

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

ENGINEERING AND COMPLIANCE DIVISION

APPLICATION PROCESSING AND CALCULATIONS

PAGE

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PAGES

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APPL. NO.

PC
568639.docx

DATE

4/15/2015

PROCESSOR

MFN

REVIEWER

PERMIT TO CONSTRUCT ANALYSIS

FACILITY MAILING ADDRESS

SAPA Extruder, Inc.
18111 E. Railroad Street
City of Industry, CA 91748

(ID: 161300 NOx RECLAIM Cycle 2 - TITLE V)

EQUIPMENT LOCATION

SAME AS ABOVE

EQUIPMENT DESCRIPTION

APPLICATION NO. 568639 - NEW CONSTRUCTION

PROCESS 1: SECONDARY METALS, ALUMINUM
SYSTEM 2: ANNEALING

(D75) FURNACE, ALUMINUM BILLET PREHEAT, BELCO INDUSTRIES, CUSTOM BUILT, 7,875,000 BTU/HR TOTAL, NATURAL GAS FIRED, WITH 8 MODEL NO. CE0225 RETENTION BURNERS, 50,000 BTU/HR EACH; 20 MODEL NO. CE0210 HIGH CAPACITY BURNERS, 60,000 BTU/HR EACH; AND 118 MODEL NO. CE0220 STANDARD CAPACITY BURNERS, 50,000 BTU/HR EACH.

APPLICATION NO. 568640 - FACILITY PERMIT MODIFICATION
DE MINIMUS SIGNIFICANT TITLE V PERMIT REVISION/RECLAIM AMENDMENT

HISTORY

Application No. 568639 was filed on September 26, 2014, for a Class I equipment replacement of existing furnace device ID, D6 A/N 502266. The new furnace has a higher heat input rating, emission increase is expected. Application No. 568640 was filed on September 26, 2014, for a Title V Permit Revision/RECLAIM Amendment.

The following compliance activity was found in District records (CLASS computer database) during the past 2 years.

Complaints: There were no complaints credited to this facility during the past 2 years.

Notices to Comply:

E25476, 12/31/13 to submit electronic report for Process Unit as required.
Applicant submitted information by 1/6/14.

| | | |
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Notices of Violation: There were no Notices of Violation issued within the last 2 years.

PROCESS DESCRIPTION

SAPA Extruder, Inc., primarily heats aluminum billet in a billet press until it can be extruded through dies to form the desired shape. The final product is then aged in an oven to create a uniform and consistent metal composition across the metal.

EVALUATION

Operating Schedule – 24 hrs/day, 7 days/wk, 52 weeks/year (Maximum)

Heat rating – 7.875 MMBTU/hr – Proposed Furnace

4.20 MMBTU/hr – Current Billet Furnace, D6

Load factor – Average Load = 100%

Maximum Load = 100%

Al Billet Temperature – 1000°F (Maximum)

NOx emissions – 50 ppmv @ 3% O₂ (To be verified with a conditioned source test)

Consultant is requesting 50 ppmv be used for emission calculations and reporting purposes as allowed in R2012.

- HC, SO_x, CO and PM emissions from the 2011 AER Program

- PM₁₀ = 1.0 PM, based on 1/30/92, Fred Del Rosario memo.

See attached sheets for criteria pollutant emission calculations of the existing Billet Furnace (D6) and the proposed Billet Furnace (D75) along with calculation sheet for Toxic Pollutants from Natural Gas combustion.

| 30Day Avg | ROG | NOx | SOx | CO | PM ₁₀ | CO ₂ | CH ₄ | N ₂ O |
|-----------|-------|--------|-------|-------|------------------|-----------------|-----------------|------------------|
| D6 | 0.67 | 12.34 | 0.06 | 3.36 | 0.72 | | | |
| D75 | 1.26 | 11.43 | 0.11 | 6.30 | 1.35 | 22092.21 | 0.38 | 0.04 |
| Δ | +0.59 | -#0.91 | +0.05 | +2.94 | +0.63 | | | |

RULES COMPLIANCE

RULE 212: Public Notification

Paragraph 212 (c)(1) Requires a public notice for all new or modified permit units that may emit air contaminants located within 1,000 feet from the outer boundary of a school. According to the website geodistance.com the closest school, Jellick Elementary is beyond a 3000 feet from SAPA Extruder's property line. A 30-Day Public Notice is not required under this paragraph.

Paragraph 212(c)(2) The equipment will not result in on-site emission increase exceeding the daily maximums as specified in the table in Rule 212(g).

Therefore, a 30-day public notice period will not be required under this paragraph.

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D29.2 THE OPERATOR SHALL CONDUCT SOURCE TESTS FOR THE POLLUTANTS IDENTIFIED BELOW:

| POLLUTANT(S) TO BE TESTED | REQUIRED TEST METHOD(S) | AVERAGING TIME | TEST LOCATION |
|------------------------------|-----------------------------|-------------------|---------------|
| NOX EMISSIONS | APPROVED DISTRICT METHOD | 15 MINUTES | OUTLET |
| CO EMISSIONS | APPROVED DISTRICT METHOD | 15 MINUTES | OUTLET |

In addition to the source test requirements of Section E of this facility permit, the facility permit holder shall submit the protocol to the AQMD engineer no later than 45 days prior to the proposed test date, and notify the District of the date and time of the test at least 10 days prior to the test.

The test(s) shall be conducted within 60 days after achieving maximum production rate, but no later than 180 days after initial start-up.

The test shall be conducted to demonstrate compliance with the BACT limit of 50 ppmv at 3 percent oxygen for NOx.

Notwithstanding the requirements of Section E conditions, the source test results shall be submitted to the District no later than 30 days after the source test was conducted.

