APPENDIX B
EMISSION RATE CALCULATIONS

AIR PERMIT APPLICATION

JACKSON COUNTY GAS PLANT

ETC TEXAS PIPELINE, LTD.

TABLE B-1

SUMMARY OF SITE-WIDE AIR POLLUTANT EMISSION RATES

AIR PERMIT APPLICATION

JACKSON COUNTY GAS PLANT

ETC TEXAS PIPELINE, LTD.

EPN	FIN	Description	CO_2 Annual[a] (T/yr)	CH_4 Annual[a] (T/yr)	N_2O Annual[a] (T/yr)	CO_2e Annual[a] (T/yr)	Adjusted[b] CO_2e Annual (T/yr)
Project-Affected Equipment							
C-1100A/B, C-2100A/B, C-3100A/B, & C4100A/B	C-1100A/B, C-2100A/B, C-3100A/B, & C4100A/B		21,944.53	0.41	0.04	21,966.06	21,966.06
C-1121A	C-1121A	Plant 1 Residue Compressor Engine 1	18,195.38	0.34	0.03	18,213.22	18,213.22
C-1121B	C-1121B	Plant 1 Residue Compressor Engine 2	18,195.38	0.34	0.03	18,213.22	18,213.22
C-1121C	C-1121C	Plant 1 Residue Compressor Engine 3	18,195.38	0.34	0.03	18,213.22	18,213.22
C-2121A	C-2121A	Plant 2 Residue Compressor Engine 1	18,195.38	0.34	0.03	18,213.22	18,213.22
C-2121B	C-2121B	Plant 2 Residue Compressor Engine 2	18,195.38	0.34	0.03	18,213.22	18,213.22
C-2121C	C-2121C	Plant 2 Residue Compressor Engine 3	18,195.38	0.34	0.03	18,213.22	18,213.22
C-3121A	C-3121A	Plant 3 Residue Compressor Engine 1	18,195.38	0.34	0.03	18,213.22	18,213.22
C-3121B	C-3121B	Plant 3 Residue Compressor Engine 2	18,195.38	0.34	0.03	18,213.22	18,213.22
C-3121C	C-3121C	Plant 3 Residue Compressor Engine 3	18,195.38	0.34	0.03	18,213.22	18,213.22
C-4121A	C-4121A	Plant 4 Residue Compressor Engine 1	18,195.38	0.34	0.03	18,213.22	18,213.22
C-4121B	C-4121B	Plant 4 Residue Compressor Engine 2	18,195.38	0.34	0.03	18,213.22	18,213.22
C-4121C	C-4121C	Plant 4 Residue Compressor Engine 3	18,195.38	0.34	0.03	18,213.22	18,213.22
H-1706	H-1706	Plant 1 Hot Oil Heater	24,830.49	0.47	0.05	24,854.83	24,854.83
H-7810	H-7810	Plant 1 Trim Heater	8,908.26	0.17	0.02	8,917.00	8,917.00
H-7820	H-7820	Plant 1 Mol Sieve Regen Heater	4,966.10	0.09	0.01	4,970.98	4,970.98
H-7410	H-7410	Plant 1 TEG Dehy Unit Regen Gas Heater	1,535.91	0.03	0.00	1,537.42	1,537.42
TO-1	TO-1, F-1117, F-1527	Plant 1 Thermal Oxidizer	43,972.72	0.14	0.01	43,979.14	48,377.05
H-2706	H-2706	Plant 2 Hot Oil Heater	24,830.49	0.47	0.05	24,854.83	24,854.83
H-7811	H-7811	Plant 2 Trim Heater	8,908.26	0.17	0.02	8,917.00	8,917.00
H-7821	H-7821	Plant 2 Mol Sieve Regen Heater	4,966.10	0.09	0.01	4,970.98	4,970.98
H-7411	H-7411	Plant 2 TEG Dehy Unit Regen Gas Heater	1,535.91	0.03	0.00	1,537.42	1,537.42
TO-2	TO-2, F-2117, F-2527	Plant 2 Thermal Oxidizer	43,972.72	0.14	0.01	43,979.14	48,377.05
H-3706	H-3706	Plant 3 Hot Oil Heater	24,830.49	0.47	0.05	24,854.83	24,854.83
H-7812	H-7812	Plant 3 Trim Heater	8,908.26	0.17	0.02	8,917.00	8,917.00
H-7822	H-7822	Plant 3 Mol Sieve Regen Heater	4,966.10	0.09	0.01	4,970.98	4,970.98
H-7412	H-7412	Plant 3 TEG Dehy Unit Regen Gas Heater	1,535.91	0.03	0.00	1,537.42	1,537.42
TO-3	TO-3, F-3117, F-3527	Plant 3 Thermal Oxidizer	43,972.72	0.14	0.01	43,979.14	48,377.05
H-4706	H-4706	Plant 4 Hot Oil Heater	24,830.49	0.47	0.05	24,854.83	24,854.83
H-7813	H-7813	Plant 4 Trim Heater	8,908.26	0.17	0.02	8,917.00	8,917.00
H-7823	H-7823	Plant 4 Mol Sieve Regen Heater	4,966.10	0.09	0.01	4,970.98	4,970.98
H-7413	H-7413	Plant 4 TEG Dehy Unit Regen Gas Heater	1,535.91	0.03	0.00	1,537.42	1,537.42
TO-4	TO-4, F-4117, F-4527	Plant 4 Thermal Oxidizer	43,972.72	0.14	0.01	43,979.14	48,377.05
P1-FUG	P1-FUG	Plant 1 Fugitives	0.06	2.67	--	56.13	61.74
P2-FUG	P2-FUG	Plant 2 Fugitives	0.06	2.67	--	56.13	61.74
P3-FUG	P3-FUG	Plant 3 Fugitives	0.06	2.67	--	56.13	61.74
P4-FUG	P4-FUG	Plant 4 Fugitives	0.06	2.67	--	56.13	61.74
FS-800	FS-800,GRP-BDSV	Plant Flare, Compressor Engine Blowdown/Starter Vents to Flare	7064.10	16.1676	0.0127	7,407.56	8,148.32
		Total Normal Operations:	**584,207.35**	**34.94**	**0.77**	**585,194.26**	**603,549.10**
		Totals Without Fugitives:	**584,207.11**	**24.26**	**0.77**	**584,969.74**	**603,302.14**
		TCEQ PSD Major Source Threshold:	**--**	**--**	**--**	**100,000**	**100,000**
Existing Unmodified Operations							
STAB-FUG	STAB-FUG	Stabilizer Unit Fugitives	0.01	0.23	--	4.84	5.32
H-741	H-741	Stabilization Unit Heater	2,969.42	0.056	0.006	2,972.33	3,269.56
TL-Flare	TL-Flare, C-LOAD	Truck Loading Flare (Controlled Condensate Loading)	893.20	0.001	0.001	893.47	982.82

a Annual emissions for the engines and Plant Flare include MSS.
b Adjusted emissions for thermal oxidizer were increased by 10 percent to allow for process gas variability. Emission calculations are based on a representative sample for current conditions and may change.

COMBUSTION SOURCES POTENTIAL TO EMIT GREENHOUSE GASES

AIR PERMIT APPLICATION

JACKSON COUNTY GAS PLANT

ETC TEXAS PIPELINE, LTD.

Combustion-Related Greenhouse Gas Emissions

Combustion Source EPN	HP	Btu/hp-hr	MMBtu/hr	Annual Operating Hours	Fuel Usage MMBtu/yr	CO_2 [a] Emissions short T/yr	CH_4 [a] Emissions short T/yr	N_2O [a] Emissions short T/yr	CO_2e[a] short T/yr	GHG Mass[a] short T/yr
Project-Affected Equipment										
C-1100A/B, C-2100A/B, C-3100A/B, & C-4100A/B	1,775	7,555	13.41	28,000	375,480.00	21,944.53	0.4139	0.0414	21,966.06	21,944.99
C-1121A	4,735	7,505	35.54	8,760	311,330.40	18,195.38	0.3432	0.0343	18,213.22	18,195.76
C-1121B	4,735	7,505	35.54	8,760	311,330.40	18,195.38	0.3432	0.0343	18,213.22	18,195.76
C-1121C	4,735	7,505	35.54	8,760	311,330.40	18,195.38	0.3432	0.0343	18,213.22	18,195.76
C-2121A	4,735	7,505	35.54	8,760	311,330.40	18,195.38	0.3432	0.0343	18,213.22	18,195.76
C-2121B	4,735	7,505	35.54	8,760	311,330.40	18,195.38	0.3432	0.0343	18,213.22	18,195.76
C-2121C	4,735	7,505	35.54	8,760	311,330.40	18,195.38	0.3432	0.0343	18,213.22	18,195.76
C-3121A	4,735	7,505	35.54	8,760	311,330.40	18,195.38	0.3432	0.0343	18,213.22	18,195.76
C-3121B	4,735	7,505	35.54	8,760	311,330.40	18,195.38	0.3432	0.0343	18,213.22	18,195.76
C-3121C	4,735	7,505	35.54	8,760	311,330.40	18,195.38	0.3432	0.0343	18,213.22	18,195.76
C-4121A	4,735	7,505	35.54	8,760	311,330.40	18,195.38	0.3432	0.0343	18,213.22	18,195.76
C-4121B	4,735	7,505	35.54	8,760	311,330.40	18,195.38	0.3432	0.0343	18,213.22	18,195.76
C-4121C	4,735	7,505	35.54	8,760	311,330.40	18,195.38	0.3432	0.0343	18,213.22	18,195.76
H-1706	---	---	48.5	8,760	424,860.00	24,830.49	0.4683	0.0468	24,854.83	24,831.01
H-7410	---	---	3.0	8,760	26,280.00	1,535.91	0.0290	0.0029	1,537.42	1,535.94
H-7810	---	---	17.4	8,760	152,424.00	8,908.26	0.1680	0.0168	8,917.00	8,908.44
H-7820	---	---	9.7	8,760	84,972.00	4,966.10	0.0937	0.0094	4,970.98	4,966.20
H-2706	---	---	48.5	8,760	424,860.00	24,830.49	0.4683	0.0468	24,854.83	24,831.01
H-7411	---	---	3.0	8,760	26,280.00	1,535.91	0.0290	0.0029	1,537.42	1,535.94
H-7811	---	---	17.4	8,760	152,424.00	8,908.26	0.1680	0.0168	8,917.00	8,908.44
H-7821	---	---	9.7	8,760	84,972.00	4,966.10	0.0937	0.0094	4,970.98	4,966.20
H-3706	---	---	48.5	8,760	424,860.00	24,830.49	0.4683	0.0468	24,854.83	24,831.01
H-7412	---	---	3.0	8,760	26,280.00	1,535.91	0.0290	0.0029	1,537.42	1,535.94
H-7812	---	---	17.4	8,760	152,424.00	8,908.26	0.1680	0.0168	8,917.00	8,908.44
H-7822	---	---	9.7	8,760	84,972.00	4,966.10	0.0937	0.0094	4,970.98	4,966.20
H-4706	---	---	48.5	8,760	424,860.00	24,830.49	0.4683	0.0468	24,854.83	24,831.01
H-7413	---	---	3.0	8,760	26,280.00	1,535.91	0.0290	0.0029	1,537.42	1,535.94
H-7813	---	---	17.4	8,760	152,424.00	8,908.26	0.1680	0.0168	8,917.00	8,908.44
H-7823	---	---	9.7	8,760	84,972.00	4,966.10	0.0937	0.0094	4,970.98	4,966.20
TO-1 (Fuel Gas)	---	---	7.0	8,760	61,320.00	3,583.78	0.0676	0.0068	3,587.31	3,583.85
TO-1 (Waste Gas)[b]	---	---				40,388.94	0.0700	0.0046	40,391.83	40,389.01
TO-2 (Fuel Gas)	---	---	7.0	8,760	61,320.00	3,583.78	0.0676	0.0068	3,587.31	3,583.85
TO-2 (Waste Gas)[b]	---	---				40,388.94	0.0700	0.0046	40,391.83	40,389.01
TO-3 (Fuel Gas)	---	---	7.0	8,760	61,320.00	3,583.78	0.0676	0.0068	3,587.31	3,583.85
TO-3 (Waste Gas)[b]	---	---				40,388.94	0.0700	0.0046	40,391.83	40,389.01
TO-4 (Fuel Gas)	---	---	7.0	8,760	61,320.00	3,583.78	0.0676	0.0068	3,587.31	3,583.85
TO-4 (Waste Gas)[b]	---	---				40,388.94	0.0700	0.0046	40,391.83	40,389.01
FS-800 (Pilot Gas)	---	---	7.0	8,760	61,320.00	3,583.78	0.0676	0.0068	3,587.31	3,583.85
FS-800 (Waste Gas)[b]	---	---				3,480.32	16.1000	0.0059	3,820.25	3,496.43
						584,207.11			**584,969.74**	**584,232.19**
Existing, Unmodified Sources										
H-741	---	---	5.8	8,760	50,808.00	2,969.42	0.0560	0.0056	2,972.33	2,969.48
TL-Flare (Pilot Gas)	---	---	0.10	8,760	876.00	51.20	0.0010	0.0001	51.25	51.20
TL-Flare (Waste Gas)[b]	---	---				842.00	0.0000	0.0007	842.22	842.00

