



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: April 4, 2011

RE: BP Products North America - Whiting Business Unit / 089 - 28934 - 00453

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

Notice of Decision: Approval - Effective Immediately

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 13-17-3-4 and 326 IAC 2, this approval is effective immediately, unless a petition for stay of effectiveness is filed and granted, and may be revoked or modified in accordance with the provisions of IC 13-15-7-1.

If you wish to challenge this decision, IC 4-21.5-3-7 and IC 13-15-7-3 require 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 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
FNPER-MOD.dot 12/3/07



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Ms. Linda Wilson
Environmental Superintendent
BP Products North America, Inc., Whiting Business Unit
2815 Indianapolis Boulevard
P.O. Box 710
Whiting, Indiana 46394-0710

April 4, 2011

Re: 089-28934-00453
Minor Source Modification to
Part 70 Operating Permit No.: 089-6741-
00453

Ms. Wilson:

BP Products North America, Inc., Whiting Business Unit was issued a Part 70 Operating Permit on December 14, 2006 for a stationary refinery and marketing terminal. A letter requesting changes to this permit was received on February 2, 2010. Pursuant to 326 IAC 2-7-10.5, the following modifications are approved at the source:

- (a) Conversion of the C-6 Ultraformate Splitter to a Dehexanizer (part of the No. 4 Ultraformer process unit);
- (b) Shutdown of the C-2 Naphtha Splitter Tower in the No. 3 Ultraformer;
- (c) Construction of a larger Naphtha Splitter Tower, identified as C-250, in the existing Isomerization (Isom) process unit;
- (d) Installation of benzene saturation capability in the existing Isom process unit; and
- (e) Process piping, pump, and exchanger modifications at each affected area.

The following construction conditions are applicable to the proposed project:

General Construction Conditions

1. The data and information supplied with the application shall be considered part of this source modification approval. Prior to any proposed change in construction which may affect the potential to emit (PTE) of the proposed project, the change must be approved by the Office of Air Quality (OAQ).
2. This approval to construct does not relieve the permittee of the responsibility to comply with the provisions of the Indiana Environmental Management Law (IC 13-11 through 13-20; 13-22 through 13-25; and 13-30), the Air Pollution Control Law (IC 13 17) and the rules promulgated thereunder, as well as other applicable local, state, and federal requirements.
3. Effective Date of the Permit
Pursuant to IC 13-15-5-3, this approval becomes effective upon its issuance.

4. Pursuant to 326 IAC 2-1.1-9 and 326 IAC 2-7-10.5(i), the Commissioner may revoke this approval if construction is not commenced within eighteen (18) months after receipt of this approval or if construction is suspended for a continuous period of one (1) year or more.
5. All requirements and conditions of this construction approval shall remain in effect unless modified in a manner consistent with procedures established pursuant to 326 IAC 2.
6. Pursuant to 326 IAC 2-7-10.5(l), the emission units constructed under this approval shall not be placed into operation prior to revision of the source's Part 70 Operating Permit to incorporate the required operation conditions.

This minor source modification authorizes modification of the emission units as described above. Operating conditions shall be incorporated into the Part 70 Operating Permit as a significant permit modification in accordance with 326 IAC 2-7-10.5(l)(2) and 326 IAC 2-7-12. Operation is not approved until the significant permit modification has been issued.

This decision is subject to the Indiana Administrative Orders and Procedures Act – IC 4-21.5-3-5. If you have any questions on this matter, please contact Jenny Acker, OAQ, 100 North Senate Avenue, MC 61-53, Room 1003, Indianapolis, Indiana, 46204-2251, or call at (800) 451-6027, and ask for Jenny Acker or extension 4-5329, or dial (317) 233-9327.

Sincerely,



Chrystal Wagner, Section Chief
Permits Branch
Office of Air Quality

Attachments:
Updated Permit
Technical Support Document
PTE Calculations

sjw

cc: File – Lake County
Lake County Health Department
U.S. EPA, Region V
Compliance and Enforcement Branch



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**Minor Source Modification to a Part 70 Source
OFFICE OF AIR QUALITY**

**BP Products North America Inc., Whiting Business Unit
2815 Indianapolis Blvd.
Whiting, Indiana 46394**

(herein known as the Permittee) is hereby authorized to construct subject to the conditions contained herein, the source described in Section A (Source Summary) of this permit.

This permit is issued in accordance with 326 IAC 2 and 40 CFR Part 70 Appendix A and contains the conditions and provisions specified in 326 IAC 2-7 as required by 42 U.S.C. 7401, et. seq. (Clean Air Act as amended by the 1990 Clean Air Act Amendments), 40 CFR Part 70.6, IC 13-15 and IC 13-17.

This permit also addresses certain new source review requirements for existing equipment and is intended to fulfill the new source review procedures pursuant to 326 IAC 2-7-10.5, applicable to those conditions.

Minor Source Modification No. 089-28934-00453	
Issued by:  Chrystal Wagner, Section Chief Permits Branch Office of Air Quality	Issuance Date: April 4, 2011

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SECTION A SOURCE SUMMARY

This permit is based on information requested by the Indiana Department of Environmental Management (IDEM), Office of Air Quality (OAQ) and Hammond Department of Environmental Management. The information describing the source contained in condition A.1 is descriptive information and does not constitute enforceable conditions. However, the Permittee 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 Permittee to obtain additional permits or seek modification of this permit pursuant to 326 IAC 2, or change other applicable requirements presented in the permit application.

A.1 General Information [326 IAC 2-7-4(c)] [326 IAC 2-7-5(15)] [326 IAC 2-7-1(22)]

The Permittee owns and operates a stationary refinery and marketing terminal.

Source Address:	2815 Indianapolis Blvd, Whiting, Indiana 46394-0170
Mailing Address:	P.O. Box 710, Whiting, Indiana 463940-170
General Source Phone Number:	219-473-3179
SIC Code:	2911
County Location:	Lake
Source Location Status:	Nonattainment for PM2.5 and 8-hour ozone standard Attainment for all other criteria pollutants
Source Status:	Part 70 Permit Program Major Source, under PSD and Emission Offset Rules Major Source, Section 112 of the Clean Air Act 1 of 28 Source Categories

A.2 Part 70 Source Definition [326 IAC 2-7-1(22)]

This stationary source consists of two (2) plants, with a third plant located on an adjacent site:

- (a) The Whiting Refinery (previously designated 089-00003), located at 2815 Indianapolis Boulevard, Whiting, Indiana 46394; and
- (b) The Marketing Terminal (previously designated 089-00004), located at 2530 Indianapolis Boulevard, Whiting, Indiana 46394.
- (c) INEOS USA LLC (designated as 089-00076), 2357 Standard Avenue, Whiting, IN 46394.

Since the two (2) plants (Whiting Refinery and the Marketing Terminal) are located on contiguous or adjacent properties, the plants are under common control of the same entity, and the Whiting Refinery supports the Marketing Terminal, the two (2) plants are considered one (1) source.

In the case of the BP Whiting refinery and the INEOS USA LLC chemical plant, neither plant has a major role in the day-to-day operations of the other plant. There is no contract between the two companies concerning the acceptance or usage of raw materials. Each plant is free to obtain raw materials from other sources. The chemical plant has obtained raw materials from other sources in the past when the refinery has been unable to supply it. Neither plant provides a majority of its output to the other plant. Neither plant has the right to assume control of the other under any circumstance. The INEOS chemical plant purchases steam, water, wastewater service and a raw material stream from the BP refinery. If the refinery were to cease operations, the chemical plant could continue to operate.

The BP refinery purchases a hydrocarbon stream from the chemical plant. It also sends by-products to the INEOS chemical plant's flare. The flared by-products come from the venting of rail cars and the depressurizing of drums. The refinery does not rely on the hydrocarbon stream in order to produce its principal products. The refinery does not rely on the INEOS flare. If the INEOS chemical plant were to cease operations, the refinery could continue to operate. The refinery has a procedure in place on what steps its employees take when the INEOS flare is unavailable. Neither plant is dependent on the other to operate.

Since there is no common control, the refinery and the chemical plant are not part of the same major source. There is no need to examine the other two criteria under the definition of major source. Therefore, the chemical plant is not included in this Title V Operating Permit. The chemical plant will receive a separate operating permit.

A.3 Emission Units and Pollution Control Equipment Summary [326 IAC 2-7-4(c)(3)]
[326 IAC 2-7-5(15)]

This stationary source is approved to construct and/or modify the following emission units and pollution control devices:

- (a) The Isomerization Unit (ISOM), identified as Unit ID 210, was constructed in 1985 as a conversion of the No.2 Ultraformer. The Isomerization process converts low octane naphtha into high octane gasoline blending components. This unit is connected to flare stack S/V 220-04, the UIU Flare, to control VOC emissions during emergency situations, unit startups and shutdowns, and preparation of equipment for maintenance. As part of the CXHO project, the ISOM heater H-1 will be modified by replacing several burners with larger burners, with rated capacity remaining at 190 MMBTU/hr. As part of the MSAT II Compliance project approved in 2010 for construction, one (1) new Naphtha Splitter Tower, identified as C-250, and associated equipment collectively identified as the Naphtha Splitter Unit, and benzene saturation capability will be installed in the ISOM. The facility includes the following emission sources and may include insignificant activities.
- (b) The No.3 Ultraformer Unit (No. 3 UF), identified as Unit ID 220, commissioned in 1958. The majority of the unit was shutdown in March 2007, including the H-1, H-2 and F-7 heaters, catalyst filled reactors and the internal scrubbing system, controlling the regeneration vent during the coke burn-off and catalyst rejuvenation steps of the regeneration process. The C-2 Splitter Tower will be shut down and demolished as part of the MSAT II Compliance project, approved in 2010 for construction. The unit consists of the C-2 Splitter Tower, the D-18 flare gas separator, D-24 knock-out drum and associated piping.
 - (1) One (1) flare gas separator (D-18) with emissions vented to vessel D-24, which exhausts to flare stack S/V 220-04.
 - (2) Leaks from process equipment, pumps, pressure relief devices, sampling connection systems, open-ended valves or lines, and instrumentation systems.
- (c) The No.4 Ultraformer Unit (no. 4 UF), identified as Unit ID 224, built in 1972, upgrades low-octane naphtha to gasoline blending material and chemical feedstocks. The front-end of the unit is a desulfurization section. The reforming section consists of a series of process furnaces and catalyst-filled reactors in which the naphtha is heated and converted from straight chain to aromatic compounds. The reactor products are separated by distillation for further

processing or blending into gasoline. A new reactor will be installed as part of the CXHO project. The C-6 Ultraformate Splitter will be used as a Dehexanizer as part of the MSAT II Compliance project, approved in 2010 for construction. The No. 4 Ultraformer includes the following sources of emissions and may also include insignificant activities:

- (1) Nine (9) process heaters, all of which burn refinery gas, natural gas, or liquified petroleum gas:

Heater Identification	Maximum Heat Input Capacity (MMBTU/hr)	Stack Exhausted To	Emission Controls
F-1	68	224-01	None
F-8A	163	224-01	None
F-8B	163	224-01	None
F-2	286	224-02	None
F-3	242	224-03	None
F-4R	137	224-04	None
F-5	99	224-04	None
F-6	49	224-04	None
F-7	52	224-05	None

- (2) One (1) flare (identified as the 4UF flare), exhausting at stack S/V 224-06. The 4UF flare is used to control VOC emissions during emergency situations, unit startups and shutdowns, preparation of equipment for maintenance, and reactor regenerations.
- (3) Six (6) catalyst-filled reactors, which are vented to flare stack S/V 224-06 during the initial catalyst depressuring and catalyst purging steps of the regeneration process.
- (4) Leaks from process equipment, including two (2) compressors (identified as K-1 and K-7), pumps, pressure relief devices, sampling connection systems, open-ended valves or lines, and instrumentation systems.
- (5) One (1) caustic scrubbing system, controlling the regeneration vent during the coke burn-off and catalyst rejuvenation steps of the regeneration process, which removes HAP emissions. The scrubber system includes:
 - (A) One (1) caustic scrubber exhausting to stack 224-07;
 - (B) One (1) carbon adsorption system used to treat waste scrubber liquor prior to disposal; and
 - (C) Caustic feed unloading, storage, and transfer equipment.

SECTION B GENERAL CONDITIONS

B.1 Definitions [326 IAC 2-7-1]

Terms in this permit 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 2-7) shall prevail.

B.2 Effective Date of the Permit [IC12-15-5-3]

Pursuant to IC-13-15-5-3, this approval becomes effective upon its issuance.

B.3 Revocation of Permits [326 IAC 2-1.1-9(5)][326 IAC 2-7-10.5(i)]

Pursuant to 326 IAC 2-1.1-9(5) (Revocation of Permits), the Commissioner may revoke this approval if construction is not commenced within eighteen (18) months after receipt of this approval or if construction is suspended for a continuous period of one (1) year or more.

B.4 Certification [326 IAC 2-7-4(f)] [326 IAC 2-7-6(1)] [326 IAC 2-7-5(3)(C)]

- (a) Where specifically designated by this permit or required by an applicable requirement, any application form, report, or compliance certification submitted shall contain certification by a responsible official of truth, accuracy, and completeness. This certification shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.
- (b) One (1) certification shall be included, using the attached Certification Form, with each submittal requiring certification. One (1) certification may cover multiple forms in one (1) submittal.
- (c) A responsible official is defined at 326 IAC 2-7-1(34).

B.5 Emergency Provisions [326 IAC 2-7-16]

- (a) An emergency, as defined in 326 IAC 2-7-1(12), is not an affirmative defense for an action brought for noncompliance with a federal or state health-based emission limitation.
- (b) An emergency, as defined in 326 IAC 2-7-1(12), constitutes an affirmative defense to an action brought for noncompliance with a technology-based emission limitation if the affirmative defense of an emergency is demonstrated through properly signed, contemporaneous operating logs or other relevant evidence that describe the following:
 - (1) An emergency occurred and the Permittee can, to the extent possible, identify the causes of the emergency;
 - (2) The permitted facility was at the time being properly operated;
 - (3) During the period of an emergency, the Permittee took all reasonable steps to minimize levels of emissions that exceeded the emission standards or other requirements in this permit;
 - (4) For each emergency lasting one (1) hour or more, the Permittee notified IDEM, OAQ, Hammond Department of Environmental Management, the Northwest Regional Office, within four (4) daytime business hours after the beginning of the emergency, or after the emergency was discovered

or reasonably should have been discovered. The Hammond Department of Environmental Management need only be notified if the emission units affected are located within the jurisdiction of the Hammond Department of Environmental Management.

IDEM, OAQ:

Telephone Number: 1-800-451-6027 (ask for Office of Air Quality, Compliance Section), or

Telephone Number: 317-233-5674 (ask for Compliance Section)

Facsimile Number: 317-233-5967

Hammond Department of Environmental Management:

Telephone Number: 219-853-6306

Facsimile Number: 219-853-6343

Northwest Regional Office:

Telephone Number: 219-881-6712

Telephone Number: 888-209-8892

Facsimile Number: 219-881-6745

- (5) For each emergency lasting one (1) hour or more, the Permittee submitted the attached Emergency Occurrence Report Form or its equivalent, either by mail or facsimile to:

Indiana Department of Environmental Management
Compliance Branch, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

For emergencies within the jurisdiction of the Hammond Department of Environmental Management, the Permittee shall submit the Emergency Occurrence Report Form to:

Hammond Department of Environmental Management
5925 Calumet Avenue
Hammond, Indiana 46320

The report shall be submitted within two (2) working days of the time when emission limitations were exceeded due to the emergency.

The notice fulfills the requirement of 326 IAC 2-7-5(3)(C)(ii) and shall contain the following:

- (A) A description of the emergency;
- (B) Any steps taken to mitigate the emissions; and
- (C) Corrective actions taken.

The notification which shall be submitted by the Permittee does not require the certification by the "responsible official" as defined by 326 IAC 2-7-1(34).

- (6) The Permittee immediately took all reasonable steps to correct the emergency.

