



INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

We Protect Hoosiers and Our Environment.

Mitchell E. Daniels Jr.
Governor

Thomas W. Easterly
Commissioner

100 North Senate Avenue
Indianapolis, Indiana 46204
(317) 232-8603
Toll Free (800) 451-6027
www.idem.IN.gov

TO: Interested Parties / Applicant

DATE: March 12, 2009

RE: Davis Petroleum - Remediation System / 089-27237-00540

FROM: Matthew Stuckey, Branch Chief
Permits Branch
Office of Air Quality

Notice of Decision: Approval - Registration

Please be advised that on behalf of the Commissioner of the Department of Environmental Management, I have issued a decision regarding the enclosed matter. Pursuant to IC 4-21.5-3-4(d) this order is effective when it is served. When served by U.S. mail, the order is effective three (3) calendar days from the mailing of this notice pursuant to IC 4-21.5-3-2(e).

If you wish to challenge this decision, IC 4-21.5-3-7 requires that you file a petition for administrative review. This petition may include a request for stay of effectiveness and must be submitted to the Office of Environmental Adjudication, 100 North Senate Avenue, Government Center North, Suite N 501E, Indianapolis, IN 46204, **within eighteen (18) calendar days of the mailing of this notice**. The filing of a petition for administrative review is complete on the earliest of the following dates that apply to the filing:

- (1) the date the document is delivered to the Office of Environmental Adjudication (OEA);
- (2) the date of the postmark on the envelope containing the document, if the document is mailed to OEA by U.S. mail; or
- (3) The date on which the document is deposited with a private carrier, as shown by receipt issued by the carrier, if the document is sent to the OEA by private carrier.

The petition must include facts demonstrating that you are either the applicant, a person aggrieved or adversely affected by the decision or otherwise entitled to review by law. Please identify the permit, decision, or other order for which you seek review by permit number, name of the applicant, location, date of this notice and all of the following:

- (1) the name and address of the person making the request;
- (2) the interest of the person making the request;
- (3) identification of any persons represented by the person making the request;
- (4) the reasons, with particularity, for the request;
- (5) the issues, with particularity, proposed for considerations at any hearing; and
- (6) identification of the terms and conditions which, in the judgment of the person making the request, would be appropriate in the case in question to satisfy the requirements of the law governing documents of the type issued by the Commissioner.

If you have technical questions regarding the enclosed documents, please contact the Office of Air Quality, Permits Branch at (317) 233-0178. Callers from within Indiana may call toll-free at 1-800-451-6027, ext. 3-0178.

Enclosures
FN-REGIS.dot 1/2/08



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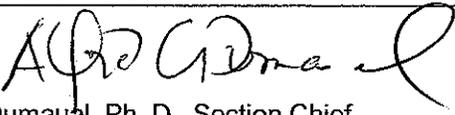
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REGISTRATION OFFICE OF AIR QUALITY

Davis Petroleum – Remediation System
330 E SR 130
Hobart, Indiana 46342

Pursuant to 326 IAC 2-5.1 (Construction of New Sources: Registrations) and 326 IAC 2-5.5 (Registrations), (herein known as the Registrant) is hereby authorized to construct and operate subject to the conditions contained herein, the source described in Section A (Source Summary) of this registration.

Registration No. 089-27237-00540	
Issued by:  Alfred C. Dumauval, Ph. D., Section Chief Permits Branch Office of Air Quality	Issuance Date: March 12, 2009

SECTION A

SOURCE SUMMARY

This registration is based on information requested by the Indiana Department of Environmental Management (IDEM), Office of Air Quality (OAQ). The information describing the source contained in conditions A.1 and A.2 is descriptive information and does not constitute enforceable conditions. However, the Registrant should be aware that a physical change or a change in the method of operation that may render this descriptive information obsolete or inaccurate may trigger requirements for the Registrant to obtain additional permits pursuant to 326 IAC 2.

A.1 General Information

The Registrant owns and operates a stationary soil vapor extraction unit to remediate groundwater and soil contamination by petroleum hydrocarbons.

