CON 12-15
Doc #15178

From: "Porter, Brian" <brporter@terracon.com>
To: "Tami Rice" <Tami.Rice@dnr.state.ia.us>
Date: 1/11/2007 2:32:39 PM
Subject: RE: FW: Olsen Engineering Work Plan

Thanks Tami! Regarding schedule, I just don't know. Let's see if I can ballpark something. I plan on making bids due by January 26. I anticipate that it might take something like a week for Welsh and Terracon to review the bids -- that puts us at February 2 for a decision. Then Welsh and the contractor need to negotiate a contract - say another week or two? That puts us at mid-February. Then contractor schedules come into play. If I had to guess, I'd say that we might be digging in March and a report might be coming your way in April.

Of course, I'm a better engineer than I am a fortune teller, so keep that in mind. ;-)

Brian

-----Original Message-----
From: Tami Rice [mailto:Tami.Rice@dnr.state.ia.us]
Sent: Thursday, January 11, 2007 2:27 PM
To: Porter, Brian
Cc: djohnson@welshco.com
Subject: Re: FW: Olsen Engineering Work Plan

Brian,

I reviewed the Remediation Work Plan and it is acceptable. Have we agreed upon a general deadline to submit the remedial summary report? I understand that weather plays a role in completing field work but it gives me a general idea of when to expect further contact or follow up on the site. If possible to get that to me yet today, I can add that in my formal work plan response letter and get that sent out this afternoon.

Thanks,
Tami

Tami S. Rice
Environmental Specialist
Iowa Department of Natural Resources
Contaminated Sites Section
502 East 9th Street
Des Moines, Iowa 50319
Ph: (515) 281-4420
Fax: (515) 281-8895

>>> "Porter, Brian" <brporter@terracon.com> 1/11/2007 1:46:05 PM >>>
Tami,

Just a reminder that when you're reading the work plan, there's quite a bit of information in there that may not interest the IDNR specifically - certain sections are there more for the benefit of potential bidders

(I plan to provide them with the work plan).

Brian

-----Original Message-----
From: Porter, Brian
Sent: Friday, January 05, 2007 3:43 PM
To: 'Tami Rice'
Cc: 'JBrumback@WelshCo.com'; David Johnson (djohnson@welshco.com)
Subject: RE: Olsen Engineering Work Plan

No problem, Tami! Our new contact at Welsh is David Johnson, and his information is attached. David replaces John Brumback on this project and is copied on this email.

-Brian

-----Original Message-----
From: Tami Rice [mailto:Tami.Rice@dnr.state.ia.us]
Sent: Friday, January 05, 2007 3:29 PM
To: Porter, Brian
Cc: John Brumback
Subject: Re: Olsen Engineering Work Plan

Thanks Brian, I should be able to respond by the end of next week.

Tami S. Rice
Environmental Specialist
Iowa Department of Natural Resources
Contaminated Sites Section
502 East 9th Street
Des Moines, Iowa 50319
Ph: (515) 281-4420
Fax: (515) 281-8895

>>> "Porter, Brian" <brporter@terracon.com> 1/5/2007 3:06 PM >>>
Hey Tami!

Here it is. As we discussed, I went a bit more formal that you needed, so that I could use this document as background information for soliciting contractor bids for remediation. An original is going in the mail. Feel free to give me a call if you have any questions. <<Work Plan.pdf>>

Brian Porter, PE
Senior Project Manager | Environmental
Terracon
870 40th Avenue | Bettendorf, Iowa 52722 P 563.355.0702 | F 563.355.4789
| M 563.370.0921 brporter@terracon.com | www.terracon.com

Terracon is a dynamic and growing consulting firm of engineers and scientists providing multiple related service lines to local, regional,

and national clients.

CC: <djohnson@welshco.com>

January 5, 2007

Terracon
Consulting Engineers & Scientists

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Iowa Department of Natural Resources
Contaminated Sites Section
502 East 9th Street
Des Moines, Iowa 50319

Attention: Ms. Tami Rice
Environmental Specialist

Re: Remediation Work Plan
Olsen Engineering Facility
1100 East LeClaire Road
Eldridge, Iowa
Terracon Project No. 07067047

Dear Ms. Rice:

Per our discussions and previous correspondence, Terracon is pleased to present this Remediation Work Plan on behalf of our client and the owner of the Olsen Engineering (Olsen) facility, Welsh Companies, LLC (Welsh).

The intent of the proposed remediation activities is to remove vadose zone (i.e., above the water table) soil exhibiting elevated concentrations of cutting/cooling oils (hereafter, machining oils) used in metal fabrication activities at the site. The suspected source of the impact are releases of used machining oil from a concrete pad along the eastern wall of "Building 2" located north of Olsen's main manufacturing building. Suspected releases occurring near this area over time have resulted in subsurface impact near Building 2. Information on the types of machining oils used by Olsen indicates that they are of low volatility, contain emulsifiers, and are generally non-toxic. See the attached Material Safety Data Sheet (MSDS) for HOCUT 795, the machining oil currently used by Olsen.

1.0 SUMMARY OF EXISTING INFORMATION

1.1 Previous Assessment Results

The attached Figure 2 (from Terracon's investigation report) depicts the location of the soil borings and sample locations discussed in this section. Analytical data tables summarizing the laboratory results are also attached.

Prior to Welsh's acquisition of the property in 2006, Nova Consulting Group, Inc. (Nova) conducted Phase I and Phase II Environmental Site Assessments (ESAs) of the property. These documents were previously provided to the Iowa Department of Natural Resources

(IDNR). The Phase I ESA identified the potential for subsurface impact due to machining oils used by Olsen. In order to assess whether impact was actually present, Nova conducted a Phase II ESA that consisted of the collection of groundwater samples from 10 soil borings (designated GP-1 through GP-10). A laboratory analyzed each groundwater sample for total extractable hydrocarbons (TEH). The laboratory reported concentrations of TEH in samples from three locations; GP-1, GP-2, and GP-3. Soil boring GP-1 was located north of Olsen's main manufacturing building. Soil borings GP-2 and GP-3 were located near "Building 2" on the northern portion of the property.

Terracon subsequently conducted a Limited Site Investigation (LSI) that included the collection of soil and groundwater samples for analysis of benzene, toluene, ethylbenzene, xylenes (BTEX), and polycyclic aromatic hydrocarbons (PAHs). The IDNR was previously provided with a copy of Terracon's LSI report. Terracon's scope of services included soil and groundwater assessment near and around locations GP-1, GP-2, and GP-3. The intent was to approximate the extent of impact by collecting samples at and near those locations previously assessed. The laboratory did not detect BTEX or PAHs above state regulatory levels.

