THE AMALGAMATED SUGAR COMPANY LLC
50 SOUTH 500 WEST • P.O. BOX 700 • PAUL, ID 83347
PHONE: (208) 438-2115 • FAX: (208) 438-5485

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DEPARTMENT OF ENVIRONMENTAL QUALITY
STATE A Q PROGRAM

December 31, 2013

William Rogers, Regional Permit Program Coordinator
Air Quality Division
Idaho Department of Environmental Quality
1410 N. Hilton
Boise, ID 83706-1255

RE: Permit to Construct (PTC) Application
B&W Boiler Natural Gas Conversion Project
The Amalgamated Sugar Company LLC (TASCO)
Mini Cassia Facility (Facility ID No. 067-00001)

Dear Bill,

The Amalgamated Sugar Company LLC (TASCO) appreciated the opportunity to recently meet with you and other IDEQ representatives to discuss the proposed conversion of the B&W boiler from coal to natural gas. The primary purpose of this project is to address Industrial Boiler Maximum Achievable Control Technology (MACT) emissions standards for hazardous air pollutants. The Mini Cassia facility has selected this fuel conversion option in place of the continued use of coal and installation of costly upgrades to emissions control systems. As documented in the attached application, this project will result in significant decreases in criteria pollutants. The application is divided into the following sections:

- Section 1 – Application Forms
- Section 2 – Project Description
- Section 3 – Process Flow Diagram
- Section 4 – Applicable Requirements
- Section 5 – Emissions Estimates & Limitations
- Section 6 – Ambient Air Quality Impact Exemption Analysis

The target completion date for converting the B&W boiler to gas is by the start of the 2015 beet campaign beginning in September 2015, ~ 6 months ahead of the Industrial Boiler MACT January 31, 2016 compliance deadline.

In addition, the Mini Cassia facility is also planning to commit to eliminating the use of coal in the Erie City boiler by utilizing natural gas only. As a result, coal would no longer be utilized by the boilers at the Mini Cassia facility. This further commitment will result in significant emissions reductions. Firing both boilers on natural gas requires an expansion of natural gas pipelines from the mainline to the facility. All efforts to complete the gas line expansion will be attempted to meet the January 31, 2016 Industrial Boiler

MACT deadline. The gas line expansion has been requested by TASCO but is controlled by the Intermountain Gas Company and Williams Pipeline Company. If the gas line cannot be expanded in time to meet our startup date, the Mini Cassia facility will request a one year extension to comply with the boiler MACT compliance deadline.

As previously discussed with IDEQ, utilizing natural gas only in the facility boilers will also need to be incorporated in the Tier I Operating Permit (No.T1-030416). Due to the significant emissions reductions associated with switching from coal to gas, TASCO will request under a separate submittal the elimination of Compliance Schedule Item 13 of the Tier I Operating Permit, regarding previous equipment and emissions changes at the facility. Based on preliminary emissions estimates, firing natural gas in the boilers will result in significant emissions reductions compared to historic baseline emissions and addresses the Compliance Schedule Item 13 requirements. TASCO requests to meet with IDEQ to discuss the permitting strategy for modifying the Tier I Operating Permit.

If you have any questions, feel free to contact Karen Cummings at (208) 438-2115 or Dean C. DeLorey at (208) 383-6500.

Sincerely,

Larry Lloyd

Larry Lloyd
Plant Manager
Mini Cassia Facility

LL/dd/ss

Cc: IDEQ – Twin Falls Regional Office – Bobby Dye
Boise Office – Joe Huff, John McCreedy, Dean DeLorey
Mini Cassia Office – Karen Cummings

Permit to Construct (PTC) Application
B&W Boiler Natural Gas Conversion Project
Mini Cassia Facility
December 2013

Section 1
IDEQ Permit Application Forms

Section 1 – IDEQ Permit Forms

The following IDEQ Permit Forms are included with this Permit to Construct Application:

Form CSPTC – Cover Sheet for Air Permit Application
Form GI – General Information
Form EU0 – Emission Unit – *Babcock & Wilcox (B&W) Boiler*
Form EU5 – Industrial Boiler Information
Form MI2 – Modeling Information – Point Source Stack Parameters
Form FRA – NSPS/NESHAPS Regulatory Review and Applicability Form
Emissions Inventory Summary Forms:

- Facility Wide PTE
- Proposed Modification at a Major Facility Inventory (Non-PSD)
- Toxic Air Pollutant Inventory
- Hazardous Air Pollutant Inventory

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

General Information **Form GI**
Revision 7
1/15/10

Please see instructions on page 2 before filling out the form.

All information is required. If information is missing, the application will not be processed.

IDENTIFICATION	
1. Company Name	The Amalgamated Sugar Company LLC
2. Facility Name (if different than #1)	Mini Cassia Facility
3. Brief Project Description:	B&W Boiler Natural Gas Conversion Project

FACILITY INFORMATION	
4. Owned/operated by: (√ if applicable)	☐ Federal government ☐ County government ☐ State government ☐ City government
5. Primary Facility Permit Contact Person/Title	Larry Lloyd, Plant Manager
6. Telephone Number and Email Address	(208) 438-2115 - llloyd@amalsugar.com
7. Alternate Facility Contact Person/Title	Karen Cummings, Plant Environmental Engineer Manager
8. Telephone Number and Email Address	(208) 438-2115 - kcummings@amalsugar.com
9. Address to which permit should be sent	P.O. Box 700
10. City/County//State/Zip	Paul, Minidoka County, Idaho 83347
11. Equipment Location Address (if different than #10)	50 South 500 West
12. City/County//State/Zip	Paul, Minidoka County, Idaho 83347
13. Is the Equipment Portable?	☐ Yes ☒ No
14. SIC Code(s) and NAICS Code	**Primary SIC:** 2063 **Secondary SIC (if any):** **NAICS:**
15. Brief Business Description and Principal Product	Beet Sugar Manufacturing
16. Identify any adjacent or contiguous facility that this company owns and/or operates	None

PERMIT APPLICATION TYPE	
17. Specify Reason for Application	☒ Permit to Construct (PTC) For Tier I permitted facilities only: if you are applying for a PTC then you must also specify how the PTC will be added to the Tier I permit. ☐ Add PTC at time of Tier I renewal ☐ Co-process Tier I Modification & PTC ☒ Administratively amend Tier I to add PTC upon your request (IDAPA 58.01.01.209.05. a, b or c) ☐ Tier I Permit ☐ Tier II Permit ☐ Tier II/Permit to Construct

CERTIFICATION

IN ACCORDANCE WITH IDAPA 58.01.01.123 (RULES FOR THE CONTROL OF AIR POLLUTION IN IDAHO), I CERTIFY BASED ON INFORMATION AND BELIEF FORMED AFTER REASONABLE INQUIRY, THE STATEMENTS AND INFORMATION IN THE DOCUMENT ARE TRUE, ACCURATE, AND COMPLETE.

18. Responsible Official's Name/Title	Larry Lloyd, Plant Manager	
19. RESPONSIBLE OFFICIAL SIGNATURE	Larry Lloyd	Date: 12/31/13
20. ☒ Check here to indicate you would like to review a draft permit prior to final issuance.		

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Cover Sheet for Air Permit Application – Permit to Construct Form CSPTC

Please see instructions on page 2 before filling out the form.

COMPANY NAME, FACILITY NAME, AND FACILITY ID NUMBER			
1. Company Name	The Amalgamated Sugar Co. LLC (TASCO)		
2. Facility Name	Mini Cassia	3. Facility ID No.	067-00001
4. Brief Project Description - One sentence or less	B&W Boiler Natural Gas Conversion Project		

PERMIT APPLICATION TYPE

5. ☐ New Source ☐ New Source at Existing Facility ☐ PTC for a Tier I Source Processed Pursuant to IDAPA 58.01.01.209.05.c
☐ Unpermitted Existing Source ☐ Facility Emissions Cap ☒ Modify Existing Source: Permit No.: T1-030416 Date Issued: 9/23/2005
☐ Required by Enforcement Action: Case No.:

6. ☒ Minor PTC ☐ Major PTC

FORMS INCLUDED

Included	N/A	Forms	DEQ Verify
X	☐	Form CSPTC – Cover Sheet	☐
X	☐	Form GI – Facility Information	☐
X	☐	Form EU0 – Emissions Units General	☐
☐	X	Form EU1– Industrial Engine Information Please specify number of EU1s attached:	☐
☐	X	Form EU2– Nonmetallic Mineral Processing Plants Please specify number of EU2s attached:	☐
☐	X	Form EU3– Spray Paint Booth Information Please specify number of EU3s attached:	☐
☐	X	Form EU4– Cooling Tower Information Please specify number of EU3s attached:	☐
X	☐	Form EU5 – Boiler Information Please specify number of EU4s attached:	☐
☐	X	Form CBP– Concrete Batch Plant Please specify number of CBPs attached:	☐
☐	X	Form HMAP – Hot Mix Asphalt Plant Please specify number of HMAPs attached:	☐
☐	X	PERF – Portable Equipment Relocation Form	☐
☐	X	Form AO – Afterburner/Oxidizer	☐
☐	X	Form CA – Carbon Adsorber	☐
☐	X	Form CYS – Cyclone Separator	☐
☐	X	Form ESP – Electrostatic Precipitator	☐
☐	X	Form BCE– Baghouses Control Equipment	☐
☐	X	Form SCE– Scrubbers Control Equipment	☐
☐	X	Form VSCE – Venturi Scrubber Control Equipment	☐
☐	X	Form CAM – Compliance Assurance Monitoring	☐
X	☐	Forms EI-CP1 - EI-CP4– Emissions Inventory– criteria pollutants (Excel workbook, all 4 worksheets)	☐
X	☐	PP – Plot Plan	☐
☐	X	Forms MI1 – MI4 – Modeling (Excel workbook, all 4 worksheets)	☐
X	☐	Form FRA – Federal Regulation Applicability	☐

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Emissions Unit - General **Form EU0**
Revision 4
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name:	2. Facility Name:	3. Facility ID No:
The Amalgamated Sugar Co. LLC	Mini Cassia	067-00001

4. Brief Project Description: B&W Boiler Natural Gas Conversion Project

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION

5.	Emissions Unit (EU) Name:	BACOCK & WILCOX (B&W) BOILER
6.	EU ID Number:	S-B1
7.	EU Type:	☐ New Source ☐ Unpermitted Existing Source ☒ Modification to a Permitted Source -- Previous Permit #: Date Issued:
8.	Manufacturer:	BABCOCK & WILCOX
9.	Model:	STIRLING
10..	Maximum Capacity:	STEAM - 190,000 LBS/H
11.	Date of Construction:	1951
12.	Date of Modification (if any):	NONE
13.	Is this a Controlled Emission Unit?	☒ No ☐ Yes If Yes, complete the following section. If No, go to line 22.

EMISSIONS CONTROL EQUIPMENT

14. Control Equipment Name and ID:	None
15. Date of Installation:	NA 16. Date of Modification (if any):
17. Manufacturer and Model Number:	NA
18. ID(s) of Emission Unit Controlled:	NA
19. Is operating schedule different than emission units(s) involved?	☐ Yes ☒ No
20. Does the manufacturer guarantee the control efficiency of the control equipment?	☐ Yes ☒ No (If Yes, attach and label manufacturer guarantee)

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency	0	0	0	0	0	0

21. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency. See narrative discussion in Section 5 - Emissions Estimates of this application.

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)

22.	Actual Operation:	24 HOURS PER DAY, 200 DAYS PER YEAR
23.	Maximum Operation:	24 HOURS PER DAY, 365 DAYS PER YEAR

REQUESTED LIMITS

24. Are you requesting any permit limits? ☐ Yes ☒ No (If Yes, indicate all that apply below)

- ☐ Operation Hour Limit(s):
- ☐ Production Limit(s):
- ☐ Material Usage Limit(s):
- ☐ Limits Based on Stack Testing: Please attach all relevant stack testing summary reports
- ☐ Other:

25. Rationale for Requesting the Limit(s):

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Air Permit Hotline – 1-877-5PERMIT

Emissions Units - Industrial Boiler Information **Form EU5**
Revision 5
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name:	2. Facility Name:	3 Facility ID No:
The Amalgamated Sugar Co. LLC (TASCO)	Mini Cassia	067-00001

4. Brief Project Description: B&W Boiler Natural Gas Conversion Project

EXEMPTION

Please see IDAPA 58.01.01.222 for a list of industrial boilers that are exempt from Permit to Construct requirements.

BOILER (EMISSION UNIT) DESCRIPTION AND SPECIFICATIONS

5. Type of Request: ☐ New Unit ☐ Unpermitted Existing Unit ☒ Modification to a Unit with Permit #:067-00001

6. Use of Boiler: ☒ % Used For Process ☐ % Used For Space Heat ☒ % Used For Generating Electricity ☐ Other:

7. Boiler ID Number: Contract #39746	8. Rated Capacity: ☒ 244 Million British Thermal Units Per Hour (MMBtu/hr) ☒ 190 1,000 Pounds Steam Per Hour (1,000 lb steam/hr)	
9. Construction Date: 1951	10. Manufacturer: Babcock & Wilcox	11. Model: Stirling
12. Date of Modification (if applicable): None	13. Serial Number (if available): None	14. Control Device (if any): **Note: Attach applicable control equipment form(s)**

FUEL DESCRIPTION AND SPECIFICATIONS

15. Fuel Type	☐ Diesel Fuel (#) (gal/hr)	☒ Natural Gas (cf/hr)	☐ Coal (unit: /hr)	☐ Other Fuels (unit: /hr)
16. Full Load Consumption Rate		244000		
17. Actual Consumption Rate		225000		
18. Fuel Heat Content (Btu/unit, LHV)		1000		
19. Sulfur Content wt%		Negligible		
20. Ash Content wt%		N/A		

STEAM DESCRIPTION AND SPECIFICATIONS

21. Steam Heat Content	NA	NA		
22. Steam Temperature (°F)	N/A	N/A		
23. Steam Pressure (psi)	N/A	N/A		
24 Steam Type	N/A	N/A	☐ Saturated ☐ Superheated	☐ Saturated ☐ Superheated

OPERATING LIMITS & SCHEDULE

25. Imposed Operating Limits (hours/year, or gallons fuel/year, etc.):	None
26. Operating Schedule (hours/day, months/year, etc.):	24h/d, 12mo/y

27. NSPS Applicability: ☒ Yes ☐ No If Yes, which subpart: Subpart Db

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PERMIT TO CONSTRUCT APPLICATION

Revision 3
3/27/2007

Please see instructions on page 2 before filling out the form.

Company Name:	The Amalgamated Sugar Company LLC
Facility Name:	Mini-Cassia Facility
Facility ID No.:	067-00001
Brief Project Description:	B&W Boiler Natural Gas Conversion Project

POINT SOURCE STACK PARAMETERS

1.	2.	3a.	3b.	4.	5.	6.	7.	8.	9.	10.
Emissions units	**Stack ID**	**UTM Easting (m)**	**UTM Northing (m)**	**Base Elevation (m)**	**Stack Height (m)**	**Modeled Diameter (m)**	**Stack Exit Temperature (K)**	**Stack Exit Flowrate (acfm)**	**Stack Exit Velocity (m/s)**	**Stack orientation (e.g., horizontal, rain cap)**
Point Source(s)										
New B&W Boiler Stack (Nat.Gas)	P-B1	273,809.9	4,721,194.8	1,264.00	21.0	1.83	466.50	105,000.00	18.84	Vertical, no rain cap
(insert more rows as needed)										

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Air Permit Hotline – 1-877-5PERMIT

AIR PERMIT APPLICATION

Revision 6
10/7/09

For each box in the table below, CTRL+click on the blue underlined text for instructions and information.

IDENTIFICATION	
1. Company Name: The Amalgamated Sugar Co. LLC	2. Facility Name: Mini Cassia Facility
3. Brief Project Description: B&W Boiler Natural Gas Conversion Project	

APPLICABILITY DETERMINATION	
4. List applicable subparts of the New Source Performance Standards (NSPS) (40 CFR part 60). Examples of NSPS affected emissions units include internal combustion engines, boilers, turbines, etc. The applicant must thoroughly review the list of affected emissions units.	List of applicable subpart(s): 40 CFR Part 60 Subpart Db Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units ☐ Not Applicable
5. List applicable subpart(s) of the National Emission Standards for Hazardous Air Pollutants (NESHAP) found in 40 CFR part 61 and 40 CFR part 63. Examples of affected emission units include solvent cleaning operations, industrial cooling towers, paint stripping and miscellaneous surface coating. EPA has a web page dedicated to NESHAP that should be useful to applicants.	List of applicable subpart(s): 40 CFR Part 63 Subpart DDDDD NESHAPs for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers & Process Heaters ☐ Not Applicable
6. For each subpart identified above, conduct a complete a regulatory analysis using the instructions and referencing the example provided on the following pages. **Note** - Regulatory reviews must be submitted with sufficient detail so that DEQ can verify applicability and document in legal terms why the regulation applies. Regulatory reviews that are submitted with insufficient detail will be determined incomplete.	☑ A detailed regulatory review is provided (Follow instructions and example). ☐ DEQ has already been provided a detailed regulatory review. Give a reference to the document including the date.

Emissions Inventory

IDEQ Summary Forms

SUMMARY OF FACILITY-WIDE POTENTIAL TO EMIT FOR CRITERIA POLLUTANTS
Mini Cassia Facility

Emissions Unit	PM[a]	SO_2	NO_x	CO	VOC	CO_2	CH_4	N_2O	CO_2e
	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr
Point Sources									
B&W Boiler	100.1	79.2	446.4	113.8	1.7	96120	11	2	96991
Erie City Boiler	118.3	86	575	2.9	4	140041	12	2.1	140967
South Pulp Dryer	78.7	51	146.5	512.4	3.3	41915	5	1.5	42487
North Pulp Dryer	80.8	29.9	145.5	620.1	3.9	49284	6		49434
Pellet Cooler No. 1	1.84								
Pellet Cooler No. 2	1.84								
Pellet Cooler No. 3	1.84								
Eberhardt Kiln	7.06	2.14	46.1	1572.7	2.8	29771	3.3	0.5	30003
Process Slaker	1.05								
Drying Granulator	2.35								
#1 Cooling Granulator	1.18								
#2 Cooling Granulator	1.18								
Sugar Handling(Process)	1.31								
Sugar Handling(Bulk Loading)	1.31								
Main Mill					132.3				
Sulfur Stoves	0.15	11.9							
Fugitives									
Coal Unloading Area	0.15								
Coal Storage Area	3.51								
Boiler Coal Unloading area & Haul Road	0.5								
Beet Hauling - West & Loop	3.24								
Beet Hauling - East	4.97								
Beet Hauling - North - East	0.74								
Cooling Towers	4.02								
Dryer Coal Unloading	0.06								
Dried Pulp Storage & Loadout	0.45								
PCC Storage & Handling	3.94								
Totals	420.6	260.1	1359.5	2821.9	148	357131	37.3	6.1	

[a] PM, PM10, PM2.5

Reference: May 2012 No. 6 Evaporator PTC Modification Application

B&W Boiler Natural Gas Conversion Project
Mini Cassia Facility

PROJECTED ACTUAL EMISSIONS *or* PTE FOR PROJECTED ACTUAL EMISSIONS

Emissions Unit	PM[a]	SO_2	NO_x	CO	VOC	LEAD	SULFURIC ACID
	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr
Point Sources							
B&W Boiler - Natural Gas Firing	23.4	0.64	108	79.1	5.91	1.22E-04	0
Total Projected Actual Emissions	23.4	0.64	108	79.1	5.91		

BASELINE ACTUAL EMISSIONS

Emissions Unit	PM[a]	SO_2	NO_x	CO	VOC	LEAD	SULFURIC ACID
	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr
Point Sources							
B&W Boiler - Coal Firing	122	96.7	521	139	1.39	5.27E-03	4.32
Total Baseline Actual Emissions	122	96.7	521	139	1.39		

COMPARISON OF THE PROJECT EMISSIONS INCREASE TO THE SIGNIFICANT EMISSIONS RATE THRESHOLDS

Emissions Unit	PM[a]	SO_2	NO_x	CO	VOC	LEAD	SULFURIC ACID
	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr
Project Emissions Increase	-98.6	-96.06	-413	-59.9	4.52	-5.15E-03	-4.32
PSD Significance Emission Rate (SER) *See 40 CFR 52.21(b)(23)*	15	40	40	100	40	0.6	7
Does the Project Emissions Increase Exceed the Significant Emissions Rate Threshold?	No	No	No	No	No	No	No

[a] PM, PM10, PM2.5

B&W Boiler Natural Gas Conversion Project
Mini Cassia Facility

PROJECTED ACTUAL EMISSIONS *or* PTE FOR PROJECTED ACTUAL EMISSIONS

Emissions Unit	CO_2	CH_4	N_20	CO_2e
	T/yr	T/yr	T/yr	T/yr
Point Sources				
B&W Boiler - Natural Gas Firing	120640	2.3	0.2	120767
Total Projected Actual Emissions	120640	2.3	0.2	120767

BASELINE ACTUAL EMISSIONS

Emissions Unit	CO_2	CH_4	N_20	CO_2e
	T/yr	T/yr	T/yr	T/yr
Point Sources				
B&W Boiler - Coal Firing	112207	13	1.8	113073
Total Baseline Actual Emissions	112207	13	1.8	113073

/PARISON OF THE PROJECT EMISSIONS INCREASE TO THE SIGNIFICANT EMISSIONS RATE THRESHO

Emissions Unit	CO_2	CH_4	N_20	CO_2e
	T/yr	T/yr	T/yr	T/yr
Project Emissions Increase	8433	-10.7	-1.6	7694
PSD Significance Emission Rate (SER) *See 40 CFR 52.21(b)(23)*	NA	NA	NA	75000
Does the Project Emissions Increase Exceed the Significant Emissions Rate Threshold?	NA	NA	NA	No

[a] PM, PM10, PM2.5

PRE- AND POST PROJECT NON-CARCINOGENIC TAP EMISSIONS SUMMARY
POTENTIAL TO EMIT
B & W Boiler Natural Gas Conversion Project
Mini Cassia Facility

Non-Carcinogenic Toxic Air Pollutants (sum of all emissions)	Pre-Project [a] 24-hour Average Emissions Rates for Units at the Facility (lb/h)	Post-Project [b] 24-hour Average Emissions Rates for Units at the Facility (lb/h)	Change in 24-hour Average Emissions Rates for Units at the Facility (lb/h)	Non-Carcinogenic Screening Emission Level (lb/h)	Exceeds Screening Level? (Y/N)
Acetophenone	1.88E-04		-1.88E-04	none	NO
Acrolein	3.64E-03		-3.64E-03	1.70E-02	NO
Antimony	2.26E-04		-2.26E-04	3.30E-02	NO
Barium	4.82E-01	1.07E-03	-4.81E-01	3.30E-02	NO
Benzyl Chloride	8.79E-03		-8.79E-03	none	NO
Carbon Disulfide	1.63E-03		-1.63E-03	2.00E+00	NO
2-chloroacetophenone	8.79E-05		-8.79E-05	2.10E-02	NO
Chlorobenzene	2.76E-04		-2.76E-04	2.33E+01	NO
Chromium (total)	3.26E-03	3.41E-04	-2.92E-03	3.30E-02	NO
Cobalt	1.26E-03	2.05E-05	-1.24E-03	3.30E-03	NO
Cumene	6.65E-05		-6.65E-05	1.63E+01	NO
Cyanide	3.14E-02		-3.14E-02	3.33E-01	NO
Dichlorobenzene	0.00E+00	2.92E-04	2.92E-04	3.00E+01	NO
2,4-Dinitrotoluene	3.52E-06		-3.52E-06	none	NO
Dimethyl Sulfate	6.03E-04		-6.03E-04	none	NO
Ethyl Benzene	1.18E-03		-1.18E-03	2.90E+01	NO
Ethyl Chloride	5.27E-04		-5.27E-04	1.76E+02	NO
Ehtylene Dichloride	5.02E-04		-5.02E-04	2.67E+00	NO
Fluorides, as F	7.53E-02		-7.53E-02	1.67E-01	NO
Hexane	8.41E-04	4.38E-01	4.38E-01	1.20E+01	NO
Hydrogen Chloride	6.64E-02		-6.64E-02	5.00E-02	NO
Hydrogen Fluoride	8.00E-02		-8.00E-02	none	NO
Isophorone	7.28E-03		-7.28E-03	1.87E+00	NO
Lead	5.27E-03	1.22E-04	-5.15E-03	none	NO
Magnesium	1.38E-01		-1.38E-01	6.67E-01	NO
Manganese	6.15E-03	9.26E-05	-6.06E-03	3.33E-01	NO
Mercury	1.04E-03	6.33E-05	-9.79E-04	none	NO
Methyl Bromide	2.01E-03		-2.01E-03	1.27E+00	NO
Methyl Chloride	6.65E-03		-6.65E-03	6.87E+00	NO
Methyl Ethyl Ketone	4.90E-03		-4.90E-03	3.93E+01	NO
Methyl Methacylate	2.51E-04		-2.51E-04	2.73E+01	NO
Methyl Tert Butyl Ether	4.39E-04		-4.39E-04	none	NO
Napthalene	1.63E-04		-1.63E-04	3.33E+00	NO
Pentane	0.00E+00	6.33E-01	6.33E-01	1.18E+02	NO
Phenol	2.01E-04		-2.01E-04	1.27E+00	NO
Propionaldehyde	4.77E-03		-4.77E-03	2.87E-02	NO
Selenium	1.63E-02	5.85E-06	-1.63E-02	1.30E-02	NO
Styrene	3.14E-04		-3.14E-04	6.67E+00	NO
Sulfuric Acid	4.32E+00		-4.32E+00		NO
Toluene	3.01E-03	8.28E-04	-2.19E-03	2.50E+01	NO
Xylene (total)	4.65E-04		-4.65E-04	2.90E+01	NO
Vinyl Acetate	9.54E-05		-9.54E-05	none	NO

[a] Coal Fired

[b] Natural Gas Fired

PRE- AND POST PROJECT CARCINOGENIC TAP EMISSIONS SUMMARY
POTENTIAL TO EMIT

Carcinogenic Toxic Air Pollutants (sum of all emissions)	Pre-Project [a] 24-hour Average Emissions Rates for Units at the Facility (lb/h)	Post-Project [b] 24-hour Average Emissions Rates for Units at the Facility (lb/h)	Change in 24-hour Average Emissions Rates for Units at the Facility (lb/h)	Carcinogenic Screening Emission Level (lb/h)	Exceeds Screening Level? (Y/N)
Acetaldehyde	7.16E-03		-7.16E-03	3.00E-03	NO
Arsenic Compounds	7.79E-02	4.87E-05	-7.79E-02	1.50E-06	NO
Benzene	2.47E-01	5.12E-04	-2.46E-01	8.00E-04	NO
Beryllium Compounds	3.99E-03	2.92E-06	-3.99E-03	2.80E-05	NO
Bis (2-ethylhexyl) phthalate	9.17E-04		-9.17E-04	2.80E-02	NO
Cadmium Compounds	9.69E-03	2.68E-04	-9.42E-03	3.70E-06	NO
Chloroform	7.41E-04		-7.41E-04	2.80E-04	NO
Chromium 6+ Compounds	9.92E-04	3.41E-04	-6.51E-04	5.60E-07	NO
Ethylene Dibromide	1.51E-05		-1.51E-05	3.00E-05	NO
Formaldehyde	3.01E-03	1.83E-02	1.53E-02	5.10E-04	YES
Methyl Hydrazine	2.13E-03		-2.13E-03	2.20E-05	NO
Methylene Chloride	5.51E-02		-5.51E-02	1.60E-03	NO
Nickel	5.32E-02	5.12E-04	-5.27E-02	2.70E-05	NO
PAHs	3.95E-03	2.03E-05	-3.93E-03	9.10E-05	NO
POM	2.61E-04	2.03E-05	-2.41E-04		NO
Tetrachloroethylene	5.40E-04		-5.40E-04	1.30E-02	NO
1,1,1 - Trichloroethane	2.51E-04		-2.51E-04	4.20E-04	NO

[a] Coal Fired

[b] Natural Gas Fired

Facility HAP Potential to Emit
Emissions Summary

HAP Pollutants	PTE (t/y)
Acetaldehyde	7.96
Acrolein	1.86
Formaldehyde	1.82
Methanol	84.02
Arsenic	0.03
Benzene	0.09
Beryllium	0.00
Cadmium	0.09
Chromium	0.02
Cyanide	0.19
Hydrochloric Acid	0.15
Hydrogen Fluoride	0.46
Lead	0.03
Manganese	0.04
Mercury	0.01
Nickel	0.02
Selenium	0.10
Toluene	0.02
Xylenes	0.00
PAH and other HAPs	0.27

Section 2
Project Description & Emission Sources

Section 2
Process Description
B&W Boiler Natural Gas Conversion Project
Mini Cassia Facility

The purpose of this project is to convert the B&W Boiler from coal firing to natural gas firing only to ensure compliance with the Industrial Boiler MACT requirements as outlined in Section 4 of this application.

FACILITY DESCRIPTION

The Mini Cassia sugar beet processing facility produces refined granulated sugar and other related products for commercial and retail markets. The Mini Cassia factory is located ~ 1 mile east of Paul, Idaho. The facility was constructed in 1917 and is currently owned by the Snake River Sugar Company, a cooperative of sugar beet growers. The Mini Cassia factory is a seasonal operation. The size and quality of the beet crop can vary significantly each year as a result of many factors including weather conditions and availability of irrigation water. The annual beet crop is harvested and processed during fall and winter.

Operations can be divided into the beet end and sugar end processes. Beet end processes consist of : 1) Beet cleaning to remove dirt and trash; 2) Slicing and diffusion to extract raw sugar juices; 3) Juice purification to remove non sugars; and 4) Evaporation to concentrate purified sugar juices into thick juice which is transferred to the sugar end or to storage tanks. Other beet end processes include the: boiler house produces steam to evaporate water, heat sugar juices and produce a portion of onsite power; sugar beet pulp pressing, drying and pelletizing for animal feed; and lime and CO_2 production for the juice purification process. Within the sugar end, purified and concentrated thick juices are processed into granulated sugar and molasses. Granulated sugar is stored and then either shipped to customers in bulk or in packages of various sizes. Molasses is stored and then shipped off-site for further processing.

There are two distinctive processing periods for the Mini Cassia facility. During the beet run, the entire facility is in full operation including all beet and sugar end processing equipment. Following the beet run, only a small portion of the facility is in operation. During this operating period known as the juice run, only the sugar end equipment is operated to process thick juice from storage or juice transferred from other facilities into sugar.

BOILER HOUSE & STEAM PRODUCTION PROCESS

The boiler house provides steam primarily for evaporation processes within the main mill and electricity generation for onsite uses. The boiler house consists of a stoker fired Babcock & Wilcox boiler, fired by coal; the Erie City boiler, fired by pulverized coal and/or natural gas; and if necessary, the natural gas fired Nebraska for back up purposes. When firing coal, emissions from the B&W and Erie City boilers are controlled by multiclones and wet scrubbers, in series. Electricity is co-generated by first passing high pressure steam through turbine generators. From the turbines, lower pressure steam is directed to the main mill for process uses. Table 1 provides a summary description of each boiler at the Mini Cassia facility.