Source Address:	330 E SR 130, Hobart, Indiana 46342
Mailing Address:	5757 W 74 th St, Indianapolis, Indiana 46278
General Source Phone Number:	(317) 472-0999
SIC Code:	4959
County Location:	Lake County
Source Location Status:	Nonattainment for 8-hour ozone standard Nonattainment for PM _{2.5} standard Attainment for all other criteria pollutants
Source Status:	Registration

A.2 Emission Units and Pollution Control Equipment Summary

This stationary source consists of the following emission units and pollution control devices:

One (1) soil and groundwater remediation system, for remediation of petroleum hydrocarbon contamination, consisting of the following:

- (1) One (1) soil vapor extraction unit, with an air flow rate of two hundred (200) cubic feet per minute (cfm), with emissions controlled by one (1) propane-fired thermal/catalytic oxidizer, identified as Cat-Ox-01, with a fuel heat input capacity of 0.02 MMBtu/hr, exhausting through a stack, identified as Cat-Ox#1, and
- (2) One (1) Multiphase Phase Extraction (MPE) remediation unit, with groundwater extracted at a flow rate of 75 gallons per minute (gpm) and treated in an air-stripper unit, identified as AS-1, exhausting through a stack, identified as AS#1, and soil vapors extracted at an air flow rate of two hundred (200) cubic feet per minute (cfm). Soil vapors collected by the MPE unit are separated from the groundwater and controlled by thermal/catalytic oxidizer Cat-Ox-01, exhausting through a stack, identified as Cat-Ox#1.

SECTION B

GENERAL CONDITIONS

B.1 Definitions [326 IAC 2-1.1-1]

Terms in this registration shall have the definition assigned to such terms in the referenced regulation. In the absence of definitions in the referenced regulation, the applicable definitions found in the statutes or regulations (IC 13-11, 326 IAC 1-2 and 326 IAC 2-1.1-1) shall prevail.

B.2 Effective Date of Registration [IC 13-15-5-3]

Pursuant to IC 13-15-5-3, this registration is effective immediately, unless a petition for stay of effectiveness is filed and granted according to IC 13-15-6-3, and may be revoked or modified in accordance with the provisions of IC 13-15-7-1.

B.3 Registration Revocation [326 IAC 2-1.1-9]

Pursuant to 326 IAC 2-1.1-9 (Revocation), this registration to operate may be revoked for any of the following causes:

- (a) Violation of any conditions of this registration.
- (b) Failure to disclose all the relevant facts, or misrepresentation in obtaining this registration.
- (c) Changes in regulatory requirements that mandate either a temporary or permanent reduction of discharge of contaminants. However, the amendment of appropriate sections of this registration shall not require revocation of this registration.
- (d) For any cause which establishes in the judgment of IDEM the fact that continuance of this registration is not consistent with purposes of this article.

B.4 Prior Permits Superseded [326 IAC 2-1.1-9.5]

- (a) All terms and conditions of permits established prior to Registration No. 089-27237-00540 and issued pursuant to permitting programs approved into the state implementation plan have been either:
 - (1) incorporated as originally stated,
 - (2) revised, or
 - (3) deleted.
- (b) All previous registrations and permits are superseded by this registration.

B.5 Annual Notification [326 IAC 2-5.1-2(f)(3)] [326 IAC 2-5.5-4(a)(3)]

Pursuant to 326 IAC 2-5.1-2(f)(3) and 326 IAC 2-5.5-4(a)(3):

- (a) An annual notification shall be submitted by an authorized individual to the Office of Air Quality stating whether or not the source is in operation and in compliance with the terms and conditions contained in this registration.
- (b) The annual notice shall be submitted in the format attached no later than March 1 of each year to:

Indiana Department of Environmental Management
Compliance and Enforcement Branch, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003

Indianapolis, IN 46204-2251

- (c) The notification shall be considered timely if the date postmarked on the envelope or certified mail receipt, or affixed by the shipper on the private shipping receipt, is on or before the date it is due. If the document is submitted by any other means, it shall be considered timely if received by IDEM, OAQ on or before the date it is due.

B.6 Source Modification Requirement [326 IAC 2-5.5-6(a)]

Pursuant to 326 IAC 2-5.5-6(a), an application or notification shall be submitted in accordance with 326 IAC 2 to the Office of Air Quality (OAQ) if the source proposes to construct new emission units, modify existing emission units, or otherwise modify the source.

B.7 Registrations [326 IAC 2-5.1-2(i)]

Pursuant to 326 IAC 2-5.1-2(i), this registration does not limit the source's potential to emit.