Terracon provided Nova's Phase I and Phase II ESAs and Terracon's LSI to the IDNR for review and comment. The IDNR requested additional investigation activities to further delineate the extent of groundwater impact and to measure TEH concentrations at select locations at the site. The IDNR also requested that Terracon install a temporary monitoring well near the "source" of the impact (GP-2/GP-2R) to check for the presence of free product. In December 2006, Terracon mobilized to the site and conducted the additional investigation work. The analytical results for the December 2006 investigation and previous work are summarized on the attached tables. Terracon did not observe free product at GP-2/GP-2R. The investigation also delineated groundwater concentrations to the IDNR's satisfaction.

1.2 Soil and Groundwater Conditions

During its LSI, Terracon encountered approximately 10 to 24 inches of crushed limestone aggregate in the drive and parkway areas (GP-2R, GP-11, GP-12, and GP-14) and 1 to 2 feet of topsoil in the green spaces (GP-1R, GP-3R, and GP-13). In each soil boring, Terracon encountered silty clay below the surface material. At a depth of approximately 4 to 6 feet below ground surface (bgs), Terracon encountered a water bearing, sandy layer. The sandy layer ranged in thickness from 1 to 4 feet. Below the sandy layer, Terracon encountered highly plastic, dense clay. With the exception of soil borings GP-1R and GP-13, this clay layer extended to the maximum depths explored. At GP-1R and GP-13, Terracon encountered a second water bearing, sandy layer from approximately 11 feet bgs to the boring terminuses. Terracon's field crew noted an apparent petroleum odor within the uppermost sandy layer in soil borings GP-2R and GP-12.

In each soil boring, Terracon encountered groundwater in the sandy layers. Depth to water measurements obtained during the fieldwork indicated a slight artesian (upward) pressure. The field crew observed a sheen on the groundwater at soil boring location GP-2R.

2.0 PROPOSED REMEDIATION

The intent of the proposed scope of services is to address soil impact near Building 2. Although groundwater impact exists at the site, the suspected source of the impact is vadose zone soil above the water table. Terracon expects that removal of this source material will prevent further impact to groundwater, and that existing groundwater impact will naturally attenuate. Natural attenuation of groundwater is supported by the hydraulic conductivity measured by others at an adjoining leaking underground storage tank (LUST) site (0.211 and 0.249 meters per day), availability of municipal water, and the lack of nearby potable water wells.

2.1 Area to be Remediated

Terracon proposes conventional dig-and-haul technology to address potentially saturated soil conditions near GP-2/GP-2R, GP-12, and GP-14. Based on the analytical results and field observations, soil at locations GP-3/GP-3R, GP-11, and GP-13 appear to be relatively unimpacted. Terracon used straight-line interpolation to estimate the midpoint between these locations and GP-2/GP-2R. This results in a rectangular area measuring approximately 180 feet north-south by 90 feet east-west, generally centered over GP-2/GP-2R. The rectangular area abuts the property boundary east of GP-12 and extends approximately 20 feet south of GP-14. The area also includes the eastern portion of Building 2.

Based on the soil boring logs, the potentially impacted material is likely present to a depth of approximately 8 feet below ground surface, or the top of the lower clay layer. Using these dimensions, Terracon calculated a volume for soil removal of 4,800 cubic yards. Currently, the total volume includes soil beneath Building 2; however, Welsh does not plan to demolish this structure. Its continued presence serves as a barrier to restrict occupant exposure to impacted materials. During contractor bid solicitation, Welsh may request an optional component that includes removal of the existing pad east of Building 2 and replacement with a new pad that includes a "roll-over" curb to prohibit the release of machining oils to the subsurface, should totes continue to be stored on the pad.

2.2 Transport and Disposal of Excavated Material

The excavated material will be loaded onto trucks lined with plastic for transport to the Scott County Landfill in Buffalo, Iowa. According to conversations with Mr. Keith Krambeck of the

landfill, this material can be disposed of as non-hazardous waste and managed in their land farming program.

2.3 Confirmation Criteria

The IDNR has indicated that visual and/or olfactory criteria are sufficient to document removal of the soil impact. Terracon will provide an environmental technician during the remediation activities to observe the remediation and document the remediation activities. Terracon anticipates that the depth of the excavation will be limited by the depth to groundwater; however, the activity will be geared towards the removal of as much impacted soil from the "smear zone" (i.e., the depth interval near the water table where groundwater impact influences soil concentrations) as practical. Terracon will document the appearance of the excavation sidewalls with photographs. Additionally, rough excavation dimensions will be measured in the field using a measuring tape, walking wheel, or equivalent.

2.4 Backfill

The source of the backfill material will be at the discretion of the selected contractor; however, Welsh will specify that the material must originate from an off-site, unimpacted source. The contractor will be required to provide backfill material that comprises of approved materials; is free of organic matter, frozen material, and debris; with a liquid limit less than 45 and a maximum plasticity index of 20.

The contractor will place the backfill in horizontal lifts of 9 inches or less in loose thickness. The contractor will be responsible for compacting each lift to at least 95% of the material's maximum standard Proctor dry density (ASTM D 698). However, the degree of compaction will be increased to at least 98% of the material's maximum standard Proctor dry density for backfill placed within 12 inches of the surface. The density of the placed backfill will be confirmed by up to three density tests per lift. The contractor will be required to compact low plasticity cohesive fill near the material's optimum moisture content as determined by the standard Proctor test. If granular fill is used, it will be compacted at workable moisture contents.

Based on an anticipated final surface consisting of gravel drive areas, extensive subgrade preparation should not be necessary. The contractor will be required to proofroll the final lift of backfill below the gravel using rubber-tired equipment with a gross weight of at least 25 tons (e.g., a loaded tandem axle dump truck).

2.5 Documentation

Following the completion of the remediation activities, Terracon will prepare and submit a brief report to the IDNR documenting the completed work. At a minimum, the report will include the following.

- the dates of the remediation activities
- a brief narrative description of the activities, including identification of the contractor
- a narrative describing unanticipated deviations from this work plan
- a rough estimate of the size of the final excavation
- photographic documentation
- records of landfill disposal (e.g., scale tickets, etc.)
- identification of the source for the backfill material

Upon IDNR's approval of the documentation, Welsh anticipates receipt of an "opinion" letter (sometimes referred to as a comfort letter) regarding conditions at the Olsen site.

3.0 CLOSING

Terracon and Welsh appreciate the IDNR's assistance with this project and look forward to working with the Department to remediate residual soil impact. If you have any questions concerning this information, feel free to contact Brian Porter at (563) 355-0702.

Sincerely,
Terracon

Brian Porter, PE
Senior Project Manager

John F. Brimeyer, PE, CGP
Environmental Department Manager

Attachments: MSDS for HOCUT 795
Figure 2 - Soil Boring Location Map from Terracon's LSI
Soil Analytical Results
Groundwater Analytical Results
Figure 3 - Area to be Remediated

Copies to: Addressee (1)
John Brumback, Welsh (1)

BRP/JFB/edl/wkb/bp3
N:\Projects\2006\07067047\reports\Remediation Workplan\Work Plan.doc

Houghton International Inc.