I297.1 THIS EQUIPMENT SHALL NOT BE OPERATED UNLESS THE FACILITY HOLDS 4116 POUNDS OF NOX RTCS IN ITS ALLOCATION ACCOUNT TO OFFSET THE ANNUAL EMISSIONS INCREASE FOR THE FIRST YEAR OF OPERATION. RTCS HELD TO SATISFY THIS CONDITION MAY BE TRANSFERRED ONLY AFTER ONE YEAR FROM THE INITIAL START OF OPERATION. IF THE HOLD AMOUNT IS PARTIALLY SATISFIED BY HOLDING RTCS THAT EXPIRE MIDWAY THROUGH THE HOLD PERIOD, THOSE RTCS MAY BE TRANSFERRED UPON THEIR RESPECTIVE EXPIRATION DATES. THIS HOLD AMOUNT IS IN ADDITION TO ANY OTHER AMOUNT OF RTCS REQUIRED TO BE HELD UNDER OTHER CONDITION(S) STATED IN THIS PERMIT.

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| | | | | | | |
|---------------|----|----|-----|----|----|-----|
| Maximum Daily | 30 | 30 | 40* | 30 | 60 | 220 |
|---------------|----|----|-----|----|----|-----|

* RECLAIM pollutant, not subject to emission accumulation requirements

RECLAIM Pollutants

Rule 3000(b)(15)(A)(v) defines a “minor permit revision” as any Title V permit revision that does not result in an emission increase of RECLAIM pollutants over the facility starting Allocation plus non-tradable Allocations, or higher Allocation amount which has previously undergone a significant permit revision process. Since NOx is a RECLAIM pollutant for this facility, a separate analysis shall be made to determine if the proposed permit revision is considered a “minor permit revision” for RECLAIM pollutants. Section B of the Title V permit shows that this facility’s NOx starting Allocation plus the non-tradable Allocation is 30,832 pounds. The proposed project is expected to result in an increase 11.73 lbs/day (4,116 lbs/yr) of NOx emissions from this permit revision, less than the starting Allocation plus the non-tradable Allocations of 30,832 pounds. As a result, this proposed project is considered as a “minor permit revision” for RECLAIM pollutants.

RECOMMENDATION

Approve Permit to Construct for A/N 568639 as described in this report and Section H of the Facility Permit, once it is off of 45-Day EPA notice. Approve TV/RECLAIM revision plan, under A/N 568640.

Conditions:

B59.1 THE OPERATOR SHALL NOT USE THE FOLLOWING MATERIAL(S) IN THIS DEVICE:

Smoke producing material

Metal contaminated with rubber, plastic, paper, rags, oil, grease

D28.4 THE OPERATOR SHALL CONDUCT SOURCE TEST(S) IN ACCORDANCE WITH THE FOLLOWING SPECIFICATIONS:

The test shall be conducted to determine the NOX emissions at the outlet.

The test shall be conducted every five-year period, with the first five year-period ending June 30, 2015.

The test shall be conducted within 12 months of the approval of the concentration limit.

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REG XXX This facility is in the RECLAIM program. The proposed project is considered a "de minimis significant permit revision" for non-RECLAIM pollutants and hazardous air pollutants (HAPs); and a "minor permit revision" for RECLAIM pollutants to the RECLAIM/Title V permit for this facility.

Non-RECLAIM Pollutants or HAPs

Rule 3000(b)(6) defines a "de minimis significant permit revision" as any Title V permit revision where the cumulative emission increases of non-RECLAIM pollutants or HAPs from these permit revisions during the term of the permit are not greater than any of the following emission threshold levels:

| Air Contaminant | Daily Maximum (lbs/day) |
|------------------------|------------------------------------|
| HAP | 30 |
| VOC | 30 |
| NOx* | 40 |
| PM ₁₀ | 30 |
| SOx* | 60 |
| CO | 220 |

* Not applicable if this is a RECLAIM pollutant

To determine if a project is considered as a "de minimis significant permit revision" for non-RECLAIM pollutants or HAPs, emission increases for non-RECLAIM pollutants or HAPs resulting from all permit revisions that are made after the issuance of the Title V renewal permit shall be accumulated and compared to the above threshold levels. This proposed project is the 3rd permit revision to the Title V renewal permit issued to this facility on November 17, 2010. The following table summarizes the cumulative emission increases resulting from all permit revisions since the Title V renewal permit was issued:

| Revision | HAP | VOC | NOx* | PM₁₀ | SOx | CO |
|-------------------------------------------------------------------------------------|------------|----------------|------------------|------------------------|----------------|----------------|
| 1 st Permit Revision: Replacing Billet D10 with Billet Furnace D66 | 0 | -1.44 +0.81 | -13.07 +7.38 | -1.54 +0.87 | -0.12 +0.07 | -7.20 +4.06 |
| 2 nd Permit Revision: Replacing Billet D7 with Billet Furnace D72 | 0 | -0.70 +1.16 | -12.93 +10.57 | -0.75 +1.25 | -0.06 +0.10 | -3.52 +5.82 |
| 3 rd Permit Revision: Replacing Billet D6 with Billet Furnace D75 | 0 | -0.67 +1.26 | -12.34 +11.73 | -0.72 +1.35 | -0.06 +0.11 | -3.36 +6.30 |
| Cumulative Total | | +0.42 | -8.66 | +0.46 | +0.04 | +2.10 |

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Paragraph 212(c)(3) Public notice will not be required under this paragraph. See Rule 1401 evaluation section.