Table 1. EXISTING BOILERS – MINI CASSIA FACILITY

Parameters	B&W Boiler	Erie City	Nebraska[a]
Fuel	Coal	Coal/Gas	Gas
Steam Type	Superheated	Superheated	Saturated
Maximum Capacity (Klbs/h)	190	250 (gas) 200 (coal)	200
Pressure (psig)	200	400	200
Temperature (°F)	450	625	400
Emissions Controls	Multiclone/Scrubber[b]	Multiclone/Scrubber[b]	None

[a] Backup boiler
[b] Coal-firing only

PROJECT DESCRIPTION

The Mini Cassia facility is proposing to replace the B&W boiler coal firing system and associated equipment with a new natural gas firing system. The stoker grate system will be removed and replaced with two wall-fired natural gas burners located on the same side of the firebox. Exhaust gases from the B&W boiler will pass through the economizer and then out through a new stack. The wet scrubber will not need to be utilized for natural gas firing. As discussed in Section 4, the new natural gas burners manufactured by Coen, will be designed to meet the NOx emissions standards required by the New Source Performance Standard for Industrial, Commercial and Institutional Boilers (40 CFR 60 Subpart Db).

A comparison of B&W boiler operations before and after the natural gas conversion project is provided in Table 2 below:

Table 2. B&W BOILER COAL FIRING vs NATURAL GAS FIRING PRODUCTION COMPARISONS

Parameter	Coal	Natural Gas
Maximum Heat Input (MMBtu/h)	245	244[a]
Coal Input (tons/h)	13	None
Natural Gas Input (cf/h)	None	244,000

[a] 2 burners each at 122 MMBtu's per hour.

Following the conversion from coal to natural gas, the B&W boiler coal handling system including the coal transfer points, elevators and conveyors, will no longer be operated.

As recently discussed with IDEQ and Section 4 of this application, by the January 31, 2016 Boiler MACT compliance deadline, the Mini Cassia facility is planning to also fire the Erie City Boiler with natural gas only. With this additional commitment, all boilers will be fired with natural gas. In addition to significant point source combustion gas emissions reductions, fugitive dust emissions from boiler coal handling will be eliminated. Other benefits include the elimination of coal ash and flue gas desulfurization handling systems.

Section 3
Process Flow Diagram & Plot Plans

Section 3
Factory Layout & Process Flow Diagrams

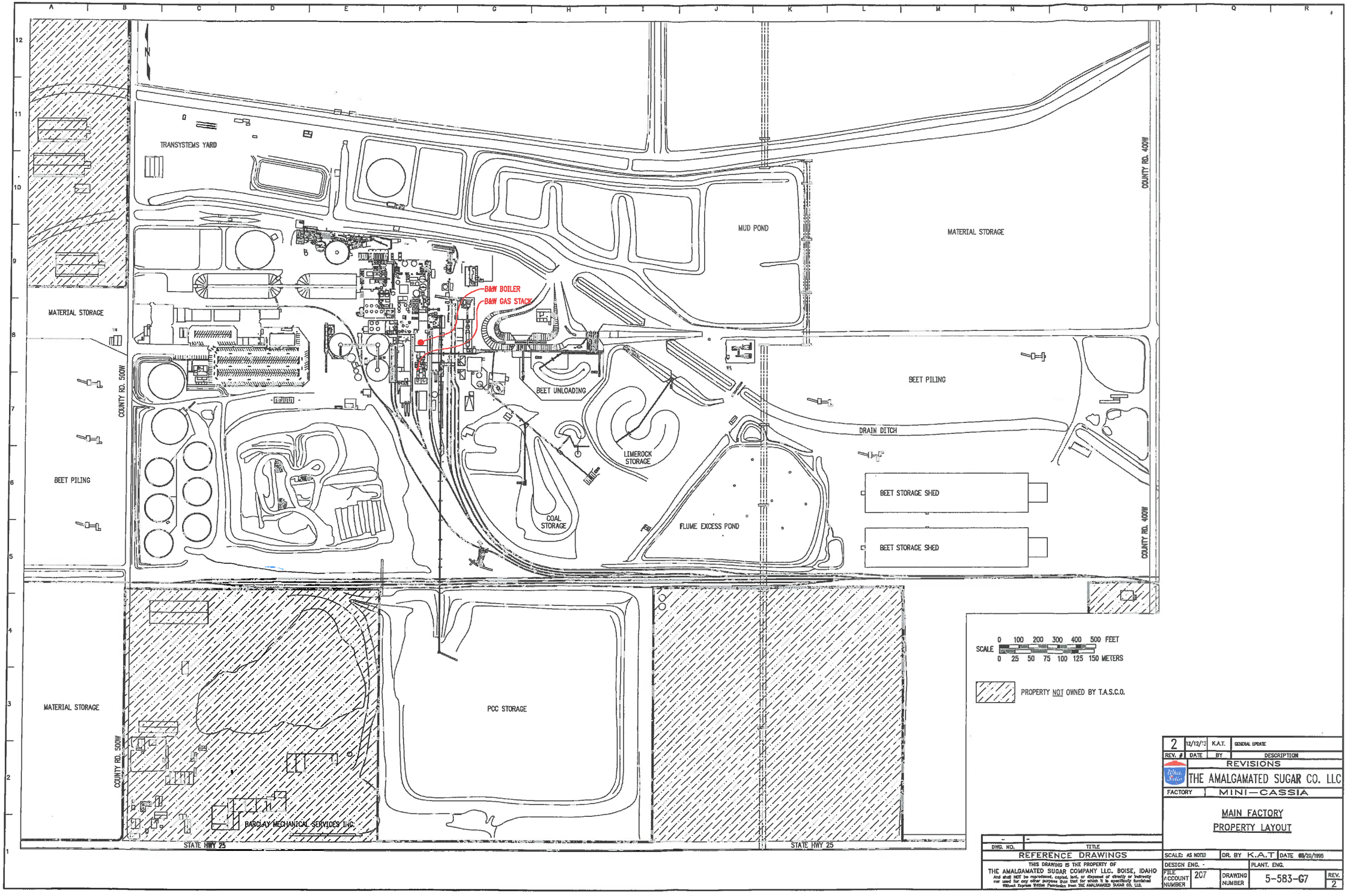
The following process flow diagrams are included in the application:

Figure 1 – MINI CASSIA PLANT FACTORY LAYOUT
Figure 1 is a general layout of the facility and identifies the B&W boiler.

Figure 2 – STACK LOCATION
Figure 2 is a general plan view identifying the location of the new B&W boiler stack.

Figure 3 – EXISTING AND PROPOSED PROCESS FLOW DIAGRAMS
Figure 3 shows the process flow diagrams for the existing stoker coal-fired B&W boiler/emissions control system which will be decommissioned and proposed diagram for natural gas firing.

Figure 1 – Mini Cassia Factory Layout



REV. #	DATE	BY	DESCRIPTION
2	12/12/13	K.A.T.	GENERAL UPDATE

REVISIONS

THE AMALGAMATED SUGAR CO. LLC

FACTORY: MINI-CASSIA

MAIN FACTORY PROPERTY LAYOUT

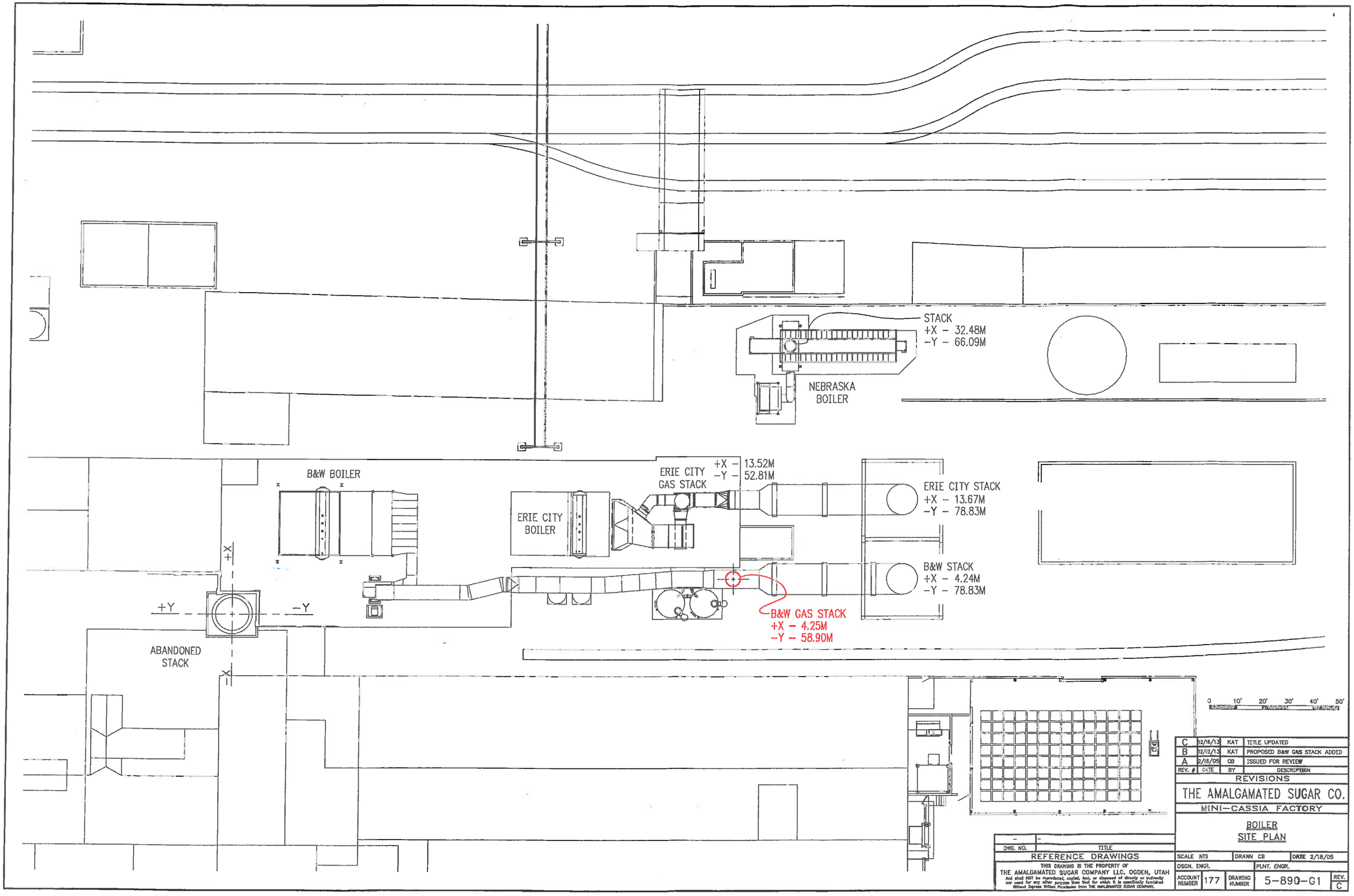
DWG. NO.	TITLE
-	-
REFERENCE DRAWINGS	

SCALE: AS NOTED | DR. BY K.A.T | DATE 05/20/1995

DESIGN ENG. - | PLANT. ENG.

FILE & ACCOUNT NUMBER: 207 | DRAWING NUMBER: 5-583-G7 | REV. 2

Figure 2 – B&W Boiler New Stack Location



REV. #	DATE	BY	DESCRIPTION
C	12/16/13	KAT	TITLE UPDATED
B	12/02/13	KAT	PROPOSED B&W GAS STACK ADDED
A	2/18/05	CB	ISSUED FOR REVIEW

REVISIONS

THE AMALGAMATED SUGAR CO.

MINI-CASSIA FACTORY

BOILER
SITE PLAN

DWG. NO.	TITLE
–	–
REFERENCE DRAWINGS	

SCALE NTS | DRAWN CB | DATE 2/18/05

DSGN. ENGR. | PLNT. ENGR.

ACCOUNT NUMBER 177 | DRAWING NUMBER 5-890-G1 | REV. C

Figure 3 – Existing & Proposed B&W Boiler Process Flow Diagram

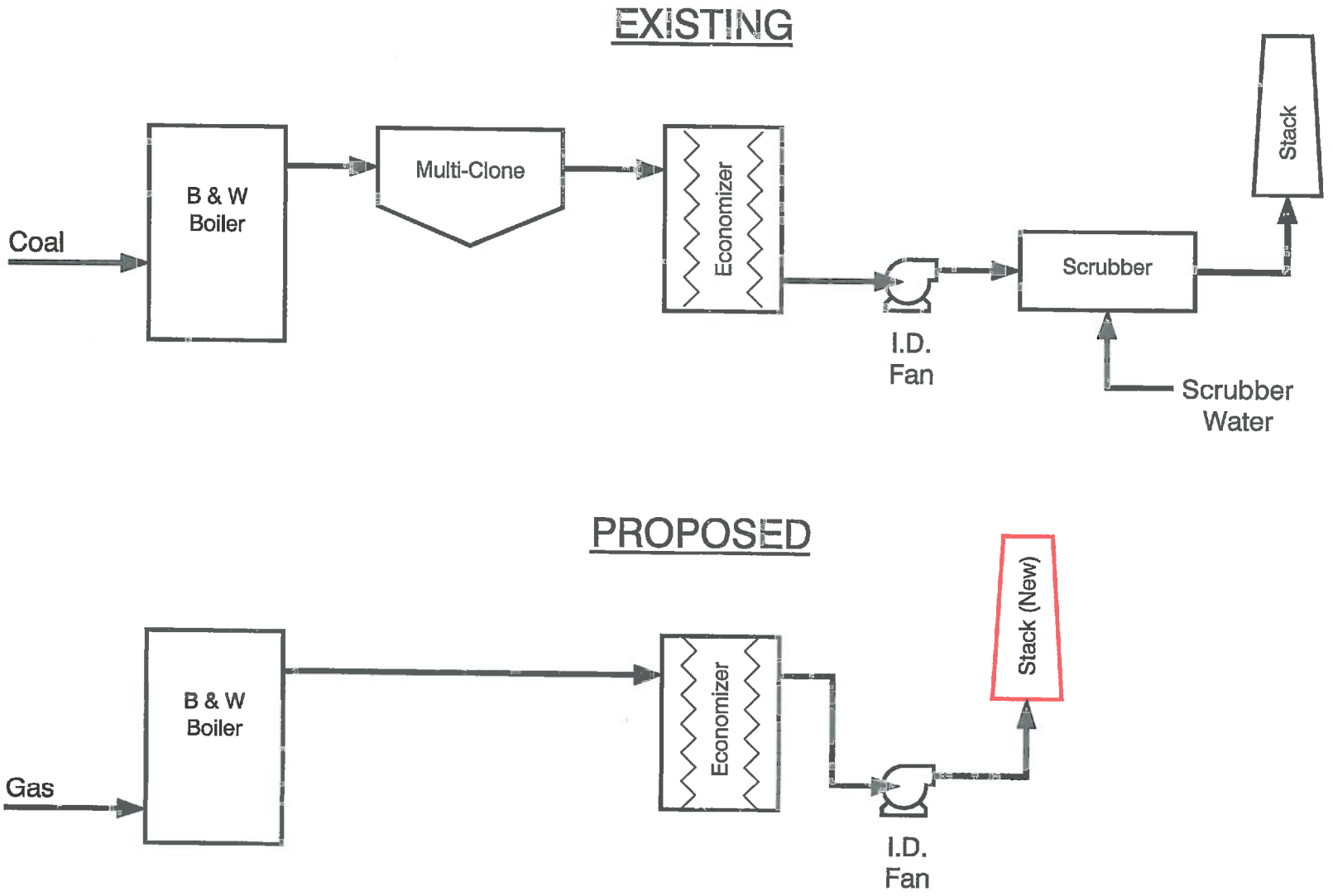


Figure -2-

White Satin	THE AMALGAMATED SUGER CO. LLC.	B&W BOILER NATURAL GAS CONVERSION PROJECT PROCESS FLOW DIAGRAM
FACTORY	MINI-CASSIA	

Section 4
Applicable Requirements

Section 4
Regulatory Analysis & Applicable Requirements

This section provides an analysis of Federal and Idaho State air quality regulations which apply to the B&W boiler natural gas conversion project. For this project, TASCO has conducted a detailed analysis of EPA's New Source Performance Standards (NSPS) and National Emissions Standards for Hazardous Air Pollutants (NESHAP's). A Prevention of Significant Deterioration (PSD) evaluation is also provided for overall facility-wide emissions before and after the project. Applicable requirements for the Rules for the Control of Air Pollution in Idaho were also evaluated along with requirements of IDEQ issued construction and operating permits.

Federal NSPS Requirements

General provisions of the Federal NSPS for this project are covered under 40 CFR 60 Subpart A, Sections 60.1 through 60.14. For the purposes of this PTC application, the conversion of the B&W boiler from coal to gas is considered as a modification to an existing source. However, emissions will decrease as a result of this physical change. General notification (60.7), performance testing (60.8), maintenance (60.11) and monitoring requirements (60.13) are included in this Subpart.

Specific NSPS requirements which apply to the conversion of the B&W boiler from coal to natural gas are referenced in the "Standards of Performance for Industrial – Commercial – Institutional Steam Generating Units (40 CFR 60 Subpart Db)." These requirements apply for industrial boilers with heat inputs greater than 100 MMBtu/h (40 CFR 60.40b). Table 1 below provides a summary of the key NSPS requirements for natural gas-fired boilers:

Table 1. Summary of NSPS Requirements

Section	Description
40 CFR 60.44 b(a)	NO_x emissions limits
40 CFR 60.46 b(c), (e), & (g)	NO_x performance testing requirements
40 CFR 60.48 b(b) thru (f)	NO_x and O_2 (or CO_2) continuous emissions monitoring requirements
40 CFR 60.49b	Reporting & Monitoring Requirements

As shown in Table 1, the NSPS requirements focus on NO_x emissions and associated monitoring requirements. NO_x limits are based on the calculated heat release rate of the boiler furnace as defined in 40 CFR 60.41.b. The calculated heat release rate for the B&W boiler with natural gas

burners is 45,000 Btu/h·ft^3. Calculated values less than or equal to 70,000 Btu/h·ft^3 are categorized as a low heat release furnace. Therefore, as per 40 CFR 60.44.b., the NO_x emissions limit for this natural gas conversion project must not exceed 0.10 lbs per MMBtu heat input. The manufacturer of the B&W gas burners has provided a guarantee to ensure compliance with the NO_x standards. A continuous emissions monitoring system (CEMS) for measuring NO_x and O_2 emissions is also required. Proposed design information for the CEMS will be submitted for review and approval to IDEQ at least 180 days before the B&W boiler begins operation on gas.

Industrial Boiler NESHAP's/MACT

Following the conversion of the B&W boiler from coal to natural gas, only limited requirements of the National Emissions Standards for Hazardous Air Pollutants (NESHAPS) will apply. Applicable requirements for this project are covered under 40 CFR Part 63 Subpart DDDDD (5D) or NESHAPS for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters. These rules (commonly referred to as the industrial Boiler Maximum Achievable Control Technology (MACT) standards) were promulgated on March 21, 2011 with final changes published in the Federal Register on January 31, 2013. As provided to IDEQ in the Tier I Permit application and the Initial Notification to EPA, the Mini-Cassia facility is categorized as a major HAP's source since estimated facility-wide emissions are greater than 10 tons per year of any single hazardous air pollutant (HAP) and 25 or more tons per year of any combination of HAP (see Section 5.5 for facility HAP's emissions estimates). The B&W boiler is an industrial boiler as defined in 40 CFR 63.7575 and is therefore subject to the rule under 63.7485. With a heat input greater than 10 MMBtu/hr, it is categorized as a large fuel boiler. Following the conversion and installation of gas burners on the B&W boiler, the Mini Cassia facility will be required to notify EPA within 120 days as specified in 63.9(b)(2); 63.7545(b) and Table VII of Subpart 5D.

When fired with natural gas, the B&W boiler will not be subject to any emission limits, and/or operating limits. In accordance with Subpart 5D, natural gas boilers are subject only to work practice standards including annual tune-ups and a onetime energy assessment. A tune-up of the natural gas burners will be required every 5 years as per 63.7540(a)(12) and Table 3 of the rule[1]. For boiler tune ups only, a compliance report is due every five years. The first 5-year report for the B&W boiler when firing gas must be postmarked by January 31, 2022.

An energy assessment as defined in 63.7575 must be completed by a qualified energy assessor. The scope of the energy assessment is defined in Item 4 in Table 3 of Subpart 5D and includes an evaluation of the boiler efficiencies and potential facility-wide energy conservation measures. Based on an estimated combined total boiler heat input of ~ 4.0 T·Btu/y, 48 hours of onsite

[1] The burner tune- up consists of inspecting the flame pattern and system controlling the air to fuel ratios. As needed, adjustments, cleaning or replacements are required in order to optimize CO and NO_x emissions.

technical labor hours are required for this assessment. The assessment is required to be completed by the January 31, 2016 compliance deadline[2], as per 63.7495(b) and 63.7510(e).

PSD Regulatory Analysis

Prevention of Significant Deterioration regulations (40 CFR 52.21) including net emissions changes were evaluated for this project. The Mini Cassia facility is an existing major emissions source (see Section 5.1 for facility-wide emissions estimates). Therefore, a "project", as defined by 52.21(b)(52) means a "physical change in, or change in the method of operation of, an existing major stationary source." Conversion of the B&W boiler from coal to gas firing is a physical change to an existing source. In order to quantify the net emissions reductions, baseline versus projected actual emissions estimates have been calculated. Net emissions decreases associated with B&W boiler natural gas conversion project were calculated based on PSD regulatory procedures for major modifications determinations[3].

Baseline actual emissions for calculating the net emission increase for this request is defined in 40 CFR Part 52.21(b)(48)(ii). The Baseline actual emissions are defined as the average rate in tons per year, at which the emission units actually emitted the pollutant during a 24-month consecutive period during past 10 year period. The 24 month period selected for this analysis is the average for the 2006 and 2007 beet campaigns (including juice runs). Projected actual emissions are based on the definition in 40 CFR 52.21(b)(41) and conservatively assuming that boiler natural gas firing will occur for 8760 hours per year. Table 2 provides net emissions changes for the B&W boiler only for conversion from stoker coal to natural gas.

[2] Unless a one-year extension is granted by IDEQ.

[3] As per the PSD regulations, a project is a major modification for a regulated NSR pollutant if it causes two types of emissions increases: 1) A significant emissions increase and 2) A significant net emissions increase. The regulations specify a two part test to make this determination. The first test is to determine if the project will cause a significant emissions increase as specified in 52.21(a)(2)(iv)(b) through (f). The second test, if required, is used to determine if the project will cause a significant net emissions increase, specified in 52.21(a)(2)(iv)(b) and 52.21 (b)(3). Future projected actual emissions (PAE) and baseline actual emissions (BAE) are compared to determine whether a significant emissions increase would occur in accordance with 40 CFR 52.21(a)(2)(iv)(c). Contemporaneous emissions increases and/or decreases of actual emissions resulting other projects are also considered.

Table 2. B&W Boiler Baseline Actual Emissions (BAE) vs. Predicted Actual Emissions (PAE)

Type of Emissions	PM[a] (t/y)	NO_x (t/y)	SO_2 (t/y)	CO (t/y)	VOC (t/y)	CO_2e (t/y)
Projected Actual	23.4	108	0.64	79.1	5.91	113,073
Baseline Actual	122	521	96.7	139	1.39	120,767
Net Change	-98.6	-413	-96.1	-59.9	4.52	7,694
PSD Significant Emission Rate	15	40	40	100	40	75,000
Significant	No	No	No	No	No	No

[a] PM, PM_{10}, $PM_{2.5}$

As shown, significant decreases in criteria pollutants will occur from this project with the exception of a small increase in VOC's. Overall, criteria pollutant emissions are estimated to decrease by over 900 tons per year. CO_2e increases are only due to the permitting assumption that the B&W boiler will operate 8760 hours per year. Actual operations will be far less than 8760 hours per year. As a result, actual CO_2e will decrease when the B&W boiler fires natural gas only.

Net decreases in future facility wide emissions are shown in Table 3. By the Boiler MACT compliance deadline the Mini Cassia facility is committed to firing natural gas on both the B&W and Erie City boilers. Future projected actual emissions reflect all boilers firing natural gas and conservatively assumes 8760 hours of operation (PTE).

Table 3. – Facility Wide Baseline Actual Emissions (BAE) vs. Projected Actual Emissions (PAE)

Type of Emissions	PM[a] (t/y)	NO_x (t/y)	SO_2 (t/y)	CO (t/y)	VOC (t/y)	CO_2e (t/y)
Projected Actual	258	856	127	2,905	156	401,613
Baseline Actual	425	1,368	298	3,007	126	328,743
Net Change	-167	-512	-171	-120	+30	72,870
PSD Significant Emission Rate	15	40	40	100	40	75,000
Significant	No	No	No	No	No	No

[a] PM, PM_{10}, $PM_{2.5}$

Again, overall emissions are expected to decrease significantly, with the exception of VOC's. The VOC increase was previously approved by IDEQ as part of the revised No. 6 Evaporator Permit to Construct issued on issued on June 11, 2012. As discussed above, CO_2e increases are based on the PTE permitting assumption only. Actual facility-wide CO_2e emissions are expected to decrease.

Supporting documentation for the annual baseline actual emissions, future projected actual emissions and net emissions changes are provided in Section 5. These spreadsheets, which have

also been provided electronically, include the emission estimates, emission factors and production data. Greenhouse gas emission estimates are also provided.

State of Idaho Requirements

This application has been prepared in accordance with the Permit to Construct (PTC) requirements in IDAPA 58.01.01.200. Following the conversion to natural gas, emissions from the B&W boiler are expected to be well below Idaho's particulate (IDAPA 58.01.01.677) and opacity (IDAPA 58.01.01.625) standards.

In accordance with Idaho's Toxic Air Pollutant (TAP's) preconstruction standards (IDAPA 58.01.01.210), net emissions changes for this project were calculated. A listing of TAP's and emissions calculations is provided in Section 5.2.3 of this application. As shown, overall TAP's will decrease when firing natural gas versus coal. Based on EPA emissions factors and other assumptions, overall TAP's emissions are expected to decrease by ~ 80%. Using very limited and low quality EPA AP-42 emissions factors, estimated formaldehyde emissions are estimated to increase by 0.0153 lbs/h. As per 58.01.01.586, the screening emissions level for formaldehyde is 5.1×10^{-4} lbs/h. As a result, an ambient air quality analysis was performed and is provided in Section 6. As shown, the predicted model impact is 0.00143 $\mu g/m^3$ which is less than 2% of the TAP's acceptable ambient concentration of 0.077 $\mu g/m^3$. However, as noted above, due to the 80% overall TAP's emissions decreases, overall trace ambient concentrations of TAP's will also decrease.

In addition, the facility will continue to operate in accordance with the existing Tier I Operating Permit (Permit No. T1-030416), revised No. 6 Evaporator Permit to Construct (Permit No. P-2011.0040) and Eberhardt Lime Kiln Permit to Construct (Permit No. P-2010.0043).

Section 5
Emissions Estimates & Limitations

Section 5
Emissions Estimates and Limitations

This section provides a detailed evaluation of the emissions changes associated with the B&W Boiler Natural gas conversion project. Overall, this project will result in significant emissions reduction for all pollutions including criteria, Greenhouse Gases (GHG's) and Toxic Air Pollutants (TAPs)/Hazardous Air Pollutants (HAPs). Net emissions changes are provided for the B&W only and also on a facility wide basis. Detailed documentation of all emission factors is also provided. This section is divided into the following subsections:

- Section 5.1 Pre-construction Facility PTE and Classification. The facility PTE for criteria pollutants and GHG's are based on the No.6 Evaporator PTC modification which was issued by IDEQ in June 2012. Supporting documentation for the PTE estimates were previously included in the April 2012 PTC application (updated in May 2012). Facility classification information is also provided.

- Section 5.2 Pre and Post Construction B&W Boiler Emissions. Pre-project emission estimates are based on coal firing while post project estimates are based on natural gas firing. Baseline emissions are based on the average of the 2006/2007 operations. The B&W boiler PTE while firing gas is based on 8760 hours per year of operation.

- Section 5.3 Comparison of Facility Projected vs. Baseline Emissions. Two different scenarios are provided. The first scenario assumes that the one B&W boiler is fired on natural gas only and the Erie City boiler is fired on coal only. This scenario is provided for the interim period when the B&W boiler is converted to gas and the Boiler MACT compliance date. The second scenario is based on both boilers firing natural gas only which is the planned operation following the Boiler MACT compliance date. Baseline emissions are based on the average of the 2006/2007 operations. For boiler natural gas firing, the PTE is based on 8760 hours per year of operation.

- Section 5.4 Facility GHG's – Facility Projected vs. Baseline. GHG's are estimated based on the same scenarios as provided in Section 5.3.

- Section 5.5 Facility Hazardous Air Pollutants. Facility HAP's emissions estimates are based on emissions factors included the Tier I Permit Renewal Application and operations provided in the May 2012 No. 6 Evaporator PTC application

- Section 5.6 Emission Factory (EF) Documentation. Detailed documentation of the criteria pollutant emissions factors is provided for all emissions sources at the facility. GHG and TAP's/HAP's emissions factor documentation are included other sections described above.

Section 5.1

Facility PTE & Classification

Section 5.1
Facility Classification
The Amalgamated Sugar Company LLC
Mini Cassia Facility

The existing facility is categorized as a major source. The B&W boiler natural gas conversion project is classified as a minor modification.

