#54880-0456-07H

Wisconsin
Department of Natural Resources



# WI DNR Activities at Discharge Sites

Help

BRRTS data comes from many sources inside and outside of DNR. There may be gaps and errors in the data, or delays in updating new information. Please see our disclaimers page for more information.

**DNR Activity Number:** 02-16-222701 *See page 3

| | |
|---|---|
| **Activity Type:** | ERP |
| **Activity Name:** | MURPHY OIL - TANK BASIN 51 & 52 |
| **Start Date:** | 01/14/1994 |
| **End Date:** | |
| **Site Name:** | MURPHY OIL CORP |
| **Address:** | 2400 STINSON AVE |
| **Municipality:** | SUPERIOR |
| **Zip:** | 548800456 |
| **County:** | Douglas |
| **DNR Region:** | Northern Region |
| **Facility Acres:** | 365 |
| **Degrees of Latitude:** | 46 |
| **Minutes of Latitude:** | 41 |
| **Seconds of Latitude:** | 27.6 |
| **Degrees of Longitude:** | 92 |
| **Minutes of Longitude:** | 4 |
| **Seconds of Longitude:** | 16.4 |
| **Lat/Long Datum:** | 1927 (NAD27) |

| | |
|---|---|
| **Lat/Long Method:** | Digitized from a map @ larger than 1:24,000 scale [40 meters] |
| **Quarter Quarter Section:** | NW |
| **Quarter Section:** | NW |
| **Survey Section:** | 36 |
| **Survey Township:** | 49 |
| **Survey Range:** | 14W |

**FID Number:** 816009590

**Jurisdiction:** Commerce

**Priority:** Unknown

**Risk:** Medium

## Persons or Companies associated with this DNR Activity

| Person or Company | Role | Address | Address 2 | PO Box | Municipality | State | Zip |
|---|---|---|---|---|---|---|---|
| HOSCH, JIM | Project Manager | 1401 TOWER AVE | WDNR | | SUPERIOR | WI | 54880 |

Record 1 of 1

Download

## Actions performed during this DNR Activity

| Action Name | Action Description | Comment | Date Action Occurred |
|---|---|---|---|
| Notification | Date the DNR is notified of the discovery of the contamination. | PER SPILL 04-16-049234, 04-16-202285, 04-16-208524 | 01/14/1994 |
| Activity Transferred to DCOM | Date that project management for the activity is transferred to Department of Commerce. Includes transfer of site files. | | 06/15/1999 |

Records 1 to 2 of 2

Download

# Impacts

| Impact Description | Comment |
|---|---|
| Soil Contamination | |

Record 1 of 1

# Substance

| Substance Description | Substance Name | Amount Released | Units |
|---|---|---|---|
| Fuel Oil | | | |

Record 1 of 1

# Spiller Action

No Records returned

- Person or Company
- Distance
- PLSS
- Lat/Long

---

- **Return Links**
  - BRRTS on the Web

**Send DNR Feedback About This DNR Activity**

BRRTS on the Web Feedback Form


# WI DNR Activities at Discharge Sites


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| | |
|---|---|
| **DNR Activity Number:** | 04-16-049234 |
| **Activity Type:** | Spills |
| **Activity Name:** | MURPHY OIL - TANK BASIN 51 & 52 |
| **Start Date:** | 01/14/1994 |
| **End Date:** | |
| **Site Name:** | MURPHY OIL CORP |
| **Address:** | 2400 STINSON AVE |
| **Municipality:** | SUPERIOR |
| **Zip:** | 548800456 |
| **County:** | Douglas |
| **DNR Region:** | Northern Region |
| **Facility Acres:** | 365 |
| **Degrees of Latitude:** | 46 |
| **Minutes of Latitude:** | 41 |
| **Seconds of Latitude:** | 27.6 |
| **Degrees of Longitude:** | 92 |
| **Minutes of Longitude:** | 4 |
| **Seconds of Longitude:** | 16.4 |
| **Lat/Long Datum:** | 1927 (NAD27) |
| **Lat/Long Method:** | Digitized from a map @ larger than 1:24,000 scale [40 meters] |
| **Quarter Quarter Section:** | NW |
| **Quarter Section:** | NW |
| **Survey Section:** | 36 |
| **Survey Township:** | 49 |
| **Survey Range:** | 14W |

**FID Number:** 816009590
**Activity Comment:** OLD SPILL ID: 940114-01
**Jurisdiction:** DNR

**Incident Time:** 01/14/1994 04:00:00 am

**Spill Cause:** OVERFILL

**Spill Source Description:** Pipeline, Terminal, Tank Farm, Oil Jobber/Wholesaler

**Notified DNR Immediately:** Y
**DNR Investigator:** S LAVALLEY

## Persons or Companies associated with this DNR Activity

| Person or Company | Role | Address | Address 2 | PO Box | Municipality | State | Zip |
|---|---|---|---|---|---|---|---|
| MURPHY OIL USA | Responsible Party | | | | | | |

Record 1 of 1

Download

## Actions performed during this DNR Activity

| Action Name | Action Description | Comment | Date Action Occurred |
|---|---|---|---|
| Notification | Date the DNR is notified of the discovery of the contamination. | Auto populated via migration process | 01/14/1994 |
| Activity Transferred to ERP | This case was not closed out shortly after occurrence and is now tracked as an activity in ERP program. | 02-16-222701 | 06/10/1999 |

Records 1 to 2 of 2

Download

# Impacts

| Impact Description | Comment |
|---|---|
| Soil Contamination | SOIL |

Record 1 of 1

# Substance

| Substance Description | Substance Name | Amount Released | Units |
|---|---|---|---|
| Fuel Oil | 5 FUEL OIL | 4200 | Gallon |

Record 1 of 1

# Spiller Action

| Spiller Action | Comment |
|---|---|
| Cleanup Method | SOIL |

Record 1 of 1

- Person or Company
- Distance
- PLSS
- Lat/Long

---

- **Return Links**
  - BRRTS on the Web

**Send DNR Feedback About This DNR Activity**
BRRTS on the Web Feedback Form


# WI DNR Activities at Discharge Sites


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| | |
|---|---|
| **DNR Activity Number:** | 04-16-202285 |
| **Activity Type:** | Spills |
| **Activity Name:** | MURPHY OIL - TANK BASIN 51 & 52 |
| **Start Date:** | 03/12/1996 |
| **End Date:** | |
| **Site Name:** | MURPHY OIL CORP |
| **Address:** | 2400 STINSON AVE |
| **Municipality:** | SUPERIOR |
| **Zip:** | 548800456 |
| **County:** | Douglas |
| **DNR Region:** | Northern Region |
| **Facility Acres:** | 365 |
| **Degrees of Latitude:** | 46 |
| **Minutes of Latitude:** | 41 |
| **Seconds of Latitude:** | 27.6 |
| **Degrees of Longitude:** | 92 |
| **Minutes of Longitude:** | 4 |
| **Seconds of Longitude:** | 16.4 |
| **Lat/Long Datum:** | 1927 (NAD27) |
| **Lat/Long Method:** | Digitized from a map @ larger than 1:24,000 scale [40 meters] |
| **Quarter Quarter Section:** | NW |
| **Quarter Section:** | NW |
| **Survey Section:** | 36 |
| **Survey Township:** | 49 |
| **Survey Range:** | 14W |

**FID Number:** 816009590

**Jurisdiction:** DNR

**Incident Time:** 03/12/1996 12:30:00 pm
**Reported Time:** 03/12/1996 02:15:00 pm
**Spill Cause:** Valve failed on a mechanical pump
**Spill Comment:** See comments on spill form for more detail.
**Spill Source Description:** Other
**Spill Source Comment:** oil refinery

## Persons or Companies associated with this DNR Activity

| Person or Company | Role | Address | Address 2 | PO Box | Municipality | State | Zip |
|---|---|---|---|---|---|---|---|
| MURPHY OIL USA INC | Responsible Party | 2400 STINSON AVE | | | SUPERIOR | WI | 54880 |

Record 1 of 1

Download

## Actions performed during this DNR Activity

| Action Name | Action Description | Comment | Date Action Occurred |
|---|---|---|---|
| Notification | Date the DNR is notified of the discovery of the contamination. | | 03/12/1996 |
| Activity Transferred to ERP | This case was not closed out shortly after occurrence and is now tracked as an activity in ERP program. | 02-16-222701 | 06/10/1999 |

Records 1 to 2 of 2

Download

# Impacts

| Impact Description | Comment |
|---|---|
| Soil Contamination | |

Record 1 of 1

# Substance

| Substance Description | Substance Name | Amount Released | Units |
|---|---|---|---|
| Fuel Oil | | 420 | Gallon |

Record 1 of 1

# Spiller Action

| Spiller Action | Comment |
|---|---|
| Cleanup Method | vac up |
| Waste Destination | Slop oil tank |
| Contractor Hired | CEDA Corp |

Records 1 to 3 of 3

- Person or Company
- Distance
- PLSS
- Lat/Long

---

- **Return Links**
  - BRRTS on the Web


# WI DNR Activities at Discharge Sites


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| | |
|---|---|
| **DNR Activity Number:** | 04-16-208524 |
| **Activity Type:** | Spills |
| **Activity Name:** | MURPHY OIL - TANK BASIN 51 & 52 |
| **Start Date:** | 02/08/1996 |
| **End Date:** | |
| **Site Name:** | MURPHY OIL CORP |
| **Address:** | 2400 STINSON AVE |
| **Municipality:** | SUPERIOR |
| **Zip:** | 548800456 |
| **County:** | Douglas |
| **DNR Region:** | Northern Region |
| **Facility Acres:** | 365 |
| **Degrees of Latitude:** | 46 |
| **Minutes of Latitude:** | 41 |
| **Seconds of Latitude:** | 27.6 |
| **Degrees of Longitude:** | 92 |
| **Minutes of Longitude:** | 4 |
| **Seconds of Longitude:** | 16.4 |
| **Lat/Long Datum:** | 1927 (NAD27) |
| **Lat/Long Method:** | Digitized from a map @ larger than 1:24,000 scale [40 meters] |
| **Quarter Quarter Section:** | NW |
| **Quarter Section:** | NW |
| **Survey Section:** | 36 |
| **Survey Township:** | 49 |
| **Survey Range:** | 14W |

**FID Number:** 816009590

**Jurisdiction:** DNR

**Incident Time:** 02/08/1996 01:15:00 pm
**Reported Time:** 02/08/1996 02:15:00 pm
**Spill Cause:** overfill

**Spill Source Description:** Pipeline, Terminal, Tank Farm, Oil Jobber/Wholesaler

## Persons or Companies associated with this DNR Activity

| Person or Company | Role | Address | Address 2 | PO Box | Municipality | State | Zip |
|---|---|---|---|---|---|---|---|
| MURPHY OIL | Responsible Party | EAST SECOND STREET | | | SUPERIOR | WI | 54880 |

Record 1 of 1

Download

## Actions performed during this DNR Activity

| Action Name | Action Description | Comment | Date Action Occurred |
|---|---|---|---|
| Notification | Date the DNR is notified of the discovery of the contamination. | | 02/08/1996 |
| Date Spill Ocurred (Activity Date) | Date the spill occurred. Use notification date if unknown. | | 02/08/1996 |
| Activity Transferred to ERP | This case was not closed out shortly after occurrence and is now tracked as an activity in ERP program. | 02-16-222701 | 06/10/1999 |

Records 1 to 3 of 3

Download

# Impacts

| Impact Description | Comment |
|---|---|
| Contained/Recovered | |

Record 1 of 1

# Substance

| Substance Description | Substance Name | Amount Released | Units |
|---|---|---|---|
| Fuel Oil | | 30 | Barrel |

Record 1 of 1

# Spiller Action

| Spiller Action | Comment |
|---|---|
| Cleanup Method | recovery |
| Containment | |

Records 1 to 2 of 2

- Person or Company
- Distance
- PLSS
- Lat/Long

---

- **Return Links**

Wisconsin
Department of Commerce

P. O. Box 530
Park Falls, Wisconsin 54552
(715) 762-5557
FAX (715) 762-0054

Tommy G. Thompson, Governor
Brenda J. Blanchard, Secretary

August 19, 1999

Mr. Greg Neve
Murphy Oil USA, Inc.
2407 Stinson Ave.
Superior, WI 54880

Subject: **Close-out of Case # 54880-0456-07H/ BRRTS # 02-16-222701**
**Tanks 51 and 52**
**2400 Stinson Ave**
**Superior, WI 54880**

Dear Mr. Neve:

On August 17, 1999 the above site was reviewed for closure by the Site Review staff of the PECFA Bureau. Because the site involved only soil contamination, without a threat to groundwater, all issues relating to this site are administered by the staff within the Department of Commerce's PECFA Bureau. Using the standards established in NR 700, the Department has determined that this site has been remediated to a level protective of the environment and human health. The Department considers this site to meet environmental standards, and no further action is necessary.

This is based upon the information provided to us by your consultant. If, in the future, site conditions indicate that any contamination that might remain poses a threat, the need for further remediation would be determined and required if necessary.

Be sure on future submittals for closure your consultant includes the correct BRRT's Number as well as the Commerce number and the addresses for anyone who needs to be copied on the closure letter. With this letter I am asking that you or your consultant get copies to the appropriate parties.

Thank you for your efforts in the protection of the environment. If you have any additional questions, please call me at 715-762-5557.

Sincerely,

Shanna L. Laube, P.G.
Hydrogeologist
PECFA Program

cc: David Olig, Gannett Fleming, Inc

eder associates
a division of Gannett Fleming

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

August 6, 1999
File #34265.003



Ms. Shanna Laube
Wisconsin Department of Commerce
Env. & Regulatory Services
214 North Fourth Avenue
P.O. Box 220
Park Falls, WI 54552

Re: Tanks 51/52 Release Site, Murphy Oil USA. Inc., Superior, Wisconsin
PECFA Claim #: 54880-0456-07-H
WDNR BRRTS #: 02-16-22701

Dear Ms. Laube:

While reviewing Murphy's historic release records for the Tanks 45, 46, and 79 basin, we identified an error in the release list for this tank basin and are writing this letter to correct the record. A list of historical spills originally prepared for Murphy's Superior refinery identified two releases in this tank basin; one of which was a release of light cycle oil from Tank 46. Upon further examination of Murphy's records, we became aware of a mistake in the historical spills list that had not been previously detected. The November 15, 1993, release occurred during the transfer of special #6 fuel oil (light cycle oil and slurry oil mixture) *from* Tank 46 *to* Tank 51. The actual release occurred in the Tank 51/52 basin, not in the Tank 45/46/79 basin as identified in the historical spills list. A copy of Murphy's notification to the WDNR confirming this is attached.

In addition to this release, there were three other releases in the Tank 51/52 basin. Please note that the other three releases in the Tank 51/52 basin were all #6 fuel oil. Therefore, the product (special #6 fuel oil) involved in this fourth release in the Tank 51/52 basin is consistent with the other three releases in that basin, and the investigative activities, including the parameters analyzed for in the investigation, were appropriate. The addition of this release in the Tank 51/52 basin should not affect your decision on our July 2, 1999, closure request for this tank basin.

We apologize for this misunderstanding, but we believe it is necessary to correct the record regarding this release. We request that you continue with your review of our closure request for the Tank 51/52 basin. Because the product in the November 1993 release is consistent with the other three



Continued . . .

Ms. Shanna Laube
Wisconsin Department of Commerce
August 6, 1999



releases identified in the Tank 51/52 basin, we do not believe the addition of this fourth release in the tank basin should affect your response to our closure request for the Tank 51 basin.

If you have any questions about this letter, please call me.

Sincerely,

GANNETT FLEMING, INC.

David J. Olig, P.G.
Senior Project Manager

DJO/jec
Enc.

cc: James Hosch (WDNR/Superior)
Lee Vail (Murphy/New Orleans)
Greg Neve (Murphy/Superior)
Liz Lundmark (Murphy/Superior)
Kevin Melnyk (Murphy/El Dorado)
Richard Lewandowski (DeWitt, Ross & Stevens)

P 430 484 604

MURPHY OIL USA, INC.

SUPERIOR REFINERY
SUPERIOR, WISCONSIN 54880

November 20, 1993

Steve LaValley
Area Hazardous/Solid Waste Specialist
Department of Natural Resources
1705 Tower Avenue
Superior, WI 54880

RE: Special #6 Fuel Oil Storage Tank Overfill

Dear Mr. LaValley:

On behalf of Murphy Oil USA, Inc, I am providing written confirmation of the notification given on November 15, 1993, per Wisconsin Statutes, regarding the release of Special #6 fuel oil.

On November 15, 1993, at 5:30 a.m., Murphy Oil experienced an inadvertent overfill of Special #6 fuel oil from tank 51. Approximately 350 barrels of Light Cycle Oil and Slurry Oil mixture, overflowed from the tank and channeled towards the inner dike area.

After shutting off the inflow to tank 51, the dike drain valves were opened and the oil gravity flowed through hard pipe into the concrete ditch. The concrete ditch flows to the #2 oil/water separator where the material was recovered.

A contractor was called in and clean-up operations began immediately. This site will be remediated appropriately.

Murphy Oil is conducting an incident investigation into the cause of the overfill. When the root cause has been identified, recommendations to prevent a recurrence will be established.

If you have any questions or wish to discuss this matter further, please call me at (715)398-3533.

Sincerely,

William P. Gustafson
Environmental Operations Superintendent

cc: Jim Gesick
Jim Britt
Jim Kowitz
Randy Kooiman
Rick Lewandowski

SPUR

MURPHY OIL CORPORATION

# SPILL REPORT

## SUPERVISOR'S INVESTIGATION OF SPILL

### (HOW IT HAPPENED AND WHY)

PLEASE COMPLETE THIS FORM IMMEDIATELY AFTER SPILL. EACH SPILL SHOULD BE INVESTIGATED IRRESPECTIVE OF WHETHER THE RESULT WAS SERIOUS OR MINOR. THE OBJECT IS TO PREVENT RECURRENCE AND IT IS ONLY BY THOROUGH INVESTIGATION (INTERVIEW PERSON, VISIT SCENE OF SPILL IF NECESSARY, TALK TO WITNESSES) THAT THE REAL CAUSES CAN BE DETERMINED AND CORRECTED. USE BACK OF FORM IF NECESSARY.

| FULL NAME OF PERSON REPORTING SPILL | DEPARTMENT | SUPERVISOR |
|---|---|---|
| WILLIAM NUTTER | OPER. | B. KRENZ |

| PRODUCT | LOCATION | QUANTITY — ESTIMATED | DATE | TIME OCCURRED |
|---|---|---|---|---|
| LCO | E-51 | 500 BBLS ? | 11/15/93 | 0530 Hrs |

DESCRIBE DAMAGE OR EXTENT

HOW DID SPILL OCCUR? AND WHEN AND WHOM REPORTED TO:

E-51 Rec. Mgr. Notified J. Fowler and Company Exchange Coll. Engr.

DESCRIBE CAUSE FOR SPILL

A gasket was left out after fill E-51 from E-46.

PLEASE ANSWER THE FOLLOWING BY CHECKING "YES" OR "NO":

| | | | |
|---|---|---|---|
| 1. | WAS MAN PROPERLY INSTRUCTED | YES ✓ | NO |
| 2. | DID HE VIOLATE ANY INSTRUCTIONS? | YES | NO ✓ |
| 3. | WAS NECESSARY PROTECTIVE EQUIPMENT USED? | YES ✓ | NO |
| 4. | DID POOR HOUSEKEEPING CONTRIBUTE SPILL? | YES | NO ✓ |
| 5. | WERE AUTHORITIES NOTIFIED? | WHEN 0630 Hrs | WHOM ERCL ✓ |
| 6. | WAS IT CAUSED BY SOMETHING WHICH NEEDED REPAIRS? | YES | NO ✓ |
| 7. | SHOULD A GUARD BE PROVIDED? | YES | NO ✓ |
| 8. | DID ANY BODILY DEFECT CONTRIBUTE TO ACCIDENT? | YES | NO ✓ |
| 9. | WAS IT CAUSED BY AN UNSAFE ACT? | YES | NO ✓ |

PLEASE GIVE US YOUR HONEST COMMENTS ON QUESTIONS BELOW. WE ARE NOT TRYING TO BLAME ANYONE. YOUR OPINION MAY HELP US TO PREVENT REPETITION.

WHAT DO YOU CONSIDER THE REAL CAUSE OF THIS SPILL? (PLEASE DO NOT USE THE WORD "CARELESS")

Unit line and E-46 gasket at E-51

WHAT STEPS ARE BEING TAKEN TO PREVENT SIMILAR SPILLS? (EXAMPLE: MEN ARE BEING INSTRUCTED IN CORRECT PROCEDURE).

WHAT OTHER STEPS SHOULD BE TAKEN TO PREVENT RECURRENCE?

Tank gauger should be checked against the last gauge used on the tank to see if site is going up or down.

| SUPERVISOR | DATE |
|---|---|
| Tom Fowler | 11 1 ST 93 |

REVIEWING AUTHORITY — COMPLETE REVERSE SIDE

LIQUID HYDROCARBON/HAZARDOUS MATERIALS
Orig: Ref. Mgr SPILL CONTROL PLAN
cc: Opr. Mgr EMERGENCY RESPONSE CALL LOG
Env. Mgr

Murphy Oil USA, Inc. - Superior, Wisconsin Refinery

Telephone No: 715-398-3533
Location: 24th Avenue East and 26th Street
P.O. Box 2066
Superior, Wisconsin 54880

Date of Spill: 11/15/93 Time of Spill: 0530 am ____ pm

Type of Spill: LCO Amt of Spill: 500 Bbls

Specific Spill Location: F-51

Cause of Spill: F-46 Gravity F-51

Continue on back, if necessary

Time of Each Call:

____ am ____ pm Fire Dept - ONLY IF NEEDED - 394-0227 or 911
Person Contacted: ____

____ am ____ pm Police Dept - ONLY IF NEEDED - 394-0234 or 911
Person Contacted: ____

0630 am ____ pm Game Warden - 392-7988
09:45 Hazel Schoenborn DC
Person Contacted: Answering Machine

0632 am ____ pm Coast Guard MSO - 720-5286
09:47 Pete Beaman DC
Person Contacted: Answering Machine

0635 am ____ pm Douglas County Emergency Government - 394-0391
09:50 Barb Greskovich DC
Person Contacted: Answering Machine

0636 am ____ pm DNR - Environmental Engineer, Brule - 1-372-4866
10:00 Terry Tichnor DC
Person Contacted: No Answer

0638 am ____ pm Wisconsin Emergency Government - 1-608-266-3232
Person Contacted: Henry Nissen

0640 am ____ pm National Response Center - 1-800-424-8802
Person Contacted: 207921 Mr. Stewart

Signed by Person Making Calls: Tom Hintz

policy/genproc.019 (rev 4-91) 4:5(c)

# MURPHY INCIDENT REPORT FORM

JPK
RL
DH
LAS
TH
BM
BN
BG
LL
CM
CRW
FCA
BHW
MM
EC
ECSIC
Phill

AREA O/C MOVEMENTS DATE 11-15-93

UNIT TANK FARM EQUIP. NO. TANK 51

DESCRIBE INCIDENT: AT 0500 BILL NUTTER REPORTED TO TOM JOHNSTONE THAT TANK 51 HAD RUN OVER DURING THE NIGHT BUT WAS NOT OVERFLOWING AT THIS TIME (0530) ABOUT 350 BARRELS WAS SPILLED IN THE TANK 51 AREA

CONTRIBUTING FACTORS: UNMARKED PIPING, NO WRITTEN PROCEDURE, RARELY USED LINES AND LACK OF TRAINING.

IMMEDIATE CORRECTIVE ACTION TAKEN (BEFORE END OF SHIFT): PIPING WAS INSPECTED AND A VALVE TO THE FILL LINE ON TANK 46 WAS FOUND OPEN CAUSING TANK 46 TO GRAVITATE TO T-51. THIS VALVE WAS CLOSED AT THAT POINT IN TIME.

THIS INCIDENT HAS been RESOLVED TO MY SATISFACTION.

| | NAME | DATE |
|---|---|---|
| ON SCENE INVESTIGATOR | TOM JOHNSTONE | |
| PERSON(S) INVOLVED | BILL NUTTER | |
| | DICK LANHART | |
| | BRUCE KRANZ | 11-15-93 |

I HAVE REVIEWED THIS INCIDENT AND IT HAS BEEN RESOLVED TO MY SATISFACTION (WITHIN SEVEN DAYS).

What is our long-term plan here?

SAFETY SUPERVISOR Kelly Creson DATE 11-22-93

WE HAVE REVIEWED THIS INCIDENT AND ENSURE THAT THE NECESSARY CORRECTIVE ACTION HAS BEEN TAKEN (WITHIN FORTY DAYS).

| CENTRAL SAFETY COMMITTEE | DATE |
|---|---|
| | |
| | |
| | |
| | |
| | |

DISTRIBUTION: Employee (white) Admin Asst (yellow) Safety (pink)

FORM.011

eder associates
a division of Gannett Fleming

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

July 2, 1999
File #34265.009 / 367-18

Ms. Shanna Laube
Wisconsin Department of Commerce
Env. & Regulatory Services
214 North Fourth Avenue
P.O. Box 220
Park Falls, WI 54552



Re: Closure Requests for Tank 59 and Tanks 51/52 Releases
Murphy Oil USA, Inc., Superior

Dear Shanna:

Enclosed are closure request reports for two petroleum product release sites at the Murphy Oil refinery in Superior. One report is for a 1991 release of unleaded gasoline from Tank 59 at the refinery, and the other is for the January 1994, February 1996, and March 1996 releases of #6 fuel oil from Tanks 51/52 at the refinery. Also enclosed are completed Wisconsin Department of Commerce (COMM) Case Summary and Close Out forms for each release site.

These reports are being sent to your attention based on two June 15, 1999, letters from Daniella Lancour of the Wisconsin Department of Natural Resources (WDNR) in the Rhinelander office to Mr. Lee Vail at Murphy Oil Corporation. In those letters, the WDNR notified Murphy that it was transferring authority for these sites to COMM, based on the absence of impacts to the groundwater at both release sites. You were copied on both of the June 15th letters.

If you have any questions or need additional information after reviewing the reports, please contact me. We look forward to your timely review of the reports and closure of these two release sites

Sincerely,

GANNETT FLEMING, INC.

Dennis F. Kugle
Vice President

DFK/jec/Enc.

cc w/enc: Lee Vail (Murphy/New Orleans)
Greg Neve (Murphy/Superior)
Liz Lundmark (Murphy/Superior)
Kevin Melnyk (Murphy/El Dorado)
Richard Lewandowski (DeWitt, Ross & Stevens)
cc w/o enc: Jim Hosch (WDNR/Superior)

M:\CLERICAL\PROJECTS\0300\367-18\CORRESP\DFK\3L367-18.019

# COMMERCE
# CASE SUMMARY AND CLOSE OUT

Personal information you provide may be used for secondary purposes [Privacy Act, s. 15.04(1)(M)].

SEE INSTRUCTIONS ON THE BACK OF THIS PAGE

Date Received (office use only)

A. **COMMERCE NUMBER:** 5488 0-0456-07 H

DNR BRRTS NUMBER (optional): __ __ - __ __ - __ __ __ __ __

| B. Responsible Party or Owner Name | C. Responsible Party or Owner Phone Number |
|---|---|
| MURPHY OIL USA, INC. | 715-398-8204 |
| **D. Responsible Party or Owner Address, City, State and Zip Code** | **E. Remedial Action Site Name, Address, City and Zip Code** |
| 2407 STINSON AVENUE<br>SUPERIOR, WISCONSIN 54880 | MURPHY OIL - SITE H (TK-51)<br>2400 STINSON AVENUE<br>SUPERIOR, WISCONSIN 54880 |

Enforcement Actions or Permits Closed Out? ____ Y ✓ N  Contaminant Type(s): FUEL OIL

Quantity Released: 4,200; 1,260; 420 GALLONS  Potential Receptors: NEWTON CREEK

Status of water supply wells within 1200 feet of the site? ONE POTENTIAL WATER SUPPLY WELL APPROXIMATELY 800 FEET EAST, AT LAKEHEAD PIPELINE CO.. THIS WELL MAY HAVE BEEN ABANDONED, AS LAKEHEAD CLAIMS TO HAVE NO KNOWLEDGE OF IT. WELL WAS 179 FEET DEEP WITH CLAY TO 135 FEET PLUS 40 FEET OF HARDPAN.

## ◆ SOIL

Soil Type: CLAY (CL)  Depth to Bedrock: 260 feet

Site Specific Soil Standards (NR 720.19)? ____ Y ✓ N  Final Confirmation Sampling Method: GEOPROBE

Remedial Action Taken: PUMPED PRODUCT FROM BASIN  Were Soils Excavated? ✓ Y ____ N  Quantity: 315 Total Tons

Treatment/Disposal Method: RECLAIMED - PRODUCT; THERMAL - SOIL  Treatment/Disposal Location: API SEPARATOR (MURPHY) - PRODUCT; LAKEHEAD BLACKTOP

## ◆ GROUNDWATER (if applicable)

Groundwater Encountered? ____ Y ✓ N  Monitoring Well(s) Installed? ____ Y ✓ N

Depth to Groundwater & Flow Direction: 3-5 FEET/EAST  Perched Water? ____ Y ✓ N  Depth: NA feet

Preventive Action Limit exceeded at this time? ____ Y ____ N  (If yes, location) ____

Enforcement Standard exceeded at this time? ____ Y ____ N  (If yes, location) ____

| Environmental Consultant Name and Phone Number | Environmental Consultant Address, City, State and Zip Code |
|---|---|
| GANNETT FLEMING, INC.<br>608/836-1500 | 8025 EXCELSIOR DRIVE<br>MADISON, WISCONSIN 53717 |

I, the environmental consultant, certify with my signature that the information presented is true and accurate and recommend that no further action be required at this site.

Consultant Signature: David J. Olig  Date: 7/2/99

## CASE SUMMARY AND CLOSE-OUT FORM INSTRUCTIONS

The Close Out Form and attachments should provide sufficient information to determine closure.

Item:

A. - Enter the eleven digit Commerce number. Please use this number on any correspondence with the department. The DNR BRRTS# is optional.

B. - Enter the responsible party or owner name.

C. - Enter the responsible party or owner phone number.

D. - Enter the responsible party or owner mailing address, city, state and zip code.

E. - Enter the remedial action site name, address (PO Box # not accepted), city and zip code.

**The following items should be included as attachments to the form**

- Justification for Closure
- Background Information
  - * Site location map (USGS topographic map, 1:24,000 scale or plat map).
  - * Site layout map depicting; buildings, property boundaries, roads, utilities, potential receptors (water supply wells and surface water features, and land uses on adjacent properties.
  - * Site layout map depicting; source location(s), pre and post remediation levels, sample locations and extent of excavation.
  - * Number of tank(s), size of tank, product contained, tank status (removed or in place).
  - * Geologic cross section depicting the stratigraphy of the site, including sample locations and results.
  - * A description of the sequence of activities.
  - * Description of remedial action taken.
  - * List of previous reports.
- Remedial Results
  - * Table(s) depicting analytical soil results (pre and post remediation). Clearly indicate the units of measurement.
  - * Table(s) depicting analytical groundwater results (if applicable).
  - * Chain of custody forms.
- Site Specific Soil Standards Supporting Documentation

* This form is intended to be a stand alone document containing the items listed above. **Do not refer to previously submitted reports.**
* Submit only one copy.
* **Forms that are not completed correctly may be returned.**

eder associates
a division of Gannett Fleming

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

July 2, 1999
File #34265.008

Ms. Shanna Laube
Wisconsin Department of Commerce
Env. & Regulatory Services
214 North Fourth Avenue
P.O. Box 220
Park Falls, WI 54552

Re: Tanks 51/52 Release Site Investigation Results and Request for Closure
Murphy Oil USA, Inc., Superior, Wisconsin
PECFA Claim #: 54880-0456-07-H

Dear Ms. Laube:

On behalf of Murphy Oil USA, Inc., Gannett Fleming, Inc. (fka Eder Associates) is submitting this report describing our 1998 site investigation associated with three separate releases of #6 fuel oil from Tanks 51 and 52 at Murphy's Superior refinery. The investigation results document that the remedial action by Murphy following the releases removed all product and all significantly contaminated soil from the basin. Post-remediation sampling showed that only three near-surface samples contained any contaminants at concentrations above their respective NR 7209 generic residual contaminant levels (RCLs). None of the deeper (4- to 5-foot) samples contained detectable concentrations of any petroleum volatile organic compounds (PVOCs) or polycyclic aromatic hydrocarbons (PAHs).

The information summarized here was sent to James Hosch of the Wisconsin Department of Natural Resources (WDNR) on April 9, 1999. Because groundwater at the site has not been affected, the WDNR transferred authority for this site to the Wisconsin Department of Commerce (COMM). Lee Vail of Murphy was notified of this transfer by a letter sent by Daniella Lancour of the WDNR's Rhinelander office and dated June 15, 1999. You were copied on that letter.

On behalf of Murphy, we are requesting closure of this release site from COMM based on the investigation results. A completed COMM "Case Summary and Close Out" form is included with this report.



Continued . . .

Ms. Shanna Laube
Wisconsin Department of Commerce
July 2, 1999



**Background**

Releases from Tanks 51 and 52, which have capacities of 90,000 gallons and 390,000 gallons, respectively, were reported to the WDNR in January 1994 (4,200 gallons - Tank 51), February 1996 (1,260 gallons - Tank 52), and March 1996 (420 gallons - Tank 51). The first two releases resulted from tank overfills; the third was due to a valve failure.

Because the basin containing Tanks 51 and 52 is bounded by berms, the clay soil at the site is relatively impermeable, the air temperature at the time of the releases was very low, and the viscosity of #6 fuel oil is low, the released product ponded on the soil surface. This ponding allowed Murphy personnel time to vacuum up most of the released product following each spill. The recovered product was run through one of the refinery's API separators to reclaim the product. Murphy also removed about 25, 175, and 25 cubic yards of soil after cleaning up the product following the three releases, respectively. This soil was transported to Lakehead Blacktop in Superior, where it was thermally treated. Murphy did not collect soil samples after completing its remedial activities, and the WDNR did not initially request that Murphy conduct a site investigation.

Figure 1 is a location map for the area around the refinery that was prepared using the most recent USGS topographic map. The refinery is identified on the map. Figure 2 is a refinery site plan. The Tank 51/52 basin is located on level land in the south-central part of the refinery, as shown on Figure 2. The land surrounding the basin is also owned by Murphy and is part of the refinery. The basin is enclosed by an approximately 6-foot-high clay dike. The ground surface in the basin is unpaved but consists of low-permeability clay. Rainwater and snow melt within the diked area drain to and collect in the southeast corner of the tank basin. The closest surface water is Newton Creek, located over 1,000 feet to the east-northeast. The creek is shown on both Figures 1 and 2.

Access to the refinery property, which is zoned industrial, is restricted to Murphy employees and subcontractors. The entire property is fenced and uses 24-hour security guards. Any work done on refinery property requires a "safe work permit" that is issued by trained Murphy personnel. This permit must be reissued daily and is updated if conditions warrant. The work permits detail the type of work to be performed, who will be doing the work, the equipment/machinery to be used, the type of personal protective equipment that is required, and the monitoring (i.e., field screening, air



Continued . . .

monitoring) that is required. In those circumstances where contaminated soil is encountered, only HAZWOPER trained personnel are allowed to do the work.

These institutional controls prevent exposure to the general public and minimize the likelihood of any workers being exposed to potentially harmful levels of petroleum-related constituents. This level of control goes far beyond the typical fence in a remote or unused industrial area. Further, there is no chance of real or potential impact to other off-site receptors of concern, such as humans, plants, and animals; water supply wells; basements; or water and sewer utility lines.

The potable and process water supply for the refinery and the area around the refinery is provided by the City of Superior, which obtains its water from Lake Superior. On April 21, 1999, we requested a well records search of the area around the refinery from the Wisconsin Geological & Natural History Survey. Only two private wells were located: One is about one mile northwest of the refinery and was installed in 1941, and the other is less than a quarter-mile southeast of the refinery at Lakehead Pipeline and was installed in 1953. Murphy contacted Lakehead Pipeline to inquire about the status of this well. The well is no longer in service, and Lakehead now obtains its water from the City of Superior. Copies of the well records request form and the two well logs are included as Attachment A. There are no active private or public water supply wells at or in the area around the refinery.

The site is underlain by 300 feet of clay, as documented by a boring done on refinery property, meaning there is no developable groundwater available. There is moist clay at about 3 to 5 feet below grade across the site, as documented by numerous monitoring wells at the site, although these monitoring wells typically take weeks to recharge after being purged. Because the analytical results for the soil samples collected during the site investigation confirmed only low contaminant concentrations, which were limited to the upper 2 feet of soil, monitoring wells were not installed in the Tank 51/52 basin during this investigation. Based on physical parameter testing of the soil in the Tank 51/52 basin ($1.3 \times 10^{-6}$ cm/sec permeability), the moist clay under the basin meets the definition of low-permeability material, as defined in the April 23rd draft amendments to emergency rule COMM 46. This conclusion is confirmed by the fact that it takes weeks for the water table wells at the facility to recover after they are purged.



Continued . . .

Ms. Shanna Laube
Wisconsin Department of Commerce
July 2, 1999



In a letter dated October 6, 1997, the WDNR notified Murphy that it was required under NR 716.05(2)(b) to conduct an investigation of the three historical Tank 51/52 releases. Murphy subsequently confirmed PECFA eligibility for these releases with COMM and retained Gannett Fleming to conduct the site investigation.

**Hand-Auger and Geoprobe Investigations (July 1998)**

To qualitatively assess the degree and extent of contamination and to focus future soil sampling, Gannett Fleming used a hand auger to collect shallow (1 to 1.5 feet below ground surface [bgs]) soil samples from nine locations (1 through 9) from the bottom of this tank basin in early July 1998. Three of the nine sampling locations were in the southeast corner of the tank basin where any significant release would naturally pond. These samples were field-screened with a flame-ionization detector. Figure 3 is a site plan showing the locations and the field-screening results of the samples.

Based on these results, we used a Geoprobe in late July 1998 to collect soil samples from a location (GP-16) in the southeast corner of the basin. Soil samples were collected from GP-16 at depths of 1 to 1.5 and 4.5 to 5 feet bgs and analyzed for diesel range organics (DRO), petroleum volatile organic compounds (PVOCs), and polycyclic aromatic hydrocarbons (PAHs). These analytical results are included in Table 1. The shallow sample contained DRO above the NR 720 generic RCLs, but all other analytes were well below their respective RCLs. The location of GP-16 is also shown on Figure 3.

**Hand-Auger Investigation (October 1998)**

In October 1998, Twin Ports Testing collected and field-screened shallow soil samples from 32 locations (1 through 32) within the diked area of the Tank 51/52 basin to identify the lateral extent of contamination within the basin. Figure 3 identifies these sampling locations and provides the field-screening results for the samples.



Continued . . .

Ms. Shanna Laube
Wisconsin Department of Commerce
July 2, 1999



**Geoprobe Investigation (December 1998)**

A work plan for the investigation of the Tank 51/52 basin was submitted to the WDNR on November 12, 1998, and conditionally approved on December 7, 1998. In December 1998, Gannett Fleming staff attempted to implement the work plan. It is important to note that access was very limited in the central and southeastern portions of the basin near Tank 51, due to aboveground piping and very wet soils, respectively. For these reasons, it was not possible to gain access for sampling in these areas using the Geoprobe. However, a total of four probe holes were completed.

The results for the samples collected around Tank 52 delineate the extent of contaminated soil in that area. These results correlated well with the field-screening results from that area and confirmed that the field-screening values can be used to define the extent of contaminated soil around Tank 51. Each of the probe holes in the basin was advanced to a depth of 7 feet bgs. Soil samples for chemical analysis were collected at depths of 1 to 2 and 4 to 5 feet in each probe hole. In one probe hole, a Shelby tube was used to collect a sample from a depth of 2 to 4 feet for permeability testing, and four other samples were collected at various depths throughout that probe hole for organic carbon fraction testing.

The samples collected for chemical analysis were submitted to Commonwealth Technology, Inc. (CTI) for DRO, PVOCs, and PAH analysis. CTI also analyzed the 2- to 4-foot sample for vertical permeability, using the falling head test, and four samples from various depths for their organic carbon fraction. Table 1 lists all the analytical results for the chemical testing of the samples from the Tank 51/52 basin. Table 2 contains the results of the physical tests. Attachment B contains copies of the boring logs and abandonment forms for all December 1998 probe holes and the laboratory reports and chain of custody forms for all samples.

**Results**

Soils encountered during the site investigation consisted of approximately 1 foot of either silty clay (Unified Soil Classification System [USCS] CL/ML) or sand and gravel fill, underlain by red clay (USCS CL) and an occasional lens of silty clay (USCS CL/ML) to 7 feet, the maximum depth explored. The fill is likely associated with construction of the access roads in the basin.



Continued . . .

Ms. Shanna Laube
Wisconsin Department of Commerce
July 2, 1999



As noted above, Table 2 contains the results of the organic carbon fractions measured in the soil samples collected from B52-1. Figure 3 shows this sampling location. Table 2 also contains the soil permeability (hydraulic conductivity) value for the Shelby tube sample. The hydraulic conductivity of the sample was $1.3 \times 10^{-6}$, which although somewhat high, is within the range of hydraulic conductivity for clay listed in Physical and Chemical Hydrogeology, P.A. Domenico and F.W. Schwartz, 1990. Based on this value and the fact that it takes weeks for water to recover in monitoring wells across the refinery after they are bailed dry, developable groundwater is not present, and the saturated clay soils under the site meet the definition of low-permeability material, as defined in the draft amendments to COMM 46.

As noted above, Table 1 lists the analytical chemical results for the soil samples collected from all boreholes. The only samples collected from this tank basin that contained concentrations of petroleum-related parameters that exceeded at least one generic NR 720 RCL were B52-1 (1 to 2 feet) B52-2 (1 to 2 feet), and GP-16 (1 to 1.5 feet). The analyte exceeding its RCL was primarily DRO, although B52-1 (1 to 2 feet) had a xylene concentration of 4.2 mg/kg/, 0.1 mg/kg above the 4.1 mg/kg RCL. None of the other soil samples contained petroleum-related analytes at concentrations above applicable NR 720 RCLs.

**Summary**

Three releases of #6 fuel oil from Tank 51 or Tank 52, totaling about 5,900 gallons, occurred in January 1994, February 1996, and March 1996 at the Murphy refinery. All the fuel oil that pooled on the clay surface of the Tank 51/52 basin was removed by Murphy personnel immediately following the releases. Murphy also removed a total of 225 cubic yards of contaminated soil from the bottom of the basin following these releases. This soil was thermally treated by Lakehead Blacktop.

After the WDNR notified Murphy that it was required to investigate the releases from Tanks 51/52, Gannett Fleming and Twin Ports Testing conducted subsurface site investigations in July 1998, October 1998, and December 1998 to define the extent and degree of petroleum-contaminated soil in the basin.



Continued . . .

Ms. Shanna Laube
Wisconsin Department of Commerce
July 2, 1999



Analytical results for the soil samples confirm that very limited, low-level contamination exists in surficial soils at several locations in the basin. The primary analyte above its respective NR 720 generic RCL is DRO. None of the samples contained any PAHs above NR 720 generic RCLs, and xylenes, at 4.2 mg/kg in one near-surface sample, were the only PVOC detected above an RCL. Soil samples collected at 4 to 5 feet bgs in the basin did not contain concentrations of PVOCs or PAHs above applicable generic NR 720 RCLs.

The estimated volume of unsaturated soil in the Tank 51/52 basin with levels of DRO and/or PVOCs above NR 720 generic RCLs is less than 700 $yd^3$. This volume is based on the laboratory test and field-screening results of the soil samples collected and the depth to moist clay in the tank basin.

The measured concentrations in the soil do not pose any direct contact threat of any kind to the public or to workers who may on a very infrequent basis be in the diked area for short periods of time. No other exposure pathways or risk factors exist.

**Request for Closure**

The results of the site investigations show that groundwater at the Tank 51/52 site has not been affected by the releases of #6 fuel oil in the basin. As stated in Section 46.06(1)(a) of COMM 46, "Sites where contamination is determined to be below the enforcement standard on site and below the enforcement standard off site, and no environmental factors exist, shall be closed without requiring or reimbursing for additional remedial efforts except for otherwise eligible post-closure costs." None of the following five environmental factors, as defined in Chapter COMM 47, are present at the Tank 59 release site:

- Documented expansion of the groundwater contaminant plume.
- Contamination of a private or public water supply well.
- Contamination of bedrock or contamination within 3 feet of bedrock.
- Floating product on the groundwater.
- Documented contamination discharges to surface waters or wetlands.



Continued . . .

Ms. Shanna Laube
Wisconsin Department of Commerce
July 2, 1999



Since no enforcement standard are exceeded and there are no environmental factors associated with the Tank 51/52 releases of #6 fuel oil, on behalf of Murphy, we are requesting that COMM issue a closure letter for this release site.

Please call if you have any questions or need additional information.

Sincerely,

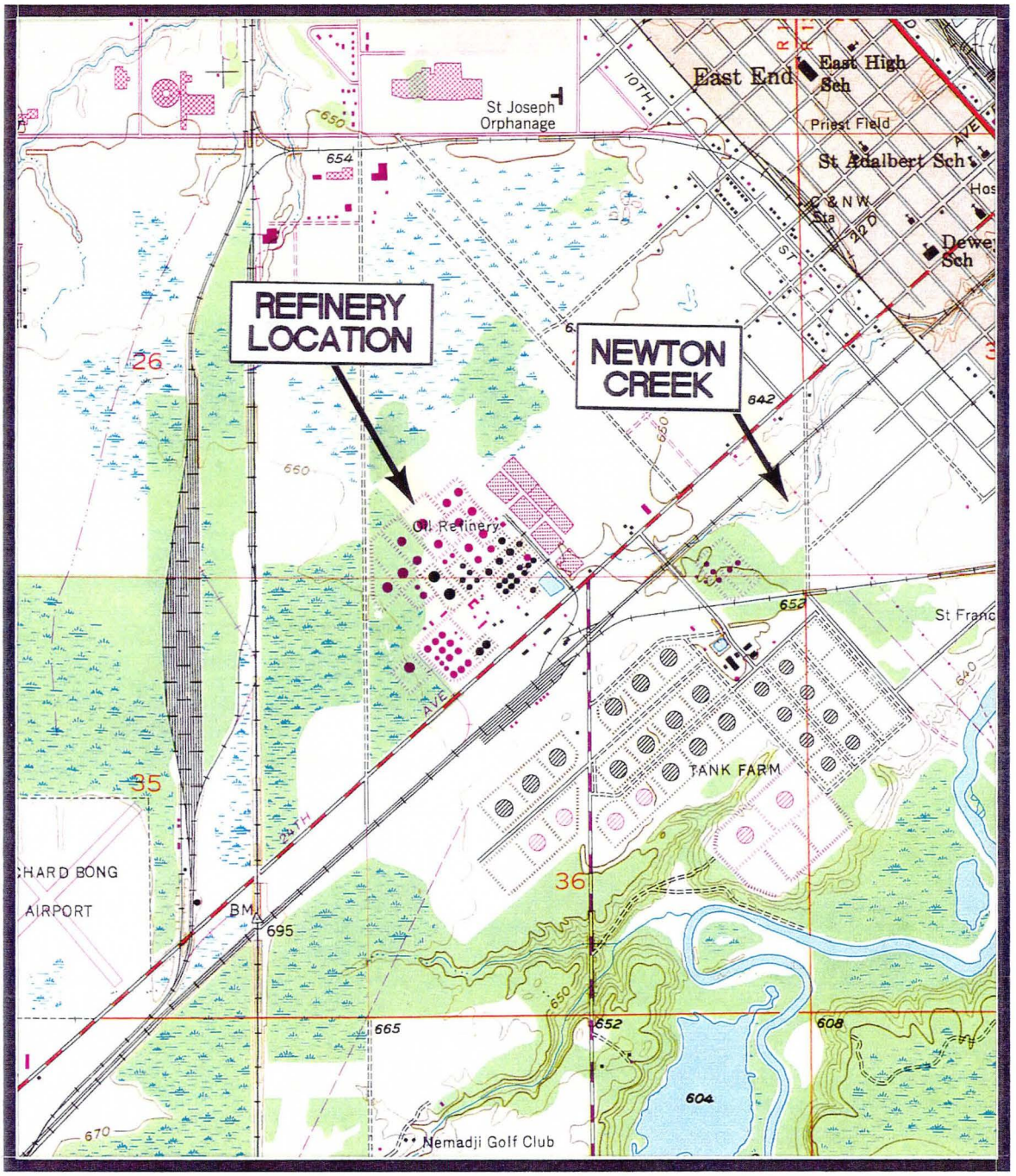
GANNETT FLEMING, INC.

