Date: 5/28/98 Analyst: KIG

Analyte	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Analysis Method
Gasoline Range Organics	390			18	mg/kg		5/29/98	WI Mod GRO
Blank Spike	109				%Recov		5/29/98	WI Mod GRO
Blank Spike Duplicate	111				%Recov		5/29/98	WI Mod GRO
GRO blank	< 2.5			2.5	mg/kg		5/29/98	WI Mod GRO

Organic Results

PVOC + NAPHT - METHANOL PRESERVED SOIL Prep Method: SW846 5030 Prep Date: 5/28/98 Analyst: KIG

Analyte	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Analysis Method
a,a,a-Trifluorotoluene	106				%Recov		5/29/98	SW846 8020
Benzene	150	36	86		ug/kg		5/29/98	SW846 8020
Ethylbenzene	1100	36	86		ug/kg		5/29/98	SW846 8020
Methyl-tert-butyl-ether	< 25	25	60		ug/kg		5/29/98	SW846 8020
Naphthalene	15000	36	86		ug/kg		5/29/98	SW846 8020
Toluene	< 25	25	60		ug/kg		5/29/98	SW846 8020
1,3,5-Trimethylbenzene	3600	36	86		ug/kg		5/29/98	SW846 8020
1,2,4-Trimethylbenzene	11000	36	86		ug/kg		5/29/98	SW846 8020
Xylenes, -m, -p	3800	36	86		ug/kg		5/29/98	SW846 8020
Xylene, -o	780	36	86		ug/kg		5/29/98	SW846 8020

All soil results are reported on a dry weight basis unless otherwise noted.

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- Analytical Report -

Project Name : TANK 29, #2
Project Number : 828-98E
Field ID : B-10
Lab Sample Number : 780170-010
WI DNR LAB ID : 816079330

Client : TWIN PORTS TESTING
Report Date : 6/1/98
Collection Date : 5/22/98
Matrix Type : SOIL

Inorganic Results

Test	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method	Analyst
Solids, percent	76.0				%		5/27/98	SM2540G	SM2540G	DJB

Organic Results

GASOLINE RANGE ORGANICS - SOIL/METHANOL Prep Method: Wi Mod GRO Prep Date: 5/28/98 Analyst: KIG

Analyte	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Analysis Method
Gasoline Range Organics	550			16	mg/kg		5/29/98	WI Mod GRO
Blank Spike	109				%Recov		5/29/98	WI Mod GRO
Blank Spike Duplicate	111				%Recov		5/29/98	WI Mod GRO
GRO blank	< 2.5			2.5	mg/kg		5/29/98	WI Mod GRO

Organic Results

PVOC + NAPHT - METHANOL PRESERVED SOIL Prep Method: SW846 5030 Prep Date: 5/28/98 Analyst: KIG

Analyte	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Analysis Method
a,a,a-Trifluorotoluene	109				%Recov		5/29/98	SW846 8020
Benzene	< 130	130	310		ug/kg		5/29/98	SW846 8020
Ethylbenzene	1900	160	380		ug/kg		5/29/98	SW846 8020
Methyl-tert-butyl-ether	< 130	130	310		ug/kg		5/29/98	SW846 8020
Naphthalene	22000	160	380		ug/kg		5/29/98	SW846 8020
Toluene	< 130	130	310		ug/kg		5/29/98	SW846 8020
1,3,5-Trimethylbenzene	6200	160	380		ug/kg		5/29/98	SW846 8020
1,2,4-Trimethylbenzene	18000	160	380		ug/kg		5/29/98	SW846 8020
Xylenes, -m, -p	7900	160	380		ug/kg		5/29/98	SW846 8020
Xylene, -o	< 130	130	310		ug/kg		5/29/98	SW846 8020

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- Analytical Report -

Project Name : TANK 29, #2
Project Number : 828-98E
Field ID : B-11
Lab Sample Number : 780170-011
WI DNR LAB ID : 816079330

Client : TWIN PORTS TESTING
Report Date : 6/1/98
Collection Date : 5/22/98
Matrix Type : SOIL

Inorganic Results

Test	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method	Analyst
Solids, percent	75.1				%		5/27/98	SM2540G	SM2540G	DJB

Organic Results

GASOLINE RANGE ORGANICS - SOIL/METHANOL **Prep Method:** Wi Mod GRO **Prep Date:** 5/28/98 **Analyst:** KIG

Analyte	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Analysis Method
Gasoline Range Organics	900			33	mg/kg		5/29/98	WI Mod GRO
Blank Spike	109				%Recov		5/29/98	WI Mod GRO
Blank Spike Duplicate	111				%Recov		5/29/98	WI Mod GRO
GRO blank	< 2.5			2.5	mg/kg		5/29/98	WI Mod GRO

Organic Results

PVOC + NAPHT - METHANOL PRESERVED SOIL **Prep Method:** SW846 5030 **Prep Date:** 5/28/98 **Analyst:** KIG

Analyte	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Analysis Method
a,a,a-Trifluorotoluene	111				%Recov		5/29/98	SW846 8020
Benzene	600	330	790		ug/kg	Q	5/29/98	SW846 8020
Ethylbenzene	5100	330	790		ug/kg		5/29/98	SW846 8020
Methyl-tert-butyl-ether	< 250	250	600		ug/kg		5/29/98	SW846 8020
Naphthalene	36000	330	790		ug/kg		5/29/98	SW846 8020
Toluene	< 250	250	600		ug/kg		5/29/98	SW846 8020
1,3,5-Trimethylbenzene	12000	330	790		ug/kg		5/29/98	SW846 8020
1,2,4-Trimethylbenzene	34000	330	790		ug/kg		5/29/98	SW846 8020
Xylenes, -m, -p	18000	330	790		ug/kg		5/29/98	SW846 8020
Xylene, -o	< 250	250	600		ug/kg		5/29/98	SW846 8020

Branch or Location: Superior
Project Contact: Hans Wronka
Telephone: 715-392-7114
Project Number: 828-98E
Project Name: Tank 29, #2
Project Location: Superior
Sampled By (Print): Hans Wronka

Regulatory Program *(circle)*: UST RCRA CLP SDWA NPDES/WPDES CAA NR_____ Other _____

NR720 Confirmation Analysis Required? *(circle)*: Y N
(En Chem will not confirm unless otherwise instructed.)

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Address:

Mail Invoice To:

FILTERED? (YES/NO)
PRESERVATION (CODE)*

ANALYSES REQUESTED: GRO/BVOC/Naphthalene

#18 5-26-98

FIELD ID	SAMPLE DESCRIPTION	COLLECTION DATE	COLLECTION TIME	GRO/BVOC/Naphthalene	FIELD SCREEN	MATRIX	GOOD COND.	TOTAL BOTTLES	COMMENTS	LABORATORY NUMBER
	B-1	5/22		X		S	✓	2	1-5oz 1-2oz w/ MeOH	-001
	B-2									-002
	B-3									-003
	B-4									-004
	B-5									-005
	B-6									-006
	B-7									-007
	B-8									-008
	B-9									-009
	B-10									-010
	B-11									-011

SHADED AREA FOR LABORATORY USE ONLY

Relinquished By:	Date/Time:	Received By:	Date/Time:	En Chem Project No.
[signature]	26 May 1998			780170
Relinquished By:	Date/Time:	Received By:	Date/Time:	Sample Receipt Temp.
				ROI
Relinquished By:	Date/Time:	Received By:	Date/Time:	Sample Receipt pH (Wet/Metals)
Relinquished By:	Date/Time:	Received By (En Chem): [signature]	Date/Time: 5/26/98 11:25 AM	

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Corporate Office & Laboratory
1795 Industrial Drive
Green Bay, WI 54302
920-469-2436 • Fax: 920-469-8827
1-800-7-ENCHEM

- Analytical Report -

Project Name : TANK 29, #2

Project Number : 828-98E

WI DNR LAB ID : 816079330

Client: TWIN PORTS TESTING

Report Date : 7/2/98

Sample No.	Field ID	Collection Date	Sample No.	Field ID	Collection Date
780171-001	SHELBY #1 2-3.5'	5/22/98			
780171-002	SHELBY #2 2-3.5'	5/22/98			
780171-003	SHELBY #3 2-3.5'	5/22/98			

The "Q" flag is present when a parameter has been detected below the LOQ. This indicates the results are qualified due to the uncertainty of the parameter concentration between the LOD and the LOQ.

Soil VOC detects are corrected for the total solids, unless otherwise noted.

I certify that the data contained in this Final Report has been generated and reviewed in accordance with approved methods and Laboratory Standard Operating Procedure. Exceptions, if any, are discussed in the accompanying sample narrative. Release of this final report is authorized by Laboratory management, as is verified by the following signature.

