



# 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](http://www.idem.IN.gov)

TO: Interested Parties / Applicant

DATE: April 28, 2009

RE: Johnson Junction, Inc. / 069-27776-00082

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

## Notice of Decision – Approval

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 326 IAC 2, this approval was effective immediately upon submittal of the application.

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 from 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  
FNPER-AM.dot12/3/07



# 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](http://www.idem.IN.gov)

Darlene Stanley  
Johnson Junction, Inc.  
2840 Guilford Street  
Huntington, Indiana, 46750

April 28, 2009

Re: Exempt Construction and Operation Status,  
069-27776-00082

Dear Darlene Stanley:

The application from Johnson Junction, Inc, received on April 14, 2009, has been reviewed. Based on the data submitted and the provisions in 326 IAC 2-1.1-3, it has been determined that the following stationary high vacuum dual-phase extraction remediation system, for the removal of liquid phase, vapor phase and dissolved phase hydrocarbons from the subsurface, located at 507 West Park Drive, Huntington, Indiana 46750 is classified as exempt from air pollution permit requirements:

- (a) One (1) air stripping, high vacuum dual-phase extraction remediation system, identified as DPE-1, constructed in 2009, with groundwater extracted at a flow rate of 25 gallons per minute (gpm), and soil vapors extracted at a maximum air flowrate of 300 actual cubic feet per minute (acfm). Soil vapors collected by the DPE-1 system are separated from the groundwater and controlled by a catalytic oxidizer, identified as CATOX-1, and exhausting to stack STACK-1.
- (b) One (1) catalytic oxidizer, identified as CATOX-1, with a maximum organic vapor concentration of 2,200 parts per million by volume (ppmv) at an input flow rate of 300 actual cubic feet per minute (acfm), and a control efficiency of 99 percent.
- (c) Fugitive emissions from paved roads and parking lots with public access.

The following conditions shall be applicable:

1. 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:
  - (a) Opacity shall not exceed an average of forty percent (40%) 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.
2. 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.

This exemption is the first air approval issued to this source. A copy of the Exemption is available on the Internet at: <http://www.in.gov/ai/appfiles/idem-caats/>. 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](http://www.idem.in.gov)

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. If you have any questions on this matter, please contact Sarah Conner, Ph. D., OAQ, 100 North Senate Avenue, MC 61-53 IGCN 1003, Indianapolis, Indiana, 46204-2251, at 317-234-6555 or at 1-800-451-6027 (ext 4-6555).

Sincerely,



Alfred C. Dumauval, Ph. D., Section Chief  
Permits Branch  
Office of Air Quality

ACD/SLC

cc: File - Huntington County  
Huntington County Health Department  
Compliance and Enforcement Branch  
Billing, Licensing and Training Section

## Indiana Department of Environmental Management Office of Air Quality

### Technical Support Document (TSD) for an Exemption

<b>Source Description and Location</b>
--

<b>Source Name:</b>	<b>Johnson Junction, Inc.</b>
<b>Source Location:</b>	<b>507 West Park Drive, Huntington, Indiana 46750</b>
<b>County:</b>	<b>Huntington</b>
<b>SIC Code:</b>	<b>4959</b>
<b>Exemption No.:</b>	<b>069-27776-00082</b>
<b>Permit Reviewer:</b>	<b>Sarah Conner, Ph. D.</b>

On April 14, 2009, the Office of Air Quality (OAQ) received an application from Johnson Junction, Inc. related to the construction and operation of a new high vacuum dual-phase extraction remediation system.

<b>Existing Approvals</b>
---------------------------

There have been no previous approvals issued to this source.

<b>County Attainment Status</b>
---------------------------------

The source is located in Huntington County.

Pollutant	Designation
SO <sub>2</sub>	Better than national standards.
CO	Unclassifiable or attainment effective November 15, 1990.
O <sub>3</sub>	Unclassifiable or attainment effective June 15, 2004, for the 8-hour ozone standard. <sup>1</sup>
PM <sub>10</sub>	Unclassifiable effective November 15, 1990.
NO <sub>2</sub>	Cannot be classified or better than national standards.
Pb	Not designated.
<sup>1</sup> Unclassifiable or attainment effective October 18, 2000, for the 1-hour ozone standard which was revoked effective June 15, 2005. Unclassifiable or attainment effective April 5, 2005, for PM2.5.	

