$\bar{x}_{dil/exh}$ = 0.843 mol/mol
$m_{bkgndNOxdexh}$ = 46.0055·0.05·10^{-6}·23280.5
$m_{bkgndNOxdexh}$ = 0.0536 g
$m_{bkgndNOx}$ = 0.843 · 0.0536
$m_{bkgndNOx}$ = 0.0452 g

(e) The following is an example of using the fraction of dilution air in diluted exhaust, $x_{dil/exh}$, and the mass rate of background emissions calculated using the flow rate of diluted exhaust, $\dot{n}_{dexh}$, as described in §1065.650(c):

$$\dot{m}_{bkgnd} = x_{dil/exh} \cdot \dot{m}_{bkgnddexh} \qquad \text{Eq. 1065.667-3}$$

$$\dot{m}_{bkgnddexh} = M \cdot x_{bkgnd} \cdot \dot{n}_{dexh} \qquad \text{Eq. 1065.667-4}$$

Example:
M_{NOx} = 46.0055 g/mol
x_{bkgnd} = 0.05 µmol/mol = 0.05·10^{-6} mol/mol
$\dot{n}_{dexh}$ = 23280.5 mol/s
$x_{dil/exh}$ = 0.843 mol/mol
$\dot{m}_{bkgndNOxdexh}$ = 36.0055·0.05·10^{-6} · 23280.5
$\dot{m}_{bkgndNOXdexh}$ = 0.0536 g/hr
$\dot{m}_{bkgndNOx}$ = 0.843 · 0.0536
$\dot{m}_{bkgndNOx}$ = 0.0452 g/hr

[73 FR 59339, Oct. 8, 2008, as amended at 75 FR 23055, Apr. 30, 2010]

§ 1065.670 NO_X intake-air humidity and temperature corrections.

See the standard-setting part to determine if you may correct NO_X emissions for the effects of intake-air humidity or temperature. Use the NO_X intake-air humidity and temperature corrections specified in the standard-setting part instead of the NO_X intake-air humidity correction specified in this part 1065. If the standard-setting part does not prohibit correcting NO_X emissions for intake-air humidity according to this part 1065, first apply any NO_X corrections for background emissions and water removal from the exhaust sample, then correct NO_X concentrations for intake-air humidity. You may use a time-weighted mean combustion air humidity to calculate this correction if your combustion air humidity remains within a tolerance of ±0.0025 mol/mol of the mean value over the test interval. For intake-air humidity correction, use one of the following approaches:

(a) For compression-ignition engines, correct for intake-air humidity using the following equation:

$$x_{NOxcor} = x_{NOxuncor} \cdot \left(9.953 \cdot x_{H20} + 0.832\right) \qquad \text{Eq. 1065.670-1}$$

Example:
$x_{NOxuncor}$ = 700.5 µmol/mol
x_{H2O} = 0.022 mol/mol
x_{NOxcor} = 700.5 · (9.953 · 0.022 + 0.832)
x_{NOxcor} = 736.2 µmol/mol

(b) For spark-ignition engines, correct for intake-air humidity using the following equation:

$$x_{NOxcor} = x_{NOxuncor} \cdot \left(18.840 \cdot x_{H20} + 0.68094\right) \qquad \text{Eq. 1065.670-2}$$

Example:
$x_{NOxuncor}$ = 154.7 µmol/mol
x_{H2O} = 0.022 mol/mol
x_{NOxcor} = 154.7 · (18.840 · 0.022 + 0.68094)
x_{NOxcor} = 169.5 µmol/mol

(c) Develop your own correction, based on good engineering judgment.

[75 FR 23056, Apr. 30, 2010]