Thomas R. Marker — 7-2-98

Approval Signature — Date

Superior Laboratory
1423 N. 8th Street, Suite 122
Superior, WI 54880
715-392-5844 • Fax: 715-392-5843
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1795 Industrial Drive
Green Bay, WI 54302
920-469-2436 • Fax: 920-469-8827
1-800-7-ENCHEM

- Analytical Report -

Project Name : TANK 29, #2

Project Number : 828-98E

Field ID : SHELBY #1 2-3.5'

Lab Sample Number : 780171-001

WI DNR LAB ID : 816079330

Client : TWIN PORTS TESTING

Report Date : 7/2/98

Collection Date : 5/22/98

Matrix Type : SOIL

Inorganic Results

Test	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method	Analyst
Special Analytical Services	Attached									
Solids, percent	68.7				%		5/27/98	SM2540G	SM2540G	DJB

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Green Bay, WI 54302
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- Analytical Report -

Project Name : TANK 29, #2

Project Number : 828-98E

Field ID : SHELBY #2 2-3.5'

Lab Sample Number : 780171-002

WI DNR LAB ID : 816079330

Client : TWIN PORTS TESTING

Report Date : 7/2/98

Collection Date : 5/22/98

Matrix Type : SOIL

Inorganic Results

Test	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method	Analyst
Special Analytical Services	Attached									
Solids, percent	74.9				%		5/27/98	SM2540G	SM2540G	DJB

uperior Laboratory
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uperior, WI 54880
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1795 Industrial Drive
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- Analytical Report -

Project Name : TANK 29, #2

Project Number : 828-98E

Field ID : SHELBY #3 2-3.5'

Lab Sample Number : 780171-003

WI DNR LAB ID : 816079330

Client : TWIN PORTS TESTING

Report Date : 7/2/98

Collection Date : 5/22/98

Matrix Type : SOIL

Inorganic Results

Test	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method	Analyst
Special Analytical Services	Attached									
Solids, percent	70.0				%		5/27/98	SM2540G	SM2540G	DJB

United Engineering Consultants, Inc.

Report of Falling Head Hydraulic Conductivity Test

Client: Mr. Tom Marque
En Chem, Inc.
1423 N. 8th Street
Superior, WI 54880

Subject: Physical Soil Testing

Date: 6/25/98

Project No.: 98001-019

En Chem Project No.: 780171
Sample Location: 780171-001
Sample Description: Reddish Brown Silty Clay, trace Sand and gravel
Test Method: ASTM D5084 - Method C

Material Properties

Wet Density, PCF:	120.6	Percent Finer No. 200:	-
Moisture Content, %:	30.1	Percent Finer .005MM:	-
Specific Gravity:	2.71	Liquid Limit%:	-
Porosity:	0.452	Plasticity Index:	-

Sample Characteristics

Height, cm:	7.93
Diameter, cm:	7.16
Wet Weight,gm:	616.8
Moisture, %	30.1
Dry Density,pcf:	92.7

Test Parameters

Permeameter:	Flexible Wall
Permeant Fluid:	Deaired Water
Cell Pressure:	45
Back Pressure:	39
Test Pressure:	42
Differential Head:	3

Run No.	Time t (sec)	Head Loss, cm ho	Head Loss, cm hi	Inflow/ Outflow	Coeff. of Permeability, cm/sec k=aL/2At{ln(ho/hi)}
1	23880	242.40	241.25	1.09	2.0E-08
2	88800	241.25	237.10	1.02	1.9E-08
3	62160	237.10	234.40	0.93	1.8E-08
4	171420	234.40	227.45	0.93	1.7E-08
5	258540	227.45	217.35	0.96	1.7E-08
Average Steady Hydraulic Conductivity				**K=**	**1.8E-08 cm/sec**

United Engineering Consultants, Inc.

Report of Falling Head Hydraulic Conductivity Test

Client: Mr. Tom Marque
En Chem, Inc.
1423 N. 8th Street
Superior, WI 54880

Subject: Physical Soil Testing

Date: 6/25/98

Project No.: 98001-019

En Chem Project No.: 780171
Sample Location: 780171-002
Sample Description: Reddish Brown Silty Clay, trace Sand and gravel
Test Method: ASTM D5084 - Method C

Material Properties

Wet Density, PCF:	116.3	Percent Finer No. 200:	-
Moisture Content, %:	34.9	Percent Finer .005MM:	-
Specific Gravity:	2.69	Liquid Limit%:	-
Porosity:	0.486	Plasticity Index:	-

Sample Characteristics

Height, cm:	6.15
Diameter, cm:	7.17
Wet Weight,gm:	462.7
Moisture, %	34.9
Dry Density,pcf:	86.1

Test Parameters

Permeameter:	Flexible Wall
Permeant Fluid:	Deaired Water
Cell Pressure:	45
Back Pressure:	39.5
Test Pressure:	42
Differential Head:	2.5

Run No.	Time t (sec)	Head Loss, cm ho	Head Loss, cm hi	Inflow/ Outflow	Coeff. of Permeability, cm/sec k=aL/2At{ln(ho/hi)}
1	8580	224.25	167.75	0.97	2.6E-06
2	2160	223.55	207.20	0.98	2.7E-06
3	540	207.20	203.70	0.94	2.4E-06
4	780	203.70	198.30	1.00	2.6E-06
5	360	198.30	196.05	0.96	2.4E-06
Average Steady Hydraulic Conductivity				**K=**	**2.5E-06 cm/sec**

10617 West Oklahoma Avenue, Suite L2 West Allis, Wisconsin 53227

United Engineering Consultants, Inc.

Report of Falling Head Hydraulic Conductivity Test

Client: Mr. Tom Marque
En Chem, Inc.
1423 N. 8th Street
Superior, WI 54880

Subject: Physical Soil Testing

Date: 6/29/98

Project No.: 98001-019

En Chem Project No.: 780171
Sample Location: 780171-003
Sample Description: Reddish Brown Silty Clay, trace Sand and gravel
Test Method: ASTM D5084 - Method C

Material Properties

Wet Density, PCF:	117.2	Percent Finer No. 200:	-
Moisture Content, %:	30.2	Percent Finer .005MM:	-
Specific Gravity:	2.70	Liquid Limit%:	-
Porosity:	0.466	Plasticity Index:	-

Sample Characteristics

Height, cm:	8.31
Diameter, cm:	7.09
Wet Weight,gm:	615.9
Moisture, %	30.2
Dry Density,pcf:	90.0

Test Parameters

Permeameter:	Flexible Wall
Permeant Fluid:	Deaired Water
Cell Pressure:	48
Back Pressure:	41.5
Test Pressure:	45
Differential Head:	3.5

Run No.	Time t (sec)	Head Loss, cm ho	Head Loss, cm hi	Inflow/ Outflow	Coeff. of Permeability, cm/sec k=aL/2At{ln(ho/hi)}
1	15840	269.05	268.05	1.00	2.5E-08
2	88740	268.05	262.50	0.98	2.5E-08
3	68040	262.50	258.40	1.00	2.4E-08
4	23940	258.40	257.05	0.80	2.3E-08
5	60240	257.05	253.35	1.06	2.5E-08
Average Steady Hydraulic Conductivity				**K=**	**2.4E-08 cm/sec**

Branch or Location: Superior
Project Contact: Hans Wranka
Telephone: 715-392-7114
Project Number: 828-98E
Project Name: Tank 29, #2
Project Location: Superior
Sampled By (Print): Hans Wranka

Regulatory Program (circle): UST RCRA CLP SDWA NPDES/WPDES CAA NR____ Other

NR720 Confirmation Analysis Required? (circle): Y N
(En Chem will not confirm unless otherwise instructed.)

EN CHEM INC.
Green Bay, WI 54302 920-469-2436 • 1-800-736-2436 FAX 920-469-8827
Madison, WI 53711 608-232-3300 • 1-888-536-2436 FAX: 608-233-0502
Superior, WI 54880 715-392-5844 • 1-800-837-8238 FAX 715-392-5843

CHAIN OF CUSTODY

24169

P.O. # Quote #
Mail Report To: TPT
Company:
Address:
Invoice To: TPT
Company:
Address:
Mail Invoice To:

Filed 5-26-98

FILTERED? (YES/NO)
PRESERVATION (CODE)*

ANALYSES REQUESTED: TOC, Porosity, Permeability, Bulk Density

	COLLECTION DATE/TIME	TOC	Porosity	Permeability	Bulk Density	FIELD SCREEN	MATRIX	GOOD COND.	TOTAL BOTTLES	COMMENTS	LABORATORY NUMBER
Shelby #1 2-3.5'	5/22	X	X	X	X		S	✓	1	1-502	-001
Shelby #2 2-3.5'	↓	↓	↓	↓	↓		↓	↓	↓	↓	-002
Shelby #3 2-3.5'	↓	↓	↓	↓	↓		↓	↓	↓	2 ↓	-003

REC'D JUL 6 - 1998

TOC canceled by client on 5-29-98.
TPM
5-29-98

SHADED AREA FOR LABORATORY USE ONLY

Relinquished By:	Date/Time:	Received By:	Date/Time:	En Chem Project No.
[signature]	26 May 1998			7801741
Relinquished By:	Date/Time:	Received By:	Date/Time:	Sample Receipt Temp. 13.0 I
Relinquished By:	Date/Time:	Received By:	Date/Time:	Sample Receipt pH (Wet/Metals)
Relinquished By:	Date/Time:	Received By (En Chem): [signature]	Date/Time: 5/26/98 11:25AM	

Superior Laboratory
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1-800-7-ENCHEM

- Analytical Report -

Project Name : MURPHY OIL TANK 29 #2

Project Number : 828-98E

Client: TWIN PORTS TESTING

WI DNR LAB ID : 816079330

Report Date : 7/1/98

Sample No.	Field ID	Collection Date	Sample No.	Field ID	Collection Date
780200-001	SHELBY #1	6/10/98			
780200-002	SHELBY #2	6/10/98			
780200-003	SHELBY #3	6/10/98			

The "Q" flag is present when a parameter has been detected below the LOQ. This indicates the results are qualified due to the uncertainty of the parameter concentration between the LOD and the LOQ.