- (c) In any enforcement proceeding, the Permittee seeking to establish the occurrence of an emergency has the burden of proof.
- (d) This emergency provision supersedes 326 IAC 1-6 (Malfunctions). This permit condition is in addition to any emergency or upset provision contained in any applicable requirement.
- (e) The Permittee seeking to establish the occurrence of an emergency shall make records available upon request to ensure that failure to implement a PMP did not cause or contribute to an exceedance of any emission limitation. However, IDEM, OAQ, and Hammond Department of Environmental Management may require that the Preventive Maintenance Plans required under 326 IAC 2-7-4-(c)(9) be revised in response to an emergency.
- (f) Failure to notify IDEM, OAQ, and Hammond Department of Environmental Management (for emergencies occurring within its jurisdiction) by telephone or facsimile of an emergency lasting more than one (1) hour in accordance with (b)(4) and (5) of this condition shall constitute a violation of 326 IAC 2-7 and any other applicable rules.
- (g) If the emergency situation causes a deviation from a technology-based limit, the Permittee may continue to operate the affected emitting facilities during the emergency provided the Permittee immediately takes all reasonable steps to correct the emergency and minimize emissions.
- (h) The Permittee shall include all emergencies in the Quarterly Deviation and Compliance Monitoring Report.

SECTION C

SOURCE OPERATION CONDITIONS

Entire Source

Emission Limitations and Standards [326 IAC 2-7-5(1)]

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 permit:

- (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 Permittee 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). 326 IAC 6-4-2(4) is not federally enforceable.

C.3 Fugitive Dust Emissions [326 IAC 6.8-10-3]

Pursuant to 326 IAC 6.8-10-3 (Lake County Fugitive Particulate Matter Control Requirements), the particulate matter emissions from source wide activities shall meet the following requirements:

- (a) The average instantaneous opacity of fugitive particulate emissions from a paved road shall not exceed ten percent (10%), as determined in accordance with the procedures specified in 326 IAC 6.8-10-3(1).
- (b) The average instantaneous opacity of fugitive particulate emissions from an unpaved road shall not exceed ten percent (10%), as determined in accordance with the procedures specified in 326 IAC 6.8-10-3(2).
- (c) The average instantaneous opacity of fugitive particulate emissions from batch transfer shall not exceed ten percent (10%), as determined in accordance with the procedures specified in 326 IAC 6.8-10-3(3)(A).
- (d) The opacity of fugitive particulate emissions from storage piles shall not exceed ten percent (10%) on a six (6) minute average, as determined in accordance with the procedures specified in 326 IAC 6.8-10-3(5).
- (e) There shall be a zero (0) percent frequency of visible emission observations of a material during the inplant transportation of material by truck or rail at any time, as determined in accordance with the procedures specified in 326 IAC 6.8-10-3(6)(A).
- (f) The opacity of fugitive particulate emissions from the in plant transportation of material by front end loaders and skip hoists shall not exceed ten percent (10%),

as determined in accordance with the procedures specified in 326 IAC 6.8-10-3(6)(B).

- (g) There shall be a zero (0) percent frequency of visible emission observations from a building enclosing all or part of the material processing equipment, except from a vent in the building, as determined in accordance with the procedures specified in 326 IAC 6.8-10-3(7)(D).
- (h) The PM10 emissions from building vents shall not exceed twenty-two thousandths (0.022) grains per dry standard cubic foot and ten percent (10%) opacity, as determined in accordance with the procedures specified in 326 IAC 6.8-10-3(7)(E).
- (i) The opacity of particulate emissions from dust handling equipment shall not exceed ten percent (10%), as determined in accordance with the procedures specified in 326 IAC 6.8-10-3(8).
- (j) Any facility or operation not specified in 326 IAC 6.8-10-3 shall meet a twenty percent (20%), three (3) minute average opacity standard, as determined in accordance with the procedures specified in 326 IAC 6.8-10-3(9).

The Permittee shall achieve these limits by controlling fugitive particulate matter emissions according to the Fugitive Dust Control Plan, submitted on December 11, 1993, revised on May 28, 2004, and included in Appendix A.

Compliance Requirements [326 IAC 2-1.1-11]

C.4 Compliance Requirements [326 IAC 2-1.1-11]

The commissioner may require stack testing, monitoring, or reporting at any time to assure compliance with all applicable requirements by issuing an order under 326 IAC 2-1.1-11. Any monitoring or testing shall be performed in accordance with 326 IAC 3 or other methods approved by the commissioner or the U.S. EPA.

C.5 Actions Related to Noncompliance Demonstrated by a Stack Test [326 IAC 2-7-5] [326 IAC 2-7-6]

- (a) When the results of a stack test performed in conformance with Section C - Performance Testing, of this permit exceed the level specified in any condition of this permit, the Permittee shall take appropriate response actions. The Permittee shall submit a description of these response actions to IDEM, OAQ, within thirty (30) days of receipt of the test results. The Permittee shall take appropriate action to minimize excess emissions from the affected facility while the response actions are being implemented.
- (b) A retest to demonstrate compliance shall be performed within one hundred twenty (120) days of receipt of the original test results. Should the Permittee demonstrate to IDEM, OAQ that retesting in one-hundred and twenty (120) days is not practicable, IDEM, OAQ may extend the retesting deadline.
- (c) IDEM, OAQ reserves the authority to take any actions allowed under law in response to noncompliant stack tests.

The response action documents submitted pursuant to this condition do require the certification by the "responsible official" as defined by 326 IAC 2-7-1(34).

Record Keeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]

C.6 General Record Keeping Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-6] [326 IAC 2-2] [326 IAC 2-3]

- (a) Records of all required monitoring data, reports and support information required by this Permit shall be retained for a period of at least five (5) years from the date of monitoring sample, measurement, report, or application. These records shall be physically present or electronically accessible at the source location for a minimum of three (3) years. The records may be stored elsewhere for the remaining two (2) years as long as they are available upon request. If the Commissioner or the Hammond Department of Environmental Management, makes a request for records to the Permittee, the Permittee shall furnish the records to the Commissioner or the Hammond Department of Environmental Management, within a reasonable time.
- (b) Unless otherwise specified in this permit, all record keeping requirements not already legally required shall be implemented within ninety (90) days of the effective date of this permit.
- (c) If there is a reasonable possibility that a "project" (as defined in 326 IAC 2-2-1(qq) or 326 IAC 2-3-1(II)) at a major source other than projects at a source with a Plantwide Applicability Limitation (PAL) which is not part of a "major Modification" (as defined in 326 IAC 2-2-1(ee) or 326 IAC 2-3-1(z)) and the Permittee elects to utilize the "projected actual emissions" (as defined in 326 IAC 2-2-1(rr) or 326 IAC 2-3-1(mm)), the Permittee shall comply with the following:
 - (1) Prior to commencing the construction of "project" (as defined in 326 IAC 2-2-1(qq) or 326 IAC 2-3-1(II)) document and maintain the following records:
 - (A) A description of the project;
 - (B) Identification of any emissions unit whose emissions of a regulated new source review pollutant could be affected by the project;
 - (C) A description of the applicability test used to determine that the project is not a major modification for any regulated NSR pollutant, including:
 - (i) Baseline actual emissions;
 - (ii) Projected actual emissions;
 - (iii) Amount of emissions excluded under section 326 IAC 2-2-1(rr)(2)(A)(iii) or 326 IAC 2-3-1(mm)(2)(A)(iii); and
 - (iv) An explanation for why the amount was excluded, and any netting calculations, if applicable.
 - (2) Monitor the emissions of any regulated NSR pollutant that could increase as a result of the project and that is emitted by any emissions unit identified in (1)(B) above; and

- (3) Calculate and maintain a record of the annual emissions, in tons per year on a calendar year basis, for a period of five (5) years following resumption of regular operations after the change, or for a period of ten (10) ten years following resumption of regular operations after the change if the project increases the design capacity of or the potential to emit that regulated NSR pollutant at the emission unit.

C.7 General Reporting Requirements [326 IAC 2-7-5(3)(C)] [326 IAC 2-1.1-11] [326 IAC 2-2] [326 IAC 2-3]

- (a) The Permittee shall submit the attached Quarterly Deviation and Compliance Monitoring Report or its equivalent. Any deviation from permit requirements, the date(s) of each deviation, the cause of the deviation, and the response steps taken shall be reported. This report shall be submitted within thirty (30) days of the end of the reporting period. The Quarterly Deviation and Compliance Monitoring Report shall include the certification by the "responsible official" as defined by 326 IAC 2-7-1(34).
- (b) The report required in (a) of this condition and reports required by conditions in Section D of this permit shall be submitted to:

Indiana Department of Environmental Management
Compliance Data Section, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

and, for facilities located with the jurisdiction of the Hammond Department of Environmental Management, to

Hammond Department of Environmental Management
5925 Calumet Avenue
Hammond, Indiana 46320
- (c) Unless otherwise specified in this permit, any notice, report, or other submission required by this permit 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, and Hammond Department of Environmental Management, on or before the date it is due.
- (d) Unless otherwise specified in this permit, all reports required in Section D of this permit shall be submitted within thirty (30) days of the end of the reporting period. All reports do require the certification by the "responsible official" as defined by 326 IAC 2-7-1(34).
- (e) The first report shall cover the period commencing on the effective date of this permit and ending on the last day of the reporting period. Reporting periods are based on calendar years, unless otherwise specified in this permit. For the purpose of this permit "calendar year" means the twelve (12) month period from January 1 to December 31 inclusive.
- (f) If the Permittee is required to comply with the recordkeeping provisions of (c) in Section C – General Record Keeping Requirements for any "project" (as defined

in 326 IAC 2-2-1(qq) or 326 IAC 2-3-1(II)), and the project meets the following criteria, then the Permittee shall submit a report to IDEM, OAQ:

- (1) The annual emission, in tons per year, from the project identified in (c)(1) in Section C - General Record Keeping Requirements exceed the baseline actual emissions, as documented and maintained under Section C - General Record Keeping Requirements (c)(1)(C)(i), by a significant amount, as defined in 326 IAC 2-2-1(xx) or 326 IAC 2-3-1(qq), for that regulated NSR pollutant, and;
 - (2) The emissions differ from the preconstruction projection as documented and maintained under Section C - General Record Keeping Requirements (c)(1)(C)(ii).
- (g) The report shall be submitted within sixty (60) days after the end of the year and contain the following:
- (1) The name, address, and telephone number of the major stationary source.
 - (2) The annual emissions calculated in accordance with (c)(2) and (3) in Section C - General Record Keeping Requirements.
 - (3) The emissions calculated under the actual-to-projected actual test stated in 326 IAC 2-2-2(d)(3) or 326 IAC 2-3-2(c)(3).
 - (4) Any other information that the Permittee deems fit to include in this report.

Reports required in this part shall be submitted to:

Indiana Department of Environmental Management
Air Compliance Section, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

- (h) The Permittee shall make the information required to be documented and maintained in accordance with (c) in Section C - General Record Keeping Requirements available for review upon a request for inspection by IDEM, OAQ. The general public may request this information from the IDEM, OAQ under 326 IAC 17.1

SECTION D.1 FACILITY CONSTRUCTION CONDITIONS - MSAT II Compliance Project

Facility Description [326 IAC 2-7-5(15)]

Emissions units - new, modified and affected by MSAT II Compliance project, including the following:

- (a) The Isomerization Unit (ISOM), identified as Unit ID 210, was constructed in 1985 as a conversion of the No.2 Ultraformer. The Isomerization process converts low octane naphtha into high octane gasoline blending components. This unit is connected to flare stack S/V 220-04, the UIU Flare, to control VOC emissions during emergency situations, unit startups and shutdowns, and preparation of equipment for maintenance. As part of the CXHO project, the ISOM heater H-1 will be modified by replacing several burners with larger burners, with rated capacity remaining at 190 MMBTU/hr. As part of the MSAT II Compliance project approved in 2010 for construction, one (1) new Naphtha Splitter Tower, identified as C-250, and associated equipment collectively identified as the Naphtha Splitter Unit, and benzene saturation capability will be installed in the ISOM. The facility includes the following emission sources and may include insignificant activities.
 - (1) One (1) flare gas separator (D-18) with emissions vented to vessel D-24, which exhausts to flare stack S/V 220-04.
 - (2) Leaks from process equipment, pumps, pressure relief devices, sampling connection systems, open-ended valves or lines, and instrumentation systems.

- (b) The No.3 Ultraformer Unit (No. 3 UF), identified as Unit ID 220, commissioned in 1958. The majority of the unit was shutdown in March 2007, including the H-1, H-2 and F-7 heaters, catalyst filled reactors and the internal scrubbing system, controlling the regeneration vent during the coke burn-off and catalyst rejuvenation steps of the regeneration process. The C-2 Splitter Tower will be shut down and demolished as part of the MSAT II Compliance project, approved in 2010 for construction. The unit consists of the C-2 Splitter Tower, the D-18 flare gas separator, D-24 knock-out drum and associated piping.
 - (1) One (1) flare gas separator (D-18) with emissions vented to vessel D-24, which exhausts to flare stack S/V 220-04.
 - (2) Leaks from process equipment, pumps, pressure relief devices, sampling connection systems, open-ended valves or lines, and instrumentation systems.

- (c) The No.4 Ultraformer Unit (no. 4 UF), identified as Unit ID 224, built in 1972, upgrades low-octane naphtha to gasoline blending material and chemical feedstocks. The front-end of the unit is a desulfurization section. The reforming section consists of a series of process furnaces and catalyst-filled reactors in which the naphtha is heated and converted from straight chain to aromatic compounds. The reactor products are separated by distillation for further processing or blending into gasoline. A new reactor will be installed as part of the CXHO project. The C-6 Ultraformate Splitter will be used as a Dehexanizer as part of the MSAT II Compliance project, approved in 2010 for construction. The No. 4 Ultraformer includes the following sources of emissions and may also include insignificant activities:
 - (1) Nine (9) process heaters, all of which burn refinery gas, natural gas, or liquified petroleum gas:

Heater Identification	Maximum Heat Input Capacity (MMBTU/hr)	Stack Exhausted To	Emission Controls
F-1	68	224-01	None
F-8A	163	224-01	None

F-8B	163	224-01	None
F-2	286	224-02	None
F-3	242	224-03	None
F-4R	137	224-04	None
F-5	99	224-04	None
F-6	49	224-04	None
F-7	52	224-05	None

(2) One (1) flare (identified as the 4UF flare), exhausting at stack S/V 224-06. The 4UF flare is used to control VOC emissions during emergency situations, unit startups and shutdowns, preparation of equipment for maintenance, and reactor regenerations.

(3) Six (6) catalyst-filled reactors, which are vented to flare stack S/V 224-06 during the initial catalyst depressuring and catalyst purging steps of the regeneration process.

(4) Leaks from process equipment, including two (2) compressors (identified as K-1 and K-7), pumps, pressure relief devices, sampling connection systems, open-ended valves or lines, and instrumentation systems.

(5) One (1) caustic scrubbing system, controlling the regeneration vent during the coke burn-off and catalyst rejuvenation steps of the regeneration process, which removes HAP emissions. The scrubber system includes:

- (A) One (1) caustic scrubber exhausting to stack 224-07;
- (B) One (1) carbon adsorption system used to treat waste scrubber liquor prior to disposal; and
- (C) Caustic feed unloading, storage, and transfer equipment.

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

THE SECTION OF THE PERMIT IS BEING ISSUED UNDER THE PROVISIONS OF 326 IAC 2-1.1 AND 326 IAC 2-7-10.5, WITH THE CONDITIONS LISTED BELOW.

General Construction Conditions

D.1.1 Permit No Defense

This permit to construct does not relieve the Permittee of responsibility to comply with the provisions of the Indiana Environmental Management Law (IC 13-11 through 13-20; 13-22 through 13-25; and 13-30), the Air Pollution Control Law (IC 13-17), and the rules promulgated thereunder, as well as other applicable local, state, and federal requirements.

D.1.2 Modification to Construction Conditions [326 IAC 2]

All requirements of these construction conditions shall remain in effect unless modified in a manner consistent with procedures established for modifications pursuant to 326 IAC 2.

Emission Limitations and Standards [326 IAC 2-7-5(1)]

D.1.3 PSD and Nonattainment NSR Minor Limit [326 IAC 2-2-2] [326 IAC 2-1.1-5]

The steam energy usage for the combined C-250 and C-1 systems shall not exceed 1,687,693 MMBtu per twelve (12) consecutive month period, with compliance determined at the end of each month.

