APPENDIX A

VOC Emissions Data – Tank Breathing

A1. Daily VOC Emission Rate Calculations

A2. Daily One-Minute Data

A3. Daily Analyzer Calibrations and Data Sheets

A4. Daily Equipment Checks

A1. Daily VOC Emission Rate Calculations

Emission Rate Calculation Sheet
Total Hydrocarbon Emissions

Facility : Sprague Searsport	**Start Date:** 13-Jun-12
Source/Location: Residual Oil Exhaust Duct	**End Date** 13-Jun-12
	Start Time: 0:00
	End Time: 23:59

Average Concentration:		1,831 ppmvw
Average Flow Rate:		281 scfm
Molecular Weight:	Propane	44.09 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**3355.91** mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**95.04** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**2.10E-04** lb/SCF
THC lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**3.54** lb/hr
CH4 lb/hr =	(lb/SCF * SCFM * 60 min/hr)		**0.177** lb/hr
NMHC lb/hr =			**3.36** lb/hr
NMHC TPY =			**14.72** tons/year

Emission Rate Calculation Sheet
Total Hydrocarbon Emissions

Facility : Sprague Searsport	**Start Date:** 14-Jun-12
Source/Location: Residual Oil Exhaust Duct	**End Date** 14-Jun-12
	Start Time: 0:00
	End Time: 23:59

Average Concentration:		1,639 ppmvw
Average Flow Rate:		286 scfm
Molecular Weight:	Propane	44.09 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**3003.43** mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**85.06** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**1.88E-04** lb/SCF
THC lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**3.21** lb/hr
CH4 lb/hr =	(lb/SCF * SCFM * 60 min/hr)		**0.171** lb/hr
NMHC lb/hr =			**3.04** lb/hr
NMHC TPY =			**13.33** tons/year

Emission Rate Calculation Sheet
Total Hydrocarbon Emissions

Facility : Sprague Searsport	**Start Date:** 15-Jun-12
Source/Location: Residual Oil Exhaust Duct	**End Date** 15-Jun-12
	Start Time: 0:00
	End Time: 23:59

Average Concentration:		1,716 ppmvw
Average Flow Rate:		285 scfm
Molecular Weight:	Propane	44.09 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**3145.39** mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**89.08** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**1.96E-04** lb/SCF
THC lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**3.36** lb/hr
CH4 lb/hr =	(lb/SCF * SCFM * 60 min/hr)		**0.184** lb/hr
NMHC lb/hr =			**3.17** lb/hr
NMHC TPY =			**13.90** tons/year

Emission Rate Calculation Sheet
Total Hydrocarbon Emissions

Facility : Sprague Searsport	**Start Date:** 16-Jun-12
Source/Location: Residual Oil Exhaust Duct	**End Date** 16-Jun-12
	Start Time: 0:00
	End Time: 23:59

Average Concentration:		1,749 ppmvw
Average Flow Rate:		289 scfm
Molecular Weight:	Propane	44.09 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**3206.01** mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**90.80** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**2.00E-04** lb/SCF
THC lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**3.47** lb/hr
CH4 lb/hr =	(lb/SCF * SCFM * 60 min/hr)		**0.200** lb/hr
NMHC lb/hr =			**3.27** lb/hr
NMHC TPY =			**14.33** tons/year

Emission Rate Calculation Sheet
Total Hydrocarbon Emissions

Facility : Sprague Searsport	**Start Date:** 17-Jun-12
Source/Location: Residual Oil Exhaust Duct	**End Date** 17-Jun-12
	Start Time: 0:00
	End Time: 23:59

Average Concentration:		1,810 ppmvw
Average Flow Rate:		283 scfm
Molecular Weight:	Propane	44.09 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**3318.22**	mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**93.97**	mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**2.07E-04**	lb/SCF
THC lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**3.51**	lb/hr
CH4 lb/hr =	(lb/SCF * SCFM * 60 min/hr)		**0.201**	lb/hr
NMHC lb/hr =			**3.31**	lb/hr
NMHC TPY =			**14.51**	tons/year

Emission Rate Calculation Sheet
Total Hydrocarbon Emissions

Facility : Sprague Searsport	**Start Date:** 18-Jun-12
Source/Location: Residual Oil Exhaust Duct	**End Date** 18-Jun-12
	Start Time: 0:00
	End Time: 23:59

Average Concentration:		1,815 ppmvw
Average Flow Rate:		280 scfm
Molecular Weight:	Propane	44.09 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**3325.90** mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**94.19** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**2.08E-04** lb/SCF
THC lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**3.49** lb/hr
CH4 lb/hr =	(lb/SCF * SCFM * 60 min/hr)		**0.188** lb/hr
NMHC lb/hr =			**3.30** lb/hr
NMHC TPY =			**14.47** tons/year

Emission Rate Calculation Sheet
Total Hydrocarbon Emissions

Facility : Sprague Searsport	**Start Date:** 19-Jun-12
Source/Location: Residual Oil Exhaust Duct	**End Date** 19-Jun-12
	Start Time: 0:00
	End Time: 23:59

Average Concentration:		1,836 ppmvw
Average Flow Rate:		280 scfm
Molecular Weight:	Propane	44.09 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**3364.65** mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**95.29** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**2.10E-04** lb/SCF
THC lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**3.53** lb/hr
CH4 lb/hr =	(lb/SCF * SCFM * 60 min/hr)		**0.191** lb/hr
NMHC lb/hr =			**3.34** lb/hr
NMHC TPY =			**14.63** tons/year

Emission Rate Calculation Sheet
Total Hydrocarbon Emissions

Facility : Sprague Searsport	**Start Date:** 21-Jun-12
Source/Location: Residual Oil Exhaust Duct	**End Date** 21-Jun-12
	Start Time: 13:00
	End Time: 23:59

Average Concentration:		1,784 ppmvw
Average Flow Rate:		283 scfm
Molecular Weight:	Propane	44.09 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**3269.13** mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**92.58** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**2.04E-04** lb/SCF
THC lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**3.47** lb/hr
CH4 lb/hr =	(lb/SCF * SCFM * 60 min/hr)		**0.111** lb/hr
NMHC lb/hr =			**3.36** lb/hr
NMHC TPY =			**14.72** tons/year

Emission Rate Calculation Sheet
Total Hydrocarbon Emissions

Facility : Sprague Searsport	**Start Date:** 22-Jun-12
Source/Location: Residual Oil Exhaust Duct	**End Date** 22-Jun-12
	Start Time: 0:00
	End Time: 23:59

Average Concentration:		1,890 ppmvw
Average Flow Rate:		265 scfm
Molecular Weight:	Propane	44.09 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**3464.90** mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**98.13** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**2.16E-04** lb/SCF
THC lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**3.45** lb/hr
CH4 lb/hr =	(lb/SCF * SCFM * 60 min/hr)		**0.102** lb/hr
NMHC lb/hr =			**3.34** lb/hr
NMHC TPY =			**14.64** tons/year

Emission Rate Calculation Sheet
Total Hydrocarbon Emissions

Facility :	Sprague Searsport	**Start Date:**	23-Jun-12
Source/Location:	Residual Oil Exhaust Duct	**End Date**	23-Jun-12
		Start Time:	0:00
		End Time:	23:59

Average Concentration:		1,778 ppmvw
Average Flow Rate:		255 scfm
Molecular Weight:	Propane	44.09 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**3259.14** mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**92.30** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**2.03E-04** lb/SCF
THC lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**3.11** lb/hr
CH4 lb/hr =	(lb/SCF * SCFM * 60 min/hr)		**0.084** lb/hr
NMHC lb/hr =			**3.02** lb/hr
NMHC TPY =			**13.25** tons/year

Emission Rate Calculation Sheet
Total Hydrocarbon Emissions

Facility : Sprague Searsport	**Start Date:** 24-Jun-12
Source/Location: Residual Oil Exhaust Duct	**End Date** 24-Jun-12
	Start Time: 0:00
	End Time: 23:59

Average Concentration:		1,767 ppmvw
Average Flow Rate:		256 scfm
Molecular Weight:	Propane	44.09 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**3239.60** mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**91.75** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**2.02E-04** lb/SCF
THC lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**3.11** lb/hr
CH4 lb/hr =	(lb/SCF * SCFM * 60 min/hr)		**0.079** lb/hr
NMHC lb/hr =			**3.03** lb/hr
NMHC TPY =			**13.26** tons/year

Emission Rate Calculation Sheet
Total Hydrocarbon Emissions

Facility : Sprague Searsport	**Start Date:** 25-Jun-12
Source/Location: Residual Oil Exhaust Duct	**End Date** 25-Jun-12
	Start Time: 0:00
	End Time: 23:59

Average Concentration:		1,738 ppmvw
Average Flow Rate:		244 scfm
Molecular Weight:	Propane	44.09 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**3186.04** mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**90.23** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**1.99E-04** lb/SCF
THC lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**2.91** lb/hr
CH4 lb/hr =	(lb/SCF * SCFM * 60 min/hr)		**0.070** lb/hr
NMHC lb/hr =			**2.84** lb/hr
NMHC TPY =			**12.46** tons/year

Emission Rate Calculation Sheet
Total Hydrocarbon Emissions

Facility :	Sprague Searsport	**Start Date:**	26-Jun-12
Source/Location:	Residual Oil Exhaust Duct	**End Date**	26-Jun-12
		Start Time:	0:00
		End Time:	13:00

Average Concentration:		1,221 ppmvw
Average Flow Rate:		238 scfm
Molecular Weight:	Propane	44.09 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**2237.77** mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**63.37** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**1.40E-04** lb/SCF
THC lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**1.99** lb/hr
CH4 lb/hr =	(lb/SCF * SCFM * 60 min/hr)		**0.040** lb/hr
NMHC lb/hr =			**1.95** lb/hr
NMHC TPY =			**8.55** tons/year

Emission Rate Calculation Sheet
Total Hydrocarbon Emissions

Facility : Sprague Searsport	**Start Date:** 27-Jun-12
Source/Location: Residual Oil Exhaust Duct	**End Date** 27-Jun-12
	Start Time: 0:00
	End Time: 23:59

Average Concentration:		990 ppmvw
Average Flow Rate:		259 scfm
Molecular Weight:	Propane	44.09 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**1814.10** mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**51.38** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**1.13E-04** lb/SCF
THC lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**1.76** lb/hr
CH4 lb/hr =	(lb/SCF * SCFM * 60 min/hr)		**0.047** lb/hr
NMHC lb/hr =			**1.71** lb/hr
NMHC TPY =			**7.49** tons/year

Emission Rate Calculation Sheet
Total Hydrocarbon Emissions

Facility : Sprague Searsport	**Start Date:** 28-Jun-12
Source/Location: Residual Oil Exhaust Duct	**End Date** 28-Jun-12
	Start Time: 0:00
	End Time: 23:59

Average Concentration:		1,055 ppmvw
Average Flow Rate:		256 scfm
Molecular Weight:	Propane	44.09 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**1933.44** mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**54.76** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**1.21E-04** lb/SCF
THC lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**1.86** lb/hr
CH4 lb/hr =	(lb/SCF * SCFM * 60 min/hr)		**0.053** lb/hr
NMHC lb/hr =			**1.80** lb/hr
NMHC TPY =			**7.90** tons/year

Emission Rate Calculation Sheet
Total Hydrocarbon Emissions

Facility : Sprague Searsport	**Start Date:** 29-Jun-12
Source/Location: Residual Oil Exhaust Duct	**End Date** 29-Jun-12
	Start Time: 0:00
	End Time: 23:59