Soil VOC detects are corrected for the total solids, unless otherwise noted.

I certify that the data contained in this Final Report has been generated and reviewed in accordance with approved methods and Laboratory Standard Operating Procedure. Exceptions, if any, are discussed in the accompanying sample narrative. Release of this final report is authorized by Laboratory management, as is verified by the following signature.

Thomas P. Manthe

Approval Signature

7-1-98

Date

Superior Laboratory
1423 N. 8th Street, Suite 122
Superior, WI 54880
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Green Bay, WI 54302
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- Analytical Report -

Project Name : MURPHY OIL TANK 29 #2

Project Number : 828-98E

Field ID : SHELBY #1

Lab Sample Number : 780200-001

WI DNR LAB ID : 816079330

Client : TWIN PORTS TESTING

Report Date : 7/1/98

Collection Date : 6/10/98

Matrix Type : SOIL

Inorganic Results

Test	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method	Analyst
TOC as NPOC	7800	120	380		mg/kg		6/30/98	SW846 9060	SW846 9060	*MD

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Green Bay, WI 54302
920-469-2436 • Fax: 920-469-8827
1-800-7-ENCHEM

- Analytical Report -

Project Name : MURPHY OIL TANK 29 #2

Project Number : 828-98E

Field ID : SHELBY #2

Lab Sample Number : 780200-002

WI DNR LAB ID : 816079330

Client : TWIN PORTS TESTING

Report Date : 7/1/98

Collection Date : 6/10/98

Matrix Type : SOIL

Inorganic Results

Test	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method	Analyst
TOC as NPOC	1400	120	380		mg/kg		6/30/98	SW846 9060	SW846 9060	*MD

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- Analytical Report -

Project Name : MURPHY OIL TANK 29 #2

Project Number : 828-98E

Field ID : SHELBY #3

Lab Sample Number : 780200-003

WI DNR LAB ID : 816079330

Client : TWIN PORTS TESTING

Report Date : 7/1/98

Collection Date : 6/10/98

Matrix Type : SOIL

Inorganic Results

Test	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method	Analyst
TOC as NPOC	2600	120	380		mg/kg		6/30/98	SW846 9060	SW846 9060	*MD

Branch or Location: Superior

Project Contact: Hans Wronka

Telephone: 715-392-7114

Project Number: 828-98F

Project Name: Murphy Oil Tank 29 #2

Project Location: Superior

Sampled By (Print): Hans Wronka

Regulatory Program *(circle)*: UST RCRA CLP SDWA NPDES/WPDES CAA NR_____ Other _____

NR720 Confirmation Analysis Required? *(circle)*: Y N

(En Chem will not confirm unless otherwise instructed.)

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FAX: 608-233-0502

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FAX 715-392-5843

CHAIN OF CUSTODY

6527

Page 1 of 1

P.O. # 781 Quote #

Mail Report To: Hans Wronka

Company: Twin Ports Testing

Address: 1301 N 3rd St
Superior, WI 54880

Invoice To: TPT

Company:

Address:

Mail Invoice To:

KLB 6-10-98

FILTERED? (YES/NO)

PRESERVATION (CODE)*

ANALYSES REQUESTED: TOC

FIELD ID	SAMPLE DESCRIPTION	COLLECTION DATE	COLLECTION TIME	TOC	FIELD SCREEN	MATRIX	GOOD COND.	TOTAL BOTTLES	COMMENTS	LABORATORY NUMBER
	Shelby #1	6/10		X		S	✓	1-5oz		-001
	Shelby #2	↓		↓		↓	↓	↓		-002
	Shelby #3	↓		↓		↓	↓	↓		-003

SHADED AREA FOR LABORATORY USE ONLY

*Preservation Code	Relinquished By:	Date/Time:	Received By:	Date/Time:	En Chem Project No.
Acid=HCl, Nitric, H_2SO_4	[signature]	10 June 98 1525			780200
	Relinquished By:	Date/Time:	Received By:	Date/Time:	Sample Receipt Temp.
					ROI
	Relinquished By:	Date/Time:	Received By:	Date/Time:	Sample Receipt pH (Wet/Metals)
	Relinquished By:	Date/Time:	Received By (En Chem): [signature]	Date/Time: 6/10/98 15:25	

*If methanol (En Chem) or methanol indicate methanol added and mark the appropriate samples.

uperior Laboratory
423 N. 8th Street, Suite 122
uperior, WI 54880
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-800-837-8238

EN HEM INC.

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1795 Industrial Drive
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1-800-7-ENCHEM

August 4, 1998

Irvin Mossberger
Twin Ports Testing
1301 North Third Street
Superior, WI 54880

Dear Irvin:

I am submitting a revised report to you for your project #828-98E. The correction that was made was to change the Field ID for the one sample that comprised that project. The original report indicated the Field ID as B-R and the revised report has been corrected to reflect the actual Field ID indicated on the COC. That corrected Field ID is B-12.

If you have any questions in regard to this change, or anything else about the report please don't hesitate to contact me at 392-5844.

Sincerely,

Thomas P. Markee

Thomas P. Markee
Laboratory Manager

Superior Laboratory
1423 N. 8th Street, Suite 122
Superior, WI 54880
715-392-5844 • Fax: 715-392-5843
1-800-837-8238

ENCHEM INC.

Corporate Office & Laboratory
1795 Industrial Drive
Green Bay, WI 54302
920-469-2436 • Fax: 920-469-8827
1-800-7-ENCHEM

- Analytical Report -

Project Name :

Project Number : 828-98E

WI DNR LAB ID : 816079330

Client: TWIN PORTS TESTING

Report Date : 8/4/98

Sample No.	Field ID	Collection Date	Sample No.	Field ID	Collection Date
780286-001	B-12	7/20/98			

REVISED
8-4-98

The "Q" flag is present when a parameter has been detected below the LOQ. This indicates the results are qualified due to the uncertainty of the parameter concentration between the LOD and the LOQ.

Soil VOC detects are corrected for the total solids, unless otherwise noted.

I certify that the data contained in this Final Report has been generated and reviewed in accordance with approved methods and Laboratory Standard Operating Procedure. Exceptions, if any, are discussed in the accompanying sample narrative. Release of this final report is authorized by Laboratory management, as is verified by the following signature.

Thomas P. Knobbe — 8-4-98

Approval Signature — Date

Superior Laboratory
1423 N. 8th Street, Suite 122
Superior, WI 54880
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Corporate Office & Laboratory
1795 Industrial Drive
Green Bay, WI 54302
920-469-2436 • Fax: 920-469-8827
1-800-7-ENCHEM

- Analytical Report -

Project Name :

Project Number : 828-98E

Field ID : B-12

Lab Sample Number : 780286-001

WI DNR LAB ID : 816079330

Client : TWIN PORTS TESTING

Report Date : 8/4/98

Collection Date : 7/20/98

Matrix Type : SOIL

Inorganic Results

Test	Result	LOD	LOQ	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method	Analyst
Arsenic	< 6.49	6.49	20.7		mg/kg		7/23/98	SW846 3050	SW846 6010	SUB
Barium	227	0.721	2.30		mg/kg		7/23/98	SW846 3050	SW846 6010	SUB
Cadmium	< 0.721	0.721	2.30		mg/kg		7/23/98	SW846 3050	SW846 6010	SUB
Chromium	56.4	0.361	1.15		mg/kg		7/23/98	SW846 3050	SW846 6010	SUB
Lead	16.9	3.97	12.6		mg/kg		7/23/98	SW846 3050	SW846 6010	SUB
Mercury	0.0289	.024	0.0793		mg/kg	Q	7/22/98	SW846 7470	SW846 7471	SUB
Selenium	42.8	7.21	23.0		mg/kg		7/23/98	SW846 3050	SW846 6010	SUB
Silver	< 0.361	0.361	1.15		mg/kg		7/23/98	SW846 3050	SW846 6010	SUB
Solids, percent	73.0				%		7/24/98	SM2540G	SM2540G	SUB

Branch or Location: Superior
Project Contact: Irvin Mossberger
Telephone: (715) 392-7114
Project Number: 828-9KE
Project Name:
Project Location: Wisconsin
Sampled By (Print): Irvin G. Mossberger

EN CHEM INC.