SECTION C

SOURCE OPERATION CONDITIONS

Entire Source

Emission Limitations and Standards [326 IAC 2-5.1-2(g)] [326 IAC 2-5.5-4(b)]

C.1 Opacity [326 IAC 5-1]

Pursuant to 326 IAC 5-1-2 (Opacity Limitations), except as provided in 326 IAC 5-1-3 (Temporary Alternative Opacity Limitations), opacity shall meet the following, unless otherwise stated in this registration:

- (a) Opacity shall not exceed an average of twenty percent (20%) in any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.
- (b) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of fifteen (15) minutes (sixty (60) readings as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuous opacity monitor) in a six (6) hour period.

C.2 Fugitive Dust Emissions [326 IAC 6-4]

The Registrant shall not allow fugitive dust to escape beyond the property line or boundaries of the property, right-of-way, or easement on which the source is located, in a manner that would violate 326 IAC 6-4 (Fugitive Dust Emissions).

**INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
COMPLIANCE AND ENFORCEMENT BRANCH**

**REGISTRATION
ANNUAL NOTIFICATION**

This form should be used to comply with the notification requirements under 326 IAC 2-5.1-2(f)(3) and 326 IAC 2-5.5-4(a)(3).

Company Name:	Davis Petroleum – Remediation System
Address:	330 E SR 130
City:	Hobart, Indiana 46342
Phone Number:	(317) 472-0999
Registration No.:	089-27237-00540

I hereby certify that Davis Petroleum – Remediation System is :

still in operation.

I hereby certify that Davis Petroleum – Remediation is :

no longer in operation.

in compliance with the requirements of Registration No. 089-27237-00540.

not in compliance with the requirements of Registration No. 089-27237-00540.

Authorized Individual (typed):
Title:
Signature:
Phone Number:
Date:

If there are any conditions or requirements for which the source is not in compliance, provide a narrative description of how the source did or will achieve compliance and the date compliance was, or will be achieved.

Noncompliance:

Indiana Department of Environmental Management Office of Air Quality

Technical Support Document (TSD) for Registration

Source Description and Location

Source Name: Davis Petroleum - Remediation
Source Location: 330 E SR 130, Hobart, Indiana 46341
County: Lake
SIC Code: 4959
Registration (or Exemption) No.: 089-27237-00540
Permit Reviewer: Marcia Earl

On December 8, 2008, the Office of Air Quality (OAQ) received an application from Davis Petroleum – Remediation System related to the construction and operation of a soil vapor extraction unit to remediate groundwater and soil contamination by petroleum hydrocarbons.

Existing Approvals

There have been no previous approvals issued to this source.

County Attainment Status

The source is located in Lake County.

Pollutant	Designation
SO ₂	Better than national standards.
CO	Attainment effective February 18, 2000, for the part of the city of East Chicago bounded by Columbus Drive on the north; the Indiana Harbor Canal on the west; 148 th Street, if extended, on the south; and Euclid Avenue on the east. Unclassifiable or attainment effective November 15, 1990, for the remainder of East Chicago and Lake County.
O ₃	Nonattainment Subpart 2 Moderate effective June 15, 2004, for the 8-hour ozone standard. ¹
PM ₁₀	Attainment effective March 11, 2003, for the cities of East Chicago, Hammond, Whiting, and Gary. Unclassifiable effective November 15, 1990, for the remainder of Lake County.
NO ₂	Cannot be classified or better than national standards.
Pb	Not designated.
¹ Nonattainment Severe 17 effective November 15, 1990, for the Chicago-Gary-Lake County area for the 1-hour ozone standard which was revoked effective June 15, 2005. Basic nonattainment designation effective federally April 5, 2005 for PM _{2.5} .	

- (a) Ozone Standards
Volatile organic compounds (VOC) and Nitrogen Oxides (NO_x) are regulated under the Clean Air Act (CAA) for the purposes of attaining and maintaining the National Ambient Air Quality Standards (NAAQS) for ozone.