- (a) **Ozone Standards**  
 Volatile organic compounds (VOC) and Nitrogen Oxides (NOx) are regulated under the Clean Air Act (CAA) for the purposes of attaining and maintaining the National Ambient Air Quality Standards (NAAQS) for ozone. Therefore, VOC and NOx emissions are considered when evaluating the rule applicability relating to ozone. Huntington County has been designated as attainment or unclassifiable for ozone. Therefore, VOC and NOx emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2.
- (b) **PM2.5**  
 Huntington County has been classified as attainment for PM2.5. On May 8, 2008 U.S. EPA promulgated the requirements for Prevention of Significant Deterioration (PSD) for PM2.5 emissions, and the effective date of these rules was July 15, 2008. Indiana has three years from the publication of these rules to revise its PSD rules, 326 IAC 2-2, to include those requirements. The May 8, 2008 rule revisions require IDEM to regulate PM10 emissions as a surrogate for PM2.5 emissions until 326 IAC 2-2 is revised.

- (c) Other Criteria Pollutants  
Huntington County has been classified as attainment or unclassifiable in Indiana for all other criteria pollutants. 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 2-1.1-3 (Exemptions) applicability.

### **Background and Description of Emission Units and Pollution Control Equipment**

The Office of Air Quality (OAQ) has reviewed an application, submitted by Johnson Junction, Inc. on April 14, 2009, relating to construction and operation of a new high vacuum dual-phase extraction remediation system.

The following is a list of the new emission units and pollution control device:

- (a) One (1) air stripping, high vacuum dual-phase extraction remediation system, identified as DPE-1, constructed in 2009, with groundwater extracted at a flow rate of 25 gallons per minute (gpm), and soil vapors extracted at a maximum air flowrate of 300 actual cubic feet per minute (acfm). Soil vapors collected by the DPE-1 system are separated from the groundwater and controlled by a catalytic oxidizer, identified as CATOX-1, and exhausting to stack STACK-1.
- (b) One (1) catalytic oxidizer, identified as CATOX-1, with a maximum organic vapor concentration of 2, 200 parts per million by volume (ppmv) at an input flow rate of 300 actual cubic feet per minute (acfm), and a control efficiency of 99 percent.
- (c) Fugitive emissions from paved roads and parking lots with public access.

### **Enforcement Issues**

There are no pending enforcement actions related to this source.

### **Emission Calculations**

See Appendix A of this TSD for detailed emission calculations.

#### Dual-Phase Extraction (DPE) System

Dual-Phase Extraction (DPE) is a remediation technology that employs a vacuum pump to remove various combinations of contaminated groundwater, separate-phase petroleum product and hydrocarbon vapor from the subsurface. Hydrocarbons will be removed from a network of vertical extraction wells and piped to the centralized equipment compound.

### **Permit Level Determination – Exemption**

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 <sub>2</sub>	NO <sub>x</sub>	VOC	CO	Total HAPs	Worst Single HAP
Dual-phase extraction remediation system (DPE-1)	-	-	-	-	-	0.20	-	0.105	0.037 (Toluene)
Fugitive Emissions from Roads	1.00	0.19	0.02	-	-	-	-	-	-
<b>Total PTE of Entire Source</b>	<b>1.00</b>	<b>0.19</b>	<b>0.02</b>	<b>0.00</b>	<b>0.00</b>	<b>0.20</b>	<b>0.00</b>	<b>0.105</b>	<b>0.037 (Toluene)</b>
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 (PM10), 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 all regulated criteria pollutants are less than the levels listed in 326 IAC 2-1.1-3(e)(1). Therefore, the source is subject to the provisions of 326 IAC 2-1.1-3 (Exemptions).
- (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)(40 CFR Part 60) included in the permit.

