

**MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY
OPERATING PERMIT TECHNICAL REVIEW DOCUMENT**

**Air, Energy & Mining Division
1520 E. Sixth Avenue
P.O. Box 200901
Helena, Montana 59620-0901**

Calumet Montana Refining, LLC
NE¼, Section 1, Township 20 North, Range 3 East, Cascade County
1900 10th Street Northeast
Great Falls, MT 59404

The following table summarizes the air quality programs testing, monitoring, and reporting requirements applicable to this facility.

Facility Compliance Requirements	Yes	No	Comments
Source Tests Required	X		
Ambient Monitoring Required	X		
Continuous Opacity Monitoring System (COMS) Required	X		FCCU
Continuous Emission Monitoring System (CEMS) Required	X		Flare Gas and RFG for NSPS J, Ja, and CD, NO _x for NSPS Ja units, SO ₂ on Boilers and FCCU, CO on FCCU
Continuous Parameter Monitoring System (CPMS)	X		Truck and Railcar Loading Rack
Schedule of Compliance Required		X	
Annual Compliance Certification and Semiannual Reporting Required	X		
Monthly Reporting Required		X	
Quarterly Reporting Required	X		Consent Decree Required Reporting
Applicable Air Quality Programs			
ARM Subchapter 7 Montana Air Quality Permitting	X		MAQP # 2161
New Source Performance Standards (NSPS)	X		40 CFR 60, Subparts J, Ja, Kb, UU, VV, GGG, VVa, GGGa, and QQQ
National Emission Standards for Hazardous Air Pollutants (NESHAPS)	X		40 CFR 61, Subpart M, FF, J, and V
Maximum Achievable Control Technology (MACT)	X		40 CFR 63, Subparts R, CC, UUU, EEEE, ZZZZ, DDDDD
Major New Source Review (NSR/Prevention of Significant Deterioration (PSD))	X		Calumet is a Major Stationary Source subject to Prevention of Significant Deterioration requirements when triggered under New Source Review
Risk Management Plan Required (RMP)	X		
Acid Rain Title IV		X	
Compliance Assurance Monitoring (CAM)		X	
State Implementation Plan (SIP)	X		General Montana SIP

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SECTION I GENERAL INFORMATION

A. Purpose

This document establishes the basis for the decisions made regarding the applicable requirements, monitoring plan, and compliance status of emission units affected by the operating permit proposed for this facility. The document is intended for reference during review of the proposed permit by the U.S. Environmental Protection Agency (EPA) and the public. It is also intended to provide background information not included in the operating permit and to document issues that may become important during modifications or renewals of the permit.

B. Facility Location

Calumet operates the Great Falls refinery, which is located along the Missouri River in Great Falls, Montana. This facility is located in the NE¹/₄ of Section 1, Township 20 North, Range 3 East, in Cascade County, Montana. The air quality of Cascade County is considered attainment/unclassified for all pollutants. A narrow area along 10th Avenue South (bounded by 9th Avenue South on the north, 11th Avenue South on the south, 54th Street South on the east and 2nd Street South on the west) in Great Falls was previously classified as a non-attainment area for Carbon Monoxide (CO) but has since been re-designated to attainment area status under a limited maintenance plan. This re-designation became effective on July 8, 2002. The area lies in a region that is transitional between mountains to the west and plains to the east. Potential sensitive areas include schools, residential areas, parks, dams, and recreational areas.

C. Facility Background Information

On December 2, 1985, the Montana Department of Health and Environmental Sciences and Montana Refining Company (MRC) signed a stipulation requiring MRC to obtain an air quality permit, and stipulated that a permit emission limitation of 4,700 tons per year (TPY) CO would constitute compliance with ambient CO standards. MRC submitted this permit with the intentions of permitting its existing refining operations, including all equipment not already permitted.

On October 20, 1985, MRC was granted a general permit for their petroleum refinery and major refinery equipment located in Great Falls, Cascade County, Montana. The application was assigned **Montana Air Quality Permit (MAQP) #2161**.

The first alteration to the original permit was given **MAQP #2161-A** and was issued on May 31, 1989. This alteration involved the addition of a deisobutanizer reboiler.

The second alteration was given **MAQP #2161-A1** and was issued on March 12, 1990. This project involved the installation of one (1) 30,000-barrel gasoline storage tank and one (1) 40,000-barrel crude oil storage tank at the present facility. Both tanks were to be installed with external floating roof control.

The third alteration was given **MAQP #2161-A3** and was issued on December 18, 1990. This alteration consisted of the installation of a Hydrofluoric Acid Alkylation Unit, internal floating roofs at existing storage tanks, which had fixed roofs, and a safety flare.

The fourth alteration was given **MAQP #2161-04** and was issued on June 16, 1992. This alteration consisted of the installation of a sodium hydrosulfide (NaHS) unit at the existing Great Falls Refinery.

The NaHS unit receives refinery fuel gas (540,000 standard cubic feet per day (scf/day) maximum rated capacity) containing hydrogen sulfide (H₂S) and reacts this fuel with a sodium hydroxide caustic solution to remove virtually 100% of the H₂S by converting it to NaHS, a saleable product.

The resultant sweet fuel gas is burned, as before, in other process heaters; however, since the fuel gas contains virtually no H₂S, SO₂ emissions from the process heaters, assuming no other changes, decrease by nearly 60 percent. There was no decrease in permitted SO₂ emissions from this permit because the refinery wanted to retain the existing permitted SO₂ emission limitations so it could charge less expensive, higher sulfur crude oil.

In the basic process, off-gases from product desulfurizing processes (fuel gases) are contacted with a caustic solution in a gas contractor. The resultant reaction solution is continually circulated until the caustic solution is essentially used up; NaHS product is then sent to storage. Make-up caustic is added to the process as required. The process requires a gas contractor, process heat exchanger, circulation pump, storage tanks for fresh caustic and NaHS product, 12 pipeline valves, 4 open ended valves, 21 flanges, and other process control equipment.

The only process emissions will be fugitive Volatile Organic Compounds (VOCs) from equipment (valves and flanges) in fuel gas stream service. To estimate unit VOC emissions, emission factors developed by EPA for equipment in gas vapor service with measured emissions from 0 to 1,000 parts per million (ppm) are used. With an aggressive monitoring and maintenance program, fugitive VOC emissions from valves and flanges will be within this 0 to 1,000-ppm range. Total annual fugitive VOC emissions from the sodium hydrosulfide unit are estimated to be 20 pounds per year.

The tank that is to be used to store NaHS product was in jet fuel service. When taken out of jet fuel service, this tank (#35) will no longer be a source of VOC emissions; the reduction in VOC emissions will be 2,270 pounds per year. Considering the 2,270-pound-per-year decrease due to tank #35 service change, the refinery will realize a net decrease in annual VOC emissions of 2,250 pounds or 1.1 TPY.

The fifth alteration was given **MAQP #2161-05** and was issued on October 15, 1992. This permit alteration was for the construction and operation of two (2) 20,000-barrel capacity aboveground storage tanks at its Great Falls Refinery. The new tanks contain heavy naphtha (#127) and raw diesel (#128).

Each tank is constructed of metal sections welded together and rests on a concrete ring wall foundation. External floating roofs with dual seals are installed on each tank for VOC control.

On April 6, 1993, MRC was granted **MAQP # 2161-06** to construct and operate a hydrodesulfurization (HDS) unit and hydrogen plant. This sixth alteration was required to go through PSD review for NO_x and was deemed complete on February 22, 1993. The HDS project is designed to process 5,000 barrels per day of diesel/gas oil and to reduce the sulfur content to 0.05 weight percent. The reduction of sulfur in diesel fuel and gasoline are mandated by the 1990 Clean Air Act Amendments and must be accomplished by October 1993 and 1995, respectively. The current desulfurizer unit operated by MRC was limited in size and the throughput capacity to approximately 1,400 barrels per day.

This new HDS project consisted of an HDS process unit and heater, hydrogen plant with reformer heater, and the removal of storage Tanks #40 through #43. Tanks #40 and #41, which currently process gas oil, would be discontinued. Tanks #42 and #43, which process raw diesel, would be discontinued. Tanks #44 and #111, which currently service naphtha, are now be used for gas oil. Tank #45, which services JP-4, is used for gas oil.

On July 28, 1993, **MAQP #2161-07**, a modification to MRC's air quality permit, was issued to change the emission control requirements of Section II.A.4.d.i., titled "Pressure Vessels."

In a system where the valves relieve to atmosphere, rupture discs can prevent emissions in the event of relief valve leakage. In hydrogen fluoride (HF) systems, they can provide some protection from acid corrosion on the relief valve and acid salt formation. Except where HF acid is present, rupture discs do not provide any additional protection; nor do they prevent any release of air contaminants in a closed relief system.

In heavy liquid service, rupture discs can be safety hazards by partial failure or leaking and changing, over time, the differential pressure required to provide vessel protection. Therefore, only pressure vessels in HF Acid service shall be equipped with rupture discs upstream of the relief valves and all except storage tanks shall be vented to the flare system.

Also, the allowable particulate emission limitation for MRC's FCC unit was corrected to reflect the maximum allowable emissions based on the process weight rule (Administrative Rules of Montana (ARM) 17.8.310). The maximum allowable emissions were calculated to be 234.53 TPY using a catalyst circulation rate of 125 tons per hour (TPH).

MRC requested **MAQP Modification #2161-08** to remove the alkylation unit and Tanks #127 and #128 from new source performance standards (NSPS) status because they were erroneously classified as affected facilities under NSPS when originally permitted. This request for modification was submitted on August 11, 1993, and issued on January 6, 1994.

When MRC applied for the preconstruction permit to build the HF Alkylation Unit in 1990, it was presumed, since this unit was new to MRC, it automatically fell under NSPS as new construction. Subsequently, it has been determined that if a source is moved as a unit from a location where operation occurred (Garden City, Kansas) to another location, it must meet the definition of reconstruction or modification in order to trigger NSPS applicability.

The alkylation plant was originally constructed in Garden City, Kansas during 1959 - 1960 and moved, in its entirety, to Great Falls and installed. Since the unit was originally constructed before the NSPS-affected date of January 5, 1981, it does not meet the criteria for construction date of a new source under 40 CFR, Subpart GGG or Subpart QQQ.

The project does not meet the criteria under reconstruction because no capital equipment was replaced when the unit was relocated. The replacement work performed as the unit was moved amounted to pump seals, valve packing, bearings, small amounts of corroded piping, and some heat exchanger tubes and bundles, all of which are done routinely as maintenance. The VOC emitters, such as valve packing and pump seals, were upgraded to meet Best Available Control Technology (BACT).

Along the same line, tanks #127 and #128 were originally constructed at Cody, Wyoming in 1960 and relocated to Great Falls in 1993. The only change was the modification of the roof seals to double seals to meet BACT. This cost a total of \$15,000 for both tanks as compared to more than \$500,000 if two new tanks were to be built.

Also, on October 28, 1993, MRC submitted a permit application to alter the existing permit. This modification and alteration of the existing permit was assigned MAQP #2161-08. MRC proposed to construct and operate a 3,500 barrel-per-day asphalt polymerization unit. The unit would enable MRC to produce a polymerized asphalt product that meets future federal specifications for road asphalt, as well as supply polymerized asphalt to customers that currently wish to use the product.

The proposed unit consists of two circuits: the asphalt circuit and the hot oil circuit. In the asphalt circuit, polymerization occurs in a 1,000-barrel steel, vented mix tank. Product blending and storage occurs in three steel, vented 1,000-barrel tanks identified as A, B, and C on the attached flow diagram. Existing Tanks #55 and #56 (3,000 barrels each) will remain in asphalt service and will be used for storage. In addition to the above equipment, the asphalt circuit also consists of four (4) pumps and approximately 47 standard valves. All the above equipment is in asphalt service and, except for Tanks #55 and #56, are new.