Designated:_____ yes ___√___ no

Potential to Emit – For the purposes of this application, The Amalgamated Sugar Company LLC (TASCO) proposes to utilize emission inventory data submitted to IDEQ as part of the May 2012 No. 6 Evaporator PTC Modification Application. The following is a summary of the facility wide PTE inventory:

Constituent	Tons/y
PM_{10}	421
NO_x	1360
SO_2	290
CO	2865
VOC's	148

SUMMARY OF FACILITY-WIDE POTENTIAL TO EMIT FOR CRITERIA POLLUTANTS
Mini Cassia Facility

Emissions Unit	PM[a]	SO_2	NO_x	CO	VOC	CO_2	CH_4	N_2O	CO_2e
	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr
Point Sources									
B&W Boiler	100.1	79.2	446.4	113.8	1.7	96120	11	2	96120
Erie City Boiler	118.3	86	575	46.3	4	140041	12	2.1	140824
South Pulp Dryer	78.7	51	146.5	512.4	3.3	41915	5	1.5	42239
North Pulp Dryer	80.8	59.9	145.5	620.1	3.9	49284	6		49665
Pellet Cooler No. 1	1.84								
Pellet Cooler No. 2	1.84								
Pellet Cooler No. 3	1.84								
Eberhardt Kiln	7.06	2.14	46.1	1572.7	2.8	29771	3.3	0.5	29999
Process Slaker	1.05								
Drying Granulator	2.35								
#1 Cooling Granulator	1.18								
#2 Cooling Granulator	1.18								
Sugar Handling(Process)	1.31								
Sugar Handling(Bulk Loading)	1.31								
Main Mill					132.3				
Sulfur Stoves	0.15	11.9							
Fugitives									
Coal Unloading Area	0.15								
Coal Storage Area	3.51								
Boiler Coal Unloading area & Haul Road	0.5								
Beet Hauling - West & Loop	3.24								
Beet Hauling - East	4.97								
Beet Hauling - North - East	0.74								
Cooling Towers	4.02								
Dryer Coal Unloading	0.06								
Dried Pulp Storage & Loadout	0.45								
PCC Storage & Handling	3.94								
Totals	420.6	290.1	1359.5	2865.3	148	357131	37.3	6.1	358847

[a] PM, PM10, PM2.5

Reference: Based on May 2012 No. 6 Evaporator PTC Modification Application

GHG Emissions Estimates
Future @ 3,500,000 tons slice
The Amalgamated Sugar Co. LLC
Mini Cassia Facility

Source Name	Source ID	Annual	Units	Emissions Parameter	Factor	Units	Reference		Annual Emissions (tons/y)
B&W Boiler	S-B1	720000	klbs steam - coal	CO_2	267	lbs/klb steam	40CFR98 Subpart C Table C-1		96120
		720000	klbs steam - coal	CH_4	0.03	lbs/klb steam	40CFR98 Subpart C Table C-2		11
		720000	klbs steam - coal	N_2O	0.0044	lbs/klb steam	40CFR98 Subpart C Table C-2		2
								CO2 e	96862
Erie City Boiler	S-B2	715000	klbs steam - coal	CO_2	267	lbs/klb steam	40CFR98 Subpart C Table C-1		95453
		715000	klbs steam - coal	CH_4	0.03	lbs/klb steam	40CFR98 Subpart C Table C-2		11
		715000	klbs steam - coal	N_2O	0.0044	lbs/klb steam	40CFR98 Subpart C Table C-2		2
								CO2 e	96189
		615000	klbs steam - gas	CO_2	145	lbs/klb steam	40CFR98 Subpart C Table C-1		44588
		615000	klbs steam - gas	CH_4	0.0028	lbs/klb steam	40CFR98 Subpart C Table C-2		0.86
		615000	klbs steam - gas	N_2O	0.00028	lbs/klb steam	40CFR98 Subpart C Table C-2		0.09
								CO2 e	44635

	CO_2(tons/y)	CH_4(ton/y)	N_2O(tons/y)		
Total - Boilers	236160	22	3	Total CO2 e	140824

Source Name	Source ID	Annual	Units	Emissions Parameter	Factor	Units	Reference		Annual Emissions (tons/y)
South Dryer	S-D1	18200	tons - coal	CO_2	4606	lbs/ton coal	40CFR98 Subpart C Table C-1		41915
		18200	tons - coal	CH_4	0.518	lbs/ton coal	40CFR98 Subpart C Table C-2		5
		18200	tons - coal	N_2O	0.076	lbs/ton coal	40CFR98 Subpart C Table C-2		0.7
								CO2 e	42239
North Dryer	S-D2	21400	tons - coal	CO_2	4606	lbs/ton coal	40CFR98 Subpart C Table C-1		49284
		21400	tons - coal	CH_4	0.518	lbs/ton coal	40CFR98 Subpart C Table C-2		6
		21400	tons - coal	N_2O	0.076	lbs/ton coal	40CFR98 Subpart C Table C-2		0.8
								CO2 e	49665

	CO_2(tons/y)	CH_4(ton/y)	N_2O(tons/y)
Total - Pulp Dryers	91199	10	2

Source Name	Source ID	Annual	Units	Emissions Parameter	Factor	Units	Reference		Annual Emissions (tons/y)
Eberhardt Lime Kiln	S-K2	10680	tons - coke	CO_2	5575	lbs/ton coke	40CFR98 Subpart C Table C-1		29771
		10680	tons - coke	CH_4	0.624	lbs/ton coke	40CFR98 Subpart C Table C-2		3.3
		10680	tons - coke	N_2O	0.091	lbs/ton coke	40CFR98 Subpart C Table C-2		0.5
								CO2 e	29999

	CO_2(tons/y)	CH_4(ton/y)	N_2O(tons/y)
Total - Lime Kilns	29771	3.3	0.5

Section 5.2

B&W Boiler Emissions

Section 5.2.1

B&W Boiler Criteria Pollutants

B&W Boiler Natural Gas Conversion Project
Mini Cassia Facility

PROJECTED ACTUAL EMISSIONS *or* PTE FOR PROJECTED ACTUAL EMISSIONS

Emissions Unit	PM[a]	SO_2	NO_x	CO	VOC	LEAD	SULFURIC ACID
	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr
Point Sources							
B&W Boiler - Natural Gas Firing	23.4	0.64	108	79.1	5.91	1.22E-04	0
Total Projected Actual Emissions	23.4	0.64	108	79.1	5.91		

BASELINE ACTUAL EMISSIONS

Emissions Unit	PM[a]	SO_2	NO_x	CO	VOC	LEAD	SULFURIC ACID
	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr
Point Sources							
B&W Boiler - Coal Firing	122	96.7	521	139	1.39	5.27E-03	4.32
Total Baseline Actual Emissions	122	96.7	521	139	1.39		

COMPARISON OF THE PROJECT EMISSIONS INCREASE TO THE SIGNIFICANT EMISSIONS RATE THRESHOLDS

Emissions Unit	PM[a]	SO_2	NO_x	CO	VOC	LEAD	SULFURIC ACID
	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr
Project Emissions Increase	-98.6	-96.06	-413	-59.9	4.52	-5.15E-03	-4.32
PSD Significance Emission Rate (SER) *See 40 CFR 52.21(b)(23)*	15	40	40	100	40	0.6	7
Does the Project Emissions Increase Exceed the Significant Emissions Rate Threshold?	No	No	No	No	No	No	No

[a] PM, PM10, PM2.5

B&W Boiler Natural Gas Conversion Project
2006-2007 Baseline Emissions vs Future Projected Emissions
The Amalgamated Sugar Co. LLC
Mini Cassia Facility

Stack & ID	PM[a] (lbs/h)	PM[a] (tons/y)	NOx (lbs/h)	NOx (tons/y)	SO2 (lbs/h)	SO2 (tons/y)	CO (lbs/h)	CO (tons/y)	VOC (lbs/h)	VOC (tons/y)
B&W Boiler -Stoker Coal	55.3	122	236	521	43.7	96.7	62.9	139	0.63	1.39
B&W Boiler -Natural Gas	5.34	23.4	24.7	108	0.15	0.64	18.1	79.1	1.35	5.91
Net Change	-50.0	-99	-211	-413	-43.6	-96.0	-44.8	-60	0.72	4.52

[a] PM, PM10 and PM2.5

B&W Boiler Natural Gas Conversion Project
2006-2007 Baseline Emissions(Coal)
The Amalgamated Sugar Co. LLC
Mini Cassia Facility

Source Name	Source ID	Production (klbs steam) Max Hourly	Daily	Annual	Emissions Parameter	Factor	Units	Reference	Emissions (lbs/h)	Emissions (tons/y)
B&W Boiler -Stoker Coal	S-B1	190	4560	840,500	PM & PM10	0.291	klbs/steam	IDAPA Grain Loading Limit - IDAPA 58.01.01.677 0.1 gr/dscf at 8% O2.	55.3	122.3
		190	4560	840,500	NOx	1.24	klbs/steam	Oct 2005 Eng. Stack Test	235.6	521.1
		190	4560	840,500	SO2	0.23	klbs/steam	AP-42(9/98),Table1.1-3, 1% sulfur, 90% SO2 removal	43.7	96.7
		190	4560	840,500	CO	0.331	klbs/steam	AP-42(9/98),Table1.1-3	62.9	139.1
		190	4560	840,500	VOC	0.0033	klbs/steam	AP-42(9/98),Table1.1-19, spreader stoker methane. TNMOC	0.63	1.39

Future Projected Emissions (Natural Gas)

Source Name	Source ID	Production Max Hourly	Daily	Annual	Emissions Parameter	Factor	Units	Reference	Emissions (lbs/h)	Emissions (tons/y)
B&W Boiler -Natural Gas	S-B1	190	4560	1,664,400	PM & PM10	0.0281	klbs/steam	IDAPA Grain Loading Limit - IDAPA 58.01.01.677 0.015 gr/dscf at 3% O2.	5.3	23.4
		190	4560	1,664,400	NOx	0.13	klbs/steam	0.1 lbs/MMBtu NSPS Standard - Low Heat Release Furnace	24.7	108.2
		190	4560	1,664,400	SO2	0.00077	klbs/steam	AP-42(7/98), Table 1.4-2	0.15	0.64
		190	4560	1,664,400	CO	0.095	klbs/steam	Natural gas burner manufacturer estimate of 100 ppm at 3% O2 (dry basis).	18.1	79.1
		190	4560	1,664,400	VOC	0.0071	klbs/steam	AP42(7/98)	1.35	5.91

Assumes 365 day per year operation

Section 5.2.2

B&W Boiler Greenhouse Gases

B&W Boiler Natural Gas Conversion Project
Mini Cassia Facility

PROJECTED ACTUAL EMISSIONS *or* PTE FOR PROJECTED ACTUAL EMISSIONS

Emissions Unit	CO_2	CH_4	N_20	CO_2e
	T/yr	T/yr	T/yr	T/yr
Point Sources				
B&W Boiler - Natural Gas Firing	120640	2.3	0.2	120767
Total Projected Actual Emissions	120640	2.3	0.2	120767

BASELINE ACTUAL EMISSIONS

Emissions Unit	CO_2	CH_4	N_20	CO_2e
	T/yr	T/yr	T/yr	T/yr
Point Sources				
B&W Boiler - Coal Firing	112207	13	1.8	113073
Total Baseline Actual Emissions	112207	13	1.8	113073

/IPARISON OF THE PROJECT EMISSIONS INCREASE TO THE SIGNIFICANT EMISSIONS RATE THRESHO

Emissions Unit	CO_2	CH_4	N_20	CO_2e
	T/yr	T/yr	T/yr	T/yr
Project Emissions Increase	8433	-10.7	-1.6	7694
PSD Significance Emission Rate (SER) *See 40 CFR 52.21(b)(23)*	NA	NA	NA	75000
Does the Project Emissions Increase Exceed the Significant Emissions Rate Threshold?	NA	NA	NA	No

[a] PM, PM10, PM2.5

B&W Boiler Natural Gas Conversion Project
2006-2007 Baseline Emissions vs Future Projected Emissions
GHG Net Emissions Summary
Mini Cassia Facility

Source	CO_2 (tons/y)	CH_4 (tons/y)	N_2O (tons/y)	CO_2e (tons/y)
B&W Boiler - Stoker Coal	112207	12.6	1.8	113073
B&W Boiler - Natural Gas	120640	2.3	0.2	120768
Net Change	8433	-10.3	-1.6	7695

B&W Boiler Natural Gas Conversion Project
GHG Emissions Estimates
2006-2007 Baseline Emissions (Coal)
The Amalgamated Sugar Co. LLC
Mini Cassia Facility

Source Name	Source ID	Annual	Units	Emissions Parameter	Factor	Units	Reference	Annual Emissions (tons/y)
B&W Boiler	S-B1	840500	klbs steam - coal	CO_2	267	lbs/klb steam	40CFR98 Subpart C Table C-1	112207
		840500	klbs steam - coal	CH_4	0.03	lbs/klb steam	40CFR98 Subpart C Table C-2	13
		840500	klbs steam - coal	N_2O	0.0044	lbs/klb steam	40CFR98 Subpart C Table C-2	2
							Total	112221

Future Projected Emissions (Natural Gas)

Source Name	Source ID	Annual	Units	Emissions Parameter	Factor	Units	Reference	Annual Emissions (tons/y)
B&W Boiler - Natural Gas	S-B1	1,664,000	klbs steam - gas	CO_2	145	lbs/klb steam	40CFR98 Subpart C Table C-1	120640
		1,664,000	klbs steam - gas	CH_4	0.0028	lbs/klb steam	40CFR98 Subpart C Table C-2	2
		1,664,000	klbs steam - gas	N_2O	0.00028	lbs/klb steam	40CFR98 Subpart C Table C-2	0.2
							Total	120643

Section 5.2.3

B&W Boiler TAPs & HAPs

PRE- AND POST PROJECT NON-CARCINOGENIC TAP EMISSIONS SUMMARY
POTENTIAL TO EMIT
B & W Boiler Natural Gas Conversion Project
Mini Cassia Facility

Non-Carcinogenic Toxic Air Pollutants (sum of all emissions)	Pre-Project [a] 24-hour Average Emissions Rates for Units at the Facility (lb/h)	Post-Project [b] 24-hour Average Emissions Rates for Units at the Facility (lb/h)	Change in 24-hour Average Emissions Rates for Units at the Facility (lb/h)	Non-Carcinogenic Screening Emission Level (lb/h)	Exceeds Screening Level? (Y/N)
Acetophenone	1.88E-04		-1.88E-04	none	NO
Acrolein	3.64E-03		-3.64E-03	1.70E-02	NO
Antimony	2.26E-04		-2.26E-04	3.30E-02	NO
Barium	4.82E-01	1.07E-03	-4.81E-01	3.30E-02	NO
Benzyl Chloride	8.79E-03		-8.79E-03	none	NO
Carbon Disulfide	1.63E-03		-1.63E-03	2.00E+00	NO
2-chloroacetophenone	8.79E-05		-8.79E-05	2.10E-02	NO
Chlorobenzene	2.76E-04		-2.76E-04	2.33E+01	NO
Chromium (total)	3.26E-03	3.41E-04	-2.92E-03	3.30E-02	NO
Cobalt	1.26E-03	2.05E-05	-1.24E-03	3.30E-03	NO
Cumene	6.65E-05		-6.65E-05	1.63E+01	NO
Cyanide	3.14E-02		-3.14E-02	3.33E-01	NO
Dichlorobenzene	0.00E+00	2.92E-04	2.92E-04	3.00E+01	NO
2,4-Dinitrotoluene	3.52E-06		-3.52E-06	none	NO
Dimethyl Sulfate	6.03E-04		-6.03E-04	none	NO
Ethyl Benzene	1.18E-03		-1.18E-03	2.90E+01	NO
Ethyl Chloride	5.27E-04		-5.27E-04	1.76E+02	NO
Ehtylene Dichloride	5.02E-04		-5.02E-04	2.67E+00	NO
Fluorides, as F	7.53E-02		-7.53E-02	1.67E-01	NO
Hexane	8.41E-04	4.38E-01	4.38E-01	1.20E+01	NO
Hydrogen Chloride	6.64E-02		-6.64E-02	5.00E-02	NO
Hydrogen Fluoride	8.00E-02		-8.00E-02	none	NO
Isophorone	7.28E-03		-7.28E-03	1.87E+00	NO
Lead	5.27E-03	1.22E-04	-5.15E-03	none	NO
Magnesium	1.38E-01		-1.38E-01	6.67E-01	NO
Manganese	6.15E-03	9.26E-05	-6.06E-03	3.33E-01	NO
Mercury	1.04E-03	6.33E-05	-9.79E-04	none	NO
Methyl Bromide	2.01E-03		-2.01E-03	1.27E+00	NO
Methyl Chloride	6.65E-03		-6.65E-03	6.87E+00	NO
Methyl Ethyl Ketone	4.90E-03		-4.90E-03	3.93E+01	NO
Methyl Methacylate	2.51E-04		-2.51E-04	2.73E+01	NO
Methyl Tert Butyl Ether	4.39E-04		-4.39E-04	none	NO
Napthalene	1.63E-04		-1.63E-04	3.33E+00	NO
Pentane	0.00E+00	6.33E-01	6.33E-01	1.18E+02	NO
Phenol	2.01E-04		-2.01E-04	1.27E+00	NO
Propionaldehyde	4.77E-03		-4.77E-03	2.87E-02	NO
Selenium	1.63E-02	5.85E-06	-1.63E-02	1.30E-02	NO
Styrene	3.14E-04		-3.14E-04	6.67E+00	NO
Sulfuric Acid	4.32E+00		-4.32E+00		NO
Toluene	3.01E-03	8.28E-04	-2.19E-03	2.50E+01	NO
Xylene (total)	4.65E-04		-4.65E-04	2.90E+01	NO
Vinyl Acetate	9.54E-05		-9.54E-05	none	NO

[a] Coal Fired

[b] Natural Gas Fired

PRE- AND POST PROJECT CARCINOGENIC TAP EMISSIONS SUMMARY
POTENTIAL TO EMIT

Carcinogenic Toxic Air Pollutants (sum of all emissions)	Pre-Project [a] 24-hour Average Emissions Rates for Units at the Facility (lb/h)	Post-Project [b] 24-hour Average Emissions Rates for Units at the Facility (lb/h)	Change in 24-hour Average Emissions Rates for Units at the Facility (lb/h)	Carcinogenic Screening Emission Level (lb/h)	Exceeds Screening Level? (Y/N)
Acetaldehyde	7.16E-03		-7.16E-03	3.00E-03	NO
Arsenic Compounds	7.79E-02	4.87E-05	-7.79E-02	1.50E-06	NO
Benzene	2.47E-01	5.12E-04	-2.46E-01	8.00E-04	NO
Beryllium Compounds	3.99E-03	2.92E-06	-3.99E-03	2.80E-05	NO
Bis (2-ethylhexyl) phthalate	9.17E-04		-9.17E-04	2.80E-02	NO
Cadmium Compounds	9.69E-03	2.68E-04	-9.42E-03	3.70E-06	NO
Chloroform	7.41E-04		-7.41E-04	2.80E-04	NO
Chromium 6+ Compounds	9.92E-04	3.41E-04	-6.51E-04	5.60E-07	NO
Ethylene Dibromide	1.51E-05		-1.51E-05	3.00E-05	NO
Formaldehyde	3.01E-03	1.83E-02	1.53E-02	5.10E-04	YES
Methyl Hydrazine	2.13E-03		-2.13E-03	2.20E-05	NO
Methylene Chloride	5.51E-02		-5.51E-02	1.60E-03	NO
Nickel	5.32E-02	5.12E-04	-5.27E-02	2.70E-05	NO
PAHs	3.95E-03	2.03E-05	-3.93E-03	9.10E-05	NO
POM	2.61E-04	2.03E-05	-2.41E-04		NO
Tetrachloroethylene	5.40E-04		-5.40E-04	1.30E-02	NO
1,1,1 - Trichloroethane	2.51E-04		-2.51E-04	4.20E-04	NO

[a] Coal Fired

[b] Natural Gas Fired

B&W Boiler Natural Gas Conversion Project
HAPs & TAPs Emissions Estimates
Mini Cassia Facility

	B&W Boiler - Baseline							B&W Boiler - Projected						Total						
	Coal			Natural Gas				Coal			Natural Gas									
Non Carcinogens	EF lbs/klb	Annual Emissions lbs/y	Hourly Emissions lbs/h	EF lbs/klb	Annual Emissions lbs/y	Hourly Emissions lbs/h	Total Hourly Emissions	EF lbs/klb	Annual Emissions lbs/y	Hourly Emissions lbs/h	EF lbs/klb	Annual Emissions lbs/y	Hourly Emissions lbs/h	Total Hourly Emissions	Net Change Hourly Emissions	TAPs Screening Level (lb/h)	Exceeds Screening Level?	AAC (mg/m3)	Modeled? Conc	Exceeds AAC or AACC?
Acetophenone	9.91E-07	8.38E-01	1.9E-04				1.9E-04	9.91E-07	0.00E+00	0.0E+00				0.00E+00	-1.88E-04	none	No	none		
Acrolein	1.92E-05	1.62E+01	3.6E-03				3.6E-03	1.92E-05	0.00E+00	0.0E+00				0.00E+00	-3.64E-03	0.017	No	0.0125		
Antimony	1.19E-06	1.01E+00	2.3E-04				2.3E-04	1.19E-06	0.00E+00	0.0E+00				0.00E+00	-2.26E-04	0.033	No	0.025		
Barium	2.54E-03		4.8E-01	5.64E-06	0.00E+00	0.00E+00	4.8E-01	2.54E-03			5.64E-06	9.39E+00	1.07E-03	1.07E-03	-4.81E-01	0.033	No	0.025		
Benzyl Chloride	4.63E-05	3.91E+01	8.8E-03				8.8E-03	4.63E-05	0.00E+00	0.0E+00				0.00E+00	-8.79E-03	none	No	none		
Carbon Disulfide	8.59E-06	7.26E+00	1.6E-03				1.6E-03	8.59E-06	0.00E+00	0.0E+00				0.00E+00	-1.63E-03	2	No	1.5		
2-Chloroacetophenone	4.63E-07	3.91E-01	8.8E-05				8.8E-05	4.63E-07	0.00E+00	0.0E+00				0.00E+00	-8.79E-05	0.021	No	0.016		
Chlorobenzene	1.45E-06	1.23E+00	2.8E-04				2.8E-04	1.45E-06	0.00E+00	0.0E+00				0.00E+00	-2.76E-04	23.3	No	17.5		
Chromium (total)	1.72E-05	1.45E+01	3.3E-03	1.79E-06	0.00E+00	0.00E+00	3.3E-03	1.72E-05	0.00E+00	0.0E+00	1.79E-06	2.99E+00	3.41E-04	3.41E-04	-2.92E-03	0.033	No	0.025		
Cobalt	6.61E-06	5.58E+00	1.3E-03	1.08E-07	0.00E+00	0.00E+00	1.3E-03	6.61E-06	0.00E+00	0.0E+00	1.08E-07	1.79E-01	2.05E-05	2.05E-05	-1.24E-03	0.0033	No	0.0025		
Cumene	3.50E-07	2.96E-01	6.7E-05				6.7E-05	3.50E-07	0.00E+00	0.0E+00				0.00E+00	-6.65E-05	1.63E+01	No	12.25		
Cyanide	1.65E-04	1.40E+02	3.1E-02				3.1E-02	1.65E-04	0.00E+00	0.0E+00				0.00E+00	-3.14E-02	3.33E-01	No	0.25		
Dichlorobenzene	0.00E+00		0.0E+00	1.54E-06	0.00E+00	0.00E+00	0.0E+00	0.00E+00			1.54E-06	2.56E+00	2.92E-04	2.92E-04	2.92E-04	3.00E+01	No	15		
2,4-Dinitrotoluene	1.85E-08	1.56E-02	3.5E-06				3.5E-06	1.85E-08	0.00E+00	0.0E+00				0.00E+00	-3.52E-06	none	No	none		
Dimethyl Sulfate	3.17E-06	2.68E+00	6.0E-04				6.0E-04	3.17E-06	0.00E+00	0.0E+00				0.00E+00	-6.03E-04	none	No	none		
Ethyl Benzene	6.21E-06	5.25E+00	1.2E-03				1.2E-03	6.21E-06	0.00E+00	0.0E+00				0.00E+00	-1.18E-03	29	No	21.75		
Ethyl Chloride	2.78E-06	2.35E+00	5.3E-04				5.3E-04	2.78E-06	0.00E+00	0.0E+00				0.00E+00	-5.27E-04	176	No	132		
Ehtylene Dichloride	2.64E-06	2.23E+00	5.0E-04				5.0E-04	2.64E-06	0.00E+00	0.0E+00				0.00E+00	-5.02E-04	2.667	No	2		
Fluorides, as F	3.97E-04	3.35E+02	7.5E-02				7.5E-02	3.97E-04	0.00E+00	0.0E+00				0.00E+00	-7.53E-02	0.167	No	0.125		
Hexane	4.43E-06	3.74E+00	8.4E-04	2.31E-03	0.00E+00	0.00E+00	8.4E-04	4.43E-06	0.00E+00	0.0E+00	2.31E-03	3.84E+03	4.38E-01	4.38E-01	4.38E-01	12	No	9		
Hydrogen Chloride	3.50E-04	2.95E+02	6.6E-02				6.6E-02	3.50E-04	0.00E+00	0.0E+00				0.00E+00	-6.64E-02	0.05	No	0.375		
Hydrogen Fluoride	4.19E-04		8.0E-02				8.0E-02	4.19E-04		0.0E+00				0.00E+00	-7.96E-02	none		none		
Isophorone	3.83E-05	3.24E+01	7.3E-03				7.3E-03	3.83E-05	0.00E+00	0.0E+00				0.00E+00	-7.28E-03	1.867	No	1.4		
Lead	2.78E-05	2.35E+01	5.3E-03	6.41E-07	0.00E+00	0.00E+00	5.3E-03	2.78E-05	0.00E+00	0.0E+00	6.41E-07	1.07E+00	1.22E-04	1.22E-04	-5.15E-03	none	No	none		
Magnesium	7.27E-04	6.14E+02	1.4E-01				1.4E-01	7.27E-04	0.00E+00	0.0E+00				0.00E+00	-1.38E-01	0.667	No	0.5		
Manganese	3.24E-05	2.74E+01	6.2E-03	4.87E-07	0.00E+00	0.00E+00	6.2E-03	3.24E-05	0.00E+00	0.0E+00	4.87E-07	8.11E-01	9.26E-05	9.26E-05	-6.06E-03	0.333	No	0.25		
Mercury	5.49E-06	4.63E+00	1.0E-03	3.33E-07	0.00E+00	0.00E+00	1.0E-03	5.49E-06	0.00E+00	0.0E+00	3.33E-07	5.55E-01	6.33E-05	6.33E-05	-9.79E-04	none	No	none		
Methyl Bromide	1.06E-05	8.93E+00	2.0E-03				2.0E-03	1.06E-05	0.00E+00	0.0E+00				0.00E+00	-2.01E-03	1.27	No	0.95		
Methyl Chloride	3.50E-05	2.96E+01	6.7E-03				6.7E-03	3.50E-05	0.00E+00	0.0E+00				0.00E+00	-6.65E-03	6.867	No	5.15		
Methyl Ethyl Ketone	2.58E-05	2.18E+01	4.9E-03				4.9E-03	2.58E-05	0.00E+00	0.0E+00				0.00E+00	-4.90E-03	39.3	No	29.5		
Methyl Methacylate	1.32E-06	1.12E+00	2.5E-04				2.5E-04	1.32E-06	0.00E+00	0.0E+00				0.00E+00	-2.51E-04	27.3	No	20.5		
Methyl Tert Butyl Ether	2.31E-06	1.95E+00	4.4E-04				4.4E-04	2.31E-06	0.00E+00	0.0E+00				0.00E+00	-4.39E-04	none	No	none		
Napthalene	8.59E-07	7.26E-01	1.6E-04				1.6E-04	8.59E-07	0.00E+00	0.0E+00				0.00E+00	-1.63E-04	3.33	No	2.5		
Pentane	0.00E+00		0.0E+00	3.33E-03	0.00E+00	0.00E+00	0.0E+00	0.00E+00			3.33E-03	5.55E+03	6.33E-01	6.33E-01	6.33E-01	118	No	88.5		
Phenol	1.06E-06	8.93E-01	2.0E-04				2.0E-04	1.06E-06	0.00E+00	0.0E+00				0.00E+00	-2.01E-04	1.27	No	0.95		
Propionaldehyde	2.51E-05	2.12E+01	4.8E-03				4.8E-03	2.51E-05	0.00E+00	0.0E+00				0.00E+00	-4.77E-03	0.0287	No	0.0215		
Selenium	8.59E-05	7.26E+01	1.6E-02	3.08E-08	0.00E+00	0.00E+00	1.6E-02	8.59E-05	0.00E+00	0.0E+00	3.08E-08	5.12E-02	5.85E-06	5.85E-06	-1.63E-02	0.013	No	0.01		
Styrene	1.65E-06	1.40E+00	3.1E-04				3.1E-04	1.65E-06	0.00E+00	0.0E+00				0.00E+00	-3.14E-04	6.67E+00	No	1		
Sulfuric Acid	2.27E-02	1.92E+04	4.3E+00				4.3E+00	2.27E-02	0.00E+00	0.0E+00				0.00E+00	-4.32E+00		No			
Toluene	1.59E-05	1.34E+01	3.0E-03	4.36E-06	0.00E+00	0.00E+00	3.0E-03	1.59E-05	0.00E+00	0.0E+00	4.36E-06	7.26E+00	8.28E-04	8.28E-04	-2.19E-03	25	No	18.75		
Xylene (total)	2.45E-06	2.07E+00	4.6E-04				4.6E-04	2.45E-06	0.00E+00	0.0E+00				0.00E+00	-4.65E-04	29	No	21.75		
Vinyl Acetate	5.02E-07	4.24E-01	9.5E-05				9.5E-05	5.02E-07	0.00E+00	0.0E+00				0.00E+00	-9.54E-05	none	No	none		
Compounds - Carcinogens																		AACC (ug/m3)		
Acetaldehyde	3.77E-05	3.18E+01	7.2E-03				7.2E-03	3.77E-05	0.00E+00	0.0E+00				0.00E+00	-7.16E-03	3.00E-03	No	4.5-1		
Arsenic Compounds	4.10E-04	3.46E+02	7.8E-02	2.56E-07	0.00E+00	0.00E+00	7.8E-02	4.10E-04	0.00E+00	0.0E+00	2.56E-07	4.27E-01	4.87E-05	4.87E-05	-7.79E-02	1.50E-06	No	2.30E-04		
Benzene	1.30E-03	1.10E+03	2.5E-01	2.69E-06	0.00E+00	0.00E+00	2.5E-01	1.30E-03	0.00E+00	0.0E+00	2.69E-06	4.48E+00	5.12E-04	5.12E-04	-2.46E-01	8.00E-04	No	1.20E-01		
Beryllium Compounds	2.10E-05	1.77E+01	4.0E-03	1.54E-08	0.00E+00	0.00E+00	4.0E-03	2.10E-05	0.00E+00	0.0E+00	1.54E-08	2.56E-02	2.92E-06	2.92E-06	-3.99E-03	2.80E-05	No	4.20E-03		
Bis (2-ethylhexyl) phthalate	4.82E-06	4.08E+00	9.2E-04				9.2E-04	4.82E-06	0.00E+00	0.0E+00				0.00E+00	-9.17E-04	2.80E-02	No	4.20E+00		
Cadmium Compounds	5.10E-05	4.31E+01	9.7E-03	1.41E-06	0.00E+00	0.00E+00	9.7E-03	5.10E-05	0.00E+00	0.0E+00	1.41E-06	2.35E+00	2.68E-04	2.68E-04	-9.42E-03	3.70E-06	No	5.60E-04		
Chloroform	3.90E-06	3.29E+00	7.4E-04				7.4E-04	3.90E-06	0.00E+00	0.0E+00				0.00E+00	-7.41E-04	2.80E-04	No	4.30E-02		
Chromium 6+ Compounds	5.22E-06	4.41E+00	9.9E-04	1.79E-06	0.00E+00	0.00E+00	9.9E-04	5.22E-06	0.00E+00	0.0E+00	1.79E-06	2.99E+00	3.41E-04	3.41E-04	-6.51E-04	5.60E-07	No	8.30E-05		
Ethylene Dibromide	7.93E-08	6.70E-02	1.5E-05				1.5E-05	7.93E-08	0.00E+00	0.0E+00				0.00E+00	-1.51E-05	3.00E-05	No	4.50E-03		
Formaldehyde	1.59E-05	1.34E+01	3.0E-03	9.62E-05	0.00E+00	0.00E+00	3.0E-03	1.59E-05	0.00E+00	0.0E+00	9.62E-05	1.60E+02	1.83E-02	1.83E-02	1.53E-02	5.10E-04	Yes	7.70E-02	1.36E-02	No
Methyl Hydrazine	1.12E-05	9.49E+00	2.1E-03				2.1E-03	1.12E-05	0.00E+00	0.0E+00				0.00E+00	-2.13E-03	2.20E-05	No	3.20E-03		
Methylene Chloride	2.90E-04	2.45E+02	5.5E-02				5.5E-02	2.90E-04	0.00E+00	0.0E+00				0.00E+00	-5.51E-02	1.60E-03	No	2.40E-01		
Nickel	2.80E-04	2.37E+02	5.3E-02	2.69E-06	0.00E+00	0.00E+00	5.3E-02	2.80E-04	0.00E+00	0.0E+00	2.69E-06	4.48E+00	5.12E-04	5.12E-04	-5.27E-02	2.70E-05	No	4.20E-03		
PAHs	2.08E-05	1.76E+01	4.0E-03	1.07E-07	0.00E+00	0.00E+00	4.0E-03	2.08E-05	0.00E+00	0.0E+00	1.07E-07	1.78E-01	2.03E-05	2.03E-05	-3.93E-03	9.10E-05	No	1.40E-02		
POM	1.37E-06	1.16E+00	2.6E-04	1.07E-07	0.00E+00	0.00E+00	2.6E-04	1.37E-06	0.00E+00	0.0E+00	1.07E-07	1.78E-01	2.03E-05	2.03E-05	-2.41E-04		No			
Tetrachloroethylene	2.84E-06	2.40E+00	5.4E-04				5.4E-04	2.84E-06	0.00E+00	0.0E+00				0.00E+00	-5.40E-04	1.30E-02	No			
1,1,1 - Trichloroethane	1.32E-06	1.12E+00	2.5E-04				2.5E-04	1.32E-06	0.00E+00	0.0E+00				0.00E+00	-2.51E-04	4.20E-04	No			