☐ 1241 Bellevue St., Suite 9
Green Bay, WI 54302
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☒ 2231 Catlin Ave., Suite 420
Superior, WI 54880
715-392-5844 • 1-800-837-8238
FAX 715-392-5843

CHAIN OF CUSTODY

Mail Report To: Irvin Mossberger
Company: Twin Ports Testing
Address: 1301 N. 3rd St.
Superior, WI 54880
Invoice To: Same
Company:
Address:

Regulatory Program *(circle)*: UST RCRA CLP SDWA
NPDES/WPDES CAA NR_____ Other_____

NR720 Confirmation Analysis Required? ✓
(En Chem will confirm unless otherwise instructed.)

P.O. No.: 666 Quote No.:

Field ID	Sample Description	Collection Date	Collection Time	Field Screen	Matrix	Filt'd Y/N	Preserv*	Analysis Requested	Good Cond.	Total Bottles	Comments	Laboratory Number
B-R		7/20/98	4:10		soil	N	A	RCRA metals	✓	1-5oz		-001

SHADED AREA FOR LABORATORY USE ONLY

*Preservation Code
A=None B=HCL C=H2SO4
D=HN03 E=EnCore F=Methanol**
G=NaOH O=Other (Indicate)

**If not using En Chem's methanol, indicate volume of methanol added and mark the appropriate samples.

Relinquished By:	Date/Time:	Received By:	En Chem Project No.
Irvin G. Mossberger	7/20/98 4:40		780286
Relinquished By:	Date/Time:	Received By:	Sample Receipt Temp. *(Must be rec'd at 4°C)*
Relinquished By:	Date/Time:	Received By (En Chem):	
	7/20/98 4:40PM	Tom Markee	ROI

TRANSMITTAL

SINCE 1972

RTS TESTING, Inc.

1301 NORTH THIRD STREET • SUPERIOR, WISCONSIN 54880
FAX # (715) 392-7163 • (715) 392-7114

To: Bill Gustafson
Murphy Oil
2407 Stinson Ave.
Superior, WI 54880

Date: 6/26/98
Job #: 259-93E & 828-98E
Client: Murphy Oil
Project:

We are sending you: X Enclosed ___ Separate Cover ___ By our Messenger ___ By your Messenger

___ Airmail ___ 1st Class ___ Other

___ Shop Drawings ___ Other Drawings ___ Specifications ___ Other

# OF COPIES	REPORT/PROPOSAL ID	LATEST DATE	DESCRIPTION OR REMARKS
1	259-93E 823-98E	6/26/98	Thermal Trtmt. Apps

THESE ARE TRANSMITTED as checked below:

For approval ☒ As requested ☐ No Exception Taken ☐ Revise & resubmit ☐
For your use ☒ For review & comment ☐ Make corrections noted ☐ Submit specified item ☐

Remarks: Enclosed are Thermal Treatment Apps for the soil that Kinnines has. The applications include only the analytes used in the emissions calculations.
The applications are ready for you to sign & forward to WDNR if you approve
Any questions, please call 392-7114.

COPIES TO: Encl. Trans.

Sincerely,

Scott D. Mosley

SINCE 1972

TWIN PORTS TESTING INC.

1301 NORTH THIRD STREET • SUPERIOR, WISCONSIN 54880
(715) 392-7114 • FAX (715) 392-7163

728 GARFIELD AVENUE • DULUTH, MINNESOTA 55802
(218) 722-1911 • FAX (218) 722-3295

8 INDUSTRIAL PARK ROAD • NEGAUNEE, MICHIGAN 49866
(906) 226-6653 • FAX (906) 226-3699

June 26, 1998
TPT# 828-98E.EX

Wisconsin Department of Natural Resources
1705 Tower Avenue
Superior, Wisconsin 54880
Attn: Ms. Phyliss Holmbeck

Re: Soil Treatment Application for
Soil Excavated from Tank 29 area (excavation #2)
Murphy Oil U.S.A., Superior, Wisconsin

Dear Ms. Holmbeck:

Enclosed is the application to thermally treat approximately 440 cubic yards of petroleum contaminated soil from a release near the Tank 29 area at Murphy Oil. The petroleum contamination is naphtha/gasoline intermediate product. Soil samples B-3 and B-11 represent the highest benzene concentrations sampled at the site and are averaged for the emissions calculations.

If you have any questions or need any additional information, please call me at (715) 392-7114.

Sincerely,

TWIN PORTS TESTING, INC.

Irvin Mossberger, Hydrogeologist

c: Mr. Bill Gustafson

EMISSION CALCULATIONS
CONTAMINATED SOIL EXCAVATED FROM
TANK 29 AREA (excavation #2)
MURPHY OIL USA
SUPERIOR, WISCONSIN

GRO CALCULATION:

B-3 = 160 ppm GRO
B-11 = 900 ppm GRO
Avg. = 530 ppm GRO

$$\frac{530 \text{ ppm}}{1{,}000{,}000 \text{ ppm}} \times \frac{2{,}800 \text{ lbs.}}{\text{yd}^3} \times 440 \text{ yds}^3 = 652.96 \text{ lbs. of GRO}$$

BENZENE CALCULATION:

B-3 = 0.200 ppm benzene
B-11 = 0.600 ppm benzene
Avg. = 0.400 ppm benzene

$$\frac{0.400 \text{ ppm}}{1{,}000{,}000 \text{ ppm}} \times \frac{2{,}800 \text{ lbs.}}{\text{yd}^3} \times 440 \text{ yd}^3 = 0.493 \text{ lbs. of benzene}$$

Department of Natural Resources

PETROLEUM CONTAMINATED SO[illegible]TER

Form 4400-[illegible]
Rev. 9-[illegible]

This form is required by the Department of Natural Resources (DNR) to [illegible] contaminated soil and water is compliance with NR 500-640, NR 158, NR 419 and NR 445, Wis. Adm. Code. F[illegible] comply [illegible] and preventative [illegible] may le[illegible] to violations of subchapters III and IV of Ch. 144, Wis. Stats. and may result [illegible] of not [illegible] more than $25,000 for each violatio[illegible] pursuant to ss. 144.426(1), 144.74(1), 144.99, Wis. Stats., or fines of not less th[illegible] or more than [illegible] imprisonment for not more than 10 yea[illegible] or both, pursuant to s. 144.74(2), Wis. Stats. Each day of a continuing violation constitutes a sep[illegible] Except for the remediation of virg[illegible] petroleum spills, this form needs to be submitted to the DNR 10 business days prior to the co[illegible]nt of the remediation.

DIRECTIONS: 1) Complete both sides of the form. 2) Have the responsible party sign the form. Th[illegible] certifies that the information on th[illegible] form and in all supporting documents is accurate. 3) Submit the form with supporting documenta[illegible] and any maps to the appropriate Distr[illegible] Air Management Program at least 10 business days prior to the commencement of remediation. 4) Sub[illegible] of this form to the DNR project manag[illegible] and retain a copy for your records.

PART I - GENERAL INFORMATION

Site Name & Address: Murphy Oil U.S.A. 2407 Stinson Ave. Superior, WI 54880	Date of Form Completion: 6/26/98
Site #:	Do Other Remediation Systems Exist at This Site? ☐ YES ☐ NO
County: Douglas	Site Type: ☐ LUST ☒ ERP ☐ CERCLA ☐ Other, Explain:
Responsible Party Name & Address: Murphy Oil U.S.A. 2407 Stinson Ave. Superior, WI 54880	Responsible Party Signature: Telephone #:
Consulting Firm Name & Address: Twin Ports Testing, Inc. 1301 N. 3rd St. Superior, WI 54880	Consulting Firm Contact: Irvin Mossberger Telephone #: (715) 392-7114

PART II - SOIL AND WATER DATA (Attach Lab Reports and Calculations)

Type of Contamination: ☐ Gasoline ☐ Diesel ☐ Fuel Oil ☐ Waste Oil ☐ Chlorinated Organics ☒ Other: Gasoline/Naphtha intermediate product

Soil Concentration:

GRO:	530	mg/kg/10⁶	x	2,800 lb/yd³	x	440	yd³	=	652.96 lb
DRO:		mg/kg/10⁶	x	2,800 lb/yd³	x		yd³	=	lb
Benzene:	0.400	mg/kg/10⁶	x	2,800 lb/yd³	x	440	yd³	=	0.493 lb
Chlorinated Organics:		mg/kg/10⁶	x	2,800 lb/yd³	x		yd³	=	lb
Other:		mg/kg/10⁶	x	2,800 lb/yd³	x		yd³	=	lb