- RULE 401:** Compliance is expected. Visible emissions are not expected from the proper operation of this equipment. There has been no visible emission citations associated with the operation of similar furnaces at this facility.
- RULE 402:** Compliance is expected. Nuisance is not expected with the proper operation and maintenance of this furnace. There is no record of any nuisance complaints or citations associated with the billet furnaces at this facility.
- RULE 404:** Compliance is expected. Natural gas combustion is the only source of PM contaminants, there is no melting.
- RULE 431.1:** Compliance is expected. The furnace will be fired on natural gas with sulfur compounds (as H₂S) less than 16 ppm.

RULE 1147: Applicant is in NO_x RECLAIM and thus not subject to Rule 1147.

REG XIII/XX: BACT for a preheat furnace is 50 ppmv @ 3% O₂ for NO_x and natural gas combustion for SO_x and inorganic pollutants. As requested by the applicant, 50 ppmv shall be conditioned to this furnace as both its NO_x BACT limit and for RECLAIM reporting purposes. NO_x compliance shall be verified with required source test of furnace once constructed. See device condition D28.4

Modeling is met. Emission rates for the furnaces are below the screening level of Table A-1 of Rule 1303.

| Heat Input (mmBtu/hr) | CO (lb/hr) | PM (lb/hr) |
|-----------------------|------------|------------|
| >5 <10 | 25.9 | 2.8 |
| D75 | 0.26 | 0.056 |

Offsets are not required. SAPA Extruder is a NO_x RECLAIM facility, NO_x emissions will be offset by their available NO_x RTCs. See Condition I297.2 for NO_x holding requirement for 1st year, 4,116 lbs. All non-RECLAIM pollutants are below Table A of Rule 1304 (d).

| Pollutant | PTE, lbs | Increase, lbs | Table A, tons |
|-------------------|----------|---------------|---------------|
| CO | 29.0 | +2.94 | 29 (159 lbs) |
| NO _x * | 72.0 | +0.91 | 4 (22 lbs) |
| PM ₁₀ | 7.0 | +0.63 | 4 (22 lbs) |
| ROG | 6.0 | +0.59 | 4 (22 lbs) |
| SO _x | 2.0 | +0.05 | 4 (22 lbs) |

* Facility is in NO_x RECLAIM, Table A is not applicable for NO_x.

REG XIV: Billet Furnace is in compliance of Tier 1 Screening. Tier 2 analysis is also included in calculations sheets in application file.

**SAPA
D75**

External Combustion

Toxic Emission Factors

| | | <10 mmbtu | 10-100 mmbtu | >100 mmbtu | 0.00750000 | mmcf/hr |
|-----|---------------|-----------|--------------|------------|----------------|---------|
| B1 | Benzene | 0.0080 | 0.0058 | 0.0017 | 8.33333333E-08 | lb/hr |
| F3 | Formaldehyde | 0.0170 | 0.0123 | 0.0036 | 1.77083333E-07 | lb/hr |
| P9 | Total PAHs | 0.0001 | 0.0004 | 0.0004 | 1.04166667E-09 | lb/hr |
| P30 | Napthalene | 0.0003 | | | 3.12500000E-09 | lb/hr |
| A1 | Acetaldehyde | 0.0043 | | | 4.47916667E-08 | lb/hr |
| A3 | Acrolein | 0.0027 | | | 2.81250000E-08 | lb/hr |
| A9 | Ammonia | 3.2000 | 3.2000 | 3.2000 | 3.33333333E-05 | lb/hr |
| E4 | Ethyl Benzene | 0.0095 | | | 9.89583333E-08 | lb/hr |
| H8 | Hexane | 0.0063 | | | 6.56250000E-08 | lb/hr |
| T3 | Toluene | 0.0366 | | | 3.81250000E-07 | lb/hr |
| X1 | Xylene | 0.0272 | | | 2.83333333E-07 | lb/hr |

7.875 mmbtu/hr

24 hr/day

365.00 day/yr

1050 mmbtu/mmcf

=

65.70 mmcf/yr

Stack ⇒ 20ft
 RESIDENTIAL ⇒ 330 m
 COMMERCIAL ⇒ 25m

Natural Gas Combustion Emissions Billet Furnace

| | maximum | normal |
|-------|---------|--------|
| hr/dy | 24 | 16 |
| dy/wk | 7 | 7 |
| wk/yr | 52 | 52 |
| load | 100% | 50% |

| | |
|---------------------------|--------------------|
| max heat input | 7.875E+06 (Btu/hr) |
| gross heating value | 1050 (Btu/scf) |
| maximum gas usage per day | 180000 (scf/dy) |
| average gas usage per day | 60000 (scf/dy) |

| Criteria | Emission Factors | MAX (lb/hr) | AVE (lb/hr) | MAX (lb/dy) | 30-DAY (lb/dy) | MAX (lb/yr) | MAX (ton/yr) |
|------------------------------|------------------|-------------|-------------|-------------|----------------|-------------|--------------|
| | (lb/MMscf) | | | | | | |
| SO _x (R1) | 0.6 | 0.005 | 0.002 | 0.11 | NA | 39 | 0.020 |
| SO _x (R2) | 0.6 | 0.005 | 0.002 | 0.11 | 0.11 | 39 | 0.020 |
| NO _x (R1) | 64.10256 | 0.481 | 0.240 | 11.5385 | NA | 4,200 | 2.100 |
| NO _x (R2) | 64.10256 | 0.481 | 0.240 | 11.5385 | 11.54 | 4,200 | 2.100 |
| CO (R1) | 35 | 0.263 | 0.131 | 6.30 | NA | 2,293 | 1.147 |
| CO (R2) | 35 | 0.263 | 0.131 | 6.30 | 6.30 | 2,293 | 1.147 |
| PM, PM ₁₀ (R1=R2) | 7.5 | 0.056 | 0.028 | 1.35 | 1.35 | 491 | 0.246 |
| ROG (R1=R2) | 7 | 0.053 | 0.026 | 1.26 | 1.26 | 459 | 0.229 |