David J. Olig, P.G.
Senior Project Manager

Jeffrey J. King
Staff Hydrogeologist

DJO/jec
Enc.

cc: Lee Vail (Murphy/New Orleans)
Liz Lundmark (Murphy/Superior)
Kevin Melnyk (Murphy/El Dorado)
Greg Neve (Murphy/Superior)
Rick Lewandowski (DeWitt, Ross & Stevens/Madison)




SCALE: 1 INCH = 2000 FEET

7.5 MIN TOPOGRAPHIC MAP
SUPERIOR, WISCONSIN
1954
PHOTOREVISED 1983

# LOCATION MAP

MURPHY OIL USA, INC.
SUPERIOR, WISCONSIN

070199
34265.000

**Gannett Fleming**

FIGURE 2

GENERAL DIRECTION OF GROUNDWATER FLOW

## LEGEND

- Monitoring Well Location
- Monitoring Well Nest Location
- (65) Former Tank Location
- Liner

HILL AVENUE

MW-8

MW-6

MW-4
MW-5

MW-7

MW-1/T29

MW-2/T59

MW-1&PZ-1/T59

MW-1

MW-2

MW-3B

MW-1/PP
PZ-1/PP

MW-2/PP

MW-5/T66

MW-1/T31

MW-4&PZ-4/T66

MW-7/T66

MW-1/T67

MW-6/T66

MW-1&PZ-1/T66

MW-2/T67

PZ-2/T66
PZ-3/T66

MW-2/T66

MW-3/T66

MW-9

MW-1/T8

MW-2/T8

MW-10

MW-11

MW-12

MW-13

MW-14

Pond 1 (Closed)

Pond 6 (Closed)

Pond 7 Aeration Pond

Pond 8 Settling Pond

Fire Water Pond No. 3

Fire Water Pond No. 4

Fire Water Pond No. 5

Propane/ Butane Loading Area

Flare

Warehouse

Maintenance Shop

Process Area

Process Area

Process Area

Fire House

Railcar Loading Area

Boiler House

Loading Area

Storage

Lab

Office

Marketing

100'ø Equalization Tank

30'ø Primary Clarifer

Treatment Plant Building

Impoundment Area

NEWTON CREEK

STINSON AVENUE

BARDON AVENUE

**NOTE**

*Monitoring Well Locations Are Based On Field Sketches From The Field Investigation Reports.*

0 300

Approximate Scale In Feet

070199
34265WBB

# SITE PLAN

MURPHY OIL USA, INC

SUPERIOR, WISCONSIN

## NOTES

1. *Site Layout And Sample Locations Are Based On Field Measurements And Are To Be Considered Approximate; Site Not Surveyed.*

2. *All Piping At Site Not Shown; Only Piping Which Influenced Sampling Locations Is Depicted.*

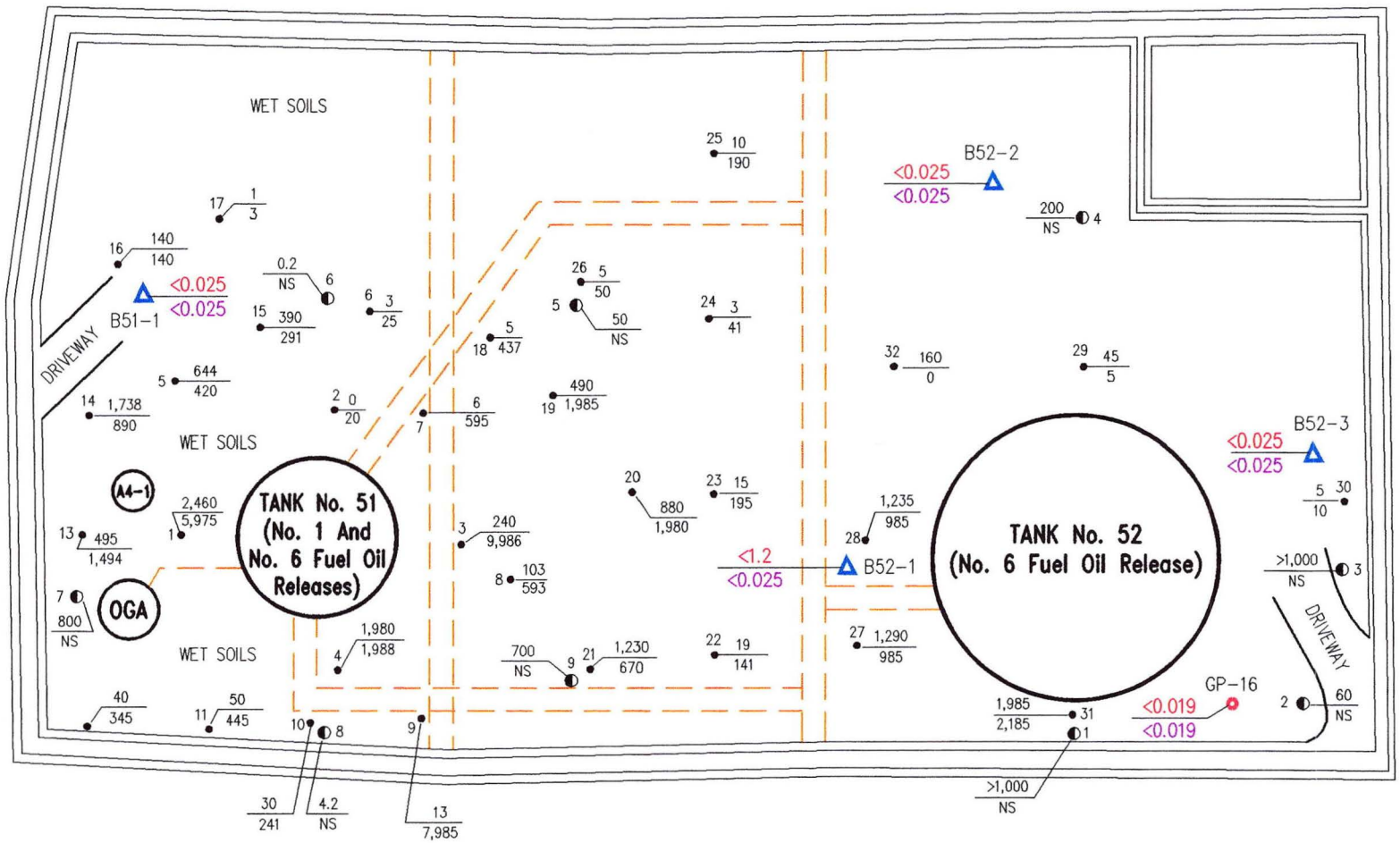
## LEGEND

- 3 — *Gannett Fleming Hand-Auger Field Screening Soil Sample Location (July 1998)*
- GP-16 — *Gannett Fleming Geoprobe Soil Sample Location (July 1998)*
- 18 — *Twin Ports Hand-Auger Field Screening Soil Sample Location (October 1998)*
- B52-2 — *Gannett Fleming Geoprobe Soil Sample Location (December 1998)*
- *Aboveground Piping*

<1.2 = Benzene Concentration At 1-2 Foot Depth (mg/kg)
<0.025 = Benzene Concentration At 4-5 Foot Depth (mg/kg)

NOTES
Concentrations In **BOLD** Exceed Generic NR 720 RCLs.
NA = Not Analyzed

5 / 10 = FID Reading At 1 Foot Depth / FID Reading At 2 Foot Depth
NS = Not Sampled




0 30
Scale In Feet

# SAMPLE LOCATIONS AND FID READINGS AT TANK NOS. 51 AND 52

MURPHY OIL USA, INC.
SUPERIOR, WISCONSIN

070199
34265WO

Gannett Fleming
FIGURE 3

MURPHY OIL USA, INC.
SUPERIOR, WISCONSIN

TABLE 1

ANALYTICAL RESULTS FOR SOIL SAMPLES FROM TANKS 51/52 BASIN (mg/kg)

| Parameter | Sample I.D. and Depth | | | | | | | | | | NR 720 RCL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | B51-1 | | B52-1 | | B52-2 | | B52-3 | | GP-16 @ Tank 52 | | |
| | 1-2 ft. | 4-5 ft. | 1-2 ft. | 4-5 ft. | 1-2 ft. | 4-5 ft. | 1-2 ft. | 4-5 ft. | 1-1.5 | 4.5-5 | |
| DRO | 21 | <1.4 | **14,000** | <1.4 | **510** | <1.4 | 41 | <1.4 | **2,200** | 7.5 | 250 |
| Benzene | <0.025 | <0.025 | <1.2 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.019 | <0.019 | 0.0055 |
| Ethylbenzene | <0.025 | <0.025 | <1.2 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.011 | <0.011 | 2.9 |
| Toluene | <0.025 | <0.025 | <1.2 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.011 | <0.011 | 1.5 |
| Total Xylenes | <0.050 | <0.050 | **4.2*** | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | 0.103 | <0.034 | 4.1 |
| Trimethylbenzenes | <0.050 | <0.050 | 6 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | 0.47 | <0.026 | |
| MTBE | <0.025 | <0.025 | <1.2 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.0090 | <0.0090 | |
| **Detected Polycyclic Aromatic Hydrocarbons** | | | | | | | | | | | |
| Acenapthylene | <0.051 | <0.051 | <0.51 | <0.051 | <0.051 | <0.051 | 0.11* | <0.051 | <1.3 | <0.051 | |
| Benzo(a)anthracene | <0.0020 | <0.0020 | <0.020 | <0.0020 | <0.0020 | <0.0020 | 0.11 | <0.0020 | <0.050 | <0.0020 | |
| Benzo(a)pyrene | <0.0015 | <0.0015 | 0.69 | <0.0015 | <0.0015 | <0.0015 | <0.0015 | <0.0015 | <0.038 | <0.0015 | |
| Benzo(b)fluoranthene | 0.022 | <0.0015 | 1.2 | <0.0015 | <0.0015 | <0.0015 | <0.0015 | <0.0015 | 2 | <0.0015 | |
| Benzo(g,h,i)perylene | 0.029 | <0.0041 | <0.041 | <0.0041 | <0.0041 | <0.0041 | <0.0041 | <0.0041 | <0.10 | <0.0041 | |
| Benzo(k)fluoranthene | <0.0015 | <0.0015 | 0.8 | <0.0015 | <0.0015 | <0.0015 | <0.0015 | <0.0015 | <0.038 | <0.0015 | |
| Fluoranthene | 0.02 | <0.0049 | 2.4 | <0.0049 | <0.0049 | <0.0049 | 0.18 | <0.0049 | <0.12 | <0.0049 | |
| Indeno(1,2,3-cd)pyrene | 0.023* | <0.0094 | <0.094 | <0.0094 | <0.0094 | <0.0094 | <0.0094 | <0.0094 | <0.24 | <0.0094 | |
| Phenanthrene | <0.0035 | <0.0035 | 1.2 | <0.0035 | <0.0035 | <0.0035 | 0.011* | <0.0035 | 0.41 | <0.0035 | |
| Pyrene | <0.0062 | <0.0062 | 3.1 | <0.0062 | <0.0062 | <0.0062 | 0.44 | <0.0062 | <0.16 | <0.0062 | |
| Naphthalene | <0.031 | <0.031 | 0.93* | <0.031 | <0.031 | <0.031 | <0.031 | <0.031 | <0.78 | <0.031 | |
| 1-Methyl naphthalene | <0.047 | <0.047 | 19 | <0.047 | <0.047 | <0.047 | <0.047 | <0.047 | <1.2 | <0.047 | |
| 2-Methyl naphthalene | <0.031 | <0.031 | 9.3 | <0.031 | <0.031 | <0.031 | <0.031 | <0.031 | <0.78 | <0.031 | |

NOTES:
Sample GP-16 collected in July 1998.
Samples B51-1 and B52-1 through B52-3 collected in December 1998.
Results reported in units of milligrams per kilogram (mg/kg) on a dry-weight basis.
Results in bold exceed applicable NR 720 RCLs.
NR 720 RCL = Wisconsin Administrative Code NR 720 residual contaminant level.
* = Reported concentration below the quantitation limit.

MURPHY OIL USA, INC.
SUPERIOR, WISCONSIN

TABLE 2

ORGANIC CARBON FRACTION AND SOIL PERMEABILITY
IN SOIL SAMPLES COLLECTED FROM TANKS 51/52 BASIN

| Sample I.D. | Sample Depth (ft) | Organic Carbon Fraction | Sample Depth (ft) | Soil Permeabiltiy (cm/sec) |
|---|---|---|---|---|
| B52-1 | 0-1.25 | 0.0562 | 2-4 | 1.3E-06 |
| | 1.25-2.5 | 0.0155 | | |
| | 2.5-3.75 | 0.0321 | | |
| | 3.75-5 | 0.0297 | | |

# ATTACHMENT A

## WELL RECORDS REQUEST FORM AND WELL CONSTRUCTION REPORTS

# WELL RECORDS REQUEST FORM - *FOR AN AREA*

**(may be faxed or mailed)**

Send to: Wisconsin Geological and Natural History Survey
3817 Mineral Point Road, Madison, WI 53705-5100

**Fax: 608-262-8086** Telephone: 608-262-7430 Irene Lippelt; 608-263-7387 Roger Peters; 608-262-1705 Main Office

**Date** 4/21/99 **Page** 1 **of** 1

**From:** Name Jeff King

Company Gannett Fleming, Inc. (fna Eder Associates)

Mailing Address 8025 Excelsior Dr.
Madison, WI 53717

Telephone Number 608-836-1500 Fax Number 608-831-3337

Project number or billing code for order 34265.003

Note: Prepayment is required unless your company has an account with our map sales department.

Where should invoice be sent? to person ordering? X OR to company's accounting department? ____

If prepaying, Mastercard ___ or Visa ___ # _____ _____ _____ _____, expires: ____-____

**TYPE OF RECORDS REQUESTED: (PLEASE CHECK ALL THAT APPLY)**

1. *WELL CONSTRUCTOR'S REPORTS*: 1936-79 X 1980-89 X ≥1990 X
   If there are only a few reports (or none) in the area you requested, do you want us to expand the search area? ___yes X no. If you are ordering less than an entire section, do you want reports that do not list a ¼ section included? X yes ___no. If you are ordering ¼ ¼ section(s) do you want reports that list just one ¼ section included? X yes ___no.
   **Most reports (except in Milwaukee & Waukesha Counties) do NOT list more than one quarter section.**
2. *GEOLOGIC LOGS*: only within area requested X or up to ~1 mile away if few or none in area ____

**AREA(S) FOR WHICH RECORDS ARE BEING REQUESTED:**

| Quarter Section(s) (please use "of" or "and") | | Section | Township | Range (list E or W) | County |
|---|---|---|---|---|---|
| | of | 36 | 49 | 14W | Douglas |
| SE and SW | of | 25 | 49 | 14W | Douglas |
| SE | of | 26 | 49 | 14W | Douglas |
| NE | of | 35 | 49 | 14W | Douglas |
| | of | | | | |
| | of | | | | |
| | of | | | | |
| | of | | | | |

Special Instructions (if any):

Please call when ready, We will pick-up

Note: **All orders are sent first class mail unless other arrangements are requested.**
If you need this material in an alternative format, please contact the Wisconsin Geological and Natural History Survey (608/262.1705) or the UWEX Affirmative Action Office.

WELL CONSTRUCTION REPO

# WISCONSIN STATE BOARD OF HEALTH

## WELL DRILLING DIVISION

AUG 28 1941

Note: Section 32 of the Wisconsin Well Drilling Sanitary Code, having the force and effect of law, provides that within thir days after completion of every well the driller shall submit a report covering all essential details of construction to the State Board of Health on a form provided by the Board.

Owner William Kolb & | Driller Maertens Bros

Street or RFD Norman Road | Post Office Wentworth Ex

Post Office Superior | Date Feb 27/1941 | Permit No. 231

### LOCATION OF PREMISES

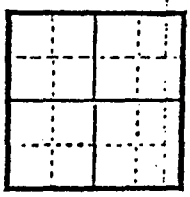
Douglas (County) | City of Superior (Town)

Blk 12 Hammond Add Lot 27

Describe further by subdivision, plat, district, lake, lot, block, nearest principal highway, etc., whichever apply.

S ½ of Sec 28 Sec 26?

The square below represents a section of land divided into 40 acre tracts. Mark the position of the premises in the section.



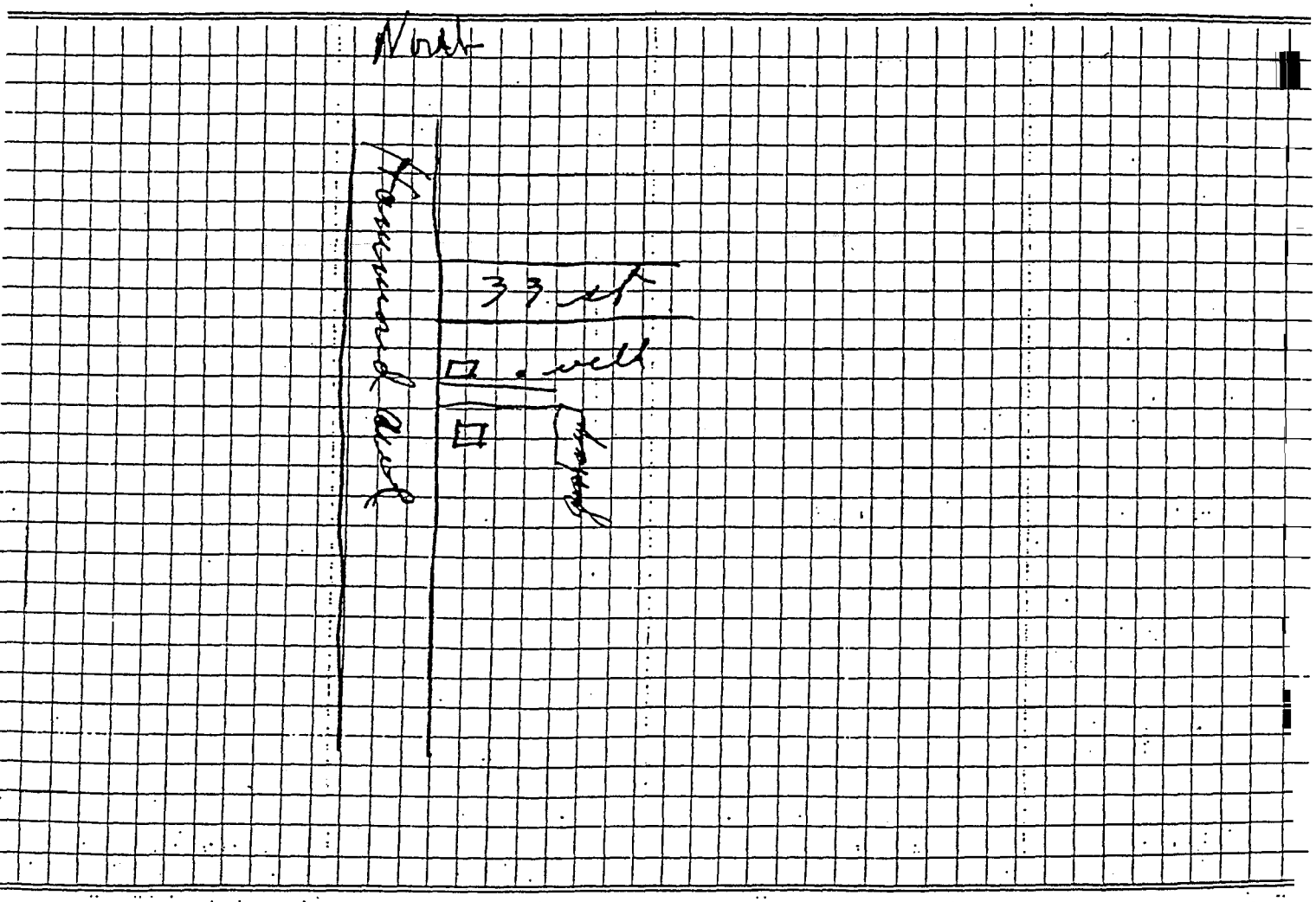
Sec. 28

Twp. 49

Range 14 { E W

### DIAGRAM OF PREMISES

See discussion and illustration in Part III Well Drilling Code. In making the diagram in the space below consider 10 ft. as the distance between lines. Be sure to indicate NORTH.




Additional copies of this form may be obtained in lots of 12 for 25¢. Send remittance with order to State Board of Health, Well Drilling Division, Madison, Wis.

# WELL LOG *and* REPORT

| In this column indicate the kind of casing, liner, shoe and other accessories used. | WELL DIAGRAM Use a red line to show casing or liner pipe. Use black for drill or borehole. | In this column state the kind of formations penetrated, their thickness in feet and if water bearing. | Record of FINAL Pumping test |
|---|---|---|---|

4 in special Well pipe

Drive shoe steel

Inches Diameter 2 3 4 5 6 8 10 12 14 16 18

Depth: 25, 50, 75, 100, 150, 200, 260, 275, 400, 800, 1200

Red Clay

150 ft

Had pain Boulders

110 ft

Casing to 260 ft.

rock 15

sand stone 15 ft

Draw the diagram to show the right half only

Duration of test Hours 24 hr

Pumping rate G.P.M. 5

Depth of pump in well. Ft. 108

Standing water-level (from surface) Ft. 45

Water-level when pumping Ft. 106

Water. End of test.
Clear ✓
Cloudy
Turbid

Was the well sterilized?
Yes ✓ No

To which laboratory was sample sent?
Superior
Date Feb 24

Was the well sealed on completion?
Yes ✓ No

How high did you leave the casing-pipe above grade?
1 ft

Well was completed
Date Feb 27-41

Well Driller
M M Madsen
Signature

RECEIVED
JAN 14 1954
ENVIRONMENTAL SANITATION

# WELL CONSTRUCTOR'S REPORT TO WISCONSIN STATE BOARD OF HEALTH

See Instructions on Reverse Side

1. County Douglas — Town ☐ Village ☐ City ☒ (Check one and give name)

Sec 36 T 49 R 14 W

2. Location City of Superior Hanson and Belknap Ave
Name of street and number of premise or Section, Town and Range numbers

3. Owner ☐ or Agent ☐ Lake Head Pipe Line Co
Name of individual, partnership or firm

4. Mail Address East End Superior Wis
Complete address required

5. From well to nearest: Building ~ ft; sewer ~ ft; drain ~ ft; septic tank ~ ft; dry well or filter bed ~ ft; abandoned well ~ ft.

6. Well is intended to supply water for: Drinking

7. DRILLHOLE:

| Dia. (in.) | From (ft.) | To (ft.) | Dia. (in.) | From (ft.) | To (ft.) |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |

8. CASING AND LINER PIPE OR CURBING:

| Dia. (in.) | Kind and Weight | From (ft.) | To (ft.) |
|---|---|---|---|
| 4 | standard | 0 | 179 |
| | | | |
| | | | |

9. GROUT:

| Kind | From (ft.) | To (ft.) |
|---|---|---|
| | | |
| | | |

10. FORMATIONS:

| Kind | From (ft.) | To (ft.) |
|---|---|---|
| Red clay | 0 | 135 |
| Hardpan | 135 | 175 |
| water gravel | 175 | 179 |

Construction of the well was completed on: Oct 9 1953

The well is terminated 22 inches ☒ above, below ☐ the permanent ground surface.

Was the well disinfected upon completion? Yes ~ No

Was the well sealed watertight upon completion? Yes ~ No

11. MISCELLANEOUS DATA:

Yield test: 5 Hrs. at 7 GPM.

Depth from surface to water-level: ~ ft.

Water-level when pumping: Same ft.

Water sample was sent to the state laboratory at: By Owner on ~ 19~

Signature Hanson Bros
Registered Well Driller

Kentworth Wis
Complete Mail Address

Please do not write in space below

Rec'd ~ No ~

Ans'd ~

Interpretation ~

| | 10 ml | 10 ml | 10 ml | 10 ml | 10 ml |
|---|---|---|---|---|---|
| Gas—24 hrs. | | | | | |
| 48 hrs. | | | | | |
| Confirm | | | | | |
| B. Coli | | | | | |

Examiner ~

# ATTACHMENT B

## COPIES OF SOIL BORING LOGS, ABANDONMENT FORMS, LABORATORY REPORTS, AND CHAIN OF CUSTODY RECORDS

State of Wisconsin
Department of Natural Resources

Route To:
☐ Solid Waste ☐ Haz. Waste
☐ Emergency Response ☐ Underground Tanks
☐ Wastewater ☐ Water Resources
☐ Other

Soil Boring Log Information
Form 4400-122 7-91

Page 1 of 1

| Facility/Project Name | License/Permit/Monitoring Number | Boring Number |
|---|---|---|
| Murphy Oil USA, Inc. | | GP-16 |

| Boring Drilled By (Firm name and name of crew chief) | Date Drilling Started | Date Drilling Completed | Drilling Method |
|---|---|---|---|
| Twin Ports Testing | 07/22/98 | 07/22/98 | Geoprobe |

| DNR Facility Well No. | WI Unique Well No. | Common Well Name | Final Static Water Level | Surface Elevation | Borehole Diameter |
|---|---|---|---|---|---|
| | | | Feet MSL | Feet MSL | 1.3 Inches |

Boring Location
State Plane N, E
NE 1/4 of NW 1/4 of Section 36 T 49 N,R 14 W
Lat ° ' "
Long ° ' "

Local Grid Location (If applicable)
☐ N ☐ E
Feet ☐ S Feet ☐ W

| County | DNR County Code | Civil Town/City/ or Village |
|---|---|---|
| Douglas | 16 | Superior |

| Sample Number | Sample Length (in) Recovered | Blow Counts | Depth In Feet | Soil/Rock Description And Geologic Origin For Each Major Unit | USCS | Graphic Log | Well Diagram | PID/FID | Soil Properties: Standard Penetration | Moisture Content | Liquid Limit | Plastic Limit | P 200 | RQD/ Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1-3 | 16 | | 1 | Brown-black fine to coarse SAND, petroleum-like odor | SP | | | | | M | | | | |
| | | | 2 | Red CLAY, moist becoming more moist with depth, petroleum-like odor, no fractures | CL | | | | | | | | | |
| 3-5 | 20 | | 3 | | | | | | | M | | | | |
| | | | 4 | Same as above, no petroleum-like odor | | | | | | | | | | |
| | | | 5 | End of boring at 5 feet | | | | | | | | | | |

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature

Firm Eder Associates
8025 Excelsior Drive Madison, WI 53717
Tel: (608)836-1500 Fax: (608)831-3337

This form is authorized by Chapters 144, 147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than $10 nor more than $5,000 for each violation. Fined not less than $10 or more than $100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

State of Wisconsin
Department of Natural Resources

e To:
☐ Solid Waste ☐ Haz. Waste
☐ Emergency Response ☐ Underground Tanks
☐ Wastewater ☐ Water Resources
☐ Other

Soil Boring Log Information
Form 4400-122 7-9



| Facility/Project Name | License/Permit/Monitoring Number | Boring Number |
|---|---|---|
| Murphy Oil USA, Inc. | | B51-1 |

| Boring Drilled By (Firm name and name of crew chief) | Date Drilling Started | Date Drilling Completed | Drilling Method |
|---|---|---|---|
| Soil Essentials (Dave Paulson) | 12/17/98 | 12/17/98 | Geoprobe |

| DNR Facility Well No. | WI Unique Well No. | Common Well Name | Final Static Water Level | Surface Elevation | Borehole Diameter |
|---|---|---|---|---|---|
| | | | Feet MSL | Feet MSL | 2.3 Inches |

Boring Location
State Plane N, E
NE 1/4 of NW 1/4 of Section 36 T 49 N,R 14 W
Lat ° ' "
Long ° ' "

Local Grid Location (If applicable)
Feet ☐ N ☐ S Feet ☐ E ☐ W

| County | DNR County Code | Civil Town/City/ or Village |
|---|---|---|
| Douglas | 16 | Superior |

| Sample Number | Sample Length (in) Recovered | Blow Counts | Depth In Feet | Soil/Rock Description And Geologic Origin For Each Major Unit | USCS | Graphic Log | Well Diagram | PID/FID | Soil Properties: Standard Penetration | Moisture Content | Liquid Limit | Plastic Limit | P 200 | RQD/ Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0-3.5 | 24 | | 1 | Black-red SILTY CLAY, no odor | CL ML | | | | | M | | | | |
| | | | 2 | Red CLAY, no odor | CL | | | | | | | | | |
| 3.5-7 | 36 | | 3 4 5 6 | | | | | | | M | | | | |
| | | | 7 | End of boring | | | | | | | | | | |

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature

Firm Gannett Fleming, Inc.
8025 Excelsior Drive Madison, WI 53717
Tel: (608)836-1500 Fax: (608)831-3337

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State of Wisconsin
Department of Natural Resources

e To:
☐ Solid Waste ☐ Haz. Waste
☐ Emergency Response ☐ Underground Tanks
☐ Wastewater ☐ Water Resources
☐ Other

Soil Boring Log Information
Form 4400-122 7-91



| Facility/Project Name | License/Permit/Monitoring Number | Boring Number |
|---|---|---|
| Murphy Oil USA, Inc. | | B52-3 |

| Boring Drilled By (Firm name and name of crew chief) | Date Drilling Started | Date Drilling Completed | Drilling Method |
|---|---|---|---|
| Soil Essentials (Dave Paulson) | 12/17/98 | 12/17/98 | Geoprobe |

| DNR Facility Well No. | WI Unique Well No. | Common Well Name | Final Static Water Level | Surface Elevation | Borehole Diameter |
|---|---|---|---|---|---|
| | | | Feet MSL | Feet MSL | 2.3 Inches |

Boring Location
State Plane N, E
NE 1/4 of NW 1/4 of Section 36 T 49 N,R 14 W
Lat ° ' "
Long ° ' "

Local Grid Location (If applicable)
Feet ☐ N ☐ S Feet ☐ E ☐ W

| County | DNR County Code | Civil Town/City/ or Village |
|---|---|---|
| Douglas | 16 | Superior |

| Sample Number | Sample Length (in) Recovered | Blow Counts | Depth In Feet | Soil/Rock Description And Geologic Origin For Each Major Unit | USCS | Graphic Log | Well Diagram | PID/FID | Soil Properties: Standard Penetration | Moisture Content | Liquid Limit | Plastic Limit | P 200 | RQD/ Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0-3.5 | 30 | | 1 | Gray sand and gravel FILL, no odor | | | | | | M | | | | |
| | | | 2 | Red CLAY, trace organic material grading to no organic material, no odor | CL | | | | | | | | | |
| 3.5-7 | 24 | | 3 | | | | | | | M | | | | |
| | | | 4 | | | | | | | | | | | |
| | | | 5 | | | | | | | | | | | |
| | | | 6 | | | | | | | | | | | |
| | | | 7 | End of boring | | | | | | | | | | |

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature

Firm: Gannett Fleming, Inc.
8025 Excelsior Drive Madison, WI 53717
Tel: (608)836-1500 Fax: (608)831-3337

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State of Wisconsin
Department of Natural Resources

e To:
☐ Solid Waste ☐ Haz. Waste
☐ Emergency Response ☐ Underground Tanks
☐ Wastewater ☐ Water Resources
☐ Other

Soil Boring Log Information
Form 4400-122 7-



| Facility/Project Name | License/Permit/Monitoring Number | Boring Number |
|---|---|---|
| Murphy Oil USA, Inc. | | B52-1 |

| Boring Drilled By (Firm name and name of crew chief) | Date Drilling Started | Date Drilling Completed | Drilling Method |
|---|---|---|---|
| Soil Essentials (Dave Paulson) | 12/17/98 | 12/17/98 | Geoprobe |

| DNR Facility Well No. | WI Unique Well No. | Common Well Name | Final Static Water Level | Surface Elevation | Borehole Diameter |
|---|---|---|---|---|---|
| | | | Feet MSL | Feet MSL | 2.3 Inches |

Boring Location
State Plane N, E
NE 1/4 of NW 1/4 of Section 36 T 49 N,R 14 W
Lat ° ' "
Long ° ' "

Local Grid Location (If applicable)
Feet ☐ N ☐ S Feet ☐ E ☐ W

| County | DNR County Code | Civil Town/City/ or Village |
|---|---|---|
| Douglas | 16 | Superior |

| Sample Number | Sample Length (in) Recovered | Blow Counts | Depth In Feet | Soil/Rock Description And Geologic Origin For Each Major Unit | USCS | Graphic Log | Well Diagram | PID/FID | Soil Properties: Standard Penetration | Moisture Content | Liquid Limit | Plastic Limit | P 200 | RQD/ Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0-3.5 | 36 | | 1 | Brown SILTY CLAY | CL | | | | | M | | | | |
| | | | 2 | Red CLAY, petroleum-like odor | ML CL | | | | | | | | | |
| | | | 3 | | | | | | | | | | | |
| 3.5-7 | 36 | | 4 | | | | | | | M | | | | |
| | | | 5 | | | | | | | | | | | |
| | | | 6 | | | | | | | | | | | |
| | | | 7 | End of boring | | | | | | | | | | |

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature

Firm: Gannett Fleming, Inc.
8025 Excelsior Drive Madison, WI 53717
Tel: (608)836-1500 Fax: (608)831-3337

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State of Wisconsin
Department of Natural Resources

e To:
- ☐ Solid Waste
- ☐ Emergency Response
- ☐ Wastewater
- ☐ Haz. Waste
- ☐ Underground Tanks
- ☐ Water Resources
- ☐ Other

Soil Boring Log Information
Form 4400-122 7-91



| Facility/Project Name | License/Permit/Monitoring Number | Boring Number |
|---|---|---|
| Murphy Oil USA, Inc. | | B52-2 |

| Boring Drilled By (Firm name and name of crew chief) | Date Drilling Started | Date Drilling Completed | Drilling Method |
|---|---|---|---|
| Soil Essentials (Dave Paulson) | 12/17/98 | 12/17/98 | Geoprobe |

| DNR Facility Well No. | WI Unique Well No. | Common Well Name | Final Static Water Level | Surface Elevation | Borehole Diameter |
|---|---|---|---|---|---|
| | | | Feet MSL | Feet MSL | 2.3 Inches |

Boring Location
State Plane N, E
NE 1/4 of NW 1/4 of Section 36 T 49 N,R 14 W
Lat ° ' "
Long ° ' "

Local Grid Location (If applicable)
☐ N Feet ☐ S ☐ E Feet ☐ W

| County | DNR County Code | Civil Town/City/ or Village |
|---|---|---|
| Douglas | 16 | Superior |

| Sample Number | Sample Length (in) Recovered | Blow Counts | Depth In Feet | Soil/Rock Description And Geologic Origin For Each Major Unit | USCS | Graphic Log | Well Diagram | PID/FID | Soil Properties: Standard Penetration | Moisture Content | Liquid Limit | Plastic Limit | P 200 | RQD/ Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0-3.5 | 24 | | 1 | Black-red silt, sand, clay, and gravel FILL, no odor | | | | | | M | | | | |
| | | | 1 | Red CLAY, no odor | CL | | | | | | | | | |
| | | | 2 | | | | | | | | | | | |
| | | | 3 | Brown-red SILTY CLAY | CL | | | | | | | | | |
| 3.5-7 | 36 | | 4 | Red CLAY, trace fractures and coarse sand, no odor | ML CL | | | | | M | | | | |
| | | | 5 | | | | | | | | | | | |
| | | | 6 | | | | | | | | | | | |
| | | | 7 | End of boring | | | | | | | | | | |

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature

Firm Gannett Fleming, Inc.
8025 Excelsior Drive Madison, WI 53717
Tel: (608)836-1500 Fax: (608)831-3337

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Department of Natural Resources

# WELL/DRILLHOLE/BOREHOLE ABANDONMENT

Form 3300-5B Rev. 12-91

All abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or NR 141, Wis. Admin. Code, whichever is applicable. Also, see instructions on back.

## (1) GENERAL INFORMATION

Well/Drillhole/Borehole Location

County: Douglas

NE 1/4 of NW 1/4 of Sec. 36 ; T. 49 N; R. 14 ☐ E ☒ W

(If applicable) _____ Gov't Lot _____ Grid Number

Grid Location _____ ft. ☐ N. ☐ S., _____ ft. ☐ E. ☐ W.

Civil Town Name

Street Address of Well: 2407 Stinson Ave

City, Village: Superior

## (2) FACILITY NAME

Original Well Owner (If Known)

Present Well Owner: Murphy Oil USA, Inc.

Street or Route: 2407 Stinson Ave

City, State, Zip Code: Superior WI 54880

Facility Well No. and/or Name (If Applicable): B52-1

WI Unique Well No.: _ _ _ _ _ _

Reason For Abandonment: Samples collected, no longer needed

Date of Abandonment: 12/17/98

## WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On

(Date) 12/17/98

☐ Monitoring Well
☐ Water Well
☐ Drillhole
☒ Borehole

Construction Report Available? ☒ Yes ☐ No

Construction Type:
☐ Drilled ☐ Driven (Sandpoint) ☐ Dug
☒ Other (Specify) Geoprobe

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth (ft.) 7 (From groundsurface) Casing Diameter (ins.) 2.3 Borehole

Casing Depth (ft.) NA

Was Well Annular Space Grouted? ☐ Yes ☐ No ☐ Unknown
If Yes, To What Depth? _____ Feet

(4) Depth to Water (Feet) ~4 ft.

| | | | |
|---|---|---|---|
| Pump & Piping Removed? | ☒ Yes | ☐ No | ☐ Not Applicable |
| Liner(s) Removed? | ☒ Yes | ☐ No | ☐ Not Applicable |
| Screen Removed? | ☐ Yes | ☐ No | ☒ Not Applicable |
| Casing Left in Place? | ☐ Yes | ☐ No | |

If No, Explain _____

| | | |
|---|---|---|
| Was Casing Cut Off Below Surface? | ☐ Yes | ☐ No |
| Did Sealing Material Rise to Surface? | ☒ Yes | ☐ No |
| Did Material Settle After 24 Hours? | ☐ Yes | ☒ No |
| If Yes, Was Hole Retopped? | ☐ Yes | ☐ No |

(5) Required Method of Placing Sealing Material
☒ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Dump Bailer ☐ Other (Explain)

(6) Sealing Materials
☐ Neat Cement Grout
☐ Sand-Cement (Concrete) Grout
☐ Concrete
☐ Clay-Sand Slurry
☐ Bentonite-Sand Slurry
☐ Chipped Bentonite

For monitoring wells and monitoring well boreholes only
☐ Bentonite Pellets
☒ Granular Bentonite
☐ Bentonite - Cement Grout

| (7) Sealing Material Used | From (Ft.) | To (Ft.) | No. Yards, Sacks Sealant or Volume (Circle One) | Mix Ratio or Mud Weight |
|---|---|---|---|---|
| Granular Bentonite | Surface | 7 | 12 lbs | |
| | | | | |
| | | | | |
| | | | | |

(8) Comments: _____

(9) Name of Person or Firm Doing Sealing Work
Oil Essentials / Gannett Fleming, Inc.

Signature of Person Doing Work: Jeff Zimmerman of GF
Date Signed: 4/5/99

Street or Route: 8025 Excelsior Dr.
Telephone Number: (608) 836-1500

City, State, Zip Code: Madison WI 53717

(10) FOR DNR OR COUNTY USE ONLY

| | |
|---|---|
| Date Received/Inspected | District/County |
| Reviewer/Inspector | ☐ Complying Work ☐ Noncomplying Work |
| Follow-up Necessary | |

Department of Natural Resources | Form 3300-5B | Rev. 12-91

All abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or NR 141, Wis. Admin. Code, whichever is applicable. Also, see instructions on back.

**(1) GENERAL INFORMATION**

Well/Drillhole/Borehole Location — County: Douglas

NE 1/4 of NW 1/4 of Sec. 36 ; T. 49 N; R. 14 ☐ E ☒ W

(If applicable) _____ Gov't Lot _____ Grid Number

Grid Location _____ ft. ☐ N. ☐ S., _____ ft. ☐ E. ☐ W.

Civil Town Name

Street Address of Well: 2407 Stinson Ave

City, Village: Superior

**(2) FACILITY NAME**

Original Well Owner (If Known)

Present Well Owner: Murphy Oil USA, Inc.

Street or Route: 2407 Stinson Ave

City, State, Zip Code: Superior WI 54880

Facility Well No. and/or Name (If Applicable): B52-2

WI Unique Well No.: _____

Reason For Abandonment: Samples collected, no longer needed

Date of Abandonment: 12/17/98

**WELL/DRILLHOLE/BOREHOLE INFORMATION**

(3) Original Well/Drillhole/Borehole Construction Completed On

(Date) 12/17/98

☐ Monitoring Well
☐ Water Well
☐ Drillhole
☒ Borehole

Construction Report Available? ☒ Yes ☐ No

Construction Type:
☐ Drilled ☐ Driven (Sandpoint) ☐ Dug
☒ Other (Specify) Geoprobe

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth (ft.) 7 (From groundsurface)

Casing/Borehole Diameter (ins.) 2.3

Casing Depth (ft.) NA

Was Well Annular Space Grouted? ☐ Yes ☐ No ☐ Unknown
If Yes, To What Depth? _____ Feet

(4) Depth to Water (Feet) ~4 ft.

| | | | |
|---|---|---|---|
| Pump & Piping Removed? | ☒ Yes | ☐ No | ☐ Not Applicable |
| Liner(s) Removed? | ☒ Yes | ☐ No | ☐ Not Applicable |
| Screen Removed? | ☐ Yes | ☐ No | ☒ Not Applicable |
| Casing Left in Place? | ☐ Yes | ☐ No | |

If No, Explain _____

| | | |
|---|---|---|
| Was Casing Cut Off Below Surface? | ☐ Yes | ☐ No |
| Did Sealing Material Rise to Surface? | ☒ Yes | ☐ No |
| Did Material Settle After 24 Hours? | ☐ Yes | ☒ No |
| If Yes, Was Hole Retopped? | ☐ Yes | ☐ No |

(5) Required Method of Placing Sealing Material
☒ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Dump Bailer ☐ Other (Explain)

(6) Sealing Materials
☐ Neat Cement Grout
☐ Sand-Cement (Concrete) Grout
☐ Concrete
☐ Clay-Sand Slurry
☐ Bentonite-Sand Slurry
☐ Chipped Bentonite

For monitoring wells and monitoring well boreholes only
☐ Bentonite Pellets
☒ Granular Bentonite
☐ Bentonite - Cement Grout

| (7) Sealing Material Used | From (Ft.) | To (Ft.) | No. Yards, Sacks Sealant or Volume (Circle One) | Mix Ratio or Mud Weight |
|---|---|---|---|---|
| Granular Bentonite | Surface | 7 | 12 lbs | |
| | | | | |
| | | | | |
| | | | | |

(8) Comments: _____

(9) Name of Person or Firm Doing Sealing Work: Soil Essentials / Gannett Fleming, Inc.

Signature of Person Doing Work: Jeff Zimmerman of GF — Date Signed: 4/5/99

Street or Route: 8025 Excelsior Dr. — Telephone Number: (608) 836-1500

City, State, Zip Code: Madison, WI 53717

**(10) FOR DNR OR COUNTY USE ONLY**

| | |
|---|---|
| Date Received/Inspected | District/County |
| Reviewer/Inspector | ☐ Complying Work ☐ Noncomplying Work |
| Follow-up Necessary | |

DNR/COUNTY

Department of Natural Resources

Form 3300-5B

Rev. 12-9

All abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or NR 141, Wis. Admin. Code, whichever is applicable. Also, see instructions on back.

## (1) GENERAL INFORMATION

Well/Drillhole/Borehole Location

County: Douglas

NE 1/4 of NW 1/4 of Sec. 36 ; T. 49 N; R. 14 ☐ E ☒ W

(If applicable) Gov't Lot _____ Grid Number _____

Grid Location _____ ft. ☐ N. ☐ S., _____ ft. ☐ E. ☐ W.

Civil Town Name

Street Address of Well: 2407 Stinson Ave

City, Village: Superior

## (2) FACILITY NAME

Original Well Owner (If Known)

Present Well Owner: Murphy Oil USA, Inc.

Street or Route: 2407 Stinson Ave

City, State, Zip Code: Superior WI 54880

Facility Well No. and/or Name (If Applicable): B52-3

WI Unique Well No.: _ _ _ _ _ _

Reason For Abandonment: Samples collected, no longer needed

Date of Abandonment: 12/17/98

## WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On

(Date) 12/17/98

☐ Monitoring Well
☐ Water Well
☐ Drillhole
☒ Borehole

Construction Report Available? ☒ Yes ☐ No

Construction Type:
☐ Drilled ☐ Driven (Sandpoint) ☐ Dug
☒ Other (Specify) Geoprobe

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth (ft.) 7 (From groundsurface)

~~Casing~~ Borehole Diameter (ins.) 2.3

Casing Depth (ft.) NA

Was Well Annular Space Grouted? ☐ Yes ☐ No ☐ Unknown

If Yes, To What Depth? _____ Feet

(4) Depth to Water (Feet) ~4 ft.

| | | | |
|---|---|---|---|
| Pump & Piping Removed? | ☒ Yes | ☐ No | ☐ Not Applicable |
| Liner(s) Removed? | ☒ Yes | ☐ No | ☐ Not Applicable |
| Screen Removed? | ☐ Yes | ☐ No | ☒ Not Applicable |
| Casing Left in Place? | ☐ Yes | ☐ No | |

If No, Explain _____

| | | |
|---|---|---|
| Was Casing Cut Off Below Surface? | ☐ Yes | ☐ No |
| Did Sealing Material Rise to Surface? | ☒ Yes | ☐ No |
| Did Material Settle After 24 Hours? | ☐ Yes | ☒ No |
| If Yes, Was Hole Retopped? | ☐ Yes | ☐ No |

(5) Required Method of Placing Sealing Material

☒ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Dump Bailer ☐ Other (Explain)

(6) Sealing Materials

☐ Neat Cement Grout
☐ Sand-Cement (Concrete) Grout
☐ Concrete
☐ Clay-Sand Slurry
☐ Bentonite-Sand Slurry
☐ Chipped Bentonite

For monitoring wells and monitoring well boreholes only

☐ Bentonite Pellets
☒ Granular Bentonite
☐ Bentonite - Cement Grout

| (7) Sealing Material Used | From (Ft.) | To (Ft.) | No. Yards, Sacks Sealant or Volume (Circle One) | Mix Ratio or Mud Weight |
|---|---|---|---|---|
| Granular Bentonite | Surface | 7 | 12 lbs | |
| | | | | |
| | | | | |
| | | | | |

(8) Comments: _____

(9) Name of Person or Firm Doing Sealing Work

Soil Essentials / Garnett Fleming, Inc.

Signature of Person Doing Work: Jeff Zorn of GF

Date Signed: 4/5/99

Street or Route: 8025 Excelsior Dr.

Telephone Number: (608) 836-1500

City, State, Zip Code: Madison WI 53717

(10) FOR DNR OR COUNTY USE ONLY

| | |
|---|---|
| Date Received/Inspected | District/County |
| Reviewer/Inspector | ☐ Complying Work ☐ Noncomplying Work |
| Follow-up Necessary | |

Department of Natural Resources | Form 3300-5B | Rev. 12-91

All abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or NR 141, Wis. Admin. Code, whichever is applicable. Also, see instructions on back.

## (1) GENERAL INFORMATION

Well/Drillhole/Borehole Location

County: Douglas

NE 1/4 of NW 1/4 of Sec. 36 : T. 49 N R. 14 ☐ E ☒ W

(If applicable) _____ Gov't Lot _____ Grid Number

Grid Location _____ ft. ☐ N. ☐ S., _____ ft. ☐ E. ☐ W.

Civil Town Name

Street Address of Well: 2407 Stinson Ave

City, Village: Superior

## (2) FACILITY NAME

Original Well Owner (If Known)

Present Well Owner: Murphy Oil USA, Inc.

Street or Route: 2407 Stinson Ave.

City, State, Zip Code: Superior WI 54880

Facility Well No. and/or Name (If Applicable): B51-1

WI Unique Well No. _ _ _ _ _ _

Reason For Abandonment: Samples collected, no longer needed.

Date of Abandonment: 12/17/98

## WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On

(Date) 12/17/98

☐ Monitoring Well
☐ Water Well
☐ Drillhole
☒ Borehole

Construction Report Available? ☒ Yes ☐ No

Construction Type:
☐ Drilled ☐ Driven (Sandpoint) ☐ Dug
☒ Other (Specify) Geoprobe

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth (ft.) 7 (From groundsurface)

Casing Diameter (ins.) 2.3 Borehole

Casing Depth (ft.) NA

Was Well Annular Space Grouted? ☐ Yes ☐ No ☐ Unknown
If Yes, To What Depth? _____ Feet

(4) Depth to Water (Feet) ~4 ft.

| | | | |
|---|---|---|---|
| Pump & Piping Removed? | ☒ Yes | ☐ No | ☐ Not Applicable |
| Liner(s) Removed? | ☒ Yes | ☐ No | ☐ Not Applicable |
| Screen Removed? | ☐ Yes | ☐ No | ☒ Not Applicable |
| Casing Left in Place? | ☐ Yes | ☐ No | |

If No, Explain _____

| | | |
|---|---|---|
| Was Casing Cut Off Below Surface? | ☐ Yes | ☐ No |
| Did Sealing Material Rise to Surface? | ☒ Yes | ☐ No |
| Did Material Settle After 24 Hours? | ☐ Yes | ☒ No |
| If Yes, Was Hole Retopped? | ☐ Yes | ☐ No |

(5) Required Method of Placing Sealing Material
☒ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Dump Bailer ☐ Other (Explain)

(6) Sealing Materials
☐ Neat Cement Grout
☐ Sand-Cement (Concrete) Grout
☐ Concrete
☐ Clay-Sand Slurry
☐ Bentonite-Sand Slurry
☐ Chipped Bentonite

For monitoring wells and monitoring well boreholes only
☐ Bentonite Pellets
☒ Granular Bentonite
☐ Bentonite - Cement Grout

| (7) Sealing Material Used | From (Ft.) | To (Ft.) | No. Yards, Sacks Sealant or Volume (Circle One) | Mix Ratio or Mud Weight |
|---|---|---|---|---|
| Granular Bentonite | Surface | 7 | 12 lbs | |
| | | | | |
| | | | | |
| | | | | |

(8) Comments: _____

(9) Name of Person or Firm Doing Sealing Work
Soil Essentials / Garnett Fleming, Inc.

Signature of Person Doing Work: Jeff Zimmi of GF
Date Signed: 4/5/99

Street or Route: 8025 Excelsior Dr.
Telephone Number: (608) 836-1500

City, State, Zip Code: Madison, WI 53717

(10) FOR DNR OR COUNTY USE ONLY

| Date Received/Inspected | District/County |
|---|---|
| Reviewer/Inspector | ☐ Complying Work ☐ Noncomplying Work |
| Follow-up Necessary | |

DNR/COUNTY

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*



GANNETT FLEMING
JEFF KING
8025 EXCELSIOR DRIVE
MADISON, WI 53717

Note: None

Customer #: LE8000012374
Work Order: 9809000070
Report Date: 09/04/98
Date Received: 09/02/98
Arrival Temperature: On Ice

Report Submitted By: Record Reviewer

Project Name: MURPHY OIL  Project Number: 367-18.3

Sample I.D. #: 210803 Sample Description: GP-6  Date Sampled: 07/21/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| Lead | 116 | mg/kg | Y | 0.050 | 0.150 | | 09/04/98 | NAH | EPA 6010B |
| Total Percent Solids | 72.7 | % | | | | | 09/03/98 | NMP | EPA 5030 |

Sample I.D. #: 210804 Sample Description: GP-7  Date Sampled: 07/21/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| Lead | 12.6 | mg/kg | | 0.050 | 0.150 | | 09/04/98 | NAH | EPA 6010B |
| Total Percent Solids | 77.0 | % | | | | | 09/03/98 | NMP | EPA 5030 |

Sample I.D. #: 210805 Sample Description: GP-8  Date Sampled: 07/21/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| Lead | 11.6 | mg/kg | | 0.050 | 0.150 | | 09/04/98 | NAH | EPA 6010B |
| Total Percent Solids | 71.9 | % | | | | | 09/03/98 | NMP | EPA 5030 |

Sample I.D. #: 210806 Sample Description: GP-16  Date Sampled: 07/22/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| Lead | 9.78 | mg/kg | | 0.050 | 0.150 | | 09/04/98 | NAH | EPA 6010B |
| Total Percent Solids | 73.7 | % | | | | | 09/03/98 | NMP | EPA 5030 |

Sample I.D. #: 210807 Sample Description: GP-18  Date Sampled: 07/22/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| Lead | 13.0 | mg/kg | | 0.050 | 0.150 | | 09/04/98 | NAH | EPA 6010B |
| Total Percent Solids | 73.6 | % | | | | | 09/03/98 | NMP | EPA 5030 |

Sample I.D. #: 210808 Sample Description: GP-25  Date Sampled: 07/22/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| Lead | 15.4 | mg/kg | | 0.050 | 0.150 | | 09/04/98 | NAH | EPA 6010B |

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



REVISED
*ANALYTICAL REPORT*

Customer #: LE8000006752
Work Order: 9807000689
Date Revised: 08/12/98
Date Received: 07/24/98
Arrival Temperature: On Ice

EDER ASSOCIATES
JEFF KING
8025 EXCELSIOR DR
MADISON, WI 53717-1900

Report Submitted By: HGC
*Record Reviewer*

Note: None

Project Name: MURPHY OIL  Project Number: 367-18.3

Sample I.D. #: 206231  Sample Description: GP-15(4.5-5)  Date Sampled: 07/22/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| o-Xylene | <0.048 | mg/Kg | | 0.012 | 0.042 | 07/24/98 | 07/31/98 | RLD | EPA 8021A |
| Toluene | <0.044 | mg/Kg | | 0.011 | 0.037 | 07/24/98 | 07/31/98 | RLD | EPA 8021A |
| Diesel Range Organics | 290 | mg/kg | | 1.4 | 4.7 | 07/27/98 | 08/05/98 | PML | WDNR DRO |
| 1-Methyl Naphthalene | 3.1 | mg/kg | | 0.047 | 0.16 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| 2-Methyl Naphthalene | 6.5 | mg/kg | | 0.031 | 0.10 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Acenaphthene | <0.048 | mg/kg | | 0.048 | 0.16 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Acenaphthylene | 0.67 | mg/kg | | 0.051 | 0.17 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Anthracene | <0.023 | mg/kg | | 0.023 | 0.077 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Benzo(a)anthracene | <0.0020 | mg/kg | | 0.002 | 0.006 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Benzo(a)pyrene | <0.0015 | mg/kg | | 0.001 | 0.005 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Benzo(b)fluoranthene | <0.0015 | mg/kg | | 0.001 | 0.005 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Benzo(g,h,i)perylene | <0.0041 | mg/kg | | 0.004 | 0.014 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Benzo(k)fluoranthene | <0.0015 | mg/kg | | 0.001 | 0.005 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Chrysene | <0.092 | mg/kg | | 0.092 | 0.31 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Dibenzo(a,h)anthracene | <0.23 | mg/kg | | 0.23 | 0.77 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Fluoranthene | 0.44 | mg/kg | | 0.004 | 0.016 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Fluorene | <0.0086 | mg/kg | | 0.008 | 0.029 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Indeno(1,2,3-cd)pyrene | <0.0094 | mg/kg | | 0.009 | 0.031 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Naphthalene | 1.1 | mg/kg | | 0.031 | 0.10 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Phenanthrene | 0.30 | mg/kg | | 0.003 | 0.012 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Pyrene | <0.0062 | mg/kg | | 0.006 | 0.021 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |

Sample I.D. #: 206232  Sample Description: GP-15(4-4.5)  Date Sampled: 07/22/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| Air-filled Porosity | 0 | % | | | | | 08/06/98 | ETK | MOSA 18-2 |
| Total Porosity | 0.460 | | | | | | 08/06/98 | ETK | MOSA 18-2 |
| % Moisture/ %SMHC | 67.6 | % | | | | | 08/06/98 | ETK | MOSA 36-2 |
| Moisture Holding Capacity | 38.3 | % | | | | | 08/06/98 | ETK | MOSA 36-2 |
| Bulk Density | 1.43 | gTS/cm3 | | | | | 08/06/98 | ETK | MOSA 13-2 |
| Total Percent Solids | 73.5 | % | | | | | 07/27/98 | NMP | EPA 5030 |
| pH (Soil)(Lab) | 7.85 | S.U.'s | | | | | 07/27/98 | JDC | EPA 9040 |
| TOC as % Organic Matter | 1.74 | % | | 0.01 | NA | | 07/29/98 | KJF | MOSA 29.4 |

Sample I.D. #: 206233  Sample Description: GP-16(1-1.5)  Date Sampled: 07/22/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| Total Percent Solids | 69.4 | % | | | | | 07/27/98 | NMP | EPA 5030 |
| Gasoline Range Organics | 37 | mg/kg | L | 1.3 | 4.5 | 07/24/98 | 07/30/98 | EMH | WDNR GRO |
| 1,2,4-Trimethylbenzene | 0.24 | mg/Kg | | 0.014 | 0.048 | 07/24/98 | 07/29/98 | RLD | EPA 8021A |

WI DNR Lab Certification Number: 157066030 DATCP Certification Number: 000289

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


REVISED
*ANALYTICAL REPORT*

Customer #: LE8000006752
Work Order: 9807000689
Date Revised: 08/12/98
Date Received: 07/24/98
Arrival Temperature: On Ice

EDER ASSOCIATES
JEFF KING
8025 EXCELSIOR DR
MADISON, WI 53717-1900

Report Submitted By: HOC
*Record Reviewer*

Note: None

Project Name: MURPHY OIL  Project Number: 367-18.3

Sample I.D. #: 206233  Sample Description: GP-16(1-1.5)  Date Sampled: 07/22/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| 1,2-Dibromoethane (EDB) | <0.0070 | mg/Kg | | 0.007 | 0.023 | 07/24/98 | 07/29/98 | RLD | EPA 8021A |
| 1,3,5-Trimethylbenzene | 0.23 | mg/Kg | | 0.012 | 0.039 | 07/24/98 | 07/29/98 | RLD | EPA 8021A |
| Benzene | <0.019 | mg/Kg | | 0.019 | 0.063 | 07/24/98 | 07/29/98 | RLD | EPA 8021A |
| Ethylbenzene | <0.011 | mg/Kg | | 0.011 | 0.036 | 07/24/98 | 07/29/98 | RLD | EPA 8021A |
| m&p-Xylene | <0.022 | mg/Kg | | 0.022 | 0.075 | 07/24/98 | 07/29/98 | RLD | EPA 8021A |
| Methyl-tert-butyl ether | <0.0090 | mg/Kg | | 0.009 | 0.030 | 07/24/98 | 07/29/98 | RLD | EPA 8021A |
| o-Xylene | 0.092 | mg/Kg | | 0.012 | 0.042 | 07/24/98 | 07/29/98 | RLD | EPA 8021A |
| Toluene | <0.011 | mg/Kg | | 0.011 | 0.037 | 07/24/98 | 07/29/98 | RLD | EPA 8021A |
| Diesel Range Organics | 2200 | mg/kg | L | 1.4 | 4.7 | 07/30/98 | 08/02/98 | PML | WDNR DRO |
| 1-Methyl Naphthalene | <1.2 | mg/kg | V | 0.047 | 0.16 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| 2-Methyl Naphthalene | <0.78 | mg/kg | | 0.031 | 0.10 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Acenaphthene | <1.2 | mg/kg | | 0.048 | 0.16 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Acenaphthylene | <1.3 | mg/kg | | 0.051 | 0.17 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Anthracene | <0.58 | mg/kg | | 0.023 | 0.077 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Benzo(a)anthracene | <0.050 | mg/kg | | 0.002 | 0.006 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Benzo(a)pyrene | <0.038 | mg/kg | | 0.001 | 0.005 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Benzo(b)fluoranthene | 2.0 | mg/kg | | 0.001 | 0.005 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Benzo(g,h,i)perylene | <0.10 | mg/kg | | 0.004 | 0.014 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Benzo(k)fluoranthene | <0.038 | mg/kg | | 0.001 | 0.005 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Chrysene | <2.3 | mg/kg | | 0.092 | 0.31 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Dibenzo(a,h)anthracene | <5.8 | mg/kg | | 0.23 | 0.77 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Fluoranthene | <0.12 | mg/kg | | 0.004 | 0.016 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Fluorene | <0.22 | mg/kg | | 0.008 | 0.029 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Indeno(1,2,3-cd)pyrene | <0.24 | mg/kg | | 0.009 | 0.031 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Naphthalene | <0.78 | mg/kg | | 0.031 | 0.10 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Phenanthrene | 0.41 | mg/kg | | 0.003 | 0.012 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Pyrene | <0.16 | mg/kg | | 0.006 | 0.021 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |

Sample I.D. #: 206234  Sample Description: GP-16(4.5-5)  Date Sampled: 07/22/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| Total Percent Solids | 70.8 | % | | | | | 07/27/98 | NMP | EPA 5030 |
| Gasoline Range Organics | <1.3 | mg/kg | | 1.3 | 4.5 | 07/24/98 | 08/03/98 | RJW | WDNR GRO |
| 1,2,4-Trimethylbenzene | <0.014 | mg/Kg | | 0.014 | 0.048 | 07/24/98 | 07/29/98 | RLD | EPA 8021A |
| 1,2-Dibromoethane (EDB) | <0.0070 | mg/Kg | | 0.007 | 0.023 | 07/24/98 | 07/29/98 | RLD | EPA 8021A |
| 1,3,5-Trimethylbenzene | <0.012 | mg/Kg | | 0.012 | 0.039 | 07/24/98 | 07/29/98 | RLD | EPA 8021A |
| Benzene | <0.019 | mg/Kg | | 0.019 | 0.063 | 07/24/98 | 07/29/98 | RLD | EPA 8021A |
| Ethylbenzene | <0.011 | mg/Kg | | 0.011 | 0.036 | 07/24/98 | 07/29/98 | RLD | EPA 8021A |
| m&p-Xylene | <0.022 | mg/Kg | | 0.022 | 0.075 | 07/24/98 | 07/29/98 | RLD | EPA 8021A |
| Methyl-tert-butyl ether | <0.0090 | mg/Kg | | 0.009 | 0.030 | 07/24/98 | 07/29/98 | RLD | EPA 8021A |
| o-Xylene | <0.012 | mg/Kg | | 0.012 | 0.042 | 07/24/98 | 07/29/98 | RLD | EPA 8021A |
| Toluene | <0.011 | mg/Kg | | 0.011 | 0.037 | 07/24/98 | 07/29/98 | RLD | EPA 8021A |
| Diesel Range Organics | 7.5 | mg/kg | | 1.4 | 4.7 | 07/30/98 | 08/02/98 | PML | WDNR DRO |

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

REVISED
*ANALYTICAL REPORT*

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


Customer #: LE8000006752
Work Order: 9807000689
Date Revised: 08/12/98
Date Received: 07/24/98
Arrival Temperature: On Ice

Report Submitted By: HOC
*Record Reviewer*

EDER ASSOCIATES
JEFF KING
8025 EXCELSIOR DR
MADISON, WI 53717-1900

Note: None

Project Name: MURPHY OIL  Project Number: 367-18.3

Sample I.D. #: 206234  Sample Description: GP-16(4.5-5)  Date Sampled: 07/22/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methyl Naphthalene | <0.047 | mg/kg | | 0.047 | 0.16 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| 2-Methyl Naphthalene | <0.031 | mg/kg | | 0.031 | 0.10 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Acenaphthene | <0.048 | mg/kg | | 0.048 | 0.16 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Acenaphthylene | <0.051 | mg/kg | | 0.051 | 0.17 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Anthracene | <0.023 | mg/kg | | 0.023 | 0.077 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Benzo(a)anthracene | <0.0020 | mg/kg | | 0.002 | 0.006 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Benzo(a)pyrene | <0.0015 | mg/kg | | 0.001 | 0.005 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Benzo(b)fluoranthene | <0.0015 | mg/kg | | 0.001 | 0.005 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Benzo(g,h,i)perylene | <0.0041 | mg/kg | | 0.004 | 0.014 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Benzo(k)fluoranthene | <0.0015 | mg/kg | | 0.001 | 0.005 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Chrysene | <0.092 | mg/kg | | 0.092 | 0.31 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Dibenzo(a,h)anthracene | <0.23 | mg/kg | | 0.23 | 0.77 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Fluoranthene | <0.0049 | mg/kg | | 0.004 | 0.016 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Fluorene | <0.0086 | mg/kg | | 0.008 | 0.029 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Indeno(1,2,3-cd)pyrene | <0.0094 | mg/kg | | 0.009 | 0.031 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Naphthalene | <0.031 | mg/kg | | 0.031 | 0.10 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Phenanthrene | <0.0035 | mg/kg | | 0.003 | 0.012 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |
| Pyrene | <0.0062 | mg/kg | | 0.006 | 0.021 | 07/28/98 | 07/30/98 | CMK | EPA 8310 |

Sample I.D. #: 206235  Sample Description: GP-16(4-4.5)  Date Sampled: 07/22/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| Air-filled Porosity | 3.70 | % | | | | | 08/06/98 | ETK | MOSA 18-2 |
| Total Porosity | 0.532 | | | | | | 08/06/98 | ETK | MOSA 18-2 |
| % Moisture/ %SMHC | 69.7 | % | | | | | 08/06/98 | ETK | MOSA 36-2 |
| Moisture Holding Capacity | 41.9 | % | | | | | 08/06/98 | ETK | MOSA 36-2 |
| Bulk Density | 1.24 | gTS/cm3 | | | | | | | MOSA 13-2 |
| Total Percent Solids | 71.5 | % | | | | | 07/27/98 | NMP | EPA 5030 |
| pH (Soil)(Lab) | 7.43 | S.U.'s | | | | | 07/27/98 | JDC | EPA 9040 |
| TOC as % Organic Matter | 1.64 | % | | 0.01 | NA | | 07/29/98 | KJF | MOSA 29.4 |

Sample I.D. #: 206236  Sample Description: GP-17(1-1.5)  Date Sampled: 07/22/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| Total Percent Solids | 80.5 | % | | | | | 07/27/98 | NMP | EPA 5030 |
| Gasoline Range Organics | <1.3 | mg/kg | | 1.3 | 4.5 | 07/24/98 | 07/29/98 | EMH | WDNR GRO |
| 1,2,4-Trimethylbenzene | <0.014 | mg/Kg | | 0.014 | 0.048 | 07/24/98 | 07/29/98 | RLD | EPA 8021A |
| 1,2-Dibromoethane (EDB) | <0.0070 | mg/Kg | | 0.007 | 0.023 | 07/24/98 | 07/29/98 | RLD | EPA 8021A |
| 1,3,5-Trimethylbenzene | <0.012 | mg/Kg | | 0.012 | 0.039 | 07/24/98 | 07/29/98 | RLD | EPA 8021A |
| Benzene | <0.019 | mg/Kg | | 0.019 | 0.063 | 07/24/98 | 07/29/98 | RLD | EPA 8021A |

WI DNR Lab Certification Number: 157066030 DATCP Certification Number: 000289

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

H:\MSWORD\DATQUAL.DOC

# Commonwealth Technology, Inc.

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

Project #: 367-18.3

Proj. Name: Murphy Oil

Client Name / Number: Eder Associates

FILL IN ANALYSIS NEEDED BELOW

Remarks: 02705

689

| Date | Time | Comp | Grab | Sample Description | Sample # | Number of Containers | Viscosity / % moisture | Fraction organic Carbon | Bulk density | pH | GRO/PRO + BTEX + chlorinated aliphatics | DRO | PAH's | Space Below For Laboratory Use: Pres. | Sample I.D. #'s: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7/21/98 | 9am | 50:1 | X | | GP-11(4.5-5) | 3 | | | | | ✓ | ✓ | ✓ | | 206224 |
| | | | | | GP-11(4-4.5) | 1 | ✓ | ✓ | ✓ | ✓ | | | | | 206225 |
| | | | | | GP12(1-1.5) | 3 | | | | | ✓ | ✓ | ✓ | | 206225 |
| | | | | | GP-13(4.5-5) | 3 | | | | | ✓ | ✓ | ✓ | | 206226 |
| | | | | | GP-13(4-4.5) | 1 | ✓ | ✓ | ✓ | ✓ | | | | | 206276 |
| | | | | | GP-14(1-1.5) | 3 | | | | | ✓ | ✓ | ✓ | | 206227 |
| | | | | | GP-14(4.5-5) | 3 | | | | | ✓ | ✓ | ✓ | | 206228 |
| ↓ | ↓ | | | | GP-14(4-4.5) | 1 | ✓ | ✓ | ✓ | ✓ | | | | | 206229 |
| 7/22/98 | 9:10 | | | | GP-15(1-1.5) | 3 | | | | | ✓ | ✓ | ✓ | | 206230 |
| | 9:35 | | | | GP-15(4.5-5) | 3 | | | | | ✓ | ✓ | ✓ | | 206231 |
| | 9:35 | | | | GP-15(4-4.5) | 1 | ✓ | ✓ | ✓ | ✓ | | | | | 206 232 |
| | 9:55 | | | | GP-16(1-1.5) | 3 | | | | | ✓ | ✓ | ✓ | | 206233 |
| | 10:05 | | | | GP-16(4.5-5) | 3 | | | | | ✓ | ✓ | ✓ | | 206234 |
| | 10:05 | | | | GP-16(4-4.5) | 1 | ✓ | ✓ | ✓ | ✓ | | | | | 206235 |
| | 10:20 | | | | GP17(1-1.5) | 3 | | | | | ✓ | ✓ | ✓ | | 206236 |
| | 10:30 | | | | GP-17(4.5-5) | 3 | | | | | ✓ | ✓ | ✓ | | 206 237 |
| | 10:30 | | | | GP-17(4-4.5) | 1 | ✓ | ✓ | ✓ | ✓ | | | | | 206238 |
| | 10:45 | | | | GP-18(1-1.5) | 3 | | | | | ✓ | ✓ | ✓ | | 206239 |
| | 10:55 | | | | GP-18(4.5-5) | 3 | | | | | ✓ | ✓ | ✓ | | 206240 |
| | 10:55 | | | | GP-18(4-4.5) | 1 | ✓ | ✓ | ✓ | ✓ | | | | | 206241 |
| ↓ | 11:15 | ↓ | ↓ | | GP-19(1-1.5) | 3 | | | | | ✓ | ✓ | ✓ | | 206242 |

Sampled By: Jeff King (J.K.)

Relinquished By: Jeff King

Date: 7/23/98 Time: 7:15

Received By:

Date: Time:

Received By Lab: 8:20 AM

Date: 7/23/98 Time:

Remarks:

Date Sample Disposed of:

Sample Shipped Via: _____ 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:

Commonwealth Technology, Inc. (CTI)
1-800-228-3012
1230 Lange Court
Baraboo, WI 53913
(608) 356-2760
FAX: (608) 356-2766

070

No: 5203

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

SAMPLE COLLECTOR: Jeff King (JJK) | COMPANY: Gannett Fleming | TELEPHONE # (include area code): (608) 836-1500

PROJECT NUMBER: 367-18.3 | PROJECT NAME: Murphy Oil - Superior

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

INVOICE ADDRESS (must be completed): Lee Vail, Murphy Oil, 131 S Robertson St 11th Floor, New Orleans, LA 70112

REPORT ADDRESS (must be completed): Jeff King, Gannett Fleming, 8025 Excelsior Dr., Madison, WI 53717

DATE & TIME OF RELINQUISHMENT: 9/2/98 8:00 A.M. | RELINQUISHED BY (signature): Luke Cecil LUKE CECIL | RECEIVED BY (signature): | DATE / TIME OF RECEPTION:

DATE & TIME OF RELINQUISHMENT: | RELINQUISHED BY (signature): | RECEIVED BY LABORATORY (signature): D. Dill | DATE / TIME OF RECEPTION: 9-2-98

| 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 CONTAIN-ERS | LAB I.D. |
|---|---|---|---|---|---|---|---|---|---|---|
| GP-6 | 7/21/98 | PM | Soil | grab | 4°C | | DRO GRO GRO/PVOC PVOC (Pb) Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER PAH Other (please list): | | 1 | 210803 |
| GP-7 | 7/21/98 | PM | | | | | DRO GRO GRO/PVOC PVOC (Pb) Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER PAH Other (please list): | | 1 | 210804 |
| GP-8 | 7/21/98 | PM | | | | | DRO GRO GRO/PVOC PVOC (Pb) Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER PAH Other (please list): | | 1 | 210805 |
| GP-16 | 7/20/98 | AM | | | | | DRO GRO GRO/PVOC PVOC (Pb) Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER PAH Other (please list): | | 1 | 210806 |
| GP-18 | 7/20/98 | AM | | | | | DRO GRO GRO/PVOC PVOC (Pb) Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER PAH Other (please list): | | 1 | 210807 |
| GP-25 | 7/20/98 | PM | | | | | DRO GRO GRO/PVOC PVOC (Pb) Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER PAH Other (please list): | | 1 | 210808 |
| HA-2 | 7/20/98 | PM | ↓ | ↓ | ↓ | | DRO GRO GRO/PVOC PVOC (Pb) Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER PAH Other (please list): | | 1 | 210809 |
| | | | | | | | DRO GRO GRO/PVOC PVOC Pb Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER PAH Other (please list): | | | |

SAMPLE CONDITIONS / COMMENTS: Rush - Need Results by Friday, 9/4 per Shelly Maxwell

CHECKED

ARRIVAL TEMPERATURE: 6.4

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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 #: LE8000012374
Work Order: 9812000729
Report Date: 01/14/99
Date Received: 12/18/98
Arrival Temperature: On Ice

GANNETT FLEMING
JEFF KING
8025 EXCELSIOR DRIVE
MADISON, WI 53717

Report Submitted By: PAB
*Record Reviewer*

Note: None

Project Name: MURPHY 51,52 Project Number: 34265.008

Sample I.D. #: 224810 Sample Description: BS1-1 1-2 Date Sampled: 12/17/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| Total Percent Solids | 70.2 | % | | | | | 12/21/98 | NMP | EPA 5030 |
| 1,2,4-Trimethylbenzene | <0.025 | mg/kg | | 0.015 | 0.053 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| 1,3,5-Trimethylbenzene | <0.025 | mg/kg | | 0.010 | 0.030 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| Benzene | <0.025 | mg/kg | | 0.009 | 0.029 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| Ethylbenzene | <0.025 | mg/kg | | 0.009 | 0.028 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| m & p- Xylene | <0.025 | mg/kg | | 0.017 | 0.053 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| Methyl t-Butyl Ether | <0.025 | mg/kg | | 0.011 | 0.034 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| o-Xylene | <0.025 | mg/kg | | 0.008 | 0.026 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| Toluene | <0.025 | mg/kg | | 0.008 | 0.026 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| Diesel Range Organics | 21 | mg/kg | L | 1.4 | 4.7 | 12/21/98 | 01/02/99 | PML | WDNR DRO |
| 1-Methyl Naphthalene | <0.047 | mg/kg | | 0.047 | 0.16 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| 2-Methyl Naphthalene | <0.031 | mg/kg | | 0.031 | 0.10 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Acenaphthene | <0.048 | mg/kg | | 0.048 | 0.16 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Acenaphthylene | <0.051 | mg/kg | | 0.051 | 0.17 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Anthracene | <0.023 | mg/kg | | 0.023 | 0.077 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Benzo(a)anthracene | <0.0020 | mg/kg | | 0.002 | 0.006 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Benzo(a)pyrene | <0.0015 | mg/kg | | 0.001 | 0.005 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Benzo(b)fluoranthene | 0.022 | mg/kg | | 0.001 | 0.005 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Benzo(g,h,i)perylene | 0.029 | mg/kg | | 0.004 | 0.014 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Benzo(k)fluoranthene | <0.0015 | mg/kg | | 0.001 | 0.005 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Chrysene | <0.092 | mg/kg | | 0.092 | 0.31 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Dibenzo(a,h)anthracene | <0.23 | mg/kg | | 0.23 | 0.77 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Fluoranthene | 0.020 | mg/kg | | 0.004 | 0.016 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Fluorene | <0.0086 | mg/kg | | 0.008 | 0.029 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Indeno(1,2,3-cd)pyrene | 0.023 | mg/kg | J | 0.009 | 0.031 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Naphthalene | <0.031 | mg/kg | | 0.031 | 0.10 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Phenanthrene | <0.0035 | mg/kg | | 0.003 | 0.012 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Pyrene | <0.0062 | mg/kg | | 0.006 | 0.021 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |

Sample I.D. #: 224811 Sample Description: BS1-1 4-5 Date Sampled: 12/17/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| Total Percent Solids | 70.8 | % | | | | | 12/21/98 | NMP | EPA 5030 |
| 1,2,4-Trimethylbenzene | <0.025 | mg/kg | | 0.015 | 0.053 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| 1,3,5-Trimethylbenzene | <0.025 | mg/kg | | 0.010 | 0.030 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| Benzene | <0.025 | mg/kg | | 0.009 | 0.029 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| Ethylbenzene | <0.025 | mg/kg | | 0.009 | 0.028 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| m & p- Xylene | <0.025 | mg/kg | | 0.017 | 0.053 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| Methyl t-Butyl Ether | <0.025 | mg/kg | | 0.011 | 0.034 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| o-Xylene | <0.025 | mg/kg | | 0.008 | 0.026 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| Toluene | <0.025 | mg/kg | | 0.008 | 0.026 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| Diesel Range Organics | <1.4 | mg/kg | | 1.4 | 4.7 | 12/21/98 | 01/01/99 | PML | WDNR DRO |
| 1-Methyl Naphthalene | <0.047 | mg/kg | | 0.047 | 0.16 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |

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



***ANALYTICAL REPORT***

GANNETT FLEMING
JEFF KING
8025 EXCELSIOR DRIVE
MADISON, WI 53717

Customer #: LE8000012374
Work Order: 9812000729
Report Date: 01/14/99
Date Received: 12/18/98
Arrival Temperature: On Ice

Report Submitted By: *Record Reviewer*

Note: None

Project Name: MURPHY 51,52 Project Number: 34265.008

Sample I.D. #: 224811 Sample Description: BS1-1 4-5 Date Sampled: 12/17/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| 2-Methyl Naphthalene | <0.031 | mg/kg | | 0.031 | 0.10 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Acenaphthene | <0.048 | mg/kg | | 0.048 | 0.16 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Acenaphthylene | <0.051 | mg/kg | | 0.051 | 0.17 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Anthracene | <0.023 | mg/kg | | 0.023 | 0.077 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Benzo(a)anthracene | <0.0020 | mg/kg | | 0.002 | 0.006 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Benzo(a)pyrene | <0.0015 | mg/kg | | 0.001 | 0.005 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Benzo(b)fluoranthene | <0.0015 | mg/kg | | 0.001 | 0.005 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Benzo(g,h,i)perylene | <0.0041 | mg/kg | | 0.004 | 0.014 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Benzo(k)fluoranthene | <0.0015 | mg/kg | | 0.001 | 0.005 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Chrysene | <0.092 | mg/kg | | 0.092 | 0.31 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Dibenzo(a,h)anthracene | <0.23 | mg/kg | | 0.23 | 0.77 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Fluoranthene | <0.0049 | mg/kg | | 0.004 | 0.016 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Fluorene | <0.0086 | mg/kg | | 0.008 | 0.029 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Indeno(1,2,3-cd)pyrene | <0.0094 | mg/kg | | 0.009 | 0.031 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Naphthalene | <0.031 | mg/kg | | 0.031 | 0.10 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Phenanthrene | <0.0035 | mg/kg | | 0.003 | 0.012 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Pyrene | <0.0062 | mg/kg | | 0.006 | 0.021 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |

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


RECEIVED
GANNETT FLEMING, INC.
MADISON, WI
JAN 11 [illegible]
FILE NO. 34265.008
WJG DSK DJO
JSK
Murphy Tank 51

***ANALYTICAL REPORT***

GANNETT FLEMING
JEFF KING
8025 EXCELSIOR DRIVE
MADISON, WI 53717

Customer #: LE8000012374
Work Order: 9812000729
Report Date: 01/08/99
Date Received: 12/18/98
Arrival Temperature: On Ice

Report Submitted By: _____
*Record Reviewer*

Note: None

Project Name: MURPHY 51,52 Project Number: 34265.008

Sample I.D. #: 224812 Sample Description: FB-51 Date Sampled: 12/17/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| 1,2,4-Trimethylbenzene | <0.025 | mg/kg | | 0.015 | 0.053 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| 1,3,5-Trimethylbenzene | <0.025 | mg/kg | | 0.010 | 0.030 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| Benzene | <0.025 | mg/kg | | 0.009 | 0.029 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| Ethylbenzene | <0.025 | mg/kg | | 0.009 | 0.028 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| m & p- Xylene | <0.025 | mg/kg | | 0.017 | 0.053 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| Methyl t-Butyl Ether | <0.025 | mg/kg | | 0.011 | 0.034 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| o-Xylene | <0.025 | mg/kg | | 0.008 | 0.026 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| Toluene | <0.025 | mg/kg | | 0.008 | 0.026 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |

Sample I.D. #: 224813 Sample Description: BS2-1 1-2 Date Sampled: 12/17/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| Total Percent Solids | 76.1 | % | | | | | 12/21/98 | NMP | EPA 5030 |
| 1,2,4-Trimethylbenzene | <1.2 | mg/kg | | 0.015 | 0.053 | 12/22/98 | 12/24/98 | KMC | EPA 8020 |
| 1,3,5-Trimethylbenzene | 4.8 | mg/kg | | 0.010 | 0.030 | 12/22/98 | 12/24/98 | KMC | EPA 8020 |
| Benzene | <1.2 | mg/kg | V | 0.009 | 0.029 | 12/22/98 | 12/24/98 | KMC | EPA 8020 |
| Ethylbenzene | <1.2 | mg/kg | | 0.009 | 0.028 | 12/22/98 | 12/24/98 | KMC | EPA 8020 |
| m & p- Xylene | 3.0 | mg/kg | J | 0.017 | 0.053 | 12/22/98 | 12/24/98 | KMC | EPA 8020 |
| Methyl t-Butyl Ether | <1.2 | mg/kg | | 0.011 | 0.034 | 12/22/98 | 12/24/98 | KMC | EPA 8020 |
| o-Xylene | <1.2 | mg/kg | | 0.008 | 0.026 | 12/22/98 | 12/24/98 | KMC | EPA 8020 |
| Toluene | <1.2 | mg/kg | | 0.008 | 0.026 | 12/22/98 | 12/24/98 | KMC | EPA 8020 |
| Diesel Range Organics | 14000 | mg/kg | L | 1.4 | 4.7 | 12/21/98 | 01/01/99 | PML | WDNR DRO |
| 1-Methyl Naphthalene | 19 | mg/kg | V | 0.047 | 0.16 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| 2-Methyl Naphthalene | 9.3 | mg/kg | | 0.031 | 0.10 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Acenaphthene | <0.48 | mg/kg | | 0.048 | 0.16 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Acenaphthylene | <0.51 | mg/kg | | 0.051 | 0.17 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Anthracene | <0.23 | mg/kg | | 0.023 | 0.077 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(a)anthracene | <0.020 | mg/kg | | 0.002 | 0.006 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(a)pyrene | 0.69 | mg/kg | | 0.001 | 0.005 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(b)fluoranthene | 1.2 | mg/kg | | 0.001 | 0.005 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(g,h,i)perylene | <0.041 | mg/kg | | 0.004 | 0.014 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(k)fluoranthene | 0.80 | mg/kg | | 0.001 | 0.005 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Chrysene | <0.92 | mg/kg | | 0.092 | 0.31 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Dibenzo(a,h)anthracene | <2.3 | mg/kg | | 0.23 | 0.77 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Fluoranthene | 2.4 | mg/kg | | 0.004 | 0.016 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Fluorene | <0.086 | mg/kg | | 0.008 | 0.029 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Indeno(1,2,3-cd)pyrene | <0.094 | mg/kg | | 0.009 | 0.031 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Naphthalene | 0.93 | mg/kg | J | 0.031 | 0.10 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Phenanthrene | 1.2 | mg/kg | | 0.003 | 0.012 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Pyrene | 3.1 | mg/kg | | 0.006 | 0.021 | 12/31/98 | 01/06/99 | PML | EPA 8310 |

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Baraboo, WI 53913-3901
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***ANALYTICAL REPORT***

Customer #: LE8000012374
Work Order: 9812000729
Report Date: 01/08/99
Date Received: 12/18/98
Arrival Temperature: On Ice

GANNETT FLEMING
JEFF KING
8025 EXCELSIOR DRIVE
MADISON, WI 53717

Report Submitted By: _____
*Record Reviewer*

Note: None

Project Name: MURPHY 51,52 Project Number: 34265.008

Sample I.D. #: 224814 Sample Description: B52-1 4-5 Date Sampled: 12/17/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| Total Percent Solids | 73.4 | % | | | | | 12/21/98 | NMP | EPA 5030 |
| 1,2,4-Trimethylbenzene | <0.025 | mg/kg | | 0.015 | 0.053 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| 1,3,5-Trimethylbenzene | <0.025 | mg/kg | | 0.010 | 0.030 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| Benzene | <0.025 | mg/kg | | 0.009 | 0.029 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| Ethylbenzene | <0.025 | mg/kg | | 0.009 | 0.028 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| m & p- Xylene | <0.025 | mg/kg | | 0.017 | 0.053 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| Methyl t-Butyl Ether | <0.025 | mg/kg | | 0.011 | 0.034 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| o-Xylene | <0.025 | mg/kg | | 0.008 | 0.026 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| Toluene | <0.025 | mg/kg | | 0.008 | 0.026 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| Diesel Range Organics | <1.4 | mg/kg | | 1.4 | 4.7 | 12/21/98 | 01/01/99 | PML | WDNR DRO |
| 1-Methyl Naphthalene | <0.047 | mg/kg | | 0.047 | 0.16 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| 2-Methyl Naphthalene | <0.031 | mg/kg | | 0.031 | 0.10 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Acenaphthene | <0.048 | mg/kg | | 0.048 | 0.16 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Acenaphthylene | <0.051 | mg/kg | | 0.051 | 0.17 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Anthracene | <0.023 | mg/kg | | 0.023 | 0.077 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(a)anthracene | <0.0020 | mg/kg | | 0.002 | 0.006 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(a)pyrene | <0.0015 | mg/kg | | 0.001 | 0.005 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(b)fluoranthene | <0.0015 | mg/kg | | 0.001 | 0.005 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(g,h,i)perylene | <0.0041 | mg/kg | | 0.004 | 0.014 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(k)fluoranthene | <0.0015 | mg/kg | | 0.001 | 0.005 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Chrysene | <0.092 | mg/kg | | 0.092 | 0.31 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Dibenzo(a,h)anthracene | <0.23 | mg/kg | | 0.23 | 0.77 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Fluoranthene | <0.0049 | mg/kg | | 0.004 | 0.016 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Fluorene | <0.0086 | mg/kg | | 0.008 | 0.029 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Indeno(1,2,3-cd)pyrene | <0.0094 | mg/kg | | 0.009 | 0.031 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Naphthalene | <0.031 | mg/kg | | 0.031 | 0.10 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Phenanthrene | <0.0035 | mg/kg | | 0.003 | 0.012 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Pyrene | <0.0062 | mg/kg | | 0.006 | 0.021 | 12/31/98 | 01/06/99 | PML | EPA 8310 |

Sample I.D. #: 224815 Sample Description: B52-2 1-2 Date Sampled: 12/17/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| Total Percent Solids | 76.8 | % | | | | | 12/21/98 | NMP | EPA 5030 |
| 1,2,4-Trimethylbenzene | <0.025 | mg/kg | | 0.015 | 0.053 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| 1,3,5-Trimethylbenzene | <0.025 | mg/kg | | 0.010 | 0.030 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| Benzene | <0.025 | mg/kg | | 0.009 | 0.029 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| Ethylbenzene | <0.025 | mg/kg | | 0.009 | 0.028 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| m & p- Xylene | <0.025 | mg/kg | | 0.017 | 0.053 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| Methyl t-Butyl Ether | <0.025 | mg/kg | | 0.011 | 0.034 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| o-Xylene | <0.025 | mg/kg | | 0.008 | 0.026 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| Toluene | <0.025 | mg/kg | | 0.008 | 0.026 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| Diesel Range Organics | 510 | mg/kg | L | 1.4 | 4.7 | 12/21/98 | 01/01/99 | PML | WDNR DRO |
| 1-Methyl Naphthalene | <0.047 | mg/kg | | 0.047 | 0.16 | 12/31/98 | 01/06/99 | PML | EPA 8310 |

WI DNR Lab Certification Number: 157066030 DATCP Certification Number: 000289

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Fax: 608-356-2766
email: fyi@ctienv.com


***ANALYTICAL REPORT***

Customer #: LE8000012374
Work Order: 9812000729
Report Date: 01/08/99
Date Received: 12/18/98
Arrival Temperature: On Ice

GANNETT FLEMING
JEFF KING
8025 EXCELSIOR DRIVE
MADISON, WI 53717

Report Submitted By: _____
*Record Reviewer*

Note: None

Project Name: MURPHY 51,52 Project Number: 34265.008

Sample I.D. #: 224815 Sample Description: B52-2 1-2 Date Sampled: 12/17/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| 2-Methyl Naphthalene | <0.031 | mg/kg | | 0.031 | 0.10 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Acenaphthene | <0.048 | mg/kg | | 0.048 | 0.16 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Acenaphthylene | <0.051 | mg/kg | | 0.051 | 0.17 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Anthracene | <0.023 | mg/kg | | 0.023 | 0.077 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(a)anthracene | <0.0020 | mg/kg | | 0.002 | 0.006 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(a)pyrene | <0.0015 | mg/kg | | 0.001 | 0.005 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(b)fluoranthene | <0.0015 | mg/kg | | 0.001 | 0.005 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(g,h,i)perylene | <0.0041 | mg/kg | | 0.004 | 0.014 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(k)fluoranthene | <0.0015 | mg/kg | | 0.001 | 0.005 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Chrysene | <0.092 | mg/kg | | 0.092 | 0.31 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Dibenzo(a,h)anthracene | <0.23 | mg/kg | | 0.23 | 0.77 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Fluoranthene | <0.0049 | mg/kg | | 0.004 | 0.016 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Fluorene | <0.0086 | mg/kg | | 0.008 | 0.029 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Indeno(1,2,3-cd)pyrene | <0.0094 | mg/kg | | 0.009 | 0.031 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Naphthalene | <0.031 | mg/kg | | 0.031 | 0.10 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Phenanthrene | <0.0035 | mg/kg | | 0.003 | 0.012 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Pyrene | <0.0062 | mg/kg | | 0.006 | 0.021 | 12/31/98 | 01/06/99 | PML | EPA 8310 |

Sample I.D. #: 224816 Sample Description: B52-2 4-5 Date Sampled: 12/17/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| Total Percent Solids | 77.3 | % | | | | | 12/21/98 | NMP | EPA 5030 |
| 1,2,4-Trimethylbenzene | <0.025 | mg/kg | | 0.015 | 0.053 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| 1,3,5-Trimethylbenzene | <0.025 | mg/kg | | 0.010 | 0.030 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| Benzene | <0.025 | mg/kg | | 0.009 | 0.029 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| Ethylbenzene | <0.025 | mg/kg | | 0.009 | 0.028 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| m & p- Xylene | <0.025 | mg/kg | | 0.017 | 0.053 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| Methyl t-Butyl Ether | <0.025 | mg/kg | | 0.011 | 0.034 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| o-Xylene | <0.025 | mg/kg | | 0.008 | 0.026 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| Toluene | <0.025 | mg/kg | | 0.008 | 0.026 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| Diesel Range Organics | <1.4 | mg/kg | | 1.4 | 4.7 | 12/21/98 | 01/04/99 | PML | WDNR DRO |
| 1-Methyl Naphthalene | <0.047 | mg/kg | | 0.047 | 0.16 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| 2-Methyl Naphthalene | <0.031 | mg/kg | | 0.031 | 0.10 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Acenaphthene | <0.048 | mg/kg | | 0.048 | 0.16 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Acenaphthylene | <0.051 | mg/kg | | 0.051 | 0.17 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Anthracene | <0.023 | mg/kg | | 0.023 | 0.077 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(a)anthracene | <0.0020 | mg/kg | | 0.002 | 0.006 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(a)pyrene | <0.0015 | mg/kg | | 0.001 | 0.005 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(b)fluoranthene | <0.0015 | mg/kg | | 0.001 | 0.005 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(g,h,i)perylene | <0.0041 | mg/kg | | 0.004 | 0.014 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(k)fluoranthene | <0.0015 | mg/kg | | 0.001 | 0.005 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Chrysene | <0.092 | mg/kg | | 0.092 | 0.31 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Dibenzo(a,h)anthracene | <0.23 | mg/kg | | 0.23 | 0.77 | 12/31/98 | 01/06/99 | PML | EPA 8310 |

WI DNR Lab Certification Number: 157066030 DATCP Certification Number: 000289

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email: fyi@ctienv.com


***ANALYTICAL REPORT***

Customer #: LE8000012374
Work Order: 9812000729
Report Date: 01/08/99
Date Received: 12/18/98
Arrival Temperature: On Ice

GANNETT FLEMING
JEFF KING
8025 EXCELSIOR DRIVE
MADISON, WI 53717

Report Submitted By: _____
*Record Reviewer*

Note: None

Project Name: MURPHY 51,52 Project Number: 34265.008

Sample I.D. #: 224816 Sample Description: BS2-2 4-5 Date Sampled: 12/17/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| Fluoranthene | <0.0049 | mg/kg | | 0.004 | 0.016 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Fluorene | <0.0086 | mg/kg | | 0.008 | 0.029 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Indeno(1,2,3-cd)pyrene | <0.0094 | mg/kg | | 0.009 | 0.031 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Naphthalene | <0.031 | mg/kg | | 0.031 | 0.10 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Phenanthrene | <0.0035 | mg/kg | | 0.003 | 0.012 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Pyrene | <0.0062 | mg/kg | | 0.006 | 0.021 | 12/31/98 | 01/06/99 | PML | EPA 8310 |

Sample I.D. #: 224817 Sample Description: BS2-3 1-2 Date Sampled: 12/17/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| Total Percent Solids | 77.5 | % | | | | | 12/21/98 | NMP | EPA 5030 |
| 1,2,4-Trimethylbenzene | <0.025 | mg/kg | | 0.015 | 0.053 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| 1,3,5-Trimethylbenzene | <0.025 | mg/kg | | 0.010 | 0.030 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| Benzene | <0.025 | mg/kg | | 0.009 | 0.029 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| Ethylbenzene | <0.025 | mg/kg | | 0.009 | 0.028 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| m & p- Xylene | <0.025 | mg/kg | | 0.017 | 0.053 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| Methyl t-Butyl Ether | <0.025 | mg/kg | | 0.011 | 0.034 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| o-Xylene | <0.025 | mg/kg | | 0.008 | 0.026 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| Toluene | <0.025 | mg/kg | | 0.008 | 0.026 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| Diesel Range Organics | 41 | mg/kg | L | 1.4 | 4.7 | 12/21/98 | 01/04/99 | PML | WDNR DRO |
| 1-Methyl Naphthalene | <0.047 | mg/kg | | 0.047 | 0.16 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| 2-Methyl Naphthalene | <0.031 | mg/kg | | 0.031 | 0.10 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Acenaphthene | <0.048 | mg/kg | | 0.048 | 0.16 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Acenaphthylene | 0.11 | mg/kg | J | 0.051 | 0.17 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Anthracene | <0.023 | mg/kg | | 0.023 | 0.077 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(a)anthracene | 0.11 | mg/kg | | 0.002 | 0.006 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(a)pyrene | <0.0015 | mg/kg | | 0.001 | 0.005 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(b)fluoranthene | <0.0015 | mg/kg | | 0.001 | 0.005 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(g,h,i)perylene | <0.0041 | mg/kg | | 0.004 | 0.014 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(k)fluoranthene | <0.0015 | mg/kg | | 0.001 | 0.005 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Chrysene | <0.092 | mg/kg | | 0.092 | 0.31 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Dibenzo(a,h)anthracene | <0.23 | mg/kg | | 0.23 | 0.77 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Fluoranthene | 0.18 | mg/kg | | 0.004 | 0.016 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Fluorene | <0.0086 | mg/kg | | 0.008 | 0.029 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Indeno(1,2,3-cd)pyrene | <0.0094 | mg/kg | | 0.009 | 0.031 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Naphthalene | <0.031 | mg/kg | | 0.031 | 0.10 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Phenanthrene | 0.011 | mg/kg | J | 0.003 | 0.012 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Pyrene | 0.44 | mg/kg | | 0.006 | 0.021 | 12/31/98 | 01/06/99 | PML | EPA 8310 |

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


***ANALYTICAL REPORT***

Customer #: LS8000012374
Work Order: 9812000729
Report Date: 01/08/99
Date Received: 12/18/98
Arrival Temperature: On Ice

GANNETT FLEMING
JEFF KING
8025 EXCELSIOR DRIVE
MADISON, WI 53717

Report Submitted By: _____
*Record Reviewer*

Note: None

Project Name: MURPHY 51,52 Project Number: 34265.008

Sample I.D. #: 224818 Sample Description: B52-3 4-5 Date Sampled: 12/17/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| Total Percent Solids | 74.1 | % | | | | | 12/21/98 | NMP | EPA 5030 |
| 1,2,4-Trimethylbenzene | <0.025 | mg/kg | | 0.015 | 0.053 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| 1,3,5-Trimethylbenzene | <0.025 | mg/kg | | 0.010 | 0.030 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| Benzene | <0.025 | mg/kg | | 0.009 | 0.029 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| Ethylbenzene | <0.025 | mg/kg | | 0.009 | 0.028 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| m & p- Xylene | <0.025 | mg/kg | | 0.017 | 0.053 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| Methyl t-Butyl Ether | <0.025 | mg/kg | | 0.011 | 0.034 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| o-Xylene | <0.025 | mg/kg | | 0.008 | 0.026 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| Toluene | <0.025 | mg/kg | | 0.008 | 0.026 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| Diesel Range Organics | <1.4 | mg/kg | | 1.4 | 4.7 | 12/21/98 | 01/01/99 | PML | WDNR DRO |
| 1-Methyl Naphthalene | <0.047 | mg/kg | | 0.047 | 0.16 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| 2-Methyl Naphthalene | <0.031 | mg/kg | | 0.031 | 0.10 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Acenaphthene | <0.048 | mg/kg | | 0.048 | 0.16 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Acenaphthylene | <0.051 | mg/kg | | 0.051 | 0.17 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Anthracene | <0.023 | mg/kg | | 0.023 | 0.077 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(a)anthracene | <0.0020 | mg/kg | | 0.002 | 0.006 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(a)pyrene | <0.0015 | mg/kg | | 0.001 | 0.005 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(b)fluoranthene | <0.0015 | mg/kg | | 0.001 | 0.005 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(g,h,i)perylene | <0.0041 | mg/kg | | 0.004 | 0.014 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(k)fluoranthene | <0.0015 | mg/kg | | 0.001 | 0.005 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Chrysene | <0.092 | mg/kg | | 0.092 | 0.31 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Dibenzo(a,h)anthracene | <0.23 | mg/kg | | 0.23 | 0.77 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Fluoranthene | <0.0049 | mg/kg | | 0.004 | 0.016 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Fluorene | <0.0086 | mg/kg | | 0.008 | 0.029 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Indeno(1,2,3-cd)pyrene | <0.0094 | mg/kg | | 0.009 | 0.031 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Naphthalene | <0.031 | mg/kg | | 0.031 | 0.10 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Phenanthrene | <0.0035 | mg/kg | | 0.003 | 0.012 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Pyrene | <0.0062 | mg/kg | | 0.006 | 0.021 | 12/31/98 | 01/06/99 | PML | EPA 8310 |

Sample I.D. #: 224819 Sample Description: B52-1 0-1.25 Date Sampled: 12/17/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| TOC as % Organic Matter | 5.62 | % | | 0.01 | NA | | 12/22/98 | EMH | MOSA 29.4 |

Sample I.D. #: 224820 Sample Description: B52-1 1.25-2.5 Date Sampled: 12/17/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| TOC as % Organic Matter | 1.55 | % | | 0.01 | NA | | 12/22/98 | EMH | MOSA 29.4 |

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 #: LE8000012374
Work Order: 9812000729
Report Date: 01/08/99
Date Received: 12/18/98
Arrival Temperature: On Ice

GANNETT FLEMING
JEFF KING
8025 EXCELSIOR DRIVE
MADISON, WI 53717

Report Submitted By: _____
*Record Reviewer*

Note: None

Project Name: MURPHY 51,52 Project Number: 34265.008

Sample I.D. #: 224821 Sample Description: B52-1 2.5-3.75 Date Sampled: 12/17/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| TOC as % Organic Matter | 3.21 | % | | 0.01 | NA | | 12/22/98 | EMH | MOSA 29.4 |

Sample I.D. #: 224822 Sample Description: B52-1 3.75-5 Date Sampled: 12/17/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| TOC as % Organic Matter | 2.97 | % | | 0.01 | NA | | 12/22/98 | EMH | MOSA 29.4 |

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***

GANNETT FLEMING
JEFF KING
8025 EXCELSIOR DRIVE
MADISON, WI 53717

Customer #: LE8000012374
Work Order: 9812000906
Report Date: 01/04/99
Date Received: 12/29/98
Arrival Temperature: On Ice

Report Submitted By: _____
*Record Reviewer*

Note: None

Project Name: MURPHY 51,52 Project Number: 34265.008

---

Sample I.D. #: 225471 Sample Description: BS2-1 2-4 Date Sampled: 12/17/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| Soil Permeability | 0.13E-5 | cm/s | | | | | 12/28/98 | GJM | MOSA 28-4.2 |

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

H:\MSWORD\DATQUAL.DOC

Commonwealth Technology, Inc.
1-800-228-3012
1230 Lange Court
Baraboo, WI 53913
(608) 356-2760
FAX: (608) 356-2766

2 of 2

No. 5724

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

| | | | |
|---|---|---|---|
| SAMPLE COLLECTOR: Jeff King (GZA) | COMPANY: Gannett Fleming | TELEPHONE # (include area code): | |
| PROJECT NUMBER: 34265.008 | PROJECT NAME: Tank 51/52 | | |

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

| | |
|---|---|
| INVOICE ADDRESS (must be completed): Liz Lundmark | REPORT ADDRESS (must be completed): Jeff King |

| | | | |
|---|---|---|---|
| DATE & TIME OF RELINQUISHMENT: 12/18/98 16:00 | RELINQUISHED BY (signature): | RECEIVED BY (signature): | DATE / TIME OF RECEPTION: |
| DATE & TIME OF RELINQUISHMENT: | RELINQUISHED BY (signature): | RECEIVED BY LABORATORY (signature): | DATE / TIME OF RECEPTION: 12-18-98 1800 |

| 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. |
|---|---|---|---|---|---|---|---|---|---|---|
| B52-3 4-5 | 12/17/98 | PM | Soil | grab | Meoh | | DRO GRO GRO/PVOC PVOC Pb Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER PAH Other (please list): | | 3 | 224818 |
| B52-1 0-1.25 | | | | | | Zip lock | DRO GRO GRO/PVOC PVOC Pb Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER PAH Other (please list): Organic Carbon Fraction | | 1 | 224819 |
| B52-1 1.25-2.5 | | | | | | Zip lock | DRO GRO GRO/PVOC PVOC Pb Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER PAH Other (please list): | | 1 | 224820 |
| B52-1 2.5-3.75 | | | | | | Zip lock | DRO GRO GRO/PVOC PVOC Pb Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER PAH Other (please list): | | 1 | 224821 |
| B52-1 3.75-5 | | | | | | Zip lock | DRO GRO GRO/PVOC PVOC Pb Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER PAH Other (please list): | | 1 | 224822 |
| B52-1 2-4 | | | | | | Acetate sleeve | DRO GRO GRO/PVOC PVOC Pb Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER PAH Other (please list): Permeability | MM 12/21/98 | 1 | 224823 |
| B52-1 2-4 | | | | | | | DRO GRO GRO/PVOC PVOC Pb Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER PAH Other (please list): Permeability * | | | 225471 |
| | | | | | | | DRO GRO GRO/PVOC PVOC Pb Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER PAH Other (please list): | | | |

SAMPLE CONDITIONS / COMMENTS: * See Sample Log-in form.

CHECKED

ARRIVAL TEMPERATURE: on ice

729

1 of 2


# Commonwealth Technology, Inc.

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


No. 5723

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

SAMPLE COLLECTOR: Jeff King (JSK) | COMPANY: Gannett Fleming | TELEPHONE # (include area code): (608) 836-1500

PROJECT NUMBER: 34265.008 | PROJECT NAME: Tank 51/52

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

INVOICE ADDRESS (must be completed): Liz Lundvark, Murphy Oil USA | REPORT ADDRESS (must be completed): Jeff King, Gannett Fleming

DATE & TIME OF RELINQUISHMENT: 12/18/98 16:00 | RELINQUISHED BY (signature): Jeff King | RECEIVED BY (signature): | DATE / TIME OF RECEPTION:

DATE & TIME OF RELINQUISHMENT: | RELINQUISHED BY (signature): | RECEIVED BY LABORATORY (signature): P. Thurgen | DATE / TIME OF RECEPTION: 12-18-98 1300

| 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 CONTAIN-ERS | LAB I.D. |
|---|---|---|---|---|---|---|---|---|---|---|
| B51-1 1-2 | 12/17/98 | PM | Soil | grab | MeOH | | (DRO) GRO GRO/PVOC (PVOC) Pb Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER (PAH) Other (please list): | | 3 | 224810 |
| B51-1 4-5 | | | | | | | (DRO) GRO GRO/PVOC (PVOC) Pb Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER (PAH) Other (please list): | | | 224811 |
| FB-51 | | | | | | Methanol Blank | (DRO) GRO GRO/PVOC (PVOC) Pb Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER (PAH) Other (please list): 12-22-98 | 12-22-98 | | 224812 |
| B52-1 1-2 | | | | | | | (DRO) GRO GRO/PVOC (PVOC) Pb Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER (PAH) Other (please list): | | | 224813 |
| B52-1 4-5 | | | | | | | (DRO) GRO GRO/PVOC (PVOC) Pb Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER (PAH) Other (please list): | | | 224814 |
| B52-2 1-2 | | | | | | | (DRO) GRO GRO/PVOC (PVOC) Pb Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER (PAH) Other (please list): | | | 224815 |
| B52-2 4-5 | | | | | | | (DRO) GRO GRO/PVOC (PVOC) Pb Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER (PAH) Other (please list): | | | 224816 |
| B52-3 1-2 | ↓ | ↓ | ↓ | ↓ | ↓ | | (DRO) GRO GRO/PVOC (PVOC) Pb Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER (PAH) Other (please list): | | ↓ | 224817 |

SAMPLE CONDITIONS / COMMENTS:

CHECKED

ARRIVAL TEMPERATURE

WISCONSIN
DEPT. OF NATURAL RESOURCES

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

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

Northern Region Headquarters
107 Sutliff Ave.
Rhinelander, Wisconsin 54501-0818
Telephone 715-365-8900
FAX 715-365-8932
TDD 715-365-8957

June 24, 1999

NOR UID #02-16-222701

R. Lee Vail
Environmental Affairs
Murphy Oil Corp.
PO Box 61780
New Orleans, LA 70160-1780

Subject: Numbering correction for Murphy Oil Tank Basin 51 & 52, 2400 Stinson Ave., Superior, WI

Dear Mr. Vail:

You recently received a letter from me referencing 02-16-221811 as the NOR UID number for the above site. That number is **incorrect**. Please use **02-16-222701** on all correspondence and please inform your consultant of this change. A copy of this letter will also be sent to the Department of Commerce. I apologize for any inconvenience this may have caused.

Sincerely,

Danielle Lancour

Danielle Lancour
Remediation and Redevelopment Program

cc: Shanna Laube, Dept. of Commerce, PO Box 530, Park Falls, WI 54552-0530

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

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

Northern Region Headquarters
107 Sutliff Ave.
Rhinelander, Wisconsin 54501-0818
Telephone 715-365-8900
FAX 715-365-8932
TDD 715-365-8957

June 15, 1999

RECEIVED
JUN 17 1999
ERS DIVISION

NOR UID # ~~02-16-221811~~ 02-16-222701

R. Lee Vail
Environmental Affairs Dept.
Murphy Oil Corp.
PO Box 61780
New Orleans, LA 70160-1780

Subject: Murphy Oil – Tank Basin 51 & 52, 2400 Stinson Ave., Superior, WI

Dear Mr. Vail:

The Department of Natural Resources - Remediation and Redevelopment Program recently reviewed a report that indicates that groundwater is not impacted by contamination at the above-referenced site.

Based on this, the Department is transferring authority for the site to the Wisconsin Department of Commerce, in accordance with statutory requirements.

Please notify your consultant of this change.

Sincerely,
NORTHERN REGION

Danielle Lancour

Danielle Lancour
Remediation and Redevelopment Program

cc: File
Shanna Laube, Dept. of Commerce, PO Box 530, Park Falls, WI 54552

WISCONSIN
DEPT. OF NATURAL RESOURCES

**State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES**

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

1705 Tower Avenue
Superior, Wisconsin 54880
Telephone 715-392-0802
FAX 715-392-7993

June 11, 1999

RECEIVED
JUN 14 1999
ERS DIVISION

Shanna Laube – Hydrogeologist
Department of Commerce
PO Box 530
Park Falls, WI 54552-0530

Subject: Murphy Oil Tank Basin 51 and Tank Basin 52

Dear Shanna:

The purpose of this letter is to notify you of our intent to transfer the Murphy Oil Tank 51 and Tank 52 Basin file. This is one of 21 sites on their refinery listed as Environmental Repair Sites in the Department's BRRTs system. This is another one of the many of the former spill sites which are nearing completion of their investigative phases.

In regards to the Tank Basin 51 and Tank Basin 52 site, their latest report on this case indicates that some of the borings at the site are above NR 720 soil standards for DRO. PAHs at the site may be a concern, sample results exceed the DNR's PAH guidance RCLs.

Danielle Lancour will be providing the file shortly and notifying the company of the transfer. If you have any questions please feel free to call me at 715-392-0802.

Sincerely,
NORTHERN REGION

James A. Hosch
Spills Coordinator/Hydrogeologist

Cc: Mark Stokstad – Rhinelander
Linda Meyer – LC/5
Danielle Lancour – Rhinelander

eder associates
a division of Gannett Fleming

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



April 9, 1999
File #34265.003 and #34265.008

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

Re: Status Reports - Tanks 51/52 and Former Tank 81
Murphy Oil USA, Inc., Superior, Wisconsin

Dear Mr. Hosch:

Attached are status reports providing new data collected in late 1998, as well as the previous data from Tank 51/52 basin and the former Tank 81 basin, at Murphy's Superior refinery.

We will continue to provide a steady flow of status reports to you on the other sites. In accordance with our goal of getting out two status reports per week until updates have been provided to you for all active sites at the refinery, this submittal contains the second set of two status reports.

If you have any questions or comments during your review of these status reports, please call me.

Very truly yours,

GANNETT FLEMING, INC.

Dennis F. Kugle
Vice President

DFK/reb
Enc.
cc: Lee Vail (Murphy/New Orleans)
Liz Lundmark (Murphy/Superior)
Kevin Melnyk (Murphy/El Dorado)
Greg Neve (Murphy/Superior)
Rick Lewandowski (DeWitt Ross & Stevens/Madison)

M:\CLERICAL\PROJECTS\0300\367-18\CORRESP\DJO\IL367-18.004

eder associates
a division of Gannett Fleming

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

April 9, 1999
File #34265.008



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

Re: Site Status Report, Tanks 51/52, Murphy Oil USA, Inc., Superior, Wisconsin

Dear Mr. Hosch:

On behalf of Murphy Oil USA, Inc., Gannett Fleming, Inc. is submitting this status report describing our 1998 site investigation of the area affected by three separate releases of #6 fuel oil from Tanks 51 and 52 at Murphy's Superior refinery.

**Background**

Releases from these tanks were reported to the Wisconsin Department of Natural Resources (WDNR) in January 1994 (4,200 gallons), February 1996 (1,260 gallons), and March 1996 (420 gallons).

In July 1998, Gannett Fleming collected and field-screened shallow (1 to 1.5 feet below ground surface [bgs]) soil samples from the bottom of this tank basin. In addition, a Geoprobe was used to collect undisturbed soil samples from one probe hole (GP-16) in the tank basin. These samples were analyzed for diesel range organics (DRO), gasoline range organics (GRO), petroleum volatile organic compounds (PVOCs), and polynuclear aromatic hydrocarbons (PAHs).

In October 1998, Twin Ports Testing collected and field-screened shallow soil samples from 32 locations within the diked area of Tanks 51/52 to identify the lateral extent of contamination within the tank basin. The results of all previous soil screening and sampling from this tank basin have been provided in previous reports to the WDNR. The attached Figure 1 identifies all these sampling locations, along with the field-screening results from samples collected in this basin.



Continued . . .

Mr. James A. Hosch
Wisconsin Department of Natural Resources
April 9, 1999



**December 1998 Geoprobe Investigation**

A work plan for the investigation of the Tank 51/52 basin was submitted to you on November 12, 1998, and conditionally approved on December 7, 1998. In December 1998, Gannett Fleming staff attempted to implement the work plan. It is important to note that access was very limited in the central and southeastern portions of the basin near Tank 51 due to aboveground piping and very wet soils, respectively. For these reasons, it was not possible to gain access for sampling in these areas using the Geoprobe. However, a total of four probe holes were completed. This site was unique. All other release investigations were able to be completed as planned.

The results for the samples collected around Tank 52 delineate the extent of contaminated soil in that area. These results correlated well with the field-screening results from that area and confirmed that the field-screening values can be used to define the extent of contaminated soil around Tank 51. Each of the probe holes in the basin was advanced to a depth of 6 feet bgs. Soil samples for chemical analysis were collected at depths of 1 to 2 and 4 to 5 feet in each probe hole. In one probe hole, a Shelby tube was used to collect a sample from a depth of 2 to 4 feet for permeability testing, and four other samples were collected at various depths throughout the probe hole for organic carbon fraction testing.