Water Concentration: GRO: _____ mg/L DRO: _____ mg/L Benzene: _____ mg/L

Chlorinated Organics: _____ mg/L Other: _____ mg/L

PART III - TREATMENT OR DISPOSAL FACILITY INFORMATION

Treatment/Disposal Facility Name & Address: Lakehead Blacktop Materials 5800 Albany Ave Superior, WI 54880	**Facility ID:** 816032640
	Air Pollution Control Permit #: 93-BAB-502
Facility Contact: Scott Kinnes	**Facility Located in 10-county Area in Southeast Wisconsin:** No
Telephone #: (715) 392-7989	**Distance to Nearest Residence or Business:** ~5,000 ft.
Headquarter Address: 6327 Tower Ave. Superior, WI 54880	**Portable Sources Only:** Has a Portable Source Relocation Notification (Form 4500-25) Been Submitted for this Location: ☐ YES ☐ NO N/A

PART III - SOIL VACUUM EXTRACTION OR GROUNDWATER REMEDIATION

Site Contact & Telephone #:	Proposed Operations (Attach Calculations) Anticipated Start-Up Date:
Is Site Located in the 10-county Area in Southeastern WI	Estimated Project Duration: # of Wells:
Distance to Nearest Residence or Business:	# of Emission Points:
Pilot Test/Soil Venting Only (Attach Lab Reports and Calculations) Date of Test:	Stack Height: Maximum Equipment Flow Rate (scfm or gpm):
Flow Rate (scfm):	Total VOC Emission Rate (lb/hr):
Total Withdrawal of Air (scf):	Benzene Emission Rate (lb/hr):
Total VOC Emission Rate (lb/hr):	Benzene Emission Rate (lb/yr):
Benzene Emission Rate (lb/hr):	

PART III - OTHER REMEDIATION METHODS

Proposing Other Remediation Method: ☐ YES Method Name: _____

Attach a project description for other remediation methods including landspreading, passive aeration and bioremediation. At a minimum, the information submitted should include the following items (with any supporting lab reports and calculations):

- ✓ Address/Location of Remediation Site - Indicate if this location is in the 10-county area in Southeast Wisconsin and the distance to the nearest residence or business. Include a map or site plan if appropriate.
- ✓ Description of Remediation Method
- ✓ Project Contact & Telephone #
- ✓ Anticipated Start-Up and Estimated Project Duration
- ✓ Highest Estimated Hourly VOC Emissions
- ✓ Highest Estimated Hourly and Annual Benzene Emissions
- ✓ Emission Testing Methodology
- ✓ Final Destination of Soil

Commonwealth Technology, Inc.
Laboratory Division
Accredited Lab Data for Today's Environment

Post-it® Fax Note 7671	Date 9-4-98	# of pages ▶ 8
To Irvin M.	From Sharon Maxwell	
Co./Dept. TPT	Co. CTI	
Phone #	Phone #	
Fax #	Fax #	

ANALYTICAL REPORT

Customer #: LT7000003487
Work Order: 9808000949
Report Date: 09/04/98
Date Received: 08/31/98
Arrival Temperature: On Ice

Report Submitted By: _____
Record Reviewer

WIN PORTS TESTING
RVIN G. MOSSBERGER
301 N THIRD ST
UPERIOR, WI 54880

ote: None

roject Name: **MURPHY OIL** Project Number: **828-98E**

ample D. #: 210490 **Sample Description:** R-24 7' **Date Sampled:** 08/27/98

nalyte	Result	Units	Qualifier	LOD	LOQ	Date Extracted	Date Analyzed	Analyst	Method
otal Percent Solids	68.3	%					09/01/98	EMH	EPA 5030
2,4-Trimethylbenzene	1.2	mg/kg		0.015	0.053	09/01/98	09/03/98	RDW	WDNR GRO
3,5-Trimethylbenzene	0.44	mg/kg		0.010	0.030	09/01/98	09/03/98	RDW	WDNR GRO
enzene	1.0	mg/kg		0.009	0.029	09/01/98	09/03/98	RDW	WDNR GRO
thylbenzene	1.2	mg/kg	Z	0.009	0.028	09/01/98	09/03/98	RDW	WDNR GRO
asoline Range Organics	20	mg/kg	KL	1.3	4.5	09/01/98	09/03/98	RDW	WDNR GRO
& p- Xylene	1.9	mg/kg		0.017	0.053	09/01/98	09/03/98	RDW	WDNR GRO
lethyl t-Butyl Ether	<0.025	mg/kg		0.011	0.034	09/01/98	09/03/98	RDW	WDNR GRO
-Xylene	0.18	mg/kg		0.008	0.026	09/01/98	09/03/98	RDW	WDNR GRO
oluene	0.11	mg/kg		0.008	0.026	09/01/98	09/03/98	RDW	WDNR GRO

ample D. #: 210491 **Sample Description:** R-25 6' **Date Sampled:** 08/27/98

nalyte	Result	Units	Qualifier	LOD	LOQ	Date Extracted	Date Analyzed	Analyst	Method
otal Percent Solids	69.8	%					09/01/98	EMH	EPA 5030
2,4-Trimethylbenzene	1.7	mg/kg		0.015	0.053	09/01/98	09/04/98	RDW	WDNR GRO
3,5-Trimethylbenzene	0.59	mg/kg		0.010	0.030	09/01/98	09/04/98	RDW	WDNR GRO
enzene	0.10	mg/kg		0.009	0.029	09/01/98	09/04/98	RDW	WDNR GRO
thylbenzene	0.29	mg/kg	Z	0.009	0.028	09/01/98	09/04/98	RDW	WDNR GRO
asoline Range Organics	37	mg/kg	L	1.3	4.5	09/01/98	09/04/98	RDW	WDNR GRO
& p- Xylene	1.0	mg/kg		0.017	0.053	09/01/98	09/04/98	RDW	WDNR GRO
lethyl t-Butyl Ether	<0.025	mg/kg		0.011	0.034	09/01/98	09/04/98	RDW	WDNR GRO
-Xylene	<0.025	mg/kg		0.008	0.026	09/01/98	09/04/98	RDW	WDNR GRO
oluene	0.059	mg/kg		0.008	0.026	09/01/98	09/04/98	RDW	WDNR GRO
-Methyl Naphthalene	2.6	mg/kg		0.047	0.16	09/03/98	09/03/98	CMK	EPA 8310
-Methyl Naphthalene	4.0	mg/kg		0.031	0.10	09/03/98	09/03/98	CMK	EPA 8310
cenaphthene	<0.048	mg/kg		0.048	0.16	09/03/98	09/03/98	CMK	EPA 8310
cenaphthylene	<0.051	mg/kg		0.051	0.17	09/03/98	09/03/98	CMK	EPA 8310
nthracene	<0.023	mg/kg		0.023	0.077	09/03/98	09/03/98	CMK	EPA 8310
enzo(a)anthracene	<0.0020	mg/kg		0.0020	0.0068	09/03/98	09/03/98	CMK	EPA 8310
enzo(a)pyrene	<0.0015	mg/kg		0.0015	0.0050	09/03/98	09/03/98	CMK	EPA 8310
enzo(b)fluoranthene	0.0024	mg/kg	J	0.0015	0.0050	09/03/98	09/03/98	CMK	EPA 8310
enzo(g,h,i)perylene	<0.0041	mg/kg		0.0041	0.014	09/03/98	09/03/98	CMK	EPA 8310
enzo(k)fluoranthene	<0.0015	mg/kg		0.0015	0.0050	09/03/98	09/03/98	CMK	EPA 8310
hrysene	<0.092	mg/kg		0.092	0.31	09/03/98	09/03/98	CMK	EPA 8310
ibenzo(a,h)anthracene	<0.23	mg/kg		0.23	0.77	09/03/98	09/03/98	CMK	EPA 8310
uoranthene	<0.0049	mg/kg		0.0049	0.016	09/03/98	09/03/98	CMK	EPA 8310
uorene	<0.0086	mg/kg		0.0086	0.029	09/03/98	09/03/98	CMK	EPA 8310
deno(1,2,3-cd)pyrene	<0.0094	mg/kg		0.0094	0.031	09/03/98	09/03/98	CMK	EPA 8310
aphthalene	0.97	mg/kg		0.031	0.10	09/03/98	09/03/98	CMK	EPA 8310
enanthrene	0.22	mg/kg		0.0035	0.012	09/03/98	09/03/98	CMK	EPA 8310
rene	<0.0062	mg/kg		0.0062	0.021	09/03/98	09/03/98	CMK	EPA 8310

Commonwealth Technology, Inc.
Laboratory Division
Accredited Lab Data for Today's Environment

