San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

HEALTHY AIR LIVING™

September 14, 2020

Jonathan Meyer
Treehouse California Almonds, LLC.
PO Box 12150
Earlimart, CA 93219

Re: Notice of Preliminary Decision - Authority to Construct
Facility Number: S-634
Project Number: S-1201769

Dear Mr. Meyer:

Enclosed for your review and comment is the District's analysis of Treehouse California Almonds, LLC.'s application for an Authority to Construct for an air curtain burner to combust wood waste from an almond pre-cleaning operation, at 2115 Road 144, in Delano.

The notice of preliminary decision for this project has been posted on the District's website (www.valleyair.org). After addressing all comments made during the 30-day public notice period, the District intends to issue the Authority to Construct. Please submit your written comments on this project within the 30-day public comment period, as specified in the enclosed public notice.

Thank you for your cooperation in this matter. If you have any questions regarding this matter, please contact Ms. Silvana Procopio of Permit Services at (661) 392--5606.

Sincerely,

Arnaud Marjollet
Director of Permit Services

AM:SP

Enclosures

cc: Courtney Graham, CARB (w/ enclosure) via email

Samir Sheikh
Executive Director/Air Pollution Control Officer

Northern Region
4800 Enterprise Way
Modesto, CA 95356-8718
Tel: (209) 557-6400 FAX: (209) 557-6475

Central Region (Main Office)
1990 E. Gettysburg Avenue
Fresno, CA 93726-0244
Tel: (559) 230-6000 FAX: (559) 230-6061

Southern Region
34946 Flyover Court
Bakersfield, CA 93308-9725
Tel: (661) 392-5500 FAX: (661) 392-5585

www.valleyair.org www.healthyairliving.com

San Joaquin Valley Air Pollution Control District

Authority to Construct Application Review

Air Curtain Incinerator

Facility Name:	Treehouse California Almonds, LLC.	Date:	August 19, 2020
Mailing Address:	PO Box 12150, Earlimart, CA 93219	Engineer:	Silvana Procopio
		Lead Engineer:	Richard Karrs *RWK 8/31/2020*
Contact Person:	Daniel Lawson – Huller Manager		
Telephone:	559.837.5963		
E-Mail:	dan@treehousealmonds.com		
Application:	S-634-11-0		
Project #:	S-1201769		
Deemed Complete:	May 11, 2020		

I. Proposal

Treehouse California Almonds has requested an Authority to Construct (ATC) permits for the installation of a new air curtain incinerator.

The air curtain incinerator will be used to burn stockpiles of almond wood sticks removed from the almond unloading and precleaning operations. The facility has proposed to use the air curtain incinerator to burn up to 7 ton/hr and 1,000 ton/year of almond wood waste material.

Permit Exempt Equipment:

The facility has proposed to use a 49 bhp Hatz Model 3H50TIC Tier 4 Final certified diesel-fired IC engine to power air curtain incinerator fan and the instrument panel (see Appendix B). Since the IC engine is less than 50 bhp, it is exempt from District permits pursuant to Section 6.1.2 of Rule 2020. Therefore, emissions from the IC engine are not evaluated in this application review.

Background of Biomass Disposal:

Historically, the almond hulling and shelling facilities in the District paid for the biomass waste material to be chipped and hauled to the biomass power plants. However, with the shutdown of a number of biomass power plants in the San Joaquin Valley and legislative stipulations on the ratio of agricultural to forest derived biomass that can be burned on still operating biomass plants accepting subsidies, disposal of agricultural biomass at biomass power plants has been curtailed. Consequently, the facilities have built up large inventories of almond stick waste materials. Open burning is not an option because the sticks, having been removed from the fields, are not considered agricultural waste under District Rule 4103, Open Burning. The feasibility and cost effectiveness of alternative disposal options such as sending the material to

a landfill or a composting facility are addressed in the Best Available Control Technology (BACT) analysis in Appendix G of this application review.

II. Rules Applicable or Evaluated

Rule 2020	Exemptions (12/18/14)
Rule 2201	New and Modified Stationary Source Review Rule (8/15/19)
Rule 2410	Prevention of Significant Deterioration (6/16/11)
Rule 2520	Federally Mandated Operating Permits (8/15/19)
Rule 4001	New Source Performance Standards (4/14/99)
Rule 4002	National Emissions Standards for Hazardous Air Pollutants (5/20/04)
Rule 4101	Visible Emissions (2/17/05)
Rule 4102	Nuisance (12/17/92)
Rule 4103	Open Burning (4/15/2010)
Rule 4106	Prescribed Burning and Hazard Reduction Burning (6/21/2001)
Rule 4201	Particulate Matter Concentration (12/17/92)
Rule 4202	Particulate Matter Emission Rate (12/17/92)
Rule 4301	Fuel Burning Equipment (12/17/1992)
Rule 4302	Incinerator Burning (12/16/93)
Rule 4702	Internal Combustion Engines (11/14/13)
CH&SC 41700	Health Risk Assessment
CH&SC 42301.6	School Notice

Public Resources Code 21000-21177: California Environmental Quality Act (CEQA)
California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000-15387: CEQA Guidelines

III. Project Location

The facility is located at 2115 Road 144 in Delano, CA. The District has verified that the equipment is not located within 1,000 feet of the outer boundary of a K-12 school. Therefore, public notification requirement of California Health and Safety Code 42301.6 is not applicable to this project.

IV. Process Description

The facility operates an almond processing plant. As a byproduct of the almond receiving and precleaning operations, field debris consisting of wood sticks and dirt are removed from the almonds and collected into piles. As stated earlier, the facility has been accumulating stockpiles of wood sticks as the closure of biomass power plants within the San Joaquin Valley has curtailed what was the primary and most cost effective option for the disposal of woody biomass for local agricultural sources and agricultural processors.

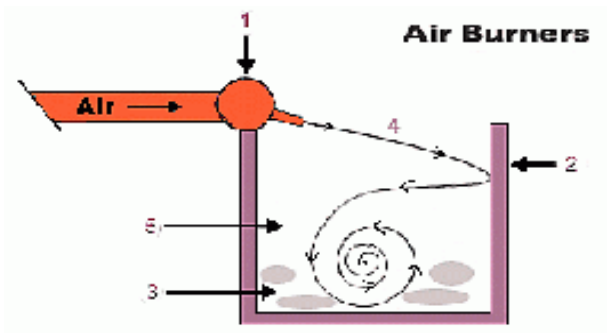
The facility has proposed an Air Burners Inc. Model S-220 air curtain incinerator (see manufacturer technical datasheet in Appendix B) as a means of disposing of their biomass waste. The proposed air curtain incinerator is a 30’ 1” feet long by 8' 6" feet wide by 8' 6" feet

high portable unit consisting of refractory-lined, opened-topped firebox, and a heavy duty fan for air supply. A schematic of the air curtain incinerator and photographs of air curtain incinerators in the field are included at the end of this section. The power source for the fan will be provided by a permit exempt (50 bhp or less) diesel-fired Tier 4 final IC engine. Waste material is loaded through the top opening of the firebox by heavy equipment such as a grapple loader or claw. Although the device is described as an incinerator and classified as such under New Source Performance Standards Subparts CCCC and EEEE, unlike conventional incinerators, there are no burners per se or use of supplementary fuels to support the combustion. Once ignited, the waste material sustains its own combustion. Ignition of the waste material could be performed with accelerants, a propane torch, drip torch, or flare. However, accelerants (e.g. gasoline, diesel fuel, kerosene, turpentine) will not be allowed with this project. Once ignited, to avoid blowing out the fire, 15 – 20 minutes of burn time is required before the air curtain can be engaged. The applicable New Source Performance Standard allows a 30-minute start-up period.

The air curtain is produced by a fan, powered by the diesel-fired IC engine, which produces up to 18,000 cfm of air, which is distributed across the top of the firebox by means of a manifold lining the top of one side. The high velocity air curtain is directed at a slight angle downward so that a rotational air current develops within the upper portion of the firebox. The air curtain promotes complete combustion by: (1) oxygenating the fire, increasing its temperature (1,600 - 2,200 ºF), which helps combust green wood, and (2) increasing the residence time of gases and particles within the firebox by impeding their upward flow out of the firebox. The result is a burn with visible emissions not exceeding 10% opacity. As the waste material in the firebox burns down, new material is periodically dropped by a front end loader through the top opening of the firebox. When new material is dropped into the firebox, the air curtain is briefly “broken” and a puff of smoke is emitted. According to a number of emissions tests performed, the exhaust flow exits the firebox along the side opposite the air curtain manifold.

At the conclusion of the burn, the ashes will be removed with a large rake and stockpiled with the “dirt” material that has been removed from the precleaning lines.

Schematic from Air Burners Inc. and Photographs of Units in Operation



1. Air-curtain burner manifold directs high-velocity airflow downward along refractory-lined walls.

2. Firebox contains the fire and ash.

3. Vegetation to be burned.

4. Airflow forms an air curtain over the burning vegetation.

5. Continuous airflow oxygenates the burning vegetation, allowing for higher burning temperatures and a more complete burn.

V. Equipment Listing

S-634-11-0: AIR BURNERS INC. MODEL S-220 AIR CURTAIN BURNER WITH A FAN POWERED BY A PERMIT EXEMPT IC ENGINE (50 BHP OR LESS)

VI. Emission Control Technology Evaluation

Combustion contaminants NOx, SOx, PM_{10}, CO, and VOC are emitted by the air curtain incinerator. The purpose of the air curtain is to promote more complete combustion compared to open burning, producing less PM_{10}, VOC and CO. There are also source test data that indicate the air curtain produces less NOx than open burning. The proposed air curtain incinerator is a portable unit and a permit exempt diesel-fired IC engine will provide the source of power for the fan and auxiliary power needs of the unit.

As stated earlier, the facility has proposed a permit exempt 49 bhp Tier 4 Final certified diesel-fired IC engine to power fan of the air curtain incinerator. The use of a Tier 4 Final certified diesel-fired IC engine will minimize engine emissions; however, since engine is permit exempt, its emissions are not evaluated under this project.

VII. General Calculations

A. Assumptions

To streamline emission calculations, $PM_{2.5}$ emissions are assumed to be equal to PM_{10} emissions. Only if needed to determine if a project is a Federal major modification for $PM_{2.5}$ will specific $PM_{2.5}$ emission calculations be performed.

- Two new emissions units are considered with the operation: the air curtain incinerator and the ash handling operation. Since these emissions units are integral part of a single functioning operation, they will be part of one permit unit per District Policy APR-1025, *Permit Unit Determination (8/6/14)*.

- The air contaminants emitted are combustion contaminants (NOx, SOx, PM_{10}, CO, and VOC) from the burning of almond biomass waste from the air curtain incinerator and PM_{10} from the ash handling operation after the burn is completed.

- It is assumed that the proposed air curtain incinerator will only burn biomass waste material, including almond wood sticks, that has been generated onsite as a byproduct of almond processing.

- Proposed maximum daily burn rate = 56 tons/day (7 ton/hr with an 8 hr/day schedule, per applicant).

- Proposed maximum annual burn rate = 1,000 tons/year (per applicant).
- The mass reduction of the almond sticks from the burn is 97 – 98% (Air Burners Inc.). Thus, 2 – 3% of the original mass of the material introduced into the fire box remains as residual ash after the burn. For a conservative estimate of emissions, it is assumed that 3% of the original mass of material remains as residual ash after the burn.
- Ash generated daily = 1.68 ton/day (56 ton/day x 0.03 lb-ash/lb-waste burned).
- Ash generated annually = 30 ton/year (1,000 ton/year x 0.03 lb-ash/lb-waste burned).

B. Emission Factors

Air Curtain Incinerator emission factors are based on a District memo (see Appendix C) as summarized in the following tables:

Emission Factors for Air Curtain Incinerator		
Pollutant	**Emission Factor (lb/ton)**	**Source**
NOx	1.0	Air Curtain Incinerator Emission Factors Determination Memo
SOx	0.1	
PM_{10}	1.3	
CO	2.6	
VOC	0.9	

Emission Factor for Ash Handling Operation		
Pollutant	**Emission Factor (lb/ton)**	**Source**
PM_{10}	0.23	Air Curtain Incinerator Emission Factors Determination Memo

As noted in the memo in Appendix C, the ash handling emission factor is based on the emission factor for coal fly ash for the combined activities of unloading from a dump truck and spreading at a landfill.

C. Calculations

1. Pre-Project Potential to Emit (PE1)

Since this is a new emissions unit, PE1 = 0 for all pollutants.

2. Post Project Potential to Emit (PE2)

The permit unit for air curtain incinerator consists of two emissions units: combustion emissions from fire box and PM_{10} emissions from the ash handling. PE for each emission unit is calculated below:

Combustion Emissions:

Daily and annual PE2 for combustion emissions are calculated using the equations below and summarized in the following tables:

Daily PE2 = Throughput (ton/day) x EF2 (lb-pollutant/ton)

Annual PE2 = Throughput (ton/year) x EF2 (lb-pollutant/ton)

Daily PE2 for Air Curtain Incinerator					
Pollutant	**Throughput (tons/day)**		**Emission Factor (lb/ton)**		**Daily PE2 (lb/day)**
NOx	56	x	1.0	=	56.0
SOx		x	0.1	=	5.6
PM_{10}		x	1.3	=	72.8
CO		x	2.6	=	145.6
VOC		x	0.9	=	50.4

Annual PE2 for Air Curtain Incinerator					
Pollutant	**Throughput (tons/year)**		**Emission Factor (lb/ton)**		**Annual PE2 (lb/year)**
NOx	1,000	x	1.0	=	1,000
SOx		x	0.1	=	100
PM_{10}		x	1.3	=	1,300
CO		x	2.6	=	2,600
VOC		x	0.9	=	900

Ash Handling Emissions

Ash handling operation involves with PM_{10} emissions only, calculated as below:

Daily PE2 = Amount of Ash Handled (ton/day) x Emission Factor (lb-PM_{10}/ton)
= 1.68 ton/day x 0.23 lb-PM_{10}/ton
= 0.4 lb-PM_{10}/day

Annual PE2 = Amount of Ash Handled (ton/year) x Emission Factor (lb-PM_{10}/ton)
= 30 ton/year x 0.23 lb-PM_{10}/ton

= 7 lb-PM_{10}/year

Permit Unit Total Emissions:

Permit unit total emissions are calculated by adding emissions from air curtain incinerator and ash handling in the following tables:

Daily PE2 (lb/day)					
Emissions Unit	**NOx**	**SOx**	**PM_{10}**	**CO**	**VOC**
Air Curtain Incinerator	56.0	5.6	72.8	145.6	50.4
Ash Handling	0.0	0.0	0.4	0.0	0.0
Permit Unit Total PE2	**56.0**	**5.6**	**73.2**	**145.6**	**50.4**

Annual PE2 (lb/year)					
Emissions Unit	**NOx**	**SOx**	**PM_{10}**	**CO**	**VOC**
Air Curtain Incinerator	1,000	100	1,300	2,600	900
Ash Handling	0	0	7	0	0
Permit Unit Total PE2	**1,000**	**100**	**1,307**	**2,600**	**900**

3. Pre-Project Stationary Source Potential to Emit (SSPE1)

Pursuant to District Rule 2201, the SSPE1 is the Potential to Emit (PE) from all units with valid Authorities to Construct (ATC) or Permits to Operate (PTO) at the Stationary Source and the quantity of Emission Reduction Credits (ERC) which have been banked since September 19, 1991 for Actual Emissions Reductions (AER) that have occurred at the source, and which have not been used on-site.

Based on calculations in Appendix D, SSPE1 is summarized in the following table:

SSPE1 (lb/year)					
Permit Unit	**NOx**	**SOx**	**PM_{10}**	**CO**	**VOC**
S-634-1-3 (Receiving and Pre-Cleaning)	0	0	3,871	0	0
S-634-2-1 (Hulling)	0	0	2,246	0	0
S-634-3-1 (Hulling)	0	0	2,246	0	0
S-634-4-5 (Shelling and Cleaning)	0	0	11,376	0	0
S-634-7-3 (Inshell and Sizing)	0	0	438	0	0
S-634-8-0 (Fumigation)	0	0	0	0	1,570
S-634-9-2 (Fumigation)	0	0	0	0	0
SSPE1	**0**	**0**	**20,177**	**0**	**1,570**

4. Post Project Stationary Source Potential to Emit (SSPE2)

Pursuant to District Rule 2201, the SSPE2 is the PE from all units with valid ATCs or PTOs at the Stationary Source and the quantity of ERCs which have been banked since September 19, 1991 for AER that have occurred at the source, and which have not been used on-site.

SSPE2 (lb/year)					
Permit Unit	**NOx**	**SOx**	**PM_{10}**	**CO**	**VOC**
SSPE1	0	0	20,177	0	1,570
ATC S-634-11-0 (Air Curtain Incinerator)	1,000	100	1,307	2,600	900
SSPE2	**1,000**	**100**	**21,484**	**2,600**	**2,470**

5. Major Source Determination

Rule 2201 Major Source Determination:

Pursuant to District Rule 2201, a Major Source is a stationary source with a SSPE2 equal to or exceeding one or more of the following threshold values. For the purposes of determining major source status the following shall not be included:

- any ERCs associated with the stationary source
- Emissions from non-road IC engines (i.e. IC engines at a particular site at the facility for less than 12 months)

- Fugitive emissions, except for the specific source categories specified in 40 CFR 51.165

Rule 2201 Major Source Determination (lb/year)						
	NOx	**SOx**	**PM_{10}**	**$PM_{2.5}$**	**CO**	**VOC**
SSPE1	0	0	20,177	20,177	0	1,570
SSPE2	1,000	100	21,484	21,484	2,600	2,470
Major Source Threshold	20,000	140,000	140,000	140,000	200,000	20,000
Major Source?	**No**	**No**	**No**	**No**	**No**	**No**

Note: $PM_{2.5}$ assumed to be equal to PM_{10}

As seen in the table above, the facility is not an existing Major Source and is not becoming a Major Source as a result of this project.

Rule 2410 Major Source Determination:

The facility or the equipment evaluated under this project is not listed as one of the categories specified in 40 CFR 52.21 (b)(1)(iii). Therefore, the PSD Major Source threshold is 250 tpy for any regulated NSR pollutant.

PSD Major Source Determination (tons/year)						
	NO_2	**VOC**	**SO_2**	**CO**	**PM**	**PM_{10}**
Estimated Facility PE before Project Increase	0	0.8	0	0	10.1	10.1
PSD Major Source Thresholds	250	250	250	250	250	250
PSD Major Source?	**No**	**No**	**No**	**No**	**No**	**No**

As shown above, the facility is not an existing PSD major source for any pollutant.

6. Baseline Emissions (BE)

The BE calculation (in lb/yr) is performed pollutant-by-pollutant for each unit within the project to calculate the QNEC, and if applicable, to determine the amount of offsets required.

Pursuant to District Rule 2201, BE = PE1 for:

- Any unit located at a non-Major Source,

- Any Highly-Utilized Emissions Unit, located at a Major Source,
- Any Fully-Offset Emissions Unit, located at a Major Source, or
- Any Clean Emissions Unit, located at a Major Source.

otherwise,

BE = Historic Actual Emissions (HAE), calculated pursuant to District Rule 2201.

As shown in Section VII.C.5 above, the facility is not a Major Source for any pollutant.

Therefore BE = PE1.

Since this is a new emissions unit, BE = PE1 = 0 for all pollutants.

7. SB 288 Major Modification

SB 288 Major Modification is defined in 40 CFR Part 51.165 as "any physical change in or change in the method of operation of a major stationary source that would result in a significant net emissions increase of any pollutant subject to regulation under the Act."

Since this facility is not a major source for any of the pollutants addressed in this project, this project does not constitute an SB 288 major modification.

8. Federal Major Modification

District Rule 2201 states that a Federal Major Modification is the same as a “Major Modification” as defined in 40 CFR 51.165 and part D of Title I of the CAA.

Since this facility is not a Major Source for any pollutants, this project does not constitute a Federal Major Modification.

9. Rule 2410 – Prevention of Significant Deterioration (PSD) Applicability Determination

Rule 2410 applies to any pollutant regulated under the Clean Air Act, except those for which the District has been classified nonattainment. The pollutants which must be addressed in the PSD applicability determination for sources located in the SJV and which are emitted in this project are: (See 52.21 (b) (23) definition of significant)

- NO_2
- SO_2
- CO
- PM
- PM_{10}

I. Project Emissions Increase - New Major Source Determination

The post-project potentials to emit from all new and modified units are compared to the PSD major source thresholds to determine if the project constitutes a new major source subject to PSD requirements.

The facility or the equipment evaluated under this project is not listed as one of the categories specified in 40 CFR 52.21 (b)(1)(i). The PSD Major Source threshold is 250 tpy for any regulated NSR pollutant.

PSD Major Source Determination: Potential to Emit (tons/year)						
	NO_2	**SO_2**	**PM**	**PM_{10}**	**CO**	**VOC**
Total PE from New and Modified Units	0.5	0	0.6	0.6	1.3	0.5
PSD Major Source threshold	250	250	250	250	250	250
New PSD Major Source?	No	No	No	No	No	No

As shown in the table above, the potential to emit for the project, by itself, does not exceed any PSD major source threshold. Therefore, Rule 2410 is not applicable and no further analysis is required.

10. Quarterly Net Emissions Change (QNEC)

The QNEC is calculated solely to establish emissions that are used to complete the District's PAS emissions profile screen. Detailed QNEC calculations are included in Appendix E.

VIII. Compliance Determination

Rule 2020 Exemptions

This rule specifies emissions units that are not required to obtain an Authority to Construct or Permit to Operate. Section 6.0 lists District exempt source categories for which no Authority to Construct or Permit to Operate is required, except as required by Section 5.0.

Section 6.1.2 lists a permit exempt source category for piston type internal combustion engines with a manufacturer's maximum continuous rating of 50 braking horsepower (bhp) or less.

The facility has proposed a 49 bhp Hatz Model 3H50TIC Tier 4 Final certified diesel-fired IC engine to power the air curtain incinerator fan and the instrument panel (see Appendix B), which meets the exemption listed in Section 6.1.2 above.

Rule 2201 New and Modified Stationary Source Review Rule

A. Best Available Control Technology (BACT)

1. BACT Applicability

BACT requirements are triggered on a pollutant-by-pollutant basis and on an emissions unit-by-emissions unit basis. Unless specifically exempted by Rule 2201, BACT shall be required for the following actions*:

a. Any new emissions unit with a potential to emit exceeding two pounds per day,
b. The relocation from one Stationary Source to another of an existing emissions unit with a potential to emit exceeding two pounds per day,
c. Modifications to an existing emissions unit with a valid Permit to Operate resulting in an Adjusted Increase in Permitted Emissions (AIPE) exceeding two pounds per day, and/or
d. Any new or modified emissions unit, in a stationary source project, which results in an SB 288 Major Modification or a Federal Major Modification, as defined by the rule.

