Appendix I

Measured THC Emission Rates Sorted by Emission Rate

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	---	High Pressure Process Flare	Installation of vapour recovery unit	175.397	100000.00	428293.56	4829.39	0.42
3	Direct	400 bbl Oil/H2O Separator -	Thief hatch	160.983	NE	---	807.58	Repaired
4	---	Process Flare Line	Installation of vapour recovery unit	121.144	100000.00	93481.14	3335.58	0.55
3	---	Low Pressure Process Flare	Installation of vapour recovery unit	121.144	NE	---	306.88	NA
1	---	Process Flare Line to Flare Pit	Installation of vapour recovery unit	121.144	60000.00	26122.92	539.93	2.05
2	Direct	Compressor Unit # 3 -	Compressor seals vent - 2"	86.122	2000.00	131477.59	12218.29	0.01
3	Direct	Residue Gas Comp 4 - Distance piece vents and packing case drains tied to common vent stack.	Compressor Seals (4) - 4"	22.526	2000.00	32912.34	3201.64	0.05
4	3824	Re-compressors - Leak from bottom of valve.	Plug valve - 4"	11.544	200.00	65513.56	1668.99	0.01
4	3910C	Re-Compression: Unit 3 - FG Line 6	Union - 2"	11.100	100.00	33334.19	1604.91	0.01
4	3809	Re-compressors -	Threaded connection - 0.5"	9.540	10.00	28723.87	1379.28	0.001
1	---	Refrig Comp Unit 12 - Common vent line for 4 cylinders.	Common compressor seals vent	9.314	2000.00	12434.70	0.00	0.13
2	Direct	Compressor Unit # 2 -	Compressor seals vent - 2"	8.348	2000.00	10938.92	1184.40	0.15
4	3621	Flare Line - Valve stem leak	Plug valve - 4"	8.302	200.00	47058.94	968.81	0.01
2	4305	Compressor Unit # 1 -	Valve cover	7.318	200.00	21842.90	1054.94	0.02
4	3920	Re-Compression: Unit 5 - Stem packing	Governor - 3"	7.046	200.00	39912.49	1018.77	0.02
4	3893	Re-Compression: Unit 1 - Cylinder No. 1	Distance piece	6.985	2000.00	8825.18	1009.85	0.17
2	Direct	12" Flare Stack -	Flare stack / blowdown - 12"	6.869	NE	---	990.13	NA
2	4046	Mole Sieve Tower B -	Control valve - orbit - 8"	6.799	353.00	20124.05	831.47	0.03
4	3779	Central Yard - Between C3 Compressors and Gen Building	Open-ended line - 0.75"	6.355	60.00	19081.87	918.85	0.01
4	3913B	Re-Compression: Unit 3 - FG Line 5	Union - 2"	6.038	100.00	18087.77	873.05	0.01
3	1937	Residue Gas/N2 Comp Bldg - Comp 1	Crank case vent	5.890	2000.00	7128.79	837.16	0.21
3	Direct	Residue Gas Comp 3 - Distance piece vents and packing case drains tied to common vent stack.	Compressor Seals (4) - 4"	5.826	2000.00	7028.80	827.99	0.21
1	3352	Low Pressure JT Expander -	Control valve - 8"	5.570	353.00	16424.59	801.97	0.04
3	1323	Propane Yard: V8-411 - A411N-2	Gate valve - 4"	5.501	190.00	31124.61	1.05	0.02
2	Direct	Compressor Unit # 5 -	Compressor seals vent - 2"	5.308	2000.00	6225.90	752.98	0.23
4	Direct	Re-Compressor Unit 3 -	Seals vent	5.281	2000.00	6185.21	763.57	0.23
1	3381	EP Skid to Koch -	Pump seal	5.054	500.00	7332.97	8.89	0.06
3	Direct	Residue Gas Comp 1 - Distance piece vents and packing case drains tied to common vent stack.	Compressor Seals (4) - 3"	5.041	2000.00	5813.38	716.53	0.24
2	4277	Compressor Unit # 7 - stem packing	Governor - 2"	4.909	200.00	27747.81	707.70	0.02
3	Direct	Comp 8 HHE -	Blowdown Stack - 14"	4.761	5000.00	2379.30	570.15	0.64

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	Direct	Re-Comp 1 (E03400-1A) - 3 Primary Seal Drains (Comp 1) & 3 Secondary Seal Drains (Comp 2)	Compressor Seal Drains - 1"	4.744	2000.00	5352.77	568.10	0.26
1	---	Refrig Comp Unit 10 -	Compressor seals - 1"	4.703	2000.00	5288.72	0.00	0.26
2	Direct	Compressor Unit # 9 -	Compressor seals vent - 2"	4.671	2000.00	5239.26	662.67	0.26
3	1553	HP1 Bldg: E35-04 - To drain.	Open-ended line - 0.375"	4.451	60.00	13346.18	532.98	0.01
3	1653	Re-Compressor Building - Re-Comp 2 (WE4C-301-2) (Drain from distance piece to sump)	Distance Piece - 2"	4.364	2000.00	4763.58	522.57	0.28
4	3872	Re-Compression: Yard Piping -	Gate valve - 0.75"	4.319	60.00	24526.40	624.44	0.01
4	3809B	Re-Compression: Yard Piping - Base of valve	Threaded connection - 0.5"	4.076	10.00	12268.08	589.37	0.001
3	Direct	Condensate Storage Tanks - PVSV - 2 (Center)	Pressure relief valve	4.000	600.00	11448.50	20.07	0.09
2	4224	Compressor Unit # 9 -	Governor - 2"	3.728	200.00	21023.88	537.43	0.03
1	3129	Compressor CM-14 - Damaged/cracked line	Tubing connection - 0.375"	3.718	15.00	21148.27	433.83	0.002
1	3413	Mole Sieve Tower 511B (Top) -	Flange - 18"	3.560	200.00	10523.11	415.45	0.03
3	1191	NRU 1 -	Block valve - 10"	3.468	500.00	19244.18	415.32	0.09
4	3908	Re-Compression: Unit 2 - Stem packing	Governor - 3"	3.380	200.00	19041.81	488.70	0.04
2	4233	Compressor Unit 8 -	Valve cover	3.318	200.00	9795.00	478.35	0.04
1	3458	Refrig Comp Unit 12 -	Open-ended line - 1"	3.283	75.00	9813.67	0.00	0.01
3	1197	NRU Expander 1 -	Flange - 10"	3.275	150.00	9713.58	392.14	0.03
4	3559	TEG Still - Stem at burners.	Needle valve - 0.5"	3.245	60.00	18411.47	469.14	0.01
4	3488	Inlet Yard Piping: Pig Traps - Plug valve seat	Open-ended line - 2"	3.174	100.00	9459.32	385.16	0.02
4	3874	Re-Compression: Yard Piping -	Gate valve - 0.75"	3.076	60.00	17453.32	444.80	0.01
1	3138B	Compressor CM-13 - Lube oil tank drain.	Lube oil tank vent - 1"	2.991	4000.00	636.18	349.07	0.81
1	Direct	Compressor CM-19 - Lube oil tank vent #2	Lube oil tank vent - 0.75"	2.988	4000.00	630.37	337.48	0.81
4	3654	Mole Sieve Dehy: Regen Fan/Blower -	Gate valve - 6"	2.982	245.00	16729.57	431.12	0.05
4	3603	Yard North of Office - Orifice meter rack	Valve - 1"	2.966	75.00	16806.98	428.77	0.02
3	1419	Residue Gas/N2 Comp Bldg - Comp 2	Valve cover	2.926	200.00	8614.23	415.93	0.04
2	4221	Compressor Unit # 9 -	Flange - 2"	2.906	50.00	8703.53	418.93	0.01
3	Direct	Condensate Storage Tanks - PVSV - 1 (West)	Pressure relief valve	2.885	600.00	8089.62	14.47	0.13
4	3787	Re-Compression: Clark Discharge Cooler -	Gate valve - 0.75"	2.817	60.00	15978.18	407.34	0.01
2	Direct	Compressor Unit # 4 -	Compressor seals vent - 2"	2.813	2000.00	2359.09	399.02	0.43
3	Direct	Condensate Storage Tanks - PVSV-3 (East)	Pressure relief valve	2.773	600.00	7750.86	13.91	0.13
3	Direct	NRU-N2 Vent Cold Can 1 -	NRU vent - 16"	2.769	NE	---	331.61	NA
3	1861	Residue Gas/N2 Comp Bldg: Heat Pump 4 -	Threaded connection - 0.5"	2.756	10.00	8291.19	405.46	0.002
3	1133	NRU 3 - Top Platform - G2323N	Gate valve - 3"	2.683	120.00	15153.78	321.29	0.03
4	3798	Re-Compression: Unit 5 - Cylinder No. 2	Distance piece	2.668	2000.00	2134.25	385.67	0.46
4	3842	Re-Compression: Yard Piping -	Gate valve - 2"	2.650	100.00	14984.50	383.11	0.02
1	3459	Refrig Comp Unit 12 - Crank case vent	Crank case vent - 2"	2.589	2000.00	2012.37	0.00	0.47
4	3911A	Re-Compression: Unit 4 - FG Line 6	Plug valve - 2"	2.563	120.00	14469.05	370.53	0.03
2	Direct	Compressor Unit # 1 -	Compressor seals vent - 2"	2.542	2000.00	1940.10	360.67	0.48
2	Direct	Compressor Unit # 8 -	Compressor seals vent - 2"	2.526	2000.00	1914.39	358.32	0.48
4	Direct	Generator 1 -	Crank case vent - 3"	2.520	2000.00	1906.12	364.39	0.48
1	3158	Refrig Comp Unit 11 -	Valve cover	2.517	200.00	7380.76	0.00	0.05
3	1464	Residue Gas/N2 Comp Bldg - Heat Pump 4	Valve cover	2.507	200.00	7352.49	368.89	0.05
3	1686	Re-Compressor Building - Re-Comp 5	Crank case vent - 2"	2.501	2000.00	1876.07	299.48	0.49
2	4236	Compressor Unit # 8 - stem packing	Governor - 2"	2.481	200.00	13921.32	357.58	0.05

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Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
1	3450	Refrig Comp Unit 12 -	Open-ended line - 1"	2.467	75.00	7355.17	0.00	0.02
4	3901	Re-Compression: Unit 1 -	Distance piece	2.461	2000.00	1814.27	355.82	0.49
4	3651	Mole Sieve Dehy: Regen Fan/Blower - Gate valve seat	Open-ended line - 0.75"	2.402	60.00	7175.40	347.31	0.02
1	3096	Compressor CM-13 -	Valve cover	2.369	200.00	6934.05	276.40	0.05
3	1679	IR Compressor Building - East Lobe Lift Comp (E4-322)	Crank case vent - 2"	2.287	2000.00	1543.88	273.81	0.53
4	3876	Generators -	Threaded connection - 2"	2.275	15.00	6838.13	328.96	0.004
1	3415	Mole Sieve Tower 511A (Top) -	Flange - 18"	2.262	200.00	6612.64	263.94	0.05
1	3142A	Compressor CM-19 - Lube oil tank # 1	Lube oil tank vent - 0.75"	2.245	4000.00	-520.69	261.97	1.08
1	Direct	Mole Sieve - Regen Gas Re-Compressor - Compressor seal vent	Compressor seals vent - 0.5"	2.219	2000.00	1438.55	308.07	0.55
4	3909	Re-Compression: Unit 3 -	Governor - 3"	2.218	200.00	12425.90	320.67	0.05
2	4320	Compressor Unit # 1 -	Injector	2.213	200.00	12395.94	318.96	0.06
1	3137	Compressor CM-14 - Distance piece drain	Distance piece drain - 0.75"	2.194	2000.00	1400.76	256.05	0.55
4	Direct	Generator 2 -	Crank case vent - 3"	2.154	2000.00	1338.40	311.43	0.57
4	3946B	Re-Compression: Unit 1 - FG Line 5	Union - 2"	2.134	100.00	6326.63	308.49	0.03
2	4042	Mole Sieve Tower B -	Control valve - orbit - 8"	2.130	353.00	6062.71	260.51	0.10
2	4299	Compressor Yard - Suction/Discharge Piping -	Orbit valve - 3"	2.021	120.00	11387.29	291.39	0.04
1	1987	Inlet Header -	Gate valve - 6"	1.988	245.00	11071.18	231.97	0.08
2	4188	Cryo 101 top of exchanger E401 -	Flange - 6"	1.955	100.00	5787.94	281.79	0.03
4	3848	Re-Compression: Yard Piping -	Gate valve - 0.75"	1.951	60.00	11045.34	282.05	0.02
1	3431	EP Skid to Koch -	Pump seal	1.949	500.00	2521.10	3.43	0.16
2	3994	SCW Inlet Line - ball valve seat	Open-ended line - 2"	1.928	100.00	5707.67	235.82	0.03
4	Direct	Generator 3 -	Crank case vent - 3"	1.914	2000.00	966.18	276.71	0.64
3	1675	Re-Compressor Building - Re-Comp 5 (Fuel Gas Line) (Threads on Both Sides)	Union - 2"	1.913	100.00	5661.87	271.89	0.03
3	Direct	Heat Pump 4 -	Compressor Seals (8) - 4"	1.882	2000.00	917.55	276.94	0.65
3	1325	Propane Yard - A406N	Gate valve - 6"	1.871	245.00	10403.14	0.36	0.08
3	1660	Re-Compressor Building - Re-Comp 2	Crank case vent - 2"	1.851	2000.00	868.85	221.66	0.66
3	1708	V2811-1 -	Regulator - 1"	1.817	175.00	12395.78	258.18	0.06
2	4020	Gas-Gas Exchanger -	Flange - 16"	1.793	200.00	5200.78	219.30	0.07
4	3918	Re-Compression: Unit 4 - Stem packing	Governor - 3"	1.755	200.00	9791.49	253.76	0.07
2	4323	Compressor Unit # 1 -	Governor - 2"	1.749	200.00	9758.78	252.18	0.07
1	3480	South of Low Press Inlet Compressors - Leaking around bolts.	Flowmeter - 1"	1.736	150.00	2541.16	249.99	0.05
3	1750	Residue Gas/N2 Comp Bldg - Comp 4 - crank case vent	Crank case vent - 2"	1.720	2000.00	665.56	244.45	0.71
1	3481	Expander Skid - Off orifice meter	Tubing connection - 0.5"	1.713	15.00	9738.83	246.69	0.01
2	4199	Compressor Unit 3 -	Cylinder end - flange	1.702	400.00	2238.18	245.37	0.14
3	Direct	Comp 8 HHE - 4 seals connected.	Seal Drains - 2"	1.689	2000.00	617.55	202.24	0.72
1	3423	Refrig Comp Unit 12 - Yard Piping -	Control valve - butterfly - 6"	1.623	282.00	4607.47	0.00	0.11
4	3838	Re-Compression: Yard Piping -	Gate valve - 2"	1.590	100.00	8950.12	229.85	0.04
3	Direct	Re-Comp 4 (E03400-4A) - 4 Seal Drains (Comp 4 & Comp 5)	Compressor Seal Drains - 2"	1.584	2000.00	454.48	189.64	0.77
3	1542	Residue Gas/N2 Comp Bldg - Heat Pump 3	Valve cover	1.561	200.00	4501.53	0.30	0.08
1	3430	Refrig Comp Yard Piping -	Gate valve - 10"	1.560	500.00	8379.63	0.00	0.20
4	3645	Sales Gas Header -	Flange - 12"	1.531	150.00	4462.86	221.43	0.06
1	3103	Compressor CM-9 - Lube oil tank - drain/vent	Lube oil tank vent - 0.75"	1.521	4000.00	-1642.31	177.52	1.60
4	3850	Re-Compression: Yard Piping -	Gate valve - 0.75"	1.439	60.00	8130.26	208.02	0.03

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Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	Direct	Heat Pump 2 - Vent	Compressor Seals (8) - 4"	1.434	2000.00	221.76	210.89	0.85
3	Direct	Heat Pump 1 - Vent	Compressor Seals (8) - 4"	1.401	2000.00	170.69	206.04	0.87
1	3042	Scrubber (PV-517) -	Gate valve - 1.5"	1.326	75.00	7474.18	154.75	0.03
4	---	Mole Sieve Dehy: Dehy Train A - Instrument bleed	Pressure transmitter - 1"	1.319	75.00	3896.34	153.87	0.03
3	Direct	Comp 7 HHE -	Blowdown Stack - 14"	1.307	5000.00	-2974.31	156.51	2.33
1	---	Refrig Comp Unit 11 -	Crank case vent	1.306	2000.00	24.39	0.00	0.93
3	1840	Co-Gen Building: Outside (CA 625 - HP FG Scrubber) - Stem Area	Regulator - 0.5"	1.302	175.00	8835.59	185.06	0.08
3	1327	Propane Yard - Behind Economizer - PV2934N	Control valve - plug - 6"	1.278	282.00	3568.01	0.24	0.13
4	3566	Mole Sieve Dehy: Outlet -	Gate valve - 12"	1.276	595.00	6667.97	148.89	0.28
4	3932C	Re-Compression: Unit 5 - FG Line 1	Union - 2"	1.275	100.00	3739.40	184.30	0.05
2	4222	Compressor Unit # 9 -	Injector	1.269	200.00	7021.48	182.86	0.10
3	1623	IR Compressor Building - IR Comp 3	Valve cover	1.264	200.00	3607.00	151.35	0.10
4	3672	Cryo System: Turbo Expander - Gate valve seat	Open-ended line - 1"	1.238	75.00	3653.63	2.88	0.04
3	1113	NRU 3 - Base of Cold Box - Valve 132	Gate valve - 10"	1.218	500.00	6435.83	145.90	0.25
2	4194	Compressor Unit 2 -	Injector - 1"	1.217	200.00	6729.85	175.48	0.10
3	1319	Propane Yard: V8-411 - A411N-4	Gate valve - 16"	1.208	920.00	5955.82	0.23	0.46
2	4317	Compressor Unit # 1 -	Injector	1.195	200.00	6601.18	172.22	0.10
2	4346	Residue Gas Suction Scrubber - stem (around greaser)	Plug valve - 6"	1.175	255.00	6432.75	169.35	0.13
1	3417	Mole Sieve Tower 511C (Top) -	Flange - 18"	1.163	200.00	3303.24	135.73	0.10
2	4304	Compressor Unit # 1 -	Valve cover	1.155	200.00	3279.06	166.50	0.11
3	Direct	IR Comp 1 (E4-342) -	Compressor Seal Drains	1.148	2000.00	-220.49	137.49	1.06
4	---	Mole Sieve Dehy: Dehy Train B - Instrument bleed	Pressure transmitter - 1"	1.130	75.00	3327.06	131.81	0.04
1	1976	Inlet Header -	Gate valve - 3"	1.129	120.00	6305.70	131.72	0.06
1	3457	Refrig Comp Unit 12 -	Threaded connection - 0.5"	1.117	10.00	3354.77	0.00	0.01
3	1520	Residue Gas/N2 Comp Bldg - Comp 1 (Throw 4)	Open-ended line - 0.5"	1.116	60.00	3300.94	158.60	0.03
3	1199	NRU Expander 2 - Expander Housing	Flange - 10"	1.111	150.00	3197.17	133.07	0.08
1	---	Compressor CM-19 - (On roof) compressor side	Crank case vent - 1.5"	1.093	2000.00	-305.33	127.60	1.11
3	1636	Re-Compressor Building - Re-Comp 1 (WE4C-301-1)	Valve cover	1.086	200.00	3072.03	130.08	0.11
4	3804	Re-Compression: Yard Piping - Gate valve seat	Open-ended line - 1"	1.027	75.00	3019.18	148.53	0.04
4	3894	Re-Compression: Unit 1 -	Valve cover	1.015	200.00	2857.57	146.77	0.12
1	3398	EP Skid to Koch -	Pump seal	1.006	500.00	1058.58	1.77	0.30
1	3437	Refrig Comp Unit 12 - Yard Piping -	Open-ended line - 2"	0.988	100.00	2876.63	1.74	0.06
2	4286	Compressor Yard - Compressor unit 7 - on body plus around bolts	Ball valve - 2"	0.986	100.00	5510.71	142.07	0.06
4	3846	Re-Compression: Yard Piping -	Gate valve - 0.75"	0.985	60.00	5549.14	142.46	0.04
1	3012	Inlet Comp Yard Piping -	Threaded connection - 1.5"	0.981	15.00	2938.51	114.43	0.01
4	3565	Mole Sieve Dehy: Outlet -	Gate valve - 12"	0.976	595.00	4960.61	113.89	0.37
3	1088	Amine Bldg (V2806-2) - Plug on A2806N-4 (under vessel)	Threaded connection - 1"	0.974	15.00	2917.38	116.58	0.01
4	3649	Sales Gas Header -	Open-ended line	0.954	75.00	2798.07	137.91	0.05
4	3982	Power Generators: Unit 1 -	Union - 3"	0.952	150.00	2716.69	137.61	0.10
2	4135	Gas-Gas Exchanger -	Gate valve - 16"	0.950	920.00	4488.19	116.19	0.59
3	1104	NRU 3 - Hot Box - PV4169	Control valve	0.948	560.00	2294.26	113.48	0.36

