

BACT Summary

Best Available Control Technology (BACT) Determination for Husky Gas Plant and CDP

BACT is required for the Husky Gas Plant and Central Delivery Point (CDP), as a completely new major source subject to prevention of significant deterioration (PSD) air quality review. The Air Quality Bureau (AQB) performed a BACT review and determination based on all of the information provided by the applicant, XTO Energy Inc and AQB’s own research. XTO provided a considerable amount of information and data that was evaluated by the AQB. The following table (Table A-1) is an overall summary of the BACT being applied to Husky Gas Plant and CDP. Tables 1 through 31 provide the detailed analyses for all equipment and pollutants subject to PSD BACT. The pollutants subject to PSD review were: NOx, CO, O3 (VOC), PM10, PM2.5, SO2, and GHG (CO2e).

Table A-1: Overall Summary of BACT Limits.

Emission Unit(s)		Pollutant	BACT Limit (numerical figure implemented)	BACT Control Method (implemented BACT)	BACT Floor Source ¹
Turbines	TUR1 to TUR4	NOx	2.0 ppmv@15% O2	Selective Catalytic Reduction (SCR) for NOx; and Oxidation for CO, VOC, and HAP; and GCP ²	NSPS KKKK NOx at 15 ppm@15% O2 (or 0.43 lbs/MWh); SO2 at 0.90 lbs/MWh (or 0.060 lbs/MMBtu)
		CO	2.0 ppmv@15% O2		
		VOC	4.0 ppmv@15% O2		
		SO2	0.75 gr total S/100 scf gas		
		PM10 and PM2.5	0.00786 lbs/MMBtu		
		CO2e	117 lbs/MMBtu		
RICE Emergency Generators	GEN1 to GEN8	NOx	0.50 g/bhp-hr	engines have lean burn technology; and GCP	NSPS JJJJ at 2.0 g/hp-hr or 160 ppmvd; and Zia II Gas Plant
		CO	1.5 g/bhp-hr	GCP	NSPS JJJJ at 4.0 g/hp-hr or 540 ppmvd
		VOC	0.21 g/bhp-hr	GCP	NSPS JJJJ at 1.0 g/hp-hr or 86 ppmvd
		PM10 and PM2.5	7.71 E-05 lb/MMBtu	GCP and pipeline quality natural gas ³	
		SO2	0.75 gr total S/100 scf gas	Pipeline quality natural gas	
		CO2e	117 lbs/MMBtu (= 379 g/hp-hr)	GCP and pipeline quality natural gas	
Heaters	CHTR1 to CHTR3	NOx	0.034 lb/MMBtu	Low NOx burners and GCP	NSPS Db at 0.1 lb/MMBtu

Emission Unit(s)		Pollutant	BACT Limit (numerical figure implemented)	BACT Control Method (implemented BACT)	BACT Floor Source ¹
	RHTR1 to RHTR3 and SHTR1 to SHTR12		0.0267 lb/MMBtu	Low NOx burners and GCP	
	CHTR1-3, and RHTR1-3, and SHTR1-12	CO	0.00163 lb/MMBtu	GCP	
	CHTR1-3, and RHTR1-3, and SHTR1-12	VOC	0.0054 lb/MMBtu	GCP	Zia II Gas Plant BACT
	CHTR1-3, and RHTR1-3, and SHTR1-12	PM10 and PM2.5	0.0075 lb/MMBtu	GCP and pipeline quality natural gas	Zia II Gas Plant BACT
	CHTR1-3, and RHTR1-3, and SHTR1-12	SO2	0.75 gr total S/100 scf gas	Pipeline quality natural gas	
	CHTR1-3, and RHTR1-3, and SHTR1-12	CO2e	117 lb/MMBtu	GCP; pipeline quality natural gas; monitoring fuel flow (rate and volume) and fuel heat values	
Amine (amine units)	AU1 to AU3	VOC	100% capture from still vents and flash tanks; 99% DRE ⁴ (zero emissions at amine still and flash tank vents)	Thermal oxidizers (TO1 to TO3)	
	AU1 to AU3	CO2e	100% capture from still vents and flash tanks; 99% DRE (zero emissions at amine still and flash tank vents)		