*Except for CO emissions from a new or modified emissions unit at a Stationary Source with an SSPE2 of less than 200,000 pounds per year of CO.

a. New emissions units – PE > 2 lb/day

This project involves two new emissions units (air curtain incinerator combustion emissions and ash handling operation) and emissions from each emissions unit are compared to the BACT thresholds in the tables below:

Combustion Emissions:

New Emissions Unit BACT Applicability				
Pollutant	**Daily PE2 (lb/day)**	**BACT Threshold (lb/day)**	**SSPE2 (lb/yr)**	**BACT Triggered?**
NOx	56.0	> 2.0	n/a	Yes
SOx	5.6	> 2.0	n/a	Yes
PM_{10}	72.8	> 2.0	n/a	Yes
CO	145.6	> 2.0 and SSPE2 ≥ 200,000 lb/yr	2,600	No
VOC	50.4	> 2.0	n/a	Yes

As shown above, BACT is triggered for NO_x, SO_x, PM_{10}, and VOC emissions from the air curtain incinerator involved with this project.

Ash Handling Emissions:

New Emissions Unit BACT Applicability				
Pollutant	**Daily PE2 (lb/day)**	**BACT Threshold (lb/day)**	**SSPE2 (lb/yr)**	**BACT Triggered?**
PM_{10}	0.4	> 2.0	n/a	No

b. Relocation of emissions units – PE > 2 lb/day

As discussed in Section I above, there are no emissions units being relocated from one stationary source to another; therefore, BACT is not triggered for relocation purposes.

c. Modification of emissions units – AIPE > 2 lb/day

There are no emissions units being modified with this project. Therefore, BACT is not triggered.

d. SB 288/Federal Major Modification

As discussed in Sections VII.C.7 and VII.C.8 above, this project does not constitute an SB 288 and/or Federal Major Modification for any pollutant. Therefore, BACT is not triggered for any pollutant.

2. BACT Guideline

BACT Guideline 1.9.17 - *Stationary Air Curtain Incinerator* - applies to the air curtain incinerator involved with this project. See Appendix F.

3. Top-Down BACT Analysis

Per Permit Services Policies and Procedures for BACT, a Top-Down BACT analysis shall be performed as a part of the application review for each application subject to the BACT requirements pursuant to the District's NSR Rule.

Pursuant to the attached Top-Down BACT Analysis (see Appendix G), BACT has been satisfied with the following:

NO_x, SO_x, PM_{10}, and VOC: Air curtain incinerator complying with visible emissions of 10% opacity or less after start-up (per 40 CFR Part 60 Subpart CCCC, sections 60.2250 and 60.2255)

Note that pollutant emission limits are not specified because emissions are known to vary by type of biomass material burned, and this guideline is not specific to any one type of biomass.

B. Offsets

1. Offset Applicability

Offset requirements shall be triggered on a pollutant by pollutant basis and shall be required if the SSPE2 equals or exceeds the offset threshold levels in Table 4-1 of Rule 2201.

The SSPE2 is compared to the offset thresholds in the following table.

Offset Determination (lb/year)					
	NO_X	**SO_X**	**PM_{10}**	**CO**	**VOC**
SSPE2	1,000	100	21,484	2,600	2,470
Offset Thresholds	20,000	54,750	29,200	200,000	20,000
Offsets Triggered?	**No**	**No**	**No**	**No**	**No**

2. Quantity of Offsets Required

As seen above, the SSPE2 is not greater than the offset thresholds for all the pollutants; therefore, offset calculations are not necessary and offsets will not be required for this project.

C. Public Notification

1. Applicability

Public noticing is required for:
a. New Major Sources, Federal Major Modifications, and SB 288 Major Modifications,
b. Any new emissions unit with a Potential to Emit greater than 100 pounds during any one day for any one pollutant,
c. Any project which results in the offset thresholds being surpassed,
d. Any project with an SSIPE of greater than 20,000 lb/year for any pollutant, and/or
e. Any project which results in a Title V significant permit modification

a. New Major Sources, Federal Major Modifications, and SB 288 Major Modifications

New Major Sources are new facilities, which are also Major Sources. Since this is not a new facility, public noticing is not required for this project for New Major Source purposes.

As demonstrated in Sections VII.C.7 and VII.C.8, this project does not constitute an SB 288 or Federal Major Modification; therefore, public noticing for SB 288 or Federal Major Modification purposes is not required.

b. PE > 100 lb/day

The PE2 for this new unit is compared to the daily PE Public Notice thresholds in the following table:

PE > 100 lb/day Public Notice Thresholds			
Pollutant	**PE2 (lb/day)**	**Public Notice Threshold**	**Public Notice Triggered?**
NO_X	56	100 lb/day	No
SO_X	5.6	100 lb/day	No
PM_{10}	73.2	100 lb/day	No
CO	145.6	100 lb/day	Yes
VOC	50.4	100 lb/day	No

Therefore, public noticing for PE > 100 lb/day purposes is required.

c. Offset Threshold

The SSPE1 and SSPE2 are compared to the offset thresholds in the following table.

Offset Thresholds				
Pollutant	**SSPE1 (lb/year)**	**SSPE2 (lb/year)**	**Offset Threshold**	**Public Notice Required?**
NO_X	0	1,000	20,000 lb/year	**No**
SO_X	0	100	54,750 lb/year	**No**
PM_{10}	20,177	21,484	29,200 lb/year	**No**
CO	0	2,600	200,000 lb/year	**No**
VOC	1,570	2,470	20,000 lb/year	**No**

As detailed above, there were no thresholds surpassed with this project; therefore, public noticing is not required for offset purposes.

d. SSIPE > 20,000 lb/year

Public notification is required for any permitting action that results in a SSIPE of more than 20,000 lb/year of any affected pollutant. According to District policy, the SSIPE = SSPE2 – SSPE1. The SSIPE is compared to the SSIPE Public Notice thresholds in the following table.

SSIPE Public Notice Thresholds					
Pollutant	**SSPE2 (lb/year)**	**SSPE1 (lb/year)**	**SSIPE (lb/year)**	**SSIPE Public Notice Threshold**	**Public Notice Required?**
NO_x	1,000	0	1,000	20,000 lb/year	**No**
SO_x	100	0	100	20,000 lb/year	**No**
PM_{10}	21,484	20,177	1,307	20,000 lb/year	**No**
CO	2,600	0	2,600	20,000 lb/year	**No**
VOC	2,470	1,570	900	20,000 lb/year	**No**

As demonstrated above, the SSIPEs for all pollutants were less than 20,000 lb/year; therefore, public noticing for SSIPE purposes is not required.

e. Title V Significant Permit Modification

Since this facility does not have a Title V operating permit, this change is not a Title V significant Modification and, therefore, public noticing is not required.

2. Public Notice Action

As discussed above, public noticing is required for this project for CO emissions in excess of 100 lb/day. Therefore, public notice documents will be submitted to the California Air Resources Board (CARB) and a public notice will be electronically published on the District's website prior to the issuance of the ATC for this equipment.

D. Daily Emission Limits (DELs)

DELs and other enforceable conditions are required by Rule 2201 to restrict a unit's maximum daily emissions, to a level at or below the emissions associated with the maximum design capacity. The DEL must be contained in the latest ATC and contained in or enforced by the latest PTO and enforceable, in a practicable manner, on a daily basis. DELs are also required to enforce the applicability of BACT.

Proposed Rule 2201 (DEL) Conditions:

- *The air curtain incinerator shall burn no more than 56 tons of waste material in any one day. [District Rules 2201 and 4102]*
- *The air curtain incinerator shall burn no more than 1,000 tons of waste material in any year. [District Rules 2201 and 4102]*
- *The amount of ash handled shall not exceed 1.68 ton in any one day.[1] [District Rules 2201 and 4102]*
- *The amount of ash handled shall not exceed 30 tons in any year. [District Rules 2201 and 4102]*
- *Emissions (in units of pounds per ton of waste material) from the air curtain incinerator shall not exceed any of the following limits: 1.0 lb-NOx/ton, 0.1 lb-SOx/ton, 1.3 lb-PM_{10}/ton, 2.6 lb-CO/ton, or 0.9 lb-VOC/ton. [District Rule 2201]*
- *Emissions from ash handling shall not exceed 0.23 lb-PM_{10}/ton. [District Rule 2201]*
- *The air curtain incinerator shall be operated according to manufacturer's specifications and in a manner to minimize emissions of air contaminants into the atmosphere. This includes but is not limited to the following prohibitions: biomass shall not protrude from the firebox into the air curtain, flames shall not be visible above the air curtain, and plumes of ash shall not be generated due to excessive loading. [District Rules 2201 and 4102]*
- *The air curtain incinerator shall burn only biomass waste material, including almond wood sticks generated onsite as a byproduct of almond processing. [District Rules 2201 and 4102]*
- *Ash removed from the firebox shall be handled, stored, and disposed of in a manner minimizing entrainment into the atmosphere. [District Rules 2201 and 4102]*
- *For conducting a cold start, the operator shall use a propane or butane torch, driptorch, or flare to ignite the material inside the air curtain incinerator. No accelerants (e.g. gasoline, diesel fuel, kerosene, turpentine) may be used. [District Rules 2201 and 4102]*

[1] The amount of ash residue is assumed to be 3% of the total mass of waste introduced into the firebox, as stated in Section VII.A of this document (Assumptions). The throughput limit for ash is linked to the overall process rate limits of 56 ton/day and 1,000 ton/year. To require weighing of the ash handled each day would be to introduce additional handling of this material, thereby additional opportunities for entrainment into the atmosphere.

E. Compliance Assurance

1. Source Testing

The air curtain incinerator is an unconventional and complex emissions source with no dedicated stack, so it has inherent challenges of conducting an emissions source test. No source testing conducted by an individual facility has been undertaken without substantial involvement by a government entity and/or the manufacturer. Since District Policy APR 1705, Source Test Frequency makes an allowance for source test feasibility when considering whether or not to require source testing, and since the District selected representative yet conservative emission factors, no source testing will be required for the air curtain incinerator.

2. Monitoring

Opacity monitoring will be required for the air curtain incinerator. The unit is subject to opacity requirements of 40 CFR Subpart CCCC and District Rule 4101. The opacity requirements during startup periods and steady state operation are discussed below:

Opacity Limit during Startup Periods:

- §60.2250(b) of 40 CFR Subpart CCCC requires an opacity limit of 35% or less during the startup period that is within the first 30 minutes of operation.
- District Rule 4101 limits opacity to 20%, which is a more stringent requirement that applies at all times of operation, including during startup.

Therefore, the following condition will be listed on the ATC to enforce the most stringent Rule 4101 opacity limit with a reference of Rule 2201:

- *During the startup period that is within the first 30 minutes of operation, visible emissions from the air curtain incinerator shall not equal or exceed Ringelmann 1 or 20% opacity for more than 3 minutes in any one hour. [District Rules 2201 and 4101]*

Opacity Limit during Steady State Operation:

- §60.2250(a) of 40 CFR Subpart CCCC requires an opacity limit of 10% during steady-state operation, using an averaging period of three 1-hr blocks.
- District Rule 4101 limits opacity to 20% during steady state operation using an averaging period of 3 minutes in any one hour

Since each opacity requirement has different averaging periods with different limits, both requirements are enforced by the following permit condition:

- *After the startup period, during steady state operation, visible emissions from the air curtain incinerator shall not equal or exceed either of the following limits: Ringelmann 1 or 20% opacity for more than 3 minutes in any one hour or 10% opacity as determined by the average of three 1-hour blocks consisting of ten 6-minute average opacity values. [District Rules 2201 and 4101]*

In addition, the following conditions will be listed on the ATC regarding opacity testing requirements:

- *Opacity testing shall be conducted using the methods and procedures approved by the District. The District must be notified 30 days prior to any compliance opacity testing and an opacity test plan must be submitted for approval at least 15 days prior to testing. [District Rule 1081]*

- *The operator shall conduct periodic testing for opacity at least once every 12 calendar months. Opacity testing shall consist of one 30-minute cold start observation, and three 1 hour observations under normal steady state operation. [District Rule 1081]*

- *Opacity observations shall be made at the point of greatest opacity in that portion of the plume where condensed water vapor is not present. [District Rule 1081]*

- *The permittee shall submit to the District the opacity test results report in paper or electronic format within 60 days of completion of the field test. The opacity results shall include information regarding the charge rate during opacity observation. [District Rule 1081]*

- *The operator shall keep records of all initial and annual opacity test results and reports onsite in either paper copy or electronic format for at least 5 years. [District Rule 1070]*

- *Within 60 days after achieving the maximum production rate at which the unit will be operated, but no later than 180 days after initial startup, the owner or operator shall conduct performance test(s). [District Rule 1081]*

3. Recordkeeping

Recordkeeping is required to demonstrate compliance with the offset, public notification and daily emission limit requirements of Rule 2201. The following conditions are listed on the ATC to ensure compliance:

- *The permittee shall maintain daily and cumulative annual records of the tons of waste material burned in the air curtain incinerator. [District Rule 2201]*

- *{edited 3246} All records shall be maintained and retained on-site for a period of at least 5 years and shall be made available for District inspection upon request. [District Rules 1070 and 4702]*

No records of the tons of ash handled will be required. To require daily weighing of the ash would be to introduce additional ash handling, increasing the probability of entrainment of the ash into the atmosphere, i.e. PM_{10} emissions (see footnote 2 under the DEL section).

4. Reporting

No reporting is required to demonstrate compliance with Rule 2201.

F. Ambient Air Quality Analysis (AAQA)

Section 4.14 of District Rule 2201 requires that an AAQA be conducted for the purpose of determining whether a new or modified Stationary Source will cause or make worse a violation of an air quality standard. The District's Technical Services Division conducted the required analysis. Refer to Appendix H of this document for the AAQA summary sheet.

The proposed location is in an attainment area for NO_X, CO, and SO_X. As shown by the AAQA summary sheet the proposed equipment will not cause a violation of an air quality standard for NO_X, CO, or SO_X.

The proposed location is in a non-attainment area for the state's PM_{10} as well as federal and state $PM_{2.5}$ thresholds. As shown by the AAQA summary sheet the proposed equipment will not cause a violation of an air quality standard for PM_{10} and $PM_{2.5}$.

To ensure that human health risks will not exceed District allowable levels, the following conditions shall be included in the ATC:

- *After hours of operation are completed, the fire in the firebox will be snuffed out and will not be allowed to smolder overnight. Ash from the firebox will be emptied in a manner to minimize emissions. [District Rules 2201 and 4102]*

- *The air curtain incinerator shall be operated according to manufacturer's specifications and in a manner to minimize emissions of air contaminants into the atmosphere. This includes but is not limited to the following prohibitions: biomass shall not protrude from the firebox into the air curtain, flames shall not be visible above the air curtain, and plumes of ash shall not be generated due to excessive loading. [District Rules 2201 and 4102]*

Rule 2410 Prevention of Significant Deterioration

As shown in Section VII.C.9 above, this project does not result in a new PSD major source or PSD major modification. No further discussion is required.

Rule 2520 Federally Mandated Operating Permits

Since this facility's potential emissions do not exceed any major source thresholds of Rule 2201, this facility is not a major source, and Rule 2520 does not apply.

Per Section 4.1(6), the air curtain incinerator is exempt from the requirements of this rule as it is classified as a solid waste incineration unit that is required to obtain a Part 70 permit pursuant to section 129(e) of the Clean Air Act (CAA).

Rule 4001 New Source Performance Standards (NSPS)

This rule incorporates NSPS from Part 60, Chapter 1, Title 40, Code of Federal Regulations (CFR); and it applies to all new sources of air pollution and modifications of existing sources of air pollution listed in 40 CFR Part 60.

40 CFR 60 Subpart CCCC – Standards of Performance for Commercial and Industrial Solid Waste Incineration Units

The District has not been delegated the authority to implement Subpart CCCC requirements for non-Major Sources; therefore, references to this subpart will not be included on the permit until the operator is issued a Title V permit. However, the substance of the requirements of this subpart will be included on the ATC because they have been determined to be part of the BACT requirements for unit '-11-0, as required by District Rule 2201.

Per District Rule 2201, Section 3.10, BACT is the most stringent emission limitation or control technique of the following: (3.10.3) Contained in an applicable federal New Source Performance Standard.

INTRODUCTION

§60.2000 What does this subpart do?

This subpart establishes new source performance standards for commercial and industrial solid waste incineration (CISWI) units.

The air curtain incinerator in this project is used for disposal of a byproduct of an industrial/commercial process and is, thus, considered a CISWI unit; therefore, this subpart is applicable. Whereas, Subpart EEEE (Standards of Performance for Other Solid Waste Incineration Units), which applies to units used for wildfire hazard reduction, is not applicable to this project.

§60.2005 When does this subpart become effective?

This subpart takes effect on August 7, 2013. Some of the requirements in this subpart apply to planning the CISWI unit (i.e., the preconstruction requirements in §60.2045 and

60.2050). Other requirements such as the emission limitations and operating limits apply after the CISWI unit begins operation.

APPLICABILITY

§60.2010 Does this subpart apply to my incineration unit?

Yes, if your incineration unit meets all the requirements specified in paragraphs (a) through (c) of this section.

(a) Your incineration unit is a new incineration unit as defined in §60.2015.
(b) Your incineration unit is a CISWI unit as defined in §60.2265.
(c) Your incineration unit is not exempt under §60.2020.

The sections that apply to an air curtain incinerator are indicated under §60.2020 as below:

§60.2020 What combustion units are exempt from this subpart?

This subpart exempts the types of units described in paragraphs (a), (c) through (i) and (n) of this section, but some units are required to provide notifications. Air curtain incinerators are exempt from the requirements in this subpart except for the provisions in §60.2242, 60.2250, and 60.2260.

(i) Air curtain incinerators. Air curtain incinerators that burn only the materials listed in paragraphs (i)(1) through (3) of this section are only required to meet the requirements under §60.2242 and under "Air Curtain Incinerators" (§60.2245 through 60.2260).

(1) 100 percent wood waste.
(2) 100 percent clean lumber.
(3) 100 percent mixture of only wood waste, clean lumber, and/or yard waste.

The air curtain incinerator in this project will burn only biomass waste material, including almond wood sticks generated onsite as a byproduct of almond processing. Therefore, only sections §60.2242 and §60.2245 through 60.2260 apply.

TITLE V OPERATING PERMITS

§60.2242 Am I required to apply for and obtain a Title V operating permit for my unit?

Yes. Each CISWI unit and air curtain incinerator subject to standards under this subpart must operate pursuant to a permit issued under Section 129(e) and Title V of the Clean Air Act.

Therefore, the following condition will be listed on the ATC for the air curtain incinerator:

- *Within 12 months of initial operation of this air curtain incinerator, the operator shall submit a complete application for a Title V operating permit to the District for compliance with New Source Performance Standard Subpart CCCC - Standards of Performance for Commercial and Industrial Solid Waste Incineration Units. [40 CFR 60.2242]*

AIR CURTAIN INCINERATORS

§60.2245 What is an air curtain incinerator?

(a) An air curtain incinerator operates by forcefully projecting a curtain of air across an open chamber or open pit in which combustion occurs. Incinerators of this type can be constructed above or below ground and with or without refractory walls and floor. (Air curtain incinerators are not to be confused with conventional combustion devices with enclosed fireboxes and controlled air technology such as mass burn, modular, and fluidized bed combustors.)

(b) Air curtain incinerators that burn only the materials listed in paragraphs (b)(1) through (3) of this section are only required to meet the requirements under §60.2242 and under "Air Curtain Incinerators" (§§60.2245 through 60.2260).

(1) 100 percent wood waste.
(2) 100 percent clean lumber.
(3) 100 percent mixture of only wood waste, clean lumber, and/or yard waste.

The air curtain incinerator in this project will burn only biomass waste material, including almond wood sticks generated onsite as a byproduct of almond processing. Therefore, the following condition will be listed on the ATC to ensure compliance:

- *The air curtain incinerator shall burn only biomass waste material, including almond wood sticks generated onsite as a byproduct of almond processing. [District Rules 2201 and 4102]*

§60.2250 What are the emission limitations for air curtain incinerators?

Within 60 days after your air curtain incinerator reaches the charge rate at which it will operate, but no later than 180 days after its initial startup, you must meet the two limitations specified in paragraphs (a) and (b) of this section.

(a) Maintain opacity to less than or equal to 10 percent opacity (as determined by the average of three 1-hour blocks consisting of ten 6-minute average opacity values), except as described in paragraph (b) of this section.

(b) Maintain opacity to less than or equal to 35 percent opacity (as determined by the average of three 1-hour blocks consisting of ten 6-minute average opacity values) during the startup period that is within the first 30 minutes of operation.

The following conditions are being applied as a BACT requirement and will be included on the ATC:

- *During the startup period that is within the first 30 minutes of operation, visible emissions from the air curtain incinerator shall not equal or exceed Ringelmann 1 or 20% opacity for more than 3 minutes in any one hour. [District Rules 2201 and 4101]*

- *After the startup period, during steady state operation, visible emissions from the air curtain incinerator shall not equal or exceed either of the following limits: Ringelmann 1 or 20% opacity for more than 3 minutes in any one hour or 10% opacity as determined by the average of three 1-hour blocks consisting of ten 6-minute average opacity values. [District Rules 2201 and 4101]*

§60.2255 How must I monitor opacity for air curtain incinerators?

(a) Use Method 9 of appendix A of this part to determine compliance with the opacity limitation.

Therefore, the following conditions, which have a basis from District Rule 4101, will be listed on the ATC to ensure compliance:

- *Compliance with the opacity limits on this permit shall be determined by EPA Method 9. [District Rule 4101]*

- *Observers for the opacity compliance demonstration shall be certified according to the procedure in EPA Method 9. [District Rule 4101]*

(b) Conduct an initial test for opacity as specified in §60.8.

As discussed earlier, since District Rule 4101 has a more stringent 20% opacity limit that is applicable at all times, the following condition will be listed on the ATC to ensure compliance:

- *During the startup period that is within the first 30 minutes of operation, visible emissions from the air curtain incinerator shall not equal or exceed Ringelmann 1 or 20% opacity for more than 3 minutes in any one hour. [District Rules 2201 and 4101]*

(c) After the initial test for opacity, conduct annual tests no more than 12 calendar months following the date of your previous test.