Compliance with this limitation will ensure that the potential to emit from this modification is less than twenty-five (25) tons of PM per year, less than fifteen (15) tons of PM₁₀ per year, less than ten (10) tons of PM_{2.5} per year, less than forty (40) tons per year of NO_x, less than forty (40) tons of SO₂ per year, less than 100 tons of CO per year, less than seven (7) tons of H₂SO₄ per year, less than 0.6 tons of lead per year, less than 0.1 tons of mercury per year, less than 0.0004 tons of beryllium per year, less than ten (10) tons of H₂S per year, and less than twenty-five (25) tons per year of VOC. Therefore, the requirements of 326 IAC 2-2 (PSD) and 326 IAC 2-1.1-5 (Nonattainment NSR) are rendered not applicable.

Compliance Determination Requirements

D.1.4 Steam Energy Usage

Compliance with the steam energy usage limit in Condition D.1.3 shall be determined by an energy balance calculation, as follows:

$$\text{Energy Demand (MMBtu/yr)} = E_{\text{in},400\#} \text{ (MMBtu/yr)} + E_{\text{in},100\#} \text{ (MMBtu/yr)} + E_{\text{in,BFW}} \text{ (MMBtu/yr)} - E_{\text{out},100\#} \text{ (MMBtu/yr)} - E_{\text{out},10\#} \text{ (MMBtu/yr)} - E_{\text{out,condensate}} \text{ (MMBtu/yr)}$$

where: E_x (MMBtu/yr) = F_x (lb x/hr) * H_x (Btu/lb) * 10^{-6} (MMBtu/Btu) * 8760 (hr/yr);

F_x (lb x/hr) = steam, condensate, or boiler feed water mass flow rate; and
 H_x (Btu/lb) = enthalpy of steam, condensate, or boiler feed water based on known conditions (superheated or saturated, and temperature and/or pressure).

Record Keeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]

D.1.5 Record Keeping Requirements

To document the compliance status with Condition D.1.3, the Permittee shall maintain a daily record of the steam, condensate, and boiler feed water mass flow rates for the combined C-250 and C-1 systems.

D.1.6 Reporting Requirements

A quarterly report of the information to document the compliance status with Condition D.1.3 shall be submitted not later than thirty (30) days after the end of the quarter being reported. Section C - General Reporting contains the Permittee's obligation with regard to the reports required by this condition. The report submitted by the Permittee does require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official", as defined by 326 IAC 2-7-1(34).

**INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY**

**PART 70 OPERATING PERMIT
CERTIFICATION**

Source Name: BP Products North America, Inc., Whiting Business Unit
Source Address: 2815 Indianapolis Blvd, Whiting, Indiana 46394-0710
Part 70 Permit No.: T089-6741-00453

This certification shall be included when submitting monitoring, testing reports/results or other documents as required by this permit.

Please check what document is being certified:

- Annual Compliance Certification Letter
- Test Result (specify) _____
- Report (specify) _____
- Notification (specify) _____
- Affidavit (specify) _____
- Other (specify) _____

I certify that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

Signature:

Printed Name:

Title/Position:

Phone:

Date:

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

Part 70 Quarterly Report

Source Name: BP Products North America, Inc., Whiting Business Unit
Source Address: 2815 Indianapolis Boulevard, Whiting, Indiana 46394-0710
Part 70 Permit No.: T089-6741-00453
Parameter: Hydrogen usage
Facility: Benzene saturation reactor

QUARTER: _____ YEAR: _____

Month	Column 1	Column 2	Column 1 + Column 2
	This Month	Previous 11 Months	12 Month Total
Month 1			
Month 2			
Month 3			

- No deviation occurred in this quarter.
 Deviation/s occurred in this quarter.
Deviation has been reported on: _____

Submitted by: _____
Title / Position: _____
Signature: _____
Date: _____
Phone: _____

**Indiana Department of Environmental Management
Office of Air Quality**

**Technical Support Document (TSD) for a Part 70 Minor Source
Modification**

Source Description and Location

Source Name:	BP Products North America, Inc., Whiting Business Unit
Source Location:	2815 Indianapolis Boulevard, Whiting, Indiana 46394
County:	Lake
SIC Code:	2911
Operation Permit No.:	T089-6741-00453
Operation Permit Issuance Date:	December 14, 2006
Minor Source Modification No.:	089-28934-00453
Significant Permit Modification No.:	089-29033-00453
Permit Reviewer:	Stephanie Wilkerson

Source Definition

This stationary source consists of two (2) plants, with a third plant located on an adjacent site:

- (a) The Whiting Refinery (previously designated 089-00003), located at 2815 Indianapolis Boulevard, Whiting, Indiana 46394; and
- (b) The Marketing Terminal (previously designated 089-00004), located at 2530 Indianapolis Boulevard, Whiting, Indiana 46394.
- (c) INEOS USA LLC (designated as 089-00076), 2357 Standard Avenue, Whiting, IN 46394.

Since the two (2) plants (Whiting Refinery and the Marketing Terminal) are located on contiguous or adjacent properties, the plants are under common control of the same entity, and the Whiting Refinery supports the Marketing Terminal; the two (2) plants are considered one (1) source.

In the case of the BP Whiting refinery and the INEOS USA LLC chemical plant, neither plant has a major role in the day-to-day operations of the other plant. There is no contract between the two companies concerning the acceptance or usage of raw materials. Each plant is free to obtain raw materials from other sources. The chemical plant has obtained raw materials from other sources in the past when the refinery has been unable to supply it. Neither plant provides a majority of its output to the other plant. Neither plant has the right to assume control of the other under any circumstance. The INEOS chemical plant purchases steam, water, wastewater service and a raw material stream from the BP refinery. If the refinery were to cease operations, the chemical plant could continue to operate.

The BP refinery purchases a hydrocarbon stream from the chemical plant. It also sends byproducts to the INEOS chemical plant's flare. The flared by-products come from the venting of rail cars and the depressurizing of drums. The refinery does not rely on the hydrocarbon stream in order to produce its principal products. The refinery does not rely on the INEOS flare. If the INEOS chemical plant were to cease operations, the refinery could continue to operate. The refinery has a procedure in place on what steps its employees take when the INEOS flare is unavailable. Neither plant is dependent on the other to operate.

Since there is no common control, the refinery and the chemical plant are not part of the same major source. There is no need to examine the other two criteria under the definition of major source. Therefore, the chemical plant is not included in this Title V Operating Permit. The chemical plant will receive a separate operating permit.

Existing Approvals

The source was issued Part 70 Operating Permit No. 089-6741-00453 on December 14, 2006. The source has since received the following approvals:

Permit Type	Permit Number	Issuance Date
Minor Source Modification	089-23783-00453	February 20, 2007
Significant Permit Modification	089-24068-00453	May 21, 2007
Minor Source Modification	089-24258-00453	March 30, 2007
Significant Permit Modification	089-24410-00453	June 19, 2007
Significant Source Modification	089-25484-00453	May 1, 2008
Significant Permit Modification	089-25488-00453	June 16, 2008

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; 148th 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	Attainment effective June 4, 2010. 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.

¹The U. S. EPA has acknowledged in both the proposed and final rulemaking for this redesignation that the anti-backsliding provisions for the 1-hour ozone standard no longer apply as a result of the redesignation under the 8-hour ozone standard. Therefore, permits in Lake County are no longer subject to review pursuant to Emission Offset, 326 IAC 2-3.

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. Therefore, VOC and NO_x emissions are considered when evaluating the rule applicability relating to ozone. Lake County has been designated as attainment or unclassifiable for ozone. Therefore, VOC and NO_x emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2.

- (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 lawsuit 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 8, 2008, and effective on July 15, 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 all other criteria pollutants. Therefore, these emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2.
- (d) Since this source is classified as a petroleum refinery, it is considered one (1) of the twenty-eight (28) listed source categories, as specified in 326 IAC 2-2-1(gg)(1).

Fugitive Emissions

Since this source is classified as a petroleum refinery, it is considered one (1) of the twenty-eight (28) listed source categories, as specified in 326 IAC 2-2 or 326 IAC 2-7. Therefore, fugitive emissions are counted toward the determination of PSD and Part 70 Permit applicability.

Source Status

The table below summarizes the potential to emit of the entire source, prior to the proposed modification, after consideration of all enforceable limits established in the effective permits:

Pollutant	Emissions (ton/yr)
PM	>100
PM ₁₀	>100
PM _{2.5}	>100
SO ₂	>100
VOC	>100
CO	>100
NO _x	>100
Single HAP	>10
Total HAPs	>25

- (a) This existing source is a major stationary source, under PSD (326 IAC 2-2), because a regulated pollutant is emitted at a rate of 100 tons per year or more, and it is one (1) of the twenty-eight (28) listed source categories, as specified in 326 IAC 2-2-1(gg)(1).
- (b) This existing source is a major stationary source under Nonattainment New Source Review rules (326 IAC 2-1.1-5) since direct PM_{2.5} and/or SO₂ is emitted at a rate of 100 tons per year or more.
- (c) This existing source is a major source of HAPs, as defined in 40 CFR 63.2, because HAP emissions are greater than ten (10) tons per year for a single HAP and greater than twenty-five (25) tons per year for a combination of HAPs. Therefore, this source is a major source under Section 112 of the Clean Air Act (CAA).

- (d) These emissions are based upon the 2008 emissions data submitted to the IDEM OAQ.

Description of Proposed Modification

The Office of Air Quality (OAQ) has reviewed a modification application, submitted by BP Products North America, Inc., Whiting Business Unit, on February 2, 2010, relating to the modification of existing process units that will reduce the amount of benzene in the finished gasoline product produced by the Whiting Refinery. The changes are necessary, in part, for the source to comply with the federal MSAT II Rule (40 CFR Part 80, Subpart L).

This project proposes the following modifications:

- (a) Shutdown of the C-2 Naphtha Splitter Tower in the No. 3 Ultraformer
- (1) The C-2 tower has reached the end of its useful life at the refinery. The distillation capacity of this unit will be absorbed into the one (1) proposed C-250 Splitter Tower.
- (b) Construction of a larger Naphtha Splitter Tower, identified as C-250, in the existing Isomerization (Isom) process unit
- (1) The refinery must install additional distillation capacity to create a new high benzene content stream, which can then be treated as required by future mobile source air toxics regulations. As stated previously, the existing C-2 Naphtha Splitter Tower has reached the end of its working life and, instead of constructing two (2) new columns to compensate for replacement and growth; the source has opted to construct one (1) large tower. The C-250 unit is larger only in the way that it combines the functions of two (2) existing towers: the C-2 unit and the C-6 Ultraformate Splitter discussed below.
- (c) Conversion of the C-6 Ultraformate Splitter to a Dehexanizer (part of the No. 4 Ultraformer process unit)
- (1) The construction of the C-250 unit allows the C-6 Ultraformate Splitter to be placed into dehexanizer service. This conversion does not require a modification of the tower as the unit is currently able to perform this function but is needed in its current configuration. Converting to operate as a Dehexanizer allows the unit to create the new light light ultraformate (LLUF) stream as required to meet the requirements of the federal MSAT II Rule.
- (d) Construction of one (1) new benzene saturation reactor
- (1) The benzene saturation reactor will be used to hydrogenate the LLUF, working with the converted C-6 Dehexanizer.
- (e) Upgrade of the Isomerization unit's C-1 Reactor Stabilizer tower reboiler
- (1) The C-1 reboiler duty must be increased in order to accommodate the additional reactor effluent (resulting from the addition of the new benzene saturation reaction system) through the unit's C-1 and C-3 Reactor Stabilizer towers.
- (f) Process piping, pump, and exchanger modifications at each affected area.

The following is a list of the modified process units:

- (a) The No.4 Ultraformer Unit (4UF), identified as Unit ID 224, built in 1972, upgrades low-octane naphtha to gasoline blending material and chemical feedstocks. The front-end of the unit is a desulfurization section. The reforming section consists of a series of process

furnaces and catalyst-filled reactors in which the naphtha is heated and converted from straight chain to aromatic compounds. The reactor products are separated by distillation for further processing or blending into gasoline. A new reactor will be installed as part of the CXHO project. The No. 4 Ultraformer includes the following sources of emissions and may also include insignificant activities:

- (1) Nine (9) process heaters, all of which burn refinery gas, natural gas, or liquefied petroleum gas:

Heater Identification	Maximum Heat Input Capacity (MMBtu/hr)	Stack Exhausted To	Emission Controls
F-1	68	224-01	None
F-8A	163	224-01	None
F-8B	163	224-01	None
F-2	286	224-02	None
F-3	242	224-03	None
F-4	137	224-03	None
F-5	99	224-04	None
F-6	49	224-04	None
F-7	52	224-05	None

- (2) One (1) flare (identified as the 4UF flare), exhausting at stack S/V 224-06. The 4UF flare is used to control VOC emissions during emergency situations, unit startups and shutdowns, preparation of equipment for maintenance, and reactor regenerations.
- (3) Six (6) catalyst-filled reactors, which are vented to flare stack S/V 224-06 during the initial catalyst depressuring and catalyst purging steps of the regeneration process.
- (4) Leaks from process equipment, including two (2) compressors (identified as K-1 and K-7), pumps, pressure relief devices, sampling connection systems, open-ended valves or lines, and instrumentation systems.
- (5) One (1) caustic scrubbing system, controlling the regeneration vent during the coke burn-off and catalyst rejuvenation steps of the regeneration process, which removes HAP emissions. The scrubber system includes:
- (A) One (1) caustic scrubber exhausting to stack 224-07;
 - (B) One (1) carbon adsorption system used to treat waste scrubber liquor prior to disposal; and
 - (C) Caustic feed unloading, storage, and transfer equipment.

- (b) The No.3 Ultraformer Unit (3UF), identified as Unit ID 220, commissioned in 1958. The majority of the unit was shut down in March 2007, including the H-1, H-2 and F-7 heaters, catalyst filled reactors and the internal scrubbing system, controlling the regeneration vent during the coke burn-off and catalyst rejuvenation steps of the regeneration process. The unit consists of the C-2 Splitter Tower, the D-18 flare gas separator, D-24 knock-out drum and associated piping.

- (1) One (1) flare gas separator (D-18) with emissions vented to vessel D-24, which exhausts to flare stack S/V 220-04.
 - (2) Leaks from process equipment, pumps, pressure relief devices, sampling connection systems, open-ended valves or lines, and instrumentation systems.
- (c) The Isomerization Unit (ISOM), identified as Unit ID 210, was constructed in 1985 as a conversion of the No.2 Ultraformer. The Isomerization process converts low octane naphtha into high octane gasoline blending components. This unit is connected to flare stack S/V 220-04, the UIU Flare, to control VOC emissions during emergency situations, unit startups and shutdowns, and preparation of equipment for maintenance. As part of the CXHO project, the ISOM heater H-1 will be modified by replacing several burners with larger burners, with rated capacity remaining at 190 MMBTU/hr. The facility includes the following emission sources and may include insignificant activities:
- (1) One (1) natural gas, refinery gas, or liquefied petroleum gas-fired Process Heater H-1, modified as part of CXHO, rated at 190 MMBtu/hr and vented to stack S/V 210-01.
 - (2) One (1) Flare Knock-out Drum (D-18) with emissions vented to vessel D-24, which exhausts to flare stack S/V 220-04.
 - (3) Leaks from process equipment, including one (1) compressor (identified as K1), pumps, valves, process drains and pressure relief devices.

Enforcement Issues

There are no pending enforcement actions related to this modification.

Emission Calculations

The Permittee has submitted emissions calculations for modified units and affected units that are included in the MSAT II Compliance project. See Appendix A of this document for detailed emissions calculations.

Permit Level Determination – Part 70

Pursuant to 326 IAC 2-1.1-1(16), Potential to Emit is defined as “the maximum capacity of a stationary source or emission unit to emit any air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of a source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or type or amount of material combusted, stored, or processed shall be treated as part of its design if the limitation is enforceable by the U. S. EPA, IDEM, or the appropriate local air pollution control agency.”

The following table is used to determine the appropriate permit level under 326 IAC 2-7-10.5. This table reflects the PTE before controls. Control equipment is not considered federally enforceable until it has been required in a federally enforceable permit.

