Middletown Cogen Project
Actual Emissions from Existing and New Units Affected by the Project

BFG Rates (includes Stoves/Coke Oven) LHV

Before Project	**14,119,385**	**MMBtu/yr**
After Project - Project Production	**15,501,396**	**MMBtu/yr**
Increase	**1,382,011**	**MMBtu/yr**
	11,565	**MMscf/yr**

Preliminary Draft: for discussion purposes only

Assumptions:

1) AK retains the legal and physical capability to operate the Blast Furnace as currently permitted, at existing BFG combustion points.
2) Sulfur level in BFG is 85.5 ppmvd annual average for Baseline emissions based on data from blast furnace stove stack 2010 test.
   Future projected emissions are based on 100 ppm. However higher sulfur levels can be accommodated by the existing blast furnace and could be above 100 ppm annual average for reasons unrelated to the project.
3) Cogen includes startup, shutdown and natural gas usage.
4) Cogen project design basis of 1,840 MMBtu/hr - Turbine at 1,100 MMBtu/hr and each boiler at 370 MMBtu/hr for total 740 MMBtu/hr.
5) New boilers must operate interchangeably under combined annual restriction of 740 MMBtu/hr total.
6) New Cogen units PTE include fuel usage limitations. BFG firing to the turbine and two new boilers will not exceed 1, 450 MMBtu/hr rolling 12-month average collectively
7) Cogen boiler NOx levels set at RACT limit of 0.1 lb/MMBtu.

Line	Before Project (4/05 - 3/07)		PE (TPY)	PM10 (TPY)	PM2.5 (TPY)	SO2 (TPY)	NOx (TPY)	CO (TPY)	VOC (TPY)	
1	P925 & B918	AK Steel Blast Furnace BFG Combustion	128	128	128	636	1,016	605	0	***Flare & Stoves/Coke Battery***
2	B007-B010	AK Steel Boilers BFG Consumption	38	38	38	190	32	181	0	***BFG Only - AK #2 Boiler House***
3	B007-B010	AK Steel Boilers Nat Gas Consumption	0.6	0.6	0.6	0.2	90	27	1.8	***NG Only - AK #2 Boiler House***
4		**Baseline Actual Emissions (BAE)**	**167**	**167**	**167**	**826**	**1,139**	**813**	**2**	

	After Project		PE (TPY)	PM10 (TPY)	PM2.5 (TPY)	SO2 (TPY)	NOx (TPY)	CO (TPY)	VOC (TPY)	
	New Units Potential to Emit (PTE)									
5	P001	Gas Turbine - BFG or natural gas	93	93	93	578	327	308	10	***All emissions based on firing BFG at maximum rate of 1,100 MMBtu/hr for 8,760 hrs. Since SO2 emission factor is the same for the turbine and two boilers, the SO2 potential emissions are based on combined BFG firing of the turbine and both boilers (not to exceed 1,450 MMBtu/hr on annual 12-month rolling basis).***
5A		Gas Turbine - Added emissions from NG firing						48.2	2.3	***These emission represent only the "added" emissions (versus BFG) from firing natural gas if unit operates at max capacity on natural gas for 8,760 hr.***
6	P002	Cooling Tower	3	3	3					
7	P003	AP Flare	0.017	0.017	0.017	0.006	0.64	3.47	0.05	***Emissions from natural gas pilot only. Post-project flare emissions could come from the AK flare or the Cogen flare interchangeably, and will be the same from either flare. Either flare is to be used for BFG combustion only in the event of safety emergencies and planned or forced outage of the Cogen units.***
8	B001-B002	Two Boilers - BFG or natural gas	46	46	46	184	308	339	15	***Based on maximum BFG firing for 8,760 hrs except for SO2. Since SO2 emission factor is the same for turbine and two boilers, the SO2 potential emissions are based on combined BFG firing of the turbine and both boilers (not to exceed 1,450 MMBtu/hr on annual 12-month rolling basis). No added emissions from natural gas as unit will voluntarily be limited to 10 % annual capacity.***
9	P801	Fugitive CO						13		
10	F001	Roadways/Parking - De Minimus	1	1	1					
11	P004	Ethylene Glycol - De Minimus							0.7	
12	T001/002	Acid Storage Tanks (HAPs Only)								
13		Total - New Units PTE	143	143	143	762	635	711	29	***Sum lines 5 through 12***
	Existing Units Projected Actual Emissions (PAE)									
14	P925 & B918	AK Steel Blast Furnace BFG Stoves and Coke Ovens Projected Actual (PAE)	44.4	44.4	44.4	235	352	210	0	***Based on future 15,501,396 MMBtu/yr with 23.9% going to stoves and coke ovens - 3,704,834 MMBtu/yr. The blast furnace can produce more than 15,501,396 MMBtu/yr for reasons unrelated to the project.***
	Unrelated Could Have Accommodated Emissions (UCHA)									
15		**Emissions from increased BFG (UCHA)**	(16.8)	(16.8)	(16.8)	(81)	(133)	(79)	0	***Excluded per OAC 3745-31-01(JJJ)(5)(f). Projections based on BFG combusted in stoves, FIRE Factors and 85.5 ppm sulfur in BFG. The blast furnace can produce more than 15,501,396 MMBtu/yr for reasons unrelated to the project.***
15A		**BFG sulfur content above 85.5 ppm annual average (UCHA)**				(78)				***Excluded per OAC 3745-31-01(JJJ)(5)(e). Difference in 85.5 ppm and future estimate of 100 ppmvd for 15,501,396 MMBtu/yr. BFG sulfur content could exceed 100 ppm for reasons unrealted to the project.***
16	**Existing Units Adjusted PAE (Existing Units PAE minus UCHA)**		27.6	27.6	27.6	77	219	130	0	
17	**New Units PTE + Existing Units Adjusted PAE**		170	170	170	839	854	841	29	***Line 15 plus negative lines 16 and 17***
18	**New Units PTE + Existing Units Adjusted PAE minus BAE**		3	3	3	13	(285)	28	27	***Line 18 minus line 4***
		NSR Significance Levels	**25**	**15**	**10**	**40**	**40**	**100**	**40**	

BFG Emission Factor Basis

AK Flare	EPA Fire Factors
AK #2 Boiler House	EPA Fire Factors except NOx (1998 Stack Test)
AK Stoves	EPA Fire Factors
Gas Turbine	Vendor Guarantee
AP Boilers	Vendor Guarantee
AP Flare	EPA Fire Factors