Therefore, the following condition will be listed on the ATC to ensure compliance:

- *The operator shall conduct periodic testing for opacity at least once every 12 calendar months. Opacity testing shall consist of one 30-minute cold start observation, and three 1 hour observations under normal steady state operation. [District Rule 1081]*

§60.2260 What are the recordkeeping and reporting requirements for air curtain incinerators?

(a) Prior to commencing construction on your air curtain incinerator, submit the three items described in paragraphs (a)(1) through (3) of this section.

(1) Notification of your intent to construct the air curtain incinerators.
(2) Your planned initial startup date.
(3) Types of materials you plan to burn in your air curtain incinerator.

The facility's ATC application satisfies the requirements of sections (a)(1) thru (a)(3) above.

(b) Keep records of results of all initial and annual opacity tests onsite in either paper copy or electronic format, unless the Administrator approves another format, for at least 5 years.

(c) Make all records available for submittal to the Administrator or for an inspector's onsite review.

(d) You must submit the results (as determined by the average of three 1-hour blocks consisting of ten 6-minute average opacity values) of the initial opacity tests no later than 60 days following the initial test. Submit annual opacity test results within 12 months following the previous report.

(e) Submit initial and annual opacity test reports as electronic or paper copy on or before the applicable submittal date.

(f) Keep a copy of the initial and annual reports onsite for a period of 5 years.

Therefore, the following recordkeeping and report submittal requirements will be included on the ATC:

- *The permittee shall submit to the District the opacity test results report in paper or electronic format within 60 days of completion of the field test. The opacity results shall include information regarding the charge rate during opacity observation. [District Rule 1081]*

- *Opacity observations shall be made at the point of greatest opacity in that portion of the plume where condensed water vapor is not present. [District Rule 1081]*

- *The operator shall keep records of all initial and annual opacity test results and reports onsite in either paper copy or electronic format for at least 5 years. [District Rule 1070]*

- *{3246} All records shall be maintained and retained on-site for a period of at least 5 years and shall be made available for District inspection upon request. [District Rules 1070 and 4702]*

40 CFR 60 Subpart EEEE – Standards of Performance for Other Solid Waste Incineration Units for Which Construction is Commenced After December 9, 2004, or for Which Modification or Reconstruction is Commenced on or After June 16, 2006

§60.2880 What does this subpart do?

This subpart establishes new source performance standards for other solid waste incineration (OSWI) units. Other solid waste incineration units are very small municipal waste combustion units and institutional waste incineration units.

§60.2881 When does this subpart become effective?

This subpart takes effect June 16, 2006. Some of the requirements in this subpart apply to planning the incineration unit and must be completed even before construction is initiated on the unit (i.e., the preconstruction requirements in §§60.2894 and 60.2895). Other requirements such as the emission limitations and operating limits apply when the unit begins operation.

Applicability

§60.2885 Does this subpart apply to my incineration unit?

Yes, if your incineration unit meets all the requirements specified in paragraphs (a) through (c) of this section.

(a) Your incineration unit is a new incineration unit as defined in §60.2886.

(b) Your incineration unit is an OSWI unit as defined in §60.2977 or an air curtain incinerator subject to this subpart as described in §60.2888(b). Other solid waste incineration units are very small municipal waste combustion units and institutional waste incineration units as defined in §60.2977.

(c) Your incineration unit is not excluded under §60.2887.

As discussed below, the proposed air curtain incinerator is excluded from this Subpart as it is subject to the requirements of Subpart CCCC.

§60.2887 What combustion units are excluded from this subpart?

This subpart excludes the types of units described in paragraphs (a) through (q) of this section, as long as you meet the requirements of this section:

(Note: only applicable paragraph ‘d’ of this section is listed below)

(d) Commercial and industrial solid waste incineration units. Your unit is excluded if it is regulated under Subparts CCCC or DDDD of this part and is required to meet the emission limitations established in those subparts.

Since the proposed air curtain incinerator is regulated under Subpart CCCC as discussed above, the air curtain incinerator is excluded from the requirements of Subpart EEEE. Therefore, no further discussion is necessary under this Subpart.

40 CFR 60 Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

The District has not been delegated the authority to implement Subpart IIII requirements for non-Major Sources. In addition, since the proposed 49 bhp diesel-fired IC engine is exempt from District permit, no Subpart IIII requirements applicable to the permit exempt engine will be listed on the permit for air curtain incinerator. However, since Section 5.1 of District Rule 4702 requires the proposed engine to meet the applicable requirements and emission limits of 40 CFR 60 Subpart IIII, the following breakdown will only address the emission limits applicable to the proposed engine.

§60.4200 - Applicability

Section 60.4200(a)(2)(i) states that the provisions of this subpart apply to owners and operators of stationary compression ignition (CI) internal combustion engines that commence construction after July 11, 2005, where the engines are:

1) Manufactured after April 1, 2006, if not a fire pump engine.
2) Manufactured as a National Fire Protection Association (NFPA) fire pump engine after July 1, 2006.

Since the proposed engine will be installed after July 11, 2005 and will be manufactured after April 1, 2006, this subpart applies. In addition, since air curtain incinerator will be permitted as stationary source operation, the permit exempt IC engine will also be considered stationary and this Subpart applies.

Sections 60.4201 through 60.4203 apply to engine manufacturers. Therefore, these sections will not be discussed unless they are referenced later by another section of this subpart.

§60.4204 – Emission Standards for Owners and Operators

Section 60.4204(b) states that owners and operators of 2007 model year and later non-emergency stationary CI ICE with a displacement of less than 30 liters per cylinder must comply with the emission standards for new CI engines in §60.4201 for their 2007 model year and later stationary CI ICE, as applicable.

§60.4201(c) states that stationary CI internal combustion engine manufacturers must certify their 2011 model year and later non-emergency stationary CI ICE with a maximum engine power greater than 2,237 KW (3,000 bhp) and a displacement of less than 10 liters per cylinder to the certification emission standards for new non-road CI engines in 40 CFR 1039.101, 40 CFR 1039.102, 40 CFR 1039.104, 40 CFR 1039.105, 40 CFR 1039.107, and 40 CFR 1039.115, as applicable, for all pollutants, for the same maximum engine power.

§1039.101 of 40 CFR Part 1039 (Control of Emissions from New and In-Use Non-Road Compression-Ignition Engines) Subpart B (Emission Standards and Related Requirements), lists the exhaust emission standards that apply to the 2014 and later model year engines. Certain of these standards also apply for model year 2014 and earlier. This section presents the full set of emission standards that apply after all the transition and phase-in provisions of §1039.102 and §1039.104 expire. Since the proposed engine is 2020 model year, sections 1039.102 and 1039.104 do not apply.

§1039.101(b) states that the steady-state exhaust emissions from the engine may not exceed the applicable emission standards in Table 1 of this section (see table below). Measure emissions using the applicable steady-state test procedures described in subpart F of this part.

TABLE 1 OF §1039.101—TIER 4 EXHAUST EMISSION STANDARDS AFTER THE 2014 MODEL YEAR, G/KW-HR[1]

Maximum engine power	Application	PM	NO_x	NMHC	NO_x + NMHC	CO
kW <19	All	[2]0.40			7.5	[3]6.6
19 ≤kW <56	All	0.03			4.7	[4]5.0
56 ≤kW <130	All	0.02	0.40	0.19		5.0
130 ≤kW ≤560	All	0.02	0.40	0.19		3.5
	Generator sets	0.03	0.67	0.19		3.5
kW >560	All except generator sets	0.04	3.5	0.19		3.5

[1]Note that some of these standards also apply for 2014 and earlier model years. This table presents the full set of emission standards that apply after all the transition and phase-in provisions of §1039.102 expire.

[2]See paragraph (c) of this section for provisions related to an optional PM standard for certain engines below 8 kW.

[3]The CO standard is 8.0 g/kW-hr for engines below 8 kW.

[4]The CO standard is 5.5 g/kW-hr for engines below 37 kW.

The facility is proposing a 49 bhp (37 kw) Tier 4 Final certified IC engine with emissions summarized in the table below based on ARB certification (see Appendix B):

RATED POWER CLASS	EMISSION STANDARD CATEGORY		EXHAUST (g/kw-hr)					OPACITY (%)		
			NMHC	NOx	NMHC+NOx	CO	PM	ACCEL	LUG	PEAK
37 ≤ kW < 56	Tier 4 Final	STD	N/A	N/A	4.7	5.0	0.03	N/A	N/A	N/A
		CERT	--	--	4.4	0.5	0.01	--	--	--

Therefore, emission requirements of 40 CFR 60 Subpart IIII are satisfied.

§1039.105(a) states smoke standards and these smoke standards do not apply to the following engines:

(1) Single-cylinder engines.

(2) Constant-speed engines.

(3) Engines certified to a PM emission standard or FEL of 0.07 g/kW-hr or lower.

Since proposed engine is certified to a PM emission standard of 0.03 g/kW-hr, the smoke standards of §1039.105(a) do not apply.

§1039.107 lists the evaporative emission standards which are not applicable to the diesel-fueled engines. Therefore, §1039.107 is not applicable to the proposed engine.

As stated earlier, the District has not been delegated the authority to implement Subpart IIII requirements for non-Major Sources; therefore, no Subpart IIII requirements applicable to the permit exempt engine will be discussed in this application review or listed on the permit for air curtain incinerator. Therefore, no further discussion is necessary under this section.

Rule 4002 National Emission Standards for Hazardous Air Pollutants (NESHAPs)

This rule incorporates NESHAPs from Part 61, Chapter I, Subchapter C, Title 40, CFR and the NESHAPs from Part 63, Chapter I, Subchapter C, Title 40, CFR; and applies to all sources of hazardous air pollution listed in 40 CFR Part 61 or 40 CFR Part 63. However, no subparts of 40 CFR Part 61 or 40 CFR Part 63 apply to air curtain incinerators.

Rule 4101 Visible Emissions

Rule 4101 states that no person shall discharge into the atmosphere emissions of any air contaminant aggregating more than 3 minutes in any hour which is as dark as or darker than Ringelmann 1 (or 20% opacity).

As discussed under monitoring requirements of Rule 2201 earlier in this document, the unit is subject to opacity requirements of 40 CFR Subpart CCCC in addition to District Rule 4101. Based on that discussion, the following conditions will be listed on the ATC to ensure compliance:

- *During the startup period that is within the first 30 minutes of operation, visible emissions from the air curtain incinerator shall not equal or exceed Ringelmann 1 or 20% opacity for more than 3 minutes in any one hour. [District Rules 2201 and 4101]*

- *After the startup period, during steady state operation, visible emissions from the air curtain incinerator shall not equal or exceed either of the following limits: Ringelmann 1 or 20% opacity for more than 3 minutes in any one hour or 10% opacity as determined by the average of three 1-hour blocks consisting of ten 6-minute average opacity values. [District Rules 2201 and 4101]*

In addition, section 6.0 of the rule states that the following test methods shall be used unless otherwise approved by the District and EPA:

6.1 US EPA Method 9 for visual determination of the opacity of emissions.

6.2 40 Code of Federal Regulations (CFR) Part 60 Appendix B Performance Specification 1 for determination of certified, calibrated in-stack opacity monitoring system.

Therefore, the following condition will be listed on the ATC to ensure compliance:

- *Compliance with the opacity limits on this permit shall be determined by EPA Method 9. [District Rule 4101]*

In addition, Section 3.2 defines an 'observer' as a human observer certified and trained by the California Air Resources Board, or a certified in-stack opacity monitoring system calibrated in accordance with the test method specified in Section 6.2. Therefore, the following condition will be listed on the ATC to ensure compliance:

- *Observers for the opacity compliance demonstration shall be certified according to the procedure in EPA Method 9. [District Rule 4101]*

Rule 4102 Nuisance

Rule 4102 prohibits discharge of air contaminants which could cause injury, detriment, nuisance or annoyance to the public. Public nuisance conditions are not expected as a result of these operations, provided the equipment is well maintained. Therefore, compliance with this rule is expected and the following condition will be listed on the ATC issued under this project to ensure compliance:

- *{98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]*

California Health & Safety Code 41700 (Health Risk Assessment)

District Policy APR 1905 – *Risk Management Policy for Permitting New and Modified Sources* specifies that for an increase in emissions associated with a proposed new source or modification, the District perform an analysis to determine the possible impact to the nearest resident or worksite.

An HRA is not required for a project with a total facility prioritization score of less than one. According to the Technical Services Memo for this project (Appendix H), the total facility prioritization score including this project was greater than one. Therefore, an HRA was required to determine the short-term acute and long-term chronic exposure from this project. The cancer risk for this project is shown below:

Units	Prioritization Score	Acute Hazard Index	Chronic Hazard Index	Maximum Individual Cancer Risk	T-BACT Required	Special Permit Requirements
11	873.65	0.05	0.00	7.30E-07	No	Yes
Project Totals	873.65	0.05	0.00	7.30E-07		
Facility Totals	>1	0.327	0.395	5.21E-06		

Discussion of T-BACT

BACT for toxic emission control (T-BACT) is required if the cancer risk exceeds one in one million. As demonstrated above, T-BACT is not required for this project because the HRA indicates that the risk is not above the District's thresholds for triggering T-BACT requirements; therefore, compliance with the District's Risk Management Policy is expected.

District policy APR 1905 also specifies that the increase in emissions associated with a proposed new source or modification not have acute or chronic indices, or a cancer risk greater than the District's significance levels (i.e. acute and/or chronic indices greater than 1 and a cancer risk greater than 20 in a million). As outlined by the HRA Summary in Appendix H of this report, the emissions increases for this project was determined to be less than significant.

The following conditions will be listed on the ATC to ensure validity of the HRA assumptions:

- *The air curtain incinerator shall be operated according to manufacturer's specifications and in a manner to minimize emissions of air contaminants into the atmosphere. This includes but is not limited to the following prohibitions: biomass shall not protrude from the firebox into the air curtain, flames shall not be visible above the air curtain, and plumes of ash shall not be generated due to excessive loading. [District Rules 2201 and 4102]*

- *After operation is completed for a day, the fire in the firebox will be snuffed out and will not be allowed to smolder overnight. Ash from the firebox will be emptied in a manner to minimize emissions. [District Rules 2201 and 4102]*

- *Ash removed from the firebox shall be handled, stored, and disposed of in a manner minimizing entrainment into the atmosphere. [District Rules 2201 and 4102]*

Rule 4103 Open Burning

The purpose of this rule is to permit, regulate, and coordinate the use of open burning while minimizing smoke impacts on the public.

This rule applies to open burning conducted in the San Joaquin Valley Air Basin, with the exception of prescribed burning and hazard reduction burning as defined in Rule 4106 (Prescribed Burning and Hazard Reduction Burning).

Section 3.23 defines open burning as:

> "The combustion of any combustible refuse or other material of any type outdoors in the open air, not in any enclosure, where the products of combustion are not directed through a flue. For the purposes of this rule, prescribed burning and hazard reduction burning are not considered to be open burning."

The air curtain incinerator burns material inside an enclosure with the air curtain serving as a control device that increases the residence time of the products of incomplete combustion (CO, VOC, and PM). The District does not regard air curtain incinerators as a form of open burning. Therefore, this rule is not applicable to the air curtain incinerator.

Rule 4106 Prescribed Burning and Hazard Reduction Burning

The purpose of this rule is to permit, regulate, and coordinate the use of prescribed burning and hazard reduction burning while minimizing smoke impacts on the public.

This rule applies to all prescribed burning and to hazard reduction burning in wildland/urban interface.

The rule defines prescribed burning in Section 3.12 as:

> "The planned application of fire, including natural or accidental ignition, to vegetation on lands selected in advance of such application to meet specific planned resource management objectives as set forth in section 3.11."

Section 3.11 defines planned resource management objectives as including:

> "Forest management, wildlife habitat management, range improvement, fire hazard reduction, wilderness management, weed abatement, watershed rehabilitation, vegetation manipulation, disease and pest prevention, and ecosystem management."

Hazard reduction burning is defined in Section 3.7 as:

> "The burning of flammable vegetation that has been removed and cleared away from buildings or structures in compliance with local ordinances to reduce fire hazard pursuant to Section 4291 of the California Public Resources Code for the purpose of maintaining a firebreak of up to 100 feet from such buildings or structures."

The use of the air curtain incinerator to dispose of almond processing waste material does not qualify as a prescribed burn nor a hazard reduction burn as defined in this rule. Therefore, this rule does not apply to the air curtain incinerator in this project.

Rule 4201 Particulate Matter Concentration

Section 3.1 prohibits discharge of dust, fumes, or total particulate matter into the atmosphere from any single source operation in excess of 0.1 grain per dry standard cubic foot.

The following formula is used to calculate the PM concentration:

$$\text{PM Conc. (gr/dscf)} = \frac{\text{(PM emission rate) x (7,000 gr/lb)}}{\text{(Air flow rate) x (60 min/hr) x (24 hr/day)}}$$

Assuming 100% of PM is PM_{10} (worst case):

PM emission rate = 72.8 lb-PM/day (as calculated in Section VII.C.2 of this document)
Exhaust Gas Flow = 9,300 scfm (minimum rate, per applicant's email dated 7/8/2020)

$$\text{PM Conc. (gr/dscf)} = \frac{\text{(72.8 PM emission rate) x (7,000 gr/lb)}}{\text{(9,300 scfm) x (60 min/hr) x (24 hr/day)}}$$

$$= 0.04 \text{ gr/dscf}$$

Since this is less than 0.1 gr/dscf, compliance with Rule 4201 is expected. Therefore, the following condition will be listed on the ATC to ensure compliance:

- *{14} Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]*

Ash Handling Operation

As implied by the test methods in Section 4.0 of this rule, this rule applies to operations where there is a point of measurable exhaust or air flow, such as from a stack or a fan. However, for the ash handling operation, ash will only be collected after the air curtain fan is turned off and the unit is cooled down for a safe ash cleanup. Therefore, no exhaust or air flow is desired or associated with the ash handling operation and this rule is not applicable to ash handling operation.

Rule 4202 Particulate Matter - Emission Rate

The purpose of this rule is to limit particulate matter (PM) emissions by establishing allowable (PM) emission rates.

Per Section 4.1, particulate matter (PM) emissions from any source operation shall not exceed the allowable hourly emission rate (E, in lb/hr) as calculated using the following applicable formulas:

$E_{max} = 3.59\ P^{0.62}$ (when, P = process weight rate $\leq$ 30 tons/hr)

$E_{max} = 17.31\ P^{0.16}$ (when, P = process weight rate $>$ 30 tons/hr)

Daily process rate is 56 tons per day. Assuming a worst case operation of 24 hours per day (assuming a longer operating time results in smaller hourly rate and smaller E_{max} to comply), the maximum hourly processing rate is:

$P = 56$ ton/day ÷ 24 hr/day

$= 2.33$ ton/hour

The maximum allowable PM hourly emission rate is calculated as follows:

$E_{max} = 3.59 \times P^{0.62}$

$= 3.59 \times 2.33^{0.62}$

$= 6.1$ lb-PM/hr

Based on the daily PE2 calculated in Section VII.C.2 of this document and that 100% PM_{10} is PM, the actual emission rate is:

E_{actual} = 73.2 lb-PM_{10}/day ÷ 24 hr/day x 1 lb-PM/1 lb-PM_{10}

= 3.05 lb-PM/hr

Since the actual PM emissions rate (E_{actual}) is less than the maximum allowable PM emission rate (E_{max}), compliance with this rule is expected. The Rule 2201-based DEL conditions are sufficient to ensure compliance with this rule.

Rule 4301 Fuel Burning Equipment

The purpose of this rule is to limit the emission of air contaminants from fuel burning equipment. This rule limits the concentration of combustion contaminants and specifies maximum emission rates for sulfur dioxide, nitrogen oxide and combustion contaminant emissions.

The provisions of this rule shall apply to any fuel burning equipment except air pollution control equipment which is exempted according to Section 4.0.

The rule defines fuel burning equipment as:

> "any furnace, boiler, apparatus, stack, and all appurtenances thereto, used in the process of burning fuel for the primary purpose of producing heat or power by indirect heat transfer."

The primary purpose of the air curtain incinerator is to dispose of almond processing waste material, not the production of heat or power by indirect heat transfer. The air curtain incinerator

is not *fuel burning equipment* according to the definition in this rule, and, therefore, this rule is not applicable.

Rule 4302 Incinerator Burning

This rule limits air pollution by prohibiting the use of any incinerator except for a multiple-chamber incinerator or one equally effective in controlling air pollution.

From District Rule 1020, Definitions, Section 3.27, a multiple-chamber incinerator is defined as:

> "any source operation, structure, or any part of a structure used to dispose of combustible refuse by burning, consisting of three (3) or more refractory lined combustion furnaces in series, physically separated by refractory walls, interconnected by gas passage ports or ducts, and *employing adequate design parameters necessary for maximum combustion of the material to be burned*. The refractories shall have a pyrometric cone equivalent of at least 17, tested according to the method described in the American Society for Testing Materials, Method C-24.

The purpose of a multiple-chamber incinerator is to minimize the emissions of the products of incomplete combustion, i.e. PM_{10}, CO, and VOC. The secondary and tertiary chambers of a multiple-chamber incinerator accomplish this by re-burning the flue gas from the primary chamber before emitting the exhaust to the atmosphere. The air curtain of the air curtain incinerator performs a function similar to the secondary and tertiary chambers of a multiple-chamber incinerator. Besides oxygenating the fire with forced air and increasing the combustion temperature, the air curtain increases the residency time of the products of incomplete combustion by forming a barrier preventing their immediate escape. The increased residency time causes particles (especially) and gases to be re-burned continually in the flame.

For the disposal of large amounts of agricultural waste material, the District regards the air curtain incinerator as an *equally effective* control device as a multiple-chamber incinerator provided the air curtain is operated according to manufacturer's specifications and operates in compliance with visible emissions limits. Therefore, compliance with this rule is expected.

Rule 4702 Internal Combustion Engines

The purpose of this rule is to limit the emissions of nitrogen oxides (NOx), carbon monoxide (CO), volatile organic compounds (VOC), and sulfur oxides (SOx) from internal combustion engines. This rule applies to any internal combustion engine rated at 25 brake horsepower (bhp) or greater.

Section 5.1 applies to stationary engines rated at least 25 bhp up to and including 50 bhp and used in non-agricultural operations (non-AO). The facility has proposed a 49 bhp Hatz Model 3H50TIC Tier 4 Final certified diesel-fired IC engine to power the fan of the air curtain incinerator (see Appendix B); therefore, this rule is applicable to the IC engine.