PTE Change of the Modified Process	
Pollutant	PTE Increase from the Modification (ton/yr)
PM	-
PM ₁₀	-
PM _{2.5}	-
VOC	12.9
CO	-
NO _x	-
H ₂ S/TRS	0.012

- (a) The utility hydrogen required for the project will be obtained from the new hydrogen unit (New HU), Unit ID 801, which was permitted in Significant Source Modification No. 089-25484-00453, as a part of the Whiting Refinery Modernization Project (WRMP). The firing rate limits of heaters HU-1 and HU-2 are not being increased as a result of this project. Therefore, the emissions from this unit are not included in the calculations above for Part 70 permit level determination.
- (b) The MSAT II Compliance project will have an impact on the facility's steam energy production. BP is conservatively assuming that the additional steam energy will be produced by the 3SPS boilers. However, the firing rate limit of the 3SPS boilers or duct burners is not being increased as a result of this project. Therefore, the emissions from this affected unit are not included in the calculations above for Part 70 permit level determination.

This source modification is subject to 326 IAC 2-7-10.5(d)(3) and 326 IAC 2-7-10.5(d)(9), as the increase in potential to emit of the project for VOC emissions is greater than ten (10) tons per year and fifteen (15) pounds per day. Therefore, it will be processed as a minor source modification. Additionally, the modification will be incorporated into the Part 70 Operating Permit through a significant permit modification issued pursuant to 326 IAC 2-7-12(d), because case-by-case emission limitations are applied to the modification.

Permit Level Determination – PSD and Nonattainment NSR

The Permittee has provided information as part of the application for this approval that, based on Actual to Potential test in 326 IAC 2-2-2 or 2-1.1-5, this modification at a major stationary source will not be major for Prevention of Significant Deterioration under 326 IAC 2-2-1 and Nonattainment NSR under 326 IAC 2-1.1.5. The applicant will be required to keep records and report in accordance with Source Obligation in 326 IAC 2-2-8. The table below summarizes the project emissions increase, reflecting all limits, of the emission units. Any control equipment is considered federally enforceable only after issuance of this Part 70 source and permit modification, and only to the extent that the effect of the control equipment is made practically enforceable in the permit.

Actual-to-Potential Emissions (tpy)											
	VOC	NO_x	PM	PM₁₀/ PM_{2.5}	SO₂	CO	H₂SO₄	Pb	Hg	Be	H₂S
MSAT II Compliance Project Emissions Increase	14.9	6.2	0.6	3.4	6.8	6.3	0.3	1.5E-04	5.6E-05	3.6E-06	0.012
PSD Significance Level	40	40	25	15 (PM ₁₀)	-	100	7	0.6	0.1	4.0E-04	10
Nonattainment NSR Significance Level	-	-	-	10 (PM _{2.5})	40	-	-	-	-	-	-

- (a) The source proposes to limit the steam energy available to the MSAT II Compliance Project in order to limit the future potential emissions increases at the 3SPS boilers as a result of the project. Thus, actual-to-potential emissions increases at the 3SPS boilers are evaluated by summing the difference between the future potential utility usage and the baseline actual utility usage for the equipment installed as part of the MSAT II Compliance Project. A detailed evaluation is included in Appendix A as Tables 4a-4d.
- (1) The combined steam energy usage for the C-250 system (E-253A/B, E-251) and C-1 system (E-9) shall not exceed 1,687,693 MMBtu per twelve (12) consecutive month period, with compliance determined at the end of each month. Compliance with this limit shall be determined by performing a steam energy balance on the C-250 and C-1 systems, as detailed in Table 4c of Appendix A.
- (b) This modification to an existing major stationary source is not major because the emissions increase is less than the PSD significant levels. Therefore, pursuant to 326 IAC 2-2, the PSD requirements do not apply.
- (c) This modification to an existing major stationary source is not major because the emissions increase is less than the Nonattainment NSR significant levels. Therefore, pursuant to 326 IAC 2-1.1-5, the Nonattainment NSR requirements do not apply.

The modification of the existing emissions units as part of this modification (MSAT II Compliance) is projected to occur contemporaneously with the modifications approved as part of the Whiting Refinery Modernization Project (WRMP). The WRMP was approved for construction and operation with Significant Source Modification No. 089-25484-00453, issued May 1, 2008, and Significant Permit Modification No. 089-25488-00453, issued June 16, 2008.

	VOC	NO _x	PM	PM ₁₀ / PM _{2.5}	SO ₂	CO	H ₂ SO ₄	Pb	Hg	Be	H ₂ S
Net Emissions Increase - WRMP	-6.3	-0.6	-281.9	-41.6	-26.7	-23.7	-112.7	-0.02	-0.00113	-0.0054	-15.9
MSAT II Compliance Project Emissions Increase	14.9	0.0*	0.6	3.4	6.8	0.1*	0.3	1.5E-04	5.6E-05	3.6E-06	0.012
Total	8.6	-0.6	-281.3	-38.2	-19.9	-23.6	-112.4	-0.02	-0.00107	-0.0054	-15.9
PSD Significance Level	40	40	25	15 (PM ₁₀)	-	100	7	0.6	0.1	4.0E-04	10
Nonattainment NSR Significance Level	-	-	-	10 (PM _{2.5})	40	-	-	-	-	-	-

*For the Actual-to-Potential evaluation at the 3SPS boilers, no credit is taken for the reduction in NO_x emissions due to the installation of the duct burners and SCR systems, which are necessary to satisfy consent decree requirements (United State, et. al. v. BP Exploration & Oil, et. Al.; Northern District of Indiana, Hammond Division, Civil Action No. 2:96 CV 095 RL). Additionally, a baseline-to-potential reduction in CO emissions from the 3SPS boilers has already been quantified in the netting analysis performed in Significant Source Modification No. 089-25484-00453, issued May 1, 2008.

Federal Rule Applicability Determination

NSPS:

- (a) 40 CFR 60, Subpart Ja (NSPS Subpart Ja - Standards of Performance for Petroleum Refineries for which Construction, Reconstruction, or Modification Commenced after May 14, 2007) was promulgated on June 24, 2008. However, subsequent to the promulgation of Subpart Ja, several rulemakings have taken place and portions of this rule have been stayed. The MSAT II Compliance Project will execute tie-ins of pressure relief valves and pump seals, from equipment in the ISOM, VRU 300, and/or the 4UF process unit(s), to the UIU, VRU, and/or the 4UF flare(s) that could potentially trigger NSPS Subpart Ja applicability. However, a final determination cannot be made until both project design and the stayed portions of the NSPS Subpart Ja are finalized. Language has been added requiring the Permittee to comply with the requirements of Subpart Ja whenever the Permittee determines that Subpart Ja has been triggered.
- (b) 40 CFR 60, Subpart GGGa (NSPS Subpart GGGa - Standards of Performance for Equipment Leaks of VOC in Petroleum Refineries for which Construction, Reconstruction, or Modification Commenced after November 7, 2006) was promulgated on November 7, 2007. However, subsequent to the promulgation of Subpart GGGa, several rulemakings have taken place and portions of this rule have been stayed. BP Whiting has also identified emissions units that could potentially trigger NSPS Subpart GGGa applicability. However, a final determination cannot be made until both project design and the stayed portions of the NSPS Subpart GGGa are finalized. Language has been added requiring the Permittee to comply with the requirements of NSPS Subpart GGGa whenever the Permittee determines that NSPS Subpart GGGa has been triggered.
- (c) The requirements of 40 CFR 60, Subpart NNN (NSPS Subpart NNN - Standards of Performance for VOC Emissions from Synthetic Organic Chemical Manufacturing

(SOCMI) Distillation Operations) are included as part of this source and permit modification.

- (1) Installation of the new C-250 Naphtha Splitter Tower will constitute construction of a new affected facility pursuant to 40 CFR 60.660(a), because this tower will produce butane as an intermediate and butane is a listed chemical in 40 CFR 60.667. Therefore, language has been added requiring the Permittee to comply with the requirements of NSPS Subpart NNN for applicable distillation units within the ISOM Unit.
 - (2) The MSAT II Compliance project will not result in the modification or reconstruction of the C-1 or C-3 Stabilizer Towers or of the C-6 Ultraformate Splitter. The C-1 Stabilizer changes will not result in an increase in emissions from the existing facility and, therefore, will not constitute a modification per 40 CFR 60.14. The fixed capital cost of the C-1 Stabilizer modifications does not exceed 50 percent of the fixed capital cost that would be required to construct a comparable entirely new facility, thus the changes do not constitute a reconstruction per 40 CFR 60.15(b)(1). Additionally, neither the C-3 Stabilizer Tower nor the C-6 Ultraformate Splitter will be physically modified to accommodate the change in process operation. Therefore, the changes are accomplished without capital expenditures on the existing facilities and are not considered modifications, per 40 CFR 60.14(e)(2), or reconstructions, per 40 CFR 60.15(b)(1).
- (d) The requirements of 40 CFR 60, Subpart QQQ (NSPS QQQ - Standards of Performance for VOC Emissions for Petroleum Refinery Wastewater Systems) are included as part of this source and permit modification. The MSAT II Compliance Project will execute new tie-ins to existing stormwater drain systems in addition to installing new stormwater drain system components, which will result in the applicability of NSPS QQQ to individual drain system(s) in the ISOM Unit. Language has been added requiring the Permittee to comply with the requirements of NSPS QQQ for applicable components within the ISOM Unit. The MSAT II Compliance project does not plan to add or modify sewer components in the 4UF Unit and any additional drains will be routed to the existing NESHAP FF sewer. Therefore, this project does not result in a modification pursuant to Subpart QQQ for the 4UF Unit.
- (e) The requirements of 40 CFR 60, Subpart RRR (NSPS RRR - Standards of Performance for VOC Emissions from Synthetic Organic Chemical Manufacturing (SOCMI) Reactor Processes) are not included as part of this source and permit modification. Cyclohexane is a listed chemical in 40 CFR 60.707; however, the cyclohexane will exit the Isom unit as part of a mixed stream that will ultimately be blended into gasoline. Therefore, cyclohexane is not sold or used in a downstream unit specifically for that chemical, and Subpart RRR does not apply to this modification.

NESHAP:

- (f) The requirements of 40 CFR 61, Subpart J (NESHAP J - Standard for Equipment Leaks (Fugitive Emission Sources) of Benzene) are not included as part of this source and permit modification. The source is currently subject to the requirements of this rule. Components constructed as part of the MSAT II Compliance project are also subject to the equipment leak requirements of the Refinery MACT (40 CFR 63, Subpart CC). Pursuant to the overlap provision of 40 CFR 63.640(p)(1), fugitive components constructed as part of the MSAT II Compliance project will be required to comply with the Refinery MACT (40 CFR 63, Subpart CC).
- (g) The requirements of 40 CFR 61, Subpart FF (NESHAP FF - Standard for Benzene Waste Operations) are not included as part of this source and permit modification. The source is currently subject to the requirements of this rule. The source will update its Total Annual Benzene generation and install additional controls as appropriate and as

required. All new process sewer components constructed as a part of the MSAT II Compliance project will be constructed to meet the requirements of NESHAP FF.

- (h) The requirements of 40 CFR 63, Subpart CC (MACT CC - Petroleum Refineries) are not included as part of this source and permit modification. The source is currently subject to the requirements of this rule as an affected facility (the entire refinery), and the MSAT II Compliance project will not constitute a "reconstruction" of the affected facility or constitute a major source of HAPs on its own. Therefore, the equipment constructed as part of the MSAT II Compliance project will be subject to the same requirements as the existing facility and no changes are required to be made to the permit.
- (i) Pursuant to 40 CFR 64.2, Compliance Assurance Monitoring (CAM) is applicable to each new or modified pollutant-specific emission unit that meets the following criteria:
 - (1) has a potential to emit before controls equal to or greater than the Part 70 major source threshold for the pollutant involved;
 - (2) is subject to an emission limitation or standard for that pollutant; and
 - (3) uses a control device, as defined in 40 CFR 64.1, to comply with that emission limitation or standard.

Based on this evaluation, the requirements of 40 CFR Part 64 (CAM) are not applicable to any of the modified units as part of this modification. No modification as part of the MSAT II Compliance project will result in potentials to emit greater than Part 70 major source thresholds.

State Rule Applicability Determination

326 IAC 2-1.1-5 (Nonattainment New Source Review)

Nonattainment New Source Review applicability is discussed under the Permit Level Determination – PSD and Nonattainment NSR section.

326 IAC 2-2 and 2-3 (PSD)

PSD applicability is discussed under the Permit Level Determination – PSD and Nonattainment NSR section.

326 IAC 8-4-8 (VOC Leaks from Petroleum Refineries; Monitoring; Reports)

The proposed equipment modifications as part of the MSAT II Compliance project are subject to the requirements of this rule. The source shall incorporate all equipment installed by this project into the facility's existing Leak Detection and Repair (LDAR) plan.

Compliance Determination and Monitoring Requirements

Permits issued under 326 IAC 2-7 are required to ensure that sources can demonstrate compliance with all applicable state and federal rules on a continuous basis. All state and federal rules contain compliance provisions; however, these provisions do not always fulfill the requirement for a continuous demonstration. When this occurs, IDEM, OAQ, in conjunction with the source, must develop specific conditions to satisfy 326 IAC 2-7-5. As a result, Compliance Determination Requirements are included in the permit. The Compliance Determination Requirements in Section D of the permit are those conditions that are found directly within state and federal rules and the violation of which serves as grounds for enforcement action.

If the Compliance Determination Requirements are not sufficient to demonstrate continuous compliance, they will be supplemented with Compliance Monitoring Requirements, also in Section D of the permit. Unlike Compliance Determination Requirements, failure to meet

Compliance Monitoring conditions would serve as a trigger for corrective actions and not grounds for enforcement action. However, a violation in relation to a compliance monitoring condition will arise through a source's failure to take the appropriate corrective actions within a specific time period.

- (a) Compliance with the steam energy usage limit required for PSD purposes shall be determined by an energy balance calculation, as follows:

$$\text{Energy Demand (MMBtu/yr)} = E_{\text{in},400\#} \text{ (MMBtu/yr)} + E_{\text{in},100\#} \text{ (MMBtu/yr)} + E_{\text{in,BFW}} \text{ (MMBtu/yr)} - E_{\text{out},100\#} \text{ (MMBtu/yr)} - E_{\text{out},10\#} \text{ (MMBtu/yr)} - E_{\text{out,condensate}} \text{ (MMBtu/yr)}$$

where: E_x (MMBtu/yr) = F_x (lb x/hr) * H_x (Btu/lb) * 10^{-6} (MMBtu/Btu) * 8760 (hr/yr);
 F_x (lb x/hr) = steam, condensate, or boiler feed water mass flow rate; and
 H_x (Btu/lb) = enthalpy of steam, condensate, or boiler feed water based on known conditions (superheated or saturated, and temperature and/or pressure).

Conclusion and Recommendation

The construction of this proposed modification shall be subject to the conditions of the attached proposed Part 70 Minor Source Modification No. 089-28934-00453. The staff recommends to the Commissioner that this Part 70 Minor Source Modification be approved.

Table 1. MSAT II Compliance Project
 PSD / NSR Permitting Applicability
 Project Actual-to-Potential Emissions Evaluation

Pollutant	Modified Emissions Units ⁴		Affected Emissions Units ⁸		Actual-to-Potential Project Emissions Increase (tpy) ³	PSD Significance Level (tpy)	Emission Offset Significance Level (tpy) ^{1,2}	Nonattainment NSR Significance Level (tpy) ⁷	NSR / PSD Review Required?
	Potential Fugitive Emissions Increase - LDAR (tpy)	Potential Fugitive Emissions Increase - Sewers (tpy)	Actual-to-Potential 3SPS Emissions Increase (tpy) ⁵	Actual-to-Potential Emissions Increase from Planned Startup and Shutdown Events (tpy) ⁶					
VOC	5.80	7.07	1.66	0.37	14.9	-	25	-	No
NO _x	-	-	6.16	0.02	6.2	-	40	-	No
PM	-	-	0.57	0.00	0.6	25	-	-	No
PM ₁₀	-	-	3.36	0.00	3.4	15	-	-	No
PM _{2.5}	-	-	3.36	0.00	3.4	-	-	10	No
SO ₂	-	-	6.79	0.03	6.8	40	-	40	No
CO	-	-	6.16	0.12	6.3	100	-	-	No
H ₂ SO ₄	-	-	0.31	0.00	0.3	7	-	-	No
Pb	-	-	1.5E-04	1.0E-07	1.5E-04	0.6	-	-	No
Hg	-	-	5.6E-05	3.7E-08	5.6E-05	0.1	-	-	No
Be	-	-	3.6E-06	2.4E-09	3.6E-06	4.0E-04	-	-	No
H ₂ S/TRS	0.0054	0.0066	-	-	0.012	10	-	-	No

¹ The 25 tpy threshold assumes that the 1-hour severe ozone nonattainment designation is still applicable in Lake County. See Table 2 for VOC de minimis test, which further addresses NSR applicability in serious or severe ozone nonattainment areas.