| Green House Gas | (lb/MMBtu) | | | | | | |
|--------------------------|------------|--------|--------|----------|----------|----------|---------|
| CO ₂ (R1=R2) | 116.89 | 920.51 | 920.51 | 22092.21 | 22092.21 | 8.04E+06 | 4020.78 |
| CH ₄ (R1=R2) | 0.002 | 0.016 | 0.016 | 0.38 | 0.38 | 138 | 0.069 |
| N ₂ O (R1=R2) | 0.0002 | 0.002 | 0.002 | 0.04 | 0.04 | 14 | 0.007 |

| Rule 1401 Toxic | (lb/MMscf) | | | | | | |
|-----------------|------------|---------|---------|---------|----|---------|---------|
| Acetaldehyde | 0.0043 | 3.2E-05 | 1.6E-05 | 7.7E-04 | NA | 2.82E-1 | 1.41E-4 |
| Acrolein | 0.0027 | 2.0E-05 | 1.0E-05 | 4.9E-04 | NA | 1.77E-1 | 8.85E-5 |
| Ammonia | 3.2000 | 2.4E-02 | 1.2E-02 | 5.8E-01 | NA | 2.10E+2 | 1.05E-1 |
| Benzene | 0.0080 | 6.0E-05 | 3.0E-05 | 1.4E-03 | NA | 5.24E-1 | 2.62E-4 |
| Ethyl Benzene | 0.0095 | 7.1E-05 | 3.6E-05 | 1.7E-03 | NA | 6.22E-1 | 3.11E-4 |
| Formaldehyde | 0.0170 | 1.3E-04 | 6.4E-05 | 3.1E-03 | NA | 1.11E+0 | 5.57E-4 |
| Hexane | 0.0063 | 4.7E-05 | 2.4E-05 | 1.1E-03 | NA | 4.13E-1 | 2.06E-4 |
| Napthalene | 0.0003 | 2.3E-06 | 1.1E-06 | 5.4E-05 | NA | 1.97E-2 | 9.83E-6 |
| PAH's | 0.0001 | 7.5E-07 | 3.8E-07 | 1.8E-05 | NA | 6.55E-3 | 3.28E-6 |
| Propylene | 0.7310 | 5.5E-03 | 2.7E-03 | 1.3E-01 | NA | 4.79E+1 | 2.39E-2 |
| Toluene | 0.0366 | 2.7E-04 | 1.4E-04 | 6.6E-03 | NA | 2.40E+0 | 1.20E-3 |
| Xylenes | 0.0272 | 2.0E-04 | 1.0E-04 | 4.9E-03 | NA | 1.78E+0 | 8.91E-4 |

NO₂ @ 3% excess O₂ >>>> 50 (ppmv)
 CO @ 3% excess O₂ >>>> 45 (ppmv)

SO₂ @ 3% excess O₂ >>>> 0.3 (ppmv)
 PM @ 12% CO₂ >>>> 5.6E-09 (grain/ft³)

TIER 1 SCREENING RISK ASSESSMENT REPORT

| | |
|------------------------------------|----|
| Receptor Distance (actual) | 25 |
| Receptor Distance (for X/Q LOOKUP) | 25 |

| Tier 1 Results | |
|--------------------|-----------|
| Cancer/Chronic ASI | Acute ASI |
| 1.08E-02 | 5.01E-05 |
| PASSED | PASSED |

APPLICATION SCREENING INDEX CALCULATION

| Compound | Average Annual Emission Rate | Max Hourly Emission Rate (lbs/hr) | Cancer / Chronic Pollutant Screening Level (lbs/yr) | Acute Pollutant Screening Level (lbs/hr) | Cancer / Chronic Pollutant Screening Index | Acute Pollutant Screening Index (PSI) |
|--------------------------------------------|------------------------------|-----------------------------------|-----------------------------------------------------|------------------------------------------|--------------------------------------------|---------------------------------------|
| Acetaldehyde | 3.91E-04 | 4.48E-08 | 1.14E+01 | 2.35E-01 | 3.43E-05 | 1.91E-07 |
| Acrolein | 2.46E-04 | 2.81E-08 | 1.16E+01 | 1.25E-03 | 2.12E-05 | 2.25E-05 |
| Benzene (including benzene from gasoline) | 7.28E-04 | 8.33E-08 | 1.14E+00 | 7.39E-01 | 6.38E-04 | 1.13E-07 |
| Ethyl benzene | 8.64E-04 | 9.90E-08 | 1.31E+01 | | 6.60E-05 | |
| Formaldehyde | 1.55E-03 | 1.77E-07 | 5.44E+00 | 2.75E-02 | 2.84E-04 | 6.44E-06 |
| Hexane (n-) | 5.73E-04 | 6.56E-08 | 2.31E+05 | | 2.48E-09 | |
| Naphthalene | 2.73E-05 | 3.13E-09 | 9.51E-01 | | 2.87E-05 | |
| PolyCyclic Aromatic Hydrocarbon (PAHs) | 9.10E-06 | 1.04E-09 | 9.84E-04 | | 9.25E-03 | |
| Propylene | 4.43E+01 | 5.07E-03 | 9.92E+04 | | 4.46E-04 | |
| Toluene (methyl benzene) | 3.33E-03 | 3.81E-07 | 9.92E+03 | 1.85E+01 | 3.36E-07 | 2.06E-08 |
| Xylenes (isomers and mixtures) | 2.48E-03 | 2.83E-07 | 2.31E+04 | 1.10E+01 | 1.07E-07 | 2.58E-08 |
| Ammonia | 2.91E-01 | 3.33E-05 | 6.61E+03 | 1.60E+00 | 4.40E-05 | 2.08E-05 |
| TOTAL (APPLICATION SCREENING INDEX) | | | | | 1.08E-02 | 5.01E-05 |