Baseline

Source	Material	Units	Max Hourly	Annual
B&W Boiler - Coal	Steam	klbs	190	845,000
B&W Boiler - Nat. Gas	Steam	klbs	0	0

Projected

Source	Material	Units	Max Hourly	Annual
B&W Boiler - Coal	Steam	klbs	0	0
B&W Boiler(Gas)	Steam	klbs	190	1,664,400

B&W Boiler
Estimated TAP's Emissions Factors
Coal Combustion (lbs per klb steam)
Mini Cassia Facility

Non Carcinogens	Type	Reference	Type	Uncontrolled EF (lbs/ton coal)	Controlled EF (lbs/klbs steam)
Acetophenone	HAP	a	VOC	1.50E-05	9.91E-07
Acrolein	HAP/TAP	a	VOC	2.90E-04	1.92E-05
Antimony	TAP	b	Trace Metal	1.80E-05	1.19E-06
Barium	TAP	c	Trace Metal	3.84E-02	2.54E-03
Benzyl Chloride	HAP	a	VOC	7.00E-04	4.63E-05
Carbon Disulfide	HAP/TAP	a	VOC	1.30E-04	8.59E-06
2-Chloroacetophenone	HAP/TAP	a	VOC	7.00E-06	4.63E-07
Chlorobenzene	HAP/TAP	a	VOC	2.20E-05	1.45E-06
Chromium (total)	HAP/TAP	b	Trace Metal	2.60E-04	1.72E-05
Cobalt	HAP/TAP	b	Trace Metal	1.00E-04	6.61E-06
Cumene	HAP/TAP	b	Trace Metal	5.30E-06	3.50E-07
Cyanide	HAP/TAP			2.50E-03	1.65E-04
2,4-Dinitrotoluene	HAP	a	VOC	2.80E-07	1.85E-08
Dimethyl Sulfate	HAP	a	VOC	4.80E-05	3.17E-06
Ethyl Benzene	HAP/TAP	a	VOC	9.40E-05	6.21E-06
Ethyl Chloride	HAP/TAP	a	VOC	4.20E-05	2.78E-06
Ethylene Dichloride	HAP/TAP	a	VOC	4.00E-05	2.64E-06
Flourides, as F	TAP	d		6.00E-03	3.97E-04
Hexane	HAP/TAP	a	VOC	6.70E-05	4.43E-06
Hydrogen Chloride	HAP/TAP	d		5.29E-03	3.50E-04
Hydrogen Fluoride	HAP	d		6.34E-03	4.19E-04
Isophorone	HAP/TAP	a	VOC	5.80E-04	3.83E-05
Lead	HAP	b	Trace Metal	4.20E-04	2.78E-05
Magnesium	NA	b	Trace Metal	1.10E-02	7.27E-04
Manganese	HAP/TAP	b	Trace Metal	4.90E-04	3.24E-05
Mercury	HAP	b	Trace Metal	8.30E-05	5.49E-06
Methyl Bromide	HAP/TAP	a	VOC	1.60E-04	1.06E-05
Methyl Chloride	HAP/TAP	a	VOC	5.30E-04	3.50E-05
Methyl Ethyl Ketone	HAP/TAP	a	VOC	3.90E-04	2.58E-05
Methyl Methacylate	HAP/TAP	a	VOC	2.00E-05	1.32E-06
Methyl Tert Butyl Ether	HAP	a	VOC	3.50E-05	2.31E-06
Naphthalene	HAP/TAP	a	VOC	1.30E-05	8.59E-07
Phenol	HAP/TAP	a	VOC	1.60E-05	1.06E-06
Propionaldehyde	HAP/TAP	a	VOC	3.80E-04	2.51E-05
Selenium	HAP/TAP	b	Trace Metal	1.30E-03	8.59E-05
Styrene	HAP/TAP	a	VOC	2.50E-05	1.65E-06
Sulfuric Acid	TAP	e		3.44E-01	2.27E-02
Toluene	HAP/TAP	a	VOC	2.40E-04	1.59E-05
Xylene (total)	HAP	a	VOC	3.70E-05	2.45E-06
Vinyl Acetate	HAP/TAP	a	VOC	7.60E-06	5.02E-07
Compounds - Carcinogens					
Acetaldehyde	HAP/TAP	a	VOC	5.70E-04	3.77E-05
Arsenic Compounds	HAP/TAP	b	Trace Metal	4.10E-04	2.71E-05
Benzene	HAP/TAP	a	VOC	1.30E-03	8.59E-05
Beryllium Compounds	HAP/TAP	b	Trace Metal	2.10E-05	1.39E-06
Bis(2-ethylhexyl)phthalate	HAP/TAP	a	VOC	7.30E-05	4.82E-06
Cadmium Compounds	HAP/TAP	b	Trace Metal	5.10E-05	3.37E-06
Chloroform	HAP/TAP	a	VOC	5.90E-05	3.90E-06
Chromium 6+ compounds	HAP/TAP	b	Trace Metal	7.90E-05	5.22E-06
Ethylene Dibromide	HAP	a	VOC	1.20E-06	7.93E-08
Formaldehyde	HAP/TAP	a	VOC	2.40E-04	1.59E-05
Methyl Hydrazine	HAP/TAP	a	VOC	1.70E-04	1.12E-05
Methylene Chloride	HAP/TAP	a	VOC	2.90E-04	1.92E-05
Nickel	HAP/TAP	b	Trace Metal	2.80E-04	1.85E-05
PAHs	TAP	f	VOC	2.08E-05	1.37E-06
POM	TAP	f	VOC	2.08E-05	1.37E-06
Tetrachloroethylene	HAP/TAP	a	VOC	4.30E-05	2.84E-06
1,1,1 - Trichloroethane	HAP/TAP	a	VOC	2.00E-05	1.32E-06
			Total (Coal) EF		**2.80E-02**

a. AP-42, Table 1.1-14 Emissions Factors for Various Organic Compounds from Controlled Combustion
b. AP-42, Table 1.1-18 Emissions Factors for Trace Metals from Controlled Combustion
c Mass balance, USGS data and 80% emissions control.
d. Title V Permit Application & USGS Data
e. Eng. Stack Test
f. AP-42, Table 1.1-13 Emissions Factors for Polynuclear Aromatic Hydrocarbons (PAH)

Boiler
Estimated TAP's Emissions Factors
Natural Gas Combustion (lbs per klb steam)
Mini Cassia Facility

Non Carcinogens	Type	Reference	Type	EF (lbs/MMcuft)	EF (lbs/klbs steam)
Barium	TAP	a	Trace Metal	4.40E-03	5.64E-06
Chromium (total)	HAP/TAP	a	Trace Metal	1.40E-03	1.79E-06
Cobalt	HAP/TAP	a	Trace Metal	8.40E-05	1.08E-07
Dichlorobenzene	TAP	b	VOC	1.20E-03	1.54E-06
Hexane	HAP/TAP	b	VOC	1.80E+00	2.31E-03
Lead	HAP	a	Trace Metal	5.00E-04	6.41E-07
Manganese	HAP/TAP	a	Trace Metal	3.80E-04	4.87E-07
Mercury	HAP	a	Trace Metal	2.60E-04	3.33E-07
Naphthalene	HAP/TAP	b	VOC	6.10E-04	7.82E-07
Pentane	TAP	b	VOC	2.60E+00	3.33E-03
Selenium	HAP/TAP	a	Trace Metal	2.40E-05	3.08E-08
Toluene	HAP/TAP	b	VOC	3.40E-03	4.36E-06
Compounds - Carcinogens					
Arsenic Compounds	HAP/TAP	a	Trace Metal	2.00E-04	2.56E-07
Benzene	HAP/TAP	b	VOC	2.10E-03	2.69E-06
Beryllium Compounds	HAP/TAP	a	Trace Metal	1.20E-05	1.54E-08
Cadmium Compounds	HAP/TAP	a	Trace Metal	1.10E-03	1.41E-06
Chromium 6+ compounds	HAP/TAP	a	Trace Metal	1.40E-03	1.79E-06
Formaldehyde	HAP/TAP	b	VOC	7.50E-02	9.62E-05
Nickel	HAP/TAP	a	Trace Metal	2.10E-03	2.69E-06
PAHs	TAP	b	VOC	8.32E-05	1.07E-07
POM	TAP	b	VOC	8.32E-05	1.07E-07
			Total (Natural Gas) EF		**5.76E-03**

a. AP-42, Table 1.4-4 Emissions Factors for Metals from Natural Gas Combustion
b. AP-42, Table 1.4-3 Emissions Factors for Speciated Organic Compounds from Natural Gas

Section 5.3

Facility Baseline vs. Projected Emission Estimates

SUMMARY OF CRITERIA POLLUTANT ACTUAL FACILITY EMISSIONS
2006 & 2007 Crop Year Average vs. Future B&W Boiler Gas Only & EC Boiler Coal Only
Mini Cassia Facility

Year	PM10	SO2	CO	NO x	VOC	Production Summary						
						Days		Steam (klbs steam)				
						Beet	Juice	Total	Coal	%	Gas	%
Baseline	425	298	3025	1368	126	187	112	1815000	1731450	95.4%	83550	4.6%
Future	416	285	2763	1241	148	206	125	2050000	1330000	64.9%	720000	35.1%
Net	-9	-13	-262	-127	22	19	14	235000	-401450		636450	

SUMMARY OF CRITERIA POLLUTANT ACTUAL FACILITY EMISSIONS
2006 & 2007 Crop Year Average vs. Future BW & EC Boilers Gas Only 8760 h/y Operation
Mini Cassia Facility

Year	PM10	SO2	CO	NO x	VOC	Production Summary						
						Days		Steam (klbs steam)				
						Beet	Juice	Total	Coal	%	Gas	%
Baseline	425	298	3025	1368	126	187	112	1815000	1731450	95.4%	83550	4.6%
Future	258	127	2905	856	156	206	125	3942000	0	0.0%	3942000	100.0%
Net	-167	-171	-120	-512	30	19	14	2127000	-1731450		3858450	

Section 5.3.1

Facility Baseline Emissions

SUMMARY OF CRITERIA POLLUTANT EMISSIONS - Baseline (Average 2006 & 2007)
Mini Cassia Facility

Table I

3084139
187.00 Beet run (days)
111.50 Juice run (days)

Source	ID	PM max lbs/hr	PM avg lbs/h	PM year tns/yr	PM10 max lbs/hr	PM10 avg lbs/h	PM10 year tns/yr	SO2 max lbs/hr	SO2 avg lbs/h	SO2 year tns/yr	CO max lbs/hr	CO avg lbs/h	CO year tns/yr	NOx max lbs/hr	NOx avg lbs/h	NOx year tns/yr	VOC max lbs/hr	VOC avg lbs/h	VOC year tns/yr
B&W Boiler	S-B1	52.8	26.7	116.8	52.8	26.7	116.8	41.8	21.1	92.5	60.0	30.3	132.8	235.6	119.0	521.1	0.6	0.3	1.4
Erie City Boiler	S-B2	67.3	31.4	137.5	67.3	31.4	137.5	52.8	24.4	106.9	7.7	4.6	20.1	283.8	134.8	590.5	0.9	0.5	2.2
South Pulp Dryer	S-D1	44.1	15.2	66.5	44.1	15.2	66.5	27.4	9.1	39.7	287.3	98.9	433.0	78.9	26.1	114.1	1.8	0.6	2.6
North Pulp Dryer	S-D2	45.5	15.7	68.6	45.5	15.7	68.6	31.9	10.6	46.6	349.4	120.3	526.8	77.5	25.8	113.2	2.1	0.7	3.0
Pellet Cooler No. 1	S-D3	2.40	0.68	2.96	1.20	0.34	1.48												
Pellet Cooler No. 2	S-D4	2.40	0.68	2.96	1.20	0.34	1.48												
Pellet Cooler No. 3	S-D5	2.40	0.68	2.96	1.20	0.34	1.48												
Union Carbide Kiln	S-K1	1.36	0.48	2.12	1.36	0.48	2.12	2.34E-04	1.16E-04	5.07E-04	835.7	298.2	1306.3	14.46	10.37	22.60	2.34E-03	1.16E-03	5.07E-03
Belgian Coke Kiln	S-K2	0.68	0.24	1.05	0.68	0.24	1.05	2.00E-01	6.48E-02	2.84E-01	388.5	138.4	606.3	4.41	2.90	6.88	4.77E-02	1.54E-02	6.76E-02
Process & Flume Slaker	S-K3	0.50	0.17	0.76	0.50	0.17	0.76												
Drying Granulator	S-W1	0.73	0.41	1.81	0.73	0.41	1.81												
#1 Cooling Granulator	S-W2	0.37	0.21	0.90	0.37	0.21	0.90												
#2 Cooling Granulator	S-W3	0.37	0.21	0.90	0.37	0.21	0.90												
Sugar Handling(Process)	S-W4	0.30	0.30	1.31	0.30	0.30	1.31												
Sugar Handling(Bulk Loading)	S-W5	0.30	0.30	1.31	0.30	0.30	1.31												
Main Mill	S-O5																61.5	26.6	116.6
Sulfur Stoves	S-O7							6.1	2.7	11.8									
Coal Unloading Area	F-O1					0.02	0.09												
Coal Storage Area	F-O2					0.73	3.20												
Boiler Coal Unloading area & Haul Road	F-B3					0.10	0.43												
Beet Hauling - West & Loop	F-O4 (a-e)					0.73	3.18												
Beet Hauling - East	F-O4 (f-l)					1.13	4.97												
Beet Hauling - North - East	F-O4 (j)					0.17	0.74												
Cooling Towers	F-O6					0.86	3.78												
Dryer Coal Unloading	F-D6					0.01	0.06												
D[illegible] Pulp Storage & Loadout	F-D7					0.10	0.45												
PCC Storage & Handling	F-O8 (a-e)					0.88	3.87												
TOTAL	**TOTAL**	**221.6**	**93.3**	**408.6**	**218.0**	**97.0**	**424.9**	**160.2**	**68.0**	**297.8**	**1928.6**	**690.7**	**3025.3**	**694.7**	**318.9**	**1368.4**	**66.9**	**28.7**	**125.8**

SECTION 3B. PRODUCTION DATA - BOILER HOUSE

NO.		MATERIAL	UNITS	Max Hr	Avg Hr	ANNUAL
S-B1	B & W BOILER	Steam - Beet	1000 lbs	190.0	146	637500
		Coal - Beet	Tons	13.2	10.1	44100
		Steam - Juice	1000 lbs	190.0	150	203000
		Coal - Juice	Tons	13.2	10.4	14100
S-B2	ERIE CITY BOILER	Steam (Coal)-Beet	1000 lbs	220.0	173	714000
		Coal (1)-Beet	Tons	16.8	13.2	54500
		Steam (Natural Gas)-Beet	1000 lbs	250.0	173	74000
		Natural Gas (1)-Beet	MMcf	0.286	0.198	84.7
		Steam (Coal)-Juice	1000 lbs	220.0	150	176950
		Coal (1)-Juice	Tons	16.8	11.5	13600
		Steam (Natural Gas)-Juice	1000 lbs	250.0	150	9550
		Natural Gas (1)-Juice	MMcf	0.286	0.172	11.0
		Total Steam(klbs)				1815000
		Beet Steam (klbs)			78.5%	1425500
		Juice Steam(klbs)			21.5%	389500
		Coal Steam(klbs)			95.4%	1731450
		Gas Steam(klbs)			4.6%	83550

Beet run	**187.00**	**4488 hrs.**
Juice Run (testout/cleanup[5])	**111.50**	**2676 hrs.**
totals	**298.5**	**7164 hrs.**

SECTION 3C. EMISSION FACTORS - BOILER HOUSE

NO.		POLLUTANT	UNIT	EMISSION FACTOR (1) LB/UNIT	REFERENCE
S-B1	B & W BOILER - STEAM(coal)	PM	1000 lbs	0.278	IDAPA 58.01.01.677 0.1 gr/dscf grain loading standard
		PM10	1000 lbs	0.278	Assume PM10 is 100% of PM
		SO2	1000 lbs	0.220	Based on 1% sulfur and 90% scrubber efficiency.
		CO	1000 lbs	0.316	AP-42,9/98,Table 1.1-3
		NOx	1000 lbs	1.24	Oct. 05 Engineering Stack Test
		VOC	1000 lbs	0.0033	AP-42 9/98,Table 1.1-19, spreader stoker, methane & TNMOC
S-B2	ERIE CITY BOILER - STEAM (coal)	PM	1000 lbs	0.306	IDAPA 58.01.01.677 0.1 gr/dscf grain loading standard
		PM10	1000 lbs	0.306	Assume PM10 is 100% of PM
		SO2	1000 lbs	0.240	Based on 1% sulfur and 90% scrubber efficiency.
		CO	1000 lbs	0.03480	AP-42 Table 1.1-3(9/98) for subbituminous coal
		NOx	1000 lbs	1.29	Oct. 05 Engineering Stack Test
		VOC	1000 lbs	0.0042	AP-42 9/98,Table 1.1-19, PC, methane & TNMOC

SECTION 3C. EMISSION FACTORS - BOILER HOUSE

NO.		POLLUTANT	UNIT	EMISSION FACTOR (1) LB/UNIT	REFERENCE
S-B2	ERIE CITY BOILER - STEAM (gas)	PM	1000 lbs	2.94E-02	IDAPA 58.01.01.677 0.015 gr/dscf grain loading standard
		PM10	1000 lbs	2.94E-02	AP-42, 9/98, Table 1.4-2
		SO2	1000 lbs	8.10E-04	AP-42, 9/98, Table 1.4-2
		CO	1000 lbs	1.10E-01	AP-42 Table 1.4-1(7/98) for utility boilers
		NOx	1000 lbs	3.78E-01	AP-42, 9/98, Table 1.4-1
		VOC	1000 lbs	7.43E-03	AP-42, 9/98, Table 1.4-2

SECTION 3D. EMISSIONS - BOILER HOUSE

Based on campaign length (days) = 187

NO.		POLLUTANT	Max lb/hr	Avg. lbs./hr.	TONS/YR
S-B1	B & W BOILER (Beet)	PM	52.8	40.6	89
		PM10	52.8	40.6	89
		SO2	41.8	32.1	70
		CO	60.0	46.1	101
		NOx	236	181	395
		VOC	0.9	0.7	1.5
S-B2	ERIE CITY BOILER (beet)	PM	67.3	52.9	110
		PM10	67.3	52.9	110
		SO2	52.8	41.5	86
		CO	0.5	0.4	1
		NOx	284	223	474
		VOC	1.1	0.9	2

SECTION 3D. EMISSIONS - BOILER HOUSE

Based on Juice Run length (days) = 111.5

NO.		POLLUTANT	Max lb/hr	Avg. lbs./hr.	TONS/YR
S-B1	B & W BOILER (juice)	PM	52.82	41.70	28.22
		PM10	52.82	41.70	28.22
		SO2	41.80	33.00	22.33
		CO	60.04	47.40	32.07
		NOx	235.60	186.00	125.86
		VOC	0.89	0.71	0.48
S-B2	ERIE CITY BOILER (juice)	PM	67.3	45.9	27.2
		PM10	67.3	45.9	27.2
		SO2	52.8	36.0	21.2
		CO	0.5	0.3	0.2
		NOx	283.8	193.5	115.9
		VOC	1.1	0.8	0.5

SECTION 3B. PRODUCTION DATA - PULP DRYING AND PELLETIZING

NO.		MATERIAL	UNITS	Max Hrly	Avg Hrly	ANNUAL
S-D1	SOUTH DRYER	Total Input (1)	Tons	48.5	32.7	146180
		Coal (2)	Tons	4.9	3.3	14179
		Natural Gas (3)	MMcf	0.097	0.066	218
S-D2	NORTH DRYER	Total Input (1)	Tons	56.9	38.3	171603
		Coal (2)	Tons	5.7	3.8	16645
		Natural Gas (3)	MMcf	0.110	0.074	247
S-D3	PELLET COOLER NO. 1	Pellets	Tons	7.5	6.1	18487
S-D4	PELLET COOLER NO. 2	Pellets	Tons	7.5	6.1	18487
S-D5	PELLET COOLER NO. 3	Pellets	Tons	7.5	6.1	18487

(1) Total input includes press pulp, coal, and additives.

Est days of campaign	**187.00**
Est. hours of operation	**4488**

SECTION 3C. EMISSION FACTORS - PULP DRYING AND PELLETIZING

NO.		POLLUTANT	UNIT	EMISSION FACTOR (1) LB/UNIT	REFERENCE
S-D1	SOUTH DRYER	PM	Tons	0.91	Title V (derived from PW calculation for allowable emissions)
	-TOTAL INPUT	PM10	Tons	0.91	Assume 100% of PM is PM10
		CO	Tons	5.92	11/02 eng. Stack Test @MC
	- COAL	SO2	Tons	5.60	Title V, based on 0.8% sulfur in coal & 80% scrubber efficiency.
		NOx	Tons	16.10	11/02 eng. Stack Test @MC & 10 % safety factor
		VOC	Tons	0.36	11/98 NY Engineering Source Test & eng. estimates

NO.		POLLUTANT	UNIT	EMISSION FACTOR (1) LB/UNIT	REFERENCE
S-D2	NORTH DRYER	PM	Tons	0.80	Title V (derived from PW calculation for allowable emissions)
	-TOTAL INPUT	PM10	Tons	0.80	Assume 100% of PM is PM10
		CO	Tons	6.14	11/02 eng. Stack Test @MC
	- COAL	SO2	Tons	5.60	Title V, based on 0.8% sulfur in coal & 80% scrubber efficiency.
		NOx	Tons	13.60	11/02 eng. Stack Test @MC & 10 % safety factor
		VOC	Tons	0.36	11/98 NY Engineering Source Test & eng. estimates

SECTION 3D. EMISSIONS - PULP DRYING AND PELLETIZING

NO.		POLLUTANT	Max lb/hr	Avg. lbs./hr.	TONS/YR
S-D1	SOUTH DRYER	PM	44.1	29.8	66.5
		PM10	44.1	29.8	66.5
		CO	287.3	193.7	433.0
		SO2	27.4	18.5	39.7
		NOx	78.9	53.1	114.1
		VOC	1.8	1.2	2.6
S-D2	NORTH DRYER	PM	45.5	30.6	68.6
		PM10	45.5	30.6	68.6
		CO	349.4	235.2	526.8
		SO2	31.9	21.3	46.6
		NOx	77.5	51.7	113.2
		VOC	2.1	1.4	3.0
S-D3	PELLET COOLER NO.1	PM	2.40	1.95	3.0
	- PELLETS (tons)	PM10	1.20	0.98	1.5
S-D4	PELLET COOLER NO.2	PM	2.40	1.95	3.0
	- PELLETS (tons)	PM10	1.20	0.98	1.5
S-D5	PELLET COOLER NO.3	PM	2.40	1.95	3.0
	- PELLETS (tons)	PM10	1.20	0.98	1.5

(1) Hourly emissions cannot be calculated because hourly production cannot be determined.

SECTION 3B. PRODUCTION DATA - LIME KILN AND CO2 PRODUCTION

NO.		MATERIAL	UNITS	Max Hrly	Avg Hrly	ANNUAL
S-K1	UNION CARBIDE KILN (GAS KILN)	Lime Rock	Tons	15.1	10.8	47075
		Natural Gas	MMcf	0.039	0.038	169
S-K2	BELGIUM KILN (COKE KILN)	Lime Rock	Tons	7.0	4.6	21849
		Coke		0.50	0.300	1419
S-K3	PROCESS & FLUME SLACKERS	CaO	Tons	17.9	12.1	54258

(1) Process input to S-K3 is the sum of kiln lime & supplemental lime.

Days 187.00

SECTION 3C. EMISSION FACTORS - LIME KILN AND CO2 PRODUCTION

NO.		POLLUTANT	EMISSION FACTOR (1) UNIT	LB/UNIT	REFERENCE
S-K1	UNION CARBIDE KILN				
	- LIME ROCK	PM	Tons	0.09	Eng. est and 99% removal
		PM10	Tons	0.09	Eng. est and 99% removal
		CO	Tons	55.5	12/03 Stack Testing Nampa Facility
		NOx	Tons	0.96	AP42, Boilers Table 1.4-1
	- NATURAL GAS	SO2	MMcf	0.006	AP-42, 7/98, Table 1.4-2 & 99% removal
		VOC	MMcf	0.06	AP-42, 7/98, Table 1.4-2 & 99% removal
S-K2	BELGIUM KILN				
	-TOTAL INPUT	PM	Tons	0.09	Eng. est and 99% removal
		PM10	Tons	0.09	Eng. est and 99% removal
	-LIME ROCK	CO	Tons	55.5	12/03 Stack Testing Nampa Facility
		NOx	Tons	0.630	AP42, Boiler,anthracite coal, Table 1.2-1
	-COKE	SO2	Tons	0.4	AP-42, 9/98, Table 1.4-2 & 99% removal
		VOC	Tons	0.095	Eng. est based on 2005 TF Stack Test
S-K3	PROCESS & FLUME				
	SLACKERS	PM	Tons	0.028	Nampa Tier II Nov 2004 Compliance test
	- CaO	PM10	Tons	0.028	Nampa Tier II Nov 2004 Compliance test

SECTION 3D. EMISSIONS - LIME KILN AND CO2 PRODUCTION

NO.		POLLUTANT	Max lbs./hr.	Avg. lbs./hr.	TONS/YR
S-K1	UNION CARBIDE KILN	PM	1.36	0.97	2.12
		PM10	1.36	0.97	2.12
		SO2	0.00	2.28E-04	0.00
		CO	836	599	1306
		NOx	14.46	10.37	22.60
		VOC	2.34E-03	2.28E-03	5.07E-03
S-K2	BELGIUM KILN	PM	0.68	0.44	1.05
		PM10	0.68	0.44	1.05
		SO2	0.20	0.12	0.3
		CO	389	255.3	606.3
		NOx	4.41	2.90	6.88
		VOC	0.05	0.03	0.07
S-K3	PROCESS SLACKER	PM	0.50	0.34	0.76
		PM10	0.50	0.34	0.76

SECTION 3B. PRODUCTION DATA - SUGAR WAREHOUSE AND SHIPPING

NO.		MATERIAL	UNITS	3084139 Max hrly	Hourly	ANNUAL
S-W1	DRYING GRANULATOR	Sugar	Tons	73.0	48.5	361866
S-W2	NO. 1 COOLING GRANULATOR	Sugar	Tons	73.0	48.5	361866
S-W3	NO. 2 COOLING GRANULATOR	Sugar	Tons	73.0	48.5	361866
S-W4	SUGAR HANDLING (PROCESS)	NA	Hours	1.0	1	8760
S-W5	SUGAR HANDLING (BULK LOADING)	NA	Hours	1.0	1	8760

Beet Run	187.00	4488 hrs.
Juice Run	111.50	2676 hrs.
totals	298.5	7164 hrs.

SECTION 3C. EMISSION FACTORS - SUGAR WAREHOUSE AND SHIPPING

NO.		POLLUTANT	UNIT	EMISSION FACTOR (1) UNIT	LB/UNIT	REFERENCE
S-W1	DRYING GRANULATOR - SUGAR	PM	tons	Tons	0.01	11/04 Compliance Test at Nampa
		PM10	tons	Tons	0.01	Assume 100% of PM = PM10
S-W2	NO. 1 COOLING GRANULATOR	PM	tons	Tons	0.005	11/05 Compliance Test at Nampa
		PM10	tons	Tons	0.005	Assume 100% of PM=PM10
S-W3	NO. 2 COOLING GRANULATOR - SUGAR	PM	tons	Tons	0.005	11/05 Compliance Test at Nampa
		PM10	tons	Tons	0.005	Assume 100% of PM=PM10
S-W4	SUGAR HANDLING (PROCESS)	PM	lbs/h	lbs/h	0.3	Nov. 2001 Eng. Source test at Nampa
		PM10	lbs/h	lbs/h	0.3	Assume 100% of PM=PM10
S-W5	SUGAR HANDLING (BULK LOADING)	PM	lbs/h	lbs/h	0.3	Nov. 2001 Eng. Source test at Nampa
		PM10	lbs/h	lbs/h	0.3	Assume 100% of PM=PM10

(1) See Appendix G for emission factor documentation.

SECTION 3D. EMISSIONS - SUGAR WAREHOUSE AND SHIPPING

NO.		POLLUTA	Max lbs./hr.	Avg. lbs./hr.	TONS/YR
S-W1	DRYING GRANULATOR	PM	0.73	0.49	1.81
	- SUGAR (tons)	PM10	0.73	0.49	1.81
S-W2	NO. 1 COOLING GRANULATOR	PM	0.37	0.24	0.90
	- SUGAR	PM10	0.37	0.24	0.90
S-W3	NO. 2 COOLING GRANULATOR	PM	0.37	0.24	0.90
	- SUGAR	PM10	0.37	0.24	0.90
S-W4	SUGAR HANDLING	PM	0.30	0.30	1.31
	(PROCESS)	PM10	0.30	0.30	1.31
S-W5	SUGAR HANDLING	PM	0.30	0.30	1.31
	(BULK LOADING)	PM10	0.30	0.30	1.31

SECTION 3B. PRODUCTION DATA - OTHER SOURCES

NO.		MATERIAL	UNITS	3084139 Max Hrly	Avg Hrly	ANNUAL
S-O5	MAIN MILL	Thin Juice	1000 gal	222.0	200	841970
S-O7	SULFUR STOVE	Sulfur	Tons	0.07	0.06	258

(1) Estimating thin juice flow from diffuser operation in 2002-03 campaign of 273 gal./ton beets.

Beet Run	187.00 days	4488 hrs.
Juice run	111.50 days	

Annual Beet Slice	**3,084,139**	tons

SECTION 3C. EMISSION FACTORS - OTHER SOURCES

NO.		POLLUTANT	EFF	EMISSION FACTOR (1) UNIT	LB/UNIT	REFERENCE
S-05	MAIN MILL	VOC		1000 gal	0.277	Nonvalidated Test Method - 2005 Beet Campaign
S-07	SULFUR STOVE	SO2		lb/ton	91.60	July 1992 Eng Stack Test @ Nampa & Safety Factor

(1) See Appendix G for emission factor documentation.

