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 Operating 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 X [**wt%S_{fuel}**] = 31,200 X _____ = _____
B = 0.148 X [**wt%S_{fuel}**] = 0.148 X _____ = _____
C = 0.396 X [**wt%C_{fuel}**] = 0.396 X _____ = _____
D = 0.933 X [**wt%H_{fuel}**] = 0.933 X _____ = _____
E = B + C + D = _____ + _____ + _____ = _____

F = 20.9 – [**vol%$_{dry}O_{2,\ exhaust}$**] = 20.9 - _____ = _____
G = [**vol%$_{dry}O_{2,\ exhaust}$**] ÷ F = _____ ÷ _____ = _____

H = 1 + G = 1 + _____ = _____
I = E x H = _____ x _____ = _____

SO_2 concentration = A ÷ I = _____ ÷ _____ = _____ **ppm** [PPM]

[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.

The **wt%S_{fuel}**, **wt%C_{fuel}**, and **wt%H_{fuel}** are equal to the weight percents of sulfur, carbon, and hydrogen in the fuel. These percentages should total 100%.

The fuel weight percent [(WT%)] of sulfur **(wt%S_{fuel})** is obtained pursuant to **Condition** [CONDITION] ***<insert cross reference to SPC** XI.2>*. 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 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.