Montana Department of
ENVIRONMENTAL QUALITY
Brian Schweitzer, Governor
P. O. Box 200901 Helena, MT 59620-0901 (406) 444-2544 Website: www.deq.mt.gov

December 22, 2011

Parrish Andrews
Malteurop North America, Inc.
415 US Highway 87
Great Falls, MT
59404

Dear Mr. Andrews,

Montana Air Quality Permit #3238-06 is deemed final as of December 22, 2011, by the Department of Environmental Quality (Department). This permit is for the addition of a new natural gas-fired heater at the facility. All conditions of the Department's Decision remain the same. Enclosed is a copy of your permit with the final date indicated.

For the Department,

Vickie Walsh
Air Permitting Program Supervisor
Air Resources Management Bureau
(406) 444-9741

Craig Henrikson, PE
Environmental Engineer
Air Resources Management Bureau
(406)-444-6711

VW:CH
Enclosure

Montana Department of Environmental Quality
Permitting and Compliance Division

Montana Air Quality Permit #3238-06

Malteurop North America, Inc.
415 US Highway 87
Great Falls, MT 59404

December 22, 2011

MONTANA AIR QUALITY PERMIT

Issued To:	Malteurop North America Incorporated 415 North US Highway 87 Great Falls, MT 59404	Montana Air Quality Permit: #3238-06 Application Received: October 12, 2011 Preliminary Decision Issued: November 18, 2011 Department Decision Issued: December 6, 2011 Permit Final: December 22, 2011 AFS: #013-0035

A Montana Air Quality Permit (MAQP), with conditions, is hereby granted to Malteurop North America Incorporated (Malteurop), pursuant to Sections 75-2-204 and 211 of the Montana Code annotated (MCA), as amended, and Administrative Rules of Montana (ARM) 17.8.740, *et seq*., as amended, for the following:

SECTION I: Permitted Facilities

A. Plant Location

The Malteurop facility is located approximately 2 miles north of the City of Great Falls, Montana, and approximately ½ mile west of Black Eagle Road. The legal description of the facility site is the NE ¼ of the SE ¼ of Section 30, Township 21 North, Range 4 East, in Cascade County, Montana.

B. Current Permit Action

On October 12, 2011, The Department of Environmental Quality Department received an MAQP modification request to add a new natural gas-fired heater (HEATEC Heater #4) to the facility. Additionally, Malteurop requested to update the description of an existing boiler from "Future Plant Heater" to "HEATEC Heater #3". HEATEC Heater #4 is identical to the design capacity of HEATEC Heater #3 and minor description edits were incorporated for HEATEC Heater #3 to reflect the "input" heater rating rather than the "output" rating which was previously used.

SECTION II: Conditions and Limitations

A. Operational Requirements

1. Malt and salable malt by-product production shall be limited to 16,000,000 bushels during any rolling 12-month time period (ARM 17.8.749).

2. Malteurop shall not receive more than 456,000 tons of barley during any rolling 12-month time period (ARM 17.8.749).

3. Malteurop shall install, operate, and maintain three separate fabric filter baghouses, including BF01 – Main Process Baghouse, BF02 – Grain Receiving Baghouse, and BF03 – Product Load-Out Baghouse, for the control of particulate matter (PM) and particulate matter with an aerodynamic diameter less than or equal to 10 microns (PM_{10}) from affected operations (ARM 17.8.752).

4. Malteurop shall house all barley preparation processes within the headhouse and shall utilize fabric filter baghouse control for emissions from the barley preparation processes (ARM 17.8.752).

5. Malteurop shall unload all barley shipments to underground hoppers. Malteurop shall utilize fabric filter baghouse emission control on the hoppers (ARM 17.8.752).

6. Malteurop shall load all malt and salable malt by-product for shipment via covered conveyors. Malteurop shall utilize fabric filter baghouse emission control on the conveyors (ARM 17.8.752).

7. Each material transfer point for grain receiving and off-loading shall incorporate an enclosure (at least three-sided) for fugitive emission control (ARM 17.8.752).

8. Malteurop shall not cause or authorize the production, handling, storage, or transportation of any material without taking reasonable precautions to control emissions of particulate matter (ARM 17.8.308).

9. Malteurop shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter (ARM 17.8.308).

10. Malteurop shall treat all unpaved portions of the haul roads, access roads, parking lots, or general plant area with water and/or chemical dust suppressant as necessary to maintain compliance with the reasonable precautions limitation in Section II.A.8 and II.A.9 (ARM 17.8.752).

11. Elemental sulfur burning for kiln operations shall be limited to 200 pounds of sulfur per kiln batch (ARM 17.8.749).

12. Total elemental sulfur burning for kiln operations (cumulative for all three kilns) shall be limited to 146,000 pounds during any rolling 12-month time period (ARM 17.8.749).

13. Total elemental sulfur burning for kiln operations (cumulative for all three kilns) shall not exceed 2,190 hours during any rolling 12-month time period (ARM 17.8.749).

14. Malteurop shall burn only pipeline-quality natural gas for the kiln operations process heaters (ARM 17.8.752).

15. Malteurop shall utilize dry low oxides of nitrogen (NO_x) combustion technology to control emissions from the HEATEC Heater #1 (25 million British thermal units per hour (MMBtu/hr)), the HEATEC Heater #2 (42 MMBtu/hr), and HEATEC Heater #3 (57.7 MMBtu/hr) (ARM 17.8.752).

16. The HEATEC Heater #4 shall not exceed 57.7 MMBtu/hr rated input capacity (ARM 17.8.749).

17. Malteurop shall install and operate the HEATEC Heater #4 with low NO_x burners and flue gas recirculation (ARM 17.8.752).

18. The design of each kiln shall include a screw auger for movement of malt product/by-product out of the kiln and the kiln heat exchanger shall be located at the top of each kiln (ARM 17.8.749).

B. Emission Limitations

1. PM_{10} emissions from the main fabric filter baghouse (BF01) shall be limited to the following (ARM 17.8.749):

   i. 0.010 grains per dry standard cubic foot (gr/dscf) of air-flow
   ii. 5.73 pounds per hour (lb/hr)

2. PM_{10} emissions from the grain receiving fabric filter baghouse (BF02) shall be limited to the following (ARM 17.8.749):

   i. 0.010 gr/dscf of air-flow
   ii. 0.62 lb/hr

3. PM_{10} emissions from the product load-out fabric filter baghouse (BF03) shall be limited to the following (ARM 17.8.749):

   i. 0.010 gr/dscf of air-flow
   ii. 0.30 lb/hr

4. Emissions from the MOCO process Heater #1 (53.4 MMBtu/hr capacity) shall not exceed the following (ARM 17.8.749):

NO_x	5.24 lb/hr calculated on a 1-hour averaging period
Carbon monoxide (CO)	4.40 lb/hr calculated on a 1-hour averaging period

5. Emissions from the Johnston process Heater #1 (24.4 MMBtu/hr capacity) shall not exceed the following (ARM 17.8.749):

NO_x	2.39 lb/hr calculated on a 1-hour averaging period
CO	2.01 lb/hr calculated on a 1-hour averaging period

6. Emissions from the Johnston process Heater #2 (24.4 MMBtu/hr capacity) shall not exceed the following (ARM 17.8.749):

NO_x	2.39 lb/hr calculated on a 1-hour averaging period
CO	2.01 lb/hr calculated on a 1-hour averaging period

7. Emissions from the HEATEC process Heater #1 (27.0 MMBtu/hr capacity) shall not exceed the following (ARM 17.8.749):

NO_x	1.32 lb/hr calculated on a 1-hour averaging period
CO	2.22 lb/hr calculated on a 1-hour averaging period

8. Emissions from the HEATEC process Heater #2 (34.4 MMBtu/hr capacity) shall not exceed the following (ARM 17.8.749):

NO_x	1.69 lb/hr calculated on a 1-hour averaging period
CO	2.83 lb/hr calculated on a 1-hour averaging period

9. Emissions from the HEATEC process Heater #3 (57.7 MMBtu/hr capacity) shall not exceed the following (ARM 17.8.749):

NO_x	2.83 lb/hr calculated on a 1-hour averaging period
CO	4.75 lb/hr calculated on a 1-hour averaging period

10. Emissions from the HEATEC process Heater #4 (57.7 MMBtu/hr capacity) shall not exceed the following (ARM 17.8.752):

NO_x	2.11 lb/hr calculated on a 1-hour averaging period
CO	2.83 lb/hr calculated on a 1-hour averaging period

11. Sulfur dioxide (SO_2) emissions from each kiln shall be limited to 33.33 lb/hr during elemental sulfur burning (ARM 17.8.749).

12. Malteurop shall not cause or authorize emissions to be discharged into the outdoor atmosphere from any sources installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes (ARM 17.8.304).

13. Malteurop shall not cause or authorize any fugitive emissions to be discharged into the outdoor atmosphere that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes (ARM 17.8.308).

C. Testing Requirements

1. Malteurop shall conduct Method 5 and Method 9 performance source testing, or another Method as may be approved by the Department, on the main process baghouse (BF01) and monitor compliance with the particulate and opacity limitations in Section II.B.1 and Section II.B.12, respectively. After the initial source tests, additional source testing shall be conducted on an annual basis, or according to another source testing/monitoring schedule as may be approved by the Department in writing (ARM 17.8.105 and ARM 17.8.749).

2. Malteurop shall conduct Method 5 and Method 9 performance source testing, or another Method as may be approved by the Department, on the grain receiving baghouse (BF02) to monitor compliance with the particulate and opacity limitations in Section II.B.2 and Section II.B.12, respectively. After the initial source tests, additional source testing shall be conducted on an every 2-year basis, or according to another source testing/monitoring schedule as may be approved by the Department in writing (ARM 17.8.105 and ARM 17.8.749).

3. Malteurop shall conduct Method 5 and Method 9 performance source testing, or another Method as may be approved by the Department, on the product load-out baghouse (BF03) to monitor compliance with the particulate and opacity limitations in Section II.B.3 and Section II.B.12, respectively. After the initial source tests, additional source testing shall be conducted on an every 5-year basis, or according to another source testing/monitoring schedule as may be approved by the Department in writing (ARM 17.8.105 and ARM 17.8.749).

4. Malteurop shall conduct performance source testing for NO_x and CO, concurrently, on the MOCO process Heater #1 to monitor compliance with the emission limitations in Section II.B.4. After the initial source tests, additional source testing shall be conducted as required by the Department (ARM 17.8.105 and ARM 17.8.749).

5. Malteurop shall conduct performance source testing for NO_x and CO, concurrently, on the Johnston process Heater #1 to monitor compliance with the emission limitations in Section II.B.5. After the initial source tests, additional source testing shall be conducted as required by the Department (ARM 17.8.105 and ARM 17.8.749).

6. Malteurop shall conduct performance source testing for NO_x and CO, concurrently, on the Johnston process Heater #2 to monitor compliance with the emission limitations in Section II.B.6. After the initial source tests, additional source testing shall be conducted as required by the Department (ARM 17.8.105 and ARM 17.8.749).

7. Malteurop shall conduct performance source testing for NO_x and CO, concurrently, on the HEATEC process Heater #1 to monitor compliance with the emission limitations in Section II.B.7. After the initial source tests, additional source testing shall be conducted as required by the Department (ARM 17.8.105 and ARM 17.8.749).

8. Malteurop shall conduct performance source testing for NO_x and CO, concurrently, on the HEATEC process Heater #2 and to monitor compliance with the emission limitations in Section II.B.8. After the initial source tests, additional source testing shall be conducted as required by the Department (ARM 17.8.105 and ARM 17.8.749).

9. Malteurop shall conduct performance source testing for NO_x and CO, concurrently, on the HEATEC process Heater #3 to monitor compliance with the emission limitations in Section II.B.9. After the initial source tests, additional source testing shall be conducted as required by the Department (ARM 17.8.105 and ARM 17.8.749).

10. Within 60 days after startup, but no later than 180 days after initial startup of the Heater #4, Malteurop shall conduct performance source testing for NO_x and CO, concurrently, on the HEATEC process Heater #4 to monitor compliance with the emission limitations in Section II.B.10. After the initial source tests, additional source testing shall be conducted as required by the Department (ARM 17.8.105 and ARM 17.8.749).