[a]Sample calculations:

CO_2, CH_4, or N_2O = Fuel * HHV * EF (Eq. C-1, §98.33(a)(1)(i) and C-8, §98.33(c)(1))

Where:

CO_2, CH_4, or N_2O = Annual emissions from combustion in kilograms

Fuel = volume combusted, scfy

HHV = High heat value of fuel, MMBtu/scf

EF = Emission Factors from Tables C-1 and C-2 of 40 CFR 98, Subpart C are as follows:

CO_2 = 53.02 kg/MMBtu

CH_4 = 0.001 kg/MMBtu

N_2O = 0.0001 kg/MMBtu

The engine design rating in MMBtu/hr was substituteed for Fuel and HHV in Equation C-1 and a conversion from metric tons to short tons was applied in the following sample calculation for EPN-C-1121A:

CO_2 (short T/yr) = (0.001 metric T/kg)*(Fuel usage, MMBtu/yr))*[CO_2 EF, kg/MMBtu] * (2,204.6 lb/metric T) / (2,000 lb/short T)

= 18,195.38 short T/yr

An example calculation for CO_2e in using Eq. A-1 and global warming potential factors found in Table A-1:

CO_2e (short T/yr) = (CO2 Emission, short T/yr) + 21 * (CH4 Emission, short T/yr) + 310 * (N2O Emission, short T/yr)

= 18,213.22 short T/yr

An example calculation for GHG Mass in short T/yr for EPN C-1121A follows:

GHG Mass (short T/yr) = (CO2 Emission, short T/yr) + (CH4 Emission, short T/yr) + (N2O Emission, short T/yr)

= 18,195.76 short T/yr

[b]Waste gas combustion GHG emissions from the flares and thermal oxidizers are calculated on the following sheets.

PLANT 1 PIPING FUGITIVES POTENTIAL TO EMIT

AIR PERMIT APPLICATION

JACKSON COUNTY GAS PLANT

ETC TEXAS PIPELINE, LTD.

Component	Number of Components	Emission Factors [a] (lb/hr-component)	Operating Hours (hr/yr)	Maximum Methane (wt%)	Maximum CO_2 (wt%)	Reduction Credit [a] (%)	PTE Methane Hourly [b] (lb/hr)	PTE Methane Annual [c] (T/yr)	PTE CO_2 Hourly [b] (lb/hr)	PTE CO_2 Annual [c] (T/yr)
Valves										
Gas Streams (Inlet)	210	0.00992	8,760	55%	2%	97%	0.0344	0.1506	0.0012	0.0055
Gas Streams (Residue)	315	0.00992	8,760	98%	1%	97%	0.0919	0.4024	0.0009	0.0041
Gas Streams (Processing)	326	0.00992	8,760	55%	2%	97%	0.0534	0.2337	0.0019	0.0085
Light Liquid Streams	262	0.0055	8,760	0%	0%	97%	0.0000	0.0000	0.0000	0.0000
Water/Light Liquid	105	0.000216	8,760	0%	0%	97%	0.0000	0.0000	0.0000	0.0000
Heavy Liquid	525	0.0000185	8,760	0%	0%	0%	0.0000	0.0000	0.0000	0.0000
Relief Valves							0.0000	0.0000	0.0000	0.0000
Gas Streams (Inlet)	22	0.0194	8,760	55%	2%	97%	0.0070	0.0308	0.0003	0.0011
Gas Streams (Residue)	32	0.0194	8,760	98%	1%	97%	0.0183	0.0799	0.0002	0.0008
Gas Streams (Processing)	32	0.0194	8,760	55%	2%	97%	0.0102	0.0449	0.0004	0.0016
Light Liquid Streams	53	0.0165	8,760	0%	0%	0%	0.0000	0.0000	0.0000	0.0000
Water/Light Liquid	11	0.0309	8,760	0%	0%	0%	0.0000	0.0000	0.0000	0.0000
Heavy Liquid	26	0.0000683	8,760	0%	0%	0%	0.0000	0.0000	0.0000	0.0000
Compressor Seals										
Gas Streams (Inlet)	13	0.0194	8,760	55%	2%	95%	0.0069	0.0304	0.0003	0.0011
Gas Streams (Residue)	25	0.0194	8,760	98%	1%	95%	0.0238	0.1041	0.0002	0.0011
Gas Streams (Processing)	4	0.0194	8,760	55%	2%	95%	0.0021	0.0093	0.0001	0.0003
Light Liquid Streams	0	0.0165	8,760	0%	0%	0%	0.0000	0.0000	0.0000	0.0000
Water/Light Liquid	0	0.0309	8,760	0%	0%	0%	0.0000	0.0000	0.0000	0.0000
Heavy Liquid	0	0.0000683	8,760	0%	0%	0%	0.0000	0.0000	0.0000	0.0000
Pump Seals										
Gas Streams (Inlet)	2	0.00529	8,760	55%	2%	0%	0.0058	0.0255	0.0002	0.0009
Gas Streams (Residue)	2	0.00529	8,760	98%	1%	0%	0.0104	0.0454	0.0001	0.0005
Gas Streams (Processing)	2	0.00529	8,760	55%	2%	0%	0.0058	0.0255	0.0002	0.0009
Light Liquid Streams	21	0.02866	8,760	0%	0%	93%	0.0000	0.0000	0.0000	0.0000
Water/Light Liquid	11	0.000052	8,760	0%	0%	93%	0.0000	0.0000	0.0000	0.0000
Heavy Liquid	16	0.00113	8,760	0%	0%	0%	0.0000	0.0000	0.0000	0.0000
Flanges										
Gas Streams (Inlet)	557	0.00086	8,760	55%	2%	75%	0.0659	0.2885	0.0024	0.0105
Gas Streams (Residue)	820	0.00086	8,760	98%	1%	75%	0.1728	0.7568	0.0018	0.0077
Gas Streams (Processing)	847	0.00086	8,760	55%	2%	75%	0.1002	0.4387	0.0036	0.0160
Light Liquid Streams	708	0.000243	8,760	0%	0%	75%	0.0000	0.0000	0.0000	0.0000
Water/Light Liquid	274	0.000006	8,760	0%	0%	75%	0.0000	0.0000	0.0000	0.0000
Heavy Liquid	1,339	0.00000086	8,760	0%	0%	30%	0.0000	0.0000	0.0000	0.0000
						Gas Streams (Inlet):	**0.1200**	**0.5258**	**0.0044**	**0.0191**
						Gas Streams (Residue):	**0.3172**	**1.3886**	**0.0032**	**0.0142**
						Gas Streams (Processing):	**0.1717**	**0.7521**	**0.0062**	**0.0273**
						Light Liquid Streams:	**0.0000**	**0.0000**	**0.0000**	**0.0000**
						Water/Light Liquid:	**0.0000**	**0.0000**	**0.0000**	**0.0000**
						Heavy Liquid:	**0.0000**	**0.0000**	**0.0000**	**0.0000**
						TOTALS:	**0.61**	**2.67**	**0.01**	**0.06**

[a] Fugitive Emission Factors and Reduction Credits are per TCEQ Technical Guidance Document for Equipment Leak Fugitives, dated October 2000. The emission factors are for total hydrocarbon. Reduction credit is from 28LAER.

[b] Hourly Methane and CO_2 emission rates are calculated as follows:
(210 components) * (0.00992 lb/hr-component) * (55% Methane) * (100% - 97% reduction credit) = 0.0344 lb/hr

[c] Annual Methane and CO_2 emission rates are calculated as follows:
(210 components) * (0.00992 lb/hr-component) * (8,760 hr/yr) * (55% Methane) * (100% - 97% reduction credit) / (2,000 lb/T) = 0.1506 T/yr

PLANT 2 PIPING FUGITIVES POTENTIAL TO EMIT
AIR PERMIT APPLICATION
JACKSON COUNTY GAS PLANT
ETC TEXAS PIPELINE, LTD.

Component	Number of Components	Emission Factors [a] (lb/hr-component)	Operating Hours (hr/yr)	Maximum Methane (wt%)	Maximum CO_2 (wt%)	Reduction Credit [a] (%)	PTE Methane Hourly [b] (lb/hr)	PTE Methane Annual [c] (T/yr)	PTE CO_2 Hourly [b] (lb/hr)	PTE CO_2 Annual [c] (T/yr)
Valves										
Gas Streams (Inlet)	210	0.00992	8,760	55%	2%	97%	0.0344	0.1506	0.0012	0.0055
Gas Streams (Residue)	315	0.00992	8,760	98%	1%	97%	0.0919	0.4024	0.0009	0.0041
Gas Streams (Processing)	326	0.00992	8,760	55%	2%	97%	0.0534	0.2337	0.0019	0.0085
Light Liquid Streams	262	0.0055	8,760	0%	0%	97%	0.0000	0.0000	0.0000	0.0000
Water/Light Liquid	105	0.000216	8,760	0%	0%	97%	0.0000	0.0000	0.0000	0.0000
Heavy Liquid	525	0.0000185	8,760	0%	0%	0%	0.0000	0.0000	0.0000	0.0000
Relief Valves										
Gas Streams (Inlet)	22	0.0194	8,760	55%	2%	97%	0.0070	0.0308	0.0003	0.0011
Gas Streams (Residue)	32	0.0194	8,760	98%	1%	97%	0.0183	0.0799	0.0002	0.0008
Gas Streams (Processing)	32	0.0194	8,760	55%	2%	97%	0.0102	0.0449	0.0004	0.0016
Light Liquid Streams	53	0.0165	8,760	0%	0%	0%	0.0000	0.0000	0.0000	0.0000
Water/Light Liquid	11	0.0309	8,760	0%	0%	0%	0.0000	0.0000	0.0000	0.0000
Heavy Liquid	26	0.0000683	8,760	0%	0%	0%	0.0000	0.0000	0.0000	0.0000
Compressor Seals										
Gas Streams (Inlet)	13	0.0194	8,760	55%	2%	95%	0.0069	0.0304	0.0003	0.0011
Gas Streams (Residue)	25	0.0194	8,760	98%	1%	95%	0.0238	0.1041	0.0002	0.0011
Gas Streams (Processing)	4	0.0194	8,760	55%	2%	95%	0.0021	0.0093	0.0001	0.0003
Light Liquid Streams	0	0.0165	8,760	0%	0%	0%	0.0000	0.0000	0.0000	0.0000
Water/Light Liquid	0	0.0309	8,760	0%	0%	0%	0.0000	0.0000	0.0000	0.0000
Heavy Liquid	0	0.0000683	8,760	0%	0%	0%	0.0000	0.0000	0.0000	0.0000
Pump Seals										
Gas Streams (Inlet)	2	0.00529	8,760	55%	2%	0%	0.0058	0.0255	0.0002	0.0009
Gas Streams (Residue)	2	0.00529	8,760	98%	1%	0%	0.0104	0.0454	0.0001	0.0005
Gas Streams (Processing)	2	0.00529	8,760	55%	2%	0%	0.0058	0.0255	0.0002	0.0009
Light Liquid Streams	21	0.02866	8,760	0%	0%	93%	0.0000	0.0000	0.0000	0.0000
Water/Light Liquid	11	0.000052	8,760	0%	0%	93%	0.0000	0.0000	0.0000	0.0000
Heavy Liquid	16	0.00113	8,760	0%	0%	0%	0.0000	0.0000	0.0000	0.0000
Flanges										
Gas Streams (Inlet)	557	0.00086	8,760	55%	2%	75%	0.0659	0.2885	0.0024	0.0105
Gas Streams (Residue)	820	0.00086	8,760	98%	1%	75%	0.1728	0.7568	0.0018	0.0077
Gas Streams (Processing)	847	0.00086	8,760	55%	2%	75%	0.1002	0.4387	0.0036	0.0160
Light Liquid Streams	708	0.000243	8,760	0%	0%	75%	0.0000	0.0000	0.0000	0.0000
Water/Light Liquid	274	0.000006	8,760	0%	0%	75%	0.0000	0.0000	0.0000	0.0000
Heavy Liquid	1,339	0.00000086	8,760	0%	0%	30%	0.0000	0.0000	0.0000	0.0000
						Gas Streams (Inlet):	**0.1200**	**0.5258**	**0.0044**	**0.0191**
						Gas Streams (Residue):	**0.3172**	**1.3886**	**0.0032**	**0.0142**
						Gas Streams (Processing):	**0.1717**	**0.7521**	**0.0062**	**0.0273**
						Light Liquid Streams:	**0.0000**	**0.0000**	**0.0000**	**0.0000**
						Water/Light Liquid:	**0.0000**	**0.0000**	**0.0000**	**0.0000**
						Heavy Liquid:	**0.0000**	**0.0000**	**0.0000**	**0.0000**
						TOTALS:	**0.61**	**2.67**	**0.01**	**0.06**

[a] Fugitive Emission Factors and Reduction Credits are per TCEQ Technical Guidance Document for Equipment Leak Fugitives, dated October 2000. The emission factors are for total hydrocarbon. Reduction credit is from 28LAER.