Average Concentration:		1,329 ppmvw
Average Flow Rate:		248 scfm
Molecular Weight:	Propane	44.09 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**2435.35** mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**68.97** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**1.52E-04** lb/SCF
THC lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**2.26** lb/hr
CH4 lb/hr =	(lb/SCF * SCFM * 60 min/hr)		**0.066** lb/hr
NMHC lb/hr =			**2.19** lb/hr
NMHC TPY =			**9.61** tons/year

Emission Rate Calculation Sheet
Total Hydrocarbon Emissions

Facility : Sprague Searsport	**Start Date:** 30-Jun-12
Source/Location: Residual Oil Exhaust Duct	**End Date** 30-Jun-12
	Start Time: 0:00
	End Time: 23:59

Average Concentration:		1,510 ppmvw
Average Flow Rate:		245 scfm
Molecular Weight:	Propane	44.09 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol, PPM) =		**2767.78** mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**78.39** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**1.73E-04** lb/SCF
THC lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**2.54** lb/hr
CH4 lb/hr =	(lb/SCF * SCFM * 60 min/hr)		**0.073** lb/hr
NMHC lb/hr =			**2.47** lb/hr
NMHC TPY =			**10.82** tons/year

Emission Rate Calculation Sheet
Total Hydrocarbon Emissions

Facility :	Sprague Searsport	**Start Date:**	01-Jul-12
Source/Location:	Residual Oil Exhaust Duct	**End Date**	01-Jul-12
		Start Time:	0:00
		End Time:	23:59

Average Concentration:		1,417 ppmvw
Average Flow Rate:		247 scfm
Molecular Weight:	Propane	44.09 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**2596.88** mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**73.55** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**1.62E-04** lb/SCF
THC lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**2.40** lb/hr
CH4 lb/hr =	(lb/SCF * SCFM * 60 min/hr)		**0.069** lb/hr
NMHC lb/hr =			**2.33** lb/hr
NMHC TPY =			**10.22** tons/year

Emission Rate Calculation Sheet
Total Hydrocarbon Emissions

Facility : Sprague Searsport	**Start Date:** 02-Jul-12
Source/Location: Residual Oil Exhaust Duct	**End Date** 02-Jul-12
	Start Time: 0:00
	End Time: 23:59

Average Concentration:		1,292 ppmvw
Average Flow Rate:		249 scfm
Molecular Weight:	Propane	44.09 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**2367.67** mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**67.05** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**1.48E-04** lb/SCF
THC lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**2.21** lb/hr
CH4 lb/hr =	(lb/SCF * SCFM * 60 min/hr)		**0.066** lb/hr
NMHC lb/hr =			**2.14** lb/hr
NMHC TPY =			**9.38** tons/year

Emission Rate Calculation Sheet
Total Hydrocarbon Emissions

Facility :	Sprague Searsport	**Start Date:**	03-Jul-12
Source/Location:	Residual Oil Exhaust Duct	**End Date**	03-Jul-12
		Start Time:	0:00
		End Time:	23:59

Average Concentration:		1,290 ppmvw
Average Flow Rate:		245 scfm
Molecular Weight:	Propane	44.09 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**2364.26** mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**66.96** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**1.48E-04** lb/SCF
THC lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**2.17** lb/hr
CH4 lb/hr =	(lb/SCF * SCFM * 60 min/hr)		**0.063** lb/hr
NMHC lb/hr =			**2.11** lb/hr
NMHC TPY =			**9.22** tons/year

Emission Rate Calculation Sheet
Total Hydrocarbon Emissions

Facility :	Sprague Searsport	**Start Date:**	04-Jul-12
Source/Location:	Residual Oil Exhaust Duct	**End Date**	04-Jul-12
		Start Time:	0:00
		End Time:	23:59

Average Concentration:		1,209 ppmvw
Average Flow Rate:		247 scfm
Molecular Weight:	Propane	44.09 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**2216.21** mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**62.76** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**1.38E-04** lb/SCF
THC lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**2.05** lb/hr
CH4 lb/hr =	(lb/SCF * SCFM * 60 min/hr)		**0.063** lb/hr
NMHC lb/hr =			**1.99** lb/hr
NMHC TPY =			**8.71** tons/year

Emission Rate Calculation Sheet
Total Hydrocarbon Emissions

Facility :	Sprague Searsport	**Start Date:**	05-Jul-12
Source/Location:	Residual Oil Exhaust Duct	**End Date**	05-Jul-12
		Start Time:	0:00
		End Time:	23:59

Average Concentration:		1,180 ppmvw
Average Flow Rate:		255 scfm
Molecular Weight:	Propane	44.09 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**2163.18**	mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**61.26**	mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**1.35E-04**	lb/SCF
THC lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**2.07**	lb/hr
CH4 lb/hr =	(lb/SCF * SCFM * 60 min/hr)		**0.062**	lb/hr
NMHC lb/hr =			**2.01**	lb/hr
NMHC TPY =			**8.78**	tons/year

Emission Rate Calculation Sheet
Total Hydrocarbon Emissions

Facility :	Sprague Searsport	**Start Date:**	06-Jul-12
Source/Location:	Residual Oil Exhaust Duct	**End Date**	06-Jul-12
		Start Time:	0:00
		End Time:	23:59

Average Concentration:		1,054 ppmvw
Average Flow Rate:		254 scfm
Molecular Weight:	Propane	44.09 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**1931.73** mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**54.71** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**1.21E-04** lb/SCF
THC lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**1.84** lb/hr
CH4 lb/hr =	(lb/SCF * SCFM * 60 min/hr)		**0.057** lb/hr
NMHC lb/hr =			**1.78** lb/hr
NMHC TPY =			**7.81** tons/year

Emission Rate Calculation Sheet
Total Hydrocarbon Emissions

Facility :	Sprague Searsport	**Start Date:**	07-Jul-12
Source/Location:	Residual Oil Exhaust Duct	**End Date**	07-Jul-12
		Start Time:	0:00
		End Time:	23:59

Average Concentration:		989 ppmvw
Average Flow Rate:		269 scfm
Molecular Weight:	Propane	44.09 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**1813.04** mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**51.35** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**1.13E-04** lb/SCF
THC lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**1.83** lb/hr
CH4 lb/hr =	(lb/SCF * SCFM * 60 min/hr)		**0.057** lb/hr
NMHC lb/hr =			**1.77** lb/hr
NMHC TPY =			**7.76** tons/year

Emission Rate Calculation Sheet
Total Hydrocarbon Emissions

Facility : Sprague Searsport	**Start Date:** 08-Jul-12
Source/Location: Residual Oil Exhaust Duct	**End Date** 08-Jul-12
	Start Time: 0:00
	End Time: 23:59

Average Concentration:		876 ppmvw
Average Flow Rate:		279 scfm
Molecular Weight:	Propane	44.09 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**1604.75** mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**45.45** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**1.00E-04** lb/SCF
THC lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**1.68** lb/hr
CH4 lb/hr =	(lb/SCF * SCFM * 60 min/hr)		**0.059** lb/hr
NMHC lb/hr =			**1.62** lb/hr
NMHC TPY =			**7.10** tons/year

Emission Rate Calculation Sheet
Total Hydrocarbon Emissions

Facility : Sprague Searsport	**Start Date:** 09-Jul-12
Source/Location: Residual Oil Exhaust Duct	**End Date** 09-Jul-12
	Start Time: 0:00
	End Time: 23:59

Average Concentration:		907 ppmvw
Average Flow Rate:		282 scfm
Molecular Weight:	Propane	44.09 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**1661.68** mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**47.06** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**1.04E-04** lb/SCF
THC lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**1.76** lb/hr
CH4 lb/hr =	(lb/SCF * SCFM * 60 min/hr)		**0.065** lb/hr
NMHC lb/hr =			**1.69** lb/hr
NMHC TPY =			**7.41** tons/year

Emission Rate Calculation Sheet
Total Hydrocarbon Emissions

Facility :	Sprague Searsport	**Start Date:**	10-Jul-12
Source/Location:	Residual Oil Exhaust Duct	**End Date**	10-Jul-12
		Start Time:	0:00
		End Time:	23:59

Average Concentration:		904 ppmvw
Average Flow Rate:		267 scfm
Molecular Weight:	Propane	44.09 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**1657.49** mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**46.94** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**1.03E-04** lb/SCF
THC lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**1.66** lb/hr
CH4 lb/hr =	(lb/SCF * SCFM * 60 min/hr)		**0.063** lb/hr
NMHC lb/hr =			**1.60** lb/hr
NMHC TPY =			**6.99** tons/year

Emission Rate Calculation Sheet
Total Hydrocarbon Emissions

Facility : Sprague Searsport	**Start Date:** 11-Jul-12
Source/Location: Residual Oil Exhaust Duct	**End Date** 11-Jul-12
	Start Time: 0:00
	End Time: 23:59

Average Concentration:		877 ppmvw
Average Flow Rate:		261 scfm
Molecular Weight:	Propane	44.09 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**1607.42** mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**45.52** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**1.00E-04** lb/SCF
THC lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**1.57** lb/hr
CH4 lb/hr =	(lb/SCF * SCFM * 60 min/hr)		**0.065** lb/hr
NMHC lb/hr =			**1.50** lb/hr
NMHC TPY =			**6.59** tons/year

Emission Rate Calculation Sheet
Total Hydrocarbon Emissions

Facility : Sprague Searsport	**Start Date:** 12-Jul-12
Source/Location: Residual Oil Exhaust Duct	**End Date** 12-Jul-12
	Start Time: 0:00
	End Time: 23:59

Average Concentration:		960 ppmvw
Average Flow Rate:		257 scfm
Molecular Weight:	Propane	44.09 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**1760.34** mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**49.85** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**1.10E-04** lb/SCF
THC lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**1.70** lb/hr
CH4 lb/hr =	(lb/SCF * SCFM * 60 min/hr)		**0.070** lb/hr
NMHC lb/hr =			**1.63** lb/hr
NMHC TPY =			**7.13** tons/year

Emission Rate Calculation Sheet
Total Hydrocarbon Emissions

Facility : Sprague Searsport	**Start Date:** 13-Jul-12
Source/Location: Residual Oil Exhaust Duct	**End Date** 13-Jul-12
	Start Time: 0:00
	End Time: 15:19

Average Concentration:		959 ppmvw
Average Flow Rate:		260 scfm
Molecular Weight:	Propane	44.09 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**1757.29** mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**49.77** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**1.10E-04** lb/SCF
THC lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**1.71** lb/hr
CH4 lb/hr =	(lb/SCF * SCFM * 60 min/hr)		**0.067** lb/hr
NMHC lb/hr =			**1.64** lb/hr
NMHC TPY =			**7.19** tons/year

Emission Rate Calculation Sheet
Methane Emissions

Facility : Sprague Searsport	**Start Date:** 06/13/12
Source/Location: Residual Oil Exhaust Duct	**End Date** 13-Jun-12
	Start Time: 0:00
	End Time: 23:59

Average Concentration:	252 ppmvw
Average Flow Rate:	281 scfm
Molecular Weight: (Methane)	16.04 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM)	=	**167.82** mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**4.75** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**1.04782E-05** lb/SCF
lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**0.177** lb/hr

Emission Rate Calculation Sheet
Methane Emissions

Facility : Sprague Searsport	**Start Date:** 06/14/12
Source/Location: Residual Oil Exhaust Duct	**End Date** 14-Jun-12
	Start Time: 0:00
	End Time: 23:59