Section 5.1.1 states that on and after July 1, 2012, no person shall sell or offer for sale any non-AO spark-ignited engine or any non-AO compression-ignited engine unless the engine meets the applicable requirements and emission limits specified in 40 Code of Federal Regulation (CFR) 60 Subpart IIII (Standards of Performance for Stationary Compression Ignition Internal Combustion Engines) and 40 CFR 60 Subpart JJJJ (Standards of Performance for Stationary Spark Ignition Internal Combustion Engines) for the year in which the ownership of the engine changes.

The proposed 49 bhp Hatz Model 3H50TIC diesel-fired IC engine is Tier 4 Final certified, which meets the applicable requirements and emission limits of 40 CFR Subpart IIII for compression ignited IC engines, as discussed under Rule 4001 discussion in Section VIII of this document. Therefore, requirements of this section are satisfied. In addition, as discussed under Rule 2020, since the proposed engine is less than 50 bhp, it is exempt from District permits.

Section 5.1.2 states that by January 1, 2013, the operator shall submit a one-time report that includes the number of engines at the stationary source, and the following information for each engine:

5.1.2.1 Location of each engine,
5.1.2.2 Engine manufacturer,
5.1.2.3 Model designation and engine serial number,
5.1.2.4 Rated brake horsepower,
5.1.2.5 Type of fuel and type of ignition,
5.1.2.6 Combustion type: rich-burn, lean-burn, or compression ignition,
5.1.2.7 Purpose, and intended use, of the engine,
5.1.2.8 Typical daily operating schedule, and
5.1.2.9 Fuel consumption (cubic feet for gas or gallons for liquid fuel) for the previous one-year period.

The facility has already provided the applicable information above (see Appendix B), except for the serial number which can be verified during startup inspection. Therefore, requirements of this section are satisfied and compliance with this rule is expected.

California Health & Safety Code 42301.6 (School Notice)

The District has verified that this site is not located within 1,000 feet of a school. Therefore, pursuant to California Health and Safety Code 42301.6, a school notice is not required.

California Environmental Quality Act (CEQA)

CEQA requires each public agency to adopt objectives, criteria, and specific procedures consistent with CEQA Statutes and the CEQA Guidelines for administering its responsibilities under CEQA, including the orderly evaluation of projects and preparation of environmental documents. The District adopted its *Environmental Review Guidelines* (ERG) in 2001. The basic purposes of CEQA are to:

- Inform governmental decision-makers and the public about the potential, significant environmental effects of proposed activities;
- Identify the ways that environmental damage can be avoided or significantly reduced;
- Prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governmental agency finds the changes to be feasible; and
- Disclose to the public the reasons why a governmental agency approved the project in the manner the agency chose if significant environmental effects are involved.

Greenhouse Gas (GHG) Significance Determination

District is a Responsible Agency

It is determined that another agency has prepared an environmental review document for the project. The District is a Responsible Agency for the project because of its discretionary approval power over the project via its Permits Rule (Rule 2010) and New Source Review Rule (Rule 2201), (CEQA Guidelines §15381). As a Responsible Agency, the District is limited to mitigating or avoiding impacts for which it has statutory authority. The District does not have statutory authority for regulating greenhouse gas emissions. The District has determined that the applicant is responsible for implementing greenhouse gas mitigation measures, if any, imposed by the Lead Agency.

District CEQA Findings

The County of Tulare (County) is the public agency having principal responsibility for approving the Project. As such, the County served as the Lead Agency for the Project. The County determined the project to be exempt from CEQA according to CEQA Guidelines §15301 Existing Facilities. Consistent with CEQA Guidelines §15062 a Notice of Exemption was prepared and adopted by the County.

The District is a Responsible Agency for the project because of its discretionary approval power over the project via its Permits Rule (Rule 2010) and New Source Review Rule (Rule 2201), (CEQA Guidelines §15381).

The District's engineering evaluation of the project (this document) demonstrates that compliance with District rules and permit conditions would reduce Stationary Source emissions from the project to levels below the District's thresholds of significance for criteria pollutants. Thus, the District concludes that through a combination of project design elements and permit conditions, project specific stationary source emissions will be reduced to less than significant levels. The District does not have authority over any of the other project impacts and has, therefore, determined that no additional findings are required (CEQA Guidelines §15096(h)).

Indemnification Agreement/Letter of Credit Determination

According to District Policy APR 2010 (CEQA Implementation Policy), when the District is the Lead or Responsible Agency for CEQA purposes, an indemnification agreement and/or a letter of credit may be required. The decision to require an indemnity agreement and/or a letter of credit is based on a case-by-case analysis of a particular project's potential for litigation risk, which in turn may be based on a project's potential to generate public concern, its potential for significant impacts, and the project proponent's ability to pay for the costs of litigation without a letter of credit, among other factors.

The criteria pollutant emissions and toxic air contaminant emissions associated with the proposed project are not significant, and there is minimal potential for public concern for this particular type of facility/operation. Therefore, an Indemnification Agreement and/or a Letter of Credit will not be required for this project in the absence of expressed public concern.

IX. Recommendation

Compliance with all applicable rules and regulations is expected. Issue ATC S-634-11-0 subject to the permit conditions on the attached draft ATC in Appendix I**.**

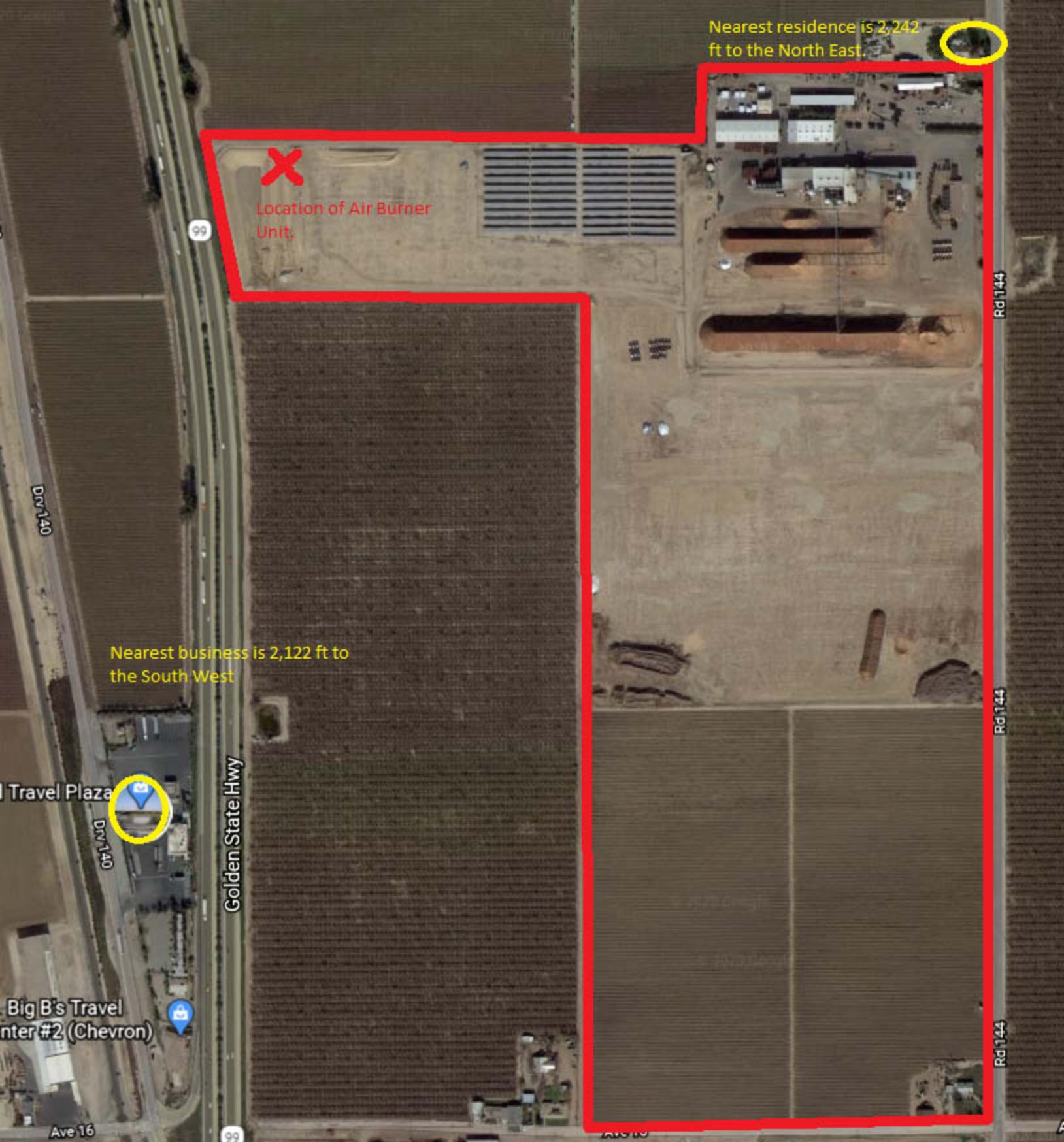
X. Billing Information

Annual Permit Fees			
Permit Number	**Fee Schedule**	**Fee Description**	**Annual Fee**
S-634-11-0	3020-06	Miscellaneous – Air Curtain Incinerator	$128

Appendices

A: Map Location
B: Manufacturer's Specification Sheets
C: Air Curtain Incinerator Emission Factors – District Memo
D: SSPE1 Calculations
E: Quarterly Net Emissions Change (QNEC) & Emissions Profile
F: BACT Guideline
G: BACT Analysis & Supporting Documents
H: HRA Summary
I: Draft ATC S-634-11-0

Appendix A:
Map Location


Nearest residence is 2,242 ft to the North East.
Location of Air Burner Unit.
Nearest business is 2,122 ft to the South West
Rd 144
Rd 144
Rd 144
Drv 140
Drv 140
Golden State Hwy
99
99
Travel Plaza
Big B's Travel
nter #2 (Chevron)
Ave 16

Appendix B:
Manufacturer's Specification Sheet

AirBurners

S220
Tier 4 Final

FIREBOX SPECIFICATIONS

General: A self-contained, completely assembled above ground Air Curtain Burner (air curtain incinerator or FireBox) with a refractory lined burn-container for portable and permanent (stationary) applications. Designed for the high temperature burning of forest slash, agricultural green waste, land clearing debris, storm debris, and other waste streams in compliance with the requirements of US EPA 40CFR60.

Shipped from the factory completely assembled ready for immediate use and does not require disassembly for relocation. The FireBox is also used for disaster recovery and Department of Homeland Security contingencies. Electrically powered version (S220E) available for permanent (stationary) installations.

1	Power	Three-cylinder Turbo Diesel Engine approx. 49 HP, HATZ Model 3H50TIC (Does not require DEF) or equivalent engine; Emissions certified US EPA Tier 4 FINAL; Engine mounted PTO	
2	Burn Container (FireBox)	4" (102 mm) thick refractory wall panels filled with proprietary thermal ceramic material; Two full height refractory rear doors; Two ignition holes; FireBox open to the ground	
3	Safety Systems	Engine over temperature and overspeed shut down; Loss of cooling fluid shutdown; Loss of oil pressure shutdown; Lockable steel front deck security enclosure	
4	Instrument Panel	MBW electronic engine control with preset throttle settings: key switch, tachometer, hour meter, fuel gauge, oil pressure and water temperature and safety shutdown features	
5	Air Supply	Custom heavy duty fan	
6	Fuel Tank	58 Gallon (220L) minimum fuel tank capacity	
7	Transportation & Set-up	Shipped completely assembled; Ready for immediate use; Lifting pads provided for crane lifting; Unit can be dragged onsite on its skids	
8	Options	Ash clean-out rake with standard universal quick disconnect for *Skidsteer* or *Bobcat*; Ember screen; Rough-terrain removable dolly	
9	Average Through-put	5-7 Tons per Hour (Average – See Note)	
10	Fuel Consumption	Approx. 2.0 gal/hr. (7.6L/hr.)	
11	Weight	36,650 lbs. (16,620kg)	
12	Dimensions	Overall Size L × W × H	Fire Box L × W × H
		30' 1" × 8' 6" × 8' 6" (9.2m × 2.6m × 2.6m)	19' 8" × 6' 2" × 7' 1" (6m × 1.9m × 2.2m)

Note:
Achievable through-put depends on several variables, especially the nature of the waste material, the burn chamber temperature and the loading rate.
All weights and dimensions are approximate and metric conversions are rounded. Specifications are subject to change without notice.

AIR BURNERS, INC.
4390 SW Cargo Way • Palm City, FL 34990
Phone 772-220-7303 • FAX 772-220-7302
E-mail: info@airburners.com • www.AirBurners.com

GSA

Rev. 03.17.2020

CALIFORNIA AIR RESOURCES BOARD	MOTORENFABRIK HATZ GMBH & CO. KG	EXECUTIVE ORDER U-R-034-0314 New Off-Road Compression-Ignition Engines

Pursuant to the authority vested in the Air Resources Board by Sections 43013, 43018, 43101, 43102, 43104 and 43105 of the Health and Safety Code; and

Pursuant to the authority vested in the undersigned by Sections 39515 and 39516 of the Health and Safety Code and Executive Order G-14-012;

IT IS ORDERED AND RESOLVED: That the following compression-ignition engines and emission control systems produced by the manufacturer are certified as described below for use in off-road equipment. Production engines shall be in all material respects the same as those for which certification is granted.

MODEL YEAR	ENGINE FAMILY	DISPLACEMENT (liters)	FUEL TYPE	USEFUL LIFE (hours)
2018	JHZXL1.95V50	1.951	Diesel	8000

SPECIAL FEATURES & EMISSION CONTROL SYSTEMS	TYPICAL EQUIPMENT APPLICATION
Electronic Direct Injection, Diesel Oxidation Catalyst, Exhaust Gas Recirculation, Electronic Control Module, Turbocharger, Charge Air Cooler	Crane, Loader, Tractor, Dozer, Pump, Compressor, Generator

The engine models and codes are attached.

The following are the exhaust certification standards (STD) and certification levels (CERT) for non-methane hydrocarbon (NMHC), oxides of nitrogen (NOx), or non-methane hydrocarbon plus oxides of nitrogen (NMHC+NOx), carbon monoxide (CO), and particulate matter (PM) in grams per kilowatt-hour (g/kw-hr), and the opacity-of-smoke certification standards and certification levels in percent (%) during acceleration (Accel), lugging (Lug), and the peak value from either mode (Peak) for this engine family (Title 13, California Code of Regulations, (13 CCR) Section 2423):

RATED POWER CLASS	EMISSION STANDARD CATEGORY		EXHAUST (g/kw-hr)					OPACITY (%)		
			NMHC	NOx	NMHC+NOx	CO	PM	ACCEL	LUG	PEAK
37 ≤ kW < 56	Tier 4 Final	STD	N/A	N/A	4.7	5.0	0.03	N/A	N/A	N/A
		CERT	--	--	4.4	0.5	0.01	--	--	--

BE IT FURTHER RESOLVED: That for the listed engine models, the manufacturer has submitted the information and materials to demonstrate certification compliance with 13 CCR Section 2424 (emission control labels), and 13 CCR Sections 2425 and 2426 (emission control system warranty).

Engines certified under this Executive Order must conform to all applicable California emission regulations.

This Executive Order is only granted to the engine family and model-year listed above. Engines in this family that are produced for any other model-year are not covered by this Executive Order.

Executed at El Monte, California on this 29 day of December 2017.

Annette Hebert, Chief
Emissions Compliance, Automotive Regulations and Science Division

Appendix C:
Air Curtain Emission Factors
District Memo

Air Curtain Incinerator
Emissions Factors Determination

From:	Brian Clerico, AQE II and Errol Villegas, Permit Services Manager
To:	Arnaud Marjollet, Director of Permit Services
Date:	April 4, 2017
Re:	Recommendation for Air Curtain Incinerator Emission Factor Determination for Woody Biomass from Agricultural Sources and Forest Vegetation

---

The purpose of this memo is to examine available test data and recommend emission factors appropriate for an air curtain incinerator (ACI) burning woody biomass derived from agricultural sources and forest vegetation.

1. BACKGROUND

The San Joaquin Valley is a large agricultural region that annually generates hundreds of thousands of tons of woody biomass debris primarily from the pruning and removal of orchards and vineyards. The main historical disposal option for this material has been open burning, but open burning of ag waste has been curtailed by 80% since 2003, largely made possible by the availability of the option of chipping the material and sending it to a nearby biomass power plant.

In recent years, as the biomass power industry has lost its financial and societal support and decreased in numbers from 15 facilities to five today (with none of the five buring much ag waste), the San Joaquin Valley has accumulated a glut of wood material in need of disposal. This excess has been exacerbated by California's recent extreme drought and the bark beetle infestation which has resulted in over 100 million dead trees in the State, mostly in the southern Sierra Nevada, which is in the Valley Air District. For areas where the buildup of wood material has become an acute hazard, air curtain incinerators (ACIs) have become an important disposal option. Within the San Joaquin Valley, CalFire is currently using ACIs for wildfire hazard reduction in forested areas, and an almond huller has received an Authority to Construct to install an ACI to dispose of an accumulation of wood sticks from their almond processing operation. To quantify emissions from ACIs for purposes of permitting and emissions inventory, the most representative emission factors should be used. This memo is intended to identify and recommend the most representative emission factors for ACIs burning woody biomass from agricultural sources and forests.

A number of emission tests have been conducted on ACIs. A table of the emission factors derived from those tests is provided in Table 1 below along with the emission factors for open burning of almond orchard residues and biomass power plants for comparison in Table 2.

In selecting the most representative emission factors, the District was guided by the following considerations:

(1) A limited number of emissions tests have been published to date;
(2) The source test results published show a wide variance;
(3) Air curtain incineration may be regarded as a controlled form of open burning;
(4) The PM10, CO, and VOC emission factors for open burning show a high degree of dependence on the material burned;
(5) The ARB open burn emission factors for agricultural orchard and vine residues provide an upper bound for PM10, CO, and VOC because the visual evidence indicates the ACI is performing significantly better at reducing smoke and visible particulates (and, by extension, other products of incomplete combustion such as PM10, CO and VOC) than open burning of woody biomass derived from agricultural or forest vegetation. The open burn emission factors for almond orchards will be used in Table 2 to represent a type of woody agricultural residue common in the San Joaquin Valley;
(6) The emission factors for biomass power plants controlled by a fabric filter provide a lower bound for PM10 (0.089 lb-PM10/ton)[1];
(7) SOx emissions are entirely material dependent; thus, the open burn SOx emission factors for agricultural orchard and vine crops, or for forests, are also likely the most representative for ACIs.

The emission factors from Table 1 (page 3) were evaluated using the criteria listed above.

A. AP-42, 2.1-12, J.O. Burckle Test from Table 1 (NOx and PM10)

The current AP-42 emission factors for the incineration of wood (cord wood) are based on a pilot scale study from 1968. The unit tested was not a functional ACI but a pilot scale version constructed for the purpose of emissions testing. The maximum temperature reached by the pilot scale firebox was 1,300 ^{0}F, which is approximately 300 to 900 ^{0}F less than an ACI in the field. The PM10 emission factor resulting from this study is higher than the ARB and AP-42 PM10 emission factors in Table 2 for the open burning of almond orchard wood, which is a representative type of orchard wood waste for the San Joaquin Valley. The NOx emission factor obtained was 4 lb-NOx/ton, which is much higher than any of the tests on actual ACIs and similar to open burn emission factors for NOx from Table 2.

[1] The seven most recent source tests for the biomass power plants Merced Power and Ampersand Chowchilla showed an average PM10 emission rate of 0.089 lb-PM10/ton. This average source test value is a more representative estimate of the PM10 emissions from biomass plants than the permitted value (0.61 lb-PM10/ton). As a comparison, a boiler fired on dry wood with a heating value of 7,610 Btu/lb has an uncontrolled emission rate of 5.5 lb-PM10/ton (Table, 1.6-1), which is approximately the same emission factor for open burning of orchard agricultural residues.

The emission factors from this study were not considered representative for an ACI burning woody biomass derived from agricultural sources or forests for the following reasons:

(1) The unit tested was not an actual ACI;
(2) The maximum combustion temperatures were lower than a typical ACI;
(3) The AP-42 ACI PM10 emissions factor is higher than the open burn PM10 emission factors for most agricultural sources (Table 2); and
(4) The NOx emission factor is significantly higher than any of the air curtain tests (note that lower combustion temperatures would be expected to lead to lower NOx emissions, adding an additional degree of caution regarding the results of this test).

2. ASSESSMENT OF SOURCE TESTS RESULTS

Table 1 below summarizes the emission factors derived from source tests conducted on ACIs. For comparison, Table 2 summarizes the generally accepted emission factors for open burning and for biomass power plants.

Table 1 - Emissions Test Results of Air Curtain Incinerators

Test	Material	Year	NOx (lb/ton)	SOx (lb/ton)	PM10 (lb/ton)	CO (lb/ton)	VOC (lb/ton)	Notes
AP-42, 2.1-12, J.O. Burckle	Wood and cord wood	1968	4	-	13	-	-	Pilot Scale Box Trench Burner, Max temp 1,300 F.
Fountainhead Engineering, Michigan	Wood	2000	Not reported*	Not reported	0.12	1.1	Not reported	Modified EPA Methods.
USDA, Baker Oregon, (Air Curtain S-217)	**Forest vegetation**	**2002**	Not measured	Not measured	**1.1 (PM2.5)**	**2.6**	**1.1**	**Missoula Fire Science Lab**
USDA, San Bernardino (McPherson M30)	**Forest vegetation**	**2003**	**Not measured**	**Not measured**	**1.4 (PM2.5)**	30	**0.6**	**Missoula Fire Science Lab**
BC Hydro, Jordan River British Columbia	Wood	2003	0.04	0.0031	0.13	0.61	0.11	Modified EPA Methods and Canadian Methods
Victoria, Australia	Wood	2016	0.27	0.23	0.0064	4.2	0.096	(US)EPA Methods
US EPA – Hurricane Katrina	Vegetative material	2016	1.6	0.49	7.7	6.9	0.41	See Attachment A, Table 5-1 for NOx, SOx, CO, and VOC; Table 5-4 for PM10

* The Victoria, Australia test indicated the Fountainhead test showed 0.05 lb-NOx/ton, but this was not confirmed by the Valley Air District.