[b] Hourly Methane and CO_2 emission rates are calculated as follows:
(210 components) * (0.00992 lb/hr-component) * (55% Methane) * (100% - 97% reduction credit) = 0.0344 lb/hr

[c] Annual Methane and CO_2 emission rates are calculated as follows:
(210 components) * (0.00992 lb/hr-component) * (8,760 hr/yr) * (55% Methane) * (100% - 97% reduction credit) / (2,000 lb/T) = 0.1506 T/yr

PLANT 3 PIPING FUGITIVES POTENTIAL TO EMIT
AIR PERMIT APPLICATION
JACKSON COUNTY GAS PLANT
ETC TEXAS PIPELINE, LTD.

Component	Number of Components	Emission Factors [a] (lb/hr-component)	Operating Hours (hr/yr)	Maximum Methane (wt%)	Maximum CO_2 (wt%)	Reduction Credit [a] (%)	PTE Methane Hourly [b] (lb/hr)	PTE Methane Annual [c] (T/yr)	PTE CO_2 Hourly [b] (lb/hr)	PTE CO_2 Annual [c] (T/yr)
Valves										
Gas Streams (Inlet)	210	0.00992	8,760	55%	2%	97%	0.0344	0.1506	0.0012	0.0055
Gas Streams (Residue)	315	0.00992	8,760	98%	1%	97%	0.0919	0.4024	0.0009	0.0041
Gas Streams (Processing)	326	0.00992	8,760	55%	2%	97%	0.0534	0.2337	0.0019	0.0085
Light Liquid Streams	262	0.0055	8,760	0%	0%	97%	0.0000	0.0000	0.0000	0.0000
Water/Light Liquid	105	0.000216	8,760	0%	0%	97%	0.0000	0.0000	0.0000	0.0000
Heavy Liquid	525	0.0000185	8,760	0%	0%	0%	0.0000	0.0000	0.0000	0.0000
Relief Valves										
Gas Streams (Inlet)	22	0.0194	8,760	55%	2%	97%	0.0070	0.0308	0.0003	0.0011
Gas Streams (Residue)	32	0.0194	8,760	98%	1%	97%	0.0183	0.0799	0.0002	0.0008
Gas Streams (Processing)	32	0.0194	8,760	55%	2%	97%	0.0102	0.0449	0.0004	0.0016
Light Liquid Streams	53	0.0165	8,760	0%	0%	0%	0.0000	0.0000	0.0000	0.0000
Water/Light Liquid	11	0.0309	8,760	0%	0%	0%	0.0000	0.0000	0.0000	0.0000
Heavy Liquid	26	0.0000683	8,760	0%	0%	0%	0.0000	0.0000	0.0000	0.0000
Compressor Seals										
Gas Streams (Inlet)	13	0.0194	8,760	55%	2%	95%	0.0069	0.0304	0.0003	0.0011
Gas Streams (Residue)	25	0.0194	8,760	98%	1%	95%	0.0238	0.1041	0.0002	0.0011
Gas Streams (Processing)	4	0.0194	8,760	55%	2%	95%	0.0021	0.0093	0.0001	0.0003
Light Liquid Streams	0	0.0165	8,760	0%	0%	0%	0.0000	0.0000	0.0000	0.0000
Water/Light Liquid	0	0.0309	8,760	0%	0%	0%	0.0000	0.0000	0.0000	0.0000
Heavy Liquid	0	0.0000683	8,760	0%	0%	0%	0.0000	0.0000	0.0000	0.0000
Pump Seals										
Gas Streams (Inlet)	2	0.00529	8,760	55%	2%	0%	0.0058	0.0255	0.0002	0.0009
Gas Streams (Residue)	2	0.00529	8,760	98%	1%	0%	0.0104	0.0454	0.0001	0.0005
Gas Streams (Processing)	2	0.00529	8,760	55%	2%	0%	0.0058	0.0255	0.0002	0.0009
Light Liquid Streams	21	0.02866	8,760	0%	0%	93%	0.0000	0.0000	0.0000	0.0000
Water/Light Liquid	11	0.000052	8,760	0%	0%	93%	0.0000	0.0000	0.0000	0.0000
Heavy Liquid	16	0.00113	8,760	0%	0%	0%	0.0000	0.0000	0.0000	0.0000
Flanges										
Gas Streams (Inlet)	557	0.00086	8,760	55%	2%	75%	0.0659	0.2885	0.0024	0.0105
Gas Streams (Residue)	820	0.00086	8,760	98%	1%	75%	0.1728	0.7568	0.0018	0.0077
Gas Streams (Processing)	847	0.00086	8,760	55%	2%	75%	0.1002	0.4387	0.0036	0.0160
Light Liquid Streams	708	0.000243	8,760	0%	0%	75%	0.0000	0.0000	0.0000	0.0000
Water/Light Liquid	274	0.000006	8,760	0%	0%	75%	0.0000	0.0000	0.0000	0.0000
Heavy Liquid	1,339	0.00000086	8,760	0%	0%	30%	0.0000	0.0000	0.0000	0.0000
						Gas Streams (Inlet):	**0.1200**	**0.5258**	**0.0044**	**0.0191**
						Gas Streams (Residue):	**0.3172**	**1.3886**	**0.0032**	**0.0142**
						Gas Streams (Processing):	**0.1717**	**0.7521**	**0.0062**	**0.0273**
						Light Liquid Streams:	**0.0000**	**0.0000**	**0.0000**	**0.0000**
						Water/Light Liquid:	**0.0000**	**0.0000**	**0.0000**	**0.0000**
						Heavy Liquid:	**0.0000**	**0.0000**	**0.0000**	**0.0000**
						TOTALS:	**0.61**	**2.67**	**0.01**	**0.06**

[a] Fugitive Emission Factors and Reduction Credits are per TCEQ Technical Guidance Document for Equipment Leak Fugitives, dated October 2000. The emission factors are for total hydrocarbon. Reduction credit is from 28LAER.

[b] Hourly Methane and CO_2 emission rates are calculated as follows:
(210 components) * (0.00992 lb/hr-component) * (55% Methane) * (100% - 97% reduction credit) = 0.0344 lb/hr

[c] Annual Methane and CO_2 emission rates are calculated as follows:
(210 components) * (0.00992 lb/hr-component) * (8,760 hr/yr) * (55% Methane) * (100% - 97% reduction credit) / (2,000 lb/T) = 0.1506 T/yr

PLANT 4 PIPING FUGITIVES POTENTIAL TO EMIT
AIR PERMIT APPLICATION
JACKSON COUNTY GAS PLANT
ETC TEXAS PIPELINE, LTD.

Component	Number of Components	Emission Factors [a] (lb/hr-component)	Operating Hours (hr/yr)	Maximum Methane (wt%)	Maximum CO_2 (wt%)	Reduction Credit [a] (%)	PTE Methane Hourly [b] (lb/hr)	PTE Methane Annual [c] (T/yr)	PTE CO_2 Hourly [b] (lb/hr)	PTE CO_2 Annual [c] (T/yr)
Valves										
Gas Streams (Inlet)	210	0.00992	8,760	55%	2%	97%	0.0344	0.1506	0.0012	0.0055
Gas Streams (Residue)	315	0.00992	8,760	98%	1%	97%	0.0919	0.4024	0.0009	0.0041
Gas Streams (Processing)	326	0.00992	8,760	55%	2%	97%	0.0534	0.2337	0.0019	0.0085
Light Liquid Streams	262	0.0055	8,760	0%	0%	97%	0.0000	0.0000	0.0000	0.0000
Water/Light Liquid	105	0.000216	8,760	0%	0%	97%	0.0000	0.0000	0.0000	0.0000
Heavy Liquid	525	0.0000185	8,760	0%	0%	0%	0.0000	0.0000	0.0000	0.0000
Relief Valves										
Gas Streams (Inlet)	22	0.0194	8,760	55%	2%	97%	0.0070	0.0308	0.0003	0.0011
Gas Streams (Residue)	32	0.0194	8,760	98%	1%	97%	0.0183	0.0799	0.0002	0.0008
Gas Streams (Processing)	32	0.0194	8,760	55%	2%	97%	0.0102	0.0449	0.0004	0.0016
Light Liquid Streams	53	0.0165	8,760	0%	0%	0%	0.0000	0.0000	0.0000	0.0000
Water/Light Liquid	11	0.0309	8,760	0%	0%	0%	0.0000	0.0000	0.0000	0.0000
Heavy Liquid	26	0.0000683	8,760	0%	0%	0%	0.0000	0.0000	0.0000	0.0000
Compressor Seals										
Gas Streams (Inlet)	13	0.0194	8,760	55%	2%	95%	0.0069	0.0304	0.0003	0.0011
Gas Streams (Residue)	25	0.0194	8,760	98%	1%	95%	0.0238	0.1041	0.0002	0.0011
Gas Streams (Processing)	4	0.0194	8,760	55%	2%	95%	0.0021	0.0093	0.0001	0.0003
Light Liquid Streams	0	0.0165	8,760	0%	0%	0%	0.0000	0.0000	0.0000	0.0000
Water/Light Liquid	0	0.0309	8,760	0%	0%	0%	0.0000	0.0000	0.0000	0.0000
Heavy Liquid	0	0.0000683	8,760	0%	0%	0%	0.0000	0.0000	0.0000	0.0000
Pump Seals										
Gas Streams (Inlet)	2	0.00529	8,760	55%	2%	0%	0.0058	0.0255	0.0002	0.0009
Gas Streams (Residue)	2	0.00529	8,760	98%	1%	0%	0.0104	0.0454	0.0001	0.0005
Gas Streams (Processing)	2	0.00529	8,760	55%	2%	0%	0.0058	0.0255	0.0002	0.0009
Light Liquid Streams	21	0.02866	8,760	0%	0%	93%	0.0000	0.0000	0.0000	0.0000
Water/Light Liquid	11	0.000052	8,760	0%	0%	93%	0.0000	0.0000	0.0000	0.0000
Heavy Liquid	16	0.00113	8,760	0%	0%	0%	0.0000	0.0000	0.0000	0.0000
Flanges										
Gas Streams (Inlet)	557	0.00086	8,760	55%	2%	75%	0.0659	0.2885	0.0024	0.0105
Gas Streams (Residue)	820	0.00086	8,760	98%	1%	75%	0.1728	0.7568	0.0018	0.0077
Gas Streams (Processing)	847	0.00086	8,760	55%	2%	75%	0.1002	0.4387	0.0036	0.0160
Light Liquid Streams	708	0.000243	8,760	0%	0%	75%	0.0000	0.0000	0.0000	0.0000
Water/Light Liquid	274	0.000006	8,760	0%	0%	75%	0.0000	0.0000	0.0000	0.0000
Heavy Liquid	1,339	0.00000086	8,760	0%	0%	30%	0.0000	0.0000	0.0000	0.0000
						Gas Streams (Inlet):	**0.1200**	**0.5258**	**0.0044**	**0.0191**
						Gas Streams (Residue):	**0.3172**	**1.3886**	**0.0032**	**0.0142**
						Gas Streams (Processing):	**0.1717**	**0.7521**	**0.0062**	**0.0273**
						Light Liquid Streams:	**0.0000**	**0.0000**	**0.0000**	**0.0000**
						Water/Light Liquid:	**0.0000**	**0.0000**	**0.0000**	**0.0000**
						Heavy Liquid:	**0.0000**	**0.0000**	**0.0000**	**0.0000**
						TOTALS:	**0.61**	**2.67**	**0.01**	**0.06**

[a] Fugitive Emission Factors and Reduction Credits are per TCEQ Technical Guidance Document for Equipment Leak Fugitives, dated October 2000. The emission factors are for total hydrocarbon. Reduction credit is from 28LAER.