11. Within 60 days after achieving the maximum production rate, but not later than 180 days after initial start-up of operations, Malteurop shall conduct performance source testing on the kiln stacks to monitor compliance with the SO_2 emission limit in Section II.B.11. The source test shall be conducted while sulfur is being burned in the batch process. After the initial source test, additional source testing shall be conducted as required by the Department (ARM 17.8.105 and ARM 17.8.749).

12. All compliance source tests shall conform to the requirements of the Montana Source Test Protocol and Procedures Manual (ARM 17.8.106).

13. The Department may require further testing (ARM 17.8.105).

D. Operational Reporting Requirements

1. Malteurop shall supply the Department with annual production information for all emission points, as required by the Department in the annual emission inventory request. The request will include, but is not limited to, all sources of emissions identified in the emission inventory contained in the permit analysis.

Production information shall be gathered on a calendar-year basis and submitted to the Department by the date required in the emission inventory request. Information shall be in the units required by the Department. This information may be used to calculate operating fees, based on actual emissions from the facility, and/or to verify compliance with permit limitations (ARM 17.8.505).

2. Malteurop shall notify the Department of any construction or improvement project conducted pursuant to ARM 17.8.745(1), that would include ***the addition of a new emissions unit***, change in control equipment, stack height, stack diameter, stack flow, stack gas temperature, source location, or fuel specifications, or would result in an increase in source capacity above its permitted operation. The notice must be submitted to the Department, in writing, 10 days prior to start up or use of the proposed de minimis change, or as soon as reasonably practicable in the event of an unanticipated circumstance causing the de minimis change, and must include the information requested in ARM 17.8.745(l)(d) (ARM 17.8.745).

3. All records compiled in accordance with this permit must be maintained by Malteurop as a permanent business record for at least 5 years following the date of the measurement, must be available at the plant site for inspection by the Department, and must be submitted to the Department upon request (ARM 17.8.749).

4. Malteurop shall document, by month, the total amount (in tons) of malt and salable malt by-product produced annually at the facility. By the 25th day of each month, Malteurop shall total the malt and salable malt by-product produced for the previous month. The monthly information will be used to verify compliance with the rolling 12-month limitation in Section II.A.1. The information for each of the previous months shall be submitted along with the annual emission inventory (ARM 17.8.749).

5. Malteurop shall document, by month, the total amount (in tons) of barley received annually by the facility. By the 25th day of each month, Malteurop shall total the amount (in tons) of barley received during the previous month. The monthly information will be used to verify compliance with the rolling 12-month limitation in Section II.A.2. The information for each of the previous months shall be submitted along with the annual emission inventory (ARM 17.8.749).

6. Malteurop shall document, per kiln batch, the total amount (in pounds) of elemental sulfur burned. Malteurop shall maintain on-site records of the amount of sulfur burned per kiln batch to verify compliance with the limitation in Section II.A.11. A written report of the compliance verification shall be submitted with the annual emission inventory (ARM 17.8.749).

7. Malteurop shall document, by month, the total amount (in pounds) of elemental sulfur burned for kiln operations. By the 25th day of each month, Malteurop shall total the amount (in pounds) of elemental sulfur burned during the previous month. The monthly information will be used to verify compliance with the rolling 12-month limitation in Section II.A.12. The information for each of the previous months shall be submitted along with the annual emission inventory (ARM 17.8.749).

8. Malteurop shall document, by month, the total hours of elemental sulfur burning for kiln operations. By the 25th day of each month, Malteurop shall total the hours of elemental sulfur burning during the previous month. The monthly information will be used to verify compliance with the rolling 12-month limitation in Section II.A.13. The information for each of the previous months shall be submitted along with the annual emission inventory (ARM 17.8.749).

SECTION III: General Conditions

A. Inspection – Malteurop shall allow the Department's representatives access to the source at all reasonable times for the purpose of making inspections or surveys, collecting samples, obtaining data, auditing any monitoring equipment or observing any monitoring or testing, and otherwise conducting all necessary functions related to this permit.

B. Waiver – The permit and the terms, conditions, and matters stated herein shall be deemed accepted if Malteurop fails to appeal as indicated below.

C. Compliance with Statutes and Regulations – Nothing in this permit shall be construed as relieving Malteurop of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq*. (ARM 17.8.756).

D. Enforcement – Violations of limitations, conditions and requirements contained herein may constitute grounds for permit revocation, penalties, or other enforcement action as specified in Section 75-2-401, *et seq*., MCA.

E. Appeals – Any person or persons jointly or severally adversely affected by the Department's decision may request, within 15 days after the Department renders its decision, upon affidavit setting forth the grounds therefore, a hearing before the Board of Environmental Review (Board). A hearing shall be held under the provisions of the Montana Administrative Procedures Act. The filing of a request for a hearing does not stay the Department's decision, unless the Board issues a stay upon receipt of a petition and a finding that a stay is appropriate under Section 75-2-211(11)(b), MCA. The issuance of a stay on a permit by the Board postpones the effective date of the Department's decision until conclusion of the hearing and issuance of a final decision by the Board. If a stay is not issued by the Board, the Department's decision on the application is final 16 days after the Department's decision is made.

F. Permit Inspection – As required by ARM 17.8.755, Inspection of Permit, a copy of the air quality permit shall be made available for inspection by the Department at the location of the source.

G. Permit Fee – Pursuant to Section 75-2-220, MCA, as amended by the 1991 Legislature, failure to pay the annual operation fee by Malteurop may be grounds for revocation of this permit, as required by that section and rules adopted thereunder by the Board.

H. Duration of Permit – Construction or installation must begin or contractual obligations entered into that would constitute substantial loss within 3 years of permit issuance and proceed with due diligence until the project is complete or the permit shall expire (ARM 17.8.762).

Montana Air Quality Permit (MAQP) Analysis
Malteurop North America Incorporated
MAQP #3238-06

I. Introduction/Process Description

A. Permitted Equipment

Malteurop North America Incorporated (Malteurop) owns and operates a barley malt manufacturing plant with a malt and salable malt by-product production capacity of 16 million bushels per year. The Malteurop plant incorporates the following equipment:

- Four steeping vessels, each 20-meters in diameter
- 8 germinating vessels, each 31-meters in diameter
- Three natural gas fired kilns incorporating the 7 permitted process heaters with a maximum rated heat input of 276.34 million British thermal units per hour (MMBtu/hr) heat input capacity
- A barley washer
- 80 silos for storing barley and malt products
- Three process fabric filter baghouses including a main process fabric filter baghouse (BF01) with an air-flow capacity of 66,800 dry standard cubic feet per minute (dscfm), a grain (barley) receiving fabric filter baghouse (BF02) with an air-flow capacity of 7,250 dscfm, and a product load-out fabric filter baghouse (BF03) with an air-flow capacity of 3,480 dscfm
- Associated equipment

B. Source Description

The Malteurop facility is located approximately 2 miles north of the City of Great Falls, Montana, and approximately ½ mile west of Black Eagle Road. The legal description of the facility site is the NE ¼ of the SE ¼ of Section 30, Township 21 North, Range 4 East, in Cascade County, Montana.

Malt is the processed form of barley grain and the basic ingredient in the production of beer. Malting is the process by which barley is transformed into malt. The process begins with "steeping" or soaking of clean barley kernels in large tanks of water called "steeping vessels." After steeping, the barley is then removed from the steeping vessels and placed in a germinating vessel. After a period of germination, the barley is dried and roasted in a kiln to stop the germination process and reduce the moisture content of the product, now considered malt. At this stage of the process, the malt product can be easily stored and/or shipped to various locations for further processing.

Construction and operation of the proposed malting plant occurred in two phases. After construction of Phase I, the malting plant had capacity to produce from 8 to 10 million bushels of malt per year. After construction of Phase II, the malting plant capacity increased to a maximum of 16 million bushels of malt per year. The entire malting plant encompasses approximately 10 acres of land.

C. Permit History

On May 17, 2003, International Malting Company, LLC (IMC) was issued final **Montana Air Quality Permit (MAQP) #3238-00** for the operation of a barley malt manufacturing plant with an initial Phase I malt and salable malt by-product production capacity of 10 million bushels per year and a final plant (after Phase II) capacity of 16 million bushels per year. The initially permitted IMC plant incorporated the following equipment:

- Four steeping vessels, each 20-meters in diameter
- 8 germinating vessels, each 31-meters in diameter
- Three natural gas fired kilns incorporating 12 primary process heaters rated at 19.1 million British thermal units per hour (MMBtu/hr) heat input capacity per process heater and two natural gas fired booster process heaters rated at 21 MMBtu/hr and 38 MMBtu/hr heat input capacity, respectively
- A barley washer
- 80 silos for storing barley and malt products
- 8 process fabric filter baghouses (Baghouse #1 through Baghouse #8)
- Associated equipment

In addition, potential emissions from the initially proposed and permitted plant exceeded the applicable major source Title V permitting thresholds; therefore, on February 26, 2005, IMC was issued final and effective Title V Operating Permit **#OP3238-00**.

On April 12, 2005, the Department of Environmental Quality – Air Resources Management Bureau (Department) received a complete application for the modification of IMC's MAQP #3238-00. Specifically, the modification included the replacement of 8 fabric filter baghouses (total air-flow capacity of 215,000 dscfm) with a single fabric filter baghouse (air-flow capacity of 66,800 dscfm); replacement of the 14 previously permitted process and booster heaters (total heat input capacity 288.2 MMBtu/hr) with 6 proposed process heaters (total heat input capacity of 218.64 MMBtu/hr); modification of the heating system from air-to-air heat exchangers to air-to-glycol heat exchangers; change in plant layout and configuration; increase in the allowable fabric filter baghouse grain loading limit from 0.005 grains per dry standard cubic feet (gr/dscf) to 0.010 gr/dscf; and a reduction in the allowable amount of elemental sulfur (S) combusted per batch of malt from 500 pounds of S per batch (lb/batch) to 200 lb S/batch.

Prior to this permit action, potential oxides of nitrogen (NO_x), carbon monoxide (CO), and particulate matter/particulate matter with an aerodynamic diameter less than or equal to 10 microns (PM/PM_{10}) emissions from IMC facility operations exceeded applicable Title V major source permitting thresholds. The changes resulted in a reduction in total facility potential emissions of all regulated pollutants to a level less than Title V major source permitting thresholds. Therefore, the permit action resulted in IMC being permitted as a minor source of emissions, as defined under the Title V permitting program. On June 21, 2005, the Department revoked IMC's Title V operating permit.

Finally, IMC requested that the Department remove the kilns from the emission inventory as potential PM/PM_{10} emitters. The kilns were re-designed from what was originally analyzed and permitted and according to IMC, no particulate emissions would result from the newly designed kiln operations. Because IMC was unable to provide technical information supporting this claim and because published information contained in the Environmental Protection Agency's (EPA), AP-42, Compilation of Air Pollutant Emissions Factors, indicated that the kiln operations do in fact emit PM/PM_{10}, the Department denied this request and maintained kiln PM/PM_{10} emissions in the emission inventory under the permit action. **MAQP #3238-01** replaced MAQP #3238-00.

On July 6, 2005, the Department received a complete permit application from IMC for the modification of MAQP #3238-01. Specifically, IMC proposed the installation and operation of two new fabric filter baghouse control units for grain receiving and product load-out operations, respectively. The baghouse controlling grain receiving operations has a maximum nominal flow rate of 7250 dscfm and a PM_{10} emission limit of 0.01 grains per dry standard cubic feet (gr/dscf) resulting in the Potential to Emit (PTE) 2.72 tons per year (TPY) of PM_{10}. The product load-out baghouse will have a maximum nominal flow rate of 3480 dscfm and a PM_{10} emission limit of 0.01 gr/dscf, resulting in the PTE 1.31 TPY of PM_{10}.

In addition, the main process baghouse (BF01) flow rate used in the ambient air quality impact analysis conducted for MAQP #3238-01 was incorrectly reported as 59,335 actual cubic feet per minute (acfm). The correct flow rate for the affected unit is 77,404 acfm (66,800 dscfm). The modeling analysis submitted for the affected permit action addressed this correction.