Average Concentration:	239 ppmvw
Average Flow Rate:	286 scfm
Molecular Weight: (Methane)	16.04 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**159.58** mg/m^3
mg/SCF =	(mg/m^3) $(m^3/35.31$ SCF)	=	**4.52** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**9.96354E-06** lb/SCF
lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**0.171** lb/hr

Emission Rate Calculation Sheet
Methane Emissions

Facility :	Sprague Searsport	**Start Date:**	06/15/12
Source/Location:	Residual Oil Exhaust Duct	**End Date**	15-Jun-12
		Start Time:	0:00
		End Time:	23:59

Average Concentration:		259 ppmvw
Average Flow Rate:		285 scfm
Molecular Weight:	(Methane)	16.04 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM)	=	**172.59** mg/m^3
mg/SCF =	(mg/m^3) $(m^3/35.31$ SCF)	=	**4.89** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**1.07759E-05** lb/SCF
lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**0.184** lb/hr

Emission Rate Calculation Sheet
Methane Emissions

Facility : Sprague Searsport	**Start Date:** 06/16/12
Source/Location: Residual Oil Exhaust Duct	**End Date** 16-Jun-12
	Start Time: 0:00
	End Time: 23:59

Average Concentration:		277 ppmvw
Average Flow Rate:		289 scfm
Molecular Weight:	(Methane)	16.04 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**184.47** mg/m^3
mg/SCF =	(mg/m^3) $(m^3/35.31$ SCF)	=	**5.22** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**1.15173E-05** lb/SCF
lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**0.200** lb/hr

Emission Rate Calculation Sheet
Methane Emissions

Facility :	Sprague Searsport	**Start Date:**	06/17/12
Source/Location:	Residual Oil Exhaust Duct	**End Date**	17-Jun-12
		Start Time:	0:00
		End Time:	23:59

Average Concentration:		284 ppmvw
Average Flow Rate:		283 scfm
Molecular Weight:	(Methane)	16.04 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**189.52** mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**5.37** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**1.18325E-05** lb/SCF
lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**0.201** lb/hr

Emission Rate Calculation Sheet
Methane Emissions

Facility : Sprague Searsport	**Start Date:** 06/18/12
Source/Location: Residual Oil Exhaust Duct	**End Date** 18-Jun-12
	Start Time: 0:00
	End Time: 23:59

Average Concentration:	268 ppmvw
Average Flow Rate:	280 scfm
Molecular Weight: (Methane)	16.04 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**178.68** mg/m^3
mg/SCF =	(mg/m^3) $(m^3/35.31$ SCF)	=	**5.06** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**1.11557E-05** lb/SCF
lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**0.188** lb/hr

Emission Rate Calculation Sheet
Methane Emissions

Facility : Sprague Searsport	**Start Date:** 06/19/12
Source/Location: Residual Oil Exhaust Duct	**End Date** 19-Jun-12
	Start Time: 0:00
	End Time: 23:59

Average Concentration:		273 ppmvw
Average Flow Rate:		280 scfm
Molecular Weight:	(Methane)	16.04 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM)	=	**181.99** mg/m^3
mg/SCF =	(mg/m^3) $(m^3/35.31$ SCF)	=	**5.15** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**1.13626E-05** lb/SCF
lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**0.191** lb/hr

Emission Rate Calculation Sheet
Methane Emissions

Facility : Sprague Searsport	**Start Date:** 06/21/12
Source/Location: Residual Oil Exhaust Duct	**End Date** 21-Jun-12
	Start Time: 13:00
	End Time: 23:59

Average Concentration:	157 ppmvw
Average Flow Rate:	283 scfm
Molecular Weight: (Methane)	16.04 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**104.46** mg/m^3
mg/SCF =	(mg/m^3) $(m^3/35.31$ SCF)	=	**2.96** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**6.52179E-06** lb/SCF
lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**0.111** lb/hr

Emission Rate Calculation Sheet
Methane Emissions

Facility : Sprague Searsport	**Start Date:** 06/22/12
Source/Location: Residual Oil Exhaust Duct	**End Date** 22-Jun-12
	Start Time: 0:00
	End Time: 23:59

Average Concentration:	155 ppmvw
Average Flow Rate:	265 scfm
Molecular Weight: (Methane)	16.04 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**103.02** mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**2.92** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**6.4322E-06** lb/SCF
lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**0.102** lb/hr

Emission Rate Calculation Sheet
Methane Emissions

Facility : Sprague Searsport	**Start Date:** 06/23/12
Source/Location: Residual Oil Exhaust Duct	**End Date** 23-Jun-12
	Start Time: 0:00
	End Time: 23:59

Average Concentration:	133 ppmvw
Average Flow Rate:	255 scfm
Molecular Weight: (Methane)	16.04 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**88.40** mg/m^3
mg/SCF =	(mg/m^3) $(m^3/35.31$ SCF)	=	**2.50** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**5.51918E-06** lb/SCF
lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**0.084** lb/hr

Emission Rate Calculation Sheet
Methane Emissions

Facility :	Sprague Searsport	**Start Date:**	06/24/12
Source/Location:	Residual Oil Exhaust Duct	**End Date**	24-Jun-12
		Start Time:	0:00
		End Time:	23:59

Average Concentration:		123 ppmvw
Average Flow Rate:		256 scfm
Molecular Weight:	(Methane)	16.04 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**82.01** mg/m^3
mg/SCF =	(mg/m^3) $(m^3/35.31$ SCF)	=	**2.32** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**5.12031E-06** lb/SCF
lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**0.079** lb/hr

Emission Rate Calculation Sheet
Methane Emissions

Facility :	Sprague Searsport	**Start Date:**	06/25/12
Source/Location:	Residual Oil Exhaust Duct	**End Date**	25-Jun-12
		Start Time:	0:00
		End Time:	23:59

Average Concentration:		115 ppmvw
Average Flow Rate:		244 scfm
Molecular Weight:	(Methane)	16.04 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM)	=	**76.70**	mg/m^3
mg/SCF =	(mg/m^3) $(m^3/35.31$ SCF)	=	**2.17**	mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**4.7888E-06**	lb/SCF
lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**0.070**	lb/hr

Emission Rate Calculation Sheet
Methane Emissions

Facility : Sprague Searsport	**Start Date:** 06/26/12
Source/Location: Residual Oil Exhaust Duct	**End Date** 26-Jun-12
	Start Time: 0:00
	End Time: 13:00

Average Concentration:		67 ppmvw
Average Flow Rate:		238 scfm
Molecular Weight:	(Methane)	16.04 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**44.83** mg/m^3
mg/SCF =	(mg/m^3) $(m^3/35.31$ SCF)	=	**1.27** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**2.79925E-06** lb/SCF
lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**0.040** lb/hr

Emission Rate Calculation Sheet
Methane Emissions

Facility : Sprague Searsport	**Start Date:** 06/27/12
Source/Location: Residual Oil Exhaust Duct	**End Date** 27-Jun-12
	Start Time: 0:00
	End Time: 23:59

Average Concentration:		72 ppmvw
Average Flow Rate:		259 scfm
Molecular Weight:	(Methane)	16.04 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**48.27** mg/m^3
mg/SCF =	(mg/m^3) $(m^3/35.31$ SCF)	=	**1.37** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**3.01401E-06** lb/SCF
lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**0.047** lb/hr

Emission Rate Calculation Sheet
Methane Emissions

Facility : Sprague Searsport	**Start Date:** 06/28/12
Source/Location: Residual Oil Exhaust Duct	**End Date** 28-Jun-12
	Start Time: 0:00
	End Time: 23:59

Average Concentration:	83 ppmvw
Average Flow Rate:	256 scfm
Molecular Weight: (Methane)	16.04 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM)	=	**55.05** mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**1.56** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**3.43712E-06** lb/SCF
lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**0.053** lb/hr

Emission Rate Calculation Sheet
Methane Emissions

Facility : Sprague Searsport	**Start Date:** 06/29/12
Source/Location: Residual Oil Exhaust Duct	**End Date** 29-Jun-12
	Start Time: 0:00
	End Time: 23:59

Average Concentration:	107 ppmvw
Average Flow Rate:	248 scfm
Molecular Weight: (Methane)	16.04 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**71.45** mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**2.02** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**4.46085E-06** lb/SCF
lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**0.066** lb/hr

Emission Rate Calculation Sheet
Methane Emissions

Facility : Sprague Searsport	**Start Date:** 06/30/12
Source/Location: Residual Oil Exhaust Duct	**End Date** 30-Jun-12
	Start Time: 0:00
	End Time: 23:59

Average Concentration:		118 ppmvw
Average Flow Rate:		245 scfm
Molecular Weight:	(Methane)	16.04 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**78.92** mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**2.24** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**4.92745E-06** lb/SCF
lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**0.073** lb/hr

Emission Rate Calculation Sheet
Methane Emissions

Facility : Sprague Searsport	**Start Date:** 07/01/12
Source/Location: Residual Oil Exhaust Duct	**End Date** 01-Jul-12
	Start Time: 0:00
	End Time: 23:59

Average Concentration:		112 ppmvw
Average Flow Rate:		247 scfm
Molecular Weight:	(Methane)	16.04 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**74.57** mg/m^3
mg/SCF =	(mg/m^3) $(m^3/35.31$ SCF)	=	**2.11** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**4.6557E-06** lb/SCF
lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**0.069** lb/hr

Emission Rate Calculation Sheet
Methane Emissions

Facility :	Sprague Searsport	**Start Date:**	07/02/12
Source/Location:	Residual Oil Exhaust Duct	**End Date**	02-Jul-12
		Start Time:	0:00
		End Time:	23:59

Average Concentration:		105 ppmvw
Average Flow Rate:		249 scfm
Molecular Weight:	(Methane)	16.04 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**70.28** mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**1.99** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**4.38807E-06** lb/SCF
lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**0.066** lb/hr

Emission Rate Calculation Sheet
Methane Emissions

Facility : Sprague Searsport	**Start Date:** 07/03/12
Source/Location: Residual Oil Exhaust Duct	**End Date** 03-Jul-12
	Start Time: 0:00
	End Time: 23:59

Average Concentration:		103 ppmvw
Average Flow Rate:		245 scfm
Molecular Weight:	(Methane)	16.04 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**68.91** mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**1.95** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**4.30268E-06** lb/SCF
lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**0.063** lb/hr

Emission Rate Calculation Sheet
Methane Emissions

Facility : Sprague Searsport	**Start Date:** 07/04/12
Source/Location: Residual Oil Exhaust Duct	**End Date** 04-Jul-12
	Start Time: 0:00
	End Time: 23:59

Average Concentration:		101 ppmvw
Average Flow Rate:		247 scfm
Molecular Weight:	(Methane)	16.04 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**67.62** mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**1.92** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**4.22206E-06** lb/SCF
lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**0.063** lb/hr

Emission Rate Calculation Sheet
Methane Emissions

Facility : Sprague Searsport	**Start Date:** 07/05/12
Source/Location: Residual Oil Exhaust Duct	**End Date** 05-Jul-12
	Start Time: 0:00
	End Time: 23:59

Average Concentration:		98 ppmvw
Average Flow Rate:		255 scfm
Molecular Weight:	(Methane)	16.04 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**65.35** mg/m^3
mg/SCF =	(mg/m^3) $(m^3/35.31$ SCF)	=	**1.85** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**4.07991E-06** lb/SCF
lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**0.062** lb/hr

Emission Rate Calculation Sheet
Methane Emissions

Facility : Sprague Searsport	**Start Date:** 07/06/12
Source/Location: Residual Oil Exhaust Duct	**End Date** 06-Jul-12
	Start Time: 0:00
	End Time: 23:59

