

Model General Permit Sample Calculations for Natural Gas/No. 2 Oil fired boilers

The following is an example calculations that was performed for boilers. The calculations were based on the highest size boiler allowed within the range for the General Permit.

Emissions from Natural Gas Combustion

Pollutant	Emission Factor (lb/mmcf) A	Boiler Capacity (mmBtu/hr) B	Fuel Heat Content (BTU/scf) C	Potential Emissions		
				(lb/mmBtu) D	(lb/hr) E	(ton/yr) F
NO _x	100	29.9	1020	0.098	2.93	12.84
SO ₂	0.6			0.00059	0.018	0.077
CO	84			0.082	2.46	10.79
PE	7.6			0.0075	0.22	0.98
PE filterable	1.9			0.0019	0.056	0.24
VOC	11			0.011	0.32	1.41

Emissions from No. 2 Fuel Oil

Pollutant	Emission Factor (lb/10 ³ gal) A	Boiler Capacity (mmBtu/hr) B	Fuel Heat Content (BTU/gal) C	Potential Emissions		
				(lb/mmBtu) D	(lb/hr) E	(ton/yr) F
NO _x	20	29.9	140,000	0.14	4.27	18.71
SO ₂	0.213			0.0015	0.045	0.20
CO	5			0.036	1.07	4.68
PE	3.3			0.024	0.70	3.09
PE filterable	2			0.014	0.43	1.87
VOC	0.252			0.0018	0.054	0.24

Potential Emissions Summary

Pollutant	Maximum Potential Emissions		
	(lb/mmBtu)	(lb/hr)	(ton/yr)
NO _x	0.14	4.27	18.71
SO ₂	0.0015	0.045	0.20
CO	0.082	2.46	10.79
PE	0.024	0.70	3.09
PE filterable	0.014	0.43	1.87
VOC	0.011	0.32	1.41

Notes:

A (natural gas): AP-42 Section 1.4, Tables 1.4-1 and 1.4-2. Conservatively, PE includes filterable and condensable particulates.

A (No. 2 fuel oil): AP-42 Section 1.3, Tables 1.3-1, 1.3-2 and 1.3-3. Sulfur content of ultra low sulfur No. 2 fuel oil is 0.0015%. Conservatively, PE includes filterable and condensable particulates.

B: Maximum heat input capacity of the boiler.

C: Typical heat content based on AP-42 Sections 1.3 (No. 2 fuel oil) and 1.4 (natural gas).

D (natural gas) = A / C

D (No. 2 fuel oil) = A * 1000 / C

E = B * D

F = E * 8760 / 2000