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4	3784	Re-Compression: Clark Discharge Cooler - PV-111B	Gate valve - 6"	0.947	245.00	5146.35	136.93	0.16
4	3921D	Re-Compression: Unit 3 - FG Line 1	Union - 2"	0.944	100.00	2742.58	136.45	0.06
1	3142B	Compressor CM-19 - Distance piece drain	Distance piece drain - 0.75"	0.940	2000.00	-543.67	109.65	1.30
1	3138A	Compressor CM-13 - Distance piece vent	Distance piece vent - 1"	0.939	2000.00	-545.08	109.55	1.30
4	3923	Re-Compression: Unit 3 - Stem packing and bonnet	Plug valve - 3"	0.938	150.00	5189.60	135.61	0.10
2	4171	Cryo skid 101 - expander K101-B	Control valve - 10"	0.934	459.00	2355.68	114.29	0.30
4	3924	Re-Compression: Unit 3 -	Gate valve - 0.75"	0.921	60.00	5183.22	133.17	0.04
3	Direct	NRU-N2 Vent Cold Can 3 -	NRU vent - 16"	0.909	NE	---	108.83	NA
2	4382	Compressor Unit # 6 -	Valve cover	0.907	200.00	2532.42	130.77	0.13
2	4106	After Filter -	Gate valve - 6"	0.897	245.00	4859.32	109.66	0.17
3	1492	Residue Gas/N2 Comp Bldg - Comp 4 (Throw 5)	Threaded connection - 0.5"	0.895	10.00	2686.69	127.25	0.01
3	1427	Residue Gas/N2 Comp Bldg - Comp 2	Valve cover	0.895	200.00	2495.79	127.21	0.14
4	3947D	Re-Compression: Unit 1 - FG Line 4	Union - 2"	0.887	100.00	2571.22	128.22	0.07
2	4319	Compressor Unit # 1 -	Flange - 1"	0.882	50.00	2607.00	127.16	0.03
3	1456	Residue Gas/N2 Comp Bldg - Heat Pump 4	Cylinder end - flange	0.881	400.00	965.39	129.61	0.28
3	1802	Fuel Gas Scrubber (V8-1720) - On Sight Glass	Gate valve - 0.75"	0.873	60.00	4912.07	124.14	0.04
1	3051	Scrubber (PV-517) -	Gate valve - 0.5"	0.870	60.00	4891.35	101.50	0.04
3	1185	NRU 3 - Top Platform - A2354N	Gate valve - 10"	0.866	500.00	4429.62	103.70	0.35
4	3913A	Re-Compression: Unit 3 - FG Line 5	Threaded connection - 2"	0.863	15.00	2583.47	124.73	0.01
2	4363	Compressor Unit # 3 -	Control valve - ball - 2"	0.853	130.00	2439.81	122.99	0.09
1	3041	Lone Star Line -	Gate valve - 10"	0.837	500.00	4265.87	97.70	0.36
2	4294	Compressor Yard - common suction line	Gate valve - 10"	0.837	500.00	4263.19	120.61	0.36
2	4015	Mole Sieve Tower D -	Three-way valve - 4"	0.835	190.00	4564.37	102.14	0.14
4	3653	Mole Sieve Dehy: Regen Fan/Blower -	Gate valve - 6"	0.835	245.00	4506.61	120.68	0.18
4	3922C	Re-Compression: Unit 5 - FG Line 2	Union - 2"	0.834	100.00	2410.89	120.53	0.07
2	4260	Compressor Unit # 5 -	Union - 1.5"	0.827	100.00	2390.72	119.20	0.07
3	1322	Propane Yard: V8-410-3 - TI411N	Threaded connection - 0.5"	0.827	10.00	2479.76	0.16	0.01
2	4380	Compressor Unit # 6 -	Valve cover	0.821	200.00	2272.13	118.31	0.15
2	4315	Compressor Unit # 1 -	Injector	0.819	200.00	4463.23	118.08	0.15
1	1949	Inlet Header -	Plug valve - 3"	0.819	150.00	4511.11	95.55	0.11
3	1645	IR Compressor Building - IR Comp 3 (Start Gas)	Threaded connection - 2"	0.814	15.00	2436.19	115.67	0.01
1	3353	Low Pressure JT Expander -	Gate valve - 12"	0.806	595.00	3995.86	116.11	0.45
3	1324	Propane Yard: V8-411 - A411N-5	Gate valve - 1"	0.799	75.00	4474.50	0.15	0.06
2	4181	Cryo skid 101 -	Butterfly valve - 8"	0.794	700.00	1691.08	114.43	0.54
2	4378	Compressor Unit # 6 -	Valve cover	0.794	200.00	2190.49	114.41	0.15
4	3831	Re-Compression: Yard Piping -	Gate valve - 0.5"	0.793	60.00	4454.75	114.67	0.05
4	3797	Re-Compression: Unit 5 -	Valve cover	0.790	200.00	2179.33	114.21	0.15
3	1439	Residue Gas/N2 Comp Bldg - Heat Pump 1	Valve cover	0.790	200.00	2178.26	116.16	0.15
3	Direct	IR Comp 3 (E4-321) -	Compressor Seal Drains	0.789	2000.00	-776.88	94.50	1.54
4	3851	Re-Compression: Unit 4 - Cylinder No. 1	Distance piece	0.788	2000.00	-778.70	113.93	1.54
1	3237	Solar Turbines: Unit A - On skid	Gate valve - 1.5"	0.786	75.00	4398.47	113.14	0.06
1	1990	Inlet Header - Stem packing and 2 flanges	Control valve - butterfly - 6"	0.784	282.00	2078.92	91.47	0.22
1	3131	Compressor CM-13 -	Valve cover	0.784	200.00	2160.67	91.46	0.16
4	3854	Re-Compression: Unit 4 - Cylinder No. 3	Distance piece	0.783	2000.00	-786.58	113.20	1.55
3	1002	Mole Sieve 3 - On top platform	Flange - 8"	0.782	100.00	2254.76	93.62	0.08
2	4232	Compressor Unit 8 -	Valve cover	0.779	200.00	2146.06	112.28	0.16
2	4047	Mole Sieve Tower B -	Control valve - orbit - 4"	0.778	177.00	2165.71	95.13	0.14

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1499	Residue Gas/N2 Comp Bldg - Heat Pump 2	Valve cover	0.771	200.00	2122.97	113.46	0.16
1	---	Compressor CM-14 - Fuel gas system (FG regulator + injectors)	Fuel gas system common vent line	0.769	2000.00	-808.43	110.69	1.58
4	3970	Refrigeration Compressors: Unit 2 -	Flange - 0.75"	0.764	25.00	2276.22	110.46	0.02
3	1846	Amine Yard - Near Flare Valve	Gate valve - 8"	0.759	350.00	3971.08	90.89	0.28
4	3871	Re-Compression: Yard Piping -	Gate valve - 0.75"	0.756	60.00	4242.76	109.28	0.05
4	3934B	Re-Compression: Unit 4 - FG Line 5	Plug valve - 2"	0.748	120.00	4138.17	108.15	0.10
2		Compressor Unit # 7 -	Crank case vent - 2"	0.743	2000.00	-848.22	107.12	1.64
3	1862	Residue Gas/N2 Comp Bldg -	Threaded connection - 0.5"	0.742	10.00	2225.61	109.19	0.01
2	4248	Compressor Unit 3 -	Flange - 1"	0.736	50.00	2167.99	106.15	0.04
1	3442	Regen Gas Compressors/Blowers - Compressor seal	Compressor seal - 0.375"	0.735	2000.00	-860.14	85.82	1.66
4	3812	Re-Compression: Yard Piping -	Ball valve - 4"	0.732	190.00	3977.70	105.85	0.16
2	4353	Compressor Yard - horizontal vessel - on horn	Pressure relief valve - 1.5"	0.731	130.00	2072.68	105.42	0.11
1	3063	HP Cooler - Packing	Plug valve - 8"	0.711	300.00	3749.19	83.00	0.26
1	3299	High Pressure JT Expander -	Control valve - 8"	0.710	353.00	1784.75	102.19	0.30
3	1192	NRU 1 - MA050-01	Block valve - 10"	0.708	500.00	3532.38	84.82	0.43
2	4351	Under C3 Cooler -	Plug valve - 4"	0.703	200.00	3804.08	0.00	0.17
2	4261	Compressor Unit # 5 -	Plug valve - 1.5"	0.702	75.00	3921.54	101.20	0.07
1	---	Compressor CM-19 - (On roof) engine side	Crank case vent - 1.5"	0.702	2000.00	-912.66	81.87	1.74
1	3406	Mole Sieve Common Piping -	Open-ended line - 0.75"	0.701	60.00	2050.17	81.75	0.05
1	3024	Fuel Gas Scrubber (West Yard) - PV-9	Union - 2"	0.701	100.00	2010.17	100.87	0.09
3	1039	Mole Sieve 4 - A2811N-52	Threaded connection - 0.75"	0.700	10.00	2097.38	83.78	0.01
3	1440	Residue Gas/N2 Comp Bldg - Heat Pump 1	Valve cover	0.698	200.00	1902.78	102.71	0.17
2	4372	Compressor Unit # 6 -	Governor - 2"	0.696	200.00	3763.08	100.35	0.17
2	4229	Compressor Unit 8 -	Valve cover	0.690	200.00	1878.82	99.49	0.18
1	3306	Mole Sieve Bypass Piping -	Control valve - butterfly - 6"	0.688	282.00	1790.56	80.30	0.25
1	1999	Discharge Line (221) -	Gate valve - 8"	0.687	350.00	3562.89	80.21	0.31
4	3761	Cryo System: Economizer -	Gate valve - 4"	0.684	190.00	3705.13	1.59	0.17
2	4292	Compressor Yard - Compressor unit 4	Check valve - 4"	0.681	160.00	3717.99	98.20	0.14
4	3748	Cryo System: Absorber Tower (20.001) - Top platform	Threaded connection - 0.5"	0.678	15.00	3842.53	1.58	0.01
4	3947B	Re-Compression: Unit 1 - FG Line 4	Plug valve - 2"	0.675	120.00	3720.60	97.54	0.11
3	1344	Propane Yard: V8-411 - A411N-5	Gate valve - 16"	0.675	920.00	2920.07	0.13	0.83
3	Direct	Heat Pump 3 -	Compressor Seals (8) - 4"	0.672	2000.00	-958.22	98.89	1.81
2	4213	Compressor Unit # 4 - around body	three-way valve - 3"	0.665	120.00	3664.85	95.84	0.11
4	3582	Mole Sieve Dehy: Regen Piping -	Flange - 6"	0.658	100.00	1882.03	76.79	0.09
4	3936	Re-Compression: Unit 4 - FG Line 3	Plug valve - 2"	0.648	120.00	3568.97	93.69	0.11
4	3845	Re-Compression: Yard Piping -	Gate valve - 0.75"	0.643	60.00	3601.63	93.00	0.06
3	1196	NRU Expander 1 - Inlet Line	Flange - 10"	0.643	150.00	1785.64	76.95	0.14
3	1658	Re-Compressor Building - Re-Comp 2 (Around some bolts)	Valve cover	0.639	200.00	1726.14	76.58	0.19
2	4381	Compressor Unit # 6 -	Cylinder end - flange	0.637	400.00	587.71	91.87	0.38
4	3916A	Re-Compression: Unit 3 - FG Line 3	Threaded connection - 2"	0.632	15.00	1887.37	91.32	0.01
4	3596	Mole Sieve Dehy: Dehy Tower B -	Manway - 18"	0.621	200.00	1670.39	72.47	0.20
3	1696	Re-Compressor Building - Associated Yard Piping (Near G8-311-1) Cooler	Orbit valve - 4"	0.620	190.00	3339.79	74.25	0.19
2	4191	Compressor Unit 2 -	Valve cover	0.619	200.00	1664.69	0.00	0.20
3	1432	Residue Gas/N2 Comp Bldg - Heat Pump 1	Cylinder end - flange	0.618	400.00	558.56	90.99	0.39
1	1944	Inlet Header -	Plug valve - 8"	0.617	300.00	3210.61	71.96	0.30
4	3782	Re-Compression: Piping Adjacent to Clark -	Threaded connection - 0.5"	0.616	10.00	1846.11	89.10	0.01

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
4	3699A	Cryo System: South Of Cold Gas Exchanger -	Open-ended line - 0.75"	0.613	60.00	1786.42	1.43	0.06
3	1642	IR Compressor Building - IR Comp 3 (Start Gas)	Union - 2"	0.612	100.00	1744.03	87.02	0.10
3	1827	Fuel Gas To Co-Gen - VO-32	Gate valve - 2"	0.608	100.00	3361.99	86.44	0.10
4	3939	Re-Compression: Unit 2 - FG Line 6	Union - 2"	0.606	100.00	1724.71	87.59	0.10
1	3476	EB Skid to Chevron -	Threaded connection - 1"	0.604	15.00	1804.03	1.06	0.02
4	3826A	Re-Compression: Yard Piping - on 4" plug valve	Grease nipple	0.600	50.00	3367.34	86.79	0.05
1	3027	Fuel Gas to Mansfield (222) -	Tubing connection - 0.375"	0.599	15.00	3392.23	69.85	0.02
3	1446	Residue Gas/N2 Comp Bldg: Lower Level - B301N-1	Threaded connection - 1"	0.592	15.00	1768.93	84.18	0.02
4	3558	TEG Still - Located down low.	Union - 1"	0.589	100.00	1672.83	85.10	0.10
1	3205	Solar Turbines: Unit B - Fuel gas filter piping	Threaded connection - 0.75"	0.588	10.00	1760.07	84.61	0.01
4	3864	Re-Compression: Unit 3 - Cylinder No. 3	Distance piece	0.583	2000.00	-1096.92	84.24	2.09
4	3863	Re-Compression: Unit 3 -	Variable volume pocket stem	0.570	400.00	482.92	82.36	0.43
2	4198	Compressor Unit # 3 -	Variable volume pocket stem	0.569	400.00	481.59	82.00	0.43
4	3853	Re-Compression: Unit 4 - Cylinder No. 2	Distance piece	0.566	2000.00	-1123.06	81.81	2.15
1	3098B	Compressor CM-13 - Bottom NW valve cover.	Valve cover	0.561	200.00	1490.32	65.49	0.22
4	3826B	Re-Compression: Yard Piping - on 4" plug valve	Grease nipple	0.551	50.00	3088.04	79.70	0.06
3	1345B	Propane Yard: V8-411 - A411N-3	Threaded connection - 1"	0.546	15.00	1630.51	0.10	0.02
3	1674	Re-Compressor Building - Re-Comp 4	Crank case vent - 2"	0.545	2000.00	-1155.65	65.24	2.23
4	Direct	Re-Compressor Unit 1 -	Seals vent	0.542	2000.00	-1160.48	78.32	2.25
4	3867	Re-Compression: Unit 2 -	Valve cover	0.541	200.00	1428.84	78.19	0.23
3	1114	NRU 3 - Base of Cold Box - Near TB-0481	Union - 0.5"	0.539	50.00	1572.05	64.49	0.06
3	1110	NRU 3 - Base of Cold Box	Block valve - 10"	0.537	500.00	2558.04	64.33	0.57
2		Compressor Unit # 6 -	Crank case vent - 2"	0.536	2000.00	-1169.02	77.29	2.27
3	1426	Residue Gas/N2 Comp Bldg - Comp 2	Cylinder end - flange	0.536	400.00	430.33	76.15	0.45
4	3805	Re-Compression: Yard Piping -	Gate valve - 0.5"	0.534	60.00	2978.36	77.17	0.07
4	3944A	Re-Compression: Unit 2 - FG Line 2	Threaded connection - 2"	0.532	15.00	1586.00	76.85	0.02
4	3801	Re-Compression: Yard Piping -	Gate valve - 14"	0.527	780.00	2218.73	76.16	0.90
4	3911C	Re-Compression: Unit 4 - FG Line 6	Union - 2"	0.524	100.00	1479.69	75.83	0.12
4	3925	Re-Compression: Unit 3 -	Union - 0.75"	0.523	50.00	1523.79	75.54	0.06
3	1471	Residue Gas/N2 Comp Bldg - Heat Pump 4	Valve cover	0.520	200.00	1366.48	76.51	0.23
3	1193	NRU 1 - to Expander	JT valve - 10"	0.515	500.00	2432.83	61.69	0.59
2	4189	Cryp 101 top of exchanger E401 -	Flange - 6"	0.514	100.00	1449.50	74.16	0.12
4	3878	Generators - Outside under walkway on orifice meter.	Gate valve - 0.5"	0.514	60.00	2867.69	74.36	0.07
4	3592	Mole Sieve Dehy: Dehy Train C - Top of dehy tower	Flange - 18"	0.512	200.00	1342.09	59.75	0.24
3	1333	Propane Yard: V8-410-3 - B410N-6	Threaded connection - 2"	0.508	15.00	1515.32	0.10	0.02
4	3934C	Re-Compression: Unit 4 - FG Line 5	Union - 2"	0.506	100.00	1425.02	73.20	0.12
4	3656	Mole Sieve Dehy: Regen Fan/Blower -	Gate valve - 6"	0.503	245.00	2619.00	72.74	0.30
3	1266	NGL Bullet 4 - Near A1101N-41	Gate valve - 0.75"	0.500	60.00	2784.54	0.14	0.07
4	3929	Re-Compression: Unit 5 -	Gate valve - 0.75"	0.491	60.00	2737.69	71.06	0.07
3	1894	Hg Removal Bed V8-401-2 - A401N-21 plug on GTV (seat leak)	Threaded connection - 0.75"	0.489	10.00	1463.13	58.57	0.01
2	4283	Compressor Unit 5 - VVP Stem same cylinder as 4282	Cylinder end - flange - 1"	0.483	400.00	348.96	69.66	0.50
2	4077	Sales Piping - on 6" orifice meter	Rack	0.483	75.00	2674.09	69.61	0.09