[b] Hourly Methane and CO_2 emission rates are calculated as follows:
(210 components) * (0.00992 lb/hr-component) * (55% Methane) * (100% - 97% reduction credit) = 0.0344 lb/hr

[c] Annual Methane and CO_2 emission rates are calculated as follows:
(210 components) * (0.00992 lb/hr-component) * (8,760 hr/yr) * (55% Methane) * (100% - 97% reduction credit) / (2,000 lb/T) = 0.1506 T/yr

PROJECT-AFFECTED AMINE UNITS POTENTIAL TO EMIT

AIR PERMIT APPLICATION

JACKSON COUNTY GAS PLANT

ETC TEXAS PIPELINE, LTD.

	Plant 1 Amine Unit Uncontrolled Emissions [a]				Thermal Oxidizer	Plant 1 Amine Unit Total Potential to Emit (FIN: F-1117)	
	Inlet Gas Treating		Product Treating				
Component	Hourly (lb/hr)	Annual (T/yr)	Hourly (lb/hr)	Annual (T/yr)	DRE (%)	Hourly (lb/hr)	Annual (T/yr)
Nitrogen	0.0012	0.0053	0.0000	0.0000	0%	0.0012	0.0053
Carbon Dioxide	7,773	34,046	898	3,933	0%	8,671.00	37,979.00
Hydrogen Sulfide [b]	0.7500	3.2850	0.0000	0.0000	99.9%	0.0008	0.0033
Methane	11.2922	49.4598	0.0710	0.3110	99.9%	0.0114	0.0498
Ethane	10.8001	47.3044	9.6775	42.3875	99.9%	0.0205	0.0897
Propane	3.8442	16.8376	1.5209	6.6615	99.9%	0.0054	0.0235
i-Butane	0.5657	2.4778	0.1132	0.4958	99.9%	0.0007	0.0030
n-Butane	1.4765	6.4671	0.2378	1.0416	99.9%	0.0017	0.0075
i-Pentane	0.1701	0.7450	0.0217	0.0950	99.9%	0.0002	0.0008
n-Pentane	0.1778	0.7788	0.0174	0.0762	99.9%	0.0002	0.0009
n-Hexane	0.1386	0.6071	0.0067	0.0293	99.9%	0.0001	0.0006
Heptane	0.0086	0.0377	0.0004	0.0018	99.9%	0.0000	0.0000
Octane	0.0049	0.0215	0.0001	0.0004	99.9%	0.0000	0.0000
Benzene	4.5818	20.0683	0.1869	0.8186	99.9%	0.0048	0.0209
Toluene	6.3164	27.6658	0.1336	0.5852	99.9%	0.0065	0.0283
Ethylbenzene	0.2316	1.0144	0.0024	0.0105	99.9%	0.0002	0.0010
m-Xylene	1.2073	5.2880	0.0116	0.0508	99.9%	0.0012	0.0053
o-Xylene	0.2827	1.2382	0.0023	0.0101	99.9%	0.0003	0.0012
p-Xylene	0.9291	4.0695	0.0092	0.0403	99.9%	0.0009	0.0041
DEA	2.99E-15	0.0000	0.0000	0.0000	99.9%	0.0000	0.0000
MDEA	5.07E-11	0.0000	0.0000	0.0000	99.9%	0.0000	0.0000
Total VOC	**19.9353**	**87.3168**	**2.2642**	**9.9171**		**0.0222**	**0.0971**
Adjusted VOC [c]						**0.0244**	**0.1068**

	Plant 2 Amine Unit Uncontrolled Emissions [a]				Thermal Oxidizer	Plant 2 Amine Unit Total Potential to Emit (FIN: F-2117)	
	From Gas Treating		From Liquids Treating				
Component	Hourly (lb/hr)	Annual (T/yr)	Hourly (lb/hr)	Annual (T/yr)	DRE (%)	Hourly (lb/hr)	Annual (T/yr)
Nitrogen	0.0012	0.0053	0.0000	0.0000	0%	0.0012	0.0053
Carbon Dioxide	7,773	34,046	898	3,933	0%	8,671.00	37,979.00
Hydrogen Sulfide [b]	0.7500	3.2850	0.0000	0.0000	99.9%	0.0008	0.0033
Methane	11.2922	49.4598	0.0710	0.3110	99.9%	0.0114	0.0498
Ethane	10.8001	47.3044	9.6775	42.3875	99.9%	0.0205	0.0897
Propane	3.8442	16.8376	1.5209	6.6615	99.9%	0.0054	0.0235
i-Butane	0.5657	2.4778	0.1132	0.4958	99.9%	0.0007	0.0030
n-Butane	1.4765	6.4671	0.2378	1.0416	99.9%	0.0017	0.0075
i-Pentane	0.1701	0.7450	0.0217	0.0950	99.9%	0.0002	0.0008
n-Pentane	0.1778	0.7788	0.0174	0.0762	99.9%	0.0002	0.0009
n-Hexane	0.1386	0.6071	0.0067	0.0293	99.9%	0.0001	0.0006
Heptane	0.0086	0.0377	0.0004	0.0018	99.9%	0.0000	0.0000
Octane	0.0049	0.0215	0.0001	0.0004	99.9%	0.0000	0.0000
Benzene	4.5818	20.0683	0.1869	0.8186	99.9%	0.0048	0.0209
Toluene	6.3164	27.6658	0.1336	0.5852	99.9%	0.0065	0.0283
Ethylbenzene	0.2316	1.0144	0.0024	0.0105	99.9%	0.0002	0.0010
m-Xylene	1.2073	5.2880	0.0116	0.0508	99.9%	0.0012	0.0053
o-Xylene	0.2827	1.2382	0.0023	0.0101	99.9%	0.0003	0.0012
p-Xylene	0.9291	4.0695	0.0092	0.0403	99.9%	0.0009	0.0041
DEA	2.99E-15	0.0000	0.0000	0.0000	99.9%	0.0000	0.0000
MDEA	5.07E-11	0.0000	0.0000	0.0000	99.9%	0.0000	0.0000
Total VOC	**19.9353**	**87.3168**	**2.2642**	**9.9171**		**0.0222**	**0.0971**
Adjusted VOC [c]						**0.0244**	**0.1068**

PROJECT-AFFECTED AMINE UNITS POTENTIAL TO EMIT

AIR PERMIT APPLICATION

JACKSON COUNTY GAS PLANT

ETC TEXAS PIPELINE, LTD.

	Plant 3 Amine Unit Uncontrolled Emissions [a]				Thermal Oxidizer	Plant 3 Amine Unit Total Potential to Emit (FIN: F-3117)	
	From Gas Treating		From Liquids Treating				
Component	Hourly (lb/hr)	Annual (T/yr)	Hourly (lb/hr)	Annual (T/yr)	DRE (%)	Hourly (lb/hr)	Annual (T/yr)
Nitrogen	0.0012	0.0053	0.0000	0.0000	0%	0.0012	0.0053
Carbon Dioxide	7,773	34,046	898	3,933	0%	8,671.00	37,979.00
Hydrogen Sulfide [b]	0.7500	3.2850	0.0000	0.0000	99.9%	0.0008	0.0033
Methane	11.2922	49.4598	0.0710	0.3110	99.9%	0.0114	0.0498
Ethane	10.8001	47.3044	9.6775	42.3875	99.9%	0.0205	0.0897
Propane	3.8442	16.8376	1.5209	6.6615	99.9%	0.0054	0.0235
i-Butane	0.5657	2.4778	0.1132	0.4958	99.9%	0.0007	0.0030
n-Butane	1.4765	6.4671	0.2378	1.0416	99.9%	0.0017	0.0075
i-Pentane	0.1701	0.7450	0.0217	0.0950	99.9%	0.0002	0.0008
n-Pentane	0.1778	0.7788	0.0174	0.0762	99.9%	0.0002	0.0009
n-Hexane	0.1386	0.6071	0.0067	0.0293	99.9%	0.0001	0.0006
Heptane	0.0086	0.0377	0.0004	0.0018	99.9%	0.0000	0.0000
Octane	0.0049	0.0215	0.0001	0.0004	99.9%	0.0000	0.0000
Benzene	4.5818	20.0683	0.1869	0.8186	99.9%	0.0048	0.0209
Toluene	6.3164	27.6658	0.1336	0.5852	99.9%	0.0065	0.0283
Ethylbenzene	0.2316	1.0144	0.0024	0.0105	99.9%	0.0002	0.0010
m-Xylene	1.2073	5.2880	0.0116	0.0508	99.9%	0.0012	0.0053
o-Xylene	0.2827	1.2382	0.0023	0.0101	99.9%	0.0003	0.0012
p-Xylene	0.9291	4.0695	0.0092	0.0403	99.9%	0.0009	0.0041
DEA	2.99E-15	0.0000	0.0000	0.0000	99.9%	0.0000	0.0000
MDEA	5.07E-11	0.0000	0.0000	0.0000	99.9%	0.0000	0.0000
Total VOC	**19.9353**	**87.3168**	**2.2642**	**9.9171**		**0.0222**	**0.0971**
Adjusted VOC [c]						**0.0244**	**0.1068**

	Plant 4 Amine Unit Uncontrolled Emissions [a]				Thermal Oxidizer	Plant 4 Amine Unit Total Potential to Emit (FIN: F-4117)	
	From Gas Treating		From Liquids Treating				
Component	Hourly (lb/hr)	Annual (T/yr)	Hourly (lb/hr)	Annual (T/yr)	DRE (%)	Hourly (lb/hr)	Annual (T/yr)
Nitrogen	0.0012	0.0053	0.0000	0.0000	0%	0.0012	0.0053
Carbon Dioxide	7,773	34,046	898	3,933	0%	8,671.00	37,979.00
Hydrogen Sulfide [b]	0.7500	3.2850	0.0000	0.0000	99.9%	0.0008	0.0033
Methane	11.2922	49.4598	0.0710	0.3110	99.9%	0.0114	0.0498
Ethane	10.8001	47.3044	9.6775	42.3875	99.9%	0.0205	0.0897
Propane	3.8442	16.8376	1.5209	6.6615	99.9%	0.0054	0.0235
i-Butane	0.5657	2.4778	0.1132	0.4958	99.9%	0.0007	0.0030
n-Butane	1.4765	6.4671	0.2378	1.0416	99.9%	0.0017	0.0075
i-Pentane	0.1701	0.7450	0.0217	0.0950	99.9%	0.0002	0.0008
n-Pentane	0.1778	0.7788	0.0174	0.0762	99.9%	0.0002	0.0009
n-Hexane	0.1386	0.6071	0.0067	0.0293	99.9%	0.0001	0.0006
Heptane	0.0086	0.0377	0.0004	0.0018	99.9%	0.0000	0.0000
Octane	0.0049	0.0215	0.0001	0.0004	99.9%	0.0000	0.0000
Benzene	4.5818	20.0683	0.1869	0.8186	99.9%	0.0048	0.0209
Toluene	6.3164	27.6658	0.1336	0.5852	99.9%	0.0065	0.0283
Ethylbenzene	0.2316	1.0144	0.0024	0.0105	99.9%	0.0002	0.0010
m-Xylene	1.2073	5.2880	0.0116	0.0508	99.9%	0.0012	0.0053
o-Xylene	0.2827	1.2382	0.0023	0.0101	99.9%	0.0003	0.0012
p-Xylene	0.9291	4.0695	0.0092	0.0403	99.9%	0.0009	0.0041
DEA	2.99E-15	0.0000	0.0000	0.0000	99.9%	0.0000	0.0000
MDEA	5.07E-11	0.0000	0.0000	0.0000	99.9%	0.0000	0.0000
Total VOC	**19.9353**	**87.3168**	**2.2642**	**9.9171**		**0.0222**	**0.0971**
Adjusted VOC [c]						**0.0244**	**0.1068**

a Emissions were calculated using ProMax v. 3.0 simulation program at 200 MMSCFD total capacity. Inputs to the simulation program were a representative inlet gas analysis.

b Amine inlet gas treater and product treater vent gas enters an absorber (scavenger) for H_2S removal prior to combustion in the thermal oxidizer. Uncontrolled H2S emissions are calculated as follows:

H_2S (lb/hr) = (H_2S conc., ppmv)/10^6 * (Scavenger Unit molar flow, lbmol/hr) * (34-lb H_2S/lbmol H_2S)

(103.5 lbmol H2S/10^6 lbmol gas) * (191.39 + 22.36 lbmol/hr) * (34-lb H2S/lbmol H2S) = 0.75 lb/hr

c Adjusted emissions were increased by 10 percent to allow for process gas variability. Emission calculations are based on a representative sample for current conditions and may change.

