State of Oregon Department of Environmental Quality

Oregon Title V Operating Permit Fees

Formulas - Determining VOC Emissions Using Material Balance, Determining Sulfur Dioxide Emissions Using Material Balance and Verified Emission Factors Using Source Testing

OAR Division 220

340-220-0150 - Determining VOC Emissions Using Material Balance

$VOC_{tot} = VOC_{add} - VOC_{cons}$

Where:

- VOC_{tot} = Total VOC emissions, tons
- VOC_{add} = VOC added to the process, tons
- VOC_{cons} = VOC consumed and/or recovered from the process, tons

340-220-0160 - Determining Sulfur Dioxide Emissions Using Material Balance

(3) $SO_2 = \%S/100 \times F \times 2$

Where:

- SO_2 = Sulfur dioxide emissions for each quantity of fuel, tons
- %S = Percent sulfur in the fuel being burned, % (w/w).
- F = Amount of fuel burned, based on a quantity measurement, tons
- 2 = Pounds of sulfur dioxide per pound of sulfur

(4) $SO_{2adj} = SO_2 \times 0.97$

Where:

- SO_{2adj} = Sulfur dioxide adjusted for sulfur retention (40 CFR Part 60, Appendix A, Method 19, Section 5.2)
- SO_2 = Sulfur dioxide emissions from each quantity burned (OAR 340-220-0140(3))

340-220-0170 - Verified Emission Factors Using Source Testing

(7)(b) If the correlation coefficient (R^2) is less than 0.50, the EEAF shall be:

$EEAF = 1 + SD/EF_{avg}$

Where:

- SD = Standard Deviation
- EF_{avg} = Average of the Emission Factors

8(a) If the regression analysis correlation coefficient is less than 0.50, the actual emissions shall be the average emission factor determined from at least nine test runs multiplied by the EEAF multiplied by the total production for the entire year; or

$AE = EF_{avg} \times EEAF \times P$

Where:

- AE = Actual Emissions
- EF_{avg} = Average of the Emission Factors
- EEAF = Estimated Emissions Adjustment Factor
- P = Total production for the year

(9)(a) All emissions during startup and shutdown, and emissions greater than normal shall be assumed equivalent to operation without an air pollution control device, unless accurately demonstrated by the owner or operator and approved by the Department in accordance with OAR 340-220-0170(9)(b), (9)(c), (9)(d), and (9)(e). The emission factor plus the EEAF shall be adjusted by the air pollution control device collection efficiency as follows:

Actual emission factor = (EF x EEAF)/(1 - PCDE)

Where:

- EF = Emission Factor
- EEAF = Emission Estimate Adjustment Factor
- PCDE = Pollution Control Device Collection Efficiency Unless otherwise approved by the Department, the pollution control device collection efficiencies used in this calculation shall be:

Particulate Matter:

ESP or baghouse — 0.90

High energy wet scrubber — 0.80

Low energy wet scrubber — 0.70

Cyclonic separator — 0.50

Acid gases:

Wet or dry scrubber — 0.90

VOCs:

Incinerator — 0.98

Carbon absorber — 0.95