Further, on August 22, 2005, the Department received comments from IMC on the Department's Preliminary Determination (PD). Specifically, IMC requested the removal of the 1-hour averaging time period requirement for the applicable baghouse pound per hour (lb/hr) emission rate limits and the removal of the applicable baghouse flow-rate limitations included in the PD.

Based on the information contained in the comment letter, the Department recognized that the 1-hr averaging times for the lb/hr applicable baghouse emission limits have the effect of creating an overly stringent compliance demonstration for the affected units, in this case. Further, because the permit imposes grain loading and lb/hr emission limits on the baghouse(s) and because these limits together ensure that compliant actual emissions will not exceed emissions analyzed under the ambient air quality impact analysis conducted for the permit modification, the Department determined that the baghouse flow-rate limitations represented redundant permit requirements, in this case. Therefore, the Department modified the compliance source test requirement for the affected units to specify that the testing, including averaging times, be conducted pursuant to Method 5 and removed the subject baghouse flow-rate conditions under the Date of Decision (DD). **MAQP #3238-02** replaced MAQP #3238-01.

On November 16, 2006, the Department received notification of proposed changes in operations at the IMC facility in accordance with the provisions contained in the Administrative Rules of Montana (ARM) 17.8.745 (de minimis rule). Specifically, IMC proposed a change in the actual location of the facility fabric filter baghouses and kiln vents, updates to the kiln building dimensions, a change in the type of emission source for baghouse BF03 from a point source to a volume source, and a change in the type of emission source for the kiln vents from volume sources to point sources. The Department determined that all proposed changes can be accomplished in accordance with the de minimis rule.

However, in accordance with ARM 17.8.745(1)(a)(iii) because the current permit action would result in changed conditions of operation at the IMC facility that would affect the plume rise or dispersion characteristics of IMC emissions, IMC was required to submit an ambient air impact analysis (modeling) to demonstrate compliance with the applicable standards. A detailed discussion of ambient impacts associated with the changed conditions of operation at the IMC facility is contained in Section VI, Ambient Air Impact Analysis, of the Permit Analysis to this permit. Further, in accordance with ARM 17.8.745(1)(a)(i) and ARM 17.8.745(2), because the proposed permit action would change the stack on BF02 and BF03 from a vertical to horizontal or downward exhaust and thereby violate an existing condition in the IMC permit (Section II.A.17, MAQP #3238-02), an Administrative Amendment in accordance with ARM 17.8.764 is required for the current permit action. Because modeling conducted for the current permit

action shows compliance with all applicable standards without relying on unobstructed vertical stacks for BF02 and BF03, Section II.A.17 of MAQP #3238-02, which required unobstructed vertical stacks on the affected units, was removed under the current permit action. **MAQP #3238-03** replaced MAQP #3238-02.

On February 14, 2008, the Department received a request for an administrative amendment to MAQP #3238-03 to change the corporate name from IMC to Archer Daniels Midland Company – Malting. This permit action changed the name on MAQP #3238-03. **MAQP #3238-04** replaced MAQP #3238-03.

On February 9, 2009, the Department received a request for an administrative amendment to MAQP #3238-04 to change the corporate name from Archer Daniels Midland Company – Malting to Malteurop. This permit action changed the name on MAQP #3238-04 and updated the permit to reflect the current permit language and rule references used by the Department. **MAQP #3238-05** replaced MAQP #3238-04.

D. Current Permit Action

On January 26, 2009, the Department received a de minimis request regarding the relocation of the product load-out baghouse (BF03). This request was reviewed and approved via letter dated March 18, 2009. There were no changes in emissions associated with the change. The request was made to improve worker safety and allow easier access for maintenance. The de minimis request and approval was inadvertently not added to MAQP #3238-05 but is being incorporated into the existing permit action.

On October 12, 2011, the Department received a permit modification request to add a new natural gas fired heater to the facility. Additionally, Malteurop requested to update the description of an existing boiler from "Future Plant Heater" to "HEATEC Heater #3". The newest heater is identical to the HEATEC Heater #3 and minor description edits for HEATEC Heater #3 were incorporated to reflect the "input" heater ratings rather than the "output" rating. Each of HEATEC Heaters #3 and #4 have an input rating of 57.7 MMBtu/hr. The potential emissions associated with HEATEC Heater #3 were increased to match HEATEC Heater #4 and updated in the emission inventory within the permit analysis. Additionally, the heater input ratings for the other existing heaters were revised slightly based on information provided by Malteurop and the CO and NO_x limits adjusted accordingly based on AP 42 emission factors. **MAQP #3238-06** replaces MAQP #3238-05.

E. Response to Public Comments

Person/Group Commenting	Permit Reference	Comment	Department Response
Nathan Bartow/Bison Engineering	Section II.C.10, first sentence of section	Request that the language in the sentence be changed to more closely match the language of 40 CFR 60.8(a) to read "within 60 days after achieving the maximum production rate, but no later than 180 days after initial startup"	Department concurs with requested change.

F. Additional Information

Additional information, such as applicable rules and regulations, Best Available Control Technology (BACT)/Reasonably Available Control Technology (RACT) determinations, air quality impacts, and environmental assessments, is included in the analysis associated with each change to the permit.

II. Applicable Rules and Regulations

The following are partial explanations of some applicable rules and regulations that apply to the facility. The complete rules are stated in the ARM and are available, upon request, from the Department. Upon request, the Department will provide references for location of complete copies of all applicable rules and regulations or copies where appropriate.

A. ARM 17.8, Subchapter 1 – General Provisions, including but not limited to:

1. ARM 17.8.101 Definitions. This rule includes a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.105 Testing Requirements. Any person or persons responsible for the emission of any air contaminant into the outdoor atmosphere shall, upon written request of the Department, provide the facilities and necessary equipment (including instruments and sensing devices), and shall conduct test, emission or ambient, for such periods of time as may be necessary using methods approved by the Department.

3. ARM 17.8.106 Source Testing Protocol. The requirements of this rule apply to any emission source testing conducted by the Department, any source, or other entity as required by any rule in this chapter, or any permit or order issued pursuant to this chapter, or the provisions of the Clean Air Act of Montana, 75-2-101, *et seq*., Montana Code Annotated (MCA).

   Malteurop shall comply with the requirements contained in the Montana Source Test Protocol and Procedures Manual, including, but not limited to, using the proper test methods and supplying the required reports. A copy of the Montana Source Test Protocol and Procedures Manual is available from the Department upon request.

4. ARM 17.8.110 Malfunctions. (2) The Department must be notified promptly by telephone whenever a malfunction occurs that can be expected to create emissions in excess of any applicable emission limitation or to continue for a period greater than four hours.

5. ARM 17.8.111 Circumvention. (1) No person shall cause or permit the installation or use of any device or any means that, without resulting in reduction of the total amount of air contaminant emitted, conceals or dilutes an emission of air contaminant that would otherwise violate an air pollution control regulation. (2) No equipment that may produce emissions shall be operated or maintained in such a manner as to create a public nuisance.

B. ARM 17.8, Subchapter 2 – Ambient Air Quality, including, but not limited to the following:

1. ARM 17.8.204 Ambient Air Monitoring
2. ARM 17.8.210 Ambient Air Quality Standards for Sulfur Dioxide
3. ARM 17.8.211 Ambient Air Quality Standards for Nitrogen Dioxide
4. ARM 17.8.212 Ambient Air Quality Standards for Carbon Monoxide
5. ARM 17.8.220 Ambient Air Quality Standard for Settled Particulate Matter
6. ARM 17.8.221 Ambient Air Quality Standard for Visibility
7. ARM 17.8.223 Ambient Air Quality Standard for PM_{10}

Malteurop must maintain compliance with the applicable ambient air quality standards.

C. ARM 17.8, Subchapter 3 – Emission Standards, including, but not limited to:

1. ARM 17.8.304 Visible Air Contaminants. This rule requires that no person may cause or authorize emissions to be discharged into the outdoor atmosphere from any source installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes.

2. ARM 17.8.308 Particulate Matter, Airborne. (1) This rule requires an opacity limitation of 20% for all fugitive emission sources and that reasonable precautions be taken to control emissions of airborne particulate matter. (2) Under this rule, Malteurop shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter.

3. ARM 17.8.309 Particulate Matter, Fuel Burning Equipment. This rule requires that no person shall cause, allow, or permit to be discharged into the atmosphere particulate matter caused by the combustion of fuel in excess of the amount determined by this rule.

4. ARM 17.8.310 Particulate Matter, Industrial Process. This rule requires that no person shall cause, allow, or permit to be discharged into the atmosphere particulate matter in excess of the amount set forth in this rule.

5. ARM 17.8.322 Sulfur Oxide Emissions--Sulfur in Fuel. This rule requires that no person shall burn liquid, solid, or gaseous fuel in excess of the amount set forth in this rule.

6. ARM 17.8.324 Hydrocarbon Emissions--Petroleum Products. (3) No person shall load or permit the loading of gasoline into any stationary tank with a capacity of 250 gallons or more from any tank truck or trailer, except through a permanent submerged fill pipe, unless such tank is equipped with a vapor loss control device as described in (1) of this rule.

7. ARM 17.8.340 Standard of Performance for New Stationary Sources and Emission Guidelines for Existing Sources. This rule incorporates, by reference, 40 CFR Part 60, Standards of Performance for New Stationary Sources (NSPS). This facility is not an NSPS affected source because it does not meet the applicability definition of any NSPS subpart in 40 CFR Part 60.

   40 CFR 60, Subpart DD, Standard of Performance for Grain Elevators. This subpart does not apply to the proposed facility because the facility does not meet or exceed the grain storage capacity of an affected source as defined in this subpart.

D. ARM 17.8, Subchapter 5 – Air Quality Permit Application, Operation, and Open Burning Fees, including, but not limited to:

1. ARM 17.8.504 Air Quality Permit Application Fees. This rule requires that an applicant submit an air quality permit application fee concurrent with the submittal of an air quality permit application. A permit application is incomplete until the proper application fee is paid to the Department. Malteurop submitted the appropriate permit application fee for the current permit action.

2. ARM 17.8.505 When Permit Required--Exclusions. An annual air quality operation fee must, as a condition of continued operation, be submitted to the Department by each source of air contaminants holding an air quality permit (excluding an open burning permit) issued by the Department. The air quality operation fee is based on the actual or estimated actual amount of air pollutants emitted during the previous calendar year.

An air quality operation fee is separate and distinct from an air quality permit application fee. The annual assessment and collection of the air quality operation fee, described above, shall take place on a calendar-year basis. The Department may insert into any final permit issued after the effective date of these rules, such conditions as may be necessary to require the payment of an air quality operation fee on a calendar-year basis, including provisions that prorate the required fee amount.

E. ARM 17.8, Subchapter 7 – Permit, Construction and Operation of Air Contaminant Sources, including, but not limited to:

1. ARM 17.8.740 Definitions. This rule is a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.743 Montana Air Quality Permits--When Required. This rule requires a facility to obtain an air quality permit or permit modification if they construct, modify or use any air contaminant sources that have the PTE greater than 25 tons per year of any pollutant. Malteurop has the PTE more than 25 tons per year of total PM, PM_{10}, sulfur dioxide (SO_2), NO_x, and CO; therefore, an air quality permit is required.

3. ARM 17.8.744 Montana Air Quality Permits--General Exclusions. This rule identifies the activities that are not subject to the Montana Air Quality Permit program.

4. ARM 17.8.745 Montana Air Quality Permits—Exclusion for De Minimis Changes. This rule identifies the de minimis changes at permitted facilities that are not subject to the Montana Air Quality Permit Program.

5. ARM 17.8.748 New or Modified Emitting Units--Permit Application Requirements. (1) This rule requires that a permit application be submitted prior to installation, modification, or use of a source. The current permit action is an administrative amendment and does not require an application. (7) This rule requires that the applicant notify the public by means of legal publication in a newspaper of general circulation in the area affected by the application for a permit. Malteurop submitted an affidavit of publication of public notice for the October 15th issue of the *Great Falls Tribune*, a newspaper of general circulation in the Town of Great Falls, MT in Cascade County, as proof of compliance with the public notice requirements.