1230 Lange Court
Baraboo, WI 53913-3901
Phone: 800-228-3012
Fax: 608-356-2766
email: fyi@ctienv.com

ANALYTICAL REPORT

Customer #: LT7000003487
Work Order: 9808000949
Report Date: 09/04/98
Date Received: 08/31/98
Arrival Temperature: On Ice

Report Submitted By: _____
Record Reviewer

TWIN PORTS TESTING
IRVIN G. MOSSBERGER
1301 N THIRD ST
SUPERIOR, WI 54880

Note: None

Project Name: **MURPHY OIL** Project Number: **828-98E**

Sample I.D. #: 210492 **Sample Description:** R-26 5' **Date Sampled:** 08/27/98

Analyte	Result	Units	Qualifier	LOD	LOQ	Date Extracted	Date Analyzed	Analyst	Method
Total Percent Solids	59.6	%					09/01/98	EMH	EPA 5030
1,2,4-Trimethylbenzene	1.6	mg/kg		0.015	0.053	09/01/98	09/04/98	RDW	WDNR GRO
1,3,5-Trimethylbenzene	0.66	mg/kg		0.010	0.030	09/01/98	09/04/98	RDW	WDNR GRO
Benzene	<0.12	mg/kg	V	0.009	0.029	09/01/98	09/04/98	RDW	WDNR GRO
Ethylbenzene	0.50	mg/kg	Z	0.009	0.028	09/01/98	09/04/98	RDW	WDNR GRO
Gasoline Range Organics	42	mg/kg	L	1.3	4.5	09/01/98	09/04/98	RDW	WDNR GRO
m & p- Xylene	0.84	mg/kg		0.017	0.053	09/01/98	09/04/98	RDW	WDNR GRO
Methyl t-Butyl Ether	<0.12	mg/kg		0.011	0.034	09/01/98	09/04/98	RDW	WDNR GRO
o-Xylene	<0.12	mg/kg		0.008	0.026	09/01/98	09/04/98	RDW	WDNR GRO
Toluene	<0.12	mg/kg		0.008	0.026	09/01/98	09/04/98	RDW	WDNR GRO

Sample I.D. #: 210493 **Sample Description:** R-28 5' **Date Sampled:** 08/27/98

Analyte	Result	Units	Qualifier	LOD	LOQ	Date Extracted	Date Analyzed	Analyst	Method
Total Percent Solids	64.3	%					09/01/98	EMH	EPA 5030
1,2,4-Trimethylbenzene	1.7	mg/kg		0.015	0.053	09/01/98	09/04/98	RDW	WDNR GRO
1,3,5-Trimethylbenzene	0.84	mg/kg		0.010	0.030	09/01/98	09/04/98	RDW	WDNR GRO
Benzene	0.076	mg/kg		0.009	0.029	09/01/98	09/04/98	RDW	WDNR GRO
Ethylbenzene	0.28	mg/kg	Z	0.009	0.028	09/01/98	09/04/98	RDW	WDNR GRO
Gasoline Range Organics	65	mg/kg	L	1.3	4.5	09/01/98	09/04/98	RDW	WDNR GRO
m & p- Xylene	0.47	mg/kg		0.017	0.053	09/01/98	09/04/98	RDW	WDNR GRO
Methyl t-Butyl Ether	<0.025	mg/kg		0.011	0.034	09/01/98	09/04/98	RDW	WDNR GRO
o-Xylene	0.075	mg/kg		0.008	0.026	09/01/98	09/04/98	RDW	WDNR GRO
Toluene	0.067	mg/kg		0.008	0.026	09/01/98	09/04/98	RDW	WDNR GRO
1-Methyl Naphthalene	0.96	mg/kg		0.047	0.16	09/03/98	09/03/98	CMK	EPA 8310
2-Methyl Naphthalene	1.6	mg/kg		0.031	0.10	09/03/98	09/03/98	CMK	EPA 8310
Acenaphthene	<0.048	mg/kg		0.048	0.16	09/03/98	09/03/98	CMK	EPA 8310
Acenaphthylene	<0.051	mg/kg		0.051	0.17	09/03/98	09/03/98	CMK	EPA 8310
Anthracene	<0.023	mg/kg		0.023	0.077	09/03/98	09/03/98	CMK	EPA 8310
Benzo(a)anthracene	<0.0020	mg/kg		0.0020	0.0068	09/03/98	09/03/98	CMK	EPA 8310
Benzo(a)pyrene	<0.0015	mg/kg		0.0015	0.0050	09/03/98	09/03/98	CMK	EPA 8310
Benzo(b)fluoranthene	0.0058	mg/kg		0.0015	0.0050	09/03/98	09/03/98	CMK	EPA 8310
Benzo(g,h,i)perylene	<0.0041	mg/kg		0.0041	0.014	09/03/98	09/03/98	CMK	EPA 8310
Benzo(k)fluoranthene	<0.0015	mg/kg		0.0015	0.0050	09/03/98	09/03/98	CMK	EPA 8310
Chrysene	<0.092	mg/kg		0.092	0.31	09/03/98	09/03/98	CMK	EPA 8310
Dibenzo(a,h)anthracene	<0.23	mg/kg		0.23	0.77	09/03/98	09/03/98	CMK	EPA 8310
Fluoranthene	<0.0049	mg/kg		0.0049	0.016	09/03/98	09/03/98	CMK	EPA 8310
Fluorene	<0.0086	mg/kg		0.0086	0.029	09/03/98	09/03/98	CMK	EPA 8310
Indeno(1,2,3-cd)pyrene	<0.0094	mg/kg		0.0094	0.031	09/03/98	09/03/98	CMK	EPA 8310
Naphthalene	0.44	mg/kg		0.031	0.10	09/03/98	09/03/98	CMK	EPA 8310
Phenanthrene	0.080	mg/kg		0.0035	0.012	09/03/98	09/03/98	CMK	EPA 8310
Pyrene	<0.0062	mg/kg		0.0062	0.021	09/03/98	09/03/98	CMK	EPA 8310

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ANALYTICAL REPORT

Customer #: LT7000003487
Work Order: 9808000949
Report Date: 09/04/98
Date Received: 08/31/98
Arrival Temperature: On Ice

Report Submitted By: *Record Reviewer*

'WIN PORTS TESTING
RVIN G. MOSSBERGER
301 N THIRD ST
UPERIOR, WI 54880

Iote: None

roject Name: **MURPHY OIL** Project Number: **828-98E**

ample D. #: 210494 **Sample Description:** R-29 4' **Date Sampled:** 08/27/98

Analyte	Result	Units	Qualifier	LOD	LOQ	Date Extracted	Date Analyzed	Analyst	Method
'otal Percent Solids	62.7	%					09/01/98	EMH	EPA 5030
,2,4-Trimethylbenzene	9.6	mg/kg		0.015	0.053	09/01/98	09/04/98	RDW	WDNR GRO
,3,5-Trimethylbenzene	2.3	mg/kg		0.010	0.030	09/01/98	09/04/98	RDW	WDNR GRO
enzene	<0.50	mg/kg	V	0.009	0.029	09/01/98	09/04/98	RDW	WDNR GRO
thylbenzene	2.2	mg/kg	Z	0.009	0.028	09/01/98	09/04/98	RDW	WDNR GRO
asoline Range Organics	350	mg/kg	L	1.3	4.5	09/01/98	09/04/98	RDW	WDNR GRO
n & p- Xylene	2.9	mg/kg		0.017	0.053	09/01/98	09/04/98	RDW	WDNR GRO
Iethyl t-Butyl Ether	<0.50	mg/kg		0.011	0.034	09/01/98	09/04/98	RDW	WDNR GRO
-Xylene	<0.50	mg/kg		0.008	0.026	09/01/98	09/04/98	RDW	WDNR GRO
'oluene	<0.50	mg/kg		0.008	0.026	09/01/98	09/04/98	RDW	WDNR GRO
-Methyl Naphthalene	1.3	mg/kg		0.047	0.16	09/03/98	09/03/98	CMK	EPA 8310
-Methyl Naphthalene	2.1	mg/kg		0.031	0.10	09/03/98	09/03/98	CMK	EPA 8310
cenaphthene	<0.048	mg/kg		0.048	0.16	09/03/98	09/03/98	CMK	EPA 8310
cenaphthylene	<0.051	mg/kg		0.051	0.17	09/03/98	09/03/98	CMK	EPA 8310
nthracene	<0.023	mg/kg		0.023	0.077	09/03/98	09/03/98	CMK	EPA 8310
enzo(a)anthracene	<0.0020	mg/kg		0.0020	0.0068	09/03/98	09/03/98	CMK	EPA 8310
enzo(a)pyrene	<0.0015	mg/kg		0.0015	0.0050	09/03/98	09/03/98	CMK	EPA 8310
enzo(b)fluoranthene	0.0061	mg/kg		0.0015	0.0050	09/03/98	09/03/98	CMK	EPA 8310
enzo(g,h,i)perylene	<0.0041	mg/kg		0.0041	0.014	09/03/98	09/03/98	CMK	EPA 8310
enzo(k)fluoranthene	<0.0015	mg/kg		0.0015	0.0050	09/03/98	09/03/98	CMK	EPA 8310
'hrysene	<0.092	mg/kg		0.092	0.31	09/03/98	09/03/98	CMK	EPA 8310
ibenzo(a,h)anthracene	<0.23	mg/kg		0.23	0.77	09/03/98	09/03/98	CMK	EPA 8310
luoranthene	<0.0049	mg/kg		0.0049	0.016	09/03/98	09/03/98	CMK	EPA 8310
luorene	<0.0086	mg/kg		0.0086	0.029	09/03/98	09/03/98	CMK	EPA 8310
ideno(1,2,3-cd)pyrene	<0.0094	mg/kg		0.0094	0.031	09/03/98	09/03/98	CMK	EPA 8310
laphthalene	0.66	mg/kg		0.031	0.10	09/03/98	09/03/98	CMK	EPA 8310
henanthrene	0.11	mg/kg		0.0035	0.012	09/03/98	09/03/98	CMK	EPA 8310
yrene	<0.0062	mg/kg		0.0062	0.021	09/03/98	09/03/98	CMK	EPA 8310