Average Concentration:		90 ppmvw
Average Flow Rate:		254 scfm
Molecular Weight:	(Methane)	16.04 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**60.12** mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**1.70** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**3.75349E-06** lb/SCF
lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**0.057** lb/hr

Emission Rate Calculation Sheet
Methane Emissions

Facility : Sprague Searsport	**Start Date:** 07/07/12
Source/Location: Residual Oil Exhaust Duct	**End Date** 07-Jul-12
	Start Time: 0:00
	End Time: 23:59

Average Concentration:		84 ppmvw
Average Flow Rate:		269 scfm
Molecular Weight:	(Methane)	16.04 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**56.09** mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**1.59** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**3.50221E-06** lb/SCF
lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**0.057** lb/hr

Emission Rate Calculation Sheet
Methane Emissions

Facility : Sprague Searsport	**Start Date:** 07/08/12
Source/Location: Residual Oil Exhaust Duct	**End Date** 08-Jul-12
	Start Time: 0:00
	End Time: 23:59

Average Concentration:	84 ppmvw
Average Flow Rate:	279 scfm
Molecular Weight: (Methane)	16.04 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM)	=	**56.09** mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**1.59** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**3.50182E-06** lb/SCF
lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**0.059** lb/hr

Emission Rate Calculation Sheet
Methane Emissions

Facility :	Sprague Searsport	**Start Date:**	07/09/12
Source/Location:	Residual Oil Exhaust Duct	**End Date**	09-Jul-12
		Start Time:	0:00
		End Time:	23:59

Average Concentration:		92 ppmvw
Average Flow Rate:		282 scfm
Molecular Weight:	(Methane)	16.04 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM)	=	**61.48** mg/m^3
mg/SCF =	(mg/m^3) $(m^3/35.31$ SCF)	=	**1.74** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**3.83845E-06** lb/SCF
lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**0.065** lb/hr

Emission Rate Calculation Sheet
Methane Emissions

Facility : Sprague Searsport	**Start Date:** 07/10/12
Source/Location: Residual Oil Exhaust Duct	**End Date** 10-Jul-12
	Start Time: 0:00
	End Time: 23:59

Average Concentration:		94 ppmvw
Average Flow Rate:		267 scfm
Molecular Weight:	(Methane)	16.04 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**62.48** mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**1.77** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**3.90098E-06** lb/SCF
lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**0.063** lb/hr

Emission Rate Calculation Sheet
Methane Emissions

Facility : Sprague Searsport	**Start Date:** 07/11/12
Source/Location: Residual Oil Exhaust Duct	**End Date** 11-Jul-12
	Start Time: 0:00
	End Time: 23:59

Average Concentration:		99 ppmvw
Average Flow Rate:		261 scfm
Molecular Weight:	(Methane)	16.04 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM) =		**66.22** mg/m^3
mg/SCF =	(mg/m^3) $(m^3/35.31$ SCF)	=	**1.88** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**4.1346E-06** lb/SCF
lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**0.065** lb/hr

Emission Rate Calculation Sheet
Methane Emissions

Facility : Sprague Searsport	**Start Date:** 07/12/12
Source/Location: Residual Oil Exhaust Duct	**End Date** 12-Jul-12
	Start Time: 0:00
	End Time: 23:59

Average Concentration:		109 ppmvw
Average Flow Rate:		257 scfm
Molecular Weight:	(Methane)	16.04 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM)	=	**72.53**	mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**2.05**	mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**4.52867E-06**	lb/SCF
lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**0.070**	lb/hr

Emission Rate Calculation Sheet
Methane Emissions

Facility : Sprague Searsport	**Start Date:** 07/13/12
Source/Location: Residual Oil Exhaust Duct	**End Date** 13-Jul-12
	Start Time: 0:00
	End Time: 15:19

Average Concentration:	103 ppmvw
Average Flow Rate:	260 scfm
Molecular Weight: (Methane)	16.04 g/mole

mg/m^3 =	(MW * PPM) / (24.055 l/mol. PPM)	=	**68.94** mg/m^3
mg/SCF =	(mg/m^3) (m^3/35.31 SCF)	=	**1.95** mg/SCF
lb/SCF =	(1 lb/ 4.536E+5 mg) * (mg/SCF)	=	**4.30431E-06** lb/SCF
lb/hr =	(lb/SCF * SCFM * 60 min/hr)	=	**0.067** lb/hr

Volumetric Flow Calculations

Facility/Site: Sprague Searsport	**Start Date:** 06/13/12
Source: Residual Oil Exhaust Duct	**Stop Date:** 0:00
	Start Time: 0:00
	Stop Time: 23:59

Trav. Point	Delta P ("H_2O)	SQ Root Delta P	Stack Temp (F)
Average	0.10	0.31	66.4

Average Delta P, ("H_2O)	0.10
Average Stack Temp, (F)	66.4
B_{ws}, (fractional water)	0.010
P_{bar}, ("H_g)	29.9
P_g, ("H_2O)	0.01
CO_2, ($\%_{vd}$)	0.00
O_2, ($\%_{vd}$)	20.90
CO, ($\%_{vd}$)	0
N_2, ($\%_{vd}$)	79.1
Stack Dia (ft)	0.58
L, (ft)	
W, (ft)	
A, (ft^2)	0.267
C_p, (pitot coefficient)	0.84
M_d, (g/mole)	28.84
M_s, (g/mole)	28.73

G	0.78	
V_s	17.50	fps
Q_s	16,719	dscfh
	16,888	scfh
	281	scfm
	279	dscfm
	281	acfm

Equations:

T_s = Temp Stack + 460

$P_s = P_g/13.6 + P_{bar}$

$M_d = .44\ CO_2 + .32\ O_2 + .28\ CO + .28\ N_2$

$M_s = M_d(1-B_{ws}) + 18(B_{ws})$

$G = Sqrt(T_s/P_s/M_s)$

$V_s = 85.9(C_p)(G)$(Avg. Sqrt Delta P)

A = either D^2(PI)/4 or (L)(W)

$Q_s = 3600(1-B_{ws})(V_s)(A)(T_{std}/P_{std})(P_s)/(T_s\ (abs))$

Volumetric Flow Calculations

Facility/Site: Sprague Searsport	**Start Date:** 06/14/12
Source: Residual Oil Exhaust Duct	**Stop Date:** 0:00
	Start Time: 0:00
	Stop Time: 23:59

Trav. Point	Delta P ("H_2O)	SQ Root Delta P	Stack Temp (F)
Average	0.10	0.32	76.3

Average Delta P, ("H_2O)	0.10
Average Stack Temp, (F)	76.3
B_{ws}, (fractional water)	0.010
P_{bar}, ("H_g)	29.9
P_g, ("H_2O)	0.01
CO_2, ($\%_{vd}$)	0.00
O_2, ($\%_{vd}$)	20.90
CO, ($\%_{vd}$)	0
N_2, ($\%_{vd}$)	79.1
Stack Dia (ft)	0.58
L, (ft)	
W, (ft)	
A, (ft^2)	0.267
C_p, (pitot coefficient)	0.84
M_d, (g/mole)	28.84
M_s, (g/mole)	28.73

G	0.79	
V_s	18.10	fps
Q_s	16,971	dscfh
	17,142	scfh
	286	scfm
	283	dscfm
	290	acfm

Equations:

T_s = Temp Stack + 460

$P_s = P_g/13.6 + P_{bar}$

$M_d = .44\ CO_2 + .32\ O_2 + .28\ CO + .28\ N_2$

$M_s = M_d(1-B_{ws}) + 18(B_{ws})$

$G = Sqrt(T_s/P_s/M_s)$

$V_s = 85.9(C_p)(G)(Avg.\ Sqrt\ Delta\ P)$

A = either D^2(PI)/4 or (L)(W)

$Q_s = 3600(1-B_{ws})(V_s)(A)(T_{std}/P_{std})(P_s)/(T_s\ (abs))$

Volumetric Flow Calculations

Facility/Site: Sprague Searsport
Source: Residual Oil Exhaust Duct

Start Date: 06/15/12
Stop Date: 0:00
Start Time: 0:00
Stop Time: 23:59

Trav. Point	Delta P ("H_2O)	SQ Root Delta P	Stack Temp (F)
Average	0.10	0.32	78.7

Average Delta P, ("H_2O)	0.10
Average Stack Temp, (F)	78.7
B_{ws}, (fractional water)	0.010
P_{bar}, ("H_g)	29.9
P_g, ("H_2O)	0.01
CO_2, ($\%_{vd}$)	0.00
O_2, ($\%_{vd}$)	20.90
CO, ($\%_{vd}$)	0
N_2, ($\%_{vd}$)	79.1
Stack Dia (ft)	0.58
L, (ft)	
W, (ft)	
A, (ft^2)	0.267
C_p, (pitot coefficient)	0.84
M_d, (g/mole)	28.84
M_s, (g/mole)	28.73

G	0.79	
V_s	18.13	fps
Q_s	16,927	dscfh
	17,098	scfh
	285	scfm
	282	dscfm
	291	acfm

Equations:

T_s = Temp Stack + 460

$P_s = P_g/13.6 + P_{bar}$

$M_d = .44\ CO_2 + .32\ O_2 + .28\ CO + .28\ N_2$

$M_s = M_d(1-B_{ws}) + 18(B_{ws})$

$G = Sqrt(T_s/P_s/M_s)$

$V_s = 85.9(C_p)(G)$(Avg. Sqrt Delta P)

A = either D^2(PI)/4 or (L)(W)

$Q_s = 3600(1-B_{ws})(V_s)(A)(T_{std}/P_{std})(P_s)/(T_s\ (abs))$

Volumetric Flow Calculations

Facility/Site: Sprague Searsport	**Start Date:** 06/16/12
Source: Residual Oil Exhaust Duct	**Stop Date:** 0:00
	Start Time: 0:00
	Stop Time: 23:59

Trav. Point	Delta P ("H_2O)	SQ Root Delta P	Stack Temp (F)
Average	0.10	0.32	72.1

Average Delta P, ("H_2O)	0.10
Average Stack Temp, (F)	72.1
B_{ws}, (fractional water)	0.010
P_{bar}, ("H_g)	29.9
P_g, ("H_2O)	0.01
CO_2, ($\%_{vd}$)	0.00
O_2, ($\%_{vd}$)	20.90
CO, ($\%_{vd}$)	0
N_2, ($\%_{vd}$)	79.1
Stack Dia (ft)	0.58
L, (ft)	
W, (ft)	
A, (ft^2)	0.267
C_p, (pitot coefficient)	0.84
M_d, (g/mole)	28.84
M_s, (g/mole)	28.73

G	0.79	
V_s	18.16	fps
Q_s	17,164	dscfh
	17,337	scfh
	289	scfm
	286	dscfm
	291	acfm

Equations:

T_s = Temp Stack + 460

$P_s = P_g/13.6 + P_{bar}$

$M_d = .44\ CO_2 + .32\ O_2 + .28\ CO + .28\ N_2$

$M_s = M_d(1-B_{ws}) + 18(B_{ws})$

$G = Sqrt(T_s/P_s/M_s)$

$V_s = 85.9(C_p)(G)$(Avg. Sqrt Delta P)

A = either D^2(PI)/4 or (L)(W)

$Q_s = 3600(1-B_{ws})(V_s)(A)(T_{std}/P_{std})(P_s)/(T_s\ (abs))$

Volumetric Flow Calculations

Facility/Site: Sprague Searsport	**Start Date:** 06/17/12
Source: Residual Oil Exhaust Duct	**Stop Date:** 0:00
	Start Time: 0:00
	Stop Time: 23:59