The samples collected for chemical analysis were submitted to Commonwealth Technology, Inc. (CTI) for DRO, PVOCs, and PAH analysis. CTI also analyzed the 2- to 4-foot sample for vertical permeability, using the falling head test, and four samples from various depths for their organic carbon fraction. Table 1, which is attached, contains all the analytical results for the chemical testing of the samples from the Tank 51/52 basin. Table 2 contains the results of the organic carbon fraction and permeameter tests. The permeameter test conducted on the Shelby Tube sample resulted in a hydraulic conductivity of $1.3 \times 10^{-6}$ cm/sec, which although somewhat high, is generally consistent with literature values and the results from other tests of the clay at the site. The boring logs and abandonment forms for all December 1998 probe holes and the laboratory reports and chain of custody forms for all analyses are attached.



Continued . . .

Mr. James A. Hosch
Wisconsin Department of Natural Resources
April 9, 1999



This report provides you with an update of the recent investigation activities at this site. Given the field screening results combined with the chemical analysis results, it is our professional conclusion that the extent of the contamination has been determined. Further, given that the releases were a heavy #6 oil that could easily be recovered, and occurred during cold weather months when the frozen ground limited infiltration, the potential for groundwater contamination should have been very limited. This statement is supported by the fact that the levels of DRO, PVOCs, and PAHs decline dramatically with depth. None of the soil samples that were collected 4 to 5 feet below grade, the depth where saturated clay is present, contained any detectable levels of PVOCs or PAHs and only very low levels of DRO (<1.4 to 7.5 mg/kg) were present.

As soon as we submit our report on the Tank 59 site and discuss that information with you, we will complete our evaluation of the data for the Tank 51/52 basin. Following our evaluation, we will make recommendations on what should be done in this area.

If you have any questions about this status report, please call.

Sincerely,

GANNETT FLEMING, INC.

David J. Olig, P.G.
Senior Project Manager

Jeffrey J. King
Staff Hydrogeologist

Dennis F. Kugle
Vice President

DJO/reb
Enc.
cc: Lee Vail (Murphy/New Orleans)
Liz Lundmark (Murphy/Superior)
Kevin Melnyk (Murphy/El Dorado)
Greg Neve (Murphy/Superior)
Rick Lewandowski (DeWitt, Ross & Stevens/Madison)

M:\CLERICAL\PROJECTS\0300\367-18\CORRESP\DJO\1L367-18.005

MURPHY OIL USA, INC.
SUPERIOR, WISCONSIN

TABLE 1

ANALYTICAL RESULTS FOR SOIL SAMPLES FROM TANKS 51 & 52 BASIN (mg/kg)

| Parameter | Sample I.D. and Depth | | | | | | | | | | NR 720 RCL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | B51-1 | | B52-1 | | B52-2 | | B52-3 | | GP-16 @ Tank 52 | | |
| | 1-2 ft. | 4-5 ft. | 1-2 ft. | 4-5 ft. | 1-2 ft. | 4-5 ft. | 1-2 ft. | 4-5 ft. | 1-1.5 | 4.5-5 | |
| DRO | 21 | <1.4 | **14,000** | <1.4 | **510** | <1.4 | 41 | <1.4 | **2,200** | 7.5 | 250 |
| Benzene | <0.025 | <0.025 | <1.2 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.019 | <0.019 | 0.0055 |
| Ethylbenzene | <0.025 | <0.025 | <1.2 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.011 | <0.011 | 2.9 |
| Toluene | <0.025 | <0.025 | <1.2 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.011 | <0.011 | 1.5 |
| Total Xylenes | <0.050 | <0.050 | **4.2*** | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | 0.103 | <0.034 | 4.1 |
| Trimethylbenzenes | <0.050 | <0.050 | 6 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | 0.47 | <0.026 | |
| MTBE | <0.025 | <0.025 | <1.2 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.0090 | <0.0090 | |
| **Detected Polycyclic Aromatic Hydrocarbons** | | | | | | | | | | | |
| Acenapthylene | <0.051 | <0.051 | <0.51 | <0.051 | <0.051 | <0.051 | 0.11* | <0.051 | <1.3 | <0.051 | |
| Benzo(a)anthracene | <0.0020 | <0.0020 | <0.020 | <0.0020 | <0.0020 | <0.0020 | 0.11 | <0.0020 | <0.050 | <0.0020 | |
| Benzo(a)pyrene | <0.0015 | <0.0015 | 0.69 | <0.0015 | <0.0015 | <0.0015 | <0.0015 | <0.0015 | <0.038 | <0.0015 | |
| Benzo(b)fluoranthene | 0.022 | <0.0015 | 1.2 | <0.0015 | <0.0015 | <0.0015 | <0.0015 | <0.0015 | 2 | <0.0015 | |
| Benzo(g,h,i)perylene | 0.029 | <0.0041 | <0.041 | <0.0041 | <0.0041 | <0.0041 | <0.0041 | <0.0041 | <0.10 | <0.0041 | |
| Benzo(k)fluoranthene | <0.0015 | <0.0015 | 0.8 | <0.0015 | <0.0015 | <0.0015 | <0.0015 | <0.0015 | <0.038 | <0.0015 | |
| Fluoranthene | 0.02 | <0.0049 | 2.4 | <0.0049 | <0.0049 | <0.0049 | 0.18 | <0.0049 | <0.12 | <0.0049 | |
| Indeno(1,2,3-cd)pyrene | 0.023* | <0.0094 | <0.094 | <0.0094 | <0.0094 | <0.0094 | <0.0094 | <0.0094 | <0.24 | <0.0094 | |
| Phenanthrene | <0.0035 | <0.0035 | 1.2 | <0.0035 | <0.0035 | <0.0035 | 0.011* | <0.0035 | 0.41 | <0.0035 | |
| Pyrene | <0.0062 | <0.0062 | 3.1 | <0.0062 | <0.0062 | <0.0062 | 0.44 | <0.0062 | <0.16 | <0.0062 | |
| Naphthalene | <0.031 | <0.031 | 0.93* | <0.031 | <0.031 | <0.031 | <0.031 | <0.031 | <0.78 | <0.031 | |
| 1-Methyl naphthalene | <0.047 | <0.047 | 19 | <0.047 | <0.047 | <0.047 | <0.047 | <0.047 | <1.2 | <0.047 | |
| 2-Methyl naphthalene | <0.031 | <0.031 | 9.3 | <0.031 | <0.031 | <0.031 | <0.031 | <0.031 | <0.78 | <0.031 | |

NOTES:
Sample GP-16 collected in July 1998.
Samples B51-1 and B52-1 through B52-3 collected in December 1998.
Results reported in units of milligrams per kilogram (mg/kg) on a dry weight basis.
Results in bold exceed applicable NR 720 RCLs.
NR 720 RCL = Wisconsin Administrative Code NR 720 residual contaminant level.
* = Reported concentration below the quantitation limit.

MURPHY OIL USA, INC.
SUPERIOR, WISCONSIN

TABLE 2

ORGANIC CARBON FRACTION AND SOIL PERMEABILITY
IN SOIL SAMPLES COLLECTED FROM TANKS 51 & 52 BASIN

| Sample I.D. | Sample Depth (ft) | Organic Carbon Fraction | Sample Depth (ft) | Soil Permeabiltiy (cm/sec) |
|---|---|---|---|---|
| B52-1 | 0-1.25 | 0.0562 | 2-4 | 1.3E-06 |
| | 1.25-2.5 | 0.0155 | | |
| | 2.5-3.75 | 0.0321 | | |
| | 3.75-5 | 0.0297 | | |

## NOTES

1. *Site Layout And Sample Locations Are Based On Field Measurements And Are To Be Considered Approximate; Site Not Surveyed.*

2. *All Piping At Site Not Shown; Only Piping Which Influenced Sampling Locations Is Depicted.*

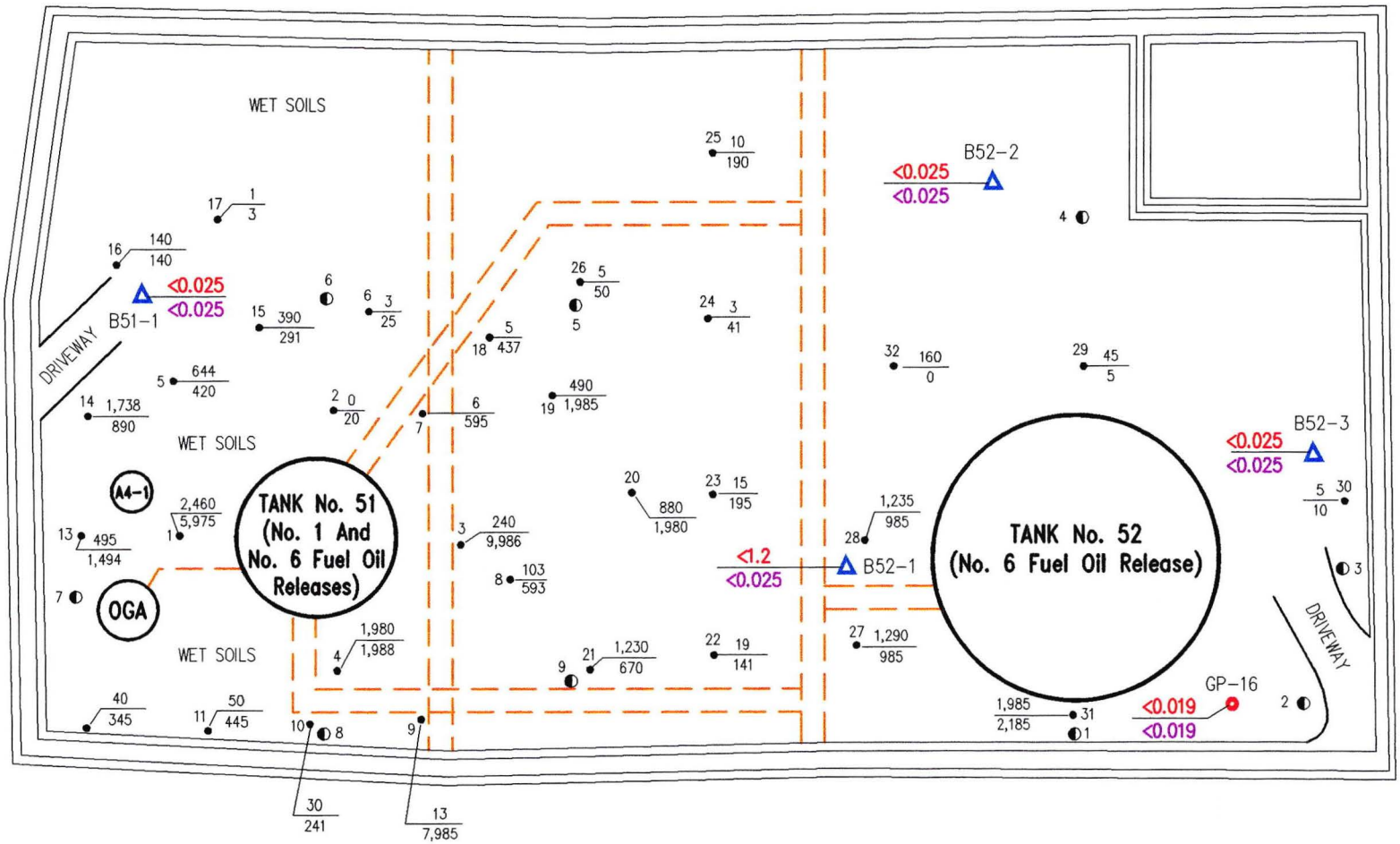
## LEGEND

- 3 — *Gannett Fleming Hand-Auger Field Screening Soil Sample Location (July 1998)*
- GP-16 — *Gannett Fleming Geoprobe Soil Sample Location (July 1998)*
- 18 — *Twin Ports Hand-Auger Field Screening Soil Sample Location (October 1998)*
- B52-2 — *Gannett Fleming Geoprobe Soil Sample Location (December 1998)*
- *Aboveground Piping*

| | |
|---|---|
| <1.2 | = Benzene Concentration At 1-2 Foot Depth (mg/kg) |
| <0.025 | = Benzene Concentration At 4-5 Foot Depth (mg/kg) |

NOTES
Concentrations In **BOLD** Exceed Generic NR 720 RCLs.
NA = Not Analyzed

5 / 10 = FID Reading At 1 Foot Depth / FID Reading At 2 Foot Depth




0 30
Scale In Feet

# SAMPLE LOCATIONS AND FID READINGS AT TANK NOS. 51 AND 52

MURPHY OIL USA, INC.
SUPERIOR, WISCONSIN

040699
34265WO

Gannett Fleming
FIGURE 1

State of Wisconsin
Department of Natural Resources

e To:
☐ Solid Waste ☐ Haz. Waste
☐ Emergency Response ☐ Underground Tanks
☐ Wastewater ☐ Water Resources
☐ Other

Soil Boring Log Information
Form 4400-122 7-91

Page 1 of 1

| Facility/Project Name | License/Permit/Monitoring Number | Boring Number |
|---|---|---|
| **Murphy Oil USA, Inc.** | | **B52-1** |

| Boring Drilled By (Firm name and name of crew chief) | Date Drilling Started | Date Drilling Completed | Drilling Method |
|---|---|---|---|
| **Soil Essentials (Dave Paulson)** | **12/17/98** | **12/17/98** | **Geoprobe** |

| DNR Facility Well No. | WI Unique Well No. | Common Well Name | Final Static Water Level | Surface Elevation | Borehole Diameter |
|---|---|---|---|---|---|
| | | | Feet MSL | Feet MSL | **2.3** Inches |

Boring Location
State Plane N, E
**NE** 1/4 of **NW** 1/4 of Section **36** T **49** N,R **14 W**
Lat ° ' "
Long ° ' "

Local Grid Location (If applicable)
☐ N ☐ E
Feet ☐ S Feet ☐ W

| County | DNR County Code | Civil Town/City/ or Village |
|---|---|---|
| **Douglas** | **16** | **Superior** |

| Sample Number | Sample Length (in) Recovered | Blow Counts | Depth In Feet | Soil/Rock Description And Geologic Origin For Each Major Unit | USCS | Graphic Log | Well Diagram | PID/FID | Soil Properties: Standard Penetration | Moisture Content | Liquid Limit | Plastic Limit | P 200 | RQD/ Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0-3.5 | 36 | | 0 | Brown SILTY CLAY | CL | | | | | M | | | | |
| | | | | Red CLAY, petroleum-like odor | ML CL | | | | | | | | | |
| | | | 1 | | | | | | | | | | | |
| | | | 2 | | | | | | | | | | | |
| | | | 3 | | | | | | | | | | | |
| 3.5-7 | 36 | | 4 | | | | | | | M | | | | |
| | | | 5 | | | | | | | | | | | |
| | | | 6 | | | | | | | | | | | |
| | | | 7 | End of boring | | | | | | | | | | |

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature

Firm Gannett Fleming, Inc.
8025 Excelsior Drive Madison, WI 53717
Tel: (608)836-1500 Fax: (608)831-3337

This form is authorized by Chapters 144, 147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than $10 nor more than $5,000 for each violation. Fined not less than $10 or more than $100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

State of Wisconsin
Department of Natural Resources

e To:
☐ Solid Waste ☐ Haz. Waste
☐ Emergency Response ☐ Underground Tanks
☐ Wastewater ☐ Water Resources
☐ Other

Soil Boring Log Information
Form 4400-122 7-91

Page 1 of 1

| Facility/Project Name | License/Permit/Monitoring Number | Boring Number |
|---|---|---|
| **Murphy Oil USA, Inc.** | | **B52-2** |

| Boring Drilled By (Firm name and name of crew chief) | Date Drilling Started | Date Drilling Completed | Drilling Method |
|---|---|---|---|
| **Soil Essentials (Dave Paulson)** | **12/17/98** | **12/17/98** | **Geoprobe** |

| DNR Facility Well No. | WI Unique Well No. | Common Well Name | Final Static Water Level | Surface Elevation | Borehole Diameter |
|---|---|---|---|---|---|
| | | | Feet MSL | Feet MSL | **2.3** Inches |

Boring Location
State Plane N, E
**NE** 1/4 of **NW** 1/4 of Section **36** T **49** N,R **14 W**
Lat ° ' "
Long ° ' "

Local Grid Location (If applicable)
☐ N Feet ☐ E
☐ S Feet ☐ W

| County | DNR County Code | Civil Town/City/ or Village |
|---|---|---|
| **Douglas** | **16** | **Superior** |

| Sample Number | Sample Length (in) Recovered | Blow Counts | Depth In Feet | Soil/Rock Description And Geologic Origin For Each Major Unit | USCS | Graphic Log | Well Diagram | PID/FID | Soil Properties: Standard Penetration | Moisture Content | Liquid Limit | Plastic Limit | P 200 | RQD/ Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0-3.5 | 24 | | 1 | Black-red silt, sand, clay, and gravel FILL, no odor | | | | | | M | | | | |
| | | | 2 | Red CLAY, no odor | CL | | | | | | | | | |
| | | | 3 | Brown-red SILTY CLAY | CL | | | | | | | | | |
| 3.5-7 | 36 | | 4 | Red CLAY, trace fractures and coarse sand, no odor | ML CL | | | | | M | | | | |
| | | | 5 | | | | | | | | | | | |
| | | | 6 | | | | | | | | | | | |
| | | | 7 | End of boring | | | | | | | | | | |

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature

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8025 Excelsior Drive Madison, WI 53717
Tel: (608)836-1500 Fax: (608)831-3337

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State of Wisconsin
Department of Natural Resources

e To:
☐ Solid Waste ☐ Haz. Waste
☐ Emergency Response ☐ Underground Tanks
☐ Wastewater ☐ Water Resources
☐ Other

Soil Boring Log Information
Form 4400-122 7-91

Page 1 of 1

| Facility/Project Name | License/Permit/Monitoring Number | Boring Number |
|---|---|---|
| **Murphy Oil USA, Inc.** | | **B52-3** |

| Boring Drilled By (Firm name and name of crew chief) | Date Drilling Started | Date Drilling Completed | Drilling Method |
|---|---|---|---|
| **Soil Essentials (Dave Paulson)** | **12/17/98** | **12/17/98** | **Geoprobe** |

| DNR Facility Well No. | WI Unique Well No. | Common Well Name | Final Static Water Level | Surface Elevation | Borehole Diameter |
|---|---|---|---|---|---|
| | | | Feet MSL | Feet MSL | **2.3** Inches |

Boring Location
State Plane N, E
**NE** 1/4 of **NW** 1/4 of Section **36** T **49** N,R **14 W**
Lat ° ' "
Long ° ' "

Local Grid Location (If applicable)
Feet ☐ N ☐ S Feet ☐ E ☐ W

| County | DNR County Code | Civil Town/City/ or Village |
|---|---|---|
| **Douglas** | **16** | **Superior** |

| Sample Number | Sample Length (in) Recovered | Blow Counts | Depth In Feet | Soil/Rock Description And Geologic Origin For Each Major Unit | USCS | Graphic Log | Well Diagram | PID/FID | Soil Properties: Standard Penetration | Moisture Content | Liquid Limit | Plastic Limit | P 200 | RQD/ Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0-3.5 | 30 | | 1 | Gray sand and gravel FILL, no odor | | | | | | M | | | | |
| | | | 2 | Red CLAY, trace organic material grading to no organic material, no odor | CL | | | | | | | | | |
| 3.5-7 | 24 | | 3 4 5 6 | | | | | | | M | | | | |
| | | | 7 | End of boring | | | | | | | | | | |

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature

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8025 Excelsior Drive Madison, WI 53717
Tel: (608)836-1500 Fax: (608)831-3337

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State of Wisconsin
Department of Natural Resources

e To:
- ☐ Solid Waste
- ☐ Emergency Response
- ☐ Wastewater
- ☐ Haz. Waste
- ☐ Underground Tanks
- ☐ Water Resources
- ☐ Other

Soil Boring Log Information
Form 4400-122 7-91

Page 1 of 1

| Facility/Project Name | License/Permit/Monitoring Number | Boring Number |
|---|---|---|
| **Murphy Oil USA, Inc.** | | **B51-1** |

| Boring Drilled By (Firm name and name of crew chief) | Date Drilling Started | Date Drilling Completed | Drilling Method |
|---|---|---|---|
| **Soil Essentials (Dave Paulson)** | **12/17/98** | **12/17/98** | **Geoprobe** |

| DNR Facility Well No. | WI Unique Well No. | Common Well Name | Final Static Water Level | Surface Elevation | Borehole Diameter |
|---|---|---|---|---|---|
| | | | Feet MSL | Feet MSL | **2.3** Inches |

Boring Location
State Plane N, E
**NE** 1/4 of **NW** 1/4 of Section **36** T **49** N,R **14 W**
Lat ° ' "
Long ° ' "

Local Grid Location (If applicable)
Feet ☐ N ☐ S Feet ☐ E ☐ W

| County | DNR County Code | Civil Town/City/ or Village |
|---|---|---|
| **Douglas** | **16** | **Superior** |

| Sample Number | Sample Length (in) Recovered | Blow Counts | Depth In Feet | Soil/Rock Description And Geologic Origin For Each Major Unit | USCS | Graphic Log | Well Diagram | PID/FID | Soil Properties: Standard Penetration | Moisture Content | Liquid Limit | Plastic Limit | P 200 | RQD/ Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0-3.5 | 24 | | 0 | Black-red SILTY CLAY, no odor | CL ML | | | | | M | | | | |
| | | | 1 | Red CLAY, no odor | CL | | | | | | | | | |
| | | | 2 | | | | | | | | | | | |
| | | | 3 | | | | | | | | | | | |
| 3.5-7 | 36 | | 4 | | | | | | | M | | | | |
| | | | 5 | | | | | | | | | | | |
| | | | 6 | | | | | | | | | | | |
| | | | 7 | End of boring | | | | | | | | | | |

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature

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8025 Excelsior Drive Madison, WI 53717
Tel: (608)836-1500 Fax: (608)831-3337

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State of Wisconsin
Department of Natural Resources

# WELL/DRILLHOLE/BOREHOLE ABANDONMENT

Form 3300-5B Rev. 12-91

All abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or NR 141, Wis. Admin. Code, whichever is applicable. Also, see instructions on back.

## (1) GENERAL INFORMATION

Well/Drillhole/Borehole Location

County: Douglas

NE 1/4 of NW 1/4 of Sec. 36 ; T. 49 N. R. 14 ☐ E ☒ W

(If applicable) _____ Gov't Lot _____ Grid Number

Grid Location _____ ft. ☐ N. ☐ S., _____ ft. ☐ E. ☐ W.

Civil Town Name

Street Address of Well: 2407 Stinson Ave

City, Village: Superior

## (2) FACILITY NAME

Original Well Owner (If Known)

Present Well Owner: Murphy Oil USA, Inc.

Street or Route: 2407 Stinson Ave

City, State, Zip Code: Superior WI 54880

Facility Well No. and/or Name (If Applicable): B52-1

WI Unique Well No.: _ _ _ _ _ _

Reason For Abandonment: Samples collected, no longer needed

Date of Abandonment: 12/17/98

## WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On

(Date) 12/17/98

☐ Monitoring Well
☐ Water Well
☐ Drillhole
☒ Borehole

Construction Report Available? ☒ Yes ☐ No

Construction Type:
☐ Drilled ☐ Driven (Sandpoint) ☐ Dug
☒ Other (Specify) Geoprobe

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth (ft.) 7 (From groundsurface)

Casing Diameter (ins.) 2.3 Borehole

Casing Depth (ft.) NA

Was Well Annular Space Grouted? ☐ Yes ☐ No ☐ Unknown
If Yes, To What Depth? _____ Feet

(4) Depth to Water (Feet) ~4 ft.

| | | | |
|---|---|---|---|
| Pump & Piping Removed? | ☒ Yes | ☐ No | ☐ Not Applicable |
| Liner(s) Removed? | ☒ Yes | ☐ No | ☐ Not Applicable |
| Screen Removed? | ☐ Yes | ☐ No | ☒ Not Applicable |
| Casing Left in Place? | ☐ Yes | ☐ No | |

If No, Explain _____

| | | |
|---|---|---|
| Was Casing Cut Off Below Surface? | ☐ Yes | ☐ No |
| Did Sealing Material Rise to Surface? | ☒ Yes | ☐ No |
| Did Material Settle After 24 Hours? | ☐ Yes | ☒ No |
| If Yes, Was Hole Retopped? | ☐ Yes | ☐ No |

(5) Required Method of Placing Sealing Material
☒ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Dump Bailer ☐ Other (Explain)

(6) Sealing Materials
☐ Neat Cement Grout
☐ Sand-Cement (Concrete) Grout
☐ Concrete
☐ Clay-Sand Slurry
☐ Bentonite-Sand Slurry
☐ Chipped Bentonite

For monitoring wells and monitoring well boreholes only
☐ Bentonite Pellets
☒ Granular Bentonite
☐ Bentonite - Cement Grout

| (7) Sealing Material Used | From (Ft.) | To (Ft.) | No. Yards, Sacks Sealant or Volume (Circle One) | Mix Ratio or Mud Weight |
|---|---|---|---|---|
| Granular Bentonite | Surface | 7 | 12 lbs | |
| | | | | |
| | | | | |
| | | | | |

(8) Comments: _____

(9) Name of Person or Firm Doing Sealing Work
Soil Essentials / Garnett Fleming, Inc.

Signature of Person Doing Work: Jeff Zaun of GF
Date Signed: 4/5/99
Street or Route: 8025 Excelsior Dr.
Telephone Number: (608) 836-1500
City, State, Zip Code: Madison, WI 53717

(10) FOR DNR OR COUNTY USE ONLY

| | |
|---|---|
| Date Received/Inspected | District/County |
| Reviewer/Inspector | ☐ Complying Work ☐ Noncomplying Work |
| Follow-up Necessary | |

DNR/COUNTY

Department of Natural Resources

# WELL/DRILLHOLE/BOREHOLE ABANDONMENT

Form 3300-5B Rev. 12-91

All abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or NR 141, Wis. Admin. Code, whichever is applicable. Also, see instructions on back.

## (1) GENERAL INFORMATION

Well/Drillhole/Borehole Location

County: Douglas

NE 1/4 of NW 1/4 of Sec. 36 ; T. 49 N; R. 14 ☐ E ☒ W

(If applicable) _____ Gov't Lot _____ Grid Number

Grid Location _____ ft. ☐ N. ☐ S., _____ ft. ☐ E. ☐ W.

Civil Town Name

Street Address of Well: 2407 Stinson Ave

City, Village: Superior

## (2) FACILITY NAME

Original Well Owner (If Known)

Present Well Owner: Murphy Oil USA, Inc.

Street or Route: 2407 Stinson Ave

City, State, Zip Code: Superior WI 54880

Facility Well No. and/or Name (If Applicable): B52-2

WI Unique Well No.

Reason For Abandonment: Samples collected, no longer needed

Date of Abandonment: 12/17/98

## WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On

(Date) 12/17/98

☐ Monitoring Well
☐ Water Well
☐ Drillhole
☒ Borehole

Construction Report Available? ☒ Yes ☐ No

Construction Type:
☐ Drilled ☐ Driven (Sandpoint) ☐ Dug
☒ Other (Specify) Geoprobe

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth (ft.) 7 (From groundsurface)

Casing Diameter (ins.) 2.3 Borehole

Casing Depth (ft.) NA

Was Well Annular Space Grouted? ☐ Yes ☐ No ☐ Unknown
If Yes, To What Depth? _____ Feet

(4) Depth to Water (Feet) ~4 ft.

| | | | |
|---|---|---|---|
| Pump & Piping Removed? | ☒ Yes | ☐ No | ☐ Not Applicable |
| Liner(s) Removed? | ☒ Yes | ☐ No | ☐ Not Applicable |
| Screen Removed? | ☐ Yes | ☐ No | ☒ Not Applicable |
| Casing Left in Place? | ☐ Yes | ☐ No | |

If No, Explain _____

| | | |
|---|---|---|
| Was Casing Cut Off Below Surface? | ☐ Yes | ☐ No |
| Did Sealing Material Rise to Surface? | ☒ Yes | ☐ No |
| Did Material Settle After 24 Hours? | ☐ Yes | ☒ No |
| If Yes, Was Hole Retopped? | ☐ Yes | ☐ No |

(5) Required Method of Placing Sealing Material
☒ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Dump Bailer ☐ Other (Explain)

(6) Sealing Materials
☐ Neat Cement Grout
☐ Sand-Cement (Concrete) Grout
☐ Concrete
☐ Clay-Sand Slurry
☐ Bentonite-Sand Slurry
☐ Chipped Bentonite

For monitoring wells and monitoring well boreholes only
☐ Bentonite Pellets
☒ Granular Bentonite
☐ Bentonite - Cement Grout

| (7) Sealing Material Used | From (Ft.) | To (Ft.) | No. Yards, Sacks Sealant or Volume (Circle One) | Mix Ratio or Mud Weight |
|---|---|---|---|---|
| Granular Bentonite | Surface | 7 | 12 lbs | |
| | | | | |
| | | | | |
| | | | | |

(8) Comments: _____

(9) Name of Person or Firm Doing Sealing Work
Soil Essentials / Gannett Fleming, Inc.

Signature of Person Doing Work: Jeff Zimmerman of GF
Date Signed: 4/5/99

Street or Route: 8025 Excelsior Dr.
Telephone Number: (608) 836-1500

City, State, Zip Code: Madison, WI 53717

(10) FOR DNR OR COUNTY USE ONLY

| | |
|---|---|
| Date Received/Inspected | District/County |
| Reviewer/Inspector | ☐ Complying Work ☐ Noncomplying Work |
| Follow-up Necessary | |

DNR/COUNTY

Department of Natural Resources

Form 3300-5B

Rev. 12-91

All abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or NR 141, Wis. Admin. Code, whichever is applicable. Also, see instructions on back.

## (1) GENERAL INFORMATION

Well/Drillhole/Borehole Location

County: Douglas

NE 1/4 of NW 1/4 of Sec. 36 ; T. 49 N; R. 14 ☐ E ☒ W

(If applicable) _____ Gov't Lot _____ Grid Number

Grid Location _____ ft. ☐ N. ☐ S., _____ ft. ☐ E. ☐ W.

Civil Town Name

Street Address of Well: 2407 Stinson Ave

City, Village: Superior

## (2) FACILITY NAME

Original Well Owner (If Known)

Present Well Owner: Murphy Oil USA, Inc.

Street or Route: 2407 Stinson Ave

City, State, Zip Code: Superior WI 54880

Facility Well No. and/or Name (If Applicable): B52-3

WI Unique Well No.: _ _ _ _ _ _

Reason For Abandonment: Samples collected, no longer needed

Date of Abandonment: 12/17/98

## WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On

(Date) 12/17/98

☐ Monitoring Well
☐ Water Well
☐ Drillhole
☒ Borehole

Construction Report Available? ☒ Yes ☐ No

Construction Type:
☐ Drilled ☐ Driven (Sandpoint) ☐ Dug
☒ Other (Specify) Geoprobe

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth (ft.) 7 (From groundsurface)

Casing/Borehole Diameter (ins.) 2.3

Casing Depth (ft.) NA

Was Well Annular Space Grouted? ☐ Yes ☐ No ☐ Unknown

If Yes, To What Depth? _____ Feet

(4) Depth to Water (Feet) ~4 ft.

| | | | |
|---|---|---|---|
| Pump & Piping Removed? | ☒ Yes | ☐ No | ☐ Not Applicable |
| Liner(s) Removed? | ☒ Yes | ☐ No | ☐ Not Applicable |
| Screen Removed? | ☐ Yes | ☐ No | ☒ Not Applicable |
| Casing Left in Place? | ☐ Yes | ☐ No | |

If No, Explain _____

| | | |
|---|---|---|
| Was Casing Cut Off Below Surface? | ☐ Yes | ☐ No |
| Did Sealing Material Rise to Surface? | ☒ Yes | ☐ No |
| Did Material Settle After 24 Hours? | ☐ Yes | ☒ No |
| If Yes, Was Hole Retopped? | ☐ Yes | ☐ No |

(5) Required Method of Placing Sealing Material

☒ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Dump Bailer ☐ Other (Explain)

(6) Sealing Materials

☐ Neat Cement Grout
☐ Sand-Cement (Concrete) Grout
☐ Concrete
☐ Clay-Sand Slurry
☐ Bentonite-Sand Slurry
☐ Chipped Bentonite

For monitoring wells and monitoring well boreholes only

☐ Bentonite Pellets
☒ Granular Bentonite
☐ Bentonite - Cement Grout

| (7) Sealing Material Used | From (Ft.) | To (Ft.) | No. Yards, Sacks Sealant or Volume (Circle One) | Mix Ratio or Mud Weight |
|---|---|---|---|---|
| Granular Bentonite | Surface | 7 | 12 lbs | |
| | | | | |
| | | | | |
| | | | | |

(8) Comments: _____

(9) Name of Person or Firm Doing Sealing Work

Soil Essentials / Gannett Fleming, Inc.

Signature of Person Doing Work: Jeff Zimmerman of GF

Date Signed: 4/5/99

Street or Route: 8025 Excelsior Dr.

Telephone Number: (608) 836-1500

City, State, Zip Code: Madison, WI 53717

(10) FOR DNR OR COUNTY USE ONLY

| Date Received/Inspected | District/County |
|---|---|
| Reviewer/Inspector | ☐ Complying Work ☐ Noncomplying Work |
| Follow-up Necessary | |

DNR/COUNTY

Department of Natural Resources

Form 3300-5B

Rev. 12-91

All abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or NR 141, Wis. Admin. Code, whichever is applicable. Also, see instructions on back.

## (1) GENERAL INFORMATION

Well/Drillhole/Borehole Location

County: Douglas

NE 1/4 of NW 1/4 of Sec. 36 ; T. 49 N; R. 14 ☐ E ☒ W

(If applicable) _____ Gov't Lot _____ Grid Number

Grid Location _____ ft. ☐ N. ☐ S., _____ ft. ☐ E. ☐ W.

Civil Town Name

Street Address of Well: 2407 Stinson Ave

City, Village: Superior

## (2) FACILITY NAME

Original Well Owner (If Known)

Present Well Owner: Murphy Oil USA, Inc.

Street or Route: 2407 Stinson Ave

City, State, Zip Code: Superior, WI 54880

Facility Well No. and/or Name (If Applicable): B51-1

WI Unique Well No.: _ _ _ _ _ _

Reason For Abandonment: Samples collected, no longer needed

Date of Abandonment: 12/17/98

## WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On

(Date) 12/17/98

☐ Monitoring Well
☐ Water Well
☐ Drillhole
☒ Borehole

Construction Report Available? ☒ Yes ☐ No

Construction Type:
☐ Drilled ☐ Driven (Sandpoint) ☐ Dug
☒ Other (Specify) Geoprobe

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth (ft.) 7 (From groundsurface)

Casing Diameter (ins.) 2.3 Borehole

Casing Depth (ft.) NA

Was Well Annular Space Grouted? ☐ Yes ☐ No ☐ Unknown

If Yes, To What Depth? _____ Feet

(4) Depth to Water (Feet) ~4 ft.

| | | | |
|---|---|---|---|
| Pump & Piping Removed? | ☒ Yes | ☐ No | ☐ Not Applicable |
| Liner(s) Removed? | ☒ Yes | ☐ No | ☐ Not Applicable |
| Screen Removed? | ☐ Yes | ☐ No | ☒ Not Applicable |
| Casing Left in Place? | ☐ Yes | ☐ No | |

If No, Explain _____

| | | |
|---|---|---|
| Was Casing Cut Off Below Surface? | ☐ Yes | ☐ No |
| Did Sealing Material Rise to Surface? | ☒ Yes | ☐ No |
| Did Material Settle After 24 Hours? | ☐ Yes | ☒ No |
| If Yes, Was Hole Retopped? | ☐ Yes | ☐ No |

(5) Required Method of Placing Sealing Material

☒ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Dump Bailer ☐ Other (Explain)

(6) Sealing Materials

☐ Neat Cement Grout
☐ Sand-Cement (Concrete) Grout
☐ Concrete
☐ Clay-Sand Slurry
☐ Bentonite-Sand Slurry
☐ Chipped Bentonite

For monitoring wells and monitoring well boreholes only

☐ Bentonite Pellets
☒ Granular Bentonite
☐ Bentonite - Cement Grout

| (7) Sealing Material Used | From (Ft.) | To (Ft.) | No. Yards, Sacks Sealant or Volume (Circle One) | Mix Ratio or Mud Weight |
|---|---|---|---|---|
| Granular Bentonite | Surface | 7 | 12 lbs | |
| | | | | |
| | | | | |
| | | | | |

(8) Comments: _____

(9) Name of Person or Firm Doing Sealing Work: Soil Essentials / Garnett Fleming, Inc.

Signature of Person Doing Work: Jeff Zorn of GF

Date Signed: 4/5/99

Street or Route: 8025 Excelsior Dr.

Telephone Number: (608) 836-1500

City, State, Zip Code: Madison, WI 53717

(10) FOR DNR OR COUNTY USE ONLY

| | |
|---|---|
| Date Received/Inspected | District/County |
| Reviewer/Inspector | ☐ Complying Work ☐ Noncomplying Work |
| Follow-up Necessary | |

DNR/COUNTY

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



***ANALYTICAL REPORT***

GANNETT FLEMING
JEFF KING
8025 EXCELSIOR DRIVE
MADISON, WI 53717

**Customer #:** LE8000012374
**Work Order:** 9812000729
**Report Date:** 01/14/99
**Date Received:** 12/18/98
**Arrival Temperature:** On Ice

**Report Submitted By:** PAB
*Record Reviewer*

**Note:** None

Project Name: **MURPHY 51,52** Project Number: **34265.008**

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**Sample I.D. #:** 224810 **Sample Description:** B51-1 1-2 **Date Sampled:** 12/17/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| Total Percent Solids | 70.2 | % | | | | | 12/21/98 | NMP | EPA 5030 |
| 1,2,4-Trimethylbenzene | <0.025 | mg/kg | | 0.015 | 0.053 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| 1,3,5-Trimethylbenzene | <0.025 | mg/kg | | 0.010 | 0.030 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| Benzene | <0.025 | mg/kg | | 0.009 | 0.029 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| Ethylbenzene | <0.025 | mg/kg | | 0.009 | 0.028 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| m & p- Xylene | <0.025 | mg/kg | | 0.017 | 0.053 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| Methyl t-Butyl Ether | <0.025 | mg/kg | | 0.011 | 0.034 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| o-Xylene | <0.025 | mg/kg | | 0.008 | 0.026 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| Toluene | <0.025 | mg/kg | | 0.008 | 0.026 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| Diesel Range Organics | 21 | mg/kg | L | 1.4 | 4.7 | 12/21/98 | 01/02/99 | PML | WDNR DRO |
| 1-Methyl Naphthalene | <0.047 | mg/kg | | 0.047 | 0.16 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| 2-Methyl Naphthalene | <0.031 | mg/kg | | 0.031 | 0.10 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Acenaphthene | <0.048 | mg/kg | | 0.048 | 0.16 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Acenaphthylene | <0.051 | mg/kg | | 0.051 | 0.17 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Anthracene | <0.023 | mg/kg | | 0.023 | 0.077 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Benzo(a)anthracene | <0.0020 | mg/kg | | 0.002 | 0.006 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Benzo(a)pyrene | <0.0015 | mg/kg | | 0.001 | 0.005 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Benzo(b)fluoranthene | 0.022 | mg/kg | | 0.001 | 0.005 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Benzo(g,h,i)perylene | 0.029 | mg/kg | | 0.004 | 0.014 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Benzo(k)fluoranthene | <0.0015 | mg/kg | | 0.001 | 0.005 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Chrysene | <0.092 | mg/kg | | 0.092 | 0.31 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Dibenzo(a,h)anthracene | <0.23 | mg/kg | | 0.23 | 0.77 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Fluoranthene | 0.020 | mg/kg | | 0.004 | 0.016 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Fluorene | <0.0086 | mg/kg | | 0.008 | 0.029 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Indeno(1,2,3-cd)pyrene | 0.023 | mg/kg | J | 0.009 | 0.031 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Naphthalene | <0.031 | mg/kg | | 0.031 | 0.10 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Phenanthrene | <0.0035 | mg/kg | | 0.003 | 0.012 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Pyrene | <0.0062 | mg/kg | | 0.006 | 0.021 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |

**Sample I.D. #:** 224811 **Sample Description:** B51-1 4-5 **Date Sampled:** 12/17/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| Total Percent Solids | 70.8 | % | | | | | 12/21/98 | NMP | EPA 5030 |
| 1,2,4-Trimethylbenzene | <0.025 | mg/kg | | 0.015 | 0.053 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| 1,3,5-Trimethylbenzene | <0.025 | mg/kg | | 0.010 | 0.030 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| Benzene | <0.025 | mg/kg | | 0.009 | 0.029 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| Ethylbenzene | <0.025 | mg/kg | | 0.009 | 0.028 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| m & p- Xylene | <0.025 | mg/kg | | 0.017 | 0.053 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| Methyl t-Butyl Ether | <0.025 | mg/kg | | 0.011 | 0.034 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| o-Xylene | <0.025 | mg/kg | | 0.008 | 0.026 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| Toluene | <0.025 | mg/kg | | 0.008 | 0.026 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| Diesel Range Organics | <1.4 | mg/kg | | 1.4 | 4.7 | 12/21/98 | 01/01/99 | PML | WDNR DRO |
| 1-Methyl Naphthalene | <0.047 | mg/kg | | 0.047 | 0.16 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |

WI DNR Lab Certification Number: 157066030 DATCP Certification Number: 000289

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



***ANALYTICAL REPORT***

**Customer #:** LE8000012374
**Work Order:** 9812000729
**Report Date:** 01/14/99
**Date Received:** 12/18/98
**Arrival Temperature:** On Ice

**Report Submitted By:** DAB
*Record Reviewer*

GANNETT FLEMING
JEFF KING
8025 EXCELSIOR DRIVE
MADISON, WI 53717

**Note:** None

Project Name: **MURPHY 51,52** Project Number: **34265.008**

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**Sample I.D. #:** 224811 **Sample Description:** BS1-1 4-5 **Date Sampled:** 12/17/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| 2-Methyl Naphthalene | <0.031 | mg/kg | | 0.031 | 0.10 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Acenaphthene | <0.048 | mg/kg | | 0.048 | 0.16 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Acenaphthylene | <0.051 | mg/kg | | 0.051 | 0.17 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Anthracene | <0.023 | mg/kg | | 0.023 | 0.077 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Benzo(a)anthracene | <0.0020 | mg/kg | | 0.002 | 0.006 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Benzo(a)pyrene | <0.0015 | mg/kg | | 0.001 | 0.005 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Benzo(b)fluoranthene | <0.0015 | mg/kg | | 0.001 | 0.005 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Benzo(g,h,i)perylene | <0.0041 | mg/kg | | 0.004 | 0.014 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Benzo(k)fluoranthene | <0.0015 | mg/kg | | 0.001 | 0.005 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Chrysene | <0.092 | mg/kg | | 0.092 | 0.31 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Dibenzo(a,h)anthracene | <0.23 | mg/kg | | 0.23 | 0.77 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Fluoranthene | <0.0049 | mg/kg | | 0.004 | 0.016 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Fluorene | <0.0086 | mg/kg | | 0.008 | 0.029 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Indeno(1,2,3-cd)pyrene | <0.0094 | mg/kg | | 0.009 | 0.031 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Naphthalene | <0.031 | mg/kg | | 0.031 | 0.10 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Phenanthrene | <0.0035 | mg/kg | | 0.003 | 0.012 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |
| Pyrene | <0.0062 | mg/kg | | 0.006 | 0.021 | 12/30/98 | 01/13/99 | RLD | EPA 8310 |

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email: fyi@ctienv.com




Murphy Tank 51

***ANALYTICAL REPORT***

GANNETT FLEMING
JEFF KING
8025 EXCELSIOR DRIVE
MADISON, WI 53717

**Customer #:** LE8000012374
**Work Order:** 9812000729
**Report Date:** 01/08/99
**Date Received:** 12/18/98
**Arrival Temperature:** On Ice

**Report Submitted By:** HGC
*Record Reviewer*

**Note:** None

Project Name: **MURPHY 51,52** Project Number: **34265.008**

**Sample I.D. #:** 224812 **Sample Description:** FB-51 **Date Sampled:** 12/17/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| 1,2,4-Trimethylbenzene | <0.025 | mg/kg | | 0.015 | 0.053 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| 1,3,5-Trimethylbenzene | <0.025 | mg/kg | | 0.010 | 0.030 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| Benzene | <0.025 | mg/kg | | 0.009 | 0.029 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| Ethylbenzene | <0.025 | mg/kg | | 0.009 | 0.028 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| m & p- Xylene | <0.025 | mg/kg | | 0.017 | 0.053 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| Methyl t-Butyl Ether | <0.025 | mg/kg | | 0.011 | 0.034 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| o-Xylene | <0.025 | mg/kg | | 0.008 | 0.026 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| Toluene | <0.025 | mg/kg | | 0.008 | 0.026 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |

**Sample I.D. #:** 224813 **Sample Description:** B52-1 1-2 **Date Sampled:** 12/17/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| Total Percent Solids | 76.1 | % | | | | | 12/21/98 | NMP | EPA 5030 |
| 1,2,4-Trimethylbenzene | <1.2 | mg/kg | | 0.015 | 0.053 | 12/22/98 | 12/24/98 | KMC | EPA 8020 |
| 1,3,5-Trimethylbenzene | 4.8 | mg/kg | | 0.010 | 0.030 | 12/22/98 | 12/24/98 | KMC | EPA 8020 |
| Benzene | <1.2 | mg/kg | V | 0.009 | 0.029 | 12/22/98 | 12/24/98 | KMC | EPA 8020 |
| Ethylbenzene | <1.2 | mg/kg | | 0.009 | 0.028 | 12/22/98 | 12/24/98 | KMC | EPA 8020 |
| m & p- Xylene | 3.0 | mg/kg | J | 0.017 | 0.053 | 12/22/98 | 12/24/98 | KMC | EPA 8020 |
| Methyl t-Butyl Ether | <1.2 | mg/kg | | 0.011 | 0.034 | 12/22/98 | 12/24/98 | KMC | EPA 8020 |
| o-Xylene | <1.2 | mg/kg | | 0.008 | 0.026 | 12/22/98 | 12/24/98 | KMC | EPA 8020 |
| Toluene | <1.2 | mg/kg | | 0.008 | 0.026 | 12/22/98 | 12/24/98 | KMC | EPA 8020 |
| Diesel Range Organics | 14000 | mg/kg | L | 1.4 | 4.7 | 12/21/98 | 01/01/99 | PML | WDNR DRO |
| 1-Methyl Naphthalene | 19 | mg/kg | V | 0.047 | 0.16 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| 2-Methyl Naphthalene | 9.3 | mg/kg | | 0.031 | 0.10 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Acenaphthene | <0.48 | mg/kg | | 0.048 | 0.16 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Acenaphthylene | <0.51 | mg/kg | | 0.051 | 0.17 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Anthracene | <0.23 | mg/kg | | 0.023 | 0.077 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(a)anthracene | <0.020 | mg/kg | | 0.002 | 0.006 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(a)pyrene | 0.69 | mg/kg | | 0.001 | 0.005 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(b)fluoranthene | 1.2 | mg/kg | | 0.001 | 0.005 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(g,h,i)perylene | <0.041 | mg/kg | | 0.004 | 0.014 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(k)fluoranthene | 0.80 | mg/kg | | 0.001 | 0.005 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Chrysene | <0.92 | mg/kg | | 0.092 | 0.31 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Dibenzo(a,h)anthracene | <2.3 | mg/kg | | 0.23 | 0.77 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Fluoranthene | 2.4 | mg/kg | | 0.004 | 0.016 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Fluorene | <0.086 | mg/kg | | 0.008 | 0.029 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Indeno(1,2,3-cd)pyrene | <0.094 | mg/kg | | 0.009 | 0.031 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Naphthalene | 0.93 | mg/kg | J | 0.031 | 0.10 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Phenanthrene | 1.2 | mg/kg | | 0.003 | 0.012 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Pyrene | 3.1 | mg/kg | | 0.006 | 0.021 | 12/31/98 | 01/06/99 | PML | EPA 8310 |

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Phone: 800-228-3012
Fax: 608-356-2766
email: fyi@ctienv.com


***ANALYTICAL REPORT***

**Customer #:** LE8000012374
**Work Order:** 9812000729
**Report Date:** 01/08/99
**Date Received:** 12/18/98
**Arrival Temperature:** On Ice

GANNETT FLEMING
JEFF KING
8025 EXCELSIOR DRIVE
MADISON, WI 53717

**Report Submitted By:** _____
*Record Reviewer*

**Note:** None

Project Name: **MURPHY 51,52** Project Number: **34265.008**

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**Sample I.D. #:** 224814 **Sample Description:** B52-1 4-5 **Date Sampled:** 12/17/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| Total Percent Solids | 73.4 | % | | | | | 12/21/98 | NMP | EPA 5030 |
| 1,2,4-Trimethylbenzene | <0.025 | mg/kg | | 0.015 | 0.053 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| 1,3,5-Trimethylbenzene | <0.025 | mg/kg | | 0.010 | 0.030 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| Benzene | <0.025 | mg/kg | | 0.009 | 0.029 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| Ethylbenzene | <0.025 | mg/kg | | 0.009 | 0.028 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| m & p- Xylene | <0.025 | mg/kg | | 0.017 | 0.053 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| Methyl t-Butyl Ether | <0.025 | mg/kg | | 0.011 | 0.034 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| o-Xylene | <0.025 | mg/kg | | 0.008 | 0.026 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| Toluene | <0.025 | mg/kg | | 0.008 | 0.026 | 12/22/98 | 12/25/98 | KMC | EPA 8020 |
| Diesel Range Organics | <1.4 | mg/kg | | 1.4 | 4.7 | 12/21/98 | 01/01/99 | PML | WDNR DRO |
| 1-Methyl Naphthalene | <0.047 | mg/kg | | 0.047 | 0.16 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| 2-Methyl Naphthalene | <0.031 | mg/kg | | 0.031 | 0.10 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Acenaphthene | <0.048 | mg/kg | | 0.048 | 0.16 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Acenaphthylene | <0.051 | mg/kg | | 0.051 | 0.17 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Anthracene | <0.023 | mg/kg | | 0.023 | 0.077 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(a)anthracene | <0.0020 | mg/kg | | 0.002 | 0.006 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(a)pyrene | <0.0015 | mg/kg | | 0.001 | 0.005 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(b)fluoranthene | <0.0015 | mg/kg | | 0.001 | 0.005 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(g,h,i)perylene | <0.0041 | mg/kg | | 0.004 | 0.014 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(k)fluoranthene | <0.0015 | mg/kg | | 0.001 | 0.005 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Chrysene | <0.092 | mg/kg | | 0.092 | 0.31 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Dibenzo(a,h)anthracene | <0.23 | mg/kg | | 0.23 | 0.77 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Fluoranthene | <0.0049 | mg/kg | | 0.004 | 0.016 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Fluorene | <0.0086 | mg/kg | | 0.008 | 0.029 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Indeno(1,2,3-cd)pyrene | <0.0094 | mg/kg | | 0.009 | 0.031 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Naphthalene | <0.031 | mg/kg | | 0.031 | 0.10 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Phenanthrene | <0.0035 | mg/kg | | 0.003 | 0.012 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Pyrene | <0.0062 | mg/kg | | 0.006 | 0.021 | 12/31/98 | 01/06/99 | PML | EPA 8310 |

**Sample I.D. #:** 224815 **Sample Description:** B52-2 1-2 **Date Sampled:** 12/17/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| Total Percent Solids | 76.8 | % | | | | | 12/21/98 | NMP | EPA 5030 |
| 1,2,4-Trimethylbenzene | <0.025 | mg/kg | | 0.015 | 0.053 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| 1,3,5-Trimethylbenzene | <0.025 | mg/kg | | 0.010 | 0.030 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| Benzene | <0.025 | mg/kg | | 0.009 | 0.029 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| Ethylbenzene | <0.025 | mg/kg | | 0.009 | 0.028 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| m & p- Xylene | <0.025 | mg/kg | | 0.017 | 0.053 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| Methyl t-Butyl Ether | <0.025 | mg/kg | | 0.011 | 0.034 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| o-Xylene | <0.025 | mg/kg | | 0.008 | 0.026 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| Toluene | <0.025 | mg/kg | | 0.008 | 0.026 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| Diesel Range Organics | 510 | mg/kg | L | 1.4 | 4.7 | 12/21/98 | 01/01/99 | PML | WDNR DRO |
| 1-Methyl Naphthalene | <0.047 | mg/kg | | 0.047 | 0.16 | 12/31/98 | 01/06/99 | PML | EPA 8310 |

WI DNR Lab Certification Number: 157066030 DATCP Certification Number: 000289

Commonwealth Technology, Inc.
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Baraboo, WI 53913-3901
Phone: 800-228-3012
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email: fyi@ctienv.com


***ANALYTICAL REPORT***

**Customer #:** LE8000012374
**Work Order:** 9812000729
**Report Date:** 01/08/99
**Date Received:** 12/18/98
**Arrival Temperature:** On Ice