² Note that for the 1-hour ozone standard, NO_x is not considered an ozone precursor due to the waiver under Section 182(f) of the Clean Air Act. NO_x information is presented here only for the purposes of an evaluation with respect to the 8-hour ozone standard.

³ For an actual-to-potential applicability test, a significant emissions increase of a regulated NSR pollutant is projected to occur if the sum of the difference between the potential to emit and the baseline actual emissions for each existing emissions unit equals or exceeds the significant amount for that pollutant [326 IAC 2-2-2(d)(4), 326 IAC 2-3-2(c)(4)].

⁴ In estimating actual-to-potential emissions for modified process units (addition of new fugitive and sewer components), the difference between baseline and future potential emissions is assumed equivalent to the potential emissions attributable to the new equipment installed as a part of the MSAT II Compliance Project. The baseline emissions are assumed to be zero even where new components will replace existing components.

⁵ BP is proposing to limit the steam energy available to the MSAT II Compliance Project in order to limit the future potential emissions increases at the 3SPS boilers as a result of the project. Thus, actual-to-potential emissions increases at the 3SPS boilers are evaluated by summing the difference between the future potential utility usage and the baseline actual utility usage for the equipment installed as a part of the MSAT II Compliance Project. Detailed evaluations are presented in Tables 4a - 4d.

⁶ Future potential emissions increases as a result of planned startup and shutdown events are limited by the physical volume of the hydrocarbon containing equipment being installed as a result of the project (as detailed in Tables 9a - 9d). Therefore, actual-to-potential emissions increases as a result of startup and shutdown events are evaluated by summing the difference in future potential equipment volume and baseline actual equipment volume for the equipment installed as a part of the MSAT II Compliance Project.

⁷ Evaluated against the significance thresholds contained in U.S. EPA's Nonattainment New Source Review Rule for PM_{2.5}, 40 CFR 51 Appendix S.

⁸ The project's proposed benzene saturation reactor will utilize hydrogen from only the New HU (Unit ID 801) and not from the refinery's existing HU (Unit ID 698). The New HU, Unit ID 801, was permitted with the WRMP as a part of SPM 089-25488-00453. The firing rate limits of heaters HU-1 and HU-2 are not being increased as a result of this project. Therefore, the New HU is not considered affected for the purposes of this permitting analysis.

Table 2. MSAT II Compliance Project
 PSD / NSR Permitting Applicability
 VOC De Minimis Test

Per 326 IAC 2-3-1(q), a de minimis increase of VOC from a modification in a serious or severe ozone nonattainment area, means an increase that does not exceed twenty-five (25) tons per year when the net emissions increases from the proposed modification are aggregated on a pollutant specific basis with all other net emissions increases from the source over a five (5) consecutive calendar year period prior to, and including, the year of the modification. This modification is expected to commence operation in 2012, and therefore the net emissions changes from projects taking place between 2008 and 2012 have been considered for this evaluation.

	VOC (ton/yr)
Project Emission Increase (PEI) ¹	14.9
PEI	14.9

5-Year Contemporaneous Projects

No. 1 Stanolind Power Station - Shutdown	(8.6)
3UF - Shutdown Heater H-1	(3.7)
3UF - Shutdown Heaters H-2 and F-7	(3.9)
3UF - Shutdown Reformer Section	(1.2)
3UF - Shutdown Fugitive Components	(10.8)
Marine Dock - Cease Gasoline Loading	(175.4)
Tank BT-002 Modification	0.6
Boiler Project	27.2
SCR	5.6
Fire Pump Engines	0.7
Thermal Desorption	2.4
Tank 8	6.1
OMD Fugitives	0.6
11A PS WARP	4.2
11C PS WARP	(3.9)
FCU500 WARP	1.0
FCU600 WARP	(1.5)
FCU600 TAR	0.3
VRU100/200 WARP	0.1
LDAR - Control Existing Heavy Liquid Pumps	(27.3)
VRU300 Temporary Compressor / Replacement	0.6
Clean Harbors Operation	2.3
4TP Temporary Cooling Tower: Jet Fuel Product Cooler	0.5
Removal of floating roof on TK-3709	0.3

NEI Project Emissions	-169.1
NSR SERs (tpy)	25.0
Significant Net Emissions Increase?	No
Pollutant	VOC (ton/yr)

Note: Net Emissions Increases (NEI) were calculated in accordance with Section D.0.1(a) and satisfies the record keeping requirement in Section D.0.4(c) and D.0.4(d).

¹ PEI for project is in Table 1.

² Data for 5-year past contemporaneous projects were obtained from Table C.82 of the Whiting Refinery Modernization Project permit application and the NEI De Minimis test from the D.0 permit tracking tool.

³ Emissions decreases for past contemporaneous projects were made enforceable either as part of the Whiting Refinery Modernization Project permit or as part of other past permitting actions. The emissions decreases were documented in the respective permit applications.

Table 3. MSAT II Compliance Project
Project Potential to Emit Increase

Pollutant	Fugitives - LDAR (tpy)	Fugitives - Sewers (tpy)	Project PTE Increase (tpy) ¹	Project PTE Increase (lbs/day)	Minor Source Mod (tpy) ²	Minor Source Mod (lbs/day) ²	Significant Source Mod (tpy) ³
VOC	5.80	7.07	12.9	70.5	10	15	25
H ₂ S/TRS	0.0054	0.0066	0.012	-	5	-	25

¹ Potential to emit for the MSAT II Compliance Project is determined based upon the estimated number of new fugitive LDAR and sewer components being installed in the modified process units. Note that there is no potential to emit increase from the affected emissions units (3SPS boilers, planned startup and shutdown emissions) as the project is not modifying the affected units or proposing to increase or alter any of the permitted emissions limits.

² Per 326 IAC 2-7-10.5(d)(3)(B)(iii) and 326 IAC 2-7-10.5(d)(9)(A), any modification with a potential to emit of greater than 10 tpy or 15 lbs/day of VOC shall be processed in accordance with the minor source modification provisions of 326 IAC 2-7-10.5(e). Per 326 IAC 2-7-10.5(d)(3)(F)(i), any modification with a potential to emit of greater than 5 tpy hydrogen sulfide shall be processed in accordance with the minor source modification provisions of 326 IAC 2-7-10.5(e).

³ Per 326 IAC 2-7-10.5(f)(4)(D) or (E), any modification with a potential to emit of greater than 25 tpy of VOC or hydrogen sulfide shall be processed in accordance with the significant source modification provisions of 326 IAC 2-7-10.5(g).

Table 4a. MSAT II Compliance Project
 PSD/NSR Permitting Applicability
 Actual-to-Potential Steam Energy Demand
 3SPS Boilers Actual-to-Potential Emissions Increase

Pollutant	Energy Demand at Unit (MMBtu/yr)		Equivalent 3SPS Firing Rate (MMBtu/yr) ³		Emission Factors (lb/MMBtu) ⁴		Equivalent 3SPS Emissions (tpy)		Actual-to-Potential 3SPS Emissions Increase (tpy)
	Baseline (2008-2009) ¹	Future Potential ²	Baseline (2008-2009)	Future Potential	Baseline (2008-2009)	Future Potential	Baseline (2008-2009)	Future Potential	
VOC	1,077,830	1,687,693	1,088,717	1,704,741	0.0054	0.0054	2.9	4.6	1.7
NOx ⁵	1,077,830	1,687,693	1,088,717	1,704,741	0.02	0.02	10.9	17.0	6.2
PM	1,077,830	1,687,693	1,088,717	1,704,741	0.0019	0.0019	1.0	1.6	0.6
PM ₁₀ /PM _{2.5} ⁶	1,077,830	1,687,693	1,088,717	1,704,741	0.0075	0.0087	4.1	7.4	3.4
SO ₂	1,077,830	1,687,693	1,088,717	1,704,741	0.0220	0.0220	12.0	18.8	6.8
CO ⁵	1,077,830	1,687,693	1,088,717	1,704,741	0.0200	0.0200	10.9	17.0	6.2
H ₂ SO ₄	1,077,830	1,687,693	1,088,717	1,704,741	0.0010	0.0010	0.6	0.9	0.3
Pb	1,077,830	1,687,693	1,088,717	1,704,741	4.90E-07	4.90E-07	2.7E-04	4.2E-04	1.5E-04
Hg	1,077,830	1,687,693	1,088,717	1,704,741	1.80E-07	1.80E-07	9.8E-05	1.5E-04	5.6E-05
Be	1,077,830	1,687,693	1,088,717	1,704,741	1.18E-08	1.18E-08	6.4E-06	1.0E-05	3.6E-06

¹ Baseline energy usage represents average energy utilized by the C-2 Naphtha Splitter system and C-1 Isomerate Stabilizer reboiler during the consecutive 24 month period from January 2008 to December 2009. Refer to Table 4c for additional details.

² BP is proposing to limit the annual steam energy usage to 1,687,693 MMBtu on a 12 month rolling basis for the combined C-250 Naphtha Splitter system and the C-1 Isomerate Stabilizer reboiler in order to limit the future potential emissions increase at the 3SPS boilers as a result of the MSAT II Compliance Project. Future potential energy usage will be evaluated by performing a steam energy balance on the C-250 Naphtha Splitter system and the C-1 Isomerate Stabilizer reboiler. Refer to Table 4c for additional details.

³ As shown in Table 4d, the firing rate at 3SPS is related to steam energy usage by accounting for boiler energy input and efficiency.

⁴ Refer to Table 4b for emission factor references.

⁵ Note that both the baseline and future potential NOx and CO emission factors assume that the 3SPS duct burners and SCRs are operational. Therefore, this calculation conservatively adjusts baseline NOx and CO emissions down to account for the future permit limitations.

⁶ Note that baseline PM10/PM2.5 emissions are calculated utilizing the emission factor applicable during the time period prior to the SCR and duct burner installation at the 3SPS boilers.

Table 4b. MSAT II Compliance Project
PSD/NSR Permitting Applicability
Emission Factors for 3SPS

	Future Potential		Baseline	
	lb/MMscf	lb/MMBtu ⁹	lb/MMscf	lb/MMBtu ⁹
VOC ^{1,4}	5.5	0.0054	5.5	0.0054
NO _x ^{1,2}	-	0.0200	-	0.0200
PM ^{1,4,5}	1.9	0.0019	1.9	0.0019
PM ₁₀ /PM _{2.5} ^{5,6}	-	0.0087	7.6	0.0075
SO ₂ ¹⁰	-	0.0220	-	0.0220
CO ³	-	0.0200	-	0.0200
H ₂ SO ₄ ¹¹	-	0.0010	-	0.0010
Pb ¹	5.0E-04	4.9E-07	5.0E-04	4.9E-07
Hg ⁷	1.8E-04	1.8E-07	1.8E-04	1.8E-07
Be ⁸	1.2E-05	1.2E-08	1.2E-05	1.2E-08

Notes / Assumptions:

- ¹ Factors are based on condition D.24.4 from SPM 089-25488-00453. Operation of the MSAT II Compliance Project equipment will not commence until after installation of the 3SPS duct burners.
- ² Note that the baseline emission factor for NO_x is assumed equivalent to the future factor, thus no credit is taken for the reduction in NO_x emissions as a result of the installation of the SCR and duct burner control system.
- ³ Factor is calculated based on condition D.24.4(f) from SPM 089-25488-00453, which specifies permitted annual CO emissions (260.4 tons) from boilers/duct burners. Assumes total heat input of boilers/duct burners as (575 + 41) = 616 MMBtu * 5 = 3,080 MMBtu/hr. MSAT II Compliance Project operation will not commence until after installation of the 3SPS duct burners. Note that the baseline emission factor for CO is assumed equivalent to the future factor, thus no credit is taken for the reduction in CO emissions as a result of the installation of the SCR and duct burner control.
- ⁴ U.S. EPA. AP-42. Fifth Edition. Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources. Chapter 1, Section 1.4 "Natural Gas Combustion," Table 1.4-2. EMISSION FACTORS FOR CRITERIA POLLUTANTS AND GREENHOUSE GASES FROM NATURAL GAS COMBUSTION; (July 1998).
- ⁵ Per AP-42 Table 1.4-2, all PM (total, condensable, and filterable) is assumed to be less than 1.0 micrometer in diameter. Therefore, the PM emission factors presented may be used to estimate PM10, PM2.5 or PM1 emissions.
- ⁶ Future potential emission factor is based on condition D.24.4 from SPM 089-25488-00453. Operation of the MSAT II Compliance Project equipment will not commence until after installation of the 3SPS duct burners. Baseline emission factor is from U.S. EPA. AP-42. Fifth Edition. Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources. Chapter 1, Section 1.4 "Natural Gas Combustion," Table 1.4-2. EMISSION FACTORS FOR CRITERIA POLLUTANTS AND GREENHOUSE GASES FROM NATURAL GAS COMBUSTION; (July 1998).
- ⁷ Emissions are based on API / WSPA Emission Factors for Boilers / Heaters using Process Gas, 1998 (Table ES-1).
- ⁸ U.S. EPA. AP-42. Fifth Edition. Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources. Chapter 1, Section 1.4 "Natural Gas Combustion," Table 1.4-4. EMISSION FACTORS FOR METALS FROM NATURAL GAS COMBUSTION; (July 1998).
- ⁹ Natural Gas HHV (Btu/scf) = 1020

¹⁰ SO₂ emission factor is based on the following calculation:

Moles in 1 MMscf (n from Ideal Gas Law)	2596.15	<i>Derived from the Ideal Gas Law, assuming V = 1MMscf, P = 14.7 psia, T = 527.7 R, R = 10.73 psia-ft³/lbmol-R</i>
Sulfur Dioxide Molecular Weight	64.06	
NSPS J Limit (ppm)	159	<i>Based on NSPS J 159 ppm TRS limit</i>
Calculated SO ₂ Emission Factor at NSPS J	26.44	<i>SO₂ emissions are calculated using Refinery fuel gas HHV and the Ideal Gas Law</i>
Fuel Gas HHV (Btu/scf)	1200	
Calculated SO ₂ Emission Factor at NSPS J	0.022	

¹¹ H₂SO₄ emission factor is based on the following calculation:

Sulfur Dioxide Molecular Weight	64.06	<i>BP is conservatively considering that all of the SO₃ emitted can form sulfuric acid mist.</i>
Sulfuric Acid Mist Molecular Weight	98.07	
Fraction of SO _x as SO ₃	0.03	
Mist	1	
Calculated H ₂ SO ₄ Emission Factor (lb H ₂ SO ₄)	0.046	
Calculated H ₂ SO ₄ Emission Factor (lb H ₂ SO ₄)	0.001	

Table 4c. MSAT II Compliance Project
 PSD/NSR Permitting Applicability
 Baseline and Future Potential Unit Energy Usages for MSAT II Compliance Project

Baseline Steam Energy Demand¹

119.8	2008 Energy Usage (MMBtu/hr)
126.2	2009 Energy Usage (MMBtu/hr)
123.0	Baseline Energy Usage (MMBtu/hr)
1,077,830	Baseline Energy Usage (MMBtu/yr)

Project Steam Energy Demand^{2,3}

192.7	Future Energy Usage (MMBtu/hr)
1,687,693	Proposed Future Energy Usage Limit (MMBtu/yr) ³

Energy Balance Calculation

$$\text{Energy Demand (MMBtu/yr)} = E_{in,400\#} \text{ (MMBtu/yr)} + E_{in,100\#} \text{ (MMBtu/yr)} + E_{in,BFW} \text{ (MMBtu/yr)} - E_{out,100\#} \text{ (MMBtu/yr)} - E_{out,10\#} \text{ (MMBtu/yr)} - E_{out,condensate} \text{ (MMBtu/yr)}$$

Where: $E_x \text{ (MMBtu/yr)} = F_x \text{ (lbs x/hr)} * H_x \text{ (Btu/lb)} * 10^{-6} \text{ (MMBtu/Btu)} * 8760 \text{ (hrs/yr)}$

$F_x \text{ (lbs x/hr)}$ = steam, condensate, or boiler feed water mass flow rate

$H_x \text{ (Btu/lb)}$ = enthalpy of steam, condensate or boiler feed water based on known conditions (superheated or saturated, and temperature and/or pressure)

Example Calculation for Superheated 400# Steam

$$E_{in,400\#} \text{ (MMBtu/yr)} = \frac{186365 \text{ lbs}}{\text{hr}} \times \frac{1298 \text{ Btu}}{\text{lb}} \times \frac{\text{MMBtu}}{1000000 \text{ Btu}} \times \frac{8760 \text{ hrs}}{\text{yr}} = 2104366 \text{ MMBtu/yr}$$

$H_{400\#} \text{ (Btu/lb)} = 1,298$ *Specific enthalpy of superheated steam at 380 psig and 585°F from <http://www.spiraxsarco.com/resources/steam-tables/superheated-steam.aspx>*

¹ The baseline energy demand is equivalent to the steam energy usage at the existing C-2 Naphtha Splitter system in 3UF and the existing C-1 Reactor Stabilizer system in the Isom. Energy usage data was calculated based on mass balance from flow information obtained from the BP Whiting PI data collection system. Detailed calculation methodology is presented in the energy balance calculation above.