To maintain the asphalt at the optimum temperature in the storage and blending tanks, a hot circuit is utilized. Hot oil (heavy fuel oil) is heated in an existing permitted process heater (Tank 56 heater) and circulated through coils in the process tankage. No change in the method of operation of the heater was anticipated. A steel, vented hot-oil storage/supply tank is used to maintain the required amount of hot oil in the unit. In addition to the process heater and storage/supply tank, the hot-oil circuit consists of one (1) pump and approximately 56 standard valves. The above equipment is in hot-oil service and, except for the heater, is new.

An annual emissions increase of 7.3 TPY of VOC is expected due to operation of the unit. The unit is only anticipated to be operated 6 months of the year. These emissions will occur from the vented hot-oil tank and the valves and pump in hot-oil service.

MAQP #2161-09 was issued on September 6, 1994, and included a change in the method of heating three previously permitted polymer modified asphalt tanks. As previously permitted, these tanks were to have been heated utilizing circulating hot oil. The tanks are now heated individually using natural gas fired fire-tube heaters. This eliminated the hot-oil circuit, including the hot-oil storage tank, entirely.

Since the initial permit application for the modified asphalt unit, several small design changes have occurred involving the addition of a new 800-gallon wetting tank, which are in asphalt service. Also added was an output line from existing Tank #69 (Tall Oil). This output line added approximately 12 new valves and one new pump, all in Tall Oil service, to the unit. All other valves and pumps were designated to be in asphalt service. All VOC emissions from equipment and tanks in asphalt service were assumed to be negligible, since asphalt has negligible vapor pressure at the working temperatures seen in the unit.

MAQP #2161-10, for the installation of an additional boiler (Boiler #3) to provide steam for the facility, was never issued as a final permit. On May 28, 1997, the Department of Environmental Quality (Department) received a letter requesting the withdrawal of the permit and the withdrawal was granted to MRC.

MAQP #2161-11 was issued on January 23, 1998, for the installation of a vapor collection system and enclosed flare for the reduction of Hazardous Air Pollutants (HAPs) resulting from the loading of gasoline. This was done in order to comply with the gasoline loading rack provisions of 40 CFR 63, Subpart CC – National Emission Standards for Petroleum Refineries. A vapor combustion unit (VCU) was added to the truck loading rack. The gasoline vapors is collected from the trucks during loading then routed to an enclosed flare where combustion occurs. The result of this project was an overall reduction in the amount of VOCs and HAPs emitted, and a slight increase in CO and NO_x emissions.

Because the Bulk gasoline and distillate truck loading tack VCU is defined as an incinerator under MCA 75-2-215, a determination that the emissions from the VCU will constitute a negligible risk to public health was required prior to the issuance of a permit to the facility. The facility and the Department identified the following hazardous air pollutants from the flare, which were used in the health risk assessment. These constituents are typical components of MRC's gasoline.

1. Benzene
2. Toluene
3. Ethyl Benzene
4. Xylenes
5. Hexane
6. 2,2,4 Trimethylpentane
7. Cumene
8. Napthalene
9. 1,3 Butadiene

MRC demonstrated compliance with the negligible risk requirement.

MRC requested, via a letter dated August 13, 1997, permitted changes to administratively and technically correct MAQP #2161-09. These changes were necessary as a result of the withdrawal of MAQP #2161-10. The changes included correctly stating opacity limits relating to asphalt storage tanks, removing references to procedural rules, changing monitoring requirements for the Diesel/Gas Hydrotreater (HTU) sour water stripper (SWS) and changing performance specifications for the continuous H₂S monitoring system. Because MRC had applied for a permit alteration on October 21, 1997, for the loading rack VCU the draft modification was addressed in the permit alteration request.

MAQP #2161-12 was not issued. MRC applied for a modification on February 18, 1998, and this action was given MAQP #2161-12. On February 27, 1998, the Department notified MRC that the permitting actions requested would require an alteration and that a complete preconstruction permit application would be required.

MAQP #2161-13 placed enforceable emissions limits on the facility, both plant-wide and on the #1 and #2 boilers. The emission limits have been shown, through the use of EPA approved models, to protect the NAAQS for sulfur dioxide.

The continuous gas flow meters being installed in the vacuum heater and the crude heater were placed in the permit as a requirement. Also, the #1 and #2 boilers limits were updated to allow MRC more flexibility in their operations. The limits were originally placed on the boilers to keep MRC below the PSD permitting threshold. The new limits maintain the status below the PSD permitting threshold.

The monitoring location was identified in the permit's Attachment 1, Ambient Air Monitoring Plan. The current location was determined to be inappropriate after reviewing the modeling analysis, and the new location is approximately 1.2 km from its present location. The monitoring location was chosen based on the modeling analysis that was submitted and is required to provide confirmation of compliance with the State SO₂ standards. The Department will work with MRC for the final exact siting of the monitor. The method numbers for examination of water and wastewater were updated in Section II.C and Attachment 2. MAQP #2161-13 replaced MAQP #2161-11.

On August 4, 2001, the Department issued **MAQP #2161-14** for the installation and operation of five 1600-kW diesel-powered, temporary generators. These generators were necessary because of the current high cost of electricity. The generators would only operate for the length of time necessary for MRC to acquire a permanent, more economical, supply of power. Further, the generators are limited to a maximum operating period of 2 years.

Because these generators would only be used when commercial power is cost prohibitive, the amount of emissions expected during actual operation is minor. In addition, because the permit limits the operation of these generators to a time period of less than 2 years, the installation and operation qualifies as a "temporary source" under the PSD permitting program. Therefore, the proposed project does not require compliance with ARM 17.8.804, 17.8.820, 17.8.822, and 17.8.824. Even though the portable generators are considered temporary, the Department requires compliance with BACT and public notice requirements; therefore, compliance with ARM 17.8.819 and 17.8.826 will be ensured. Finally, the facility is responsible for complying with all applicable ambient air quality standards.

On August 17, 2002, the Department issued **MAQP #2161-15** to eliminate the summer boiler SO₂ emission limits (both the plant-wide and 24-hour average) and redefine the winter limits as year-round limits. The seasonal limits were originally placed in the permit to allow more flexibility when operating the boilers. Both the winter and summer scenarios were supported by ambient air quality modeling performed prior to MAQP #2161-13 being issued. The winter limit being redefined as a year-round limit does not represent an increase in SO₂ emissions from the boilers or any other emitting point. In addition, the Department removed requirements to determine and report NO_x emissions both from the crude heater (due to the old SWS) and refinery wide, as these sources are not subject to NO_x emissions limitations. The requirements appeared to have been inadvertently applied through an administrative error. MRC already provides refinery-wide NO_x emissions as part of its annual emission inventory submission to the Department.

On March 19, 2003, the Department issued **MAQP #2161-16** to include certain limits and standards associated with the Consent Decree lodged on December 20, 2001. In addition, the permit was updated with new rule references under ARM 17.8, Subchapter 7.

The Department received a request to modify air quality MAQP #2161-16 on July 10, 2003, to change the emission testing schedule for the gasoline truck loading vapor combustion unit to be consistent with the current operating permit. MRC requested to remove all references to a 7,000-barrel per day (bbl/day) limit of crude charge referenced in MRC's Title V Operating Permit. By removing the 7,000 bbl/day reference, MRC is now subject to the conditions in ARM 17.8.324. In a letter received by the Department on September 30, 2003, MRC also requested to add three new asphalt tanks with associated natural gas heaters. Since the emissions from the three tanks were less than 15 TPY, the Department added the tanks under de minimis, ARM 17.8.745. The current permit action updated the permit to reflect the changes. **MAQP #2161-17** replaced MAQP #2161-16.

The above changes were also incorporated into **Operating Permit #OP2161-01**. In addition, in a letter dated May 3, 2004, MRC named Dana Leach as an alternate responsible official. Lastly, the permitting action also changed the dates when MRC shall submit to the Department the compliance monitoring reports required by Section V.D and the compliance certification report required by Section V.B.

On May 14, 2004, the Department received a letter from MRC requesting changes to MAQP #2161-17. The proposed change includes adding the ability to burn sweet gas in heaters at the HF Alkylation Unit, and at Tanks #102, #135, #137, #138, and #139. The sweet gas will have a H₂S limit equivalent to the 40 CFR Part 60, Standards of Performance for NSPS, Subpart J limit of 0.10 grains per dry standard cubic foot (gr/dscf) H₂S. The continuous refinery fuel gas monitoring system for H₂S installed on the fuel gas system that supplies the heaters would be used to determine compliance with the limit. Since the emissions from switching the fuel to sweet gas are less than 15 TPY, the Department added the fuel switch under de minimis, ARM 17.8.745. The current permit action updates the permit to reflect the changes. **MAQP #2161-18** replaced MAQP #2161-17.

On October 20, 2005, the Department received a de minimis notification and Title V permit modification request from MRC for a new floating roof wastewater surge tank, which is subject to 40 CFR 60, Subparts Kb and QQQ.

On May 17, 2007, the Department received an application from MRC for the installation of a railcar product loading rack controlled by a John Zink VCU for gasoline and naphtha. The gasoline railcar loading rack is subject to 40 CFR 63, Subpart CC. Because MRC has found that naphtha may have a vapor pressure above the regulatory threshold of 27.6 kilopascals, MRC has decided to include it as regulated product. In addition to permitting this new process, the permit was updated to improve the organization; new applicable regulations were added, including 40 CFR 63, Subpart UUU, Subpart EEEE, and Subpart DDDDD; obsolete equipment and references were removed, including the five diesel generators which were permitted in 2001 and never installed, and the old SWS unit and its monitoring requirements; Consent Decree #CIV-01-1422LH, entered March 5, 2002 (Consent Decree) requirements were integrated, including the new requirements to comply with 40 CFR 60, Subpart J limits for refinery fuel gas and SWSOH; and refinery fuel gas (RFG) and SWSOH sampling was eliminated, and revised to reflect the operation of a continuous H₂S fuel gas meter and requirement to comply with 40 CFR 60, Subpart J. **MAQP #2161-19** replaced MAQP #2161-18.

On June 5, 2006, the Department received an application for the renewal of Title V Operating Permit #OP2161-01. The application was deemed administratively complete on July 5, 2006, and technically complete on August 4, 2006. This permit incorporates all applicable source changes since the issuance of Operating Permit #OP2161-01, including:

- Addition of new emitting unit: EU15 – Gasoline Railcar Loading Rack and VCU;
- Incorporation of Consent Decree #CIV-01-1422LH, entered March 5, 2002 requirements. This included updating the Title V Operating Permit with a number of specific new emission limits and monitoring requirements which had been included in the most recent MAQP #2161-19, as well as adding a general requirement for MRC to comply with the relevant applicable terms and conditions of the Consent Decree (excluding the stipulated penalty components); and
- Inclusion of new regulations impacting MRC, including three MACT standards: 40 CFR 63, Subpart UUU, Subpart ZZZZ, and Subpart DDDDD.

Operating Permit #OP2161-02 replaced Operating Permit #OP2161-01.

On October 15, 2007, the Department received a letter from MRC requesting a correction to MAQP #2161-19, to remove the restrictions on the type of fuel used in specific asphalt tank heaters, which was added erroneously during the previous permitting action. In addition, the MAQP was updated to reflect the fact that requirements under 40 CFR 63, Subpart DDDDD are now “state-only” since the federal rule was vacated in Federal Court on July 30, 2007. **MAQP #2161-20** replaced MAQP #2161-19.

On June 9, 2008, the Department received a letter from MRC requesting an amendment to MAQP #2161-20, to modify the restrictions on Storage Tank #8. This request was a follow-up to a de minimis request received by the Department on April 21, 2008, where MRC proposed to change the operation of Storage Tank #8 from sodium hydrosulfide to naphtha. The Department reviewed this de minimis request and determined that MAQP #2161-20 must first be amended as described in the ARM 17.8.745(2) and ARM 17.8.764 before this change would be allowed. Although the potential emissions increase for this project is less than 15 tons per year, the proposal would have violated a condition of MRC’s current permit.