Trav. Point	Delta P ("H_2O)	SQ Root Delta P	Stack Temp (F)
Average	0.10	0.31	72.6

Average Delta P, ("H_2O)	0.10
Average Stack Temp, (F)	72.6
B_{ws}, (fractional water)	0.010
P_{bar}, ("H_g)	29.9
P_g, ("H_2O)	0.01
CO_2, ($\%_{vd}$)	0.00
O_2, ($\%_{vd}$)	20.90
CO, ($\%_{vd}$)	0
N_2, ($\%_{vd}$)	79.1
Stack Dia (ft)	0.58
L, (ft)	
W, (ft)	
A, (ft^2)	0.267
C_p, (pitot coefficient)	0.84
M_d, (g/mole)	28.84
M_s, (g/mole)	28.73

G	0.79	
V_s	17.77	fps
Q_s	16,785	dscfh
	16,955	scfh
	283	scfm
	280	dscfm
	285	acfm

Equations:

T_s = Temp Stack + 460

$P_s = P_g/13.6 + P_{bar}$

$M_d = .44\ CO_2 + .32\ O_2 + .28\ CO + .28\ N_2$

$M_s = M_d(1-B_{ws}) + 18(B_{ws})$

$G = Sqrt(T_s/P_s/M_s)$

$V_s = 85.9(C_p)(G)$(Avg. Sqrt Delta P)

A = either D^2(PI)/4 or (L)(W)

$Q_s = 3600(1-B_{ws})(V_s)(A)(T_{std}/P_{std})(P_s)/(T_s\,(abs))$

Volumetric Flow Calculations

Facility/Site: Sprague Searsport	**Start Date:** 06/18/12
Source: Residual Oil Exhaust Duct	**Stop Date:** 0:00
	Start Time: 0:00
	Stop Time: 23:59

Trav. Point	Delta P ("H_2O)	SQ Root Delta P	Stack Temp (F)
Average	0.10	0.31	71.2

Average Delta P, ("H_2O)	0.10
Average Stack Temp, (F)	71.2
B_{ws}, (fractional water)	0.010
P_{bar}, ("H_g)	29.9
P_g, ("H_2O)	0.01
CO_2, ($\%_{vd}$)	0.00
O_2, ($\%_{vd}$)	20.90
CO, ($\%_{vd}$)	0
N_2, ($\%_{vd}$)	79.1
Stack Dia (ft)	0.58
L, (ft)	
W, (ft)	
A, (ft^2)	0.267
C_p, (pitot coefficient)	0.84
M_d, (g/mole)	28.84
M_s, (g/mole)	28.73

G	0.79	
V_s	17.58	fps
Q_s	16,645	dscfh
	16,813	scfh
	280	scfm
	277	dscfm
	282	acfm

Equations:

T_s = Temp Stack + 460

$P_s = P_g/13.6 + P_{bar}$

$M_d = .44\ CO_2 + .32\ O_2 + .28\ CO + .28\ N_2$

$M_s = M_d(1-B_{ws}) + 18(B_{ws})$

$G = Sqrt(T_s/P_s/M_s)$

$V_s = 85.9(C_p)(G)(Avg.\ Sqrt\ Delta\ P)$

A = either D^2(PI)/4 or (L)(W)

$Q_s = 3600(1-B_{ws})(V_s)(A)(T_{std}/P_{std})(P_s)/(T_s\ (abs))$

Volumetric Flow Calculations

Facility/Site: Sprague Searsport	**Start Date:** 06/19/12
Source: Residual Oil Exhaust Duct	**Stop Date:** 0:00
	Start Time: 0:00
	Stop Time: 23:59

Trav. Point	Delta P ("H_2O)	SQ Root Delta P	Stack Temp (F)
Average	0.10	0.31	70.2

Average Delta P, ("H_2O)	0.10
Average Stack Temp, (F)	70.2
B_{ws}, (fractional water)	0.010
P_{bar}, ("H_g)	29.9
P_g, ("H_2O)	0.01
CO_2, ($\%_{vd}$)	0.00
O_2, ($\%_{vd}$)	20.90
CO, ($\%_{vd}$)	0
N_2, ($\%_{vd}$)	79.1
Stack Dia (ft)	0.58
L, (ft)	
W, (ft)	
A, (ft^2)	0.267
C_p, (pitot coefficient)	0.84
M_d, (g/mole)	28.84
M_s, (g/mole)	28.73

G	0.79	
V_s	17.55	fps
Q_s	16,646	dscfh
	16,814	scfh
	280	scfm
	277	dscfm
	281	acfm

Equations:

T_s = Temp Stack + 460

$P_s = P_g/13.6 + P_{bar}$

$M_d = .44\ CO_2 + .32\ O_2 + .28\ CO + .28\ N_2$

$M_s = M_d(1-B_{ws}) + 18(B_{ws})$

$G = Sqrt(T_s/P_s/M_s)$

$V_s = 85.9(C_p)(G)(Avg.\ Sqrt\ Delta\ P)$

A = either D^2(PI)/4 or (L)(W)

$Q_s = 3600(1-B_{ws})(V_s)(A)(T_{std}/P_{std})(P_s)/(T_s\ (abs))$

Volumetric Flow Calculations

Facility/Site: Sprague Searsport	**Start Date:** 06/21/12
Source: Residual Oil Exhaust Duct	**Stop Date:** 06/21/12
	Start Time: 13:00
	Stop Time: 23:59

Trav. Point	Delta P ("H_2O)	SQ Root Delta P	Stack Temp (F)
Average	0.10	0.32	86.6

Average Delta P, ("H_2O)	0.10
Average Stack Temp, (F)	86.6
B_{ws}, (fractional water)	0.010
P_{bar}, ("H_g)	29.9
P_g, ("H_2O)	0.01
CO_2, ($\%_{vd}$)	0.00
O_2, ($\%_{vd}$)	20.90
CO, ($\%_{vd}$)	0
N_2, ($\%_{vd}$)	79.1
Stack Dia (ft)	0.58
L, (ft)	
W, (ft)	
A, (ft^2)	0.267
C_p, (pitot coefficient)	0.84
M_d, (g/mole)	28.84
M_s, (g/mole)	28.73

G	0.80	
V_s	18.30	fps
Q_s	16,838	dscfh
	17,008	scfh
	283	scfm
	281	dscfm
	293	acfm

Equations:

T_s = Temp Stack + 460

$P_s = P_g/13.6 + P_{bar}$

$M_d = .44\ CO_2 + .32\ O_2 + .28\ CO + .28\ N_2$

$M_s = M_d(1-B_{ws}) + 18(B_{ws})$

$G = Sqrt(T_s/P_s/M_s)$

$V_s = 85.9(C_p)(G)(Avg.\ Sqrt\ Delta\ P)$

A = either D^2(PI)/4 or (L)(W)

$Q_s = 3600(1-B_{ws})(V_s)(A)(T_{std}/P_{std})(P_s/(T_s(abs))$

Volumetric Flow Calculations

Facility/Site: Sprague Searsport
Source: Residual Oil Exhaust Duct

Start Date: 06/22/12
Stop Date: 06/22/12
Start Time: 0:00
Stop Time: 23:59

Trav. Point	Delta P ("H_2O)	SQ Root Delta P	Stack Temp (F)
Average	0.09	0.30	81.9

Average Delta P, ("H_2O)	0.09
Average Stack Temp, (F)	81.9
B_{ws}, (fractional water)	0.010
P_{bar}, ("H_g)	29.9
P_g, ("H_2O)	0.01
CO_2, ($\%_{vd}$)	0.00
O_2, ($\%_{vd}$)	20.90
CO, ($\%_{vd}$)	0
N_2, ($\%_{vd}$)	79.1
Stack Dia (ft)	0.58
L, (ft)	
W, (ft)	
A, (ft^2)	0.267
C_p, (pitot coefficient)	0.84
M_d, (g/mole)	28.84
M_s, (g/mole)	28.73

G	0.79	
V_s	16.99	fps
Q_s	15,768	dscfh
	15,927	scfh
	265	scfm
	263	dscfm
	272	acfm

Equations:

T_s = Temp Stack + 460

$P_s = P_g/13.6 + P_{bar}$

$M_d = .44\ CO_2 + .32\ O_2 + .28\ CO + .28\ N_2$

$M_s = M_d(1-B_{ws})+18(B_{ws})$

$G = Sqrt(T_s/P_s/M_s)$

$V_s = 85.9(C_p)(G)(Avg.\ Sqrt\ Delta\ P)$

A = either D^2(PI)/4 or (L)(W)

$Q_s = 3600(1-B_{ws})(V_s)(A)(T_{std}/P_{std})(P_s)/(T_s\ (abs))$

Volumetric Flow Calculations

Facility/Site: Sprague Searsport
Source: Residual Oil Exhaust Duct

Start Date: 06/23/12
Stop Date: 06/23/12
Start Time: 0:00
Stop Time: 23:59

Trav. Point	Delta P ("H_2O)	SQ Root Delta P	Stack Temp (F)
Average	0.08	0.28	75.7

Average Delta P, ("H_2O)	0.08
Average Stack Temp, (F)	75.7
B_{ws}, (fractional water)	0.010
P_{bar}, ("H_g)	29.9
P_g, ("H_2O)	0.01
CO_2, ($\%_{vd}$)	0.00
O_2, ($\%_{vd}$)	20.90
CO, ($\%_{vd}$)	0
N_2, ($\%_{vd}$)	79.1
Stack Dia (ft)	0.58
L, (ft)	
W, (ft)	
A, (ft^2)	0.267
C_p, (pitot coefficient)	0.84
M_d, (g/mole)	28.84
M_s, (g/mole)	28.73

G	0.79	
V_s	16.11	fps
Q_s	15,126	dscfh
	15,279	scfh
	255	scfm
	252	dscfm
	258	acfm

Equations:

T_s = Temp Stack + 460

$P_s = P_g/13.6 + P_{bar}$

$M_d = .44\ CO_2 + .32\ O_2 + .28\ CO + .28\ N_2$

$M_s = M_d(1-B_{ws}) + 18(B_{ws})$

$G = Sqrt(T_s/P_s/M_s)$

$V_s = 85.9(C_p)(G)(Avg.\ Sqrt\ Delta\ P)$

A = either D^2(PI)/4 or (L)(W)

$Q_s = 3600(1-B_{ws})(V_s)(A)(T_{std}/P_{std})(P_s)/(T_s\ (abs))$

Volumetric Flow Calculations

Facility/Site: Sprague Searsport	**Start Date:** 06/24/12
Source: Residual Oil Exhaust Duct	**Stop Date:** 06/24/12
	Start Time: 0:00
	Stop Time: 23:59

Trav. Point	Delta P ("H_2O)	SQ Root Delta P	Stack Temp (F)
Average	0.08	0.29	80.9

Average Delta P, ("H_2O)	0.08
Average Stack Temp, (F)	80.9
B_{ws}, (fractional water)	0.010
P_{bar}, ("H_g)	29.9
P_g, ("H_2O)	0.01
CO_2, ($\%_{vd}$)	0.00
O_2, ($\%_{vd}$)	20.90
CO, ($\%_{vd}$)	0
N_2, ($\%_{vd}$)	79.1
Stack Dia (ft)	0.58
L, (ft)	
W, (ft)	
A, (ft^2)	0.267
C_p, (pitot coefficient)	0.84
M_d, (g/mole)	28.84
M_s, (g/mole)	28.73