ample D. #: 210495 **Sample Description:** R-31 6' **Date Sampled:** 08/27/98

nalyte	Result	Units	Qualifier	LOD	LOQ	Date Extracted	Date Analyzed	Analyst	Method
otal Percent Solids	71.7	%					09/01/98	EMH	EPA 5030
,2,4-Trimethylbenzene	0.26	mg/kg		0.015	0.053	09/01/98	09/04/98	RDW	WDNR GRO
,3,5-Trimethylbenzene	0.15	mg/kg		0.010	0.030	09/01/98	09/04/98	RDW	WDNR GRO
enzene	0.036	mg/kg	J	0.009	0.029	09/01/98	09/04/98	RDW	WDNR GRO
thylbenzene	0.11	mg/kg	Z	0.009	0.028	09/01/98	09/04/98	RDW	WDNR GRO
asoline Range Organics	36	mg/kg	L	1.3	4.5	09/01/98	09/04/98	RDW	WDNR GRO
n & p- Xylene	0.17	mg/kg		0.017	0.053	09/01/98	09/04/98	RDW	WDNR GRO
Iethyl t-Butyl Ether	<0.025	mg/kg		0.011	0.034	09/01/98	09/04/98	RDW	WDNR GRO
-Xylene	0.054	mg/kg		0.008	0.026	09/01/98	09/04/98	RDW	WDNR GRO
oluene	<0.025	mg/kg		0.008	0.026	09/01/98	09/04/98	RDW	WDNR GRO

Commonwealth Technology, Inc.
Laboratory Division
Accredited Lab Data for Today's Environment

1230 Lange Court
Baraboo, WI 53913-3901
Phone: 800-228-3012
Fax: 608-356-2766
email: fyi@ctienv.com

ANALYTICAL REPORT

Customer #: LT7000003487
Work Order: 9808000949
Report Date: 09/04/98
Date Received: 08/31/98
Arrival Temperature: On Ice

Report Submitted By: *Record Reviewer*

TWIN PORTS TESTING
IRVIN G. MOSSBERGER
1301 N THIRD ST
SUPERIOR, WI 54880

Note: RUSH 9/8

Project Name: **MURPHY OIL** Project Number: **828-98E**

Sample I.D. #: 210496 **Sample Description:** SP-4 **Date Sampled:** 08/27/98

Analyte	Result	Units	Qualifier	LOD	LOQ	Date Extracted	Date Analyzed	Analyst	Method
Total Percent Solids	75.4	%					09/01/98	EMH	EPA 5030
1,2,4-Trimethylbenzene	4.5	mg/kg		0.015	0.053	09/01/98	09/03/98	RDW	WDNR GRO
1,3,5-Trimethylbenzene	3.8	mg/kg		0.010	0.030	09/01/98	09/03/98	RDW	WDNR GRO
Benzene	<0.25	mg/kg	V	0.009	0.029	09/01/98	09/03/98	RDW	WDNR GRO
Ethylbenzene	<0.25	mg/kg		0.009	0.028	09/01/98	09/03/98	RDW	WDNR GRO
Gasoline Range Organics	380	mg/kg	L	1.3	4.5	09/01/98	09/03/98	RDW	WDNR GRO
m & p- Xylene	1.1	mg/kg		0.017	0.053	09/01/98	09/03/98	RDW	WDNR GRO
Methyl t-Butyl Ether	<0.25	mg/kg		0.011	0.034	09/01/98	09/03/98	RDW	WDNR GRO
o-Xylene	0.64	mg/kg		0.008	0.026	09/01/98	09/03/98	RDW	WDNR GRO
Toluene	<0.25	mg/kg		0.008	0.026	09/01/98	09/03/98	RDW	WDNR GRO

Sample I.D. #: 210497 **Sample Description:** FB **Date Sampled:** 08/27/98

Analyte	Result	Units	Qualifier	LOD	LOQ	Date Extracted	Date Analyzed	Analyst	Method
1,2,4-Trimethylbenzene	<0.025	mg/kg		0.015	0.053	09/01/98	09/04/98	RDW	WDNR GRO
1,3,5-Trimethylbenzene	<0.025	mg/kg		0.010	0.030	09/01/98	09/04/98	RDW	WDNR GRO
Benzene	<0.025	mg/kg		0.009	0.029	09/01/98	09/04/98	RDW	WDNR GRO
Ethylbenzene	<0.025	mg/kg		0.009	0.028	09/01/98	09/04/98	RDW	WDNR GRO
Gasoline Range Organics	<1.3	mg/kg		1.3	4.5	09/01/98	09/04/98	RDW	WDNR GRO
m & p- Xylene	<0.025	mg/kg		0.017	0.053	09/01/98	09/04/98	RDW	WDNR GRO
Methyl t-Butyl Ether	<0.025	mg/kg		0.011	0.034	09/01/98	09/04/98	RDW	WDNR GRO
o-Xylene	<0.025	mg/kg		0.008	0.026	09/01/98	09/04/98	RDW	WDNR GRO
Toluene	<0.025	mg/kg		0.008	0.026	09/01/98	09/04/98	RDW	WDNR GRO

Sample I.D. #: 210498 **Sample Description:** SP-1 **Date Sampled:** 08/27/98

Analyte	Result	Units	Qualifier	LOD	LOQ	Date Extracted	Date Analyzed	Analyst	Method
Total Percent Solids	79.2	%					09/01/98	EMH	EPA 5030
1,2,4-Trimethylbenzene	7.1	mg/kg		0.015	0.053	09/01/98	09/03/98	RDW	WDNR GRO
1,3,5-Trimethylbenzene	4.0	mg/kg		0.010	0.030	09/01/98	09/03/98	RDW	WDNR GRO
Benzene	<0.25	mg/kg	V	0.009	0.029	09/01/98	09/03/98	RDW	WDNR GRO
Ethylbenzene	1.0	mg/kg	Z	0.009	0.028	09/01/98	09/03/98	RDW	WDNR GRO
Gasoline Range Organics	450	mg/kg	L	1.3	4.5	09/01/98	09/03/98	RDW	WDNR GRO
m & p- Xylene	2.3	mg/kg		0.017	0.053	09/01/98	09/03/98	RDW	WDNR GRO
Methyl t-Butyl Ether	<0.25	mg/kg		0.011	0.034	09/01/98	09/03/98	RDW	WDNR GRO
o-Xylene	1.2	mg/kg		0.008	0.026	09/01/98	09/03/98	RDW	WDNR GRO
Toluene	0.61	mg/kg		0.008	0.026	09/01/98	09/03/98	RDW	WDNR GRO

Commonwealth Technology, Inc.
Laboratory Division
Accredited Lab Data for Today's Environment

1230 Lange Court
Baraboo, WI 53913-3901
Phone: 800-228-3012
Fax: 608-356-2766
email: fyi@ctienv.com

ANALYTICAL REPORT

Customer #: LT7000003487
Work Order: 9808000949
Report Date: 09/04/98
Date Received: 08/31/98
Arrival Temperature: On Ice