Table 2 – Emission Factors for Biomass Open Burn and Biomass Power Plant

Source	Material	Year	NOx (lb/ton)	SOx (lb/ton)	PM10 (lb/ton)	CO (lb/ton)	VOC (lb/ton)	Notes/ Documentation
Open Burn – ARB	**Almond**	1992	5.9	**0.1**	7.0	52	5.2	ARB Memo
Open Burn – ARB	Forest	Not indicated	3.5	0.1	19 - 30	154 - 312	8 - 21	ARB Memo
Open Burn – AP-42	Almond	1974	-	-	6 (PM)	46	6	AP-42, Table 2.5-5
Open Burn – AP-42	Forest	1995	4 (est.)	-	17	140	19	AP-42, Table 2.5-5
Merced Power (N-4607-8) & Ampersand Chowchilla (C-6923-3)	Biomass	-	1.2 (1.1)	0.61 (0.033)	0.61 (0.089)	0.87 (0.25)	0.076	Permitted EFs (top) and average of seven source tests (indicated in parentheses) of two active biomass power plants

B. Fountainhead, Table 1 (PM10, CO)

The Fountainhead study was conducted in October, 2000 in Clarkston, Michigan using a Whitton Model S-127 ACI having a 15-18 ton per hour capacity, burning wood debris. The nature of the wood debris is not described, but the location of the test is in a forested region of Michigan. The test will therefore be considered in this analysis to establish representative emission factors for agricultural sources and forest vegetation.

The PM10 emission factor (0.13 lb-PM10/ton) from the Fountainhead test is only slightly greater than the average PM10 emission factor (0.089 lb-PM10/ton) measured from the seven most recent source tests of the biomass power plants Merced Power (N-4607-8) and Ampersand Chowchilla (C-6923-3), which have a fabric filter for PM10 control. The fabric filter has been established as the highest level of PM10 control for biomass combustion through extensive emissions testing with District oversight. In general, fabric filters are expected to achieve at least 99% control for PM10.

For open burning of almond orchard wood, the accepted PM10 emission factor is 7.0 lb-PM10/ton. When compared to the 0.13 lb-PM10/ton emission factor from the Fountainhead test, the ACI would appear to have achieved over 98% control efficiency, which is comparable to the fabric filter control efficiency rate used to control biomass combustion emissions. The District at this point does not believe that sufficient information is available to overrule the District's doubt that an ACI can achieve a nearly equal level of PM10 emission control as a high efficiency fabric filter.

For instance, ACIs are known to have visible emissions during the approximately 10 - 30 minute start-up period before the air curtain is engaged, when the combustion process is presumably roughly equivalent to an open burn. Also, when new material is added to the firebox, the flow of the air curtain is broken, and the ACI emits a puff of smoke. The fabric filter does not have such gaps associated with its effectiveness as a PM10 control device. Moreover, it is uncertain whether the emission factor adequately accounts for the periodic puffs of smoke from loading because the sampling probe is positioned for the maximum firebox exit velocity during steady-state operation of the air curtain, which is usually at the edge of the firebox opposite the air manifold, whereas the puff of smoke occurs above the material drop point, typically more toward the middle of the firebox.

These considerations lead one to believe that the ACI emission factor for PM10 should be higher than the biomass power plant emission factor for PM10.

C. BC Hydro, Table 1 (NOx, SOx, PM10, CO, and VOC)

The BC Hydro study was conducted in March, 2003 in Jordon River, British Columbia using an Air Burners Inc. Model S-116 ACI loaded between 4 – 8 metric tonnes per hour, burning wood debris. Although the nature of the wood debris is not described, the location of the test is in a forested region of British Columbia. The test will therefore be considered in this analysis to establish representative emission factors for agricultural sources and forest vegetation.

Similar to the Fountainhead results, the PM10 emission factor from BC Hydro (0.12 lb-PM10/ton was roughly equivalent to the average PM10 emission factor from biomass power plants. As discussed above, the District believes that the ACI emission factor for PM10 is likely higher than the fabric filter controlled biomass power plant emission factor for PM10.

The BC Hydro test also reported a NOx emission factor (0.04 lb-NOx/ton) that is significantly lower than the average emission factor (1.1 lb-NOx/ton) from seven recent source tests conducted on the biomass power plants using selective non-catalytic reduction (SNCR) with ammonia injection as a NOx control. NOx reduction levels from SNCR range from 30 to 50% according to EPA's Fact Sheet (EPA-452/F-03-031). It follows then that the BC Hydro NOx emission test would appear to represent a 99% reduction in NOx compared to open burn and a 96% reduction compared to the biomass boiler already controlled by SNCR.

Two possible explanations for the lower NOx emission factors from the ACI tests are that the biomass power plants burn plant material that is higher in nitrogen (i.e. fuel NOx) or that the boiler operates at a higher combustion temperature (i.e. thermal NOx). An analysis of the nitrogen content of the plant material burned in the biomass boiler versus the nitrogen content of the plant material burned in the ACI would need to be performed to establish that the fuel is the source of the difference in NOx emissions.[2] A comparison of peak operating temperatures does not suggest that the air curtain would produce less thermal NOx. Biomass boilers may reach temperatures of 1,850 ºF; whereas an ACI can reach temperatures over 2,000 ºF. Factors other than temperature, such as residence time in the combustion hot zones, may account for differences in thermal NOx emissions, but the District is not aware that this speculative explanation has been demonstrated. These considerations lead the District to believe that the NOx emission factor for an ACI should be significantly higher than recorded in this test.

D. Victoria, Australia, Table 1 (NOx, SOx, PM10, CO, and VOC)

The Victoria study was conducted in February, 2016 at a recycling plant. The material burned was "clean" wood, i.e. vegetative material and uncoated wood pallets, at a rate of 4.2 metric tonnes per hour. Therefore, this source test will be considered in this analysis to establish emission factors for agricultural sources and forest vegetation.

The PM10 emission factor from the Victoria test (0.0064 lb-PM10/ton) was significantly lower than the average PM10 emission factor (0.089 lb-PM10/ton) measured from biomass power plants. For the reasons discussed above, this PM10 emission rate cannot be used at this time.

[2] Extensive Operating Experiments on the Conversion of Fuel-Bound Nitrogen into Nitrogen Oxides in the Combustion of Wood Fuel, *Forests* **2017**, 8, 1. For timber wood having nitrogen content between 0.04 and 1.2%, the conversion of nitrogen to NOx ranged from approximately 66% to 15%, respectively, i.e. the rate of nitrogen to NOx conversion decreased exponentially with increasing nitrogen content.

The Victoria test also reported a NOx emission factor (0.27 lb-NOx/ton) that is significantly lower than recent source tests conducted on the biomass power plants using selective non-catalytic ammonia injection as a NOx control. Similar to the BC Hydro test results, the District believe that the NOx emission factor for an ACI should be significantly higher than recorded in this test.

E. USDA, Baker, Oregon from Table 1 (PM10, CO, and VOC)

USDA performed an ACI emission study in October, 2002 in Baker, Oregon, using an Air Curtain Inc. Model S-217 ACI, having a capacity of 6 tons per hour. The material burned was Ponderosa Pine trees. The test will therefore be considered in this analysis to establish representative emission factors for agricultural sources and forest vegetation.

The PM10 emission factor obtained from the USDA Baker, Oregon test is 1.15 lb-PM10/ton, which is the third highest PM10 emission factor of all the source tests conducted on actual ACIs.

The USDA source tests measured PM2.5. This was converted into a PM10 emission factor by using the ratio of PM10 to PM2.5 from ARB open burn emission factors for almond agricultural residues. For almond agricultural residues, the ratio of PM10 to PM2.5 is 7.0 lb-PM10/ton to 6.7 lb-PM2.5/ton. Therefore 1.1 lb-PM2.5/ton × (7.0 lb-PM10/ton ÷ 6.7 lb-PM2.5/ton) = 1.15 lb-PM10/ton

This emission factor is an order of magnitude larger than the PM10 emissions measured for the biomass power plants (0.089 lb-PM10/ton), which are controlled by a fabric filter, and yet lower than the emission factor for open burning of almond wood (7.0 lb-PM10/ton), which is an uncontrolled source. As the ACI is a controlled form of open burning, it is reasonable that the PM10 emission factor for an ACI would be lower than the PM10 emission factor for open burning. Thus, the USDA emission factor for PM10 falls between the expected upper bound (uncontrolled open burning) and lower bound (biomass power plant with a fabric filter).

As PM10, CO and VOC are the products of incomplete combustion, acceptance of the PM10 emission factor implies an acceptance of the CO and VOC emission factors as well.

The USDA study did not include NOx or SOx emission factors.

F. USDA, San Bernardino from Table 1 (PM10, CO, and VOC)

USDA performed a second ACI emission study in June, 2003 in San Bernardino (Lake Arrowhead), California, using a McPherson Model M30 ACI burning forest vegetation. The burn rate (tons per hour) of the unit was not identified. The test will therefore be considered in this analysis to establish representative emission factors for agricultural sources and forest vegetation.

The PM emission factor obtained from the San Bernardino study is 1.46 lb-PM10/ton, similar to the Baker, Oregon study above.

The USDA source tests measured PM2.5. This was converted into a PM10 emission factor by using the ratio of PM10 to PM2.5 from ARB open burn emission factors for almond agricultural residues. For almond agricultural residues, the ratio of PM10 to PM2.5 is 7.0 lb-PM10/ton to 6.7 lb-PM2.5/ton. Therefore 1.4 lb-PM2.5/ton × (7.0 lb-PM10/ton ÷ 6.7 lb-PM2.5/ton) = 1.46 lb-PM10/ton

For CO, the reported emission factor was 30 lb-CO/ton, which is an order of magnitude higher than the CO emission factor reported for the Baker, Oregon study and more than four times larger than the next highest reported CO emission factor in Table 1.

The San Bernardino report includes tables comparing the Baker, Oregon results to the San Bernardino results. Those tables also show the CO emission factor for the Baker, Oregon study to be ten times larger, i.e. 26 lb-CO/ton than originally reported. It should be noted that the Baker, Oregon study and the San Bernardino study have different lead authors, and no mention is made in the report of USDA making a correction to the originally reported CO emission factor from the Baker, Oregon study. USDA has not responded to requests for clarification of this matter. Norbert Fuhrmann, Vice President of Air Burners, Inc. disputed the 26 lb-CO/ton emission factor in the San Bernardino report, stating that the originally reported value from Baker, Oregon of 2.6 lb-CO/ton was correct and that an error in the placement of the decimal had likely been made in the San Bernardino report. If Mr. Fuhrmann's contention is correct, the CO emission factors from the USDA studies would agree better with the other ACI CO emission factors reported in Table 1. Nevertheless, since USDA has not issued a correction for the San Bernardino CO emission factor, the District will regard the reported value of 30 lb-CO/ton as the official value from this study.

As noted at the beginning of this analysis, the District is primarily concerned with choosing the most representative emission factors for an ACI incinerating woody biomass derived from agricultural sources and forests. The CO emission factor reported in the San Bernardino study (30 lb-CO/ton) is roughly the same order of magnitude as the open burn emission factors in Table 2 for almond wood (e.g. 46 lb-CO/ton and 52 lb-CO/ton). Since the available data suggests that the ACI should perform an order of magnitude better than open burning for the products of incomplete combustion (i.e. PM10, CO and VOC), the CO emission factor from this study will not be considered representative for an ACI burning woody biomass derived from agricultural sources or forests.

In ATC project N-1162806, for an ACI burning almond sticks at an almond huller, the concern about the representativeness of the CO emission factor in the San Bernardino study extended to the other pollutants measured in that study (PM2.5 and VOC). One of the criteria for selecting emission factors in the ATC project was to accept or reject emission factor sets for PM10, CO and VOC because of the assumption that the emission factors of these pollutants are related as the products of incomplete combustion. Therefore, none of the reported emission factors from San Bernardino were used in the ATC project. However, since other emission factor sets of PM, CO and VOC have been evaluated based on the reported PM emission factor, and PM

emission factor from the San Bernardino study is comparable to the Baker, Oregon study, the District has now reconsidered the use of the PM and VOC emission factors from the San Bernardino study.

Therefore, in this memo, the District will include the PM and VOC emission factors from the San Bernardino study with the Baker, Oregon study as representative for the burning of woody biomass derived from both agricultural sources and forests.

The USDA study did not include NOx or SOx emission factors.

G. Assessment of EPA "Katrina" Study (NOx, SOx, PM10, CO, and VOC)

The District received a draft copy of EPA's *Managing Debris after a Natural Disaster: Evaluation of the Combustion of Storm-Generated Vegetative and C&D Debris in an Air Curtain Burner: Source Emissions Measurement Results*, November 17, 2016 (see Attachment A). The study measured emissions and estimated emission factors for an ACI burning vegetative and construction and demolition debris in 2008 as part of the cleanup from Hurricane Katrina. Three test runs of the emissions from vegetative debris and three test runs for construction and demolition debris were measured separately.

Based on the District's analysis of EPA's document (Attachment B), the District concluded that the emission factors from EPA's study are likely overstated and cannot be found to be representative of the emissions from incineration of the agricultural or forest wood biomass in California. Therefore, the results of this test are not recommended to be used in future permitting actions for air curtain incinerators in the District and will not be discussed any further.

3. EMISSION FACTOR DETERMINATION

Based on the following reasons, a single set of ACI emission factors will be recommended for use for both agricultural wood (such as orchard pruning, almond sticks, orchard removals, etc) and forest vegetation (such as large parts of tree trunk, branches and other woody materials):

(1) There are no published ACI emission studies specific to agricultural wood; all the available ACI studies are based on forest vegetation or a mix of forest vegetation and generic wood (e.g. wood pallets).

(2) The USDA studies that are the basis of the PM10, CO, and VOC emission factors recommended in Table 3 below burned forest vegetation, with can be large sections of trunks and small wood. Among the ACI tests considered as potentially representative, the USDA studies produced the highest PM10 and VOC emission factors.

(3) The ARB (August 17, 2000 Memorandum) open burn emission factors for the products of incomplete combustion (i.e. PM10, CO, and VOC) are generally higher

for forest vegetation than for agricultural materials. Since ACI may be considered a controlled form of open burning, the same pattern present in the open burn emission factors may be expected in the ACI emission factors so use of emissions factors for forest debris is likely to conservatively overstate emissions from agricultural waste.

(4) The SOx emission factor is entirely material dependent, and the SOx emission factor for open burning orchard and vineyard residues is the same as for forest vegetation.

(5) The open burn emission factors for NOx for orchard and vineyard wood residues are higher than the NOx open burn emission factor for forest wood. When taken with point (1) above, this means that a single NOx emission factor based on a forest vegetation test may be too low if it is also used to represent woody agricultural residues. However, the District's estimated NOx emission factor includes a compliance margin that more than compensates for the potential greater NOx emissions from woody agricultural residues.

Based on the analysis presented in Section 2 above, the District has determined the following emission factors to be appropriately conservative and representative for the burning of woody biomass derived from agricultural sources and forest vegetation in an ACI.

NOx

Only the BC Hydro and Victoria ACI emissions tests reported a NOx emission factor. However, for the reasons discussed in Sections 2D and 2E above, the emission factors derived from those tests appear to be insufficiently conservative when compared to the NOx emission factor for a biomass boiler.

Therefore, the District estimated a more conservative NOx emission factor of 1.0 lb-NOx/ton by multiplying the emission factors reported by BC Hydro and Victoria by a ratio of concentrations. The numerator in this ratio was based on NOx concentration measurements from a 2007 EPA study, Emissions from the Burning of Vegetative Debris in Air Curtain Destructors, J. AWMA, 57, 959-967. This 2007 EPA study did not include measurements of exhaust flow rate or tons of vegetative debris burned; therefore, no emission factors could be derived from the study by itself.

Although the open burn emission factors for NOx for orchard and vineyard residues is higher than the NOx open burn emission factor for forest vegetation by a factor of 1.5 to 1, the District's estimated NOx emission factor is almost 4 times higher than the highest NOx emission factor measured among the potentially representative ACI emissions tests. Therefore, the recommended NOx emission factor provides a sufficient compliance margin to allow for the potential that smaller sized wood pieces from agricultural sources would burn hotter in an ACI, and potentially producing more thermal NOx, than large wood pieces from forest vegetation.

See Attachment C for the derivation of the 1.0 lb-NOx/ton emission factor.

SOx

Since SOx emissions are entirely dependent on the sulfur content of the material burned, the most representative SOx emission factor for an ACI burning woody biomass derived from agricultural sources and forests will be the same as for open burning of those materials, i.e. 0.1 lb-SOx/ton (ARB Memo, "Agricultural Burning Emission Factors," 2000).

PM10

Our current engineering judgement is that PM10 emissions from the combustion of woody biomass in ACIs should be higher than PM10 emissions from a biomass power plant controlled by a fabric filter baghouse. Although there is a growing body of evidence that ACIs are capable of achieving complete combustion with minimal PM10 emissions, to remain conservative when establishing a PM10 emission factor for ACI, the District is recommending the use of the higher PM10 emissions factors derived from the USDA studies in Baker, Oregon and San Bernardino.

The emission factors from the USDA Baker, Oregon (1.15 lb-PM10/ton) and USDA San Bernardino (1.46 lb-PM10/ton) studies are the second and third highest PM emission factors among the full scale ACIs tested, and the only PM emission factors that are lower than the PM10 emission factors for uncontrolled open burning of woody agricultural and forest biomass and higher than the PM10 emission factor for a biomass power plant with fabric filter for PM10 control.

The average PM10 emission factor for the USDA tests is (1.15 lb-PM10/ton + 1.46 lb-PM10/ton)/2 = 1.3 lb-PM10/ton.

Therefore, the 1.3 lb-PM10/ton emission factor derived from the two USDA studies will be accepted as the most representative and conservative PM emission factor for the burning of woody biomass from agricultural sources and forests in an ACI.

CO

As PM10, CO and VOC are all the products of incomplete combustion, acceptance of the PM10 emission factor from the USDA Baker, Oregon study implies an acceptance of the CO emission factor (2.6 lb-CO/ton) as well. The CO emission factor from the San Bernardino study was not included for reasons discussed in Section 2F of this memo. Among the full scale ACIs tested, the Baker, Oregon study produced the median value for a CO emission factor.

VOC

As PM10, CO and VOC are all the products of incomplete combustion, acceptance of the PM10 emission factors from the USDA studies implies acceptance of the VOC emission factors, as well (1.1 lb-VOC/ton and 0.6 lb-VOC/ton, with an average of 0.9 lb-VOC/ton). Among the full scale ACIs tested, the USDA studies produced the highest two emission factors for VOC.

CONCLUSION

Table 3 below summarizes the emission factors selected from the determination above for an ACI burning woody biomass derived from agricultural sources and forest vegetation.

Table 3: Emission Factors for Air Curtain Incinerator Burning Woody Biomass (Agricultural Sources and Forest Vegetation)		
Pollutant	**Emission Factor (lb/ton)**	**Source**
NOx	1.0	SJV Estimation Using/Averaging Data from Multiple Studies, Attachment B
SOx	0.1	ARB Open Burn for Orchard and Vine Crops and Forest Biomass, Table 2
PM10	1.3	Average of USDA Baker, Oregon and USDA San Bernardino Air Curtain Tests, Table 1
CO	2.6	USDA, Baker, Oregon Air Curtain Test, Table 1
VOC	0.9	Average of USDA Baker, Oregon and USDA San Bernardino Air Curtain Tests, Table 1

Please note, as discussed in Section 2F above, the USDA San Bernardino ACI study was not included in the emission factor determination for Authority to Construct (ATC) project N-1162806, for an ACI burning almond sticks at an almond huller. The PM10 and VOC emission factors in that project were 1.1 lb-PM10/ton and 1.1 lb-VOC/ton (based on USDA Baker, Oregon).

Table 4 below includes a wood ash handling emission factor, which is for the combined activities of unloading from a dump truck and spreading coal fly ash at a landfill.

Table 4: Emission Factor for Wood Ash Handling		
Pollutant	**Emission Factor (lb/ton)**	**Source**
PM10	0.23[3]	Fugitive particulate emission factors for dry fly ash disposal, Journal of the Air & Waste Management Association, 63(&): 806-818, 2013

Attachment A: Managing Debris after a Natural Disaster, EPA's Evaluation of Air Curtain Incinerator Emission Source Test Results
Attachment B: Managing Debris after a Natural Disaster, SJVAPCD's Analysis of EPA's Air Curtain Incinerator Study
Attachment C: Derivation of NOx Emission Factor for Air Curtain Incineration of Woody Biomass

[3] The emission factor was reported as 18 g/Mg for PM2.5 and 96 g/Mg for PM10 – PM2.5. Thus, the total PM10 emission factor is 18 g/Mg + 96 g/Mg = 114 g/Mg. 114 g/Mg = 114 lb/10^6 lb × 2,000 lb/1 ton = 0.228 lb-PM10/ton or 0.23 lb-PM10/ton.

Attachment A

Managing Debris after a Natural Disaster: EPA's Evaluation of the Combustion of Storm-Generated Vegetative and C&D Debris in an Air Curtain Burner:

Source Emissions Measurement Results
(November 17, 2016)

Managing Debris after a Natural Disaster, EPA Air Curtain Emissions Study (11-17-2016).pdf

Attachment B

Managing Debris after a Natural Disaster: Evaluation of the Combustion of Storm-Generated Vegetative and C&D Debris in an Air Curtain Burner:

SJVAPCD Analysis of EPA's Air Curtain Incinerator Study

Analysis of EPA's Air Curtain Incinerator Study

From: Brian Clerico, AQE II

To: Arnaud Marjollet, Director of Permit Services

Reviewed by: Errol Villegas, Permit Services Manager

Date: March 10, 2017

Re: Evaluation of EPA's Air Curtain Incinerator Study: *Managing Debris after a Natural Disaster: Evaluation of the Combustion of Storm-Generated Vegetative and C&D Debris in an Air Curtain Burner: Source Emissions Measurement Results*, November 17, 2016

Background

The District received a draft copy of EPA's *Managing Debris after a Natural Disaster: Evaluation of the Combustion of Storm-Generated Vegetative and C&D Debris in an Air Curtain Burner: Source Emissions Measurement Results*, November 17, 2016 (see **Attachment A**). The study measured emissions and estimated emission factors for an air curtain incinerator (ACI) burning vegetative and construction and demolition debris in 2008 as part of the cleanup from Hurricane Katrina. Three test runs of the emissions from vegetative debris and three test runs for construction and demolition debris were measured separately.

The District's interest in evaluation of this test is in its potential applicability to assessing emissions from Air Curtain Burners that may be employed in and around the San Joaquin Valley to burn vegetative material, such as may be necessary to process over 100 million trees that have died in surrounding forests due to California's recent extreme drought. Therefore, in evaluating the source test results from this EPA study, the District focused solely on the test runs pertaining to vegetative debris.

EPA Air Curtain Incinerator Draft Emission Factors

Table 1 summarizes the emission factors obtained from this study.

