

## San Luis Obispo County Air Pollution Control District - Agricultural Operation Potential to Emit Estimating Calculator

The federal Clean Act Amendments of 1990 created a nation-wide permit requirement referred to as the "Title V" program. Any agricultural operation with a potential to emit more than 100 tons per year (tpy) of a criteria air pollutant must apply for a Title V permit no later than December 31, 2004. The calculations below focus on the emission of oxides of nitrogen (NOx) and volatile organic compounds (VOC). Completion of this form is intended to allow a member of the farm community to independently estimate their potential to emit. If the calculations performed here result in an estimate of greater than 100 tpy for either NOx or VOC, you should contact the David Dixon at the Air Pollution Control District at 805-781-5912 to discuss the need to submit a permit application.

### Part I - Irrigation Engines

	A	B	C	D	E	F	AxBxCxDxE	AxBxCxDxF
Engine(s)	Acres	Well Depth (ft)	Water Use Factor (acre-ft/acre-yr)	Conversion Factor	NOx Emission Factor (g/bhp-hr)	VOC Emission Factor (g/bhp-hr)	NOx (lb/yr)	VOC (lb/yr)
				0.00593				
				0.00593				
				0.00593				

Engine(s): Irrigation engines may be grouped by crop type (or water use factor), well depth, and/or emission factor to reduce the number of calculations.

Acres: Number of acres irrigated by the engine(s).

Well Depth: Average well depth for the engine(s)

Emission Factors: Pre-1996 diesel based on SLOCo Carl Moyer Program. Nat gas based on AP-42, Table 3.2-2, dated 1/95.

Conv. Factor:  $(43560\text{ft}^2/\text{acre} \times 62.4\text{lb}/\text{ft}^3 \times 5.05 \times 10^{-7}\text{hp-hr}/\text{ft-lb}) \div (454\text{g}/\text{lb} \times 0.51 \text{ mechanical efficiency})$

#### Water Use Factors (acre-ft/acre-yr)

Crop	Water Use
Field Crops	2.85
Grain	1.49
Truck Crops	2.74
Deciduous Orchards	2.89
Subtropical Orchards	2.18
Vineyards	1.50

#### Emission Factors (g/bhp-hr)

Engine	Fuel	NOx	VOC
pre-1996	diesel	10.0	1.13
post-1996	diesel	6.9	1.13
all	nat gas	10.0	0.14

### Part II - Other Engines

		A	B	C	D	E	AxBxCxD	AxBxCxE
Engine(s)	Usage	Horse-power	Potential Hours/Year	Conversion Factor	NOx Emission Factor (g/bhp-hr)	VOC Emission Factor (g/bhp-hr)	NOx (lb/yr)	VOC (lb/yr)
				0.0022				
				0.0022				
				0.0022				

Engine(s): Other engines may be grouped by usage and/or emission factor to reduce the number of calculations.

Horsepower: Total the horsepower rating for all engines in group.

Emission Factors: Pre-1996 diesel based on SLOCo Carl Moyer Program experience. Nat gas based on AP-42, Table 3.2-2, dated 1/95.

Conv. Factor:  $(1 \div 454\text{g}/\text{lb})$

#### Potential Hours per Year by Usage

Usage	Potential Hours/yr
irrigation distribution or booster	2190
standby generator	500
frost protection	30
wind machine	30
other	2190

#### Emission Factors (g/bhp-hr)

Engine	Fuel	NOx	VOC
pre-1996	diesel	10.0	1.13
post-1996	diesel	6.9	1.13
all	nat gas	10.0	0.14

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### Part III - Gasoline Storage Tanks greater than 250 gallons in capacity

A	B	AxB
Number of Gasoline Tanks	VOC Emission Factor (lb/tank/yr)	VOC (lb/yr)
	117	

### Part IV - Manure Lagoons at Dairies

A	B	AxB
Number of Milking Cows	VOC Emission Factor (lb/head/yr)	VOC/lb/yr
	6.3	

### Part V - Heaters and Boilers

		A	B	C	D	AxBxC	AxBxD
Heater/Boiler	Usage	Heat Input Rating (mmBtu/hr)	Potential Hours/Year	NOx Emission Factor (lb/mmBtu)	VOC Emission Factor (lb/mmBtu)	NOx (lb/yr)	VOC (lb/yr)
			4380	0.098	0.0054		
			4380	0.098	0.0054		
			4380	0.098	0.0054		

Heater/Boiler: Combustion devices may be grouped by usage and/or emission factor.

Heat Input Rating: Total the heat input rating for all combustion devices in a group.

Potential Hours/Year: Assumes use during a maximum of two seasons.

Emission Factors: Default factors based on AP-42, Table 1.4-1, dated 2/98. Use manufacturer's data instead if known.

### Part VI - Total Estimated Potential to Emit

	A	B	C	D	E	F	(A+B+C+E) ÷ F
	Irrigation Engines	Other Engines	Gasoline Tanks	Dairy Lagoons	Heaters/Boilers	Conversion Factor	tons/year
NOx						2000 lb/ton	
VOC						2000 lb/ton	

#### Abbreviations:

lb = pound	mmBtuh = million British thermal units per hour	NOx = oxides of nitrogen
yr = year	g/bhp-hr = grams per brake horsepower hour	VOC = volatile organic compounds
ft = feet		

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