² The MSAT II Compliance Project requires additional steam energy in order to support the upgraded Naphtha Splitter (C-250), which will combine the functions of the refinery's existing C-2 Naphtha Splitter and C-6 Ultraformate Splitter. The C-6 Ultraformate Splitter will then be used as a dehexanizer to create a high content benzene stream which can be routed to the project's new hydrogenation reactor to convert benzene to cyclohexane and, thus, comply with the requirements of the future MSAT regulation. Additionally, the MSAT II Compliance Project will upgrade the Isom's C-1 Reactor Stabilizer tower reboiler in order to accommodate the additional reactor effluent (resulting from the addition of the new benzene hydrogenation reactor) through the Isom's C-1 and C-3 Reactor Stabilizer tower systems. Energy usage at the C-6 Ultraformate Splitter and C-3 Reactor Stabilizer are expected to remain constant or decrease.

³ BP is proposing to limit the annual steam energy usage to 1,687,693 MMBtu on a rolling 12 month basis for the combined C-250 Naphtha Splitter system and the C-1 Isomerate Stabilizer reboiler in order to limit the future potential emissions increase at the 3SPS boiler as a result of the MSAT II Compliance Project. Future potential energy usage will be evaluated by performing a steam energy balance on the C-250 Naphtha Splitter system and the C-1 Isomerate Stabilizer reboiler as shown in the energy balance calculation above.

Table 4d. MSAT II Compliance Project
 PSD/NSR Permitting Applicability
 Baseline to Future Potential 3SPS Firing Rate Increase

	Steam Energy Demand at Process Unit ¹			Equivalent 3SPS Firing Rate (Boiler Heat Input)
	MMBtu/yr	lbs 400# steam/yr	lbs 400# steam/hr	MMBtu/yr
Baseline	1,077,830	830,377,304	94,792	1,088,717
Future Potential	1,687,693	1,300,226,110	148,428	1,704,741
Baseline to Future Potential	609,864	469,848,806	53,636	616,024

Thermodynamic Properties/Assumptions

118	Heat of Saturated Liquid, 150 °F (Btu/lb) for Boiler Feed Water ²
1,298	Specific Enthalpy of Superheated Steam (380 psig, 585 °F) (Btu/lb) ²
1,180	Ideal Total Heat Input (Btu/lb) ³
0.9	Boiler Efficiency ⁴
1,311	Total Boiler Heat Input (Btu/lb)

¹ Refer to Table 4c for detailed calculations of baseline and future potential steam energy demand/usage at the unit.

² Per the WRMP BEDD document, 400# steam is superheated steam at 380 psig and 585 °F. Per Utilities Unit Engineer, power house supply water feed is at 150 °F. Saturated water and superheated steam enthalpies were obtained from <http://www.spiraxsarco.com/resources>

³ Total specific heat required to generate superheated steam is the sum of the heat of saturated liquid and the heat of saturated steam.

⁴ Per Dave May, Utilities LTOE, the efficiency of the 3SPS boilers is approximately 90%.

Table 5. MSAT II Compliance Project
 PSD/NSR Permitting Applicability
 Fugitive Leaks of VOC
 LDAR Components

LDAR Program: Monitoring per Consent Decree¹;

Factor Type: Refinery Screening (EPA Emission Factors EPA-453/R-95-017, Table 2-6)

Annual Hours of Service: 8760

Component Type	Estimated Component Count	EPA 'Refinery Screening' Factors LEAK (lb/hr/component)	EPA 'Refinery Screening' Factors NO LEAK (lb/hr/component)	Percent Leak	Maximum Uncontrolled Emission Rate (lbs/hr)	LD&R Control Efficiency ²	Percent in VOC Service	Total VOC Emissions (Tons/yr)	Total VOC Emissions (lbs/day)
Valves³									
Gas/Vapor	256	0.5789	0.0013	2.0%	3.2901	95%	100%	0.72	3.95
Light Liquid	896	0.1878	0.0037	2.0%	6.6143	95%	100%	1.45	7.94
Heavy Liquid	0	0.00051	0.00051	2.0%	0.0000	30%	100%	0.00	0.00
Pumps⁴									
Light Liquid - Single Seal	15	0.9630	0.0265	2.0%	0.6785	80%	100%	0.59	3.26
Light Liquid - Dual Seal	0	0.9630	0.0265	2.0%	0.0000	98%	100%	0.00	0.00
Heavy Liquid	0	0.8565	0.02976	2.0%	0.0000	30%	100%	0.00	0.00
Flanges									
Gas/Vapor	544	0.0827	0.00013	0.3%	0.2055	30%	100%	0.63	3.45
Light Liquid	1,856	0.0827	0.00013	0.3%	0.7010	30%	100%	2.15	11.78
Heavy Liquid	0	0.0827	0.00013	0.3%	0.0000	30%	100%	0.00	0.00
Compressors	0	3.545	0.1971	2.0%	0.0000	0%	100%	0.00	0.00
Relief Valves⁴	17	3.728	0.0985	2.0%	2.9085	98%	100%	0.25	1.40
Open-ended Lines	0	0.02635	0.0033	2.0%	0.0000	0%	100%	0.00	0.00
Sampling Connections	0	0.0827	0.00013	2.0%	0.0000	0%	100%	0.00	0.00
Total VOC Emissions (tons/yr):								5.80	31.77

¹ United States, et.al v. BP Exploration & Oil, et.al., Northern District of Indiana, Hammond Division, Civil Action No. 2:96 CV 095 RL

² LD&R control efficiency for valves and single seal pumps in gas/light liquid service are 95% and 80%, respectively, based on a 500 ppmv leak definition for valves and a 2,000 ppm leak definition for pumps for compared to the 10,000 leak definition basis for screening factors (i.e., (1-500/10,000 = 95%) and (1-2,000/10,000 = 80%).

LDAR control efficiency for dual seal pumps is based on seal area venting to flare (API seal flush plan 52) and 98% flare control efficiency.

AVO monitoring equivalent to 30% control is applied to all flanges and heavy liquid valves and pumps.

30% control estimate is per TCEQ Guidance "Air Permit Technical Guidance for Chemical Sources: Equipment Leak Fugitives" (October 2000).

³ Estimated valve counts provided by MSAT II Compliance Project team (Ken Keckler, BP, via email on 11/19/09).

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⁴ Relief will be routed to flare.

Table 6. MSAT II Compliance Project
 PSD/NSR Permitting Applicability
 Fugitive Leaks of VOC
 Sewer Components

Component Type	No.
Atmospheric Drain Hub	37
Catch Basin (Pad or Paving Drain) ¹	8
Inspection Points	4
Cleanouts	5
Above Ground Sewer Pump Out Points	0
Sum of Drains	46
Manhole/Junction Box w/o Vent	10
Manhole/Junction Box w/ CC and/or Vent	0
OSBL Manholes Per Unit - Sealed	0
Flare / Degassing/ KO Tanks (ie Above Ground Junction Boxes)	0
Sealed cover sumps - Gas Traps or other sumps	0
Total Manholes/Junction Boxes/Sealed Sumps	10
Below Grade Oily Water Separator - Fixed Roof	0
Below Grade Oily Water Separator - Floating Roof	0
OSBL Sumps/OWS Per Unit	2
Total In ground OWS/Sumps	2
Tanks DGO / LGO / Sour Water service	0
Above Ground Oil Water Separator Tanks	0
Total Above Ground Tanks	0

Notes / Assumptions:

Component counts provided by MSAT II Compliance Project team (Raju Dhaduti, Jacobs Engineering, "NFR Process Drains - Estimate - Rev C.xls"). Oil water separator and oil water sump flow per day is based on project material balance estimate of 194.5 gpd oily water from the Naphtha Fractionator System.

All units will meet Benzene NESHAP Compliance Standards
 No COV's will be utilized

Table 7. MSAT II Compliance Project
 PSD/NSR Applicability
 Fugitive Leaks of H₂S/TRS
 LDAR and Sewer Components

H₂S/TRS Fugitive Emissions

Emissions Source	VOC Emissions (tpy) ¹	H ₂ S Emission Factor (lb H ₂ S/lb VOC) ²	H ₂ S/TRS Emissions (tpy) ³
Fugitive LDAR Components	5.80	0.0009	0.0054
Sewer Fugitives	7.07	0.0009	0.0066

TOTAL H₂S (tpy): 0.0120

Calculation of H₂S Fugitive Factor⁴

Unit	Feed Sulfur (%)	Product Sulfur (%)	Feed factor	Fugitive H ₂ S Factor (lb H ₂ S/lb VOC)
C-2 Splitter	0.0874%	0.0874%	0.56	0.0009
#4UF	0.0539%	0.0539%	1.00	0.0006
ISOM	0.0355%	0.0000%	0.56	0.0002

Notes / Assumptions:

¹ Refer to Table 5 for calculation of fugitive VOC from new LDAR components and Table 6 for fugitive VOC from new sewer components installed as a part of the MSAT II Compliance Project.

² Conservatively chosen as the highest of the calculated H₂S fugitive emission factors for three process unit areas that will be affected and/or modified as a part of the MSAT II Compliance Project.

³ H₂S emissions are assumed equivalent to emissions of total reduced sulfur (TRS), as H₂S is expected to be the only reduced sulfur compound present in appreciable quantity.

⁴ Calculation of H₂S fugitive emissions factor for each unit is based upon information on anticipated feed and product sulfur percentages for the post Whiting Refinery Modernization Project (post-WRMP) case.

Table 8a. MSAT II Compliance Project
Planned Startup and Shutdown Events
Actual-to-Potential Emissions Increases

Pollutant	Annualized ¹		Per TAR ¹		Actual-to-Potential Emissions Increase (tpy) ²
	Planned Startup and Shutdown VOC (tpy)	Planned Startup and Shutdown Combustion Emissions (tpy)	Planned Startup and Shutdown VOC (tpy)	Planned Startup and Shutdown Combustion Emissions (tpy)	
VOC	0.11	0.02	0.32	0.05	0.37
NO _x	-	0.01	-	0.02	0.02
PM	-	0.00	-	0.00	0.00
PM ₁₀	-	0.00	-	0.00	0.00
PM _{2.5}	-	0.00	-	0.00	0.00
SO ₂	-	0.01	-	0.03	0.03
CO	-	0.04	-	0.12	0.12
H ₂ SO ₄	-	0.00	-	0.00	0.00
Pb	-	3.4E-08	-	1.0E-07	1.0E-07
Hg	-	1.2E-08	-	3.7E-08	3.7E-08
Be	-	8.1E-10	-	2.4E-09	2.4E-09

¹ The MSAT II Compliance Project anticipates that an increase in planned startup and shutdown emissions may occur due to the increase in process unit equipment volume resulting from the project. Refer to Table 9b for calculation of the baseline to potential increase in planned startup and shutdown emissions as calculated *per shutdown (TAR)*. Refer to Table 8c for detailed baseline and future equipment volume calculations. A TAR will not occur annually, but will likely occur every 3 - 5 years. Therefore, annualized emissions represent "per TAR" emissions divided by TAR frequency, which is conservatively assumed to be every 3 years for the purpose of these calculations.

² Conservatively assumes that the annual startup/shutdown emissions increase for the MSAT II Compliance Project is equivalent to the projected emissions increase per TAR, as opposed to the annualized projected emissions increase.

Table 8b. MSAT II Compliance Project
 Planned Startup and Shutdown Events
 Actual-to-Potential Emissions Increase Per TAR

Process Assumptions

TAR Frequency (years)	1
Flare Destruction Efficiency (%)	98%

Conservatively assumes that a TAR (process unit shutdown) occurs annually. The actual anticipated TAR frequency is every 5 years.

VOC Emitted

Increase in Material routed to flare on Startup/Shutdown (lbs/TAR)	31,961
VOC Emitted (tpy)	0.3

Future potential emissions increases as a result of planned startup and shutdown events are limited by the physical volume of the equipment being installed as a result of the project. Baseline emissions are calculated based on current volume of equipment in system and future potential emissions are calculated based on volume of equipment post-MSAT II Compliance Project.

Flare Combustion Emissions

MW (lb/lb-mol)	30
Heating Value (Btu/scf)	1,624
Mole Volume (scf/mol)	379.5
Volume to Flare (scf)	404,312
Heat to Flare (MMBtu)	656
H ₂ S (wt%)	0.016
Other Sulfur (wt%)	0.07
NH ₃ (wt%)	0.00
Other Nitrogen (wt%)	0.00
CO Emission Factor (lb/MMBtu) ¹	0.37
VOC Emission Factor (lb/MMBtu) ¹	0.14
NO _x Emission Factor (lb/MMBtu) ¹	0.068
PM Emission Factor (lb/MMscf) ²	1.90
PM ₁₀ /PM _{2.5} Emission Factor (lb/MMscf)	7.60
H ₂ SO ₄ Emission Factor (lb H ₂ SO ₄ / lb SO ₂ emitted) ⁴	0.046
Pb (lb/MMscf) ²	5.00E-04
Hg (lb/MMscf) ³	1.84E-04
Be (lb/MMscf) ²	1.20E-05
SO ₂ (tpy)	0.03
NO _x (tpy)	0.02
CO (tpy)	0.12
VOC (tpy)	0.05
PM (tpy)	0.00
PM ₁₀ /PM _{2.5} (tpy)	0.00
H ₂ SO ₄ (tpy)	0.00
Pb (tpy)	0.00
Hg (tpy)	0.00
Be (tpy)	0.00

Assumed average molecular weight of wet gas system

Based on equation used in flaring calculations for C-2 Naphtha Splitter process developed by BP engineering staff.

Based on the NSPS J limit of 159 ppm TRS

Based on BP engineering process knowledge and assumptions in flaring calculations for C-2 Naphtha Splitter process

Based on BP engineering process knowledge and assumptions in flaring calculations for C-2 Naphtha Splitter process

Based on BP engineering process knowledge and assumptions in flaring calculations for C-2 Naphtha Splitter process

Based on BP engineering process knowledge and assumptions on sulfur content of process stream.

Based on BP engineering process knowledge and assumptions on nitrogen content of process stream in addition to thermal NO_x formation.

¹ U.S. AP-42. EPA. Fifth Edition. Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources. Chapter 1, Section 13.5, "Industrial Flares" Table 13.5-1. EMISSION FACTORS FOR FLARE OPERATION; (September 1991).

² U.S. EPA. AP-42. Fifth Edition. Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources. Chapter 1, Section 1.4 "Natural Gas Combustion," Table 1.4-2. EMISSION FACTORS FOR CRITERIA POLLUTANTS AND GREENHOUSE GASES FROM NATURAL GAS COMBUSTION; (July 1998).

³ Based on API/WSPA Emission Factors for Boilers/Heaters using Process Gas, 1998 (Table ES-1).