On July 2, 2008, the Department received another letter from MRC requesting an administrative amendment to MAQP #2161-20 to include certain conditions specified in the Administrative Order on Consent (AOC) that MRC entered into with the Department on May 13, 2008. The AOC requires MRC to install and operate a SO₂ and Oxygen (O₂) continuous emission monitor system (CEMS) on the stack for the #1 and #2 Boilers. This SO₂/O₂ CEMS is to be used as the primary analytical instrument to determine compliance with state and federal SO₂ requirements. The AOC requires MRC to request that these conditions be included in the MAQP as enforceable permit conditions.

In addition, MRC requested that the permit be amended to allow certain de minimis changes related to the Diesel/Gas Oil HDS heater and three PMA tank heaters. Specifically, MRC requested that refinery fuel gas, in addition to natural gas, be allowed to be burned in these heaters. The current permit requires that the Diesel/Gas Oil HDS heater and the three PMA tank heaters be fired only with natural gas. This requirement is based on BACT. For the Diesel/Gas Oil HDS heater, the BACT analysis requires that low sulfur fuel be used. Since the refinery fuel gas is also a low sulfur fuel meeting 40 CFR 60, Subpart J requirements of 160 ppm H₂S, the Department determined that the proposed change does not violate any applicable rule and therefore, can be allowed through an administrative amendment as specified in ARM 17.8.745(2) and ARM 17.8.764. For the three PMA tank heaters, however, the BACT analysis specifically requires that these heaters be fired with natural gas for control of NO_x emissions. Therefore, the Department determined that the proposed three PMA tank heaters de minimis changes are prohibited under ARM 17.8.745(1)(a)(i) since an applicable rule, specifically ARM 17.8.752 requiring that BACT be utilized, would be violated. Because BACT determinations cannot be changed under the amendment process, the Department requested that MRC submit an application for a permit modification that would include a revised BACT analysis in order to make the proposed change for the three PMA tank heaters. **MAQP #2161-21** replaced MAQP #2161-20.

On December 19, 2008, the Department received a request from MRC to amend MAQP #2161-21. MRC requested to change the wording for material stored in specified storage tanks to language representative of the requirements of 40 CFR 60, Subpart Kb in order to provide operational flexibility. Instead of referring to specific products (e.g., naphtha, gasoline, diesel, tall oil, etc.), the products would instead be referred to as light oils, medium oils, and heavy oils.

Under MRC's proposed language, light oils would be defined as a volatile organic liquid with a maximum true vapor pressure greater than or equal to 27.6 kilopascal (kPa), but less than 76.6 kPa and would include, but not be limited to, gasoline and naphtha. Medium oils would be defined as volatile organic liquids with a vapor pressure less than 27.6 kPa and greater than or equal to 5.2 kPa and would include, but not be limited to, ethanol. Heavy oils would be defined as volatile organic liquid with a maximum true vapor pressure less than 5.2 kPa and would include, but not be limited to diesel, kerosene, jet fuel, slurry oil, and asphalt.

In addition to making the requested change, the Department clarified the permit language for the bulk loading rack VCU regarding the products that may be loaded in the event the VCU is inoperable and deleted all references to 40 CFR 63, Subpart DDDDD – NESHAP for Industrial, Commercial, and Institutional Boilers and Process Heaters, as it was removed from the ARM in October 2008. The Department has also updated Attachment 1, Ambient Monitoring to reflect the most current permit language and requirements for ambient monitoring. **MAQP #2161-22** replaced **MAQP #2161-21**.

On July 9, 2009, the Department received a permit application from MRC to modify **MAQP #2161-22**. The application was deemed complete on July 24, 2009. MRC submitted a permit modification to allow the use of treated refinery fuel gas or natural gas in the tank heaters. Previously, the PMA tanks heaters were permitted to use natural gas only pursuant to a BACT analysis that was completed for **MAQP #2161-09**. This permit modification applied to three previously permitted asphalt tanks (Tanks #130, #132, and #133) and the associated PMA tank heaters. **MAQP #2161-23** replaced **MAQP #2161-22**.

On January 15, 2008, the Department received a request from MRC to allow the installation of a second hydrogen plant (Hydrogen Plant #2) that utilizes a process heater with a heat input of 80 MMBtu/hr. The Department approved this de minimis request on February 8, 2008. Pursuant to the Consent Decree and the approval of the de minimis request, MRC was required to conduct an initial performance test on the process heater with the results reported based upon the average of three, one hour testing periods. The Consent Decree also required MRC to submit an application to the Department and to propose a NO_x permit limit for the heater. MRC submitted a permit application on December 29, 2009 and the Department deemed this application incomplete on January 15, 2010. On July 12, 2010, MRC submitted additional information as requested by the Department. On September 2, 2010, during the comment period, MRC submitted information to support the guaranteed ultra-low NO_x burner emission limit of 0.033 lb/MMBtu based on the Higher Heating Value (HHV) of the fuel. This limit was based on the process heater of the hydrogen plant operating at full capacity (80 MMBtu/hr) with fuel gas consisting of 40.5 % natural gas and 59.4% PSA vent gas. This permit modification only applied to the NO_x limit on Hydrogen Plant #2 process heater and was assigned **MAQP #2161-24** and replaced **MAQP #2161-23**.

On December 19, 2008, the Department received an application for a significant modification to Title V Operating Permit #OP2161-02. This permit incorporates all applicable source changes since the issuance of Operating Permit #OP2161-02, including:

- A change in the type of material allowed to be stored in Storage Tank #8;
- A wording change for the type of material to be stored in specified storage tanks that is representative of the requirements of 40 CFR 60, Subpart Kb in order to provide operational flexibility;

- Incorporation of SO₂/O₂ CEMS requirements on boilers #1 and #2;
- A change to the type of fuel that may be fired in the HTU unit;
- Clarification of permit language for the bulk loading rack VCU regarding products that may be loaded in the event the VCU is inoperable;
- Removal of 40 CFR 63, Subpart DDDDD “state-only” requirements, as this MACT was removed from the ARM in October 2008; and
- Revisions to Appendix E, Ambient Air Monitoring Plan to reflect the most current permit language and requirements for ambient monitoring.

Operating Permit #OP2161-03 replaced Operating Permit #OP2161-02.

On July 9, 2009, the Department received a request from MRC to modify MAQP #2161-22. MRC submitted a permit modification to allow the use of treated refinery fuel gas or natural gas in the tank heaters. This modification applies to three modified asphalt tanks (Tanks #130, #132, and #133) and the associated PMA tank heaters. MAQP #2161-23 replaced MAQP #2161-22. This action also required a significant modification to Operating Permit #OP2161-03. **Operating Permit #OP2161-04** replaced Operating Permit #OP2161-03.

Pursuant to the Consent Decree and the approval of the de minimis request dated February 8, 2008, MRC was required to submit an application to the Department and to propose a NO_x permit limit for the reformer heater at Hydrogen Plant #2. MRC submitted a permit application on December 29, 2009, and the Department deemed this application incomplete on January 15, 2010. On July 12, 2010, MRC submitted additional information as requested by the Department and the application was deemed complete. On September 2, 2010, during the comment period, MRC disagreed with the Department’s proposed limits and submitted information to support the guaranteed ultra-low NO_x burner emission limit of 0.033 lb/MMBtu based on the HHV of the fuel. This limit was based on the process heater of the hydrogen plant operating at full capacity (80 MMBtu/hr) with fuel gas consisting of 40.5% natural gas and 59.4% PSA vent gas. This permit modification only applied to the NO_x limit on Hydrogen Plant #2 process heater and was assigned Operating Permit #OP2161-05. Additionally this permit updates the NO_x emission limits for the FCCU unit established by the Environmental Protection Agency (EPA). Pursuant to a letter dated September 23, 2010 from the EPA and received by the Department on October 1, 2010, and paragraph 11.E of the MRC Consent Decree, the final FCCU NO_x emission limits were established at 68.0 parts per million, volumetric dry (ppmvd) (at 0% O₂) based on a 365-day rolling average and 87.0 ppmvd (at 0% O₂) based on a 7-day rolling average. **Operating Permit #OP2161-05** replaced Operating Permit #OP2161-04.

On July 6, 2011, MRC submitted a permit application and subsequent modeling demonstration to add a new boiler (boiler #3) capable of firing refinery fuel gas or natural gas. The primary purpose of boiler #3 is to supplement the two existing boilers (#1 and #2) that provide process steam to the refinery. The design burner heat input capacity for boiler #3 varies depending upon fuel characteristics ranging from 59.7 to 60.3 million British thermal units per hour (MMBtu/hr). The Department deemed the application incomplete on August 4, 2011, and MRC provided additional information in response to the Department’s letter on September 26, 2011.

On October 25, 2011, the Department requested additional information with respect to MRC's plant wide applicability limit (PAL) and the fuel combustion properties of the caustic scrubbed sour water stripper overhead gas (SWSOH). This information, and a request to allow a backup method of monitoring compliance with sulfur dioxide (SO₂) emissions from the #1 and #2 boiler stack and the #3 boiler stack were received by the Department on November 15, 2011. **MAQP #2161-25** replaced MAQP #2161-24. This permit action also required a significant modification to Operating Permit #OP2161-05. **Operating Permit #OP2161-06** replaced Operating Permit #OP2161-05.

On June 5, 2012, Calumet submitted an application for renewal and this application was assigned as **Operating Permit #OP2161-07**. With this request, Calumet requested that the Department add several applicable requirements to the Operating Permit including but not limited to: 40 CFR 60, Subpart Ja and some additional requirements of 40 CFR 63, Subpart CC were clarified in this action.

Several *de minimis* actions were incorporated with this permit action:

- Calumet requested to add two new process heaters, the naphtha splitter reboiler heater equipment number is H-405, and the other heater H-402 is a replacement for the naphtha heater previously listed as EU05b.
- Calumet requested that the Department note that Asphalt tank #138 was put into service in 2008 and is subject to 40 CFR 60, Subpart UU. This was submitted as a *de minimis* request on January 15, 2008.
- On October 7, 2010, Calumet submitted a *de minimis* request to add ethanol tank #176.
- On January 15, 2008, Calumet was submitted a *de minimis* request to add diesel tanks #170 and #171 (associated with IEU11), and heavy gas oil Tank #150 (associated with IEU25).
- On April 2, 2013, (with additional information received on May 21, 2013) Calumet submitted a *de minimis* request to replace two existing 10,000 bbl tanks (Tank 29 and Tank 51) with two, 21,000 bbl fixed-roof tanks.

In the renewal application (application number #OP2161-07) Calumet noted that Tanks #44, #45, and #11 were dismantled in 2008; Tank #62 was changed to non-hydrocarbon service (spent hydroxide solution); Tank #124 was changed to gasoline service; and Tank #125 was changed from gasoline blend to crude oil.

Calumet submitted several administrative changes and information to show that a Compliance Assurance Monitoring Plan (CAM plan) is not required. In addition to those items previously mentioned, on October 24, 2012, Calumet submitted an administrative request (assigned permit action #OP2161-08) for a name change from Montana Refining Company to Calumet Montana Refining, LLC. These two permit actions were combined into one and were issued as **Operating Permit #OP2161-08** to replace Operating Permit #OP2161-06.

On July 30, 2013, the Department received an application to modify MAQP #2161-26 and Operating Permit #OP2161-08. The Department received additional information to support the application on August 16, 2013. The permit action removed older storage tanks and replaced and/or re-located tanks in order to accommodate potential future expansion. As such, Calumet requested to remove nine (9) tanks and replace eight (8) tanks with new ones as shown in more detail below:

Current Tank ID	Current Service	Current Capacity (bbl)	New Tank ID	Service	New Capacity (in bbl)
Tank #122	Unleaded Gasoline	11300	Tank #122	Unleaded Gasoline	20000
Tank #123	Unleaded Gasoline	11300	Tank #123	Unleaded Gasoline	20000
Tank #52	Premium Gasoline	3000	Tank #52	Premium Gasoline	11300
Tank #53	Premium Gasoline	3000	Removed from service		
Tank #46	Kero/Jet A	5140	Tank #49	Kero/Jet A	20000
Tank #47	Kero/Jet A	10500	Tank #47	Kero/Jet A	20000
Tank #48	Kero/Jet A	10500	Tank #48	Kero/Jet A	20000
Tank #50	Asphalt	55700	Tank #50	Asphalt	20000
Tank #102	Asphalt	10300	Tank #102	Asphalt	20000

With this permit action, **MAQP #2161-27** replaced MAQP #2161-26 and **Operating Permit #OP2161-09** replaced Operating Permit #OP2161-08.