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1128	NRU 2 - Top Platform - A2331N	Open-ended line - 0.375"	0.476	60.00	1372.62	56.96	0.08
4	3591	Mole Sieve Dehy: Dehy Train C - Instrument bleed	Pressure transmitter - 0.125"	0.455	60.00	1311.27	53.13	0.08
3	1106	NRU 3 - Hot Box - G411N-19	Gate valve - 0.5"	0.454	60.00	2525.35	54.38	0.08
3	1290	NGL Bullet 2 - Near B1101N-1	Gate valve - 0.75"	0.453	60.00	2517.63	0.13	0.08
3	1935	Mole Sieve Tower 3 - top of dehydrator	Manway - 18"	0.451	200.00	1158.90	54.03	0.27
3	Direct	NRU-N2 Vent Cold Can 2 -	NRU vent - 16"	0.449	NE	---	53.81	NA
4	3916B	Re-Compression: Unit 3 - FG Line 3	Plug valve - 2"	0.448	120.00	2429.03	64.74	0.16
2	4254	Compressor Unit # 4 -	Injector	0.447	200.00	2345.61	64.46	0.27
4	3938A	Re-Compression: Unit 4 - FG Line 1	Threaded connection - 2"	0.445	15.00	1325.16	64.33	0.02
3	1115	NRU 3 - Base of Cold Box - Near TB-0472	Threaded connection - 0.5"	0.433	10.00	1294.58	51.87	0.01
1	3097	Compressor CM-13 -	Open-ended line - 0.5"	0.432	60.00	1242.36	50.46	0.08
2	4111	After Filter - 3 tubing connections	Tubing connection - 0.375"	0.430	15.00	2432.75	52.59	0.02
3	1543	Residue Gas/N2 Comp Bldg - Heat Pump 3	Threaded connection - 0.5"	0.428	10.00	1279.55	0.08	0.01
1	3064	HP Cooler - Bonnet	Plug valve - 8"	0.428	300.00	2134.86	49.91	0.43
3	1690	IR Compressor Building - IR Comp 3	Crank case vent - 2"	0.426	2000.00	-1339.08	51.06	2.85
1	2000	Fuel Gas to Mansfield (222) -	Gate valve - 2"	0.420	100.00	2292.70	49.05	0.14
3	1111	NRU 3 - Base of Cold Box - Channel Plate	Flange	0.420	200.00	1065.77	50.32	0.29
2	4204	Residue Compressors FG Scrubber -	Control valve - globe - 2"	0.420	130.00	1134.86	60.53	0.19
4	3652	Mole Sieve Dehy: Regen Inlet Scrubber - Gate valve seat	Open-ended line - 0.5"	0.416	60.00	1192.81	60.14	0.09
3	1436	Residue Gas/N2 Comp Bldg - Heat Pump 1	Valve cover	0.412	200.00	1040.73	60.60	0.30
2	4276	Compressor Unit 7 -	Cylinder end - flange	0.412	400.00	238.41	59.38	0.59
4	3917C	Re-Compression: Unit 5 - FG Line 3	Union - 2"	0.412	100.00	1140.27	59.54	0.15
1	1965	Inlet Comp Yard Piping - On 10" orifice meter (gate valve seat)	Open-ended line - 0.5"	0.410	60.00	1175.50	47.87	0.09
3	1040	Mole Sieve 4 - A2811N-52	Gate valve - 0.75"	0.410	60.00	2273.97	49.10	0.09
2	4273	Compressor Unit 7 -	Valve cover	0.406	200.00	1023.04	58.53	0.30
4	3650	Sales Gas Header -	Open-ended line - 1"	0.404	75.00	1143.24	58.48	0.11
3	1375	Amine Bldg: Near Glycol-Gas Outlet Scrubber - A-2809N-2	Gate valve - 8"	0.404	350.00	1950.06	48.38	0.53
1	3048	Scrubber (PV-517) - On level controller	Threaded connection - 1"	0.396	15.00	1178.98	46.26	0.02
2	4318	Compressor Unit # 1 -	Injector	0.394	200.00	2044.60	56.84	0.31
4	3915B	Re-Compression: Unit 5 - FG Line 4	Plug valve - 2"	0.391	120.00	2105.45	56.52	0.19
4	3834	Re-Compression: Yard Piping -	Gate valve - 2"	0.385	100.00	2093.22	55.70	0.16
1	3195	Solar Turbines: Unit A - Fuel gas scrubber piping	Filter cover - 6"	0.385	50.00	1109.06	55.40	0.08
4	3799	Re-Compression: Unit 5 - Cylinder No. 3	Distance piece	0.383	2000.00	-1406.34	55.38	3.18
3	1669	IR Compressor Building - IR Comp 2	Threaded connection - 0.5"	0.380	10.00	1135.96	45.56	0.02
3	Direct	Residue Gas Comp 2 - Distance piece vents and packing case drains tied to common vent stack.	Compressor Seals (4) - 3"	0.380	2000.00	-1411.42	53.98	3.21
4	3694A	Cryo System: Chiller Outlet Separator -	Open-ended line - 0.75"	0.376	60.00	1071.71	0.87	0.10
4	3950B	Re-Compression: Unit 1 - FG Line 1	Plug valve - 2"	0.373	120.00	2003.28	53.93	0.20
1	3208	Solar Turbines: Unit B - On orifice meter	Threaded connection - 0.5"	0.373	10.00	1112.57	53.66	0.02
3	1391	Residue Gas/N2 Comp Bldg: Yard - Suction Scrubber: A304N-1	Gate valve - 1.5"	0.371	75.00	2035.33	52.69	0.12
4	3508	Regen Heater -	Threaded connection - 0.5"	0.370	10.00	1105.11	53.53	0.02

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
4	3916D	Re-Compression: Unit 3 - FG Line 3	Union - 2"	0.367	100.00	1005.17	53.05	0.17
4	3836	Re-Compression: Yard Piping -	Gate valve - 2"	0.367	100.00	1986.63	53.00	0.17
2	4033	Mole Sieve Tower C - Both sides of union	Union - 1"	0.362	100.00	990.35	44.27	0.17
1	3044	Scrubber (PV-517) - Sight glass	Gate valve - 0.75"	0.359	60.00	1982.68	41.87	0.10
2	4169	Cryo skid north - Note: was fixed already on expander	Threaded connection - 0.5"	0.354	10.00	1056.11	43.29	0.02
4	3915A	Re-Compression: Unit 5 - FG Line 4	Threaded connection - 2"	0.352	15.00	1045.95	50.93	0.03
2	4383	Compressor Unit # 6 -	Valve cover	0.352	200.00	859.75	50.72	0.35
4	3932A	Re-Compression: Unit 5 - FG Line 1	Plug valve - 2"	0.351	120.00	1875.96	50.69	0.21
1	3194	Solar Turbines: Unit A - Fuel gas scrubber piping	Gate valve - 2"	0.344	100.00	1857.76	49.51	0.18
2	4113	After Filter -	Gate valve - 6"	0.341	245.00	1693.98	41.66	0.44
4	3509	Regen Heater -	Flange - 6"	0.335	100.00	909.67	48.47	0.18
1	3374	Fuel Gas Scrubber (PV-15) -	Threaded connection - 1"	0.334	15.00	992.43	48.16	0.03
3	1366	Amine Bldg: Near V8-2701N-11 - V2702-024B	Gate valve - 0.5"	0.334	60.00	1840.87	39.99	0.11
3	1858	Residue Gas/N2 Comp Bldg: Heat Pump 4 -	Threaded connection - 0.5"	0.333	10.00	994.43	49.06	0.02
4	3840	Re-Compression: Yard Piping -	Gate valve - 2"	0.328	100.00	1766.99	47.42	0.19
4	3933A	Re-Compression: Unit 4 - FG Line 6	Threaded connection - 2"	0.328	15.00	972.46	47.40	0.03
4	3830	Re-Compression: Yard Piping -	Gate valve - 2"	0.325	100.00	1747.45	46.92	0.19
4	3843	Re-Compression: Yard Piping -	Gate valve - 0.75"	0.322	60.00	1775.38	46.61	0.11
3	1343	Amine Bldg: Near V8-2810N - A2809N-2	Flange - 18"	0.320	200.00	764.50	38.35	0.38
1	1974	Inlet Comp Yard Piping -	Plug valve - 8"	0.318	300.00	1510.14	37.11	0.57
4	3795	Re-Compression: Unit 5 - Cylinder No. 1	Distance piece	0.313	2000.00	-1514.79	45.26	3.89
1	3209	Solar Turbines: Header Outside - Needle valve seat	Threaded connection - 0.5"	0.312	10.00	928.27	44.85	0.02
4	3937A	Re-Compression: Unit 4 - FG Line 2	Threaded connection - 2"	0.310	15.00	918.03	44.79	0.03
3	1407	Residue Gas/N2 Comp Bldg: Yard	Filter cover - 36"	0.310	400.00	532.87	44.02	0.79
1	3259	Solar Turbines - Sight glass valve	Gate valve - 0.75"	0.306	60.00	1681.26	44.04	0.12
4	3891	Re-Compression: Unit 2 - Cylinder No. 3	Distance piece	0.304	2000.00	-1528.27	44.01	4.00
4	3949B	Re-Compression: Unit 1 - FG Line 3	Plug valve - 2"	0.303	120.00	1605.63	43.83	0.24
4	3663	Cryo System: Warm Gas Exchanger -	Gate valve - 6"	0.302	245.00	1475.77	0.70	0.49
4	3917B	Re-Compression: Unit 5 - FG Line 3	Plug valve - 2"	0.302	120.00	1597.82	43.63	0.24
4	3579	Mole Sieve Dehy: Dehy Tower B -	Gate valve - 0.5"	0.301	60.00	1656.13	35.18	0.12
3	1672	Re-Compressor Building - Re-Comp 4 (Fuel Gas Line) Diaphragm	Regulator - 2"	0.300	175.00	1903.60	42.69	0.35
3	1303	Propane Yard - PV458N	Control valve - globe - 6"	0.300	282.00	621.24	0.06	0.57
3	1910	Hg Removal Bed V8-401-2	Flange - 3"	0.297	75.00	821.00	35.62	0.15
3	1536	Residue Gas/N2 Comp Bldg - Heat Pump 3	Cylinder end - flange	0.297	400.00	59.78	0.06	0.82
1	3270	Solar Turbines - Needle valve seat	Open-ended line - 2"	0.296	100.00	791.31	42.60	0.21
4	3934A	Re-Compression: Unit 4 - FG Line 5	Threaded connection - 2"	0.296	15.00	875.39	42.74	0.03
4	3866	Re-Compression: Unit 2 -	Variable volume pocket stem	0.295	400.00	56.48	42.58	0.83
3	1275	NGL Bullet 3 - Near A1101N-38	Gate valve - 0.75"	0.294	60.00	1611.79	0.08	0.12
4	3907	Re-Compression: Unit 2 -	Union - 0.75"	0.291	50.00	826.49	42.07	0.10
1	3291	High Pressure JT Expander -	Gate valve - 4"	0.288	190.00	1446.74	41.40	0.40
4	3796	Re-Compression: Unit 5 -	Valve cover	0.285	200.00	657.60	41.17	0.43
1	3296	High Pressure JT Expander -	Threaded connection - 0.75"	0.285	10.00	847.45	40.99	0.02
3	1813	Stab 1 Building (Yard) - (NGL Vessel)	Gate valve - 3"	0.281	120.00	1481.07	0.59	0.26
3	1184	NRU 1 - Top Platform - G2302N	Threaded connection - 0.5"	0.277	10.00	825.70	33.22	0.02

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1734	HHE Compressor Building - Comp HHE 8	Threaded connection - 0.5"	0.275	10.00	819.79	32.99	0.02
3	1317	Propane Yard: V8-411 - A411N-1	Gate valve - 16"	0.275	920.00	643.51	0.05	2.04
4	3567	Mole Sieve Dehy: Outlet -	Gate valve - 12"	0.272	595.00	951.61	31.71	1.33
4	3950D	Re-Compression: Unit 1 - FG Line 1	Union - 2"	0.269	100.00	711.59	38.96	0.23
1	3062	HP Cooler -	Threaded connection - 0.75"	0.268	10.00	796.53	31.25	0.02
1	1952	PV-1A - Sight glass	Gate valve - 0.75"	0.261	60.00	1423.44	30.41	0.14
2	4265	Compressor Unit # 5 -	Union - 1.5"	0.260	100.00	684.53	37.55	0.23
4	3835	Re-Compression: Yard Piping -	Gate valve - 2"	0.260	100.00	1381.99	37.64	0.23
3	1031	Mole Sieve 4 - A2811N-49	Threaded connection - 0.75"	0.259	25.00	1450.03	31.03	0.06
2	4267	Compressor Unit # 5 -	Threaded connection - 1.5"	0.259	15.00	763.75	37.27	0.04
3	1166	NRU 2 - Base of Cold Box - Valve 373	Gate valve - 1"	0.257	75.00	1388.95	30.79	0.18
2	4132	Mole Sieve Tower C -	Threaded connection - 0.5"	0.257	10.00	763.29	31.40	0.02
4	3984	Cryo System: Expander Feed Separator - Around body	Gate valve - 0.75"	0.257	60.00	1401.46	0.60	0.14
2	4268	Compressor Unit # 5 -	Threaded connection - 0.375"	0.256	10.00	761.44	36.92	0.02
3	1457	Residue Gas/N2 Comp Bldg: Heat Pump 4 -	Valve cover	0.254	200.00	563.63	37.30	0.48
4	3921A	Re-Compression: Unit 3 - FG Line 1	Threaded connection - 2"	0.253	15.00	746.61	36.56	0.04
3	1539	Residue Gas/N2 Comp Bldg - Heat Pump 3	Cylinder end - flange	0.253	400.00	-8.42	0.05	0.96
1	1948	Inlet Header -	Threaded connection - 0.375"	0.253	10.00	750.99	29.48	0.02
3	1871	Co-Gen (Fuel Gas Scrubber SE Corner of Bldg) - Sight Glass	Gate valve - 0.75"	0.252	60.00	1371.88	35.75	0.15
4	3709	Sales Gas Header -	Orifice meter plate - 4"	0.250	150.00	237.91	36.19	0.36
4	3861	Re-Compression: Unit 3 -	Distance piece	0.249	2000.00	-1613.84	36.02	4.89
1	3124	Compressor CM-14 - Stem packing	Variable volume pocket stem	0.245	400.00	-20.15	28.60	0.99
2	4175	Cryo skid 101 - expander K101-A	Butterfly valve - 8"	0.242	700.00	28.84	29.59	1.76
4	3941C	Re-Compression: Unit 2 - FG Line 4	Union - 2"	0.239	100.00	618.41	34.49	0.26
4	3617	Yard North of Office -	Gate valve - 0.75"	0.238	60.00	1296.50	34.45	0.15
4	3696A	Cryo System: Chiller Outlet Separator Line - Gate valve seat	Open-ended line - 0.75"	0.237	60.00	654.56	0.55	0.15
4	3637	Sales Gas Header -	Orifice meter plate - 10"	0.237	150.00	217.52	34.28	0.39
1	3469	Refrig Comp Unit 12 -	Gate valve - 0.5"	0.236	60.00	1284.23	34.00	0.15
1	3301	HP Expander Scrubber (PV-503) -	Gate valve - 0.75"	0.235	60.00	1280.59	33.91	0.16
4	3676	Cryo System: Turbo Expander -	Threaded connection - 0.75"	0.234	10.00	695.26	33.85	0.03
4	3510	Regen Heater -	Threaded connection - 0.5"	0.233	10.00	691.96	33.70	0.03
3	1105	NRU 3 - Hot Box - Near TB0416	Open-ended line - 0.5"	0.232	60.00	639.99	27.83	0.16
4	3807	Re-Compression: Inlet Scrubber -	Gate valve - 1"	0.231	75.00	1242.22	33.45	0.20
1	3004	Inlet Comp Yard Piping -	Threaded connection - 0.5"	0.231	10.00	685.38	26.94	0.03
2	4321	Compressor Unit # 1 - on cylinder head bolts	Flange - 3"	0.231	75.00	619.83	33.25	0.20
2	4253	Compressor Unit 4 -	Valve cover	0.225	200.00	477.87	32.44	0.54
4	3892	Re-Compression: Unit 2 - Cylinder No. 4	Distance piece	0.223	2000.00	-1654.58	32.22	5.46
4	3793	Re-Compression: Valero Discharge Scrubber -	Gate valve - 0.75"	0.221	60.00	1200.89	32.02	0.16
1	3059	Lone Star Line - T's on flapper	Check valve - 8"	0.220	275.00	977.22	25.67	0.76
2	4211	Compressor Unit 3 - Body	Three-way valve - 2"	0.219	100.00	1148.16	31.61	0.28

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1200	NRU Expander 3 - Inlet Line	Control valve - 10"	0.219	459.00	200.09	26.20	1.28
2	4040	Mole Sieve Tower B -	Flange - 4"	0.218	75.00	582.77	26.71	0.21
3	1164	NRU 1 - Base of Cold Box - PV-4171	Control valve - 10"	0.217	459.00	194.71	25.99	1.29
1	3258	Solar Turbines - Sight glass valve	Gate valve - 1"	0.216	75.00	1154.49	31.10	0.21
3	Direct	Re-Comp 1 (E03400-1A) - Connected to same vent manifold as above stack.	Compressor Seal Drains - 2"	0.215	2000.00	-1667.36	25.70	5.67
4	3919D	Re-Compression: Unit 3 - FG Line 2	Union - 2"	0.212	100.00	539.46	30.70	0.29
2	4039	Mole Sieve Tower C -	Flange - 4"	0.208	75.00	551.40	25.44	0.22
1	3464	Refrig Comp Unit 12 -	Open-ended line - 0.75"	0.207	60.00	564.58	29.86	0.18
4	3869	Re-Compression: Unit 2 - Cylinder No. 2	Distance piece	0.207	2000.00	-1679.10	29.94	5.88
3	1730	HHE Compressor Building - Comp HHE 7	Threaded connection - 0.5"	0.205	10.00	606.21	24.50	0.03
2	4004B	Mole Sieve Tower D -	Threaded connection - 1"	0.204	15.00	600.13	24.98	0.04
3	1125	NRU 2 - Top Platform - A2339N	Gate valve - 10"	0.203	500.00	653.95	24.27	1.50
3	1911	Hg Removal Bed V8-401-2 - A401N-11	Gate valve - 0.75"	0.202	60.00	1088.89	24.17	0.18
2	4272	Compressor Unit 7 -	Valve cover	0.201	200.00	404.48	28.93	0.61
4	3557	TEG Still - Located down low.	Threaded connection - 1"	0.201	15.00	589.16	29.00	0.05
2	4008	Mole Sieve Tower A -	Gate valve - 0.5"	0.200	60.00	1079.27	24.48	0.18
3	1183	NRU 1 - Top Platform - GDW-22	Gate valve - 10"	0.200	500.00	637.67	23.93	1.52
1	3094	Compressor CM-13 - Stem packing	Variable volume pocket stem	0.199	400.00	-91.73	23.21	1.22
4	3783	Re-Compression: Piping Adjacent to Clark - PV-111B	Gate valve - 2"	0.199	100.00	1031.28	28.73	0.31
2	4117	Skid 2 Inlet -	Gate valve - 6"	0.198	245.00	879.93	24.17	0.75
1	3016	Inlet Comp Yard Piping -	Threaded connection - 2"	0.197	15.00	579.13	23.02	0.05
4	3935	Re-Compression: Unit 4 - FG Line 4	Plug valve - 2"	0.195	120.00	991.27	28.22	0.37
4	3865	Re-Compression: Unit 2 - Cylinder No. 1	Distance piece	0.194	2000.00	-1699.00	28.08	6.27
4	3852	Re-Compression: Unit 4 -	Valve cover	0.194	200.00	383.18	27.99	0.63
4	3705	Sales Gas Header - Analyzer blowdown	Orbit valve - 6"	0.192	245.00	849.72	27.80	0.78
1	3400	Cold Gas Separator (PV-505) -	Gate valve - 3"	0.190	120.00	960.63	22.15	0.38
4	3632	Top of MEA Contactor - Gate valve seat	Open-ended line - 1"	0.190	75.00	495.89	22.12	0.24
3	1235	NGL Bullet 5 - LG3059NB	Gate valve - 0.75"	0.186	60.00	999.38	0.05	0.20
4	3913C	Re-Compression: Unit 3 - FG Line 5	Flange - 2"	0.185	50.00	508.18	26.79	0.16
1	3401	Mole Sieve Tower 511B -	Flange - 2"	0.185	50.00	507.52	21.60	0.16
4	3910A	Re-Compression: Unit 3 - FG Line 6	Threaded connection - 2"	0.185	15.00	541.89	26.73	0.05
1	3317	Regen Gas Compressors/Blowers -	Threaded connection - 0.75"	0.183	10.00	542.22	21.39	0.03
3	1867	Residue Gas/N2 Comp Bldg: Res Comp 3 -	Threaded connection - 0.5"	0.183	10.00	541.21	26.01	0.03
2	4054	Inlet Scrubber - horn	Pressure relief valve - 4"	0.183	214.00	336.27	22.34	0.71
4	Direct	Refrigerant Compressor Unit 4 -	Crank case vent - 4"	0.182	2000.00	-1718.57	0.00	6.70
4	3825	Re-Compression: Yard Piping - Stem packing	Plug valve - 4"	0.181	200.00	831.89	26.21	0.67
4	Direct	Re-Compressor Unit 5 -	Seals vent	0.181	2000.00	-1719.67	26.15	6.73
3	1274	NGL Bullet 3 - A1101N-1	Gate valve - 3"	0.180	120.00	903.05	0.05	0.41
2	4246	Compressor Unit 3 -	Injector - 1"	0.176	200.00	801.11	25.35	0.69
1	3251	Solar Turbines -	Gate valve - 2"	0.175	100.00	893.59	25.13	0.35
3	1514	Residue Gas/N2 Comp Bldg: Lower Level -	Gate valve - 0.75"	0.174	60.00	930.93	25.61	0.21
4	3977	Refrigeration Compressors: Unit 2 - Common line	Packing case drains	0.173	2000.00	-1732.07	0.00	7.00
3	1685	Re-Compressor Building - Re-Comp 3 (Fuel Gas Line)	Ball valve - 2"	0.173	100.00	884.25	24.57	0.35
4	3593	Mole Sieve Dehy: Dehy Train A - Top of dehy tower	Flange - 18"	0.169	200.00	308.40	19.70	0.72