SECTION 3D. EMISSIONS - OTHER SOURCES

NO.		POLLUTANT	Max lbs/h	Avg lbs/hr	tons/y
S-O5	MAIN MILL	VOC	61.5	55.40	116.6
S-O7	SULFUR STOVE	SO2	6.1	5.27	11.8

(1) Hourly production data cannot be determined, because of a batch process with significant hourly variability.
(2) Hourly averages on fugitive sources are calculated by dividing production by hours of beet campaign.

Beet Campaign	187	4488.00
Juice Run	111.5	2676.00
Total	298.5	7164.00

Section 5.3.2

Projected Emissions
B&W Boiler Natural Gas Only &
Erie City Boiler Coal Only

SUMMARY OF CRITERIA POLLUTANT EMISSIONS - Future B&W Boiler gas only & Erie City Boiler coal only
Mini Cassia Facility

Table I

3500000
206.00 Beet run (days)
125.00 Juice run (days)

Source	ID	PM max lbs/hr	PM avg lbs/h	PM year tns/yr	PM10 max lbs/hr	PM10 avg lbs/h	PM10 year tns/yr	SO2 max lbs/hr	SO2 avg lbs/h	SO2 year tns/yr	CO max lbs/hr	CO avg lbs/h	CO year tns/yr	NOx max lbs/hr	NOx avg lbs/h	NOx year tns/yr	VOC max lbs/hr	VOC avg lbs/h	VOC year tns/yr
Beet Boiler	S-B1	5.3	2.3	10.1	5.3	2.3	10.1	0.1	0.1	0.3	18.1	7.8	34.2	23.8	10.3	45.0	1.3	0.6	2.6
Erie City Boiler	S-B2	67.3	46.5	203.5	67.3	46.5	203.5	52.8	36.4	159.6	7.7	5.3	23.1	283.8	195.9	857.9	0.9	0.6	2.8
South Pulp Dryer	S-D1	44.1	17.9	78.5	44.1	17.9	78.5	27.4	11.6	51.0	287.3	116.7	510.9	78.9	33.4	146.5	1.8	0.7	3.3
North Pulp Dryer	S-D2	45.5	18.5	81.0	45.5	18.5	81.0	31.9	13.7	59.9	349.4	141.9	621.7	77.5	33.2	145.5	2.1	0.9	3.9
Pellet Cooler No. 1	S-D3	2.40	0.84	3.68	1.20	0.42	1.84												
Pellet Cooler No. 2	S-D4	2.40	0.84	3.68	1.20	0.42	1.84												
Pellet Cooler No. 3	S-D5	2.40	0.84	3.68	1.20	0.42	1.84												
		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00
Eberhardt Kiln	S-K1	3.10	1.61	7.06	3.10	1.61	7.06	0.92	0.49	2.14	690.2	359.1	1572.7	20.22	20.22	46.08	1.21	0.64	2.80
Process Slaker	S-K2	0.46	0.24	1.05	0.46	0.24	1.05												
Drying Granulator	S-W1	0.73	0.54	2.35	0.73	0.54	2.35												
#1 Cooling Granulator	S-W2	0.37	0.27	1.18	0.37	0.27	1.18												
#2 Cooling Granulator	S-W3	0.37	0.27	1.18	0.37	0.27	1.18												
Sugar Handling(Process)	S-W4	0.30	0.30	1.31	0.30	0.30	1.31												
Sugar Handling(Bulk Loading)	S-W5	0.30	0.30	1.31	0.30	0.30	1.31												
Main Mill	S-O5																61.5	30.2	132.3
Sulfur Stoves	S-O7							5.5	2.7	11.9									
Coal Unloading Area	F-O1					0.03	0.15												
Coal Storage Area	F-O2					0.80	3.51												
Boiler Coal Unloading area & Haul Road	F-B3					0.11	0.50												
Beet Hauling - West & Loop	F-O4 (a-e)					0.74	3.24												
Beet Hauling - East	F-O4 (f-l)					1.13	4.97												
Beet Hauling - North - East	F-O4 (j)					0.17	0.74												
Cooling Towers	F-O6					0.92	4.02												
Dryer Coal Unloading	F-D6					0.01	0.06												
Dry Pulp Storage & Loadout	F-D7					0.10	0.45												
PCC Storage & Handling	F-O8 (a-e)					0.90	3.94												
TOTAL	**TOTAL**	**175.1**	**91.2**	**399.6**	**171.5**	**94.9**	**415.6**	**118.8**	**65.0**	**284.8**	**1352.5**	**630.8**	**2762.7**	**484.2**	**293.0**	**1241.0**	**68.8**	**33.7**	**147.6**

SECTION 3B. PRODUCTION DATA - BOILER HOUSE

NO.		MATERIAL	UNITS	Max Hr	Avg Hr	ANNUAL
S-B1	B & W BOILER	Steam - PTE	1000 lbs	190.0	146	720000
		Natural Gas- PTE	MMcf	0.244	0.244	2137
		Steam - Juice	1000 lbs	0.0	0	0
		Natural Gas -Juice	Tons	0.0	0.0	0
S-B2	ERIE CITY BOILER	Steam (Coal)-Beet	1000 lbs	220.0	175	880000
		Coal -Beet	Tons	16.8	13.4	66250
		Steam (Natural Gas)-Beet	1000 lbs	250.0	175	0
		Natural Gas -Beet	MMcf	0.286	0.200	303
		Steam (Coal)-Juice	1000 lbs	220.0	150	450000
		Coal -Juice	Tons	16.8	11.5	34500
		Steam (Natural Gas)-Juice	1000 lbs	250.0	150	0
		Natural Gas -Juice	MMcf	0.286	0.172	400
		Total Steam(klbs)				2050000
		Beet Steam (klbs)			78.0%	1600000
		Juice Steam(klbs)			22.0%	450000
		Coal Steam(klbs)			64.9%	1330000
		Gas Steam(klbs)			35.1%	720000

Assumes B&W Boiler on Gas Only and Erie City on Coal Only.

Beet run	206.00	4944 hrs.
Juice Run (testout/cleanup[5])	125.00	3000 hrs.
totals	331	7944 hrs.

SECTION 3C. EMISSION FACTORS - BOILER HOUSE

NO.		POLLUTANT	EMISSION FACTOR (1) UNIT	LB/UNIT	REFERENCE
S-B1	B & W BOILER - STEAM(gas)	PM	1000 lbs	0.0281	IDAPA 58.01.01.677 - 0.015 gr/dscf grain loading standard
		PM10	1000 lbs	0.0281	Assume PM10 is 100% of PM
		SO2	1000 lbs	7.70E-04	AP-42(7/98),Table 1.4-2
		CO	1000 lbs	9.50E-02	Burner manufacturer estimate(100ppm @ 3% O2 dry basis)
		NOx	1000 lbs	0.13	0.1 lbs/MMBtu NSPS Standard - Low Heat Release Furnace
		VOC	1000 lbs	0.0071	AP-42(7/98) Table 1.4-2
S-B2	ERIE CITY BOILER - STEAM (coal)	PM	1000 lbs	0.306	IDAPA 58.01.01.677 0.1 gr/dscf grain loading standard
		PM10	1000 lbs	0.306	Assume PM10 is 100% of PM
		SO2	1000 lbs	0.240	Based on 1% sulfur and 90% scrubber efficiency.
		CO	1000 lbs	0.03480	AP-42 Table 1.1-3(9/98) for subbituminous coal
		NOx	1000 lbs	1.29	Oct. 05 Engineering Stack Test
		VOC	1000 lbs	0.0042	AP-42 9/98,Table 1.1-19, PC, methane & TNMOC

SECTION 3C. EMISSION FACTORS - BOILER HOUSE

NO.		POLLUTANT	EMISSION FACTOR (1) UNIT	LB/UNIT	REFERENCE
S-B2	ERIE CITY BOILER - STEAM (gas)	PM	1000 lbs	2.94E-02	IDAPA 58.01.01.677 0.015 gr/dscf grain loading standard
		PM10	1000 lbs	2.94E-02	AP-42, 9/98, Table 1.4-2
		SO2	1000 lbs	8.10E-04	AP-42, 9/98, Table 1.4-2
		CO	1000 lbs	1.10E-01	AP-42 Table 1.4-1(7/98) for utility boilers
		NOx	1000 lbs	3.78E-01	AP-42, 9/98, Table 1.4-1
		VOC	1000 lbs	7.43E-03	AP-42, 9/98, Table 1.4-2

SECTION 3D. EMISSIONS - BOILER HOUSE

Based on campaign length (days) = 206

NO.		POLLUTANT	Max lb/hr	Avg. lbs./hr.	TONS/YR
S-B1	B & W BOILER (Beet)	PM	5.3	4.1	10
		PM10	5.3	4.1	10
		SO2	0.1	0.1	0
		CO	18.1	13.9	34
		NOx	24	18	45
		VOC	1.3	1.0	2.6
S-B2	ERIE CITY BOILER (beet)	PM	67.3	53.6	135
		PM10	67.3	53.6	135
		SO2	52.8	42.0	106
		CO	7.7	6.1	15
		NOx	284	226	568
		VOC	0.9	0.7	2

(1) Hourly production data cannot be determined, because this is a batch process with significant hourly variability.

SECTION 3D. EMISSIONS - BOILER HOUSE

Based on Juice Run length (days) = 125

NO.		POLLUTANT	Max lb/hr	Avg. lbs./hr.	TONS/YR
S-B1	B & W BOILER (juice)	PM	0.00	0.00	0.00
		PM10	0.00	0.00	0.00
		SO2	0.00	0.00	0.00
		CO	0.00	0.00	0.00
		NOx	0.00	0.00	0.00
		VOC	0.00	0.00	0.00
S-B2	ERIE CITY BOILER (juice)	PM	67	46	68.9
		PM10	67	46	68.9
		SO2	53	36	54.0
		CO	8	5	7.8
		NOx	284	194	290.3
		VOC	1	1	0.9

NO.		MATERIAL	UNITS	19550 slice Max Hrly	Avg Hrly	ANNUAL
S-D1	SOUTH DRYER	Total Input (1)	Tons	48.5	34.9	172500
		Coal (2)	Tons	4.9	3.7	18200
		Natural Gas (3)	MMcf	0.097	0.097	0
S-D2	NORTH DRYER	Total Input (1)	Tons	56.9	41.0	202500
		Coal (2)	Tons	5.7	4.3	21400
		Natural Gas (3)	MMcf	0.110	0.110	0
S-D3	PELLET COOLER NO. 1	Pellets	Tons	7.5	4.3	23000
S-D4	PELLET COOLER NO. 2	Pellets	Tons	7.5	4.3	23000
S-D5	PELLET COOLER NO. 3	Pellets	Tons	7.5	4.3	23000

(1) Total input includes press pulp, coal, and additives.
(2) Production data assumes that only coal is used to dry pulp.

Est days of campaign	**206.00**
Est. hours of operation	**4944**

NO.			EMISSION FACTOR (1)		
		POLLUTANT	UNIT	LB/UNIT	REFERENCE
S-D1	SOUTH DRYER	PM	Tons	0.91	Title V (derived from PW calculation for allowable emissions)
	-TOTAL INPUT	PM10	Tons	0.91	Assume 100% of PM is PM10
		CO	Tons	5.92	11/02 eng. Stack Test @MC
	- COAL	SO2	Tons	5.60	Title V, based on 0.8% sulfur in coal & 90% scrubber efficiency.
		NOx	Tons	16.10	11/02 eng. Stack Test @MC & 10 % safety factor
		VOC	Tons	0.36	11/98 NY Engineering Source Test & eng. estimates

NO.			EMISSION FACTOR (1)		
		POLLUTANT	UNIT	LB/UNIT	REFERENCE
S-D2	NORTH DRYER	PM	Tons	0.80	Title V (derived from PW calculation for allowable emissions)
	-TOTAL INPUT	PM10	Tons	0.80	Assume 100% of PM is PM10
		CO	Tons	6.14	11/02 eng. Stack Test @MC
	- COAL	SO2	Tons	5.60	Title V, based on 0.8% sulfur in coal & 90% scrubber efficiency.
		NOx	Tons	13.60	11/02 eng. Stack Test @MC & 10 % safety factor
		VOC	Tons	0.36	11/98 NY Engineering Source Test & eng. estimates

SECTION 3D. EMISSIONS - PULP DRYING AND PELLETIZING

NO.		POLLUTANT	Max lb/hr	Avg. lbs./hr.	TONS/YR
S-D1	SOUTH DRYER	PM	44.1	32	78
		PM10	44.1	32	78
		CO	287	207	511
		SO2	27	21	51
		NOx	79	60	147
		VOC	2	1	3
S-D2	NORTH DRYER	PM	45.5	33	81
		PM10	45.5	33	81
		CO	349	252	622
		SO2	32	24	60
		NOx	78	58	146
		VOC	2	2	4

(1) Hourly emissions cannot be calculated because hourly production cannot be determined.

S-D3	PELLET COOLER NO.1	PM	2.40	1.38	3.7
	- PELLETS (tons)	PM10	1.20	0.69	1.8
S-D4	PELLET COOLER NO.2	PM	2.40	1.38	3.7
	- PELLETS (tons)	PM10	1.20	0.69	1.8
S-D5	PELLET COOLER NO.3	PM	2.40	1.38	3.7
	- PELLETS (tons)	PM10	1.20	0.69	1.8

SECTION 3B. PRODUCTION DATA - LIME KILN AND CO2 PRODUCTION

NO.		MATERIAL	UNITS	Max Hrly	Avg Hrly	ANNUAL
	UNION CARBIDE KILN	Lime Rock	Tons	0.0	0.0	0
		Natural Gas	MMcf	0.000	0.000	0
S-K1	EBERHARDT KILN	Lime Rock	Tons	32.1	32.1	146300
		Coke		2.30	2.300	10680
S-K2	EBERHARDT SLACKER	CaO	Tons	16.4	16.4	74860

(1) Process input to S-K3 is the sum of kiln lime & supplemental lime.

PROJECTED OPERATING DAYS = 206.00

Hours of Op. 4416

Shutdown & disassembled.

SECTION 3C. EMISSION FACTORS - LIME KILN AND CO2 PRODUCTION

NO.		POLLUTANT	UNIT	EMISSION FACTOR (1) LB/UNIT	REFERENCE
	UNION CARBIDE KILN				
	- LIME ROCK	PM	Tons	0.09	Eng. est and 99% removal
		PM10	Tons	0.09	Eng. est and 99% removal
		CO	Tons	55.5	12/03 Stack Testing Nampa Facility
		NOx	Tons	0.96	AP42, Boilers Table 1.4-1
	- NATURAL GAS	SO2	MMcf	0.006	AP-42, 7/98, Table 1.4-2 & 99% removal
		VOC	MMcf	0.06	AP-42, 7/98, Table 1.4-2 & 99% removal

Shutdown & disassembled.

S-K1	EBERHARDT KILN				
	-TOTAL INPUT	PM	Tons	0.09	Eng. est and 99% removal
		PM10	Tons	0.09	Eng. est and 99% removal
	-LIME ROCK	CO	Tons	21.5	Eng. combustion evaluation & safety factor
		NOx	Tons	0.630	AP42, Boiler,anthracite coal, Table 1.2-1
	-COKE	SO2	Tons	0.4	AP-42, 9/98, Table 1.4-2 & 99% removal
		VOC	Tons	0.524	Eng. est based on 2005 TF Stack Test

S-K3	PROCESS & FLUME				
	SLACKERS	PM	Tons	0.028	Nampa Tier II Nov 2004 Compliance test
	- CaO	PM10	Tons	0.028	Nampa Tier II Nov 2004 Compliance test

(1) See Appendix G for emission factor documentation.

SECTION 3D. EMISSIONS - LIME KILN AND CO2 PRODUCTION

NO.		POLLUTANT	Max lbs./hr.	Avg. lbs./hr.	TONS/YR
	UNION CARBIDE KILN	PM	0.00	0.00	0.00
		PM10	0.00	0.00	0.00
		SO2	0.00	0.00E+00	0.00
		CO	0	0	0
		NOx	0.00	0.00	0.00
		VOC	0.00E+00	0.00E+00	0.00E+00

Shutdown & disassembled.

S-K1	EBERHARDT KILN	PM	3.10	3.10	7.06
		PM10	3.10	3.10	7.06
		SO2	0.92	0.92	2.1
		CO	690	690.2	1572.7
		NOx	20.22	20.22	46.08
		VOC	1.21	1.21	2.80
S-K3	PROCESS SLACKER	PM	0.46	0.46	1.05
		PM10	0.46	0.46	1.05

(1) Hourly production data cannot be determined, because of a batch process with significant hourly variability.

SECTION 3B. PRODUCTION DATA - SUGAR WAREHOUSE AND SHIPPING

NO.		MATERIAL	UNITS	3500000 Max hrly	Hourly	ANNUAL
S-W1	DRYING GRANULATOR	Sugar	Tons	73.0	48.5	470000
S-W2	NO. 1 COOLING GRANULATOR	Sugar	Tons	73.0	48.5	470000
S-W3	NO. 2 COOLING GRANULATOR	Sugar	Tons	73.0	48.5	470000
S-W4	SUGAR HANDLING (PROCESS)	NA	Hours	1.0	1	8760
S-W5	SUGAR HANDLING (BULK LOADING)	NA	Hours	1.0	1	8760

1) Assume max hourly is 15% above average hourly.

Beet Run	206.00	4944 hrs.
Juice Run	125.00	3000 hrs.
totals	331	7944 hrs.

SECTION 3C. EMISSION FACTORS - SUGAR WAREHOUSE AND SHIPPING

NO.		POLLUTANT	UNIT	EMISSION FACTOR (1) UNIT	LB/UNIT	REFERENCE
S-W1	DRYING GRANULATOR - SUGAR	PM	tons	Tons	0.01	11/04 Compliance Test at Nampa
		PM10	tons	Tons	0.01	Assume 100% of PM = PM10
S-W2	NO. 1 COOLING GRANULATOR	PM	tons	Tons	0.005	11/05 Compliance Test at Nampa
		PM10	tons	Tons	0.005	Assume 100% of PM=PM10
S-W3	NO. 2 COOLING GRANULATOR - SUGAR	PM	tons	Tons	0.005	11/05 Compliance Test at Nampa
		PM10	tons	Tons	0.005	Assume 100% of PM=PM10
S-W4	SUGAR HANDLING (PROCESS)	PM	lbs/h	lbs/h	0.3	Nov. 2001 Eng. Source test at Nampa
		PM10	lbs/h	lbs/h	0.3	Assume 100% of PM=PM10
S-W5	SUGAR HANDLING (BULK LOADING)	PM	lbs/h	lbs/h	0.3	Nov. 2001 Eng. Source test at Nampa
		PM10	lbs/h	lbs/h	0.3	Assume 100% of PM=PM10

(1) See Appendix G for emission factor documentation.

SECTION 3D. EMISSIONS - SUGAR WAREHOUSE AND SHIPPING

NO.		POLLUTA	Max lbs./hr.	Avg. lbs./hr.	TONS/YR
S-W1	DRYING GRANULATOR	PM	0.73	0.49	2.35
	- SUGAR (tons)	PM10	0.73	0.49	2.35
S-W2	NO. 1 COOLING GRANULATOR	PM	0.37	0.24	1.18
	- SUGAR	PM10	0.37	0.24	1.18
S-W3	NO. 2 COOLING GRANULATOR	PM	0.37	0.24	1.18
	- SUGAR	PM10	0.37	0.24	1.18
S-W4	SUGAR HANDLING	PM	0.30	0.30	1.31
	(PROCESS)	PM10	0.30	0.30	1.31
S-W5	SUGAR HANDLING	PM	0.30	0.30	1.31
	(BULK LOADING)	PM10	0.30	0.30	1.31

SECTION 3B. PRODUCTION DATA - OTHER SOURCES

NO.		MATERIAL	UNITS	3500000 Max Hrly	Avg Hrly	ANNUAL
S-O5	MAIN MILL	Thin Juice	1000 gal	222.0	200	955500
S-O7	SULFUR STOVE	Sulfur	Tons	0.06	0.05	260

(1) Assume max hourly rates are 15 % above average rates.
(2) Estimating thin juice flow from diffuser operation in 2002-03 campaign of 273 gal./ton beets.

Beet Run	206.00 days	4944 hrs.
Juice run	125.00 days	

Annual Beet Slice	**3,500,000** tons

SECTION 3C. EMISSION FACTORS - OTHER SOURCES

NO.		POLLUTANT	EFF	UNIT	EMISSION FACTOR (1) LB/UNIT	REFERENCE
S-O5	MAIN MILL	VOC		1000 gal	0.277	Nonvalidated Test Method - 2005 Beet Campaign
S-O7	SULFUR STOVE	SO2		lb/ton	91.60	July 1992 Eng Stack Test @ Nampa & Safety Factor

(1) See Appendix G for emission factor documentation.

SECTION 3D. EMISSIONS - OTHER SOURCES

NO.		POLLUTANT	Max lbs/h	Avg lbs/hr	tons/y
S-O5	MAIN MILL	VOC	61.5	55.40	132.3
S-O7	SULFUR STOVE	SO2	5.5	4.82	11.9

(1) Hourly production data cannot be determined, because of a batch process with significant hourly variability.
(2) Hourly averages on fugitive sources are calculated by dividing production by hours of beet campaign.

Beet Campaign	206	4944.00
Juice Run	125	3000.00
Total	331	7944.00

Section 5.3.3

Projected Emissions
B&W Boiler and Erie City Boiler
Natural Gas Only @ 8760 hours per year

SUMMARY OF CRITERIA POLLUTANT EMISSIONS - Future
Mini Cassia Facility

Table I

3500000
206.00 Beet run (days)
125.00 Juice run (days)

Source	ID	PM max lbs/hr	PM avg lbs/h	PM year tns/yr	PM10 max lbs/hr	PM10 avg lbs/h	PM10 year tns/yr	SO2 max lbs/hr	SO2 avg lbs/h	SO2 year tns/yr	CO max lbs/hr	CO avg lbs/h	CO year tns/yr	NOx max lbs/hr	NOx avg lbs/h	NOx year tns/yr	VOC max lbs/hr	VOC avg lbs/h	VOC year tns/yr
Babw Boiler	S-B1	5.3	5.3	23.4	5.3	5.3	23.4	0.1	0.1	0.6	18.1	18.0	79.0	23.8	23.7	104.0	1.3	1.3	5.9
Erie City Boiler	S-B2	0.0	7.4	32.2	0.0	7.4	32.2	0.0	0.2	0.9	0.0	27.5	120.5	0.0	94.5	413.9	0.0	1.9	8.1
South Pulp Dryer	S-D1	44.1	17.9	78.5	44.1	17.9	78.5	27.4	11.6	51.0	287.3	116.7	510.9	78.9	33.4	146.5	1.8	0.7	3.3
North Pulp Dryer	S-D2	45.5	18.5	81.0	45.5	18.5	81.0	31.9	13.7	59.9	349.4	141.9	621.7	77.5	33.2	145.5	2.1	0.9	3.9
Pellet Cooler No. 1	S-D3	2.40	0.84	3.68	1.20	0.42	1.84												
Pellet Cooler No. 2	S-D4	2.40	0.84	3.68	1.20	0.42	1.84												
Pellet Cooler No. 3	S-D5	2.40	0.84	3.68	1.20	0.42	1.84												
		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00
Eberhardt Kiln	S-K1	3.10	1.61	7.06	3.10	1.61	7.06	0.92	0.49	2.14	690.2	359.1	1572.7	20.22	20.22	46.08	1.21	0.64	2.80
Process Slaker	S-K2	0.46	0.24	1.05	0.46	0.24	1.05												
Drying Granulator	S-W1	0.73	0.54	2.35	0.73	0.54	2.35												
#1 Cooling Granulator	S-W2	0.37	0.27	1.18	0.37	0.27	1.18												
#2 Cooling Granulator	S-W3	0.37	0.27	1.18	0.37	0.27	1.18												
Sugar Handling(Process)	S-W4	0.30	0.30	1.31	0.30	0.30	1.31												
Sugar Handling(Bulk Loading)	S-W5	0.30	0.30	1.31	0.30	0.30	1.31												
Main Mill	S-O5																61.5	30.2	132.3
Sulfur Stoves	S-O7							5.5	2.7	11.9									
Coal Unloading Area	F-O1					0.03	0.15												
Coal Storage Area	F-O2					0.80	3.51												
Boiler Coal Unloading area & Haul Road	F-B3					0.11	0.50												
Beet Hauling - West & Loop	F-O4 (a-e)					0.74	3.24												
Beet Hauling - East	F-O4 (f-l)					1.13	4.97												
Beet Hauling - North - East	F-O4 (j)					0.17	0.74												
Cooling Towers	F-O6					0.92	4.02												
Dryer Coal Unloading	F-D6					0.01	0.06												
Dry Pulp Storage & Loadout	F-D7					0.10	0.45												
PCC Storage & Handling	F-O8 (a-e)					0.90	3.94												
TOTAL	**TOTAL**	**107.8**	**55.1**	**241.5**	**104.2**	**58.8**	**257.6**	**66.0**	**28.9**	**126.5**	**1344.9**	**663.2**	**2904.8**	**200.4**	**205.1**	**856.0**	**67.9**	**35.7**	**156.3**

SECTION 3B. PRODUCTION DATA - BOILER HOUSE

NO.		MATERIAL	UNITS	Max Hr	Avg Hr	ANNUAL
S-B1	B & W BOILER	Steam - PTE	1000 lbs	190.0	146	1664000
		Natural Gas- PTE	MMcf	0.244	0.244	2137
		Steam - Juice	1000 lbs	0.0	0	0
		Natural Gas -Juice	Tons	0.0	0.0	0
S-B2	ERIE CITY BOILER	Steam (Coal)-Beet	1000 lbs	0.0	0	0
		Coal -Beet	Tons	0.0	0.0	0
		Steam - PTE	1000 lbs	250.0	250	2190000
		Natural Gas- PTE	MMcf	0.286	0.286	2505
		Steam (Coal)-Juice	1000 lbs	0.0	0	0
		Coal -Juice	Tons	0.0	0.0	0
		Steam (Natural Gas)-Juice	1000 lbs	0.0	0	0
		Natural Gas -Juice	MMcf	0.000	0.000	400
		Total Steam(klbs)				3854000
		Beet Steam (klbs)			100.0%	3854000
		Juice Steam(klbs)			0.0%	0
		Coal Steam(klbs)			0.0%	0
		Gas Steam(klbs)			100.0%	3854000

Beet run	**206.00**	**4944 hrs.**
Juice Run (testout/cleanup[5])	**125.00**	**3000 hrs.**
totals	**331**	**7944 hrs.**

SECTION 3C. EMISSION FACTORS - BOILER HOUSE

NO.		POLLUTANT	EMISSION FACTOR (1) UNIT	LB/UNIT	REFERENCE
S-B1	B & W BOILER - STEAM(gas)	PM	1000 lbs	0.0281	IDAPA 58.01.01.677 - 0.015 gr/dscf grain loading standard
		PM10	1000 lbs	0.0281	Assume PM10 is 100% of PM
		SO2	1000 lbs	7.70E-04	AP-42(7/98),Table 1.4-2
		CO	1000 lbs	9.50E-02	Burner manufacturer estimate(100ppm @ 3% O2 dry basis)
		NOx	1000 lbs	0.13	0.1 lbs/MMBtu NSPS Standard - Low Heat Release Furnace
		VOC	1000 lbs	0.0071	AP-42(7/98) Table 1.4-2
S-B2	ERIE CITY BOILER - STEAM (coal)	PM	1000 lbs	0.306	IDAPA 58.01.01.677 0.1 gr/dscf grain loading standard
		PM10	1000 lbs	0.306	Assume PM10 is 100% of PM
		SO2	1000 lbs	0.240	Based on 1% sulfur and 90% scrubber efficiency.
		CO	1000 lbs	0.03480	AP-42 Table 1.1-3(9/98) for subbituminous coal
		NOx	1000 lbs	1.29	Oct. 05 Engineering Stack Test
		VOC	1000 lbs	0.0042	AP-42 9/98,Table 1.1-19, PC, methane & TNMOC

SECTION 3C. EMISSION FACTORS - BOILER HOUSE

NO.		POLLUTANT	EMISSION FACTOR (1) UNIT	LB/UNIT	REFERENCE
S-B2	ERIE CITY BOILER - STEAM (gas)	PM	1000 lbs	2.94E-02	IDAPA 58.01.01.677 0.015 gr/dscf grain loading standard
		PM10	1000 lbs	2.94E-02	AP-42, 9/98, Table 1.4-2
		SO2	1000 lbs	8.10E-04	AP-42, 9/98, Table 1.4-2
		CO	1000 lbs	1.10E-01	AP-42 Table 1.4-1(7/98) for utility boilers
		NOx	1000 lbs	3.78E-01	AP-42, 9/98, Table 1.4-1
		VOC	1000 lbs	7.43E-03	AP-42, 9/98, Table 1.4-2

SECTION 3D. EMISSIONS - BOILER HOUSE

Based on campaign length (days) = **206**

NO.		POLLUTANT	Max lb/hr	Avg. lbs./hr.	TONS/YR
S-B1	B & W BOILER (Beet)	PM	5.3	4.1	23
		PM10	5.3	4.1	23
		SO2	0.1	0.1	1
		CO	18.1	13.9	79
		NOx	24	18	104
		VOC	1.3	1.0	5.9
S-B2	ERIE CITY BOILER (beet)	PM	0.0	0.0	32
		PM10	0.0	0.0	32
		SO2	0.0	0.0	1
		CO	0.0	0.0	120
		NOx	0	0	414
		VOC	0.0	0.0	8

(1) Hourly production data cannot be determined, because this is a batch process with significant hourly variability.