GANNETT FLEMING
JEFF KING
8025 EXCELSIOR DRIVE
MADISON, WI 53717

**Report Submitted By:** _____
*Record Reviewer*

**Note:** None

Project Name: **MURPHY 51,52** Project Number: **34265.008**

**Sample I.D. #:** 224815 **Sample Description:** B52-2 1-2 **Date Sampled:** 12/17/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| 2-Methyl Naphthalene | <0.031 | mg/kg | | 0.031 | 0.10 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Acenaphthene | <0.048 | mg/kg | | 0.048 | 0.16 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Acenaphthylene | <0.051 | mg/kg | | 0.051 | 0.17 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Anthracene | <0.023 | mg/kg | | 0.023 | 0.077 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(a)anthracene | <0.0020 | mg/kg | | 0.002 | 0.006 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(a)pyrene | <0.0015 | mg/kg | | 0.001 | 0.005 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(b)fluoranthene | <0.0015 | mg/kg | | 0.001 | 0.005 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(g,h,i)perylene | <0.0041 | mg/kg | | 0.004 | 0.014 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(k)fluoranthene | <0.0015 | mg/kg | | 0.001 | 0.005 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Chrysene | <0.092 | mg/kg | | 0.092 | 0.31 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Dibenzo(a,h)anthracene | <0.23 | mg/kg | | 0.23 | 0.77 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Fluoranthene | <0.0049 | mg/kg | | 0.004 | 0.016 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Fluorene | <0.0086 | mg/kg | | 0.008 | 0.029 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Indeno(1,2,3-cd)pyrene | <0.0094 | mg/kg | | 0.009 | 0.031 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Naphthalene | <0.031 | mg/kg | | 0.031 | 0.10 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Phenanthrene | <0.0035 | mg/kg | | 0.003 | 0.012 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Pyrene | <0.0062 | mg/kg | | 0.006 | 0.021 | 12/31/98 | 01/06/99 | PML | EPA 8310 |

**Sample I.D. #:** 224816 **Sample Description:** B52-2 4-5 **Date Sampled:** 12/17/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| Total Percent Solids | 77.3 | % | | | | | 12/21/98 | NMP | EPA 5030 |
| 1,2,4-Trimethylbenzene | <0.025 | mg/kg | | 0.015 | 0.053 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| 1,3,5-Trimethylbenzene | <0.025 | mg/kg | | 0.010 | 0.030 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| Benzene | <0.025 | mg/kg | | 0.009 | 0.029 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| Ethylbenzene | <0.025 | mg/kg | | 0.009 | 0.028 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| m & p- Xylene | <0.025 | mg/kg | | 0.017 | 0.053 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| Methyl t-Butyl Ether | <0.025 | mg/kg | | 0.011 | 0.034 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| o-Xylene | <0.025 | mg/kg | | 0.008 | 0.026 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| Toluene | <0.025 | mg/kg | | 0.008 | 0.026 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| Diesel Range Organics | <1.4 | mg/kg | | 1.4 | 4.7 | 12/21/98 | 01/04/99 | PML | WDNR DRO |
| 1-Methyl Naphthalene | <0.047 | mg/kg | | 0.047 | 0.16 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| 2-Methyl Naphthalene | <0.031 | mg/kg | | 0.031 | 0.10 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Acenaphthene | <0.048 | mg/kg | | 0.048 | 0.16 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Acenaphthylene | <0.051 | mg/kg | | 0.051 | 0.17 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Anthracene | <0.023 | mg/kg | | 0.023 | 0.077 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(a)anthracene | <0.0020 | mg/kg | | 0.002 | 0.006 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(a)pyrene | <0.0015 | mg/kg | | 0.001 | 0.005 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(b)fluoranthene | <0.0015 | mg/kg | | 0.001 | 0.005 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(g,h,i)perylene | <0.0041 | mg/kg | | 0.004 | 0.014 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(k)fluoranthene | <0.0015 | mg/kg | | 0.001 | 0.005 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Chrysene | <0.092 | mg/kg | | 0.092 | 0.31 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Dibenzo(a,h)anthracene | <0.23 | mg/kg | | 0.23 | 0.77 | 12/31/98 | 01/06/99 | PML | EPA 8310 |

WI DNR Lab Certification Number: 157066030 DATCP Certification Number: 000289

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


***ANALYTICAL REPORT***

**Customer #:** LE8000012374
**Work Order:** 9812000729
**Report Date:** 01/08/99
**Date Received:** 12/18/98
**Arrival Temperature:** On Ice

GANNETT FLEMING
JEFF KING
8025 EXCELSIOR DRIVE
MADISON, WI 53717

**Report Submitted By:** _____
*Record Reviewer*

**Note:** None

Project Name: **MURPHY 51,52** Project Number: **34265.008**

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**Sample I.D. #:** 224816 **Sample Description:** B52-2 4-5 **Date Sampled:** 12/17/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| Fluoranthene | <0.0049 | mg/kg | | 0.004 | 0.016 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Fluorene | <0.0086 | mg/kg | | 0.008 | 0.029 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Indeno(1,2,3-cd)pyrene | <0.0094 | mg/kg | | 0.009 | 0.031 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Naphthalene | <0.031 | mg/kg | | 0.031 | 0.10 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Phenanthrene | <0.0035 | mg/kg | | 0.003 | 0.012 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Pyrene | <0.0062 | mg/kg | | 0.006 | 0.021 | 12/31/98 | 01/06/99 | PML | EPA 8310 |

**Sample I.D. #:** 224817 **Sample Description:** B52-3 1-2 **Date Sampled:** 12/17/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| Total Percent Solids | 77.5 | % | | | | | 12/21/98 | NMP | EPA 5030 |
| 1,2,4-Trimethylbenzene | <0.025 | mg/kg | | 0.015 | 0.053 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| 1,3,5-Trimethylbenzene | <0.025 | mg/kg | | 0.010 | 0.030 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| Benzene | <0.025 | mg/kg | | 0.009 | 0.029 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| Ethylbenzene | <0.025 | mg/kg | | 0.009 | 0.028 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| m & p- Xylene | <0.025 | mg/kg | | 0.017 | 0.053 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| Methyl t-Butyl Ether | <0.025 | mg/kg | | 0.011 | 0.034 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| o-Xylene | <0.025 | mg/kg | | 0.008 | 0.026 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| Toluene | <0.025 | mg/kg | | 0.008 | 0.026 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| Diesel Range Organics | 41 | mg/kg | L | 1.4 | 4.7 | 12/21/98 | 01/04/99 | PML | WDNR DRO |
| 1-Methyl Naphthalene | <0.047 | mg/kg | | 0.047 | 0.16 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| 2-Methyl Naphthalene | <0.031 | mg/kg | | 0.031 | 0.10 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Acenaphthene | <0.048 | mg/kg | | 0.048 | 0.16 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Acenaphthylene | 0.11 | mg/kg | J | 0.051 | 0.17 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Anthracene | <0.023 | mg/kg | | 0.023 | 0.077 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(a)anthracene | 0.11 | mg/kg | | 0.002 | 0.006 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(a)pyrene | <0.0015 | mg/kg | | 0.001 | 0.005 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(b)fluoranthene | <0.0015 | mg/kg | | 0.001 | 0.005 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(g,h,i)perylene | <0.0041 | mg/kg | | 0.004 | 0.014 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(k)fluoranthene | <0.0015 | mg/kg | | 0.001 | 0.005 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Chrysene | <0.092 | mg/kg | | 0.092 | 0.31 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Dibenzo(a,h)anthracene | <0.23 | mg/kg | | 0.23 | 0.77 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Fluoranthene | 0.18 | mg/kg | | 0.004 | 0.016 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Fluorene | <0.0086 | mg/kg | | 0.008 | 0.029 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Indeno(1,2,3-cd)pyrene | <0.0094 | mg/kg | | 0.009 | 0.031 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Naphthalene | <0.031 | mg/kg | | 0.031 | 0.10 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Phenanthrene | 0.011 | mg/kg | J | 0.003 | 0.012 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Pyrene | 0.44 | mg/kg | | 0.006 | 0.021 | 12/31/98 | 01/06/99 | PML | EPA 8310 |

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


***ANALYTICAL REPORT***

**Customer #:** LE8000012374
**Work Order:** 9812000729
**Report Date:** 01/08/99
**Date Received:** 12/18/98
**Arrival Temperature:** On Ice

GANNETT FLEMING
JEFF KING
8025 EXCELSIOR DRIVE
MADISON, WI 53717

**Report Submitted By:** _____
*Record Reviewer*

**Note:** None

Project Name: **MURPHY 51,52** Project Number: **34265.008**

**Sample I.D. #:** 224818 **Sample Description:** B52-3 4-5 **Date Sampled:** 12/17/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| Total Percent Solids | 74.1 | % | | | | | 12/21/98 | NMP | EPA 5030 |
| 1,2,4-Trimethylbenzene | <0.025 | mg/kg | | 0.015 | 0.053 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| 1,3,5-Trimethylbenzene | <0.025 | mg/kg | | 0.010 | 0.030 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| Benzene | <0.025 | mg/kg | | 0.009 | 0.029 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| Ethylbenzene | <0.025 | mg/kg | | 0.009 | 0.028 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| m & p- Xylene | <0.025 | mg/kg | | 0.017 | 0.053 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| Methyl t-Butyl Ether | <0.025 | mg/kg | | 0.011 | 0.034 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| o-Xylene | <0.025 | mg/kg | | 0.008 | 0.026 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| Toluene | <0.025 | mg/kg | | 0.008 | 0.026 | 12/21/98 | 12/26/98 | RDW | EPA 8020 |
| Diesel Range Organics | <1.4 | mg/kg | | 1.4 | 4.7 | 12/21/98 | 01/01/99 | PML | WDNR DRO |
| 1-Methyl Naphthalene | <0.047 | mg/kg | | 0.047 | 0.16 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| 2-Methyl Naphthalene | <0.031 | mg/kg | | 0.031 | 0.10 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Acenaphthene | <0.048 | mg/kg | | 0.048 | 0.16 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Acenaphthylene | <0.051 | mg/kg | | 0.051 | 0.17 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Anthracene | <0.023 | mg/kg | | 0.023 | 0.077 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(a)anthracene | <0.0020 | mg/kg | | 0.002 | 0.006 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(a)pyrene | <0.0015 | mg/kg | | 0.001 | 0.005 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(b)fluoranthene | <0.0015 | mg/kg | | 0.001 | 0.005 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(g,h,i)perylene | <0.0041 | mg/kg | | 0.004 | 0.014 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Benzo(k)fluoranthene | <0.0015 | mg/kg | | 0.001 | 0.005 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Chrysene | <0.092 | mg/kg | | 0.092 | 0.31 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Dibenzo(a,h)anthracene | <0.23 | mg/kg | | 0.23 | 0.77 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Fluoranthene | <0.0049 | mg/kg | | 0.004 | 0.016 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Fluorene | <0.0086 | mg/kg | | 0.008 | 0.029 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Indeno(1,2,3-cd)pyrene | <0.0094 | mg/kg | | 0.009 | 0.031 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Naphthalene | <0.031 | mg/kg | | 0.031 | 0.10 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Phenanthrene | <0.0035 | mg/kg | | 0.003 | 0.012 | 12/31/98 | 01/06/99 | PML | EPA 8310 |
| Pyrene | <0.0062 | mg/kg | | 0.006 | 0.021 | 12/31/98 | 01/06/99 | PML | EPA 8310 |

**Sample I.D. #:** 224819 **Sample Description:** B52-1 0-1.25 **Date Sampled:** 12/17/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| TOC as % Organic Matter | 5.62 | % | | 0.01 | NA | | 12/22/98 | EMH | MOSA 29.4 |

**Sample I.D. #:** 224820 **Sample Description:** B52-1 1.25-2.5 **Date Sampled:** 12/17/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| TOC as % Organic Matter | 1.55 | % | | 0.01 | NA | | 12/22/98 | EMH | MOSA 29.4 |

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 #:** LE8000012374
**Work Order:** 9812000729
**Report Date:** 01/08/99
**Date Received:** 12/18/98
**Arrival Temperature:** On Ice

GANNETT FLEMING
JEFF KING
8025 EXCELSIOR DRIVE
MADISON, WI 53717

**Report Submitted By:** HSC
*Record Reviewer*

**Note:** None

Project Name: **MURPHY 51,52** Project Number: **34265.008**

---

**Sample I.D. #:** 224821 **Sample Description:** B52-1 2.5-3.75 **Date Sampled:** 12/17/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| TOC as % Organic Matter | 3.21 | % | | 0.01 | NA | | 12/22/98 | EMH | MOSA 29.4 |

**Sample I.D. #:** 224822 **Sample Description:** B52-1 3.75-5 **Date Sampled:** 12/17/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| TOC as % Organic Matter | 2.97 | % | | 0.01 | NA | | 12/22/98 | EMH | MOSA 29.4 |

Commonwealth Technology, Inc.
Laboratory Division
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Baraboo, WI 53913-3901
Phone: 800-228-3012
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email: fyi@ctienv.com


***ANALYTICAL REPORT***

**Customer #:** LE8000012374
**Work Order:** 9812000906
**Report Date:** 01/04/99
**Date Received:** 12/29/98
**Arrival Temperature:** On Ice

GANNETT FLEMING
JEFF KING
8025 EXCELSIOR DRIVE
MADISON, WI 53717

**Report Submitted By:** _____
*Record Reviewer*

**Note:** None

Project Name: **MURPHY 51,52** Project Number: **34265.008**

---

**Sample I.D. #:** 225471 **Sample Description:** B52-1 2-4 **Date Sampled:** 12/17/98

| Analyte | Result | Units | Qualifier | LOD | LOQ | Date Extracted | Date Analyzed | Analyst | Method |
|---|---|---|---|---|---|---|---|---|---|
| Soil Permeability | 0.13E-5 | cm/s | | | | | 12/28/98 | GJM | MOSA 28-4.2 |

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

H:\MSWORD\DATQUAL.DOC

Commonwealth Technology, Inc.
1-800-228-3012
1230 Lange Court
Baraboo, WI 53913
(608) 356-2760
FAX: (608) 356-2766

2 of 2

**Nº 5724**

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

| | | |
|---|---|---|
| SAMPLE COLLECTOR: Jeff King (GZA) | COMPANY: Gannett Fleming | TELEPHONE # (include area code): |
| PROJECT NUMBER: 34265.008 | PROJECT NAME: Tank 51/52 | |

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

| | |
|---|---|
| INVOICE ADDRESS (must be completed): Liz Lundmark | REPORT ADDRESS (must be completed): Jeff King |

| | | | |
|---|---|---|---|
| DATE & TIME OF RELINQUISHMENT: 12/18/98 16:00 | RELINQUISHED BY (signature): | RECEIVED BY (signature): | DATE / TIME OF RECEPTION: |
| DATE & TIME OF RELINQUISHMENT: | RELINQUISHED BY (signature): | RECEIVED BY LABORATORY (signature): | DATE / TIME OF RECEPTION: 12-18-98 1800 |

| 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 CONTAIN-ERS | LAB I.D. |
|---|---|---|---|---|---|---|---|---|---|---|
| B52-3 4-5 | 12/17/98 | PM | Soil | grab | Meoh | | DRO GRO GRO/PVOC PVOC Pb Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER PAH Other (please list): | | 3 | 224818 |
| B52-1 0-1.25 | | | | | | Zip lock | DRO GRO GRO/PVOC PVOC Pb Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER PAH Other (please list): Organic Carbon fraction | | 1 | 224819 |
| B52-1 1.25-2.5 | | | | | | Zip lock | DRO GRO GRO/PVOC PVOC Pb Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER PAH Other (please list): | | 1 | 224820 |
| B52-1 2.5-3.75 | | | | | | Zip lock | DRO GRO GRO/PVOC PVOC Pb Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER PAH Other (please list): | | 1 | 224821 |
| B52-1 3.75-5 | | | | | | Zip lock | DRO GRO GRO/PVOC PVOC Pb Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER PAH Other (please list): | | 1 | 224822 |
| ~~B52-1~~ 2-4 | | | | | | Acetate sleeve | DRO GRO GRO/PVOC PVOC Pb Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER PAH Other (please list): Permeability | MM 12/21/98 | 1 | ~~224823~~ |
| B52-1 2-4 | | | | | | | DRO GRO GRO/PVOC PVOC Pb Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER PAH Other (please list): Permeability * | | | 225471 |
| | | | | | | | DRO GRO GRO/PVOC PVOC Pb Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER PAH Other (please list): | | | |

SAMPLE CONDITIONS / COMMENTS: * See Sample log-in form.

CHECKED

ARRIVAL TEMPERATURE: on ice

729

# Commonwealth Technology, Inc.

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

1 of 2

**Nº 5723**

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

| | | |
|---|---|---|
| SAMPLE COLLECTOR: Jeff King (JJK) | COMPANY: Gannett Fleming | TELEPHONE # (include area code): (608) 836-1500 |
| PROJECT NUMBER: 34265.008 | PROJECT NAME: Tank 51/52 | |

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

| | |
|---|---|
| INVOICE ADDRESS (must be completed): Liz Lundark, Murphy Oil USA | REPORT ADDRESS (must be completed): Jeff King, Gannett Fleming |
| DATE & TIME OF RELINQUISHMENT: 12/18/98 16:00 | RELINQUISHED BY (signature): Jeff King |
| DATE & TIME OF RELINQUISHMENT: | RELINQUISHED BY (signature): |
| RECEIVED BY (signature): | DATE / TIME OF RECEPTION: |
| RECEIVED BY LABORATORY (signature): P. Thuyen | DATE / TIME OF RECEPTION: 12-18-98 1800 |

| 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 CONTAIN-ERS | LAB I.D. |
|---|---|---|---|---|---|---|---|---|---|---|
| B51-1 1-2 | 12/17/98 | PM | Soil | grab | MeOH | | (DRO) GRO GRO/PVOC (PVOC) Pb Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER (PAH) Other (please list): | | 3 | 224810 |
| B51-1 4-5 | | | | | | | (DRO) GRO GRO/PVOC (PVOC) Pb Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER (PAH) Other (please list): | | | 224811 |
| FB-51 | | | | | | Methanol Blank | (DRO) GRO GRO/PVOC (PVOC) Pb Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER (PAH) Other (please list): | 12-22-98 | | 224812 |
| B52-1 1-2 | | | | | | | (DRO) GRO GRO/PVOC (PVOC) Pb Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER (PAH) Other (please list): | | | 224813 |
| B52-1 4-5 | | | | | | | (DRO) GRO GRO/PVOC (PVOC) Pb Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER (PAH) Other (please list): | | | 224814 |
| B52-2 1-2 | | | | | | | (DRO) GRO GRO/PVOC (PVOC) Pb Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER (PAH) Other (please list): | | | 224815 |
| B52-2 4-5 | | | | | | | (DRO) GRO GRO/PVOC (PVOC) Pb Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER (PAH) Other (please list): | | | 224816 |
| B52-3 1-2 | | | | | | | (DRO) GRO GRO/PVOC (PVOC) Pb Cd % SOLIDS FLASHPOINT VOC-LUST VOC-8021 SIEVE #200 SIEVE PAINT FILTER (PAH) Other (please list): | | | 224817 |

SAMPLE CONDITIONS / COMMENTS:

CHECKED

ARRIVAL TEMPERATURE: on ice

eder associates
a division of Gannett Fleming

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

December 31, 1998
File #34265.003, .007, .008, and .010



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

Re: Status of Field Investigations
Murphy Oil USA, Inc., Superior, Wisconsin

Dear Mr. Hosch:

This letter is to inform you that we have completed the field portion of the work outlined in work plans we sent you on November 12, 1998, for the soil investigations at Murphy Oil USA's, Inc., refinery in Superior. The field work for the following areas was completed during the week of December 14, 1998:

- Former Tank 8
- Tanks 32/33
- Tanks 34/35
- Tanks 51/52
- Former Tank 81

We also collected groundwater samples from the monitoring wells and piezometers that were installed as part of our subsurface investigations at Tanks 59 and 66, as described in our September 22, 1998, and September 4, 1998, works plans, respectively.

The subsurface investigations at the Fuel Loading Area and the Crude Unit Process Area were not completed, due to the possible presence of underground utilities in these areas. Weather permitting, Murphy plans to determine the location of any underground utilities in these areas by February 1999. In addition, Murphy was disassembling Tank 67 during the week of December 14th; the presence of heavy equipment restricted access to areas around the tank, so soil samples were not collected in that basin. Murphy plans to have Tank 67 removed by the middle of February 1999.



Continued . . .

Mr. James A. Hosch
Wisconsin Department of Natural Resources
December 31, 1998



Weather permitting, we plan to implement the work plans for Tank 67, the Fuel Loading Area, and the Crude Unit Process Area once Tank 67 has been removed. We will notify you of the field work dates once this work is scheduled.

If you have any questions or comments, please call us.

Sincerely,

GANNETT FLEMING, INC.

Jeffrey J. King
Staff Hydrogeologist

JJK/jec

cc: Lee Vail (Murphy/New Orleans)
Greg Neve (Murphy/Superior)
Liz Lundmark (Murphy/Superior)
Kevin Melnyk (Murphy/El Dorado)
Mark Stokstad (WDNR/Rhinelander)
Rick Lewandowski (DeWitt, Ross & Stevens)
Shanna Laube (COMM)

eder associates
a division of Gannett Fleming

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

VIA FACSIMILE
December 10, 1998
File #34265.003, .007, .008, and .010



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

Re: Notification of Work Plan Implementation
Murphy Oil USA, Inc., Superior, Wisconsin

Dear Mr. Hosch:

This letter is to inform you that we plan to begin the work outlined in the work plans that we sent you on November 12, 1998, for the soil investigations at Murphy Oil USA's, Inc., refinery in Superior. Weather permitting, we will implement the work plans for the following areas, beginning on Tuesday, December 15, 1998:

- Former Tank 8
- Tanks 32/33
- Tank 47
- Tanks 51/52
- Tank 67
- Former Tank 81
- Fuel Loading Area
- Crude Unit Process Area.

By the end of the current week, all monitoring wells and piezometers will have been purged, for well development purposes, at least twice. During the week of December 14, we also plan to collect groundwater samples for petroleum and natural attenuation parameters from the monitoring wells and piezometers installed as part of the subsurface investigations conducted at Tanks 59 and 66, as described in our September 22, 1998, and September 4, 1998, work plans, respectively. This assumes there is a sufficient volume of groundwater in each well.

If you would like to observe the soil sampling or have any questions or comments, please call us.

Sincerely,

GANNETT FLEMING, INC.

Jeffrey J. King
Staff Hydrogeologist

Dennis F. Kugle for
Dennis F. Kugle
Vice President

JJK/jec

cc: Lee Vail (Murphy/New Orleans)
Greg Neve (Murphy/Superior)
Liz Lundmark (Murphy/Superior)
Kevin Melnyk (Murphy/El Dorado)
Mark Stokstad (WDNR/Rhinelander)
Rick Lewandowski (DeWitt, Ross & Stevens)
Shanna Laube (COMM)

M:\CLERICAL\PROJECTS\0300\367-18\CORRESP\JJK\3L367-18.006

Gannett Fleming

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

November 12, 1998
File #34265.003, .007, .008, .010

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

Re: Work Plans — Murphy Oil USA, Inc., Superior, Wisconsin

Dear Mr. Hosch:

Enclosed are individual work plans for nine historical release sites at which you have requested additional subsurface investigation. These sites are:

- Former Tank 8
- Tanks 32/33
- Tanks 34/35
- Tank 47
- Tanks 51/52
- Tank 67
- Former Tank 81
- Fuel Loading Area
- Crude Unit Process Area

We will be soliciting triple bids for the Geoprobe services at the PECFA-eligible sites, as required by COMM 47. As soon as we have selected the Geoprobe operator and coordinated the work with Murphy's refinery staff, we will begin the investigations, weather permitting. If possible, we plan to complete as much of the work as we can before the onset of winter. Any work that remains will be completed as soon as the weather permits next spring.

The proposed investigation will be limited to soils we believe are in the unsaturated zone. We are not proposing the installation of any monitoring wells at this time. We will re-evaluate the need for additional monitoring wells after reviewing the results of these additional investigations.



Continued . . .

Mr. James A. Hosch
Wisconsin Department of Natural Resources
November 12, 1998



This submittal does not address the contamination under the road near the former UST site or the S1/S2 release site. We will submit additional information to you on these sites by the end of November 1998.

Investigation of the October 1998 release at tank 40 has begun. Field screening has been done and is being used to focus additional investigation. We will submit a report to you as soon as the investigation has been completed.

If you have any questions or comments on the enclosed work plans, please contact us as soon as possible.

Sincerely,

GANNETT FLEMING, INC.

David J. Olig, P.G.
Senior Project Manager

Jeffrey J. King
Staff Hydrogeologist

Dennis F. Kugler
Vice President

DJO/jec
Enc.

cc: Lee Vail (Murphy/New Orleans)
Greg Neve (Murphy/Superior)
Liz Lundmark (Murphy/Superior)
Kevin Melynk (Murphy/El Dorado)
Mark Stokstad (WDNR/Rhinelander)
Rick Lewandowski (DeWitt, Ross & Stevens)
Shanna Laube (COMM)

Gannett Fleming

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

November 12, 1998
File #34265.007

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

Re: Work Plan for Soil Investigation — Former Tank 8 Releases
Murphy Oil USA, Inc., Superior, Wisconsin
PECFA Claim # 54880-0456-07-E

Dear Mr. Hosch:

This letter provides the proposed work plan for an investigation to determine the extent and degree of unsaturated soil contamination within the diked area of former Tank 8 at Murphy Oil's Superior refinery. Releases from this tank of about 2,000 gallons of #2 fuel oil, 250 gallons of #1 fuel oil, and 630 gallons and 8,400 gallons of #2 fuel oil were reported in March 1991, September 1991, June 1992, and August 1994, respectively. During the investigation, we will also collect samples for physical testing, and these data will be used in our contaminant transport modeling. This work plan is being submitted in response to your October 1, 1998, letter to Mr. Lee Vail requesting additional investigation at these release locations.

**Previous Work**

In late July 1998, Gannett Fleming, Inc. used a Geoprobe to collect undisturbed soil samples from one borehole in the basin that formerly contained Tank 8. Soil samples from 1 to 1.5 feet and from 4.5 to 5 feet below the ground surface (bgs) were submitted to the laboratory for analysis of diesel range organics (DRO), gasoline range organics (GRO), petroleum volatile organic compounds (PVOCs), and polynuclear aromatic hydrocarbons (PAHs). The Geoprobe sampling location (GP-21) and the analytical results are shown on Figure 1. The complete results of our July investigative activities were sent to you in our September 10, 1998, report.

On October 8, 1998, Twin Ports Testing used a hand auger to collect shallow soil samples (i.e., 1 to 1.5 feet and 2 to 2.5 feet bgs) from 17 locations within the diked area that had contained Tank 8. These soil samples were field-screened with both a flame-ionization detector (FID) and a photoionization (PID) detector. The field-screening results are attached. The hand-auger sampling locations and the FID field-screening results, which are more useful than the PID results due to the



Continued . . .

sensitivity of the instrument, are shown on Figure 1. The PID results were relatively high throughout the basin, except for those samples from the basin's north central border.

**Proposed Scope of Work**

Gannett Fleming proposes to advance eight Geoprobe boreholes within the diked area that formerly contained Tank 8 in order to define the degree of petroleum contamination in the unsaturated soils in this tank basin. All eight boreholes will be advanced to 6 feet bgs. The proposed locations for these boreholes are shown on Figure 1. These may be adjusted in the field, depending on the locations of underground utilities, pipelines, standing water, or other constraints on accessibility.

Soil samples will be collected from each borehole for chemical analysis and for testing of physical parameters. Figure 2 is a schematic representation of a typical borehole, showing the depths from which the samples for chemical and physical analysis will be collected from each borehole.

Soil Sampling (Chemical Parameters)

All the boreholes will be advanced with a Geoprobe equipped with a 4-foot-long, 2-inch-diameter, macro-core sampler. A new acetate liner will be inserted into the sampler to collect each soil core, and we will collect continuous soil samples from each borehole. The samples will be visually classified and logged. Soil samples will be collected from each borehole at 1 to 2 feet and 4 to 5 feet bgs. These samples will be placed in laboratory-supplied containers, preserved as necessary, placed on ice, and shipped to Commonwealth Technology, Inc. (CTI), a Wisconsin-certified laboratory in Baraboo, Wisconsin, for analysis of DRO, PVOCs, and PAHs.

Soil Sampling (Physical Parameters)

Soil samples for physical testing (organic carbon and permeability) will be collected from only one of the boreholes in this tank basin. Soil samples from each 1.25-foot interval to a depth of 5 feet in one of the eight boreholes will be shipped to CTI for analysis of the organic carbon fraction in the sample. A separate macro-core sampler will also be advanced next to one of the eight boreholes in order to collect an undisturbed sample at 2 to 4 feet bgs. This sample will be shipped to a qualified laboratory for falling head permeability testing. The permeability and organic carbon results will be



Continued . . .

used to calibrate the model that will be used to develop site-specific residual contaminant levels (RCLs), as discussed in our September 10, 1998, report.

Equipment Decontamination

All non-disposable sampling equipment will be decontaminated between samples using a detergent/potable water solution and rinsed with either potable or distilled water.

**Project Documentation**

The following required forms will be completed and submitted to the Wisconsin Department of Natural Resources (WDNR) with the investigation report:

- Soil Boring Log Information (Form 4400-122).
- Well/Drill Hole/Borehole Abandonment (Form 3300-5B).

We will begin soliciting bids from Geoprobe operators and coordinating the proposed work immediately. If you have any questions or comments about this work plan, please call.

Sincerely,

GANNETT FLEMING, INC.

David J. Olig, P.G.
Senior Project Manager

Jeffrey J. King
Project Hydrogeologist

DJO/jec
Enc.

MURPHY OIL U.S.A.
SUPERIOR, WISCONSIN
HAND AUGER BORING RESULTS
TANKS 7 & 8
OCTOBER 8, 1998

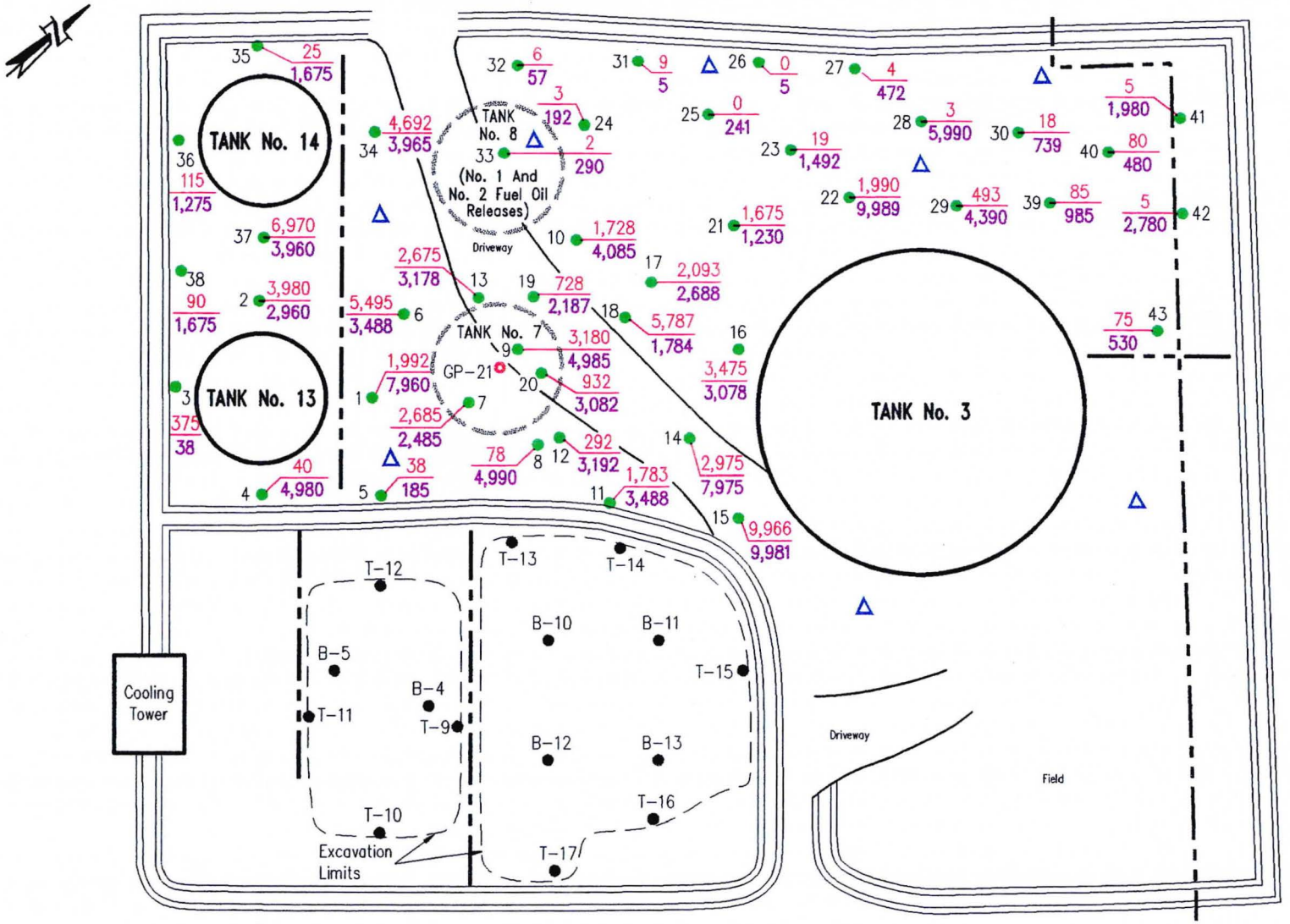


| Hand Auger Boring Identification | Sample Depth (ft.) | Soil Description | FID Background (ppm) | FID Reading (ppm) | PID Background (ppm) | PID Reading (ppm) |
|---|---|---|---|---|---|---|
| 1 | 1 | sandy reddish brown clay | 8 | 2,000 | 0 | 71 |
| | 2 | reddish brown clay | 40 | 8,000 | 0 | 122 |
| 2 | 1 | sandy reddish brown clay | 20 | 4,000 | 0 | 158 |
| | 2 | reddish brown clay | 40 | 3,000 | 0 | 74 |
| 3 | 1 | gravel and reddish brown clay | 25 | 400 | 0 | 13 |
| | 2 | gravel and reddish brown clay | 22 | 60 | 0 | 35 |
| 4 | 1 | black to reddish organic clay | 20 | 60 | 0 | 42 |
| | 2 | reddish brown clay | 20 | 5,000 | 0 | 52 |
| 5 | 1 | reddish brown clay | 22 | 60 | 0 | 11 |
| | 2 | reddish brown clay | 15 | 200 | 0 | 8 |
| 6 | 1 | black to reddish organic clay | 5 | 5,500 | 0 | 132 |
| | 2 | reddish brown clay | 12 | 3,500 | 0 | 122 |
| 7 | 1 | black to reddish organic clay | 15 | 2,700 | 0 | 46 |
| | 2 | reddish brown clay | 15 | 2,500 | 0 | 139 |
| 8 | 1 | silty sand | 17 | 95 | 0 | 3 |
| | 2 | reddish brown clay | 10 | 5,000 | 0 | 188 |
| 9 | 1 | gravel and reddish brown clay | 20 | 3,200 | 0 | 33 |
| | 2 | reddish brown clay | 15 | 5,000 | 0 | 189 |
| 10 | 1 | black to reddish organic clay | 22 | 1,750 | 0 | 57 |
| | 2 | sandy reddish brown clay | 15 | 4,100 | 0 | 149 |
| 11 | 1 | sandy reddish brown clay | 17 | 1,800 | 0 | 10 |
| | 2 | sandy reddish brown clay | 12 | 3,500 | 0 | 288 |
| 12 | 1 | gravel and reddish brown clay | 8 | 300 | 0 | 8 |
| | 2 | reddish brown clay | 8 | 3,200 | 0 | 232 |
| 13 | 1 | silty sand | 25 | 2,700 | 0 | 153 |
| | 2 | sand and gravel | 22 | 3,200 | 0 | 175 |
| 14 | 1 | sandy reddish brown clay | 25 | 3,000 | 0 | 208 |
| | 2 | sandy reddish brown clay | 25 | 8,000 | 0 | 222 |
| 15 | 1 | black to reddish organic clay | 35 | 10,001 | 0 | 296 |
| | 2 | reddish brown clay | 20 | 10,001 | 0 | 409 |
| 16 | 1 | reddish brown clay | 25 | 3,500 | 0 | 107 |
| | 2 | reddish brown clay | 22 | 3,100 | 0 | 144 |
| 17 | 1 | silty sand | 7 | 2,100 | 0 | 92 |
| | 2 | sandy reddish brown clay | 12 | 2,700 | 0 | 75 |
| 18 | 1 | silty sand | 13 | 5,800 | 0 | 138 |
| | 2 | silty sand | 16 | 1,800 | 0 | 174 |
| 19 | 1 | silty sand | 22 | 750 | 0 | 52 |
| | 2 | silty sand | 13 | 2,200 | 0 | 94 |
| 20 | 1 | silty sand | 18 | 950 | 0 | 85 |
| | 2 | reddish brown clay | 18 | 3,100 | 0 | 211 |
| 21 | 1 | black to reddish organic clay | 25 | 1,700 | 0 | 71 |
| | 2 | reddish brown clay | 20 | 1,250 | 0 | 53 |
| 22 | 1 | reddish brown clay | 10 | 2,000 | 0 | 246 |
| | 2 | sandy reddish brown clay | 12 | 10,001 | 0 | 422 |
| 23 | 1 | black to reddish organic clay | 11 | 30 | 0 | 13 |
| | 2 | sandy reddish brown clay | 8 | 1,500 | 0 | 138 |
| 24 | 1 | reddish brown clay | 7 | 10 | 0 | 0 |
| | 2 | reddish brown clay | 8 | 200 | 0 | 86 |

MURPHY OIL U.S.A.
SUPERIOR, WISCONSIN
HAND AUGER BORING RESULTS
TANKS 7 & 8
OCTOBER 8, 1998



| Hand Auger Boring Identification | Sample Depth (ft.) | Soil Description | FID Background (ppm) | FID Reading (ppm) | PID Background (ppm) | PID Reading (ppm) |
|---|---|---|---|---|---|---|
| 25 | 1 | sandy reddish brown clay | 14 | 14 | 0 | 0 |
| | 2 | black to reddish organic clay | 9 | 250 | 0 | 75 |
| 26 | 1 | reddish brown clay | 15 | 15 | 0 | 0 |
| | 2 | reddish brown clay | 10 | 15 | 0 | 2 |
| 27 | 1 | reddish brown clay | 8 | 12 | 0 | 0 |
| | 2 | reddish brown clay | 8 | 480 | 0 | 5 |
| 28 | 1 | reddish brown clay | 9 | 12 | 0 | 0 |
| | 2 | reddish brown clay | 10 | 6,000 | 0 | 372 |
| 29 | 1 | reddish brown clay | 7 | 500 | 0 | 579 |
| | 2 | reddish brown clay | 10 | 4,400 | 0 | 264 |
| 30 | 1 | reddish brown clay | 20 | 38 | 0 | 8 |
| | 2 | reddish brown clay | 11 | 750 | 0 | 111 |
| 31 | 1 | reddish brown clay | 10 | 19 | 0 | 3 |
| | 2 | reddish brown clay | 10 | 15 | 0 | 61 |
| 32 | 1 | reddish brown clay | 9 | 15 | 0 | 2 |
| | 2 | reddish brown clay | 8 | 65 | 0 | 57 |
| 33 | 1 | reddish brown clay | 15 | 17 | 0 | 3 |
| | 2 | reddish brown clay | 10 | 300 | 0 | 119 |
| 34 | 1 | black to reddish organic clay | 8 | 4,700 | 0 | 300 |
| | 2 | reddish brown clay | 35 | 4,000 | 0 | 257 |
| 35 | 1 | reddish brown clay | 40 | 65 | 0 | 69 |
| | 2 | reddish brown clay | 25 | 1,700 | 0 | 174 |
| 36 | 1 | reddish brown clay | 30 | 145 | 0 | 85 |
| | 2 | reddish brown clay | 25 | 1,300 | 0 | 164 |
| 37 | 1 | reddish brown clay | 30 | 7,000 | 0 | 205 |
| | 2 | black to reddish organic clay | 40 | 4,000 | 0 | 238 |
| 38 | 1 | sand and gravel | 35 | 125 | 0 | 77 |
| | 2 | gravel and reddish brown clay | 25 | 1,700 | 0 | 91 |
| 39 | 1 | black to reddish organic clay | 15 | 100 | 0 | 27 |
| | 2 | reddish brown clay | 15 | 1,000 | 0 | 114 |
| 40 | 1 | reddish brown clay | 20 | 100 | 0 | 74 |
| | 2 | reddish brown clay | 20 | 500 | 0 | 144 |
| 41 | 1 | black to reddish organic clay | 20 | 25 | 0 | 0 |
| | 2 | reddish brown clay | 20 | 2,000 | 0 | 241 |
| 42 | 1 | silty sand | 25 | 30 | 0 | 5 |
| | 2 | sandy reddish brown clay | 20 | 2,800 | 0 | 316 |
| 43 | 1 | sandy reddish brown clay | 25 | 100 | 0 | 55 |
| | 2 | sandy reddish brown clay | 20 | 550 | 0 | 189 |




## LEGEND

- Proposed Gannett Fleming Geoprobe Soil Sample Location
- GP-21 — Gannett Fleming Geoprobe Soil Sample Location (July 1998)
- 18 — Twin Ports Hand-Auger Field Screening Soil Sample Location (October 1998)
- B-5 — Twin Ports Chemical Analysis Soil Sample Location (October 1998: See Note 3)
- Piping Run
- TANK No. 8 — Former Tank Location

11 = FID Reading At 1 Foot Depth
100 = FID Reading At 2 Foot Depth

### GP-21 CHEMICAL RESULTS

| | 1'-1.5' | 4.5'-5' |
|---|---|---|
| DRO | 1,200 | 500 |
| GRO | 1,700 | 430 |
| B | < 0.95 | < 0.19 |
| T | < 0.55 | < 0.11 |
| E | < 0.55 | < 0.11 |
| X | < 1.7 | < 0.34 |

Concentrations In Parts Per Million

## NOTES

1. *Locations Are Approximate Based On Field Measurements; Site Not Surveyed.*
2. *Area Around Tanks 13 And 14 Not Accessible With A Geoprobe.*
3. *Chemical Analysis Will Be Submitted As A Separate Report For Former Tanks 1 And 2 Releases.*

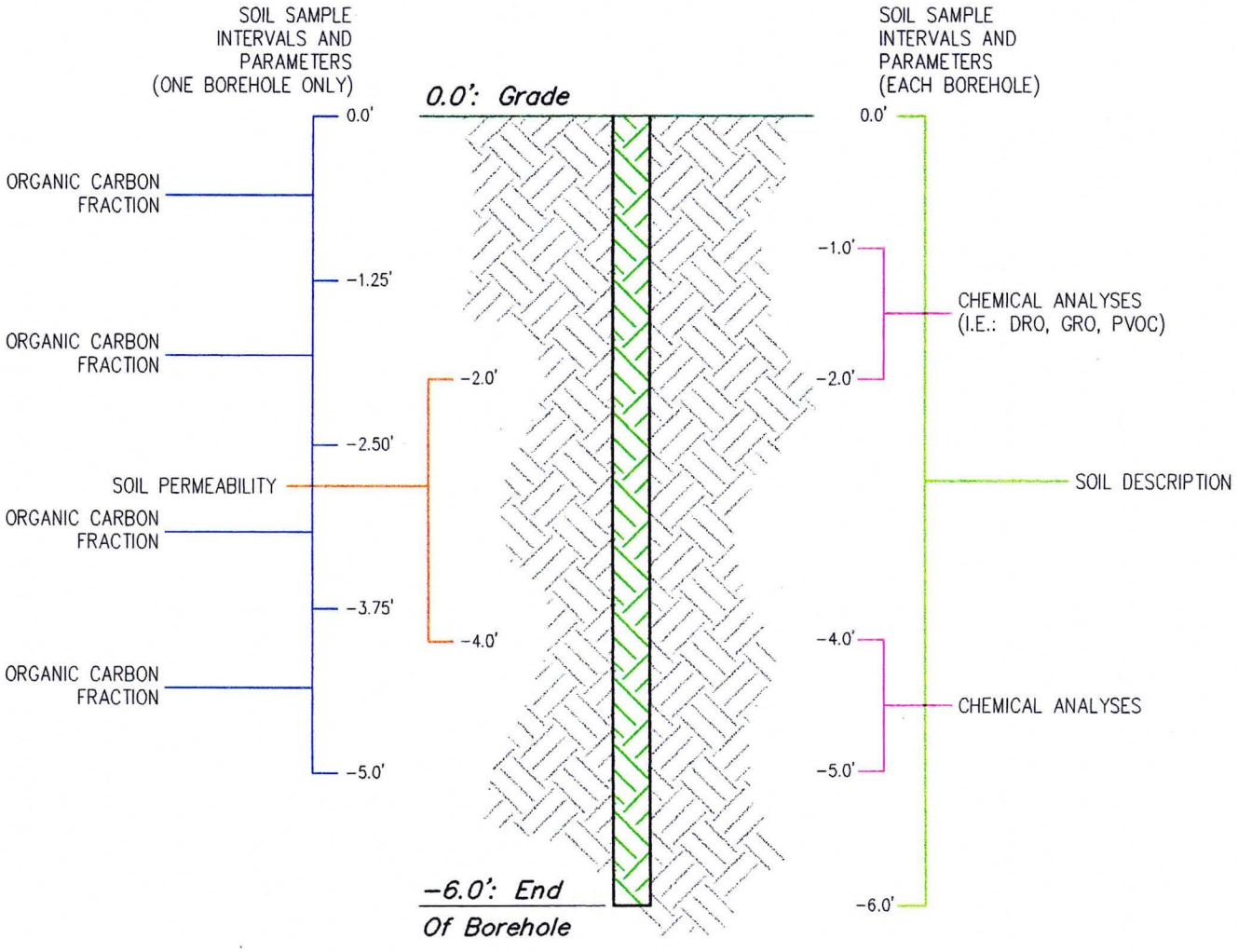
0 40
Scale In Feet

# SAMPLE LOCATIONS AND FID READINGS AT FORMER TANK NO. 8

MURPHY OIL USA, INC.
SUPERIOR, WISCONSIN

111298
34265WQ

Gannett Fleming
FIGURE 1




## NOTES

1. *One Soil Sample Will Be Collected Per Tank Basin For Soil Permeability And Samples For Organic Carbon Fraction Analytes Will Only Be Collected From One Probehole Per Basin.*
2. *Samples For Chemical Analysis At Gasoline And Gasoline Blended Stock Release Sites Will Be Analyzed For GRO, PVOCs, And Lead.*
3. *Samples For Chemical Analysis At Fuel Oil And Crude Sites Will Be Analyzed For DRO, PVOCs, And PAHs.*

Not To Scale

# PROPOSED SOIL SAMPLE INTERVALS AND ANALYTES

MURPHY OIL USA, INC.
SUPERIOR, WISCONSIN

111298
34265WV

Gannett Fleming

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

November 12, 1998
File #34265.003

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

Re: Work Plan for Soil Investigation — Tanks 32 and 33 Releases
Murphy Oil USA, Inc., Superior, Wisconsin

Dear Mr. Hosch:

This letter provides the proposed work plan for an investigation to determine the extent and degree of unsaturated soil contamination within the diked area of Tanks 32 and 33 at Murphy Oil's Superior refinery. Releases from these tanks of about 300 gallons and 420 gallons of #2 fuel oil were reported in December 1988 and January 1994, respectively. During the investigation, we will also collect samples for physical parameter testing, and these data will be used in our contaminant transport modeling. This work plan is being submitted in response to your October 1, 1998, letter to Mr. Lee Vail requesting additional investigation at these release locations.

**Previous Work**

On October 14, 1998, Twin Ports Testing used a hand auger to collect shallow soil samples (i.e., 1 to 1.5 feet and 2 to 2.5 feet below ground surface [bgs]) from 17 locations within the diked area of Tanks 32 and 33. These samples were field-screened with both a flame-ionization detector (FID) and a photoionization detector (PID). The field-screening results are attached. The hand-auger sampling locations and the FID field-screening results, which are more useful than the PID results due to the sensitivity of the instrument, are shown on Figure 1. The FID results were consistently high (greater than 500 ppm) in all samples except those in the northwest and southern portions of the tank basin.

**Proposed Scope of Work**

Gannett Fleming, Inc. proposes to advance eight Geoprobe boreholes within the diked area at Tanks 32 and 33 in order to define the degree of #2 fuel oil contamination in the unsaturated soils in this tank basin. All eight boreholes will be advanced to 6 feet bgs. The proposed locations for these



Continued . . .

boreholes are shown on Figure 1. These may be adjusted in the field, depending on the locations of underground utilities, pipelines, standing water, or other constraints on accessibility.

Soil samples will be collected from each borehole for chemical analysis and for testing of physical parameters. Figure 2 is a schematic representation of a typical borehole, showing the depths from which the samples for chemical and physical analysis will be collected from each borehole.

Soil Sampling (Chemical Parameters)

All the boreholes will be advanced with a Geoprobe equipped with a 4-foot-long, 2-inch-diameter, macro-core sampler. A new acetate liner will be inserted into the sampler to collect each soil core. We will collect continuous soil samples from each borehole. The samples will be visually classified and logged. Soil samples will be collected from each borehole at 1 to 2 feet and 4 to 5 feet bgs. These samples will be placed in laboratory-supplied containers, preserved as necessary, placed on ice, and shipped to Commonwealth Technology, Inc. (CTI), a Wisconsin-certified laboratory in Baraboo, Wisconsin, for analysis of diesel range organics (DRO), petroleum volatile organic compounds (PVOCs), and polynuclear aromatic hydrocarbons (PAHs).

Soil Sampling (Physical Parameters)

Soil samples for physical testing (organic carbon and permeability) will be collected from only one of the boreholes in this tank basin. Soil samples from each 1.25-foot interval to a depth of 5 feet in one of the eight boreholes will be shipped to CTI for analysis of the organic carbon fraction in the sample. A separate macro-core sampler will also be advanced next to one of the eight boreholes in order to collect an undisturbed sample at 2 to 4 feet bgs. This sample will be shipped to a qualified laboratory for falling head permeability testing. The permeability and organic carbon results will be used to calibrate the model that will be used to develop site-specific residual contaminant levels (RCLs), as discussed in our September 10, 1998, report.



Continued . . .

Mr. James A. Hosch
Wisconsin Department of Natural Resources
November 12, 1998



Equipment Decontamination

All non-disposable sampling equipment will be decontaminated between samples using a detergent/potable water solution and rinsed with either potable or distilled water.

**Project Documentation**

The following required forms will be completed and submitted to the Wisconsin Department of Natural Resources (WDNR) with the investigation report:

- Soil Boring Log Information (Form 4400-122).
- Well/Drill Hole/Borehole Abandonment (Form 3300-5B).

We will begin soliciting bids from Geoprobe operators and coordinating the proposed work immediately. If you have any questions or comments about this work plan, please call.

Sincerely,

GANNETT FLEMING, INC.

David J. Olig, P.G.
Senior Project Manager

Jeffrey J. King
Project Hydrogeologist

DJO/jec
Enc.