Table 1: EPA Emission Factors for Air Curtain Incinerator (Vegetative Debris)		
Pollutant	**Emission Factor (lb/ton)**	**Source**
NOx	1.6	*Managing Debris after a Natural Disaster: Evaluation of the Combustion of Storm-Generated Vegetative and C&D Debris in an Air Curtain Burner: Source Emissions Measurement Result*, Table 5-1 for NOx, SOx, CO, and VOC; Table 5-4 for PM10. See Attachment A
SOx	0.49	
PM10	7.7	
CO	6.9	
VOC	0.41	

Analysis

The District has identified the following concerns with EPA's draft emission factors for vegetative debris:

(1) The vegetative debris in the study is not representative of the types of agricultural or forest wood material in California that would be disposed of in an ACI.

The vegetative debris incinerated consisted of material that had been submerged in brackish water for an unknown amount of time before it was recovered and brought to the test site. Section 3.2.1 Feed Debris from the report describes the vegetative material incinerated as follows:

> *It must be noted that the vegetative debris used for fuel was recovered as part of the Hurricane Katrina response and* ***had sat in brackish water for an unknown period of time prior to being recovered and brought to the test site****. The debris used in the tests therefore was likely representative of much of the vegetative debris recovered during hurricane response activities, where the debris was exposed to salt water for extended periods of time. This uncontrollable variable may have influenced emissions of chlorinated organic compounds including chlorinated benzenes and phenols as well as polychlorinated dibenzo-p-dioxins and polychlorinated furans.*

Given the known dependence of PM10, VOC, CO, and SOx emission factors on the material burned, emission factors derived from vegetative debris soaked in salt water cannot be treated as universally applicable to all biomass materials.

(2) The pollutant mass emission rates are a function of the measured pollutant concentrations multiplied by total flow rate from the air curtain firebox. EPA's calculated flow rates used to derive the pollutant mass emission rates may be overstated by a factor of 3 - 6.

That EPA's calculated flow rates may be overstated can be seen by a comparison of the calculated "slot" (or linear) velocity derived from the calculated flow rates being 3 to 6 times higher than the measured slot velocity for the same make and model ACI operated by EPA burning the same material in a 2007 study

EPA published a 2007 study of limited testing of the Air Burners Model S-327 ACI burning hurricane Katrina vegetative debris in Emissions from the Burning of Vegetative Debris in Air Curtain Destructors, J. AWMA, 57, 959-967. In that study, EPA noted the following:

> *Velocity measurements suggest that the exhaust flow is occurring in a relatively narrow area along the length of the unit on the side opposite the blower (see Figure 5). Measurements of 15 fps [i.e. 15 ft/s] in this narrow area were close to the estimated temperature adjusted flow velocity based on the ACD fan output.*

The "narrow area" referred to above is an 18 inch-wide slot running the length of the ACI. The measured velocity beyond this slot is 0 f/s, meaning all the exhaust exits the firebox along this slot opposite the blower. This is a finding corroborated by other ACI studies. The 15 ft/s appears to be an average slot velocity measurement, uncorrected for temperature, although the exact temperature corresponding to this velocity is unclear.

EPA did not perform velocity measurements in the draft ACI emission factor study; however, EPA did make use of the findings from the 2007 study to design their sample collection scoop for the ACI emission factor study:

> *The entry face of the extraction scoop was 18 inches by 5 inches, with the longer dimension spanning the final 18 inches of the ACB firebox width on the side opposite the blower plenum as shown in Figure 2-2. This 18-inch span along the length of the ACB represents the area where, from earlier flow determinations on an identical burner, essentially all the combustion product gases exit the firebox. With this experience in mind, and the earlier measurement of 15 ft/sec bulk velocity in that 18-inch span, estimated extraction scoop isokinetic variation during the sampling runs was calculated. During the test program, isokinetic variation was between 47.8% and 90.9%, with an average of 65.9%.[Section 3.2.3]*

Using the calculated flow rates from the emission factor study, an average slot velocity can be calculated. EPA's calculated flow rates from the firebox are based on a mass balance calculation of carbon (Section 3.4 of the EPA report in Attachment A). Taking the average calculated flow rates from Table 3-2 of the report (104,147 dscfm) and dividing by the area of the slot (27 feet by 1.5 feet), yields and average slot velocity of 43 ft/s at 68 ºF, or 94 ft/s at 700 ºF (average scoop temperature along the slot). Since the slot velocity is directly proportional to the average volumetric flow rate, if the volumetric flow is overstated by a factor of 3 (43 ft/s ÷ 15 ft/s) to 6 (94 ft/s ÷ 15 ft/s), then so too will be the emission factors, which are based on the calculated flow rates.

One possible objection to this comparison of the calculated versus the measured slot velocities would be that we do not know the feed rate to the ACI when the velocity measurements were made in the EPA 2007 study. If the feed rates during the slot velocity measurements in the 2007 study were low in comparison to the feed rates during the emission measurements in the emission factor study, then the claim above is not valid. We do know, however, that during the emission factor study, the feed rates to the ACI were reported as 4.8 ton/hr, 4.8 ton/hr and 6.8 ton/hr. Air Burners Model S-327 ACI has a capacity of 6-10 tons/hr. Thus, the feed rates to the ACI during the emission factor study were either below the rated capacity of the unit or on the low side. It seems unlikely during the 2007 study, EPA would have operated the ACI at a feed rate 3 to 6 times lower, i.e. 1 – 2 ton/hr, to account for the observed difference in the measured to the calculated velocities.

(3) The high SOx emission factor suggests a possible overstatement of all the emission factors by a factor of 4 - 5.

The draft SOx emission factor (0.49 lb/ton) is more than twice the next highest reported emission factor for an ACI and almost five times the open burn value for almonds or forest material.

Since SOx emissions are purely a function of the sulfur content of the material burned, the high SOx emission factor could be another indicator that the emission factors are high across the board by a factor of four to five because of EPA's flow rate calculation estimation procedure above. An alternative explanation for the high sulfur is that the wood burned could have a considerable amount of sulfur contamination from being submerged in brackish water for an unknown amount of time; however, this could raise concerns of the representativeness of the emission factors for material not subjected to the same conditions.

On the other hand, when coupled with concern number 2, above, the weight of evidence starts to lead to a conclusion that the emissions factors are significantly overestimated.

The following concerns relate specifically to EPA's particulate matter (PM10) emission factor.

(4) EPA's proposed PM10 emission factor is greater than the currently accepted emission factor for open burning of almond wood as well as many other agricultural materials.

The emission factors for open burning of almond wood (6 lb-PM/ton, AP-42, Table 2.5-5; or 7.0 lb-PM10/ton, ARB Memo, "Agricultural Burning Emission Factors," August 17, 2000) are lower than EPA's proposed air curtain emission factor (7.7 lb-PM10/ton). For the same material burned, we believe all parties should agree that the PM10 emission factor for the ACI should be significantly lower than the emission factor for open burning. At a minimum, this suggests that EPA's proposed emission factor cannot be universally applied to all wood materials.

When considered in conjunction with concerns 2 and 3 above, and the expectation of actual control of PM10 emissions when comparing ACI to open burning (prior tests demonstrated a control efficiency of 54% to 99+%), the weight of evidence continues to grow that emissions estimates from this study are likely and significantly overstated.

(5) *The hurricane occurred in August 2005, whereas the vegetative debris was retrieved and tested in June 2008. Thus vegetative debris/wood may have been submerged in brackish water for up to three years prior to being sent to the air curtain for incineration. The salt water likely left a residue of salts (i.e. inorganic species) precipitated on and in the wood, which would increase the measured PM concentrations. Possible effect on PM10 EF: 30% too high.*

The PM fraction contained a relatively high amount of inorganic condensable PM (EPA report, Table 5 – 4: 38% weighted average; 51% in Run 1 and 26% in Run 2, Run 3 not reported). The report noted a variety of chlorinated organics found in the air toxics analysis. The predominant anionic species in salt water is chloride ion, which could be the source of the elemental chlorine in the chlorinated organics observed. Wood is porous, so salts containing chloride ion could infiltrate and precipitate on the wood over time. The presence of salts in combustion processes are known to produce condensable PM, which can be seen in detached white plumes. This phenomenon would be consistent with the opacities recorded in this study, which were higher than in other air curtain tests: e.g. Run 3 failed opacity (using NSPS Subpart EEEE standard). One potential cause for higher opacity could be associated with overloading the air curtain firebox; however, the higher opacities cannot be due to overloading because according to Air Burners Inc., the model air curtain has a capacity of 6-10 tons/hour, but in the Katrina study, it was fed at an average rate of 4.8 tons/hr.

Additionally, for open burning, wet wood is known to produce more smoke than dry wood. According to the moisture analysis EPA performed on the vegetative debris burned, the water content was not more than 30%, which is similar to “green” wood. In conversation with District staff, Air Burners, Inc. has claimed that the ACI should be able to burn green wood and maintain compliance with NSPS visible emission limits of 10% opacity or less. As a reference, District Rule 4901, Wood Burning Fireplaces and Wood Burning Heaters, which is a PM rule, prohibits the sale of wood having greater than 20% moisture. For comparison, the average moisture content of almond tree derived biomass = 18% according to the ARB agricultural burning emission factors memo.

(6) *The average isokinetic variation (ratio of $Velocity_{sample}/Velocity_{“stack”}$) was 65.9%. Estimated effect on PM10 EF: 10%+ too high.*

A low isokinetic % means the measured PM value is higher than the actual PM value (https://www.arb.ca.gov/testmeth/vol1/vol1suppl.doc). 90 – 110% (or under some conditions 80 – 120%) is the normal acceptable quality control range. The magnitude of error depends on a number of variables, especially particle size distribution. EPA characterizes the overestimation error from anisokinetic sampling

conditions in the Katrina study as "slight" perhaps because the PM emission factor appears to be predominantly composed of PM2.5. However, in ARB's Supplement to Stationary Source Test Methods, Volume 1, Chaper IX, pg. 6), an example is given of a study where an isokinetic variation of 50% represented an 80% over-estimate of the PM12 emissions. On the Fountainhead test, a similar sized unit to the unit used in the EPA study, the reported average isokinetic variation was 112%, which would lead one to believe that the reported Fountainhead emission factor was on the low side, but also that isokinetic sampling is achievable with such as source.

From page 90 (pg 106 .pdf) of EPA's report, "*If isokinetic rate calculations are based upon the estimated total flow rates presented in Table 5-1[4], variation was between 6.1% and 46.5% isokinetic."* Meaning if EPA's calculated flow is 100% correct, then the isokinetic variation (#1) is dramatically worse than the 65.9%. The bias to a higher PM rate grows exponentially higher at lower isokinetic percentages.

Conclusion

Based on the analysis presented above, the District concludes that the weight of evidence suggests that emission factors from EPA's study *Managing Debris after a Natural Disaster: Evaluation of the Combustion of Storm-Generated Vegetative and C&D Debris in an Air Curtain Burner: Source Emissions Measurement Results* (November 17, 2016) are likely overstated and cannot be found to be representative of the emissions from incineration of vegetative materials.

Therefore, the results of this test are not recommended to be used in future permitting actions for air curtain incinerators in the District.

[4] This may be a typographical error as volumetric flow rates are presented in Table 3-2, whereas Table 5-1 present mass emission rates.

Attachment C

Derivation of NOx Emission Factor for Air Curtain Incineration of Woody Biomass

NOx Emission Factor Estimation

There are two published source tests on ACIs where NOx emission factors were derived: BC Hydro (0.040 lb-NOx/ton) and Victoria, Australia (0.274 lb-NOx/ton). These values are significantly lower than the biomass power plant NOx emissions, which is equipped with NOx control selective non-catalytic reduction system).

EPA published NO and NO_2 concentration measurements (ppmv) from an ACI burning vegetative debris in a 2007 study, Emissions from the Burning of Vegetative Debris in Air Curtain Destructors, J. AWMA, 57, 959-967; however, no emission factor (lb-NOx/ton material burned) was published or derived from the data because no flow rates or material throughputs corresponding to the measured concentrations were measured or published. This 2007 EPA study measured an average NOx (NO + NO_2) concentration of 79 ppmv from the air curtain, which is higher than the NOx concentration measurements from the BC Hydro (3.4 ppmv) and Victoria, Australia (19.5 ppmv) tests. Assuming the NOx emission factor that could be derived from the 2007 EPA test data will be proportional to its NOx concentration, following ratio will be used:

$$\left(\frac{lb-NOx}{ton}\right)_{EPA\,(2007)} = \left(\frac{lb-NOx}{ton}\right)_{Source\ Test\ X} \times \frac{(ppmv\ NOx)_{EPA\,(2007)}}{(ppmv\ NOx)_{Source\ Test\ X}}$$

Source Test X = BC Hydro

The NOx emission factor from the BC Hydro test was 0.040 lb-NOx/ton.[5] The average NOx concentration measured during the BC Hydro test was 6.5 mg/m^3 (at 20 ˚C). The molar volume of an ideal gas at 20ºC is 24.1 × 10^{-3} m^3/g-mol.

$$6.5\ \frac{mg\ NO_x}{m^3(at\ 20^0C)} \times \frac{1\ g\ mol\ NO_2}{46\ g\ NO_2} \times \frac{1\ g}{1{,}000\ mg} \times \frac{24.1 \times 10^{-3}\ m^3\ (at\ 20^0C)}{1\ g\ mol} = 3.4\ ppmv\ NO_x$$

$$\left(\frac{lb-NOx}{ton}\right)_{EPA\,(2007)} = \left(\frac{0.040\ lb-NOx}{ton}\right)_{BC\ Hydro} \times \frac{(79\ ppmv\ NOx)_{EPA\,(2007)}}{(3.4\ ppmv\ NOx)_{BC\ Hydro}}$$

$$\left(\frac{lb-NOx}{ton}\right)_{KEPA\,(2007)} = \frac{0.93\ lb-NOx}{ton}$$

[5] Based on an emission rate of 0.12 kg-NO_2/hr and 6 metric tonnes feed/hr
EF = 0.12 kg/hr x 2.2 lb/kg x 1 hr/6 tonne x 1 tonne/1.1 tons = 0.040 lb-NOx/ton

Source Test X = Victoria, Australia

The NOx emission factor from the Victoria test was 0.247 lb-NOx/ton. The average NOx concentration measured during the Victoria test was 40.0 mg/Nm^3 (i.e. at 0 ˚C). The molar volume of an ideal gas at 0ºC is 22.4 × 10^{-3} m^3/g-mol.

$$40.0\ \frac{mg\ NO_2}{Nm^3} \times \frac{1\ g\ mol\ NO_2}{46\ g\ NO_2} \times \frac{1\ g}{1{,}000\ mg} \times \frac{22.4 \times 10^{-3}\ Nm^3}{1\ g\ mol} = 19.5\ ppmv\ NO_x$$

$$\left(\frac{lb - NOx}{ton}\right)_{EPA\ (2007)} = \left(\frac{0.274\ lb - NOx}{ton}\right)_{Australia} \times \frac{(79\ ppmv\ NOx)_{EPA\ (2007)}}{(19.5\ ppmv\ NOx)_{Australia}}$$

$$\left(\frac{lb - NOx}{ton}\right)_{EPA\ (2007)} = \frac{1.1\ lb - NOx}{ton}$$

Average NOx Emission Factor

Average NOx emission factor (lb/ton) = (0.93 lb-NOx/ton + 1.1 lb-NOx/ton) ÷ 2

Average NOx emission factor (lb/ton) = 1.0 lb-NOx/ton

Appendix D:
SSPE1 Calculations

Detailed SSPE Report

Region	Facility	Unit	Mod	NOx	SOx	PM10	CO	VOC	Number of Outstanding ATCs
S	634	1	3	0	0	3871	0	0	0
S	634	2	1	0	0	2246	0	0	1
S	634	3	1	0	0	2246	0	0	0
S	634	4	5	0	0	11376	0	0	0
S	634	7	3	0	0	438	0	0	1
S	634	8	0	0	0	0	0	1570	0
S	634	9	2	0	0	0	0	0	0
	SSPE (lbs)			0	0	20177	0	1570	

Notes:

Blank values for a particular permit unit do not necessarily relfect zero emissions. For units with blank values, the PE must still be determined based on physical PE or as limited by permit condition.

For permits that show outstanding ATCs, consult PAS ATC Emission Profile records to determine what the highest PE is for each pollutant.

ATCs for new units (e.g. S-XXXX-X-0) must be added in separately.

ERC's for onsite reductions must be added in separately per Rule 2201 as well.

Appendix E:
QNEC and Emissions Profile

Quarterly Net Emissions Change (QNEC)

The Quarterly Net Emissions Change is used to complete the emission profile screen for the District's PAS database. The QNEC shall be calculated as follows:

QNEC = PE2 - PE1, where:

QNEC = Quarterly Net Emissions Change for each emissions unit, lb/qtr.
PE2 = Post Project Potential to Emit for each emissions unit, lb/qtr.
PE1 = Pre-Project Potential to Emit for each emissions unit, lb/qtr.

Since this is new emissions unit, PE1 is zero for all pollutants.

Based on PE2 calculated in Section VII.C.2, quarterly PE2 can be calculated as follows:

Pollutant	Annual PE2 (lb/yr)	Quarterly PE2 (lb/qtr)
NOx	1,000	250
SOx	100	25
PM_{10}	1,307	326.75
CO	2,600	650
VOC	900	225

Thus QNEC is calculated as follows:

Quarterly NEC [QNEC]			
Pollutant	**PE2 (lb/qtr)**	**PE1 (lb/qtr)**	**QNEC (lb/qtr)**
NOx	1,000	0	250
SOx	100	0	25
PM_{10}	1,307	0	326.75
CO	2,600	0	650
VOC	900	0	225

Application Emissions

Permit #: S-634-11-0 **Last Updated**
Facility: TREEHOUSE CALIFORNIA ALMONDS LLC 08/10/2020 PROCOPIS

Equipment Pre-Baselined: NO

	NOX	SOX	PM10	CO	VOC
Potential to Emit (lb/Yr):	1000.0	100.0	1307.0	2600.0	900.0
Daily Emis. Limit (lb/Day)	56.0	5.6	73.2	145.6	50.4
Quarterly Net Emissions Change (lb/Qtr)					
Q1:	250.0	25.0	326.0	650.0	225.0
Q2:	250.0	25.0	327.0	650.0	225.0
Q3:	250.0	25.0	327.0	650.0	225.0
Q4:	250.0	25.0	327.0	650.0	225.0
Check if offsets are triggered but exemption applies	N	N	N	N	N
Offset Ratio					
Quarterly Offset Amounts (lb/Qtr)					
Q1:					
Q2:					
Q3:					
Q4:					

Appendix F:
BACT Guideline 1.9.17

San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 1.9.17*

Last Update: 1/30/2017

Stationary Air Curtain Incinerator

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
VOC	Air curtain incinerator (electric powered), complying with visible emissions of 10% opacity or less after start-up (per 40 CFR Part 60 Subpart CCCC, sections 60.2250 and 60.2255)		1. Biomass Power Plant 2. Landfill 3. Composting
SOx	Air curtain incinerator (electric powered), complying with visible emissions of 10% opacity or less after start-up (per 40 CFR Part 60 Subpart CCCC, sections 60.2250 and 60.2255)		1. Biomass Power Plant 2. Landfill 3. Composting
PM10	Air curtain incinerator (electric powered), complying with visible emissions of 10% opacity or less after start-up (per 40 CFR Part 60 Subpart CCCC, sections 60.2250 and 60.2255)		1. Biomass Power Plant 2. Landfill 3. Composting
NOx	Air curtain incinerator (electric powered), complying with visible emissions of 10% opacity or less after start-up (per 40 CFR Part 60 Subpart CCCC, sections 60.2250 and 60.2255)		1. Biomass Power Plant 2. Landfill 3. Composting

BACT is the most stringent control technique for the emissions unit and class of source. Control techniques that are not achieved in practice or contained in a State Implementation Plan must be cost effective as well as feasible. Economic analysis to demonstrate cost effectiveness is required for all determinations that are not achieved in practice or contained in an EPA approved State Implementation Plan.

***This is a Summary Page for this Class of Source**

Appendix G:
BACT Cost Effective Analysis
& Supporting Documents

BACT Analysis for NOx, SOx, PM_{10}, and VOC for Air Curtain Incinerator

The following BACT analysis will evaluate the pollutants triggering BACT collectively since no pollutant specific add-on controls have been identified. In addition, the alternative basic equipment options identified affect the emission rates of all the pollutants. Therefore, a Multi-Pollutant Cost Effectiveness Threshold (MCET) will be calculated in accordance with the District Policy APR 1305, Best Available Control Technology Policy.

Step 1 - Identify All Possible Control Technologies

District BACT Guideline 1.9.17 identifies the following controls for NOx, PM_{10}, SOx, and VOC emissions:

Achieved-in-Practice:

1. Air curtain incinerator (electric powered), complying with visible emissions of 10% opacity or less after start-up (per 40 CFR Part 60 Subpart CCCC, sections 60.2250 and 60.2255).

Note that pollutant emission limits are not specified because emissions are known to vary by type of biomass material burned, and this BACT guideline is not specific to the type of biomass.

Technologically Feasible:

None identified.

Alternate Basic Equipment:

1. Biomass power plant.
2. Landfill disposal.
3. Composting (shipping to offsite facility).

Step 2 - Eliminate Technologically Infeasible Options

Although the proposed air curtain incinerator is being permitted as a stationary source operation, the equipment is indeed a portable unit that will be operated in the yard with several mobile equipment. Therefore, a permanent electrical connection is not feasible and the option of an electric powered air curtain incinerator will be eliminated.

As stated in the project's proposal, the shutdown of a number of biomass power plants in the San Joaquin Valley and legislative stipulations on the ratio of agricultural to forest derived biomass that can be burned on still operating biomass plants accepting subsidies, disposal

of agricultural biomass at biomass power plants has been curtailed. Therefore, a biomass power plant is not a feasible option and will be eliminated from the analysis.

Step 3 - Rank Remaining Control Technologies by Control Effectiveness

1. Landfill (Alternate Basic Equipment)
2. Composting (Alternate Basic Equipment)
3. Air curtain incinerator complying with visible emissions of 10% opacity or less after start-up (per 40 CFR Part 60 Subpart CCCC, sections 60.2250 and 60.2255).

Step 4 - Cost Effectiveness Analysis

The facility has proposed Option #3 from the Step 3 above. Options #1 and 2 are less polluting and a cost effective analysis will be performed for each option.

The capital cost, including freight and training, has been provided by the manufacturer, *Air Burners Inc.*, as summarized in the table below. The only operating cost considered is the diesel fuel cost for the IC engine as summarized in the table below. Cost of labor and front end loader diesel fuel will not be included as these are ongoing costs to the facility and would not change if the facility was hauling biomass offsite for landfill disposal or composting.