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1418	Residue Gas/N2 Comp Bldg - Comp 2	Cylinder end - flange	0.168	400.00	-139.47	23.89	1.45
4	3590	Mole Sieve Dehy: Dehy Train C -	Gate valve - 0.75"	0.168	60.00	894.07	19.56	0.22
3	1198	NRU Expander 2 - Inlet Line	Control valve - 10"	0.167	459.00	45.36	20.05	1.67
1	3334	Mole Sieve Tower 511C -	Flange - 2"	0.167	50.00	452.59	19.47	0.18
3	1100	NRU 3 - Base of Cold Box - Near TB-0470	Union - 0.5"	0.167	50.00	452.05	19.96	0.18
3	1458	Residue Gas/N2 Comp Bldg: Heat Pump 4 -	Valve cover	0.166	200.00	300.85	24.46	0.73
3	1557	Residue Gas/N2 Comp Bldg - Heat Pump 3	Valve cover	0.166	200.00	300.55	0.03	0.73
4	3965	Refrigeration Compressors: Unit 3 -	Needle valve - 0.75"	0.166	60.00	885.21	24.01	0.22
4	3618	Yard North of Office -	Threaded connection - 0.75"	0.164	10.00	482.90	23.66	0.04
3	1382	Amine Bldg: G8-1650 - Below A1650N-4	Threaded connection - 0.75"	0.163	10.00	480.26	19.49	0.04
4	3494	Inlet Header - Depressured line (open to air)	Open-ended line - 0.5"	0.163	60.00	429.57	19.73	0.22
3	1455	Residue Gas/N2 Comp Bldg - Heat Pump 4	Cylinder end - flange	0.162	400.00	-148.34	23.89	1.50
3	1187	NRU 3 - Top Platform - G2357N	Threaded connection - 0.375"	0.162	10.00	477.58	19.38	0.04
2	4129	Mole Sieve Tower B - from body	Ball valve - 2"	0.161	100.00	816.35	19.69	0.38
4	3526	South Heat Medium Heater - Pilot	Gate valve - 0.5"	0.160	60.00	853.19	23.19	0.23
3	1546	Residue Gas/N2 Comp Bldg - Heat Pump 2	Valve cover	0.160	200.00	281.00	23.49	0.76
2	4004C	Mole Sieve Tower D -	Threaded connection - 1"	0.160	15.00	465.50	19.51	0.06
3	1160	NRU 1 - Top Platform - C2302N	Gate valve - 3"	0.159	120.00	784.04	19.02	0.46
1	3046	Scrubber (PV-517) -	Gate valve - 1"	0.157	75.00	820.92	18.37	0.29
3	1373	Amine Bldg: Glycol-Gas Outlet Scrubber -	Gate valve - 1.5"	0.156	75.00	810.24	18.62	0.29
3	1236	NGL Bullet 5 - LG3059NA	Gate valve - 0.75"	0.155	60.00	820.18	0.04	0.24
3	1345A	Propane Yard: V8-411 - A411N-3	Gate valve - 1"	0.155	75.00	804.57	0.03	0.30
4	3883	Refrigeration Compression: Outside Yard Piping - Main fuel line orifice meter	Gate valve - 0.5"	0.154	60.00	818.74	22.32	0.24
2	4068	SE HP Inlet - on 8" plug valve	Grease nipple	0.154	50.00	825.80	18.82	0.20
4	3945E	Re-Compression: Unit 1 - FG Line 6	Threaded connection - 2"	0.154	15.00	447.93	22.22	0.06
4	Direct	Refrigerant Compressor Unit 3 -	Crank case vent - 4"	0.153	2000.00	-1762.52	0.00	7.95
4	3552	Glycol Reboiler: Fuel Gas - Chart recorder	Tubing connection - 0.5"	0.153	15.00	854.73	22.09	0.06
2	4004A	Mole Sieve Tower D -	Threaded connection - 1"	0.152	15.00	444.32	18.65	0.06
3	1619	IR Compressor Building - IR Comp 1 (Fuel Gas)	Union - 2"	0.152	100.00	357.82	21.60	0.40
4	3487	Inlet Yard Piping: Pig Traps -	Pig trap cover - 16"	0.151	150.00	304.30	18.30	0.61
1	3428	Refrig Comp Yard Piping -	Control valve - butterfly - 8"	0.150	353.00	98.34	0.00	1.43
2	4022	Mole Sieve Tower C -	Control valve - orbit - 4"	0.148	177.00	268.21	18.08	0.73
1	3033	Fuel Gas to Mansfield (222) -	Orbit valve - 3"	0.148	120.00	720.44	17.23	0.49
4	3839	Re-Compression: Yard Piping -	Gate valve - 2"	0.147	100.00	737.26	21.26	0.41
2	4078	Sales Piping - on 6" orifice meter	Slide valve	0.147	75.00	761.37	21.18	0.31
4	3549	Mole Sieve Dehy: Regen Heater -	Gate valve - 8"	0.147	350.00	484.65	21.20	1.45
1	3479	South of Low Press Inlet Compressors -	Gate valve - 1"	0.146	75.00	753.92	20.96	0.31
4	3698A	Cryo System: South Of Cold Gas Exchanger - Near FV-205B	Open-ended line - 0.75"	0.146	60.00	378.46	0.34	0.25
4	3624A	Yard North of Office - Gate valve seat	Open-ended line - 0.75"	0.143	60.00	370.41	16.68	0.26
2	4063	Surge Scrubber - sight glass	Gate valve - 0.75"	0.143	60.00	752.56	17.46	0.26
1	3227	HP Expander Scrubber (PV-503) -	Tubing connection - 0.375"	0.142	15.00	790.58	20.37	0.06
1	3013	Inlet Comp Yard Piping - Gate valve seat	Threaded connection - 0.75"	0.141	10.00	415.00	16.47	0.04
4	3849	Re-Compression: Yard Piping - Needle valve seat	Open-ended line - 0.5"	0.141	60.00	364.66	20.38	0.26

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1751	Residue Gas/N2 Comp Bldg - Comp 3 - crank case vent	Crank case vent - 2"	0.140	2000.00	-1782.43	19.95	8.67
1	3310	Dust Filters for Regen Gas -	Filter cover - 18"	0.140	150.00	272.83	16.38	0.65
2	4266	Compressor Unit # 5 -	Threaded connection - 0.375"	0.140	10.00	412.81	20.24	0.04
2	4357	Compressor Yard - Centre Residue Gas Cooler -	Gate valve - 3"	0.140	120.00	679.11	20.24	0.52
4	3489	WADD Flash Tank -	Control valve - globe - 4"	0.140	177.00	245.71	17.03	0.77
1	3058	Lone Star Line -	Threaded connection - 1"	0.140	15.00	407.06	16.35	0.07
1	3126	Compressor CM-14 - Stem packing	Variable volume pocket stem	0.140	400.00	-182.86	16.35	1.74
1	3019	To Fuel Gas Scrubber (PV-9) -	Gate valve - 3"	0.140	120.00	676.06	20.13	0.52
4	3919A	Re-Compression: Unit 3 - FG Line 2	Threaded connection - 2"	0.140	15.00	405.68	20.19	0.07
2	4174A	Cryo skid 101 - expander K101-B on gate valve	Open-ended line - 0.5"	0.138	60.00	356.56	16.91	0.26
3	1887	FG Piping on RES/N2/Heat Pump Bldg (outside) - A2400N-1	Gate valve - 3"	0.138	120.00	663.52	19.56	0.53
4	3886	Refrigeration Compression: Outside Yard Piping - Chart recorder (Unit 2)	Tubing connection - 0.375"	0.137	15.00	765.57	19.82	0.07
1	3090	West Inlet Yard Piping - On glycol dehy (PV-32)	Gate valve - 0.5"	0.137	60.00	719.84	15.99	0.27
3	1233	NGL Bullet 5 - LG3059B	Gate valve - 0.75"	0.137	60.00	718.98	0.04	0.27
4	3584	Mole Sieve Dehy: Regen Piping -	Gate valve - 1"	0.137	75.00	703.70	15.96	0.33
1	3108	Compressor CM-19 -	Valve cover	0.137	200.00	211.76	15.95	0.89
2	4138	Dehydrated gas to sales -	Gate valve - 6"	0.135	245.00	522.24	19.43	1.11
1	3439A	EP Skid to Koch -	Open-ended line - 0.75"	0.134	60.00	344.39	0.24	0.27
1	3193	Solar Turbines: Unit A - Fuel gas scrubber piping	Threaded connection - 0.5"	0.134	10.00	393.75	19.30	0.05
1	3156	Refrig Comp Unit 11 -	Valve cover	0.134	200.00	203.63	0.00	0.91
3	1874	Co-Gen (Fuel Gas Scrubber SE Corner of Bldg) -	Gate valve - 0.75"	0.133	60.00	699.02	18.95	0.27
1	3443	De-propanizer Accumulator (PV-11) -	Pump seal	0.133	500.00	-293.57	0.23	2.29
4	3905	Re-Compression: Unit 2 - Bonnet	Plug valve - 3"	0.133	150.00	606.27	19.21	0.69
1	3210	Solar Turbines: Header Outside -	Needle valve - 0.5"	0.133	60.00	694.97	19.09	0.28
4	3703	Sales Gas Header -	Gate valve - 4"	0.132	190.00	563.95	19.15	0.87
4	3569	Mole Sieve Dehy: Common Line -	Gate valve - 2"	0.132	100.00	652.45	15.43	0.46
2	3996	Inlet Line - PECO brand	Pressure transmitter - 1.5"	0.132	75.00	676.52	16.15	0.35
1	3175	Solar Turbines: Unit B - On skid	Gate valve - 2"	0.132	100.00	649.06	18.94	0.46
4	3899	Re-Compression: Unit 1 -	Needle valve - 0.5"	0.131	60.00	687.42	18.98	0.28
3	1121	NRU 2 - Near TB0396	Union - 1"	0.131	100.00	294.20	15.67	0.47
4	3587	Mole Sieve Dehy: Regen Piping -	Gate valve - 1"	0.130	75.00	664.14	15.15	0.35
3	1723	HHE Compressor Building - Comp HHE 7	Threaded connection - 0.5"	0.130	10.00	380.27	15.52	0.05
3	1246	NGL Bullet 4 - LG3058-A	Gate valve - 0.75"	0.130	60.00	677.57	0.04	0.28
3	1014	Mole Sieve Header - XY2821NC	Flange - 8"	0.129	100.00	287.26	15.40	0.47
3	1496	Residue Gas/N2 Comp Bldg - Heat Pump 2	Cylinder end - flange	0.128	400.00	-201.19	18.87	1.90
4	3605	Yard North of Office - Orifice meter equalizer	Valve - 1"	0.128	75.00	652.07	18.47	0.36
4	3562	Mole Sieve Dehy: Outlet - Stem packing	Gate valve - 12"	0.128	595.00	131.12	14.89	2.84
4	3778	Central Yard - Between C3 Compressors and Gen Building	Gate valve - 6"	0.127	245.00	478.93	18.39	1.17
4	3535	North Heat Medium Heater - Pilot	Gate valve - 0.5"	0.126	60.00	658.31	18.24	0.29
3	1405	Residue Gas/N2 Comp Bldg: Yard -	Gate valve - 4"	0.126	190.00	527.08	17.90	0.92
3	1928	Dehydration Tower # 1 west - B2802N-1	Ball valve - 1"	0.123	75.00	624.72	14.72	0.37

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
1	3449	Refrig Comp Unit 12 -	Threaded connection - 0.5"	0.122	10.00	357.55	0.00	0.05
3	1079	NRU 3 - A2311N	Open-ended line - 0.5"	0.121	60.00	305.59	14.53	0.30
1	3099	Compressor CM-13 -	Cylinder end - flange	0.121	400.00	-212.45	14.12	2.01
3	1276	NGL Bullet 3 - A1101N-24	Gate valve - 0.5"	0.121	60.00	628.22	0.03	0.30
2	4167	Cryo skid north - Note: was fixed already on expander	Control valve - 10"	0.121	459.00	-95.77	14.75	2.32
4	3702	Sales Gas Header - Gate valve seat	Open-ended line - 1"	0.120	75.00	286.64	17.36	0.38
3	1367	Amine Bldg: Near V8-2701N-11 -	Gate valve - 12"	0.120	595.00	87.20	14.35	3.02
4	3813	Re-Compression: Yard Piping -	Gate valve - 3"	0.120	120.00	561.82	17.32	0.61
3	1313	NGL Bullet 1 - A1101N-1	Gate valve - 4"	0.119	190.00	489.69	0.03	0.97
2	4014	Mole Sieve Tower A -	Control valve - orbit - 4"	0.119	177.00	181.82	14.57	0.90
4	3588	Mole Sieve Dehy: Regen Piping -	Gate valve - 1"	0.119	75.00	602.94	13.90	0.38
3	1518	Residue Gas/N2 Comp Bldg - Heat Pump 2	Valve cover	0.119	200.00	157.69	17.47	1.03
3	1190	NRU Expander 1 - Valve 415-11	Control valve - 10"	0.118	459.00	-102.30	14.18	2.36
3	1351	Process Heater - B2803N-20 (E028005A)	Ball valve - 1"	0.118	75.00	598.18	16.81	0.39
4	3623	Yard North of Office - Gate valve seat	Threaded connection - 0.75"	0.118	10.00	345.13	13.76	0.05
2	4243	Compressor Unit 3 -	Flange - 1"	0.118	50.00	304.21	16.95	0.26
3	1099	Amine Bldg: V8-404N - Filter Cover	Filter cover - 20"	0.117	200.00	150.98	13.95	1.04
1	3298	High Pressure JT Expander -	Tubing connection - 0.5"	0.116	15.00	647.77	16.76	0.08
3	1398	Residue Gas/N2 Comp Bldg - Comp 1 (Suction Bottle Throw 1/2)	Flange - 10"	0.116	150.00	200.17	16.52	0.79
3	1080	Mole Sieve 3 - Ground level	Gate valve - 0.75"	0.115	60.00	595.12	13.78	0.32
4	3822	Re-Compression: Yard Piping -	Gate valve - 0.5"	0.114	60.00	590.51	16.52	0.32
3	1062	Mole Sieve Header - PDSL-2860N	Tubing connection - 0.375"	0.114	15.00	634.65	13.67	0.08
3	1074	NRU 3 - A412N-13	Gate valve - 10"	0.113	500.00	144.18	13.55	2.69
1	1981	Inlet Header - Chart recorder	Tubing connection - 0.375"	0.113	15.00	627.81	13.18	0.08
2	Direct	Compressor Unit # 6 -	Compressor seals vent - 2"	0.112	2000.00	-1825.81	15.94	10.83
4	3746	Cryo System: Absorber Tower (20.001) - First platform	Gate valve - 0.75"	0.112	60.00	579.77	0.26	0.32
3	1513	Residue Gas/N2 Comp Bldg: Lower Level - A301N-109	Gate valve - 0.75"	0.112	60.00	578.54	15.94	0.33
2	4251	Compressor Unit 4 -	Valve cover	0.112	200.00	137.83	16.17	1.09
3	1046	Mole Sieve 1 - A2811N-3	Gate valve - 0.5"	0.111	60.00	574.51	13.35	0.33
3	1254	NGL Pump 2 - A1201N-4	Gate valve - 4"	0.111	190.00	444.40	0.03	1.04
4	3675	Cryo System: Turbo Expander -	Tubing connection - 0.5"	0.111	15.00	617.08	0.26	0.08
4	3507	Regen Heater -	Gate valve - 1"	0.110	75.00	552.05	15.93	0.41
3	1212	NGL Pump 5 - ---	Pump seal	0.110	500.00	-329.33	0.03	2.76
2	4377	Compressor Unit # 6 -	Cylinder end - flange	0.110	400.00	-229.91	15.82	2.22
1	---	Refrig Comp Unit 11 -	Compressor seals - 1"	0.109	2000.00	-1830.31	0.00	11.12
2	4282	Compressor Unit 5 - VVP Stem same cylinder as 4283	Cylinder end - flange	0.109	400.00	-230.89	15.73	2.23
4	3921B	Re-Compression: Unit 3 - FG Line 1	Plug valve - 2"	0.108	120.00	496.64	15.66	0.67
4	3896	Re-Compression: Unit 1 - Cylinder No. 2	Distance piece	0.108	2000.00	-1832.72	15.61	11.28
3	1223	NGL Pump 2 -	Pump seal - 1"	0.108	500.00	-332.74	0.03	2.82
4	3922B	Re-Compression: Unit 5 - FG Line 2	Plug valve - 2"	0.107	120.00	490.76	15.51	0.68
4	3914	Re-Compression: Unit 3 - FG Line 4	Threaded connection - 2"	0.106	15.00	304.62	15.34	0.09
1	3314	Dust Filters for Regen Gas -	Gate valve - 3"	0.106	120.00	484.04	12.38	0.69
2	4291	Compressor Yard - Compressor unit 4	Orbit valve - 4"	0.106	190.00	413.90	15.29	1.09
4	3841	Re-Compression: Yard Piping -	Gate valve - 0.5"	0.106	60.00	542.80	15.31	0.34
1	3418	Refrig Comp Unit 12 - Yard Piping -	Orbit valve - 6"	0.106	245.00	357.51	0.00	1.41