G	0.79	
V_s	16.35	fps
Q_s	15,201	dscfh
	15,355	scfh
	256	scfm
	253	dscfm
	262	acfm

Equations:

T_s = Temp Stack + 460

$P_s = P_g/13.6 + P_{bar}$

$M_d = .44\ CO_2 + .32\ O_2 + .28\ CO + .28\ N_2$

$M_s = M_d(1-B_{ws}) + 18(B_{ws})$

$G = Sqrt(T_s/P_s/M_s)$

$V_s = 85.9(C_p)(G)$(Avg. Sqrt Delta P)

A = either D^2(PI)/4 or (L)(W)

$Q_s = 3600(1-B_{ws})(V_s)(A)(T_{std}/P_{std})(P_s)/(T_s\,(abs))$

Volumetric Flow Calculations

Facility/Site: Sprague Searsport	**Start Date:** 06/25/12
Source: Residual Oil Exhaust Duct	**Stop Date:** 06/25/12
	Start Time: 0:00
	Stop Time: 23:59

Trav. Point	Delta P ("H_2O)	SQ Root Delta P	Stack Temp (F)
Average	0.07	0.27	74.3

Average Delta P, ("H_2O)	0.07
Average Stack Temp, (F)	74.3
B_{ws}, (fractional water)	0.010
P_{bar}, ("H_g)	29.9
P_g, ("H_2O)	0.01
CO_2, ($\%_{vd}$)	0.00
O_2, ($\%_{vd}$)	20.90
CO, ($\%_{vd}$)	0
N_2, ($\%_{vd}$)	79.1
Stack Dia (ft)	0.58
L, (ft)	
W, (ft)	
A, (ft^2)	0.267
C_p, (pitot coefficient)	0.84
M_d, (g/mole)	28.84
M_s, (g/mole)	28.73

G	0.79	
V_s	15.41	fps
Q_s	14,504	dscfh
	14,651	scfh
	244	scfm
	242	dscfm
	247	acfm

Equations:

T_s = Temp Stack + 460

$P_s = P_g/13.6 + P_{bar}$

$M_d = .44\ CO_2 + .32\ O_2 + .28\ CO + .28\ N_2$

$M_s = M_d(1-B_{ws}) + 18(B_{ws})$

$G = Sqrt(T_s/P_s/M_s)$

$V_s = 85.9(C_p)(G)(Avg.\ Sqrt\ Delta\ P)$

A = either D^2(PI)/4 or (L)(W)

$Q_s = 3600(1-B_{ws})(V_s)(A)(T_{std}/P_{std})(P_s)/(T_s\ (abs))$

Volumetric Flow Calculations

Facility/Site: Sprague Searsport	**Start Date:** 06/26/12
Source: Residual Oil Exhaust Duct	**Stop Date:** 06/26/12
	Start Time: 0:00
	Stop Time: 13:00

Trav. Point	Delta P ("H_2O)	SQ Root Delta P	Stack Temp (F)
Average	0.07	0.26	67.7

Average Delta P, ("H_2O)	0.07
Average Stack Temp, (F)	67.7
B_{ws}, (fractional water)	0.010
P_{bar}, ("H_g)	29.9
P_g, ("H_2O)	0.01
CO_2, ($\%_{vd}$)	0.00
O_2, ($\%_{vd}$)	20.90
CO, ($\%_{vd}$)	0
N_2, ($\%_{vd}$)	79.1
Stack Dia (ft)	0.58
L, (ft)	
W, (ft)	
A, (ft^2)	0.267
C_p, (pitot coefficient)	0.84
M_d, (g/mole)	28.84
M_s, (g/mole)	28.73

G	0.78	
V_s	14.81	fps
Q_s	14,115	dscfh
	14,258	scfh
	238	scfm
	235	dscfm
	237	acfm

Equations:

T_s = Temp Stack + 460

$P_s = P_g/13.6 + P_{bar}$

$M_d = .44\ CO_2 + .32\ O_2 + .28\ CO + .28\ N_2$

$M_s = M_d(1-B_{ws}) + 18(B_{ws})$

$G = Sqrt(T_s/P_s/M_s)$

$V_s = 85.9(C_p)(G)$(Avg. Sqrt Delta P)

A = either D^2(PI)/4 or (L)(W)

$Q_s = 3600(1-B_{ws})(V_s)(A)(T_{std}/P_{std})(P_s)/(T_s\ (abs))$

Volumetric Flow Calculations

Facility/Site: Sprague Searsport	**Start Date:** 06/27/12
Source: Residual Oil Exhaust Duct	**Stop Date:** 06/27/12
	Start Time: 0:00
	Stop Time: 23:59

Trav. Point	Delta P ("H_2O)	SQ Root Delta P	Stack Temp (F)
Average	0.08	0.29	68.0

Average Delta P, ("H_2O)	0.08
Average Stack Temp, (F)	68.0
B_{ws}, (fractional water)	0.010
P_{bar}, ("H_g)	29.9
P_g, ("H_2O)	0.01
CO_2, ($\%_{vd}$)	0.00
O_2, ($\%_{vd}$)	20.90
CO, ($\%_{vd}$)	0
N_2, ($\%_{vd}$)	79.1
Stack Dia (ft)	0.58
L, (ft)	
W, (ft)	
A, (ft^2)	0.267
C_p, (pitot coefficient)	0.84
M_d, (g/mole)	28.84
M_s, (g/mole)	28.73

G	0.78	
V_s	16.13	fps
Q_s	15,360	dscfh
	15,515	scfh
	259	scfm
	256	dscfm
	259	acfm

Equations:

T_s = Temp Stack + 460

$P_s = P_g/13.6 + P_{bar}$

$M_d = .44\ CO_2 + .32\ O_2 + .28\ CO + .28\ N_2$

$M_s = M_d(1-B_{ws}) + 18(B_{ws})$

$G = Sqrt(T_s/P_s/M_s)$

$V_s = 85.9(C_p)(G)(Avg.\ Sqrt\ Delta\ P)$

A = either D^2(PI)/4 or (L)(W)

$Q_s = 3600(1-B_{ws})(V_s)(A)(T_{std}/P_{std})(P_s)/(T_s\ (abs))$

Volumetric Flow Calculations

Facility/Site: Sprague Searsport	**Start Date:** 06/28/12
Source: Residual Oil Exhaust Duct	**Stop Date:** 06/28/12
	Start Time: 0:00
	Stop Time: 23:59

Trav. Point	Delta P ("H_2O)	SQ Root Delta P	Stack Temp (F)
Average	0.08	0.29	76.0

Average Delta P, ("H_2O)	0.08
Average Stack Temp, (F)	76.0
B_{ws}, (fractional water)	0.010
P_{bar}, ("H_g)	29.9
P_g, ("H_2O)	0.01
CO_2, ($\%_{vd}$)	0.00
O_2, ($\%_{vd}$)	20.90
CO, ($\%_{vd}$)	0
N_2, ($\%_{vd}$)	79.1
Stack Dia (ft)	0.58
L, (ft)	
W, (ft)	
A, (ft^2)	0.267
C_p, (pitot coefficient)	0.84
M_d, (g/mole)	28.84
M_s, (g/mole)	28.73

G	0.79	
V_s	16.22	fps
Q_s	15,220	dscfh
	15,374	scfh
	256	scfm
	254	dscfm
	260	acfm

Equations:

T_s = Temp Stack + 460

$P_s = P_g/13.6 + P_{bar}$

$M_d = .44\ CO_2 + .32\ O_2 + .28\ CO + .28\ N_2$

$M_s = M_d(1-B_{ws}) + 18(B_{ws})$

$G = Sqrt(T_s/P_s/M_s)$

$V_s = 85.9(C_p)(G)(Avg.\ Sqrt\ Delta\ P)$

A = either D^2(PI)/4 or (L)(W)

$Q_s = 3600(1-B_{ws})(V_s)(A)(T_{std}/P_{std})(P_s)/(T_s\ (abs))$

Volumetric Flow Calculations

Facility/Site: Sprague Searsport	**Start Date:** 06/29/12
Source: Residual Oil Exhaust Duct	**Stop Date:** 06/29/12
	Start Time: 0:00
	Stop Time: 23:59

Trav. Point	Delta P ("H_2O)	SQ Root Delta P	Stack Temp (F)
Average	0.08	0.28	75.4

Average Delta P, ("H_2O)	0.08
Average Stack Temp, (F)	75.4
B_{ws}, (fractional water)	0.010
P_{bar}, ("H_g)	29.9
P_g, ("H_2O)	0.01
CO_2, ($\%_{vd}$)	0.00
O_2, ($\%_{vd}$)	20.90
CO, ($\%_{vd}$)	0
N_2, ($\%_{vd}$)	79.1
Stack Dia (ft)	0.58
L, (ft)	
W, (ft)	
A, (ft^2)	0.267
C_p, (pitot coefficient)	0.84
M_d, (g/mole)	28.84
M_s, (g/mole)	28.73

G	0.79	
V_s	15.66	fps
Q_s	14,713	dscfh
	14,861	scfh
	248	scfm
	245	dscfm
	251	acfm

Equations:

T_s = Temp Stack + 460

$P_s = P_g/13.6 + P_{bar}$

$M_d = .44\ CO_2 + .32\ O_2 + .28\ CO + .28\ N_2$

$M_s = M_d(1-B_{ws}) + 18(B_{ws})$

$G = Sqrt(T_s/P_s/M_s)$

$V_s = 85.9(C_p)(G)$(Avg. Sqrt Delta P)

A = either D^2(PI)/4 or (L)(W)

$Q_s = 3600(1-B_{ws})(V_s)(A)(T_{std}/P_{std})(P_s)/(T_s\,(abs))$

Volumetric Flow Calculations

Facility/Site: Sprague Searsport
Source: Residual Oil Exhaust Duct

Start Date: 06/30/12
Stop Date: 06/30/12
Start Time: 0:00
Stop Time: 23:59

Trav. Point	Delta P ("H_2O)	SQ Root Delta P	Stack Temp (F)
Average	0.08	0.28	85.3

Average Delta P, ("H_2O)	0.08
Average Stack Temp, (F)	85.3
B_{ws}, (fractional water)	0.010
P_{bar}, ("H_g)	29.9
P_g, ("H_2O)	0.01
CO_2, ($\%_{vd}$)	0.00
O_2, ($\%_{vd}$)	20.90
CO, ($\%_{vd}$)	0
N_2, ($\%_{vd}$)	79.1
Stack Dia (ft)	0.58
L, (ft)	
W, (ft)	
A, (ft^2)	0.267
C_p, (pitot coefficient)	0.84
M_d, (g/mole)	28.84
M_s, (g/mole)	28.73

G	0.80	
V_s	15.79	fps
Q_s	14,568	dscfh
	14,715	scfh
	245	scfm
	243	dscfm
	253	acfm

Equations:

T_s = Temp Stack + 460

$P_s = P_g/13.6 + P_{bar}$

$M_d = .44\ CO_2 + .32\ O_2 + .28\ CO + .28\ N_2$

$M_s = M_d(1-B_{ws}) + 18(B_{ws})$

$G = Sqrt(T_s/P_s/M_s)$

$V_s = 85.9(C_p)(G)(Avg.\ Sqrt\ Delta\ P)$

A = either D^2(PI)/4 or (L)(W)