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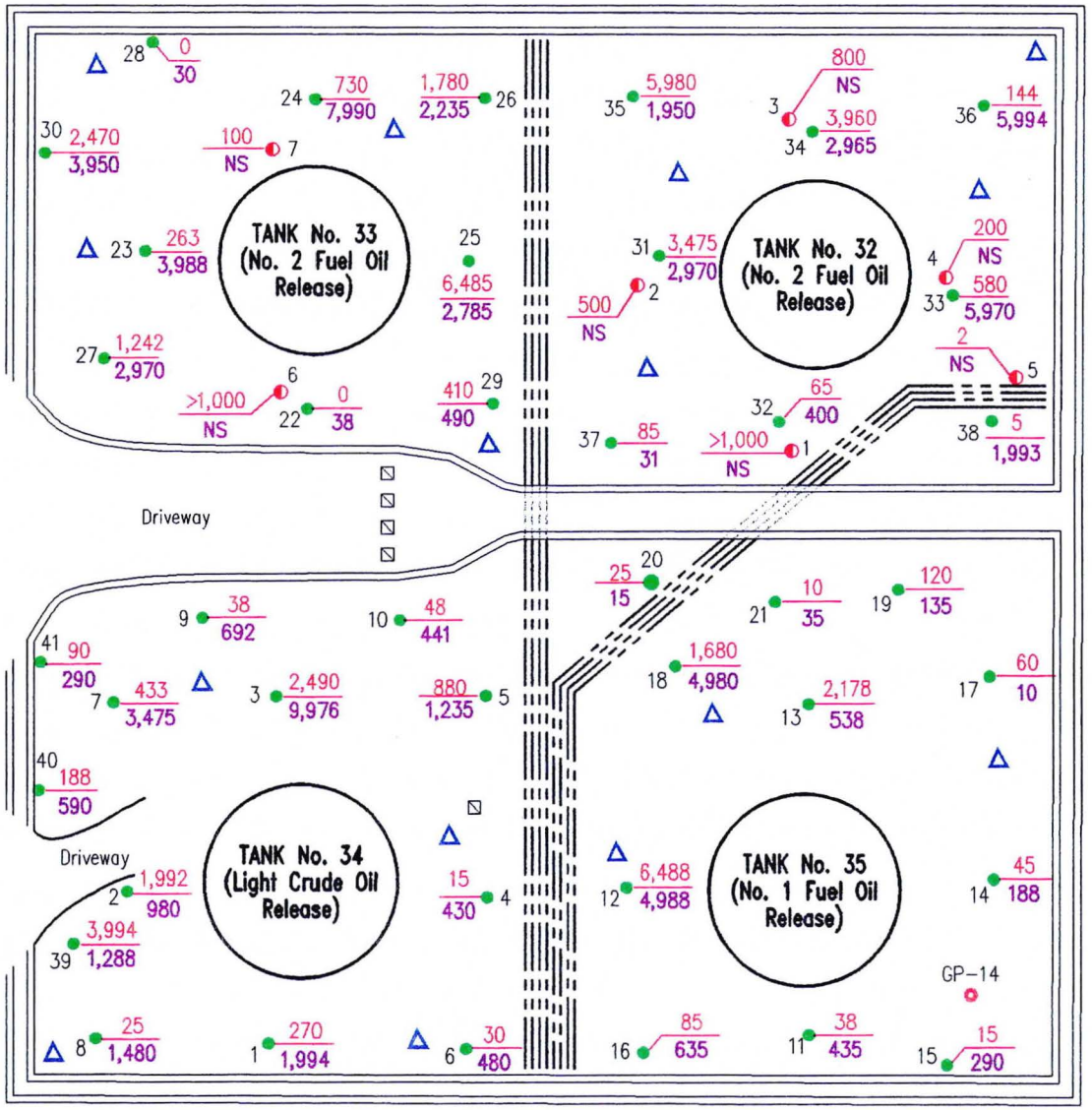
MURPHY OIL U.S.A.
SUPERIOR, WISCONSIN
HAND AUGER BORING RESULTS
TANKS 32 & 33
OCTOBER 14, 1998



| Hand Auger Boring Identification | Sample Depth (ft.) | Soil Description | FID Background (ppm) | FID Reading (ppm) | PID Background (ppm) | PID Reading (ppm) |
|---|---|---|---|---|---|---|
| 22 | 1 | reddish brown clay | 12 | 12 | 0 | 0 |
| | 2 | reddish brown clay | 12 | 50 | 0 | 29 |
| 23 | 1 | reddish brown clay | 12 | 275 | 0 | 77 |
| | 2 | reddish brown clay | 12 | 4,000 | 0 | 250 |
| 24 | 1 | reddish brown clay | 20 | 750 | 0 | 17 |
| | 2 | reddish brown clay | 10 | 8,000 | 0 | 269 |
| 25 | 1 | black to reddish organic clay | 15 | 6,500 | 0 | 175 |
| | 2 | reddish brown clay | 15 | 2,800 | 0 | 216 |
| 26 | 1 | black to reddish organic clay | 20 | 1,800 | 0 | 97 |
| | 2 | reddish brown clay | 15 | 2,250 | 0 | 92 |
| 27 | 1 | reddish brown clay | 8 | 1,250 | 0 | 207 |
| | 2 | reddish brown clay | 30 | 3,000 | 0 | 238 |
| 28 | 1 | reddish brown clay | 35 | 35 | 0 | 0 |
| | 2 | reddish brown clay | 15 | 45 | 0 | 0 |
| 29 | 1 | reddish brown clay | 40 | 450 | 0 | 92 |
| | 2 | reddish brown clay | 10 | 500 | 0 | 52 |
| 30 | 1 | reddish brown clay | 30 | 2,500 | 0 | 322 |
| | 2 | reddish brown clay | 50 | 4,000 | 0 | 325 |
| 31 | 1 | reddish brown clay | 25 | 3,500 | 0 | 166 |
| | 2 | reddish brown clay | 30 | 3,000 | 0 | 208 |
| 32 | 1 | reddish brown clay | 60 | 125 | 0 | 16 |
| | 2 | reddish brown clay | 50 | 450 | 0 | 105 |
| 33 | 1 | reddish brown clay | 20 | 600 | 0 | 94 |
| | 2 | reddish brown clay | 30 | 6,000 | 0 | 196 |
| 34 | 1 | reddish brown clay | 40 | 4,000 | 0 | 164 |
| | 2 | reddish brown clay | 35 | 3,000 | 0 | 125 |
| 35 | 1 | black to reddish organic clay | 20 | 6,000 | 0 | 194 |
| | 2 | reddish brown clay | 50 | 2,000 | 0 | 163 |
| 36 | 1 | reddish brown clay | 6 | 150 | 0 | 30 |
| | 2 | reddish brown clay | 6 | 6,000 | 0 | 189 |
| 37 | 1 | black to reddish organic clay | 15 | 100 | 0 | 28 |
| | 2 | reddish brown clay | 9 | 40 | 0 | 2 |
| 38 | 1 | reddish brown clay | 15 | 20 | 0 | 0 |
| | 2 | reddish brown clay | 7 | 2,000 | 0 | 188 |
| 39 | 1 | black to reddish organic clay | 6 | 4,000 | 0 | 82 |
| | 2 | reddish brown clay | 12 | 1,300 | 0 | 26 |
| 40 | 1 | black to reddish organic clay | 12 | 200 | 0 | 17 |
| | 2 | reddish brown clay | 10 | 600 | 0 | 17 |
| 41 | 1 | black to reddish organic clay | 10 | 100 | 0 | 17 |
| | 2 | reddish brown clay | 10 | 300 | 0 | 17 |




MW-5
(Approximate Location)

## LEGEND

- Proposed Gannett Fleming Geoprobe Soil Sample Location
- MW-5 Monitoring Well Location
- 3 Gannett Fleming Hand-Auger Field Screening Soil Sample Location (July 1998)
- GP-14 Gannett Fleming Geoprobe Soil Sample Location (July 1998)
- 18 Twin Ports Hand-Auger Field Screening Soil Sample Location (October 1998)
- Pump
- Piping Run

11 = FID Reading At 1 Foot Depth
100 = FID Reading At 2 Foot Depth

## NOTE

*Locations Are Approximate Based On Field Measurements; Site Not Surveyed*

### GP-14 CHEMICAL RESULTS

| | 1'-1.5' | 4.5'-5' |
|---|---|---|
| DRO | 380 | 15 |
| GRO | 180 | 22 |
| B | 2.2 | < 0.019 |
| T | < 0.11 | < 0.011 |
| E | < 0.11 | < 0.011 |
| X | < 0.34 | < 0.034 |

Concentrations In Parts Per Million

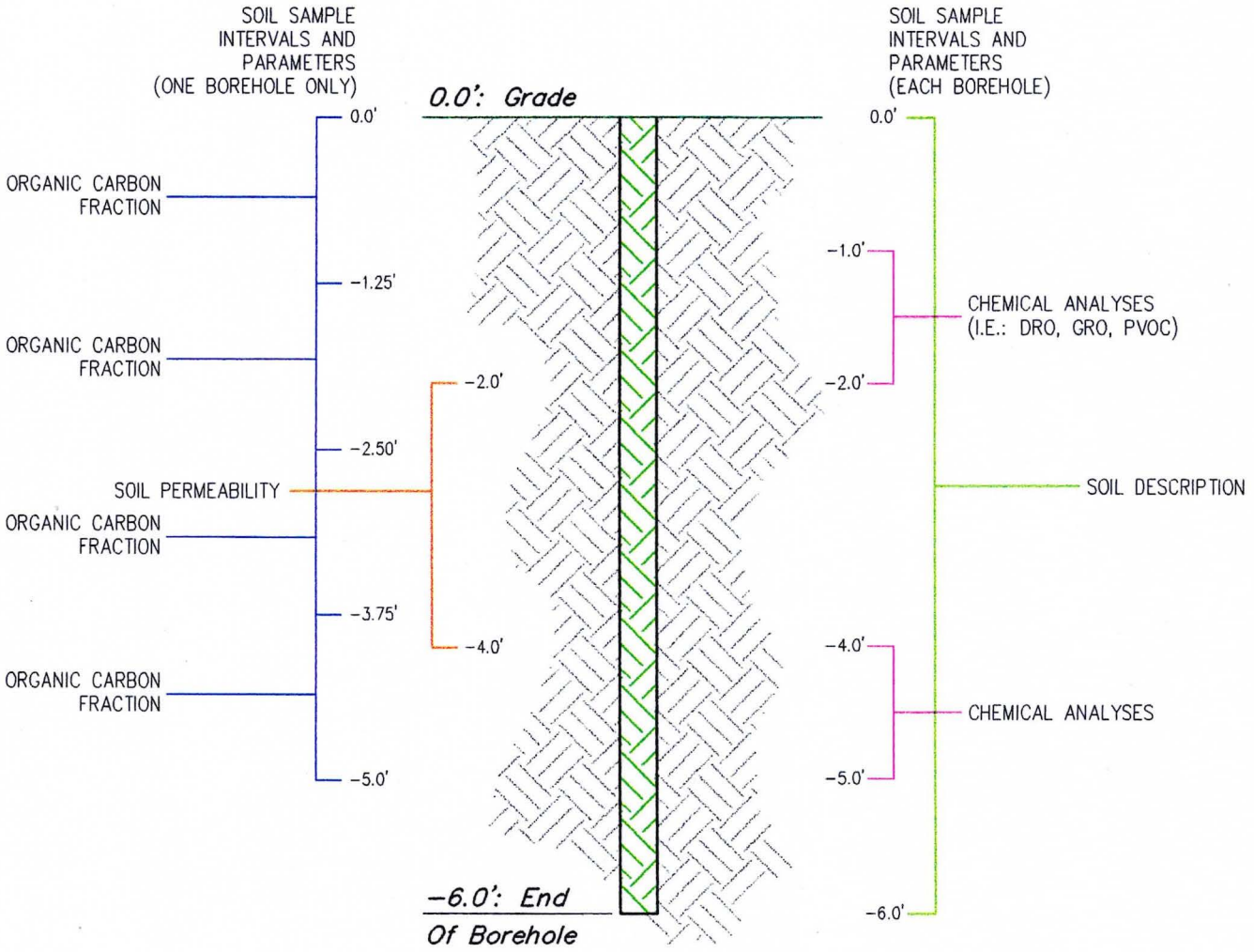
0 40
Scale In Feet

# SAMPLE LOCATIONS AND FID READINGS AT TANK NOS. 32 THROUGH 35

MURPHY OIL USA, INC.
SUPERIOR, WISCONSIN

111298
34265WS

Gannett Fleming
FIGURE 1




## NOTES

1. *One Soil Sample Will Be Collected Per Tank Basin For Soil Permeability And Samples For Organic Carbon Fraction Analytes Will Only Be Collected From One Probehole Per Basin.*
2. *Samples For Chemical Analysis At Gasoline And Gasoline Blended Stock Release Sites Will Be Analyzed For GRO, PVOCs, And Lead.*
3. *Samples For Chemical Analysis At Fuel Oil And Crude Sites Will Be Analyzed For DRO, PVOCs, And PAHs.*

Not To Scale

# PROPOSED SOIL SAMPLE INTERVALS AND ANALYTES

MURPHY OIL USA, INC.
SUPERIOR, WISCONSIN

111298
34265WV

Gannett Fleming

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

November 12, 1998
File #34265.003

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

Re: Work Plan for Soil Investigation — Tanks 34 and 35 Releases
Murphy Oil USA, Inc., Superior, Wisconsin

Dear Mr. Hosch:

This letter provides the proposed work plan for an investigation to determine the extent and degree of unsaturated soil contamination within the diked area of Tanks 34 and 35 at Murphy Oil's Superior refinery. Releases from these tanks of about 4,500 gallons of light crude, 500 gallons of #1 fuel oil, and 420 gallons of #1 fuel oil were reported in July 1990, February 1991, and March 1994, respectively. During the investigation, we will also collect samples for physical parameter testing, and these data will be used in our contaminant transport modeling. This work plan is being submitted in response to your October 1, 1998, letter to Mr. Lee Vail requesting additional investigation at these release locations.

**Previous Work**

In early July 1998, Gannett Fleming, Inc. personnel used a hand auger to collect nine soil samples at 1 to 1.5 feet below the ground surface (bgs) at the bottom of this tank basin. These samples were field-screened with a flame ionization detector (FID). The field-screening locations and results are shown on Figure 1; these data were also included in our September 10, 1998, Phase 1 and 2 report to you.

In late July, Gannett Fleming used a Geoprobe to collect undisturbed soil samples near the location from which the sample with the highest FID reading had been collected earlier. Soil samples from 1 to 1.5 and 4.5 to 5 feet bgs were collected and submitted to the laboratory for analysis of diesel range organics (DRO), gasoline range organics (GRO), petroleum volatile organic compounds (PVOCs), and polynuclear aromatic hydrocarbons (PAHs). The Geoprobe sampling location (GP-14) and the analytical results are shown on Figure 1.



Continued . . .

On October 13, 1998, Twin Ports Testing used a hand auger to collect shallow soil samples (i.e., 1 to 1.5 feet and 2 to 2.5 feet bgs) from 24 locations within the diked area of Tanks 34 and 35. These samples were field-screened with both an FID and a photoionization detector (PID). The field-screening results are attached. The hand-auger sampling locations and the FID field-screening results, which are more useful than the PID results due to the sensitivity of the instrument, are shown on Figure 1. The screening results in this tank basin were variable, ranging from 5 to 9,976 ppm.

## Proposed Scope of Work

Gannett Fleming proposes to advance seven Geoprobe boreholes within the diked area at Tanks 34 and 35 in order to define the degree of petroleum contamination in the unsaturated soils in this tank basin. All seven boreholes will be advanced to 6 feet bgs. The proposed locations for these boreholes are shown on Figure 1. These may be adjusted in the field, depending on the locations of underground utilities, pipelines, standing water, or other constraints on accessibility.

Soil samples will be collected from each borehole for chemical analysis and for testing of physical parameters. Figure 2 is a schematic representation of a typical borehole, showing the depths from which the samples for chemical and physical analysis will be collected from each borehole.

### Soil Sampling (Chemical Parameters)

All the boreholes will be advanced with a Geoprobe equipped with a 4-foot-long, 2-inch-diameter, macro-core sampler. A new acetate liner will be inserted into the sampler to collect each soil core, and we will collect continuous soil samples from each borehole. The samples will be visually classified and logged. Soil samples will be collected from each borehole at 1 to 2 feet and 4 to 5 feet bgs. These samples will be placed in laboratory-supplied containers, preserved as necessary, placed on ice, and shipped to Commonwealth Technology, Inc. (CTI), a Wisconsin-certified laboratory in Baraboo, Wisconsin, for analysis of DRO, PVOCs, and PAHs.

### Soil Sampling (Physical Parameters)

Soil samples for physical testing (organic carbon and permeability) will be collected from only one of the boreholes in this tank basin. Soil samples from each 1.25-foot interval to a depth of 5 feet in



Continued . . .

one of the seven boreholes will be shipped to CTI for analysis of the organic carbon fraction in the sample. A separate macro-core sampler will also be advanced next to one of the seven boreholes in order to collect an undisturbed sample at 2 to 4 feet bgs. This sample will be shipped to a qualified laboratory for falling head permeability testing. The permeability and organic carbon results will be used to calibrate the model that will be used to develop site-specific residual contaminant levels (RCLs), as discussed in our September 10, 1998, report.

Equipment Decontamination

All non-disposable sampling equipment will be decontaminated between samples using a detergent/potable water solution and rinsed with either potable or distilled water.

**Project Documentation**

The following required forms will be completed and submitted to the Wisconsin Department of Natural Resources (WDNR) with the investigation report:

- Soil Boring Log Information (Form 4400-122).
- Well/Drill Hole/Borehole Abandonment (Form 3300-5B).

We will begin soliciting bids from Geoprobe operators and coordinating the proposed work immediately. If you have any questions or comments about this work plan, please call.

Sincerely,

GANNETT FLEMING, INC.

David J. Olig, P.G.
Senior Project Manager

Jeffrey J. King
Project Hydrogeologist

DJO/jec
Enc.

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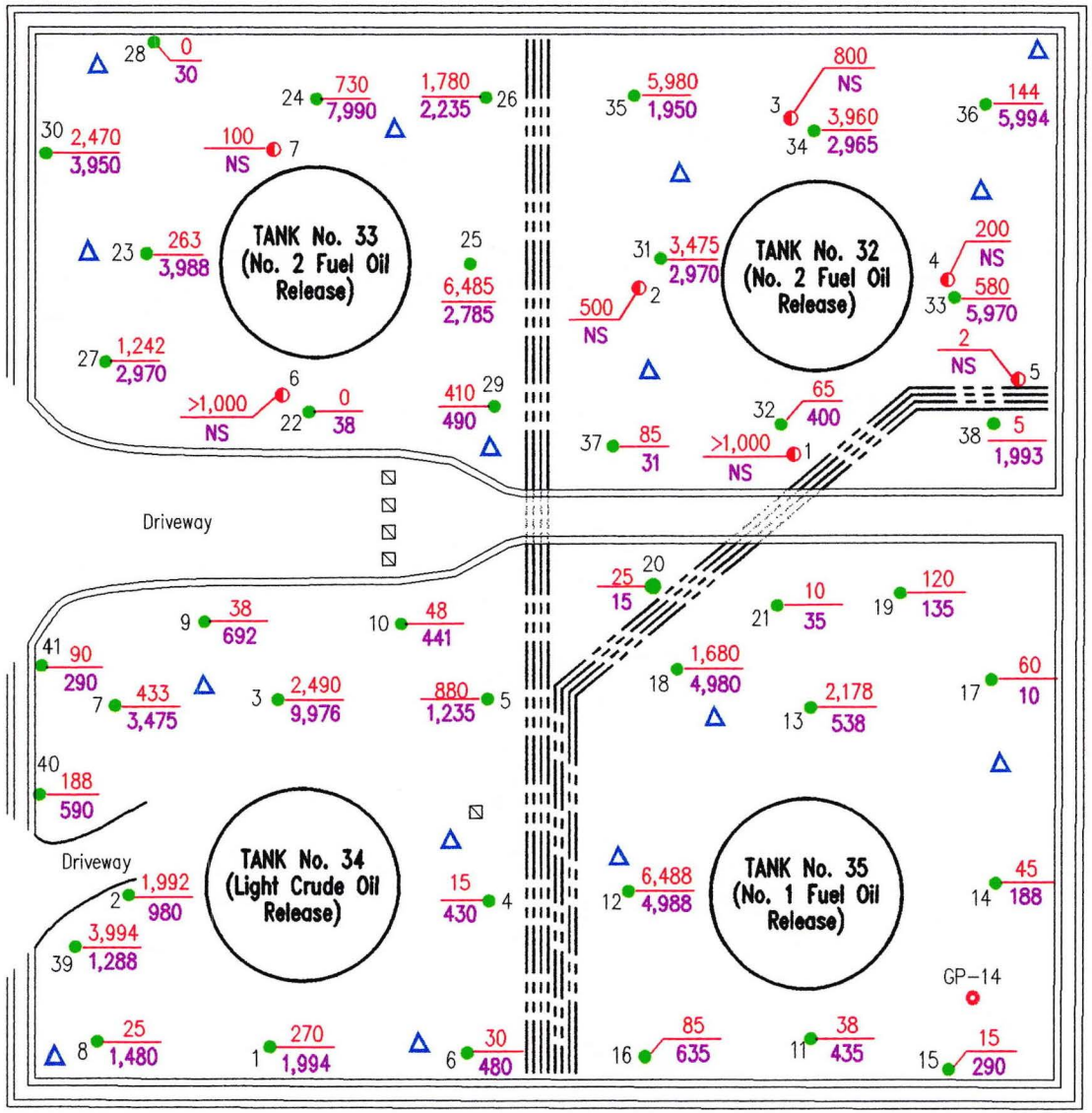
MURPHY OIL U.S.A.
SUPERIOR, WISCONSIN
HAND AUGER BORING RESULTS
TANKS 34 & 35
OCTOBER 13, 1998



| Hand Auger Boring Identification | Sample Depth (ft.) | Soil Description | FID Background (ppm) | FID Reading (ppm) | PID Background (ppm) | PID Reading (ppm) |
|---|---|---|---|---|---|---|
| 1 | 1 | reddish brown clay | 5 | 275 | 0 | 2 |
| | 2 | reddish brown clay | 6 | 2,000 | 0 | 8 |
| 2 | 1 | reddish brown clay | 8 | 2,000 | 0 | 146 |
| | 2 | reddish brown clay | 20 | 1,000 | 0 | 7 |
| 3 | 1 | reddish brown clay | 10 | 2,500 | 0 | 155 |
| | 2 | reddish brown clay | 25 | 10,001 | 0 | 314 |
| 4 | 1 | reddish brown clay | 30 | 45 | 0 | 2 |
| | 2 | reddish brown clay | 20 | 450 | 0 | 2 |
| 5 | 1 | reddish brown clay | 20 | 900 | 0 | 21 |
| | 2 | reddish brown clay | 15 | 1,250 | 0 | 27 |
| 6 | 1 | reddish brown clay | 20 | 50 | 0 | 0 |
| | 2 | reddish brown clay | 20 | 500 | 0 | 19 |
| 7 | 1 | reddish brown clay | 17 | 450 | 0 | 86 |
| | 2 | reddish brown clay | 25 | 3,500 | 0 | 269 |
| 8 | 1 | reddish brown clay | 35 | 60 | 0 | 2 |
| | 2 | reddish brown clay | 20 | 1,500 | 0 | 14 |
| 9 | 1 | reddish brown clay | 7 | 45 | 0 | 5 |
| | 2 | reddish brown clay | 8 | 700 | 0 | 55 |
| 10 | 1 | black to reddish organic clay | 12 | 60 | 0 | 2 |
| | 2 | reddish brown clay | 9 | 450 | 0 | 41 |
| 11 | 1 | reddish brown clay | 22 | 60 | 0 | 2 |
| | 2 | reddish brown clay | 15 | 450 | 0 | 27 |
| 12 | 1 | black to reddish organic clay | 12 | 6,500 | 0 | 38 |
| | 2 | black to reddish organic clay | 12 | 5,000 | 0 | 153 |
| 13 | 1 | reddish brown clay | 22 | 2,200 | 0 | 2 |
| | 2 | reddish brown clay | 12 | 550 | 0 | 3 |
| 14 | 1 | reddish brown clay | 15 | 60 | 0 | 5 |
| | 2 | reddish brown clay | 12 | 200 | 0 | 33 |
| 15 | 1 | black to reddish organic clay | 15 | 30 | 0 | 0 |
| | 2 | black to reddish organic clay | 10 | 300 | 0 | 58 |
| 16 | 1 | sandy reddish brown clay | 15 | 100 | 0 | 33 |
| | 2 | black to reddish organic clay | 15 | 650 | 0 | 67 |
| 17 | 1 | reddish brown clay | 30 | 90 | 0 | 0 |
| | 2 | reddish brown clay | 20 | 30 | 0 | 1 |
| 18 | 1 | black to reddish organic clay | 20 | 1,700 | 0 | 55 |
| | 2 | reddish brown clay | 20 | 5,000 | 0 | 202 |
| 19 | 1 | black to reddish organic clay | 30 | 150 | 0 | 0 |
| | 2 | reddish brown clay | 15 | 150 | 0 | 0 |
| 20 | 1 | black to reddish organic clay | 20 | 45 | 0 | 0 |
| | 2 | reddish brown clay | 20 | 35 | 0 | 2 |
| 21 | 1 | reddish brown clay | 25 | 35 | 0 | 0 |
| | 2 | reddish brown clay | 20 | 55 | 0 | 0 |




MW-5
(Approximate Location)

## LEGEND

- Proposed Gannett Fleming Geoprobe Soil Sample Location
- MW-5 Monitoring Well Location
- 3 Gannett Fleming Hand-Auger Field Screening Soil Sample Location (July 1998)
- GP-14 Gannett Fleming Geoprobe Soil Sample Location (July 1998)
- 18 Twin Ports Hand-Auger Field Screening Soil Sample Location (October 1998)
- Pump
- Piping Run

11 = FID Reading At 1 Foot Depth
100 = FID Reading At 2 Foot Depth

### GP-14 CHEMICAL RESULTS

| | 1'-1.5' | 4.5'-5' |
|---|---|---|
| DRO | 380 | 15 |
| GRO | 180 | 22 |
| B | 2.2 | < 0.019 |
| T | < 0.11 | < 0.011 |
| E | < 0.11 | < 0.011 |
| X | < 0.34 | < 0.034 |

Concentrations In Parts Per Million

## NOTE

*Locations Are Approximate Based On Field Measurements; Site Not Surveyed*

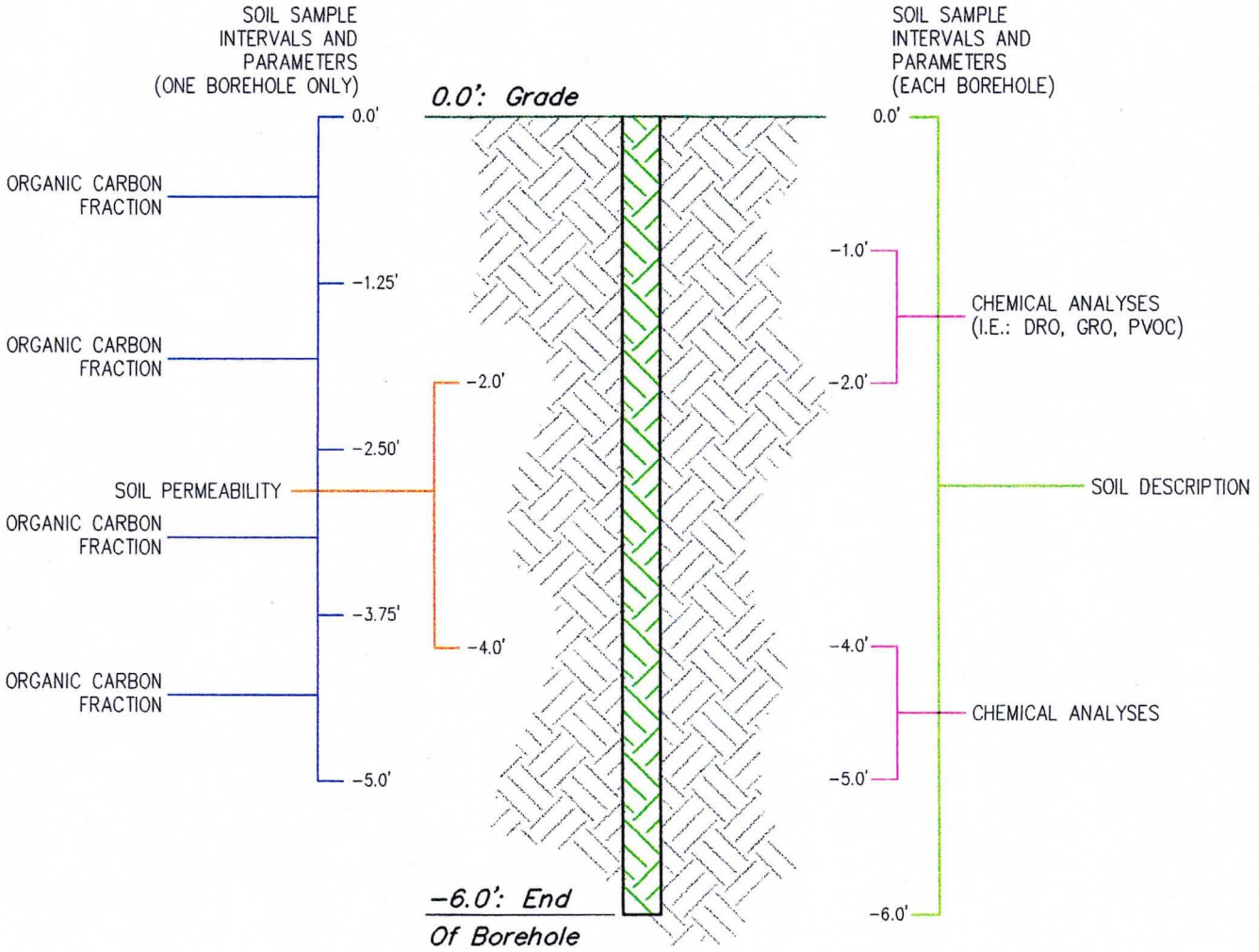
0 40
Scale In Feet

# SAMPLE LOCATIONS AND FID READINGS AT TANK NOS. 32 THROUGH 35

MURPHY OIL USA, INC.
SUPERIOR, WISCONSIN

111298
34265WS

Gannett Fleming
FIGURE 1




## NOTES

1. *One Soil Sample Will Be Collected Per Tank Basin For Soil Permeability And Samples For Organic Carbon Fraction Analytes Will Only Be Collected From One Probehole Per Basin.*
2. *Samples For Chemical Analysis At Gasoline And Gasoline Blended Stock Release Sites Will Be Analyzed For GRO, PVOCs, And Lead.*
3. *Samples For Chemical Analysis At Fuel Oil And Crude Sites Will Be Analyzed For DRO, PVOCs, And PAHs.*

Not To Scale

# PROPOSED SOIL SAMPLE INTERVALS AND ANALYTES

MURPHY OIL USA, INC.
SUPERIOR, WISCONSIN

111298
34265WV

Gannett Fleming

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

November 12, 1998
File #34265.003

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

Re: Work Plan for Soil Investigation — Tank 47 Releases
Murphy Oil USA, Inc., Superior, Wisconsin

Dear Mr. Hosch:

This letter provides the proposed work plan for an investigation to determine the extent and degree of unsaturated soil contamination within the diked area of Tank 47 at Murphy Oil's Superior refinery. Releases from this tank of about 500 gallons and 100 gallons of crude oil were reported in July 1989 and March 1990, respectively. During the investigation, we will also collect samples for physical parameters testing, and these data will be used in our contaminant transport modeling. This work plan is being submitted in response to your October 1, 1998, letter to Mr. Lee Vail requesting additional investigation within this tank basin.

**Previous Work**

In early July 1998, Gannett Fleming, Inc. personnel used a hand auger to collect shallow soil samples (i.e., 1 to 1.5 feet below the ground surface [bgs]) from six locations within the diked area of Tank 47. These samples were field-screened with a flame ionization detector (FID). The field-screening locations and results are shown on Figure 1. This information was also included in our Phase 1 and 2 report sent to you on September 10, 1998.

In late July, Gannett Fleming used a Geoprobe to collect undisturbed soil samples near the location from which the sample with the highest FID reading had been collected. Soil samples from 1 to 1.5 feet bgs and from 4.5 to 5 feet bgs were analyzed by a laboratory for diesel range organics (DRO), petroleum volatile organic compounds (PVOCs), and polynuclear aromatic hydrocarbons (PAHs). The Geoprobe sampling location (GP-5) and the analytical results are shown on Figure 1.

On October 12, 1998, Twin Ports Testing used a hand auger to collect additional shallow soil samples (i.e., 1 to 1.5 feet and 2 to 2.5 feet bgs) from 15 locations within the diked area of Tank 47. These samples were field-screened with both a flame-ionization detector (FID) and a photoionization detector (PID). The field-screening results are attached. The hand-auger sampling locations and the



Continued . . .

FID field-screening results, which we believe are more useful than the PID results due to the sensitivity of the instrument, are shown on Figure 1.

Elevated FID readings were measured in only 5 of the 15 samples that Twin Ports collected from this tank basin. These samples were collected directly west and south/southeast of the tank. Samples collected north, east, and southwest of the tank did not have elevated readings.

## Proposed Scope of Work

Gannett Fleming proposes to advance six Geoprobe boreholes within the diked area at Tank 47 in order to define the degree of crude oil contamination in the unsaturated soils in this tank basin. All six boreholes will be advanced to 6 feet bgs. The proposed locations for these boreholes are shown on Figure 1. These may be adjusted in the field, depending on the locations of underground utilities, pipelines, standing water, or any other constraints on accessibility.

Soil samples will be collected from each borehole for chemical analysis and for testing of physical parameters. Figure 2 is a schematic representation of a typical borehole, showing the depths from which we will collect samples for chemical and physical analysis in each borehole.

### Soil Sampling (Chemical Parameters)

All the boreholes will be advanced with a Geoprobe equipped with a 4-foot-long, 2-inch-diameter, macro-core sampler. A new acetate liner will be inserted into the sampler to collect each soil core, and we will collect continuous soil samples from each borehole. The samples will be visually classified and logged. Soil samples will be collected from each borehole at 1 to 2 feet and 4 to 5 feet bgs. These samples will be placed in laboratory-supplied containers, preserved as necessary, placed on ice, and shipped to Commonwealth Technology, Inc. (CTI), a Wisconsin-certified laboratory in Baraboo, Wisconsin, for analysis of DRO, PVOCs, and PAHs.

### Soil Sampling (Physical Parameters)

Soil samples for physical testing (organic carbon and permeability) will be collected from only one of the boreholes in this tank basin. Soil samples from each 1.25-foot interval to a depth of 5 feet in



Continued . . .

one of the six boreholes will be shipped to CTI for analysis of the organic carbon fraction in the sample. A separate macro-core sampler will also be advanced next to one of the six boreholes in order to collect an undisturbed sample at 2 to 4 feet bgs. This sample will be shipped to a qualified laboratory for falling head permeability testing. The permeability and organic carbon results will be used to calibrate the model that will be used to develop site-specific residual contaminant levels (RCLs), as discussed in our September 10, 1998, report.

Equipment Decontamination

All non-disposable sampling equipment will be decontaminated between samples using a detergent/potable water solution and rinsed with either potable or distilled water.

**Project Documentation**

The following required forms will be completed and submitted to the Wisconsin Department of Natural Resources (WDNR) with the investigation report:

- Soil Boring Log Information (Form 4400-122).
- Well/Drill Hole/Borehole Abandonment (Form 3300-5B).

We will begin soliciting bids from Geoprobe operators and coordinating the proposed work immediately. If you have any questions or comments about this work plan, please call.

Sincerely,

GANNETT FLEMING, INC.

David J. Olig, P.G.
Senior Project Manager

Jeffrey J. King
Project Hydrogeologist

DFK/jec
Enc.

M:\CLERICAL\PROJECTS\0300\367-18\CORRESP\DFK\3L367-18.009

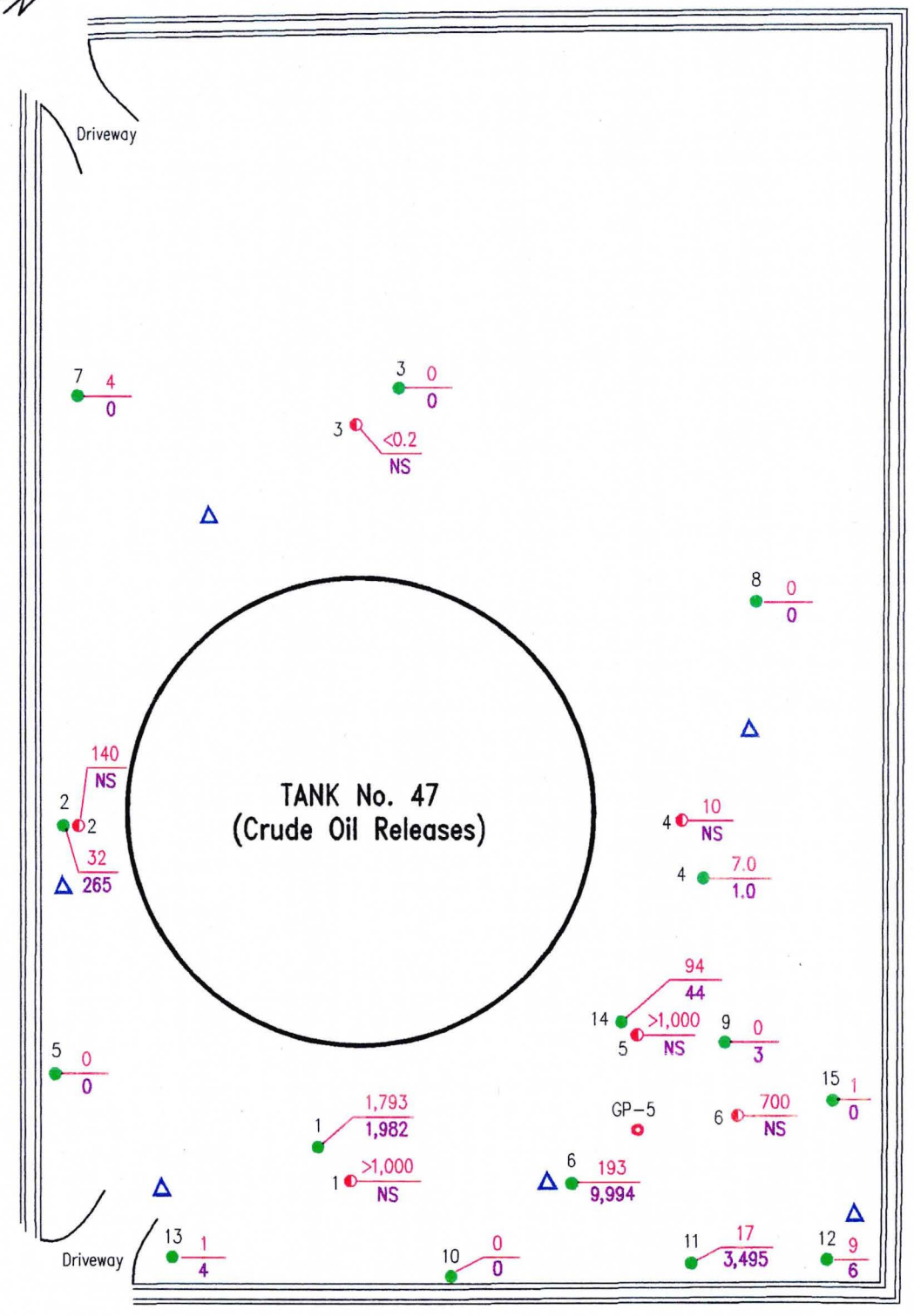
MURPHY OIL U.S.A.
SUPERIOR, WISCONSIN
HAND AUGER BORING RESULTS
TANK 47
OCTOBER 12, 1998



| Hand Auger Boring Identification | Sample Depth (ft.) | Soil Description | FID Background (ppm) | FID Reading (ppm) | PID Background (ppm) | PID Reading (ppm) |
|---|---|---|---|---|---|---|
| 1 | 1 | reddish brown clay | 7 | 1,800 | 0 | 97 |
| | 2 | reddish brown clay | 18 | 2,000 | 0 | 82 |
| 2 | 1 | reddish brown clay | 18 | 50 | 0 | 11 |
| | 2 | black to reddish organic clay | 10 | 275 | 0 | 5 |
| 3 | 1 | reddish brown clay | 10 | 10 | 0 | 0 |
| | 2 | reddish brown clay | 9 | 9 | 0 | 0 |
| 4 | 1 | black to reddish organic clay | 8 | 15 | 0 | 0 |
| | 2 | reddish brown clay | 8 | 9 | 0 | 0 |
| 5 | 1 | black to reddish organic clay | 7 | 7 | 0 | 0 |
| | 2 | reddish brown clay | 7 | 7 | 0 | 0 |
| 6 | 1 | reddish brown clay | 7 | 200 | 0 | 0 |
| | 2 | black to reddish organic clay | 7 | 10,001 | 0 | 258 |
| 7 | 1 | reddish brown clay | 5 | 9 | 0 | 0 |
| | 2 | reddish brown clay | 6 | 6 | 0 | 0 |
| 8 | 1 | black to reddish organic clay | 5 | 5 | 0 | 0 |
| | 2 | reddish brown clay | 5 | 5 | 0 | 0 |
| 9 | 1 | reddish brown clay | 5 | 5 | 0 | 0 |
| | 2 | reddish brown clay | 5 | 8 | 0 | 0 |
| 10 | 1 | reddish brown clay | 5 | 5 | 0 | 0 |
| | 2 | reddish brown clay | 5 | 5 | 0 | 0 |
| 11 | 1 | reddish brown clay | 5 | 22 | 0 | 0 |
| | 2 | reddish brown clay | 5 | 3,500 | 0 | 317 |
| 12 | 1 | reddish brown clay | 6 | 15 | 0 | 0 |
| | 2 | reddish brown clay | 6 | 12 | 0 | 0 |
| 13 | 1 | reddish brown clay | 5 | 6 | 0 | 0 |
| | 2 | sandy reddish brown clay | 7 | 11 | 0 | 0 |
| 14 | 1 | black to reddish organic clay | 6 | 100 | 0 | 0 |
| | 2 | reddish brown clay | 6 | 50 | 0 | 0 |
| 15 | 1 | black to reddish organic clay | 6 | 7 | 0 | 0 |
| | 2 | reddish brown clay | 7 | 7 | 0 | 0 |

**Gannett Fleming**

FIGURE 1




## LEGEND

- Proposed Gannett Fleming Geoprobe Soil Sample Location
- 3 — Gannett Fleming Hand-Auger Field Screening Soil Sample Location (July 1998)
- GP-5 — Gannett Fleming Geoprobe Soil Sample Location (July 1998)
- 18 — Twin Ports Hand-Auger Field Screening Soil Sample Location (October 1998)

11 = FID Reading At 1 Foot Depth
100 = FID Reading At 2 Foot Depth

### GP-5 CHEMICAL RESULTS

| | 1'-1.5' | 4.5'-5' |
|---|---|---|
| DRO | 40 | < 1.4 |
| GRO | 51 | < 1.3 |
| B | 0.73 | < 0.019 |
| T | 0.24 | < 0.011 |
| E | 0.20 | < 0.011 |
| X | 1.0 | < 0.034 |

Concentrations In Parts Per Million

## NOTE

*Locations Are Approximate Based On Field Measurements; Site Not Surveyed*

0 50

Scale In Feet

# SAMPLE LOCATIONS AND FID READINGS AT TANK NO. 47

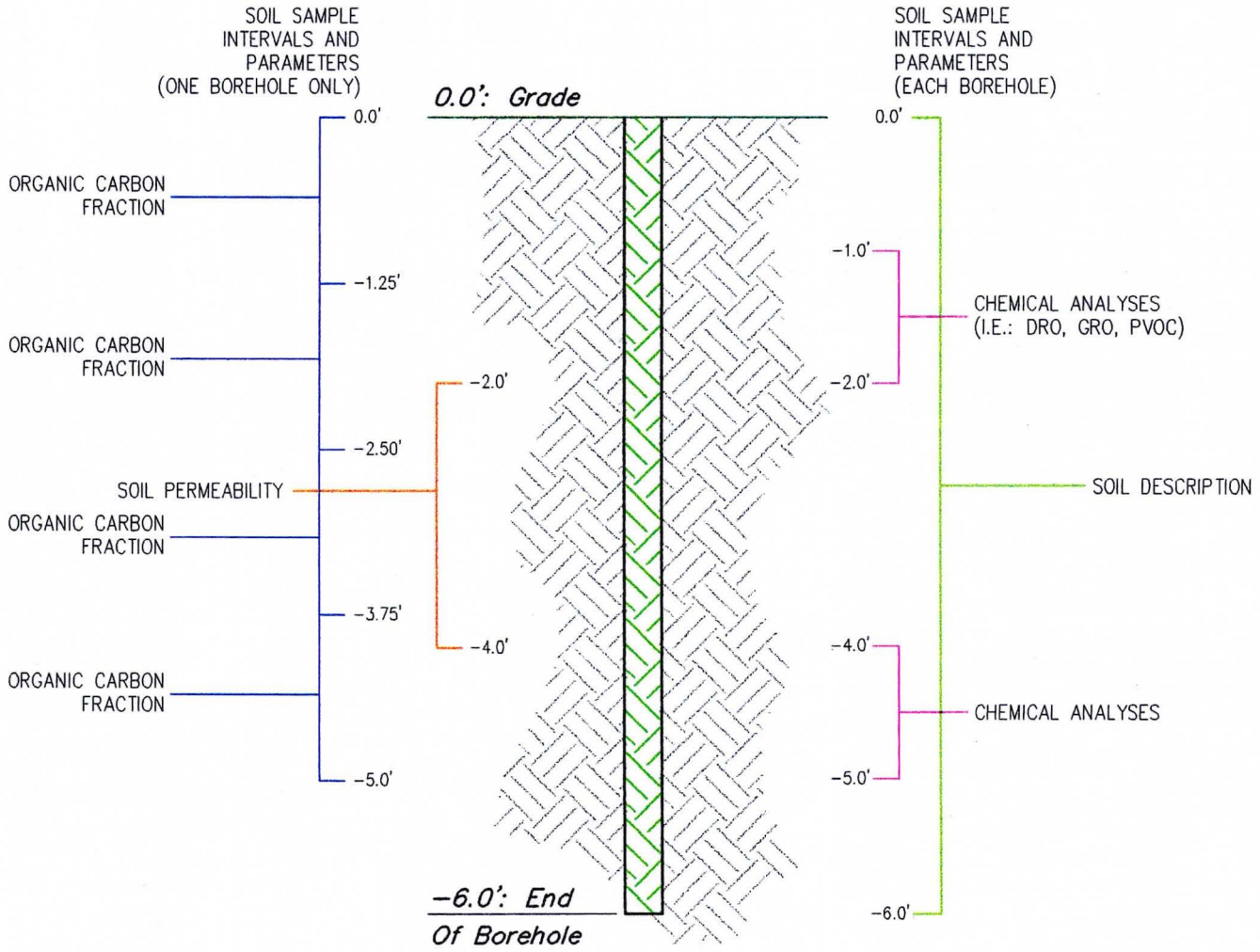
MURPHY OIL USA, INC.

SUPERIOR, WISCONSIN

111298
34265WR

**Gannett Fleming**

FIGURE 2




## NOTES

1. *One Soil Sample Will Be Collected Per Tank Basin For Soil Permeability And Samples For Organic Carbon Fraction Analytes Will Only Be Collected From One Probehole Per Basin.*
2. *Samples For Chemical Analysis At Gasoline And Gasoline Blended Stock Release Sites Will Be Analyzed For GRO, PVOCs, And Lead.*
3. *Samples For Chemical Analysis At Fuel Oil And Crude Sites Will Be Analyzed For DRO, PVOCs, And PAHs.*

Not To Scale

# PROPOSED SOIL SAMPLE INTERVALS AND ANALYTES

MURPHY OIL USA, INC.

SUPERIOR, WISCONSIN

111298
34265WV

Gannett Fleming

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

November 12, 1998
File #34265.008

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

Re: Work Plan for Soil Investigation — Tanks 51 and 52 Releases
Murphy Oil USA, Inc., Superior, Wisconsin
PECFA Claim # 54880-0456-07-H

Dear Mr. Hosch:

This letter provides the proposed work plan for an investigation to determine the extent and degree of unsaturated soil contamination within the diked area of Tanks 51 and 52 at Murphy Oil's Superior refinery. Releases from these tanks of about 4,200 gallons, 1,260 gallons, and 420 gallons of #6 fuel oil were reported in January 1994, February 1996, and March 1996, respectively. During the investigation, we will also collect samples for physical parameter testing, and these data will be used in our contaminant transport modeling. This work plan is being submitted in response to your October 1, 1998, letter to Mr. Lee Vail requesting additional investigation at this release location.

**Previous Work**

In early July 1998, Gannett Fleming, Inc. personnel used a hand auger to collect shallow soil samples (i.e., 1 to 1.5 feet below ground surface [bgs]) from nine locations within the diked area of Tanks 51 and 52. These samples were field-screened with a flame ionization detector (FID). The field-screening locations and results are shown on Figure 1. These data were also included in our September 10, 1998, Phase 1 and 2 report to you.

In late July, Gannett Fleming used a Geoprobe to collect undisturbed soil samples near the location from which the sample with the highest FID reading had been collected. Soil samples from 1 to 1.5 feet and 4.5 to 5 feet bgs were submitted to the laboratory for analysis of diesel range organics (DRO), gasoline range organics (GRO), petroleum volatile organic compounds (PVOCs), and polynuclear aromatic hydrocarbons (PAHs). The Geoprobe sampling location (GP-16) and the analytical results are shown on Figure 1.

On October 23, 1998, Twin Ports Testing used a hand auger to collect shallow soil samples (i.e., 1 to 1.5 feet and 2 to 2.5 feet bgs) from 32 locations within the diked area of Tanks 51 and 52. These samples were field-screened with both a flame-ionization detector (FID) and a photoionization detector (PID). The field-screening results are attached. The hand-auger sampling locations and the



Continued . . .

FID field-screening results, which are more useful than the PID results due to the sensitivity of the instrument, are shown on Figure 1.

As shown on Figure 1, FID results are relatively elevated throughout the basin, although results for the northern half were one to three orders of magnitude less than they were in the southern half of the basin. Generally, FID concentrations were more elevated in the deeper samples.

## Proposed Scope of Work

Gannett Fleming proposes to advance ten Geoprobe boreholes within the diked area of Tanks 51 and 52 in order to define the degree of petroleum contamination in the unsaturated soils in this basin. All ten boreholes will be advanced to 6 feet bgs. The proposed locations for these boreholes are shown on Figure 1. These may be adjusted in the field, depending on the locations of underground utilities, pipelines, standing water, or other constraints on accessibility.

Soil samples will be collected from each borehole for chemical analysis and for testing of physical parameters. Figure 2 is a schematic representation of a typical borehole, showing the depths from which the samples for chemical and physical analysis will be collected from each borehole.

### Soil Sampling (Chemical Parameters)

All the boreholes will be advanced with a Geoprobe equipped with a 4-foot-long, 2-inch-diameter, macro-core sampler. A new acetate liner will be inserted into the sampler to collect each soil core, and we will collect continuous soil samples from each borehole. The samples will be visually classified and logged. Soil samples will be collected from each borehole at 1 to 2 feet and 4 to 5 feet bgs. These samples will be placed in laboratory-supplied containers, preserved as necessary, placed on ice, and shipped to Commonwealth Technology, Inc. (CTI), a Wisconsin-certified laboratory in Baraboo, Wisconsin, for analysis of DRO, PVOCs, and PAHs.

### Soil Sampling (Physical Parameters)

Soil samples for physical testing (organic carbon and permeability) will be collected from only one of the boreholes in this tank basin. Soil samples from each 1.25-foot interval to a depth of 5 feet in one of the ten boreholes will be shipped to CTI for analysis of the organic carbon fraction in the sample. A separate macro-core sampler will also be advanced next to one of the ten boreholes in order to collect an undisturbed sample at 2 to 4 feet bgs. This sample will be shipped to a qualified laboratory for falling head permeability testing. The permeability and organic carbon results will be



Continued . . .

Mr. James A. Hosch
Wisconsin Department of Natural Resources
November 12, 1998



used to calibrate the model that will be used to develop site-specific residual contaminant levels (RCLs), as discussed in our September 10, 1998, report.

Equipment Decontamination

All non-disposable sampling equipment will be decontaminated between samples using a detergent/potable water solution and rinsed with either potable or distilled water.

**Project Documentation**

The following required forms will be completed and submitted to the Wisconsin Department of Natural Resources (WDNR) with the investigation report:

- Soil Boring Log Information (Form 4400-122).
- Well/Drill Hole/Borehole Abandonment (Form 3300-5B).

We will begin soliciting bids from Geoprobe operators and coordinating the proposed work immediately. If you have any questions or comments about this work plan, please call.

Sincerely,

GANNETT FLEMING, INC.

Jeffrey J. King
Project Hydrogeologist

David J. Olig, P.G.
Senior Project Manager

JJK/jec
Enc.

