LRAPA
Lane Regional Air Protection Agency

**Lane Regional Air Protection Agency**
**Simple Air Contaminant Discharge Permit**

**REVIEW REPORT**
**Addendum No. 1**

**Grain Millers Inc.**
315 Madison Street
Eugene, Oregon 97402
https://www.grainmillers.com/

**Permit No. 203136**

**Source Information:**

| | |
|---|---|
| Primary SIC | 2043 – Cereal Breakfast Foods |
| Secondary SIC | -- |
| Primary NAICS | 311230 – Breakfast Cereal Manufacturing |
| Secondary NAICS | -- |

| | |
|---|---|
| Source Categories (LRAPA Title 37, Table 1) | Part B: 17. Cereal preparation and associated grain elevators 10,000 or more tons/year throughput |
| Public Notice Category | II |

**Compliance and Emissions Monitoring Requirements:**

| | |
|---|---|
| Unassigned emissions | N |
| Emission credits | N |
| Special Conditions | N |
| Compliance schedule | N |

| | |
|---|---|
| Source test [date(s)] | EU: No. 35 – Within 12 months of start-up |
| COMS | N |
| CEMS | N |
| Ambient monitoring | N |

**Reporting Requirements**

| | |
|---|---|
| Annual report (due date) | Feb 15 |
| SACC (due date) | N |
| Quarterly report (due date) | N |

| | |
|---|---|
| Monthly report (due dates) | N |
| Excess emissions report | Y |
| Greenhouse gas report | As applicable |
| Other report | N |

**Air Programs**

| | |
|---|---|
| NSPS (list subparts) | N |
| NESHAP (list subparts) | N |
| CAM | N |
| Regional Haze (RH) | N |
| Synthetic Minor (SM) | N |
| SM-80 | N |
| Part 68 Risk Management | N |
| Title V | N |
| ACDP (SIP) | N |

| | |
|---|---|
| Major HAP Source | N |
| Federal Major Source | N |
| New Source Review (NSR) | N |
| Prevention of Significant Deterioration (PSD) | N |
| Acid Rain | N |
| Clean Air Mercury Rule (CAMR) | N |
| TACT | N |
| >20 Megawatts | N |

Permittee Identification

1. Grain Millers Inc. ('Grain Millers' and/or 'the facility') is a grain preparation operation located at 315 Madison Street in Eugene, Oregon.

General Background Information

2. The facility operates a cereal processing facility. Unprocessed grain arrives by rail and truck, it is clean and hulled, ground and processed into cereal. The facility uses one (1) cyclone, 26 baghouses, and four (4) silo filters to control emissions from the process and operates two (2) natural gas-fired boilers, a natural gas-fired air makeup furnace, an electric Bio-Char Kiln, and a natural gas-fired Bio-Char kiln. Prior to this modification, the only Bio-Char Kiln onsite was a small, electrical unit operating on a pilot scale. The addition of the natural gas-fired Bio-Char Kiln (EU: No. 35), controlled by a natural gas-fired thermal oxidizer, will increase the throughput of oat hulls in the bio-charring process. The operating schedule for the facility is 8,760 hours per year (24 hours per day, 7 days per week, and 52 weeks per year).

Reason for Permit Action

3. The proposed permit action is a non-PSD/NSR moderate technical permit modification to an existing Simple Air Contaminant Discharge Permit (Simple ACDP) to include the following changes:

   - Addition of one natural gas-fired Bio-Char Kiln, EU: No. 35, controlled by a natural gas-fired thermal oxidizer.
   - Addition of two (2) new baghouses, EU: No. 36 and No. 37, associated with the material handling for the Bio-Char Kiln in EU: No. 35.
   - Added emission factors for the Bio-Char Kiln in EU: No. 35, as well as emission factors for the combustion of natural gas in the thermal oxidizer in EU: No. 35.
   - Inclusion of an emission factor verification testing requirement for the $NO_X$ and VOC emissions from the exhaust of the thermal oxidizer used to control the emissions from the Bio-Char Kiln in EU: No. 35.

   This permit action will require the addition of $SO_2$, VOC, and GHG PSELs at the generic levels into the permit.

Attainment Status

4. Grain Millers is a cereal processing facility located inside the Eugene Springfield Air Quality Management Area. The facility is located in an area that has been designated an attainment/ unclassified area for $PM_{2.5}$, $O_3$, $NO_X$, $SO_2$ and Pb and a maintenance area for CO and $PM_{10}$.

Emission Unit Description

5. This permit action required a revision of the emission units at the facility. The Bio-Char Kiln and the two (2) new baghouses were added to the emission unit table in Condition 2 of the permit. There are no other changes to the emission unit descriptions as a result of this permit action.

| EU ID | Emission Unit (EU) Description | Pollution Control Devices |
|---|---|---|
| No. 35 | Natural Gas-fired Bio-Char Kiln | Thermal Oxidizer (TO) |
| No. 36 | Silo Relay Bin Vent | Baghouse |
| No. 37 | Filter Receiving – Prator M Filter | Baghouse |

Emission Limitations Applicable to EU: No. 35, No. 36, and No. 37

6. EU: No. 35, No. 36 and No. 37 are subject to the visible emission limitations under LRAPA 32-010(3). These emission units may not have visible emissions equal to or greater than 20% opacity for a period or periods aggregating more than three minutes in any one hour. Compliance is demonstrated through the use of operational and work practice requirements.

7. EU: No. 35, No. 36 and No. 37 are subject to particulate matter emission limitations under LRAPA 32-015(2)(c). For sources other than fuel burning equipment, refuse burning equipment and fugitive emissions, installed, constructed or modified after April 16, 2015, the particulate matter emission limit is 0.10 grains per dry standard cubic foot. Compliance is demonstrated through operational and work practice requirements.

8. EU: No. 35, No. 36 and No. 37 are subject to the process weight rate emission limitation under LRAPA 32-045. Particulate matter emissions in any one hour may not exceed the amount shown in LRAPA 32-8010 for the process weight allocated to the process. Compliance is demonstrated through the use of operational and work practice requirements.