Annual Cost of Air Curtain Incinerator (Year 2020 Model S-220 / Tier 4 Final, 49 HP HATZ 3H50 Diesel Engine)	
Capital Costs	
Air Curtain (Air Burners Inc.)	$120,864
Freight (Air Burners Inc.)	$7,125
Sales Tax at 8%	$9,669
Training	$3,980
Total Capital Costs	$141,638
Annualized Capital Costs (at 10%, see Appendix G)	**$23,050**
Annual Operating Cost (IC engine diesel fuel)	
Diesel fuel price (see Appendix G)[2]	$3.25/gal
Diesel fuel consumption (Air Burner Inc. – Appendix B)[3]	2.0 gal/hr
Maximum operation[4]	200 hr/yr
Annual Operating Cost (total diesel fuel cost)[5]	**$1,300**
Total Annual Cost (annualized capital cost + operating cost)	**$24,350**

[2] Diesel fuel price of $3.25/gal is taken from the following website (see Appendix G for a print out): https://www.eia.gov/dnav/pet/pet_pri_gnd_a_EPD2DXL0_pte_dpgal_w.htm

[3] Based on air curtain incinerator spec sheets by manufacturer (see Appendix B), IC engine diesel fuel consumption is approx. 2.0 gal/hr.

[4] Based on permit limit of 1,000 ton/yr and a min throughput of 5 ton/hr, max operation = 1,000 ton/yr ÷ 5 ton/hr = 200 hr/yr (per manufacturer spec sheets in Appendix B, average air curtain incinerator throughput 5-7 ton/hr, selected min rate for worst case operation).

[5] Total IC engine diesel fuel cost = $3.25/gal x 2.0 gal/hr x 200 hr/yr = $1,300/yr.

The costs of landfilling or composting the almond sticks involve transporting the sticks off-site to a landfill or composting site that will accept them. As previously mentioned under project N-1162806, a local biosolids compost site indicated that the material would be acceptable for composting; however, they do not have space for any of this material at present. A compost operator in Kern County indicated that the problem for composters is a shortage of nitrogenous materials (and water). Taking on more wood waste (a carbonaceous material) would only make the carbon to nitrogen ratio worse (i,e, higher), hence, it would be unlikely that anyone would accept this material at any price given the current imbalance.

The costs of off-site disposal are dominated by the tipping fees, which is the amount of money per ton of waste charged at the gate of a landfill.

The commercial hauling costs are based on the following calculation:

1,000 tons almond sticks/yr x 2,000 lb/ton x 1 yd-wood sticks (unchipped)/400 lb[6] x 1 load/100 yd x $150/load[7] = $7,500/yr

The cost of the material sent to a landfill is summarized in the table below:

Annual Cost of Transport to Landfill	
Annual Off-site Transportation Costs	
Tipping fee ($73.03/ton x 1,000 tons/yr)[8]	$73,030
Commercial hauling costs (City of Bakersfield)	$7,500
Total Annual Operating Cost	**$80,530**

The material sent to a composting facility must also be chipped; hence, a chipping cost must be added as in the table below:

Annual Cost of Transport to Compost Site	
Annual Off-site Transportation Costs	
Tipping fee ($43/ton[9] x 1,000 tons/yr)	$43,000
Commercial hauling costs (City of Bakersfield)	$7,500
Chipping costs ($6/ton x 1,000 tons/yr) CalRecycle	$6,000
Total Annual Operating Cost	**$56,500**

Multi-Pollutant Cost Effectiveness Threshold (MCET)

[6] CalRecycle density of uncompacted, unchipped wood waste taken from the following website (see Appendix G for hard copy): http://www.calrecycle.ca.gov/swfacilities/cdi/Tools/Calculations.htm

[7] As stated in project N-1162806, flat rate charged to City of Bakersfield to haul overs from compost facility (2601 South Mount Vernon Avenue, Bakersfield) to Bena Landfill 2951 Neumarkel Road, Bakersfield, approximately 15 miles one-way.

[8] Analysis of MSW Landfill Tipping Fees (April 2019) states an average tipping fee of $73.03 for California taken from website below (see Appendix G for a hard copy):
https://erefdn.org/wp-content/uploads/woocommerce_uploads/2017/12/MSWLF-Tipping-Fees-2019-FINAL.pdf

[9] Taken from project N-1162806 for Minturn Huller.

District Policy 1305 requires that for control options that affect more than one pollutant, a MCET is calculated. If the difference between the cost of the ABE option (e.g. landfill, composting) and the proposed option (e.g. air curtain) is greater than the MCET, then the option is not cost effective.

Cost effective threshold = CET ($/ton)

$MCET = CET_{NOx} \times PE_{NOx} + CET_{PM10} \times PE_{PM10} + CET_{VOC} \times PE_{VOC}$

The following table calculates the annual PE2 for NOx, PM_{10}, and VOC emissions in units of ton/year based on annual PE2 calculated in Section VII.C.2 of this document:

Annual PE2 for Air Curtain Incinerator		
Pollutant	**Annual PE2 (lb/year)**	**Annual PE2 (ton/year)**
NOx	1,000	0.5
PM_{10}	1,307	0.65
VOC	900	0.45

Thus,

MCET = ($24,500/ton x 0.5 ton-NOx/yr) + ($11,400/ton x 0.65 ton-PM10/yr) + ($17,500/ton x 0.45 ton-VOC/yr)

= $27,535

In the present analysis, it is simpler and more conservative to make no deduction to the MCET for emissions caused by either ABE option.

Compare Annual Cost of ABE Options to MCET

Landfill Disposal Option:

Cost of Landfill – Cost of air curtain = $80,530/yr – $24,350/yr = **$56,180/yr**

Since the cost difference for the landfill disposal option is greater than the MCET, the landfill is not a cost effective ABE at this time.

Composting Option:

Cost of Compost – Cost of air curtain = $56,500/yr – $24,350/yr = **$32,150/yr**

Since the cost difference for the composting option is greater than the MCET, the composting is not a cost effective ABE at this time.

Step 5 - Select BACT

BACT for NOx, PM_{10}, and VOC is the air curtain incinerator with visible emissions of 10% opacity or less after start-up (using NSPS Subpart CCCC procedure and averaging period).

Note that pollutant emission limits are not specified because emissions are known to vary by type of biomass material burned, and this BACT guideline is not specific to the type of biomass.

Analysis of MSW Landfill Tipping Fees— April 2019

Published 2019

The Environmental Research & Education Foundation (EREF) maintains a database of Municipal Solid Waste (MSW) landfills across the United States (EREF, 2017). This database was used to draw a sample of active facilities for analysis of MSW landfill (MSWLF) tipping fees. Landfill owners were contacted and asked to provide gate rate information for MSW disposal, supplemented by current website information on fees. For the purpose of this report, the terms gate rate, tip fee, and tipping fee are used interchangeably to refer to the per-ton fee for hauled MSW loads.

In the 2019 study, MSW tip fee information was obtained from 392 landfills categorized as large, medium, or small based on accepted tonnage. Of the landfills providing gate rate information, approximately:

- 15% were large (i.e. accepting more than 390,000 tons/year),
- 44% were medium (i.e. accepting between 390,000 and 65,000 tons/year), and
- 41% were small (i.e. accepting less than 65,000 tons/year).

The small landfills reported an average of 26,150 tons/year, while medium landfills and large landfills accepted 163,010 tons/year and 831,480 tons/year, respectively.

Summary of 2019 MSW Landfill Tip Fees. MSWLF tip fee data were compiled by geographic region and basic statistical data were computed. For 2019, the national MSW landfill tip fee average was $55.36/ton. Regional MSW tip fees ranged from $40.92/ton in the South Central region to $73.03/ton in the Pacific (Table 1). Ninety-one percent of landfills that provided 2018 gate rates also provided data in 2019.

Table 1. Average MSW Landfill Tip Fees, by region

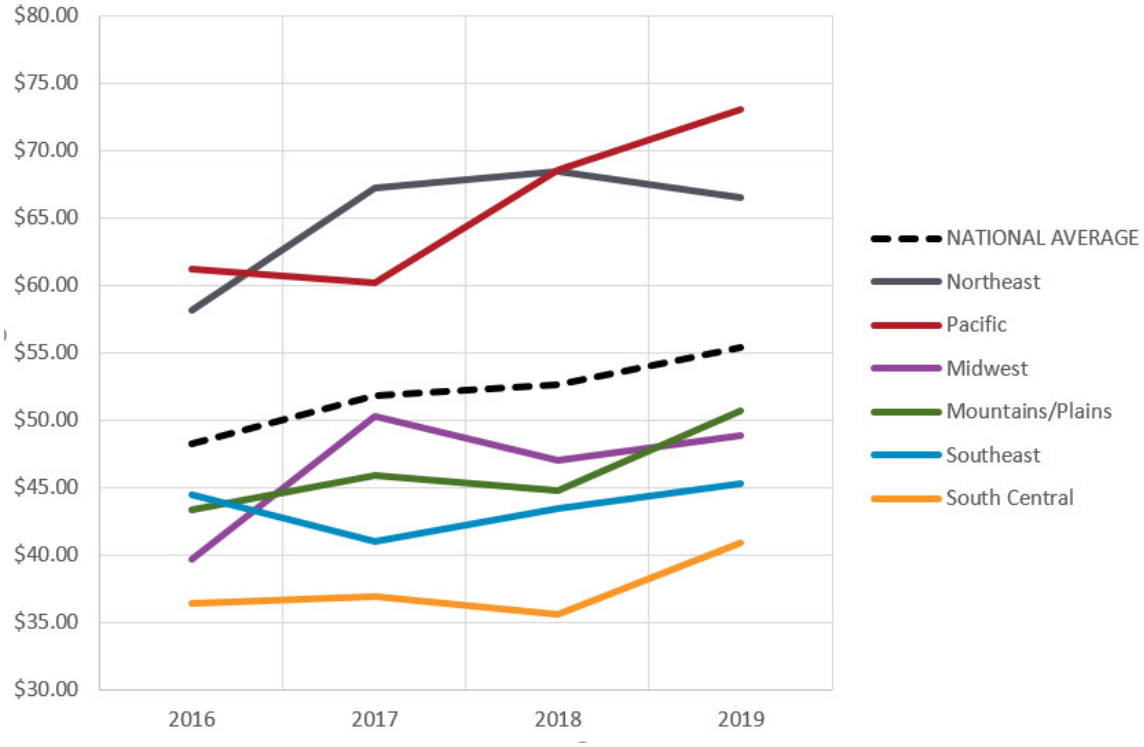
Region	Average Tipping Fee		
	April 2018[a]	April 2019	Difference
Pacific (AK, AZ, CA, HI, ID, OR, WA)	$68.46	$73.03	+$4.50
Northeast (CT, DE, ME, MD, MA, NH, NJ, NY, PA, RI, VT, VA, WV)	$67.39	$66.53	-$1.91
Mountains/Plains (CO, MT, ND, SD, UT, WY)	$43.57	$50.71	+$5.94
Midwest (IL, IN, IA, KS, MI, MN, MO, NE, OH, WI)	$46.89	$48.87	+$1.86
Southeast (AL, FL, GA, KY, MS, NC, SC, TN)	$43.32	$45.25	+$1.82
South Central (AR, LA, NM, OK, TX)	$34.80	$40.92	+$5.31
National Average	**$52.62**	**$55.36**	**+$2.74**

[a]From EREF, 2018 rev. ed.

Based on previous EREF analysis (2018), the national average tip fee increased 5.2% from 2018 to 2019, increasing from $52.62 per ton to $55.36 (Table 1). Compared to 2018, average regional tip fees increased in all regions except for the Northeast, where tip fees decreased (-2.8%, -$1.91) in part due to the closure of landfills that previously had high tip fees due to limited remaining capacity. The largest increases occurred in the Mountains/Plains (+13.3%, +$5.94), South Central (+14.9%, +$5.31) and Pacific (+6.6%, +$4.50) regions. For 2019, average tip fee increased by $2.74 or +5.2%.

Four-year trends in average tip fee (Figure 1) show a continued increase in the national average MSW tip fee with an average year-over-year increase of 3.5% from 2016 through 2018 (Table 2). Tip fees in the Northeast and Pacific remain notably higher than the rest of the U.S., with the Pacific region having the highest tip fees for the second year in a row. The Mountains/Plains region surpassed the Midwest for the third highest regional tip fees in 2019. The Southeast and South Central continued to be the least expensive regions for MSW landfill disposal (Figure 1).

Figure 1. Regional MSWLF Tipping Fees, 2016 through 2019[a,b,c]



[a]Regions, and the states contained therein, are denoted in Table 1.
[b]Data Years: Jan 2016, April 2017, April 2018, April 2019
[c]Values for all regions and years are provided in the Summary Table at the end of the report.

On a state-basis, MSWLF tipping fees vary substantially. Average state tipping fees range from $29.82 (Kentucky, Southeast region) to $154.92 (Alaska, Pacific region) per ton of MSW (Table 3). A tip fee is not provided for Connecticut, Massachusetts, and Vermont as facilities or tip fees for MSW could not be identified.

Table 2. MSW Landfill Tip Fees 2016–2019

Region	Average Tipping Fee				Average Year-over-Year Change (`16–`19)
	Jan 2016	April 2017	April 2018	April 2019	
Pacific (AK, AZ, CA, HI, ID, OR, WA)	$58.20	$67.27	$68.46	$73.03	+4.7%
Northeast (CT, DE, ME, MD, MA, NH, NJ, NY, PA, RI, VT, VA, WV)	$61.20	$60.20	$67.39	$66.53	+3.6%
Mountains/Plains (CO, MT, ND, SD, UT, WY)	$39.64	$50.27	$43.57	$50.71	+4.2%
Midwest (IL, IN, IA, KS, MI, MN, MO, NE, OH, WI)	$43.38	$45.84	$46.89	$48.87	+6.1%
Southeast (AL, FL, GA, KY, MS, NC, SC, TN)	$44.46	$41.01	$43.32	$45.25	+0.6%
South Central (AR, LA, NM, OK, TX)	$36.34	$36.94	$34.80	$40.92	+3.2%
National Average	**$48.27**	**$51.82**	**$52.62**	**$55.36**	**+3.5%**

Table 3. State and Regional Average Tip Fees, from April 2018 survey[a,b]

Region/State	Average Tipping Fee[c]
Pacific	$ 73.03
Alaska	*$ 154.92*
Hawaii	*$ 112.33*
Washington	*$ 89.08*
Nevada	*$ 74.20*
Oregon	*$ 71.28*
Idaho	*$ 68.71*
California	*$ 55.56*
Arizona	*$ 43.39*
Northeast	$ 66.53
Rhode Island	*$ 110.00*
Delaware	*$ 85.00*
New Jersey	*$ 81.91*
Maine	*$ 78.50*
New Hampshire	*$ 74.34*
Maryland	*$ 68.57*
New York	*$ 68.40*
Pennsylvania	*$ 68.07*
Virginia	*$ 52.22*
West Virginia	*$ 51.50*
Connecticut	*N.A.*
Massachusetts	*N.R.*
Vermont	*N.R.*
Mountains/Plains	$ 50.71
Wyoming	*$ 74.45*
Colorado	*$ 62.04*
Montana	*$ 49.36*
South Dakota	*$ 49.14*
North Dakota	*$ 46.98*
Utah	*$ 32.08*
Midwest	$ 48.87
Wisconsin	*$ 65.00*
Minnesota	*$ 63.52*
Missouri	*$ 62.42*
Illinois	*$ 51.78*
Iowa	*$ 48.47*
Indiana	*$ 47.91*
Ohio	*$ 44.35*
Michigan	*$ 41.97*
Kansas	*$ 39.32*
Nebraska	*$ 39.21*
Southeast	$ 45.25
Florida	*$ 55.08*
Tennessee	*$ 50.24*
Georgia	*$ 48.77*
South Carolina	*$ 44.03*
North Carolina	*$ 43.87*
Mississippi	*$ 38.70*
Alabama	*$ 33.41*
Kentucky	*$ 29.82*
South Central	$ 40.92
Oklahoma	*$ 50.22*
Arkansas	*$ 40.23*
Texas	*$ 40.18*
New Mexico	*$ 38.28*
Louisiana	*$ 33.28*
National Average	**$ 55.36**

[a]N.A– not applicable, no landfills actively accepting MSW were identified in the state.

[b]N.R. – not reported, response rate did not meet threshold for publication.

[c]Regional and national averages computed on a facility-basis, and therefore do no equal the average of the individual state averages reported herein.

States with active MSW waste-to-energy (WTE) facilities continue to have higher tipping fees than those without ($p<0.05$). The average MSWLF tip fee was $59.93/ton for states with WTE in 2019. In states without WTE, the average MSW tip fee was $53.58/ton. For 2019, the difference was less pronounced for 2019 than in years past due to large tip fee increases in many states without active WTE facilities. Nationally, landfilling was 12% more expensive in WTE states, equivalent to $6.34/ton higher. Comparatively, in 2018 tip fees in states with WTE were 28% higher (+$13.89/ton) than states without WTE. The relationship between WTE use and landfill tip fee suggests that MSW landfill fees continue to indicate, in part, if market conditions are suitable for the use of WTE for MSW management (EREF, 2018).

Exploring Methodology Impacts when Estimating National Average Tip Fee

EREF's national average tip fees are calculated as an average of all observations (n= 392 for 2019). We know, however, that the amount of MSW landfilled in each state varies due to factors such as total waste generation, fraction recovered for recycling and/or composting, and interstate transport (i.e. import and export of MSW). To account for these differences, a weighted-average national tip fee was also calculated for 2019 based on the relative amount of MSW disposed of via landfilling in each state and the average tip fee for each state (EREF, 2017). Results indicate a tonnage-weighted average tip fee of $52.08 for 2019, which is $3.27 less than the unweighted national average of $55.36/ton MSW. This difference suggests that MSW may be disproportionally sent to landfills in states with lower tip fees; a practice which is recognized through interstate transport of landfilled MSW. This trend was also observed in the 2018 data, where the tonnage-weighted average national tip fee was $50.08, or $2.54 less than the unweighted national average of $52.62 per ton. Year-to-year change for each of the calculated averages was roughly 4%, suggesting that while interstate transport may allow for lower tip fees to be paid, it does not insulate against the overall national trend of increasing MSW tip fees (Table 4).

Table 4. Summary of Average and Weighted-Average Tip Fee

	National Average[a]	Ton-Weighted Average	Difference (%)
2018	$52.62	$50.08	4.8%
2019	$55.36	$52.08	5.9%
Difference (%)	4.1%	4.0%	

[a]Calculated as an unweighted average of all observations (n=392 for 2019; n=397 for 2018)

Construction & Demolition Waste Pricing at MSW Landfills

In addition to collecting MSW tip fee data, information gathered for 2019 included tip fee for construction & demolition (C&D) wastes deposited in MSW landfills. Although MSW landfills primarily receive MSW, many are permitted and readily accept non-MSW special wastes such as construction, demolition, ash, or liquid wastes. Of the special wastes accepted at MSW landfills in the U.S., construction and demolition wastes are most common: C&D waste is accepted at MSW landfills in 41 states and comprises roughly 12% of the landfilled stream on average (EREF, 2019).

Of the 392 landfills providing MSW tip fee data, 241 also had a posted gate rate for C&D materials disposed of at the landfill. The national average tip fee for C&D waste in 2019 was not statistically different from the MSW tip fee at $54.04/ton C&D compared to $55.36 for MSW (Table 5). Although over half of landfills (57%) set the same tip fee for MSW and C&D materials, this pricing strategy was not uniform. C&D tip fees were priced lower than MSW at 27% of sites. At the remaining 16% of MSW landfills, the cost to dispose of a ton of C&D material was higher than for MSW (Table 5).

Table 5. Construction & Demolition (C&D) Pricing Summary

	2019	% of total
National Average C&D Tip Fee[a]	$ 54.04	
National Average MSW Tip Fee	$ 55.36	
# Sites where C&D and MSW priced the same	138	57%
# Sites where C&D priced lower than MSW	65	27%
# Sites where C&D priced higher than MSW	38	16%

[a]For C&D disposed of at MSW landfills

References

Environmental Research & Education Foundation [EREF] (2017) "MSW Management Facilities in the U.S.: 2010 & 2013". Retrieved from www.erefdn.org

Environmental Research & Education Foundation [EREF] (2018) "Analysis of MSW Tipping Fees, April 2018 (Rev. ed.)" Retrieved from www.erefdn.org

Environmental Research & Education Foundation [EREF] (2019) "Analysis of Waste Streams Entering MSW Landfills: Estimating DOC Values & the Impact of Non-MSW Material" Retrieved from www.erefdn.org

---

Contributing Authors: Debra L. Kantner and Bryan F. Staley, Ph.D., P.E.

Questions regarding this content may be directed to the corresponding authors at IRP@erefdn.org

Please cite as: Environmental Research & Education Foundation (2019) "Analysis of MSW Landfill Tipping Fees— April 2019". Retrieved from www.erefdn.org

Environmental Research & Education Foundation™

Lighting a path to sustainable waste management practices

For more information on EREF and the Data & Policy Program,

visit www.erefdn.org.