Report Submitted By: *Record Reviewer*

'WIN PORTS TESTING
RVIN G. MOSSBERGER
301 N THIRD ST
UPERIOR, WI 54880

Note: RUSH 9/8

Project Name: **MURPHY OIL** Project Number: **828-98E**

Sample I.D. #: 210499 **Sample Description:** SP-2 **Date Sampled:** 08/27/98

Analyte	Result	Units	Qualifier	LOD	LOQ	Date Extracted	Date Analyzed	Analyst	Method
'otal Percent Solids	78.9	%					09/01/98	EMH	EPA 5030
,2,4-Trimethylbenzene	4.2	mg/kg	D	0.015	0.053	09/01/98	09/03/98	RDW	WDNR GRO
,3,5-Trimethylbenzene	2.9	mg/kg		0.010	0.030	09/01/98	09/03/98	RDW	WDNR GRO
3enzene	<0.025	mg/kg		0.009	0.029	09/01/98	09/03/98	RDW	WDNR GRO
:thylbenzene	0.27	mg/kg	Z	0.009	0.028	09/01/98	09/03/98	RDW	WDNR GRO
3asoline Range Organics	300	mg/kg	L	1.3	4.5	09/01/98	09/03/98	RDW	WDNR GRO
1 & p- Xylene	0.99	mg/kg		0.017	0.053	09/01/98	09/03/98	RDW	WDNR GRO
1ethyl t-Butyl Ether	<0.025	mg/kg		0.011	0.034	09/01/98	09/03/98	RDW	WDNR GRO
-Xylene	0.53	mg/kg		0.008	0.026	09/01/98	09/03/98	RDW	WDNR GRO
'oluene	0.23	mg/kg		0.008	0.026	09/01/98	09/03/98	RDW	WDNR GRO

Sample I.D. #: 210500 **Sample Description:** SP-3 **Date Sampled:** 08/27/98

Analyte	Result	Units	Qualifier	LOD	LOQ	Date Extracted	Date Analyzed	Analyst	Method
'otal Percent Solids	74.1	%					09/01/98	EMH	EPA 5030
,2,4-Trimethylbenzene	18	mg/kg		0.015	0.053	09/01/98	09/03/98	RDW	WDNR GRO
,3,5-Trimethylbenzene	11	mg/kg		0.010	0.030	09/01/98	09/03/98	RDW	WDNR GRO
3enzene	<1.0	mg/kg	V	0.009	0.029	09/01/98	09/03/98	RDW	WDNR GRO
:thylbenzene	<1.0	mg/kg		0.009	0.028	09/01/98	09/03/98	RDW	WDNR GRO
3asoline Range Organics	1100	mg/kg	L	1.3	4.5	09/01/98	09/03/98	RDW	WDNR GRO
1 & p- Xylene	5.4	mg/kg		0.017	0.053	09/01/98	09/03/98	RDW	WDNR GRO
1ethyl t-Butyl Ether	<1.0	mg/kg		0.011	0.034	09/01/98	09/03/98	RDW	WDNR GRO
-Xylene	<1.0	mg/kg		0.008	0.026	09/01/98	09/03/98	RDW	WDNR GRO
'oluene	<1.0	mg/kg		0.008	0.026	09/01/98	09/03/98	RDW	WDNR GRO

Commonwealth
Technology, Inc.
Laboratory Division
Accredited Lab Data for Today's Environment

1230 Lange Court
Baraboo, WI 53913-3901
Phone: 800-228-3012
Fax: 608-356-2766
email: fyi@ctienv.com

Data Qualifiers

A	Sample analyzed with a dilution. Surrogates were diluted outside the calibration range. Applies to all analytes for this method.
B	Analyte detected in associated Method Blank.
C	Sample result confirmed by alternate analysis.
D	Results reported from higher dilution.
E	Analyte concentration exceeded calibration range.
F	Unable to analyze due to sample matrix interference. Applies to all analytes for this method.
G	Insufficient sample for analysis. Applies to all analytes for this method.
H	Sample was received past the established holding time. Applies to all analytes for this method.
I	Sample was analyzed past the established holding time. Applies to all analytes for this method.
J	Reported concentration below the Quantitation Limit.
K	Sample contained lighter hydrocarbon fractions.
L	Sample contained heavier hydrocarbon fractions.
M	Matrix Spike and/or Matrix Spike Duplicate outside acceptance limits.
O	Hydrocarbons atypical of gasoline.
P	Hydrocarbons atypical of diesel #2 fuel.
Q	Laboratory Control Sample outside acceptance limits.
S	Surrogate outside acceptance limits. Applies to all analytes for this method.
T	Sample received exceeding proper preservation criteria. Applies to all analytes for this method.
V	Raised Quantitation Limit due to dilution for background interference. Applies to all analytes for this method.
W	Raised Quantitation Limit due to limited sample volume. Applies to all analytes for this method.
Y	Replicate outside acceptance limits.
Z	Calibration criteria exceeded.

1	Safe, No Total Coliform detected.
2	Unsafe, Total Coliform detected, no E. coli detected.
3	Unsafe, Total Coliform detected, E. coli detected.
4	Sample weight was below program minimum. Applies to all analytes for this method.
5	Insufficient oxygen depletion.
6	Complete oxygen depletion.
7	Sliding BOD, toxicity present in sample.

CTI Wisconsin Division Laboratory Certification #'s:
IA DNR: 146
KY Dept. of Environmental Protection: 90110
WI DNR: 157066030
DATCP: 289

Commonwealth Technology, Inc.
1230 Lange Court
Baraboo, WI 53913
(608) 356-2760
FAX: (608) 356-2766

949

№ 5357

Is this a PECFA project? (Please indicate "Yes" or "No") _____

SAMPLE COLLECTOR: Irvin Mossberger | COMPANY: Twin Ports Testing | TELEPHONE # (include area code): (715) 392-7114

PROJECT NUMBER: 8208-98E | PROJECT NAME:

I HEREBY CERTIFY THAT I RECEIVED, PROPERLY HANDLED, AND DISPOSED OF THESE SAMPLES AS NOTED BELOW:

INVOICE ADDRESS (must be completed): Murphy Oil 2407 Stinson Ave. Superior, WI 54880

REPORT ADDRESS (must be completed): Twin Ports Testing 1301 N. 3rd St. Superior, WI 54880 ATTN: Irvin Mossberger

DATE & TIME OF RELINQUISHMENT:	RELINQUISHED BY (signature):	RECEIVED BY (signature):	DATE / TIME OF RECEPTION:
8/28/98 8:10am	[signature]		
DATE & TIME OF RELINQUISHMENT:	RELINQUISHED BY (signature):	RECEIVED BY LABORATORY (signature): [signature]	DATE / TIME OF RECEPTION: 8/29/98

FIELD ID NUMBER	DATE COLLECTED	TIME COLLECTED	SAMPLE TYPE	SAMPLE DEVICE	PRESERV. TYPE	LOCATION / DESCRIPTION	TYPE OF ANALYSES REQUIRED (please circle)	LAB USE ONLY PROF. W/MeOH? "X" IF YES	NO./TYPE OF CONTAINERS	LAB I.D.
R-24 7'	8/27/98	1:10	Soil		MeOH		DRO GRO (GRO/PVOC) PVOC Pb Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER PAH Other (please list):		2	210490
R-25 6'		1:15					DRO GRO (GRO/PVOC) PVOC Pb Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER (PAH) Other (please list):		3	210491
R-26 5'		1:19					DRO GRO (GRO/PVOC) PVOC Pb Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER PAH Other (please list):		2	210492
R-28 5'		1:23					DRO GRO (GRO/PVOC) PVOC Pb Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER (PAH) Other (please list):		3	210493
R-29 4'		1:26					DRO GRO (GRO/PVOC) PVOC Pb Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER (PAH) Other (please list):		3	210494
R-31 6'		1:32					DRO GRO (GRO/PVOC) PVOC Pb Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER PAH Other (please list):		2	210495
SP-4		1:35				"Rush" Turnaround	DRO GRO (GRO/PVOC) PVOC Pb Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER PAH Other (please list):		2	210496
Field Blank		4:05					DRO GRO (GRO/PVOC) PVOC Pb Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER PAH Other (please list):		1	210497

SAMPLE CONDITIONS / COMMENTS:

CHECKED _____

ARRIVAL TEMPERATURE: On ice

Commonwealth Technology, Inc.

ENVIRONMENTAL AND ANALYTICAL SERVICES
1230 Lange Court
Baraboo, WI 53913
1-800-228-3012 (608) 356-2760 FAX: (608) 356-2766

N° 2100

"Rush" Turnaround Please

949

Project #: 808-98E

Proj. Name:

Client Name / Number: Twin Ports Testing

Date	Time	Comp	Grab	Sample Description	Sample #	Number of Containers	GRO/PVOC	Pres.	Sample I.D. #'s:
8/28/98	3:35		X		SP-1	2	X		210498
	3:40				SP-2	1			210499
	3:45				SP-3				210500

Space Below For Laboratory Use

Sampled By: Irvin G. Mossberger

Relinquished By: Irvin G. Mossberger Date: 8/28/98 Time: 8:10 am

Received By: Date: Time:

Received By Lab: O. Gill Date: 8/29/98 Time:

Remarks:

Date Sample Disposed of:

Sample Shipped Via: X UPS ____ Fed. Exp. ____ Hand ____ U.S. Mail

Sublab: ____

Is this a PECFA project? (Please indicate "Yes" or "No") Yes

Sample Status: on ice

Deg. C: pH:

Form 4400-120 was not completed at the time this report was prepared.