6. ARM 17.8.749 Conditions for Issuance or Denial of Permit. This rule requires that the permits issued by the Department must authorize the construction and operation of the facility or emitting unit subject to the conditions in the permit and the requirements of this subchapter. This rule also requires that the permit must contain any conditions necessary to assure compliance with the Federal Clean Air Act (FCAA), the Clean Air Act of Montana, and rules adopted under those acts.

7. ARM 17.8.752 Emission Control Requirements. This rule requires a source to install the maximum air pollution control capability that is technically practicable and economically feasible, except that BACT shall be utilized. The required BACT analysis is included in Section III of this permit analysis.

8. ARM 17.8.755 Inspection of Permit. This rule requires that air quality permits shall be made available for inspection by the Department at the location of the source.

9. ARM 17.8.756 Compliance with Other Requirements. This rule states that nothing in the permit shall be construed as relieving Malteurop of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq*.

10. ARM 17.8.759 Review of Permit Applications. This rule describes the Department's responsibilities for processing permit applications and making permit decisions on those permit applications that do not require the preparation of an environmental impact statement.

11. ARM 17.8.762 Duration of Permit. An air quality permit shall be valid until revoked or modified, as provided in this subchapter, except that a permit issued prior to construction of a new or modified source may contain a condition providing that the permit will expire unless construction is commenced within the time specified in the permit, which in no event may be less than one year after the permit is issued.

12. ARM 17.8.763 Revocation of Permit. An air quality permit may be revoked upon written request of the permittee, or for violations of any requirement of the Clean Air Act of Montana, rules adopted under the Clean Air Act of Montana, the FCAA, rules adopted under the FCAA, or any applicable requirement contained in the Montana State Implementation Plan (SIP).

13. ARM 17.8.764 Administrative Amendment to Permit. An air quality permit may be amended for changes in any applicable rules and standards adopted by the Board of Environmental Review (Board) or changed conditions of operation at a source or stack that do not result in an increase of emissions as a result of those changed conditions. The owner or operator of a facility may not increase the facility's emissions beyond permit limits unless the increase meets the criteria in ARM 17.8.745 for a de minimis change not requiring a permit, or unless the owner or operator applies for and receives another permit in accordance with ARM 17.8.748, ARM 17.8.749, ARM 17.8.752, ARM 17.8.755, and ARM 17.8.756, and with all applicable requirements in ARM Title 17, Chapter 8, Subchapters 8, 9, and 10.

14. ARM 17.8.765 Transfer of Permit. This rule states that an air quality permit may be transferred from one person to another if written notice of Intent to Transfer, including the names of the transferor and the transferee, is sent to the Department.

F. ARM 17.8, Subchapter 8 – Prevention of Significant Deterioration of Air Quality, including, but not limited to:

1. ARM 17.8.801 Definitions. This rule is a list of applicable definitions used in this subchapter.

2. ARM 17.8.818 Review of Major Stationary Sources and Major Modifications--Source Applicability and Exemptions. The requirements contained in ARM 17.8.819 through ARM 17.8.827 shall apply to any major stationary source and any major modification, with respect to each pollutant subject to regulation under the FCAA that it would emit, except as this subchapter would otherwise allow.

This facility is not a major stationary source since this facility is not a listed source and the facility's potential to emit is below 250 tons per year of any pollutant (excluding fugitive emissions).

G. ARM 17.8, Subchapter 12 – Operating Permit Program Applicability, including, but not limited to:

1. ARM 17.8.1201 Definitions. (23) Major Source under Section 7412 of the FCAA is defined as any source having:

   a. PTE > 100 tons/year of any pollutant;

   b. PTE > 10 tons/year of any one Hazardous Air Pollutant (HAP), PTE > 25 tons/year of a combination of all HAPs, or a lesser quantity as the Department may establish by rule; or

   c. PTE > 70 tons/year of PM_{10} in a serious PM_{10} nonattainment area.

2. ARM 17.8.1204 Air Quality Operating Permit Program. (1) Title V of the FCAA amendments of 1990 requires that all sources, as defined in ARM 17.8.1204(1), obtain a Title V Operating Permit. In reviewing and issuing MAQP #3238-06 for Malteurop, the following conclusions were made:

   a. The facility's PTE is less than 100 tons/year for all regulated pollutants except for greenhouse gases (GHG). In addition, the facility's GHG emissions calculated as carbon dioxide equivalent (CO_2e) exceeds 100,000 tons/year. Under Phase II of the Tailoring Rule, the facility has until July 1, 2012 to submit an application for a new Title V operating permit.

   b. The facility's PTE is less than 10 tons/year for any one HAP and less than 25 tons/year for all HAPs.

   c. This source is not located in a serious PM_{10} nonattainment area.

   d. This facility is not subject to any current NSPS.

   e. This facility is not subject to any current National Emission Standards for Hazardous Air Pollutants (NESHAP) standards except 40 CFR 61, Subpart M, National Emission Standard for Asbestos.

   f. This source is not a Title IV affected source, nor a solid waste combustion unit.

   g. This source is an EPA designated Title V source for GHG and CO_2e.

   Prior to MAQP #3238-01, facility operations resulted in emissions of PM, NO_x, and CO which exceeded the applicable Title V major source permitting threshold(s); therefore, the facility was a Title V major source and received final and effective Title V Operating Permit #OP3238-00 on February 26, 2005. However, MAQP #3238-01 modified operations to the extent that potential emissions of all regulated pollutants fell below the applicable Title V threshold(s) making the facility a minor source of emissions as defined under the Title V permit program. Based on that permit action, the Department revoked Title V Operating Permit #OP3238-00 on June 21, 2005. After July 1, 2011, Malteurop is again subject to Title V because it is a major source of regulated pollutants based on GHG emissions.

III. BACT Determination

A BACT determination is required for each new or modified source. Malteurop shall install on the new or modified source the maximum air pollution control capability which is technically practicable and economically feasible, except that BACT shall be utilized.

A BACT analysis was submitted by Malteurop and prepared by Bison Engineering in MAQP application #3238-06, addressing available methods of controlling NO_x, CO, and VOC emissions for the proposed new process heater. Additionally, a discussion of PM and SO_2 is included in the analysis. The Department reviewed these methods, as well as previous BACT determinations and has included information provided directly in the submitted BACT analysis. A full copy is on file with the Department. The following control options have been reviewed by the Department in order to make the following BACT determination.

A. NO_x Control Technologies for the Natural Gas Fired Heater

For the natural gas-fired heater, Bison reviewed BACT analyses conducted on other boiler and heaters made recently by the Department. Bison used also used the EPA RACT-BACT LAER Clearinghouse (RBLC) website for checking boilers and heaters less than 100 MMBtu/hr for NO_x Thirty six of the 151 BACT decisions within the RBLC for the natural gas heater have emissions rates equal to or lower than the guaranteed value from the vendor.
Readily available technologies identified for NO_x control fall into two primary categories –- combustion control and post-combustion techniques. Pre-combustion techniques rely on combustion controls such as low NO_x burners (LNB) and ultra low NO_x burners (ULNB) which both also normally include flue gas recirculation (FGR).

Combustion Control Technologies

LNB provides a staged combustion into the burner creating a fuel-rich primary combustion zone. Fuel NO_x formation is decreased by the reducing conditions in the primary combustion zone. Thermal NO_x is limited due to the lower flame temperature caused by the lower oxygen concentration. The secondary combustion zone is a fuel-lean zone where combustion is completed. LNB may result in increased CO and hydrocarbon emissions, decreased heater efficiency, and increased fuel costs. ULNB further reduce NO_x emission as the expense of efficiency with the addition of internal recirculation of combustion gases.

FGR is a flame quenching technique that involves recirculating a portion of the flue gas from the economizers or the air heater outlet and recycling it to the combustion chamber. The recirculated gas provides for a lower peak flame temperature by absorption of the combustion heat. FGR also serves to reduce the oxygen concentration in the combustion zone.

Post-Combustion Technologies

Selective Catalytic Reduction (SCR) and Selective Non-Catalytic Reduction (SNCR) are the two available technologies available for post combustion control of NO_x. SCR works by reducing NO and NO_2 in the exhaust stream to molecular nitrogen, water and oxygen. Ammonia (NH_3) must be added to the process and serves as the reducing agent for the chemical reactions. The reactions that occur in SCR are:

$$4NH_3 + 4NO + O_2 \text{-->} 4N_2 + 6H_2O$$
$$8NH_3 + 6NO_2 \text{--->} 7N_2 + 12H_2O$$
$$2NO_2 + 4\ NH_3 + O_2 \text{-->} 3N_2 + 6H_2O$$

In order for the process to work, ammonia is injected into the exhaust stream upstream of a catalyst bed. Consistent with catalytic processes, the catalyst functions by lowering the activation energy necessary for the reactions to proceed to completion. Catalyst materials normally include metals oxides such as titanium oxide and vanadium, noble metals including platinum and rhodium, zeolite and ceramics.

Technical factors identified which impact the overall effectiveness include inlet NO_x concentration, catalyst reactor design, operating temperatures and stability, type of fuel fired, sulfur content of the fuel, design of the ammonia injection system, catalyst age and reactivity, and the potential for catalyst poisoning. SCR technology has been demonstrated to achieve high levels of NO_x reduction by 70% to 90% for a wide range of natural gas boilers and heaters.

SNCR like SCR also needs a reducing agent such as ammonia or urea to drive the non-catalytic decomposition to nitrogen and water. In SNCR there is no catalyst present so the reactions for SNCR are carried out as higher temperatures since there is no concern around catalyst poisoning. Temperatures for SNCR are carried out in the range of 1650 °F to 1800 °F with control efficiencies lower than SCR with 30% to 50% control typical of this technology.

B. Technical Feasibility

Each of the four alternatives listed is above is technically feasible for NO_x control and none can be eliminated at this stage of the BACT analysis.

C. Ranked NO_x Control Technologies and Evaluation

The table below summarizes the submitted BACT ranking as submitted in the application. The emission rates for each alternative including the uncontrolled alternative are shown in the column furthest to the right.

Ranking of Control Effectiveness

Control Technology	NO_x Reduction (% Control)	NO_x Reduction above Baseline (% Control)	NO_x Emission Rate lb/MMBtu
Selective Catalyst Reduction (SCR)	Additional 70% to 90 %	90%	0.0036
Selective Non-Catalytic Reduction (SNCR)	Additional 30% to 50 %	50%	0.018
Ultra Low NO_x Burner (ULNB) with FGR	Up to 80 %	44%	0.02
Baseline: Low NO_x (LNB) Combustion Control with FGR	67%	0	0.036
Uncontrolled	0%	NA	0.098

The top three alternatives are presented as an estimated annual cost and cost effectiveness of dollars per ton above the baseline case. These estimates are reportedly prepared according to the Office of Air Quality Planning and Standards Control Cost Manual, 6th Edition (OAQPS).

Control Technology	Estimated Total Annual Cost	Baseline Emissions (tpy)	Control Efficiency %	Tons Removed (tpy)	Cost Effectiveness ($/ton)
SCR	$223K	9.22	90	8.30	$26,900
SNCR	$202K	9.22	50	4.6	$43,900
UNLB	$167K	9.22	44	4.2	$39, 800

D. Alternative Elimination

Each of SCR, SNCR, and UNLB are all technically feasible and have acceptable environmental and energy impacts. Upon review of the incremental cost effectiveness in dollar per ton, each of these alternatives has cost effectiveness values which range from $27,000 to $44,000 are far above industry norms and each is rejected based on economic impacts.

E. BACT Selection

The proposed baseline emission limit with a low NO_x burner and FGR will provide NO_x control at an emission rate of 0.0365 lb/MMBtu. On a 8,760 hours per year basis this results in a baseline emission level of 9.22 tons per year. A summary provided in the application taken from the RBLC database shows a comparison of emission rates and technologies similar to the proposed alternative. Of 151 BACT decisions within the RBLC, 36 show emission rates equal to or lower than the proposed 0.0365 lb/MMBtu. Of the 36, 27 use either LNB, UNLB with varying combinations of FGR. Of the27 decisions, only 7 have rates significantly lower than the proposed emission rate proposed by this BACT analysis. The proposed emission limit conforms to recent Department decisions and determinations found in the RBLC.

F. Control Technologies for CO and VOC Control

CO and VOC presence in the exhaust stream is an indicator of incomplete combustion. As both are indicators of the same phenomenon, CO and VOC control were presented in the application together and will be summarized together here as well.