Emission Unit(s)		Pollutant	BACT Limit (numerical figure implemented)	BACT Control Method (implemented BACT)	BACT Floor Source ¹
Oil tanks and produced water tanks	OTK1 to OTK6, OTK7, GBS1, PWTK1 to PWTK2, and IFR1 to IFR4	VOC CO2e (CH4)	OTK1 - OTK6, OTK7, GBS1, PWTK1 - PWTK2: 100% capture; 98% DRE by ECD1; zero emissions at tanks IFR1 to IFR4: permitted limits of 5.15 tpy VOC	Fixed roof design, submerged fill pipe, vented to ECD1; flash emissions via stabilization and ECD1 control. IFR1 to IFR4: Floating roof design, primary and secondary seals, submerged fill	NSPS OOOOa 95% Control if VOC PTE 6 tpy or more Per federally enforceable permit conditions, exempt from NSPS OOOOa except for GBS1
Tank load-out to trucks	PWTL and OTL	VOC	98% DRE by ECD1	Submerged loading and vent to ECD1	
Enclosed combustion device (ECD1)	ECD1	NOx	0.098 lb/MMBtu	GCP	40 CFR 60.5400a(a) (NSPS OOOOa refers to NSPS VVa at 60.482 and 95% VOC control requirement – ECD1 is control for tanks); and Zia II Gas Plant
		CO	0.082 lb/MMBtu	GCP	
		VOC	98-99% DRE	GCP	
		PM10 and PM2.5	98-99% DRE	GCP and pipeline quality natural gas	
		SO2	0.75 gr total S/100 scf gas	Pipeline quality natural gas	
		CO2e	96.2 lb/MMBtu (= 0.25 lbs/scf)	GCP and pipeline quality natural gas	
Thermal oxidizers	TO1 to TO3	NOx	30 ppmv @ 3% O2	Ultra-low NOx burners	
		CO	50 ppmv @ 3% O2	GCP	
		VOC	98-99% DRE	GCP	
		PM10 and PM2.5	98-99% DRE	GCP and pipeline quality natural gas	
		SO2	0.75 gr total S/100 scf gas	Pipeline quality natural gas	
		CO2e	117 lb/MMBtu (and 101,557 tpy)	GCP and pipeline quality natural gas	

Emission Unit(s)		Pollutant	BACT Limit (numerical figure implemented)	BACT Control Method (implemented BACT)	BACT Floor Source ¹
Flares	FL1, FL2, FL3 for CRYO-SSM and OVHD-SSM	NO _x , CO, VOC, PM ₁₀ , PM _{2.5} , SO ₂ , and CO _{2e}	CRYO-SSM: 102.4 pph NO _x , 204.5 pph CO, 210.1 pph VOC, 0.05 pph SO ₂ , 5.53 pph PM ₁₀ /PM _{2.5} 16,652 tpy CO _{2e} OVHD-SSM: 61.5 pph NO _x , 122.8 pph CO, 404.3 pph VOC, 0.0 pph SO ₂ , 3.32 pph PM ₁₀ /PM _{2.5} 9441 tpy CO _{2e} pilot/purge: 5539 tpy CO _{2e} no cogen 16,618 tpy CO _{2e} cogen	GCP; pipeline quality natural gas for the pilot/purge; limitations on vented gases (SSM limits); 40 CFR 60.18; 98% DRE ⁴ for VOC, CH ₄	40 CFR 60.18 requirements
Fugitives	FUG	VOC and CH ₄ (CO _{2e})	500 ppm leak detection level	LDAR program	NSPS OOOOa at 500 ppm leak detection
Haul road	ROAD	PM ₁₀ PM _{2.5} , PM total	no numerical BACT emission limit	Base course surface and speed limit of 15 mph	

1. Stated as BACT floor even if not subject to a standard per PTE. See NSPS/NESHAP requirements in permit.

2. GCP = Good Combustion Practices.

3. Pipeline Quality Natural Gas as used in this permit shall be defined as: 0.75 grains of total sulfur/100 dscf of natural gas and after processing through the inlets, inlet separator, oil stabilization, and amine units to remove impurities. Applies to all combustion units.

4. DRE = Destruction rate efficiency.

This summary of BACT (Table A-1) is from unit specific tables (Tables 1 through 31). The applicant provided their BACT analysis in an organized tabular fashion (for most pollutants/equipment). There were also comments and information about control efficiency, economics, feasibility, and other environmental considerations in the text of the applicant's BACT analysis. The AQB reviewed and verified the applicant's analysis and also completed its own research to complete the BACT determination.

Attachments:

1) Good Combustion Practices background information from EPA

2) Department's BACT Analysis Tables (Tables 1 through 31)