- (i) 1-hour ozone standard

On December 22, 2006 the United States Court of Appeals, District of Columbia issued a

decision which served to partially vacate and remand the U.S. EPA's final rule for implementation of the eight-hour National Ambient Air quality Standard for ozone. *South Coast Air Quality Mgmt. Dist. v. EPA*, 472 F.3d 882 (D.C. Cir., December 22, 2006), *rehearing denied* 2007 U.S. App. LEXIS 13748 (D.C. Cir., June 8, 2007). The U.S. EPA has instructed IDEM to issue permits in accordance with its interpretation of the *South Coast* decision as follows: Gary-Lake-Porter County was previously designated as a severe non-attainment area prior to revocation of the one-hour ozone standard, therefore, pursuant to the anti-backsliding provisions of the Clean Air Act, any new or existing source must be subject to the major source applicability cut-offs and offset ratios under the area's previous one-hour standard designation. This means that a source must achieve the Lowest Achievable Emission Rate (LAER) if it exceeds 25 tons per year of VOC emissions and must offset any increase in VOC emissions by a decrease of 1.3 times that amount.

On January 26, 1996 in 40 CFR 52.777(i), the U.S. EPA granted a waiver of the requirements of Section 182(f) of the CAA for Lake and Porter Counties, including the lower NOx threshold for nonattainment new source review. Therefore, VOC emissions alone are considered when evaluating the rule applicability relating to the 1-hour ozone standards. Therefore, VOC emissions were reviewed pursuant to the requirements for Emission Offset, 326 IAC 2-3. See the State Rule Applicability for the source section.

(ii) 8-hour ozone standard

VOC and NOx emissions are considered when evaluating the rule applicability relating to the 8-hour ozone standard. Lake County has been designated as nonattainment for the 8-hour ozone standard. Therefore, VOC and NOx emissions were reviewed pursuant to the requirements for Emission Offset, 326 IAC 2-3. See the State Rule Applicability – Entire Source section.

(b) PM_{2.5}

U.S. EPA, in the Federal Register Notice 70 FR 943 dated January 5, 2005, has designated Lake County as nonattainment for PM_{2.5}. On March 7, 2005 the Indiana Attorney General's Office, on behalf of IDEM, filed a law suit with the Court of Appeals for the District of Columbia Circuit challenging U.S. EPA's designation of nonattainment areas without sufficient data. However, in order to ensure that sources are not potentially liable for a violation of the Clean Air Act, the OAQ is following the U.S. EPA's New Source Review Rule for PM_{2.5} promulgated on May 8th, 2008, and effective on July 15th 2008. Therefore, direct PM_{2.5} and SO₂ emissions were reviewed pursuant to the requirements of Nonattainment New Source Review, 326 IAC 2-1.1-5. See the State Rule Applicability – Entire Source section.

(c) Other Criteria Pollutants

Lake County has been classified as attainment or unclassifiable in Indiana for PM₁₀, SO₂, CO and Lead. Therefore, these emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2.

Fugitive Emissions

The fugitive emissions of criteria pollutants and hazardous air pollutants are counted toward the determination of 326 IAC 2-5.1-2 (Registrations) applicability.

Background and Description of Emission Units and Pollution Control Equipment

The source consists of the following existing emission unit(s):

One (1) soil and groundwater remediation system, for remediation of petroleum hydrocarbon

contamination, consisting of the following:

- (1) One (1) soil vapor extraction unit, with an air flow rate of two hundred (200) cubic feet per minute (cfm), with emissions controlled by one (1) propane-fired thermal/catalytic oxidizer, identified as Cat-Ox-01, with a fuel heat input capacity of 0.02 MMBtu/hr, exhausting through a stack, identified as Cat-Ox#1, and
- (2) One (1) Multiphase Phase Extraction (MPE) remediation unit, with groundwater extracted at a flow rate of 75 gallons per minute (gpm) and treated in an air-stripper unit, identified as AS-1, exhausting through a stack, identified a AS#1, and soil vapors extracted at an air flow rate of two hundred (200) cubic feet per minute (cfm). Soil vapors collected by the MPE unit are separated from the groundwater and controlled by thermal/catalytic oxidizer Cat-Ox-01, exhausting through a stack, identified as Cat-Ox#1.

Enforcement Issues

There are no pending enforcement actions related to this source.

Emission Calculations

See Appendix A, pages 1 and 2 of this TSD for detailed emission calculations.

Permit Level Determination – Registration

The following table reflects the unlimited potential to emit (PTE) of the entire source before controls. Control equipment is not considered federally enforceable until it has been required in a federally enforceable permit.

