Example:

x_{COmeas} = 29.0 µmol/mol
$x_{H2OCOmeas}$ = 8.601 mmol/mol = 0.008601 mol/mol
x_{H2Oexh} = 34.04 mmol/mol = 0.03404 mol/mol

$$x_{CO} = 29.0 \cdot \left[\frac{1 - 0.03404}{1 - 0.008601} \right]$$

x_{CO} = 28.3 µmol/mol

§ 1065.660 THC and NMHC determination.

(a) *THC determination.* If we require you to determine THC emissions, calculate x_{THC} using the initial THC contamination concentration $x_{THCinit}$ from § 1065.520 as follows:

$$x_{THCcor} = x_{THCuncor} - x_{THCinit} \qquad \text{Eq. 1065.660-1}$$

Example:

$x_{THCuncor}$ = 150.3 µmol/mol
$x_{THCinit}$ = 1.1 µmol/mol
x_{THCcor} = 150.3 − 1.1
x_{THCcor} = 149.2 µmol/mol

(b) *NMHC determination.* Use one of the following to determine NMHC emissions, x_{NMHC}.

(1) Report x_{NMHC} as 0.98 · x_{THC} if you did not measure CH_4, or if the result of paragraph (b)(2) or (3) of this section is greater than the result using this paragraph (b)(1).

(2) For nonmethane cutters, calculate x_{NMHC} using the nonmethane cutter's penetration fractions (PF) of CH_4 and C_2H_6 from § 1065.365, and using the initial NMHC contamination concentration $x_{NMHCinit}$ from § 1065.520 as follows:

$$x_{NMHC} = \frac{PF_{CH4} \cdot x_{THC} - RF_{CH4} \cdot x_{CH4}}{PF_{CH4} - PF_{C2H6}} - x_{NMHCinit} \qquad \text{Eq. 1065.660-2}$$

Where:

x_{NMHC} = concentration of NMHC.
PF_{CH4} = nonmethane cutter CH_4 penetration fraction, according to § 1065.365.
x_{THC} = concentration of THC, as measured by the THC FID.
RF_{CH4} = response factor of THC FID to CH_4, according to § 1065.360.
x_{CH4} = concentration of methane, as measured downstream of the nonmethane cutter.
PF_{C2H6} = nonmethane cutter CH_4 penetration fraction, according to § 1065.365.
$x_{NMHCinit}$ = initial NMHC contamination concentration, according to § 1065.520.

Example:

PF_{CH4} = 0.990
x_{THC} = 150.3 µmol/mol
RF_{CH4} = 1.05
x_{CH4} = 20.5 µmol/mol
PF_{C2H6} = 0.020
$x_{NMHCinit}$ = 1.1 µmol/mol

$$x_{NMHC} = \frac{0.990 \cdot 150.3 - 1.05 \cdot 20.5}{0.990 - 0.020} - 1.1$$

x_{NMHC} = 130.1 µmol/mol

(3) For a gas chromatograph, calculate x_{NMHC} using the THC analyzer's response factor (RF) for CH_4, from § 1065.360, and using the initial NMHC contamination concentration $x_{NMHCinit}$ from § 1065.520 as follows:

$$x_{NMHC} = x_{THC} - RF_{CH4} \cdot x_{CH4} - x_{NMHCinit} \qquad \text{Eq. 1065.660-3}$$

Example:

x_{THC} = 145.6 µmol/mol
RF_{CH4} = 0.970
x_{CH4} = 18.9 µmol/mol
$x_{NMHCinit}$ = 1.1 µmol/mol
x_{NMHC} = 145.6 − 0.970 · 18.9 − 1.1
x_{NMHC} = 126.2 µmol/mol

EFFECTIVE DATE NOTE: At 73 FR 37336, June 30, 2008, § 1065.660 was revised, effective July

7, 2008. For the convenience of the user, the revised text is set forth as follows:

§ 1065.660 THC and NMHC determination.

(a) *THC determination and THC/CH_4 initial contamination corrections.* (1) If we require you to determine THC emissions, calculate $x_{THC[THC–FID]}$ using the initial THC contamination concentration $x_{THC[THC–FID]init}$ from § 1065.520 as follows:

$$x_{THC[THC\text{-}FID]cor} = x_{THC[THC\text{-}FID]uncor} - x_{THC[THC\text{-}FID]init} \qquad \text{Eq. 1065.660-1}$$

Example:

$x_{THCuncor}$ = 150.3 μmol/mol
$x_{THCinit}$ = 1.1 μmol/mol
x_{THCcor} = 150.3 − 1.1
x_{THCcor} = 149.2 μmol/mol

(2) For the NMHC determination described in paragraph (b) of this section, correct $x_{THC[THC–FID]}$ for initial HC contamination using Eq. 1065.660–1. You may correct for initial contamination of the CH_4 sample train using Eq. 1065.660–1, substituting in CH_4 concentrations for THC.

(b) *NMHC determination.* Use one of the following to determine NMHC concentration, x_{NMHC}:

(1) If you do not measure CH_4, you may determine NMHC concentrations as described in § 1065.650(c)(1)(vi).

(2) For nonmethane cutters, calculate x_{NMHC} using the nonmethane cutter's penetration fractions (PF) of CH_4 and C_2H_6 from § 1065.365, and using the HC contamination and wet-to-dry corrected THC concentration $x_{THC[THC–FID]cor}$ as determined in paragraph (a) of this section.

(i) Use the following equation for penetration fractions determined using an NMC configuration as outlined in § 1065.365(d):

$$x_{NMHC} = \frac{x_{THC[THC\text{-}FID]cor} - x_{THC[NMC\text{-}FID]} \cdot RF_{CH4[THC\text{-}FID]}}{1 - RFPF_{C2H6[NMC\text{-}FID]} \cdot RF_{CH4[THC\text{-}FID]}} \qquad \text{Eq. 1065.660-2}$$

Where:

x_{NMHC} = concentration of NMHC.
$x_{THC[THC–FID]cor}$ = concentration of THC, HC contamination and dry-to-wet corrected, as measured by the THC FID during sampling while bypassing the NMC.
$x_{THC[NMC–FID]}$ = concentration of THC, HC contamination (optional) and dry-to-wet corrected, as measured by the THC FID during sampling through the NMC.
$RF_{CH4[THC–FID]}$ = response factor of THC FID to CH_4, according to § 1065.360(d).
$RFPF_{C2H6[NMC–FID]}$ = nonmethane cutter combined ethane response factor and penetration fraction, according to § 1065.365(d).

Example:

$x_{THC[THC–FID]cor}$ = 150.3 μmol/mol
$x_{THC[NMC–FID]}$ = 20.5 μmol/mol
$RFPF_{C2H6[NMC–FID]}$ = 0.019
$RF_{CH4[THC–FID]}$ = 1.05

$$x_{NMHC} = \frac{150.3 - 20.5 \cdot 1.05}{1 - 0.019 \cdot 1.05}$$

x_{NMHC} = 130.4 μmol/mol

(ii) For penetration fractions determined using an NMC configuration as outlined in § 1065.365(e), use the following equation:

$$x_{NMHC} = \frac{x_{THC[THC\text{-}FID]cor} \cdot PF_{CH4[NMC\text{-}FID]} - x_{THC[NMC\text{-}FID]}}{PF_{CH4[NMC\text{-}FID]} - PF_{C2H6[NMC\text{-}FID]}} \qquad \text{Eq. 1065.660-3}$$