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1841	Stab 1 Heat Medium Building -	Threaded connection - 3"	0.106	25.00	293.41	15.03	0.14
4	3578	Mole Sieve Dehy: Dehy Tower A -	Gate valve - 0.5"	0.106	60.00	541.26	12.33	0.35
1	3185	Refrig Comp Unit 10 -	Open-ended line - 0.25"	0.105	60.00	255.58	0.00	0.35
3	1279	NGL Bullet 3 - A1101N-7	Gate valve - 4"	0.104	190.00	404.12	0.03	1.11
4	3759	C3 Refrigeration: PSV Header - Outside Refrig Comp Building	Control valve - plug - 3"	0.104	141.00	172.95	0.00	0.82
4	3910B	Re-Compression: Unit 3 - FG Line 6	Plug valve - 2"	0.104	120.00	469.49	14.97	0.71
3	1462	Residue Gas/N2 Comp Bldg - Heat Pump 4	Valve cover	0.103	200.00	110.75	15.18	1.18
2	4079	Common inlet lines -	Gate valve - 8"	0.103	350.00	236.98	12.61	2.07
3	1136	NRU 3 - A409N-11	Gate valve - 4"	0.103	190.00	396.41	12.34	1.12
2	4114	Skid 2 Inlet -	Gate valve - 8"	0.103	350.00	235.46	12.58	2.07
3	1857	Residue Gas/N2 Comp Bldg: Heat Pump 4 -	Threaded connection - 0.5"	0.102	10.00	296.11	14.95	0.06
1	3061	HP Cooler -	Gate valve - 0.75"	0.101	60.00	516.70	11.82	0.36
1	3201	Solar Turbines: Unit B - Fuel gas filter piping	Threaded connection - 0.5"	0.101	10.00	294.94	14.58	0.06
4	3928	Re-Compression: Unit 4 -	Union - 0.75"	0.101	50.00	254.51	14.62	0.30
3	1318	Propane Yard: V8-411 - G411N-1	Gate valve - 2"	0.101	100.00	474.94	0.02	0.60
3	1358	Amine Bldg: Near V8-2701N-2 - Near A2701N-9 (stem and seat)	Gate valve - 0.5"	0.101	60.00	513.25	12.06	0.36
2	4029	Mole Sieve Tower C -	Control valve - orbit - 8"	0.100	353.00	-50.47	12.28	2.14
3	1550	HP1 Bldg: E35-04 - PV-216-3	Control valve - ball - 1"	0.0993	130.00	168.98	11.89	0.80
2	4147	Compressor Unit 4 Outside -	Threaded connection - 2"	0.0990	15.00	283.28	14.28	0.09
1	3010	Inlet Comp Yard Piping - Gate valve seat	Threaded connection - 0.75"	0.0989	10.00	287.94	11.54	0.06
1	3331	Mole Sieve Tower 511C -	Gate valve - 0.75"	0.0986	60.00	501.42	11.51	0.37
4	3912	Re-Compression: Unit 4 - FG Line 5	Plug valve - 2"	0.0985	120.00	440.88	14.25	0.74
1	3454	Refrig Comp Unit 12 -	Open-ended line - 0.5"	0.0984	60.00	236.48	0.00	0.37
3	1259	NGL Pump 3 - A1201N-7	Gate valve - 4"	0.0982	190.00	368.94	0.03	1.18
2	4110	After Filter - 4 tubing connections	Tubing connection - 0.375"	0.0979	15.00	542.53	11.98	0.09
3	1868	Residue Gas/N2 Comp Bldg: Res Comp 3 -	Threaded connection - 0.5"	0.0978	10.00	284.54	13.90	0.06
1	3102	Compressor CM-9 -	Threaded connection - 2"	0.0973	15.00	278.22	11.36	0.09
1	3342	Mole Sieve Tower 511A -	Flange - 8"	0.0973	100.00	192.95	11.35	0.63
3	1929	Dehydration Tower # 1 west -	Gate valve - 0.75"	0.0969	60.00	491.46	11.60	0.38
3	1402	Residue Gas/N2 Comp Bldg: Yard -	Gate valve - 4"	0.0968	190.00	361.31	13.76	1.19
4	3781	Re-Compression: Fuel Gas Piping -	Threaded connection - 0.25"	0.0965	10.00	280.72	13.95	0.06
3	1737	HHE Compressor Building - Comp HHE 8	Threaded connection - 0.5"	0.0965	10.00	280.58	11.55	0.06
3	1930	Dehydration Tower # 1 west - A2802N-3	Gate valve - 10"	0.0964	500.00	49.05	11.55	3.16
1	1977	Inlet Header - Buried	Gate valve - 4"	0.0962	190.00	357.88	11.23	1.20
2	4367	Compressor Unit # 1 - stem packing	Control valve - orbit - 3"	0.0962	141.00	148.72	13.87	0.89
4	3755	Cryo System: De-methanizer Reboiler -	Gate valve - 4"	0.0959	190.00	356.05	0.22	1.21
4	3942D	Re-Compression: Unit 2 - FG Line 1	Union - 2"	0.0958	100.00	188.40	13.84	0.64
4	3625A	Yard North of Office - On orifice meter	Gate valve - 0.5"	0.0957	60.00	484.59	11.16	0.38
3	1790	Stab 1 Building (Yard) - A410N-6 (NGL Vessel)	Threaded connection - 0.5"	0.0955	10.00	277.72	0.20	0.06
3	1447	Residue Gas/N2 Comp Bldg: Lower Level -	Gate valve - 10"	0.0951	500.00	41.21	13.51	3.20
4	3625B	Yard North of Office - On orifice meter (gate valve seat)	Open-ended line - 0.5"	0.0949	60.00	225.84	11.07	0.38

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
4	3710	Sales Gas Header - On 4" orifice meter.	Grease nipple	0.0947	50.00	489.30	13.70	0.32
1	3179	Solar Turbines: Unit B - On skid	Gate valve - 1.5"	0.0946	75.00	463.58	13.62	0.48
2	4210	Compressor Unit 3 - on 3-Way 4211	Three-way valve vent - 0.5"	0.0944	60.00	477.37	13.61	0.39
3	1659	Re-Compressor Building - Re-Comp 2	Threaded connection - 0.5"	0.0944	10.00	274.31	11.30	0.06
2	4258	Compressor Unit # 5 -	Threaded connection - 1.5"	0.0944	15.00	269.31	13.61	0.10
3	1294	NGL Bullet 1 - Near A1101N-8	Gate valve - 0.75"	0.0942	60.00	476.09	0.03	0.39
4	3662	Cryo System: Warm Gas Exchanger -	Gate valve - 10"	0.0941	500.00	35.82	0.22	3.23
3	1170	NRU 1 - A412N-1	Gate valve - 10"	0.0937	500.00	33.46	11.22	3.25
2	4347	Compressor Yard - Near Engine/Heater Fuel ESD -	Plug valve - 2"	0.0936	120.00	412.68	13.49	0.78
4	3577	Mole Sieve Dehy: Dehy Tower A -	Gate valve - 1.5"	0.0933	75.00	456.36	10.89	0.49
1	3462	Refrig Comp Unit 12 -	Valve cover	0.0932	200.00	80.82	0.00	1.31
4	3564	Mole Sieve Dehy: Outlet -	Gate valve - 0.75"	0.0932	60.00	470.41	10.87	0.39
1	3130	Glycol Reboiler -	Control valve - butterfly - 0.5"	0.0924	130.00	148.46	13.31	0.86
4	3756	Cryo System: Economizer -	Gate valve - 4"	0.0924	190.00	336.11	0.21	1.25
1	1983	Inlet Header -	Threaded connection - 0.75"	0.0923	10.00	268.00	10.77	0.07
4	3502	Regen Heater -	Gate valve - 1.5"	0.0920	75.00	448.80	13.30	0.50
3	1162	NRU 1 - PSV4123-1	Union - 0.75"	0.0916	50.00	226.01	10.97	0.33
3	1142	NRU 2 - A415N-62	Gate valve - 0.75"	0.0912	60.00	459.29	10.92	0.40
3	1175	NRU 1 - TE411NB-1	Flange - 10"	0.0909	150.00	123.88	10.89	1.00
3	1692	Re-Compressor Building - Re-Comp 3 (Distance Piece to Drain)	Distance Piece - 1"	0.0906	2000.00	-1859.56	10.85	13.44
1	3106	Compressor CM-19 -	Valve cover	0.0906	200.00	72.92	10.57	1.34
4	3961	Refrigeration Compressors: Unit 3 -	Flange - 1"	0.0905	50.00	222.72	13.09	0.34
1	3147	Refrig Comp Unit 11 - Plug on cylinder body.	Threaded connection - 0.25"	0.0902	10.00	261.66	0.00	0.07
4	3858	Re-Compression: Unit 3 - Cylinder No. 1	Distance piece	0.0900	2000.00	-1860.53	13.01	13.53
2	4371	Compressor Unit # 2 - stem packing	Control valve - ball - 2"	0.0898	130.00	140.59	0.00	0.88
2	4000	Inlet Line -	Threaded connection - 2"	0.0892	15.00	253.54	10.90	0.10
1	3312	Dust Filters for Regen Gas -	Gate valve - 0.75"	0.0890	60.00	446.50	10.38	0.41
3	1026	NRU 3 - Base of Cold Box - A2346N	Gate valve - 10"	0.0888	500.00	5.75	10.64	3.43
2	4157	Residue Compressors FG Scrubber - sight glass	Gate valve - 0.75"	0.0887	60.00	444.68	12.78	0.41
3	1673	Re-Compressor Building - Re-Comp 4 (Fuel Gas Manifold)	Flange - 2"	0.0884	50.00	216.25	12.56	0.34
2	4249	Compressor Unit 3 -	Threaded connection - 0.5"	0.0882	10.00	255.66	12.71	0.07
3	1437	Residue Gas/N2 Comp Bldg - Heat Pump 1	Threaded connection - 0.375"	0.0879	10.00	254.73	12.93	0.07
2	4121	Free Water KO - horn	Pressure relief valve - 2"	0.0879	135.00	129.66	10.75	0.94
3	1664	Re-Compressor Building - Re-Comp 3	Threaded connection - 0.5"	0.0872	10.00	252.78	10.45	0.07
4	3967	Refrigeration Compressors: Unit 2 -	Governor - 2"	0.0871	200.00	295.56	12.59	1.40
2	4242	Compressor Unit 3 - front flange seam	Cylinder body	0.0861	400.00	-266.49	12.42	2.83
1	1978	Inlet Header -	Gate valve - 0.75"	0.0861	60.00	430.31	10.05	0.42
3	1413	Residue Gas/N2 Comp Bldg - Comp 1	Gate valve - 0.75"	0.0856	60.00	427.49	12.17	0.43
1	3127	Compressor CM-14 - On governor	Flange - 2"	0.0852	50.00	206.68	9.94	0.36
4	3720	Cryo System: De-methanizer Tower (1st Platform) -	Gate valve - 0.75"	0.0851	60.00	424.63	0.20	0.43
1	3238	Solar Turbines: Unit A - On skid	Gate valve - 1.5"	0.0851	75.00	409.34	12.25	0.54
2	4200	Compressor Unit # 3 -	Valve cover	0.0847	200.00	55.07	12.21	1.44
1	3333	Mole Sieve Tower 511C -	Flange - 8"	0.0845	100.00	154.36	9.85	0.72

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
2	4364	Compressor Unit # 2 -	Control valve - ball - 2"	0.0844	130.00	124.19	12.16	0.94
2	4309	Compressor Unit # 1 -	Valve cover	0.0843	200.00	53.86	0.00	1.44
3	1919	Hg Removal Bed V8-401-1 - near A401N-3	Flange - 3"	0.0839	75.00	177.62	10.04	0.54
3	1856	Amine Bldg - Analyzer AX-2300 Vent	Vent - 0.375"	0.0838	NE	---	10.04	NA
1	3453	Refrig Comp Unit 12 -	Valve cover	0.0838	200.00	52.39	0.00	1.45
3	1408	Residue Gas/N2 Comp Bldg: Yard -	Open-ended line - 2"	0.0835	100.00	151.48	11.87	0.73
1	1982	Inlet Header -	Gate valve - 0.75"	0.0834	60.00	414.59	9.73	0.44
3	1123	NRU 2 - Top Platform - A2333N	Gate valve - 0.5"	0.0831	60.00	412.94	9.95	0.44
1	3284	HP Expander Scrubber (PV-503) -	Gate valve - 1"	0.0828	75.00	396.43	11.92	0.55
3	1245	NGL Bullet 4 - A1101N-11	Gate valve - 6"	0.0815	245.00	218.96	0.02	1.83
1	3100	Compressor CM-13 -	Threaded connection - 0.5"	0.0815	10.00	235.48	9.51	0.07
1	3303	Dust Filter Header -	Threaded connection - 0.5"	0.0811	10.00	234.40	9.47	0.08
3	1670	Re-Compressor Building - Re-Comp 1 (WE4C-301-1) (Start Gas)	Threaded connection - 2"	0.0810	15.00	229.12	11.52	0.11
4	3694B	Cryo System: Chiller Outlet Separator - Stem packing	Gate valve - 0.75"	0.0808	60.00	400.04	0.19	0.45
3	1480	Residue Gas/N2 Comp Bldg: Back Wall -	Gate valve - 10"	0.0808	500.00	-40.08	11.48	3.77
3	1320	Propane Yard: V8-411 - A411N-3	Gate valve - 16"	0.0807	920.00	-460.41	0.02	6.94
1	3231	Solar Turbines: Unit B - On skid	Union - 1.5"	0.0806	100.00	142.78	11.61	0.76
1	3343	Mole Sieve Tower 511A -	Flange - 2"	0.0804	50.00	192.18	9.38	0.38
4	3926	Re-Compression: Unit 4 -	Plug valve - 3"	0.0791	150.00	300.10	11.43	1.15
2	4245	Compressor Unit 3 -	Flange - 1"	0.0788	50.00	187.32	11.36	0.39
2	4013	After Filter -	Flange - 8"	0.0785	100.00	136.49	9.60	0.78
3	1691	IR Compressor Building - IR Comp 1	Crank case vent - 2"	0.0783	2000.00	-1878.61	9.38	15.54
4	3877	Generators - Outside under walkway on orifice meter.	Union - 2"	0.0781	100.00	135.17	11.29	0.78
3	1654	Re-Compressor Building - Re-Comp 2 (WE4C-301-2) (Fuel Gas Line)	Threaded connection - 2"	0.0781	15.00	220.17	11.10	0.12
3	1828	Fuel Gas To Co-Gen - VO-31	Gate valve - 6"	0.0774	245.00	195.81	11.01	1.93
3	1035	Mole Sieve Header - A2811N-29	Gate valve - 1"	0.0771	75.00	363.84	9.23	0.59
4	Direct	Re-Compressor Unit 2 -	Seals vent	0.0771	2000.00	-1880.56	11.14	15.80
1	3402	Mole Sieve Tower 511B -	Flange - 2"	0.0768	50.00	181.21	8.96	0.40
3	1934	Heater # 5 - RJK -240	Gate valve - 3"	0.0767	120.00	316.86	10.91	0.95
1	3350	Mole Sieve Tower 511B -	Gate valve - 0.75"	0.0767	60.00	376.69	8.95	0.48
4	3553	Glycol Reboiler: Fuel Gas -	Gate valve - 0.5"	0.0764	60.00	374.69	11.04	0.48
4	3627A	Yard North of Office - On orifice meter (damaged body)	Orifice meter plate - 0.625"	0.0763	150.00	-31.72	8.91	1.20
3	1917	Hg Removal Bed V8-401-1 - near A401N-4	Flange - 3"	0.0763	75.00	154.82	9.14	0.60
1	3040	Lone Star Line -	Threaded connection - 2"	0.0762	15.00	214.50	8.89	0.12
3	1350	Process Heater - Near LG2810N-2	Threaded connection - 2"	0.0759	15.00	213.61	10.79	0.12
1	3028	Fuel Gas to Mansfield (222) -	Threaded connection - 0.375"	0.0752	10.00	216.56	8.78	0.08
1	3095	Compressor CM-13 - Stem packing	Variable volume pocket stem	0.0751	400.00	-283.65	8.76	3.24
3	1555	Residue Gas/N2 Comp Bldg - Heat Pump 3	Threaded connection - 0.5"	0.0746	10.00	214.60	0.01	0.08
2	4359	Compressor Unit # 3 -	Control valve - ball - 2"	0.0745	130.00	94.34	10.74	1.06
1	3045	Scrubber (PV-517) -	Gate valve - 0.75"	0.0742	60.00	362.46	8.66	0.49
4	3595	Mole Sieve Dehy: Dehy Train B - Top of dehy tower	Flange - 18"	0.0736	200.00	21.71	8.59	1.65
2	4324	Compressor Unit # 1 -	Needle valve - 0.25"	0.0736	60.00	358.86	10.61	0.50
3	1307	NGL Bullet 1 - LG1101-A	Gate valve - 0.75"	0.0725	60.00	352.73	0.02	0.50
3	1700	Re-Compressor Building - Associated Yard Piping (Near G8-311-1) Cooler	Gate valve - 3"	0.0723	120.00	291.37	8.65	1.01

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
1	3445	Refrig Comp Unit 12 -	Valve cover	0.0721	200.00	17.06	0.00	1.69
4	3534	Heat Medium Fuel Gas Header - Stem	Needle valve - 0.5"	0.0719	60.00	349.03	10.39	0.51
3	1289	NGL Bullet 2 - A1101N-16	Gate valve - 0.75"	0.0718	60.00	348.68	0.02	0.51
3	1018	Mole Sieve 2 - XY2813N0	Orbit valve - 8"	0.0718	350.00	58.55	8.59	2.97
2	4094	Tower by D-208 -	Threaded connection - 1"	0.0716	15.00	200.68	8.76	0.13
1	3252	Solar Turbines -	Gate valve - 2"	0.0711	100.00	304.81	10.24	0.86
2	4075	Sales Piping - on 6" orifice meter	Rack	0.0707	75.00	327.59	10.19	0.65
1	3366	Inlet Gas Scrubber (PV-501) -	Gate valve - 1"	0.0705	75.00	326.37	8.23	0.65
3	1158	NRU 1 - Top Platform - G2314N	Threaded connection - 0.5"	0.0701	10.00	201.28	8.40	0.09
1	3386	High Pressure Chiller -	Control valve - globe - 2"	0.0698	130.00	80.22	0.00	1.13
1	3104	Compressor CM-9 -	Threaded connection - 2"	0.0696	15.00	194.73	8.13	0.13
1	3014	Inlet Comp Yard Piping -	Gate valve - 6"	0.0694	245.00	149.87	8.09	2.15
1	3335	Mole Sieve Tower 511C -	Flange - 2"	0.0694	50.00	158.90	8.09	0.44
3	1042	Mole Sieve 3 -	Flange - 8"	0.0692	100.00	108.31	8.28	0.88
3	1796	Fuel Gas Scrubber (V8-1720) - A1720-7	Gate valve - 1"	0.0689	75.00	317.43	9.80	0.66
1	3160	Refrig Comp Unit 11 -	Valve cover	0.0687	200.00	7.04	0.00	1.77
4	3978	Power Generators: Unit 1 -	Threaded connection - 3"	0.0683	25.00	363.77	9.87	0.22
1	3197	Solar Turbines: Unit A - Fuel gas scrubber piping	Gate valve - 2"	0.0677	100.00	285.39	9.75	0.90
1	3069	Compressor CM-9 -	Cylinder end - flange	0.0673	400.00	-295.65	7.86	3.62
4	3581	Mole Sieve Dehy: Regen Piping -	Gate valve - 1"	0.0673	75.00	308.26	7.86	0.68
4	3544	North Heat Medium Heater - Pilot stem	Gate valve - 0.5"	0.0673	60.00	322.90	9.72	0.54
3	1161	NRU 1 - Near A2517N (Gate valve seat).	Open-ended line - 0.75"	0.0669	60.00	141.53	8.01	0.55
1	3266	Solar Turbines -	Gate valve - 1"	0.0666	75.00	304.25	9.59	0.69
4	3760	Cryo System: Economizer -	Gate valve - 4"	0.0664	190.00	188.22	0.15	1.74
3	1384	Amine Bldg: On Platform - A2809N-5	Gate valve - 12"	0.0664	595.00	-217.25	7.95	5.46
4	3803	Re-Compression: Yard Piping -	Gate valve - 1"	0.0663	75.00	302.30	9.58	0.69
4	3938B	Re-Compression: Unit 4 - FG Line 1	Union - 2"	0.0661	100.00	99.21	9.56	0.92
1	3111	Compressor CM-19 -	Filter cover - 4"	0.0652	25.00	171.51	7.61	0.23
4	3942A	Re-Compression: Unit 2 - FG Line 1	Threaded connection - 2"	0.0652	15.00	181.25	9.42	0.14
2	4244	Compressor Unit 3 -	Flange - 1"	0.0649	50.00	145.61	9.36	0.47
2	4218	Compressor Unit # 9 - flange	Cylinder body	0.0648	400.00	-299.53	9.34	3.76
3	1610	IR Compressor Building - East Lobe Lift Comp (E4-322) G322-2	Gate valve - 2"	0.0645	100.00	266.96	7.72	0.94
1	3257	Solar Turbines -	Gate valve - 1"	0.0644	75.00	291.70	9.27	0.71
4	3570	Mole Sieve Dehy: Dehy Tower B - Regen Gas	Flange - 4"	0.0643	75.00	118.58	7.50	0.71
1	3217	Solar Turbines: Header Outside -	Gate valve - 2"	0.0640	100.00	264.30	9.21	0.95
3	1145	NRU 2 - A491N-8	Gate valve - 1"	0.0640	75.00	289.08	7.66	0.71
1	3233	Solar Comp Unit B -	Union - 1.5"	0.0637	100.00	91.99	9.18	0.95
4	3947A	Re-Compression: Unit 1 - FG Line 4	Threaded connection - 2"	0.0636	15.00	176.44	9.19	0.14
3	1634	Re-Compressor Building - Re-Comp 1 (WE4C-301-1)	Threaded connection - 0.5"	0.0635	10.00	181.28	7.60	0.10
4	3945A	Re-Compression: Unit 1 - FG Line 6	Threaded connection - 2"	0.0635	15.00	176.21	9.18	0.14
1	1945	Inlet Header -	Plug valve - 3"	0.0633	150.00	210.27	7.39	1.44
1	3360	Inlet Scrubber (PV-504) -	Gate valve - 3"	0.0632	120.00	240.04	9.11	1.15
4	3483	Inlet Yard Piping: Pig Traps -	Pig trap cover - 1"	0.0631	15.00	174.95	7.65	0.14
2	4217	Compressor Unit # 9 - flange	Cylinder end - flange	0.0631	400.00	-302.27	9.09	3.86
2	4192	Compressor Unit 2 - VVP Stem	Cylinder end - flange	0.0629	400.00	-302.50	9.07	3.87
3	1924	Dehydration Tower # 2 east - 1st platform	Tubing connection - 0.375"	0.0627	15.00	341.71	7.50	0.15