$Q_s = 3600(1-B_{ws})(V_s)(A)(T_{std}/P_{std})(P_s)/(T_s\ (abs))$

Volumetric Flow Calculations

Facility/Site: Sprague Searsport	**Start Date:** 07/01/12
Source: Residual Oil Exhaust Duct	**Stop Date:** 07/01/12
	Start Time: 0:00
	Stop Time: 23:59

Trav. Point	Delta P ("H_2O)	SQ Root Delta P	Stack Temp (F)
Average	0.08	0.28	83.2

Average Delta P, ("H_2O)	0.08
Average Stack Temp, (F)	83.2
B_{ws}, (fractional water)	0.010
P_{bar}, ("H_g)	29.9
P_g, ("H_2O)	0.01
CO_2, ($\%_{vd}$)	0.00
O_2, ($\%_{vd}$)	20.90
CO, ($\%_{vd}$)	0
N_2, ($\%_{vd}$)	79.1
Stack Dia (ft)	0.58
L, (ft)	
W, (ft)	
A, (ft^2)	0.267
C_p, (pitot coefficient)	0.84
M_d, (g/mole)	28.84
M_s, (g/mole)	28.73

G	0.79	
V_s	15.85	fps
Q_s	14,674	dscfh
	14,822	scfh
	247	scfm
	245	dscfm
	254	acfm

Equations:

T_s = Temp Stack + 460

$P_s = P_g/13.6 + P_{bar}$

$M_d = .44\ CO_2 + .32\ O_2 + .28\ CO + .28\ N_2$

$M_s = M_d(1-B_{ws}) + 18(B_{ws})$

$G = Sqrt(T_s/P_s/M_s)$

$V_s = 85.9(C_p)(G)(Avg.\ Sqrt\ Delta\ P)$

A = either D^2(PI)/4 or (L)(W)

$Q_s = 3600(1-B_{ws})(V_s)(A)(T_{std}/P_{std})(P_s)/(T_s\ (abs))$

Volumetric Flow Calculations

Facility/Site: Sprague Searsport	**Start Date:** 07/02/12
Source: Residual Oil Exhaust Duct	**Stop Date:** 07/02/12
	Start Time: 0:00
	Stop Time: 23:59

Trav. Point	Delta P ("H_2O)	SQ Root Delta P	Stack Temp (F)
Average	0.08	0.28	81.5

Average Delta P, ("H_2O)	0.08
Average Stack Temp, (F)	81.5
B_{ws}, (fractional water)	0.010
P_{bar}, ("H_g)	29.9
P_g, ("H_2O)	0.01
CO_2, ($\%_{vd}$)	0.00
O_2, ($\%_{vd}$)	20.90
CO, ($\%_{vd}$)	0
N_2, ($\%_{vd}$)	79.1
Stack Dia (ft)	0.58
L, (ft)	
W, (ft)	
A, (ft^2)	0.267
C_p, (pitot coefficient)	0.84
M_d, (g/mole)	28.84
M_s, (g/mole)	28.73

G	0.79	
V_s	15.92	fps
Q_s	14,783	dscfh
	14,932	scfh
	249	scfm
	246	dscfm
	255	acfm

Equations:

T_s = Temp Stack + 460

$P_s = P_g/13.6 + P_{bar}$

$M_d = .44\ CO_2 + .32\ O_2 + .28\ CO + .28\ N_2$

$M_s = M_d(1-B_{ws}) + 18(B_{ws})$

$G = Sqrt(T_s/P_s/M_s)$

$V_s = 85.9(C_p)(G)(Avg.\ Sqrt\ Delta\ P)$

A = either D^2(PI)/4 or (L)(W)

$Q_s = 3600(1-B_{ws})(V_s)(A)(T_{std}/P_{std})(P_s)/(T_s\ (abs))$

Volumetric Flow Calculations

Facility/Site: Sprague Searsport	**Start Date:** 07/03/12
Source: Residual Oil Exhaust Duct	**Stop Date:** 07/03/12
	Start Time: 0:00
	Stop Time: 23:59

Trav. Point	Delta P ("H_2O)	SQ Root Delta P	Stack Temp (F)
Average	0.08	0.27	82.5

Average Delta P, ("H_2O)	0.08
Average Stack Temp, (F)	82.5
B_{ws}, (fractional water)	0.010
P_{bar}, ("H_g)	29.9
P_g, ("H_2O)	0.01
CO_2, ($\%_{vd}$)	0.00
O_2, ($\%_{vd}$)	20.90
CO, ($\%_{vd}$)	0
N_2, ($\%_{vd}$)	79.1
Stack Dia (ft)	0.58
L, (ft)	
W, (ft)	
A, (ft^2)	0.267
C_p, (pitot coefficient)	0.84
M_d, (g/mole)	28.84
M_s, (g/mole)	28.73

G	0.79	
V_s	15.69	fps
Q_s	14,544	dscfh
	14,691	scfh
	245	scfm
	242	dscfm
	252	acfm

Equations:

T_s = Temp Stack + 460

$P_s = P_g/13.6 + P_{bar}$

$M_d = .44\ CO_2 + .32\ O_2 + .28\ CO + .28\ N_2$

$M_s = M_d(1-B_{ws}) + 18(B_{ws})$

$G = Sqrt(T_s/P_s/M_s)$

$V_s = 85.9(C_p)(G)(Avg.\ Sqrt\ Delta\ P)$

A = either D^2(PI)/4 or (L)(W)

$Q_s = 3600(1-B_{ws})(V_s)(A)(T_{std}/P_{std})(P_s)/(T_s\ (abs))$

Volumetric Flow Calculations

Facility/Site: Sprague Searsport
Source: Residual Oil Exhaust Duct

Start Date: 07/04/12
Stop Date: 07/04/12
Start Time: 0:00
Stop Time: 23:59

Trav. Point	Delta P ("H_2O)	SQ Root Delta P	Stack Temp (F)
Average	0.08	0.28	75.1

Average Delta P, ("H_2O)	0.08
Average Stack Temp, (F)	75.1
B_{ws}, (fractional water)	0.010
P_{bar}, ("H_g)	29.9
P_g, ("H_2O)	0.01
CO_2, ($\%_{vd}$)	0.00
O_2, ($\%_{vd}$)	20.90
CO, ($\%_{vd}$)	0
N_2, ($\%_{vd}$)	79.1
Stack Dia (ft)	0.58
L, (ft)	
W, (ft)	
A, (ft^2)	0.267
C_p, (pitot coefficient)	0.84
M_d, (g/mole)	28.84
M_s, (g/mole)	28.73

G	0.79	
V_s	15.61	fps
Q_s	14,676	dscfh
	14,824	scfh
	247	scfm
	245	dscfm
	250	acfm

Equations:

T_s = Temp Stack + 460

$P_s = P_g/13.6 + P_{bar}$

$M_d = .44\ CO_2 + .32\ O_2 + .28\ CO + .28\ N_2$

$M_s = M_d(1-B_{ws}) + 18(B_{ws})$

$G = Sqrt(T_s/P_s/M_s)$

$V_s = 85.9(C_p)(G)(Avg.\ Sqrt\ Delta\ P)$

A = either D^2(PI)/4 or (L)(W)

$Q_s = 3600(1-B_{ws})(V_s)(A)(T_{std}/P_{std})(P_s)/(T_s\ (abs))$

Volumetric Flow Calculations

Facility/Site: Sprague Searsport	**Start Date:** 07/05/12
Source: Residual Oil Exhaust Duct	**Stop Date:** 07/05/12
	Start Time: 0:00
	Stop Time: 23:59

Trav. Point	Delta P ("H_2O)	SQ Root Delta P	Stack Temp (F)
Average	0.08	0.29	80.8

Average Delta P, ("H_2O)	0.08
Average Stack Temp, (F)	80.8
B_{ws}, (fractional water)	0.010
P_{bar}, ("H_g)	29.9
P_g, ("H_2O)	0.01
CO_2, ($\%_{vd}$)	0.00
O_2, ($\%_{vd}$)	20.90
CO, ($\%_{vd}$)	0
N_2, ($\%_{vd}$)	79.1
Stack Dia (ft)	0.58
L, (ft)	
W, (ft)	
A, (ft^2)	0.267
C_p, (pitot coefficient)	0.84
M_d, (g/mole)	28.84
M_s, (g/mole)	28.73

G	0.79	
V_s	16.30	fps
Q_s	15,158	dscfh
	15,312	scfh
	255	scfm
	253	dscfm
	261	acfm

Equations:

T_s = Temp Stack + 460

$P_s = P_g/13.6 + P_{bar}$

$M_d = .44\ CO_2 + .32\ O_2 + .28\ CO + .28\ N_2$

$M_s = M_d(1-B_{ws}) + 18(B_{ws})$

$G = Sqrt(T_s/P_s/M_s)$

$V_s = 85.9(C_p)(G)(Avg.\ Sqrt\ Delta\ P)$

A = either D^2(PI)/4 or (L)(W)

$Q_s = 3600(1-B_{ws})(V_s)(A)(T_{std}/P_{std})(P_s)/(T_s\ (abs))$

Volumetric Flow Calculations

Facility/Site: Sprague Searsport	**Start Date:** 07/06/12
Source: Residual Oil Exhaust Duct	**Stop Date:** 07/06/12
	Start Time: 0:00
	Stop Time: 23:59

Trav. Point	Delta P ("H_2O)	SQ Root Delta P	Stack Temp (F)
Average	0.08	0.29	81.1

Average Delta P, ("H_2O)	0.08
Average Stack Temp, (F)	81.1
B_{ws}, (fractional water)	0.010
P_{bar}, ("H_g)	29.9
P_g, ("H_2O)	0.01
CO_2, ($\%_{vd}$)	0.00
O_2, ($\%_{vd}$)	20.90
CO, ($\%_{vd}$)	0
N_2, ($\%_{vd}$)	79.1
Stack Dia (ft)	0.58
L, (ft)	
W, (ft)	
A, (ft^2)	0.267
C_p, (pitot coefficient)	0.84
M_d, (g/mole)	28.84
M_s, (g/mole)	28.73

G	0.79	
V_s	16.26	fps
Q_s	15,111	dscfh
	15,264	scfh
	254	scfm
	252	dscfm
	261	acfm

Equations:

T_s = Temp Stack + 460

$P_s = P_g/13.6 + P_{bar}$

$M_d = .44\ CO_2 + .32\ O_2 + .28\ CO + .28\ N_2$

$M_s = M_d(1-B_{ws}) + 18(B_{ws})$

$G = Sqrt(T_s/P_s/M_s)$

$V_s = 85.9(C_p)(G)(Avg.\ Sqrt\ Delta\ P)$

A = either D^2(PI)/4 or (L)(W)

$Q_s = 3600(1-B_{ws})(V_s)(A)(T_{std}/P_{std})(P_s)/(T_s\ (abs))$

Volumetric Flow Calculations

Facility/Site: Sprague Searsport
Source: Residual Oil Exhaust Duct

Start Date: 07/07/12
Stop Date: 07/07/12
Start Time: 0:00
Stop Time: 23:59

Trav. Point	Delta P ("H_2O)	SQ Root Delta P	Stack Temp (F)
Average	0.09	0.30	87.0

Average Delta P, ("H_2O)	0.09
Average Stack Temp, (F)	87.0
B_{ws}, (fractional water)	0.010
P_{bar}, ("H_g)	29.9
P_g, ("H_2O)	0.01
CO_2, ($\%_{vd}$)	0.00
O_2, ($\%_{vd}$)	20.90
CO, ($\%_{vd}$)	0
N_2, ($\%_{vd}$)	79.1
Stack Dia (ft)	0.58
L, (ft)	
W, (ft)	
A, (ft^2)	0.267
C_p, (pitot coefficient)	0.84
M_d, (g/mole)	28.84
M_s, (g/mole)	28.73