Emission Factors

9. The following emission factors were added for the Bio-Char Kiln in EU: No. 35, which were provided by the kiln manufacturer, and emission factors were added for the natural gas combustion in the thermal oxidizer (TO) in EU: No. 35:

| Natural gas-fired Bio-Char Kiln Emission Factors (EU: No. 35) | | |
|---|---|---|
| $PM/PM_{10}/PM_{2.5}$ | 0.0317 | lb/hr |
| $SO_2$ | 0.566 | lb/hr |
| $NO_X$ | 2.3 | lb/hr |
| CO | 0.247 | lb/hr |
| VOC | 0.92 | lb/hr |
| GHG ($CO_2$) | 994.2 | lb/hr |
| Natural gas-fired Bio-Char Kiln – TO Natural Gas Usage (EU: No. 35) | | |
| $PM/PM_{10}/PM_{2.5}$ | 7.6 | lb/MMscf |
| $SO_2$ | 0.6 | lb/MMscf |
| $NO_X$ | 100 | lb/MMscf |
| CO | 84 | lb/MMscf |
| VOC | 5.5 | lb/MMscf |
| GHG ($CO_2$) | 120,000 | lb/MMscf |

Source Testing Requirements

10. The facility had a stack test performed on July 27, 2020, on the electric Bio-Char Kiln (ARTi Activator kiln) in EU: No. 33. The kiln was tested in Prairie City, Iowa and then moved to the Eugene facility. Only the $PM/PM_{10}/PM_{2.5}$ emissions factor of 0.0317 lb/hr quantified in the 2020 test was utilized in this permit action for the natural gas-fired Bio-Char Kiln in EU: No. 35. The remaining emission factors for $SO_2$, $NO_X$, CO, VOC and GHG were provided by the natural gas-fired Bio-Char Kiln manufacturer. This permit action requires that the facility conduct an emission factor verification test

for $NO_X$ and VOC emissions within twelve (12) months of the startup of the Bio-Char Kiln in EU: No. 35. The test for the $NO_X$ emission factor verification requirement is due to the projected potential emissions of over 10 tons per year for the kiln. The VOC emission factor verification requirement is due to the assumption incorporated into the emission factor of 99% control by the thermal oxidizer, where uncontrolled emissions would likely exceed 10 tons per year. The 10 ton per year threshold for testing is based on Oregon DEQ guidance (IMD No. AQ.00.020 – Emission Factor Guidance for NSR Regulated Pollutants) regarding the frequency of emissions unit testing for PSEL compliance demonstrations.

Projected Potential to Emit (PTE)

11. The maximum annual emissions are based on the throughputs per process provided by the facility and using emission factors detailed in the permit and in Attachment A to the Addendum No.1 Review Report.

| Pollutant | Pre-Construction PTE (tons/yr) | Post-Construction PTE (tons/yr) |
|---|---|---|
| PM | 4.9 | 5.1 |
| $PM_{10}$ | 1.7 | 2.0 |
| $PM_{2.5}$ | 1.1 | 1.4 |
| $NO_X$ | 7.6 | 19.2 |
| $SO_2$ | 0.04 | 2.5 |
| CO | 6.3 | 8.7 |
| VOC | 0.42 | 4.5 |
| GHG ($CO_2e$) | 8,346 | 14,555 |

Plant Site Emission Limits (PSELs)

12. Provided below is a summary of the baseline emission rate, netting basis, and the PSELs for this facility. PSELs for $SO_2$, VOC and GHG were added as a result of this permitting action.

| Pollutant | Baseline Emission Rate (TYP) | Netting Basis | | Plant Site Emission Limit (PSEL) | |
|---|---|---|---|---|---|
| | | Previous (TPY) | Proposed (TPY) | Previous PSEL (TPY) | Proposed PSEL (TPY) |
| PM | 0 | 0 | 0 | 24 | 24 |
| $PM_{10}$ | 0 | 0 | 0 | 14 | 14 |
| $PM_{2.5}$ | NA | 0 | 0 | 9 | 9 |
| $NO_X$ | 0 | 0 | 0 | 39 | 39 |
| $SO_2$ | 0 | 0 | 0 | de minimis | 39 |
| CO | 0 | 0 | 0 | 99 | 99 |
| VOC | 0 | 0 | 0 | de minimis | 39 |
| GHG ($CO_2e$) | 0 | 0 | 0 | de minimis | 74,000 |

12.a. The facility does not have a baseline emission rate for pollutants other than $PM_{2.5}$ and GHGs because the facility was not in operation during either the 1977 or 1978 baseline year. A baseline emission rate is not established for $PM_{2.5}$ in accordance with LRAPA 42-0048(3). The facility has no baseline for GHGs because the facility did not request a baseline for this pollutant.

12.b. The netting basis for all pollutants is zero (0) in accordance with LRAPA 42-0040(3).

12.c. PSELs for all pollutants are set at the generic PSEL level in accordance with LRAPA 37-0064(3)(b).

Federal Hazardous Air Pollutants/Toxic Air Contaminants

13. The facility does not currently have a PSEL for federal HAPs and has a calculated PTE of total combined HAP of 0.43 tons per year following this permit action. Provided below is a summary of the potential federal HAP emissions from this permit action, as well as the previous HAP PTE for the facility.

| Pollutant | EU: No. 35 HAP Emissions | |
|---|---|---|
| | (lb/yr) | (ton/yr) |
| Hexane | 6.1 | 3.07E-03 |
| Cresols (mixture: m-cresol, o-cresol, p-cresol) | 250 | 1.25E-01 |
| Phenol | 268 | 1.34E-01 |
| Naphthalene | 0.53 | 2.63E-04 |
| 1,3-Butadiene | 26.3 | 1.31E-02 |
| Total | 551 | 0.28 |
| | | |
| Previous HAP PTE | 0.15 ton/yr | |
| Proposed HAP PTE | 0.43 ton/yr | |

Continuous Monitoring Requirements

14. The facility is required to monitor and record the firebox temperature of the thermal oxidizer in EU: No. 35 on a 3-hour block average. Corrective action must be taken if the recorded temperature is below 1800 °F, or the minimum average temperature established in the performance test required per Condition 20 of the modified permit.

Typically Achievable Control Technology Applicability

15. LRAPA 32-008 requires new and modified emission units to meet TACT if the emission unit meets the following criteria: the emission unit is not already subject to emission standards for the regulated pollutant under Title 32, Title 33, Title 39, Title 46 or Major NSR or Type A State NSR under Title 38 at the time TACT is required; the source is required to have a permit; the emission unit has emissions of criteria pollutants equal to or greater than one (1) ton per year of any criteria pollutant; and LRAPA determines the proposed air pollution control devices and emission reduction processes in use for the emissions do not represent TACT. The Bio-Char Kiln in EU: No. 35 is expected to emit more than one (1) ton per year of $NO_X$, CO, $SO_2$ and VOC. While LRAPA has not performed a formal TACT determination for these criteria pollutants, LRAPA has determined that the use of the thermal

oxidizer for emissions control of the Bio-Char Kiln likely meets TACT. The baghouses in EU: No. 36 and No. 37 emit less than one (1) ton per year of PM and are subject to the grain loading and visible emissions standards under Title 32; therefore, they are not required to meet TACT.

New Source Performance Standards (NSPS) Applicability

16. This permitting action does not change the current NSPS applicability of the facility. There are no emission units at this facility for which NSPS have been promulgated or are applicable.

National Emission Standards for Hazardous Air Pollutants (NESHAP) Applicability

17. This permitting action does not change the current NESHAP applicability of the facility. There are no devices/processes at this facility for which NESHAPs have been promulgated or are applicable.