MURPHY OIL U.S.A.
SUPERIOR, WISCONSIN
HAND AUGER BORING RESULTS
TANKS 51 & 52
OCTOBER 8, 1998

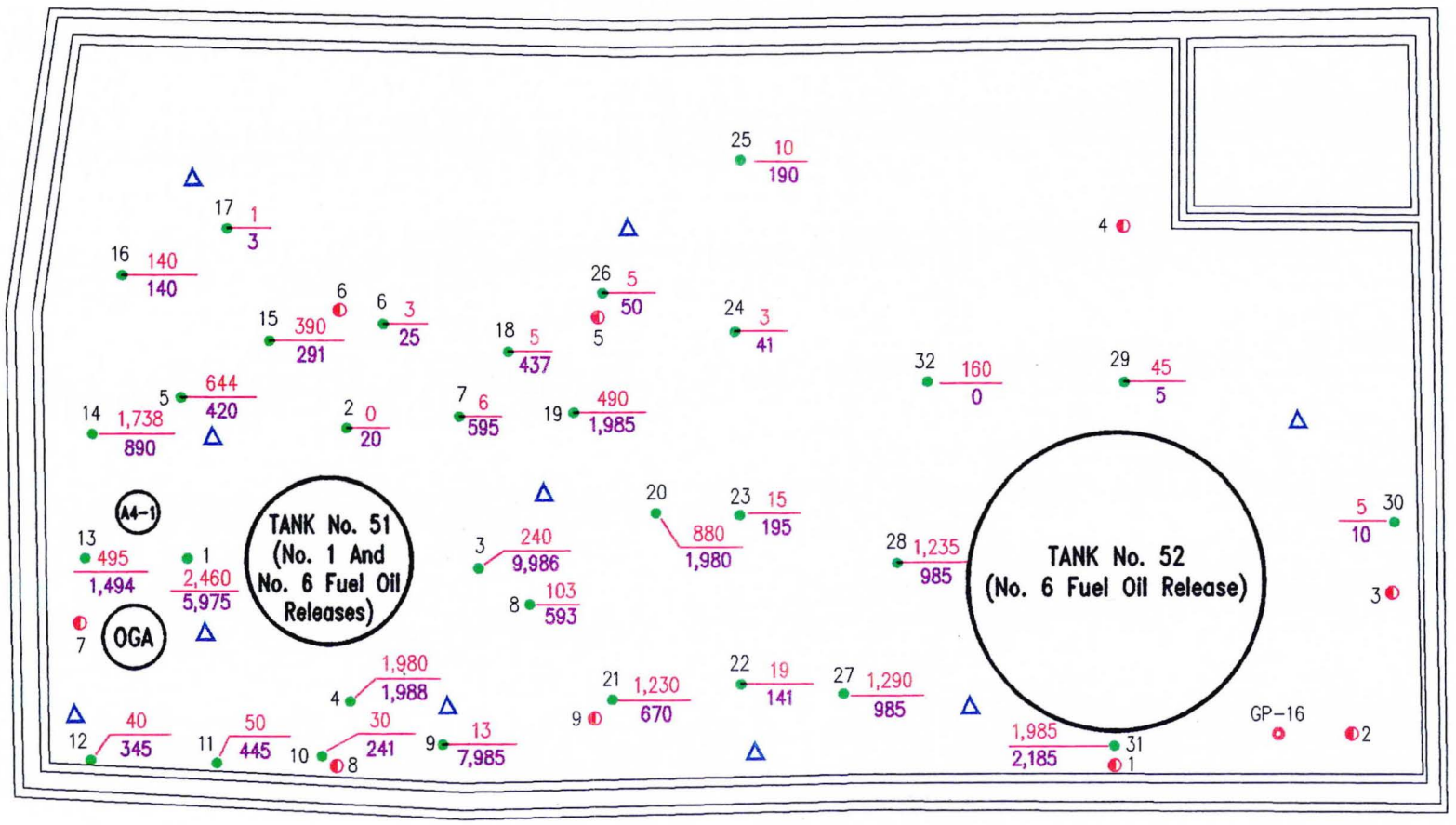


| Hand Auger Boring Identification | Sample Depth (ft.) | Soil Description | FID Background (ppm) | FID Reading (ppm) | PID Background (ppm) | PID Reading (ppm) |
|---|---|---|---|---|---|---|
| 1 | 1 | reddish brown clay w/ sand | 40 | 2,500 | 0 | 66 |
| | 2 | reddish brown clay w/ sand | 25 | 6,000 | 0 | 41 |
| 2 | 1 | black to reddish organic clay | 20 | 20 | 0 | 0 |
| | 2 | reddish brown clay | 30 | 50 | 0 | 3 |
| 3 | 1 | sandy reddish brown clay | 10 | 250 | 0 | 0 |
| | 2 | reddish brown clay | 15 | 10,001 | 0 | 146 |
| 4 | 1 | reddish brown clay | 20 | 2,000 | 0 | 8 |
| | 2 | reddish brown clay | 12 | 2,000 | 0 | 35 |
| 5 | 1 | reddish brown clay | 6 | 650 | 0 | 2 |
| | 2 | reddish brown clay | 5 | 425 | 0 | 2 |
| 6 | 1 | reddish brown clay | 5 | 8 | 0 | 0 |
| | 2 | reddish brown clay | 5 | 30 | 0 | 7 |
| 7 | 1 | silty sand | 5 | 11 | 0 | 3 |
| | 2 | reddish brown clay | 5 | 600 | 0 | 52 |
| 8 | 1 | reddish brown clay | 7 | 110 | 0 | 30 |
| | 2 | reddish brown clay | 7 | 600 | 0 | 208 |
| 9 | 1 | reddish brown clay | 15 | 28 | 0 | 16 |
| | 2 | reddish brown clay | 15 | 8,000 | 0 | 511 |
| 10 | 1 | reddish brown clay | 10 | 40 | 0 | 24 |
| | 2 | reddish brown clay | 9 | 250 | 0 | 10 |
| 11 | 1 | reddish brown clay | 5 | 55 | 0 | 3 |
| | 2 | reddish brown clay | 5 | 450 | 0 | 17 |
| 12 | 1 | reddish brown clay | 5 | 45 | 0 | 2 |
| | 2 | reddish brown clay | 5 | 350 | 0 | 3 |
| 13 | 1 | reddish brown clay | 5 | 500 | 0 | 8 |
| | 2 | reddish brown clay | 6 | 1,500 | 0 | 157 |
| 14 | 1 | reddish brown clay | 12 | 1,750 | 0 | 33 |
| | 2 | reddish brown clay | 10 | 900 | 0 | 77 |
| 15 | 1 | reddish brown clay | 10 | 400 | 0 | 2 |
| | 2 | reddish brown clay | 9 | 300 | 0 | 5 |
| 16 | 1 | reddish brown clay | 10 | 150 | 0 | 2 |
| | 2 | reddish brown clay | 10 | 150 | 0 | 2 |
| 17 | 1 | reddish brown clay | 9 | 10 | 0 | 0 |
| | 2 | reddish brown clay | 10 | 13 | 0 | 2 |
| 18 | 1 | reddish brown clay | 10 | 15 | 0 | 0 |
| | 2 | reddish brown clay | 13 | 450 | 0 | 14 |
| 19 | 1 | reddish brown clay | 10 | 500 | 0 | 189 |
| | 2 | reddish brown clay | 15 | 2,000 | 0 | 182 |
| 20 | 1 | reddish brown clay | 20 | 900 | 0 | 66 |
| | 2 | reddish brown clay | 20 | 2,000 | 0 | 127 |
| 21 | 1 | reddish brown clay | 20 | 1,250 | 0 | 230 |
| | 2 | reddish brown clay | 30 | 700 | 0 | 60 |
| 22 | 1 | reddish brown clay | 6 | 25 | 0 | 17 |
| | 2 | reddish brown clay | 9 | 150 | 0 | 94 |
| 23 | 1 | reddish brown clay | 20 | 35 | 0 | 24 |
| | 2 | reddish brown clay | 15 | 210 | 0 | 99 |
| 24 | 1 | reddish brown clay | 7 | 10 | 0 | 2 |
| | 2 | reddish brown clay | 9 | 50 | 0 | 42 |

MURPHY OIL U.S.A.
SUPERIOR, WISCONSIN
HAND AUGER BORING RESULTS
TANKS 51 & 52
OCTOBER 8, 1998



| Hand Auger Boring Identification | Sample Depth (ft.) | Soil Description | FID Background (ppm) | FID Reading (ppm) | PID Background (ppm) | PID Reading (ppm) |
|---|---|---|---|---|---|---|
| 25 | 1 | reddish brown clay | 10 | 20 | 0 | 3 |
| | 2 | reddish brown clay | 10 | 200 | 0 | 3 |
| 26 | 1 | reddish brown clay | 10 | 15 | 0 | 2 |
| | 2 | reddish brown clay | 10 | 60 | 0 | 22 |
| 27 | 1 | reddish brown clay | 10 | 1,250 | 0 | 60 |
| | 2 | silty sand | 15 | 1,000 | 0 | 27 |
| 28 | 1 | reddish brown clay | 15 | 1,250 | 0 | 11 |
| | 2 | reddish brown clay | 15 | 1,000 | 0 | 49 |
| 29 | 1 | silty sand | 15 | 60 | 0 | 2 |
| | 2 | reddish brown clay | 15 | 20 | 0 | 0 |
| 30 | 1 | reddish brown clay | 15 | 20 | 0 | 3 |
| | 2 | reddish brown clay | 15 | 25 | 0 | 3 |
| 31 | 1 | sandy reddish brown clay | 15 | 2,000 | 0 | 3 |
| | 2 | reddish brown clay | 15 | 2,200 | 0 | 8 |
| 32 | 1 | reddish brown clay | 15 | 175 | 0 | 41 |
| | 2 | reddish brown clay | 20 | 20 | 0 | 5 |




## LEGEND

- Proposed Gannett Fleming Geoprobe Soil Sample Location
- 3 — Gannett Fleming Hand-Auger Field Screening Soil Sample Location (July 1998)
- GP-16 — Gannett Fleming Geoprobe Soil Sample Location (July 1998)
- 18 — Twin Ports Hand-Auger Field Screening Soil Sample Location (October 1998)

11 = FID Reading At 1 Foot Depth
100 = FID Reading At 2 Foot Depth

### GP-16 CHEMICAL RESULTS

| | 1'-1.5' | 4.5'-5' |
|---|---|---|
| DRO | 2,200 | 7.5 |
| GRO | 37 | < 1.3 |
| B | < 0.019 | < 0.019 |
| T | < 0.011 | < 0.011 |
| E | < 0.011 | < 0.011 |
| X | 0.103 | < 0.034 |

Concentrations In Parts Per Million

## NOTE

*Locations Are Approximate Based On Field Measurements; Site Not Surveyed*

0 30

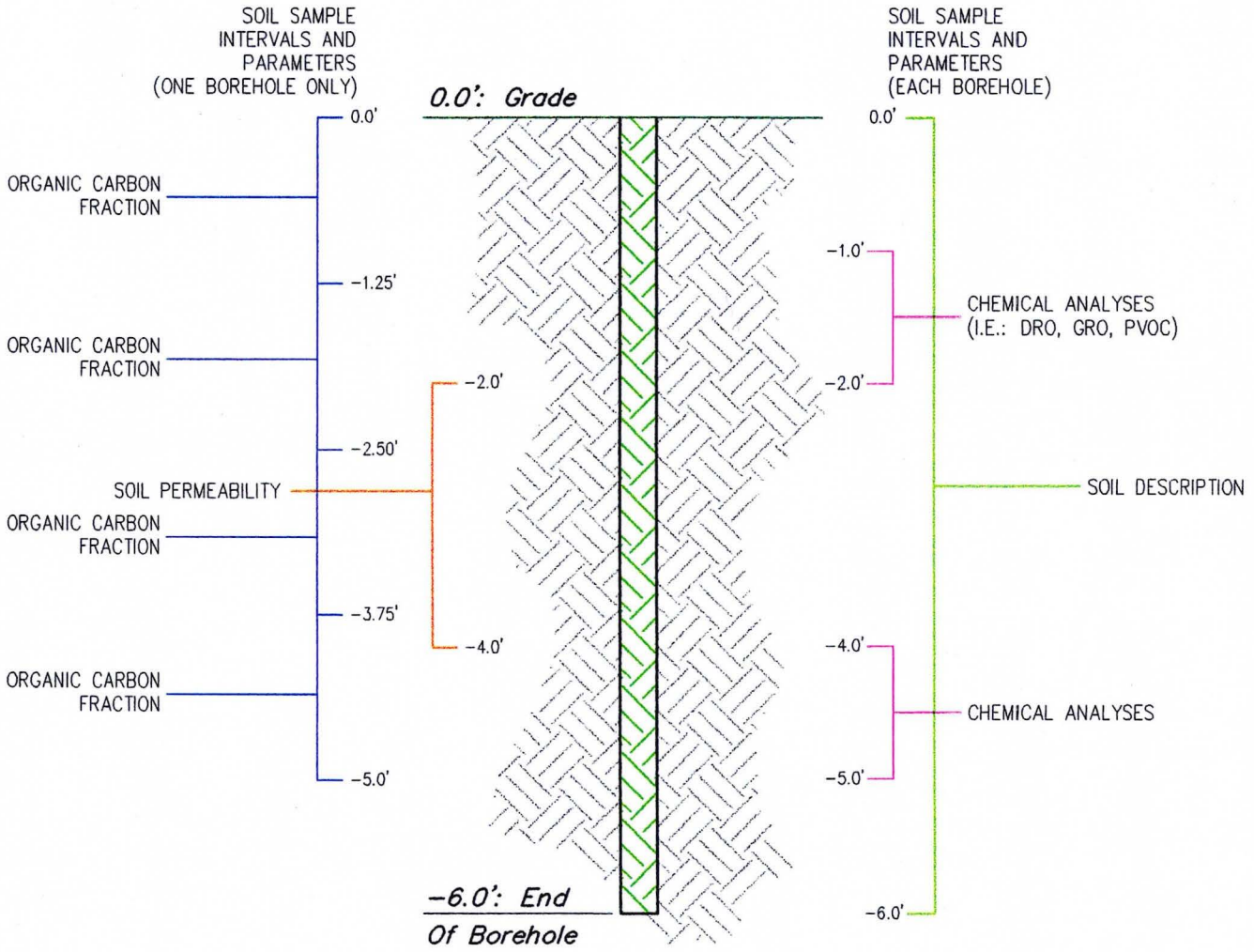
Scale In Feet

# SAMPLE LOCATIONS AND FID READINGS AT TANK NOS. 51 AND 52

MURPHY OIL USA, INC.
SUPERIOR, WISCONSIN

110998
34265WO

Gannett Fleming
FIGURE 1




## NOTES

1. *One Soil Sample Will Be Collected Per Tank Basin For Soil Permeability And Samples For Organic Carbon Fraction Analytes Will Only Be Collected From One Probehole Per Basin.*
2. *Samples For Chemical Analysis At Gasoline And Gasoline Blended Stock Release Sites Will Be Analyzed For GRO, PVOCs, And Lead.*
3. *Samples For Chemical Analysis At Fuel Oil And Crude Sites Will Be Analyzed For DRO, PVOCs, And PAHs.*

Not To Scale

# PROPOSED SOIL SAMPLE INTERVALS AND ANALYTES

MURPHY OIL USA, INC.
SUPERIOR, WISCONSIN

111298
34265WV

Gannett Fleming

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

November 12, 1998
File #34265.010

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

Re: Work Plan for Soil Investigation — Tank 67 Releases
Murphy Oil USA, Inc., Superior, Wisconsin
PECFA Claim #: 54880-0456-07-M

Dear Mr. Hosch:

This letter provides the proposed work plan for an investigation to determine the extent and degree of unsaturated soil contamination within the diked area of Tank 67 at Murphy Oil's Superior refinery. Releases from this tank of about 40,000 gallons of #1 fuel oil and 600 gallons of #2 fuel oil were reported in August 1991 and November 1995, respectively. During the investigation, we will also collect samples for physical parameter testing, and these data will be used in our contaminant transport modeling. This work plan is being submitted in response to your October 1, 1998, letter to Mr. Lee Vail requesting additional investigation within this tank basin.

**Previous Work**

In early July 1998, Gannett Fleming, Inc. personnel used a hand auger to collect shallow soil samples (i.e., 1 to 1.5 feet below ground surface [bgs]) from five locations within the diked area of Tank 67. These samples were field-screened with a flame ionization detector (FID). The field-screening locations and the results are shown on Figure 1. This information was also included in our September 10, 1998, Phase 1 and 2 report to you.

In late July, Gannett Fleming used a Geoprobe to collect undisturbed soil samples near the location from which the sample with the highest FID reading had been collected. Soil samples from 1 to 1.5 feet bgs and from 4.5 to 5 feet bgs were analyzed by a laboratory for diesel range organics (DRO), petroleum volatile organic compounds (PVOCs), and polynuclear aromatic hydrocarbons (PAHs). The Geoprobe sampling location (GP-11) and the analytical results are shown on Figure 1.

On September 29, 1998, Twin Ports Testing used a hand auger to collect additional shallow soil samples (i.e., 1 to 1.5 feet and 2 to 2.5 feet bgs) from 46 locations within the diked area of Tank 67. These samples were field-screened with a flame-ionization (FID) detector. The field-screening results are attached. The hand-auger sampling locations and the FID field-screening results are shown on Figure 1.



Continued . . .

Elevated FID readings were measured in most of the samples collected south/southeast and west of the tank. In some cases, the shallow sample had a higher reading than the deeper sample, while at other locations, the opposite was true. However, all soil samples collected along the base of the dike wall west, north, and east of the tank had low FID readings.

**Proposed Scope of Work**

Gannett Fleming proposes to advance nine Geoprobe boreholes within the diked area at Tank 67 in order to define the degree of fuel oil contamination in the unsaturated soils in this tank basin. All nine boreholes will be advanced to 6 feet bgs. The proposed locations for these boreholes are shown on Figure 1. These may be adjusted in the field, depending on the locations of underground utilities, pipelines, standing water, or other constraints on accessibility.

Soil samples will be collected from each borehole for chemical analysis and for testing of physical parameters. Figure 2 is a schematic representation of a typical borehole, showing the depths from which we will collect the samples for chemical and physical analysis in each borehole.

Soil Sampling (Chemical Parameters)

All the boreholes will be advanced with a Geoprobe equipped with a 4-foot-long, 2-inch-diameter, macro-core sampler. A new acetate liner will be inserted into the sampler to collect each soil core, and we will collect continuous soil samples from each borehole. The samples will be visually classified and logged. Soil samples will be collected from each borehole at 1 to 2 feet and 4 to 5 feet bgs. These samples will be placed in laboratory-supplied containers, preserved as necessary, placed on ice, and shipped to Commonwealth Technology, Inc. (CTI), a Wisconsin-certified laboratory in Baraboo, Wisconsin, for analysis of DRO, GRO, PVOCs, and PAHs.

Soil Sampling (Physical Parameters)

Soil samples for physical testing (organic carbon and permeability) will be collected from only one of the boreholes in this tank basin. Soil samples from each 1.25-foot interval to a depth of 5 feet in one of the nine boreholes will be shipped to CTI for analysis of the organic carbon fraction in the sample. A separate macro-core sampler will also be advanced next to one of the nine boreholes in order to collect an undisturbed sample at 2 to 4 feet bgs. This sample will be shipped to a qualified laboratory for falling head permeability testing. The permeability and organic carbon results will be used to calibrate the model that will be used to develop site-specific residual contaminant levels (RCLs), as discussed in our September 10, 1998, report.



Continued . . .

Mr. James A. Hosch
Wisconsin Department of Natural Resources
November 12, 1998



Equipment Decontamination

All non-disposable sampling equipment will be decontaminated between samples using a detergent/potable water solution and rinsed with either potable or distilled water.

**Project Documentation**

The following required forms will be completed and submitted to the Wisconsin Department of Natural Resources (WDNR) with the investigation report:

- Soil Boring Log Information (Form 4400-122).
- Well/Drill Hole/Borehole Abandonment (Form 3300-5B).

We will begin soliciting bids from Geoprobe operators and coordinating the proposed work immediately. If you have any questions or comments about this work plan, please call.

Sincerely,

GANNETT FLEMING, INC.

David J. Olig, P.G.
Senior Project Manager

Jeffrey J. King
Project Hydrogeologist

DFK/jec
Enc.

MURPHY OIL U.S.A.
SUPERIOR, WISCONSIN
HAND AUGER BORING RESULTS
TANK 67
SEPTEMBER 29, 1998

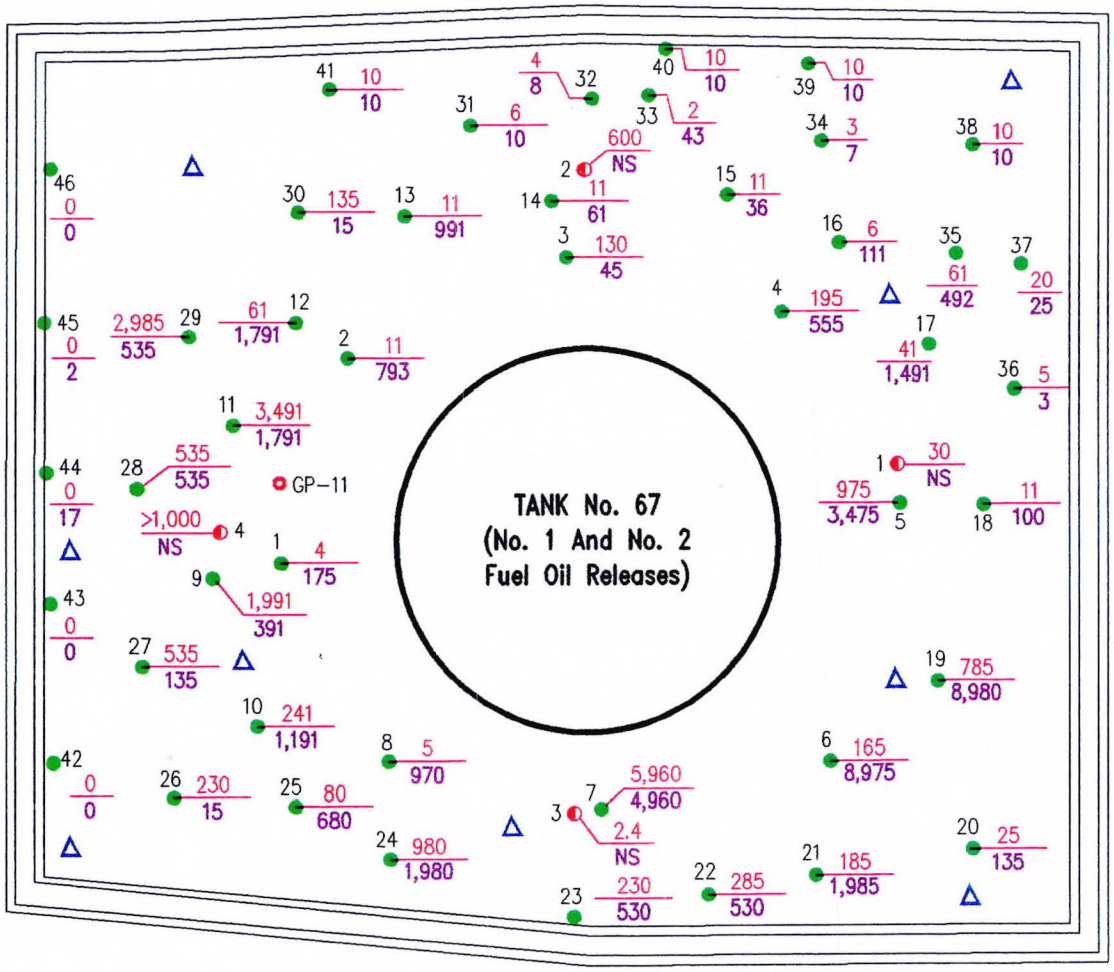


| Hand Auger Boring Identification | Sample Depth (ft.) | Soil Description | FID Background (ppm) | FID Reading (ppm) | PID Background (ppm) | PID Reading (ppm) |
|---|---|---|---|---|---|---|
| 1 | 1 | reddish brown clay | 5 | 9 | n/a | n/a |
| | 2 | reddish brown clay | 5 | 180 | n/a | n/a |
| 2 | 1 | reddish brown clay | 7 | 18 | n/a | n/a |
| | 2 | reddish brown clay | 7 | 800 | n/a | n/a |
| 3 | 1 | reddish brown clay | 20 | 150 | n/a | n/a |
| | 2 | reddish brown clay | 15 | 60 | n/a | n/a |
| 4 | 1 | reddish brown clay | 25 | 220 | n/a | n/a |
| | 2 | reddish brown clay | 25 | 580 | n/a | n/a |
| 5 | 1 | reddish brown clay | 25 | 1000 | n/a | n/a |
| | 2 | reddish brown clay | 25 | 3,500 | n/a | n/a |
| 6 | 1 | reddish brown clay | 35 | 200 | n/a | n/a |
| | 2 | reddish brown clay | 25 | 9,000 | n/a | n/a |
| 7 | 1 | reddish brown clay w/ sand | 40 | 6,000 | n/a | n/a |
| | 2 | reddish brown clay | 40 | 5,000 | n/a | n/a |
| 8 | 1 | reddish brown clay | 35 | 40 | n/a | n/a |
| | 2 | reddish brown clay | 30 | 1,000 | n/a | n/a |
| 9 | 1 | black to reddish organic clay | 9 | 2,000 | n/a | n/a |
| | 2 | black to reddish organic clay | 9 | 400 | n/a | n/a |
| 10 | 1 | reddish brown clay | 9 | 250 | n/a | n/a |
| | 2 | reddish brown clay | 9 | 1,200 | n/a | n/a |
| 11 | 1 | black to reddish organic clay | 9 | 3,500 | n/a | n/a |
| | 2 | black to reddish organic clay | 9 | 1,800 | n/a | n/a |
| 12 | 1 | reddish brown clay | 9 | 70 | n/a | n/a |
| | 2 | reddish brown clay | 9 | 1,800 | n/a | n/a |
| 13 | 1 | reddish brown clay | 9 | 20 | n/a | n/a |
| | 2 | reddish brown clay | 9 | 1,000 | n/a | n/a |
| 14 | 1 | black to reddish organic clay | 9 | 20 | n/a | n/a |
| | 2 | reddish brown clay | 9 | 70 | n/a | n/a |
| 15 | 1 | reddish brown clay | 9 | 20 | n/a | n/a |
| | 2 | reddish brown clay | 9 | 45 | n/a | n/a |
| 16 | 1 | reddish brown clay | 9 | 15 | n/a | n/a |
| | 2 | reddish brown clay | 9 | 120 | n/a | n/a |
| 17 | 1 | reddish brown clay | 9 | 50 | n/a | n/a |
| | 2 | reddish brown clay | 9 | 1,500 | n/a | n/a |
| 18 | 1 | reddish brown clay | 9 | 20 | n/a | n/a |
| | 2 | reddish brown clay | 20 | 120 | n/a | n/a |
| 19 | 1 | reddish brown clay | 15 | 800 | n/a | n/a |
| | 2 | reddish brown clay | 20 | 9,000 | n/a | n/a |
| 20 | 1 | reddish brown clay | 15 | 40 | n/a | n/a |
| | 2 | reddish brown clay | 15 | 150 | n/a | n/a |
| 21 | 1 | reddish brown clay | 15 | 200 | n/a | n/a |
| | 2 | reddish brown clay | 15 | 2,000 | n/a | n/a |
| 22 | 1 | reddish brown clay | 15 | 300 | n/a | n/a |
| | 2 | reddish brown clay | 20 | 550 | n/a | n/a |
| 23 | 1 | dark brown silty sand | 20 | 250 | n/a | n/a |
| | 2 | dark brown silty sand | 20 | 550 | n/a | n/a |
| 24 | 1 | reddish brown clay | 20 | 1,000 | n/a | n/a |
| | 2 | reddish brown clay | 20 | 2,000 | n/a | n/a |

MURPHY OIL U.S.A.
SUPERIOR, WISCONSIN
HAND AUGER BORING RESULTS
TANK 67
SEPTEMBER 29, 1998



| Hand Auger Boring Identification | Sample Depth (ft.) | Soil Description | FID Background (ppm) | FID Reading (ppm) | PID Background (ppm) | PID Reading (ppm) |
|---|---|---|---|---|---|---|
| 25 | 1 | reddish brown clay | 20 | 100 | n/a | n/a |
| | 2 | reddish brown clay | 20 | 700 | n/a | n/a |
| 26 | 1 | reddish brown clay | 20 | 250 | n/a | n/a |
| | 2 | reddish brown clay | 20 | 35 | n/a | n/a |
| 27 | 1 | black to reddish organic clay | 15 | 550 | n/a | n/a |
| | 2 | reddish brown clay | 15 | 150 | n/a | n/a |
| 28 | 1 | black to reddish organic clay | 15 | 550 | n/a | n/a |
| | 2 | black to reddish organic clay | 15 | 550 | n/a | n/a |
| 29 | 1 | black to reddish organic clay | 15 | 3,000 | n/a | n/a |
| | 2 | reddish brown clay | 15 | 550 | n/a | n/a |
| 30 | 1 | black to reddish organic clay | 15 | 150 | n/a | n/a |
| | 2 | reddish brown clay | 15 | 30 | n/a | n/a |
| 31 | 1 | reddish brown clay | 5 | 11 | 0 | 0 |
| | 2 | reddish brown clay | 5 | 15 | 0 | 2 |
| 32 | 1 | reddish brown clay | 7 | 11 | 0 | 0 |
| | 2 | reddish brown clay | 6 | 14 | 0 | 0 |
| 33 | 1 | reddish brown clay | 7 | 9 | 0 | 0 |
| | 2 | reddish brown clay | 7 | 50 | 0 | 24 |
| 34 | 1 | reddish brown clay | 12 | 15 | 0 | 0 |
| | 2 | reddish brown clay | 9 | 16 | 0 | 2 |
| 35 | 1 | reddish brown clay | 9 | 70 | 0 | 0 |
| | 2 | reddish brown clay | 8 | 500 | 0 | 39 |
| 36 | 1 | reddish brown clay | 10 | 15 | 0 | 0 |
| | 2 | reddish brown clay | 11 | 14 | 0 | 0 |
| 37 | 1 | reddish brown clay | 30 | 50 | 0 | 3 |
| | 2 | reddish brown clay | 35 | 60 | 0 | 3 |
| 38 | 1 | reddish brown clay | 30 | 40 | 0 | 5 |
| | 2 | reddish brown clay | 30 | 40 | 0 | 5 |
| 39 | 1 | reddish brown clay | 30 | 40 | 0 | 5 |
| | 2 | reddish brown clay | 30 | 40 | 0 | 4 |
| 40 | 1 | reddish brown clay | 30 | 40 | 0 | 5 |
| | 2 | reddish brown clay | 30 | 40 | 0 | 4 |
| 41 | 1 | reddish brown clay | 30 | 40 | 0 | 5 |
| | 2 | reddish brown clay | 30 | 40 | 0 | 5 |
| 42 | 1 | reddish brown clay | 3 | 3 | 0 | 0 |
| | 2 | reddish brown clay | 2 | 2 | 0 | 0 |
| 43 | 1 | reddish brown organic clay | 2 | 2 | 0 | 0 |
| | 2 | reddish brown clay | 5 | 5 | 0 | 0 |
| 44 | 1 | reddish brown clay | 3 | 3 | 0 | 0 |
| | 2 | reddish brown clay | 3 | 20 | 0 | 0 |
| 45 | 1 | reddish brown clay | 3 | 3 | 0 | 0 |
| | 2 | reddish brown clay | 3 | 5 | 0 | 0 |
| 46 | 1 | reddish brown clay | 3 | 3 | 0 | 0 |
| | 2 | reddish brown clay | 3 | 3 | 0 | 0 |




## LEGEND

- Proposed Gannett Fleming Geoprobe Soil Sample Location
- 3 — Gannett Fleming Hand-Auger Field Screening Soil Sample Location (July 1998)
- GP-11 — Gannett Fleming Geoprobe Soil Sample Location (July 1998)
- 18 — Twin Ports Hand-Auger Field Screening Soil Sample Location (October 1998)

11 = FID Reading At 1 Foot Depth
100 = FID Reading At 2 Foot Depth

### GP-11 CHEMICAL RESULTS

| | 1'-1.5' | 4.5'-5' |
|---|---|---|
| DRO | 6.7 | 100 |
| GRO | 16 | 260 |
| B | < 0.019 | < 0.38 |
| T | < 0.011 | < 0.22 |
| E | < 0.011 | < 0.22 |
| X | < 0.034 | < 0.68 |

Concentrations In Parts Per Million

## NOTE

*Locations Are Approximate Based On Field Measurements; Site Not Surveyed*

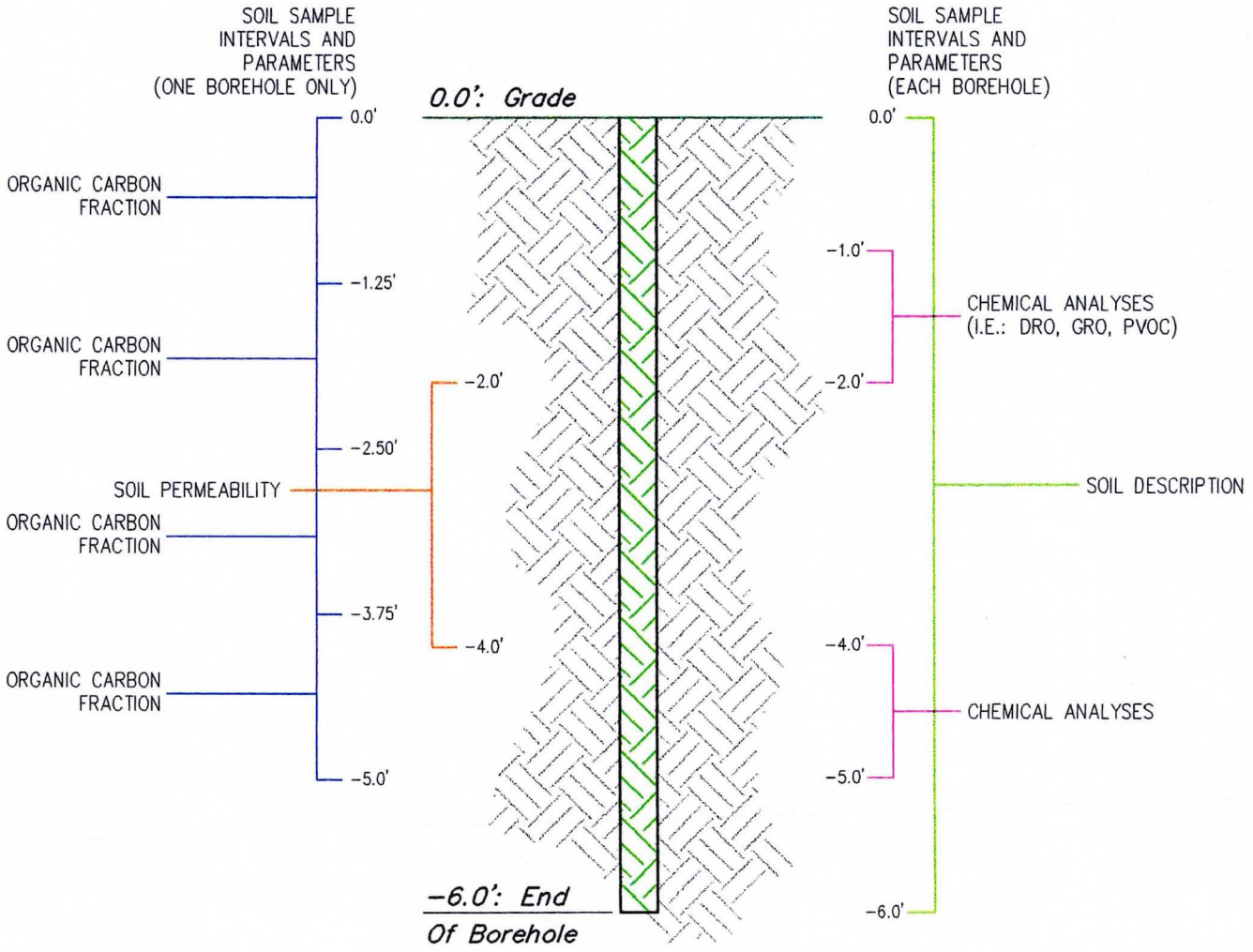
0 30
Scale In Feet

# SAMPLE LOCATIONS AND FID READINGS AT TANK NO. 67

MURPHY OIL USA, INC.
SUPERIOR, WISCONSIN

111298
34265WN

Gannett Fleming
FIGURE 1




## NOTES

1. *One Soil Sample Will Be Collected Per Tank Basin For Soil Permeability And Samples For Organic Carbon Fraction Analytes Will Only Be Collected From One Probehole Per Basin.*
2. *Samples For Chemical Analysis At Gasoline And Gasoline Blended Stock Release Sites Will Be Analyzed For GRO, PVOCs, And Lead.*
3. *Samples For Chemical Analysis At Fuel Oil And Crude Sites Will Be Analyzed For DRO, PVOCs, And PAHs.*

Not To Scale

# PROPOSED SOIL SAMPLE INTERVALS AND ANALYTES

MURPHY OIL USA, INC.
SUPERIOR, WISCONSIN

111298
34265WV

Gannett Fleming

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

November 12, 1998
File #34265.003

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

Re: Work Plan for Soil Investigation — Former Tank 81 Release
Murphy Oil USA, Inc., Superior, Wisconsin

Dear Mr. Hosch:

This letter provides the proposed work plan for an investigation to determine the extent and degree of unsaturated soil contamination within the diked area of the former location of Tank 81 at Murphy Oil's Superior refinery. A release from this tank of about 150 gallons of gasoline was reported in August 1989. During the investigation, we will also collect samples for physical parameter testing, and these data will be used in our contaminant transport modeling. This work plan is being submitted in response to your October 1, 1998, letter to Mr. Lee Vail requesting additional investigation at this release location.

**Previous Work**

On October 14, 1998, Twin Ports Testing used a hand auger to collect shallow soil samples (i.e., 1 to 1.5 feet and 2 to 2.5 feet below ground surface [bgs]) from 20 locations within the diked area of former Tank 81. These samples were field-screened with both a flame-ionization detector (FID) and a photoionization detector (PID). The field-screening results are attached. The hand auger sampling locations and the FID field-screening results, which are more useful than the PID results due to the sensitivity of the instrument, are shown on Figure 1.

As shown on Figure 1, FID results were relatively elevated throughout the basin, except for near the western boundary, where results were at or slightly above background concentrations. Generally, FID concentrations were more elevated in the deeper samples.

**Proposed Scope of Work**

Gannett Fleming, Inc. proposes to advance seven Geoprobe boreholes within the diked area at former Tank 81 in order to define the degree of gasoline contamination in the unsaturated soils in this basin.



Continued . . .

All seven boreholes will be advanced to 6 feet bgs. The proposed locations for these boreholes are shown on Figure 1. These may be adjusted in the field, depending on the locations of underground utilities, pipelines, standing water, or other constraints on accessibility.

Soil samples will be collected from each borehole for chemical analysis and for testing of physical parameters. Figure 2 is a schematic representation of a typical borehole, showing the depths from which the samples for chemical and physical analysis will be collected in each borehole.

Soil Sampling (Chemical Parameters)

All the boreholes will be advanced with a Geoprobe equipped with a 4-foot-long, 2-inch-diameter, macro-core sampler. A new acetate liner will be inserted into the sampler to collect each soil core, and we will collect continuous soil samples from each borehole. The samples will be visually classified and logged. Soil samples will be collected from each borehole at 1 to 2 feet and 4 to 5 feet bgs. These samples will be placed in laboratory-supplied containers, preserved as necessary, placed on ice, and shipped to Commonwealth Technology, Inc. (CTI), a Wisconsin-certified laboratory in Baraboo, Wisconsin, for analysis of gasoline range organics (GRO), petroleum volatile organic compounds (PVOCs), and lead.

Soil Sampling (Physical Parameters)

Soil samples for physical testing (organic carbon and permeability) will be collected from only one of the boreholes in this tank basin. Soil samples from each 1.25-foot interval to a depth of 5 feet in one of the seven boreholes will be shipped to CTI for analysis of the organic carbon fraction in the sample. A separate macro-core sampler will also be advanced next to one of the seven boreholes in order to collect an undisturbed sample at 2 to 4 feet bgs. This sample will be shipped to a qualified laboratory for falling head permeability testing. The permeability and organic carbon results will be used to calibrate the model that will be used to develop site-specific residual contaminant levels (RCLs), as discussed in our September 10, 1998, report.



Continued . . .

Mr. James A. Hosch
Wisconsin Department of Natural Resources
November 12, 1998



Equipment Decontamination

All non-disposable sampling equipment will be decontaminated between samples using a detergent/potable water solution and rinsed with either potable or distilled water.

**Project Documentation**

The following required forms will be completed and submitted to the Wisconsin Department of Natural Resources (WDNR) with the investigation report:

- Soil Boring Log Information (Form 4400-122).
- Well/Drill Hole/Borehole Abandonment (Form 3300-5B).

We will begin soliciting bids from Geoprobe operators and coordinating the proposed work immediately. If you have any questions or comments about this work plan, please call.

Sincerely,

GANNETT FLEMING, INC.

Jeffrey J. King
Project Hydrogeologist

David J. Olig, P.G.
Senior Project Manager

JJK/jec
Enc.

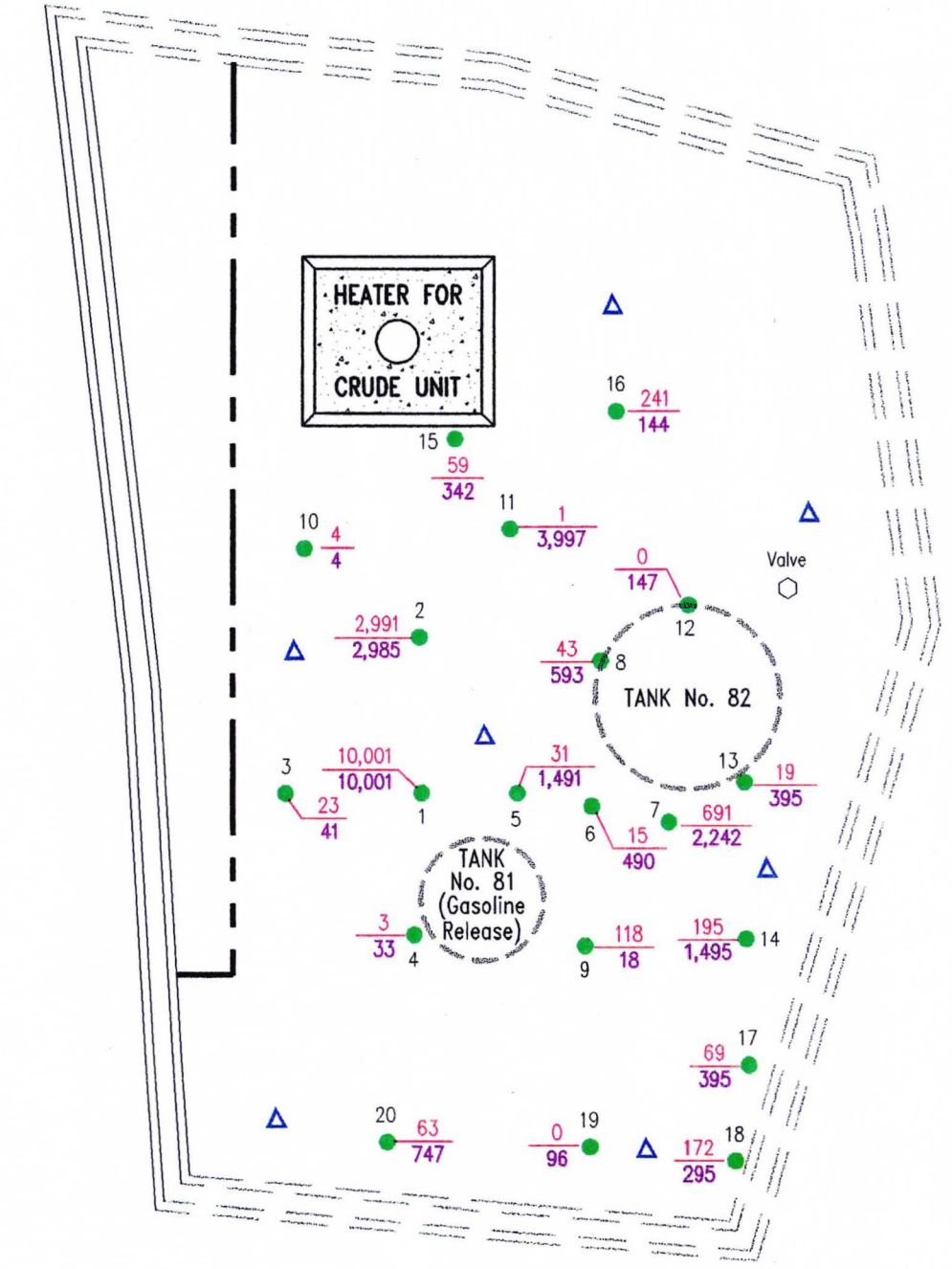
MURPHY OIL U.S.A.
SUPERIOR, WISCONSIN
HAND AUGER BORING RESULTS
TANKS 81 & 82
OCTOBER 14, 1998



| Hand Auger Boring Identification | Sample Depth (ft.) | Soil Description | FID Background (ppm) | FID Reading (ppm) | PID Background (ppm) | PID Reading (ppm) |
|---|---|---|---|---|---|---|
| 1 | 1 | reddish brown clay | 6 | 10,001 | 0 | 274 |
| | 2 | reddish brown clay | 20 | 10,001 | 0 | 235 |
| 2 | 1 | reddish brown clay | 9 | 3,000 | 0 | 97 |
| | 2 | reddish brown clay | 15 | 3,000 | 0 | 97 |
| 3 | 1 | reddish brown clay | 12 | 35 | 0 | 3 |
| | 2 | reddish brown clay | 9 | 50 | 0 | 0 |
| 4 | 1 | black to reddish organic clay | 7 | 10 | 0 | 0 |
| | 2 | reddish brown clay | 7 | 40 | 0 | 2 |
| 5 | 1 | silty sand | 9 | 40 | 0 | 0 |
| | 2 | reddish brown clay | 9 | 1,500 | 0 | 24 |
| 6 | 1 | silty sand | 25 | 40 | 0 | 0 |
| | 2 | silty sand | 10 | 500 | 0 | 0 |
| 7 | 1 | black to reddish organic clay | 9 | 700 | 0 | 0 |
| | 2 | black to reddish organic clay | 8 | 2,250 | 0 | 0 |
| 8 | 1 | silty sand | 7 | 50 | 0 | 0 |
| | 2 | sandy reddish brown clay | 7 | 600 | 0 | 0 |
| 9 | 1 | black to reddish organic clay | 7 | 125 | 0 | 0 |
| | 2 | black to reddish organic clay | 7 | 25 | 0 | 0 |
| 10 | 1 | sandy reddish brown clay | 2 | 6 | 0 | 2 |
| | 2 | reddish brown clay | 2 | 6 | 0 | 0 |
| 11 | 1 | sandy reddish brown clay | 2 | 3 | 0 | 0 |
| | 2 | black to reddish organic clay | 3 | 4,000 | 0 | 0 |
| 12 | 1 | black to reddish organic clay | 3 | 3 | 0 | 0 |
| | 2 | black to reddish organic clay | 3 | 150 | 0 | 0 |
| 13 | 1 | black to reddish organic clay | 6 | 25 | 0 | 0 |
| | 2 | brown sand | 5 | 400 | 0 | 2 |
| 14 | 1 | sandy black organic clay | 5 | 200 | 0 | 0 |
| | 2 | sandy black organic clay | 5 | 1,500 | 0 | 88 |
| 15 | 1 | sandy brown organic clay | 11 | 70 | 0 | 2 |
| | 2 | sandy brown organic clay | 8 | 350 | 0 | 2 |
| 16 | 1 | brown sand | 9 | 250 | 0 | 0 |
| | 2 | sandy reddish brown clay | 6 | 150 | 0 | 0 |
| 17 | 1 | sandy brown organic clay | 11 | 80 | 0 | 0 |
| | 2 | reddish brown clay | 5 | 400 | 0 | 4 |
| 18 | 1 | brown organic clay | 3 | 175 | 0 | 0 |
| | 2 | brown organic clay | 5 | 300 | 0 | 0 |
| 19 | 1 | brown organic clay | 5 | 5 | 0 | 0 |
| | 2 | brown organic clay | 4 | 100 | 0 | 0 |
| 20 | 1 | reddish brown clay | 7 | 70 | 0 | 0 |
| | 2 | black to reddish organic clay | 3 | 750 | 0 | 0 |

**Gannett Fleming**

FIGURE 1




## LEGEND

- Proposed Gannett Fleming Geoprobe Soil Sample Location
- 18 Twin Ports Hand-Auger Field Screening Soil Sample Location (October 1998)
- Piping Run
- TANK No. 81 Former Tank Location
- 11 / 100 = FID Reading At 1 Foot Depth / FID Reading At 2 Foot Depth

## NOTES

1. Locations Are Approximate Based On Field Measurements; Site Not Surveyed
2. North, East, And West Dike Walls Have Been Removed.

0 30

Scale In Feet

# SAMPLE LOCATIONS AND FID READINGS AT FORMER TANK NO. 81

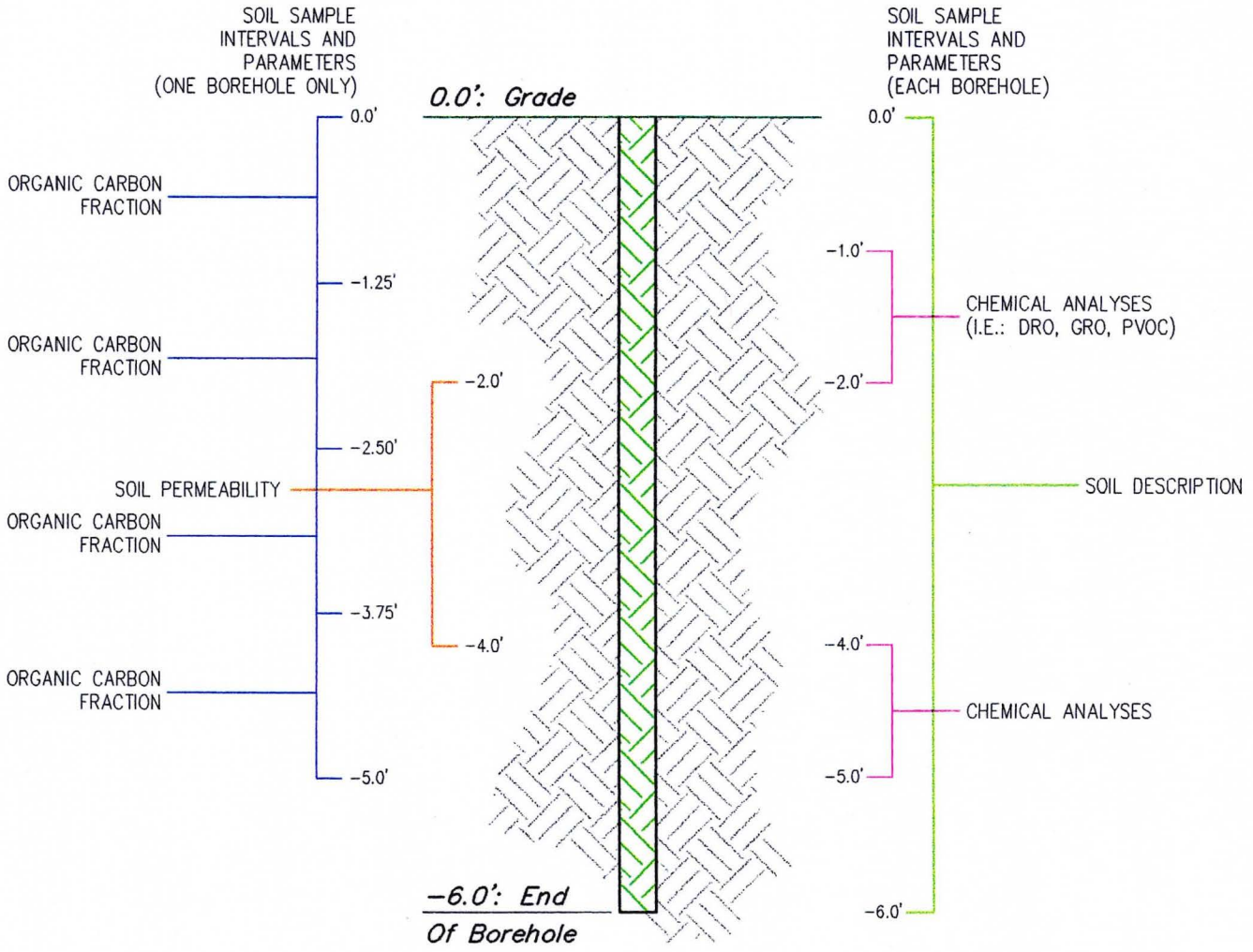
MURPHY OIL USA, INC.

SUPERIOR, WISCONSIN

110598
34265WT

**Gannett Fleming**

FIGURE 2




## NOTES

1. *One Soil Sample Will Be Collected Per Tank Basin For Soil Permeability And Samples For Organic Carbon Fraction Analytes Will Only Be Collected From One Probehole Per Basin.*
2. *Samples For Chemical Analysis At Gasoline And Gasoline Blended Stock Release Sites Will Be Analyzed For GRO, PVOCs, And Lead.*
3. *Samples For Chemical Analysis At Fuel Oil And Crude Sites Will Be Analyzed For DRO, PVOCs, And PAHs.*

Not To Scale

# PROPOSED SOIL SAMPLE INTERVALS AND ANALYTES

MURPHY OIL USA, INC.

SUPERIOR, WISCONSIN

111298
34265WV

Gannett Fleming

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

November 12, 1998
File #34265.003

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

Re: Work Plan for Soil Investigation — Fuel Loading Area Releases
Murphy Oil USA, Inc., Superior, Wisconsin

Dear Mr. Hosch:

This letter provides the proposed work plan for an investigation to determine the extent and degree of unsaturated soil contamination within the fuel loading area at Murphy Oil's Superior refinery. Releases within this area of about 115 gallons of leaded gasoline, 150 gallons of unleaded gasoline, and 450 gallons of gasoline additive were reported in June 1990, January 1993, and September 1993, respectively. During the investigation, we will also collect samples for physical parameter testing, and these data will be used in our contaminant transport modeling. This work plan is being submitted in response to your October 1, 1998, letter to Mr. Lee Vail requesting additional investigation at these release locations.

**Previous Work**

On October 23, 1998, Twin Ports Testing used a hand auger to collect shallow soil samples (1 to 1.5 feet below the ground surface [bgs]) from 26 locations within the fuel loading area. These samples were field-screened with both a flame-ionization detector (FID) and a photoionization detector (PID). The field-screening results are attached. The hand auger sampling locations and the FID field-screening results, which are more useful than the PID results due to the sensitivity of the instrument, are shown on Figure 1.

As shown on Figure 1, FID results are elevated throughout the area, except for the southeastern corner, where results were at or slightly above background concentrations.



Continued . . .

**Proposed Scope of Work**

Gannett Fleming proposes to advance five Geoprobe boreholes within the fuel loading area in order to define the degree of gasoline contamination in the unsaturated soils in this basin. All five boreholes will be advanced to 6 feet bgs. The proposed locations for these boreholes are shown on Figure 1. These may be changed in the field, depending on the locations of underground utilities, pipelines, standing water, or constraints on accessibility.

Soil samples will be collected from each borehole for chemical analysis and for testing of physical parameters. Figure 2 is a schematic representation of a typical borehole, showing the depths from which we will collect the samples for chemical and physical analysis from each borehole.

Soil Sampling (Chemical Parameters)

All the boreholes will be advanced with a Geoprobe equipped with a 4-foot-long, 2-inch-diameter, macro-core sampler. A new acetate liner will be inserted into the sampler to collect each soil core. We will collect continuous soil samples from each borehole. The samples will be visually classified and logged. Soil samples from each borehole will be collected at 1 to 2 feet and 4 to 5 feet bgs. These samples will be placed in laboratory-supplied containers, preserved as necessary, placed on ice, and shipped to Commonwealth Technology, Inc. (CTI), a Wisconsin-certified laboratory in Baraboo, Wisconsin, for analysis of gasoline range organics (GRO), petroleum volatile organic compounds (PVOCs), and lead.

Soil Sampling (Physical Parameters)

Soil samples for physical testing (organic carbon and permeability) will be collected from only one of the boreholes in this tank basin. Soil samples from each 1.25-foot interval to a depth of 5 feet in one of the five boreholes will be shipped to CTI for analysis of the organic carbon fraction in the sample. A separate macro-core sampler will also be advanced next to one of the five boreholes in order to collect an undisturbed sample at 2 to 4 feet bgs. This sample will be shipped to a qualified laboratory for falling head permeability testing. The permeability and organic carbon results will be



Continued . . .

used to calibrate the model that will be used to develop site-specific residual contaminant levels (RCLs), as discussed in our September 10, 1998, report.

Equipment Decontamination

All non-disposable sampling equipment will be decontaminated between samples using a detergent/potable water solution and rinsed with either potable or distilled water.

**Project Documentation**

The following required forms will be completed and submitted to the Wisconsin Department of Natural Resources (WDNR) with the investigation report:

- Soil Boring Log Information (Form 4400-122).
- Well/Drill Hole/Borehole Abandonment (Form 3300-5B).

We will begin soliciting bids from Geoprobe operators and coordinating the proposed work immediately. If you have any questions or comments about this work plan, please call.

Sincerely,

GANNETT FLEMING, INC.

Jeffrey J. King
Project Hydrogeologist

David J. Olig, P.G.
Senior Project Manager

JJK/jec
Enc.