SECTION 3D. EMISSIONS - BOILER HOUSE

Based on Juice Run length (days) = **125**

NO.		POLLUTANT	Max lb/hr	Avg. lbs./hr.	TONS/YR
S-B1	B & W BOILER (juice)	PM	0.00	0.00	0.00
		PM10	0.00	0.00	0.00
		SO2	0.00	0.00	0.00
		CO	0.00	0.00	0.00
		NOx	0.00	0.00	0.00
		VOC	0.00	0.00	0.00
S-B2	ERIE CITY BOILER (juice)	PM	0	0	0.0
		PM10	0	0	0.0
		SO2	0	0	0.0
		CO	0	0	0.0
		NOx	0	0	0.0
		VOC	0	0	0.0

Section 5.4

Facility Greenhouse Gases

Section 5.4.1

Baseline GHG's
vs.
Projected GHG's
B&W Boiler Natural Gas Only &
Erie City Boiler Coal Only

2006-2007 Average vs Future B&W Gas & EC Coal

GHG Baseline Emissions Summary
Mini Cassia Facility

Source	CO_2 (tons/y)	CH_4 (tons/y)	N_2O (tons/y)	CO_2e (tons/y)
Total - Boilers	237206	26	4	238997
Total - Pulp Dryers	70988	8	1	71536
Total - Lime Kilns	16546	66	0.1	18210
Total	324740	100	5	328743

Future Emissions Summary
Mini Cassia Facility

Source	CO2 (tons/y)	CH4 (tons/y)	N2O (tons/y)	CO_2e (tons/y)
Total - Boilers	229755	21	3	231181
Total - Pulp Dryers	91199	10	2	91904
Total - Lime Kilns	29771	3	0.5	29999
Total	350724	35	5	353083

GHG Net Emissions Summary
Mini Cassia Facility

Source	CO2 (tons/y)	CH4 (tons/y)	N2O (tons/y)	CO_2e (tons/y)
Total - Boilers	-7451	-5	-1	-7816
Total - Pulp Dryers	20211	2	0.3	20367
Total - Lime Kilns	13225	-62	0.4	11788
Total	25985	-65	-0.1	24340

GHG Emissions Estimates
Baseline Period (Average 2006-2007)
The Amalgamated Sugar Co. LLC
Mini Cassia Facility

Source Name	Source ID	Annual	Units	Emissions				Annual Emissions (tons/y)
				Parameter	Factor	Units	Reference	
B&W Boiler	S-B1	840500	klbs steam - coal	CO_2	267	lbs/klb steam	40CFR98 Subpart C Table C-1	112207
		840500	klbs steam - coal	CH_4	0.03	lbs/klb steam	40CFR98 Subpart C Table C-2	13
		840500	klbs steam - coal	N_2O	0.0044	lbs/klb steam	40CFR98 Subpart C Table C-2	2
Erie City Boiler	S-B2	890950	klbs steam - coal	CO_2	267	lbs/klb steam	40CFR98 Subpart C Table C-1	118942
		890950	klbs steam - coal	CH_4	0.03	lbs/klb steam	40CFR98 Subpart C Table C-2	13
		890950	klbs steam - coal	N_2O	0.0044	lbs/klb steam	40CFR98 Subpart C Table C-2	2
		83550	klbs steam - gas	CO_2	145	lbs/klb steam	40CFR98 Subpart C Table C-1	6057
		83550	klbs steam - gas	CH_4	0.0028	lbs/klb steam	40CFR98 Subpart C Table C-2	0.12
		83550	klbs steam - gas	N_2O	0.00028	lbs/klb steam	40CFR98 Subpart C Table C-2	0.01

	CO_2(tons/y)	CH_4(ton/y)	N_2O(tons/y)
Total - Boilers	237206	26	4

Source Name	Source ID	Annual	Units	Emissions				Annual Emissions (tons/y)
				Parameter	Factor	Units	Reference	
South Dryer	S-D1	14179	tons - coal	CO_2	4606	lbs/ton coal	40CFR98 Subpart C Table C-1	32654
		14179	tons - coal	CH_4	0.518	lbs/ton coal	40CFR98 Subpart C Table C-2	4
		14179	tons - coal	N_2O	0.076	lbs/ton coal	40CFR98 Subpart C Table C-2	0.5
North Dryer	S-D2	16645	tons - coal	CO_2	4606	lbs/ton coal	40CFR98 Subpart C Table C-1	38333
		16645	tons - coal	CH_4	0.518	lbs/ton coal	40CFR98 Subpart C Table C-2	4
		16645	tons - coal	N_2O	0.076	lbs/ton coal	40CFR98 Subpart C Table C-2	0.6

	CO_2(tons/y)	CH_4(ton/y)	N_2O(tons/y)
Total - Pulp Dryers	70988	8	1.2

Source Name	Source ID	Annual	Units	Emissions				Annual Emissions (tons/y)
				Parameter	Factor	Units	Reference	
Union Carbide Lime Kiln	S-D1	169	gas - mmcf	CO_2	149000	lbs/mmscf	40CFR98 Subpart C Table C-1	12591
		169	gas - mmcf	CH_4	770	lbs/mmscf	40CFR98 Subpart C Table C-2	65
		169	gas - mmcf	N_2O	0.288	lbs/mmscf	40CFR98 Subpart C Table C-2	0.02
Belgium Lime Kiln	S-D2	1419	tons - coke	CO_2	5575	lbs/ton coke	40CFR98 Subpart C Table C-1	3955
		1419	tons - coke	CH_4	0.624	lbs/ton coke	40CFR98 Subpart C Table C-2	0.4
		1419	tons - coke	N_2O	0.091	lbs/ton coke	40CFR98 Subpart C Table C-2	0.1

	CO_2(tons/y)	CH_4(ton/y)	N_2O(tons/y)
Total - Lime Kilns	16546	66	0.1

GHG Emissions Estimates
Future @ 3,500,000 tons slice (B&W Gas Only & Erie City Coal)
The Amalgamated Sugar Co. LLC
Mini Cassia Facility

Source Name	Source ID	Annual	Units	Emissions Parameter	Factor	Units	Reference	Annual Emissions (tons/y)
B&W Boiler - Natural Gas	S-B1	720,000	klbs steam - gas	CO_2	145	lbs/klb steam	40CFR98 Subpart C Table C-1	52200
		720,000	klbs steam - gas	CH_4	0.0028	lbs/klb steam	40CFR98 Subpart C Table C-2	1
		720,000	klbs steam - gas	N_2O	0.00028	lbs/klb steam	40CFR98 Subpart C Table C-2	0
Erie City Boiler	S-B2	1,330,000	klbs steam - coal	CO_2	267	lbs/klb steam	40CFR98 Subpart C Table C-1	177555
		1,330,000	klbs steam - coal	CH_4	0.03	lbs/klb steam	40CFR98 Subpart C Table C-2	20
		1,330,000	klbs steam - coal	N_2O	0.0044	lbs/klb steam	40CFR98 Subpart C Table C-2	3
		0	klbs steam - gas	CO_2	145	lbs/klb steam	40CFR98 Subpart C Table C-1	0
		0	klbs steam - gas	CH_4	0.0028	lbs/klb steam	40CFR98 Subpart C Table C-2	0.00
		0	klbs steam - gas	N_2O	0.00028	lbs/klb steam	40CFR98 Subpart C Table C-2	0.00

	CO_2(tons/y)	CH_4(ton/y)	N_2O(tons/y)
Total - Boilers	229755	21	3

Source Name	Source ID	Annual	Units	Emissions Parameter	Factor	Units	Reference	Annual Emissions (tons/y)
South Dryer	S-D1	18200	tons - coal	CO_2	4606	lbs/ton coal	40CFR98 Subpart C Table C-1	41915
		18200	tons - coal	CH_4	0.518	lbs/ton coal	40CFR98 Subpart C Table C-2	5
		18200	tons - coal	N_2O	0.076	lbs/ton coal	40CFR98 Subpart C Table C-2	0.7
North Dryer	S-D2	21400	tons - coal	CO_2	4606	lbs/ton coal	40CFR98 Subpart C Table C-1	49284
		21400	tons - coal	CH_4	0.518	lbs/ton coal	40CFR98 Subpart C Table C-2	6
		21400	tons - coal	N_2O	0.076	lbs/ton coal	40CFR98 Subpart C Table C-2	0.8

	CO_2(tons/y)	CH_4(ton/y)	N_2O(tons/y)
Total - Pulp Dryers	91199	10	2

Source Name	Source ID	Annual	Units	Emissions Parameter	Factor	Units	Reference	Annual Emissions (tons/y)
Eberhardt Lime Kiln	S-K2	10680	tons - coke	CO_2	5575	lbs/ton coke	40CFR98 Subpart C Table C-1	29771
		10680	tons - coke	CH_4	0.624	lbs/ton coke	40CFR98 Subpart C Table C-2	3.3
		10680	tons - coke	N_2O	0.091	lbs/ton coke	40CFR98 Subpart C Table C-2	0.5

	CO_2(tons/y)	CH_4(ton/y)	N_2O(tons/y)
Total - Lime Kilns	29771	3.3	0.5

Section 5.4.2

Baseline GHG's
vs.
Projected GHG's
B&W Boiler and Erie City Boiler
Natural Gas Only @ 8760 hours per year

2006-2007 Average vs Future B&W and EC Gas Only

GHG Baseline Emissions Summary
Mini Cassia Facility

Source	CO_2 (tons/y)	CH_4 (tons/y)	N_2O (tons/y)	CO_2e (tons/y)
Total - Boilers	237206	26	3.8	238997
Total - Pulp Dryers	70988	8.0	1.2	71536
Total - Lime Kilns	16546	66	0.1	18210
Total	324740	100	5.1	328743

Future Emissions Summary
Mini Cassia Facility

Source	CO_2 (tons/y)	CH_4 (tons/y)	N_2O (tons/y)	CO_2e (tons/y)
Total - Boilers	279415	5.4	0.5	279711
Total - Pulp Dryers	91199	10	1.5	91904
Total - Lime Kilns	29771	3.3	0.5	29999
Total	400384	19	2.5	401613

GHG Net Emissions Summary
Mini Cassia Facility

Source	CO_2 (tons/y)	CH_4 (tons/y)	N_2O (tons/y)	CO_2e (tons/y)
Total - Boilers	42209	-21	-3.3	40714
Total - Pulp Dryers	20211	2.3	0.3	20367
Total - Lime Kilns	13225	-62	0.4	11788
Total	75645	-81	-2.6	72870

GHG Emissions Estimates
Baseline Period (Average 2006-2007)
The Amalgamated Sugar Co. LLC
Mini Cassia Facility

Source Name	Source ID	Annual	Units	Emissions Parameter	Factor	Units	Reference	Annual Emissions (tons/y)
B&W Boiler	S-B1	840500	klbs steam - coal	CO_2	267	lbs/klb steam	40CFR98 Subpart C Table C-1	112207
		840500	klbs steam - coal	CH_4	0.03	lbs/klb steam	40CFR98 Subpart C Table C-2	13
		840500	klbs steam - coal	N_2O	0.0044	lbs/klb steam	40CFR98 Subpart C Table C-2	1.8
Erie City Boiler	S-B2	890950	klbs steam - coal	CO_2	267	lbs/klb steam	40CFR98 Subpart C Table C-1	118942
		890950	klbs steam - coal	CH_4	0.03	lbs/klb steam	40CFR98 Subpart C Table C-2	13
		890950	klbs steam - coal	N_2O	0.0044	lbs/klb steam	40CFR98 Subpart C Table C-2	2
		83550	klbs steam - gas	CO_2	145	lbs/klb steam	40CFR98 Subpart C Table C-1	6057
		83550	klbs steam - gas	CH_4	0.0028	lbs/klb steam	40CFR98 Subpart C Table C-2	0.12
		83550	klbs steam - gas	N_2O	0.00028	lbs/klb steam	40CFR98 Subpart C Table C-2	0.01

	CO_2(tons/y)	CH_4(ton/y)	N_2O(tons/y)
Total - Boilers	237206	26	4

Source Name	Source ID	Annual	Units	Emissions Parameter	Factor	Units	Reference	Annual Emissions (tons/y)
South Dryer	S-D1	14179	tons - coal	CO_2	4606	lbs/ton coal	40CFR98 Subpart C Table C-1	32654
		14179	tons - coal	CH_4	0.518	lbs/ton coal	40CFR98 Subpart C Table C-2	4
		14179	tons - coal	N_2O	0.076	lbs/ton coal	40CFR98 Subpart C Table C-2	0.5
North Dryer	S-D2	16645	tons - coal	CO_2	4606	lbs/ton coal	40CFR98 Subpart C Table C-1	38333
		16645	tons - coal	CH_4	0.518	lbs/ton coal	40CFR98 Subpart C Table C-2	4
		16645	tons - coal	N_2O	0.076	lbs/ton coal	40CFR98 Subpart C Table C-2	0.6

	CO_2(tons/y)	CH_4(ton/y)	N_2O(tons/y)
Total - Pulp Dryers	70988	8	1.2

Source Name	Source ID	Annual	Units	Emissions Parameter	Factor	Units	Reference	Annual Emissions (tons/y)
Union Carbide Lime Kiln	S-D1	169	gas - mmcf	CO_2	149000	lbs/mmscf	40CFR98 Subpart C Table C-1	12591
		169	gas - mmcf	CH_4	770	lbs/mmscf	40CFR98 Subpart C Table C-2	65
		169	gas - mmcf	N_2O	0.288	lbs/mmscf	40CFR98 Subpart C Table C-2	0.02
Belgium Lime Kiln	S-D2	1419	tons - coke	CO_2	5575	lbs/ton coke	40CFR98 Subpart C Table C-1	3955
		1419	tons - coke	CH_4	0.624	lbs/ton coke	40CFR98 Subpart C Table C-2	0.4
		1419	tons - coke	N_2O	0.091	lbs/ton coke	40CFR98 Subpart C Table C-2	0.1

	CO_2(tons/y)	CH_4(ton/y)	N_2O(tons/y)
Total - Lime Kilns	16546	66	0.1

GHG Emissions Estimates
Future @ 3,500,000 tons slice B&W and Erie City Boilers Gas Only at 8760 h/y Operation
The Amalgamated Sugar Co. LLC
Mini Cassia Facility

Source Name	Source ID	Annual	Units	Emissions Parameter	Factor	Units	Reference	Annual Emissions (tons/y)
B&W Boiler - Natural Gas	S-B1	1,664,000	klbs steam - gas	CO_2	145	lbs/klb steam	40CFR98 Subpart C Table C-1	120640
		1,664,000	klbs steam - gas	CH_4	0.0028	lbs/klb steam	40CFR98 Subpart C Table C-2	2.3
		1,664,000	klbs steam - gas	N_2O	0.00028	lbs/klb steam	40CFR98 Subpart C Table C-2	0.2
Erie City Boiler	S-B2	0	klbs steam - coal	CO_2	267	lbs/klb steam	40CFR98 Subpart C Table C-1	0
		0	klbs steam - coal	CH_4	0.03	lbs/klb steam	40CFR98 Subpart C Table C-2	0
		0	klbs steam - coal	N_2O	0.0044	lbs/klb steam	40CFR98 Subpart C Table C-2	0
		2,190,000	klbs steam - gas	CO_2	145	lbs/klb steam	40CFR98 Subpart C Table C-1	158775
		2,190,000	klbs steam - gas	CH_4	0.0028	lbs/klb steam	40CFR98 Subpart C Table C-2	3.07
		2,190,000	klbs steam - gas	N_2O	0.00028	lbs/klb steam	40CFR98 Subpart C Table C-2	0.31

	CO_2(tons/y)	CH_4(ton/y)	N_2O(tons/y)
Total - Boilers	279415	5	1

Source Name	Source ID	Annual	Units	Emissions Parameter	Factor	Units	Reference	Annual Emissions (tons/y)
South Dryer	S-D1	18200	tons - coal	CO_2	4606	lbs/ton coal	40CFR98 Subpart C Table C-1	41915
		18200	tons - coal	CH_4	0.518	lbs/ton coal	40CFR98 Subpart C Table C-2	5
		18200	tons - coal	N_2O	0.076	lbs/ton coal	40CFR98 Subpart C Table C-2	0.7
North Dryer	S-D2	21400	tons - coal	CO_2	4606	lbs/ton coal	40CFR98 Subpart C Table C-1	49284
		21400	tons - coal	CH_4	0.518	lbs/ton coal	40CFR98 Subpart C Table C-2	6
		21400	tons - coal	N_2O	0.076	lbs/ton coal	40CFR98 Subpart C Table C-2	0.8

	CO_2(tons/y)	CH_4(ton/y)	N_2O(tons/y)
Total - Pulp Dryers	91199	10	2

Source Name	Source ID	Annual	Units	Emissions Parameter	Factor	Units	Reference	Annual Emissions (tons/y)
Eberhardt Lime Kiln	S-K2	10680	tons - coke	CO_2	5575	lbs/ton coke	40CFR98 Subpart C Table C-1	29771
		10680	tons - coke	CH_4	0.624	lbs/ton coke	40CFR98 Subpart C Table C-2	3.3
		10680	tons - coke	N_2O	0.091	lbs/ton coke	40CFR98 Subpart C Table C-2	0.5

	CO_2(tons/y)	CH_4(ton/y)	N_2O(tons/y)
Total - Lime Kilns	29771	3.3	0.5

Section 5.5

Facility Hazardous Air Pollutants (HAP's)

Facility HAP Potential to Emit
Emissions Summary

HAP Pollutants	PTE (t/y)
Acetaldehyde	7.96
Acrolein	1.86
Formaldehyde	1.82
Methanol	84.02
Arsenic	0.03
Benzene	0.09
Beryllium	0.00
Cadmium	0.09
Chromium	0.02
Cyanide	0.19
Hydrochloric Acid	0.15
Hydrogen Fluoride	0.46
Lead	0.03
Manganese	0.04
Mercury	0.01
Nickel	0.02
Selenium	0.10
Toluene	0.02
Xylenes	0.00
PAH and other HAPs	0.27

HAP Emissions
from the
Mini-Cassia Facility

HAPs Based on Annual Production Values (PTE-No.6 Evaporator PTC No. P-2011.0040 (issued June 11, 2012)

Hazardous Air Pollutant (HAP)	B & W Boiler Coal (tons / year)	B & W Boiler Nat. Gas Does not run on NG	Erie City Boiler Coal (tons / year)	Erie City Boiler Nat. Gas (tons / year)	Nebraska Boiler Nat. Gas (tons / year)	South Dryer (tons / year)	North Dryer (tons / year)	EBERHARDT KILN (COKE) (tons / year)	Main Mill (tons / year)	Constituent Totals (tons / year)
Acetaldehyde	0.0142	0.0E+00	0.02			1.663	1.941	0.0E+00	4.33	7.96
Acrolein	0.0072	0.0E+00	0.01			0.804	0.939	0.0E+00	0.10	1.86
Formaldehyde	0.0060	0.0E+00	0.01	0.0E+00	0.0E+00	0.815	0.952	0.0E+00	0.04	1.82
Methanol						1.115	1.302		81.60	84.02
Arsenic	0.0102	0.0E+00	0.01	0.0E+00	0.0E+00	0.004	0.004	2.2E-03		0.03
Benzene	0.0324	0.0E+00	0.04	0.0E+00	0.0E+00	0.012	0.014	0.0E+00		0.09
Beryllium	0.0005	0.0E+00	0.00	0.0E+00	0.0E+00	0.000	0.000	1.1E-04		0.00
Cadmium	0.0013	0.0E+00	0.00	0.0E+00	0.0E+00	0.000	0.001	8.8E-02		0.09
Chromium	0.0065	0.0E+00	0.01	0.0E+00	0.0E+00	0.002	0.003	1.4E-03		0.02
Cyanide	0.0623	0.0E+00	0.07			0.023	0.027	1.3E-02		0.19
Hydrochloric Acid	0.0198	0.0E+00	0.02			0.048	0.057	0.0E+00		0.15
Hydrogen Fluoride	0.1578	0.0E+00	0.17			0.058	0.068	0.0E+00		0.46
Lead	0.0105	0.0E+00	0.01	0.0E+00	0.0E+00	0.004	0.004	2.2E-03		0.03
Manganese	0.0122	0.0E+00	0.01	0.0E+00	0.0E+00	0.004	0.005	2.6E-03		0.04
Mercury	0.0009	0.0E+00	0.00072	0.0E+00	0.0E+00	0.0006	0.0007	2.6E-03		0.0056
Nickel	0.0070	0.0E+00	0.01	0.0E+00	0.0E+00	0.003	0.003	1.5E-03		0.02
Selenium	0.0324	0.0E+00	0.04	0.0E+00	0.0E+00	0.012	0.014	6.9E-03		0.10
Toluene	0.0060	0.0E+00	0.01	0.0E+00	0.0E+00	0.002	0.003	0.0E+00		0.02
Xylenes	0.0009	0.0E+00	0.00	-	-	0.000	0.000	0.0E+00		0.00
PAH and other HAPs	0.094	0.0E+00	0.10	0.0E+00	0.00E+00	0.03	0.04	0.0E+00		0.27
									Grand Total	**97.19**

1. PAH and Other HAP emission factors are listed in the Fuel E_Factors sheet and include the following
   2,4-Dinitrotoluene, 2-Chloroacetophenone, Acetophenone, Antimony Compounds, Benzyl chloride, Bis(2-ethylhexyl)phthalate (DEHP), Bromoform, Carbon disulfide, Chlorobenzene, Chloroform, Cobalt Compounds, Cumene, Dimethyl sulfate, Ethyl benzene, Ethyl chloride (Chloroethane), Ethylene dibromide (Dibromoethane), Ethylene dichloride (1,2-Dichloroethane), Hexane, Isophorone, Methyl bromide (Bromomethane), Methyl chloride (Chloromethane), Methyl chloroform (1,1,1-Trichloroethane), Methyl hydrazine, Methyl Methacylate, Methyl tert butyl ether, Methylene chloride (Dichloromethane), Phenol, Propionaldehyde, Styrene, Tetrachloroethylene
2. Emission Factors provided in Tier I Permit Renewal Application.

HAP's Emissions Inventory
Annual Production Values
PTE-No. 6 Evaporator PTC no. P2011.0040 (issued June 11, 2012)
Mini-Cassia Facility

	Beet Campaign	Juice Campagn	Units
OPERATING CAMPAIGN	206	125	DAYS
BEETS SLICED (Max Daily)	16,990		Tons per day
BEETS SLICED (Annually)	3,500,000		Tons per year
B & W BOILERS (COAL FIRED)	49,800	0	Tons per year
ERIE CITY BOILER (COAL FIRED)	47,100	8,000	Tons per year
ERIE CITY BOILER (NATURAL GAS FIRED)	0.00	0.00	MMCF / year
NEBRASKA BOILER (NATURAL GAS FIRED)	0.0		MMCF / year
SOUTH DRYER (COAL INPUT)	18,200		Tons per year
SOUTH DRYER (NATURAL GAS INPUT)	0		MMCF / year
SOUTH DRYER (TOTAL INPUT)	173,000		Tons per year
NORTH DRYER (COAL INPUT)	21,400		Tons per year
NORTH DRYER (NATUIRAL GAS INPUT)	0		MMCF / year
NORTH DRYER (TOTAL INPUT)	202,000		Tons per year
EBERHARDT KILN (COKE)	10,680		Tons per year
(Lime Rock)	146,300		Tons per year
MAIN MILL	955,500		1000 gal / year

HAP emissions are calculated using max hourly production rates multiplied by 24 and the days of operation with the exception of operations associated directly with beet slicing rates. These are calculated using the annual beet slice rate.

[1] The Mini-Cassia facility has a Federally Enforcable Permit Limit. This limits the total tons of beets sliced to 3,500,000 tons per year. Since Major/Minor status is based on annual HAP's produced, the beet slice annual limit will be used to calculate average daily process production rates.

Although the Eire City boiler is normally operatied on mostly coal, it does have the capability of operating on natural gas, at rates as high as 250,000 lbs / hr. The actual fuel split is determined by the boiler's mechanical condition and economics. This analysis will conservatively factor in only coal, which is the fuel that generates the most overall HAPS

The Nebraska boiler is permitted as a limited use boiler. Annual use is limited to 876 hours. (@ 250 MM Btu/hr on natural gas. Steam produced in the Nebraska boiler will be used to make up for reduced steam production from the B&W and Erie City boilers. Operating the Nebraska (natural gas fired) boiler in place of the B&W or Erie City (Coal Fired) boilers will result in an overall reduction in emissions. The Nebraska boiler may be operated during the beet or juice runs.

Main mill throughput is based on 3,500,000 tons beets per year.

Emission Factors for Selected Fuels Used by Amalgamated

	Pollutants from Coal Combustion	EMISSION FACTOR		
		UNIT	LB/UNIT	REFERENCE
	Acetaldehyde	ton coal	5.70E-04	See Note (a.)
	Acrolein	ton coal	2.90E-04	See Note (a.)
	Arsenic	ton coal	4.10E-04	See Note (b.)
	Benzene	ton coal	1.30E-03	See Note (a.)
	Beryllium	ton coal	2.10E-05	See Note (b.)
	Cadmium	ton coal	5.10E-05	See Note (b.)
	Chromium	ton coal	2.60E-04	See Note (b.)
	Cyanide	ton coal	2.50E-03	See Note (a.)
	Formaldehyde	ton coal	2.40E-04	See Note (a.)
	Hydrochloric Acid	ton coal	7.96E-04	See Note (c.)
	Hydrogen Fluoride	ton coal	6.34E-03	See Note (c.)
	Lead	ton coal	4.20E-04	See Note (b.)
	Manganese	ton coal	4.90E-04	See Note (b.)
B&W	Mercury	ton coal	3.48E-05	See Note (e.)
E C	Mercury	ton coal	2.62E-05	See Note (e.)
	Nickel	ton coal	2.80E-04	See Note (b.)
	PAH (see below)			
	Selenium	ton coal	1.30E-03	See Note (b.)
	Toluene	ton coal	2.40E-04	See Note (a.)
	Xylenes	ton coal	3.70E-05	See Note (a.)

Notes

a. AP-42, 9/98, Table 1.1-14, Emission Factors for Various Organic Compounds from Controlled Coal Combustion
b. AP-42, 9/98, Table 1.1-18, Emission Factors from Trace Metals From Controlled Coal Combustion
c. EF derived from material balance calculations based on USGS Data and/or TASCO's mine specific data and EPA Emissions Modification Factors in EPA's 1998 Report to Congress
d. AP-42, 9/98, Table 1.1-13, Emission Factors from Trace Metals From Controlled Coal Combustion.
e. Based on 9/2006 engineering stack test.

Other HAPs from Coal Combustion	UNIT	LB/UNIT	REFERENCE
2,4-Dinitrotoluene	ton coal	2.80E-07	See Note (a.)
2-Chloroacetophenone	ton coal	7.00E-06	See Note (a.)
Acetophenone	ton coal	1.50E-05	See Note (a.)
Antimony Compounds	ton coal	1.80E-05	See Note (b.)
Benzyl chloride	ton coal	7.00E-04	See Note (a.)
Bis(2-ethylhexyl)phthalate (DEHP)	ton coal	7.30E-05	See Note (a.)
Bromoform	ton coal	3.90E-05	See Note (a.)
Carbon disulfide	ton coal	1.30E-04	See Note (a.)
Chlorobenzene	ton coal	2.20E-05	See Note (a.)
Chloroform	ton coal	5.90E-05	See Note (a.)
Cobalt Compounds	ton coal	1.00E-04	See Note (b.)
Cumene	ton coal	5.30E-06	See Note (a.)
Dimethyl sulfate	ton coal	4.80E-05	See Note (a.)
Ethyl benzene	ton coal	9.40E-05	See Note (a.)
Ethyl chloride (Chloroethane)	ton coal	4.20E-05	See Note (a.)
Ethylene dibromide (Dibromoethane)	ton coal	1.20E-06	See Note (a.)
Ethylene dichloride (1,2-Dichloroethane)	ton coal	4.00E-05	See Note (a.)
Hexane	ton coal	6.70E-05	See Note (a.)
Isophorone	ton coal	5.80E-04	See Note (a.)
Methyl bromide (Bromomethane)	ton coal	1.60E-04	See Note (a.)
Methyl chloride (Chloromethane)	ton coal	5.30E-04	See Note (a.)
Methyl chloroform (1,1,1-Trichloroethane)	ton coal	2.00E-05	See Note (a.)
Methyl hydrazine	ton coal	1.70E-04	See Note (a.)
Methyl Methacylate	ton coal	2.00E-05	See Note (a.)
Methyl tert butyl ether	ton coal	3.50E-05	See Note (a.)
Methylene chloride (Dichloromethane)	ton coal	2.90E-04	See Note (a.)
Phenol	ton coal	1.60E-05	See Note (a.)
Propionaldehyde	ton coal	3.80E-04	See Note (a.)
Styrene	ton coal	2.50E-05	See Note (a.)
Tetrachloroethylene (Perchloroethylene)	ton coal	4.30E-05	See Note (a.)
Vinyl Acetate	ton coal	7.60E-06	See Note (a.)

Polynuclear Aromatic Hydorcarbons From Coal Combustion	UNIT	LB/UNIT	REFERENCE
Biphenyl	ton coal	1.70E-06	See Note (d.)
Acenaphthene	ton coal	5.10E-07	See Note (d.)
Acenaphthylene	ton coal	2.50E-07	See Note (d.)
Anthracene	ton coal	2.10E-07	See Note (d.)
Benzo(a)anthracene	ton coal	8.00E-08	See Note (d.)
Benzo(a)pyrene	ton coal	3.80E-08	See Note (d.)
Benzo(b,j,k)fluoranthene	ton coal	1.10E-07	See Note (d.)
Benzo(g,h,I)perylene	ton coal	2.70E-08	See Note (d.)
Chrysene	ton coal	1.00E-07	See Note (d.)
Fluoranthene	ton coal	7.10E-07	See Note (d.)
Fluorene	ton coal	9.10E-07	See Note (d.)
Indeno(1,2,3-cd)pyrene	ton coal	6.10E-08	See Note (d.)
Naphthalene	ton coal	1.30E-05	See Note (d.)
Phenanthrene	ton coal	2.70E-06	See Note (d.)
Pyrene	ton coal	3.30E-07	See Note (d.)
5-Methyl chrysene	ton coal	2.20E-08	See Note (d.)
Total of all HAPs from Coal Combustion	lbs / ton	1.94E-02	
HCL and HF are estimated for Scrubber controlled emissions.			
To convert Emission Factor from lb/ton coal to lb / 1000 lbs steam,			
For the B&W boiler 80% eff., multiply the above EF by		6.19E-02	ton coal / 1000 lb steam
For the Erie City boiler 80% eff., multiply the above EF by		6.82E-02	ton coal / 1000 lb steam

Pollutants from Natural Gas Combustion	UNIT	LB/UNIT	REFERENCE
Arsenic	MMCF	1.00E+00	See Note (f.)
Benzene	MMCF	2.10E-03	See Note (g.)
Beryllium	MMCF	1.20E-05	See Note (f.)
Cadmium	MMCF	1.10E-03	See Note (f.)
Chromium	MMCF	1.40E-03	See Note (f.)
Cobalt	MMCF	8.40E-05	See Note (f.)
Dichlorobenzene	MMCF	1.20E-03	See Note (g.)
Formaldehyde	MMCF	7.50E-02	See Note (g.)
Hexane	MMCF	1.80E+00	See Note (g.)
Lead	MMCF	5.00E-04	See Note (h.)
Manganese	MMCF	3.80E-04	See Note (f.)
Mercury	MMCF	2.60E-04	See Note (f.)
Naphthalene	MMCF	6.10E-04	See Note (g.)
Nickel	MMCF	2.10E-03	See Note (f.)
PAH (see below)			
Selenium	MMCF	2.40E-05	See Note (f.)
Toluene	MMCF	3.40E-03	See Note (g.)