Process/ Emission Unit	Potential To Emit of the Entire Source (tons/year)								
	PM	PM10 *	PM2.5	SO ₂	NO _x	VOC	CO	Total HAPs	Worst Single HAP
Soil and Groundwater Remediation System	0.00	0.00	0.00	0.00	0.00	17.19	0.00	4.48	1.39 toluene
Total PTE of Entire Source	0.00	0.00	0.00	0.00	0.00	17.19	0.00	4.48	--
Exemptions Levels	5	5	5	10	10	5 or 10	25	25	10
Registration Levels	25	25	25	25	25	25	100	25	10
negl. = negligible * Under the Part 70 Permit program (40 CFR 70), particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM ₁₀), not particulate matter (PM), is considered as a "regulated air pollutant".									

- (a) The potential to emit (PTE) (as defined in 326 IAC 2-1.1-1(16)) of VOCs are within the ranges listed in 326 IAC 2-5.1-2(a)(1). The PTE of all other regulated criteria pollutants are less than the ranges listed in 326 IAC 2-5.1-2(a)(1). Therefore, the source is subject to the provisions of 326 IAC 2-5.1-2 (Registrations). A Registration will be issued.
- (b) The potential to emit (PTE) (as defined in 326 IAC 2-1.1-1(16)) of any single HAP is less than ten (10) tons per year and the PTE of a combination of HAPs is less than twenty-five (25) tons per

year. Therefore, this source is an area source under Section 112 of the Clean Air Act (CAA) and not subject to the provisions of 326 IAC 2-7.

Federal Rule Applicability Determination

New Source Performance Standards (NSPS)

- (a) There are no New Source Performance Standards (NSPS) (326 IAC 12 and 40 CFR Part 60) included in the permit.

National Emission Standards for Hazardous Air Pollutants (NESHAP)

- (b) The requirements of 40 CFR 63, Subpart GGGGG the National Emission Standards for Hazardous Air Pollutants: Site Remediation are not included in the permit, since this soil remediation system is not co-located with any other stationary sources that emit hazardous air pollutants (HAPs) and meet an affected source definition specified for a source category that is regulated by another subpart under 40 CFR Part 63, and is not a major source of HAP's as defined in 40 CFR 63.2
- (c) There are no National Emission Standards for Hazardous Air Pollutants (NESHAPs) (326 IAC 14, 326 IAC 20 and 40 CFR Part 63) included in the permit.

Compliance Assurance Monitoring (CAM)

- (g) Pursuant to 40 CFR 64.2, Compliance Assurance Monitoring (CAM) is not included in the permit, because the unlimited potential to emit of the source is less than the Title V major source thresholds and the source is not required to obtain a Part 70 or Part 71 permit.

State Rule Applicability Determination

326 IAC 2-2 (Prevention of significant Deterioration (PSD))

This source is not a major stationary source, under PSD (326 IAC 2-2), because the potential to emit particulate matter (PM) and all other attainment regulated pollutants are each less than 250 tons per year, and this source is not one of the twenty-eight (28) listed source categories, as specified in 326 IAC 2-2-1(gg)(1). Therefore, pursuant to 326 IAC 2-2, the PSD requirement do not apply.

326 IAC 2-4.1 (Major Sources of Hazardous air Pollutants (HAP))

The potential to emit of any single HAP is less than ten (10) tons per year and the potential to emit of a combination of HAPs are less than twenty-five (25) tons per year. Therefore, this source is an area source under Section 112 of the Clean Air Act (CAA) and not subject to the provisions of 326 IAC 2-4.1.

326 IAC 2-5.1-2 (Registrations)

Registration applicability is discussed under the Permit Level Determination – Registration section above.

326 IAC 2-6 (Emission Reporting)

Pursuant to 326 IAC 2-6-1, this source is not subject to this rule, because it is not required to have an operating permit under 326 IAC 2-7 (Part 70), it is located in Lake County, it has potential to emit of NOx and VOC of less than twenty-five (25) tons per year, and it does not emit lead into the ambient air at levels equal to or greater than 5 tons per year. Therefore, 326 IAC 2-6 does not apply.

326 IAC 5-1 (Opacity Limitations)

Pursuant to 326 IAC 5-1-2 (Opacity Limitations), except as provided in 326 IAC 5-1-3 (Temporary Alternative Opacity Limitations), opacity shall meet the following, unless otherwise stated in this permit:

- (1) Opacity shall not exceed an average of twenty percent (20%) in any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.
- (2) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of fifteen (15) minutes (sixty (60) readings as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuous opacity monitor) in a six (6) hour period.

