

San Joaquin Valley Air Pollution Control District AB 617 Community Emission Reduction Program

Ag Burn Alternatives Grant Program Emission Reduction Program Plan August 30, 2023

Arvin/Lamont Community

PROJECT IDENTIFICATION

ARVIN/LAMONT: 1.D. ALTERNATIVES TO AG BURNING

This is a Community Identified Project included and prioritized in the California Air Resources Board (CARB) and District adopted Arvin/Lamont Community Emission Reduction Programs (CERP). Ag Burn Alternatives Grant Program is part of [California Climate Investments](#), a statewide initiative that puts billions of Cap-and-Trade dollars to work reducing greenhouse gas emissions, strengthening the economy, and improving public health and the environment — particularly in disadvantaged communities.

This measure will reduce Particulate Matter (PM), Oxides of Nitrogen (NOx), and Reactive Organic Gases (ROG) emissions from agricultural open burning of orchard and vineyard removals by incentivizing chipping and soil reincorporation or land application, Air Curtain Burner (**only material with embedded wire**, such as cordon-pruned vineyard) and off-site beneficial re-use as an alternative.

COMMUNITY SUPPORT

This measure received support from the Arvin/Lamont Steering Committee and was included in the adopted Community Emission Reduction Program. Information about the Steering Committee is included below:

- (1) Name(s) of the community group(s)**
 - a. Arvin/Lamont Steering Committee [Map](#)
- (2) Purpose of community group(s)**
 - a. AB617 Community Engagement and Public Input
- (3) Total number of members in the community group(s)**
 - a. Arvin/Lamont – 69 members
- (4) Date(s) of formation/establishment**
 - a. Arvin/Lamont – March 2021
- (5) A description of the decision-making process must be included**
 - a. Arvin/Lamont Steering Committee [Charter](#)
- (6) Community Support Demonstration**
 - a. Arvin/Lamont [CERP](#)

Additionally, the District and CSC have jointly developed a tool to track progress of each measure adopted within the CERP. This tracker is updated monthly and includes updates such as number of projects contracted, funding allocated, project-associated benefits to the community, and other information specific to each measure. The tracker is shared directly with CSC members ahead of each regularly scheduled CSC meeting and is available on the community webpage in both English and Spanish.

MECHANISM FOR INFORMING COMMUNITY

This measure has been discussed at Community Steering Committee meetings in addition to the outreach activities conducted to inform residents of the program and requirements for participation. The outreach conducted has and will continue to be the following:

- Social media
- Mailers
- Print ads
- Press releases and press events
- Bus ads
- Events, town halls, webinars, etc.
- Other ideas as brought up by committee

PARTICIPANT REQUIREMENTS

(A) Ag Burn Alternatives Grant Program Eligibility:

The Ag Burn Alternatives Grant Program guidelines are attached to this program plan as Exhibit A. In implementing this CERP measure, the District will follow existing Program guidelines and eligibility criteria. Should the existing incentive program undergo enhancements in the future, the new program guidelines will be implemented. Only commercial agricultural operations are eligible to apply. The participant must submit an application and obtain an executed voucher from the District prior to chipping any of the vineyard or orchard acres to be removed at the location referenced in their application. Applications are processed on a first-come-first-served basis. Land conversions intended for non-agricultural purposes are not eligible for this Program.

The final disposition of agricultural material must be for soil incorporation (whole orchard/vineyard recycling), on-site land application, off-site beneficial re-use (such as mulch, composting, and land application near roadways for dust suppression) or other District approved practices.