AirBurners

GSA

AIR CURTAIN BURNER PRICE LIST 2020

Manufacturer's Suggested Retail Prices Effective April 1, 2020

MODEL	DESCRIPTION	PRICE US $
	TRAILER MOUNTED	
T-24	BurnBoss® with On-Board Kubota Z482-E3 Diesel Engine (US EPA Tier 4) Towable FireBox with official VIN	52,813
T-300	Trench Burner, Trailer Mounted, Powered by HATZ 3H50 Diesel Engine (US EPA Tier 4); 30 ft. Manifold; Requires Earthen Trench	41,947
	SKID-MOUNTED ABOVE GROUND REFRACTORY WALLED PORTABLE FIREBOX SERIES	
S-116 S-116E	FireBox Powered by 49 HP HATZ 3H50 Diesel Engine (US EPA Tier 4) FireBox Powered by 480V 3-Phase Electric Motor with VFD Speed Control	99,906 99,906
S-116R	Roll-off FireBox with Steel Floor Powered by 49 HP HATZ 3H50 Diesel Engine (US EPA Tier 4) Offered for Standard Cable Hoist or Hook Lift (J-Hook) Roll-off Trucks	113,852
S-119 S-119E	FireBox Powered by 49 HP HATZ 3H50 Diesel Engine (US EPA Tier 4) FireBox Powered by 480V 3-Phase 50Hz or 60Hz Electric Motor with VFD Speed Control	107,203 107,203
S-119R	Roll-off FireBox with Steel Floor Powered by 49 HP HATZ 3H50 Diesel Engine (US EPA Tier 4) Offered for Standard Cable Hoist or Hook Lift (J-Hook) Roll-off Trucks	127,071
S-220 S-220E	FireBox Powered by 49 HP HATZ 3H50 Diesel Engine (US EPA Tier 4) FireBox Powered by 480V 3-Phase 50Hz or 60Hz Electric Motor with VFD Speed Control	120,864 120,864
S-223 S-223E	FireBox Powered by 49 HP HATZ 3H50 Diesel Engine (US EPA Tier 4) FireBox Powered by 480V 3-Phase 50Hz or 60Hz Electric Motor with VFD Speed Control	127,117 127,117
S-327 S-327E	FireBox Powered by 75 HP HATZ 4H50 Diesel Engine (US EPA Tier 4) FireBox Powered by 480V 3-Phase 50Hz or 60Hz Electric Motor with VFD Speed Control	159,792 159,792
S-330 S-330E	FireBox Powered by 75 HP HATZ 4H50 Diesel Engine (US EPA Tier 4) FireBox Powered by 480V 3-Phase 50Hz or 60Hz Electric Motor with VFD Speed Control	168,900 168,900
	OPTIONS	
Ash Rake S100/S200	Ash Clean-Out Rake with Universal Quick Disconnect only for *Skidsteer* and *Bobcat* or Plain Steel Faceplate (Weld Your Own Interface); All Others at Surcharge.	3,520
Ash Rake S300	Ash Clean-Out Rake for S-327 & S-330 - Plain Steel Faceplate (Weld Your Own Interface) or Custom Interfaces; Prices on Request Only	Contact Us
Operator Training	On-site Operator Training and Certification, 2 Days, Firm Fixed Price; East of Mississippi: West of Mississippi:	3,820 3,980
Other Options	Steel Floor (Other than Roll-off FireBoxes), Stainless-steel Mesh Ember Screen (Used at End of Work Day); Rough-Terrain Dolly, Waste-to-Energy PGFireBox® Systems, 100 kWe to 1 MWe and Thermal Energy up to 5 MWth	Contact Us

For Pricing on Optional Equipment and any other information, call 772-220-7303 or email info@AirBurners.com

Prices are in US Dollars EX WORKS (FOB) Air Burners, Inc. Factory in Palm City, Florida, USA. All air curtain burners are made in the USA and shipped completely assembled. Steel surcharges may apply from time to time. Optional Common Carrier trucking cost quotes (US & Canada) do not include the cost of truck unloading at destination. Sales or Use Tax may apply in certain situations and all taxes shall be paid by Buyer. All prices are subject to change without notice. Diesel engines may be substituted with equivalent engines from other manufacturers.

Please, see reverse page for our Terms and Conditions of Sale and Delivery and Additional Notes.

Weekly Retail Gasoline and Diesel Prices

(Dollars per Gallon, Including Taxes)

Product: Ultra Low Sulfur Diesel **Period:** Weekly

Download Series History | Definitions, Sources & Notes

Show Data By: Product / Area	Graph / Clear	06/29/20	07/06/20	07/13/20	07/20/20	07/27/20	08/03/20	View History
U.S.		2.430	2.437	2.438	2.433	2.427	2.424	2007-2020
East Coast (PADD1)		2.524	2.527	2.531	2.520	2.519	2.517	2007-2020
New England (PADD 1A)		2.648	2.652	2.650	2.626	2.632	2.631	2007-2020
Central Atlantic (PADD 1B)		2.704	2.696	2.707	2.699	2.697	2.696	2007-2020
Lower Atlantic (PADD 1C)		2.377	2.388	2.387	2.377	2.375	2.372	2007-2020
Midwest (PADD 2)		2.299	2.306	2.313	2.309	2.301	2.298	2007-2020
Gulf Coast (PADD 3)		2.194	2.204	2.198	2.198	2.183	2.175	2007-2020
Rocky Mountain (PADD 4)		2.343	2.345	2.345	2.343	2.342	2.343	2007-2020
West Coast (PADD 5)		2.948	2.960	2.954	2.954	2.954	2.955	2007-2020
West Coast less California		2.586	2.596	2.594	2.597	2.586	2.592	2011-2020
States								
California		3.246	3.260	3.251	3.248	3.256	3.253	2007-2020

Click on the source key icon to learn how to download series into Excel, or to embed a chart or map on your website.

- = No Data Reported; -- = Not Applicable; **NA** = Not Available; **W** = Withheld to avoid disclosure of individual company data.

Notes: Conventional area is any area that does not require the sale of reformulated gasoline. All types of finished motor gasoline may be sold is this area. RFG area is an ozone nonattainment area designated by the Environmental Protection Agency which requires the use of reformulated gasoline. Publication of Low Sulfur On-Highway Diesel (LSD) prices at the U.S. level was discontinued on December 8, 2008 due to a diminishing number of stations selling LSD as a result of EPA diesel fuel regulations. EIA continued to collect LSD prices from retail outlets and included them in the Diesel Average All Types price until July 26, 2010, when no more outlets reported LSD sales. Beginning July 26, 2010 publication of Ultra Low Sulfur Diesel (ULSD) price became fully represented by the Diesel Average All Types price. As of December 1, 2010 (September 1, 2006 in California), any on-highway diesel fuel sold is ULSD as mandated by EPA on-highway diesel fuel regulations. EIA did not collect weekly retail motor gasoline data between December 10, 1990 and January 14, 1991. Monthly and annual averages are simple averages of the weekly data contained therein. For months and years with incomplete weekly data series, the monthly and/or annual averages are not available. See Definitions, Sources, and Notes link above for more information on this table.

Release Date: 8/3/2020
Next Release Date: 8/10/2020

Calculations

Solid Waste Cleanup Program Weights and Volumes for Project Estimates

Description of Materials	Approximate Pounds/Cubic Yard	Remarks
Burn Dump Debris/Ash	800-1000 1500-1800 2300	Dry Loose Wet for Dust Suppression Wet mixed with soil
Construction Debris, Asphalt or Concrete: Loose	2400	
Construction Debris, Wood ; Uncompacted	400	Increase up to 100% if compacted using heavy equipment
Earth	2100 3000	Loose/Dry. Plus 30% when compacted. Excavated/Wet
Gravel or Crushed Stone Loose/Dry	2600	Increase 20% if wet

BACT Cost Effectiveness Worksheet

Capital Costs (P) to be financed (supplied by applicant)	$141,638.00	(1)
Interest rate for financing (assume 10%)	0.10	(i)
time period of financing (assume 10 years)	10	(n)
annualization factor = $\frac{i(1+i)^n}{(1+i)^n - 1}$	0.16	(2)
annualized capital costs [Calculated as (1) X (2)]	$23,050.93	(3)
annual cost of operation and maintenance (includes monitoring, inspection, permitting fees, waste disposal charges, repair, administration and replacement)	$0.00	(4)
total cost of control technology [(3) + (4)]	$23,050.93	(5)
tons/year reduced by control technology being analyzed	3.25	(6)
cost effectiveness ($/ton) [(5) / (6)]	$7,092.59	(7)

Pollutant	Cost Effectiveness Threshold
VOC	17500
NOx	24500
PM10	11400
SOX	18300
CO	300

Appendix H:
HRA Results

San Joaquin Valley Air Pollution Control District
Risk Management Review and Ambient Air Quality Analysis

To:	Silvana Procopio – Permit Services
From:	Jessica Rosas – Technical Services
Date:	July 30, 2020
Facility Name:	TREEHOUSE CALIFORNIA ALMONDS LLC
Location:	2115 ROAD 144, DELANO
Application #(s):	S-634-11-0
Project #:	S-1201769

1. Summary

1.1 RMR

Units	Prioritization Score	Acute Hazard Index	Chronic Hazard Index	Maximum Individual Cancer Risk	T-BACT Required	Special Permit Requirements
11	873.65	0.05	0.00	7.30E-07	No	Yes
Project Totals	873.65	0.05	0.00	7.30E-07		
Facility Totals	>1	0.327	0.395	5.21E-06		

1.2 AAQA

Pollutant	Air Quality Standard (State/Federal)				
	1 Hour	3 Hours	8 Hours	24 Hours	Annual
CO	Pass		Pass		
NO_x	Pass[3]				Pass
SO_x	Pass	Pass		Pass	Pass
PM10				Pass[4]	Pass
PM2.5				Pass[5]	Pass

Notes:
1. Results were taken from the attached AAQA Report.
2. The criteria pollutants are below EPA's level of significance as found in 40 CFR Part 51.165 (b)(2) unless otherwise noted below.
3. Pursuant to District Policy APR-1925, a Tier 2 analysis using the Ozone Limiting Method (OLM) method was performed to demonstrate compliance with the 1-hour NO_2 standard.
4. Modeled PM10 concentrations were below the District SIL for non-fugitive sources of 5 $\mu g/m^3$ for the 24-hour average concentration and 1 $\mu g/m^3$ for the annual concentration.
5. Modeled PM2.5 concentrations were below the District SIL for non-fugitive sources of 1.2 $\mu g/m^3$ for the 24-hour average concentration and 0.2 $\mu g/m^3$ for the annual concentration.

To ensure that human health risks will not exceed District allowable levels; the following shall be included as requirements for:

Unit # 11-0

1. After hours of operation are completed, the fire in the firebox will be snuffed out and will not be allowed to smolder overnight. Ash from firebox will be emptied in a manner to minimize emissions.
2. The Air Curtain Destructor will be operated according to manufacturer's guidelines and to minimize emissions. This includes but not limited to the following prohibitions: biomass shall not protrude from the firebox into the air curtain, flames shall not be visible above the air curtain, and plumes of ash shall not be generated due to excessive loading.

2. Project Description

Technical Services received a request on July 7, 2020 to perform a Risk Management Review (RMR) and Ambient Air Quality Analysis (AAQA) for the following:

- Unit -11-0: AIR BURNERS INC. MODEL S-220 AIR CURTAIN BURNER WITH A FAN POWERED BY A PERMIT EXEMPT IC ENGINE (50 BHP OR LESS)

3. RMR Report

3.1 Analysis

The District performed an analysis pursuant to the District's Risk Management Policy for Permitting New and Modified Sources (APR 1905, May 28, 2015) to determine the possible cancer and non-cancer health impact to the nearest resident or worksite. This policy requires that an assessment be performed on a unit by unit basis, project basis, and on a facility-wide basis. If a preliminary prioritization analysis demonstrates that:

- A unit's prioritization score is less than the District's significance threshold and;
- The project's prioritization score is less than the District's significance threshold and;
- The facility's total prioritization score is less than the District's significance threshold

Then, generally no further analysis is required.

The District's significant prioritization score threshold is defined as being equal to or greater than1.0. If a preliminary analysis demonstrates that either the unit(s) or the project's or the facility's total prioritization score is greater than the District threshold, a screening or a refined assessment is required

If a refined assessment is greater than one in a million but less than 20 in one million for carcinogenic impacts (Cancer Risk) and less than 1.0 for the Acute and Chronic hazard indices(Non-Carcinogenic) on a unit by unit basis, project basis and on a facility-wide basis the proposed application is considered less than significant. For unit's that exceed a cancer risk of 1 in one million, Toxic Best Available Control Technology (TBACT) must be implemented.

Toxic emissions for this project were calculated using the following methods:

- Toxic emissions from this proposed Biomass (Agricultural Waste)-Fired External Combustion unit were calculated using District approved emission factors based on the 1999 CARB Report, (Table 19, Biomass Fluidized Bed Combustor Combustion portion)

Development of Toxics Emission Factors from Source Test Data Collected Under the Air Toxics Hot Spots Program.

- Toxic emission from handling the ash from the Air Curtain Destructor were based on emission factors from (Biomass) Table 17 in June 2008 *Trace Metal Mobilization During Combustion of Biomass Fuels*.

These emissions were input into the San Joaquin Valley APCD's Hazard Assessment and Reporting Program (SHARP). In accordance with the District's Risk Management Policy, risks from the proposed unit's toxic emissions were prioritized using the procedure in the 2016 CAPCOA Facility Prioritization Guidelines. The prioritization score for this proposed facility was greater than 1.0 (see RMR Summary Table). Therefore, a refined health risk assessment was required.

The AERMOD model was used, with the parameters outlined below and meteorological data for 2007-2011 from Tipton (rural dispersion coefficient selected) to determine the dispersion factors (i.e., the predicted concentration or X divided by the normalized source strength or Q) for a receptor grid. These dispersion factors were input into the SHARP Program, which then used the Air Dispersion Modeling and Risk Tool (ADMRT) of the Hot Spots Analysis and Reporting Program Version 2 (HARP 2) to calculate the chronic and acute hazard indices and the carcinogenic risk for the project.

The following parameters were used for the review:

Source Process Rates

Unit ID	Process ID	Process Material	Process Units	Hourly Process Rate	Annual Process Rate
11	1	Almond Biomass - HV	Ton	1.64	234
11	2	Almond Biomass - LV	Ton	5.36	766
11	3	Ash Handling	lb	0.0167	7

Area Source Parameters

Unit ID	Unit Description	Release Height (m)	X-Length (m)	Y -Length (m)	Area (m^2)
11	Air Curtain Burner - Ash	1.88	6.04	1.89	11.41

Point Source Parameters

Unit ID	Unit Description	Release Height (m)	Temp. (°K)	Exit Velocity (m/sec)	Stack Diameter (m)	Vertical/ Horizontal/ Capped
11	Air Curtain Burner - LV	1.88	723	0.32	3.32	Vertical
11	Air Curtain Burner - HV	1.88	623	2.44	1.84	Vertical

4. AAQA Report

The District modeled the impact of the proposed project on the National Ambient Air Quality Standard (NAAQS) and/or California Ambient Air Quality Standard (CAAQS) in accordance with District Policy APR-1925 (Policy for District Rule 2201 AAQA Modeling) and EPA's Guideline for Air Quality Modeling (Appendix W of 40 CFR Part 51). The District uses a progressive three level approach to perform AAQAs. The first level (Level 1) uses a very conservative approach. If this analysis indicates a likely exceedance of an AAQS or Significant Impact Level (SIL), the analysis proceeds to the second level (Level 2) which implements a more refined approach. For the 1-hour NO_2 standard, there is also a third level that can be implemented if the Level 2 analysis indicates a likely exceedance of an AAQS or SIL.

The modeling analyses predicts the maximum air quality impacts using the appropriate emissions for each standard's averaging period. Required model inputs for a refined AAQA include background ambient air quality data, land characteristics, meteorological inputs, a receptor grid, and source parameters including emissions. These inputs are described in the sections that follow.

Ambient air concentrations of criteria pollutants are recorded at monitoring stations throughout the San Joaquin Valley. Monitoring stations may not measure all necessary pollutants, so background data may need to be collected from multiple sources. The following stations were used for this evaluation:

Monitoring Stations				
Pollutant	**Station Name**	**County**	**City**	**Measurement Year**
CO	Arvin - Di Giorgio	Kern	Arvin	2018
NOx	Bakersfield-California Avenue	Kern	Bakersfield	2018
PM10	Bakersfield-California Avenue	Kern	Bakersfield	2018
PM2.5	BAKERSFIELD - SOUTHEAST (PLANZ)	Kern	Bakersfield	2018
SOx	Fresno - Garland	Fresno	Fresno	2018
Ozone (for OLM)	Tulare-Visalia	Tulare	Visalia	2016

Technical Services performed modeling for directly emitted criteria pollutants with the emission rates below:

Emission Rates (lbs/hour)						
Unit ID	**Process**	**NOx**	**SOx**	**CO**	**PM10**	**PM2.5**
11	1	6.19	0.62	16.11	2.68	1.79
11	2	0.81	0.08	2.10	0.35	0.23
11	3	0.00	0.00	0.00	0.02	0.02

Emission Rates (lbs/year)						
Unit ID	**Process**	**NOx**	**SOx**	**CO**	**PM10**	**PM2.5**
11	1	885	088	2300	1156	771
11	2	115	012	300	150	100
11	3	000	000	000	000	000

The AERMOD model was used to determine if emissions from the project would cause or contribute to an exceedance of any state of federal air quality standard. The parameters outlined below and meteorological data for 2007-2011 from Tipton (rural dispersion coefficient selected) were used for the analysis:

The following parameters were used for the review:

Area Source Parameters					
Unit ID	**Unit Description**	**Release Height (m)**	**X-Length (m)**	**Y -Length (m)**	**Area (m^2)**
11	Ash Handling	1.88	6.04	1.89	11.41

Point Source Parameters						
Unit ID	**Unit Description**	**Release Height (m)**	**Temp. (°K)**	**Exit Velocity (m/sec)**	**Stack Diameter (m)**	**Vertical/ Horizontal/ Capped**
11	Almond Biomass - LV	1.88	723	0.32	3.32	Vertical
11	Almond Biomass - HV	1.88	623	2.44	1.84	Vertical

5. Conclusion

5.1 RMR

The cumulative acute and chronic indices for this facility, including this project, are below 1.0; and the cumulative cancer risk for this facility, including this project, is less than 20 in a million. In addition, the cancer risk for each unit in this project is less than 1.0 in a million. **In accordance with the District's Risk Management Policy, the project is approved without Toxic Best Available Control Technology (T-BACT).**

To ensure that human health risks will not exceed District allowable levels; the permit requirements listed on page 1 of this report must be included for this proposed unit.

These conclusions are based on the data provided by the applicant and the project engineer. Therefore, this analysis is valid only as long as the proposed data and parameters do not change.

5.2 AAQA

The emissions from the proposed equipment will not cause or contribute significantly to a violation of the State and National AAQS.

6. Attachments

A. Modeling request from the project engineer

B. Additional information from the applicant/project engineer

C. Prioritization score w/ toxic emissions summary

D. Facility Summary

E. AAQA results

Appendix I:
Draft ATC S-634-11-0

San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

DRAFT

PERMIT NO: S-634-11-0 **ISSUANCE DATE:** DRAFT

LEGAL OWNER OR OPERATOR: TREEHOUSE CALIFORNIA ALMONDS LLC
MAILING ADDRESS: PO BOX 12150
EARLIMART, CA 93219

LOCATION: 2115 ROAD 144
DELANO, CA 93215

EQUIPMENT DESCRIPTION:
AIR BURNERS INC. MODEL S-220 AIR CURTAIN BURNER WITH A FAN POWERED BY A PERMIT EXEMPT IC ENGINE (50 BHP OR LESS)

CONDITIONS

1. Within 12 months of initial operation of this air curtain incinerator, the operator shall submit a complete application for a Title V operating permit to the District for compliance with New Source Performance Standard Subpart CCCC - Standards of Performance for Commercial and Industrial Solid Waste Incineration Units. [40 CFR 60.2242]
2. {98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
3. {14} Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]
4. The air curtain incinerator shall burn no more than 56 tons of waste material in any one day. [District Rules 2201 and 4102]
5. The air curtain incinerator shall burn no more than 1,000 tons of waste material in any year. [District Rules 2201 and 4102]
6. The amount of ash handled shall not exceed 1.68 ton in any one day. [District Rules 2201 and 4102]
7. The amount of ash handled shall not exceed 30 tons in any year. [District Rules 2201 and 4102]
8. Emissions (in units of pounds per ton of waste material) from the air curtain incinerator shall not exceed any of the following limits: 1.0 lb-NOx/ton, 0.1 lb-SOx/ton, 1.3 lb-PM10/ton, 2.6 lb-CO/ton, or 0.9 lb-VOC/ton. [District Rule 2201]
9. Emissions from ash handling shall not exceed 0.23 lb-PM10/ton. [District Rule 2201]

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (661) 392-5500 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Samir Sheikh, Executive Director / APCO

DRAFT

Arnaud Marjollet, Director of Permit Services

Southern Regional Office • 34946 Flyover Court • Bakersfield, CA 93308 • (661) 392-5500 • Fax (661) 392-5585

10. The air curtain incinerator shall be operated according to manufacturer's specifications and in a manner to minimize emissions of air contaminants into the atmosphere. This includes but is not limited to the following prohibitions: biomass shall not protrude from the firebox into the air curtain, flames shall not be visible above the air curtain, and plumes of ash shall not be generated due to excessive loading. [District Rules 2201 and 4102]
11. The air curtain incinerator shall burn only biomass waste material, including almond wood sticks generated onsite as a byproduct of almond processing. [District Rules 2201 and 4102]
12. For conducting a cold start, the operator shall use a propane or butane torch, driptorch, or flare to ignite the material inside the air curtain incinerator. No accelerants (e.g. gasoline, diesel fuel, kerosene, turpentine) may be used. [District Rules 2201 and 4102]
13. During the startup period that is within the first 30 minutes of operation, visible emissions from the air curtain incinerator shall not equal or exceed Ringelmann 1 or 20% opacity for more than 3 minutes in any one hour. [District Rules 2201 and 4101]
14. After the startup period, during steady state operation, visible emissions from the air curtain incinerator shall not equal or exceed either of the following limits: Ringelmann 1 or 20% opacity for more than 3 minutes in any one hour or 10% opacity as determined by the average of three 1-hour blocks consisting of ten 6-minute average opacity values. [District Rules 2201 and 4101]
15. Opacity testing shall be conducted using the methods and procedures approved by the District. The District must be notified 30 days prior to any compliance opacity testing and an opacity test plan must be submitted for approval at least 15 days prior to testing. [District Rule 1081]
16. Compliance with the opacity limits on this permit shall be determined by EPA Method 9. [District Rule 4101]
17. The operator shall conduct periodic testing for opacity at least once every 12 calendar months. Opacity testing shall consist of one 30-minute cold start observation, and three 1 hour observations under normal steady state operation. [District Rule 1081]
18. Opacity observations shall be made at the point of greatest opacity in that portion of the plume where condensed water vapor is not present. [District Rule 1081]
19. The permittee shall submit to the District the opacity test results report in paper or electronic format within 60 days of completion of the field test. The opacity results shall include information regarding the charge rate during opacity observation. [District Rule 1081]
20. Within 60 days after achieving the maximum production rate at which the unit will be operated, but no later than 180 days after initial startup, the owner or operator shall conduct performance test(s). [District Rule 1081]
21. After operation is completed for a day, the fire in the firebox will be snuffed out and will not be allowed to smolder overnight. Ash from the firebox will be emptied in a manner to minimize emissions. [District Rules 2201 and 4102]
22. Ash removed from the firebox shall be handled, stored, and disposed of in a manner minimizing entrainment into the atmosphere. [District Rules 2201 and 4102]
23. The operator shall keep records of all initial and annual opacity test results and reports onsite in either paper copy or electronic format for at least 5 years. [District Rule 1070]
24. The permittee shall maintain daily and cumulative annual records of the tons of waste material burned in the air curtain incinerator. [District Rule 2201]
25. All records shall be maintained and retained on-site for a period of at least 5 years and shall be made available for District inspection upon request. [District Rules 1070 and 4702]