326 IAC 6-4 (Fugitive Dust Emissions Limitations)

Pursuant to 326 IAC 6-4 (Fugitive Dust Emissions Limitations), the source shall not allow fugitive dust to escape beyond the property line or boundaries of the property, right-of-way, or easement on which the source is located, in a manner that would violate 326 IAC 6-4.

326 IAC 6-5 (Fugitive Particulate Matter Emission Limitations)

The source is not subject to the requirements of 326 IAC 6-5, because the source is located in Lake County and does not have potential fugitive particulate emissions greater than 5 tons or more per year. Therefore, 326 IAC 6-5 does not apply.

326 IAC 6.8-10 (Lake County: Fugitive Particulate Matter)

The source is located in Lake County and does not have the potential to emit of fugitive particulate emission of 5 tons per year or more. Therefore, this source is not subject to 326 IAC 6.8.10.

326 IAC 8-1-6 (VOC Rules: General Reduction Requirements for New Facilities)

This source is not subject to the requirements of 326 IAC 8-6-1, since the unlimited VOC potential emissions from the soil and ground water remediation system is less than twenty-five (25) tons per year.

326 IAC 12 (New Source Performance Standards)

See Federal Rule Applicability Section of this TSD.

326 IAC 20 (Hazardous Air Pollutants)

See Federal Rule Applicability Section of this TSD.

Conclusion and Recommendation

Unless otherwise stated, information used in this review was derived from the application and additional information submitted by the applicant. An application for the purposes of this review was received on December 8, 2008.

The construction and operation of this source shall be subject to the conditions of the attached proposed Registration No. 089-27237-00540. The staff recommends to the Commissioner that this Registration be approved.

IDEM Contact

- (a) Questions regarding this proposed permit can be directed to Marcia Earl at the Indiana Department Environmental Management, Office of Air Quality, Permits Branch, 100 North Senate Avenue, MC 61-53 IGCN 1003, Indianapolis, Indiana 46204-2251 or by telephone at (317) 233-0863 or toll free at 1-800-451-6027 extension 3-0863.
- (b) A copy of the findings is available on the Internet at: <http://www.in.gov/ai/appfiles/idem-caats/>

- (c) For additional information about air permits and how the public and interested parties can participate, refer to the IDEM's Guide for Citizen Participation and Permit Guide on the Internet at: www.idem.in.gov

Appendix A: Emission Calculations
Soil Vapor Extraction (SVE) and Multiphase Phase Extraction (MPE) System
Volatile Organic Compounds (VOCs)

Company Name: Davis Petroleum - Remediation System
Address City Zip: 330 E SR 130, Hobart, Indiana 46342
Permit No: R089-27237-00540
Reviewer: Marcia Earl
Date: January 2009

Potential To Emit (PTE) VOC by the SVE and MPE Systems (lbs)

Groundwater TPH Contamination (Dissolved Phase)		
	Zone 1	Zone 2
Plume Area (ft ²)	1800	1330
Thickness of Soil (ft)	2	1.5
Porosity	0.4	0.4
Volume of contaminated water (ft ³)	1440	798
Volume of contaminated water (gal)	10972.8	6080.76
Concentration of TPH (µg/L of water)	53	285
Weight of contamination (lbs)	0	0.01

Groundwater Remediation

Total Weight of TPH in Groundwater (lbs)	0.02
Total Weight of TPH in Groundwater (tons)	9.7E-06
Remediation Time (years)	5
PTE of VOC (tons/yr)	1.9E-06

Soil TPH Contamination (Absorbed to Soil)		
	Zone 1	Zone 2
Contaminated Area (ft ²)	18000	15600
Thickness of Soil (ft)	8	8
Volume of contaminated soil (ft ³)	144000	124800
Concentration of TPH (lb/MMlbs of soil)	11381	542
Soil density (lbs/ft ³)	100.75	100.75
Weight of Contamination (lbs)	165115.5	6814.9

Soil Remediation

Total Weight of TPH in Soil (lbs)	171930.44
Total Weight of TPH in Soil (tons)	85.97
Remediation Time (years)	5
PTE of VOC (before control) (tons/yr)	17.19

Control Efficiency (thermal oxidizer) =	90.0%
PTE of VOC (after control) (tons/yr)	1.72