Minimization of CO and VOCs are generally addressed by improving the combustion conditions within the burner or providing for additional oxidation once the exhaust stream exist the burner box. Each of these approaches can be done individually or may be applied together.

The RBLC database indicates these approaches are broken down into:

- Proper system design and operation
- Thermal Oxidation
- Catalytic Oxidation

Proper system design and operation incorporates host of variables which must be controlled and managed. These include operating at or near full design load, providing ample residence time, increasing oxygen concentration, and maximizing heating efficiency among other things including adequate operator training and maintenance procedures.

The two categories of thermal oxidation are achieved by providing separate downstream combustion zone of gases remaining from the primary combustion zone. When thermal oxidation is used it typically is done at a minimum of 1400 °F with residence times approaching 1 second within the combustion zone. Catalytic oxidizers are used as they lower the energy requirements as combustion can occur at lower temperatures than standard thermal oxidizers. As long as particulates and other species are not present catalytic oxidizers can provide benefits over traditional thermal oxidizers. Additionally, because catalytic oxidizes operate at lower temperatures; lower cost materials and thinner steel walls can help reduce the overall capital cost. For this analysis, a regenerative thermal oxidizer and catalytic oxidizer are evaluated as an add-on emission control devices.

G. Technical Feasibility

Of the three alternatives above, all are technically feasible for controlling both CO and VOCs and must be carried forward for further review.

H. Rank Control Technologies for Effectiveness

As submitted in the application, the percent reduction for CO and VOCs are summarized in the following table for both a catalytic and traditional thermal oxidizer.

Control Technology	**Percent Reduction**	
	CO	VOC
Catalytic Oxidizer	95%	95%
Thermal Oxidizer	90%	95%

A catalytic oxidizer is shown to have the highest removal of CO and both a catalytic and thermal oxidizer can achieve VOC removals of 95 percent although at very low inlet concentrations higher destruction efficiencies are difficult to achieve.

When located downstream of an existing heater, both the catalytic and thermal oxidizer will require additional energy usage to reheat the exhaust gases. This energy will come from the combustion of natural gas and will result in additional CO and VOC emissions.

As submitted in the application, the estimated CO and VOC emissions from the combustion of additional natural gas are shown in the following table. Emission factors are based on AP-42 tables for each respective technology.

Control Technology	**CO (tpy)**	**VOC (tpy)**
Catalytic	1.0	0.1
Thermal Oxidizer	3.6	0.2

The economic costs associated with both the catalytic and thermal oxidizer were also presented in the application. Each is shown in the below tables.

Catalytic Oxidation Cost Effectiveness

	CO	**VOC**
Estimated Annual Cost	$434,952	
Baseline Emissions (tpy)	12.38	1.26
Effective Control Efficiency (%)	87	90
Effective Tons Removed (tpy)	10.78	1.13
Cost Effectiveness ($/ton)	$40,340	$383,900

Thermal Oxidation Cost Effectiveness

	CO	**VOC**
Estimated Annual Cost	$986,211	
Baseline Emissions (tpy)	12.38	1.26

Thermal Oxidation Cost Effectiveness

Effective Control Efficiency (%)	61	76
Effective Tons Removed (tpy)	7.56	7.34
Cost Effectiveness ($/ton)	$130,400	$1,024,600

Each of the cost effectiveness categories show very high costs for the catalytic oxidizer and for the thermal oxidizer with the VOC categories an order of magnitude above those for CO.

No significant environmental and energy impacts are expected from the alternative for Proper System Design and Operation. Under this alternative, the application points out that when optimized for high energy efficiency, some slightly elevated levels of NO_x can form but this same condition also minimizes CO and VOC emissions.

I. Alternative Elimination

The first alternative (catalytic oxidizer) was the best performing for CO and VOC control. This alternative was acceptable for environmental and energy impacts even with some minor increases in emissions due to exhaust reheating requirements. However, the catalytic alternative is eliminated based on the high cost effectiveness for both CO and VOC removal.

Similarly, the thermal oxidizer was also acceptable for environmental and energy impacts but also is rejected for both CO and VOC on the grounds of excessively high effectiveness cost.

The third best alternative and baseline case is the Proper System Design and Operation. This alternative has no significant economic impacts and the on-going operational costs are absorbed into the annual maintenance of the system.

J. BACT Selection

In review of the RBLC database, the application summarizes that there are 26 of 140 BACT determinations that fall within the size class that have CO emission rates equal to or lower than that from the proposed heater. Of 26, 24 have a technology that has been demonstrated to be cost effective for this proposal. An emission rate of 0.040 lb/MMBtu is proposed which equates to a 2.83 lb/hr limit for 1-hr average with concentrations referenced to 3% dry stack oxygen.

VOC emissions are not being analyzed for a specific limit but rather using CO as a surrogate for an indicator or proper combustion. Compliance for VOC emissions is proposed to be determined via use of natural gas fuels.

K. $PM_{10}/PM_{2.5}$ BACT for the Natural Gas-Fired Heater

Since natural gas has negligible particulate content, and annual emissions are predicted to be very low (1.77 tons/year), BACT for particulate is proposed to be the use of pipeline quality natural gas fuels and use of good combustion techniques to minimize emissions and maximize efficiency.

L. SO_2 BACT for the Natural Gas-Fired Heater

Since natural gas has negligible sulfur content, and annual emissions are predicted to be very low (0.25 tons/year), BACT for SO_2 is proposed to be the use of pipeline quality natural gas and the use of good combustion techniques to minimize emissions and maximize efficiency.

IV. Emission Inventory

Emission Source	Emissions Tons/Year [PTE]						
	PM	PM_{10}	$PM_{2.5}$	NO_x	CO	VOC	SO_2
Main Process Baghouse	50.16	25.08	25.08				
Grain Receiving Baghouse	5.44	2.72	2.72				
Product Load-Out Baghouse	2.61	1.31	1.31				
MOCO Heater #1 (Up to 53.4 MMBTU/hr)	1.74	1.74	1.74	22.93	19.26	1.26	0.14
Johnston Heater #1 (Up to 24.4 MMBTU/hr)	0.80	0.80	0.80	10.48	8.80	0.58	0.06
Johnston Heater #2 (Up to 24.4 MMBTU/hr)	0.80	0.80	0.80	10.48	8.80	0.58	0.06
Heatec #1 (Up to 27.0 MMBTU/hr)	0.88	0.88	0.88	5.80	9.74	0.64	0.07
Heatec #2 (Up to 34.41 MMBTU/hr)	1.12	1.12	1.12	7.39	12.41	0.81	0.09
Heatec #3 (Up to 57.7 MMBTU/hr)	1.88	1.88	1.88	12.39	20.81	1.36	0.15
Heatec #4 (Up to 57.7 MMBTU/hr)	1.88	1.88	1.88	9.22	12.38	1.36	0.15
SO2 Emissions - Kilns							36.50
Fugitive Emissions: Grain Receiving Pits	0.80	0.18	0.18				
Fugitive Emissions: Malt Kilns (3)	25.84	23.12	23.12				
Fugitive Emissions: Malt Load-Out	1.17	0.39	0.39				
Fugitive Emissions: Vehicle Traffic - Paved Roads	0.75	0.43	0.43				
TOTAL EMISSIONS >	95.88	62.33	62.33	78.68	92.21	6.59	37.22
TITLE V EMISSIONS (Fugitives Excluded) >	67.32	38.21	38.21	78.68	92.21	6.59	37.22

Malteurop Emission Inventory Calculation Details

Main Process Baghouse
Calculations

Air Flow Capacity: 66800 dscfm
Operating Hours 8760 hours/year

PM Emissions:

Emission Factor 0.02 gr/dscf (EPA Baghouse Emission Factor)
Calculations (0.02 gr/dscf) * (66,800.00 dscfm) * 60 min/hr * 1 lb/7000 gr) = 11.45 lbs/hr
(11.45 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) = 50.16 TPY

PM_{10} Emissions:

Emission Factor 0.01 gr/dscf (Permit Limit)
Calculations (0.01 gr/dscf) * (66,800.00 dscfm) * 60 min/hr * 1 lb/7000 gr) = 5.73 lbs/hr
(5.73 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) = 25.08 TPY

$PM_{2.5}$ Emissions:

Emission Factor 0.01 gr/dscf (Permit Limit)
Calculations (0.01 gr/dscf) * (66,800.00 dscfm) * 60 min/hr * 1 lb/7000 gr) = 5.73 lbs/hr
(5.73 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) = 25.08 TPY

Grain Receiving Baghouse
Calculations

Air Flow Capacity: 7250 dscfm
Operating Hours 8760 hours/year

PM Emissions:

Emission Factor	0.02	gr/dscf	(EPA Baghouse Emission Factor)		
Calculations	(0.02 gr/dscf) * (7,250.00 dscfm) * 60 min/hr * 1 lb/7000 gr) =			1.24	lbs/hr
	(1.24 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =			5.44	TPY

PM_{10} Emissions:

Emission Factor	0.01	gr/dscf	(Permit Limit)		
Calculations	(0.01 gr/dscf) * (7,250.00 dscfm) * 60 min/hr * 1 lb/7000 gr) =			0.62	lbs/hr
	(0.62 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =			2.72	TPY

$PM_{2.5}$ Emissions:

Emission Factor	0.01	gr/dscf	(Permit Limit)		
Calculations	(0.01 gr/dscf) * (8,760.00 dscfm) * 60 min/hr * 1 lb/7000 gr) =			0.62	lbs/hr
	(0.62 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =			2.72	TPY

Product Load-Out Baghouse Calculations

Air Flow Capacity:	3480	dscfm
Operating Hours	8760	hours/year

PM Emissions:

Emission Factor	0.02	gr/dscf	(EPA Baghouse Emission Factor)		
Calculations	(0.02 gr/dscf) * (3,480.00 dscfm) * 60 min/hr * 1 lb/7000 gr) =			0.60	lbs/hr
	(0.60 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =			2.61	TPY

PM_{10} Emissions:

Emission Factor	0.01	gr/dscf	(Permit Limit)		
Calculations	(0.01 gr/dscf) * (3,480.00 dscfm) * 60 min/hr * 1 lb/7000 gr) =			0.30	lbs/hr
	(0.30 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =			1.31	TPY

$PM_{2.5}$ Emissions:

Emission Factor	0.01	gr/dscf	(Permit Limit)		
Calculations	(0.01 gr/dscf) * (3,480.00 dscfm) * 60 min/hr * 1 lb/7000 gr) =			0.30	lbs/hr
	(0.30 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =			1.31	TPY

MOCO Heater #1 (Up to 53.4 MMBTU/hr)

Heater Input Capacity	53.4	MMBtu/hr
Operating Hours	8760	hours/year
Natural Gas Heating Value	1020	MMBtu/MM scf (AP-42-Table 1.4-2)

PM Emissions:

Emission Factor	7.6	lb/MM scf (AP-42, Table 1.4-2)			
Calculations	(7.6 lb/MMscf) * (1 MM scf/1020 MMBtu) *(53.40 MMBtu/hour) =			0.40	lbs/hr
	(0.40 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =			1.74	TPY

PM_{10} Emissions:

Emission Factor	7.6	lb/MM scf (AP-42, Table 1.4-2)

Calculations	(7.6 lb/MMscf) * (1 MM scf/1020 MMBTU) *(53.40 MMBtu/hour) =	0.40	lbs/hr
	(0.40 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =	1.74	TPY

$PM_{2.5}$ Emissions:

Emission Factor	7.6 lb/MM scf (AP-42, Table 1.4-2)		
Calculations	(7.6 lb/MMscf) * (1 MM scf/1020 MMBTU) *(53.40 MMBtu/hour) =	0.40	lbs/hr
	(0.40 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =	1.74	TPY

NO_x Emissions

Emission Factor	100 lb/MM scf (AP-42, Table 1.4-2)		
Calculations	(100 lb/MMscf) * (1 MM scf/1020 MMBTU) *(53.40 MMBtu/hour) =	5.24	lbs/hr
	(5.24 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =	22.93	TPY