- (1) Chipped material is not to be used in any combustion processes including, but not limited to, biomass power generation and/or pyrolysis
- (2) No portion of the agricultural material from the orchard/vineyard removal can be burned or used in any of the aforementioned combustion processes, with the sole exception of air curtain burners for cordon-

pruned vineyards/embedded wire material. Agricultural material includes (but is not limited to): leaves, branches, trunks, roots, stumps, untreated sticks, grape vines, grape canes, and untreated grape stakes

- (B) Participant Requirements: The Program application is attached to this program plan as Exhibit B. A certification section is included in the application and details participant requirements. Participation in the Program occurs in five phases: Voucher Application, District Pre-Inspection, Voucher Execution, Voucher Redemption, and District Post-Inspection.
- (1) Voucher Application: A participant must submit a completed voucher application along with the Certifications Form signed by the applicant, a completed IRS Form W-9, a site map confirming the acreage to be removed, and a detailed and itemized quote from any service providers for the planned activities.
 - (2) District Pre-Inspection: If the Voucher Application is determined by a District Program Specialist to be complete and eligible, a pre-inspection of the orchard or vineyard will be scheduled and conducted by a District Air Quality Field Assistant.
 - (3) Voucher Execution: Upon completion of the pre-inspection, the District Program Specialist will review the pre-monitoring inspection report, execute a voucher if the application is deemed eligible, and mail or email the voucher to the applicant. Participants may then commence chipping of the removed vineyard or orchard and complete the project as described on the application and indicated on the executed voucher.
 - (4) Voucher Redemption: The applicant has one year from the voucher execution date to complete the project. The applicant must complete the project under the same project type (final disposition) as listed on their executed voucher. Any changes to the project type after voucher execution must be approved by the District. Once a participant has completed their project, they may submit a Claim for Payment packet to begin the voucher redemption process. A complete Claim for Payment packet is required as part of the voucher redemption process and must include a completed and signed voucher, a breakdown of services conducted, and copies of any invoices and receipts for the services performed. A District Program Specialist will review the submitted Claim for Payment packet for completeness, and begin coordination for the post-inspection.
 - (5) District Post-Inspection: After receiving a completed Claim for Payment packet, a District Air Quality Field Assistant will conduct the post-inspection site visit. Photographs will be taken during the site visit and a post-inspection report will be completed, indicating the final disposition of agricultural material. District Staff will review the post-monitoring report,

and issue reimbursement to the participant for eligible costs, up to the approved voucher amount.

FUNDING AMOUNTS

The approved CERP includes \$1,400,000 for the Arvin/Lamont community, for the implementation of this measure. This funding will eliminate agricultural burning of up to 1,000 acres in Arvin/Lamont, helping to achieve the ongoing emissions reductions associated with the phase-out of agricultural open burning.

Table 1 summarizes the eligible alternative practices and incentive amounts available to Arvin/Lamont community farmers through the Program. The recent addition of air curtain burners as an alternative measure was approved by CARB to address specific feasibility issues related to processing agricultural materials from vineyard crops (cordon-pruned) and other crops grown using wire trellising. Consistent with CARB’s findings, the District will continue to prioritize non-combustion alternatives and will only authorize funding for the air curtain burner alternative when non-combustion alternatives have been eliminated as a viable option during the application process.

These funding levels represent the maximum incentive amounts based on the number of acres removed and the final disposition of the agricultural material. If the total project cost of the orchard or vineyard removal, and the cost of chipping and disking or spreading, as applicable, are less than the incentive amount, the final amount reimbursed to the participant will be reduced. There are no minimum match requirements for participation in the program; however, participants must pay for any costs that exceed the incentive amount.

Cost-Effectiveness of each project’s emissions reductions is calculated according to the following formula:

$$\text{Formula A-1: Cost-Effectiveness (\$/ton)} = \text{Grant Amount (\$)} / \text{Total Emission Reductions (tons/acre)}$$