PROJECT-AFFECTED DEHY UNITS POTENTIAL TO EMIT

AIR PERMIT APPLICATION

JACKSON COUNTY GAS PLANT

ETC TEXAS PIPELINE, LTD.

Component	Uncontrolled Emissions [a] (FIN: F-1527) Plant 1 Waste Gas Hourly (lb/hr)	Uncontrolled Emissions [a] (FIN: F-1527) Plant 1 Waste Gas Annual (T/yr)	Thermal Oxidizer DRE (%)	Total Potential to Emit (FIN: F-1527) Hourly (lb/hr)	Total Potential to Emit (FIN: F-1527) Annual (T/yr)
Nitrogen	0.0004	0.0018	0%	0.0004	0.0018
Carbon Dioxide	2.0971	9.1853	0%	2.0971	9.1853
Hydrogen Sulfide	0.0000	0.0000	99.9%	0.0000	0.0000
Methane	3.4932	15.3002	99.9%	0.0035	0.0153
Ethane	9.8277	43.0453	99.9%	0.0098	0.0430
Propane	15.3858	67.3898	99.9%	0.0154	0.0674
i-Butane	5.4865	24.0309	99.9%	0.0055	0.0240
n-Butane	12.6261	55.3023	99.9%	0.0126	0.0553
i-Pentane	7.8557	34.4080	99.9%	0.0079	0.0344
n-Pentane	6.9554	30.4647	99.9%	0.0070	0.0305
n-Hexane	10.8220	47.4004	99.9%	0.0108	0.0474
Heptane	4.3962	19.2554	99.9%	0.0044	0.0193
Octane	3.3357	14.6104	99.9%	0.0033	0.0146
Benzene	11.6850	51.1803	99.9%	0.0117	0.0512
Toluene	20.8035	91.1193	99.9%	0.0208	0.0911
Ethylbenzene	1.1973	5.2442	99.9%	0.0012	0.0052
m-Xylene	4.6370	20.3101	99.9%	0.0046	0.0203
o-Xylene	1.4309	6.2673	99.9%	0.0014	0.0063
p-Xylene	3.3444	14.6485	99.9%	0.0033	0.0146
TEG	0.0053	0.0232	99.9%	0.0000	0.0000
Total VOC	**109.9668**	**481.6548**		**0.1099**	**0.4816**
Adjusted VOC				**0.1209**	**0.5298**

Component	Uncontrolled Emissions [a] (FIN: F-2527) Plant 2 Waste Gas Hourly (lb/hr)	Uncontrolled Emissions [a] (FIN: F-2527) Plant 2 Waste Gas Annual (T/yr)	Thermal Oxidizer DRE (%)	Total Potential to Emit (FIN: F-2527) Hourly (lb/hr)	Total Potential to Emit (FIN: F-2527) Annual (T/yr)
Nitrogen	0.0004	0.0018	0%	0.0004	0.0018
Carbon Dioxide	2.0971	9.1853	0%	2.0971	9.1853
Hydrogen Sulfide	0.0000	0.0000	99.9%	0.0000	0.0000
Methane	3.4932	15.3002	99.9%	0.0035	0.0153
Ethane	9.8277	43.0453	99.9%	0.0098	0.0430
Propane	15.3858	67.3898	99.9%	0.0154	0.0674
i-Butane	5.4865	24.0309	99.9%	0.0055	0.0240
n-Butane	12.6261	55.3023	99.9%	0.0126	0.0553
i-Pentane	7.8557	34.4080	99.9%	0.0079	0.0344
n-Pentane	6.9554	30.4647	99.9%	0.0070	0.0305
n-Hexane	10.8220	47.4004	99.9%	0.0108	0.0474
Heptane	4.3962	19.2554	99.9%	0.0044	0.0193
Octane	3.3357	14.6104	99.9%	0.0033	0.0146
Benzene	11.6850	51.1803	99.9%	0.0117	0.0512
Toluene	20.8035	91.1193	99.9%	0.0208	0.0911
Ethylbenzene	1.1973	5.2442	99.9%	0.0012	0.0052
m-Xylene	4.6370	20.3101	99.9%	0.0046	0.0203
o-Xylene	1.4309	6.2673	99.9%	0.0014	0.0063
p-Xylene	3.3444	14.6485	99.9%	0.0033	0.0146
TEG	0.0053	0.0232	99.9%	0.0000	0.0000
Total VOC	**109.9668**	**481.6548**		**0.1099**	**0.4816**
Adjusted VOC				**0.1209**	**0.5298**

PROJECT-AFFECTED DEHY UNITS POTENTIAL TO EMIT

AIR PERMIT APPLICATION

JACKSON COUNTY GAS PLANT

ETC TEXAS PIPELINE, LTD.

Component	Uncontrolled Emissions [a] (FIN: F-3527) Plant 3 Waste Gas Hourly (lb/hr)	Uncontrolled Emissions [a] (FIN: F-3527) Plant 3 Waste Gas Annual (T/yr)	Thermal Oxidizer DRE (%)	Total Potential to Emit (FIN: F-3527) Hourly (lb/hr)	Total Potential to Emit (FIN: F-3527) Annual (T/yr)
Nitrogen	0.0004	0.0018	0%	0.0004	0.0018
Carbon Dioxide	2.0971	9.1853	0%	2.0971	9.1853
Hydrogen Sulfide	0.0000	0.0000	99.9%	0.0000	0.0000
Methane	3.4932	15.3002	99.9%	0.0035	0.0153
Ethane	9.8277	43.0453	99.9%	0.0098	0.0430
Propane	15.3858	67.3898	99.9%	0.0154	0.0674
i-Butane	5.4865	24.0309	99.9%	0.0055	0.0240
n-Butane	12.6261	55.3023	99.9%	0.0126	0.0553
i-Pentane	7.8557	34.4080	99.9%	0.0079	0.0344
n-Pentane	6.9554	30.4647	99.9%	0.0070	0.0305
n-Hexane	10.8220	47.4004	99.9%	0.0108	0.0474
Heptane	4.3962	19.2554	99.9%	0.0044	0.0193
Octane	3.3357	14.6104	99.9%	0.0033	0.0146
Benzene	11.6850	51.1803	99.9%	0.0117	0.0512
Toluene	20.8035	91.1193	99.9%	0.0208	0.0911
Ethylbenzene	1.1973	5.2442	99.9%	0.0012	0.0052
m-Xylene	4.6370	20.3101	99.9%	0.0046	0.0203
o-Xylene	1.4309	6.2673	99.9%	0.0014	0.0063
p-Xylene	3.3444	14.6485	99.9%	0.0033	0.0146
TEG	0.0053	0.0232	99.9%	0.0000	0.0000
Total VOC	**109.9668**	**481.6548**		**0.1099**	**0.4816**
Adjusted VOC				**0.1209**	**0.5298**

Component	Uncontrolled Emissions [a] (FIN: F-4527) Plant 4 Waste Gas Hourly (lb/hr)	Uncontrolled Emissions [a] (FIN: F-4527) Plant 4 Waste Gas Annual (T/yr)	Thermal Oxidizer DRE (%)	Total Potential to Emit (FIN: F-4527) Hourly (lb/hr)	Total Potential to Emit (FIN: F-4527) Annual (T/yr)
Nitrogen	0.0004	0.0018	0%	0.0004	0.0018
Carbon Dioxide	2.0971	9.1853	0%	2.0971	9.1853
Hydrogen Sulfide	0.0000	0.0000	99.9%	0.0000	0.0000
Methane	3.4932	15.3002	99.9%	0.0035	0.0153
Ethane	9.8277	43.0453	99.9%	0.0098	0.0430
Propane	15.3858	67.3898	99.9%	0.0154	0.0674
i-Butane	5.4865	24.0309	99.9%	0.0055	0.0240
n-Butane	12.6261	55.3023	99.9%	0.0126	0.0553
i-Pentane	7.8557	34.4080	99.9%	0.0079	0.0344
n-Pentane	6.9554	30.4647	99.9%	0.0070	0.0305
n-Hexane	10.8220	47.4004	99.9%	0.0108	0.0474
Heptane	4.3962	19.2554	99.9%	0.0044	0.0193
Octane	3.3357	14.6104	99.9%	0.0033	0.0146
Benzene	11.6850	51.1803	99.9%	0.0117	0.0512
Toluene	20.8035	91.1193	99.9%	0.0208	0.0911
Ethylbenzene	1.1973	5.2442	99.9%	0.0012	0.0052
m-Xylene	4.6370	20.3101	99.9%	0.0046	0.0203
o-Xylene	1.4309	6.2673	99.9%	0.0014	0.0063
p-Xylene	3.3444	14.6485	99.9%	0.0033	0.0146
TEG	0.0053	0.0232	99.9%	0.0000	0.0000
Total VOC	**109.9668**	**481.6548**		**0.1099**	**0.4816**
Adjusted VOC				**0.1209**	**0.5298**

a Emissions were calculated using ProMax v. 3.0 simulation program at 200 MMSCFD total capacity. Inputs to the simulation program were a representative inlet gas analysis.

b Adjusted emissions were increased by 10 percent to allow for process gas variability. Emission calculations are based on a representative sample for current conditions and may change.

THERMAL OXIDIZERS WASTE GAS POTENTIAL TO EMIT GREENHOUSE GASES

AIR PERMIT APPLICATION

JACKSON COUNTY GAS PLANT

ETC TEXAS PIPELINE, LTD.

Acid gas removal (AGR) and dehydrator vent emissions were calculated using the ProMax v. 3.0 simulation program as allowed by §98.233(d)(4) and §98.233(e)(1), respectively. ProMax uses the Peng-Robinson equation of state. Subpart W §98.233(d) inddicates that only CO2 emissions should be calculated for acid gas removal vents; however, methane (CH4) and combustion emissions are included for the site potential to emit.

CO_2 = (CO_2 emission from gas treating) + (CO_2 emission from liquid treating)
= ((7,773 lb/hr/unit) + (898.4 lb/hr/unit)) * (8760 hr/yr) / (2000 lb/ton)
= 37,981 ton/yr/unit

CO_2 = (CO_2 emission from dehy)
= ((2.10 lb/hr/unit) * (8760 hr/yr) / (2000 lb/ton)
= 9.19 ton/yr/unit

CH_4 = ((CH_4 emission from gas treating) + (CH_4 emission from liquid treating)) * (1 - 0.999 TO-1 control eff.)
= ((11.29 lb/hr/unit) + (0.07 lb/hr/unit)) * 0.001 * (8760 hr/yr) / (2000 lb/ton)
= 0.0498 ton/yr/unit

CH_4 = (CH_4 emission from dehy) * (1 - 0.999 TO-1 control eff.)
= (3.49 lb/hr/unit) * 0.001 * (8760 hr/yr) / (2000 lb/ton)
= 0.0153 ton/yr/unit

CO_2 Combustion Emissions

			Amine Unit		Glycol	Amine Unit		Glycol Unit	
Compound	Number of Carbon Atoms	Molecular Weight lb/lbmol	Gas Treating Mass Flow lb/hr/unit	Liquid Treating Mass Flow lb/hr/unit	Unit Mass Flow lb/hr/unit	CO_2 Emission lb/hr/unit	CO_2 Emission ton/yr/unit	CO_2 Emission lb/hr/unit	CO_2 Emission ton/yr/unit
Methane	1	16.04	11.2922	0.0710	3.4932	31.1397	136.3919	9.5728	41.9289
Ethane	2	30.07	10.8001	9.6775	9.8277	59.8679	262.2214	28.7321	125.8466
Propane	3	44.10	3.8442	1.5209	15.3858	16.0427	70.2670	46.0067	201.5093
i-Butane	4	58.12	0.5657	0.1132	5.4865	2.0538	8.9956	16.5977	72.6979
n-Butane	4	58.12	1.4765	0.2378	12.6261	5.1861	22.7151	38.1963	167.2998
i-Pentane	5	72.15	0.1701	0.0217	7.8557	0.5843	2.5592	23.9297	104.8121
n-Pentane	5	72.15	0.1778	0.0174	6.9554	0.5946	2.6043	21.1872	92.7999
n-Hexane	6	86.17	0.1386	0.0067	10.8220	0.4447	1.9478	33.1223	145.0757
Heptane	7	100.20	0.0086	0.0004	4.3962	0.0276	0.1209	13.4998	59.1291
Octane	8	114.22	0.0049	0.0001	3.3357	0.0154	0.0675	10.2696	44.9808
Benzene	6	78.11	4.5818	0.1869	11.6850	16.1014	70.5241	39.4540	172.8085
Toluene	7	92.13	6.3164	0.1336	20.8035	21.5414	94.3513	69.4787	304.3167
Ethylbenzene	8	106.17	0.2316	0.0024	1.1973	0.7750	3.3945	3.9656	17.3693
m-Xylene	8	106.17	1.2073	0.0116	4.6370	4.0371	17.6825	15.3583	67.2694
o-Xylene	8	106.17	0.2827	0.0023	1.4309	0.9440	4.1347	4.7393	20.7581
p-Xylene	8	106.17	0.9291	0.0092	3.3444	3.1078	13.6122	11.0771	48.5177
TEG	6	150.17	0.0000	0.0000	0.0053	0.0000	0.0000	0.0093	0.0407
TOTAL						162.4635	711.5900	385.1965	1687.1605