TIER 2 SCREENING RISK ASSESSMENT REPORT

A/N: 568639
 Fac: 161300

Application deemed complete date: 09/26/14

2. Tier 2 Data

| | |
|------------|------|
| MET Factor | 0.71 |
| 4 hr | 0.78 |
| 6 or 7 hrs | 0.74 |

Dispersion Factors tables

| | |
|---|-----------------|
| 3 | For Chronic X/Q |
| 6 | For Acute X/Q |

Dilution Factors (ug/m3)/(tons/yr)

| | | |
|-------------|-------|--------|
| Receptor | X/Q | X/Qmax |
| Residential | 0.964 | 54.64 |
| Commercial | 49.68 | 20000 |

Adjustment and Intake Factors

| | | | |
|-------------|-------|-----|------|
| | Afann | DBR | EVF |
| Residential | 1 | 302 | 0.96 |
| Worker | 1 | 149 | 0.38 |

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Application deemed complete date: 09/26/14

TIER 2 RESULTS

5a. MICR

MICR = CP (mg/(kg-day))⁻¹ * Q (ton/yr) * (X/Q) * AFann * MET * DBR * EVF * 1E-6* MP

| Compound | Residential | Commercial |
|-------------------------------------------|-----------------|-----------------|
| Acetaldehyde | 3.88E-13 | 3.91E-12 |
| Acrolein | | |
| Benzene (including benzene from gasoline) | 7.22E-12 | 7.27E-11 |
| Ethyl benzene | 7.46E-13 | 7.51E-12 |
| Formaldehyde | 3.22E-12 | 3.24E-11 |
| Hexane (n-) | | |
| Naphthalene | 3.25E-13 | 3.27E-12 |
| PolyCyclic Aromatic Hydrocarbon (PAHs) | 1.05E-10 | 5.18E-10 |
| Propylene | | |
| Toluene (methyl benzene) | | |
| Xylenes (isomers and mixtures) | | |
| Ammonia | | |
| Total | 1.17E-10 | 6.38E-10 |
| | PASS | PASS |

No Cancer Burden, MICR<1.0E-6

| | |
|---------------------------|-----------|
| 5b. Cancer Burden | NO |
| X/Q for one-in-a-million: | |
| Distance (meter) | |
| Area (km2): | |
| Population: | |
| Cancer Burden: | |

6. Hazard Index

HIA = [Q(lb/hr) * (X/Q)max] * AF / Acute REL

HIC = [Q(ton/yr) * (X/Q) * MET * MP] / Chronic REL

| Target Organs | Acute | Chronic | Acute Pass/Fail | Chronic Pass/Fail |
|--------------------------------|----------|----------|-----------------|-------------------|
| Alimentary system (liver) - AL | | 7.62E-09 | Pass | Pass |
| Bones and teeth - BN | | | Pass | Pass |
| Cardiovascular system - CV | | | Pass | Pass |
| Developmental - DEV | 1.49E-07 | 4.17E-07 | Pass | Pass |
| Endocrine system - END | | 7.62E-09 | Pass | Pass |
| Eye | 5.00E-05 | | Pass | Pass |
| Hematopoietic system - HEM | 1.28E-07 | 2.14E-07 | Pass | Pass |
| Immune system - IMM | 1.28E-07 | | Pass | Pass |
| Kidney - KID | | 7.62E-09 | Pass | Pass |
| Nervous system - NS | 2.06E-08 | 4.74E-07 | Pass | Pass |
| Reproductive system - REP | 1.49E-07 | | Pass | Pass |
| Respiratory system - RES | 4.36E-05 | 3.02E-04 | Pass | Pass |
| Skin | | | Pass | Pass |

A/N: 568639

Application deemed complete date: 09/26/14

6a. Hazard Index Acute

$HIA = [Q(\text{lb/hr}) * (X/Q)_{\text{max}}] * AF / \text{Acute REL}$

| Compound | HIA - Residential | | | | | | | | | |
|-------------------------------------------|-------------------|----|----------|----------|----------|----------|----------|----------|----------|------|
| | AL | CV | DEV | EYE | HEM | IMM | NS | REP | RESP | SKIN |
| Acetaldehyde | | | | 5.21E-09 | | | | | 5.21E-09 | |
| Acrolein | | | | 6.15E-07 | | | | | 6.15E-07 | |
| Benzene (including benzene from gasoline) | | | 3.50E-09 | | 3.50E-09 | 3.50E-09 | | 3.50E-09 | | |
| Ethyl benzene | | | | | | | | | | |
| Formaldehyde | | | | 1.76E-07 | | | | | | |
| Hexane (n-) | | | | | | | | | | |
| Naphthalene | | | | | | | | | | |
| PolyCyclic Aromatic Hydrocarbon (PAHs) | | | | | | | | | | |
| Propylene | | | | | | | | | | |
| Toluene (methyl benzene) | | | 5.63E-10 | 5.63E-10 | | | 5.63E-10 | 5.63E-10 | 5.63E-10 | |
| Xylenes (isomers and mixtures) | | | | 7.04E-10 | | | | | 7.04E-10 | |
| Ammonia | | | | 5.69E-07 | | | | | 5.69E-07 | |
| Total | | | 4.07E-09 | 1.37E-06 | 3.50E-09 | 3.50E-09 | 5.63E-10 | 4.07E-09 | 1.19E-06 | |