Revision Date : 12/02/2005

Material Safety Data Sheet
HOCUT 795

1. Chemical Product and Company Identification

Product Name	HOCUT 795	Emergency Phone Number	24 HOUR - (800) 424-9300 (CHEMTREC)
Company Name	Houghton International Inc. Madison & Van Buren Aves Valley Forge, PA 19482	FAX	(610) 666-1376
Website	www.houghtonintl.com	Customer Service	(888) 459-9844
Telephone	(610) 666-4000		

2. Hazardous Ingredients

Component	Cas No	% by Weight	Hazards
Mineral Oil	64742-52-5	30-60	TLV: 5 mg/m³ as oil mist PEL: 5 mg/m³ as oil mist STEL: 10 mg/m³ as oil mist Other:

N/E - Not Established; N/A - Not Applicable; Mfr - Manufacturer Recommendation

3. Hazards Identification

Primary Entry Routes	EYES, SKIN, INHALATION
Acute Effects	
Inhalation	INHALATION OF MISTS MAY CAUSE IRRITATION OF THE UPPER RESPIRATORY TRACT.
Eye	MAY CAUSE EYE IRRITATION.
Skin	PROLONGED OR REPEATED SKIN CONTACT MAY CAUSE IRRITATION.
Ingestion	INGESTION MAY CAUSE NAUSEA OR DISCOMFORT. ASPIRATION MAY CAUSE LUNG DAMAGE.
Carcinogenicity	THIS PRODUCT DOES NOT CONTAIN ANY COMPONENT REPORTABLE AS A CARCINOGEN UNDER 29 CFR 1910.1200.
Medical Conditions Aggravated by LongTerm Exposure	PRE-EXISTING SKIN AND RESPIRATORY CONDITIONS MAY BE AGGRAVATED BY EXPOSURE.
Chronic Effects	SEE EFFECTS ABOVE.
HMIS:	

Continued on Next Page

3. Hazards Identification - continued

Health	1
Flammability	0
Reactivity	0

* indicates that there may be chronic health effects present

4. First Aid Measures

Inhalation	IF INHALED, REMOVE TO A SOURCE OF FRESH AIR.
Eye Contact	FLUSH EYES WITH WATER FOR 15 MINUTES. CONSULT PHYSICIAN.
Skin Contact	WASH SKIN WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING AND LAUNDER BEFORE REUSING. CONSULT PHYSICIAN IF IRRITATION PERSISTS.
Ingestion	IF INGESTED, DO NOT INDUCE VOMITING. CONSULT PHYSICIAN.
Note to Physicians	NO SPECIFIC ANTIDOTE KNOWN. BASED ON INDIVIDUAL REACTIONS OF THE PATIENT, THE PHYSICIAN'S JUDGMENT SHOULD BE USED TO CONTROL SYMPTOMS AND CLINICAL CONDITIONS.

N/A - Not Applicable

5. Fire Fighting Measures

Flash Point	N/A - PRODUCT CONTAINS WATER
Autoignition Temperature	N/D
LEL	N/D
UEL	N/D
Extinguishing Media	IF WATER IS REMOVED, USE CARBON DIOXIDE, DRY CHEMICAL OR FOAM.
Unusual Fire or Explosion Hazards	CLOSED CONTAINERS MAY SWELL AND RUPTURE WHEN EXPOSED TO EXTREME HEAT. USE WATER SPRAY TO COOL CONTAINERS EXPOSED TO FIRE AND HEAT.
Fire Fighting Instructions	WEAR PROTECTIVE GEAR DURING FIREFIGHTING.

NFPA:

Health	1

5. Fire Fighting Measures - continued

Flammability	0
Reactivity	0
Special	N/A

N/A - Not Applicable; ND - Not Determined; > - Greater Than; < - Less Than

6. Accidental Release Measures

Spill or Release Procedures: APPLY DRY ABSORBENT MATERIAL AND SWEEP UP THOROUGHLY. FLUSH AREA WITH WATER AND MOP UP THOROUGHLY.

7. Handling and Storage

Handling Precautions: USE WITH ADEQUATE VENTILATION. AVOID CONTACT WITH EYES, SKIN AND CLOTHING. WASH THOROUGHLY AFTER HANDLING. DO NOT ADD NITRITES TO THIS PRODUCT.

Storage Requirements: KEEP AWAY FROM STRONG OXIDIZERS. KEEP CONTAINERS CLOSED WHEN NOT IN USE. STORE IN A COOL, DRY, WELL VENTILATED AREA.

8. Exposure Controls/Personal Protection

Engineering Controls: PROVIDE GENERAL AND/OR LOCAL EXHAUST VENTILATION TO MAINTAIN AIRBORNE CONCENTRATIONS BELOW THE EXPOSURE LIMITS IN SECTION 2.

Personal Protective Equipment

Eye/Face Protection	WEAR SAFETY GOGGLES OR SAFETY GLASSES WITH SIDE SHIELDS.
Skin Protection	WEAR GLOVES AND LONG SLEEVES IF NECESSARY TO MINIMIZE SKIN CONTACT. USE APRON OR OVERALLS IF SPLASHING IS POSSIBLE.
Respiratory Protection	USE AN APPROVED RESPIRATOR (SEE 29CFR1910.134) IF THE EXPOSURE LIMITS ARE EXCEEDED.
Other	EYE WASH AND SAFETY SHOWER RECOMMENDED.

Comments: USE OF GLOVES AND OTHER SKIN PROTECTION DEPENDS ON THE DURATION OF EXPOSURE AND THE TASK BEING PERFORMED. IF NECESSARY, CHEMICALLY RESISTANT GLOVES SUCH AS NEOPRENE, NITRILE OR EQUIVALENT MATERIALS MAY BE USED.

Continued on Next Page

8. Exposure Controls/Personal Protection - continued

Comments: Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, or applying cosmetics.

9. Physical and Chemical Properties

Appearance	AMBER LIQUID	Water Solubility	EMULSIFIES
Odor	AMINE/OIL ODOR	Boiling Point	> 212°F
Vapor Pressure (mmHg)	N/D	Freezing/ Melting Point	N/D
Vapor Density (Air = 1)	N/D	Evaporation Rate (BuAc = 1)	< 1
Specific Gravity (Water = 1)	0.952		
pH (Neat)	10.3		
pH (Dilution)			
At Percent	5		
pH	9.7		

N/D - Not Determined; N/A - Not Applicable; > - Greater Than; < - Less Than

10. Stability and Reactivity

Stability	THIS PRODUCT IS STABLE AT ROOM TEMPERATURE IN CLOSED CONTAINERS UNDER NORMAL STORAGE AND HANDLING CONDITIONS.
Chemical Incompatibilities	STRONG OXIDIZERS
Hazardous Decomposition Products	THERMAL; OXIDES OF CARBON AND NITROGEN
Hazardous Polymerization	HAZARDOUS POLYMERIZATION WILL NOT OCCUR.