Table 1: Eligible Incentive Amounts for Arvin/Lamont Community

Project Type	Orchards	Cane-Pruned Vineyard	Cordon-Pruned Vineyard
Chipping with Soil Incorporation (whole orchard/vineyard recycling)	\$600 per acre	\$800 per acre	\$1,300 per acre
Chipping without Soil Incorporation (on-site land application)	\$300 per acre	\$500 per acre	\$1,000 per acre
Off-site Beneficial Re-use (mulching, composting, land application near roadways for dust suppression)	\$600 per acre	\$800 per acre	\$1,300 per acre
Air Curtain Burner (only for material with embedded wire such as cordon-pruned vineyard)	\$1,000 per acre	Ineligible	\$1,000 per acre
Additional incentive of \$400/acre is provided for each incentive category to agricultural operations with 100 total acres or less within the San Joaquin Valley			

*Final incentive may be less than the maximum incentive if the total eligible cost for the project is less than the maximum incentive or if the final project differs from the project as listed on the executed voucher.

PROJECT SELECTION AND REPORTING

Projects will be approved on a first come, first served basis determined by the submittal of a complete program application.

The District will report program information in accordance with Community Air Protection program guidelines found at:

https://ww3.arb.ca.gov/msprog/cap/docs/cap_incentives_2019_guidelines.pdf.

EMISSION REDUCTION TARGETS

The goal of this measure is to abate the agricultural open burning of up to 1,000 acres in the Arvin/Lamont Community with an estimated lifetime emissions reductions associated with this measure includes up to 110 tons of PM, 58 tons of NO_x, and 100 tons of VOCs.

The District will utilize an established Program emission reduction calculation methodology to calculate the emission reductions achieved from each completed project.

EMISSIONS REDUCTIONS METHODOLOGY FOR AG BURN ALTERNATIVES GRANT PROGRAM

The Program's emissions reduction calculations are based on the following references for tier ratings, emission factors, and process rates:

- District's 2007 Area Sources Emission Inventory Methodology, 670 – Agricultural Burning (revised June 1, 2009)¹
- The District's Final Staff Report and Recommendation on Agricultural Open Burning (2010 Ag Burning Staff Report)²
- The Carl Moyer Program Guidelines³
- EMFAC2017 for MHDT⁴

Step 1: Determine baseline emissions for open field burning

Step 2: Determine emissions for alternatives to agricultural open burning

¹ 2007 Area Sources Emission Inventory Methodology, 607 – Agricultural Burning, Table 9 (June 9, 2008).

https://www.valleyair.org/Air_Quality_Plans/EmissionsMethods/MethodForms/Current/AgBurningPFW2007.pdf

² Final Staff Report and Recommendations on Agricultural Open Burning, chapter 6 (May 20, 2010).

https://www.valleyair.org/BurnPrograms/Ag_Burning.htm#,

³ The Carl Moyer Program Guidelines 2017 Revisions (April 27, 2017).

https://ww2.arb.ca.gov/sites/default/files/classic/msprog/moyer/guidelines/2017/2017_cmpgl.pdf

⁴ EMFAC2017 <https://arb.ca.gov/emfac/2017/>

Step 3: Calculate emissions reductions by subtracting the total alternative to agricultural open burn emissions from the baseline emissions for open burning

The following details each of these steps.

Step 1: Determine Baseline Emissions from Open Field Burning

Emissions of PM2.5, NOx and VOC from open burning operations have been estimated by the District based on the following:

Emissions estimates for orchard removals and open field burning include:

- Highway vehicle emissions to deliver mobile equipment to the site
- Emissions from a dozer used to remove the trees or vines
- Emissions from a wheel loader used to stack trees or vines into piles for burning
- Emissions from open burning of trees, vines and roots

The analysis for Step 1 will be divided into the following:

- a. Determine the emissions for each off-road emissions source
 - Dozer
 - Wheel loader
- b. Determine the emissions for the heavy duty haul truck used to haul the heavy equipment to the orchard/vineyard removal site
- c. Determine the emissions from open burning of removed agricultural material
- d. Calculate the baseline open burning emissions from the orchard/vineyard removal project

a. Determine emissions from off-road equipment

Emissions from off-road equipment are determined by identifying typical equipment used to conduct open field burning of orchard/vineyard removals. The District’s 2010 Ag Burning Staff Report identifies bhp, tier rating, and process rates for “typical equipment” used for this activity. Equipment emission factor obtained from Carl Moyer Program Guidelines 2017 Revisions.