CO Emissions

Emission Factor	84 lb/MM scf (AP-42, Table 1.4-2)		
Calculations	(84 lb/MMscf) * (1 MM scf/1020 MMBTU) *(53.40 MMBtu/hour) =	4.40	lbs/hr
	(4.40 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =	19.26	TPY

VOC Emissions

Emission Factor	5.5 lb/MM scf (AP-42, Table 1.4-2)		
Calculations	(5.5 lb/MMscf) * (1 MM scf/1020 MMBTU) *(53.40 MMBtu/hour) =	0.29	lbs/hr
	(0.29 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =	1.26	TPY

SO_2 Emissions

Emission Factor	0.6 lb/MM scf (AP-42, Table 1.4-2)		
Calculations	(0.6 lb/MMscf) * (1 MM scf/1020 MMBTU) *(53.40 MMBtu/hour) =	0.03	lbs/hr
	(0.03 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =	0.14	TPY

Johnston Heater #1 (Up to 24.4 MMBTU/hr)

Heater Input Capacity	24.4	MMBtu/hr
Operating Hours	8760	hours/year
Natural Gas Heating Value	1020	MMBtu/MM scf (AP-42-Table 1.4-2)

PM Emissions:

Emission Factor	7.6 lb/MM scf (AP-42, Table 1.4-2)		
Calculations	(7.6 lb/MMscf) * (1 MM scf/1020 MMBTU) *(24.40 MMBtu/hour) =	0.18	lbs/hr
	(0.18 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =	0.80	TPY

PM_{10} Emissions:

Emission Factor	7.6 lb/MM scf (AP-42, Table 1.4-2)		
Calculations	(7.6 lb/MMscf) * (1 MM scf/1020 MMBTU) *(24.40 MMBtu/hour) =	0.18	lbs/hr
	(0.18 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =	0.80	TPY

$PM_{2.5}$ Emissions:

Emission Factor	7.6 lb/MM scf (AP-42, Table 1.4-2)		
Calculations	(7.6 lb/MMscf) * (1 MM scf/1020 MMBTU) *(24.40 MMBtu/hour) =	0.18	lbs/hr
	(0.18 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =	0.80	TPY

NO_x Emissions

Emission Factor	100	lb/MM scf (AP-42, Table 1.4-2)		
Calculations	(100 lb/MMscf) * (1 MM scf/1020 MMBTU) *(24.40 MMBtu/hour) =		2.39	lbs/hr
	(2.39 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =		10.48	TPY

CO Emissions

Emission Factor	84	lb/MM scf (AP-42, Table 1.4-2)		
Calculations	(84 lb/MMscf) * (1 MM scf/1020 MMBTU) *(24.40 MMBtu/hour) =		2.01	lbs/hr
	(2.01 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =		8.80	TPY

VOC Emissions

Emission Factor	5.5	lb/MM scf (AP-42, Table 1.4-2)		
Calculations	(5.5 lb/MMscf) * (1 MM scf/1020 MMBTU) *(24.40 MMBtu/hour) =		0.13	lbs/hr
	(0.13 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =		0.58	TPY

SO_2 Emissions

Emission Factor	0.6	lb/MM scf (AP-42, Table 1.4-2)		
Calculations	(0.6 lb/MMscf) * (1 MM scf/1020 MMBTU) *(24.40 MMBtu/hour) =		0.01	lbs/hr
	(0.01 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =		0.06	TPY

Johnston Heater #2 (Up to 24.4 MMBTU/hr)

Heater Input Capacity	24.4	MMBtu/hr
Operating Hours	8760	hours/year
Natural Gas Heating Value	1020	MMBtu/MM scf (AP-42-Table 1.4-2)

PM Emissions:

Emission Factor	7.6	lb/MM scf (AP-42, Table 1.4-2)		
Calculations	(7.6 lb/MMscf) * (1 MM scf/1020 MMBTU) *(24.40 MMBtu/hour) =		0.18	lbs/hr
	(0.18 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =		0.80	TPY

PM_{10} Emissions:

Emission Factor	7.6	lb/MM scf (AP-42, Table 1.4-2)		
Calculations	(7.6 lb/MMscf) * (1 MM scf/1020 MMBTU) *(24.40 MMBtu/hour) =		0.18	lbs/hr
	(0.18 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =		0.80	TPY

$PM_{2.5}$ Emissions:

Emission Factor	7.6	lb/MM scf (AP-42, Table 1.4-2)		
Calculations	(7.6 lb/MMscf) * (1 MM scf/1020 MMBTU) *(24.40 MMBtu/hour) =		0.18	lbs/hr
	(0.18 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =		0.80	TPY

NO_x Emissions

Emission Factor	100	lb/MM scf (AP-42, Table 1.4-2)		
Calculations	(100 lb/MMscf) * (1 MM scf/1020 MMBTU) *(24.40 MMBtu/hour) =		2.39	lbs/hr
	(2.39 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =		10.48	TPY

CO Emissions

Emission Factor	84	lb/MM scf (AP-42, Table 1.4-2)		
Calculations	(84 lb/MMscf) * (1 MM scf/1020 MMBTU) *(24.40 MMBtu/hour) =		2.01	lbs/hr
	(2.01 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =		8.80	TPY

VOC Emissions

Emission Factor	5.5	lb/MM scf (AP-42, Table 1.4-2)		
Calculations	(5.5 lb/MMscf) * (1 MM scf/1020 MMBTU) *(24.40 MMBtu/hour) =		0.13	lbs/hr
	(0.13 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =		0.58	TPY

SO_2 Emissions

Emission Factor	0.6	lb/MM scf (AP-42, Table 1.4-2)		
Calculations	(0.6 lb/MMscf) * (1 MM scf/1020 MMBTU) *(24.40 MMBtu/hour) =		0.01	lbs/hr
	(0.01 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =		0.06	TPY

Heatec #1 (Up to 27.0 MMBTU/hr)

Heater Input Capacity	27.0	MMBtu/hr
Operating Hours	8760	hours/year
Natural Gas Heating Value	1020	MMBtu/MM scf (AP-42-Table 1.4-2)

PM Emissions:

Emission Factor	7.6	lb/MM scf (AP-42, Table 1.4-2)		
Calculations	(7.6 lb/MMscf) * (1 MM scf/1020 MMBTU) *(27.00 MMBtu/hour) =		0.20	lbs/hr
	(0.20 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =		0.88	TPY

PM_{10} Emissions:

Emission Factor	7.6	lb/MM scf (AP-42, Table 1.4-2)		
Calculations	(7.6 lb/MMscf) * (1 MM scf/1020 MMBTU) *(27.00 MMBtu/hour) =		0.20	lbs/hr
	(0.20 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =		0.88	TPY

$PM_{2.5}$ Emissions:

Emission Factor	7.6	lb/MM scf (AP-42, Table 1.4-2)		
Calculations	(7.6 lb/MMscf) * (1 MM scf/1020 MMBTU) *(27.00 MMBtu/hour) =		0.20	lbs/hr
	(0.20 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =		0.88	TPY

NO_x Emissions

Emission Factor	50	lb/MM scf (AP-42, Table 1.4-1) (Controlled Low NO_x burner)		
Calculations	(50 lb/MMscf) * (1 MM scf/1020 MMBTU) *(27.00 MMBtu/hour) =		1.32	lbs/hr
	(1.32 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =		5.80	TPY

CO Emissions

Emission Factor	84	lb/MM scf (AP-42, Table 1.4-1)		
Calculations	(84 lb/MMscf) * (1 MM scf/8760 MMBTU) *(27.00 MMBtu/hour) =		2.22	lbs/hr
	(2.22 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =		9.74	TPY

VOC Emissions

Emission Factor	5.5	lb/MM scf (AP-42, Table 1.4-2)		
Calculations	(5.5 lb/MMscf) * (1 MM scf/1020 MMBTU) *(27.00 MMBtu/hour) =		0.15	lbs/hr
	(0.15 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =		0.64	TPY

SO_2 Emissions

Emission Factor	0.6	lb/MM scf (AP-42, Table 1.4-2)		
Calculations	(0.6 lb/MMscf) * (1 MM scf/1020 MMBTU) *(27.00 MMBtu/hour) =		0.02	lbs/hr
	(0.02 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =		0.07	TPY

Heatec #2 (Up to 34.41 MMBTU/hr)

Heater Input Capacity	34.4	MMBtu/hr
Operating Hours	8760	hours/year
Natural Gas Heating Value	1020	MMBtu/MM scf (AP-42-Table 1.4-2)

PM Emissions:

Emission Factor	7.6	lb/MM scf (AP-42, Table 1.4-2)		
Calculations	(7.6 lb/MMscf) * (1 MM scf/1020 MMBTU) *(34.41 MMBtu/hour) =		0.26	lbs/hr
	(0.26 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =		1.12	TPY

PM_{10} Emissions:

Emission Factor	7.6	lb/MM scf (AP-42, Table 1.4-2)		
Calculations	(7.6 lb/MMscf) * (1 MM scf/1020 MMBTU) *(34.41 MMBtu/hour) =		0.26	lbs/hr
	(0.26 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =		1.12	TPY

$PM_{2.5}$ Emissions:

Emission Factor	7.6	lb/MM scf (AP-42, Table 1.4-2)		
Calculations	(7.6 lb/MMscf) * (1 MM scf/1020 MMBTU) *(34.41 MMBtu/hour) =		0.26	lbs/hr
	(0.26 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =		1.12	TPY

NO_x Emissions

Emission Factor	50	lb/MM scf (AP-42, Table 1.4-1) (Controlled Low NO_x burner)		
Calculations	(50 lb/MMscf) * (1 MM scf/1020 MMBTU) *(34.41 MMBtu/hour) =		1.69	lbs/hr
	(1.69 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =		7.39	TPY

CO Emissions

Emission Factor	84	lb/MM scf (AP-42, Table 1.4-1)		
Calculations	(84 lb/MMscf) * (1 MM scf/8760 MMBTU) *(34.41 MMBtu/hour) =		2.83	lbs/hr
	(2.83 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =		12.41	TPY

VOC Emissions

Emission Factor	5.5	lb/MM scf (AP-42, Table 1.4-2)		
Calculations	(5.5 lb/MMscf) * (1 MM scf/1020 MMBTU) *(34.41 MMBtu/hour) =		0.19	lbs/hr
	(0.19 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =		0.81	TPY

SO_2 Emissions

Emission Factor	0.6	lb/MM scf (AP-42, Table 1.4-2)		
Calculations	(0.6 lb/MMscf) * (1 MM scf/1020 MMBTU) *(34.41 MMBtu/hour) =		0.02	lbs/hr
	(0.02 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =		0.09	TPY

Heatec #3 (Up to 57.7 MMBTU/hr)

Heater Input Capacity	57.7	MMBtu/hr
Operating Hours	8760	hours/year
Natural Gas Heating Value	1020	MMBtu/MM scf (AP-42-Table 1.4-2)

PM Emissions:

Emission Factor	7.6	lb/MM scf (AP-42, Table 1.4-2)		
Calculations	(7.6 lb/MMscf) * (1 MM scf/1020 MMBTU) *(57.70 MMBtu/hour) =		0.43	lbs/hr
	(0.43 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =		1.88	TPY

PM_{10} Emissions:

Emission Factor	7.6	lb/MM scf (AP-42, Table 1.4-2)		
Calculations	(7.6 lb/MMscf) * (1 MM scf/1020 MMBTU) *(57.70 MMBtu/hour) =		0.43	lbs/hr
	(0.43 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =		1.88	TPY

$PM_{2.5}$ Emissions:

Emission Factor	7.6	lb/MM scf (AP-42, Table 1.4-2)		
Calculations	(7.6 lb/MMscf) * (1 MM scf/1020 MMBTU) *(57.70 MMBtu/hour) =		0.43	lbs/hr
	(0.43 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =		1.88	TPY

NO_x Emissions

Emission Factor	50	lb/MM scf (AP-42, Table 1.4-1) (Controlled Low NO_x burner)		
Calculations	(50 lb/MMscf) * (1 MM scf/1020 MMBTU) *(57.70 MMBtu/hour) =		2.83	lbs/hr
	(2.83 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =		12.39	TPY

CO Emissions

Emission Factor	84	lb/MM scf (AP-42, Table 1.4-1)		
Calculations	(84 lb/MMscf) * (1 MM scf/1020 MMBTU) *(57.70 MMBtu/hour) =		4.75	lbs/hr
	(4.75 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =		20.81	TPY