Recordkeeping

18. The proposed amendment to the permit changed the recordkeeping requirement for the thermal oxidizer. The updated items in the recordkeeping table are listed below:

| Activity | Parameter | Units | Minimum Recording Frequency |
|---|---|---|---|
| EU: No. 35: Monitor thermal oxidizer firebox temperature in 3-hour block average and record in a log | Temperature | degrees | Every 3 hours |
| EU: No. 35: Hours of operation | Operating time | hours | Daily |

Reporting Requirements

19. The facility is required to submit an annual report to LRAPA by **February 15th** each year to include pollutant emissions calculations to demonstrate compliance with the PSELs, which after this modification will also include $SO_2$, VOC and GHG emissions estimations.

Public Notice

20. In accordance with LRAPA 37-0064(4)(a), issuance of Simple ACDPs require public notice in accordance with LRAPA 31-0030(3)(b), which requires LRAPA provide public notice of the proposed permit action and a minimum of 30 days for interested persons to submit written comments. The proposed permit was on public notice from Monday, June 27, 2022 at 8:00am to Wednesday, July 27, 2022 at 5:00pm. There were no comments.

KE/RR
7/29/2022

## Post-Construction Emissions Increase Calculations

| Emission Unit | Production Rates | | | | Pollutant | Emissions Factor (EF) | | Annual Emissions (ton/yr) |
|---|---|---|---|---|---|---|---|---|
| No. 35 Bio-Char Kiln with TO (Manufacturer-provided EFs) | 1000 | lb/hr | 4380 | tons/yr | CO | 0.247 | lb/hr | 1.08 |
| | 24 | hr/day | 365 | days | $NO_x$ | 2.3 | lb/hr | 10.1 |
| | | | | | $SO_2$ | 0.566 | lb/hr | 2.48 |
| | | | | | VOC | 0.92 | lb/hr | 4.04 |
| | | | | | PM | 0.0317 | lb/hr | 0.14 |
| | | | | | $PM_{10}$ | 0.0317 | lb/hr | 0.14 |
| | | | | | $PM_{2.5}$ | 0.0317 | lb/hr | 0.14 |
| | | | | | $CO_2$ | 994.2 | lb/hr | 4,355 |
| | | | | | | | | |
| No. 35 Bio-Char Kiln – TO Natural Gas Usage (EF - AP-42 Chapter 1.4 Natural Gas Combustion, Table 1.4-2) | 3.598 | MMBtu/hr | 31,518 | MMBtu/yr | CO | 0.0824 | lb/MMBtu | 1.30 |
| | 24 | hr/day | 365 | days | $NO_x$ | 0.0980 | lb/MMBtu | 1.55 |
| | | | | | $SO_2$ | 0.0006 | lb/MMBtu | 0.01 |
| | | | | | VOC | 0.0054 | lb/MMBtu | 0.08 |
| | | | | | PM | 0.0075 | lb/MMBtu | 0.12 |
| | | | | | $PM_{10}$ | 0.0075 | lb/MMBtu | 0.12 |
| | | | | | $PM_{2.5}$ | 0.0075 | lb/MMBtu | 0.12 |
| | | | | | $CO_2$ | 117.6 | lb/MMBtu | 1854 |
| | | | | | | | | |
| No. 36 Bin Vent (EF-calculated with grain loading and baghouse flow rate) | 10 | lb/hr | 43.8 | tons/yr | $PM/PM_{10}$ | 0.000642 | lb/hr | 0.0028 |
| | 24 | hr/day | 365 | days | $PM_{2.5}$ | 0.000638 | lb/hr | 0.0028 |
| | | | | | | | | |
| No. 37 Prator M Filter (EF-calculated with grain loading and baghouse flow rate) | 200 | lb/hr | 876 | tons/yr | $PM/PM_{10}$ | 0.00178 | lb/hr | 0.0078 |
| | 24 | hr/day | 365 | days | $PM_{2.5}$ | 0.00177 | lb/hr | 0.0077 |

Total Post-Construction Emissions Increase

| Pollutant | Annual (ton/yr) |
|---|---|
| CO | 2.4 |
| $NO_X$ | 11.6 |
| $SO_2$ | 2.5 |
| VOC | 4.1 |
| GHG ($CO_2e$) | 6,209 |
| PM | 0.27 |
| $PM_{10}$ | 0.27 |
| $PM_{2.5}$ | 0.27 |

**LANE REGIONAL AIR PROTECTION AGENCY**
1010 Main Street, Springfield, Oregon 97477
(541) 736-1056

# REVIEW REPORT

**Grain Millers Inc.**
315 Madison Street
Eugene, Oregon 97402
https://www.grainmillers.com/

**Permit No. 203136**

**Source Information:**

| | | |
|---|---|---|
| SIC | Primary | 2043 – Cereal Breakfast Foods |
| | Secondary | 4961 – Steam and Air-Conditioning Supply |
| NAICS | | 311230 – Breakfast Cereal Manufacturing |

| Source Categories | |
|---|---|
| LRAPA Title 37, Table 1 | Part B: 17. Cereal preparation and associated grain elevators 10,000 or more tons/year throughput |
| Public Notice Category | II |

**Compliance and Emissions Monitoring Requirements:**

| | |
|---|---|
| Unassigned emissions | N |
| Emission credits | N |
| Special Conditions | N |
| Compliance schedule | N |

| | |
|---|---|
| Source test [date(s)] | N |
| COMS | N |
| CEMS | N |
| PEMS | N |
| Ambient monitoring | N |

**Reporting Requirements**

| | |
|---|---|
| Annual report (due date) | Feb 15 |
| SACC (due date) | N |
| Quarterly report (due date) | N |

| | |
|---|---|
| Monthly report (due dates) | N |
| Excess emissions report | Y |
| Greenhouse gas report | As applicable |
| Other report | N |

**Air Programs**

| | |
|---|---|
| NSPS (list subparts) | N |
| NESHAP (list subparts) | N |
| CAM | N |
| Regional Haze (RH) | N |
| Synthetic Minor (SM) | N |
| SM-80 | N |
| Part 68 Risk Management | N |
| Title V | N |
| ACDP (SIP) | N |

| | |
|---|---|
| Major HAP Source | N |
| Federal Major Source | N |
| New Source Review (NSR) | N |
| Prevention of Significant Deterioration (PSD) | N |
| Acid Rain | N |
| Clean Air Mercury Rule (CAMR) | N |
| TACT | N |
| >20 Megawatts | N |

Permitting

Permittee Identification

1. Grain Millers Inc. (the facility) is a grain preparation operation located at 315 Madison Street, Eugene, Oregon.

General Background Information

2. The facility operates a cereal processing facility. Unprocessed grain arrives by rail and truck, it is clean and hulled, ground and processed into cereal. The facility uses one (1) cyclone, 25 baghouses, four (4) silo filters to control emissions from the operation, two (2) natural gas-fired boilers and a natural gas-fired air makeup furnace, and a bio-char kiln with a thermal oxidizer. The operating schedule for the facility is 8,760 hours per year (24 hours per day, 7 days per week, and 52 weeks per year).