On October 3, 2013, the Department received a permit application requesting a major modification under the New Source Review-Prevention of Significant Deterioration (NSR-PSD) program. This permit application was assigned **MAQP #2161-28**. The project was deemed significant for greenhouse gasses (GHG) and volatile organic compounds (VOCs), and the permit application was deemed complete on February 10, 2014.

With this permit action, Calumet proposed to increase the low sulfur fuels capacity at the refinery from approximately 10,000 barrels per stream day (bpsd) throughput up to 30,000 bpsd while increasing yields of distillates, kerosene, diesel, and asphalt products.

The expansion project included the construction of four new processing units: a new crude unit that will process heavy sour crudes, a MHC for gas-oil conversion to higher value distillates, a new hydrogen plant (#3) to support the MHC, and a fuel gas treatment unit to handle the increased fuel gas production from the MHC.

The main emitting units included with the expansion project are as follows: Hydrogen Plant #3 (equipped with two heaters with a total combined firing rating of up to 134 million British thermal units per hour (MMBtu/hr)); Combined Feed Heater (up to 54 MMBtu/hr); Fractionation Feed Heater (up to 38 MMBtu/hr), Crude Heater (up to 71 MMBtu/hr), Vacuum Heater (up to 27 MMBtu/hr), and a new flare interconnected to the existing flare that will be equipped with a flare gas scrubber. With the expansion, Calumet also proposed to add a new rail car loading (diesel and asphalt) and unloading (crude oil and gas oil) area, and several new storage tanks in addition to repurposing some existing storage tanks to accommodate the expansion project.

Additionally, the existing HTU that block operated in both diesel and gas-oil service was to become the kerosene HTU, and the existing kerosene HTU was to become a Naptha HTU. Lastly, Calumet requested a federally enforceable operational limit on Boiler #1 and Boiler #2.

The Department issued a preliminary determination (PD) as MAQP #2161-28 on March 18, 2014, final department decision (DD) on April 25, 2014, and final permit on May 13, 2014. However, the Department did not notify the public by advertisement in a newspaper of general circulation in the Great Falls area in accordance with ARM 17.8.826(2)(c) when it issued the PD for MAQP #2161-28. Therefore, the Department reissued its PD under MAQP #2161-29 along with a public notice in the Great Falls Tribune to satisfy the requirements of ARM 17.8.826(2)(c). All project analyses and conclusions from MAQP #2161-28 for this project remained the same. **MAQP #2161-29** contained any comments received on the PD for MAQP #2161-28 and corrections made to address them.

On April 25, 2016, the Department received a letter from Calumet requesting an Administrative Amendment to Operating Permit #OP2161-09 for the purpose of updating the Responsible Official and the Alternate Responsible Official to Wayne Leiker and Hadley Bedbury, respectively.

Operating Permit #OP2161-10 replaced Operating Permit #OP2161-09.

On March 29, 2017, the Department received a significant modification application for the Title V operating permit to incorporate applicable conditions for the expansion project authorized in MAQP #2161-28 and #2161-29. The application was assigned number #OP2161-11. Due to various operational and design issues, compliance with certain limits associated with the expansion project permitted in MAQP #2161-29 were determined to be unachievable on a continuous and ongoing basis. Because subsequent MAQP actions to address this would change the applicable requirements; the content from application #OP2161-11 would be inaccurate. Therefore, Calumet requested that the Department rescind the application in a March 15, 2018 correspondence. Title V Operating Permit **#OP2161-11** was never issued.

On April 4, 2017 the Department received an application from Calumet to modify the existing MAQP. Incompleteness responses and additional information were received, with final information completing the application on September 26, 2017. Due to various operational and design issues, compliance with certain limits associated with the expansion project permitted in MAQP #2161-29 were determined to be unachievable on a continuous and ongoing basis. These limitations were necessary to avoid the project being determined a major modification of a major stationary source and subject to the permitting requirements of ARM 17.8 Subchapter 8 for NO_x. As such, Calumet proposed an alternative operating scenario and alternative limitations to maintain the project below relevant significant emissions rates.

Calumet proposed to install a new temporary low NO_x boiler (Boiler #4) for additional/supplemental steam production and an ammonia combustor to remove and combust fuel bound nitrogen that otherwise would be present in refinery fuel gas. In addition, Calumet proposed an umbrella limit on emissions of NO_x and CO on a rolling 12-month basis. The umbrella limit would apply to combined emissions from multiple units such that any combination of emissions from these units, provided the overall emissions limitation is adhered to, maintains the project as not a major modification for NO_x or CO. Prior limitations related to PSD avoidance on Boilers #1 and #2 have been removed from the permit.

Calumet has determined a need to reduce fuel-bound nitrogen in fuel gas in order to meet NO_x limitations on various units. Further, Calumet has identified mechanical issues with Boiler #3 which has resulted in the potential for excess NO_x emissions. Bringing a temporary low NO_x boiler on-site will allow Calumet to produce steam for operations while ongoing efforts are undertaken to reduce plant wide NO_x emissions. The low NO_x boiler will provide for reduced emissions of NO_x per pound of steam produced compared to the NO_x performance capabilities of Boilers #1 and #2.

Boiler #3, the new low NO_x boiler, and the ammonia combustor were determined technically and economically related to the expansion project and were included in the expansion project as new units. The purpose of this permitting action is to establish limits which maintain the net emissions increases to less than the significant emissions rates for NO_x and CO, or less than the amount of other emissions previously reviewed for the expansion project. All pollutants were reviewed, and the project was re-permitted as if the project had not been previously permitted. A request in the future to modify or replace associated units would require a reassessment of the project emissions. The allowable operating capacity of the associated refining unit heaters as a whole was reduced in the current operational scenario, and future projects to reduce emissions will be necessary to gain full use of the increased refining capacity capable of being accomplished with the associated equipment installed for avoidance of PSD.

During PSD review, Calumet identified that Tank #50 and #102 will not be equipped with tank heaters and the emissions were removed from considerations in contemporaneous emissions increases. **MAQP #2161-30** replaced MAQP #2161-29.

On March 20, 2019, the Department received from Calumet an application to include expansion of cooling tower capacity at the refinery. The Department determined, and Calumet has concurred, that the expansion of cooling tower capacity was part of the refinery expansion project. Emissions increases therefore were required to be reviewed and permitted as part of the refinery expansion project. **MAQP #2161-31** updated the refinery expansion project net emissions increase calculations, assigned Best Available Control Technology conditions to the cooling towers to minimize volatile organic compound and particulate matter emissions, and assigned associated compliance monitoring. Additionally, Calumet requested to remove the Temporary Boiler (Boiler #4) from the project, as the boiler was not expected to be used in the future. In addition, with Calumet's concurrence, the Department removed the averaging periods associated with particulate matter, carbon monoxide, and carbon dioxide emission limits on the Crude #2 Heaters.

On July 12, 2019, the Department received from Calumet an application to modify the MAQP. Calumet sought to relax the control requirements on Tanks #125 and #128, due to a finding that the tanks were out-of-round, making seals associated with floating roof design to be infeasible to maintain. These tanks are in heavy liquid service, and as such, the Department approved request to maintain these tanks as fixed roof tanks with submerged fill. In doing so, the emissions increases associated with the expansion project was updated, and Best Available Control Technology (BACT) review was presented in demonstration that the requirements of BACT were maintained (see the permit analysis). Conditions were established to require the fixed roof tanks be maintained in heavy liquids service with submerged fill practices maintained. Prior requirements that these tanks be maintained with floating roof design were removed. **MAQP #2161-32** replaced MAQP #2161-31.

D. Current Permit Action

On June 29, 2018, the Department received a Title V renewal application from Calumet, which was assigned application number **#OP2161-12**. This application included applicable requirements related to the expansion project authorized in MAQP #2161-30.

On March 20, 2019, the Department received a Title V significant modification application to include the expansion of cooling tower capacity at the refinery authorized in MAQP #2161-31. This was assigned application number **#OP2161-13**.

On July 12, 2019, the Department received a Title V significant modification application to relax the control requirements of Tanks #125 and #128 authorized in MAQP #2161-32. This was assigned application number **#OP2161-14**.

On February 27, 2020, the Department received a Title V administrative amendment requesting correction of several administrative errors discovered in review of the proposed version of the permit posted as #OP2161-14. The Department rolled this request into the current action to ensure a final permit with corrections made as appropriate. The current permit action addresses all four of these actions. **Operating Permit #OP2161-15** replaces Operating Permit #OP2161-10.

E. Taking and Damaging Analysis

House Bill (HB) 311, the Montana Private Property Assessment Act, requires analysis of every proposed state agency administrative rule, policy, permit condition or permit denial, pertaining to an environmental matter, to determine whether the state action constitutes a taking or damaging of private real property that requires compensation under the Montana or U.S. Constitution. As part of issuing an operating permit, the Department of Environmental Quality is required to complete a Taking and Damaging Checklist. As required by 2-10-101 through 2-10-105, Montana Code Annotated (MCA), the Department conducted the following private property taking and damaging assessment.

YES	NO	
X		1. Does the action pertain to land or water management or environmental regulation affecting private real property or water rights?
	X	2. Does the action result in either a permanent or indefinite physical occupation of private property?
	X	3. Does the action deny a fundamental attribute of ownership? (ex.: right to exclude others, disposal of property)
	X	4. Does the action deprive the owner of all economically viable uses of the property?
	X	5. Does the action require a property owner to dedicate a portion of property or to grant an easement? [If no, go to (6)].
		5a. Is there a reasonable, specific connection between the government requirement and legitimate state interests?
		5b. Is the government requirement roughly proportional to the impact of the proposed use of the property?
	X	6. Does the action have a severe impact on the value of the property? (consider economic impact, investment-backed expectations, character of government action)
	X	7. Does the action damage the property by causing some physical disturbance with respect to the property in excess of that sustained by the public generally?
	X	7a. Is the impact of government action direct, peculiar, and significant?

YES	NO	
	X	7b. Has government action resulted in the property becoming practically inaccessible, waterlogged or flooded?
	X	7c. Has government action lowered property values by more than 30% and necessitated the physical taking of adjacent property or property across a public way from the property in question?
	X	Takings or damaging implications? (Taking or damaging implications exist if YES is checked in response to question 1 and also to any one or more of the following questions: 2, 3, 4, 6, 7a, 7b, 7c; or if NO is checked in response to questions 5a or 5b; the shaded areas)

Based on this analysis, the Department determined there are no taking or damaging implications associated with this permit action.

F. Compliance Designation

The Department has issued violation letters for the following.