National Emission Standards for Hazardous Air Pollutants (NESHAP)

- (b) The requirements of the National Emission Standards for Hazardous Air Pollutants (NESHAPs) for Site Remediation, 40 CFR 63, Subpart GGGGG, are not included in the permit, since the site remediation project is not a major source of HAPs.
- (c) There are no other 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)

- (d) 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

The following state rules are applicable to the source:

**326 IAC 2-1.1-3 (Exemptions)**

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

**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 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 2-4.1.

**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 not located in Lake, Porter, or LaPorte County, 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 forty percent (40%) 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 does not have potential fugitive particulate emissions greater than 25 tons per year. Therefore, 326 IAC 6-5 does not apply.

**Dual-Phase Extraction (DPE) System**

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

Each of the emission units at this source is not subject to the requirements of 326 IAC 8-1-6, since the unlimited VOC potential emissions from each emission unit is less than twenty-five (25) tons per year.

### 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 April 14, 2009.

The construction and operation of this source shall be subject to the conditions of the attached proposed Exemption No. 069-27776-00082. The staff recommends to the Commissioner that this Exemption be approved.

### IDEM Contact

- (a) Questions regarding this proposed permit can be directed to Sarah Conner, Ph. D. 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) 234-6555 or toll free at 1-800-451-6027 extension 4-6555.
- (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](http://www.idem.in.gov)

**Appendix A: Emission Calculations  
Contaminant Mass Calculations  
Free Product**

**Company Name:** Johnson Junction, Inc.  
**Address City IN Zip:** 507 West Park Drive, Huntington, Indiana 46750  
**Permit Number:** 069-27776-00082  
**Calculations:** Submitted by Johnson Junction, Inc.  
**Reviewer:** Sarah Conner, Ph. D.  
**Date:** 4/16/2009

Free Product		
<i>Constants</i>		
Volume Conversion	7.48	gal per ft <sup>3</sup>
Product Density	6.8	lbs per gal
<i>Input</i>		
Plume Area	Thickness	Soil Porosity
(ft <sup>2</sup> )	(ft)	
430	0.02	0.30
	FPPV:	9 ft <sup>3</sup>
	FPV:	3 ft <sup>3</sup>
	FPV:	19 gal
	<b>FPM:</b>	<b>131 lbs</b>

**Assumptions:**

- The plume area is the free product area located within the radius of influence of the remediation system.
- A free product thickness of 0.02 ft as measured in well MW-5 during January 2009 is utilized.
- A typical soil porosity of 30% (0.30) is utilized.

**Calculation Explanation:**

FPPV (Free Product Plume Volume) (ft<sup>3</sup>) = Plume Area (ft<sup>2</sup>) \* Thickness (ft)

FPV (Free Product Volume) (ft<sup>3</sup>) = FPPV (ft<sup>3</sup>) \* Soil Porosity

FPV (gal) = FPV (ft<sup>3</sup>) \* 7.48 (gal/ft<sup>3</sup>)

FPM (Free Product Mass) (lbs) = FPV (gal) \* Product Density (6.8 lbs/gal)

**Appendix A: Emission Calculations  
Contaminant Mass Calculations  
Dissolved Phase Contaminant Mass**

**Company Name:** Johnson Junction, Inc.  
**Address City IN Zip:** 507 West Park Drive, Huntington, Indiana 46750  
**Permit Number:** 069-27776-00082  
**Calculations:** Submitted by Johnson Junction, Inc.  
**Reviewer:** Sarah Conner, Ph. D.  
**Date:** 4/16/2009

Dissolved Phase Gasoline			
Constants			
Volume Conversion		7.48	gal per ft <sup>3</sup>
Water Density		8.35	lbs per gal
Input			
Treated Area	Thickness	Soil Porosity	Contam. Conc.
(ft <sup>2</sup> )	(ft)		(ppb)
7,225	6	0.30	9,256
	TPV:	43,350	ft <sup>3</sup>
	IGWV:	13,005	ft <sup>3</sup>
	IGWV:	97,277	gal
	IGWM:	812,266	lbs
	<b>DPHM:</b>	<b>8</b>	<b>lbs</b>

**Assumptions:**

-Treated Area values are based on the extent of the radius of influence of the soil vapor extraction system as depicted in Figures 2.