| HIA - Commercial | | | | | | | | | | |
|-------------------------------------------|----|----|----------|----------|----------|----------|----------|----------|----------|------|
| Compound | AL | CV | DEV | EYE | HEM | IMM | NS | REP | RESP | SKIN |
| Acetaldehyde | | | | 1.91E-07 | | | | | 1.91E-07 | |
| Acrolein | | | | 2.25E-05 | | | | | 2.25E-05 | |
| Benzene (including benzene from gasoline) | | | 1.28E-07 | | 1.28E-07 | 1.28E-07 | | 1.28E-07 | | |
| Ethyl benzene | | | | | | | | | | |
| Formaldehyde | | | | 6.44E-06 | | | | | | |
| Hexane (n-) | | | | | | | | | | |
| Naphthalene | | | | | | | | | | |
| PolyCyclic Aromatic Hydrocarbon (PAHs) | | | | | | | | | | |
| Propylene | | | | | | | | | | |
| Toluene (methyl benzene) | | | 2.06E-08 | 2.06E-08 | | | 2.06E-08 | 2.06E-08 | 2.06E-08 | |
| Xylenes (isomers and mixtures) | | | | 2.58E-08 | | | | | 2.58E-08 | |
| Ammonia | | | | 2.08E-05 | | | | | 2.08E-05 | |
| Total | | | 1.49E-07 | 5.00E-05 | 1.28E-07 | 1.28E-07 | 2.06E-08 | 1.49E-07 | 4.36E-05 | |

6b. Hazard Index Chronic

$$HIC = [Q(\text{ton/yr}) * (X/Q) * MET * MP] / \text{Chronic REL}$$

| Compound | HIC - Residential | | | | | | | | | | | | |
|-------------------------------------------|-------------------|----|----|----------|----------|-----|----------|-----|----------|----------|-----|----------|------|
| | AL | BN | CV | DEV | END | EYE | HEM | IMM | KID | NS | REP | RESP | SKIN |
| Acetaldehyde | | | | | | | | | | | | 9.57E-10 | |
| Acrolein | | | | | | | | | | | | 2.40E-07 | |
| Benzene (including benzene from gasoline) | | | | 4.15E-09 | | | 4.15E-09 | | | 4.15E-09 | | | |
| Ethyl benzene | 1.48E-10 | | | 1.48E-10 | 1.48E-10 | | | | 1.48E-10 | | | | |
| Formaldehyde | | | | | | | | | | | | 5.88E-08 | |
| Hexane (n-) | | | | | | | | | | 2.80E-11 | | | |
| Naphthalene | | | | | | | | | | | | 1.04E-09 | |
| PolyCyclic Aromatic Hydrocarbon (PAHs) | | | | | | | | | | | | | |
| Propylene | | | | | | | | | | | | 5.05E-06 | |
| Toluene (methyl benzene) | | | | 3.80E-09 | | | | | | 3.80E-09 | | 3.80E-09 | |
| Xylenes (isomers and mixtures) | | | | | | | | | | 1.21E-09 | | 1.21E-09 | |
| Ammonia | | | | | | | | | | | | 4.98E-07 | |
| Total | 1.48E-10 | | | 8.10E-09 | 1.48E-10 | | 4.15E-09 | | 1.48E-10 | 9.19E-09 | | 5.86E-06 | |

A/N: 568639

Application deemed complete date: 09/26/14

6b. Hazard Index Chronic (cont.)

| Compound | HIC - Commercial | | | | | | | | | | | | |
|-------------------------------------------|------------------|----|----|----------|----------|-----|----------|-----|----------|----------|-----|----------|----------|
| | AL | BN | CV | DEV | END | EYE | HEM | IMM | KID | NS | REP | RESP | SKIN |
| Acetaldehyde | | | | | | | | | | | | 4.93E-08 | |
| Acrolein | | | | | | | | | | | | 1.24E-05 | |
| Benzene (including benzene from gasoline) | | | | 2.14E-07 | | | 2.14E-07 | | | 2.14E-07 | | | |
| Ethyl benzene | 7.62E-09 | | | 7.62E-09 | 7.62E-09 | | | | 7.62E-09 | | | | |
| Formaldehyde | | | | | | | | | | | | 3.03E-06 | |
| Hexane (n-) | | | | | | | | | | 1.44E-09 | | | |
| Naphthalene | | | | | | | | | | | | 5.35E-08 | |
| PolyCyclic Aromatic Hydrocarbon (PAHs) | | | | | | | | | | | | | 2.60E-04 |
| Propylene | | | | | | | | | | | | | 1.96E-07 |
| Toluene (methyl benzene) | | | | 1.96E-07 | | | | | | 1.96E-07 | | | 1.96E-07 |
| Xylenes (isomers and mixtures) | | | | | | | | | | 6.24E-08 | | | 6.24E-08 |
| Ammonia | | | | | | | | | | | | | 2.57E-05 |
| Total | 7.62E-09 | | | 4.17E-07 | 7.62E-09 | | 2.14E-07 | | 7.62E-09 | 4.74E-07 | | 3.02E-04 | |

SAPA Extruder

Current TV Revision Old to be replaced

BilletFurnace D6 A/N 502266

EMISSIONS FOR FIRING ON NATURAL GAS (OVENS, FURNACES, HEATERS, ETC.)