- FCCU Opacity Monitoring Downtime during the 3rd and 4th quarter of 2017
- H₂S Monitoring Downtime during the 3rd quarter of 2017
- Failure to monitor NO_x emissions from H₂ Plant #2 Reformer (ongoing)
- H₂S Monitoring Downtime during the 2nd and 3rd quarters of 2018 and 1st quarter of 2019
- NO_x emissions violations of the #2 Atmospheric Crude Unit Heater H-2101 from May 2018 through March 2019

SECTION II SUMMARY OF EMISSION UNITS

A. Facility Process Description

Calumet refines petroleum hydrocarbons at a small refinery in Great Falls, Montana. The facility consists of the following major processing units:

- **Crude Distillation** - #1 and #2 Crude Units with atmospheric and vacuum distillation – separating crude oil into component parts (heavier and lighter fractions)
- **Fluidized Catalytic Cracking Unit (FCCU)** – breaking larger chains into smaller chains
- **Catalytic Reformer Unit** – convert lower octane components to high octane reformates
- **Catalytic Poly Unit** – increase lighter, smaller chains into heavier, larger chains
- **Alkylation Unit**– increase lighter, smaller chains into heavier, larger chains
- **Isomerization Unit** – convert linear molecules into higher-octane branched molecules
- **Hydrogen Plants #1, #2, and #3** – create hydrogen for use in the plant i.e. – hydrotreating and hydrocracking
- **Polymer-Modified Asphalt (PMA) Unit** – heavy asphalt handling including heated tanks
- **Mild Hydrocracker Unit** – rearranging and breaking hydrocarbons, adding hydrogen
- **Hydrotreater Unit** – reducing sulfur and nitrogen content
- **Product Loading** – loading of finished product into cargo tanks
- **Cooling Towers** – cools water used in heat exchangers throughout the process
- **Wastewater Collection and Treatment** – individual drain systems and treatment
- **Boilers** – provides heat via steam for use throughout the process
- **Storage Tanks** - crude oil, intermediates, additives, and products
- **Internal Combustion Engines** – air compression, water pumping, firewater, etc.
- **Flares and Fuel Gas Scrubber Unit** – flares are a control device for hundreds of emissions points throughout the process, and is an important safety device during maintenance, malfunctions and non-steady state conditions such as startup and shutdown. Gas from the process is treated in the fuel gas scrubber unit to reduce sulfur content to minimize SO₂ emissions created during combustion.

B. Emission Units and Pollution Control Device Identification

The following table includes the significant emitting units contained in the permit. Calumet must comply with the applicable requirements for each emitting units listed below.

Title V Section	Description	Pollution Control Device/Practice
#1 Crude Unit: up to 10,000 barrels per stream day		
Section III.C:	#1 Crude Atmospheric Heater, H-0101, 30 MMBtu/hr	CD - NSPS J, MACT DDDDD, Burner Management System, NO _x and CO Umbrella Limits
	#1 Crude Vacuum Heater, H-0102, 7 MMBtu/hr	CD - NSPS J, MACT DDDDD, Burner Management System, NO _x and CO Umbrella Limits
	Equipment Components	CD – LDAR, NSPS GGG, MACT CC
	Individual Drain System	NSPS QQQ, MACT CC, NESHAP FF
#2 Crude Unit: up to 20,000 barrels per stream day		
Section III.D:	#2 Crude Atmospheric Heater, H-2101, 71 MMBtu/hr	NSPS Ja, MACT DDDDD, Burner Management System,

Title V Section	Description	Pollution Control Device/Practice
		ULNB, NO _x and CO Umbrella Limits
	#2 Crude Vacuum Heater, H-2102, 27 MMBtu/hr	NSPS Ja, MACT DDDDD, Burner Management System, ULNB, NO _x and CO Umbrella Limits
	Equipment Components	CD, NSPS GGGa, MACT CC
	Individual Drain System	NSPS QQQ, MACT CC, NESHAP FF
Catalytic Polymerization Unit		
Section III.E EU04- Catalytic Polymerization Unit	Equipment Components	MACT CC
	Individual Drain System	NSPS QQQ, MACT CC, NESHAP FF
FCCU		
Section III.F:	Catalyst Regenerator	MACT UUU, NSPS J via CD,
	FCCU Preheater, H-0302, 8.9 MMBtu/hr	MACT DDDDD, CD NSPS J
	Equipment Components	CD, NSPS GGG, MACT CC
	Individual Drain System	NSPS QQQ, MACT CC, NESHAP FF
Catalytic Reformer and Naphtha Units		
Section III.G:	Reformer Heater, H-0403, 7.5 MMBtu/hr	CD, NSPS J, MACT DDDDD
	Process Vents	MACT CC, MACT UUU
	Equipment Components	MACT CC
	Individual Drain System	NSPS QQQ, MACT CC, NESHAP FF
	Naphtha Heater, H-0402a, 6.4 MMBtu/hr	NSPS Ja, MACT DDDDD
	Naphtha Splitter Reboiler, H-0405, 6.8 MMBtu/hr	NSPS Ja, MACT DDDDD
	Process Vents	MACT CC
	Equipment Components	NSPS GGGa, MACT CC
Alkylation Unit		
Section III.H:	Deisobutanizer Reboiler, 28 MMBtu/hr	CD, NSPS J, MACT DDDDD
	Equipment Components	MACT CC
	Individual Drain System	NSPS QQQ, MACT CC, NESHAP FF
	Pressure Vessels in HF Service	Flare System
Isomerization Unit		
Section III.I:	Equipment Components	MACT CC
	Individual Drain System	NSPS QQQ, MACT CC, NESHAP FF
Hydrogen Plants		
Section III.J:		
H ₂ Plant #1		
	#1 H ₂ Plant Furnace – H-1801, 23.8 MMBtu/hr	CD, NSPS J, MACT DDDDD
	#1 H ₂ Plant Components	CD, NSPS GGG
	#1 H ₂ Plant Individual Drain System	NSPS QQQ, MACT CC, NESHAP FF
H ₂ Plant #2		
	#2 H ₂ Plant Furnace – H-2851, 65.2 MMBtu/hr	CD, NSPS Ja, MACT DDDDD, ULNB
	#2 H ₂ Plant Components	CD, NSPS GGGa
	#2 H ₂ Plant Individual Drain System	NSPS QQQ, MACT CC, NESHAP FF
H ₂ Plant #3		

Title V Section	Description	Pollution Control Device/Practice
	#3 H ₂ Plant Furnace A and B (combined stack) – H31A&B, 67 MMBtu/hr each	CD, NSPS Ja, MACT DDDDD, ULNB, Umbrella Limits
	#3 H ₂ Plant Components	CD, NSPS GGGa
	#3 H ₂ Plant Individual Drain System	NSPS QQQ, MACT CC, NESHAP FF
Polymer-Modified Asphalt Unit		
Section III.K:		
	Tank 50	NSPS UU, MACT CC
	Tank 55 - Asphalt	MACT CC
	Tank 55 Heater – 6 MMBtu/hr	CD, NSPS J, MACT DDDDD
	Tank 56 – Asphalt	MACT CC
	Tank 56 Heater – 9 MMBtu/hr	CD, NSPS J, MACT DDDDD
	Tank 69 - Asphalt	MACT CC
	Tank 102 – Asphalt / NaHS	NSPS UU; MACT CC
	Tank 110 – Asphalt	MACT CC
	Tank 110 Heater – 5 MMBtu/hr	CD, NSPS J, MACT DDDDD
	Tank 112 – Asphalt	MACT CC
	Tank 112 Heater – 5 MMBtu/hr	CD, NSPS J, MACT DDDDD
	Tank 130 – PMA	MACT CC
	Tank 130 Heater – 0.8MMBtu/hr	CD, NSPS J, MACT DDDDD
	Tank 132 – PMA	MACT CC
	Tank 132 Heater – 0.8 MMBtu/hr	NSPS J, MACT DDDDD
	Tank 133 – PMA	MACT CC
	Tank 133 Heater – 0.8 MMBtu/hr	CD, NSPS J, MACT DDDDD
	Tank 135 – Asphalt	MACT CC
	Tank 135 Heater – 6 MMBtu/hr	NSPS J, MACT DDDDD
	Tank 137 – Asphalt	NSPS UU, MACT CC
	Tank 137 Heater – 1.4 MMBtu/hr	NSPS J, NSPS UU, MACT CC
	Tank 138 – Asphalt	NSPS UU; MACT CC
	Tank 138 Heater – 1.4 MMBtu/hr	NSPS Ja, MACT DDDDD
	Tank 139 – Asphalt	NSPS UU; MACT CC
	Tank 139 Heater – 4 MMBtu/hr	NSPS J, MACT DDDDD
	Tank 140 – Asphalt	NSPS UU, MACT CC
	Tank 140 Heater – 4 MMBtu/hr	NSPS J, MACT DDDDD
	Equipment Components	CD, NSPS GGG, MACT CC
	Individual Drain System	MACT CC, NESHAP FF
Mild Hydrocracker Unit		
	MHC Combined Feed Heater, H-4101, 54 MMBtu/hr	CD, NSPS Ja, MACT DDDDD, ULNB, Umbrella Limits
	MHC Fractionator Feed Heater, H-4102, 38 MMBtu/hr	NSPS Ja, MACT DDDDD, ULNB, Umbrella Limits
Section III.L:	Process Vents	MACT CC
	Equipment Components	CD, NSPS GGGa, MACT CC
	Individual Drain System	NSPS QQQ, MACT CC, NESHAP FF
Hydrotreater Unit		
	Kerosene Heater	NSPS J, MACT DDDDD
	HTU Heater, H-1701, 20.3 MMBtu/hr	CD, NSPS J, MACT DDDDD
Section III.M:	Process Vents	MACT CC
	Equipment Components	CD, NSPS GGG, MACT CC
	Individual Drain System	NSPS QQQ, MACT CC, NESHAP FF

Title V Section	Description	Pollution Control Device/Practice
Flares, Flare Gas Scrubber Unit		
Section III.N:	Primary Flare #1 – Air Assisted	NSPS Ja, MACT CC, Air Assisted, H ₂ S Scrubbing
	Secondary Flare (Flare #2) – Air Assisted	NSPS Ja, MACT CC, Air Assisted
	NaHS Process Vents	MACT CC
	NaHS Equipment Components	CD, MACT GGGa, MACT CC
	Flare Gas Scrubber	CD, NSPS GGGa/VVa, MACT CC
Product Loading		
Section III.O:		
Truck Loading Rack		
	Truck Loading Rack – Gasoline	MACT R, MACT CC
	Truck Loading Rack VCU	MACT R, MAQP BACT
	Truck Loading Rack Equipment Components	MACT CC
	Individual Drain System	NSPS QQQ, MACT CC, NESHAP FF
Railcar Loading Rack		
	Railcar Loading Rack – Gasoline	MACT R, MACT CC
	Railcar Loading Rack – Naphtha	MACT EEEE
	Railcar Loading Rack VCU	MACT R, MAQP BACT
	Railcar Loading Rack Equipment Components	MACT CC
	Individual Drain System	NSPS QQQ, MACT CC, NESHAP FF
Cooling Towers		
Section III.P:	North Cooling Tower	Mist Eliminator, Total Dissolved Solids Control, MACT CC
	South Cooling Tower	Mist Eliminator, Total Dissolved Solids Control, MACT CC
Wastewater Collection and Treatment		
Section III.Q:	Individual Drain Systems, Junction Boxes, and Sampling Devices	NSPS QQQ, MACT CC, NESHAP FF
	API Separator, Aeration Tank, DAF Unit, etc	NSPS QQQ, MACT CC, NESHAP FF
	Closed Vent Systems and Control Devices	NSPS QQQ, MACT CC, NESHAP FF
	External Floating Roof, Wastewater Tanks	NSPS QQQ, MACT CC, NESHAP FF
Boilers		
Section III.R:	Boiler #1, B-0701, stack combined with Boiler #2	CD, NSPS J, MACT DDDDD, NO _x and CO Umbrella Limits
	Boiler #2, B-0702, stack combined with Boiler #1	CD, NSPS J, MACT DDDDD, NO _x and CO Umbrella Limits
	Boiler #3, B-0703, 60.5 MMBtu/hr	CD, NSPS Ja, NSPS Dc, MACT DDDDD, ULNB, Flue Gas Recirculation, NO _x and CO Umbrella Limits
	Individual Drain System	NSPS QQQ
Storage Tanks		
Section III.S:	Tank 1: 152 bbl, Fixed Roof in Jet Fuel Additive service	MACT EEEE
	Tank 2: 800 bbl Pressure Vessel in Propane service	Intrinsic Design
	Tank 3: 2,000 bbl Pressure Vessel in Isobutane service	Intrinsic Design
	Tank 4: 600 bbl Pressure Vessel in Butane service	Intrinsic Design
	Tank 5: 600 bbl Pressure Vessel in Isobutane service	Intrinsic Design
	Tank 10: 375 bbl Fixed Roof tank in Transmix service	MACT CC
	Tank 14: 1,400 bbl Pressure Vessel in Isobutane service	Intrinsic Design