⁴ H₂SO₄ emission factor is based on the following calculation:

Sulfur Dioxide Molecular Weight	64.06
Sulfuric Acid Mist Molecular Weight	98.07
Fraction of SO ₂ as SO ₃	0.03
Fraction of SO ₃ converted to Sulfuric Acid Mist	1
Calculated H ₂ SO ₄ Emission Factor (lb H ₂ SO ₄ / lb SO ₂ emitted)	0.046

BP is conservatively considering that all of the SO₃ emitted can form sulfuric acid mist.

Table 8c. MSAT II Compliance Project
 Planned Startup and Shutdown Events
 Actual-to-Potential Vessel Depressurization and Startup Purge Material Quantities

Process Assumptions & Constants

Wet Gas System Operating Pressure (psig)	15.00
Fuel Gas System Operating Pressure (psig)	35.00
Atmospheric Pressure (psia)	14.44
Avg MW (lbs/lb-mol)	30.00
Temperature (°F)	60.00
Temperature (°R)	519.67
Universal Gas Constant (psi-ft ³ /(lbmol-R))	10.73

Assumes vented material is mostly light ends, C1 - C4

Shutdown - System Depressurization

C-2 Moles Vented (lbmol)	115.64
C-2 Mass Vented (lbs)	3,469.11
C-250 + MSAT Reactor Moles Vented (lbmol)	289.00
C-250 + MSAT Reactor Mass Vented (lbs)	8,669.89

Calculated using the Ideal Gas Law, assuming that entire volume of system is depressured from the wet gas system operating pressure to atmospheric pressure and all material is routed to flare.

Calculated using the Ideal Gas Law, assuming that entire volume of system is depressured from the wet gas system operating pressure to atmospheric pressure and all material is routed to flare.

Startup - Gas Purge

C-2 Moles Vented (lbmol)	194.19
C-2 Mass Vented (lbs)	5,825.83
C-250 + MSAT Reactor Moles Vented (lbmol)	485.33
C-250 + MSAT Reactor Mass Vented (lbs)	14,559.76

Calculated using the Ideal Gas Law, assuming that entire volume of system must be purged of fuel gas (at fuel gas system operating pressure) and all material is routed to flare.

Calculated using the Ideal Gas Law, assuming that entire volume of system must be purged of fuel gas (at fuel gas system operating pressure) and all material is routed to flare.

Summary - Baseline to Future Potential Startup and Shutdown Venting (Purge and Depressurization)

	Shutdown Vent to Flare (lbs)	Start-up Vent to Flare (lbs)
Baseline - C-2 System	3,469	5,826
Future Potential - C-250 + MSAT Reactor System	8,670	14,560
Baseline to Future Potential	5,201	8,734

Future potential increases in startup and shutdown venting are limited by the physical volume of the equipment being installed as a result of the project as shown in the "Shutdown - System Depressurization" and "Startup - Gas Purge" tables above. Baseline and future equipment volume calculations are detailed below.

Table 8c. MSAT II Compliance Project
 Planned Startup and Shutdown Events
 Actual-to-Potential Vessel Depressurization and Startup Purge Material Quantities

Calculated Volume of the Equipment for C-2 Naphtha Splitter (ft3) - Baseline Equipment Volume

C-2 Naphtha Splitter	16,912
E-3A Ovhd Condenser	204
E-3C Ovhd Condenser	204
E-4 Reboiler	202
E-4A Reboiler	188
D-10 Accumulator	622
D-21 Accumulator	481
Ovhd Pipe 24" (165')	487
Reb. Pipe 14" (2)(50')	96
Reb. Pipe 30" (2)(50')	467
Cond. Pipe 14" (50')	48
=====	
Subtotal	19,911
10% small piping	1,991
=====	
Total	21,902

Calculated Volume of the Equipment for C-250 Naphtha Splitter (ft3) - Future Equipment Volume

C-250 Naphtha Splitter	33134
D-250 Feed Surge Drum	6150
D-251 Splitter Reflux Drum	2481
J-250A DBN Feed Filters	71
J-250B DBN Feed Filters	71
E-250A Splitter Feed/Bottoms Exchanger	289
E-250B Splitter Feed/Bottoms Exchanger	289
E-251 Splitter Feed Heater	81
E-252A-F Splitter Overhead Condenser	353
E-253A Splitter Reboiler	432
E-253B Splitter Reboiler	432
E-255 Splitter Bottoms Rundown Cooler	156
E-256A Diluent Rundown Cooler	69
E-256B Diluent Rundown Cooler	69
E-257 Splitter Feed/Sidedraw Exchanger	177
Piping	
Overhead Piping - 185' of 30"	863
Reboiler Piping - 50' of 24"	147
Reboiler Piping - 50' of 24"	147
Reboiler Return Piping - 50' of 30"	233
Reboiler Return Piping - 50' of 30"	233
Condenser Piping - 120' of 24"	354

Calculated Volume of the Equipment for the MSAT Reactor System (ft3) - Future Equipment Volume

D-52 Hydrogenation Reactor	860
D-53 Sulfur Guard Bed	860
D-54 Reactor Effluent Separator	860
E-37 Reactor Feed/Effluent	208
E-38 Reactor Feed Heater	16
E-39 Reactor Effluent Cooler	260
E-40 Sulfur Guard Feed/Effluent	59
E-41 Sulfur Guard Feed Heater	7
Piping	
Inlet to D-52 - 200' of 12"	157
Outlet from D-52 - 100' of 12"	79
Outlet from E-37 - 300' of 10"	164

=====	
Subtotal	49,761
10% small piping	4,976
=====	
Total (C-250 + MSAT Reactor) Future Equipment Volume	54,737

Table 8d. MSAT II Compliance Project
 Planned Startup and Shutdown Events
 Actual-to-Potential Vessel Water Rinse and Residual Slop Venting

Process Assumptions

Oil in Water (%)	1%	Assumes that oily water from equipment flush after unit deinventory contains 1% oil.
Percent of Oil Vaporized in D-18 (%)	10%	Assumes that 10% of pumpout material that is routed through D-18 flare gas separator is volatilized and routed to UIU flare.

Material Properties

Specific Gravity of Oil	0.8
Density of Water (lb/gal)	8.34
Density of Oil (lb/gal)	6.7

Summary - Baseline to Future Potential Startup and Shutdown Venting (Shutdown Rinse and Slop Venting)

Slops Generated on Shutdown (gal)	24,562	This represents the increase in residual hydrocarbon to the pumpout system as a result of the MSAT II Compliance Project. Slops estimated as 10% of the baseline to future potential increase in equipment volume due to MSAT II Compliance Project. Refer to Table 8c for calculation of baseline to future potential equipment volume.
Shutdown Rinse Water Volume (gal)	245,623	Oily water estimated as 100% of the baseline to future potential equipment volume increase due to MSAT II Compliance Project. This represents a single flush of equipment on shutdown. Refer to Table 8c for calculation of baseline to future potential equipment volume.
Slop Vented on Pumpout (lbs)	16,388	Estimated increase in volatile material vented as a result of equipment deinventory to pumpout = 18,037 gal * 6.7 lbs/gal * 10% of Oil Vaporized
Shutdown Rinse Vented on Pumpout (lbs)	1,639	Estimated increase in volatile material vented as a result of equipment rinse during shutdown = 180,371 gal * 1% Oil in Water * 6.7 lbs/gal * 10% of Oil Vaporized

Table 9a. MSAT II Compliance Project
Summary of Emissions Decreases

Pollutant	Fugitives Decrease - 3UF LDAR (tpy)	Fugitives Decrease - 3UF Sewers (tpy)	Fugitives Decrease - Isom LDAR (tpy)	Projected Fugitive Emissions Decrease (tpy)
VOC	-1.22	-5.84	-0.36	-7.42
NO _x	-	-	-	0.00
PM	-	-	-	0.00
PM ₁₀	-	-	-	0.00
PM _{2.5}	-	-	-	0.00
SO ₂	-	-	-	0.00
CO	-	-	-	0.00
H ₂ SO ₄	-	-	-	0.00
Pb	-	-	-	0.00000
Hg	-	-	-	0.00000
Be	-	-	-	0.0E+00
H ₂ S/TRS	-0.0011	-0.0054	-0.0024	-0.0089

Table 9b. MSAT II Compliance Project
 C-2 Naphtha Splitter Shutdown Emissions Decreases
 Fugitive Leaks of VOC from Sewer Components

Component Type	No.
Atmospheric Drain Hub	-42
Catch Basin (Pad or Paving Drain) ¹	0
Inspection Points	0
Cleanouts	0
Above Ground Sewer Pump Out Points	0
Sum of Drains	-42
Manhole/Junction Box w/o Vent	0
Manhole/Junction Box w/ CC and/or Vent	0
OSBL Manholes Per Unit - Sealed	0
Flare / Degassing/ KO Tanks (ie Above Ground Junction Boxes)	0
Sealed cover sumps - Gas Traps or other sumps	0
Total Manholes/Junction Boxes/Sealed Sumps	0
Below Grade Oily Water Separator - Fixed Roof	0
Below Grade Oily Water Separator - Floating Roof	0
OSBL Sumps/OWS Per Unit	0
Total In ground OWS/Sumps	0
Tanks DGO / LGO / Sour Water service	0
Above Ground Oil Water Separator Tanks	0
Total Above Ground Tanks	0

Notes / Assumptions:

Component counts provided by MSAT II Compliance Project team (Raju Dhaduti, Jacobs Engineering, via email 10/9/09). WRMP intends to shut down 48 atmospheric drain hubs in the 3UF area, per Table C.86 contained in IDEM's "Appendix C and E to the Addendum to the Technical Support Document (TSD) for a Significant Source Modification (SSM) of a Part 70 Source and Significant Permit Modification (SPM) of Part 70 Operating Permit." A total of 90 total atmospheric drain hubs will be taken out of service in the 3UF Unit plot space as a result of WRMP and the MSAT II Compliance Project, leaving 42 atmospheric drain hubs (90 drain hubs - 48 drain hubs = 42 drain hubs) to be shut down by the MSAT II Compliance Project.

Total atmospheric drain hubs shut down in Appendix C	48
Project estimated atmospheric drain shut down in 3UF	90
Remaining atmospheric drain hub decreases	42

All units will meet Benzene NESHAP Compliance Standards
 No COV's will be utilized

Table 9b. MSAT II Compliance Project
C-2 Naphtha Splitter Shutdown Emissions Decreases
Fugitive Leaks of VOC from Sewer Components

Emissions Calculations for Sewer Components

AP-42 Factors - Section 5-1 Petroleum Refining 1/95 - Calculations assume 50% control on drain versus uncontrolled drain emissions in AP-42	No. of Units	Units of 1000 liters of flow per day	Emission Factor		Total Emissions
			Value	Units	(kg/hr)
EMISSION INCREASES					
Drains Controlled ¹	-42		0.3	kg/day/unit	-0.61
Junction Boxes/Manholes Controlled (Carbon Canister to comply with BWON)	0		0.03	kg/day/unit	0.00
Sealed Manholes	0		0.16	kg/day/unit	0.00
Oil Water Separator and Auxiliaries					
	OWS	0	0.024	kg/1000 liters flow	0.000
	Slop oil tanks/OW surge tanks			Use Tanks Program	0.00
	OWS Abv Gr (API) Controlled	n/a	0.024	kg/1000 liters flow	0.000
Subtotal for Emission Increases					-0.61
EMISSION DECREASES					
Area Drains Controlled			0.3	kg/day/unit	0.00
Area Drains Uncontrolled			0.7	kg/day/unit	0.00
Process Drains Controlled			0.3	kg/day/unit	0.00
Process Drains Uncontrolled			0.7	kg/day/unit	0.00
Catch Basins Controlled			0.3	kg/day/unit	0.00
Catch Basins Uncontrolled			0.7	kg/day/unit	0.00
Junction Boxes/Manholes Controlled (Carbon Canister to comply with BWON)			0.03	kg/day/unit	0.00
Sealed Manholes			0.16	kg/day/unit	0.00
Junction Boxes/Manholes Uncontrolled			0.7	kg/day/unit	0.00
Oil Water Separator and Auxiliaries					
	OWS (API) Controlled		0.024	kg/1000 liters	0.00
	OWS (API) Uncontrolled		0.6	kg/1000 liters	0.00
	Slop oil tanks/OW surge tanks				0.00
	OWS Abv Gr (API) UnControlled		0.6	kg/1000 liters	0.00
	OWS Abv Gr (API) Controlled		0.024	kg/1000 liters	0.00
Subtotal for Emission Decreases					0.00
NET EMISSIONS				kg/hr	0.61
				lb/d	-31.98
				lb/yr	-11674
				TPY	-5.8

Notes:

¹ The number of catch basins are provided, but are not included in the total emissions calculations since they are storm water catch basins. Emissions from these catch basins are expected to be negligible in comparison to the other process sewer drains included. Uncontrolled emissions factors from AP-42 Section 5.1, Table 5.1-3 (January 1995)

Emission Source	VOC Emissions Factor per Component	Units	Source*	Ref.
Uncontrolled Drain	0.69	Kg/day	AP-42 (e.g. 450/650)	Table 5.1-3
Controlled Drain (with water trap – 50% control of AP-42)	0.3	Kg/hr	BIDa	Pg. 4-9
Sealed Manway Cover (gasketed – 77% of AP-42)	0.16	Kg/hr	BIDb	Pg. 2-23
Uncontrolled Junction Box (same as an Uncontrolled Drain)	0.7	Kg/hr	AP-42 (ref. BIDa)	Pg. 3-27
Controlled Junction Box (with carbon canister to comply with BWON – 5% of AP-42)	0.03	Kg/hr	BIDa, BWON	Pg. 4-30, 61.349(a)(2)(C)(ii)
Uncontrolled OWS	0.6	Kg/1000 liters	AP-42	Table 5.1-2
Controlled OWS	0.024	Kg/1000 liters	AP-42	Table 5.1-2

*Notes:

BIDa - Background Information Document to Proposed NSPS QQQ, Feb. 1985.
BIDb - Background Information Document to Proposed NSPS QQQ, Dec. 1987.
AP-42 - AP 42, Fifth Edition, Volume I Chapter 5.1 Petroleum Refining, Jan. 1995.

Table 9c. MSAT II Compliance Project
C-2 Naphtha Splitter Shutdown Emissions Decreases
Fugitive Leaks of VOC from LDAR Components

LDAR Program: Monitoring per Consent Decree¹;

Factor Type: Refinery Screening (EPA Emission Factors EPA-453/R-95-017, Table 2-6)

Annual Hours of Service: 8760

Component Type	Estimated Component Count	EPA 'Refinery Screening' Factors LEAK (lb/hr/component)	EPA 'Refinery Screening' Factors NO LEAK (lb/hr/component)	Percent Leak	Maximum Uncontrolled Emission Rate (lbs/hr)	LD&R Control Efficiency ²	Percent in VOC Service	Total VOC Emissions (Tons/yr)	Total VOC Emissions (lbs/day)
Valves³									
Gas/Vapor	-58	0.5789	0.0013	2.0%	-0.7454	95%	100%	-0.16	-0.89
Light Liquid	-206	0.1878	0.0037	2.0%	-1.5207	95%	100%	-0.33	-1.82
Heavy Liquid	0	0.00051	0.00051	2.0%	0.0000	30%	100%	0.00	0.00
Pumps									
Light Liquid	0	0.9630	0.0265	2.0%	0.0000	100%	100%	0.00	0.00
Heavy Liquid	0	0.8565	0.02976	2.0%	0.0000	30%	100%	0.00	0.00
Flanges³									
Gas/Vapor	-118	0.0827	0.00013	0.3%	-0.0446	30%	100%	-0.14	-0.75
Light Liquid	-419	0.0827	0.00013	0.3%	-0.1583	30%	100%	-0.49	-2.66
Heavy Liquid	0	0.0827	0.00013	0.3%	0.0000	30%	100%	0.00	0.00
Compressors	0	3.545	0.1971	2.0%	0.0000	0%	100%	0.00	0.00
Relief Valves	-7	3.728	0.0985	2.0%	-1.1976	98%	100%	-0.10	-0.57
Open-ended Lines	0	0.02635	0.0033	2.0%	0.0000	0%	100%	0.00	0.00
Sampling Connections	0	0.0827	0.00013	2.0%	0.0000	0%	100%	0.00	0.00
Total VOC Emissions (tons/yr):								-1.22	-6.70

¹ United States, et.al v. BP Exploration & Oil, et.al., Northern District of Indiana, Hammond Division, Civil Action No. 2:96 CV 095 RL

² LD&R control efficiency for valves in gas and light liquid service are 95%, based on a 500 ppmv leak definition for compared to the 10,000 leak definition basis for screening factors (i.e., (1-500/10,000 = 95%)

LDAR control efficiency for pumps based on dual mechanical seal with barrier fluid maintained at a higher pressure than the pumped fluid is 100%. Pumps will be equipped with dual mechanical seals and seal flush plan AVO monitoring equivalent to 30% control is applied to all flanges and heavy liquid valves and pumps.