Reason for Permit Action and Fee Basis

3. The proposed permit is a renewal of an existing Simple Air Contaminant Discharge Permit (Simple ACDP) that was issued on September 16, 2014 and was scheduled to expire on September 16, 2019. Grain Millers is considered a "high' Simple because the actual emission since 2015 have exceeded five (5) tons/year of $PM_{10}$ in a $PM_{10}$ maintenance area. However, this facility may qualify for the "low" fee in the future with the new calculation method that reduced the PTE for $PM_{10}$ below five (5) tons per year. The existing ACDP remains in effect until final action has been taken on the renewal application because the permittee submitted a timely and complete application for renewal.

Other Permits

4. No other LRAPA permits.

Attainment Status

5. Grain Millers is a cereal processing facility located in a maintenance area for CO and $PM_{10}$ and attainment area for PM, $PM_{2.5}$, $NO_X$, $SO_2$, and ozone (VOC).

6. The facility is not located within 10 kilometers of any Class I areas.

Permit History

7. LRAPA has reviewed and issued the following permitting actions to this facility since the last renewal issued on September 16, 2014:

| Date(s) Approved/Valid | Permit Action Type | Description |
|---|---|---|
| March 30, 2017 | Non-PSD/NSR Simple Technical Permit Modification | Replaced existing Flake Line #1 filter and Flake Line #2 filter with a single filter (baghouse) (New No. 7);<br>Replaced existing Specialty Flour Mill Line Filter (baghouse) and Prater Mill Line Filter (baghouse) and combined into Specialty Flour Mill Line (EU. No. 21);<br>Replaced Whole Oat Flour Filter (baghouse) (EU No. 20); |

| Date(s) Approved/Valid | Permit Action Type | Description |
|---|---|---|
| | | Relocated the Kiln & Pellet Cooler Line Cyclone (EU No. 1); and<br>Installed a new Flake Line #2 with baghouse (EU No. 29). |
| April 17, 2018 | Non-PSD/NSR Basic Technical Permit Modification | Rerouted Whole Oat Flour Line (Buhler baghouse) (EU No. 20) to the Whole Oat Flour Hammermill (Rolfers baghouse) and renamed to Whole Oat Flour Hammermill Line; and<br>Installed a natural gas-fired air makeup furnace (EU No. 30). |
| August 23, 2018 | Non-PSD/NSR Simple Technical Permit Modification | Installed a Work in Process (WIP) Receiving Line with baghouse (EU No. 31) |
| April 28, 2020 | Non-PSD/NSR Basic Technical Permit Modification | Installation of Truck Receiving Line with baghouse (EU No. 32) |
| January 27, 2021 | Non-PSD/NSR Simple Technical Permit Modification | Installation of an electric bio-char kiln with thermal oxidizer: Bio-Char Kiln (EU No. 33) |
| April 15, 2021 | Non-PSD/NSR Basic Technical Permit Modification | Installation of Process Grain Classifying Line with baghouse (EU No. 34) |

Compliance History

8. LRAPA has not initiated any enforcement actions against this facility during this permit period.

Source Testing

9. The Kiln Dryer & Pellet Cooler Cyclone (EU: No. 1) was tested for particulate matter (PM) in April 2014 for emission factor verification, as removal efficiency. EU: No. 1 was permitted in 2009 with a control efficiency of 94.0 percent removal efficiency. The test results demonstrated a control efficiency of 99.5% of EU: No. 1.

10. The facility had a stack test performed on July 27, 2020, on the Bio-Char Kiln (ARTi Activator kiln) EU: No. 33. The kiln was tested in Prairie City, Iowa and then moved to the Eugene facility. PM, $NO_X$, CO and VOC were tested. Emission rates were PM = 0.0317 lb/hr, $NO_X$ = 0.03 lb/hr, CO = 0.03 lb/hr, and VOC 0.004 lb/hr.

Emission Unit Description

11. The emission units regulated by this permit are the following:

| EU ID | Process Description | Installation, Construction, or Modification Date | PCD Description | PCD Control Efficiency | Maximum Allowable Exit Grain Loading (gr/dscfm) | PCD Installation/ Construction Date |
|---|---|---|---|---|---|---|
| No. 1 | Kiln Dryer & Pellet Cooler Line | 1994 | Cyclone | 99.5% | NA | 1994 |
| No. 3 | General Aspiration Roof Filter #2 | 2016 | Baghouse | 99.99% | 0.0001153 | 2016 |
| No. 4 | General Aspiration Roof Filter #1 | 2016 | Baghouse | 99.99% | 0.0001153 | 2016 |
| No. 5 | Hulling Line #1 | 1994 | Baghouse | 99.99% | 0.0001153 | 1994 |
| No. 6 | Hulling Line #2 | 1994 | Baghouse | 99.99% | 0.0001153 | 1994 |
| No. 7 | Flake Line | 2017 | Baghouse | 99.99% | 0.0001153 | 2017 |
| No. 8 | Hammermill Line | 1994 | Baghouse | 99.99% | 0.0001153 | 1994 |
| No. 9 | Mixplant Line #1 | 1996 | Baghouse | 99.99% | 0.0001153 | 1996 |
| No. 10 | Mixplant Line #2 | 1996 | Baghouse | 99.99% | 0.0001153 | 1996 |
| No.11 | Four Flour Silos (1-4) | 2016 | 4 - Filters | 99.99% | 0.0001153 | 2016 |
| No. 12 | Grain Receiving | 1994 | Baghouse | 99.99% | NA | 1994 |
| No. 13 | Natural Gas-Fired Miura Boiler (6.7 MMBtu/hr) | 1995 | NA | NA | NA | NA |
| No. 14 | Natural Gas-Fired Miura Boiler (7.85 MMBtu/hr) | 2013 | NA | NA | NA | NA |
| No. 16 | MPF G-Mill Line | 2003 | Baghouse | 99.99% | 0.0001153 | 2003 |
| No. 17 | MPF General Aspiration Line | 2003 | Baghouse | 99.99% | 0.0001153 | 2003 |
| No. 18 | Storage Bin | 2003 | Baghouse | 99.99% | 0.0001153 | 2003 |
| No. 19 | Specialty Cleaning Line | 2004 | Baghouse | 99.99% | 0.0001153 | 2004 |
| No. 20 | Whole Oat flour Hammermill Line | 2018 | Baghouse | 99.99% | 0.0001153 | 2018 |
| No. 21 | Specialty Flour Mill Line | 2017 | Baghouse | 99.99% | 0.0001153 | 2017 |
| No. 23 | MPF Mill Line | 2003 | Baghouse | 99.99% | 0.0001153 | 2003 |
| No. 24 | Groats Cooler Line | 2004 | Baghouse | 99.99% | 0.0001153 | 2004 |