M:\CLERICAL\PROJECTS\0300\367-18\CORRESP\JJK\3L367-18.002

MURPHY OIL U.S.A.
SUPERIOR, WISCONSIN
HAND AUGER BORING RESULTS
MARKETING AREA
OCTOBER 23, 1998



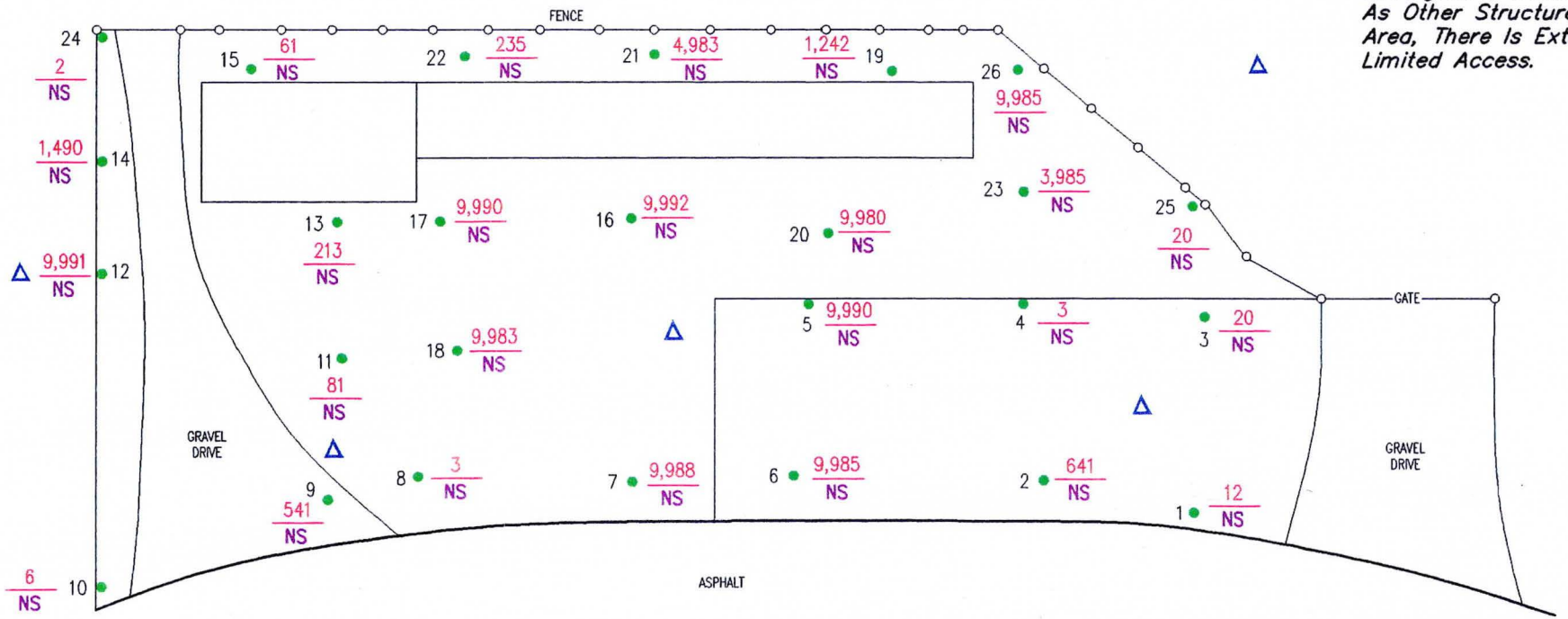
| Hand Auger Boring Identification | Sample Depth (ft.) | Soil Description | FID Background (ppm) | FID Reading (ppm) | PID Background (ppm) | PID Reading (ppm) |
|---|---|---|---|---|---|---|
| 1 | 1 | reddish brown clay | 8 | 20 | 0 | 1 |
| 2 | 1 | black clay, sand and gravel | 9 | 650 | 0 | 57 |
| 3 | 1 | reddish brown clay | 10 | 30 | 0 | 1 |
| 4 | 1 | sandy gray brown clay | 9 | 12 | 0 | 1 |
| 5 | 1 | sandy gray brown clay | 10 | 10,001 | 0 | 342 |
| 6 | 1 | sandy gray brown clay | 15 | 10,001 | 0 | 240 |
| 7 | 1 | sandy gray brown organic clay | 12 | 10,001 | 0 | 88 |
| 8 | 1 | sandy gray brown clay | 12 | 15 | 0 | 5 |
| 9 | 1 | brown sand and gravel | 9 | 550 | 0 | 74 |
| 10 | 1 | brown sand and gravel | 9 | 15 | 0 | 3 |
| 11 | 1 | brown sand and gravel | 9 | 90 | 0 | 32 |
| 12 | 1 | brown sand and gravel | 9 | 10,001 | 0 | 296 |
| 13 | 1 | brown sand and gravel | 12 | 225 | 0 | 188 |
| 14 | 1 | black clay, sand and gravel | 10 | 1,500 | 0 | 71 |
| 15 | 1 | gray brown organic clay | 9 | 70 | 0 | 5 |
| 16 | 1 | black sandy gravel | 8 | 10,001 | 0 | 514 |
| 17 | 1 | brown sand and gravel | 10 | 10,001 | 0 | 539 |
| 18 | 1 | brown sand and gravel | 17 | 10,001 | 0 | 571 |
| 19 | 1 | reddish brown clay | 8 | 1,250 | 0 | 315 |
| 20 | 1 | black clay, sand and gravel | 20 | 10,001 | 0 | 999 |
| 21 | 1 | black clay, sand and gravel | 17 | 5,000 | 0 | 9 |
| 22 | 1 | reddish brown organic clay | 15 | 250 | 0 | 5 |
| 23 | 1 | reddish brown clay | 15 | 4,000 | 0 | 282 |
| 24 | 1 | brown clay, sand and gravel | 20 | 22 | 0 | 3 |
| 25 | 1 | reddish brown clay | 15 | 35 | 0 | 9 |
| 26 | 1 | reddish brown clay | 15 | 10,001 | 0 | 2687 |

## LEGEND

- Δ — *Proposed Gannett Fleming Geoprobe Soil Sample Location*
- 18 ● — *Twin Ports Hand-Auger Field Screening Soil Sample Location (October 1998)*
- 11 / 100 = FID Reading At 1 Foot Depth / FID Reading At 2 Foot Depth (NS = Not Sampled)

## NOTES

1. *Locations Are Approximate Based On Field Measurements; Site Not Surveyed.*
2. *Releases At This Site Include Unleaded Gasoline And Gasoline Additive*
3. *It Should Be Noted That Due To The Presence Of A Significant Amount Of Aboveground And Underground Utilities, As Well As Other Structures In This Area, There Is Extremely Limited Access.*




0 30

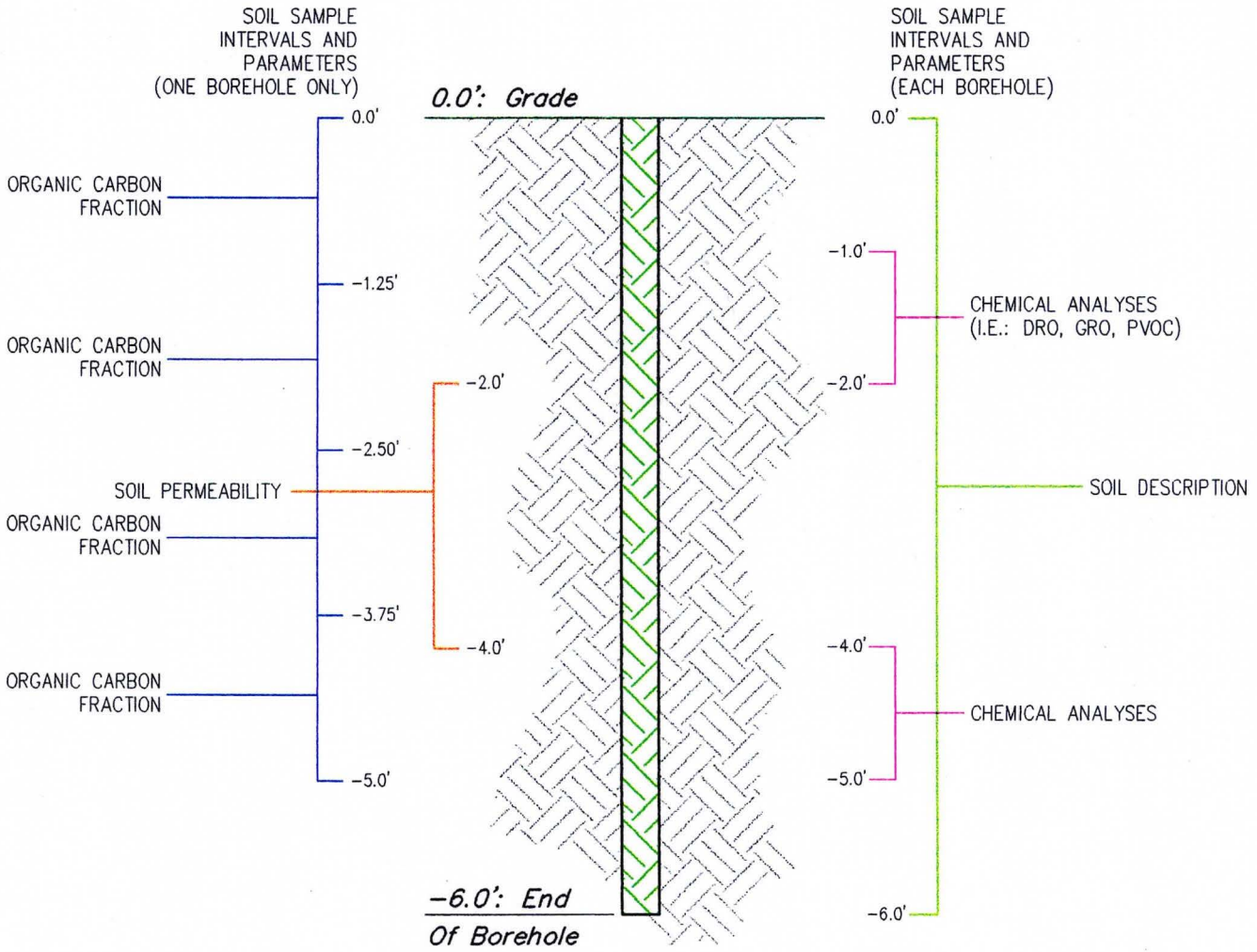
Scale In Feet

# SAMPLE LOCATIONS AND FID READINGS AT LOADING AREA

MURPHY OIL USA, INC.
SUPERIOR, WISCONSIN

111298
34265WP

Gannett Fleming
FIGURE 1




## NOTES

1. *One Soil Sample Will Be Collected Per Tank Basin For Soil Permeability And Samples For Organic Carbon Fraction Analytes Will Only Be Collected From One Probehole Per Basin.*
2. *Samples For Chemical Analysis At Gasoline And Gasoline Blended Stock Release Sites Will Be Analyzed For GRO, PVOCs, And Lead.*
3. *Samples For Chemical Analysis At Fuel Oil And Crude Sites Will Be Analyzed For DRO, PVOCs, And PAHs.*

Not To Scale

# PROPOSED SOIL SAMPLE INTERVALS AND ANALYTES

MURPHY OIL USA, INC.
SUPERIOR, WISCONSIN

111298
34265WV

Gannett Fleming

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

November 12, 1998
File #34265.003

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

Re: Work Plan for Soil Investigation — Crude Unit Process Area Release
Murphy Oil USA, Inc., Superior, Wisconsin

Dear Mr. Hosch:

This letter provides the proposed work plan for an investigation to determine the degree of unsaturated soil contamination at the crude unit process area at Murphy Oil's Superior refinery. A release of about 125 gallons of crude oil from an underground pipeline occurred in this area in September 1991. During the investigation, we will also collect samples for physical parameter testing, and these data will be used in our contaminant transport modeling. This work plan is being submitted in response to your October 1, 1998, letter to Mr. Lee Vail requesting investigation of this release.

## Previous Work

When the release occurred in September 1991, Murphy took prompt action to remove the soil affected by the release. Because the entire area was paved, a section of concrete was cut out (1991) to access the leaking pipeline, as shown on the attached photograph. Since crude oil was released, a cleanup end-point could be determined by visual observation. No follow-up investigation has been done since the affected soils were removed following the release.

## Proposed Scope of Work

Gannett Fleming, Inc. proposes to advance two Geoprobe boreholes in the immediate area where this pipeline release occurred to determine if there is any significant petroleum contamination remaining in the unsaturated soils. Since the affected area has not been re-paved, as you can see in the photograph, locating the boreholes will be a straightforward exercise. Boreholes will be advanced



Continued . . .

at both ends of the former excavation to 6 feet below ground surface (bgs). Please note that drilling in this area is limited by structures, piping, utilities, etc.
Soil samples will be collected from each borehole for chemical analysis and for testing of physical parameters. Figure 1 is a schematic representation of a typical borehole, showing the depths from which the samples for chemical and physical analysis will be collected from each borehole.

Soil Sampling (Chemical Parameters)

All the boreholes will be advanced with a Geoprobe equipped with a 4-foot-long, 2-inch-diameter, macro-core sampler. A new acetate liner will be inserted into the sampler to collect each soil core, and we will collect continuous soil samples from each borehole. The samples will be visually classified and logged. Soil samples will be collected from each borehole at 1 to 2 feet and 4 to 5 feet bgs. These samples will be placed in laboratory-supplied containers, preserved as necessary, placed on ice, and shipped to Commonwealth Technology, Inc. (CTI), a Wisconsin-certified laboratory in Baraboo, Wisconsin, for analysis of diesel range organics (DRO), petroleum volatile organic compounds (PVOCs), and polynuclear aromatic hydrocarbons (PAHs).

Soil Sampling (Physical Parameters)

Soil samples for physical testing (organic carbon and permeability) will be collected from only one of the two boreholes. Soil samples from each 1.25-foot interval to a depth of 5 feet in one of the two boreholes will be shipped to CTI for analysis of the organic carbon fraction in the sample. A separate macro-core sampler will also be advanced next to one of the two boreholes in order to collect an undisturbed sample at 2 to 4 feet bgs. This sample will be shipped to a qualified laboratory for falling head permeability testing. The permeability and organic carbon results will be used to calibrate the model that will be used to develop site-specific residual contaminant levels (RCLs), as discussed in our September 10, 1998, report.

Equipment Decontamination

All non-disposable sampling equipment will be decontaminated between samples using a detergent/ potable water solution and rinsed with either potable or distilled water.



Continued . . .

Mr. James A. Hosch
Wisconsin Department of Natural Resources
November 12, 1998



**Project Documentation**

The following required forms will be completed and submitted to the Wisconsin Department of Natural Resources (WDNR) with the investigation report:

- Soil Boring Log Information (Form 4400-122).
- Well/Drill Hole/Borehole Abandonment (Form 3300-5B).

We will begin soliciting bids from Geoprobe operators and coordinating the proposed work immediately. If you have any questions or comments about this work plan, please call.

Sincerely,

GANNETT FLEMING, INC.

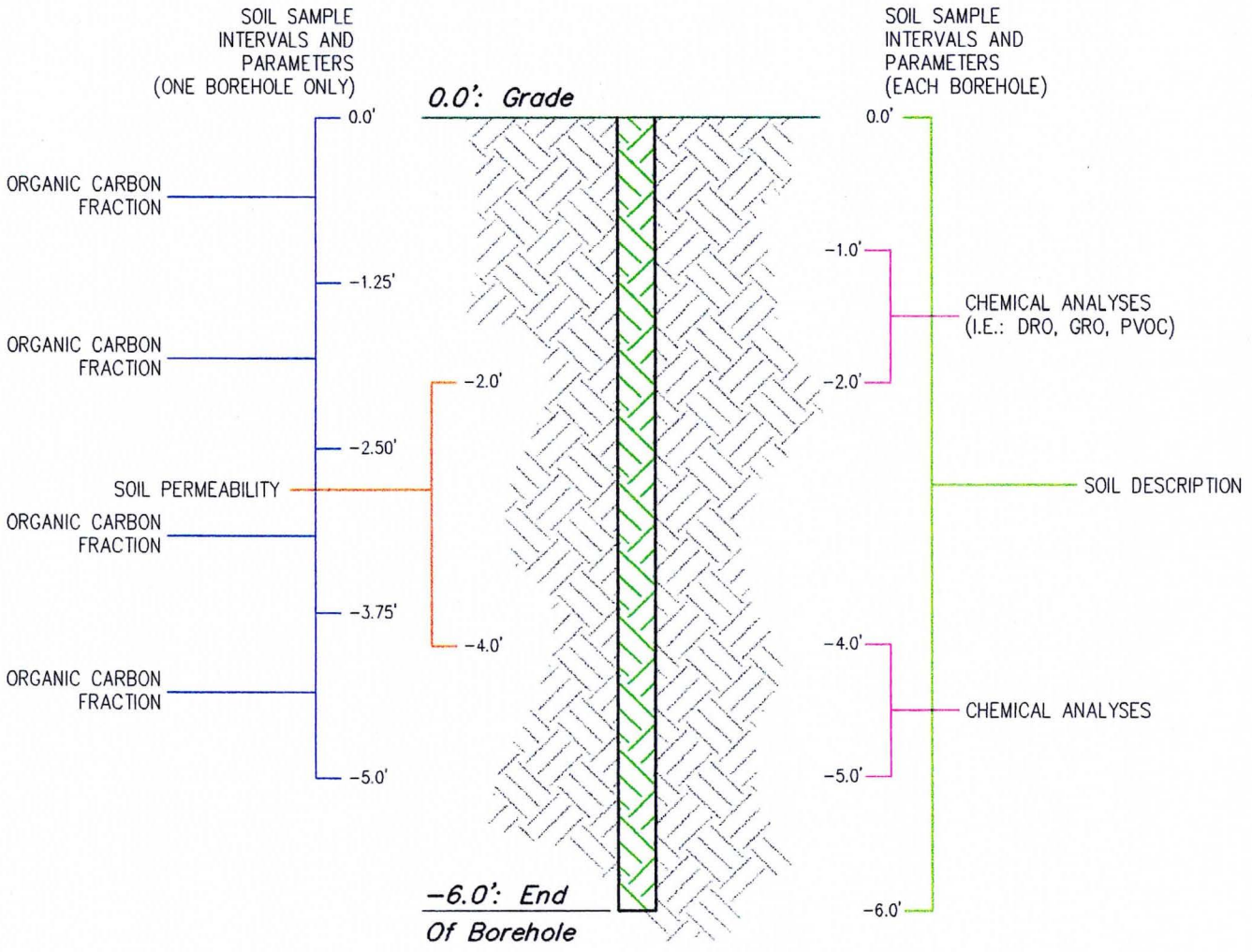
David J. Olig, P.G.
Senior Project Manager

Jeffrey J. King
Project Hydrogeologist

DJO/jec
Enc.

**Gannett Fleming**

FIGURE 1




## NOTES

1. *One Soil Sample Will Be Collected Per Tank Basin For Soil Permeability And Samples For Organic Carbon Fraction Analytes Will Only Be Collected From One Probehole Per Basin.*
2. *Samples For Chemical Analysis At Gasoline And Gasoline Blended Stock Release Sites Will Be Analyzed For GRO, PVOCs, And Lead.*
3. *Samples For Chemical Analysis At Fuel Oil And Crude Sites Will Be Analyzed For DRO, PVOCs, And PAHs.*

Not To Scale

# PROPOSED SOIL SAMPLE INTERVALS AND ANALYTES

MURPHY OIL USA, INC.

SUPERIOR, WISCONSIN

111298
34265WV

PLEASE PRINT

# State of Wisconsin Substance Release Notification Form

04-16-202285.pdf

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

| **Date and Mil. Time of Incident** 3-12-96 1230 | **Date and Mil. Time Reported** 3-12-96 1415 |
|---|---|

| **Person Reporting** Ed Smith | **Telephone #** ( 715 ) 398-8223 |
|---|---|
| **Representing Agency, Firm, or Citizen** Murphy Oil USA | |
| **Responsible Party** Murphy Oil USA | |
| **Contact Name** Ed Smith/Bill Gustafson | **Telephone #** ( 715 ) 398-8217 |
| **Address** Stinson Avenue, Superior, WI 54880 | **City, State, Zip Code** Superior, WI 54880 |

| **Substance Involved** | **Amount & Units Released** | **Amt. Recovered** | **Is this a 304 (11004 42 USC) spill?** |
|---|---|---|---|
| #6 fuel oil | 420 gallons | | ☐ Yes ☐ No ☐ Unknown |

☐ Solid ☒ Semisolid ☒ Liquid ☐ Gas **Color** Dark Brown-Black **Odor** fuel oil-asphalt

**Exact Location** (inc. address, facility name, mileage, bldg. #, etc.)
Tank #51 basin, Murphy Oil Tank Farm

| **City** Superior | **County** Douglas | **Lat/long** |
|---|---|---|
| **DNR Region** NW | ¼ ¼sec T NR (E/W) | **Weather Cond.** |

**Cause of Incident**
Valve failed on a mechanical pump

**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 oil refinery

**Action Taken By Spiller**
- ☐ No Action Taken
- ☐ No Action Needed
- ☐ Monitor
- ☒ Cleanup Method: vac up
- ☒ Waste Destination: Slop oil tank
- ☐ Containment
- ☒ Contractor Hired
  Name: CEDA Corp.
- ☐ 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:** 3/12/96 | **Rpt'd to DATCP?** ☐Yes ☒No |
|---|---|---|
| **Person Notified:** | **Region Notified:** **Time:** | **Date:** |
| **Invstgtd By:** (Print) John Krull (Sign) | **Date:** 3/18-96 | **Site Closed?** ☐Yes ☐No |
| **Spill Coordinator Signoff:** | **Date:** **Transferred to ERP?** ☐No ☐Yes; Case # _____ | **NFA Letter Sent?** ☐Yes ☐No<br>**Spill Packet Sent?** ☐Yes ☒No |

☐ Additional Comments on Reverse

PLEASE PRINT

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

| **Date and Military Time of Incident** 3-12-96 1230 | **Responsible Party** Murphy Oil USA |
|---|---|

**Additional Comments:**

Murphy feels they will need to remove some soil. I told Murphy representatives that they will need to take confirmation samples to document clean up.

- Steve LaValley

MURPHY
OIL USA, INC.

SUPERIOR REFINERY
P O BOX 2066
SUPERIOR WISCONSIN 54880



March 15, 1996

Mr. James Hosch
Northwest District Spills Coordinator
Department of Natural Resources
Highway 70 West
P.O. Box 309
Spooner, WI 54801

RE: #6 Fuel Oil Release

Dear Mr. Hosch:

On behalf of Murphy Oil USA, Inc. I am providing written confirmation of the notification given on March 12, 1996, regarding the release of #6 fuel oil.

On March 12, 1996, at 12:30 p.m., Murphy Oil experienced a release of approximately 10 barrels of #6 fuel oil. The release occurred when a head gasket on a #6 fuel oil transfer pump failed. The release was discovered while a pumper was making his normal rounds. The pump was immediately shut down and pump isolation valves were closed. The site of the release was located within the clay dike area of tank 51. The #6 fuel oil flowed along a 1 foot path next to and around the north side of tank 51 and formed a small 2 by 10 foot pool area leading north of the tank 51.

Murphy Oil maintenance personnel began site clean-up immediately. The #6 fuel oil set up very quickly due to the low air temperatures. The frozen surface clay allowed the product to be removed easily. Clean free product was re-introduced into the #1 API oil/water separator for recovery. As a precaution Murphy is in the process of removing approximately 6 inches of clay from around the tank and pool area. Murphy Oil believes the site will have been cleaned to the extent practicable.

If you have any questions or wish to discuss this matter further, please call me at (715)398-8217.

Sincerely,

William P. Gustafson
Environmental Operations Superintendent

bg.094

cc: Fred Green
Jim Gesick
Jim Britt
Jim Kowitz
Randy Kooiman
Rick Lewandowski

SPUR

The documentation should be submitted to the following address:

Northwest District Spills Coordinator
Department of Natural Resources
Hwy 70 West
P.O. Box 309
Spooner, WI 54801

Please forward this information to the Department by later then May 24, 1996. Upon receipt of this information it will be forwarded to the district case closure committee for their consideration.

If you should have any questions regarding this letter please feel free to call me at (715) 635-4058.

Sincerely,

James A. Hosch
Northwest District Spills Coordinator

cc: Gary LeRoy - Spooner
Warden Lee Wiesner - Brule
Steve LaValley - Superior
John Krull - Superior

WISCONSIN
DEPT. OF NATURAL RESOURCES

# State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

NORTHWEST DISTRICT HEADQUARTERS
P.O. Box 309
State Hwy 70 West & First Street
Spooner, WI 54801

TELEFAX 715-635-4105

George E. Meyer, Secretary
William H. Smith, District Director

April 11, 1996

Mr. William P. Gustafson
Environmental Operations Superintendent
Murphy Oil U.S.A. Inc.
Superior Refinery
P.O. Box 2066
Superior, WI 54880

Subject: #6 Fuel Oil Release on March 12, 1996
Interior of Dike Superior Refinery Tank 51,
Douglas County, Wisconsin

Dear Mr. Gustafson:

Based on the information we have received, the Department believes that you are responsible for restoring the environment at this site under Section 144.76, Wisconsin Stats. (hazardous substance spills laws). We have received your letter confirming the release of approximately 10 barrels of #6 fuel oil with in the clay dike of Tank 51. Your letter indicates that oil flowed along a one foot path next to and around the north side of Tank 51. The oil formed a 2 by 10 foot puddle leading north of Tank 51. We understand that the oil was collected and introduced to the #1 API oil/water separator for recovery. Your letter states that Murphy is intends to remove approximately six inches of clay from the area around the tank and the puddle area.

Based on the quantity of the spill we believe that sampling is warranted to confirm removal of contamination to ch. NR 720 Wis. Adm. Code standards. After you perform the excavation of the six inches of clay, we request that samples representative of the spill area be taken for documentation of site closure. In addition, we are requesting the following information be submitted:

1. Location of the discharge incident, including street address; quarter-quarter section; and legal description of lot, if located in platted area. (A Murphy Oil refinery map with a location of the release identified.)

2. The type, total volume and final disposition of the discharged hazardous substance and contaminated material generated as part of the immediate action. Including legible copies of manifest, receipts and other relevant documents

MURPHY
OIL USA, INC.

SUPERIOR REFINERY
P O BOX 2066
SUPERIOR WISCONSIN 54880

May 15, 1996



Mr. James A. Hosch
Northwest District Spills Coordinator
Department of Natural Resources
Hwy. 70 West
P.O. Box 309
Spooner, WI 54801

RE:: #6 Fuel Oil Release on March 12, 1996
Interior of Dike Superior Refinery Tank 51,
Douglas County, Wisconsin

Dear Mr. Hosch:

In response to your letter dated April, 11, 1996, to Murphy Oil concerning the release of #6 fuel oil at tank 51, the following information is provided.

- The discharge was located within dike area of tank 51. This tank is located on Superior Refinery property. Site address is 2400 Stinson Avenue, Superior, WI. Map quadrants NW 1/4, NW 1/4, Sect. 36, T49N, R 14N.

- The #6 fuel oil and snow mixture was recovered and reintroduced into the refinery #1 API oil/water separator. Six inches of surface soil was removed and stockpiled.

If you have any questions regarding this matter, please feel free to call (715) 398-8217.

Sincerely,

William Gustafson
Environmental Operations Superintendent

bg.102

cc: Jim Gesick (MOUSA)
Fred Green (MOUSA)
Jim Kowitz (MOUSA)
Jim Britt (MOUSA)
Rick Lewandowski (DeWitt, Ross & Stevens)

SPUR

# PHONE CONVERSATION RECORD

**DATE:** 5/17/96
**TIME:** 1:05

**CONVERSED WITH:** Bill Gustafson
Murphy Oil USA

**SUBJECT/PROJECT:** 3/12/96 Release at Tank 51

**UNIQUE ID#.:**

Hosch requested confirmation sampling for site. Hosch stated that for 100 gal spills Department would typically require sampling to confirm removal. Hosch stated that Murphy could wait then do all sampling at all of the spills that Hosch was working on. Gustafson stated that he would do that. Hosch then requested a map of the refinery. Gustafson stated that he would send one.

Signature: James A. Hosch
(please write legibly)

# PHONE CONVERSATION RECORD

**DATE:** 8/7/96
**TIME:** 10:10

**CONVERSED WITH:** Bill Gustafson

**SUBJECT/PROJECT:** Murphy Oil

**UNIQUE ID#.:**

Gustafson requested permission to remove contaminated soil and take to Kimmes. Hosch gave permission. Gustafson said then he would be punching holes in the ground.

Signature: James A. Hosch
(please write legibly)

WISCONSIN
DEPT. OF NATURAL RESOURCES

**State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES**

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

Northwest District Headquarters
810 West Maple
Spooner, WI 54801
TELEPHONE 715-635-2101
FAX 715-635-4105
TDD 715-635-4001

September 5, 1996

Mr. William P. Gustafson
Environmental Operations Superintendent
Murphy Oil U.S.A. Inc.
Superior Refinery
P.O. Box 2066
Superior, WI 54880

Subject: Spill at Murphy Oil on March 12, 1996
Superior, Douglas County, Wisconsin

Dear Mr. Gustafson:

You may recall my letter of April 11, 1996 ( I have attached a copy for your convenience). At that time we asked that the requested information be submitted later then May 24, 1996. At this time, we are asking that the requested information be submitted by October 11,1996.

As stated in my previous letter, we are requesting the laboratory results of sampling to confirm the removal of contamination to ch. NR 720 Wis. Adm. Code standards be submitted. In addition, we are requesting the following information be submitted:

1. Location of the discharge incident, including street address; quarter-quarter section; and legal description of lot, if located in platted area.

2. The type, total volume and final disposition of the discharged hazardous substance and contaminated material generated as part of the immediate action. Include legible copies of manifest, receipts and other relevant documents.


Printed on Recycled Paper

The documentation and sampling results should be submitted to my attention at our new address:

Department of Natural Resources
810 West Maple
Spooner, WI 54801

Again, please forward this information to the Department by no later then October 11, 1996. Upon receipt of this information it will be forwarded to the district case closure committee for their consideration.

If you should have any questions regarding this letter please feel free to call me at (715) 635-4058.

Sincerely,

James A. Hosch
Northwest District Spills Coordinator

Attach.

cc: Steve LaValley - Superior

MURPHY
OIL USA, INC.

SUPERIOR REFINERY
P O BOX 2066
SUPERIOR WISCONSIN 54880

September 18, 1996



Mr. James A. Hosch
Northwest District Spills Coordinator
Department of Natural Resources
Hwy 70 West
P.O. Box 309
Spooner, WI 54801

RE: #6 Fuel Oil Release -February 8, 1996 & March 12, 1996

Dear Mr. Hosch:

This letter is in response to your letters to Murphy Oil's Mr. Bill Gustafson regarding the subject fuel oil spills. Some of the information you requested in your correspondence to us in regard to these spills has been provided to you previously but will be reiterated here as well.

Both spills occurred within the refinery property within the storage tank (No.s 51 and 52) dike area which is a common containment area for both tanks. The refinery is located at 2400 Stinson Ave., Superior, WI. Map coordinates for the refinery are NW ¼, NW ¼, Sect. 36, T 49N, R 14N.

As discussed in the confirmation letters for both spills which followed the telephone notifications of the spills, the actual release of materials was relatively brief, of known quantities, and clean-up activities commenced immediately after discovery of the release. All the material was contained within a portion of the tank dike area and at no time was there a possibility of the material contacting ground water or of moving outside the dike area or off site.

The spilled material and the snow that it contaminated was collected and reintroduced into the refinery processing equipment by way of the #1 API Separator. This allowed the fuel to be recovered through the refinery's slop oil system and the water from the melted snow to be processed through the refinery's waste water treatment plant.

Although at the time of the spills the soil beneath the snow was frozen to a depth of several feet, the top six inches of soil was removed to ensure that any soil that may have been contaminated would have been cleaned up. With the ground frozen, penetration into the soil from spilled materials is nearly non-existent, even when dealing with material stored at elevated temperatures. For this reason, it is believed that removal of six inches of soil was well beyond the depth of penetration into the soil of the spilled materials. This was visually confirmed at the time of the clean up. It is also for this reason that sampling was considered to be unnecessary and a needless expense, regardless of the quantity of material spilled.

SPUR

The amount of soil removed from the site of the release on February 8, 1996 was approximately 25 yards. This material was taken to the Kimmes Construction asphalt plant for disposal in an asphalt roaster. A copy of the approved application Form 4400-149 for the disposal of this material at an asphalt plant is attached.

The amount of soil removed from the site of the release on March 12, 1996 was approximately 25 yards. This material was taken to the Kimmes Construction asphalt plant for disposal in an asphalt roaster. A copy of the approved application Form 4400-149 for the disposal of this material at an asphalt plant is attached.

Given the site conditions at the time of the spill, the type of material and quantity involved, and the immediate clean-up and remedial response at the site, Murphy Oil USA (MOUSA) believes that obligations and requirements under the pertinent NR 700 series Wisconsin Administrative Code standards have been met. Since there appears to be some difference in interpretations of these codes between MOUSA and yourself, I requested legal counsel to provide an opinion in this matter. A copy of this opinion is attached to this letter.

The opinion of legal counsel essential concurs with MOUSA's position that the requirements of the applicable Administrative Codes have been met in these instances. MOUSA believes that it has met its responsibilities in the clean-up and restoration of the site to its condition prior to the spills.

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

Sincerely,

William P. Gustafson
Environmental Operations Superintendent

bg.112

cc: Jim Kowitz
Fred Green
Rick Lewandowski

# APPLICATION TO TREAT OR DISPOSE OF PETROLEUM CONTAMINATED SOIL
## ASPHALT PLANT OR OTHER TYPE OF THERMAL TREATMENT UNIT

Form 4400-149

This form is required by the Department of Natural Resources for leaking underground storage tank sites to ensure that petroleum contaminated soil is treated or disposed of in compliance with NR 500-540, NR 158, and NR 419, Wis. Adm. Code. Failure to comply with applicable statutes and administrative rules may lead to violations of subchapters III and IV of ch. 144 Wis. Stats. and may result in forfeitures of not less than $10 or more than $25,000 for each violation, pursuant to ss. 144.426(1), 144.74 (1), and 144.99, Wis. Stats., or fines of not less than $100 or more than $150,000 or imprisonment for not more than 10 years, or both, pursuant to s. 144.74 (2), Wis. Stats. Each day of a continuing violation constitutes a separate violation. Department approval of this form is required prior to site remediation, except for soils to be buried in landfills.

DIRECTIONS: 1) Complete parts I and II. 2) Submit the application to the DNR project manager for approval. 3) Have the treatment facility complete part III of the approved form after the soil has been treated. 4) Return the ORIGINAL form to the DNR project manager. 5) Keep a copy for your files.

**ALL SITES MUST COMPLETE PART I.**

**Part I. Source of Soil**

Site/Facility Name: MURPHY OIL USA, INC

Site I.D. # (for DNR use only):

Site Address: 2400 STINSON AVE

Contact Name: BILL GUSTAFSON

City, State, Zip Code: SUPERIOR, WI, 54880

1/4, 1/4, Section, Township, and Range: NW 1/4, NW 1/4, SECT. 36, T 49N, R 14W

The information on this form is accurate to the best of my knowledge.

*Signature of Soil Generator*

*Telephone Number (include area code)*

Consulting Firm: None

Contact:

Telephone Number:

Estimated Volume Contaminated Soil

25 Tons/cubic yards (circle one)

Soil Type (USCS)

- ___ sand (SP, SW)
- ___ silty/clayey sands (SM, SC)
- ___ silt (ML, MH, OL)
- X clay (Cl, CH, OH)
- X gravel (GC, GM, GP, GW)
- ___ peat (PT)

Type of Petroleum Contamination (Circle):

Gasoline Diesel Fuel/#2 Fuel Oil

Other #6 Fuel Oil

Distance to Nearest Residence/Business_____

**Contaminant concentration:**

One screened sample for each 15 yds³ and one laboratory analysis for each 300 yds³ of contaminated soil when the field instrument *registers contamination* OR one laboratory analysis for each 100 yds³ when the field instrument *does not register contamination* on soil shown to be contaminated during the site investigation/excavation or stockpiling. PLEASE ATTACH A TABLE LISTING RESULTS OF BOTH FIELD SCREENING AND LAB ANALYSES, AND INCLUDE SUPPORTING LAB REPORTS, IN ADDITION TO THE TPH AND BENZENE INFORMATION REQUESTED BELOW. NOTE: DILHR requires a minimum of 3 laboratory samples on excavated soil for PECFA claims.

Total Benzene in soil to be remediated (attach calculations) .000651 lbs

Total Petroleum Hydrocarbons(TPH) in soil to be remediated (attach calculations) _____ lbs

Total ~~TPH~~ DRO as 2,317 lbs

Rev. 5-91

ATTACH EMISSIONS CALCULATION

(a/1,000,000) x (2,800 lbs/yd³) x b = benzene emission in lbs., where a = benzene concentration of soil sample in ppm or mg/kg dry weight basis, and b = amount of contaminated soil in yds³. NOTE: This calculation can also be used to estimate TPH emissions by substituting TPH concentration (ppm or mg/kg) for "a". It may also be used to calculate VOCs.

## Part II: Proposed Treatment Facility

Name of Plant LAKEHEAD BLACKTOP & MATERIALS OF SUPERIOR

Plant number and Model HEATHERINGTON & BERNER #7000 BATCH PLANT

Contact MR. JOSEPH KIMMES

DNR Facility I.D. No. 8160376 4

Address 5800 Albany Ave Superior, WI (or location of portable plant)

Distance to Nearest Residence/Business 5,000 FT

LEAVE BLANK - DEPARTMENT OF NATURAL RESOURCES USE ONLY

Application Concurrence:

Air Management Phyliss Holmbeck Date May 28, 1996

Project Manager _____ Date _____

Comments:

THIS SECTION TO BE COMPLETED BY THE ASPHALT/THERMAL UNIT PROCESSING THE CONTAMINATED SOIL *AFTER PROCESSING IS COMPLETED*

## Part III

WDNR Air Pollution Control Permit Number

Actual Volume of Soil Treated (tons/cubic yards)

Date of transport to plant

Date of treatment

Transporter Name

Transporter License Number

Circle One: Roasted and Incorporated Roasted Only

Total Benzene emissions in pounds for this batch (apply 50% destruction factor if no after burner is used)

Benzene emissions to date for this plant (including this batch) for this calendar year

*Signature* of Treatment plant representative

Telephone Number at Plant

POST BURN SAMPLE RESULTS: COMPLETE ONLY FOR SOILS NOT INCORPORATED!

(One representative sample for each 100 cubic yards-not composites)

Sample Number _____ _____ _____ _____

TPH _____ _____ _____ _____

DNR APPROVAL IS REQUIRED BEFORE USING AS COMMON FILL

Date of backfilling or use as common fill Location of fill site ____1/4____1/4____S____T____R

DEWITT
ROSS & STEVENS S.C.
LAW FIRM

Capitol Square Office
Two East Mifflin Street
Suite 600
Madison, WI 53703-2865
Fax 608-252-9243
Tel 608-255-8891

West Office
Firstar Financial Centre
8000 Excelsior Drive, Suite 401
Madison, WI 53717-1914
Fax 608-831-2106
Tel 608-831-2100

Please respond to: Capitol Square Office
Direct Line: 608-252-9357

September 16, 1996

Mr. Mark Miller
Murphy Oil USA, Inc.
2400 Stinson Ave.
P.O. Box 2066
Superior, WI 54880

RE: "No Further Response Actions" Under NR 708

Dear Mark:

Thank you for sending along the correspondence from James Hosch of DNR's Spooner office to Bill Gustafson at the refinery.

Mr. Hosch inquires about two small spills at the refinery during cold weather months when the ground was frozen. Among other things, he asks for various analytical data. I have reviewed the ch. NR 700 series of rules relating to spill remediation and reporting, and I do not believe that the information requested is required by these rules.

By way of background, the DNR adopted chs. NR 700 to NR 726 in effort to both codify and streamline the department's procedures for investigating, remediating and filing reports on spills of hazardous substances. Most of these rules took effect on May 1, 1994.

Only significant spills with the likelihood that residuals remain behind need to be investigated and analytical results taken. In an effort to streamline regulatory requirements, ch. NR 708 allows certain immediate or interim actions to be taken which, depending on the circumstances of each spill, may be the end of the matter.

Both of the incidents about which Mr. Hosch writes are not emergency situations within the meaning of NR 708.05(3)(b). Neither discharge posed an imminent threat to public health, safety or welfare or the environment, neither required the excavation of more than 100 cubic yards

of contaminated soil or other media, and Murphy responded immediately after the hazardous substance discharge. Sampling in these situations is only required in three carefully defined situations:

> NR 708.05(3)(c) Responsible parties shall conduct sampling at the completion of an immediate action, in accordance with the requirements of ss. NR 712.05 and 716.13, when any of the following conditions are met:
>
> 1. The hazardous substance discharge or environmental pollution is in contact with groundwater.
>
> 2. The amount, identity or duration of the hazardous substance discharge or environmental pollution is unknown.
>
> 3. Where other site or facility conditions indicate that sampling is necessary to confirm the adequacy of the immediate action.

None of the three conditions have been met for either spill. Other studies show that the refinery sits on extremely dense clay. There are no groundwater aquifers within 100 or more feet of the surface and, given the frozen conditions at the time of the two spills, the spilled petroleum products could not have contacted groundwater. In both incidents, the amount, identity and duration of the spills are known. There are no other site or facility conditions which "indicate that sampling is necessary to confirm the adequacy of the immediate action."

It is my understanding that the refinery provided the information to the department that is called for in NR 708.09(1). There is no reason to reopen this matter because the department cannot point to any "additional information [which] indicates that residual contamination at the site or facility poses a threat to public health, safety or welfare or the environment." NR 708.09(3).

DEWITT
ROSS & STEVENS s.c.
LAW FIRM



Although Murphy has tried hard to accommodate the information requests of various branches of the DNR, I really believe that these are unreasonable and outside both the letter and spirit of NR 708. I suggest that you raise this issue with Mr. Hosch and find out what specific information he has that would lead him to conclude that your immediate removal efforts were not successful and why any residual contaminants may still be present so as to constitute a threat to public health, welfare or the environment.

Very truly yours,

DEWITT ROSS & STEVENS s.c.

Richard J. Lewandowski

RJL:slf
cc: William Gustafson

H:\...\25731\000\SF3162

rec'd on printout

PLEASE PRINT

04-16-208524.pdf

# [redacted]te of Wisconsin Substance Release Notif[redacted]on Form

24-Hour Emergency Hotline Number: 1-800-943-0003

Form 4400-91 Rev. 11-95

| Date and Mil. Time of Incident: 2-8-96 13:15 | Date and Mil. Time Reported: 2-8-96 14:15 |
|---|---|

| Person Reporting: Mark Lisdahl | Telephone #: 715 398-3533 |
|---|---|
| Representing Agency, Firm, or Citizen: Murphy Oil USA | |
| Responsible Party: Murphy Oil USA | |
| Contact Name: Mark Lisdahl | Telephone #: 715 398-3533 |
| Address: PO BOX 2066 | City, State, Zip Code: Superior WI 54880 |

| Substance Involved | Amount & Units Released | Amt. Recovered | Is this a 304 (11004 42 USC) spill? |
|---|---|---|---|
| # 6 Fuel Oil | 30 Barrels | 90-100% | ☐ Yes ☐ No ☐ Unknown |

☐ Solid ☐ Semisolid ☒ Liquid ☐ Gas | Color: black/brown | Odor: fuel oil

**Exact Location** (inc. address, facility name, mileage, bldg. #, etc.)
Murphy Oil Refinery, Stinson Avenue

| City: Superior | County: Douglas | Lat/long: |
|---|---|---|
| DNR Region: NWD | ¼ ¼ sec TN R | Weather Cond.: |

**Cause of Incident**
Fuel oil ran over top of tank. 52

**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

**Action Taken By Spiller**
- ☐ No Action Taken
- ☐ No Action Needed
- ☐ Monitor
- ☒ Cleanup Method: Recovery
- ☐ Waste Destination:
- ☒ Containment
- ☐ Contractor Hired
  Name:
- ☐ Other:

| Injuries? ☐ Yes ☒ | Has an evacuation occurred? ☐ Yes ☒ No | Potential? ☐ |
|---|---|---|

Are there any resource damages? ☐ Yes ☒ No ☐ Potential What kinds? ☐

**Other Agencies Notified:** Check (✓) 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) John Krull | (Sign) John A. Krull | Date: 02-09-96 | Rpt'd to DATCP? ☐ Yes ☐ |
|---|---|---|---|
| Person Notified: N.A. | Region Notified: N.A. | Time: | Date: |
| Invstgtd By: (Print) John Krull | (Sign) | Date: | Site Closed? ☐ Yes ☒ No |
| Spill Coordinator Signoff: | Date: | Transferred to ERP? ☐ No ☐ Yes; Case # | NFA Letter Sent? ☐ Yes ☒ No<br>Spill Packet Sent? ☐ Yes ☒ No |

☐ Additional Comments on Reverse

PLEASE PRINT

**State of Wisconsin Substance Release Report (Cont.)**

Form 4400-91 Rev. 11-95

| **Date and Military Time of Incident** 02-08-96 13:15 | **Responsible Party** Murphy Oil USA |
|---|---|

**Additional Comments:**

Contacted the reporting person on 02-09-96, 12:05. Talked with representative of CEDA.

MURPHY
OIL USA, INC.

SUPERIOR REFINERY
P O BOX 2066
SUPERIOR WISCONSIN 54880

February 15, 1996

Steve LaValley
Area Hazardous/Solid Waste Specialist
Department of Natural Resources
1705 Tower Avenue
Superior, WI 54880

RE: #6 Fuel Oil Release

Dear Mr. LaValley:

On behalf of Murphy Oil USA, Inc. I am providing written confirmation of the notification given on February 8, 1996, regarding the release of #6 fuel oil.

On February 8, 1996, at 13:15 p.m., Murphy Oil experienced a release of approximately 30 barrels of #6 fuel oil. The release occurred when tank 52 overflowed. The overflow was discovered while transferring product from tanks 13 and 14 into tank 52. A second fill valve which is not normally used to fill tank 52 was opened earlier by a pumper. The #6 fuel oil from tank 53 would flow into tank 52 each time the transfer pump was started to fill a truck at the loading rack. This additional flow resulted in the overflow of tank 52. Upon discovery the valve was immediately closed. The spill area was located around the base circumference of the tank and extended outward approximately one to two feet in distance.

A spill contractor was on site and began remediation immediately. The heavy #6 fuel oil set up very quickly due to the low air temperatures. The frozen surface clay allowed the product to be removed easily and re-introduced into the #1 API separator for oil recovery. Murphy will remove approximately 6 inches of clay from around the tank. Murphy Oil believes the site will have been cleaned to the extent practicable.

If you have any questions or wish to discuss this matter further, please call me at (715)398-8217.

Sincerely,

William P. Gustafson
Environmental Operations Superintendent

bg.093

cc: Jim Gesick
Jim Britt
Jim Kowitz
Randy Kooiman
Rick Lewandowski



SPUR

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

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

Northwest District Headquarters
PO Box 309, Hwy 70 West
Spooner, WI 54801-0309
TELEPHONE 715-635-2101
FAX 715-635-4105
TDD 715-635-4001

February 27, 1996

Mr. William P. Gustafson
Environmental Operations Superintendent
Murphy Oil U.S.A. Inc.
Superior Refinery
P.O. Box 2066
Superior, WI 54880

Subject: #6 Fuel Oil Release on February 8, 1996
Superior Refinery Tank 52,
Douglas County, Wisconsin

Dear Mr. Gustafson:

Based on the information we have received, the Department believes that you are responsible for restoring the environment at this site under Section 144.76, Wisconsin Stats. (hazardous substance spills laws). We have received your letter confirming the release of approxiamately 30 barrels of #6 fuel oil. Your letter indicates that pooled oil formed around the base of the tank. We understand that the oil was collected and returned to the #1 API oil/water separator for recovery. You have indicated that Murphy intends to remove approximately six inches of clay in the area around the tank.

Based on the quantity of the spill we believe that sampling is warranted to confirm removal of contamination to ch. NR 720 Wis. Adm. Code standards. After you perform the excavation of the six inches of clay, we request that samples representative of the spill area be taken for documentation of site closure. In addition, we are requesting the following information be submitted:

1. Location of the discharge incident, including street address; quarter-quarter section; and legal description of lot, if located in platted area. (A Murphy Oil refinery map with a location of the release identified would be useful.)

2. The type, total volume and final disposition of the discharged hazardous substance and contaminated material generated as part of the immediate action. Including legible copies of manifest, receipts and other relevant documents

The documentation should be submitted to the following address:

Northwest District Spills Coordinator
Department of Natural Resources
Hwy 70 West
P.O. Box 309
Spooner, WI 54801

Please forward this information to the Department by later then April 26, 1996. Upon receipt of this information it will be forwarded to the district case closure committee for their consideration.

If you should have any questions regarding this letter please feel free to call me at (715) 635-4058.

Sincerely,

James A. Hosch

James A. Hosch
Northwest District Spills Coordinator

cc: Gary LeRoy - Spooner
Warden Lee Wiesner - Brule
Steve LaValley - Superior
John Krull - Superior

WISCONSIN
DEPT. OF NATURAL RESOURCES

**State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES**

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

Northwest District Headquarters
810 West Maple
Spooner, WI 54801
TELEPHONE 715-635-2101
FAX 715-635-4105
TDD 715-635-4001

September 5, 1996

Mr. William P. Gustafson
Environmental Operations Superintendent
Murphy Oil U.S.A. Inc.
Superior Refinery
P.O. Box 2066
Superior, WI 54880

Subject: Spill at Murphy Oil on February 8, 1996
Superior, Douglas County, Wisconsin

Dear Mr. Gustafson:

You may recall my letter of February 27, 1996 ( I have attached a copy for your convenience). At that time we asked that the requested information be submitted later then April 26, 1996. At this time, we are asking that the requested information be submitted by October 11,1996.

As stated in my previous letter, we are requesting the laboratory results of sampling to confirm the removal of contamination to ch. NR 720 Wis. Adm. Code standards be submitted. In addition, we are requesting the following information be submitted:

1. Location of the discharge incident, including street address; quarter-quarter section; and legal description of lot, if located in platted area.

2. The type, total volume and final disposition of the discharged hazardous substance and contaminated material generated as part of the immediate action. Include legible copies of manifest, receipts and other relevant documents.

The documentation and sampling results should be submitted to my attention at our new address:

Department of Natural Resources
810 West Maple
Spooner, WI 54801

Again, please forward this information to the Department by no later then October 11, 1996. Upon receipt of this information it will be forwarded to the district case closure committee for their consideration.

If you should have any questions regarding this letter please feel free to call me at (715) 635-4058.

Sincerely,

James A. Hosch
Northwest District Spills Coordinator

Attach.

cc: Steve LaValley - Superior

State of Wisconsin
Department of Natural Resource

# TOXIC AND HAZARDOUS SPILL REPORT

4400-91 Rev. 6-86

te Div. Emergency Gov't. (608) 266-3232
U.S. Nat'l. Response Center (800) 424-8802
Chemtrec/Pesticides/Chlorine (800) 424-9300

Spill ID Number 04-16-049234 pdf
Y Y M M D D 0-99

| Date of Incident | Day of Week | Time of Incident | | Reported By (Name) | Telephone Number |
|---|---|---|---|---|---|
| 1-14-94 | Friday | 4:00 | [X] A.M. [ ] P.M. | Bill Gustafson | ( 715 ) 398-3533 |
| **Date Reported** | **Day of Week** | **Time Reported** | | **Agency or Firm Reporting** | **Reported thru Div. Emergen. Gov't.** |
| 1-14-94 | Friday | 1:00 | [ ] A.M. [X] P.M. | Murphy Oil USA | [X] Yes [ ] No |

| Substance Involved | Quantity | Units | Person or Firm Responsible |
|---|---|---|---|
| #5 Fuel Oil | 4200 | Gallon | Murphy Oil USA |
| Substance Involved | Quantity | Units | Contact Name / Telephone Number |
| | | | Bill Gustafson ( 715 ) 398-3533 |

**Physical Characteristics**
[ ] Solid [X] Liquid [X] Semisolid [ ] Gas
Solidfying in -0° F weather
Color Brown
Odor

**Address — Street or Route**
PO Box 2066

**City, State, Zip Code**
Superior WI 54880

**Cause of Incident**
Overfill

**Exact Location Description (intersection, mileage, etc.)**
Tank #51 berm area

| County Location | ¼¼, ¼, Section, Town, Range |
|---|---|
| Douglas | __ __, __ __, __ __, T__ __ N, R__ __ __ |

| DNR Dist | DNR Area | Groundwaters Affected |
|---|---|---|
| NWD | BRL | [ ] Yes [ ] No [X] Potential |

| Surface Waters Affected | Name of Surface Water |
|---|---|
| [ ] Yes [X] No [ ] Potential | |

| Date District Notified | Day of Week | Time District Notified |
|---|---|---|
| | | [ ] A.M. [ ] P.M. |

| District Person Notified | Telephone Number |
|---|---|
| | ( ) |

| Date Investigated | Day of Week | Time Investigated |
|---|---|---|
| 1-14-94 | Friday | 3:00 [ ] A.M. [X] P.M. |

| Person Investigating | Telephone Number |
|---|---|
| Steve LaValley | ( 715 ) 392-7831 |

**Action Taken By DNR**
[ ] No Action Taken [X] Investigation [ ] Supervise/Conduct Cleanup
[X] Spiller Required To Take Action; Type Pick up and test area
[ ] Contractor Hired By DNR; Name
[ ] Amount Recovered
[ ] 29.29 Enforcement

**Other Agencies on Scene**
Local
State
Federal

**Action Taken By Spiller**
[ ] No Action Taken [ ] No Notification [ ] Investigate
[X] Containment; Type Berm
[X] Cleanup; Method Solidify and pick up
[ ] Amount Recovered
[ ] Monitor
[ ] Contractor Hired; Name
[ ] Other Action

**Spill Location**
[ ] Industrial Facility/Paper Mill/Chem. Co.
[ ] Gas/Service Station/Garage, Auto Dealer, Repair Shop
[ ] Ag Coop/Facility/Cheese Factory/Creamery
[ ] Other Small Business (bank, grocery, insurance co., etc.)
[ ] Public Property (city, county, state, church, school, etc.)
[ ] Utility Co., Power Generating/Transfer Facility
[ ] Private Property (home/farm)
[ ] Pipeline, Terminal, Tank Farm, Oil Jobber/Wholesaler
[ ] Transportation Accident, Fuel Supply Tank Spill
[ ] Transportation Accident, Load Spill
[ ] Construction, Excavation, Wrecking, Quarry, Mine
[X] Other Oil refinery

**Spilled Substance Destination**
[ ] Air
[X] Soil
[ ] Groundwater
[ ] Surface Water
[ ] Storm Sewer
[ ] Sanitary Sewer
[ ] Contained/Recovered
[ ] Other

**Person Filing This Report (print name)**
Steve LaValley

**Signature** Steve LaValley **Date Signed** 1-14-94

**Additional Comments:**

DISTRICT