Continued on Next Page

11. Toxicological Information

NO DATA AVAILABLE

12. Ecological Information

NO DATA AVAILABLE

13. Disposal Considerations

Disposal	FOLLOW PERTINENT REGULATIONS FOR DISPOSAL. IT IS THE RESPONSIBILITY OF THE PRODUCT USER TO DETERMINE, AT THE TIME OF DISPOSAL, WHETHER A MATERIAL CONTAINING THE PRODUCT OR DERIVED FROM THE PRODUCT SHOULD BE CLASSIFIED AS A HAZARDOUS WASTE. (40 CFR 261.20-24)
RCRA Hazardous Waste Number	N/A

14. Transportation Information

Proper Shipping Name	NOT HAZARDOUS UNDER DOT, AIR OR IMO REGULATIONS.

15. Regulatory Information

TSCA Section 8(b)	ALL OF THE COMPONENTS IN THIS PRODUCT ARE ON THE TSCA INVENTORY.
CERCLA Reportable Quantity	NONE
SARA Title III, Section 313	THIS PRODUCT CONTAINS NO TOXIC CHEMICAL SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF TITLE III OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 AND 40 CFR PART 372.
Ozone Depleting Substances	THIS PRODUCT WAS NOT MANUFACTURED, DOES NOT CONTAIN, AND WAS NOT PACKAGED USING ANY CLASS I OR CLASS II OZONE DEPLETING SUBSTANCE AS DEFINED BY THE CLEAN AIR ACT.

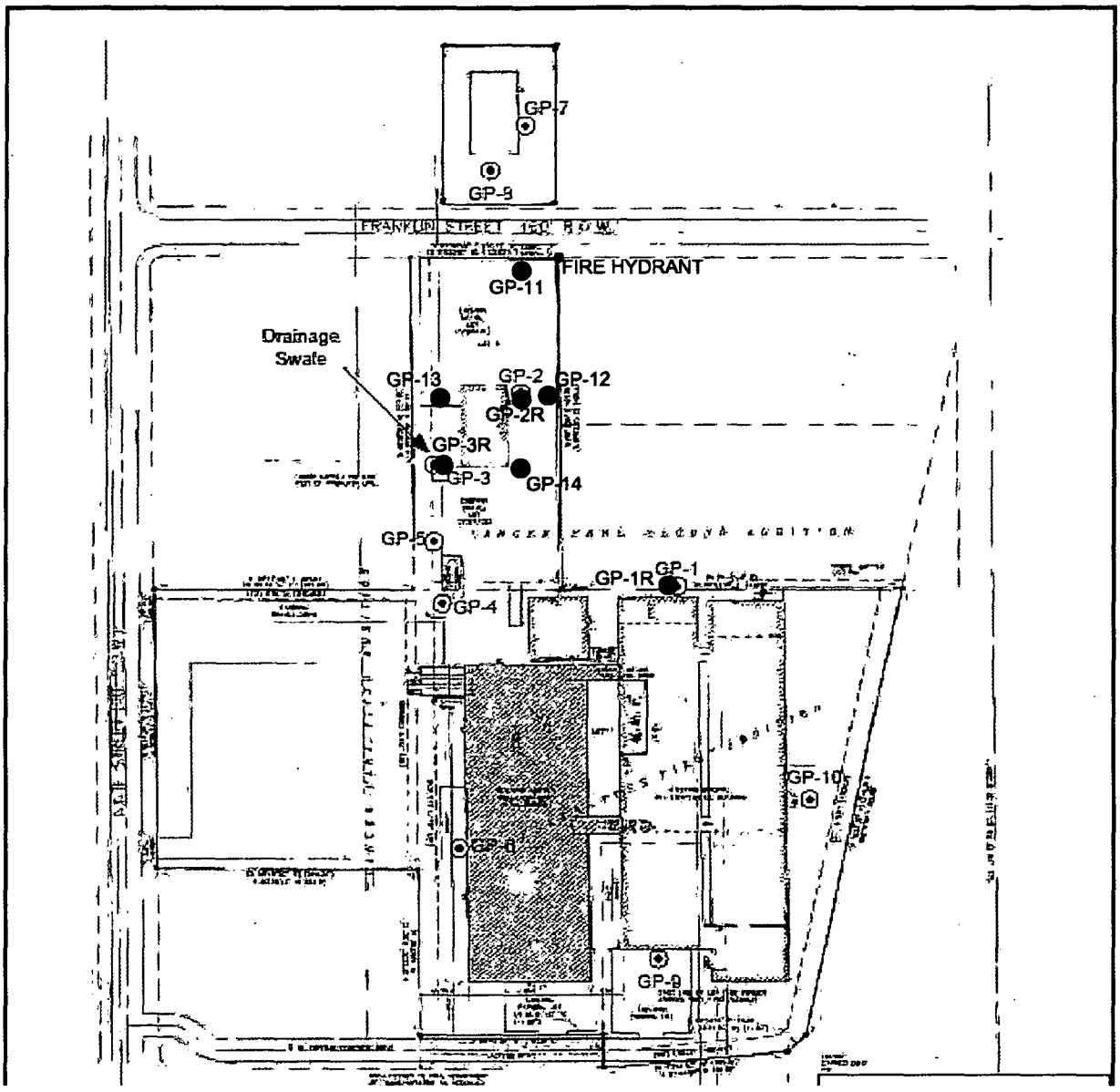
Material Safety Data Sheet
HOCUT 795

16. Other Information

Prepared By GARY CARL

Title MANAGER, PRODUCT SAFETY

Disclaimer: The information presented herein has been compiled from sources considered to be dependable and is accurate as of the date issued. However, since data, safety standards, and government regulations are subject to change and the conditions of handling and use are beyond our control, Houghton International makes no warranty regarding the accuracy of such data or its suitability for any purchaser's use or for any consequence of its use. The data in this MSDS relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process. Safe handling and use remains the responsibility of the purchaser and the purchaser has the sole responsibility to determine the suitability of the materials for any use and the manner of use contemplated. Houghton International assumes no responsibility for injury to the recipient or to third persons or for any damage to any property and the recipient assumes all such risks.