| EU ID | Process Description | Installation, Construction, or Modification Date | PCD Description | PCD Control Efficiency | Maximum Allowable Exit Grain Loading (gr/dscfm) | PCD Installation/ Construction Date |
|---|---|---|---|---|---|---|
| No. 25 | R-Mill Line | 2008 | Baghouse | 99.99% | 0.0001153 | 2008 |
| No. 26 | #2 G-Mill Line | 2008 | Baghouse | 99.99% | 0.0001153 | 2008 |
| No. 27 | Storage Bin #2 | 2008 | Baghouse | 99.99% | 0.0001153 | 2008 |
| No. 28 | MPF Classifier Line | 2010 | Baghouse | 99.99% | 0.0001153 | 2010 |
| No. 29 | Flake Line #2 | 2017 | Baghouse | 99.99% | 0.0001153 | 2017 |
| No. 30 | Phoenix Air System (3.75 MMBtu/hr) | 2018 | NA | NA | NA | NA |
| No. 31 | WIP Receiving Line | 2018 | Baghouse | 99.99% | 0.0001153 | 2018 |
| No. 32 | Truck Receiving Line | 2020 | Baghouse | 99.99% | 0.0001153 | 2020 |
| No. 33 | Bio-Char Kiln | 2021 | Thermal Oxidizer | 99.3% | NA | 2021 |
| No. 34 | Flour Classifier Line | 2021 | Baghouse | 99.99% | 0.0001153 | 2021 |

Plant Site Emission Limits (PSELs)

12. The emissions for the facility are based on the generic PSEL levels according LRAPA Title 42-0040.

**Annual PSEL**

| Pollutant | Plant Site Emission Limit (tons/year) |
|---|---|
| PM | 24 |
| $PM_{10}$ | 14 |
| $PM_{2.5}$ | 9 |
| $NO_X$ | 39 |
| CO | 99 |
| $SO_2$ | de minimis |
| VOC | de minimis |

PSELs Calculations Description

13. The Kiln Dryer & Pellet Cooler Line (EU: No. 1) the emission factor was based on source test data performed on the cyclone in 2014. This process cyclone has a control efficiency of 99.5% for PM, $PM_{10}$, and $PM_{2.5}$.

14. For the process lines that have associated baghouses (except Grain Receiving (EU: No. 12)), the facility changed their method of calculating PM, $PM_{10}$, and $PM_{2.5}$ emissions from using throughput with a control efficiency of 99.99% to using the design air volume (scfm) with the filtration media control (gr/dscfm) for each baghouse. This reduced the potential to emit for PM, $PM_{10}$, and $PM_{2.5}$ overall and still maintained a control efficiency of 99.99%.

15. Grain Receiving (EU: No. 12) is based on emission factors for railcars from AP-42 Table 9.9.1-1 (5/98) with the total annual throughput.

16. The boilers and air makeup heater (EUs: No. 13, 14, & 33) emissions are based on AP-42 Table 1.4-2 (3/9) emission factors with the maximum design capacity at 8,760 hours per year or the boilers (EUs: No. 13, and No. 14) and 4,680 hours per year for the air makeup heater (EU: No. 33).

17. The Bio-Char Kiln with thermal oxidizer emissions are based on source test data from the performance test done on July 27, 2020, operating at 8,760 hours per year.

Continuous Monitoring Devices

18. The facility has the following continuous monitoring devices:

    18.a. Once weekly, all baghouses, with a magnehelic gauge, are required to have a reading performed and recorded in a log.

    18.b. The Thermal Oxidizer's temperature is required to be documented in 3-hour block average increments while in operation and recorded in a log.

Federal Hazardous Air Pollutants (FHAPs)/Toxic Air Contaminants (TACs)

19. Under the Cleaner Air Oregon (CAO) program, only existing sources that have been notified by LRAPA are required to perform risk assessments. This source has not been notified by LRAPA and is therefore, not yet required to perform a risk assessment or report annual emission of toxic air contaminants.

    LRAPA required reporting of approximately 600 toxic air contaminants in 2016 and regulates approximately 260 toxic air contaminants that have Risk Based concentration established in rule. All FHAPs are on the list of approximately 600 toxic air contaminants. The FHAPs and toxic air contaminants listed below are based upon source testing and standard emission factors for the types of emissions units at the facility. After the source is notified by LRAPA, they must update their inventory and perform a risk assessment to see if they must reduce risk for their toxic air contaminant emissions. Until then, sources will be required to report toxic air contaminant emissions triennially.

20. The facility's federal hazardous air pollutants (FHAPs) are below the de minimis levels and therefore, are not included in the PSELs.

21. The following are the facility's reported PTE FHAP and TAC emissions for the 2016 calendar year.

| FHAP/TAC | Potential to Emit (pounds/year) |
|---|---|
| **Metals** | |
| Arsenic | 6.38E-03 |
| Barium (TAC only) | 1.40E-01 |
| Beryllium | 3.83E-04 |
| Cadmium | 3.51E-02 |
| Chromium (not VI) (FHAP only) | 4.47E-02 |
| Cobalt | 2.68E-03 |
| Copper and compounds (TAC only) | 2.71E-02 |
| Lead | 1.60E-02 |
| Manganese | 1.21E-02 |
| Mercury | 8.29E-03 |
| Nickel | 6.70E-02 |
| Selenium | 7.66E-04 |
| Zinc (TAC only) | 9.25E-01 |
| **Organics** | |
| Acenaphthene | 5.74E-05 |
| Acenaphthylene | 5.74E-05 |
| Anthracene | 7.66E-06 |
| Benz[a]anthracene | 5.74E-05 |
| Benzene | 6.70E-02 |
| Benzo[b]fluoranthene | 5.74E-05 |
| Benzo[k]fluoranthene | 5.74E-05 |
| Benzo[a]pyrene | 3.83E-05 |
| Benzo[g,h,i]perylene | 3.83E-05 |
| Chrysene | 5.74E-05 |
| Dibenz[a,h]anthracene | 3.83E-05 |
| Dichlorobenzenes (mixed isomers) (TAC only) | 3.83E-02 |
| 7,12-Dimethylbenz[a]anthracene | 5.10E-04 |
| Fluoranthene | 9.57E-05 |
| Fluorene | 8.93E-05 |
| Formaldehyde | 2.39E-00 |
| Hexane | 5.74E-01 |
| 3-Methylcholanthrene | 5.74E-05 |
| 2-Methyl naphthalene | 7.66E-04 |
| Naphthalene | 1.95E-02 |
| Phenanthrene | 5.42E-04 |
| Pyrene | 1.60E-04 |
| Toluene | 1.08E-01 |

| FHAP/TAC | Potential to Emit (pounds/year) |
|---|---|
| Total | 4.30 |

Emission Limits

22. All emission units are subject to the visible emission limitation under LRAPA 32-010(3). These emission units may not have visible emissions equal to or greater than 20% opacity for a period of periods aggregating more than three (3) minutes in any one (1) hour.