Sample calculation CO_2 combustion (using methane):

CO_2 = ((Gas treating flow, lb/hr)+(liquid treating flow, lb/hr))*(0.999 eff.)*(No. of C, lbmol C/lbmol CH4)*(44 lb CO2/lbmol C)/(Mw, lb CH4/lbmol CH4)
= ((11.29 lb/hr) + (0.07 lb/hr)) * (0.999) * (1 lbmol C/lbmol CH4) * (44 lb CO2/lbmol C) / (16.04 lb CH4/lbmol CH4)
= 31.1397 lb/hr/unit

CO_2 Annual = (31.1397 lb/hr/unit) * (8760 hr/yr) / (2000 lb/ton)
= 136.3919 ton/yr/unit

N_2O = Fuel * HHV * 0.0001 (Eq. W-40, §98.233(z)(6))

Where:
N_2O = Annual emissions from combustion in kilograms
Fuel = volume combusted, scfy
HHV = High heat value of fuel, MMBtu/scf

N2O = (0.0001 kg N2O/MMBtu) * ((Gas Treating scfy * Gas Treating HHV) + (Liquid Treating scfy * Liquid Treating HHV))
= (0.0001 kg N2O/MMBtu) * ((1.74 MMscfd) * (15.88 Btu/scf) + (0.20 MMscfd) * (35.00 Btu/scf)) * (365 days/yr) / (0.4536 kg/lb) / (2000 lb/ton)
= 1.40E-03 tons/yr/unit

N2O = 0.0001 * (dehy vent scfy) * HHV
= 0.0001 * (0.39 MMscfd) * (203.67 Btu/scf) * (365 days/yr) / (0.4536 kg/lb) / (2000 lb/ton)
= 3.17E-03 tons/yr/unit

THERMAL OXIDIZERS WASTE GAS POTENTIAL TO EMIT GREENHOUSE GASES

AIR PERMIT APPLICATION

JACKSON COUNTY GAS PLANT

ETC TEXAS PIPELINE, LTD.

Emission Summary:

EPN	FIN	Description	Uncombusted CO_2 (short T/yr)	Combustion CO_2 (short T/yr)	Uncombusted CH_4[a] (short T/yr)	Combustion N_2O (short T/yr)	CO_2e[b] (short T/yr)
TO-1	F-1117	Plant 1 Thermal Oxidizer - Amine Vent	37,981.00	711.59	0.05	0.0014	38,694.07
TO-1	F-1527	Plant 1 Thermal Oxidizer - Dehy Vent	9.19	1,687.16	0.02	0.0032	1,697.76
			37,990.19	2,398.75	0.07	0.0046	40,391.83
TO-2	F-2117	Plant 2 Thermal Oxidizer - Amine Vent	37,981.00	711.59	0.05	0.0014	38,694.07
TO-2	F-2527	Plant 2 Thermal Oxidizer - Dehy Vent	9.19	1,687.16	0.02	0.0032	1,697.76
			37,990.19	2,398.75	0.07	4.60E-03	40,391.83
TO-3	F-3117	Plant 3 Thermal Oxidizer - Amine Vent	37,981.00	711.59	0.05	0.0014	38,694.07
TO-3	F-3527	Plant 3 Thermal Oxidizer - Dehy Vent	9.19	1,687.16	0.02	0.0032	1,697.76
			37,990.19	2,398.75	0.07	4.60E-03	40,391.83
TO-4	F-4117	Plant 4 Thermal Oxidizer - Amine Vent	37,981.00	711.59	0.05	0.0014	38,694.07
TO-4	F-4527	Plant 4 Thermal Oxidizer - Dehy Vent	9.19	1,687.16	0.02	0.0032	1,697.76
			37,990.19	2,398.75	0.07	4.60E-03	40,391.83

a Emissions were calculated using ProMax v. 3.0 simulation program at 200 MMSCFD capacity per Plant. Inputs to the simulation program were a representative inlet gas analysis.

b CO_2e emissions are calculated as follows:

(37,981.00 T/yr Uncombusted CO2) + (711.59 T/yr Combustion CO2) + ((0.05 T/yr Methane) * 21) + ((0.0014 T/yr N2O) * 310) = 38,694.07 T/yr CO2e

PROJECT-AFFECTED BLOWDOWN VENTS POTENTIAL TO EMIT

AIR PERMIT APPLICATION

JACKSON COUNTY GAS PLANT

ETC TEXAS PIPELINE, LTD.

Description	C-1100A Blowdown (FIN GRP-BDSV)	C-1100B Blowdown (FIN GRP-BDSV)	C-1121A Blowdown (FIN GRP-BDSV)	C-1121B Blowdown (FIN GRP-BDSV)	C-1121C Blowdown (FIN GRP-BDSV)	C-161 Blowdown (FIN GRP-BDSV)	C-1611 Blowdown (FIN GRP-BDSV)	C-1612 Blowdown (FIN GRP-BDSV)
Number of Blowdowns per Year	72	72	72	72	72	12	12	12
Number of Blowdowns per Hour	1	1	1	1	1	1	1	1
Blowdown Volume per Event, scf	10,000	10,000	35,000	35,000	35,000	10,000	10,000	10,000
Gas Stream Specific Gravity	0.7210	0.7210	0.5622	0.5622	0.5622	1.5200	1.5200	1.5200
Gas Stream Density, lb/scf [a]	0.055	0.055	0.043	0.043	0.043	0.116	0.116	0.116
CO_2 Percentage in Gas Stream, wt%	2.150%	2.150%	0.81%	0.81%	0.81%	0%	0%	0%
Max Methane Percentage in Gas Stream, wt%	55.15%	55.15%	97.51%	97.51%	97.51%	0%	0%	0%
CO_2 Hourly Emission Rates (lb/hr): [b]	11.83	11.83	12.19	12.19	12.19	0.00	0.00	0.00
CO_2 Annual Emission Rates (T/yr): [c]	0.43	0.43	0.44	0.44	0.44	0.00	0.00	0.00
Methane Hourly Emission Rates (lb/hr): [b]	303.33	303.33	1,467.53	1,467.53	1,467.53	0.00	0.00	0.00
Methane Annual Emission Rates (T/yr): [c]	10.92	10.92	52.83	52.83	52.83	0.00	0.00	0.00

Description	C-2100A Blowdown (FIN GRP-BDSV)	C-2100B Blowdown (FIN GRP-BDSV)	C-2121A Blowdown (FIN GRP-BDSV)	C-2121B Blowdown (FIN GRP-BDSV)	C-2121C Blowdown (FIN GRP-BDSV)	C-162 Blowdown (FIN GRP-BDSV)	C-1621 Blowdown (FIN GRP-BDSV)	C-1622 Blowdown (FIN GRP-BDSV)
Number of Blowdowns per Year	72	72	72	72	72	12	12	12
Number of Blowdowns per Hour	1	1	1	1	1	1	1	1
Blowdown Volume per Event, scf	10,000	10,000	35,000	35,000	35,000	10,000	10,000	10,000
Gas Stream Specific Gravity	0.7210	0.7210	0.5622	0.5622	0.5622	1.5200	1.5200	1.5200
Gas Stream Density, lb/scf [a]	0.055	0.055	0.043	0.043	0.043	0.116	0.116	0.116
CO_2 Percentage in Gas Stream, wt%	2.150%	2.150%	0.81%	0.81%	0.81%	0%	0%	0%
Max Methane Percentage in Gas Stream, wt%	55.15%	55.15%	97.51%	97.51%	97.51%	0%	0%	0%
CO_2 Hourly Emission Rates (lb/hr): [b]	11.83	11.83	12.19	12.19	12.19	0.00	0.00	0.00
CO_2 Annual Emission Rates (T/yr): [c]	0.43	0.43	0.44	0.44	0.44	0.00	0.00	0.00
Methane Hourly Emission Rates (lb/hr): [b]	303.33	303.33	1,467.53	1,467.53	1,467.53	0.00	0.00	0.00
Methane Annual Emission Rates (T/yr): [c]	10.92	10.92	52.83	52.83	52.83	0.00	0.00	0.00

PROJECT-AFFECTED BLOWDOWN VENTS POTENTIAL TO EMIT

AIR PERMIT APPLICATION

JACKSON COUNTY GAS PLANT

ETC TEXAS PIPELINE, LTD.

Description	C-3100A Blowdown (FIN GRP-BDSV)	C-3100B Blowdown (FIN GRP-BDSV)	C-3121A Blowdown (FIN GRP-BDSV)	C-3121B Blowdown (FIN GRP-BDSV)	C-3121C Blowdown (FIN GRP-BDSV)	C-163 Blowdown (FIN GRP-BDSV)	C-1631 Blowdown (FIN GRP-BDSV)	C-1632 Blowdown (FIN GRP-BDSV)
Number of Blowdowns per Year	72	72	72	72	72	12	12	12
Number of Blowdowns per Hour	1	1	1	1	1	1	1	1
Blowdown Volume per Event, scf	10,000	10,000	35,000	35,000	35,000	10,000	10,000	10,000
Gas Stream Specific Gravity	0.7210	0.7210	0.5622	0.5622	0.5622	1.5200	1.5200	1.5200
Gas Stream Density, lb/scf [a]	0.055	0.055	0.043	0.043	0.043	0.116	0.116	0.116
CO_2 Percentage in Gas Stream, wt%	2.150%	2.150%	0.81%	0.81%	0.81%	0%	0%	0%
Max Methane Percentage in Gas Stream, wt%	55.15%	55.15%	97.51%	97.51%	97.51%	0%	0%	0%
CO_2 Hourly Emission Rates (lb/hr): [b]	11.83	11.83	12.19	12.19	12.19	0.00	0.00	0.00
CO_2 Annual Emission Rates (T/yr): [c]	0.43	0.43	0.44	0.44	0.44	0.00	0.00	0.00
Methane Hourly Emission Rates (lb/hr): [b]	303.33	303.33	1,467.53	1,467.53	1,467.53	0.00	0.00	0.00
Methane Annual Emission Rates (T/yr): [c]	10.92	10.92	52.83	52.83	52.83	0.00	0.00	0.00

Description	C-4100A Blowdown (FIN GRP-BDSV)	C-4100B Blowdown (FIN GRP-BDSV)	C-4121A Blowdown (FIN GRP-BDSV)	C-4121B Blowdown (FIN GRP-BDSV)	C-4121C Blowdown (FIN GRP-BDSV)	C-164 Blowdown (FIN GRP-BDSV)	C-1641 Blowdown (FIN GRP-BDSV)	C-1642 Blowdown (FIN GRP-BDSV)
Number of Blowdowns per Year	72	72	72	72	72	12	12	12
Number of Blowdowns per Hour	1	1	1	1	1	1	1	1
Blowdown Volume per Event, scf	10,000	10,000	35,000	35,000	35,000	10,000	10,000	10,000
Gas Stream Specific Gravity	0.7210	0.7210	0.5622	0.5622	0.5622	1.5200	1.5200	1.5200
Gas Stream Density, lb/scf [a]	0.055	0.055	0.043	0.043	0.043	0.116	0.116	0.116
CO_2 Percentage in Gas Stream, wt%	2.150%	2.150%	0.81%	0.81%	0.81%	0%	0%	0%
Max Methane Percentage in Gas Stream, wt%	55.15%	55.15%	97.51%	97.51%	97.51%	0%	0%	0%
CO_2 Hourly Emission Rates (lb/hr): [b]	11.83	11.83	12.19	12.19	12.19	0.00	0.00	0.00
CO_2 Annual Emission Rates (T/yr): [c]	0.43	0.43	0.44	0.44	0.44	0.00	0.00	0.00
Methane Hourly Emission Rates (lb/hr): [b]	303.33	303.33	1,467.53	1,467.53	1,467.53	0.00	0.00	0.00
Methane Annual Emission Rates (T/yr): [c]	10.92	10.92	52.83	52.83	52.83	0.00	0.00	0.00

Total Estimated CO_2 Sent to Plant Flare (Tyr):	**8.72**
Total Estimated Methane Sent to Plant Flare (Tyr):	**721.32**

[a] Gas stream density is calculated as follows:

(28.96 lb/mole) / (379 scf/mole) * (0.7210) = 0.055 lb/scf

[b] Hourly blowdown emissions are calculated as follows:

(1 blowdown/hr) * (10,000 scf/blowdown) * (0.055 lb/scf) * (55.15 %)= 303.33 lb/hr

[c] Annual blowdown emissions are calculated as follows:

(72 blowdowns/yr) * (10,000 scf/blowdown) * (0.055 lb/scf) * (55.15 %) / (2,000 lb/T) = 10.92 T/yr

PROJECT-AFFECTED STARTER VENTS POTENTIAL TO EMIT

AIR PERMIT APPLICATION

JACKSON COUNTY GAS PLANT

ETC TEXAS PIPELINE, LTD.