Title V Section	Description	Pollution Control Device/Practice
	Tank 15: 1,400 bbl Pressure Vessel in Butane service	Intrinsic Design
	Tank 29: 20,600 bbl Fixed Roof in Distillate service	MACT CC
	Tank 47: 20,500 bbl Fixed Roof in Kerosene / Jet Fuel service	MACT CC
	Tank 48: 20,500 bbl Fixed Roof in Kerosene / Jet Fuel service	MACT CC
	Tank 49: 20,500 bbl Fixed Roof in Kerosene / Jet Fuel service	MACT CC
	Tank 50: fixed roof tank in asphalt storage service	NSPS UU
	Tank 51: 21,000 bbl Fixed Roof in Treated Gas oil service	MACT CC
	Tank 52: 19,000 bbl External Floating Roof in Gasoline service	MACT CC, NSPS Kb
	Tank 54: 18,000 bbl Fixed Roof in Kerosene / Jet Fuel service	MACT CC
	Tank 57: 10,000 bbl Internal Floating Roof in Naphtha service	MACT CC, NSPS Kb
	Tank 58: 9,900 bbl Fixed Roof in Kerosene / Jet Fuel service	MACT CC
	Tank 100: 1,100 bbl Fixed Roof in #5 Fuel Oil service	MACT CC
	Tank 101: 1,100 bbl Fixed Roof in #5 Fuel Oil service	MACT CC
	Tank 102: fixed roof tank in asphalt storage service	NSPS UU
	Tank 116: 44,900 bbl Fixed Roof in Distillate service	MACT CC
	Tank 118: 2,000 bbl Fixed Roof in Asphalt Emulsion service	MACT CC
	Tank 119: 2,000 bbl Fixed Roof in Asphalt Emulsion service	MACT CC
	Tank 120: 2,200 bbl Fixed Roof in Asphalt Emulsion service	MACT CC
	Tank 121: 2,200 bbl Fixed Roof in Asphalt Emulsion service	MACT CC
	Tank 122: 21,900 bbl External Floating Roof in Gasoline service	MACT CC, NSPS Kb
	Tank 123: 21,900 bbl External Floating Roof in Gasoline service	MACT CC, NSPS Kb
	Tank 124: 21,500 bbl External Floating Roof in Naptha service	MACT CC, NSPS Kb
	Tank 125: 38,500 bbl Fixed Roof in Heavy Liquids service	MACT CC
	Tank 126: 29,500 bbl External Floating Roof in Gasoline service	MACT CC, NSPS Kb
	Tank 127: 21,500 bbl External Floating Roof in Gasoline service	MACT CC
	Tank 128: 21,500 bbl Fixed Roof in Heavy Liquids service	MACT CC
	Tank 137: Fixed Roof in Asphalt Storage service	NSPS UU
	Tank 138: Fixed Roof in Asphalt Storage service	NSPS UU
	Tank 139: Fixed Roof in Asphalt Storage service	NSPS UU
	Tank 140: Fixed Roof in Asphalt Storage service	NSPS UU
	Tank 150: 30,100 bbl Fixed Roof in Raw Kerosene service	MACT CC
	Tank 170: 10,200 bbl Fixed Roof in Distillate service	MACT CC
	Tank 171: 10,200 bbl Fixed Roof in Distillate service	MACT CC
	Tank 175: 400 bbl Fixed Roof in Ethanol service	MACT CC
	Tank 176: 5,000 bbl Internal Floating Roof in Ethanol service	MACT CC, NSPS Kb
	Tank 201: 69,700 bbl External Floating Roof in Crude Oil service	MACT CC, NSPS Kb
	Tank 202: 69,700 bbl External Floating Roof in Crude Oil service	MACT CC, NSPS Kb
	Tank 203: 69,700 bbl External Floating Roof in Crude Oil service	MACT CC, NSPS Kb
	Tank Farm Equipment Components	MACT CC
	Individual Drain System	MACT CC, NSPS QQQ, NESHAP FF
Stationary Internal Combustion Engines		
Section III.T:	GEN1: 400 hp diesel fired Emergency Generator	NSPS IIII, MACT ZZZZ
	AC1: 540 hp diesel fired Emergency Air Compressor Engine	NSPS IIII, MACT ZZZZ
	WP1: 165 hp, diesel fired Emergency Storm Water Pump	NSPS IIII, MACT ZZZZ
	WP2: 240 hp, diesel fired Tank 54 Emergency Fire Water Pump	MACT ZZZZ
	WP3: 300 hp, diesel fired Tank 24 Emergency Fire Water Pump	NSPS IIII, MACT ZZZZ

Title V Section	Description	Pollution Control Device/Practice
	WP4: 300 hp, diesel fired Tank 146 Emergency Fire Water Pump	NSPS IIII, MACT ZZZZ

C. Categorically Insignificant Sources/Activities

ARM 17.8.1201(22)(a) defines an insignificant emissions unit as one that emits less than 5 TPY of any regulated pollutant, has the potential to emit less than 500 pounds per year of lead or any hazardous air pollutant, and is not regulated by an applicable requirement other than the generally applicable requirement.

Emissions Unit ID	Description	Associated Unit(s)
IEU 1	Chemical Additive Pots	Crude Unit, Cat Poly Unit, Cat Reformer Unit, Storage Loadout Unit, Utility Unit, Asphalt Polymerization Unit
IEU 2	Chemical Additive Tanks	Hydrogen Unit
IEU 3	Tank 117 – Sodium Hydrosulfide Tank	H ₂ S Scrubbing
IEU 4	Tank 217 – Off Spec Sodium Hydrosulfide Tank	H ₂ S Scrubbing
IEU 5	1,042-gallon Diesel Tank	Mobil source diesel fuel tank
IEU 6	11,900 barrel Fixed Roof Ammonia Tank	Tank 160

SECTION III. PERMIT CONDITIONS

A. Emission Limits and Standards

Calumet shall comply with the general applicable requirements as well as some specific requirements.

Calumet shall comply with opacity limitations of 20% and 40%, depending on the year of installation for a given piece of equipment. In addition, the loading rack VCU's are limited to 10% opacity and asphalt tanks which are subject to 40 CFR 60, Subpart UU shall comply with a 0% opacity limitation.

Calumet is no longer exempt from the sulfur in fuel limitation of 50 gr H₂S /100 cubic feet in ARM 17.8.322(5), because the facility is no longer limited to less than 10,000 barrels of crude per day. However, since the facility became subject to 40 CFR 60, Subpart J and Ja fuel gas combustion device requirements, Calumet is also required to meet the more stringent refinery fuel gas limitations. In addition, although Calumet is subject to the sulfur in fuel rule for liquid or solid material of 1 lb/MMBtu, they are not allowed to burn liquid or solid fuels due to the Consent Decree.

Calumet has plant-wide SO₂ limitations that must be complied with both on an annual basis of 1,515 TPY and a basis of 4.15 tons per day. Calumet also has a plant-wide CO emission limitation of 4,700 TPY and 12.9 tons per day. Calumet must also comply with specific SO₂, NO_x, and CO emission limitations on the Boilers #1 and #2 stack, the Boiler #3 stack, and the FCCU, as well as a PM limit for the FCCU. The Diesel/Gas HTU heater and the hydrogen plant reformer heater have NO_x and CO emission limitations.

Calumet has 'Umbrella' limits, which are PSD avoidance limits set up to provide flexibility regarding annualized mass emissions from those units listed. These limits were established for the refinery expansion project, where plantwide NO_x performance was of potential concern.

Calumet has a gasoline truck loading rack and a gasoline railcar loading rack with specific VOC, CO, and NO_x emission limitations. During permitting of the loading racks, Calumet completed risk assessments to demonstrate negligible risk to human health and the environment.

Calumet also has several sources listed in the permit that are subject to the NSPS requirements of 40 CFR, Subpart Dc, Subpart J, Subpart Ja, Subpart Kb, Subpart VV, Subpart UU, Subpart GGG, Subpart VVa, Subpart GGGa, and Subpart QQQ. Several sources are also subject to the MACT requirements of 40 CFR 63, Subpart R Subpart CC, Subpart UUU, Subpart ZZZZ, Subpart EEEE, Subpart DDDDD. Calumet is also subject to 40 CFR 61, Subpart FF, Subpart J, Subpart M, and Subpart V. If at any time from the Date of Lodging of the Consent Decree Calumet is determined to have a total annual benzene (TAB) equal to or greater than 10 Mg/yr, Calumet, as applicable, shall comply with the compliance option set forth at 40 CFR 61.342(e).

B. Monitoring Requirements

ARM 17.8.1212(1) requires that all monitoring and analysis procedures or test methods required under applicable requirements be contained in operating permits. In addition, when the applicable requirement does not require periodic testing or monitoring, periodic monitoring must be prescribed that is sufficient to yield reliable data from the relevant time period that is representative of the source's compliance with the permit. Further, ARM 17.8.1213(2) requires that the permit contain compliance certification, testing, monitoring, reporting, and recordkeeping requirements sufficient to assure compliance with the terms and conditions of the permit.

The requirements for testing, monitoring, recordkeeping, reporting, and compliance certification sufficient to assure compliance does not require the permit to impose the same level of rigor for all emission units. Furthermore, it does not require extensive testing or monitoring to assure compliance with the applicable requirements for emission units that do not have significant potential to violate emission limitations or other requirements under normal operating conditions. When compliance with the underlying applicable requirement for an insignificant emissions unit is not threatened by lack of regular monitoring and when periodic testing or monitoring is not otherwise required by the applicable requirement, the status quo (**i.e., no monitoring**) will meet the requirements of ARM 17.8.1212(1). Therefore, the permit is not required to include monitoring for insignificant emission units.

The permit includes periodic monitoring or recordkeeping for each applicable requirement. The information obtained from the monitoring and recordkeeping will be used by Calumet to periodically certify compliance with the emission limits and standards. However, the Department may request additional testing to determine compliance with the emission limits and standards.

C. Test Methods and Procedures

The operating permit may not require testing for all sources if routine monitoring is used to determine compliance, but the Department has the authority to require testing if deemed necessary to determine compliance with an emission limit or standard. In addition, Calumet may elect to voluntarily conduct compliance testing to confirm its compliance status.

A summarizing table is provided in each section to provide an overview of testing required for each processing unit. In addition to periodic testing required throughout the permit, many units are required to install, operate, calibrate, and maintain continuous emissions monitoring systems (CEMS). In cases where a unit is subject to both CEMS and periodic testing, annual RATAs may suffice in meeting the periodic testing requirement.

D. Recordkeeping Requirements

Calumet is required to keep all records listed in the operating permit as a permanent business record for at least 5 years following the date of the generation of the record. The records are required to be maintained under Calumet's control and available to the Department upon request within a reasonable amount of time.

E. Reporting Requirements

Reporting requirements are included in the permit for each emissions unit and Section V of the operating permit "General Conditions" explains the reporting requirements. However, Calumet is required to submit quarterly, semiannual and annual monitoring reports to the Department and to annually certify compliance with the applicable requirements contained in the permit. The reports must include a list of all emission limit and monitoring deviations, the reason for any deviation, and the corrective action taken as a result of any deviation. Quarterly reports required by the Consent Decree shall be submitted to the Department on or before January 31 and July 31 and additionally on or before April 30 and October 31.

To eliminate redundant reporting, a source may reference previously submitted reports (with at least the date and subject of the report) in the semiannual and annual reports instead of resubmitting the information in monthly, quarterly, and/or other reports. However, a source must still certify continuous or intermittent compliance with each applicable requirement annually.

F. Public Notice

The Department published public notice regarding the issuance of Draft Permit #OP2161-15 in the *Great Falls Tribune* on October 31, 2019.