30% control estimate is per TCEQ Guidance "Air Permit Technical Guidance for Chemical Sources: Equipment Leak Fugitives" (October 2000).

³ Estimated valve counts provided by MSAT II Compliance Project team (Ken Keckler, BP, via email on 1/12/10).

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Table 9d. MSAT II Compliance Project
Isom Unit Modification Emissions Decreases
Fugitive Leaks of VOC from LDAR Components

LDAR Program: Monitoring per Consent Decree¹;

Factor Type: Refinery Screening (EPA Emission Factors EPA-453/R-95-017, Table 2-6)

Annual Hours of Service: 8760

Component Type	Estimated Component Count	EPA 'Refinery Screening' Factors LEAK (lb/hr/component)	EPA 'Refinery Screening' Factors NO LEAK (lb/hr/component)	Percent Leak	Maximum Uncontrolled Emission Rate (lbs/hr)	LD&R Control Efficiency ²	Percent in VOC Service	Total VOC Emissions (Tons/yr)	Total VOC Emissions (lbs/day)
Valves³									
Gas/Vapor	-53	0.5789	0.0013	2.0%	-0.6812	95%	100%	-0.15	-0.82
Light Liquid	0	0.1878	0.0037	2.0%	0.0000	95%	100%	0.00	0.00
Heavy Liquid	0	0.00051	0.00051	2.0%	0.0000	30%	100%	0.00	0.00
Pumps									
Light Liquid	0	0.9630	0.0265	2.0%	0.0000	100%	100%	0.00	0.00
Heavy Liquid	0	0.8565	0.02976	2.0%	0.0000	30%	100%	0.00	0.00
Flanges³									
Gas/Vapor	-108	0.0827	0.00013	0.3%	-0.0407	30%	100%	-0.12	-0.68
Light Liquid	0	0.0827	0.00013	0.3%	0.0000	30%	100%	0.00	0.00
Heavy Liquid	0	0.0827	0.00013	0.3%	0.0000	30%	100%	0.00	0.00
Compressors	0	3.545	0.1971	2.0%	0.0000	0%	100%	0.00	0.00
Relief Valves	-6	3.728	0.0985	2.0%	-1.0265	98%	100%	-0.09	-0.49
Open-ended Lines	0	0.02635	0.0033	2.0%	0.0000	0%	100%	0.00	0.00
Sampling Connections	0	0.0827	0.00013	2.0%	0.0000	0%	100%	0.00	0.00
Total VOC Emissions (tons/yr):								-0.36	-1.99

¹ United States, et.al v. BP Exploration & Oil, et.al., Northern District of Indiana, Hammond Division, Civil Action No. 2:96 CV 095 RL

² LD&R control efficiency for valves in gas and light liquid service are 95%, based on a 500 ppmv leak definition for compared to the 10,000 leak definition basis for screening factors (i.e., (1-500/10,000 = 95%)

LDAR control efficiency for pumps based on dual mechanical seal with barrier fluid maintained at a higher pressure than the pumped fluid is 100%. Pumps will be equipped with dual mechanical seals and seal flush plan AVO monitoring equivalent to 30% control is applied to all flanges and heavy liquid valves and pumps.

30% control estimate is per TCEQ Guidance "Air Permit Technical Guidance for Chemical Sources: Equipment Leak Fugitives" (October 2000).

³ Estimated valve counts provided by MSAT II Compliance Project team (Ken Keckler, BP, via email on 1/12/10).

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Table 10. MSAT II Compliance Project
Greenhouse Gas Emissions
Steam Production - Affected 3SPS Boilers

Operational Data:

Steam Usage Increase (lbs/hr)	53,636	<i>Estimated future actual increase in steam production at 3SPS boilers attributable to MSAT II Compliance Project Refer to Table 4d for determination of boiler heat input per lb 400# steam produced</i>
3SPS Heat Input (Btu/lb 400# steam)	1,311	

Greenhouse Gas	Emission Factor lb/MMBtu	Emissions (tons/yr)	CO ₂ e Emissions ⁴ (tons/yr)
CO ₂ ¹	129.3	39,826	39,825.95
N ₂ O ²	2.21E-04	0.07	21.05
CH ₄ ³	2.21E-03	0.68	14.26
		TOTAL:	39,861

¹ Per Mike Hoyne (Utilities Optimization Engineer) for 3SPS boilers.

² Taken from Table C-2 of 40 CFR Part 98, Subpart C for Natural Gas and converted from kilograms to pounds.

³ Taken from Table C-2 of 40 CFR Part 98, Subpart C for Natural Gas and converted from kilograms to pounds.

⁴ Methane and Nitrous Oxide emissions are scaled up by their global warming potentials of 21 and 310, respectively, which is taken from Table A-1 of 40 CFR Part 98, Subpart A for each.

Table 11. MSAT II Compliance Project
Actual-to-Potential Emissions Increases
WRMP Future Contemporaneous Project

Pollutant	3SPS Baseline to Potential Emissions Increase (tpy) ¹	Baseline to Potential Emissions Increase from Planned Startup and Shutdown Events (tpy) ²	Potential Fugitives Increase - LDAR (tpy) ³	Potential Fugitives Increase - Sewers (tpy) ⁴	WRMP Netting Increase (tpy)
VOC	1.66	0.37	5.80	7.07	14.9
NO _x ¹	N/A	0.02	-	-	0.0
PM	0.57	0.00	-	-	0.6
PM ₁₀	3.36	0.00	-	-	3.4
PM _{2.5}	3.36	0.00	-	-	3.4
SO ₂	6.79	0.03	-	-	6.8
CO ¹	N/A	0.12	-	-	0.1
H ₂ SO ₄	0.31	0.00	-	-	0.3
Pb	1.5E-04	1.0E-07	-	-	1.5E-04
Hg	5.6E-05	3.7E-08	-	-	5.6E-05
Be	3.6E-06	2.4E-09	-	-	3.6E-06
H ₂ S	-	-	0.0054	0.0066	0.0120

¹ The WRMP netting analysis accounts for potential emissions increases and decreases at 3SPS due to the installation of the duct burner and SCR systems. The baseline-to-potential emissions increases attributable to the MSAT II Compliance Project should be included in the WRMP netting analysis upon startup of the project. Refer to Tables 4a - 4d for detailed evaluation of the baseline-to-potential emissions increases at the 3SPS boilers. Note that no credit is taken for the reduction in NO_x emissions due to the installation of the duct burner and SCR systems, which are necessary to satisfy consent decree requirements (United States, et. al. v. BP Exploration & Oil, et. Al.; Northern District of Indiana, Hammond Division; Civil Action No. 2:96 CV 095 RL). Additionally, a baseline-to-potential reduction in CO emissions from the 3SPS boilers has already been quantified in the WRMP netting analysis.

² Represents the baseline-to-potential emissions increase during planned startup and shutdown events due to the additional equipment volume which will be installed as a part of the MSAT II Compliance Project. Refer to Tables 8a - 8d for detailed evaluation of the baseline-to-potential emissions increase for planned startup and shutdown events.

³ Represents the potential emissions increase from the installation of fugitive LDAR components as a result of the MSAT II Compliance Project. Note that no credit is taken for the shutdown of fugitive components which will occur as a result of the project. Refer to Tables 9a, 9c, and 9d for a detailed estimate of emissions decreases due to the shutdown of fugitive components.

⁴ Represents the potential emissions increase from the installation of sewer components as a result of the MSAT II Compliance Project. Note that no credit is taken for the shutdown of sewer components that will occur as a result of the project. Refer to Tables 9a and 9b for a detailed estimate of emissions decreases due to the shutdown of sewer components.



INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

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BP Products North America - Whiting Business Unit
2815 Indianapolis Bld., PO Box 710
Whiting, IN 46394-0710

DATE: April 4, 2011

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

SUBJECT: Final Decision
Title V
089-28934-00453

Enclosed is the final decision and supporting materials for the air permit application referenced above. Please note that this packet contains the original, signed, permit documents.

The final decision is being sent to you because our records indicate that you are the contact person for this application. However, if you are not the appropriate person within your company to receive this document, please forward it to the correct person.

A copy of the final decision and supporting materials has also been sent via standard mail to:
Nick Spencer (Business Unit Leader; BP Products North America)
Lindsay DeWitte Trinity Consultants
OAQ Permits Branch Interested Parties List

If you have technical questions regarding the enclosed documents, please contact the Office of Air Quality, Permits Branch at (317) 233-0178, or toll-free at 1-800-451-6027 (ext. 3-0178), and ask to speak to the permit reviewer who prepared the permit. If you think you have received this document in error, please contact Joanne Smiddie-Brush of my staff at 1-800-451-6027 (ext 3-0185), or via e-mail at jbrush@idem.IN.gov.

Final Applicant Cover letter.dot 11/30/07



INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

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Commissioner

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Indianapolis, Indiana 46204
(317) 232-8603
Toll Free (800) 451-6027
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TO: Interested Parties / Applicant

DATE: April 4, 2011

RE: BP Products North America - Whiting Business Unit / 089 - 28934 - 00453

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

In order to conserve paper and reduce postage costs, IDEM's Office of Air Quality is now sending many permit decisions on CDs in Adobe PDF format. The enclosed CD contains information regarding the company named above.

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CD Memo.dot 11/14/08

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2		Nick Spencer Business Unit Leader BP Products North America - Whiting Business Unit 2815 Indianapolis Blvd., PO Box Whiting IN 46394-0710 (RO CAATS)										
3		East Chicago City Council 4525 Indianapolis Blvd East Chicago IN 46312 (Local Official)										
4		Gary - Hobart Water Corp 650 Madison St, P.O. Box M486 Gary IN 46401-0486 (Affected Party)										
5		Lake County Health Department-Gary 1145 W. 5th Ave Gary IN 46402-1795 (Health Department)										
6		WJOB / WZVN Radio 6405 Olcott Ave Hammond IN 46320 (Affected Party)										
7		Hammond City Council and Mayors Office 5925 Calumet Avenue Hammond IN 46320 (Local Official)										
8		Laurence A. McHugh Barnes & Thornburg 100 North Michigan South Bend IN 46601-1632 (Affected Party)										
9		Shawn Sobocinski 3229 E. Atlanta Court Portage IN 46368 (Affected Party)										
10		Mr. Tim Maloney Hoosier Environmental Council 1915 West 18th Street, Suite A Indianapolis IN 46202 (Affected Party)										
11		Ms. Carolyn Marsh Lake Michigan Calumet Advisory Council 1804 Oliver St Whiting IN 46394-1725 (Affected Party)										
12		Whiting City Council and Mayors Office 1143 119th St Whiting IN 46394 (Local Official)										
13		Mark Coleman 9 Locust Place Ogden Dunes IN 46368 (Affected Party)										
14		Mr. Chris Hernandez Pipefitters Association, Local Union 597 8762 Louisiana St., Suite G Merrillville IN 46410 (Affected Party)										
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1		Lake County Commissioners 2293 N. Main St, Building A 3rd Floor Crown Point IN 46307 (Local Official)										
2		Anthony Copeland 2006 E. 140th Street East Chicago IN 46312 (Affected Party)										
3		Barbara G. Perez 506 Lilac Street East Chicago IN 46312 (Affected Party)										
4		Mr. Robert Garcia 3733 Parrish Avenue East Chicago IN 46312 (Affected Party)										
5		Laura Lodisio US EPA Region 5 (D-8J) 77 W. Jackson Blvd. Chicago IL 60604 (EPA)										
6		Joe Carroll Bloomberg News 111 S. Wacker Suite 4950 Chicago IL 60606 (Affected Party)										
7		Ms. Karen Kroczek 8212 Madison Ave Munster IN 46321-1627 (Affected Party)										
8		Rosemarie Cazeau Illinois Attorney General Office 69 W Washington St 18th floor Chicago IL 60602 (Affected Party)										
9		Calumet Township Trustee 31 E 5th Avenue Gary IN 46402 (Affected Party)										
10		Faith Buregel Environmental Law and Policy Center 35 East Wacker Drive, Suite 1300 Chicago IL 60601 (Affected Party)										
11		Eliza Dolin Environmental Law and Policy Center 35 E Wacker Dr #300 Chicago IL 60601 (Affected Party)										
12		Joseph Hero 11723 S Oakridge Drive St. John IN 46373 (Affected Party)										
13		Ann Alexander Natural Resources Defense Council 2 North Riverside Plaza, Suite 2250 Chicago IL 60606 (Affected Party)										
14		Bessie Dent Calumet Project 6819 Indianapolis Blvd Hammond IN 46324 (Affected Party)										
15		Mr. Thomas Frank 1616 E 142nd Street East Chicago IN 46312 (Affected Party)										

Total number of pieces Listed by Sender	Total number of Pieces Received at Post Office	Postmaster, Per (Name of Receiving employee)	The full declaration of value is required on all domestic and international registered mail. The maximum indemnity payable for the reconstruction of nonnegotiable documents under Express Mail document reconstructing insurance is \$50,000 per piece subject to a limit of \$50,000 per occurrence. The maximum indemnity payable on Express mail merchandise insurance is \$500. The maximum indemnity payable is \$25,000 for registered mail, sent with optional postal insurance. See Domestic Mail Manual R900, S913, and S921 for limitations of coverage on insured and COD mail. See International Mail Manual for limitations of coverage on international mail. Special handling charges apply only to Standard Mail (A) and Standard Mail (B) parcels.
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IDEM Staff	CDENNY 4/4/2011 BP Products North America - Whiting Business Unit 089-28934-00453 (final)		AFFIX STAMP HERE IF USED AS CERTIFICATE OF MAILING
Name and address of Sender	 Indiana Department of Environmental Management Office of Air Quality – Permits Branch 100 N. Senate Indianapolis, IN 46204	Type of Mail: CERTIFICATE OF MAILING ONLY	

Line	Article Number	Name, Address, Street and Post Office Address	Postage	Handing Charges	Act. Value (If Registered)	Insured Value	Due Send if COD	R.R. Fee	S.D. Fee	S.H. Fee	Rest. Del. Fee	Remarks
1		Tom Save the Dunes 444 Barker Rd Michigan City IN 46360 (Affected Party)										
2		Mr. Steve Kozel The Calumet Project 6819 Indianapolis Blvd Hammond IN 46324 (Affected Party)										
3		Sierra Club, Inc. - Hoosier Chapter 1915 W 18th St, Ste D Indianapolis IN 46202 (Affected Party)										
4		Environmental Integrity Project 1303 San Antonio Street, Suite 200 Austin TX 78701 (Affected Party)										
5		Gary City Council 401 Broadway # 209 Gary IN 46402 (Local Official)										
6		Lindsay DeWitte Trinity Consultants 1S660 Midwest Road, Suite 250 Oakbrook Terrace IL 60181 (Consultant)										
7		Mr. Larry Davis 268 South, 600 West Hebron IN 46341 (Affected Party)										
8		Gitte Laasby Post Tribune 1433 E. 83rd Ave Merrillville IN 46410 (Affected Party)										
9		Susan Severtson City of Gary Law Dept. 401 Broadway 4th Floor Gary IN 46402 (Local Official)										
10		Mark Zeltwanger 26545 CR 52 Nappanee IN 46550 (Affected Party)										
11		Kim Chrislip Genscape 1215 Spruce St # 201 Boulder CO 80302 (Affected Party)										
12		Bryan Bullock Counsel for Calumet Project 7863 Broadway, Suite 222 Merrillville IN 46410 (Affected Party)										
13		Tom Soulis 3646 Ridge Road Highland IN 46322 (Affected Party)										
14		Susan Eleuterio 3646 Ridge Road Highland IN 46322 (Affected Party)										
15		Jennifer Peterson Environmental Integrity Project 1920 L. Street NW, Suite 800 Washington DC 20036 (Affected Party)										

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