Polynuclear Aromatic Hydorcarbons From Natural Gas Combustion	UNIT	LB/UNIT	REFERENCE
2-Methylnaphthalene	MMCF	2.40E-05	See Note (f.)
3-Methylchloranthrene	MMCF	1.80E-06	See Note (f.)
7, 12-Dimethylbenz(a)anthracene	MMCF	1.60E-05	See Note (f.)
Acenaphthene	MMCF	1.80E-06	See Note (f.)
Acenaphthylene	MMCF	1.80E-06	See Note (f.)
Anthracene	MMCF	2.40E-06	See Note (f.)
Benz(a) anthracene	MMCF	1.80E-06	See Note (f.)
Benzo(a)pyrene	MMCF	1.20E-06	See Note (f.)
Benzo(b)fluoranthene	MMCF	1.80E-06	See Note (f.)
Benzo(g,h,I)perylene	MMCF	1.20E-06	See Note (f.)
Benzo(k)fluoranthene	MMCF	1.80E-06	See Note (f.)
Chrysene	MMCF	1.80E-06	See Note (f.)
Dibenzo(a,h)anthracene	MMCF	1.20E-06	See Note (f.)
Fluoranthene	MMCF	3.00E-06	See Note (f.)
Fluorene	MMCF	2.80E-06	See Note (f.)
Indeno(1,2,3-cd)pyrene	MMCF	1.80E-06	See Note (f.)
Phenanathrene	MMCF	1.70E-05	See Note (f.)
Pyrene	MMCF	5.00E-06	See Note (f.)
Total of all HAPs from Natural Gas Combustion	MMCF	2.89E+00	

To convert Emission Factor from lb/MMCF Nat Gas to lb / 1000 lbs steam,		
For the Nebraska boiler 80% eff., multiply the above EF by	1.30E-03	MM CF / 1000 lb steam
For the Erie City boiler 80% eff., multiply the above EF by	1.30E-03	MM CF / 1000 lb steam

f. AP-42, 7/98, Table 1.4-4, Emission Factors for Metals from Natural Gas Combustion
g. AP-42, 7/98, Table 1.4-3, Emission Factors for Speciated Organic Compounds from Natural Gas Combustion
h. AP-42, 7/98, Table 1.4-2, Emission Factors for Criteria Pollutants and Greenhouse Gases from Natural Gas Combustion

Pollutants from Coke Combustion	EMISSION FACTOR		
	UNIT	LB/UNIT	REFERENCE
Acetaldehyde	tons coke	0.00E+00	See Note (m.)
Acrolein	tons coke	0.00E+00	See Note (m.)
Arsenic	tons coke	4.10E-04	See Note (n.)
Benzene	tons coke	0.00E+00	See Note (m.)
Beryllium	tons coke	2.10E-05	See Note (n.)
Cadmium	tons coke	5.10E-05	See Note (n.)
Chromium	tons coke	2.60E-04	See Note (n.)
Cyanide	tons coke	2.50E-03	See Note (n.)
Formaldehyde	tons coke	0.00E+00	See Note (m.)
Hydrochloric Acid	tons coke	0.00E+00	See Note (m.)
Hydrogen Fluoride	tons coke	0.00E+00	See Note (m.)
Lead	tons coke	4.20E-04	See Note (n.)
Manganese	tons coke	4.90E-04	See Note (n.)
Mercury	tons coke	0.00E+00	See Note (m.)
Nickel	tons coke	2.80E-04	See Note (n.)
PAH	tons coke	0.00E+00	See Note (m.)
Selenium	tons coke	1.30E-03	See Note (n.)
Toluene	tons coke	0.00E+00	See Note (m.)
Xylenes	tons coke	0.00E+00	See Note (m.)
Other HAPS	tons coke	0.00E+00	See Note (m.)
All Haps from Coke Fired Kiln Operations	tons coke	5.73E-03	

m. No VOC or Hg emissions are identified in AP-42 for coke combustion. VOC and Hg are assumed to volitize in the formation of Coke.

n. Metal HAPs are estimated based on AP-42 for bituminous coal. See note b under Pollutants from Coal Combustion.

Pollutants from Lime Rock	EMISSION FACTOR		
	UNIT	LB/UNIT	REFERENCE
Cadmium	ton lime rock	1.20E-03	See Note (o.)
Mercury	ton lime rock	3.62E-05	See Note (p.)

Notes

o. EF based on material balance calculations using analytical results of Ash Grove Cement Company Sweet Rock samples collected on 10/18/06

p. EF based on material balance calculations using analytical results of Ash Grove Cement Company Sweet Rock samples collected on 10/18/06 and Precipitated Calcium Carbonate analysis performed by Stukenholtz Laboratory, INC

Emiss Factors
Categorized According to Fuel

Total Dryer Input POLLUTANT	UNIT	LB/UNIT	REFERENCE
Acetaldehyde	Input Tons	1.92E-02	See Note (j.)
Acrolein	Input Tons	9.30E-03	See Note (j.)
Formaldehyde	Input Tons	9.42E-03	See Note (j.)
Mercury	Tons Coal	7.00E-05	See Note (c.)
Hydrogen Chloride from P & M coal through Scrubber System	Tons Coal	5.29E-03	See Note (c.)
Hydrogen Fluoride from P & M coal through Scrubber System	Tons Coal	6.34E-03	See Note (c.)
Methanol			
North Dryer East Stack	Input Tons	7.14E-03	Engineering Estimate
North Dryer East Center Stack	Input Tons	5.75E-03	Engineering Estimate
Total Methanol From Dryer	Input Tons	1.29E-02	Engineering Estimate

Main Mill Emissions POLLUTANT	UNIT	LB/UNIT	REFERENCE
Acetaldehyde	1000 gallons	9.06E-03	See Note (k.)
Acrolein	1000 gallons	2.10E-04	See Note (j.)
Formaldehyde	1000 gallons	8.28E-05	See Note (k.)
Methanol 1st Carbonation Tank Stack	1000 gallons	6.89E-02	Engineering Estimate
Methanol 2nd Carbonation Tank Stack	1000 gallons	2.87E-02	Engineering Estimate
Methanol Evaporators	1000 gallons	7.33E-02	Engineering Estimate
Main Mill Methanol	1000 gallons	1.71E-01	Engineering Estimate

Notes

j. Nampa Source Test "Particulate, Aldehyde, and Semi-Volatile Organic Compound (SVOC) Testing Report for the Pulp Dryer Stacks, 1st and 2nd Carbonation Tank Vents, and the Evaporator Heater Vents" submitted to Idaho Department of Environmental Quality May 14, 1993

k. Twin Falls and Nampa Source Tests (2003)

Section 5.6

Emission Factor (EF) Documentation

EMISSION FACTOR SUMMARY - BOILER HOUSE

Mini Cassia Facility

Dec-13

NO.	SOURCE	POLLUTANT	UNIT	EMISSION FACTOR [1] LB/UNIT	REFERENCE
S-B1	B & W BOILER - STEAM (coal)	PM	1000 lbs steam	0.291	IDAPA 58.01.01.677 Grain loading limit 0.1 gr/dscf at 8% O_2
		PM10	1000 lbs steam	0.291	Assume PM10 is 100% of PM
		SO2	1000 lbs steam	0.230	AP-42, 9/98, Table 1.1-3, 1% sulfur & 90 % scrubber control
		CO	1000 lbs steam	0.331	AP-42, 9/98, Table 1.1-3
		NOx	1000 lbs steam	1.24	Oct. 2005 Engineering Stack Test
		VOC	1000 lbs steam	0.0033	AP-42 9/98, Table 1.1-19, spreader stoker, methane & TNMOC
	B & W BOILER - STEAM (gas)	PM	1000 lbs steam	0.0281	IDAPA 58.01.01.677 Grain loading limit 0.015 at 3% O_2
		PM10	1000 lbs steam	0.0281	Assume PM10 is 100% of PM
		SO2	1000 lbs steam	7.70E-04	AP-42, 7/98, Table 1.4-2
		CO	1000 lbs steam	9.50E-02	Burner manufacturer estimate (100ppm @3% O2 dry basis)
		NOx	1000 lbs steam	0.130	0.1 lbs/MMBtu NSPS Standard -Low Heat Release Furnace
		VOC	1000 lbs steam	7.10E-03	AP-42, 7/98, Table 1.4-2
S-B2	ERIE CITY BOILER - STEAM (coal)	PM	1000 lbs steam	0.306	IDAPA 58.01.01.677 Grain loading limit 0.1 gr/dscf at 8% O_2
		PM10	1000 lbs steam	0.306	Assume PM10 is 100% of PM
		SO2	1000 lbs steam	0.240	AP-42, 9/98, Table 1.1-3 & 90 % scrubber control
		CO	1000 lbs steam	0.03480	AP-42 Table 1.1-3 (9/98) for subbituminous coal
		NOx	1000 lbs steam	1.29	Oct. 2005 Engineering Stack Test
		VOC	1000 lbs steam	0.0042	AP-42 9/98, Table 1.1-19, PC, methane & TNMOC
S-B2	ERIE CITY BOILER - STEAM (gas)	PM	1000 lbs steam	2.94E-02	IDAPA 58.01.01.677 Grain loading limit 0.015 at 3% O_2
		PM10	1000 lbs steam	2.94E-02	Assume PM10 is 100% of PM
		SO2	1000 lbs steam	8.10E-04	AP-42, 7/98, Table 1.4-2
		CO	1000 lbs steam	0.110	AP-42 Table 1.4-1 (7/98) for utility boilers
		NOx	1000 lbs steam	0.378	AP-42, 7/98, Table 1.4-1
		VOC	1000 lbs steam	7.43E-03	AP-42, 7/98, Table 1.4-2

Assume PM2.5 is equivalent to PM10

EMISSION FACTOR SUMMARY - PULP DRYING AND PELLETIZING

Mini Cassia Facility

May-12

NO.	SOURCE	POLLUTANT	UNIT	EMISSION FACTOR [1] LB/UNIT	REFERENCE
S-D1	SOUTH DRYER	PM	Tons Input	0.91	IDAPA 58.01.01.703 Process Weight Rate Rule
	-TOTAL INPUT	PM10	Tons Input	0.91	Assume 100% of PM is PM10
		CO	Tons Input	5.92	Nov. 2002 engineering test
	- COAL	SO2	Tons Coal	5.60	Tile V, based on 0.8 % sulfur in coal & 80 % scrubber efficiency
		NOx	Tons Coal	16.1	Nov. 2002 engineering test & 10% safety factor
		VOC	Tons Coal	0.36	11/98 Engineering Source Test @ the Nyssa facility.
S-D2	NORTH DRYER	PM	Tons Input	0.80	IDAPA 58.01.01.703 Process Weight Rate Rule
	-TOTAL INPUT	PM10	Tons Input	0.80	Assume 100% of PM is PM10
		CO	Tons Input	6.14	Nov. 2002 engineering test
	- COAL	SO2	Tons Coal	5.60	Tile V, based on 0.8 % sulfur in coal & 80 % scrubber efficiency
		NOx	Tons Coal	13.60	Nov. 2002 engineering test & 10% safety factor
		VOC	Tons Coal	0.36	11/98 Engineering Source Test @ the Nyssa facility.
S-D3	PELLET COOLER NO.1	PM	Tons	0.32	Oct. 1999 compliance test at the Nyssa facility.
	- PELLETS	PM10	Tons	0.16	Assume 50% of PM = PM10
S-D4	PELLET COOLER NO. 2	PM	Tons	0.32	Oct. 1999 compliance test at the Nyssa facility.
	- PELLETS	PM10	Tons	0.16	Assume 50% of PM = PM10
S-D5	PELLET COOLER NO. 3	PM	Tons	0.32	Oct. 1999 compliance test at the Nyssa facility.
	- PELLETS	PM10	Tons	0.16	Assume 50% of PM = PM10

EMISSION FACTOR SUMMARY - LIME KILN AND CO2 PRODUCTION

Mini Cassia Facility

May-12

NO.	SOURCE	POLLUTANT	UNIT	EMISSION LB/UNIT	REFERENCE
S-K1	Eberhardt Kiln	PM	Tons	0.09	Lime Kiln Replacement PTC Application - June 16,2010
		PM10	Tons	0.09	Lime Kiln Replacement PTC Application - June 16,2010
		CO	Tons	21.50	Lime Kiln Replacement PTC Application - June 16,2010
		NOx	Tons	0.63	Lime Kiln Replacement PTC Application - June 16,2010
		SO2	MMcf	0.40	Lime Kiln Replacement PTC Application - June 16,2010
		VOC	MMcf	0.52	Lime Kiln Replacement PTC Application - June 16,2010
S-K1	UNION CARBIDE KILN	PM	Tons	0.52	Eng. est. and 99% removal
	- LIME ROCK	PM10	Tons	0.09	Assume PM10 is 100% of PM
		CO	Tons	55.5	12/03 Stack Test Nampa Facility
		NOx	Tons	0.96	AP-42, Table 1.4-1 (7/98) Natural gas combustion.
	- NATURAL GAS	SO2	MMcf	0.006	AP-42, 7/98, Table 1.4-2 & 99% removal
		VOC	MMcf	0.06	AP-42, 7/98, Table 1.4-2 & 99% removal
S-K2	BELGIUM KILN	PM	Tons	0.09	Eng. est. and 99% removal
	-LIME ROCK	PM10	Tons	0.09	Assume PM10 is 100% of PM
		CO	Tons	55.5	12/03 Stack Test Nampa Facility
		NOx	Tons	0.630	AP42, Boiler Table 1.2-1, anthracite coal
	-COKE	SO2	Tons	0.4	AP42, Table 1.4-2 & 99% removal
		VOC	Tons	0.10	Eng. est based on 2005 TF Stack Test
S-K3	PROCESS & FLUME SLACKERS CaO	PM	Tons	0.028	Nampa Tier II Nov 2004 compliance test
		PM10	Tons	0.028	Nampa Tier II Nov 2004 compliance test

EMISSION FACTOR SUMMARY - SUGAR WAREHOUSE AND SHIPPING

Mini Cassia Facility

May-12

NO.		POLLUTANT	UNIT	EMISSION FACTOR [1] LB/UNIT	REFERENCE
S-W1	DRYING GRANULATOR - SUGAR	PM	Tons	0.01	Nov.2004 Compliance test at Nampa
		PM10	Tons	0.01	Assume 100% of PM is PM10
S-W2	NO. 1 COOLING GRANULATOR - SUGAR	PM	Tons	0.005	Nov.2005 Compliance test at Nampa
		PM10	Tons	0.005	Assume 100% of PM is PM10
S-W3	NO. 2 COOLING GRANULATOR - SUGAR	PM	Tons	0.005	Nov.2005 Compliance test at Nampa
		PM10	Tons	0.005	Assume 100% of PM is PM10
S-W4	SUGAR HANDLING (PROCESS)	PM	lbs/h	0.3	Nov. 2001 Eng. Source Test at Nampa
		PM10	lbs/h	0.3	Assume 100% of PM=PM10
S-W5	SUGAR HANDLING (BULK LOADING)	PM	lbs/h	0.3	Nov. 2001 Eng. Source Test at Nampa
		PM10	lbs/h	0.3	Assume 100% of PM=PM10

EMISSION FACTOR SUMMARY - OTHER SOURCES

Mini Cassia Facility

May-12

NO.		POLLUTANT	UNIT	EMISSION FACTOR [1] LB/UNIT	REFERENCE
S-O5	MAIN MILL THIN JUICE	VOC	1000 gal	0.277	Nonvalidated Test Method
S-O7	SULFUR STOVE	SO2	lb/ton	91.60	July 1992 Eng Stack Test @ Nampa, 20% safety factor

MINI-CASSIA
PARTICULATE MATTER EMISSION FACTORS
UPDATED DECEMBER 2013

1.a. B&W BOILER (S-B1) – Coal

The permit limit based on IDAPA 58.01.01.677 for this boiler is 0.100 grains/dscf corrected at 8% O_2. The maximum capacity of the boiler is 190,000 lbs steam/hr & 244 MMBtu input/hr (the calculation assumes a heat content of the steam of 1000 Btu/lb steam & 78 % boiler efficiency). The estimated stack gas flow, from 40 CFR 60 Appendix A Method 19, for subbituminous coal combustion, adjusted at 8% O_2 is:

Fd = 9,780dscf /MMBtu * (20.9/ 20.9-8) =15,845 dscf/MMBtu at 8% O_2

15,845 dscf/MMBtu * 244 MMBtu/hr * 1 hr/60 min = 64,436 dscfm

Emission factor calculation:

0.1 grains/dscf * 64,436 dscfm * 60 min/hr * 1 lb/7,000 grains = 55.23 lb/hr

(55.23 lbs/h)(1 h/190 Klbs) = 0.291 lbs PM/Klbs steam

1.b. B&W BOILER (S-B1) – Natural Gas

The permit limit based on IDAPA 58.01.01.677 for this boiler is 0.015 grains/dscf corrected at 3% O_2. Maximum capacity of the boiler is 190,000 lbs steam/hr, 244 MMBtu input/hr and a maximum of 0.244 x 10^6 cu ft/hr (the calculation assumes a heat content of natural gas of 1000 Btu/ft^3, a heat content of steam is 1000 Btu/lb steam and efficiency of the boiler is 78%). The estimated maximum stack gas flow, from 40 CFR 60 Appendix A Method 19, for natural gas combustion, adjusted at 3% O_2 is:

Fd = 8,710 dscf/MMBtu * (20.9/ 20.9-3) =10,170 dscf/MMBtu at 3% O_2

10,170 dscf/MMBtu * 244 MMBtu/hr * 1 hr/60 min = 41,538 dscfm/min

The emissions factor is:

0.15 grains/dscf * 41,538 dscfm/min * 60 min/hr * 1 lb/7,000 grains = 5.34 lb/hr

(5.34 lbs/hr)(1hr/190 Klbs) = 0.0281 lbs PM/Klbs steam

2.a. ERIE CITY BOILER (S-B2) – Coal

The permit limit based on IDAPA 58.01.01.677 for this boiler is 0.100 grains/dscf corrected at 8% O_2. The maximum capacity of the boiler while firing coal is 220,000 lbs steam/hr & 297 MMBtu input/hr (calculation based on heat content of the steam of 1080 Btu/lb steam & 80 % boiler efficiency) and a maximum of 15.3 tons coal/hr. The heat content of coal is conservatively assumed to be 9700 Btu/lb coal. The estimated stack gas flow, from 40 CFR 60 Appendix A Method 19, for subbituminous coal combustion, adjusted at 8% O_2:

Fd = 9,780 dscf/MMBtu * (20.9/(20.9 - 8)) = 15,845 dscf/MMBtu at 8% O_2

15,845 dscf/MMBtu * 297 MMBtu/hr * 1hr/60 min = 78,433 dscfm

The emissions factor is:

0.100 grains/dscf * 78,433 dscf/min * 60 min/hr * 1lb/7,000 grains = 67.23 lb/hr

(67.23 lbs/h)(1 h/220 Klbs steam) = 0.306 lbs/Klbs steam

2.b. Erie City Boiler (S-B2) – Natural Gas

The permit limit based on IDAPA 58.01.01.677 for this boiler is 0.015 grains/dscf (corrected to 3% O_2). The maximum capacity of the boiler is 250,000 lbs steam/hr & 337.5 MMBtu input/hr (calculation based on heat content of the steam of 1080 Btu/lb steam & 80 % boiler efficiency). The heat content of natural gas is assumed to be 1000 Btu/ft^3. Based on the above assumptions, estimated exhaust gas flow is calculated based on 40CFR 60 Appendix A, Method 19 (for natural gas adjusted to 3% excess O_2).

Fd = (8,710 dscf/MMBtu) * [20.9/(20.9 - 3)] = 10,170 dscf/MMBtu @ 3% O_2

(10,170 dscf/MMBtu) * (337.5 MMBtu/hr) * (1 hr/60 minutes) = 57,206 dscfm

Emission factor calculation:

(0.015 grains/dscf) * (57,206 dscf/min) * (60 min/hr.) * (1 lb/7,000 grains) = 7.36 lbs/hr

(7.36 lbs /hr)(1 h/250 Klbs steam) = 0.0294 lbs PM/Klbs steam

3. Nebraska Boiler (S-B3) – Natural Gas

Emission factor is based on AP-42, Table 1.4-2 (7/98) for natural gas combustion.

EF = (7.6 lbs PM/10^6 scf) * (SCF/1000 Btu) * (1000 Btu/lbs stm) * (1000/(Klbs stm))

EF = 0.0076 lbs PM/Klbs Steam

4. SOUTH DRUM (S-D1) – Coal, Pressed Pulp and Additives

Applicable rule for particulate matter emissions (front half catch, only) for the South Drum is IDAPA 58.01.01.703, for process weight rates $P_w \ni 60{,}000$ lb/hr:

E(rate of emission) = 23.84 $(P_w)^{0.11} - 40$

From the production data, maximum total input is 48.5 tons/hr (97,000 lb/hr). The rate of emission for South Drum will be, in lb/hr:

$$E(\text{South Pulp Dryer}) = 23.84\ (97{,}000)^{0.11} - 40 = 44.3 \text{ lb/hr}$$

The emission factor is:

$$EF(\text{South Pulp Dryer}) = (44.31 \text{ lb/hr})(1 \text{ h}/48.5 \text{ tons/hr}) = 0.91 \text{ lb/ton input}$$

5. NORTH DRUM (S-D2) – Coal, Pressed Pulp and Additives

Applicable rule for particulate matter emissions (front half catch, only) for the North Drum is IDAPA 58.01.01.703, for process weight rates $P_w \ni 60{,}000$ lb/hr:

$$E(\text{rate of emission}) = 23.84\ (P_w)^{0.11} - 40$$

From the production data table, maximum total input is 56.9 tons/hr (113,800 lb/hr). The rate of emission for North Drum will be, in lb/hr:

$$E(\text{North Pulp Dryer}) = 23.84\ (113{,}800)^{0.11} - 40 = 45.8 \text{ lb/hr}$$

The emission factor will be:

$$EF(\text{North Pulp Dryer}) = (45.8 \text{ lb/hr})(1 \text{ hr}/56.9 \text{ tons/hr}) = 0.80 \text{ lb/ton input}$$

6. PELLET COOLER #1 (S-D3)

The particulate matter emission factor is based on a compliance test for a pellet cooler cyclone stack at the Nyssa, Oregon facility, conducted in October 1999. The Nyssa test results are as follows:

$$EF = (0.93 \text{ lbs/h})/(4.5 \text{ tons pellets/h}) = 0.21 \text{ lbs PM/tons pellets}$$

Assuming a 50% safety factor, the EF is conservatively estimated to be 0.32 lbs PM/ton pellets.

7. PELLET COOLER # 2 (S-D4)

Same as PELLET COOLER #1.

8. PELLET COOLER #3 (S-D5)

Same as PELLET COOLER #1.

9. UNION CARBIDE, GAS LIME KILN (S-K1) – Natural Gas

As discussed in Section 5 of the June 16, 2010 Lime Kiln Replacement Project PTC Application, the uncontrolled particulate emission factor is based on stack tests conducted at the Nampa facility. Based on this information, assuming a 99% control efficiency, the controlled emission factor is 0.09 lbs/ton limerock.

10. BELGIAN, COKE LIME KILN (S-K2) – Coke

Same as Union Carbide kiln.

11. PROCESS & FLUME SLACKER (S-K3)

In Nov. 2004 a compliance test was performed on a slaker at the TASCO Nampa facility (using EPA M-5-202 for PM10) and the results were 0.027 lbs. PM10 / ton lime. Assuming a 15% safety factor, the emission factor is:

$$EF = 0.027 \times 1.15 = 0.031 \text{ lbs/ton lime (CaO)}$$

12. DRYING GRANULATOR (S-W1)

The particulate matter (sugar dust) emission factor is based on a PM10 compliance test at the Nampa facility conducted in November 2004. Assume 100% of the PM10 is PM.

$$EF = (0.29 \text{ lbs/h})/43.4 \text{ tons/h}) = 0.007 \text{ lbs PM/ton sugar produced}$$

With a safety factor, the estimated EF for the drying granulator is 0.01 lbs/ton sugar produced.

13. COOLING GRANULATOR, #1 (S-W2)

The particulate matter (sugar dust) is based on a PM10 compliance test at the Nampa facility conducted in November 2005. Assume 100% of the PM10 is PM.

$$EF = (0.077 \text{ lbs/h})/(22.7 \text{t/h})$$
$$= 0.0034 \text{ lbs PM/ton sugar produced}$$

With a safety factor, the EF for the cooling granulator baghouse is 0.005 lbs/sugar produced.

14. COOLING GRANULATOR #2, FMC (S-W3)

Same as COOLING GRANULATOR #2.

15. PROCESS BAGHOUSE (S-W4)

Based on a 2001 source test at the Nampa factory, assume that the grain loading per unit of volume is 0.002 grains/dscf. The flow to the process baghouse is 16,600 acfm. Convert to standard conditions:

$$SCFM = 16{,}600 \text{ acfm} \quad \frac{P_{bar}}{P_{std\ cond}} \quad \frac{T_{std\ cond}}{T_{air}}$$

$p_{bar} = 26.0$ in Hg (avg)
$T_{air} = 44$ deg F= 504 deg R
$p_{std\ cond} = 29.92$ in Hg
$T_{std\ cond} = 537$ deg R

$$SCFM = 16{,}600 \text{ acfm } (26/29.92)(537/507) = 15{,}369 \text{ SCFM}$$

The emission rate (in lb/hr) for the process baghouse will be:

(0.002 grains/dscf) (15,369 dscf/min) (60 min/hr) (1 lb/7000 grains) = 0.26 lb/hr

16. BULK LOADING BAGHOUSE (S-W5)

Based on a 2001 source test at the Nampa factory, assume that the grain loading per unit of volume is 0.002grains/dscf. The flow to the bulk loading baghouse is 17,000 acfm. Convert to standard conditions:

$$SCFM = 17{,}000 \text{ acfm} \quad \frac{P_{bar}}{P_{std\ cond}} \quad \frac{T_{std\ cond}}{T_{air}}$$

$p_{bar} = 26.0$ in Hg (avg)
$T_{air} = 44$ deg F= 504 deg R
$p_{std\ cond} = 29.92$ in Hg
$T_{std\ cond} = 537$ deg R

$$SCFM = 17{,}000 \text{ acfm } (26/29.92)(537/504) = 15{,}740 \text{ SCFM}$$

The emission rate (in lb/hr) for the bulk loading baghouse will be:

(0.002 grains/dscf) (15,740 dscf/min) (60 min/hr) (1 lb/7000 grains) = 0.27 lb/hr

MINI-CASSIA
NITROGEN OXIDE (NO_x) EMISSION FACTORS
UPDATED DECEMBER 2013

1.a. B&W BOILER (S-B1) – Coal

The B&W boiler NO_x emission factor is based on engineering testing conducted at the Mini-Cassia facility on 10/14/05.

NO_x emission factor = 1.24 lbs NO_x/Klbs steam.

1.b. B&W BOILER (S-B1) – Natural Gas

NO_x emissions are based on the 0.1 lb/MMBtu NSPS limit as per 40 CFR 60.44.b for low heat release rate furnaces.

Conversion lbs NO_x/MMBtu in to lbs NO_x per Klbs steam out:

lbs NO_x/Klb steam = (lbs NO_x/MMBtu in)(1 MMBtu/10^6 Btu)(1 in/0.78 out)(1,000 Btu/lb steam)(1,000 lbs/Klb steam)

$= (0.10)(1/10^6)(1/0.78)(1{,}000)(1{,}000)$

= 0.13 lbs/Klbs steam

2.a. ERIE CITY BOILER (S-B2) – Coal

The Erie City boiler NO_x emission factor is based on engineering testing conducted at the Mini-Cassia facility on 10/14/05.

NO_x emission factor = 1.29 lbs. NO_x/Klbs steam.

2.b. ERIE CITY BOILER (S-B2) – Natural Gas

From AP-42, Table 1.4-1(7/98) for natural gas combustion, for Large Wall-Fired Boilers, NO_x emission factor is 280 lb/10^6 ft^3(uncontrolled, pre-NSPS). Assume the heat content of natural gas is 1000 Btu/ft^3, a heat content of steam of 1080 Btu/lb steam and efficiency of the boiler is 80 %.

(280 lb/10^6 ft^3)(1 ft^3/1,000 Btu)(10^6/MMBtu) = 0.280 lb/MMBTU

(0.280 lb/MMBtu)(1/0.80)(1.080 x 10^{-3} MMBtu/lb steam)(1,000) = 0.378 lb/10^3 lb steam

3. Nebraska Boiler (S-B3) – Natural Gas

Although NSPS standards are not applicable to this boiler, the emission factor for NO_x is conservatively based on the NSPS NO_x standards of 0.2 lbs NO_x/MMBtu. Assume an 80% boiler efficiency.

(0.2 lbs/MMBtu)(1/0.8)(1.0 x 10^{-3} MMBtu/lbs stm)(1000/ klbs stm) = 0.25 lbs NO_x/ klbs stm

0.25lbs/klbs steam

4. SOUTH DRUM (S-D1) – Coal

In November 2002, an engineering test was conducted at the Mini-Cassia facility. Based on the testing, the emission factor is 17.9 lbs NO_x/ton coal.

5. NORTH DRUM (S-D2) – Coal

In November 2002, an engineering test was conducted at the Mini-Cassia facility. Based on the testing, the NO_x emission factor is 19.75 lbs NO_x /ton coal.

6. UNION CARBIDE, GAS LIME KILN (S-K1) – Natural Gas

As discussed in Section 5 of the June 16, 2010 Lime Kiln Replacement Project PTC Application, the NO_x emission factor is based on an EPA AP-42 emission factor for a large wall natural gas-fired boiler. (Table 1.4-1, 280 lbs NO_x per MMCuft) Converting the EF in terms of limerock the estimated NO_x emission factor is 0.96 lbs NO_x/ton limerock.

7. BELGIAN, COKE LIME KILN (S-K2) – Coke

As discussed in Section 5 of the June 16, 2010 Lime Kiln Replacement Project PTC Application, the NO_x emission factor is based on an EPA AP-42 emission factor for a spreader stoker boiler firing anthracite coal (9lbs/ton coal). Converting the EF in terms of limerock the estimated NO_x emission factor is 0.63 lbs NO_x/ton limerock.

