

**E16 - ENGINES, NATURAL GAS FIRED, 4 STROKE, LEAN BURN, WITH SELECTIVE CATALYTIC REDUCTION**

**CALCULATION METHODS**

$E_a = U_a \times EF$  (lbs/mmft<sup>3</sup>)

$E_h = U_h$  (scfm)  $\times$  (60/1000000)  $\times$  EF (lbs/mmft<sup>3</sup>)

**NOTES:**

- SCR can achieve efficiencies as high as 90% in reducing of NO<sub>x</sub>.
- The trace organic factors listed below are based on detected AB 2588 compounds listed in AP-42 Table 3.2-2 (7/00).
- The AP-42 (7/00) emission factors have been converted into lbs/mmscf by assuming a natural gas BTU content of 1020 BTU/scf.
- PM<sub>10</sub> and TSP emission factors include filterable and condensable PM in accordance with the District's definition of particulate matter.
- The listed AP-42 emission factors for 1,1,2-trichloroethane, 1,1-dichloroethane, 1,2-dichloroethane, 1,2-dichloropropane, 1,3-dichloropropane, carbon tetrachloride, chloroform, ethylene dibromide, styrene, and vinyl chloride are NOT included since these values are based on nondetectable test results.
- The listed AP-42 emission factors for 1,1,2,2-tetrachloroethane, 1,2,4-trimethylbenzene, 2,2,4-trimethylpentane, 2-methylnaphthalene, acenaphthalene, acenaphthylene, anthracene, benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, biphenyl, chlorobenzene, chrysene, cyclohexane, fluoranthene, fluorene, indeno(1,2,3-c,d)pyrene, perylene, phenanthrene, and pyrene are NOT included since these values were based on insignificant and/or nondetectable test results.
- Trace metal emission factors were not reported in AP-42 and are NOT included since natural gas fired engines are not expected to emit metals.
- The AP-42 emission factors for 1,2,3-trimethylbenzene, 1,3,5-trimethylpentane, butane, butyr/isobutyraldehyde, cyclopentane, ethane, isobutane, methylcyclohexane, n-nonane, n-octane, n-pentane, and propane are not included since these are not listed toxic air contaminants.
- The AP-42 acrolein emission factor is NOT included since this value is based on test data and detection limits from incorrect sampling methods. A District factor based on local test results and adjusted for equipment VOC controls is considered more accurate than the AP-42 value.

Pollutant	District Emission Factor (lbs/million ft <sup>3</sup> fuel burned)	EPA Reference Document	EPA Factor	Units	Comments
NO <sub>x</sub>	416.16	AP-42, Sect 3.2, 7/00, Table 3.2-2	4.08E-01	lbs/MMBTU	SCR 90% control of NO <sub>x</sub>
CO	323.34	AP-42, Sect 3.2, 7/00, Table 3.2-2	3.17E-01	lbs/MMBTU	
SO <sub>x</sub>	0.60	AP-42, Sect 3.2, 7/00, Table 3.2-2	5.88E-04	lbs/MMBTU	Assume a sulfur content of 0.05% and a fuel density of 7 lbs/gal
TOG	1499.40	AP-42, Sect 3.2, 7/00, Table 3.2-2	1.47E+00	lbs/MMBTU	
ROG	120.36	AP-42, Sect 3.2, 7/00, Table 3.2-2	1.18E-01	lbs/MMBTU	
TSP	10.19	AP-42, Sect 3.2, 7/00, Table 3.2-2	9.99E-03	lbs/MMBTU	TSP includes filterable (7.71 E-05) and condensable (9.91 E-03) PM.
PM <sub>10</sub>	10.19	AP-42, Sect 3.2, 7/00, Table 3.2-2	9.99E-03	lbs/MMBTU	PM <sub>10</sub> includes filterable (7.71 E-05) and condensable (9.91 E-03) PM.
1,3-Butadiene	0.27	AP-42, Sect 3.2, 7/00, Table 3.2-2	2.67E-04	lbs/MMBTU	
Acetaldehyde	8.53	AP-42, Sect 3.2, 7/00, Table 3.2-2	8.36E-03	lbs/MMBTU	
Acrolein	0.10	AP-42, Sect 3.2, 7/00, Table 3.2-2	5.14E-03	lbs/MMBTU	District emission factor based on SDAPCD source test results.

Benzene	0.45	AP-42, Sect 3.2, 7/00, Table 3.2-2	4.40E-04	lbs/MMBTU	
Ethylbenzene	0.04	AP-42, Sect 3.2, 7/00, Table 3.2-2	3.97E-05	lbs/MMBTU	
Formaldehyde	53.86	AP-42, Sect 3.2, 7/00, Table 3.2-2	5.28E-02	lbs/MMBTU	
Hexane	1.13	AP-42, Sect 3.2, 7/00, Table 3.2-2	1.11E-03	lbs/MMBTU	
Methanol	2.55	AP-42, Sect 3.2, 7/00, Table 3.2-2	2.50E-03	lbs/MMBTU	
Methylene Chloride	0.02	AP-42, Sect 3.2, 7/00, Table 3.2-2	2.00E-05	lbs/MMBTU	
Naphthalene	0.08	AP-42, Sect 3.2, 7/00, Table 3.2-2	7.44E-05	lbs/MMBTU	
PAH	0.03	AP-42, Sect 3.2, 7/00, Table 3.2-2	2.69E-05	lbs/MMBTU	
Phenol	0.02	AP-42, Sect 3.2, 7/00, Table 3.2-2	2.40E-05	lbs/MMBTU	
Toluene	0.42	AP-42, Sect 3.2, 7/00, Table 3.2-2	4.08E-04	lbs/MMBTU	
Xylenes	0.19	AP-42, Sect 3.2, 7/00, Table 3.2-2	1.84E-04	lbs/MMBTU	

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By D. Byrnes / A. Mar