Emission factors are from form B-1
Except NOx which is calculated from the ppm of NOx

| | |
|------------------------------------|------------------|
| Maximum Burner Rating in BTU/hr = | 4,200,000 BTU/hr |
| Average Operating Schedule = | 24 hr/day |
| Maximum Operating Schedule = | 24 hr/day |
| Expected emission of NOx= | 101.2 ppm |
| Average Loading= | 100.0% |
| Maximum Loading = | 100.0% |
| Maximum operating days per month = | 30 days |

AVERAGE EMISSIONS

| | | |
|--------|--------------|----------------|
| RHC = | 0.0280 lb/hr | 0.6720 lb/day |
| NOx = | 0.5143 lb/hr | 12.3432 lb/day |
| SO2 = | 0.0024 lb/hr | 0.0576 lb/day |
| CO = | 0.1400 lb/hr | 3.3600 lb/day |
| PART = | 0.0300 lb/hr | 0.7200 lb/day |

MAXIMUM EMISSIONS

| | | |
|--------|--------------|----------------|
| RHC = | 0.0280 lb/hr | 0.6720 lb/day |
| NOx = | 0.5143 lb/hr | 12.3432 lb/day |
| SO2 = | 0.0024 lb/hr | 0.0576 lb/day |
| CO = | 0.1400 lb/hr | 3.3600 lb/day |
| PART = | 0.0300 lb/hr | 0.7200 lb/day |

Thirty day average and yearly emissions

| | | | |
|--------|-------------|------------|-------------|
| RHC = | 0.67 lb/dy | 242 lb/yr | 20.2 lb/mo |
| NOx = | 12.34 lb/dy | 4444 lb/yr | 370.3 lb/mo |
| SO2 = | 0.06 lb/dy | 21 lb/yr | 1.7 lb/mo |
| CO = | 3.36 lb/dy | 1210 lb/yr | 100.8 lb/mo |
| PART = | 0.72 lb/dy | 259 lb/yr | 21.6 lb/mo |

SAPA Extruder

Current TV Revision New Replacement

Billet Furnace D75 A/N 568639

EMISSIONS FOR FIRING ON NATURAL GAS (OVENS, FURNACES, HEATERS, ETC.)

Emission factors are from form B-1
Except NOx which is calculated from the ppm of NOx

| | |
|------------------------------------|------------------|
| Maximum Burner Rating in BTU/hr = | 7,875,000 BTU/hr |
| Average Operating Schedule = | 24 hr/day |
| Maximum Operating Schedule = | 24 hr/day |
| Expected emission of NOx= | 50 ppm |
| Average Loading= | 100.0% |
| Maximum Loading = | 100.0% |
| Maximum operating days per month = | 30 days |

AVERAGE EMISSIONS

| | | |
|--------|--------------|----------------|
| RHC = | 0.0525 lb/hr | 1.2600 lb/day |
| NOx = | 0.4764 lb/hr | 11.4345 lb/day |
| SO2 = | 0.0045 lb/hr | 0.1080 lb/day |
| CO = | 0.2625 lb/hr | 6.3000 lb/day |
| PART = | 0.0563 lb/hr | 1.3500 lb/day |

MAXIMUM EMISSIONS

| | | |
|--------|--------------|----------------|
| RHC = | 0.0525 lb/hr | 1.2600 lb/day |
| NOx = | 0.4764 lb/hr | 11.4345 lb/day |
| SO2 = | 0.0045 lb/hr | 0.1080 lb/day |
| CO = | 0.2625 lb/hr | 6.3000 lb/day |
| PART = | 0.0563 lb/hr | 1.3500 lb/day |

Thirty day average and yearly emissions

| | | |
|--------|-------------|------------|
| RHC = | 1.26 lb/dy | 454 lb/yr |
| NOx = | 11.43 lb/dy | 4116 lb/yr |
| SO2 = | 0.11 lb/dy | 39 lb/yr |
| CO = | 6.30 lb/dy | 2268 lb/yr |
| PART = | 1.35 lb/dy | 486 lb/yr |

SAPA Extruder

1st TV Revision

Billet Furnace D10

A/N 502270

EMISSIONS FOR FIRING ON NATURAL GAS (OVENS, FURNACES, HEATERS, ETC.)

Emission factors are from form B-1
Except NOx which is calculated from the ppm of NOx

| | |
|------------------------------------|------------------|
| Maximum Burner Rating in BTU/hr = | 9,000,000 BTU/hr |
| Average Operating Schedule = | 24 hr/day |
| Maximum Operating Schedule = | 24 hr/day |
| Expected emission of NOx= | 50 ppm |
| Average Loading= | 100.0% |
| Maximum Loading = | 100.0% |
| Maximum operating days per month = | 30 days |

AVERAGE EMISSIONS

| | | |
|--------|--------------|----------------|
| RHC = | 0.0600 lb/hr | 1.4400 lb/day |
| NOx = | 0.5445 lb/hr | 13.0680 lb/day |
| SO2 = | 0.0051 lb/hr | 0.1234 lb/day |
| CO = | 0.3000 lb/hr | 7.2000 lb/day |
| PART = | 0.0643 lb/hr | 1.5429 lb/day |

MAXIMUM EMISSIONS

| | | |
|--------|--------------|----------------|
| RHC = | 0.0600 lb/hr | 1.4400 lb/day |
| NOx = | 0.5445 lb/hr | 13.0680 lb/day |
| SO2 = | 0.0051 lb/hr | 0.1234 lb/day |
| CO = | 0.3000 lb/hr | 7.2000 lb/day |
| PART = | 0.0643 lb/hr | 1.5429 lb/day |

Thirty day average and yearly emissions

| | | |
|--------|-------------|------------|
| RHC = | 1.44 lb/dy | 518 lb/yr |
| NOx = | 13.07 lb/dy | 4704 lb/yr |
| SO2 = | 0.12 lb/dy | 44 lb/yr |
| CO = | 7.20 lb/dy | 2592 lb/yr |
| PART = | 1.54 lb/dy | 555 lb/yr |

EMISSIONS FOR FIRING ON NATURAL GAS
(OVENS, FURNACES, HEATERS, ETC.)