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
4	3551	Still Reboiler No. 2 - On orifice meter	Threaded connection - 0.5"	0.0625	10.00	178.29	9.04	0.10
3	1339	Amine Bldg: V8-2810N -	Tubing connection - 0.375"	0.0621	15.00	338.73	7.44	0.15
3	1172	NRU 1 - A413N-2	Gate valve - 3"	0.0621	120.00	233.26	7.43	1.18
1	3409	Mole Sieve Common Piping -	Gate valve - 3"	0.0618	120.00	231.87	7.21	1.18
1	3283	HP Expander Scrubber (PV-503) -	Gate valve - 1"	0.0614	75.00	274.70	8.84	0.74
3	1635	Re-Compressor Building - Re-Comp 1 (WE4C-301-1)	Threaded connection - 0.5"	0.0614	10.00	174.96	7.35	0.10
3	1146	NRU 2 - 2nd Platform - G413N-17	Gate valve - 0.75"	0.0613	60.00	289.21	7.35	0.60
2	4107	North oil heater -	Threaded connection - 2"	0.0612	15.00	169.30	7.48	0.15
3	1900	Hg Removal Bed V8-401-3 - plug on A401N-11 GTV seat leak	Threaded connection - 0.5"	0.0611	10.00	174.18	7.32	0.10
3	1680	Re-Compressor Building - Re-Comp 3	Threaded connection - 0.5"	0.0611	10.00	173.98	7.31	0.10
3	1309	NGL Bullet 1 - A1101N-5	Gate valve - 0.75"	0.0610	60.00	287.46	0.02	0.60
3	1923	Hg Removal Bed V8-401-3 - NV seat off A401N-15	Open-ended line - 0.25"	0.0606	60.00	122.64	7.26	0.60
4	3832	Re-Compression: Yard Piping -	Gate valve - 2"	0.0606	100.00	245.03	8.76	1.00
3	1036	Mole Sieve 3 - ZSC2851N	Orbit valve - 2"	0.0606	100.00	244.87	7.25	1.00
1	3465	Refrig Comp Unit 12 -	Valve - 1.5"	0.0605	75.00	269.27	8.71	0.75
1	3112	Compressor CM-9 -	Crank case vent - 2"	0.0601	2000.00	-1906.78	7.02	20.24
3	1210	NGL Sales Line - Filter/Vessel	Threaded connection - 12"	0.0597	100.00	79.70	0.02	1.02
2	4350B	C3 Cooler - 4 threaded connections	Threaded connection - 1"	0.0592	15.00	163.30	0.00	0.15
4	3545	North Heat Medium Heater - Pilot stem	Gate valve - 0.5"	0.0591	60.00	276.48	8.55	0.62
4	3890	Re-Compression: Inlet Scrubber - Sight glass	Gate valve - 0.75"	0.0591	60.00	276.48	8.55	0.62
3	1365	Amine Bldg: Near V8-2701N-11 -	Gate valve - 10"	0.0590	500.00	-164.15	7.06	5.16
3	1265	Amine Bldg: Near V8-2701N-11 -	Gate valve - 10"	0.0590	500.00	-164.15	7.06	5.16
3	1554	HP1 Bldg: E26-13 - To drain.	Open-ended line - 0.375"	0.0590	60.00	117.64	7.06	0.62
1	3110	Compressor CM-19 -	Threaded connection - 0.5"	0.0587	10.00	166.95	6.86	0.10
1	3029	Fuel Gas to Mansfield (222) -	Threaded connection - 0.375"	0.0587	10.00	166.69	6.85	0.10
4	3817	Re-Compression: Yard Piping -	Union - 2"	0.0584	100.00	76.02	8.45	1.04
4	3895	Re-Compression: Unit 1 -	Open-ended line - 0.5"	0.0584	60.00	116.00	8.45	0.63
4	3880	FG Scrubber - Central Walkway behind flow computer.	Tubing connection - 0.375"	0.0584	15.00	317.39	8.44	0.16
3	1820	Stab 1 Building (Yard) - (NGL Vessel)	Gate valve - 3"	0.0583	120.00	211.96	0.12	1.25
1	1970	Inlet Comp Yard Piping -	Flange - 4"	0.0583	75.00	100.64	6.80	0.78
4	3942B	Re-Compression: Unit 2 - FG Line 1	Threaded connection - 2"	0.0583	15.00	160.61	8.43	0.16
3	1186	NRU 3 - Top Platform - G2348N	Threaded connection - 0.375"	0.0579	10.00	164.39	6.93	0.11
3	1470	Residue Gas/N2 Comp Bldg - Heat Pump 4	Valve cover	0.0576	200.00	-26.42	8.48	2.11
3	1627	IR Compressor Building - IR Comp 3	Threaded connection - 0.5"	0.0575	10.00	163.33	6.89	0.11
4	3763	Cryo System: Economizer -	Gate valve - 0.75"	0.0575	60.00	267.12	0.13	0.64
1	3249	Solar Turbines -	Gate valve - 3"	0.0575	120.00	207.08	8.27	1.27
1	3271	Solar Turbines -	Threaded connection - 2"	0.0571	15.00	157.13	8.23	0.16
4	3814	Re-Compression: Yard Piping - Connection on regulator	Regulator - 2"	0.0570	175.00	219.77	8.25	1.87
2	4055	Inlet Scrubber -	Flange - 6"	0.0570	100.00	71.72	6.97	1.07
1	3305	Mole Sieve Bypass Piping -	Gate valve - 6"	0.0570	245.00	79.45	6.65	2.62

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1076	NRU 3 - A2308N	Gate valve - 10"	0.0568	500.00	-176.71	6.80	5.36
3	1755	Stab 1 Building - A612-28 (West Wall)	Gate valve - 4"	0.0566	190.00	132.41	0.12	2.04
2	4345	Residue Gas Suction Scrubber -	Gate valve - 4"	0.0565	190.00	131.51	8.14	2.05
1	3477	South of Low Press Inlet Compressors -	Threaded connection - 1"	0.0564	15.00	154.95	8.12	0.16
3	1112	NRU 3 - Base of Cold Box	Gate valve - 4"	0.0563	190.00	130.28	6.74	2.06
2	4087	Common inlet lines - gate valve seat (behind chart recorder bldg.)	Open-ended line - 0.375"	0.0563	60.00	109.45	6.88	0.65
3	1844	Co-Gen Building: Outside (CA 625 - HP FG Scrubber) - Above VG-127	Gate valve - 0.5"	0.0561	60.00	259.36	7.97	0.65
2	4336	Make-up Gas Suction Scrubber - sight glass	Gate valve - 0.75"	0.0560	60.00	259.03	8.08	0.65
2	4226	Compressor Unit 8 - rear flange seam	Cylinder body	0.0559	400.00	-313.37	8.06	4.36
3	1797	Fuel Gas Scrubber (V8-1720) - LV1720A	Regulator - 1.5"	0.0557	175.00	210.72	7.92	1.91
1	3221	De-methanizer -	Gate valve - 0.75"	0.0557	60.00	256.92	8.02	0.66
3	1077	NRU 3 - G412N-21	Threaded connection - 0.75"	0.0556	10.00	157.48	6.66	0.11
1	3165	Refrig Comp Unit 11 - Stem packing	Variable volume pocket stem	0.0550	400.00	-314.71	0.00	4.42
4	3897	Re-Compression: Unit 1 -	Variable volume pocket stem	0.0549	400.00	-314.92	7.94	4.44
3	1204	NRU 2 - Top Platform - A2333N	Threaded connection - 0.375"	0.0546	10.00	154.43	6.54	0.11
3	1081	NRU 3 - A2307N	Threaded connection - 0.75"	0.0545	10.00	154.22	6.53	0.11
2	4314	Compressor Unit # 1 -	Threaded connection - 0.25"	0.0545	10.00	154.20	7.86	0.11
3	1177	NRU 1 - G415N-2	Threaded connection - 0.75"	0.0545	10.00	154.12	6.52	0.11
4	3731	Cryo System: De-methanizer Side Reboiler - Gate valve seat	Open-ended line - 0.75"	0.0545	60.00	104.08	0.13	0.67
1	3436	EP Skid to Koch -	Gate valve - 0.75"	0.0544	60.00	249.58	0.10	0.67
4	3607	Yard North of Office -	Orifice meter plate - 10"	0.0542	150.00	-66.04	7.83	1.69
3	1848	Amine Yard - Near TB-0380 (on platform)	Gate valve - 10"	0.0542	500.00	-191.61	6.49	5.62
4	3667	Cryo System: Make Up -	Gate valve - 3"	0.0542	120.00	188.27	7.83	1.35
4	3870	Re-Compression: Unit 2 -	Valve cover	0.0541	200.00	-36.95	7.83	2.25
4	3933B	Re-Compression: Unit 4 - FG Line 6	Union - 2"	0.0539	100.00	62.41	7.80	1.13
1	3159	Refrig Comp Unit 11 -	Valve cover	0.0538	200.00	-38.05	0.00	2.26
3	1291	NGL Bullet 2 - A1101N-10	Gate valve - 3"	0.0537	120.00	185.79	0.02	1.36
3	1124	NRU 2 - Top Platform - PV4101N8-2	Control valve - globe - 12"	0.0535	560.00	-398.79	6.41	6.37
4	3522	South Heat Medium Heater - Pilot	Gate valve - 0.5"	0.0534	60.00	243.99	7.72	0.68
1	3039	Lone Star Line -	Orbit valve - 3"	0.0532	120.00	182.92	6.21	1.37
4	3940C	Re-Compression: Unit 2 - FG Line 5	Union - 2"	0.0531	100.00	60.05	7.68	1.15
3	1624	IR Compressor Building - IR Comp 3	Threaded connection - 0.5"	0.0530	10.00	149.69	6.35	0.11
2	4104	Mole Sieve Tower A -	Threaded connection - 0.5"	0.0526	10.00	148.39	6.43	0.12
3	1386	Amine Bldg: Near V8-2701N-11 -	Gate valve - 0.5"	0.0525	60.00	239.03	6.29	0.70
3	1267	NGL Bullet 4 - A1101N-3	Gate valve - 3"	0.0524	120.00	178.14	0.01	1.39
4	3816	Re-Compression: Yard Piping -	Gate valve - 3"	0.0520	120.00	175.93	7.52	1.41
4	3580	Mole Sieve Dehy: Dehy Train A -	Control valve - orbit - 4"	0.0516	177.00	-21.62	6.02	2.09
3	1155	NRU 1 - Base of Hot Box	Threaded connection - 0.25"	0.0515	10.00	145.23	6.17	0.12
1	3330	Mole Sieve Tower 511C -	Open-ended line - 0.25"	0.0515	60.00	95.20	6.01	0.71
4	3945B	Re-Compression: Unit 1 - FG Line 6	Plug valve - 2"	0.0515	120.00	173.22	7.45	1.42
3	1203	NRU 2 - Top Platform - A2344N	Threaded connection - 0.375"	0.0515	10.00	145.01	6.16	0.12

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
2	4366	Compressor Unit # 1 - stem packing	Control valve - orbit - 4"	0.0515	177.00	-22.00	7.42	2.09
4	3704	Sales Gas Header -	Flange - 4"	0.0513	75.00	79.62	7.42	0.89
3	1657	Re-Compressor Building - Re-Comp 2	Threaded connection - 0.5"	0.0513	10.00	144.57	6.15	0.12
3	1300	Propane Coolers - VG155 or V404-004	Gate valve - 1"	0.0510	75.00	215.57	0.01	0.89
1	3105	Compressor CM-9 -	Filter cover - 6"	0.0510	50.00	103.69	5.95	0.60
3	1819	Stab 1 Building (Yard) - (NGL Vessel)	Gate valve - 0.75"	0.0510	60.00	230.18	0.11	0.72
3	1913	Hg Removal Bed V8-401-2 - near A401N-9	Flange - 3"	0.0509	75.00	78.33	6.10	0.90
3	1882	FG Piping on RES/N2/Heat Pump Bldg (outside) - A2400N-1	Gate valve - 4"	0.0509	190.00	99.56	7.23	2.27
3	1138	NRU 2 - G411N-43	Threaded connection - 0.5"	0.0507	10.00	142.76	6.07	0.12
3	1689	Re-Compressor Building - Re-Comp 2 (WE4C-301-2) (Fuel Gas Line)	Governor - 2"	0.0506	200.00	87.83	7.19	2.41
2	4038	Mole Sieve Tower C -	Flange - 8"	0.0506	100.00	52.28	6.18	1.20
3	1534	Residue Gas/N2 Comp Bldg - Heat Pump 3	Cylinder end - flange	0.0505	400.00	-321.67	7.44	4.82
3	1431	Residue Gas/N2 Comp Bldg - Heat Pump 1	Valve cover	0.0505	200.00	-47.78	7.43	2.41
1	3355	Mole Sieve: Inlet Separator (PV-501) -	Gate valve - 1"	0.0499	75.00	209.34	5.83	0.91
4	3572	Mole Sieve Dehy: Dehy Tower A - Green Gas	Flange - 8"	0.0499	100.00	50.31	5.82	1.22
3	1722	East Amine Contactor - PSV horn	Pressure relief valve - 2"	0.0498	120.00	163.76	5.97	1.47
1	3344	Mole Sieve Tower 511A -	Flange - 2"	0.0497	50.00	99.75	5.80	0.61
1	3397	EB Skid to Chevron -	Pump seal	0.0496	500.00	-423.20	0.09	6.14
1	3243	Solar Turbines -	Gate valve - 1"	0.0495	75.00	206.66	7.12	0.92
1	3427	Refrig Comp Yard Piping -	Control valve - plug - 8"	0.0494	353.00	-204.15	0.00	4.35
1	3186	Refrig Comp Unit 10 -	Open-ended line - 1.5"	0.0494	75.00	73.65	0.00	0.93
3	1089	Amine Bldg (V2806-2) - (under vessel)	Gate valve - 1"	0.0493	75.00	205.57	5.90	0.93
4	3829	Re-Compression: Yard Piping -	Gate valve - 2"	0.0492	100.00	180.30	7.12	1.24
1	3356	Mole Sieve: Inlet Separator (PV-501) - Sight glass valve	Gate valve - 0.75"	0.0492	60.00	220.30	5.75	0.74
2	4303	Compressor Unit # 1 -	Variable volume pocket stem	0.0492	400.00	-323.81	7.09	4.95
2	4093	Tower by D-208 - gate valve seat	Gate valve - 1"	0.0491	75.00	204.75	6.01	0.93
4	3529	South Heat Medium Heater - Pilot	Gate valve - 0.5"	0.0491	60.00	219.57	7.10	0.74
3	1232	NGL Bullet 6 - A1101N-16/TB0319	Gate valve - 4"	0.0490	190.00	88.66	0.01	2.36
4	3501	Regen Heater -	Gate valve - 1.5"	0.0486	75.00	201.44	7.02	0.94
2	4136	Mole Sieve Pre-Filter -	Threaded connection - 0.5"	0.0483	10.00	135.33	5.90	0.13
2	4257B	Compressor Unit # 4 -	Injector	0.0479	200.00	72.66	6.90	2.54
3	1281	NGL Bullet 3 - LG1122NA	Gate valve - 0.75"	0.0478	60.00	212.34	0.01	0.76
1	3107	Compressor CM-19 -	Valve cover	0.0478	200.00	-56.04	5.58	2.55
3	1194	NRU Expander 1 - Expander Housing	Flange - 10"	0.0476	150.00	-6.71	5.70	1.92
1	3287	De-methanizer -	Gate valve - 4"	0.0470	190.00	77.44	6.76	2.46
2	4141	Condensate Vapour Scrubber -	Control valve - globe - 1"	0.0468	130.00	10.98	5.72	1.69
1	3345	Mole Sieve Tower 511A -	Gate valve - 0.75"	0.0466	60.00	205.09	5.43	0.78
1	3214	Solar Turbines: Header Outside -	Control valve - globe - 2"	0.0465	130.00	10.15	6.70	1.70
4	3739	Cryo System: Absorber Bottoms Pumps - Gate valve seat	Open-ended line - 0.5"	0.0465	60.00	80.11	0.11	0.79
4	3543	North Heat Medium Heater - Pilot stem	Gate valve - 0.5"	0.0463	60.00	203.51	6.69	0.79
4	3586	Mole Sieve Dehy: Regen Piping - Up high.	Threaded connection - 0.5"	0.0462	10.00	129.16	5.39	0.13
3	1465	Residue Gas/N2 Comp Bldg - Heat Pump 4	Cylinder end - flange	0.0460	400.00	-328.72	6.77	5.29
4	3619B	Yard North of Office - Gate valve seat	Gate valve - 0.5"	0.0459	60.00	201.40	6.64	0.80
4	3940B	Re-Compression: Unit 2 - FG Line 5	Plug valve - 2"	0.0458	120.00	140.45	6.61	1.60