-Thickness of groundwater contamination is estimated conservatively at six (6) feet based on the fact that petroleum hydrocarbons have a specific gravity of less than one (1) and will therefore tend to float on the groundwater surface instead of distributing evenly within the water column.

-A typical soil porosity of 30% (0.30) is utilized.

-The contaminant concentration is the average of the most recent total BTEX and MTBE concentrations (Table 2) as measured in the monitoring wells located within the radius of influence of the proposed remediation system (MW-2, MW-5, OW-1, OW-2, and OW-3) depicted on Figure 2.

**Calculation Explanation:**

TPV (Total Plume Volume) (ft<sup>3</sup>)= Plume Area (ft<sup>2</sup>) \* Thickness (ft)

IGWV (Impacted Groundwater Volume) (ft<sup>3</sup>)= TPV (ft<sup>3</sup>) \* Soil Porosity

IGWV (gallons) = IGWV (ft<sup>3</sup>) \* 7.48 (gal/ft<sup>3</sup>)

IGWM (Impacted Groundwater Mass) (lbs) = IGWV (gal) \* Water Density (lbs/gal)

DPHM (Dissolved Phase Hydrocarbon Mass) (lbs) = (Contaminant Concentrations (ppb) / 10<sup>9</sup>) \* IGWM (lbs)

**Appendix A: Emission Calculations  
Contaminant Mass Calculations  
Adsorbed Hydrocarbon Mass**

(Hydrocarbons adsorbed to soil above and below water table)

**Company Name:** Johnson Junction, Inc.  
**Address City IN Zip:** 507 West Park Drive, Huntington, Indiana 46750  
**Permit Number:** 069-27776-00082  
**Calculations:** Submitted by Johnson Junction, Inc.  
**Reviewer:** Sarah Conner, Ph. D.  
**Date:** 4/16/2009

Soil Adsorbed Gasoline			
Constants			
Solid Mineral Density (Quartz)		165.4	lbs/ft <sup>3</sup>
Input			
Treated Area	Thickness	Soil Porosity	Contam. Conc.
(ft <sup>2</sup> )	(ft)		(ppm)
7,225	13	0.30	82
	TISV:	93,925	ft <sup>3</sup>
	SMV:	65,748	ft <sup>3</sup>
	SMM:	10,874,637	lbs
	<b>AHM-G:</b>	<b>892</b>	<b>lbs</b>

**Assumptions:**

- Treated Area values are based on the extent of the radius of influence of the soil vapor extraction system as depicted in Figures 3.
- The contaminated thickness was estimated by summing the total thickness of all available soil sample intervals exhibiting soil vapor concentrations greater than 100 parts per million (ppm) as measured by a MiniRae 2000 photoionization detector (PID) (Table 1). For calculations, the impacted soil thickness value used is the average thickness seen in all contaminated borings within the radius of influence of the DPE system (B-2, B-5, B-14, B-17, B-18, and B-19).
- A typical soil porosity of 30% (0.30) is utilized.
- The contaminant concentration is the average of the sum of benzene, toluene, ethylbenzene, xylenes, and MTBE concentrations (Table 3) from the mostly impacted sample in each boring located within the radius of influence of the DPE system depicted on Figure 3. The minimum detection limit is utilized in cases where the results are non-detect.