G	0.80	
V_s	17.39	fps
Q_s	15,985	dscfh
	16,147	scfh
	269	scfm
	266	dscfm
	279	acfm

Equations:

T_s = Temp Stack + 460

$P_s = P_g/13.6 + P_{bar}$

$M_d = .44\ CO_2 + .32\ O_2 + .28\ CO + .28\ N_2$

$M_s = M_d(1-B_{ws}) + 18(B_{ws})$

$G = Sqrt(T_s/P_s/M_s)$

$V_s = 85.9(C_p)(G)(Avg.\ Sqrt\ Delta\ P)$

A = either D^2(PI)/4 or (L)(W)

$Q_s = 3600(1-B_{ws})(V_s)(A)(T_{std}/P_{std})(P_s)/(T_s\ (abs))$

Volumetric Flow Calculations

Facility/Site: Sprague Searsport	**Start Date:** 07/08/12
Source: Residual Oil Exhaust Duct	**Stop Date:** 07/08/12
	Start Time: 0:00
	Stop Time: 23:59

Trav. Point	Delta P ("H_2O)	SQ Root Delta P	Stack Temp (F)
Average	0.10	0.31	81.4

Average Delta P, ("H_2O)	0.10
Average Stack Temp, (F)	81.4
B_{ws}, (fractional water)	0.010
P_{bar}, ("H_g)	29.9
P_g, ("H_2O)	0.01
CO_2, ($\%_{vd}$)	0.00
O_2, ($\%_{vd}$)	20.90
CO, ($\%_{vd}$)	0
N_2, ($\%_{vd}$)	79.1
Stack Dia (ft)	0.58
L, (ft)	
W, (ft)	
A, (ft^2)	0.267
C_p, (pitot coefficient)	0.84
M_d, (g/mole)	28.84
M_s, (g/mole)	28.73

G	0.79	
V_s	17.86	fps
Q_s	16,595	dscfh
	16,762	scfh
	279	scfm
	277	dscfm
	286	acfm

Equations:

T_s = Temp Stack + 460

$P_s = P_g/13.6 + P_{bar}$

$M_d = .44\ CO_2 + .32\ O_2 + .28\ CO + .28\ N_2$

$M_s = M_d(1-B_{ws}) + 18(B_{ws})$

$G = Sqrt(T_s/P_s/M_s)$

$V_s = 85.9(C_p)(G)$(Avg. Sqrt Delta P)

A = either D^2(PI)/4 or (L)(W)

$Q_s = 3600(1-B_{ws})(V_s)(A)(T_{std}/P_{std})(P_s)/(T_s\ (abs))$

Volumetric Flow Calculations

Facility/Site: Sprague Searsport	**Start Date:** 07/09/12
Source: Residual Oil Exhaust Duct	**Stop Date:** 07/09/12
	Start Time: 0:00
	Stop Time: 23:59

Trav. Point	Delta P ("H_2O)	SQ Root Delta P	Stack Temp (F)
Average	0.10	0.32	79.2

Average Delta P, ("H_2O)	0.10
Average Stack Temp, (F)	79.2
B_{ws}, (fractional water)	0.010
P_{bar}, ("H_g)	29.9
P_g, ("H_2O)	0.01
CO_2, ($\%_{vd}$)	0.00
O_2, ($\%_{vd}$)	20.90
CO, ($\%_{vd}$)	0
N_2, ($\%_{vd}$)	79.1
Stack Dia (ft)	0.58
L, (ft)	
W, (ft)	
A, (ft^2)	0.267
C_p, (pitot coefficient)	0.84
M_d, (g/mole)	28.84
M_s, (g/mole)	28.73

G	0.79	
V_s	17.96	fps
Q_s	16,757	dscfh
	16,926	scfh
	282	scfm
	279	dscfm
	288	acfm

Equations:

T_s = Temp Stack + 460

$P_s = P_g/13.6 + P_{bar}$

$M_d = .44\ CO_2 + .32\ O_2 + .28\ CO + .28\ N_2$

$M_s = M_d(1-B_{ws})+18(B_{ws})$

$G = Sqrt(T_s/P_s/M_s)$

$V_s = 85.9(C_p)(G)(Avg.\ Sqrt\ Delta\ P)$

A = either D^2(PI)/4 or (L)(W)

$Q_s = 3600(1-B_{ws})(V_s)(A)(T_{std}/P_{std})(P_s)/(T_s\ (abs))$

Volumetric Flow Calculations

Facility/Site: Sprague Searsport	**Start Date:** 07/10/12
Source: Residual Oil Exhaust Duct	**Stop Date:** 07/10/12
	Start Time: 0:00
	Stop Time: 23:59

Trav. Point	Delta P ("H_2O)	SQ Root Delta P	Stack Temp (F)
Average	0.09	0.30	80.4

Average Delta P, ("H_2O)	0.09
Average Stack Temp, (F)	80.4
B_{ws}, (fractional water)	0.010
P_{bar}, ("H_g)	29.9
P_g, ("H_2O)	0.01
CO_2, ($\%_{vd}$)	0.00
O_2, ($\%_{vd}$)	20.90
CO, ($\%_{vd}$)	0
N_2, ($\%_{vd}$)	79.1
Stack Dia (ft)	0.58
L, (ft)	
W, (ft)	
A, (ft^2)	0.267
C_p, (pitot coefficient)	0.84
M_d, (g/mole)	28.84
M_s, (g/mole)	28.73

G	0.79	
V_s	17.05	fps
Q_s	15,866	dscfh
	16,026	scfh
	267	scfm
	264	dscfm
	273	acfm

Equations:

T_s = Temp Stack + 460

$P_s = P_g/13.6 + P_{bar}$

$M_d = .44\ CO_2 + .32\ O_2 + .28\ CO + .28\ N_2$

$M_s = M_d(1-B_{ws}) + 18(B_{ws})$

$G = Sqrt(T_s/P_s/M_s)$

$V_s = 85.9(C_p)(G)(Avg.\ Sqrt\ Delta\ P)$

A = either D^2(PI)/4 or (L)(W)

$Q_s = 3600(1-B_{ws})(V_s)(A)(T_{std}/P_{std})(P_s)/(T_s\ (abs))$

Volumetric Flow Calculations

Facility/Site: Sprague Searsport	**Start Date:** 07/11/12
Source: Residual Oil Exhaust Duct	**Stop Date:** 07/11/12
	Start Time: 0:00
	Stop Time: 23:59

Trav. Point	Delta P ("H_2O)	SQ Root Delta P	Stack Temp (F)
Average	0.09	0.29	81.2

Average Delta P, ("H_2O)	0.09
Average Stack Temp, (F)	81.2
B_{ws}, (fractional water)	0.010
P_{bar}, ("H_g)	29.9
P_g, ("H_2O)	0.01
CO_2, ($\%_{vd}$)	0.00
O_2, ($\%_{vd}$)	20.90
CO, ($\%_{vd}$)	0
N_2, ($\%_{vd}$)	79.1
Stack Dia (ft)	0.58
L, (ft)	
W, (ft)	
A, (ft^2)	0.267
C_p, (pitot coefficient)	0.84
M_d, (g/mole)	28.84
M_s, (g/mole)	28.73

G	0.79	
V_s	16.66	fps
Q_s	15,481	dscfh
	15,638	scfh
	261	scfm
	258	dscfm
	267	acfm

Equations:

T_s = Temp Stack + 460

$P_s = P_g/13.6 + P_{bar}$

$M_d = .44\ CO_2 + .32\ O_2 + .28\ CO + .28\ N_2$

$M_s = M_d(1-B_{ws})+18(B_{ws})$

$G = Sqrt(T_s/P_s/M_s)$

$V_s = 85.9(C_p)(G)$(Avg. Sqrt Delta P)

A = either D^2(PI)/4 or (L)(W)

$Q_s = 3600(1-B_{ws})(V_s)(A)(T_{std}/P_{std})(P_s)/(T_s\ (abs))$

Volumetric Flow Calculations

Facility/Site: Sprague Searsport
Source: Residual Oil Exhaust Duct

Start Date: 07/12/12
Stop Date: 07/12/12
Start Time: 0:00
Stop Time: 23:59

Trav. Point	Delta P ("H_2O)	SQ Root Delta P	Stack Temp (F)
Average	0.08	0.29	79.3

Average Delta P, ("H_2O)	0.08
Average Stack Temp, (F)	79.3
B_{ws}, (fractional water)	0.010
P_{bar}, ("H_g)	29.9
P_g, ("H_2O)	0.01
CO_2, ($\%_{vd}$)	0.00
O_2, ($\%_{vd}$)	20.90
CO, ($\%_{vd}$)	0
N_2, ($\%_{vd}$)	79.1
Stack Dia (ft)	0.58
L, (ft)	
W, (ft)	
A, (ft^2)	0.267
C_p, (pitot coefficient)	0.84
M_d, (g/mole)	28.84
M_s, (g/mole)	28.73

G	0.79	
V_s	16.40	fps
Q_s	15,294	dscfh
	15,448	scfh
	257	scfm
	255	dscfm
	263	acfm

Equations:

T_s = Temp Stack + 460

$P_s = P_g/13.6 + P_{bar}$

$M_d = .44\ CO_2 + .32\ O_2 + .28\ CO + .28\ N_2$

$M_s = M_d(1-B_{ws}) + 18(B_{ws})$

$G = Sqrt(T_s/P_s/M_s)$

$V_s = 85.9(C_p)(G)$(Avg. Sqrt Delta P)

A = either D^2(PI)/4 or (L)(W)

$Q_s = 3600(1-B_{ws})(V_s)(A)(T_{std}/P_{std})(P_s)/(T_s\ (abs))$

Volumetric Flow Calculations

Facility/Site: Sprague Searsport	**Start Date:** 07/13/12
Source: Residual Oil Exhaust Duct	**Stop Date:** 07/13/12
	Start Time: 0:00
	Stop Time: 15:19

Trav. Point	Delta P ("H_2O)	SQ Root Delta P	Stack Temp (F)
Average	0.09	0.29	83.7

Average Delta P, ("H_2O)	0.09
Average Stack Temp, (F)	83.7
B_{ws}, (fractional water)	0.010
P_{bar}, ("H_g)	29.9
P_g, ("H_2O)	0.01
CO_2, ($\%_{vd}$)	0.00
O_2, ($\%_{vd}$)	20.90
CO, ($\%_{vd}$)	0
N_2, ($\%_{vd}$)	79.1
Stack Dia (ft)	0.58
L, (ft)	
W, (ft)	
A, (ft^2)	0.267
C_p, (pitot coefficient)	0.84
M_d, (g/mole)	28.84
M_s, (g/mole)	28.73

G	0.80	
V_s	16.68	fps
Q_s	15,426	dscfh
	15,581	scfh
	260	scfm
	257	dscfm
	267	acfm

Equations:

T_s = Temp Stack + 460

$P_s = P_g/13.6 + P_{bar}$

$M_d = .44\ CO_2 + .32\ O_2 + .28\ CO + .28\ N_2$

$M_s = M_d(1-B_{ws})+18(B_{ws})$

$G = Sqrt(T_s/P_s/M_s)$

$V_s = 85.9(C_p)(G)$(Avg. Sqrt Delta P)

A = either D^2(PI)/4 or (L)(W)

$Q_s = 3600(1-B_{ws})(V_s)(A)(T_{std}/P_{std})(P_s)/(T_s\ (abs))$