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1834	Co-Gen Building: Outside (CA 625 - HP FG Scrubber) - VG-155	Gate valve - 1"	0.0457	75.00	185.35	6.50	1.00
2	4071	Sales Piping - on 8" plug valve	Grease nipple	0.0456	50.00	209.77	6.58	0.67
3	1859	Residue Gas/N2 Comp Bldg: Heat Pump 4 -	Threaded connection - 0.5"	0.0455	10.00	127.10	6.70	0.13
2	4176	Cryo skid 101 - expander K101-A	Control valve - 10"	0.0454	459.00	-322.40	5.55	6.16
3	1272	NGL Bullet 2 - A1101N-5	Gate valve - 6"	0.0452	245.00	12.53	0.01	3.30
2	4350C	C3 Cooler - 2 connections	Threaded connection - 1"	0.0449	15.00	120.27	0.00	0.20
1	3125	Compressor CM-14 -	Valve cover	0.0447	200.00	-65.49	5.21	2.73
3	1622	IR Compressor Building - IR Comp 3	Cylinder end - flange	0.0446	400.00	-330.86	5.34	5.46
1	3408	Mole Sieve Common Piping -	Union - 2"	0.0446	100.00	34.35	5.21	1.36
1	3411	Mole Sieve Common Piping -	Gate valve - 1"	0.0443	75.00	177.07	5.17	1.03
1	3294	High Pressure JT Expander -	Gate valve - 8"	0.0443	350.00	-97.93	6.38	4.81
2	4001	Top of dehy tower A -	Flange - 8"	0.0441	100.00	32.82	5.39	1.38
3	1833	Co-Gen Building: Outside (CA 625 - HP FG Scrubber) -	Gate valve - 0.5"	0.0438	60.00	189.39	6.23	0.83
1	3387	EB Skid to Chevron -	Pump seal	0.0438	500.00	-432.18	0.08	6.96
4	3957	Refrigeration Compressors: Unit 3 - On governor	Flange - 2"	0.0437	50.00	81.61	6.32	0.70
3	1626	IR Compressor Building - IR Comp 3	Valve cover	0.0436	200.00	-68.67	5.22	2.79
3	1078	NRU 3 - G412N-25	Open-ended line - 0.75"	0.0436	60.00	71.33	5.22	0.84
1	3150	Refrig Comp Unit 11 - Plug on cylinder body.	Threaded connection - 0.5"	0.0435	10.00	120.93	0.00	0.14
2	4352	Compressor Yard - horizontal vessel - plug valve stem	Plug valve - 1"	0.0433	75.00	171.71	6.25	1.05
4	3945D	Re-Compression: Unit 1 - FG Line 6	Union - 2"	0.0433	100.00	30.45	6.26	1.41
2	4010	Mole Sieve Tower A -	Threaded connection - 0.75"	0.0433	10.00	120.43	5.30	0.14
1	3164	Refrig Comp Unit 11 -	Valve cover	0.0431	200.00	-70.16	0.00	2.82
2	4069	S Inlet Scrubber (D202) - sight glass	Gate valve - 0.75"	0.0430	60.00	184.86	5.26	0.85
2	4327	Compressor Yard - Suction/Discharge Piping -	Gate valve - 3"	0.0429	120.00	124.29	6.19	1.70
2	4034	Mole Sieve Tower C -	Threaded connection - 1"	0.0428	15.00	113.84	5.23	0.21
4	3776	Central Yard - Between C3 Compressors and Gen Building	Gate valve - 14"	0.0427	780.00	-536.79	6.18	11.11
1	3351	Low Pressure JT Expander -	Gate valve - 8"	0.0427	350.00	-107.03	6.15	4.99
3	1085	NRU - Fuel Gas -	Open-ended line - 0.5"	0.0426	60.00	68.37	5.10	0.86
4	3698B	Cryo System: South Of Cold Gas Exchanger -	Gate valve - 0.75"	0.0426	60.00	182.44	0.10	0.86
1	3246	Solar Turbines -	Threaded connection - 1"	0.0423	15.00	112.49	6.09	0.22
4	3668	Cryo System: LV 120B -	Open-ended line - 0.75"	0.0421	60.00	66.77	0.10	0.87
3	1647	IR Compressor Building - V8-324	Gate valve - 0.75"	0.0419	60.00	178.49	5.02	0.87
2	4018	Mole Sieve Tower C -	Flange - 4"	0.0417	75.00	50.57	5.10	1.10
4	3881	FG Scrubber -	Tubing connection - 0.375"	0.0415	15.00	221.43	6.00	0.22
3	1749	HHE Compressor Building - Associated Yard Piping (Near C307-1)	Flange - 12"	0.0415	150.00	-24.92	4.97	2.20
3	1050	Mole Sieve 5 - XY-2854	Control valve - globe - 2"	0.0414	130.00	-5.17	4.96	1.91
1	3325	Mole Sieve Tower 511A -	Threaded connection - 2"	0.0414	15.00	109.75	4.83	0.22
4	3713	Cryo System: Absorber Tower (20.001) - Gate valve seat	Open-ended line - 0.5"	0.0411	60.00	63.92	0.10	0.89

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1189	NRU Expander 1 -	Threaded connection - 0.5"	0.0411	10.00	113.89	4.93	0.15
3	1148	NRU 2 - 2nd Platform - FT-4238N-2	3 Needle valves - 0.375"	0.0410	60.00	173.52	4.91	0.89
4	3575	Mole Sieve Dehy: Dehy Tower A/B -	Union - 0.5"	0.0409	50.00	73.17	4.77	0.74
3	1249	NGL Bullet 4 - LG3058-A	Gate valve - 0.75"	0.0409	60.00	172.68	0.01	0.89
3	1519	Residue Gas/N2 Comp Bldg - Heat Pump 2	Valve cover	0.0409	200.00	-76.89	6.01	2.98
1	3482	Off De-methanizer tower - Gate valve seat	Open-ended line - 0.5"	0.0408	60.00	62.96	5.88	0.89
1	3362	Inlet Scrubber (PV-504) -	Control valve - 6"	0.0407	282.00	-159.31	5.86	4.21
1	3375	Fuel Gas Scrubber (PV-15) -	Open-ended line - 0.5"	0.0405	60.00	62.09	5.84	0.90
2	4234	Compressor Unit 8 -	Valve cover	0.0405	200.00	-78.01	5.84	3.01
3	1058	Mole Sieve Header - PDSL-2879N	Tubing connection - 0.375"	0.0405	15.00	215.51	4.85	0.23
2	4362	Compressor Unit # 3 -	Control valve - orbit - 2"	0.0404	130.00	-8.20	5.83	1.96
3	1452	Residue Gas/N2 Comp Bldg - Comp 3	Gate valve - 0.75"	0.0401	60.00	168.50	5.70	0.91
3	1774	Stab 1 Building - A614-5 (Top of Accumulator)	Gate valve - 2"	0.0401	100.00	128.44	4.81	1.52
3	1096	Amine Bldg (V2806-1) - Plug on A2806N-9 (under vessel)	Threaded connection - 1"	0.0399	15.00	105.21	4.78	0.23
2	4044	Mole Sieve Tower B -	Gate valve - 0.75"	0.0399	60.00	166.87	4.87	0.92
3	1420	Residue Gas/N2 Comp Bldg - Comp 1 (Throw 2)	Open-ended line - 0.5"	0.0395	60.00	59.06	5.62	0.92
4	3885	Refrigeration Compression: Outside Yard Piping - Main fuel line orifice meter	Tubing connection - 0.375"	0.0395	15.00	210.01	5.71	0.23
3	1397	Refrigerant Comp Bldg: - Comp E028007A	Compressor seal	0.0395	2000.00	-1938.78	0.01	30.82
3	1695	Re-Compressor Building - Associated Yard Piping (Near B9244)	Union - 2"	0.0395	100.00	18.85	5.61	1.54
2	4310	Compressor Unit # 1 -	Valve cover	0.0395	200.00	-81.17	0.00	3.09
3	1482	Residue Gas/N2 Comp Bldg: Back Wall -	Gate valve - 10"	0.0394	500.00	-275.55	5.60	7.72
2	4269	Compressor Unit # 5 -	Plug valve - 1.5"	0.0393	75.00	148.98	5.67	1.16
1	3140	Compressor CM-14 - Gate valve seat	Open-ended line - 1"	0.0393	75.00	43.28	4.58	1.16
1	1969	Inlet Comp Yard Piping -	Gate valve - 4"	0.0392	190.00	33.26	4.58	2.95
3	1491	Residue Gas/N2 Comp Bldg - Comp 4 (Throw 5)	F/Cylinder End	0.0392	400.00	-339.30	5.57	6.22
2	4379	Compressor Unit # 6 -	Threaded connection - 0.5"	0.0392	10.00	107.95	5.65	0.16
3	1336	Propane Yard: V8-410-3 -	Gate valve - 0.75"	0.0391	60.00	162.51	0.01	0.93
2	4219	Compressor Unit # 9 - flange	Cylinder body	0.0390	400.00	-339.61	5.62	6.25
3	1347	Propane Yard - A2404N	Gate valve - 0.5"	0.0389	60.00	161.35	0.01	0.94
2	4295	Compressor Yard - common discharge line	Gate valve - 4"	0.0388	190.00	31.15	5.60	2.98
3	1310	NGL Bullet 1 - A1101N-2	Gate valve - 1"	0.0388	75.00	146.07	0.01	1.18
1	3364	Inlet Gas Scrubber (PV-501) -	Gate valve - 1"	0.0387	75.00	145.13	4.51	1.18
1	1980	Inlet Header - Chart recorder	Tubing connection - 0.375"	0.0387	15.00	205.08	4.51	0.24
1	3047	Scrubber (PV-517) -	Gate valve - 1"	0.0385	75.00	144.39	4.50	1.18
3	1410	Residue Gas/N2 Comp Bldg - Comp 1 (Throw 1)	Cylinder end - flange	0.0385	400.00	-340.32	5.47	6.32
4	3931	Re-Compression: Unit 5 -	Union - 0.75"	0.0384	50.00	65.78	5.56	0.79
1	3084	West Inlet Yard Piping - On 8" orifice meter	Rack	0.0384	75.00	143.42	4.48	1.19
1	3358	Cold Gas Separator (PV-505) -	Gate valve - 3"	0.0381	120.00	96.76	4.44	1.92
2	3995A	Inlet Line -	Gate valve - 2"	0.0379	100.00	115.63	4.63	1.61
1	3471	Refrig Comp Unit 12 -	Needle valve - 0.25"	0.0377	60.00	154.49	5.42	0.97
1	3133	Compressor CM-13 -	Valve cover	0.0375	200.00	-87.03	4.38	3.25
3	1308	NGL Bullet 1 - Near A1101N-5	Gate valve - 0.75"	0.0375	60.00	153.45	0.01	0.97
3	1854	Co-Gen Building: Fuel Gas Scrubber (SW Corner of Bldg) - Packing	Threaded connection - 1"	0.0374	15.00	97.76	5.32	0.24

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1914	Hg Removal Bed V8-401-2 - near A401N-8	Flange - 3"	0.0374	75.00	37.60	4.48	1.22
3	1920	Hg Removal Bed V8-401-1 - Near A401-2	Flange - 3"	0.0373	75.00	37.40	4.47	1.22
3	1864	Residue Gas/N2 Comp Bldg: Heat Pump 1 -	Threaded connection - 0.5"	0.0372	10.00	102.02	5.47	0.16
2	4262	Compressor Unit # 5 -	Union - 1.5"	0.0372	100.00	11.92	5.36	1.64
1	3357	Cold Gas Separator - Gate valve seat	Open-ended line - 1"	0.0371	75.00	36.80	4.33	1.23
3	1450	Residue Gas/N2 Comp Bldg - Comp 3 (Throw 4)	Cylinder end - flange	0.0368	400.00	-342.98	5.23	6.62
3	1676	Re-Compressor Building - Re-Comp 5 (Fuel Gas Line)	Union - 2"	0.0368	100.00	10.78	5.23	1.66
3	1463	Residue Gas/N2 Comp Bldg - Heat Pump 4	Cylinder end - flange	0.0367	400.00	-343.05	5.41	6.63
1	3030	Fuel Gas to Mansfield (222) - Stem packing	Needle valve - 0.375"	0.0367	60.00	149.15	4.29	0.99
2	4257A	Compressor Unit # 4 -	Flange - 1"	0.0366	50.00	60.24	5.28	0.83
2	4101	Mole Sieve Tower A -	Flange - 6"	0.0364	100.00	9.69	4.45	1.67
2	4370	Compressor Unit # 2 -	Gate valve - 0.75"	0.0363	60.00	146.51	5.23	1.01
3	1433	Residue Gas/N2 Comp Bldg - Heat Pump 1	Valve cover	0.0363	200.00	-90.79	5.33	3.36
4	3941B	Re-Compression: Unit 2 - FG Line 4	Plug valve - 2"	0.0362	120.00	86.30	5.24	2.02
3	1167	NRU 2 - Base of Cold Box - Valve 139	Gate valve - 10"	0.0361	500.00	-294.58	4.32	8.43
4	3990	Re-Compression: Yard Piping - on 2" plug valve	Grease nipple	0.0361	50.00	155.42	5.22	0.84
3	1284	NGL Bullet 3 - Near TB0326 On PSV	Flange - 4"	0.0360	75.00	33.29	0.01	1.27
3	1287	NGL Bullet 2 - Near A1101N-18	Gate valve - 0.75"	0.0359	60.00	144.63	0.01	1.02
3	1792	Fuel Gas Scrubber (V8-1720) - A1720-3	Gate valve - 1.5"	0.0359	75.00	129.39	5.10	1.27
4	3827C	Re-Compression: Yard Piping - on 4" plug valve	Grease nipple	0.0359	50.00	154.13	5.18	0.85
4	3983	Cryo System: Near FV104 -	Gate valve - 16"	0.0356	920.00	-717.37	0.08	15.73
3	1429	Residue Gas/N2 Comp Bldg - Heat Pump 1	Cylinder end - flange	0.0356	400.00	-344.88	5.23	6.85
1	3341	Mole Sieve Tower 511A -	Gate valve - 0.75"	0.0356	60.00	142.46	4.15	1.03
4	3547	Mole Sieve Dehy: Regen Heater -	Gate valve - 0.75"	0.0355	60.00	142.20	5.14	1.03
1	3181	Solar Turbines: Unit B - Fuel gas filter piping	Tubing connection - 0.375"	0.0355	15.00	186.85	5.11	0.26
3	1180	NRU 1 - 2nd Platform - FT4238N-1	2 Needle valves - 0.375"	0.0354	60.00	141.62	4.24	1.03
4	3722	Cryo System: De-methanizer Tower (1st Platform) - Gate valve seat	Open-ended line - 0.5"	0.0354	60.00	46.63	0.08	1.03
3	1247	NGL Bullet 4 - A1101N-33	Gate valve - 0.5"	0.0353	60.00	141.15	0.01	1.03
1	3456	Refrig Comp Unit 12 -	Cylinder end - flange	0.0353	400.00	-345.27	0.00	6.89
2	4009	Mole Sieve Tower A -	Gate valve - 0.75"	0.0351	60.00	139.63	4.29	1.04
3	1285	NGL Bullet 2 - Near B1101N-2	Gate valve - 0.75"	0.0348	60.00	138.30	0.01	1.05
2	3991	WCW Inlet Line -	Gate valve - 2"	0.0347	100.00	97.82	4.25	1.75
1	3468	Refrig Comp Unit 12 -	Union - 2"	0.0347	100.00	4.44	4.99	1.76
1	3151	Refrig Comp Unit 11 -	Valve cover	0.0347	200.00	-95.57	0.00	3.51
4	3706	Sales Gas Header -	Gate valve - 1.5"	0.0346	75.00	121.97	5.00	1.32
2	4024	Mole Sieve Tower C -	Gate valve - 0.75"	0.0345	60.00	136.60	4.22	1.06
3	1404	Residue Gas/N2 Comp Bldg: Yard -	Gate valve - 12"	0.0344	595.00	-399.43	4.88	10.54
1	3161	Refrig Comp Unit 11 -	Cylinder end - flange	0.0344	400.00	-346.76	0.00	7.09
4	3898	Re-Compression: Unit 1 -	Valve cover	0.0341	200.00	-97.40	4.92	3.57
1	3171	Refrig Comp Units -	Gate valve - 2"	0.0340	100.00	93.64	4.90	1.79
4	3628	Yard North of Office -	Tubing connection - 0.375"	0.0340	15.00	178.62	3.97	0.27
1	3241	Solar Turbines: Unit A - On skid	Gate valve - 2"	0.0339	100.00	92.91	4.88	1.80
3	1724	HHE Compressor Building - Comp HHE 7	Threaded connection - 0.5"	0.0338	10.00	91.69	4.04	0.18
3	1711	Re-Compressor Building - Associated Yard Piping (Near A9239)	Gate valve - 4"	0.0337	190.00	2.02	4.04	3.43
3	1497	Residue Gas/N2 Comp Bldg - Heat Pump 2	Cylinder end - flange	0.0337	400.00	-347.81	4.95	7.23
4	3823	Re-Compression: Yard Piping - Half buried	Flange - 4"	0.0336	75.00	26.22	4.86	1.36
3	1916	Hg Removal Bed V8-401-1 - NV seat	Open-ended line - 0.25"	0.0335	60.00	40.85	4.01	1.09

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
4	3862	Re-Compression: Unit 3 - Cylinder No. 2	Open-ended line - 0.5"	0.0334	60.00	40.60	4.83	1.09
4	3655	Mole Sieve Dehy: Regen Fan/Blower - From Clark Discharge	Gate valve - 6"	0.0334	245.00	-54.88	4.83	4.47
3	1038	Mole Sieve 3 - Ground level	Flange - 8"	0.0333	100.00	0.45	3.99	1.83
4	3790	Re-Compression: Clark Discharge Cooler -	Threaded connection - 0.5"	0.0333	10.00	90.41	4.82	0.18
1	1958	4th Stage Suction Scrubber (PV-47) -	Gate valve - 3"	0.0333	120.00	69.34	3.88	2.20
3	1600	HP2 Bldg: Outside - A1101	Gate valve - 18"	0.0330	920.00	-731.94	3.96	16.95
3	1721	East Amine Contactor - MW @ top	Manway - 18"	0.0330	200.00	-100.75	3.95	3.69
4	3548	Mole Sieve Dehy: Regen Heater -	Pressure relief valve - 0.75"	0.0329	79.00	20.23	4.76	1.46
3	1264	NGL Bullet 2 - A1101B-8	Gate valve - 4"	0.0329	190.00	-2.45	0.01	3.51
2	4072	Sales Piping - on 4" orifice meter	Orifice meter plate - 4"	0.0329	150.00	-98.94	4.75	2.77
1	3467	Refrig Comp Unit 12 -	Control valve - plug - 2"	0.0328	130.00	-31.32	4.72	2.42
1	3093	West Inlet Yard Piping - To PV-28	Control valve - plug - 8"	0.0326	353.00	-254.68	3.81	6.58
2	4027	Mole Sieve Tower C - stem packing	Control valve - ball - 1"	0.0326	130.00	-31.71	3.99	2.42
1	3026	Fuel Gas to Mansfield (222) -	Gate valve - 1"	0.0326	75.00	110.48	3.80	1.40
1	1955	Inlet Comp Yard Piping -	Gate valve - 3"	0.0323	120.00	63.98	3.77	2.26
1	3065	Compressor CM-9 -	Threaded connection - 0.5"	0.0323	10.00	87.33	3.77	0.19
1	3346	Mole Sieve Tower 511B -	Control valve - orbit - 8"	0.0323	353.00	-255.74	3.77	6.65
4	3517	Still Reboiler No. 2 -	Gate valve - 0.5"	0.0320	60.00	122.19	4.63	1.14
2	4126	Mole Sieve Tower B -	Gate valve - 0.5"	0.0320	60.00	122.15	3.91	1.14
3	1541	Residue Gas/N2 Comp Bldg - Heat Pump 3	Valve cover	0.0320	200.00	-103.71	0.01	3.81
3	1430	Residue Gas/N2 Comp Bldg - Heat Pump 1	Valve cover	0.0320	200.00	-103.75	4.70	3.81
3	1242	NGL Bullet 4 - A1101N-49	Open-ended line - 0.25"	0.0320	60.00	36.25	0.01	1.14
4	3624B	Yard North of Office - Gate valve seat	Gate valve - 0.75"	0.0319	60.00	121.75	3.73	1.14
2	4259	Compressor Unit # 5 -	Union - 1.5"	0.0319	100.00	-4.05	4.59	1.91
1	3178	Solar Turbines: Unit B - On skid	Gate valve - 1.5"	0.0317	75.00	105.40	4.56	1.44
2	4036	Mole Sieve Tower C -	Gate valve - 1"	0.0317	75.00	105.19	3.87	1.44
1	3373	Fuel Gas Scrubber (PV-15) -	Gate valve - 0.75"	0.0316	60.00	119.85	4.55	1.16
2	4100	DGA coalescer -	Gate valve - 1"	0.0316	75.00	104.78	3.86	1.45
4	Direct	Re-Compressor Unit 4 -	Seals vent	0.0315	2000.00	-1951.24	4.55	38.70
1	3188	Refrig Comp Unit 10 -	Injector	0.0314	200.00	-21.00	4.53	3.87
1	3272	Solar Turbines -	Threaded connection - 2"	0.0314	15.00	79.55	4.52	0.29
4	3738	Cryo System: Absorber Bottoms Pumps - Gate valve seat	Open-ended line - 0.5"	0.0313	60.00	34.42	0.07	1.16
3	1668	Re-Compressor Building - Re-Comp 3	Gate valve - 4"	0.0313	190.00	-11.64	3.75	3.69
4	3693	Cryo System: Cold Gas Exchanger Feed Line -	Gate valve - 0.75"	0.0312	60.00	117.70	0.07	1.17
2	4281	Compressor Unit # 7 -	Threaded connection - 2"	0.0312	15.00	78.91	4.49	0.29
2	4007	Mole Sieve Tower D -	Control valve - orbit - 4"	0.0312	177.00	-83.09	3.81	3.46
3	1839	Co-Gen Building: Outside (CA 625 - HP FG Scrubber) - VG-151	Gate valve - 0.5"	0.0311	60.00	116.83	4.41	1.18
4	3530	Heat Medium Heater FG Line - Bonnet/body	Plug valve - 4"	0.0310	200.00	-23.73	4.48	3.93
3	1293	NGL Bullet 1 - Near A1101N-7	Tubing connection - 0.375"	0.0310	15.00	161.27	0.01	0.29
3	1885	FG Piping on RES/N2/Heat Pump Bldg (outside) - pv2400n-1	GBV/CV - 2"	0.0307	130.00	-37.62	4.36	2.58