VOC Emissions

Emission Factor	5.5	lb/MM scf (AP-42, Table 1.4-2)		
Calculations	(5.5 lb/MMscf) * (1 MM scf/1020 MMBTU) *(57.70 MMBtu/hour) =		0.31	lbs/hr
	(0.31 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =		1.36	TPY

SO_2 Emissions

Emission Factor	0.6	lb/MM scf (AP-42, Table 1.4-2)		
Calculations	(0.6 lb/MMscf) * (1 MM scf/1020 MMBTU) *(57.70 MMBtu/hour) =		0.03	lbs/hr
	(0.03 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =		0.15	TPY

Heatec #4 (Up to 57.7 MMBTU/hr)

Heater Input Capacity	57.7	MMBtu/hr
Operating Hours	8760	hours/year
Natural Gas Heating Value	1020	MMBtu/MM scf (AP-42-Table 1.4-2)

PM Emissions:

Emission Factor	7.6	lb/MM scf (AP-42, Table 1.4-2)		
Calculations	(7.6 lb/MMscf) * (1 MM scf/1020 MMBTU) *(57.70 MMBtu/hour) =		0.43	lbs/hr
	(0.43 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =		1.88	TPY

PM_{10} Emissions:

Emission Factor	7.6	lb/MM scf (AP-42, Table 1.4-2)		
Calculations	(7.6 lb/MMscf) * (1 MM scf/1020 MMBTU) *(57.70 MMBtu/hour) =		0.43	lbs/hr
	(0.43 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =		1.88	TPY

$PM_{2.5}$ Emissions:

Emission Factor	7.6	lb/MM scf (AP-42, Table 1.4-2)		
Calculations	(7.6 lb/MMscf) * (1 MM scf/1020 MMBTU) *(57.70 MMBtu/hour) =		0.43	lbs/hr
	(0.43 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =		1.88	TPY

NO_x Emissions

Emission Factor	37.23	lb/MM scf (Vendor BACT Proposal) (Controlled Low NO_x burner with FGR)		
Calculations	(37.23 lb/MMscf) * (1 MM scf/1020 MMBTU) *(57.70 MMBtu/hour) =		2.11	lbs/hr
	(2.11 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =		9.22	TPY

CO Emissions

Emission Factor	49.98	lb/MM scf (Vendor BACT Proposal) (Controlled Low NOx burner with FGR)		
Calculations	(49.98 lb/MMscf) * (1 MM scf/1020 MMBTU) *(57.70 MMBtu/hour) =		2.83	lbs/hr
	(2.83 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =		12.38	TPY

VOC Emissions

Emission Factor	5.5	lb/MM scf (AP-42, Table 1.4-2)		
Calculations	(5.5 lb/MMscf) * (1 MM scf/1020 MMBTU) *(57.70 MMBtu/hour) =		0.31	lbs/hr
	(0.31 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =		1.36	TPY

SO2 Emissions

Emission Factor	0.6	lb/MM scf (AP-42, Table 1.4-2)		
Calculations	(0.6 lb/MMscf) * (1 MM scf/1020 MMBTU) *(57.70 MMBtu/hour) =		0.03	lbs/hr
	(0.03 lbs/hr) * (8760 hrs/yr) *(0.0005 tons/lb) =		0.15	TPY

Elemental Sulfur Burning

Molecular Weight (Sulfur)	32 lb/mol
Molecular Weight (SO_2)	64 lb/mol
Batch Process Duration	36 hrs/batch (Company Information)
Sulfur Burning Duration_ Batch Process	3hr/kiln batch (Company Information)
Maximum Sulfur Burned/Batch	200 lb/kiln batch (Permit Limit)
Barley Sulfur Absoprtion	75% (Company Conservative Estimate) (Translates to 25% Sulfur Remaining)

Kiln Throughput Capacity	380 ton/batch/kiln (Company Information)		
Number of kilns	3 kilns		
Operating Hours	8760 hr/yr		
Combined Total Barley throughput Capacity	(For 3 kilns)		
Calculations: 380 ton/batch/Kiln**1 batch/36 hr/kiln*8760 hr/yr*3 kilns =		277400	ton/yr

Total Number of Batches Processed/Year (Combined 3 Kilns)

277,400 tons/yr*1 batch/380 tons =	730	batches

Sulfur Burning Duration

Calculations: 730 batches/yr*3 hr S burning/batch =	2190	hr S burning/yr

SO_2 Emissions - Kilns

Calculations: 200 lbs/kiln batch * 1 kiln batch/3 hrs*64 lbs SO_2/32 lb S*(1-.75) =	33.33	lbs/hr
Calculations: 33.33 lb/hr* 3 hr/batch* 730 batches/yr * 0.0005 ton/lb =	36.50	tons/yr

Fugitive Emissions: Grain Receiving Pits

Barley Density	48 lb/bushel		
Process Rate	19,000,000 bushels/yr (Limit based on equipment Capacity)		
Calculations	48 lb/bushel*19,000,000 bushels/yr*0.0005 ton/lb =	456000	tons/yr

PM Emissions

Emission Factor	0.035 lb/ton (AP-42, Table 9.9.1-1, SCC03-02-005, Hopper Truck)		
Emission Control	90% (3-sided enclosure)		
Calculations	0.035 lb/ton*456,000 ton/yr * (1-0.9)*0.0005 tons/lb=	0.80	tons/yr

PM_{10} Emissions

Emission Factor	0.0078 lb/ton (AP-42, Table 9.9.1-1, SCC03-02-005, Hopper Truck)		
Emission Control	90% (3-sided enclosure)		
Calculations	0.0078 lb/ton*456,000 ton/yr * (1-0.9)*0.0005 tons/lb=	0.18	tons/yr

$PM_{2.5}$ Emissions

Emission Factor	0.0078 lb/ton (AP-42, Table 9.9.1-1, SCC03-02-005, Hopper Truck)		
Emission Control	90% (3-sided enclosure)		
Calculations	0.0078 lb/ton*456,000 ton/yr * (1-0.9)*0.0005 tons/lb=	0.18	tons/yr

Fugitive Emissions: Malt Kilns (3)

Malt Density	34 lb/bushel		
Process Rate	16,000,000 bushels/yr (Company Information)		
Calculations	34 lb/bushel*16,000,000 bushels/yr*0.0005 tons/lb = 272,000 ton/yr		

PM Emissions

Emission Factor	0.19 lb/ton (AP-42, Table 9.9.1-2)		
Calculations	0.19 lb/ton*272,000 ton/yr *0.0005 tons/lb	25.84	tons/yr

PM_{10} Emissions

Emission Factor	0.17 lb/ton (AP-42, Table 9.9.1-2)

Calculations	0.17 lb/ton*272,000 ton/yr *0.0005 tons/lb=	23.12	tons/yr

$PM_{2.5}$ Emissions

Emission Factor	0.19 lb/ton (AP-42, Table 9.9.1-2)		
Calculations	0.19 lb/ton*272,000 ton/yr *0.0005 tons/lb=	23.12	tons/yr

Fugitive Emissions: Malt Load-Out (2 spouts @190 tph and 2 spouts at 100 tph)

Process Rate 272,000 ton/yr (Malt Production Capacity)

PM Emissions

Emission Factor	0.086 lb/ton (AP-42, Table 9.9.1-1, SCC03-02-005-52, Truck)		
Emission Control	90% (3-sided enclosure)		
Calculations	0.086 lb/ton*272,000 ton/yr * (1-0.9)*0.0005 tons/lb=	1.17	tons/yr

PM_{10} Emissions

Emission Factor	0.029 lb/ton (AP-42, Table 9.9.1-1, SCC03-02-005-52, Truck)		
Emission Control	90% (3-sided enclosure)		
Calculations	0.029 lb/ton*272,000 ton/yr * (1-0.9)*0.0005 tons/lb=	0.39	tons/yr

$PM_{2.5}$ Emissions

Emission Factor	0.029 lb/ton (AP-42, Table 9.9.1-1, SCC03-02-005-52, Truck)		
Emission Control	90% (3-sided enclosure)		
Calculations	0.029 lb/ton*272,000 ton/yr * (1-0.9)*0.0005 tons/lb=	0.39	tons/yr

Fugitive Emissions: Vehicle Traffic - Paved Roads

Assumptions:

E = k (AP-42, Section 13.2.1.3, 10/02)
(sL/2)0.65 *
(W/3)1.5

Where:

k = 0.028	Particle size multiplier for PM and units of interest, lb/VMT (AP-42, Section 13.2.1.3, 10/02)
k = 0.016	Particle size multiplier for PM10 and units of interest, lb/VMT (AP-42, Section 13.2.1.3, 10/02)
sL = 0.5	Road surface silt loading, g/m2 (worst case default; AP-42, Section 13.2.1.3, 10/02)
W = 20	Average vehicle weight, tons (assumed)
E = 0.196	PM emission factor, lb/VMT (calculated)
E = 0.112	PM_{10} emission factor, lb/VMT (calculated)
E = 0.112	$PM_{2.5}$ emission factor, lb/VMT (assumed equal to PM_{10})
n = 2	Number of trucks per hour (Company Information)
VMT = 0.44	Vehicle miles traveled (calculated from site plan, MAQP #3238-00)

PM Emissions

Emission Factor:	0.172 lb/hr (calculated PM emission rate)		
Calculations:	0.172 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	0.75	ton/yr

PM_{10} Emissions

Emission Factor: 0.098 lb/hr (calculated PM_{10} emission rate)

Calculations: 0.098 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.43 ton/yr

$PM_{2.5}$ Emissions

Emission Factor: 0.098 lb/hr (assumed equal to PM_{10})
Calculations: 0.098 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.43 ton/yr

V. Existing Air Quality

The air quality of the proposed area of operation 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) was formerly classified as a non-attainment area for CO but has been re-designated to attainment area status under a limited maintenance plan (LMP) effective on July 8, 2002.

The current permit action increases the PTE for the facility by approximately the following percentages in each of the pollutant categories.

PM	PM_{10}	$PM_{2.5}$	NO_x	CO	VOC	SO_2
1.96%	3.02%	3.02%	11.72%	13.43%	20.68%	0.40%

Most of the emission increases are relatively small but the VOC, CO and NO_x increases represent double digit percent increases over the existing PTE levels. The new Heatec #4 Heater will utilize a low NO_x burner (LNB) with flue gas recycle (FGR). The combination of this technology allows the new heater to have lower emission levels for both CO and NO_xthan older similarly sized heaters at the facility. As indicated in the permit application, the new heater is intended to supplement existing heaters at the plant during low ambient temperature conditions, and act as a backup unit for the existing heaters, but will not increase overall facility capacity. Current capacity limits for the facility remain unchanged with malt and salable malt by-product production limited to 16,000,000 bushels during any rolling 12-month time period based on a barley density of 48 pounds per bushel. The ambient air impact analysis contained in Section VI of this permit analysis provides a more detailed discussion of impacts resulting from the proposed project.

VI. Ambient Air Impact Analysis

The current permit action will add a new natural gas fired heater rated up to 57.7 MMBtu/hr. The new heater does not allow for a production increase at the facility as the current malt and salable malt by-product production shall be limited to 16,000,000 bushels during any rolling 12-month time period .

The Department determined during the issuance MAQP #3238-04 that based on ambient air modeling, the ambient air impacts from the facility would be minor. At that time, the maximum estimated emissions from the total proposed project, including the permit action which did not increase or decrease emissions, was approximately 69.2 tpy of NO_x, 78.9 tpy of CO, 60.4 tpy of PM_{10}, 5.2 tpy of VOCs, and 37.1 tpy of SO_2. The current total emissions under MAQP #3238-06 including fugitives and the new heater included would be as follows, 78.7 tpy of NO_x, 91.97 tpy of CO, 62.33 tpy of PM_{10}, 6.59 tpy of VOCs, and 37.22 tpy of SO_2. Of these pollutants, CO and NO_x PTEs increase by 12.1 and 9.2 tons, respectively over the levels previously modeled. Additionally, since the MAAQS/NAAQS modeling occurred, two of the sources have had their permits revoked. Originally, Montana Refining Company (MRC), Malmstrom Air Force Base (MAFB), Montana Ethanol Project (MEP), Southern Montana Electric Generation and Transmission Cooperative – Highwood Generating Project (SME) and Montana Megawatts (MMI) were modeled along with the Malteurop emissions. Since that time MMI no longer is active and PTE emissions for the "combined cycle" which do not need to be considered are 99 tpy for PM and 99.20 tpy for CO. The Montana

Ethanol Project permit was also revoked for failure to construct but has submitted a new application which is currently in process. These changes to other sources in the area have resulted in lower emissions than were modeled during the issuance of MAQP #3238-04, reducing the likelihood of decreased ambient air quality. Further, since the PTE levels associated with the new Heatec heater are below the modeling thresholds, no new modeling is required to be conducted by Malteurop.

