



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, 24 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 PM₁₀ in a PM₁₀ maintenance area. However, this facility may qualify for the "low" fee in the future with the new calculation method that reduced the PTE for PM₁₀ 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 PM₁₀ and attainment area for PM, PM_{2.5}, NO_x, SO₂, 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); Replaced existing Specialty Flour Mill Line Filter (baghouse) and Prater Mill Line Filter (baghouse) and combined into Specialty Flour Mill Line (EU No. 21); 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 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 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, PM₁₀, 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, PM₁₀, 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, PM₁₀, 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.
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	

FHAP/TAC	Potential to Emit (pounds/year)
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
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 m³ (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 CO₂ 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
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 will be on public notice from September 13, 2021 to October 13, 2021. Written comments may be submitted during the 30-day comment period. If requested by ten (10) or more individuals or an individual representing a group of more than ten (10) individuals, there will be a public hearing following the comment period.

After the comment period and hearing (if requested), LRAPA will respond to comments received and then take final action to issue or deny the permit within 45 days of the close of the public comment or hearing period.

BAE/CMW
9/10/2021

Attachment A – Detail Sheets

Emission Units	Equipment		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)
	Asset #	Emission Unit Description ⁽¹⁾								
No. 1 ⁽²⁾	M16-11-03	Kiln Dryer & Pellet Cooler Line	Steaming	67,333		0.000075	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 Aspiration 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 PM₁₀ and PM_{2.5}

3. Mixplant Lines #1 and #2
 Mixplant lines exhausted to the outside approximately 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 Gases 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. SO₂ was not tested for and AP-42 Table 10.7-1 has no SO₂ emission factor, because SO₂ 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		