Description	C-1100A Starter Vent (FIN GRP-BDSV)	C-1100B Starter Vent (FIN GRP-BDSV)	C-1121A Starter Vent (FIN GRP-BDSV)	C-1121B Starter Vent (FIN GRP-BDSV)	C-1121C Starter Vent (FIN GRP-BDSV)
Number of Starter Vents per Year	200	200	200	200	200
Number of Starter Vents per Hour	1	1	1	1	1
Starter Vent Volume per Event, scf	1,000	1,000	1,000	1,000	1,000
Gas Stream Specific Gravity	0.5622	0.5622	0.5622	0.5622	0.5622
Gas Stream Density, lb/scf [a]	0.043	0.043	0.043	0.043	0.043
CO_2 Percentage in Gas Stream, wt%	0.81%	0.81%	0.81%	0.81%	0.81%
Methane Percentage in Gas Stream, wt%	97.51%	97.51%	97.51%	97.51%	97.51%
CO_2 Hourly Emission Rates (lb/hr): [b]	0.35	0.35	0.35	0.35	0.35
CO_2 Annual Emission Rates (T/yr): [c]	0.03	0.03	0.03	0.03	0.03
Methane Hourly Emission Rates (lb/hr): [b]	41.93	41.93	41.93	41.93	41.93
Methane Annual Emission Rates (T/yr): [c]	4.19	4.19	4.19	4.19	4.19

Description	C-2100A Starter Vent (FIN GRP-BDSV)	C-2100B Starter Vent (FIN GRP-BDSV)	C-2121A Starter Vent (FIN GRP-BDSV)	C-2121B Starter Vent (FIN GRP-BDSV)	C-2121C Starter Vent (FIN GRP-BDSV)
Number of Starter Vents per Year	200	200	200	200	200
Number of Starter Vents per Hour	1	1	1	1	1
Starter Vent Volume per Event, scf	1,000	1,000	1,000	1,000	1,000
Gas Stream Specific Gravity	0.5622	0.5622	0.5622	0.5622	0.5622
Gas Stream Density, lb/scf [a]	0.043	0.043	0.043	0.043	0.043
CO_2 Percentage in Gas Stream, wt%	0.81%	0.81%	0.81%	0.81%	0.81%
Methane Percentage in Gas Stream, wt%	97.51%	97.51%	97.51%	97.51%	97.51%
CO_2 Hourly Emission Rates (lb/hr): [b]	0.35	0.35	0.35	0.35	0.35
CO_2 Annual Emission Rates (T/yr): [c]	0.03	0.03	0.03	0.03	0.03
Methane Hourly Emission Rates (lb/hr): [b]	41.93	41.93	41.93	41.93	41.93
Methane Annual Emission Rates (T/yr): [c]	4.19	4.19	4.19	4.19	4.19

PROJECT-AFFECTED STARTER VENTS POTENTIAL TO EMIT

AIR PERMIT APPLICATION

JACKSON COUNTY GAS PLANT

ETC TEXAS PIPELINE, LTD.

Description	C-3100A Starter Vent (FIN GRP-BDSV)	C-3100B Starter Vent (FIN GRP-BDSV)	C-3121A Starter Vent (FIN GRP-BDSV)	C-3121B Starter Vent (FIN GRP-BDSV)	C-3121C Starter Vent (FIN GRP-BDSV)
Number of Starter Vents per Year	200	200	200	200	200
Number of Starter Vents per Hour	1	1	1	1	1
Starter Vent Volume per Event, scf	1,000	1,000	1,000	1,000	1,000
Gas Stream Specific Gravity	0.5622	0.5622	0.5622	0.5622	0.5622
Gas Stream Density, lb/scf [a]	0.043	0.043	0.043	0.043	0.043
CO_2 Percentage in Gas Stream, wt%	0.81%	0.81%	0.81%	0.81%	0.81%
Methane Percentage in Gas Stream, wt%	97.51%	97.51%	97.51%	97.51%	97.51%
CO_2 Hourly Emission Rates (lb/hr): [b]	0.35	0.35	0.35	0.35	0.35
CO_2 Annual Emission Rates (T/yr): [c]	0.03	0.03	0.03	0.03	0.03
Methane Hourly Emission Rates (lb/hr): [b]	41.93	41.93	41.93	41.93	41.93
Methane Annual Emission Rates (T/yr): [c]	4.19	4.19	4.19	4.19	4.19

Description	C-4100A Starter Vent (FIN GRP-BDSV)	C-4100B Starter Vent (FIN GRP-BDSV)	C-4121A Starter Vent (FIN GRP-BDSV)	C-4121B Starter Vent (FIN GRP-BDSV)	C-4121C Starter Vent (FIN GRP-BDSV)
Number of Starter Vents per Year	200	200	200	200	200
Number of Starter Vents per Hour	1	1	1	1	1
Starter Vent Volume per Event, scf	1,000	1,000	1,000	1,000	1,000
Gas Stream Specific Gravity	0.5622	0.5622	0.5622	0.5622	0.5622
Gas Stream Density, lb/scf [a]	0.043	0.043	0.043	0.043	0.043
CO_2 Percentage in Gas Stream, wt%	0.81%	0.81%	0.81%	0.81%	0.81%
Methane Percentage in Gas Stream, wt%	97.51%	97.51%	97.51%	97.51%	97.51%
CO_2 Hourly Emission Rates (lb/hr): [b]	0.35	0.35	0.35	0.35	0.35
CO_2 Annual Emission Rates (T/yr): [c]	0.03	0.03	0.03	0.03	0.03
Methane Hourly Emission Rates (lb/hr): [b]	41.93	41.93	41.93	41.93	41.93
Methane Annual Emission Rates (T/yr): [c]	4.19	4.19	4.19	4.19	4.19

Total Estimated CO_2 Sent to Plant Flare (Tyr):	**0.60**
Total Estimated Methane Sent to Plant Flare (T/yr):	**83.80**

[a] Gas stream density is calculated as follows:

(28.96 lb/mole) / (379 scf/mole) * (0.5622) = 0.043 lb/scf

[b] Hourly blowdown emissions are calculated as follows:

(1 blowdown/hr) * (1,000 scf/blowdown) * (0.043 lb/scf) * (97.51 %)= 41.93 lb/hr

[c] Annual blowdown emissions are calculated as follows:

(200 blowdowns/yr) * (1,000 scf/blowdown) * (0.043 lb/scf) * (97.51 %) / (2,000 lb/T) = 4.19 T/yr

FLARE POTENTIAL TO EMIT GREENHOUSE GASES

AIR PERMIT APPLICATION

JACKSON COUNTY GAS PLANT

ETC TEXAS PIPELINE, LTD.

Uncombusted CO_2 and CH_4 Emissions

The un-combusted emissions for CO_2 and CH_4 were calculated for the Plant Flare (FS-800) only. Stabilized condensate does not contain CH4 or CO2, so emissions were not calculated for the loading flare (FL-FLARE).

$E_{a,CH4}$ (un-combusted) = V_a *(1-η)*X_{CH4} (Eq. W-19 in 98.233(n)(4))

$E_{a,CO2}$ (un-combusted) = V_a * X_{CO2} (Eq. W-20 in 98.233(n)(4))

Where:

$E_{a,CH4}$ (un-combusted) = Contribution of annual un-combusted CH4 emissions from flare in cubic feet.

$E_{a,CO2}$ (un-combusted) = Contribution of annual un-combusted CO2 emissions from flare in cubic feet.

V_a = Volume of vent gas cubic feet per year.

η = Fraction of gas combusted (default = 0.98).

X_{CH4} = Mole fraction of CH_4 in vent gas

X_{CO2} = Mole fraction of CO_2 in vent gas

Rather than using the molar flowrate (Va * X) entering the flare, the mass flowrate of methand and CO2 was calculated through mass balance for blowdown and starter vents and is substituted into each equation to calculate the mass flowrates from the flare. See the blowdown and starter vent emission calculations for more information.

CH_4 = ((CH_4 emission from starter vents, T/yr) + (CH_4 emission from blowdown vents, T/yr)) * (1 - 0.98 control eff.)
= ((83.80 T/yr from starter vents) + (721.32 T/yr from blowdown vents)) * 0.02
= 16.10 T/yr

CO_2 = (CO_2 emission from starter vents, T/yr) + (CO_2 emission from blowdown vents, T/yr)
= (0.60 T/yr) + (8.72 T/yr)
= 9.32 T/yr

Combustion CO_2 Emissions

$E_{a,CO2}$ (combusted) = Σ η*V_a*Y_j*R_j (Eq. W-21 in 98.233(n)(4))

Where:

$E_{a,CO2}$ (combusted) = Contribution of annual combusted CO2 emissions from thermal oxidizer in cubic feet.

Y_j = Mole fraction of gas hydrocarbon constituents j.

R_j = Number of carbon atoms in the gas hydrocarbon constituent j.

	R	Y			Carbon Concentration to Flare [b]		
	Number of Carbon	Stream Mole Fractions			Propane Compressors	Gas Compressors	Condensate Loading
Compound	Atoms	Propane	Inlet Gas	Condensate [a]	lbmol	lbmol	lbmol
Methane	1	0	0.7680	0	0.0000	0.7680	0.0000
Ethane	2	0	0.1330	0.0013	0.0000	0.2660	0.0026
Propane	3	1	0.0526	0.0032	3.0000	0.1578	0.0096
i-Butane	4	0	0.0107	0.0024	0.0000	0.0428	0.0096
n-Butane	4	0	0.0138	0.0095	0.0000	0.0552	0.0380
i-Pentane	5	0	0.0040	0.0188	0.0000	0.0200	0.0940
n-Pentane	5	0	0.0028	0.0272	0.0000	0.0140	0.1360
n-Hexane	6	0	0.0024	0.0542	0.0000	0.0144	0.3252
Other Hexanes	6	0	0.0000	0.0574	0.0000	0.0000	0.3444
Heptane	7	0	0.0006	0.2598	0.0000	0.0042	1.8186
Octane	8	0	0.0004	0.3043	0.0000	0.0032	2.4344
Nonane	9	0	0.0000	0.1415	0.0000	0.0000	1.2735
Benzene	6	0	0.0001	0.0089	0.0000	0.0006	0.0534
Toluene	7	0	0.0002	0.0618	0.0000	0.0014	0.4326
Ethylbenzene	8	0	0.0010	0.0029	0.0000	0.0080	0.0232
m-Xylene	8	0	0.0040	0.0234	0.0000	0.0320	0.1872
o-Xylene	8	0	0.0010	0.0059	0.0000	0.0080	0.0472
p-Xylene	8	0	0.0030	0.0176	0.0000	0.0240	0.1408
TOTAL					3.0000	1.4196	7.3703

[a] The condensate vapor phase concentrations are unknown, so the liquid concentrations were used for emission calculations.