LEGEND

——— Approximate site boundary

⊙ Former Geoprobe soil boring location

● Terracon's approximate Geoprobe soil boring location

N

0 100 200

Approximate scale (Feet)

DIAGRAM IS FOR GENERAL LOCATION ONLY AND NOT INTENDED FOR CONSTRUCTION PURPOSES
THIS DRAWING WAS BASED ON A DRAWING PROVIDED BY NOVA ENGINEERING

SOIL BORING LOCATION MAP
LIMITED SITE INVESTIGATION
OLSEN ENGINEERING
1100 LECLAIRE ROAD
ELDRIDGE, IOWA

Project Mngr:	SC	Terracon	Project No. 07067029
Designed By:	AAH		Approximate Scale: 1"=200'
Drawn By:	AAH	870 40th Avenue Bettendorf, Iowa 52722	Date: 05-19-2006
Checked By:			File No: 07067029 D2
Approved By:	SC	Figure No.	2

	Sample Location / Name		GP-1R	GP-2R	GP-3R	GP-11	GP-12	GP-13	GP-14
	Depth Interval (feet bgs)		4-6	6-8	6-8	6-8	6-8	4-6	6-8
	Date Collected		5/17/2006	5/17/2006	5/17/2006	5/17/2006	5/17/2006	5/17/2006	5/17/2006
CAS #	Chemical	Units							
—	TEH-Gasoline	mg/kg	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
—	TEH-Diesel	mg/kg	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
—	TEH-Oil	mg/kg	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
—	TEH-Total	mg/kg	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
71-43-2	Benzene	mg/kg	<0.000463	0.000685	<0.000457	<0.000418	<0.000493	<0.000409	<0.000324
108-88-3	Toluene	mg/kg	<0.000370	0.00261	<0.000365	<0.000334	<0.000394	<0.000327	<0.000259
100-41-4	Ethylbenzene	mg/kg	<0.000440	0.00147	<0.000434	<0.000397	<0.000468	<0.000389	<0.000308
1330-20-7	Xylenes (total)	mg/kg	<0.00178	0.0365	<0.00176	<0.00161	<0.00190	<0.00158	<0.00125
83-32-9	Acenaphthene	mg/kg	<0.102	0.15	<0.103	<0.106	<0.100	<0.110	<0.0976
208-96-8	Acenaphthylene	mg/kg	<0.0942	<0.0970	<0.0949	<0.0979	<0.0927	<0.101	<0.0904
120-12-7	Anthracene	mg/kg	<0.0980	0.261	<0.0987	<0.102	<0.0964	<0.106	<0.0940
56-55-3	Benzo(a)anthracene	mg/kg	<0.106	<0.109	<0.106	<0.110	<0.104	<0.114	<0.101
50-32-8	Benzo(a)pyrene	mg/kg	<0.0930	<0.0957	<0.0937	<0.0966	<0.0915	<0.100	<0.0892
205-99-2	Benzo(b)fluoranthene	mg/kg	<0.103	<0.106	<0.104	<0.107	<0.101	<0.111	<0.0988
191-24-2	Benzo(g,h,i)perylene	mg/kg	<0.0942	<0.0970	<0.0949	<0.0979	<0.0927	<0.101	<0.0904
207-08-9	Benzo(k)fluoranthene	mg/kg	<0.106	<0.109	<0.106	<0.110	<0.104	<0.114	<0.101
218-01-9	Chrysene	mg/kg	<0.104	<0.107	<0.105	<0.108	<0.103	<0.112	<0.100
53-70-3	Dibenz(a,h)anthracene	mg/kg	<0.0741	<0.0763	<0.0747	<0.0770	<0.0729	<0.0798	<0.0711
206-44-0	Fluoranthene	mg/kg	<0.0955	<0.0983	<0.0962	<0.0992	<0.0939	<0.103	<0.0916
86-73-7	Fluorene	mg/kg	<0.103	0.399	<0.104	<0.107	<0.101	<0.111	<0.0988
193-39-5	Indeno(1,2,3-c,d)pyrene	mg/kg	<0.0930	<0.0957	<0.0937	<0.0966	<0.0915	<0.100	<0.0892
91-20-3	Naphthalene	mg/kg	<0.0967	1.64	<0.0975	<0.101	<0.0952	<0.104	<0.0928
85-01-8	Phenanthrene	mg/kg	<0.102	1.54	<0.103	<0.106	<0.100	<0.110	<0.0976
129-00-0	Pyrene	mg/kg	<0.113	0.589	<0.114	<0.117	<0.111	<0.122	<0.108
—	Total PAHs	mg/kg	Not Detected	4.579	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected

"Tier 1 Levels" for naphthalene are the "Chemical-Specific Values for Tier 1" from the IDNR's Tier 2 Guidance

	Sample Location / Name		Lowest IAC 135 Level or Statewide Standard	IAC 135 Levels				Statewide Standards
	Depth Interval (feet bgs)			Action Levels	Tier 1 Levels			
	Date Collected				Soil Leaching	Soil Vapor	Soil to PWL	
CAS #	Chemical	Units						
—	TEH-Gasoline	mg/kg	—	—	—	—	—	—
—	TEH-Diesel	mg/kg	3800	—	3800	47500	10500	—
—	TEH-Oil	mg/kg	—	—	—	—	—	—
—	TEH-Total	mg/kg	3800	3800	—	—	—	—
71-43-2	Benzene	mg/kg	0.54	0.54	0.54	1.16	1.8	88
108-88-3	Toluene	mg/kg	42	42	42	48	120	6100
100-41-4	Ethylbenzene	mg/kg	15	15	15	79	43	7600
1330-20-7	Xylenes (total)	mg/kg	15000	—	—	—	—	15000
83-32-9	Acenaphthene	mg/kg	3400	—	—	—	—	3400
208-96-8	Acenaphthylene	mg/kg	—	—	—	—	—	—
120-12-7	Anthracene	mg/kg	17000	—	—	—	—	17000
56-55-3	Benzo(a)anthracene	mg/kg	3.1	—	—	—	—	3.1
50-32-8	Benzo(a)pyrene	mg/kg	0.31	—	—	—	—	0.31
205-99-2	Benzo(b)fluoranthene	mg/kg	3.1	—	—	—	—	3.1
191-24-2	Benzo(g,h,i)perylene	mg/kg	—	—	—	—	—	—
207-08-9	Benzo(k)fluoranthene	mg/kg	31	—	—	—	—	31
218-01-9	Chrysene	mg/kg	310	—	—	—	—	310
53-70-3	Dibenz(a,h)anthracene	mg/kg	0.31	—	—	—	—	0.31
206-44-0	Fluoranthene	mg/kg	2300	—	—	—	—	2300
86-73-7	Fluorene	mg/kg	2300	—	—	—	—	2300
193-39-5	Indeno(1,2,3-c,d)pyrene	mg/kg	3.1	—	—	—	—	3.1
91-20-3	Naphthalene	mg/kg	7.6	—	7.6	95	21	1100
85-01-8	Phenanthrene	mg/kg	—	—	—	—	—	—
129-00-0	Pyrene	mg/kg	1700	—	—	—	—	1700
—	Total PAHs	mg/kg	—	—	—	—	—	—