MINI-CASSIA
SULFUR DIOXIDE (SO_2) EMISSION FACTORS
UPDATED DECEMBER 2013

1.a. B&W BOILER (S-B1) – Coal

From AP-42, Table 1.1-3 (9/98) for subituminous coal combustion, for spreader stoker, uncontrolled process SO_2 emission factor is 35, multiplied by 1 (1% S by weight, in the coal), 35 lb/ton. The EF calculation assumes a heat content of coal of 9700 BTU/lb, a heat content of steam of 1000 BTU/lb steam and boiler efficiency of 78%.

$$(35 \text{ lb/ton coal})(1 \text{ ton}/2000 \text{ lbs})(1/9700)(10^6/\text{MMBtu} = 1.8 \text{ lb/MMBtu}$$

$$(1.8 \text{ lb/MMBtu})(1/0.78)(1.000 \times 10^{-3} \text{ MMBtu/lbs steam})(1000/\text{Klb}) = 2.3 \text{ lb}/10^3 \text{ lb steam}$$

Assume 90% control efficiency for the scrubber. The emission factor is:

$$(2.3 \text{ lb/Klb steam}) * (1\text{-}0.90) = 0.23 \text{ lbs } SO_2/\text{klbs steam}$$

1.b. B&W Boiler (S-B1) – Natural Gas

From AP-42, Table 1.4-2 (7/98) for natural gas combustion and assumes a 1000 Btu/scf nat. gas, 1000 Btu/lb stm. and 78% boiler efficiency. The emissions factor is:

$$(0.6 \text{ lbs}/10^6 \text{ ft}^3)(1 \text{ ft}^3/1020 \text{ Btu})(10^6 \text{ Btu/MMBtu}) = 0.0006 \text{ lbs/MMBtu}$$

$$(0.0006 \text{ lb/MMBtu})(1/0.78)(1.000 \times 10^{-3} \text{ MMBtu/steam})(1000 \text{ lbs/klb steam}) = 0.00077 \text{ lb/Klb steam}$$

2.a. ERIE CITY BOILER (S-B2) – Coal

From AP-42, Table 1.1-3 (9/98) for subbituminous coal combustion, for pulverized coal fired, dry bottom, SO_2 emission factor is 35, multiplied by 1 (1% S by weight, in the coal), 35 lb/ton. Heat content of coal is 9,700 BTU/lb coal, heat content of steam is 1,080 BTU/lb steam and efficiency of the boiler is 80%.

$$(35 \text{ lb/ton coal})(1 \text{ ton}/2000 \text{ lbs})(1/9700)(10^6/\text{MMBtu}) = 1.8 \text{ lb/MMBtu}$$

$$(1.8 \text{ lb/MMBtu})(1/0.80)(1.080 \times 10^{-3} \text{ MMBtu/lbs steam})(1000\text{Klb}) = 2.4 \text{ lb/Klb steam}$$

Assume 90% the control efficiency of the scrubber. The emission factor is:

$$(2.4 \text{ lb/Klb steam})*(1\text{-}0.90) = 0.24 \text{ lbs. } SO_2/\text{Klbs steam}$$

2.b. ERIE CITY BOILER (S-B2) – Natural Gas

From AP-42, Table 1.4-2 (7/98) for natural gas combustion, for utility boilers, SO_2 emission factor is 0.6 lb/10^6 ft^3. Assume a 1000 Btu/ft^3, a heat content of natural gas, a 1080 Btu/lb steam heat content and a 80 % boiler efficiency then

$$(0.6 \text{ lbs}/10^6 \text{ ft}^3)(1 \text{ ft}^3/1000 \text{ Btu})(10^6 \text{ Btu/MMBtu}) = 0.0006 \text{ lbs/MMBtu}$$

$$(0.0006 \text{ lb/MMBtu})(1/0.8)(1.080 \times 10^{-3} \text{ MMBtu/steam})(1000 \text{ lbs/Klb steam}) = 0.00081 \text{ lb/Klb steam}$$

3. Nebraska Boiler (S-B3) – Natural Gas

From AP-42, Table 1.4-2 (7/98) for natural gas combustion and assumes 1000 Btu/scf nat. gas, 1000 Btu/ lb. stm. and 80% boiler efficiency. The emission factor is:

$$(0.6 \text{ lbs}/10^6 \text{ ft}^3)(1 \text{ ft}^3/1000 \text{ Btu})(10^6 \text{ Btu/MMBtu}) = 0.0006 \text{ lbs/MMBtu}$$

$$(0.0006 \text{ lb/MMBtu})(1/0.8)(1.000 \times 10^{-3} \text{ MMBtu/steam})(1000 \text{ lbs/Klb steam}) = 0.00075 \text{ lb/Klb steam}$$

4. SOUTH DRUM (S-D1) – Coal

From AP-42, Table 1.1-3 (9/98) for bituminous coal combustion, for spreader stoker, uncontrolled process SO_2 emission factor is 35, multiplied by 0.8% (0.8% S by weight, in the coal), 28 lb/ton. Assuming an 80% control efficiency of the scrubbers then the emission factor is:

$$28 \text{ lb/ton coal } (1-0.8) = 5.6 \text{ lb/ton coal}$$

5. NORTH DRUM (S-D2) – Coal

Same as South Drum (S-D1).

6. UNION CARBIDE, GAS LIME KILN (S-K1) – Natural Gas

As discussed in Section 5 of the June 16, 2010 Lime Kiln Replacement Project PTC Application, the SO_2 is based on an EPA AP-42 uncontrolled emission factor for a boiler firing natural gas. Assuming a 99% removal efficiency (gas washers, water ring compressors and carbonation tanks) the controlled EF is 0.006 lbs/MMCuft.

7. BELGIAN, COKE LIME KILN (S-K2) – Coke

As discussed in Section 5 of the June 16, 2010 Lime Kiln Replacement Project PTC Application, the SO_2 EF is based on a mass balance approach. In addition, a 99% removal efficiency was also assumed. Utilizing this information the EF is 0.4 lbs SO_2/ton coke or anthracite coal.

8. SULFUR STOVE (S-07)

Preliminary uncertified SO_2 stack tests were conducted on B-side sulfur tower at the Nampa facility in July 1992. The purpose of the testing was to obtain a rough estimate of the SO_2 emissions from the sulfur towers since there are no EPA AP-42 emission factors for this emission source. The sulfur stove can operate with or without a fan. SO_2 emissions were higher with the fan operating. As a worst case scenario, the emission factor utilized is for a sulfur stove with a fan operating at all times. In addition, a safety factor was applied to the sulfur stove emission factor. The sulfur stove SO_2 emission factor is: 91.6 lbs SO_2/tons of sulfur.

MINI-CASSIA
CARBON MONOXIDE (CO) EMISSION FACTORS
UPDATED DECEMBER 2013

1.a. B&W BOILER (S-B1) – Coal

From AP-42, Table 1.1-3 (9/98) for subbituminous coal combustion, for spreader stoker, uncontrolled process CO emission factor is 5 lb/ton. The EF calculation assumes a coal heat content of 9700 Btu/lb, a steam heat content of 1000 Btu/lb and a 78% boiler efficiency. The emission factor is:

$$(5 \text{ lb/ton})(1/2000)(1 \text{ lb}/9700 \text{ Btu})(10^6 \text{ Btu}/1\text{MMBtu}) = 0.258 \text{ lb/MMBtu}$$

$$(0.258 \text{ lb/MMBtu})(1/0.78)(1.000 \times 10^{-3} \text{ MMBtu/steam})(1000 \text{ Klb}) = 0.331 \text{ lb/Klb steam}$$

1.b. B&W BOILER (S-B1) – Natural Gas

The burner manufacturer CO estimate is 100 ppm at 3% O_2 dry basis. To determine lbs CO per Klbs steam, utilize EPA Method 19 equation:

$$E \text{ (lbs/MMBtu)} = C_d Fd \, [20.9/20.9 - \% \, O_2 d]$$

Where, C_d = lbs CO/dscf and Fd = 8,710 dscf/MMBtu for natural gas

To calculate C_d, utilize the following equation:

$$C_d \text{ (lbs CO/dscf)} = (\text{ppm} * \text{MW}) / (385.1 \times 10^6)$$

Where, MW = molecular weight of CO = 28

$$\text{Then, lbs CO/dscf} = (100 \times 28) / (385.1 \times 10^6) = 7.27 \times 10^{-6}$$

Therefore, lbs CO/MMBtu is calculated as follows:

$$\text{lbs CO/MMBtu} = (7.27 \times 10^{-6})(8{,}710) \, [20.9/20.9\text{-}3] = 0.074$$

Conversion lbs CO/MMBtu in to lbs CO per Klbs steam out:

$$\text{lbs CO/Klb steam} = (\text{lbs CO/MMBtu in})(1 \text{ MMBtu}/10^6 \text{ Btu})(1 \text{ in}/0.78 \text{ out})(1{,}000 \text{ Btu/lb steam})(1{,}000 \text{ lbs/Klb steam})$$

$$= (0.074)(1/10^6)(1/0.78)(1{,}000)(1{,}000)$$

$$= 0.095 \text{ lbs/Klbs steam}$$

2.a. ERIE CITY BOILER (S-B2) – Coal

From AP-42, Table 1.1-3 (9/98) for subbituminous coal combustion, for pulverized coal fired, dry bottom, CO emission factor is 0.5 lb/ton. Using a heat content of 9,700 BTU/lb coal, heat content of 1,080 BTU/lb steam and 80% efficiency.

$$(0.5 \text{ lb/ton})(1/2000)(1 \text{ lb}/9700 \text{ BTU})(10^6 \text{ BUT}/1\text{MMBTU}) = 0.0258 \text{ lb/MMBTU}$$

$$(0.0258 \text{ lb/MMBTU})(1/0.80)(1.080 \times 10^{-3} \text{ MMBTU/steam})(1000) = 0.0348 \text{ lb}/10^3 \text{ lb steam}$$

2.b. ERIE CITY BOILER (S-B2) – Natural Gas

From AP-42, Table 1.4-1 (7/98) for natural gas combustion, for utility boilers, CO emission factor is 84 $lb/10^6 ft^3$. Using a natural gas heat content of 1,000 BTU/ft^3, heat content of steam is 1,080 BTU/lb steam and efficiency of the boiler is 80%.

$$(84 \text{ lb}/10^6 \text{ ft}^3)(1 \text{ ft}^3/1000 \text{ BTU})(10^6 \text{ BTU/MMBTU}) = 0.084 \text{ lb/MMBTU}$$

$$(0.084 \text{ lb/MMBTU})(1/0.8)(1.080 \times 10^{-3} \text{ MMBTU})(1000) = 0.11 \text{ lb}/10^3 \text{ steam}$$

3. NEBRASKA BOILER (S-B3) – Natural Gas

From AP-42, Table 1.4-1 (7/98) for natural gas combustion, for utility boilers, CO emission factor is 84 $lb/10^6 ft^3$. Using a natural gas heat content of 1,000 BTU/ft^3, heat content of steam is 1,000 BTU/lb steam and efficiency of the boiler is 80%.

$$(84 \text{ lb}/10^6 \text{ ft}^3)(1 \text{ ft}^3/1000 \text{ BTU})(10^6 \text{ BTU/MMBTU}) = 0.084 \text{ lb/MMBTU}$$

$$(0.084 \text{ lb/MMBTU})(1/0.8)(1.000 \times 10^{-3} \text{ MMBTU})(1000) = 0.11 \text{ lb}/10^3 \text{ steam}$$

4. SOUTH DRUM (S-D1) – Input

Based on a November 2002 engineering stack test on the south pulp dryer at the Mini-Cassia facility, the CO EF is 5.92 lbs/ton input.

5. NORTH DRUM (S-D2) – Input

Based on a November 2002 engineering stack test on the south pulp dryer at the Mini-Cassia facility, the CO EF is 6.14 lbs/ton input.

6. UNION CARBIDE, GAS LIME KILN (S-K1) – Limerock

As discussed in Section 5 of the June 16, 2010 Lime Kiln Replacement Project PTC Application, the CO EF is based on stack tests conducted on a vertical shaft kiln at the

Nampa facility in December 2003. Based on this information, the CO EF is 55.5 lbs/ton limerock.

7. BELGIAN, COKE LIME KILN (S-K2) – Limerock

Same as Union Carbide kiln.

MINI-CASSIA
VOLATILE ORGANICCOMPOUNDS (VOC) EMISSION FACTORS
UPDATED DECEMBER 2013

1.a. B&W BOILER (S-B1) – Coal

From AP-42, Table 1.1-19 (9/98) for subbituminous coal combustion, for spreader stoker, uncontrolled process VOC emission factor is 0.05 lb/ton. Using a heat content of 9700 Btu/lb coal, heat content of 1000 Btu/lb steam and efficiency of the boiler is 78%.

$$(0.05 \text{ lb/ton coal})(1/2{,}000)(1/9{,}700)(10^6/\text{MMBtu}) = 0.00258 \text{ lb/MMBtu}$$

$$(0.00258 \text{ lb/MMBtu})(1.000 \times 10^{-3} \text{ MMBtu/lbs steam})(1{,}000)(1/0.78) = 0.0033 \text{ lb}/10^3 \text{ lbs steam}$$

1.b. B&W BOILER (S-B1) – Natural Gas

From AP-42, Table 1.4-1 (7/98) for natural gas combustion, for utility boilers, VOC emission factor is 5.5 $\text{lb}/10^6 \text{ ft}^3$. Assuming a natural gas heat content of 1000 Btu/ft^3, a steam heat content of steam of 1000 Btu/lb steam, then the emissions factor is:

$$(5.5 \text{ lb}/10^6 \text{ ft}^3)(1 \text{ ft}^3/1{,}000 \text{ Btu})(10^6 \text{ Btu/MMBtu}) = 0.0055 \text{ lbs/MMBtu}$$

$$(0.0055 \text{ lb/MMBtu})(1/0.78)(1.000 \times 10^{-3} \text{ MMBtu})(1{,}000) = 0.0071 \text{ lbs}/1{,}000 \text{ lb steam}$$

2.a. ERIE CITY BOILER (S-B2) – Coal

From AP-42, Table 1.1-19 (9/98) for subbituminous coal combustion, for pulverized coal fired, dry bottom boiler, VOC emissions factor is 0.06 lb/ton. Assuming a heat content of 9700 Btu/lb coal, a heat content of 1080 Btu steam and boiler efficiency of 80%, the emissions factor is:

$$(0.06 \text{ lb/ton coal})(1/2{,}000)(1/9{,}700)(10^6/\text{MMBtu}) = 0.00309 \text{ lb/MMBtu}$$

$$(0.00309 \text{ lb/MMBtu})(1.080 \times 10^{-3} \text{ MMBtu/lbs steam})(1{,}000)(1/0.80) = 0.00418 \text{ lb}/10^3 \text{ lbs steam}$$

2.b. ERIE CITY BOILER (S-B2) – Natural Gas

From AP-42, Table 1.4-1 (7/98) for natural gas combustion, for utility boilers, VOC emission factor is 5.5 lb/10^6 ft^3. Assuming a natural gas heat content of 1000 Btu/ft^3,steam heat content of 1080 Btu/lb steam and a 80% boiler efficiency, the emissions factor is:

$$(5.5 \text{ lb}/10^6 \text{ ft}^3)(1 \text{ ft}^3/1000 \text{ Btu})(10^6 \text{ Btu/MMBtu}) = 0.0055 \text{ lbs/MMBtu}$$

$$(0.0055 \text{ lb/MMBtu})(1/0.80)(1.080 \times 10^{-3} \text{ MMBtu})(1{,}000) = 0.00743 \text{ lb}/1{,}000 \text{ lb steam}$$

3. NEBRASKA BOILER (S-B3) – Natural Gas

From AP-42, Table 1.4-1 (7/98) for natural gas combustion, for utility boilers, VOC emission factor is 5.5 lb/10^6 ft^3. Assuming a natural gas heat content of 1000 Btu/ft^3, a steam heat content of 1000 Btu/lb steam and boiler efficiency of 78%, the emissions factor is:

$$(5.5 \text{ lb}/10^6 \text{ ft}^3)(1 \text{ ft}^3/1{,}000 \text{ Btu})(10^6 \text{ Btu/MMBtu}) = 0.0055 \text{ lbs/MMBtu}$$

$$(0.0055 \text{ lb/MMBtu})(1/0.80)(1.000 \times 10^{-3} \text{ MMBtu})(1{,}000) = 0.0071 \text{ lbs}/1{,}000 \text{ lb steam}$$

4. SOUTH AND NORTH PULP DRYERS (S-D1 & S-D2)

The VOC emission factor was estimated based on total hydrocarbon stack testing at the Nyssa facility and EPA AP-42 assumptions. Total hydrocarbon measurements utilizing EPA Method 25 A were conducted on a pulp dryer at the Nyssa facility in November 1998. The total hydrocarbon emission factor was:

0.42 lb THC's/ton input

To determine the VOC emission factor, methane needs to be deducted from the THC factor based on EPA AP-42 data for, horizontal coffee bean roasters with thermal oxidizer controls, the methane fraction is ~ 95.9% of the total VOC's. For the pulp dryers, conservatively assume 90% then,

0.42 (1-0.9) = 0.042 lbs VOC's/ton input
or
0.36 lbs VOC's/ton coal

5. UNION CARBIDE, GAS LIME KILN (S-K1) – Natural Gas

As referenced in Section 5 of the June 16, 2010 Lime Kiln Replacement Project PTC Application, the VOC emission factor is based on an EPA AP-42 emission factor for a natural gas-fired boiler. Based on this information, the emission factor is 0.055 lbs/MMCuft.

6. BELGIAN, COKE LIME KILN (S-K2) – Coke

As referenced in Section 5 of the June 16, 2010 Lime Kiln Replacement Project PTC Application, the VOC emission factor is based on engineering stack tests at the Twin Falls facility in 2005. Based on this information, the emission factor is 0.0953 lbs/ton coke.

7. MAIN MILL VENTS

There are no EPA approved and field validated total VOC testing procedures for the main mill vents at sugar beet processing facilities. During the 2005 beet processing campaign, TASCO hired a third party consultant to conduct speciated VOC screening engineering stack tests on selected vents at the Mini-Cassia facility and Twin Falls facility. The 1st and 2nd carbonation tank vents were sampled at the Twin Falls facility in October 2005. A stack with several evaporator heater vents was sampled at the Mini-Cassia facility in October 2005 and March 2006.

Although emissions data was collected, several noted interferences and inaccuracies with the test methods were encountered. Testing interferences, which affect the accuracy of the results, include high stack CO_2 concentrations, high moisture stack gas moistures and entrained moisture. High moisture levels greatly reduced the sample times and volumes, which limited the ability to collect accurate and representative data. In order to more accurately measure these sources, the interferences would need to be eliminated or develop alternative-testing procedures.

However, based on an analysis of this data and other information, TASCO will utilize the preliminary engineering stack testing at this time to estimate VOC's from the main mill vents. The emission factor is as follows:

0.277 lbs VOC/1,000 gals of juice

EBERHARDT LIME KILN
EMISSIONS FACTOR DOCUMENTATION SUMMARY
MAY 2012

1. PARTICULATES (PM)

As discussed in Section 5 of the June 16, 2010 Lime Kiln Replacement Project PTC Application, the uncontrolled particulate emission factor is based on stack tests conducted at the Nampa facility. Based on this information, assuming a 99% control efficiency, the controlled emission factor is 0.09 lbs/ton limerock.

2. NITROGEN OXIDE (NO_x)

As discussed in Section 5 of the June 16, 2010 Lime Kiln Replacement Project PTC Application, the NO_x emission factor is based on an EPA AP-42 emission factor for a spreader stoker boiler firing anthracite coal (9lbs/ton coal). Converting the EF in terms of limerock the estimated NO_x emission factor is 0.63 lbs NO_x/ton limerock.

3. SULFUR DIOXIDE (SO_2)

As discussed in Section 5 of the June 16, 2010 Lime Kiln Replacement Project PTC Application, the SO_2 EF is based on a mass balance approach. In addition, a 99% removal efficiency was also assumed. Utilizing this information the EF is 0.4 lbs SO_2/ton coke or anthracite coal.

4. CARBON MONOXIDE (CO)

As discussed in Section 5 of the June 16, 2010 Lime Kiln Replacement Project PTC Application, the CO emission factor for the Eberhardt Kiln is based on a mass balance calculation. Based on the mass balance and a 1% CO maximum guarantee by Eberhardt, the maximum CO emission factor is 21.5 lbs CO/ton limerock.

5. VOLATILE ORGANIC COMPOUNDS (VOC's)

As referenced in Section 5 of the June 16, 2010 Lime Kiln Replacement Project PTC Application, the VOC emission factor is based on engineering stack tests at the Twin

Falls facility in 2005. Based on this information, the emission factor is 0.524 lbs/ton anthracite coal.

Section 6

Ambient Air Quality Impact Analysis

Formaldehyde
Air Quality Impact Analysis

B & W Boiler Natural Gas Conversion Project

for the

The Amalgamated Sugar Company LLC
Mini Cassia Facility
Paul, Idaho

December 31, 2013

1.0 INTRODUCTION

The Amalgamated Sugar Company LLC (TASCO) is proposing to replace the B&W boiler coal firing system and associated equipment with a new natural gas firing system. The exhaust gases from the B&W boiler will pass through the existing economizer and then out through a new stack. TASCO has conducted an ambient air quality impact analysis in support of the B&W Boiler natural gas conversion project at the Mini Cassia facility. The analysis was performed to conservatively estimate air quality impacts for the net difference in converting the B&W Boiler from Coal firing to natural gas firing only.

The modeling analysis was performed using the air dispersion model "Breeze" developed by Trinity Consultants. The Breeze suite of programs combines into one program EPA's AERMOD and Building Profile Input Program (BPIP). The Breeze suite is also capable of importing digital elevation model (DEM) terrain files and graphically presenting contours as well as buildings, emission points and receptors.

2.0 INPUT PARAMETERS

The air dispersion model for the proposed B&W Natural Gas Conversion Project utilized stack parameters previously accepted by the Department for the Nebraska natural gas fired boiler. Table 1 presents the emission rate, stack location and base elevation. Table 2 details the stack parameters including stack height and diameter, exhaust temperature and the exhaust flow rate. Figure 1 illustrates the projected source location for the B&W Boiler Natural Gas Stack (PB1a) and the dark bold circle indicates the area the projected stack would be located. Building outlines are shown for reference as are some of the other stacks located onsite. The new B&W Stack will be located north of the location of the current stack and scrubbing system. For natural gas firing the source was modeled assuming 8760 hours of operation at 190,000 lbs / hr steam rate. The emission source was modeled at 1264 meters (4147 ft) grade level at the site.

3.0 MODEL

The Breeze Suite of programs operates using EPA's AERMOD model version 12060, BPIP Prime model version 04274 and AERMAP version 11103

4.0 METEOROLOGY

This analysis used meteorological data (met data) developed by Geomatrix of Lynwood, Washington using EPA's AERMET model (Version 06431). Upper air data was collected from the Boise, Idaho meteorology station #24131 while the surface air was collected at the Burley, Idaho met station #25867. Land use characteristics were processed in 12 sectors encompassing the Minidoka INEEL meteorological site using the AERMET user guide lookup tables. These files reflect meteorology of the area from January, 2000 to December31, 2004.

5.0 RECEPTOR GRID

The dispersion model included boundary receptors and two receptor grids. Figure 2 illustrates the fence line receptors and grid receptors. Figure 3 illustrates the location of the Highest Annual concentration identified in this model.

The full receptor grid consists of several receptor grids. Originally, receptors were placed every 200 meters on a 10 km by 15 km area grid, (3750 grid points) with the facility placed in the middle. Receptors were excluded within the facility boundaries, which includes the beet handling area, waste ponds, coal storage area, irrigation fields and the physical plant due to restricted public access. Fence line receptors were placed every 50 meters. Based upon the results of initial simulations, a refined 2 km by 2 km receptor grid with 50 meter spacing between receptors was placed around the facility with an eastern most boundary at the public road 400 West. The smaller grid is represented by grid patterns of 41 by 41 (1681) receptors. The placement of the smaller 50-meter grid pattern was determined by evaluating previous model output and prevailing wind patterns.

Terrain elevations for the receptors were obtained from USGS digital elevation model (DEM) 7.5-minute Rupert, Rupert_NW, Burley and Burley_NE quadrangles. These data have a horizontal spatial resolution of 30 meters. The receptor locations are expressed in units of UTM (NAD27) coordinates.

6.0 BACKGROUND CONCENTRATION

Background concentrations are not necessary for this impact analysis.

7.0 RESULTS

Table 3 presents the results of the analysis. The highest annual, model-predicted formaldehyde concentration is 1.43E-03 ug/m^3 (1.9% of AAAC) and is located at UTM Coordinates 273,362 meters Easting by 4,721,371 meters Northing. Figure 3 illustrates the location of the maximum model-predicted concentrations. The highest concentration occurs at the western property boundary.

8.0 CONCLUSIONS

An air quality impact analysis was conducted based on net annual emissions changes associated with converting this boiler from coal firing to natural gas firing.

As shown in Table 3, the analysis demonstrated that the model-predicted formaldehyde concentrations for the meteorological period between January 1, 2000 and December 31, 2004 are less than the Acceptable Annual Ambient Concentrations (AAAC) in Idaho's carcinogenic list in IDAPA 58.01.01.586.

Table 1. Modeled TAP's Emissions - Point Sources (lbs / hour)

Emission Source	Source ID	Annualized Net Emissions Changes (Lb/hr)
		Formaldehyde
B & W Natural Gas Fired Boiler Project	P-B1a	1.53E-02

Table 2. Stack Data for Stationary Point Sources

Emission Source (Point)	Source ID	UTM X (m)	UTM Y (m)	Stack Height (ft)	Temperature (°F)	Exit Velocity (ft / min)	Stack Diameter (ft)
B & W Natural Gas Fired Boiler	P-B1a	273,810	4,721,195	69	380	3709	6.0

Table 3. Maximum Predicted Annual Concentration

Constituent	Annual (ug / m^3)	UTM X (m)	UTM Y (m)	AAAC's (ug / m^3)
Formaldehyde	1.43E-03	273,362	4,721,371	7.70E-02

Figure 1. Facility Layout Showing Buildings, Tanks, and Stacks

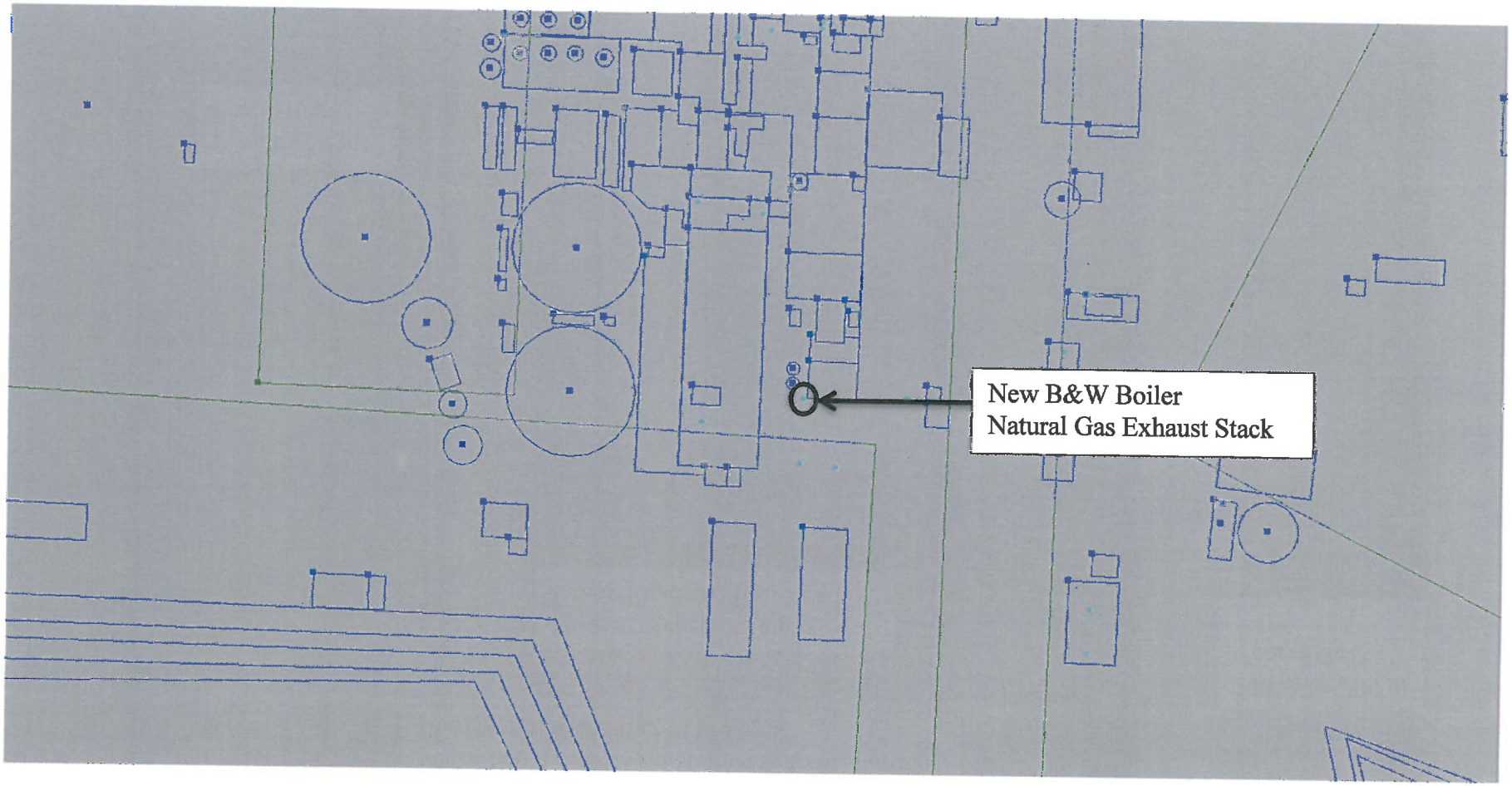


Figure 2. Fence Line and Receptor Grid

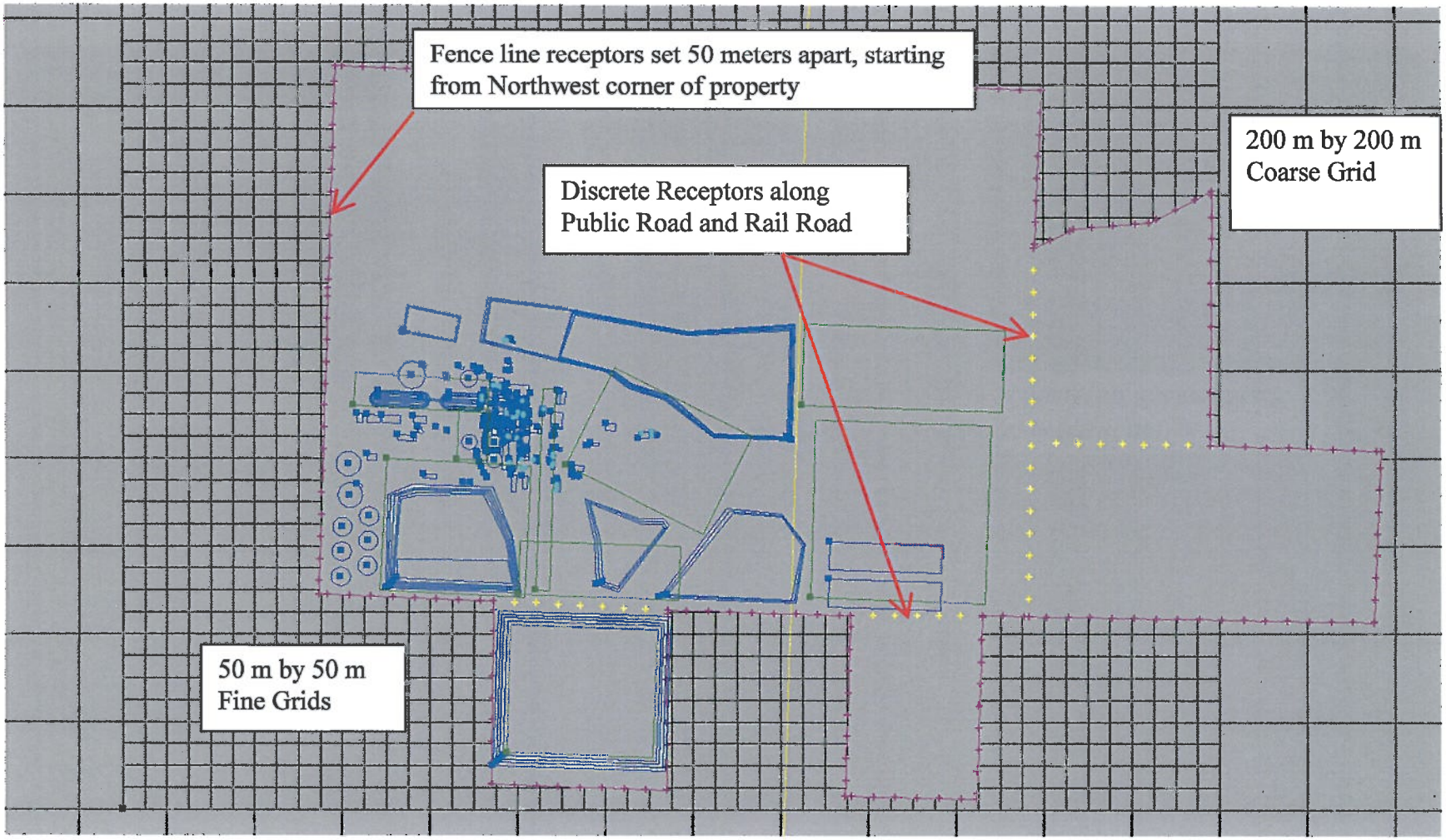


Figure 3. Location of Maximum Formaldehyde Model Predicted Concentrations