ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Standard [OPERATING] Permit Condition XII – SO$_2$ Material Balance Calculation

Permit Condition for Air Quality Permits
Adopted by Reference in 18 AAC 50.346

April 1, 2002

REVISED {*adoption date of regulations*} [AUGUST 25, 2004]

Standard [OPERATING] Permit Condition XII – SO$_2$ Material Balance Calculation

Emissions [EMISSION] Unit or Stationary Source Categories This Condition Applies to:
Any fuel burning equipment using liquid fuel.

The **Department** [DEPARTMENT] will use **Standard Permit Condition (SPC)** [STANDARD PERMIT CONDITION] XII in any operating permit unless the **Department** [DEPARTMENT] determines that **emissions** [EMISSION] unit- or stationary source-specific conditions more adequately meet the requirements of 18 AAC 50.

Permit Wording:

SO$_2$ Material Balance Calculation

If a fuel shipment contains more than 0.75 percent sulfur by weight, calculate the three-hour exhaust concentration of SO$_2$ using the following equations[1]:

$$A = 31,200 \text{ x } [\textbf{wt\%S}_{\textbf{fuel}}] = 31,200 \text{ x } \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

$$B = 0.148 \text{ x } [\textbf{wt\%S}_{\textbf{fuel}}] = 0.148 \text{ x } \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

$$C = 0.396 \text{ x } [\textbf{wt\%C}_{\textbf{fuel}}] = 0.396 \text{ x } \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

$$D = 0.933 \text{ x } [\textbf{wt\%H}_{\textbf{fuel}}] = 0.933 \text{ x } \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

$$E = B + C + D = \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

$$F = 20.9 - [\textbf{vol\%}_{\textbf{dry}}\textbf{O}_{\textbf{2, exhaust}}] = 20.9 - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

$$G = [\textbf{vol\%}_{\textbf{dry}}\textbf{O}_{\textbf{2, exhaust}}] \div F = \underline{\hspace{2cm}} \div \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

$$H = 1 + G = 1 + \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

$$I = E \text{ x } H = \underline{\hspace{2cm}} \text{ x } \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

$$\textbf{SO}_2 \textbf{ concentration} = A \div I = \underline{\hspace{2cm}} \div \underline{\hspace{2cm}} = \underline{\hspace{2cm}} \textbf{ ppm } [\text{PPM}]$$

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[1] The information contained inside brackets in the following equations is not being proposed for deletion, contrary to standard formatting for revisions. The information should be contained in parentheses; however the formatting of the equations prohibits reflecting proposed changes. When the public comment period has closed and the document is finalized, the equations will be reformatted with parentheses.

Standard [OPERATING] Permit Condition
XII – SO$_2$ Material Balance Calculation
Revised {*adoption date of regulations*}
[AUGUST 25, 2004]

1

April 1, 2002

The **wt%S$_{fuel}$, wt%C$_{fuel}$,** and **wt%H$_{fuel}$** are [EQUAL TO] the weight percents of sulfur, carbon, and hydrogen**, respectively,** in the fuel. These percentages should total 100%.

The fuel weight percent [(WT%)] of sulfur is obtained pursuant to **Condition** [CONDITION] <u>*<insert cross reference to SPC XI.2>*</u>. The fuel weight percents of carbon and hydrogen are obtained from the fuel refiner.

The volume percent of oxygen in the exhaust (**vol%$_{dry}$O$_{2, exhaust}$**) is obtained from oxygen meters, manufacturer's data, or from the most recent analysis under 40 C.F.R. 60, Appendix A-2, Method 3, adopted by reference in 18 AAC 50.040(a), at the same **emissions unit** [ENGINE] load used in the calculation.

Enter all of the data in percentages without dividing the percentages by 100. For example, if **wt%S$_{fuel}$** = 1.0%, then enter 1.0 into the equations, not 0.01, and if **vol%$_{dry}$O$_{2, exhaust}$** = 3.00%, then enter 3.00, not 0.03.

[18 AAC 50.346(c)]