Table 2

Emission Source	bhp	Tier	Pollutant	Emission Factor (g/bhp-hr)	Emissions lb/hr	Processing Rate (hr/acre)
Dozer	300	2	NOx	3.79	2.5	2
			PM2.5	0.09	0.1	
			VOC	0.09	0.1	

Wheel loader	250	2	NOx	4.15	2.3	1
			PM2.5	0.09	0.0	
			VOC	0.11	0.1	

To calculate the emissions for each piece of off-road equipment multiply the bhp of the emission source by the emission factor and divide by 453.6. Then multiply by the processing rate.

$$E_{off\ road\ equip} = \left(\frac{A \times B}{C}\right) \times D$$

Where:

$E_{off-road-equip}$ = Emissions (lb/acre)

A = bhp of emission source (dozer, wheel loader, etc.)

B = Emission Factor (g/bhp-hr)

C = 453.6 (g/lb)

D = Processing Rate (hr/acre)

Example: Calculating NO_x emissions for Dozer

$$\left(\frac{300 \times 3.79}{453.6}\right) \times 2 = 5.01 \text{ lb/acre}$$

This calculation was performed for each entry in Table 2 above to create Table 3 below.

Table 3

Emission Source	bhp	Tier	Pollutant	Emission Factor (g/bhp-hr)	Emissions lb/hr	Processing Rate (hr/acre)	Emissions (lb/acre)
Dozer	300	2	NOx	3.79	2.5	2	5.01
			PM2.5	0.09	0.1		0.12
			VOC	0.09	0.1		0.12
Wheel loader	250	2	NOx	4.15	2.3	1	2.29
			PM2.5	0.09	0.0		0.05
			VOC	0.11	0.1		0.06
Total Emissions (lb/acre)			NOx				7.30
			PM2.5				0.17
			VOC				0.18

b. Determine emissions for the heavy duty haul truck used to haul the heavy equipment to the orchard/vineyard removal site

Heavy Haul Truck vehicle emissions are obtained from EMFAC2017 for MHDT. Highway vehicle emissions for delivery of equipment assumes two 100 mile round-trips for a heavy haul truck to deliver a dozer and wheel loader.

Table 4

Emission Source	Pollutant	g/mile	Round trip Miles	# of round trips
Heavy Haul Truck	NOx	3.66	100	2
	PM2.5	0.11		
	VOC	0.34		

To calculate the emissions for a heavy duty haul truck, multiply the MHDT emission factor by round trip miles and number of trips. Then divide by 453.6.

$$E_{heavy\ haul\ truck} = \frac{F \times G \times H}{C}$$

Where:

$E_{heavy-haul-truck}$ = Emissions (lb/project)

F = MHDT Emission Factor (g/mile)

G = Round trip miles

H = Number of trips

C = 453.6 (g/1 lb)

Example: Calculating PM_{2.5} emissions for Heavy Haul Truck to transport 2 pieces of equipment

$$\frac{0.11 \times 100 \times 2}{453.6} = 0.05\ lb/project$$

This calculation was performed for each entry in Table 4 above to create Table 5 below.

Table 5

Emission Source	Pollutant	g/mile	Round trip Miles	# of round trips	lb/project
Heavy Haul Truck	NOx	3.66	100	2	1.61
	PM2.5	0.11			0.05
	VOC	0.34			0.15

c. Determine emissions from open burning of removal of agricultural material

Emission factors for open burning are taken from the District's 2007 Area Sources Emission Inventory Methodology, 670 – Agricultural Burning (revised 01Jun09) for orchard and vineyard removals.