**Calculation Explanation:**

TISV (Total Impacted Soil Volume) (ft<sup>3</sup>) = Plume Area (ft<sup>2</sup>) \* Thickness (ft)

SMV (Soil Mineral Volume) (ft<sup>3</sup>) = TISV (ft<sup>3</sup>) \* (1 - Soil Porosity)

SMM (Soil Mineral Mass) (lbs) = SMV (ft<sup>3</sup>) \* Solid Mineral Density (lbs/ft<sup>3</sup>)

AHM-G/D (Adsorbed Hydrocarbon Mass for Gasoline/Diesel) (lbs) = (Contaminant Concentration (ppm) / 10<sup>6</sup>) \* SMM (lbs)

**Appendix A: Emission Calculations  
Contaminant Mass Calculations  
Total Volatile Organic Compounds (VOCs) Potential to Emit**

**Company Name:** Johnson Junction, Inc.  
**Address City IN Zip:** 507 West Park Drive, Huntington, Indiana 46750  
**Permit Number:** 069-27776-00082  
**Calculations:** Submitted by Johnson Junction, Inc.  
**Reviewer:** Sarah Conner, Ph. D.  
**Date:** 4/16/2009

Free Product Mass (lbs):	131	
Potential Gasoline Range (BTEX/MTBE) Mass (lbs):	899	(Sum of DPHM and AHM-G)
Total Hydrocarbon Mass (lbs):	<b>1,030</b>	(Sum of Free Product, Dissolved Phase, and Adsorbed Hydrocarbons)

System Operational Period :	3	years
<b>VOC PTE:</b>	<b>0.2</b>	<b>tons/year</b>

**Assumptions:**

-System Operational Period is the estimated time that will be required to reduce petroleum impacts at this site to below IDEM closure levels.

-It is assumed that all potential hydrocarbons that can be captured and emitted by the remediation system are composed of 100% VOCs.

**Calculation Explanation:**

VOC PTE (Total VOCs Potential to Emit) (tons/year) = Total Hydrocarbon Mass (lbs) / 2000 (lbs/ton) / System Operational Period (years)

**Appendix A: Emission Calculations  
Contaminant Mass Calculations  
Individual Hazardous Air Pollutants (HAPs) Potential to Emit**

**Company Name:** Johnson Junction, Inc.  
**Address City IN Zip:** 507 West Park Drive, Huntington, Indiana 46750  
**Permit Number:** 069-27776-00082  
**Calculations:** Submitted by Johnson Junction, Inc.  
**Reviewer:** Sarah Conner, Ph. D.  
**Date:** 4/16/2009

HAP	Gasoline		Total Hydrocarbon Mass	
	Concentration	Total Mass PTE (lbs)	Totals lbs	tons/year (3 years)
Benzene	4.9%	44.06	44.06	0.007
Toluene	25.0%	224.81	224.81	0.037
Ethylbenzene	3.0%	26.98	26.98	0.004
Xylenes	15.0%	134.89	134.89	0.022
MTBE	15.0%	134.89	134.89	0.022
Naphthalene	5.0%	44.96	44.96	0.007
Isopropyl-	2.0%	17.98	17.98	0.003
			Sum:	0.105

**Assumptions:**

-Maximum HAPs percentages in gasoline based on attached MSDS (benzene 4.9%, toluene 25%, ethylbenzene 3.0%, xylene 15%, MTBE 5%)

**Calculation Explanation:**

-The individual HAP PTE is estimated by multiplying the total Potential Gasoline Range Mass by the corresponding percentage composition in gasoline or diesel fuels.

**Appendix A: Emission Calculations  
Fugitive Dust Emissions - Paved Roads**

**Company Name:** Johnson Junction, Inc.  
**Address City IN Zip:** 507 West Park Drive, Huntington, Indiana 46750  
**Permit Number:** 069-27776-00082  
**Reviewer:** Calculations submitted by Johnson Junction, Inc. and reviewed by Sarah Conner, Ph. D.  
**Date:** 4/16/2009

**Paved Roads at Industrial Site**

The following calculations determine the amount of emissions created by paved roads, based on 8,760 hours of use and AP-42, Ch 13.2.1 (12/2003).