Potential To Emit (PTE) Summary

Total PTE of VOC (before control) (tons/yr)	17.19
Total PTE of VOC (after control) (tons/yr)	1.72

METHODOLOGY:

Weight of TPH in Grounwater (Dissolved Phase) (lbs) =
 [(Concentration of TPH (µg/L of water)) * [(g/1,000,000 µg)] * [3.785L/gal] * [Volume of contaminated water (gal)] * [lb/453.6g]

Volume of contaminated water = [Plume Area (ft²)] * [Thickness of Soil (ft)] * [Porosity]

Weight of TPH in Soil (Absorbed to Soil) (lbs) =
 [Concentration of TPH (lb/million lbs of soil)] * [Volume of the contaminated soil (ft³)] * [Soil density (lbs/ft³)] * [million lbs/1,000,000 lbs]

The potential emissions rate for VOCs emitted from the SVE and MPE systems were assumed to be constant during the remediation time period.

Based on information provided by the source, the remediation time will be 5 years.

Each of the total petroleum hydrocarbon (TPH) components is considered a VOC.

Soil is assumed to have bulk density of 100.75 lb/ft³.

PTE of VOCs (before control) (tons/yr) = [Total VOC (Soil and Groundwater) (tons)] / [Remediation Time (years)]

PTE of VOCs (after control) (tons/yr) = [PTE of VOCs (before control) (tons/yr)] * [1 - Control Efficiency]

Appendix A: Emission Calculations
Soil Vapor Extraction (SVE) and Multiphase Phase Extraction (MPE) System
Hazardous Air Pollutants (HAPs)

Company Name: Davis Petroleum - Remediation System
Address City Zip: 330 E SR 130, Hobart, Indiana 46342
Permit No: R089-27237-00540
Reviewer: Marcia Earl
Date: January 2009

	Before Control	After Control
PTE of VOC (tons/yr)	17.19	1.72

Potential To Emit (PTE) of TPH Constituents (Assuming Gasoline)