To calculate the emissions from open burning of the removal of agricultural material (orchard/vineyard) multiply the emission factor by the fuel load.

$$E_{open\ burn} = I \times J$$

Where:

$E_{open-burn}$ = Open burn emissions (lb/acre)

I = Emission Factor (lb/ton)

J = Fuel Load (ton/acre)

Table 6

Emission Source	Pollutant	lb/ton	ton/acre
Ag Burn	NOx	5.20	30 (Orchard removal) 15 (Vineyard removal)
	PM2.5	7.30	
	VOC	6.30	

Example: Calculating VOC emissions for open burning of orchard removal

$$6.30 \times 30 = 189 \text{ ton/acre}$$

This calculation was performed for each entry in Table 6 above to create Table 7 below.

Table 7

Emission Source	Pollutant	lb/ton	ton/acre	lb/acre
Ag Burn Orchard Removal	NOx	5.2	30	156.0
	PM2.5	7.3		219.0
	VOC	6.3		189.0
Ag Burn Vineyard Removal	NOx	5.2	15	78.0
	PM2.5	7.3		109.5
	VOC	6.3		94.5

d. Calculate the baseline open burning emissions from the orchard/vineyard removal project

To calculate the baseline open burning emissions from orchard/vineyard removal projects, take the sum of the following: sum of the off road equipment emissions multiplied by the number of acres removed, emissions from the heavy haul truck trips, open burn emissions multiplied by the number of acres removed. Then divide by 2000.

$$BE_{OB} = \frac{(\sum E_{off\ road\ equip} \times N_{acres}) + E_{heavy\ haul\ truck} + (E_{open\ burn} \times N_{acres})}{2000}$$

Where:

BE_{OB} = Baseline emissions open burning

E_{off-road-equip} = Emissions (lb/acre) for all off road equipment listed in table 2

E_{heavy-haul-truck} = Emissions (lb/project)

E_{open-burn} = Open burn emissions (lb/acre)

N_{acres} = Number of acres removed (orchard or vineyard)

Example: Calculating NO_x baseline emissions reduction for open burn of 40 acre orchard removal:

$$\frac{(7.30 \times 40) + 1.61 + (156.00 \times 40)}{2000} = 3.3 \text{ tons NO}_x/\text{project}$$

Table 8

Pollutant	Open Burning (tons/40 acre project)
NO _x	3.27
PM _{2.5}	4.38
VOC	3.78

Step 2: Determine Emissions for Alternatives to Agricultural Burning

Emissions estimates for orchard removals, chipping, and soil incorporation or land application include:

- Highway vehicle emissions to deliver mobile equipment to the site
- Emissions from a dozer used to remove the trees or vines
- Emissions from a wheel loader used to stack trees or vines into piles
- Emissions from an excavator to load ag material into grinder
- Emissions from fuel combustion from the use of a grinder
- Emissions from grinding (PM_{2.5})
- Tractor emissions to spread chipped ag material
- Emissions from dozer to rip soil (3 passes)
- Tractor emissions used to incorporate/disc ag material chips

The analysis for Step 2 will be divided into the following:

- a. Determine the emissions for each off-road emissions source
 - Dozer #1
 - Wheel loader
 - Excavator
 - Grinder (Combustion)

- Tractor (Spreading)
 - Dozer #2
 - Tractor (Discing)
- b. Determine the emissions for the heavy duty haul truck used to haul the heavy equipment to the orchard/vineyard removal site
 - c. Determine the emissions from grinding orchard/vineyard removal
 - d. Calculate the emissions for alternatives to agricultural burning from the orchard/vineyard removal project

a. Determine emissions from off-road equipment

Emissions from off-road equipment are determined by identifying typical equipment used to conduct open field burning of orchard/vineyard removals. The District's 2010 Ag Burning Staff Report identifies bhp, tier rating, and process rates for "typical equipment" used for this activity.

Note: For projects that choose land application of the chipped material rather than soil incorporation, remove soil ripping and discing equipment and related activities from calculations.

