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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-2376D
Plant ID No.:	035-00043
Applicant:	Constellium Rolled Products Ravenswood, LLC
Facility Name:	Ravenswood Facility
Location:	Jackson County
NAICS Code:	331312, 331315, 332811
Application Type:	Modification
Received Date:	February 20, 2015
Engineer Assigned:	Steven R. Pursley, PE
Fee Amount:	$1,000.00
Date Received:	February 26, 2015
Complete Date:	March 26, 2015
Due Date:	June 24, 2015
Applicant Ad Date:	February 24, 2015
Newspaper:	*Jackson Herald*
UTM's:	Easting: 428.23 km Northing: 4,309.40 km Zone: 17
Description:	Installation of a new Ingot Pusher Furnace.

DESCRIPTION OF PROCESS

The Constellium facility consists of casting and fabrication operations. The casting operation is located in the cast house, which contains 9 direct chill processing units, two induction furnaces and a rotary furnace. The secondary aluminum melting process is initiated by charging aluminum scrap into the melting furnace. After the charging is complete and the solid metal has been liquified, alloying agents and salt flux are added to the molten aluminum as required. The molten aluminum is then sampled to determine if it has obtained the desired metal properties.

If no further alloying is required, the molten aluminum is transferred from the melting furnace to the holding furnace, analyzed for quality and then flows into the cast pit where ingots are formed.

The ingots are then transported to the fabrication facility. The fabrication area is broken into four different areas: hot line, cold line, plate, and finishing. Aluminum is sent to the various areas depending on the type of aluminum alloy as well as the desired final product. The Ingot Pusher Furnace (to be manufactured by Ebner Furnaces) is a semi-continuous unit used for reheating and homogenizing the aluminum ingots for hot rolling.

SITE INSPECTION

A site inspection was deemed not necessary for this permitting action. However, using internet mapping software, it is noted that this facility lies adjacent to the Ohio River in a primarily rural area. To get to the facility take I 77 north to exit 138 and turn left on State Route 62 and go 8.8 miles to State Route 2. Turn right on State Route 2 and go 2.4 miles and veer left onto County Route 2/20 (Century Road). Go approximately 1 mile and the facility is on the left.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emissions of SO_2, PM, and VOCs from the furnace were based on AP-42, section 1.4. Emissions of CO and NO_x from the furnace were based on calculations performed by the manufacturer (Ebner). The results are similar to results based on AP-42 emission factors for uncontrolled, natural gas fired boilers. It should be noted that no HAP emissions were included in the application. Therefore, they were performed by the writer using AP-42 Table 1.4-3.

Pollutant	lb/hr	tpy
NO_x	6.0	25.01
CO	4.0	16.51
VOC	0.30	1.18
SO_2	0.03	0.13
$PM/PM_{10}/PM_{2.5}$	0.41	1.63
Total HAPs	0.10	0.40

REGULATORY APPLICABILITY

The following state and federal rules apply (or do not apply as indicated) to the new furnace.

STATE RULES

45CSR7 To Prevent and Control Particulate Matter Air Pollution From Manufacturing Processes and Associated Operations

The main requirement of 45CSR7 is the process weight rate based PM stack emission rate in section 4 of the rule. As can be see in the table below the furnace meets this requirement.

	Process Weight Rate (lb/hr)	Rule 7 Limit (lb/hr)	Permit Limit (lb/hr)
Furnace	30,000	22.0	0.41

45CSR13 Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation).

Because NO_x emissions from the furnace exceed 6 pounds per hour and 10 tons per year Constellium is required to submit a modification permit under 45CSR13. Therefore, the applicant was required to place a class I legal ad per 45CSR§13-11.2.a. The required ad was ran in the *Jackson Herald* on February 24, 2015 and the affidavit of publication for said ad was received on March 10, 2015.

45CSR30 Requirements for Operating Permits

The facility is an existing major source under 45CSR30 with an existing Title V permit. Changes authorized by the permit must also be incorporated into the facility's Title V operating permit.

FEDERAL RULES *(None Applicable)*

40 CFR 63 Subpart RRR National Emission Standards for Hazardous Air Pollutants for Secondary Aluminum Production:

It should be noted that 40 CFR 63 Subpart RRR does NOT apply to the pusher furnace because the WVDAQ has previously determined (see Title V permit R30-03500043-2013) that pusher furnaces are not affected sources under that rule.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

The only non-criteria regulated pollutants that should be emitted from the new furnace are the small amounts that are the normal result of natural gas combustion. Constellium did not submit calculations of HAP emissions. Therefore, the writer performed calculations using AP-42 Table 1.4-3. The results show that only Hexane and Formaldehyde will be emitted in quantities equal to or greater than 0.01 pounds per hour or 0.01 tons per year.

Formaldehyde

Formaldehyde is used mainly to produce resins used in particleboard products and as an intermediate in the synthesis of other chemicals. Exposure to formaldehyde may occur by breathing contaminated indoor air, tobacco smoke, or ambient urban air. Acute (short-term) and chronic (long-term) inhalation exposure to formaldehyde in humans can result in respiratory symptoms, and eye, nose, and throat irritation. Limited human studies have reported an association between formaldehyde exposure and lung and nasopharyngeal cancer. Animal inhalation studies have reported an increased incidence of nasal squamous cell cancer. EPA considers formaldehyde a probable human carcinogen (Group B1).

n-Hexane

Hexane is used to extract edible oils from seeds and vegetables, as a special-use solvent, and as a cleaning agent. Acute (short-term) inhalation exposure of humans to high levels of hexane causes mild central nervous system (CNS) effects, including dizziness, giddiness, slight nausea, and headache. Chronic (long-term) exposure to hexane in air is associated with polyneuropathy in humans, with numbness in the extremities, muscular weakness, blurred vision, headache, and fatigue observed. Neurotoxic effects have also been exhibited in rats. No information is available on the carcinogenic effects of hexane in humans or animals. EPA has classified hexane as a Group D, not classifiable as to human carcinogenicity.

AIR QUALITY IMPACT ANALYSIS

Since this is a minor modification to an existing major source, no modeling was performed.

MONITORING OF OPERATIONS

In order to determine compliance with the furnaces emission limits, the permit will require Constellium to monitor and record the amount of natural gas fired by the furnace on a monthly basis.

CHANGES TO PERMIT R13-2376C

Permit R13-2376C was in the old (Section A, B, C) format. Essentially, all conditions in the old permit were kept, they were just renumbered and put in to the most recent permitting format. Additionally, requirements for the new pusher furnace were added to new conditions 4.1.1 (old condition A.2) and 4.1.6 (old condition A.7)

RECOMMENDATION TO DIRECTOR

Information supplied in the application indicates that compliance with all applicable regulations will be achieved. Therefore it is the recommendation of the writer that permit R13-2376D for the installation of a pusher furnace near Ravenswood, Jackson County, be granted to Constellium Rolled Products Ravenswood, LLC.

Steven R. Pursley, PE
Engineer

May 11, 2015