Vehicle Information (provided by source)

Type	Maximum number of vehicles	Number of one-way trips per day per vehicle	Maximum trips per day (trip/day)	Maximum Weight Loaded (tons/trip)	Total Weight driven per day (ton/day)	Maximum one-way distance (feet/trip)	Maximum one-way distance (mi/trip)	Maximum one-way miles (miles/day)	Maximum one-way miles (miles/yr)
Vehicle (entering plant) (one-way trip)	1098.0	1.0	1098.0	5.0	5490.0	180	0.034	37.4	13662.6
Vehicle (leaving plant) (one-way trip)	1098.0	1.0	1098.0	5.0	5490.0	180	0.034	37.4	13662.6
<b>Total</b>			<b>2196.0</b>		<b>10980.0</b>			<b>74.9</b>	<b>27325.2</b>

Average Vehicle Weight Per Trip = 

5.0
-----

 tons/trip  
 Average Miles Per Trip = 

0.03
------

 miles/trip

Unmitigated Emission Factor,  $E_f = [k * (sL/2)^{0.65} * (W/3)^{1.5} - C]$  (Equation 1 from AP-42 13.2.1)

	PM	PM10	PM2.5	
where k =	0.082	0.016	0.0024	lb/mi = particle size multiplier (AP-42 Table 13.2.1-1)
W =	5.0	5.0	5.0	tons = average vehicle weight (provided by source)
C =	0.00047	0.00047	0.00036	lb/mi = emission factor for vehicle exhaust, brake wear, and tire wear (AP-42 Table 13.2.1-2)
sL =	0.6	0.6	0.6	g/m <sup>2</sup> = Ubiquitous Baseline Silt Loading Values of paved roads (Table 13.2.1-3 for summer month)

Taking natural mitigation due to precipitation into consideration, Mitigated Emission Factor,  $E_{ext} = E * [1 - (p/4N)]$

Mitigated Emission Factor,  $E_{ext} = E_f * [1 - (p/4N)]$   
 where p = 

125
-----

 days of rain greater than or equal to 0.01 inches (see Fig. 13.2.1-2)  
 N = 

365
-----

 days per year

	PM	PM10	PM2.5	
Unmitigated Emission Factor, $E_f =$	0.08	0.02	0.00	lb/mile
Mitigated Emission Factor, $E_{ext} =$	0.07	0.01	0.00	lb/mile

Process	Unmitigated PTE of PM (tons/yr)	Unmitigated PTE of PM10 (tons/yr)	Unmitigated PTE of PM2.5 (tons/yr)	Mitigated PTE of PM (tons/yr)	Mitigated PTE of PM10 (tons/yr)	Mitigated PTE of PM2.5 (tons/yr)
Vehicle (entering plant) (one-way trip)	0.55	0.10	0.01	0.50	0.10	0.01
Vehicle (leaving plant) (one-way trip)	0.55	0.10	0.01	0.50	0.10	0.01
	<b>1.10</b>	<b>0.21</b>	<b>0.03</b>	<b>1.00</b>	<b>0.19</b>	<b>0.02</b>

**Methodology**

Total Weight driven per day (ton/day) = [Maximum Weight Loaded (tons/trip)] \* [Maximum trips per day (trip/day)]  
 Maximum one-way distance (mi/trip) = [Maximum one-way distance (feet/trip) / 5280 ft/mile]  
 Maximum one-way miles (miles/day) = [Maximum trips per year (trip/day)] \* [Maximum one-way distance (mi/trip)]  
 Average Vehicle Weight Per Trip (ton/trip) = SUM[Total Weight driven per day (ton/day)] / SUM[Maximum trips per day (trip/day)]  
 Average Miles Per Trip (miles/trip) = SUM[Maximum one-way miles (miles/day)] / SUM[Maximum trips per year (trip/day)]  
 Unmitigated PTE (tons/yr) = [Maximum one-way miles (miles/yr)] \* [Unmitigated Emission Factor (lb/mile)] \* (ton/2000 lbs)  
 Mitigated PTE (tons/yr) = [Maximum one-way miles (miles/yr)] \* [Mitigated Emission Factor (lb/mile)] \* (ton/2000 lbs)  
 Controlled PTE (tons/yr) = [Mitigated PTE (tons/yr)] \* [1 - Dust Control Efficiency]

**Abbreviations**

PM = Particulate Matter  
 PM10 = Particulate Matter (<10 um)  
 PM2.5 = Particle Matter (<2.5 um)  
 PTE = Potential to Emit