

BOILER PERFORMANCE SUMMARY				Fuel Analysis		Page 1	
Fiberight Facility - Hampden, Maine - PHS Briquettes				% by Weight		2/22/2016	
Boiler Horsepower	1067	= 36828.54 F&A 212	{	Ash	9.87	8.35	16.70
Steam Flow lb/hr	29,785			S	0.14	0.12	0.24
Steam Pres. psig	405			H2	3.23	2.74	5.47
Steam Temp. F	750			C	28.10	23.78	47.56
Feedwater Temp. F	220			N2	0.91	0.77	1.54
Feedwater Rate GPM	62.08			O2	16.83	14.25	28.49
Steam Enth. btu/lb	1388.7			H2O	40.93	50.00	0.00
Feedwater Enth. btu/lb	189						
Heat Absorb. by stm. btu/lb	1199.7						
Ex. Air [include tramp air] %	40			{ add air leakage		Total 100	100
Unburn Carbon Loss %	0.5	{ 0 for gas & oil					
Air Temp. To Boiler F (ambient)	80	{					
Gas Temp. Leaving Boiler F	350	{					
Excess Air to Burners %	45	{ no air leakage					
Moist. In Air lb H2O/lb air	0.013	{.013}					
Radiation Loss %	0.5	{.5}					
Manufactures Margin %	0.5	{1}					
Moist. from Atm. Stm. #/10kbtu	0	{use.056 when burning oil					
Fuel BTU/LB	5,000						
Water from Fuel lb/10 kbtu	1.40						
Theoretical Air lb/10 kbtu	7.26						
Fuel wt.- Ash wt. lb/10 kbtu	1.80						
Actual Dry Air lb/10 kbtu	10.13						
Wt. of Fuel Burned Wet lb/10 kbtu	1.80						
Moisture in Air lb/10 kbtu	0.13						
Added Moist. :Atm.stm.lb/10kbtu	0.00						
Total Wet Gas lb/10 kbtu	12.06						
Water from Fuel lb/10 kbtu	1.40						
Water in Wet Gas lb/10 kbtu	1.53						
Dry Gas total lb/10 kbtu	10.53						
% water by wt. in Gas %	12.67						
Gas out F - Air in F	270						
EFFICIENCY LOSSES							
Dry Gas Loss %	6.82						
H2O from Fuel Loss %	16.39						
Moist. In Air Loss %	0.17						
Unburn Comb. Loss %	0.50						
Radation Loss %	0.50						
Manufac.Unaccount.Margin %	0.50						
Total Losses %	24.89						
BOILER EFFICIENCY							
	75.11						
Fuel Input mmBtu/hr	47.57						
Wet Gas Weight M lb/hr [x1000]	57.37						
Total Air to Burners Mlb/hr x1000	50.72						
Fuel Rate lb/hr (into boiler)	9,514.9						
		Heat Output mmBtu/hr	35.73				
		Total Air Flow ACFM 70 F	11,285				
		Fuel Rate-Tons/Hr	4.76				
		Bottom Ash lb/hr	844.81				
		Fly Ash lb/hr	93.87				
		Total Ash lb/hr	938.68				
		Ash Density lb/cu-ft	35.00				
		*Mixture btu/lb value minimum = 4347 btu/lb					
		Hrs/Yr Oper.	7,920				

	CONSTITUENTS OF FLUE GAS			
	WET BASIS		DRY BASIS	
	% BY WT.	% BY VOL.	% BY WT.	%BYVOL
CO2	16.95	10.77	19.40	13.40
SO2	0.05	0.02	0.05	0.03
H2O	12.62	19.60	0.00	0.00
N2	64.85	64.77	74.21	80.56
O2	5.53	4.84	6.33	6.02
Total	100.00	100.00	100.00	100.00
Flue Gas				F
Density Flue Gas #/cf			0.044	350
Flue Gas Flow ACFM			21,613	350
Flue Gas Flow SCFM			13,875	70
Gas Flow DSCFM			11,156	70
Corrected 8% O2 dscf			12,872	70

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PROJECTED EMISSIONS	RATE (lb/mmBtu)		lbs/hr	US Tons/yr
PM -10 with Multicyclone	0.2		9.51	37.68
PM-2.5 with Multicyclone	0.12		5.71	22.61
Total PM with Multicyclone	0.30		14.27	56.52
PM-10 with Baghouse	0.022		1.05	4.14
PM-2.5 with Baghouse	0.020		0.95	3.77
Total PM with Baghouse	0.030		1.43	5.65
Nox	0.22		10.47	41.45
CO	0.22		10.47	41.45
SO2	0.025		1.19	4.71
TOC	0.039		1.86	7.35
VOC	0.013		0.62	2.45