Table 9

Emission Source	bhp	Tier	Pollutant	Tier Standard (g/bhp-hr)	Emissions lb/hr	Processing Rate (hr/acre)
Dozer #1	300	2	NOx	3.79	2.5	2
			PM2.5	0.09	0.1	
			VOC	0.09	0.1	
Wheel loader	250	2	NOx	4.15	2.3	1
			PM2.5	0.09	0.0	
			VOC	0.11	0.1	
Excavator	240	1	NOx	5.93	3.1	1
			PM2.5	0.12	0.1	
			VOC	0.29	0.2	
Grinder	1,000	2	NOx	3.79	8.4	1
			PM2.5	0.09	0.2	
			VOC	0.09	0.2	
Tractor (Spreading)	115	2	NOx	4.15	1.1	1
			PM2.5	0.13	0.0	
			VOC	0.15	0.0	
Dozer #2 (3 passes)	600	2	NOx	3.79	5.0	4.5
			PM2.5	0.09	0.1	
			VOC	0.09	0.1	
	115	2	NOx	4.15	1.1	1

Tractor (Discing)			PM2.5	0.13	0.0	
			VOC	0.15	0.0	

To calculate the emissions for each piece of off-road equipment multiply the bhp of the emission source by the emission factor and divide by 453.6. Then multiply by the processing rate.

$$E_a = \left(\frac{A \times B}{C} \right) \times D$$

Where:

E_a = Emissions_(PM2.5, NO_x, VOC) (lb/acre)

A = bhp of emission source (dozer, wheel loader, etc.)

B = Emission Factor (g/bhp-hr)

C = 453.6 (g/1 lb)

D = Processing Rate (hr/acre)

Example: Calculating NO_x emissions for Dozer #1

$$\left(\frac{300 \times 3.79}{453.6} \right) \times 2 = 5.01 \text{ lb/acre}$$

This calculation was performed for each entry in table 9 above to create table 10 below.

Table 10

Emission Source	bhp	Tier	Pollutant	Tier Standard (g/bhp-hr)	Emissions lb/hr	Processing Rate (hr/acre)	Emissions (lb/acre)
Dozer #1	300	2	NO _x	3.79	2.5	2	5.01
			PM2.5	0.09	0.1		0.12
			VOC	0.09	0.1		0.12
Wheel loader	250	2	NO _x	4.15	2.3	1	2.29
			PM2.5	0.09	0.0		0.05
			VOC	0.11	0.1		0.06
Excavator	240	1	NO _x	5.93	3.1	1	3.14
			PM2.5	0.12	0.1		0.06
			VOC	0.29	0.2		0.15
Grinder	1,000	2	NO _x	3.79	8.4	1	8.36
			PM2.5	0.09	0.2		0.20
			VOC	0.09	0.2		0.20
	115	2	NO _x	4.15	1.1	1	1.05

Tractor (Spreading)			PM2.5	0.13	0.0		0.03
			VOC	0.15	0.0		0.04
Dozer #2	600	2	NOx	3.79	5.0	4.5	22.56
			PM2.5	0.09	0.1		0.52
			VOC	0.09	0.1		0.54
Tractor (Discing)	115	2	NOx	4.15	1.1	1	1.05
			PM2.5	0.13	0.0		0.03
			VOC	0.15	0.0		0.04
Total Emissions (lb/acre)			NOx				43.46
			PM2.5				1.23
			VOC				1.19

b. Determine emissions for the heavy duty haul truck used to haul the heavy equipment to the orchard/vineyard removal site

Heavy Haul Truck vehicle emissions are taken from EMFAC2017 for MHDT. Highway vehicle emissions for delivery of equipment assumes six 100 mile round-trips for a heavy haul truck to deliver two dozers, a wheel loader, and a tractor.