23. Particulate emission limitations for sources other than fuel burning equipment, refuse burning equipment and fugitive emissions under LRAPA 32-015(2)(b)(B) in which the emission units were installed, constructed or modified after June 1, 1970 but prior to April 16, 2015 are limited to 0.14 grains per dry standard cubic feet (EUs: No. 1, No. 5, No. 6, No. 8 – No. 10, No. 12, No. 16 – No. 19, and No. 23 – 28) and under LRAPA 32-015(2)(c) in which the emission units installed, constructed or modified after April 16, 2015 are limited to 0.10 grains per dry standard cubic feet (EUs: No. 3, No. 4. No. 7, No. 11, No. 20, No. 21. No. 29, No. 31, No. 32, No. 33 and No. 34).

24. Particulate matter weight standards for new combustion sources under LRAPA 32-030(1)(b) in which the emission units were installed, constructed or modified on or after June 1, 1970, but prior to April 16, 2015 for which there are no representative compliance source test results, the particulate matter emission limit are not to exceed 0.14 grain per dry standard cubic foot (EUs: No. 13 and No. 14) and under LRAPA 32-030(2) in which the emission units were installed, constructed or modified after April 16, 2015, the particulate emissions limitation are not to exceed 0.10 grains per standard cubic foot (EU: No. 30).

25. All emission units (except EUs: No. 13, No. 14. and No. 30) are subject to the process weight emission limitations and determination of process weight under LRAPA 32-045. Particulate matter emissions in any one (1) hour may not exceed the amount shown in LRAPA 32-8010 for the process weight allocated to the process.

26. Operating and maintenance requirements under LRAPA 32-007 for all emission units with baghouses, the Kiln Dryer & Pellet Cooler Line cyclone, and the bio-char kiln's thermal oxidizer are subject to routine maintenance and must be operated at all times while the associated emission units is in operation.

Typically Achievable Control Technology Applicability

27. LRAPA Title 32-008 requires existing emission unit(s) at a facility to meet TACT if the emission unit(s) has emissions of criteria pollutants greater than ten (10) tons per year of any gaseous pollutants or five (5) tons per year of particulate, the emission unit(s) are not subject to the emission standards under LRAPA Title 32, Title 33, Title 39, or Title 46 for the pollutants emitted, and the facility is required to have a permit. The facility does emit more than 5 tons/year of PM. The facility's cyclone control efficiency is 99.5% and baghouses have 99.99% capture efficiency, and the thermal oxidizer has a capture efficiency of 99.3%. The facility is subject to grain loading and visible emissions standards in Title 32 and the control devices used at the facility are considered to meet TACT by LRAPA. Therefore, the facility is not subject to TACT.

New Source Performance Standards (NSPS) Applicability

28. Grain Millers is not subject to CFR Part 60, Subpart DD – Standards of Performance because the facility is a cereal manufacturer. Per 40 CFR 60.301(c), a grain terminal elevator means any grain elevator which has a permanent storage capacity of more than 88,100 $m^3$ (ca. 2.5 million U.S.

bushels), except those located at animal food manufacturers, pet food manufacturers, cereal manufacturers, breweries, and livestock feedlots.

National Emission Standards for Hazardous Air Pollutants (NESHAP) Applicability

29. There are no devices/processes at this facility for which NESHAPs have been promulgated or applicable.

Greenhouse Gas (GHG) Reporting Applicability

30. The facility is not subject to GHG reporting under greenhouse gas reporting under OAR 340 division 215 because actual greenhouse gas emissions have been below the 2,500 metric tons (2,756 short tons) of $CO_2$ equivalents per year.

Recordkeeping

31. The facility is required to keep and maintain a record of the following information for a period of five (5) years.

| Activity | Parameter | Units | Minimum Recording Frequency |
|---|---|---|---|
| EU: No. 33: Monitor Thermal Oxidizer temperature in 3-hour block average and record in a log | Temperature | degrees | Every 3 hours |
| EU: No. 33: Hours of operation | Operating time | hours | Daily |
| EUs: No. 1 & No. 12: Throughput for each grain-receiving unit listed | Throughput | tons | Monthly |
| Emission calculations as specified in permit Condition 7 | Emissions | tons | Monthly |
| Boiler fuel throughput | Emissions | MMBtu or SCF | Annually |
| Complaints from the public | Log each complaint and the resolution | NA | Upon receipt |
| Upset log of all planned and unplanned excess emissions | See G15 | NA | Per Occurrence |
| Monitor pressure readings of each baghouse** and record in a log | Pressure | inches of water | Report only upon request |
| Manufacturer or EPA documentation of the exit grain loading for each type of filtration media used for each baghouse | Baghouse fabric specification | gr/dscfm | Report only upon request |
| Manufacturer or EPA documentation of the design scfm for each baghouse | Baghouse fabric specification | gr/dscfm | Report only upon request |

| Activity | Parameter | Units | Minimum Recording Frequency |
|---|---|---|---|
| Maintenance of baghouses and thermal oxidizer record in a log per permit Condition 18 | Occurrence | NA | Report only upon request |

**excludes bin-vent type baghouses

Reporting Requirements

32. The facility is required to submit an annual report by **February 15th** each year to include each pollutant emission estimation information identified in permit Condition 21.

Public Notice

33. The draft permit was on public notice from September 13, 2021 to October 13, 2021. No written comments were submitted during the 30-day comment period.