Pollutant	Modeling Threshold	Proposed PTE Increase
PM_{10}	> 50 tons/year	1.9 tons/year
$PM_{2.5}$	> 12 tons/year	1.9 tons/year
SO_2	> 40 tons/year	0.15 tons/year
NO_x	> 40 tons/year	9.2 tons/year
CO	> 100 tons/year	12.4 tons/year
VOC	> 100 tons/year	1.4 tons/year

VII. Taking or Damaging Implication Analysis

As required by 2-10-105, 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?
	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.

VIII. Environmental Assessment

An environmental assessment, required by the Montana Environmental Policy Act, was completed for this project. A copy is attached.

DEPARTMENT OF ENVIRONMENTAL QUALITY
Permitting and Compliance Division
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FINAL ENVIRONMENTAL ASSESSMENT (EA)

Issued For: Malteurop North America Incorporated
415 US Highway 87
Great Falls, MT 59404

Montana Air Quality Permit (MAQP) Number: #3238-06

Preliminary Determination on Permit Issued: 11/18/2011
Department Decision Issued: 12/6/2011
Permit Final: 12/22/2011

1. *Legal Description of Site*: Malteurop North America (Malteurop) submitted an MAQP application to add an additional process heater at their existing facility which is located approximately 2 miles north of the City of Great Falls, Montana, and approximately ½ mile west of Black Eagle Road. The legal description of the facility site is the NE ¼ of the SE ¼ of Section 30, Township 21 North, Range 4 East, in Cascade County, Montana.

2. *Description of Project*: The permit application is for the addition of a new process heater rated up to 57.7 MMBtu/hr. The process description for the facility is discussed in the permit analysis Section of the permit.

3. *Objectives of Project*: The permit modification would allow for additional heating during periods of low ambient temperature and provide a back-up for the existing heaters. The capacity limitations within the permit remain the same for production output.

4. *Alternatives Considered*: In addition to the proposed action, the Department also considered the "no-action" alternative. The "no-action" alternative would deny issuance of the air quality preconstruction permit to the proposed facility. However, the Department does not consider the "no-action" alternative to be appropriate because Malteurop demonstrated compliance with all applicable rules and regulations as required for permit issuance. Therefore, the "no-action" alternative was eliminated from further consideration.

5. *A Listing of Mitigation, Stipulations, and Other Controls*: A listing of the enforceable permit conditions and a permit analysis, including a BACT analysis, would be contained in MAQP #3238-06.

6. *Regulatory Effects on Private Property Rights*: The Department considered alternatives to the conditions imposed in this permit as part of the permit development. The Department determined the permit conditions would be reasonably necessary to ensure compliance with applicable requirements and demonstrate compliance with those requirements and do not unduly restrict private property rights.

7. *The following table summarizes the potential physical and biological effects of the proposed project on the human environment. The "no action alternative" was discussed previously.*

		Major	Moderate	Minor	None	Unknown	Comments Included
A.	Terrestrial and Aquatic Life and Habitats				x		yes
B.	Water Quality, Quantity, and Distribution				x		yes
C.	Geology and Soil Quality, Stability, and Moisture				x		yes
D.	Vegetation Cover, Quantity, and Quality			x			yes
E.	Aesthetics				x		yes
F.	Air Quality			x			yes
G.	Unique Endangered, Fragile, or Limited Environmental Resource			x			yes
H.	Demands on Environmental Resource of Water, Air, and Energy			x			yes
I	Historical and Archaeological Sites				x		yes
J.	Cumulative and Secondary Impacts			x			yes

Summary of Comments on Potential Physical and Biological Effects: The following comments have been prepared by the Department.

A. Terrestrial and Aquatic Life and Habitats

The addition of the new heater is within the existing facility footprint and no impact on terrestrial and aquatic life is expected under this permit action.

B. Water Quality, Quantity, and Distribution

There would be a minor increase in PTE associated with this permit action. As described in Section 7.F of this EA, the Department determined that any impacts from deposition of pollutants would be minor. In addition, any accidental spills or leaks from equipment would be required to be handled according to the appropriate environmental regulations in an effort to minimize any potential adverse impact on the immediate and surrounding area.

C. Geology and Soil Quality, Stability, and Moisture

As a result of the new Heatec heater installation, no known impacts to the geology, soil quality, or stability and moisture are expected. The new equipment will be located inside the existing footprint of the facility, so no new areas will be disturbed.

D. Vegetation Cover, Quantity, and Quality

Because there is a minor increase in emissions associated with the permit action, small amounts of pollutant deposition would occur on the surrounding areas. Therefore, there could be minor impacts on local vegetative cover, quantity and quality.

E. Aesthetics

As the new heater will be located inside the existing building, no change in aesthetics is expected. The only visible change will be the addition of a new heater stack which would be similar to existing stacks at the facility.

F. Air Quality

The air quality emission impacts from the new heater would be minor because MAQP #3238-06 would include conditions limiting the visible emissions (opacity) from the plant. The operations would be limited by MAQP #3238-06 for allowable emission levels from the new heater according to those conditions contained in the permit and any impacts from the deposition of pollutants would be minor.

G. Unique Endangered, Fragile, or Limited Environmental Resources

The proposed project could have a minor impact on any unique endangered, fragile, or limited environmental resources. The Department, in an effort to identify any species of special concern associated with the proposed site location, contacted the Montana Natural Heritage Program (MNHP). Search results have concluded there are four species of concern in the area. Area, in this case, is defined by the township, range and section of the proposed site, with an additional one-mile buffer. The species of concern identified in the search include the following three vertebrate animals and one plant.

1. Bald Eagle (Sensitive)
2. Burrowing Owl (Sensitive)
3. Grasshopper Sparrow (Sensitive)
4. Little Indian Breadroot (Sensitive)

H. Demands on Environmental Resource of Water, Air, and Energy

The operation of the new heater at the facility would only require small amounts of additional energy for proper operation at the facility. As described in Section 7.F of this EA, pollutant emissions generated from the facility would have minimal impacts on air quality in the immediate and surrounding area. Demands and impacts to the environmental resource of water, air and energy would be minor.

I. Historical and Archaeological Sites

The new heater would be located within the existing building footprint. According to the Montana State Historic Preservation Office, there is low likelihood of adverse disturbance to any known archaeological or historic site, given previous industrial disturbance within the area. Therefore, the operation would not have an effect on any known historic or archaeological site.

J. Cumulative and Secondary Impacts

The new heater addition would cause minor cumulative and secondary impacts to the physical and biological environment in the immediate area because the new heater would generate emissions of particulate matter and PM_{10}. Little or minor impacts could occur on local vegetation, and some minor impact on air quality due to the new source. Sensitive animals and plants are in the vicinity but again minor impacts are expected with the new heater being located inside the existing facility. Small amounts of additional energy could be consumed at the facility. The Department expects this facility to operate in compliance with all applicable rules and regulations as would be outlined in MAQP #3238-06.

8. *The following table summarizes the potential economic and social effects of the proposed project on the human environment. The "no action alternative" was discussed previously.*

		Major	Moderate	Minor	None	Unknown	Comments Included
A.	Social Structures and Mores				x		yes
B.	Cultural Uniqueness and Diversity				x		yes
C.	Local and State Tax Base and Tax Revenue			x			yes
D	Agricultural or Industrial Production			x			yes
E.	Human Health			x			yes
F.	Access to and Quality of Recreational and Wilderness Activities				x		yes
G	Quantity and Distribution of Employment				x		yes
H.	Distribution of Population				x		yes
I.	Demands for Government Services			x			yes
J.	Industrial and Commercial Activity			x			yes
K.	Locally Adopted Environmental Plans and Goals				x		yes
L.	Cumulative and Secondary Impacts				x		yes

SUMMARY OF COMMENTS ON POTENTIAL ECONOMIC AND SOCIAL EFFECTS: The Department has prepared the following comments.

A. Social Structures and Mores

The operation of the new Heater at the facility would not alter or disrupt any local lifestyles or communities (social structures or mores) in the area of operation because the heater would operate similar to other existing heaters. Therefore, the existing social structures and mores would not be affected as a result of this permitting action.

B. Cultural Uniqueness and Diversity

The heater addition would have no impact on the cultural uniqueness and diversity of the area because the source would be within the existing facility footprint.

C. Local and State Tax Base and Tax Revenue

The heater addition to the facility operations would have little, if any, effect on the local and state tax base and tax revenue because the facility overall production capacity remains unchanged; therefore, it would not be expected to alter the current number of employees at the facility.

D. Agricultural or Industrial Production

The addition of the new heater would be located within an existing building footprint. Further, the new plant heater operations would be small by industrial standards and, thus, would have only a minor impact on local production within the facility. Again, the facility production is limited by existing permit limits at 16,000,000 bushels per year.

E. Human Health

MAQP #3238-06 would incorporate conditions to ensure that the new process heater operations would be in compliance with all applicable air quality rules and standards. These rules and standards are designed to be protective of human health. Since these conditions would be incorporated, only minor impacts would be expected from this facility expansion.

F. Access to and Quality of Recreational and Wilderness Activities

The proposed project would not affect any access to recreational and wilderness activities because of the lack of wilderness areas in the proximity.

G. Quantity and Distribution of Employment

The proposed project would not be expected to have an effect on the quantity and distribution of employment in the area because existing employees would likely be able to maintain this equipment.

H. Distribution of Population

The proposed project would not disrupt the normal population distribution in the area because the new heater will be located within the existing building footprint.

I. Demands of Government Services

Minor increases would be seen on traffic on existing roadways in the area while the new heater is being installed. In addition, government services may be required for acquiring the appropriate permits from government agencies. Demands for government services would be minor.

J. Industrial and Commercial Activity

The plant heater addition would represent only a minor increase in the industrial activity within the facility itself. No other known additional industrial or commercial activity would be expected as a result of the proposed operation.

K. Locally Adopted Environmental Plans and Goals

The Department is not aware of any locally adopted environmental plans or goals that would be affected by the proposed project. The state and national ambient air quality standards would protect the proposed site and the environment surrounding the site.

L. Cumulative and Secondary Impacts

The proposed project is expected to have little or very minor cumulative and secondary impacts to the social and economic environment in the immediate area because the facility is already existing and the new heater will operate similarly to existing heaters. The new heater is considered a new source and when operating will have some emission of CO and NO_x although its' emission rates are lower than existing heaters at the facility. During the construction phase of the upgrade, some increase in industrial activity and demand for government services may occur but once the project is complete, demand should return to normal. The Department believes that the new process heater will operate in compliance with all applicable rules and regulations as are outlined in MAQP #3238-06.

Recommendation: An EIS is not required.

If an EIS is not required, explain why the EA is an appropriate level of analysis: All potential effects resulting from construction and operation of the new natural gas fired heater are minor, therefore, an EIS is not required.

In addition, the source would be applying the Best Available Control Technology and the analysis indicates compliance with all applicable air quality rules and regulations.

Other groups or agencies contacted or which may have overlapping jurisdiction: Department of Environmental Quality - Permitting and Compliance Division (Air Resources Management Bureau), Montana Natural Heritage Program; and State Historic Preservation Office (Montana Historical Society).

Individuals or groups contributing to this EA: Department of Environmental Quality (Air Resources Management Bureau), Montana Natural Heritage Program, and State Historic Preservation Office (Montana Historical Society).

EA Prepared By: Craig Henrikson
October 28, 2011

Permit Analysis Prepared By: Craig Henrikson
Date: November 9, 2011