[b] Sample calcualtion using methane:

Carbon Concentration = (R, lbmol carbon/lbmol CH_4) * (Y, lbmol CH_4/lbmol gas)
= (1.0 lbmol C/lbmol CH4) * (0.7680 lbmol CH4/lbmol gas) = 0.7680 lbmol C/lbmol gas from CH4

$E_{a,CO2}$ (combusted C3) = (1,440,000 scfy C3 BD vent) * (3.0 lbmol C/lbmol gas)) * (0.98) = 4,233,600 scfy Carbon

$E_{a,CO2}$ (combusted inlet) = (36,000,000 scfy inlet BD vent) * 4,000,000 scfy inlet SV) * (1.4 lbmol C/lbmol gas)) * (0.98) = 55,648,320 scfy Carbon

$E_{a,CO2}$ (combusted load) = (15,330,000 gal/yr Condensate) * (0.1337 ft3/gal) * (7.4 lbmol C/lbmol gas)) * (0.98) = 14,804,195 scfy Carbon

BD and SV CO_2 (T/yr) = (4,233,600 + 55,648,320 scfy Carbon) * (14.7 psia) / (10.73 psia-ft3/lbmol-°R) / (520 °R) * (44 lb CO2/lbmol C) / (2,000 lb/ton)
= 3,471 ton/yr CO_2

Loading CO_2 (T/yr) = (14,804,195 acfy Carbon) * (14.7 psia) / (10.73 psia-ft3/lbmol-°R) / (530 °R) * (44 lb CO2/lbmol C) / (2,000 lb/ton)
= 842 ton/yr CO_2

FLARE POTENTIAL TO EMIT GREENHOUSE GASES

AIR PERMIT APPLICATION

JACKSON COUNTY GAS PLANT

ETC TEXAS PIPELINE, LTD.

Combustion N_2O Emissions

N_2O = Fuel * HHV * 0.0001 (Eq. W-40, §98.233(z)(6))

Where:

N_2O = Annual emissions from combustion in kilograms

Fuel = volume combusted, scfy

HHV = High heat value of fuel, MMBtu/scf

BD and SV N2O = (0.0001 kg N2O/MMBtu) * ((Propane, scfy * Propane HHV) + (Inlet Gas scfy * Inlet Gas HHV)) / (0.4536 kg/lb) / (2,000 lb/ton)

= (0.0001 kg N2O/10^6 Btu) * ((1440000.00 scfy) * (2,519 Btu/scf) + (40,000,000 scfy) * (1269 Btu/scf)) / (0.4536 kg/lb) / (2000 lb/ton)

= 0.0059 T/yr

Loading N2O = (0.0001 kg N2O/MMBtu) * (Loading, scfy * 3,000 Btu/scf) / (0.4536 kg/lb) / (2,000 lb/ton)

= (0.0001 kg N2O/10^6 Btu) * (2,049,621 acfy) * (3,000 Btu/scf) / (0.4536 kg/lb) / (2000 lb/ton)

= 0.0007 T/yr

Emission Summary:

EPN	FIN	Description	Uncombusted CO_2 (short T/yr)	Combustion CO_2 (short T/yr)	Uncombusted CH_4 (short T/yr)	Combustion N_2O (short T/yr)	CO_2e[a] (short T/yr)
FS-800	GRP-BDSV	Plant Flare BD and SV emissions	9.32	3,471.00	16.10	0.0059	3,820.25
TL-FLARE	C-LOAD	Stabilized Condensate Loading	0	842.00	0	0.0007	842.22

[a] CO_2e emissions are calculated as follows:

(9.32 T/yr Uncombusted CO2) + (3,471.00 T/yr Combustion CO2) + ((16.10 T/yr Methane) * 21) + ((0.0059 T/yr N2O) * 310) = 3,820.25 T/yr CO2e

EXISTING UNMODIFIED STABILIZATION UNIT PIPING FUGITIVES POTENTIAL TO EMIT

AIR PERMIT APPLICATION

JACKSON COUNTY GAS PLANT

ETC TEXAS PIPELINE, LTD.

Component	Number of Components	Emission Factors [a] (lb/hr-component)	Operating Hours (hr/yr)	Maximum Methane (wt%)	Maximum CO_2 (wt%)	Reduction Credit [a] (%)	PTE Methane Hourly [b] (lb/hr)	PTE Methane Annual [c] (T/yr)	PTE CO_2 Hourly [b] (lb/hr)	PTE CO_2 Annual [c] (T/yr)
Valves										
Gas Streams (Inlet)	105	0.00992	8,760	55%	2%	97%	0.0172	0.0753	0.0006	0.0027
Gas Streams (Residue)	0	0.00992	8,760	98%	1%	97%	0.0000	0.0000	0.0000	0.0000
Gas Streams (Processing)	0	0.00992	8,760	55%	2%	97%	0.0000	0.0000	0.0000	0.0000
Light Liquid Streams	263	0.0055	8,760	0%	0%	97%	0.0000	0.0000	0.0000	0.0000
Water/Light Liquid	0	0.000216	8,760	0%	0%	97%	0.0000	0.0000	0.0000	0.0000
Heavy Liquid	0	0.0000185	8,760	0%	0%	0%	0.0000	0.0000	0.0000	0.0000
Relief Valves										
Gas Streams (Inlet)	10	0.0194	8,760	55%	2%	97%	0.0032	0.0140	0.0001	0.0005
Gas Streams (Residue)	0	0.0194	8,760	98%	1%	97%	0.0000	0.0000	0.0000	0.0000
Gas Streams (Processing)	0	0.0194	8,760	55%	2%	97%	0.0000	0.0000	0.0000	0.0000
Light Liquid Streams	0	0.0165	8,760	0%	0%	0%	0.0000	0.0000	0.0000	0.0000
Water/Light Liquid	0	0.0309	8,760	0%	0%	0%	0.0000	0.0000	0.0000	0.0000
Heavy Liquid	0	0.0000683	8,760	0%	0%	0%	0.0000	0.0000	0.0000	0.0000
Compressor Seals										
Gas Streams (Inlet)	0	0.0194	8,760	55%	2%	95%	0.0000	0.0000	0.0000	0.0000
Gas Streams (Residue)	0	0.0194	8,760	98%	1%	95%	0.0000	0.0000	0.0000	0.0000
Gas Streams (Processing)	0	0.0194	8,760	55%	2%	95%	0.0000	0.0000	0.0000	0.0000
Light Liquid Streams	0	0.0165	8,760	0%	0%	0%	0.0000	0.0000	0.0000	0.0000
Water/Light Liquid	0	0.0309	8,760	0%	0%	0%	0.0000	0.0000	0.0000	0.0000
Heavy Liquid	0	0.0000683	8,760	0%	0%	0%	0.0000	0.0000	0.0000	0.0000
Pump Seals										
Gas Streams (Inlet)	0	0.00529	8,760	55%	2%	0%	0.0000	0.0000	0.0000	0.0000
Gas Streams (Residue)	0	0.00529	8,760	98%	1%	0%	0.0000	0.0000	0.0000	0.0000
Gas Streams (Processing)	0	0.00529	8,760	55%	2%	0%	0.0000	0.0000	0.0000	0.0000
Light Liquid Streams	5	0.02866	8,760	0%	0%	93%	0.0000	0.0000	0.0000	0.0000
Water/Light Liquid	0	0.000052	8,760	0%	0%	93%	0.0000	0.0000	0.0000	0.0000
Heavy Liquid	0	0.00113	8,760	0%	0%	0%	0.0000	0.0000	0.0000	0.0000
Flanges										
Gas Streams (Inlet)	263	0.00086	8,760	55%	2%	75%	0.0311	0.1362	0.0011	0.0050
Gas Streams (Residue)	0	0.00086	8,760	98%	1%	75%	0.0000	0.0000	0.0000	0.0000
Gas Streams (Processing)	0	0.00086	8,760	55%	2%	75%	0.0000	0.0000	0.0000	0.0000
Light Liquid Streams	658	0.000243	8,760	0%	0%	75%	0.0000	0.0000	0.0000	0.0000
Water/Light Liquid	0	0.000006	8,760	0%	0%	75%	0.0000	0.0000	0.0000	0.0000
Heavy Liquid	0	0.00000086	8,760	0%	0%	30%	0.0000	0.0000	0.0000	0.0000
						Gas Streams (Inlet):	**0.0515**	**0.2255**	**0.0018**	**0.0082**
						Gas Streams (Residue):	**0.0000**	**0.0000**	**0.0000**	**0.0000**
						Gas Streams (Processing):	**0.0000**	**0.0000**	**0.0000**	**0.0000**
						Light Liquid Streams:	**0.0000**	**0.0000**	**0.0000**	**0.0000**
						Water/Light Liquid:	**0.0000**	**0.0000**	**0.0000**	**0.0000**
						Heavy Liquid:	**0.0000**	**0.0000**	**0.0000**	**0.0000**
						TOTALS:	**0.05**	**0.23**	**0.00**	**0.01**

[a] Fugitive Emission Factors and Reduction Credits are per TCEQ Technical Guidance Document for Equipment Leak Fugitives, dated October 2000. The emission factors are for total hydrocarbon. Reduction credit is from 28LAER.

[b] Hourly Methane and CO_2 emission rates are calculated as follows:
(105 components) * (0.00992 lb/hr-component) * (55% Methane) * (100% - 97% reduction credit) = 0.0172 lb/hr

[c] Annual Methane and CO_2 emission rates are calculated as follows:
(105 components) * (0.00992 lb/hr-component) * (8,760 hr/yr) * (55% Methane) * (100% - 97% reduction credit) / (2,000 lb/T) = 0.0753 T/yr

SITE DATA

AIR PERMIT APPLICATION

JACKSON COUNTY GAS PLANT

ETC TEXAS PIPELINE, LTD.

Stream Compositions:

	Stream 1		Stream 2		Stream 3		Stream 4	
	Fuel/Residue		Inlet Gas		Liquid		Propane	
Component	mole %	wgt. %	mole %	wgt. %	mole %	wgt %	mole %	wgt %
Water	0.1000%	0.11%	0.0000%	0.000%	0.0000%	0.00%	0.0000%	0.00%
Nitrogen	0.1000%	0.17%	0.0660%	0.080%	0.0000%	0.00%	0.0000%	0.00%
Carbon Dioxide	0.3000%	0.81%	1.0900%	2.150%	0.0000%	0.00%	0.0000%	0.00%
Oxygen	0.0000%	0.00%	0.0000%	0.000%	0.0000%	0.00%	0.0000%	0.00%
Hydrogen Sulfide	0.0004%	0.001%	0.0000%	0.000%	0.0000%	0.00%	0.0000%	0.00%
Methane	98.9000%	97.51%	76.8000%	55.150%	0.0000%	0.00%	0.0000%	0.00%
Ethane	0.7000%	1.29%	13.3000%	17.900%	0.1330%	0.04%	0.0000%	0.00%
Propane	0.0080%	0.02%	5.2600%	10.390%	0.3240%	0.14%	100.00%	100.00%
I-Butane	0.0000%	0.00%	1.0700%	2.780%	0.2390%	0.13%	0.0000%	0.00%
N-Butane	0.0000%	0.00%	1.3800%	3.590%	0.9460%	0.53%	0.0000%	0.00%
I-Pentane	0.0000%	0.00%	0.3960%	1.280%	1.8780%	1.30%	0.0000%	0.00%
N-Pentane	0.0000%	0.00%	0.2770%	0.900%	2.7180%	1.88%	0.0000%	0.00%
n-Hexane	0.0000%	0.00%	0.2390%	0.920%	5.4200%	4.47%	0.0000%	0.00%
Other Hexanes	0.0000%	0.00%	0.0000%	0.000%	5.7420%	4.74%	0.0000%	0.00%
Heptane	0.0000%	0.00%	0.0600%	0.270%	25.9830%	24.93%	0.0000%	0.00%
Octane	0.0000%	0.00%	0.0420%	0.210%	30.4290%	33.29%	0.0000%	0.00%
Nonane	0.0000%	0.00%	0.0000%	0.000%	14.1510%	17.38%	0.0000%	0.00%
Benzene	0.0000%	0.00%	0.0100%	0.040%	0.8850%	0.66%	0.0000%	0.00%
Toluene	0.0150%	0.09%	0.0150%	0.060%	6.1810%	5.45%	0.0000%	0.00%
Ethylbenzene	0.0000%	0.00%	0.1000%	0.470%	0.2930%	0.30%	0.0000%	0.00%
m-Xylene	0.0000%	0.00%	0.4000%	1.900%	2.3400%	2.38%	0.0000%	0.00%
o-Xylene	0.0000%	0.00%	0.1000%	0.470%	0.5850%	0.59%	0.0000%	0.00%
p-Xylene	0.0000%	0.00%	0.3000%	1.420%	1.755%	1.78%	0.0000%	0.00%
Totals	100.1%	100.0%	100.9%	100.0%	100.0%	100.0%	100.0%	100.0%
Totals (C3+)	0.02%	0.11%	9.6%	24.7%	99.87%	99.95%		100.00%
VOC max		2.00%		20.00%		100.00%		100.00%
Specific Gravity	0.5622		0.7210		3.1979		1.5200	
Mw	16.3		22.3		104.4		44.1	

The hexane plus portion of the gas streams are assumed to be n-hexane.

Fuel Gas Higher Heating Value	1,011 Btu/scf
Fuel Gas Lower Heating Value	911 Btu/scf