Table 11

Emission Source	Pollutant	g/mile	Round trip Miles	# of round trips
Heavy Haul Truck	NOx	3.66	100	6
	PM2.5	0.11		
	VOC	0.34		

To calculate the emissions for a heavy duty haul truck, multiply the MHDT emission factor by round trip miles and number of trips. Then divide by 453.6.

$$E_b = \frac{F \times G \times H}{C}$$

Where:

E_b = Emissions (lb/project)

F = MHDT Emission Factor (g/mile)

G = Round trip miles

H = Number of trips

C = 453.6 (g/1 lb)

Example: Calculating PM_{2.5} emissions for Heavy Haul Truck to transport 6 pieces of equipment

$$\frac{0.11 \times 100 \times 6}{453.6} = 0.15 \text{ lb/project}$$

This calculation was performed for each entry in Table 11 above to create Table 12 below.

Table 12

Emission Source	Pollutant	g/mile	Round trip Miles	# of round trips	lb/day
Heavy Haul Truck	NOx	3.66	100	6	4.84
	PM2.5	0.11			0.15
	VOC	0.34			0.45

c. Determine emissions from grinding orchard/vineyard removal

Chipping/grinding emission factor was taken from the District's 2010 Ag Burning Staff Report, based on the emissions from permitted chipping/grinding operations.

Table 13

Emission Source	Pollutant	lb/ton	ton/acre
Chipping and Grinding	PM2.5	0.0071	30

To calculate the PM_{2.5} emissions from grinding agricultural material multiply the emission factor for grinding by the fuel load factor.

$$E_{chipping} = I \times J$$

Where:

E_{chipping} = Emissions from chipping/grinding (lb/acre)

I = Emission Factor (lb/ton)

J = Fuel Load (ton/acre)

Example: Calculating PM_{2.5} emissions from grinding orchard removal material

$$0.0071 \times 30 = 0.2 \text{ lb/acre}$$

This calculation was performed for each entry in Table 13 above to create Table 14 below.

Table 14

Emission Source	Pollutant	lb/ton	ton/acre	lb/acre
Chipping and Grinding	PM2.5	0.0071	30	0.2

d. Calculate the emissions for alternatives to agricultural burning from the orchard/vineyard removal project

To calculate the emissions for alternatives to agricultural burning from orchard/vineyard removal projects, take the sum of the following: sum of the off road equipment emissions multiplied by the number of acres removed and emissions from the heavy haul truck trips. Then divide by 2000.

$$E_{\text{Soil Incorporation}} = \frac{(\sum E_{\text{off road equip}} \times N_{\text{acres}}) + E_{\text{heavy haul truck}}}{2000}$$

Where:

$E_{\text{Soil-Incorporation}}$ = Emissions soil incorporation

$E_{\text{off-road-equip}}$ = Emissions (lb/acre) for all off road equipment listed in table 2

$E_{\text{heavy-haul-truck}}$ = Emissions (lb/project)

N_{acres} = Number of acres removed (orchard or vineyard)

Example: Calculating NO_x emissions for chipping and soil incorporation of 40 acre orchard removal project

$$\frac{(43.46 \times 40) + 4.84}{2000} = 0.57 \text{ tons NO}_x/\text{project}$$

Table 15

Pollutant	Alternative to Open Burning Soil Incorporation (tons/40 acre project)
NO _x	0.87
PM _{2.5}	0.03
VOC	0.02

Step 3: Calculate Emissions Reductions

The last step is to calculate the emissions reductions by subtracting the total alternative to agricultural open burn emissions from the baseline emissions for open burning.

$$ER = A - B$$

Where:

ER = Emission Reduction

A = Baseline emissions for open burning orchard/vineyard removal (Step 2)

B = Total alternative to agricultural open burn emissions (Step 1)

Example: Calculating NO_x emissions reductions from a 40 acre orchard removal with chipping and soil incorporation as an alternative to open burning

$$3.27 - 0.87 = 2.40 \text{ tons/project}$$

Table 16

Pollutant	Emissions Reductions (tons/40 acre project)
NO _x	2.40
PM _{2.5}	4.36
VOC	3.76