BAE/cmw
10/14/2021

## Attachment A – Detail Sheets

| Emission Units | Equipment Asset # | Emission Unit Description [1] | Operating System | Throughput (tpy) | Annual CFM | Control Efficiency | Fraction of $PM_{10}$ to PM | PM Emissions (tpy) | $PM_{10}$ Emissions (tpy) | $PM_{2.5}$ Emissions (tpy) |
|---|---|---|---|---|---|---|---|---|---|---|
| No. 1 [2] | M16-11-03 | Kiln Dryer & Pellet Cooler Line | Steaming | 67,333 | | 0.0000075 | 0.25 | 0.5050 | 0.1262 | 0.1262 |
| No. 3 | M10-21-02 | General Aspiration Roof Filter #2 | Cleaning | | 6,832,800,000 | 0.9999 | 0.25 | 0.0563 | 0.0141 | 0.0141 |
| No. 4 | M10-21-01 | General Aspiration Roof Filter #1 | Cleaning | | 19,184,400,000 | 0.9999 | 0.25 | 0.1580 | 0.0395 | 0.0395 |
| No. 5 | M14-21-01 | Hulling Line #1 | Hulling | | 5,781,600,000 | 0.9999 | 0.25 | 0.0476 | 0.0119 | 0.0119 |
| No. 6 | M14-21-02 | Hulling Line #2 | Hulling | | 5,781,600,000 | 0.9999 | 0.25 | 0.0476 | 0.0119 | 0.0119 |
| No. 7 | M10-21-05 | Flake Line | Cereal | | 14,191,200,000.0 | 0.9999 | 0.25 | 0.1169 | 0.0292 | 0.0292 |
| No. 8 | M19-21-01 | Hammermill Line | Hulling | | 1,576,800,000 | 0.9999 | 0.25 | 0.0130 | 0.0032 | 0.0032 |
| No. 9 & 10 [3] | M42-21-01-02 | Mixplant Lines #1 and #2 | Cereal | | 788,400,000 | 0.9999 | 0.25 | 0.0065 | 0.0016 | 0.0016 |
| No. 11 | M23-33-01-02-03-04 | Flour Silos (#1-4) Baghouses | Cereal | | 3,679,200 | 0.9999 | 0.25 | 0.0000303 | 0.00000758 | 0.00000758 |
| No. 12 | NA | Grain Receiving | Receiving | 180,000 | See EU No. 12 Tab for Calculations | | | 2.8800 | 0.7020 | 0.1170 |
| No. 13 [4] | M03-01-03 | Boiler: Natural Gas-fired 6.7 MMBtu/hr | | | See Boiler & Air Heater Tab for Emissions | | | | | |
| No. 14 [4] | M03-01-04 | Boiler: Natural Gas-fired 7.8 MMBtu/hr | | | See Boiler & Air Heater Tab for Emissions | | | | | |
| No. 16 | M29-21-03 | MPF G-Mill Line | Hulling | | 3,153,600,000 | 0.9999 | 0.25 | 0.0260 | 0.0065 | 0.0065 |
| No. 17 | M29-21-01 | MPF General Aspriration Line | Hulling | | 5,256,000,000 | 0.9999 | 0.25 | 0.0433 | 0.0108 | 0.0108 |
| No. 18 | M35-21-01 | Storage Bin | Hulling | | 1,156,320,000 | 0.9999 | 0.25 | 0.0010 | 0.0002 | 0.0002 |
| No. 19 | M26-21-01 | Specialty Cleaning Line | Cleaning | | 4,204,800,000 | 0.9999 | 0.25 | 0.0346 | 0.0087 | 0.0087 |
| No. 20 | M24-21-02 | Whole Oat Flour Hammermill Line | Cereal | | 1,708,200,000 | 0.9999 | 0.25 | 0.0141 | 0.0035 | 0.0035 |
| No. 21 | M24-21-01 | Specialty Flour Mill Line | Cereal | | 2,496,600,000 | 0.9999 | 0.25 | 0.0206 | 0.0051 | 0.0051 |
| No. 23 | M29-21-02 | MPF Mill Line | Hulling | | 546,624,000 | 0.9999 | 0.25 | 0.0045 | 0.0011 | 0.0011 |
| No. 24 | M16-21-01 | Groats Cooler Line | Cereal | | 1,839,600,000 | 0.9999 | 0.25 | 0.0152 | 0.0038 | 0.0038 |
| No. 25 | M29-21-08 | R-Mill Line | Hulling | | 3,153,600,000 | 0.9999 | 0.25 | 0.0260 | 0.0065 | 0.0065 |
| No. 26 | M29-21-09 | #2 G-Mill Line | Hulling | | 3,153,600,000 | 0.9999 | 0.25 | 0.0260 | 0.0065 | 0.0065 |
| No. 27 | M35-21-02 | Storage Bin #2 | Hulling | | 157,680,000 | 0.9999 | 0.25 | 0.0013 | 0.0003 | 0.0003 |
| No. 28 | M29-21-10 | MPF Classifier Line | Hulling | | 2,102,400,000 | 0.9999 | 0.25 | 0.0173 | 0.0043 | 0.0043 |
| No. 29 | M38-21-01 | Flake Line #2 | Cereal | | 7,884,000,000 | 0.9999 | 0.25 | 0.0649 | 0.0162 | 0.0162 |
| No. 30 [4] | M01-70-01 | Phoenix Air System | | | See Boiler & Air Heater Tab for Emissions | | | | | |
| No. 31 | M11-21-01 | WIP Receiving Line | Receiving | | 1,261,440,000 | 0.9999 | 0.25 | 0.0104 | 0.0026 | 0.0026 |
| No. 32 | M11-21-02 | Truck Receiving Line | Receiving | | 1,576,800,000 | 0.9999 | 0.25 | 0.0130 | 0.0032 | 0.0032 |
| No. 33 [5] | M05-46-01 | Bio-Char Kiln | | | See EU No. 33 Tab for Emissions | | | | | |
| No. 34 | M24-21-01 | Flour Classifier Line | Receiving | | 1,576,800,000 | 0.9999 | 0.25 | 0.013 | 0.003 | 0.003 |
| **TOTALS** | | | | | | | | **4.16** | **1.02** | **0.44** |

| | |
|---|---|
| 1. Unless otherwise stated all emissions are based on the maximum capacity of 24 hrs/day and 365 days/yr and all emission units not noted below are based on baghouse fabric specifications (gr/dscfm) and air volume (dscfm) of the baghouse | |
| 2. Kiln Dryer & Pellet Cooler Line Cyclone: | Control Efficiency of 99.5% |
| | Cyclone handles air that is used to cool raw material. |
| | Air that exhaust to the cyclone collects an estimated 0.15% of raw material particulate matter from the process of cooling. |
| | The factors used in the cyclone calculations are based on engineering judgment and are based on a Performance Test data done April 30, 2014. |
| | Emission factor calculations: [100 tons throughput * 0.15% Aspirated to Cyclone * 99.5% Control Efficiency of Cyclone] = [100 tons throughput * (0.15%/100) *(1- (99.5%/100)] = [tons throughput * 0.15 * 0.005] = [0.00075 tons emitted * 2000 lbs/ton] = [1.5 lbs emitted/100 tons throughput] = 0.015 lb/ton PM and [0.015 * 25% = 0.00375 lb/ton $PM_{10}$ and $PM_{2.5}$ |
| 3. Mixplant Lines #1 and #2 | Mixplant lines exhausted to the outside approxiamately 6 months out of the year, though the calculation are based on 12 months/year. |
| 4. Boilers & Phoenix Air | The Boilers and Phoenix Air System Emission Factors utilizes AP-42 Table 1.4-2 (3/98) *Emission Factors for Criteria Pollutants and Greenhouse Gasese from Natural Gas Combustion* . The boilers are based on 8,760 hours per year and the Phoenix Air System is based on 8,760 hours per year though it is only utilized for 4,380 hours per year. |
| 5. Bio-Char Kiln | The emission factors are based on source test data for pyrolysis process. The test was performed on July 27, 2020. $SO_2$ was not tested for and AP-42 Table 10.7-1 has no $SO_2$ emission factor, because $SO_2$ is insignificant. |