"Tier 1 Levels" for naphthalene are the "Chemical-Specific Values for Tier 1" from the IDNR's Tier 2 Guidance

	Sample Location / Name		GP-1	GP-1R	GP-2	GP-2R	MW-GP2-R	GP-3	GP-3R	GP-4
	Date Collected		4/25/2006	5/17/2006	4/25/2006	5/17/2006	12/19/2006	4/25/2006	5/17/2006	4/25/2006
CAS #	Chemical	Units								
—	TEH-Gasoline	mg/L	0.12	Not Analyzed	<50	Not Analyzed	0.854	<0.10	Not Analyzed	<0.10
—	TEH-Diesel	mg/L	0.13	Not Analyzed	<50	Not Analyzed	**7.25**	0.3	Not Analyzed	<0.10
—	TEH-Oil	mg/L	<0.25	Not Analyzed	**1200**	Not Analyzed	**28.9**	**0.84**	Not Analyzed	<0.25
—	TEH-Total	mg/L	<0.25	Not Analyzed	**1300**	Not Analyzed	**37**	1.2	Not Analyzed	<0.25
71-43-2	Benzene	mg/L	Not Analyzed	<0.0001	Not Analyzed	<0.0005	Not Analyzed	Not Analyzed	<0.0001	Not Analyzed
108-88-3	Toluene	mg/L	Not Analyzed	<0.00009	Not Analyzed	<0.00450	Not Analyzed	Not Analyzed	<0.00009	Not Analyzed
100-41-4	Ethylbenzene	mg/L	Not Analyzed	<0.00044	Not Analyzed	<0.00220	Not Analyzed	Not Analyzed	<0.00044	Not Analyzed
1330-20-7	Xylenes (total)	mg/L	Not Analyzed	<0.00024	Not Analyzed	0.00125	Not Analyzed	Not Analyzed	<0.00024	Not Analyzed
83-32-9	Acenaphthene	mg/L	Not Analyzed	<0.00013	Not Analyzed	<0.00013	Not Analyzed	Not Analyzed	<0.00013	Not Analyzed
208-96-8	Acenaphthylene	mg/L	Not Analyzed	<0.00017	Not Analyzed	<0.00017	Not Analyzed	Not Analyzed	<0.00017	Not Analyzed
120-12-7	Anthracene	mg/L	Not Analyzed	<0.0000093	Not Analyzed	0.00386	Not Analyzed	Not Analyzed	<0.0000093	Not Analyzed
56-55-3	Benzo(a)anthracene	mg/L	Not Analyzed	<0.000019	Not Analyzed	<0.000019	Not Analyzed	Not Analyzed	<0.000019	Not Analyzed
50-32-8	Benzo(a)pyrene	mg/L	Not Analyzed	<0.000019	Not Analyzed	<0.000019	Not Analyzed	Not Analyzed	<0.000019	Not Analyzed
205-99-2	Benzo(b)fluoranthene	mg/L	Not Analyzed	<0.000037	Not Analyzed	<0.000037	Not Analyzed	Not Analyzed	<0.000037	Not Analyzed
191-24-2	Benzo(g,h,i)perylene	mg/L	Not Analyzed	<0.000032	Not Analyzed	<0.000032	Not Analyzed	Not Analyzed	<0.000032	Not Analyzed
207-08-9	Benzo(k)fluoranthene	mg/L	Not Analyzed	<0.000023	Not Analyzed	<0.000023	Not Analyzed	Not Analyzed	<0.000023	Not Analyzed
218-01-9	Chrysene	mg/L	Not Analyzed	<0.00002	Not Analyzed	<0.00002	Not Analyzed	Not Analyzed	<0.00002	Not Analyzed
53-70-3	Dibenz(a,h)anthracene	mg/L	Not Analyzed	<0.000021	Not Analyzed	<0.000021	Not Analyzed	Not Analyzed	<0.000021	Not Analyzed
206-44-0	Fluoranthene	mg/L	Not Analyzed	<0.000032	Not Analyzed	<0.000032	Not Analyzed	Not Analyzed	<0.000032	Not Analyzed
86-73-7	Fluorene	mg/L	Not Analyzed	<0.000029	Not Analyzed	0.00169	Not Analyzed	Not Analyzed	<0.000029	Not Analyzed
193-39-5	Indeno(1,2,3-c,d)pyrene	mg/L	Not Analyzed	<0.000038	Not Analyzed	<0.000038	Not Analyzed	Not Analyzed	<0.000038	Not Analyzed
91-20-3	Naphthalene	mg/L	Not Analyzed	<0.0001	Not Analyzed	0.00637	Not Analyzed	Not Analyzed	<0.0001	Not Analyzed
85-01-8	Phenanthrene	mg/L	Not Analyzed	<0.000015	Not Analyzed	0.005	Not Analyzed	Not Analyzed	<0.000015	Not Analyzed
129-00-0	Pyrene	mg/L	Not Analyzed	<0.000036	Not Analyzed	<0.000036	Not Analyzed	Not Analyzed	<0.000036	Not Analyzed
—	Total PAHs	mg/L	Not Analyzed	Not Detected	Not Analyzed	0.01692	Not Analyzed	Not Analyzed	Not Detected	Not Analyzed

"Tier 1 Levels" for naphthalene, benzo(a)pyrene, benzo(a)anthracene, and chrysene are the "Chemical-Specific Values for Tier 1" from the IDNR's Tier 2 Guidance

	Sample Location / Name		GP-5	GP-6	GP-7	GP-8	GP-9	GP-10
	Date Collected		4/25/2006	4/25/2006	4/25/2006	4/25/2006	4/25/2006	4/25/2006
CAS #	Chemical	Units						
—	TEH-Gasoline	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
—	TEH-Diesel	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
—	TEH-Oil	mg/L	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
—	TEH-Total	mg/L	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
71-43-2	Benzene	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
108-88-3	Toluene	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
100-41-4	Ethylbenzene	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
1330-20-7	Xylenes (total)	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
83-32-9	Acenaphthene	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
208-96-8	Acenaphthylene	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
120-12-7	Anthracene	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
56-55-3	Benzo(a)anthracene	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
50-32-8	Benzo(a)pyrene	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
205-99-2	Benzo(b)fluoranthene	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
191-24-2	Benzo(g,h,i)perylene	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
207-08-9	Benzo(k)fluoranthene	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
218-01-9	Chrysene	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
53-70-3	Dibenz(a,h)anthracene	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
206-44-0	Fluoranthene	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
86-73-7	Fluorene	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
193-39-5	Indeno(1,2,3-c,d)pyrene	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
91-20-3	Naphthalene	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
85-01-8	Phenanthrene	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
129-00-0	Pyrene	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
—	Total PAHs	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed

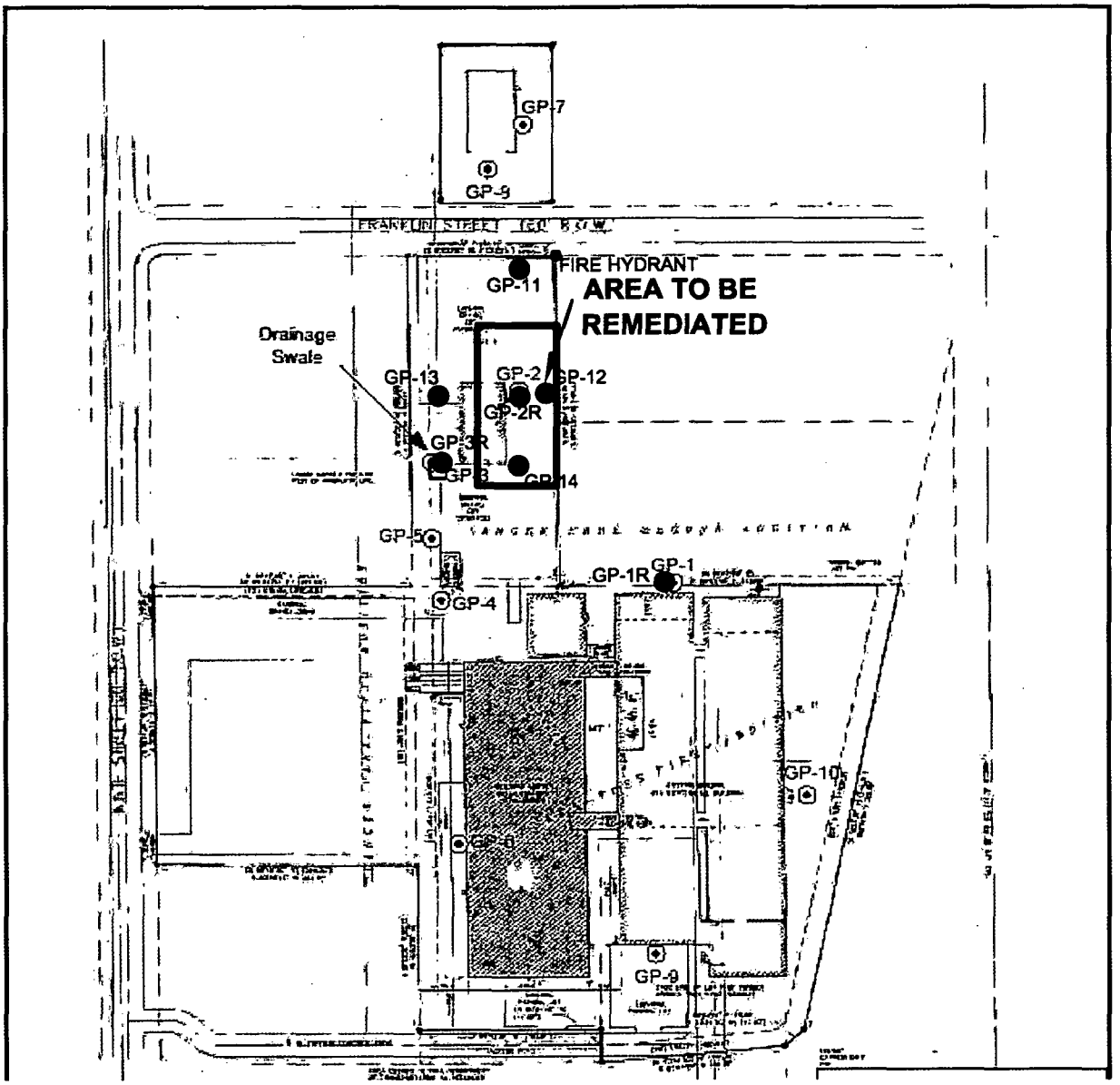
"Tier 1 Levels" for naphthalene, benzo(a)pyrene, benzo(a)anthracene, and chrysene are the "Chemical-Specific Values for Tier 1" from the IDNR's Tier 2 Guidance

