

US EPA ARCHIVE DOCUMENT

EPA	FIN	Description	Emission Rates (tpy)				Efficiency Factors					
			Fire Rate mmBtu/yr	Fire Rate scf/yr	Carbon Content	MW	CO2	CH4	N2O	CO2e	lb CO2/mmBtu	lb CO2e/mmBtu
HR15.101	HR15.101	Reactor Charge Heater Fuel	3,758,478.00	2,503,713,725	0.766	26.66	247,072.11	12.4290	2.4858	248,123.60	131.47	132.03
		DeEth Offgas (SOR)	508,582.00	287,383,412	0.798	30.07	33,321.97	1.6818	0.3364	33,464.25	131.04	131.60
		Import Ethane	508,582.00	494,432,362	0.724	17.42	30,119.61	0.56	0.06	30,150.33	118.45	118.57
		Natl Gas	4,267,060				280,394.08	14.11	2.82	281,587.86	131.42	131.98
		Total heat needed				Total emissions						
DW37.101	HR15.103	Waste Heat Boiler Boiler Fuel	297,241.00	167,961,130	0.798	30.07	19,475.01	0.98	0.03	19,509.35	131.04	131.27
		Ethane	297,241.00	198,007,252	0.766	26.66	19,539.80	0.98	0.20	19,622.96	131.47	132.03
		DeEth Offgas (SOR)	297,241.00	288,970,814	0.724	17.46	17,638.08	0.33	0.03	17,656.04	118.68	118.80
		Natl Gas	297,241.00	599,900,478	0.443	11.15	14,315.07	0.98	0.03	14,349.41	96.32	96.55
		PSA Tail gas	297,241.00		0.270	4.03	0.00			0.00		
		LTRU Offgas	297,241.00			Total emissions	19,539.80	0.98	0.20	19,622.96	131.47	132.03
		Total heat needed										
HR15.102		Regeneration Air Heater Fuel	4,789,100.00	2,706,164,815	0.798	30.07	313,778.51	5.28	3.17	314,854.38	131.04	131.49
		Ethane	4,789,100.00	3,758,478.00	0.766	26.66	247,072.11	12.43	2.49	248,123.60	131.47	132.03
		DeEth Offgas (SOR)	1,870,421.00	3,774,941,116	0.443	11.15	90,079.20	6.19	0.21	90,295.27	96.32	96.55
		PSA Tail gas	4,789,100.00	4,655,854,889	0.270	4.03	0.00	5.28	0.53	284,471.42	118.68	118.80
		Natl Gas	10,417,999.00			Total emissions*	650,929.82	23.89	5.86	653,273.26	124.96	125.41
		Total heat needed										
		**Reactor Injection Gas (NG)	777,012.00	755,393,543	0.724	17.46	46,047.00	0.86	0.09	46,093.94	118.52	118.64
		**Reactor Effluent VOC	77,868.00	13,333,556	0.847	102.22	5,980.00	0.26	0.01	5,989.00	143.32	143.55
		**Coke	531,742.00				60,000.00			60,000.00	225.67	225.67
		**Information provided 2/21/14 by company email										
GT26.101A		Regen Air Comp Turbine A	2,107,571	2,046,781,587	0.724	17.46	124,930.60	2.32	0.23	125,057.91	118.55	118.67
GT26.101B		Regen Air Comp Turbine B	2,107,571	2,046,781,587	0.724	17.46	124,930.60	2.32	0.23	125,057.91	118.55	118.67
		DW37.101 Totals	16,317,004			Total Carbon exiting Boiler stack	1,031,958	31		1,034,695	126.49	126.82
BO10.103A		Auxiliary Boiler A and										
BO10.103B		Auxiliary Boiler B	248500	140,419,280	0.798	30.07	16,281.55	0.82	0.16	16,351.07	131.04	131.60
		Ethane	248500	165,534,239	0.766	26.66	16,335.29	0.82	0.16	16,404.81	131.47	132.03
		DeEth Offgas (SOR)	248500	501,513,623	0.443	11.15	11,967.32	0.27	0.03	11,982.34	96.32	96.44
		PSA Tail gas	248500	241,590,511	0.724	17.46	14,746.10	0.27	0.03	14,761.11	118.68	118.80
		Natl Gas	248500			Total emissions from Auxiliary Boilers	16,335.29	0.82	0.16	16,404.81	131.47	132.03
		Total heat needed										
		total for company's combustion unit	20,832,564.00				1,328,687.19	45.57	9.60	1,332,687.64	127.56	127.94
SK25.801	SK25.801	Process Flare, Routine	9011	8,760,000	0.724374909	17,4228541	534.13	0.01	0.00	534.67	118.55	118.67
		Pilots (NG)	16339	15,943,200	0.724374909	17,4228541	972.11	0.02	0.00	973.10	118.99	119.11
		Purge (NG)	3354	7,545,545	0.835	43.09	1,311.63	0.01	0.00	1,312.57	782.13	782.69
		Routine Streams (Vent Gas)	28704				2,817.87	0.04	0.01	2,820.34	196.34	
		Routine Totals										
		Process Flare, MSS	2061	8,613,636	0.835	43.09	1,497.29	0.01	0.00	1,497.87	1,452.98	1,453.54
		Misc MSS (Vent Gas)	46006	45,913,143	0.735	17.96	2,928.12	0.15	0.03	2,940.99	127.29	127.85
		Startup, MSS (Vent Gas)	6944	8,613,636	0.832	43.29	1,498.84	0.02	0.00	1,500.78	431.69	432.25
		Shutdown, MSS (Vent Gas)	55011				5,924.25	0.18	0.04	5,939.64	218.88	
		MSS Totals										

*From 02/21/2014 Table A-2

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$CO_2 = (44/12) * FUEI * CC * (MW/MVC) * 0.001$
 where $CO_2 = CO_2$ emission, metris tons/yr
 Fuel = firing rate in MMscf/yr
 MVC = 836.6 (per part 98)
 CC = carbon content of fuel (kg C/kg Fuel)
 MW = (lb/lbmole)

available fuels	aux boilers	HHVs	sc
mmBtu/yr demand	mmBtu/yr demand	mmBtu/scf	
Ethane	248500	1769.7	140,419,280
DeEth Offgas (SOR)		1501.2	165,534,239
PSA Tail gas		495.5	501,513,623
Natl Gas		1028.6	241,590,511
			0.798
			0.766
			0.443
			0.724