G. Public Comments

Summary of Permittee Comments

Permit Reference	Summarized Permittee Comment	Department Response
Section III.D and III.L	The permit requires #2 Crude Vacuum Heater H-2102, and MHC Fractionator Feed Heater H-4102 to be equipped with NO _x CEMS. Calumet intends to submit a concurrent MAQP and Title V application to establish limitations negating the need for such compliance monitoring mechanism.	<p>CEMS were identified as required in the draft permit based on the current form of the limit (30-day rolling average), lack of any proposed compliance monitoring methodology, and little suspected compliance margin associated with these limits.</p> <p>Since issuance of the Draft Title V, the Department has received application from Calumet to adjust the limits. The application requests the following changes:</p> <ul style="list-style-type: none"> • Change H-2102 NO_x limit from 0.035 lb/MMBtu on a 30-day rolling average basis to 0.040 lb/MMBtu as monitored via annual Method 7E source testing (generally the average of three one-hour source test runs.) • Change the H-4102 NO_x limit from 0.035 lb/MMBtu on a 30-day rolling average basis to 0.040 lb/MMBtu as monitored via annual Method 7E source testing (generally the average of three one-hour source test runs). <p>Based on having received this application, the Department approves a change in the compliance monitoring methodology. Annual source testing will be required during this Title V term. The Title V will be modified to adjust the underlying change in limits following the modification of the MAQP. The MAQP will be modified prior to</p>

Permit Reference	Summarized Permittee Comment	Department Response
		final issuance of this Title V Renewal. Therefore, to avoid a short period of noncompliance with compliance demonstration requirements, the Department has agreed to annual source testing with this Title V Permit issuance.
Section III.D.18 and III.L.18	Section III.D.18 requires Calumet to test CO ₂ emissions as required by the Department. Calumet requests consideration of an alternative compliance monitoring plan compared to source testing.	In recognition that the underlying condition is a limitation on CO ₂ e, which includes emissions of all greenhouse gases, not just CO ₂ , a request to reconsider the prescribed compliance monitoring strategy is determined agreeable. Monitoring emissions utilizing established emissions factors is prescribed, and the Department retains authority to require testing at any time, pursuant to ARM 17.8.105. Calumet will be required to maintain daily records of compliance with the limitation.
Section III.R	Boiler #3 is not subject to NSPS Ja NO _x requirements, nor should it be required to be equipped with CEMS.	<p>It is recognized that Boiler #3 is not subject to NSPS Ja NO_x requirements as it does not meet the definition of a “process heater”. As such, NO_x CEMS is not required by NSPS Ja.</p> <p>The following represents recent past NO_x emissions performance indicators:</p> <ul style="list-style-type: none"> • The Boiler was tested November 28, 2017, returning a result of 0.013 lb/MMBtu • Monthly portable analyzer testing conducted from March 2018 through March 2019 returned results all less than the emissions limitation of 0.019 lb/MMBtu. • On November 28, 2018, the boiler was tested for NO_x emissions, returning a result of 0.018 lb/MMBtu. <p>Therefore, the Department has determined that the current testing schedule, i.e., once per calendar year, provides a sufficient</p>

Permit Reference	Summarized Permittee Comment	Department Response
		compliance monitoring requirement. The permit has been updated to reflect this requirement.
Technical Review Document	Update the list of insignificant sources to match the list in the permit	The list in the Technical Review Document has been updated.
Section II Summary Table	Update column head to read “Applicable Standards and Pollution Control Device/Practice” as the column contains applicable standards in addition to pollution control device details.	The intent of the table is not to include a notation of all applicable standards but rather a note on control practices and/or control equipment required by the permit. In many cases, applicable conditions contain detailed control practices and limitations. No changes were made as the Table contains the information as intended. This table is significantly updated compared to the last Title V permit which incorrectly listed ‘none’ as the pollution control equipment or practice in place for most units.
Section II Summary Table	The #2 H ₂ Plant Furnace is noted with an identifier of “H-2851”. The Unit ID should be ‘H-2815’	The typographical error has been corrected for the #2 H ₂ Plant Furnace Unit ID to be noted as requested.
Section II Summary Table	Revise Section III.N as “EU13” and then update subsequent emission unit references, as EU13 was previously assigned to the flares.	The permit EU numbering has been updated as requested.
Section II Summary Table	The Section III.N description should include “flare gas scrubber equipment components”, and should include NSPS VVa applicability	The permit has been updated as requested.
Section II Summary Table	The loading section should identify an emitting unit based on the following: 10a – Truck Loading Rack 10b – Truck Loading VCU 15a – Railcar Loading Rack 15b – Railcar Loading Rack VCU	The permit has been updated to show the Truck Loading Rack and VCU and Railcar Loading Rack and VCU as the emitting units.
Section II Summary Table	The following tanks are already listed in the PMA Unit section and therefore should be removed from the general Tanks section: Tank #50, 102, 137, 138, 139, 140	The permit has been updated as requested.
Section II Summary Table	NO _x and CO Umbrella Limitations should be included in the summary of pollution control practices, and Boiler #3 should have Flue Gas Recirculation noted.	The permit has been updated as requested.
Section II Summary Table	Tank 51 is listed as being in Kerosene/Jet Fuel Service. This	The permit has been updated as requested.

Permit Reference	Summarized Permittee Comment	Department Response
	tank is currently in Treated Gas Oil Service	
Section II Summary Table	Stationary Internal Combustion Engines are missing EU numbers.	The permit has been updated as requested.
Section II Summary Table	The table indicates engine WP2 as an affected unit under NSPS IIII. Based on engine construction date, NSPS IIII is not applicable.	The permit has been updated as requested.
Section II Summary Table	The products that can be loaded using the truck loading racks and railcar loading racks are not restricted by any regulations, therefore, the loading racks should not include a product qualifier.	The summary table is not a permit condition limiting products which can be loaded, rather, providing a summary of under what loading conditions certain practices apply. No change has been made.
Section III Table – condition A.18	Update the entry for condition A.18 to clarify that 40 CFR Part 98 is not an applicable requirement under Title V	The condition itself notes this. The table was updated as requested.
Section III.B	The Plantwide CO emissions has an incorrect cross reference regarding reporting	The Department has updated the permit to include an appropriate reporting requirement for this condition.
Section III.B Summary Table	The summary table has a miss-referenced reporting requirement regarding Umbrella limit reporting	The Department has updated the table condition references.
Umbrella Limit demonstration requirements throughout permit	The conditions requiring that “an emissions factor based on the average of all emissions factors used to date shall be used until the next source test and/or CEMS data is available” should be replaced with “an emissions factor based on the most recent source test shall be used”.	<p>The intent of this condition is to provide a clear description of what emissions factor shall be used until the next official source test. In the case of Boiler #3, an uncharacteristically low NO_x emissions factor was developed starting in April of 2019.</p> <p>In other units, emissions factors presented in quarterly umbrella limit reports has demonstrated variability. Therefore, requesting an average of available emissions factors be used, until an appropriate source test is conducted, remains the Department’s requirement. Thereafter, the requirement is reviewed on a unit by unit basis.</p> <p>Further, such requirement has limited duration as Calumet is currently testing all affected units.</p>
MACT DDDDD references throughout the permit	Calumet requests that the summary tables be updated to remove noting any frequency of tune-ups, as this may change due to changes in equipment configuration (i.e. – oxygen trim system). In most cases,	The Permit was updated as requested.

Permit Reference	Summarized Permittee Comment	Department Response
	Calumet is currently required to perform tune-ups every 5 years.	
Section III.D Summary Table	The NSPS Ja NO _x limits are partially cut off for H-2101. It is also not necessary to specify the numerical NO _x emission limit for H-2101 in the summary table.	The table has been updated. The purpose of the table is as a summary. The Summary Tables do not represent limitations or conditions, rather, a summary provided for convenience. Outlining the portion of NSPS Ja NO _x limits applicable to this unit is appropriate as a summary. The more stringent BACT limits override from an emissions performance requirement standpoint, and NO _x CEMS are required for demonstration against that limit. These limits are eligible for streamlining in the future.
Section III.D.10	The condition references NSPS VV instead of VVa, and the #1 Crude Unit instead of the #2 Crude Unit	The permit was updated to reflect Crude Unit #2 as subject to NSPS VVa.
Section III.F Summary Table	The condition references in the table for NSPS GGG needs correction – Change F.34 to F.35, and include F.41	The permit was updated as requested.
Section III.F.9 and associated Summary in Table	This condition should include “except for one 6-minute average in any 1 hour”.	The underlying rule (ARM 17.8.304) does not provide this exception. As such, the permit was not updated as requested.
Section III.F.22 and III.F.23	This condition should include reference to developing and maintaining an Operation, Maintenance, and Monitoring Plan (OMMP), as required by 40 CFR 63 Subpart UUU.	This requirement was intended to be included in reference to requirement to comply with 40 CFR 63 Subpart UUU. The condition was updated as requested to clearly include reference to development and maintenance of the OMMP requirement in condition F.23.
Section III.F.49.b	The condition should include reference to submittal dates of reports made or included instead of source test results.	The permit was updated as requested.
Section III.G	The only component in the reformer unit subject to NSPS GGG is the compressor, which is noted as part of the HTU. Please update the summary table row to indicate “VOC from HTU Equipment Components” as subject to NSPS GGG.	The permit was updated as requested.
Section III.H	The summary table lists the specific NSPS J Fuel Gas H ₂ S limit.	The purpose of the table is as a summary. The Summary Tables do not represent limitations or conditions, rather, a summary provided for convenience. While

Permit Reference	Summarized Permittee Comment	Department Response
		they need not be specific, providing the limitation in a summarized fashion is within scope of the intent of the summary tables. No update has been made.
Section III.J Summary Table	Condition Reference J.43 should be J.44	The Permit was updated as requested.
Section III.I	Include reference to Condition I.8	The Permit was updated as requested.
Section III.J	Reference to "H-2851" should be "H-2815".	The Permit was updated as requested.
Section III.J.6	Because there is no averaging period specified and CEMS will be utilized, a 30-day rolling average basis is requested.	This request is denied. Title V does not provide authority to change underlying limitations. CEMS may be utilized to demonstrate compliance, however, the default averaging period implied, when no averaging period was submitted, is as would be determined via a source test. Therefore, 3 hour averages, in equivalent form to as would be determined in a source test (source testing would require the average of three 1 hour runs) is clarified.
Section III.J.22	This testing should not be required to be done concurrently with the NO _x CEMS RATA.	The language has been changed to clarify that testing concurrent with RATA would be acceptable, however, not required, provided valid NO _x CEMS data can be provided along with CO test results. Concurrent testing is a requirement due to the general inverse relationship of thermally formed NO _x and CO emissions from combustion. Because RATAs generally consist of a larger number of runs which are shorter in duration, the intent is to allow for testing of CO concurrent with NO _x RATA sampling timeframes as acceptable.
Section III.J.18	Calumet requests that this condition be clarified to state that if the unit is idle, no testing will be required until a reasonable time after startup.	The Department finds this request reasonable. The condition was updated, with 180 days provided after startup.
Section III.J	PM, PM ₁₀ , and PM _{2.5} emissions limitations and associated monitoring, recordkeeping and reporting are missing	The Department has updated the permit as requested.
Section III.K	References to Conditions K.15 and K.31 are missing from the summary table	The Department has updated the permit as requested.
Section III.K	Storage Tank #138 is missing from the list of tanks in Heavy Oil service.	The Department has updated the permit as requested, with exception