**Grain Millers 203136: Renewal 2020**

**No. 13: Boiler 6.7 MMBtu/hr - Natural Gas**

| Pollutant | Maximum Design Capacity (cubic ft/hr) | Emission Factor (lbs/10^6 ft^3) | Conversion Factor (tons/lbs) | Annual Emissions (tons) |
|---|---|---|---|---|
| PM | 6,700 | 7.6 | 0.0005 | 0.223 |
| $PM_{10}$ | 6,700 | 7.6 | 0.0005 | 0.223 |
| $PM_{2.5}$ | 6,700 | 7.6 | 0.0005 | 0.223 |
| $SO_2$ | 6,700 | 0.6 | 0.0005 | 0.018 |
| $NO_X$ | 6,700 | 100 | 0.0005 | 2.935 |
| CO | 6,700 | 84 | 0.0005 | 2.465 |
| VOC | 6,700 | 5.5 | 0.0005 | 0.161 |

**No. 14: Boiler 7.8 MMBtu/hr - Natural Gas**

| Pollutant | Maximum Design Capacity (cubic ft/hr) | Emission Factor (lbs/10^6 ft^3) | Conversion Factor (tons/lbs) | Annual Emissions (tons) |
|---|---|---|---|---|
| PM | 7,800 | 7.6 | 1.00E-06 | 0.260 |
| $PM_{10}$ | 7,800 | 7.6 | 1.00E-06 | 0.260 |
| $PM_{2.5}$ | 7,800 | 7.6 | 1.00E-06 | 0.260 |
| $SO_2$ | 7,800 | 0.6 | 1.00E-06 | 0.020 |
| $NO_X$ | 7,800 | 100 | 1.00E-06 | 3.416 |
| CO | 7,800 | 84 | 1.00E-06 | 2.870 |
| VOC | 7,800 | 5.5 | 1.00E-06 | 0.188 |

Boilers operates 8,760 hours per year
Gaseous emission factors are obtained from AP-42 Table 1.4-2 (3/98) for Small Boilers Uncontrolled
Annual Emission (tons) = maximum gas usage x emission factor x 1 ton/2000 pounds x 8,760 hours per year x 1/10^6.

**Phoenix Makeup Air Heater 3.75 MMBtu/hr - Natural Gas**

| Pollutant | Maximum Design Capacity (cubic ft/hr) | Emission Factor (lbs/10^6 ft^3) | Conversion Factor (tons/lbs) | Emissions (tons/year) |
|---|---|---|---|---|
| PM | 3,750 | 7.6 | 0.0005 | 0.067 |
| $PM_{10}$ | 3,750 | 7.6 | 0.0005 | 0.067 |
| $PM_{2.5}$ | 3,750 | 7.6 | 0.0005 | 0.067 |
| $SO_2$ | 3,750 | 0.6 | 0.0005 | 0.005 |
| $NO_X$ | 3,750 | 100 | 0.0005 | 0.878 |
| CO | 3,750 | 84 | 0.0005 | 0.737 |
| VOC | 3,750 | 5.5 | 0.0005 | 0.048 |

Makeup Heater will only operate 4,380 hours per year, but used 8,760 hours per year to be conservative.
Gaseous emission factors are obtained from AP-42 Table 1.4-2 (3/98)
Annual Emission (tons) = maximum gas usage x emission factor x 1 ton/2000 pounds x 8,760 hours per year x 1/10^6.

## Bio-Char Annual Emissions

| Bio-Char Annual Emissions | | |
|---|---|---|
| | | |
| **Pollutant** | **Emissions lbs/hour** | **Annual Emissions (tons/yr)** |
| PM/PM10/PM2.5 | 0.0317 | 0.1388 |
| NOx | 0.075 | 0.3285 |
| CO | 0.05 | 0.2190 |
| VOC | 0.004 | 0.0175 |
| SO2 | Insignificant | |
| | | |
| The Bio-Char kiln with thermal oxidizer operates 8,760 per year | | |
| The emission factors are based on source test data. The test was performed on July 27, 2020. SO2 was not tested and there is not SO2 emission factor in AP-42, because SO2 emissions are significant | | |
| Annual Emissions (tons) = (maximum hours of operation x Emission Factors)/2000 pounds | | |

| Total Emissions for the Facility | | | | |
|---|---|---|---|---|
| **Pollutants** | **Kiln** | **Filters & Baghouses** | **Boiler & Air Heater** | **Total Emissions tpy** |
| PM | 0.14 | 4.16 | 0.55 | **4.85** |
| $PM_{10}$ | 0.14 | 1.02 | 0.55 | **1.71** |
| $PM_{2.5}$ | 0.14 | 0.44 | 0.55 | **1.13** |
| NOx | 0.33 | 0.00 | 7.23 | **7.56** |
| CO | 0.22 | 0.00 | 6.07 | **6.29** |
| $SO_2$ | 0.00 | 0.00 | 0.04 | **0.04** |
| VOC | 0.02 | 0.00 | 0.40 | **0.42** |
| HAP | 0.05 | 0.00 | 0.10 | **0.15** |

**Example for new method of calculations**:

| General Aspiration Roof Filter 2 (EU: No. 3) | |
|---|---|
| Asset: M10-21-02 | |
| **Information:** | |
| Grains/lb | 7,000 |
| Minutes/year | 525,600 |
| lb/ton | 2,000 |
| Annual Max Cap (tons): | 4,818 |
| % to Filter Section | 0.02 |

| Process | Baghouse | Filter Type | Filter Manufacturer | Fabric Spec gr/dscfm | Air Volume (dscfm) | Air/ Cloth Ratio | Maximum Total PM Emissions @ 0.0001153 gr/scf (grains/min) | Maximum Total PM Emissions @ 0.0001153 gr/scf (lb/min) | Maximum Total PM Emissions @ 0.0001153 gr/scf (lb/hr) | Maximum Total PM Emissions @ 0.0001153 gr/scf (lb/day) | Maximum PM10 & PM2.5 Emisson @ 25% of PM (lb/day) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Cleaning | **Existing** | **PE-16-US** | Total Filtration Services | 0.0001153 | 13,000 | 10:1 | 1.50 | 0.00021 | 0.0128 | 0.3083 | 0.0771 |

| | |
|---|---|
| Annual CFM | 6,832,800,000 |
| **Annual PM (tons)** | **0.056** |
| **Annual PM10 (tons)** | **0.0141** |
| **Annual PM2.5 (tons)** | **0.0141** |