Emission factors are from form B-1
Except NOx which is calculated from the ppm of NOx

| | |
|------------------------------------|------------------|
| Maximum Burner Rating in BTU/hr = | 5,080,000 BTU/hr |
| Average Operating Schedule = | 24 hr/day |
| Maximum Operating Schedule = | 24 hr/day |
| Expected emission of NOx= | 50 ppm |
| Average Loading= | 100.0% |
| Maximum Loading = | 100.0% |
| Maximum operating days per month = | 30 days |

AVERAGE EMISSIONS

| | | |
|--------|--------------|---------------|
| RHC = | 0.0339 lb/hr | 0.8128 lb/day |
| NOx = | 0.3073 lb/hr | 7.3762 lb/day |
| SO2 = | 0.0029 lb/hr | 0.0697 lb/day |
| CO = | 0.1693 lb/hr | 4.0640 lb/day |
| PART = | 0.0363 lb/hr | 0.8709 lb/day |

MAXIMUM EMISSIONS

| | | |
|--------|--------------|---------------|
| RHC = | 0.0339 lb/hr | 0.8128 lb/day |
| NOx = | 0.3073 lb/hr | 7.3762 lb/day |
| SO2 = | 0.0029 lb/hr | 0.0697 lb/day |
| CO = | 0.1693 lb/hr | 4.0640 lb/day |
| PART = | 0.0363 lb/hr | 0.8709 lb/day |

Thirty day average and yearly emissions

| | | | |
|--------|------------|------------|--------------|
| RHC = | 0.81 lb/dy | 293 lb/yr | 24.38 lb/mo |
| NOx = | 7.38 lb/dy | 2655 lb/yr | 221.28 lb/mo |
| SO2 = | 0.07 lb/dy | 25 lb/yr | 2.09 lb/mo |
| CO = | 4.06 lb/dy | 1463 lb/yr | 121.92 lb/mo |
| PART = | 0.87 lb/dy | 314 lb/yr | 26.13 lb/mo |

SAPA Extruder

2nd TV Revision

Billet Furnace D7

A/N 502237

EMISSIONS FOR FIRING ON NATURAL GAS (OVENS, FURNACES, HEATERS, ETC.)

Emission factors are from form B-1
Except NOx which is calculated from the ppm of NOx

| | |
|------------------------------------|------------------|
| Maximum Burner Rating in BTU/hr = | 4,400,000 BTU/hr |
| Average Operating Schedule = | 24 hr/day |
| Maximum Operating Schedule = | 24 hr/day |
| Expected emission of NOx= | 101.2 ppm |
| Average Loading= | 100.0% |
| Maximum Loading = | 100.0% |
| Maximum operating days per month = | 30 days |

AVERAGE EMISSIONS

| | | |
|--------|--------------|----------------|
| RHC = | 0.0293 lb/hr | 0.7040 lb/day |
| NOx = | 0.5388 lb/hr | 12.9309 lb/day |
| SO2 = | 0.0025 lb/hr | 0.0603 lb/day |
| CO = | 0.1467 lb/hr | 3.5200 lb/day |
| PART = | 0.0314 lb/hr | 0.7543 lb/day |

MAXIMUM EMISSIONS

| | | |
|--------|--------------|----------------|
| RHC = | 0.0293 lb/hr | 0.7040 lb/day |
| NOx = | 0.5388 lb/hr | 12.9309 lb/day |
| SO2 = | 0.0025 lb/hr | 0.0603 lb/day |
| CO = | 0.1467 lb/hr | 3.5200 lb/day |
| PART = | 0.0314 lb/hr | 0.7543 lb/day |

Thirty day average and yearly emissions

| | | |
|--------|-------------|------------|
| RHC = | 0.70 lb/dy | 253 lb/yr |
| NOx = | 12.93 lb/dy | 4655 lb/yr |
| SO2 = | 0.06 lb/dy | 22 lb/yr |
| CO = | 3.52 lb/dy | 1267 lb/yr |
| PART = | 0.75 lb/dy | 272 lb/yr |

EMISSIONS FOR FIRING ON NATURAL GAS
(OVENS, FURNACES, HEATERS, ETC.)

Emission factors are from form B-1
Except NOx which is calculated from the ppm of NOx

| | |
|------------------------------------|------------------|
| Maximum Burner Rating in BTU/hr = | 7,280,000 BTU/hr |
| Average Operating Schedule = | 16 hr/day |
| Maximum Operating Schedule = | 24 hr/day |
| Expected emission of NOx= | 50 ppm |
| Average Loading= | 100.0% |
| Maximum Loading = | 100.0% |
| Maximum operating days per month = | 30 days |

AVERAGE EMISSIONS

| | | |
|--------|--------------|---------------|
| RHC = | 0.0485 lb/hr | 0.7765 lb/day |
| NOx = | 0.4404 lb/hr | 7.0470 lb/day |
| SO2 = | 0.0042 lb/hr | 0.0666 lb/day |
| CO = | 0.2427 lb/hr | 3.8827 lb/day |
| PART = | 0.0520 lb/hr | 0.8320 lb/day |

MAXIMUM EMISSIONS

| | | |
|--------|--------------|----------------|
| RHC = | 0.0485 lb/hr | 1.1648 lb/day |
| NOx = | 0.4404 lb/hr | 10.5706 lb/day |
| SO2 = | 0.0042 lb/hr | 0.0998 lb/day |
| CO = | 0.2427 lb/hr | 5.8240 lb/day |
| PART = | 0.0520 lb/hr | 1.2480 lb/day |

Thirty day average and yearly emissions

| | | |
|--------|-------------|------------|
| RHC = | 1.16 lb/dy | 419 lb/yr |
| NOx = | 10.57 lb/dy | 3805 lb/yr |
| SO2 = | 0.10 lb/dy | 36 lb/yr |
| CO = | 5.82 lb/dy | 2097 lb/yr |
| PART = | 1.25 lb/dy | 449 lb/yr |