	Sample Location / Name		GP-11	GP-11T	GP-12	GP-12T	GP-13	MW-GP13-R	GP-14	GP-14T
	Date Collected		5/17/2006	12/15/2006	5/17/2006	12/15/2006	5/17/2006	12/19/2006	5/17/2006	12/15/2006
CAS #	Chemical	Units								
—	TEH-Gasoline	mg/L	Not Analyzed	<0.3	Not Analyzed	<0.3	Not Analyzed	<0.462	Not Analyzed	<0.385
—	TEH-Diesel	mg/L	Not Analyzed	<0.3	Not Analyzed	**1.22**	Not Analyzed	**1.67**	Not Analyzed	**1.55**
—	TEH-Oil	mg/L	Not Analyzed	<0.3	Not Analyzed	0.319	Not Analyzed	**1.21**	Not Analyzed	<0.385
—	TEH-Total	mg/L	Not Analyzed	<0.3	Not Analyzed	**1.54**	Not Analyzed	**2.88**	Not Analyzed	**1.55**
71-43-2	Benzene	mg/L	<0.0001	Not Analyzed	<0.0001	Not Analyzed	<0.0001	Not Analyzed	<0.0001	Not Analyzed
108-88-3	Toluene	mg/L	<0.00009	Not Analyzed	<0.00009	Not Analyzed	<0.00009	Not Analyzed	0.0001	Not Analyzed
100-41-4	Ethylbenzene	mg/L	<0.00044	Not Analyzed	<0.00044	Not Analyzed	<0.00044	Not Analyzed	<0.00044	Not Analyzed
1330-20-7	Xylenes (total)	mg/L	<0.00024	Not Analyzed	<0.00024	Not Analyzed	<0.00024	Not Analyzed	<0.00024	Not Analyzed
83-32-9	Acenaphthene	mg/L	<0.00013	Not Analyzed	<0.000165	Not Analyzed	<0.00013	Not Analyzed	<0.00013	Not Analyzed
208-96-8	Acenaphthylene	mg/L	<0.00017	Not Analyzed	<0.000215	Not Analyzed	<0.00017	Not Analyzed	<0.00017	Not Analyzed
120-12-7	Anthracene	mg/L	<0.0000093	Not Analyzed	0.000034	Not Analyzed	<0.0000093	Not Analyzed	<0.0000093	Not Analyzed
56-55-3	Benzo(a)anthracene	mg/L	<0.000019	Not Analyzed	0.0000273	Not Analyzed	<0.000019	Not Analyzed	0.000102	Not Analyzed
50-32-8	Benzo(a)pyrene	mg/L	<0.000019	Not Analyzed	<0.0000241	Not Analyzed	<0.000019	Not Analyzed	**0.0000779**	Not Analyzed
205-99-2	Benzo(b)fluoranthene	mg/L	<0.000037	Not Analyzed	<0.0000468	Not Analyzed	<0.000037	Not Analyzed	0.000146	Not Analyzed
191-24-2	Benzo(g,h,i)perylene	mg/L	<0.000032	Not Analyzed	<0.0000405	Not Analyzed	<0.000032	Not Analyzed	0.0000893	Not Analyzed
207-08-9	Benzo(k)fluoranthene	mg/L	<0.000023	Not Analyzed	<0.0000291	Not Analyzed	<0.000023	Not Analyzed	0.000105	Not Analyzed
218-01-9	Chrysene	mg/L	<0.00002	Not Analyzed	0.0000296	Not Analyzed	<0.00002	Not Analyzed	0.000128	Not Analyzed
53-70-3	Dibenz(a,h)anthracene	mg/L	<0.000021	Not Analyzed	<0.0000266	Not Analyzed	<0.000021	Not Analyzed	<0.000021	Not Analyzed
206-44-0	Fluoranthene	mg/L	<0.000032	Not Analyzed	0.000231	Not Analyzed	<0.000032	Not Analyzed	0.000391	Not Analyzed
86-73-7	Fluorene	mg/L	<0.000029	Not Analyzed	<0.0000367	Not Analyzed	<0.000029	Not Analyzed	<0.000029	Not Analyzed
193-39-5	Indeno(1,2,3-c,d)pyrene	mg/L	<0.000038	Not Analyzed	<0.0000481	Not Analyzed	<0.000038	Not Analyzed	0.000117	Not Analyzed
91-20-3	Naphthalene	mg/L	<0.0001	Not Analyzed	<0.000127	Not Analyzed	<0.0001	Not Analyzed	<0.0001	Not Analyzed
85-01-8	Phenanthrene	mg/L	<0.000015	Not Analyzed	0.000127	Not Analyzed	<0.000015	Not Analyzed	0.000181	Not Analyzed
129-00-0	Pyrene	mg/L	<0.000036	Not Analyzed	0.00037	Not Analyzed	<0.000036	Not Analyzed	0.000584	Not Analyzed
—	Total PAHs	mg/L	Not Detected	Not Analyzed	0.0008189	Not Analyzed	Not Detected	Not Analyzed	0.0019212	Not Analyzed

"Tier 1 Levels" for naphthalene, benzo(a)pyrene, benzo(a)anthracene, and chrysene are the "Chemical-Specific Values for Tier 1" from the IDNR's Tier 2 Guidance

	Sample Location / Name		Lowest IAC 135	IAC 135 Levels						Statewide
	Date Collected		Level or Statewide	Action	Tier 1 Levels					Standard
CAS #	Chemical	Units	Standard	Level	GW-Actual	GW-Potential	GW Vapor	GW to PWL	Surface Water	
---	TEH-Gasoline	mg/L	---	---	---	---	---	---	---	---
---	TEH-Diesel	mg/L	**1.2**	---	**1.2**	75	2200	75	75	---
---	TEH-Oil	mg/L	**0.4**	---	**0.4**	**40**	---	**40**	**40**	---
---	TEH-Total	mg/L	**1.2**	**1.2**	---	---	---	---	---	---
71-43-2	Benzene	mg/L	0.005	0.005	---	---	---	---	---	0.005
108-88-3	Toluene	mg/L	1	1	---	---	---	---	---	1
100-41-4	Ethylbenzene	mg/L	0.7	0.7	---	---	---	---	---	0.7
1330-20-7	Xylenes (total)	mg/L	10	10	---	---	---	---	---	10
83-32-9	Acenaphthene	mg/L	0.42	---	---	---	---	---	---	0.42
208-96-8	Acenaphthylene	mg/L	---	---	---	---	---	---	---	---
120-12-7	Anthracene	mg/L	2.1	---	---	---	---	---	---	2.1
56-55-3	Benzo(a)anthracene	mg/L	0.00012	---	0.00012	0.012	---	0.012	0.012	0.00024
50-32-8	Benzo(a)pyrene	mg/L	***0.000012***	---	***0.000012***	0.0012	---	0.0012	0.0012	0.0002
205-99-2	Benzo(b)fluoranthene	mg/L	0.00024	---	---	---	---	---	---	0.00024
191-24-2	Benzo(g,h,i)perylene	mg/L	---	---	---	---	---	---	---	---
207-08-9	Benzo(k)fluoranthene	mg/L	0.0024	---	---	---	---	---	---	0.0024
218-01-9	Chrysene	mg/L	0.0012	---	0.0012	---	---	---	---	0.024
53-70-3	Dibenz(a,h)anthracene	mg/L	0.000024	---	---	---	---	---	---	0.000024
206-44-0	Fluoranthene	mg/L	0.28	---	---	---	---	---	---	0.28
86-73-7	Fluorene	mg/L	0.28	---	---	---	---	---	---	0.28
193-39-5	Indeno(1,2,3-c,d)pyrene	mg/L	0.00024	---	---	---	---	---	---	0.00024
91-20-3	Naphthalene	mg/L	0.1	---	0.15	0.15	4.44	0.15	0.15	0.1
85-01-8	Phenanthrene	mg/L	---	---	---	---	---	---	---	---
129-00-0	Pyrene	mg/L	0.21	---	---	---	---	---	---	0.21
---	Total PAHs	mg/L	---	---	---	---	---	---	---	---

"Tier 1 Levels" for naphthalene, benzo(a)pyrene, benzo(a)anthracene, and chrysene are the "Chemical-Specific Values for Tier 1" from the IDNR's Tier 2 Guidance



LEGEND

——— Approximate site boundary

◎ Former Geoprobe soil boring location

● Terracon's approximate Geoprobe soil boring location

N

0 100 200

Approximate scale (Feet)

DIAGRAM IS FOR GENERAL LOCATION ONLY AND NOT INTENDED FOR CONSTRUCTION PURPOSES
THIS DRAWING WAS BASED ON A DRAWING PROVIDED BY NOVA ENGINEERING

AREA TO BE REMEDIATED
REMEDIATION WORK PLAN
OLSEN ENGINEERING
1100 LECLAIRE ROAD
ELDRIDGE, IOWA

Project Mngr: BP	Terracon	Project No.	07067047
Designed By: AAH		Approximate Scale:	1"=200'
Drawn By: EDL	870 40th Avenue Bettendorf, Iowa 52722	Date:	01-04-2007
Checked By:		File No:	07067047 D3
Approved By: BP	Figure No.		3