Permit Reference	Summarized Permittee Comment	Department Response
	Tank #160 is not in the Polymer Modified Asphalt Unit. Because Tank #160 is not in the Polymer Modified Asphalt Unit, NSPS Ja does not apply to any units in the Poly-Modified Asphalt Unit.	that Tank #138 is equipped with a heater subject to NSPS Ja, and is in the PMA unit and therefore NSPS Ja remains referenced as an applicable requirement in this section.
Section III.L Summary Table	Condition L.13, L.14, and L.35 is incorrectly referenced	The Department has updated the permit as requested.
Section III.L.23	The condition rule incorrectly references NSPS GGG instead of NSPS GGGa.	The Department has updated the permit as requested.
Section III.M Summary Table	The table incorrectly references a quarterly reporting requirement	Quarterly Reporting is required by the Consent Decree. To be clearer, the permit was updated to include condition A.24 throughout as appropriate.
Section III.N	The Secondary flare is not classified as an emergency flare under NSPS Ja. As such, the use of “emergency” as a flare description should be removed.	The secondary flare was not permitted to receive gasses outside of cases where flow of vented gasses from equipment during process upsets, failures, or emergencies exceeds the capacity of the primary flare. Emissions from the secondary flare were quantified in permitting review of the expansion project, and relied on in making permitting determinations. The request to remove this description is not granted at this time.
Section III.N	The Summary Table, for the individual drain system, referenced N.35. It should be N.36.	The Department has updated the permit as requested.
Section III.N	Calumet requests the Ammonia Combustor be removed from the Title V. The Ammonia Combustor has not been installed, and Calumet will file required Title V modification following installation if installed.	The Department has removed the Ammonia Combustor from the Title V permit.
Section III.O	The PM limits for the VCUs do not include the “corrected to 12% CO ₂ ”	The Summary Tables do not represent limitations or conditions, rather, a summary provided for convenience. The condition itself is worded appropriately, and the summary table updated based on Calumet’s request.
Section III.O.2.d	The Opacity and PM requirements are combined into a single permit condition for the railcar loading VCU, whereas they are separate for the truck loading VCU.	The conditions likely reflect the format in the underlying MAQP. However, there are no implications as to formatting.
Section III.O.2.d.i	This condition, as applicable to incinerators pursuant to ARM 17.8.316(3), does not include the	Please note that ARM 17.8.316(6) states that “This rule does not apply to incinerators for which a Montana

Permit Reference	Summarized Permittee Comment	Department Response
	appropriate averaging period for the opacity limitation.	Air Quality Permit has been issued". Therefore, the citation of ARM 17.8.316 regarding opacity requirements is not an appropriate basis. The condition was made through authority of ARM 17.8.752. Any required compliance test would be required to comply with the Montana Source Test Protocol and Procedures Manual, and Method 9 requirements. Based on the underlying measurement method, the clarification requested can be made on that basis. The addition of language stating "averaged over six consecutive minutes" was added, but the addition of an ARM 17.8.316 reference was not.
Section III.O.4.a	Calumet does not have regulatory requirement to load only gasoline or naphtha from the railcar loading rack. Calumet requests this condition be removed.	Section II.B.19.a of the MAQP contains this requirement exactly as worded. Calumet may explore changing this MAQP condition through modification, administrative amendment, and/or de minimis avenues, as this condition is based solely on ARM 17.8.749, based on operations reviewed at the time of permitting. Products with vapor pressure equivalent to, or lower than, those listed, would likely be approvable. The condition remains unchanged in the Title V.
Section III.R	The EU numbers for Boilers do not match the header. EU15a and EU15b should be EU16a and EU16b. Condition references throughout are off.	The permit has been updated as requested.
Section III.R Summary Table	The NSPS J limit in the Summary Table does not label the limitation as applying to H ₂ S in fuel gas on a 3-hr rolling average basis. It is requested to remove reference to the limit in the table. Specific limits in the tables are requested to be removed.	The Summary Tables do not represent limitations or conditions, rather, a summary provided for convenience. The permit has been updated to reflect the limitation as an H ₂ S in fuel gas limitation.
Section III.R Summary Table	The SO ₂ limit for Boiler #3 should include that it is on a 3-hour basis	The Summary Tables do not represent limitations or conditions, rather, a summary provided for convenience. The permit has been updated to reflect the change requested.
Section III.R	The NO _x emission limit should include the word 'or' in listing 0.019	The underlying MAQP condition does not provide the language

Permit Reference	Summarized Permittee Comment	Department Response
	lb/MMBtu and 1.15 lb/hr limitations.	requested. The condition will remain as stated in the underlying MAQP condition, which includes regulatory authorities additional to the consent decree.
Section III.R.3.c	This condition does not include the applicable 365-day rolling SO ₂ limit, nor does it include the alternative limit on H ₂ S in fuel gas.	The referenced condition is solely a state BACT condition, and is stated as it is found in the underlying MAQP. No change is provided. Section III.R.7 requires compliance with NSPS Ja.
Section III.S	Tank #125 will be maintained in heavy liquids service as now required by MAQP #2161-32, therefore, NSPS Kb does not apply. Tanks #125 and #128 are to be converted to fixed roof tanks	The permit has been updated as requested.
Section III.S	Tanks 50, 55, 56, 69, 102, 110, 112, 130, 132, 133, 135, 137, 139, 140 are already included in Section K.	The permit has been updated as requested.
Section III.S.13 and 14	The summary table for these conditions lists “tank storage and design” as a permit limitation. Only storage limitations exist.	Tanks may have been reviewed and approved based on design as presented, therefore while a permit condition itself may not have a design requirement, tanks reviewed may have been reviewed with design as presented.
Section III.S.10	Tanks #145B and #8 does not exist at the facility and should therefore be removed from this condition.	The permit has been updated as requested.
Section II	A general statement that the plant’s maximum capacity is 30,000 barrels per day would be more accurate, and throughput capacities associated with each crude unit should be removed.	The permit was updated as requested.
Throughout	The draft permit is inconsistent in referencing applicable requirement from Federal Regulations. In some cases, numerical limits are referenced, in others, it is not.	The Summary Tables do not represent limitations or conditions, rather, a summary provided for convenience. The conditions themselves are either worded as worded in the MAQP, or referenced as generally as possible.
Section III.A	The permit does not contain provisions related to fenceline monitoring of benzene as required by MACT CC.	The permit was updated to list MACT CC in the general plantwide requirements to clarify that fenceline monitoring is identified as an applicable requirement.

Permit Reference	Summarized Permittee Comment	Department Response
Throughout	Calumet requests that NO _x and CO umbrella limitations be removed from individual subsections and addressed only in Section III.B.	Due to complexities regarding compliance demonstration/emissions tracking requirements, this request was not implemented at this time.

SECTION IV NON-APPLICABLE REQUIREMENT ANALYSIS

Section IV of the operating permit contains Non-Applicable Requirements. The following table summarizes the requirements that Calumet previously identified as non-applicable and contains the reasons that the Department did not include these requirements as non-applicable in the permit.

Applicable Requirement	Reason
Federal Requirements	
40 CFR 72 Permit Regulation (Acid Rain Permit) 40 CFR 73 Sulfur Dioxide Allowance System 40 CFR 74 Sulfur Dioxide OPT-Ins 40 CFR 75 CEM (Acid Rain Emission Monitoring) 40 CFR 76 Acid Rain Nitrogen Oxides Emission Reduction Program 40 CFR 77 Excess Emissions (Acid Rain) 40 CFR 78 Appeal Procedures for Acid Rain Program 40 CFR 63 Subpart Q – Cooling Towers MACT 40 CFR 63 Subpart VV – MACT for Oil-Water Separators	These regulations do or may become applicable to this facility, or the source category or equipment types related to the rule are located at this facility.
40 CFR 82 Protection of Stratospheric Ozone (except Subpart F)	These rules contain requirements for processes, equipment, or activity that is not used at the facility.
FCAA Title I Part D Plan Requirements for Non-Attainment Areas FCAA Section 111(d)	These rules have specific requirements that may become relevant to a major source during the permit span.

SECTION V. FUTURE PERMIT CONSIDERATIONS

A. MACT Standards

The Department is not aware of any proposed or pending MACT standards, in addition to those already listed, that may be applicable. Calumet could become subject to 40 CFR, Subpart GGGGG – National Emission Standards for Hazardous Air Pollutants: Site Remediation in the future.

Calumet is affected by the Refinery Sector Rule updates made to 40 CFR 63 Subpart CC and UUU.

B. NESHAP Standards

The Department is not aware of any proposed or pending NESHAP standards, in addition to those already listed, that may be applicable.

C. NSPS Standards

The Department is not aware of any proposed or pending NSPS standards, in addition to those already listed that may be applicable at this time.

Calumet is affected by the Refinery Sector Rule updates made to 40 CFR 60 Subpart J and Ja.

D. Risk Management Plan

Calumet has more than a threshold quantity of a regulated substance in a process, and was required to comply with 40 CFR Part 68 requirements no later than June 21, 1999; 3 years after the date on which a regulated substance is first listed under 40 CFR Part 68.130; or the date on which a regulated substance is first present in more than a threshold quantity in a process, whichever is later.

E. Compliance Assurance Monitoring (CAM) Plan

An emitting unit located at a Title V facility that meets the following criteria listed in ARM 17.8.1503 is subject to Subchapter 15 and must develop a CAM Plan for that unit:

- The emitting unit is subject to an emission limitation or standard for the applicable regulated air pollutant (other than emission limits or standards proposed after November 15, 1990, since these regulations contain specific monitoring requirements);
- The emitting unit uses a control device to achieve compliance with such limit; and
- The emitting unit has potential pre-control device emission of the applicable regulated air pollutant that are greater than major source thresholds.

Calumet submitted information on September 5, 2013 to show that CAM is not applicable to any of the units at the petroleum refinery. The refinery expansion project did not result in any new emitting units triggering CAM applicability.

F. Prevention of Significant Deterioration (PSD) and Title V Greenhouse Gas Tailoring Rule

On May 7, 2010, EPA published the “light duty vehicle rule” (Docket # EPA-HQ-OAR- 2009-0472, 75 FR 25324) controlling greenhouse gas (GHG) emissions from mobile sources, whereby GHG became a pollutant subject to regulation under the Federal and Montana Clean Air Act(s). On June 3, 2010, EPA promulgated the GHG “Tailoring Rule” (Docket # EPA-HQ-OAR-2009-0517, 75 FR 31514) which modified 40 CFR Parts 51, 52, 70, and 71 to specify which facilities are subject to GHG permitting requirements and when such facilities become subject to regulation for GHG under the PSD and Title V programs.

Under the Tailoring Rule, any PSD action (either a new major stationary source or a major modification at a major stationary source) taken for a pollutant or pollutants other than GHG that was not final prior to January 2, 2011, would be subject to PSD permitting requirements for GHG if the GHG increases associated with that action were at or above 75,000 TPY of carbon dioxide equivalent (CO₂e). Similarly, if such action were taken, any resulting requirements would be subject to inclusion in the Title V Operating Permit.

Starting on July 1, 2011, PSD permitting requirements would be triggered for modifications that were determined to be major under PSD based on GHG emissions alone, even if no other pollutant triggered a major modification. Sources that are not considered PSD major sources based on criteria pollutant emissions would become subject to PSD review if their facility-wide potential emissions equaled or exceeded 100,000 TPY of CO₂e and 100 or 250 TPY of GHG on a mass basis depending on their listed status in ARM 17.8.801(22) and they undertook a permitting action with increases of 75,000 TPY or more of CO₂e and greater than 0 TPY of GHG on a mass basis. With respect to Title V, sources not currently holding a Title V permit that have potential facility-wide emissions equal to or exceeding 100,000 TPY of CO₂e and 100 TPY of GHG on a mass basis would be required to obtain a Title V Operating Permit.

The Supreme Court of the United States (SCOTUS), in its *Utility Air Regulatory Group v. EPA* decision on June 23, 2014, ruled that the Clean Air Act neither compels nor permits EPA to require a source to obtain a PSD or Title V permit on the sole basis of its potential emissions of GHG. SCOTUS also ruled that EPA lacked the authority to tailor the Clean Air Act’s unambiguous numerical thresholds of 100 or 250 TPY to accommodate a CO₂e threshold of 100,000 TPY. SCOTUS upheld that EPA reasonably interpreted the Clean Air Act to require sources that would need PSD permits based on their emission of conventional pollutants to comply with BACT for GHG. As such, the Tailoring Rule has been rendered invalid and sources cannot become subject to PSD or Title V regulations based on GHG emissions alone. Sources that must undergo PSD permitting due to pollutant emissions other than GHG may still be required to comply with BACT for GHG emissions.