Compound Class	Compound	CAS#	Molecular Weight	Average Composition (% by weight)*	Potential to Emit (before control) (tons/yr)	Potential to Emit (after control) (tons/yr)	Hazardous Air Pollutants
	1,3-Butadiene	106-99-0	54.1	0.0037%	6.4E-04	6.4E-05	HAP
	cis-2-Butene	590-18-1	56.1	0.3100%	5.3E-02	5.3E-02	
	trans-2-Butene	624-64-6	56.1	0.3600%	6.2E-02	6.2E-03	
	2-Methyl-1-butene	563-46-2	70.1	0.5400%	9.3E-02	9.3E-03	
	2-Methyl-2-butene	513-35-9	70.1	1.1000%	1.9E-01	1.9E-02	
	cis-2-Pentene	627-20-3	70.1	0.3900%	6.7E-02	6.7E-03	
	trans-2-Pentene	646-04-8	70.1	0.7200%	1.2E-01	1.2E-03	
Alkyl-Monoaromatics	Benzene	71-43-2	78.1	1.9000%	3.3E-01	3.3E-02	HAP
	Toluene	108-88-3	92.1	8.1000%	1.4E+00	1.4E-01	HAP
	Ethylbenzene	100-41-4	106.2	1.7000%	2.9E-01	2.9E-02	HAP
	m-Xylene	108-38-3	106.2	4.6000%	7.9E-01	7.9E-02	HAP
	o-Xylene	95-47-6	106.2	2.5000%	4.3E-01	4.3E-02	HAP
	p-Xylene	106-42-3	106.2	1.9000%	3.3E-01	3.3E-02	
	1,1,4-Trimethylbenzene	95-63-6	120.2	3.0000%	5.2E-01	5.2E-02	
	1,2,5-Trimethylbenzene	108-67-8	120.2	0.9800%	1.7E-01	1.7E-02	
	1-Methyl-2-ethylbenzene	611-14-3	120.2	0.7100%	1.2E-01	1.2E-02	
	1-Methyl-3-ethylbenzene	620-14-4	120.2	1.8000%	3.1E-01	3.1E-02	
	1-Methyl-4-ethylbenzene	622-96-8	120.2	0.8000%	1.4E-01	1.4E-02	
Branched Alkanes	Isobutane	75-28-5	58.1	1.7000%	2.9E-01	2.9E-02	
	Isopentane	78-78-4	72.1	7.9000%	1.4E+00	1.4E-01	
	2,2-Bimethylbutane	75-82-2	86.2	0.4900%	8.4E-02	8.4E-03	
	2,3Dimethylbutane	79-28-8	86.2	1.0000%	1.7E-01	1.7E-02	
	2-Methylpentane	107-83-5	86.2	3.9000%	6.7E-01	6.7E-02	
	3-Methylpentane	96-14-0	86.2	2.5000%	4.3E-01	4.3E-02	
	2,4 Dimethylpentane	108-08-7	100.2	0.8300%	1.4E-01	1.4E-02	
	2-Methylhexane	591-76-4	100.2	3.0000%	5.2E-01	5.2E-02	
	3-Methylhexane	589-34-4	100.2	1.7000%	2.9E-01	2.9E-02	
	2,2,4-Trimethylpentane	540-84-1	114.2	2.4000%	4.1E-01	4.1E-02	HAP
	2,3,3-Trimethylpentane	560-21-4	114.2	0.6600%	1.1E-01	1.1E-02	
	2,3,4-Trimethylpentane	565-75-3	114.2	0.9700%	1.7E-01	1.7E-02	
	2,3 Dimethylhexane	584-94-1	114.2	0.3900%	6.7E-02	6.7E-03	
	2,4-Dimethylhexane	589-43-5	114.2	0.4400%	7.6E-02	7.6E-03	
	3-Methylheptane	589-81-1	114.2	0.7500%	1.3E-01	1.3E-02	
Cycloalkanes	Cyclopentane	287-92-3	70.1	0.4700%	8.1E-02	8.1E-03	
	Cyclohexane	110-82-7	84.2	0.3900%	6.7E-02	6.7E-03	
	Methylcyclopentane	96-37-7	84.2	1.8000%	3.1E-01	3.1E-02	
	Methylcyclohexane	108-87-2	98.2	0.5800%	1.6E-01	1.0E-02	
n-Alkanes	n-butane	106-97-8	58.1	4.7000%	8.1E-01	8.1E-02	
	n-Pentane	109-66-0	72.1	3.9000%	6.7E-01	6.7E-02	
	n-Hexane	110-54-3	86.2	2.4000%	4.1E-01	4.1E-02	HAP
	n-Heptane	142-82-5	100.2	1.1000%	1.9E-01	1.9E-02	
	Naphthalene	91-20-3	128.2	0.2500%	4.3E-02	4.3E-03	HAP
	1-Methylnaphthalene	90-12-0	142.2	0.0700%	1.2E-02	1.2E-03	
	2-Methylnaphthalene	91-57-6	142.2	0.1800%	3.1E-02	3.1E-03	
Oxygenates	Methyl-tert-butyl ether	1634-04-4	88.1	33.0000%	5.7E-02	5.7E-03	HAP
	Total				76.21%		

*Composition of TPH assuming that site is contaminated with gasoline. Composition Data Obtained from: Potter, T.L. and K.E. Simmons. 1998. Total Petroleum Hydrocarbon Criteria Working Group Series, Volume 2. Composition of Petroleum Mixtures. The Association for Environmental Health and Science. Available on the Internet at: <http://www.aehs.com/publications/catalog/contents/tpb.htm>

Hazardous Air Pollutants (HAPs) Summary

Compound	Potential To Emit (before control) (tons/yr)	Potential To Emit (after control) (tons/yr)
1,3-Butadiene	6.4E-04	6.4E-05
Benzene	3.3E-01	3.3E-02
Toluene	1.40	0.14
Ethylbenzene	2.9E-01	2.9E-02
m-Xylene	0.79	0.08
o-Xylene	4.3E-01	4.3E-02
p-Xylene	3.3E-01	3.3E-02
2,2,4-Trimethylpentane	4.1E-01	4.1E-02
n-Hexane	4.1E-01	4.1E-02
Naphthalene	4.3E-02	4.3E-03
Methyl-tert-butyl ether	5.7E-02	5.7E-03

	Before Control	After Control
Total PTE of HAPs (tons/yr)	4.48	0.45
PTE of Worst Case HAP (tons/yr)	1.39	0.14

METHODOLOGY:

PTE of HAPs (ton/yr) = [PTE of VOC (tons/yr)] * [Average HAP Composition (% by weight)]