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
2	4172	Cryo skid 101 - expander K101-B	Threaded connection - 0.5"	0.0306	10.00	82.25	3.75	0.20
2	4225	Compressor Unit # 9 -	Flange - 2"	0.0306	50.00	42.25	4.42	0.99
1	3128	Compressor CM-14 - On governor	Threaded connection - 0.375"	0.0305	10.00	81.91	4.39	0.20
3	1064	Amine Bldg: V8-404N - A404N-1	Gate valve - 1"	0.0304	75.00	97.88	3.64	1.50
3	1630	IR Compressor Building - IR Comp 3	Threaded connection - 0.5"	0.0301	10.00	80.67	3.60	0.20
1	3391	EP Skid to Koch -	Gate valve - 0.75"	0.0301	60.00	111.36	0.05	1.21
3	1531	Residue Gas/N2 Comp Bldg - Heat Pump 3	Cylinder end - flange	0.0301	400.00	-353.41	4.42	8.10
3	1814	Stab 1 Building (Yard) - (NGL Vessel)	Threaded connection - 0.5"	0.0301	10.00	80.53	0.06	0.20
4	3533	Heat Medium Heater FG Line -	Gate valve - 4"	0.0300	190.00	-18.96	4.34	3.85
3	1494	Residue Gas/N2 Comp Bldg - Heat Pump 2	Valve cover	0.0300	200.00	-109.56	4.42	4.05
1	3289	HP Expander Scrubber (PV-503) -	Gate valve - 1"	0.0298	75.00	94.71	4.29	1.53
3	1090	Amine Bldg (V2806-2) -	Flange - 30"	0.0298	300.00	-210.22	3.57	6.13
4	3681	Cryo System: Expander Feed Separator -	Gate valve - 2"	0.0298	100.00	69.46	0.07	2.04
3	1356	Amine Bldg: V8-2701 - A2701N-42	Gate valve - 1.5"	0.0296	75.00	93.78	3.55	1.54
1	3176	Solar Turbines: Unit B - On skid	Gate valve - 2"	0.0296	100.00	68.77	4.27	2.05
3	1901	Hg Removal Bed V8-401-3 - A401N-11	Gate valve - 0.5"	0.0295	60.00	107.89	3.53	1.24
4	3943B	Re-Compression: Unit 2 - FG Line 3	Union - 2"	0.0294	100.00	-11.51	4.25	2.07
3	1927	Dehydration Tower # 1 west - on NV seat 2802N-1 1st platform	Open-ended line - 0.25"	0.0294	60.00	28.42	3.52	1.24
4	3765	C3 Refrigeration: Compressors - Discharge bottle	Open-ended line - 0.75"	0.0293	60.00	28.26	0.00	1.25
2	4313	Compressor Unit # 1 -	Threaded connection - 1"	0.0292	15.00	73.01	4.21	0.31
3	1273	NGL Bullet 2 - A1101N-	Gate valve - 6"	0.0291	245.00	-79.57	0.01	5.13
3	1137	NRU 2 - A411N-35	Threaded connection - 0.75"	0.0290	10.00	77.21	3.47	0.21
1	3255	Solar Turbines -	Gate valve - 1"	0.0290	75.00	89.83	4.17	1.58
3	1677	Re-Compressor Building - Re-Comp 5 (Fuel Gas Line)	Threaded connection - 2"	0.0289	15.00	72.19	4.11	0.32
3	1312	NGL Bullet 1 - A1101N-6	Gate valve - 0.75"	0.0289	60.00	104.58	0.01	1.26
1	3018	Inlet Comp Yard Piping -	Orbit valve - 4"	0.0289	190.00	-25.73	3.37	4.01
4	3636	Sales Gas Header -	Gate valve - 3"	0.0289	120.00	44.24	4.17	2.53
1	3109	Compressor CM-19 -	Threaded connection - 0.5"	0.0288	10.00	76.83	3.36	0.21
4	3828	Re-Compression: Yard Piping -	Union - 2"	0.0287	100.00	-13.56	4.15	2.12
3	1140	NRU 2 - A2305N	Gate valve - 10"	0.0287	500.00	-336.67	3.44	10.61
1	1992	Inlet Header -	Tubing connection - 0.25"	0.0287	15.00	148.29	3.35	0.32
2	4349C	C3 Cooler - 3 threaded connections	Threaded connection - 1"	0.0286	15.00	71.23	0.00	0.32
1	3017	Inlet Comp Yard Piping -	Flange - 3"	0.0285	75.00	10.89	3.33	1.60
3	1652	Re-Compressor Building - Re-Comp 2	Valve cover	0.0285	200.00	-114.24	3.41	4.28
3	1261	NGL Pump 3 - A11201N-6	Gate valve - 1"	0.0284	75.00	86.75	0.01	1.61
4	3900	Re-Compression: Unit 1 -	Open-ended line - 0.5"	0.0284	60.00	25.55	4.11	1.29
3	1870	Co-Gen (Fuel Gas Scrubber SE Corner of Bldg) -	Gate valve - 0.5"	0.0283	60.00	101.35	4.03	1.29
2	4177	Cryo skid 101 - expander K101-A	Flange - 8"	0.0283	290.00	-204.63	3.47	6.23
4	3556	TEG Still - Located down low.	Threaded connection - 1"	0.0282	15.00	69.97	4.08	0.32
4	3980	Power Generators: Unit 2 -	Union - 3"	0.0282	150.00	-65.17	4.07	3.24
4	3971	Refrigeration Compressors: Unit 2 - To injector	Flange - 2"	0.0282	50.00	34.80	4.07	1.08
1	3405	Mole Sieve Tower 511B -	Flange - 2"	0.0281	50.00	34.52	3.27	1.08
1	3011	Inlet Comp Yard Piping - On 2" orifice meter	Slide valve	0.0281	75.00	84.74	3.27	1.63

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
1	3240	Solar Turbines: Unit A - On skid	Threaded connection - 1.5"	0.0280	15.00	69.41	4.04	0.33
2	4349A	C3 Cooler -	Threaded connection - 1"	0.0280	15.00	69.20	0.00	0.33
4	3806	Re-Compression: Inlet Scrubber -	Gate valve - 1"	0.0279	75.00	84.08	4.04	1.63
4	3927	Re-Compression: Unit 4 -	Threaded connection - 0.75"	0.0278	10.00	73.66	4.02	0.22
3	1525	Residue Gas/N2 Comp Bldg - Heat Pump 2	Valve cover	0.0278	200.00	-116.34	4.09	4.38
2	4037	Mole Sieve Tower C -	Gate valve - 0.75"	0.0276	60.00	97.17	3.38	1.32
4	3810	Re-Compression: Yard Piping -	Threaded connection - 0.75"	0.0275	10.00	72.90	3.98	0.22
3	1425	Residue Gas/N2 Comp Bldg - Comp 2	Valve cover	0.0275	200.00	-117.10	3.91	4.42
2	4270	North oil heater -	Threaded connection - 2"	0.0275	15.00	67.90	3.37	0.33
1	3189	Refrig Comp Unit 10 -	Injector	0.0275	200.00	-43.33	3.96	4.42
1	3187	Refrig Comp Unit 10 -	Injector	0.0275	200.00	-43.49	3.96	4.43
3	1409	Amine Yard - Near 2700N-1	Threaded connection - 0.75"	0.0273	10.00	72.28	3.27	0.22
2	4026B	Mole Sieve Tower C -	Threaded connection - 1"	0.0273	15.00	67.21	3.34	0.33
4	3922A	Re-Compression: Unit 5 - FG Line 2	Threaded connection - 2"	0.0273	15.00	67.15	3.94	0.33
2	4300	Compressor Yard - Suction/Discharge Piping -	Orbit valve - 3"	0.0273	120.00	35.22	3.93	2.68
3	1314	NGL Bullet 1 - A1101N-8	Gate valve - 1.5"	0.0272	75.00	80.12	0.01	1.68
2	4339	Make-up Gas Suction Scrubber - sight glass	Gate valve - 0.75"	0.0272	60.00	94.71	3.92	1.34
1	3377	De-ethanizer Accumulator (PV-10) -	Control valve - globe - 3"	0.0271	141.00	-59.34	0.05	3.17
1	3035	Discharge to NG PL - In ground.	Threaded connection - 1.5"	0.0269	15.00	66.17	3.14	0.34
1	1975	Inlet Header - Grease nipple plus stem packing.	Plug valve - 2"	0.0269	120.00	33.36	3.14	2.71
2	4160	Residue Compressors FG Scrubber - sight glass	Gate valve - 0.75"	0.0269	60.00	93.28	3.88	1.36
3	1280	NGL Bullet 3 - A1101N-11	Gate valve - 1"	0.0269	75.00	78.17	0.01	1.70
3	1504	Residue Gas/N2 Comp Bldg: Lower Level - A301N-3	Gate valve - 3"	0.0268	120.00	32.48	3.81	2.73
2	4349B	C3 Cooler - 3 threaded connections	Threaded connection - 1"	0.0268	15.00	65.60	0.00	0.34
3	1484	Residue Gas/N2 Comp Bldg: Back Wall -	Threaded connection - 0.75"	0.0267	10.00	70.42	3.79	0.23
1	3135	Compressor CM-14 - Sight glass valve	Plug valve - 1"	0.0266	75.00	76.66	3.11	1.71
4	3819	Re-Compression: Yard Piping - on 4" plug valve	Grease nipple	0.0266	50.00	101.63	3.85	1.14
3	1510	Residue Gas/N2 Comp Bldg: Lower Level -	Gate valve - 0.75"	0.0266	60.00	91.51	3.78	1.37
3	1075	NRU 3 - A412N-13	Threaded connection - 0.5"	0.0266	10.00	70.05	3.18	0.23
1	1986	Inlet Header -	Gate valve - 0.75"	0.0266	60.00	91.29	3.10	1.37
1	3390	EP Skid to Koch -	Gate valve - 1"	0.0266	75.00	76.16	0.05	1.72
1	3068	Compressor CM-9 -	Valve cover	0.0265	200.00	-120.03	3.10	4.59
4	3753	Sales Gas Header -	Gate valve - 0.5"	0.0265	60.00	90.78	3.83	1.38
3	1417	Residue Gas/N2 Comp Bldg - Comp 2	Threaded connection - 0.5"	0.0264	10.00	69.37	3.75	0.23
3	1698	Re-Compressor Building - Associated Yard Piping (A9240)	Gate valve - 4"	0.0264	190.00	-39.98	3.16	4.39
1	3136	Compressor CM-14 -	Cylinder end - flange - 0.75"	0.0263	400.00	-359.29	3.07	9.27
3	1922	Hg Removal Bed V8-401-2 - NV seat	Open-ended line - 0.25"	0.0261	60.00	18.65	3.13	1.40

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
4	3772	C3 Refrigeration: Coolers - Near Refrig Compressor Building	Grease nipple - 4"	0.0261	50.00	98.42	0.00	1.17
3	1799	Fuel Gas Scrubber (V8-1720) - A1720-10	Gate valve - 1"	0.0261	75.00	73.38	3.70	1.75
3	1237	NGL Bullet 5 - A1101N-?	Gate valve - 1.5"	0.0260	75.00	73.23	0.01	1.75
4	3604	Yard North of Office - Orifice meter slide	Valve - 1"	0.0260	75.00	72.95	3.76	1.76
1	1996	Inlet Header - Controller box	Needle valve - 1"	0.0260	75.00	72.89	3.03	1.76
3	1853	Co-Gen Building: Fuel Gas Scrubber (SW Corner of Bldg) - Plug on GTV	Gate valve - 1"	0.0259	75.00	72.70	3.69	1.76
3	1800	Fuel Gas Scrubber (V8-1720) - A1720-1	Gate valve - 0.75"	0.0258	60.00	87.11	3.67	1.41
2	4187	Inlet gas to cryo skid 101 -	Control valve - butterfly - 6"	0.0258	282.00	-204.20	3.16	6.65
2	4131	Mole Sieve Tower C -	Flange - 4"	0.0258	75.00	2.69	3.15	1.77
3	1255	NGL Pump 2 - A1210N-6	Gate valve - 0.5"	0.0258	60.00	86.63	0.01	1.42
1	3460	Refrig Comp Unit 12 -	Valve cover	0.0257	200.00	-122.46	0.00	4.73
1	3340	Mole Sieve Tower 511A -	Threaded connection - 0.5"	0.0257	10.00	67.51	3.00	0.24
2	4003	Mole Sieve Tower D -	Gate valve - 0.75"	0.0256	60.00	85.84	3.13	1.43
2	4118	Skid 2 Inlet -	Gate valve - 0.5"	0.0256	60.00	85.83	3.13	1.43
1	3425	Refrig Comp Yard Piping -	Gate valve - 1.5"	0.0255	75.00	70.27	0.00	1.79
4	3721	Cryo System: De-methanizer Tower (1st Platform) - Sight glass	Gate valve - 0.75"	0.0255	60.00	85.01	0.06	1.43
3	1065	Amine Bldg: V8-404N - A404N-1	Gate valve - 0.5"	0.0255	60.00	84.91	3.05	1.43
2	4011	Mole Sieve Tower A -	Control valve - ball - 1"	0.0254	130.00	-53.51	3.11	3.12
3	1033	Mole Sieve 5 - Ground level	Threaded connection - 4"	0.0253	25.00	51.23	3.03	0.60
1	3376	De-butanizer Reflux Drum -	Threaded connection - 0.5"	0.0253	10.00	66.22	0.04	0.24
4	3818	Re-Compression: Yard Piping - Connection on regulator	Threaded connection - 2"	0.0252	15.00	60.75	3.64	0.36
2	4086	Common inlet lines - needle valve seat	Open-ended line - 0.5"	0.0251	60.00	15.69	3.07	1.45
3	1490	Residue Gas/N2 Comp Bldg - Comp 4 (Throw 4)	Threaded connection - 0.5"	0.0251	60.00	65.59	3.57	0.24
3	1288	NGL Bullet 2 - A1101N-18	Gate valve - 0.75"	0.0251	10.00	82.87	0.01	1.46
3	1438	Residue Gas/N2 Comp Bldg - Heat Pump 1	Valve cover	0.0251	200.00	-124.54	3.69	4.86
3	1130	NRU 1 - A411N-15	Threaded connection - 0.5"	0.0250	10.00	65.43	3.00	0.24
3	1248	NGL Bullet 4 - Near A1101N-44	Gate valve - 0.75"	0.0250	60.00	82.48	0.01	1.46
4	3785	Re-Compression: Piping Adjacent to Clark - PV-111B	Gate valve - 3"	0.0250	120.00	22.37	3.62	2.92
1	3297	High Pressure JT Expander -	Threaded connection - 0.75"	0.0250	10.00	65.15	3.59	0.24
1	1962	Inlet Comp Yard Piping -	Gate valve - 3"	0.0250	120.00	22.04	2.91	2.93
2	4373	Compressor Unit # 6 -	Threaded connection - 1"	0.0249	15.00	60.15	3.60	0.37
3	1331	Propane Yard: V8-411 (On Platform) -	Tubing connection - 0.5"	0.0248	15.00	126.44	0.00	0.37
1	3269	Solar Turbines -	Gate valve - 1"	0.0247	75.00	65.77	3.56	1.85
2	4385	Compressor fuel gas scrubber -	Tubing connection - 0.25"	0.0247	15.00	125.67	3.56	0.37
1	3307	Dust Filters for Regen Gas -	Gate valve - 0.75"	0.0247	60.00	80.67	2.88	1.48
3	1803	Fuel Gas Scrubber (V8-1720) - A1720-5	Gate valve - 1"	0.0247	75.00	65.43	3.51	1.85
4	3884	Refrigeration Compression: Outside Yard Piping - Main fuel line orifice meter	Tubing connection - 0.375"	0.0247	15.00	125.35	3.56	0.37
4	3683	Cryo System: Platform -	Gate valve - 4"	0.0246	190.00	-49.74	0.06	4.69
1	3446	Refrig Comp Unit 12 -	Valve cover	0.0245	200.00	-126.33	0.00	4.98
3	1263	NGL Pump 4 - A1201N-8	Gate valve - 4"	0.0245	190.00	-50.78	0.01	4.73
3	1335	Propane Yard: V8-410-3 - A410N-16	Threaded connection - 0.5"	0.0244	10.00	63.34	0.00	0.25

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1315	NGL Bullet 2 - A1101N-3	Gate valve - 2"	0.0243	100.00	38.27	0.01	2.51
2	4179	Cryo skid 101 -	Tubing connection - 0.375"	0.0243	15.00	123.27	2.97	0.38
1	---	EP Skid to Koch -	Tubing connection - 0.375"	0.0242	15.00	123.02	0.04	0.38
1	3318	Regen Gas Compressors/Blowers -	Gate valve - 0.5"	0.0242	60.00	78.01	2.83	1.51
3	1435	Residue Gas/N2 Comp Bldg - Heat Pump 1	Valve cover	0.0242	200.00	-127.07	3.56	5.03
4	3786	Re-Compression: Clark Discharge Cooler -	Control valve - globe - 6"	0.0242	282.00	-209.25	3.49	7.11
3	1252	NGL Pump 2 - A1202N-14	Gate valve - 1"	0.0241	75.00	62.14	0.01	1.90
3	1299	NGL Pumps - A2504N	Gate valve - 4"	0.0241	190.00	-53.04	0.01	4.81
2	4183	Cryo skid 101 -	Flange - 3"	0.0241	180.00	-107.53	3.47	4.55
3	1239	NGL Bullet 5 - A1101N-15	Gate valve - 4"	0.0240	190.00	-53.45	0.01	4.82
3	1132	NRU 3 - Top Platform - A2347N	Gate valve - 10"	0.0239	500.00	-363.94	2.86	12.73
4	3540	North Heat Medium Heater - Pilot stem	Gate valve - 0.5"	0.0238	60.00	75.59	3.44	1.53
1	3419	Refrig Comp Unit 11 - Yard Piping -	Orbit valve - 8"	0.0238	350.00	-214.49	0.00	8.95
4	3847	Re-Compression: Yard Piping -	Gate valve - 0.75"	0.0238	60.00	75.36	3.44	1.54
1	3212	Solar Turbines: Header Outside -	Gate valve - 2"	0.0238	100.00	35.36	3.42	2.56
3	1414	Residue Gas/N2 Comp Bldg - Comp 1	Gate valve - 0.75"	0.0236	60.00	74.55	3.36	1.55
1	3274	DEA Contactor Pumps -	Gate valve - 6"	0.0236	245.00	-110.63	3.40	6.32
4	3674	Cryo System: Turbo Expander -	Gate valve - 0.75"	0.0236	60.00	74.25	0.05	1.55
4	3987	Mole Sieve Dehy: Coalescing Filter Separator - Gate valve seat	Threaded connection - 1"	0.0235	15.00	55.92	2.75	0.39
2	4028C	Mole Sieve Tower C -	Threaded connection - 1"	0.0235	15.00	55.90	2.88	0.39
3	1211	NGL Pump 5 - A1202N-6	Gate valve - 3"	0.0235	120.00	13.90	0.01	3.11
4	3484	Inlet Yard Piping: Pig Traps - Plug valve seat	Open-ended line - 4"	0.0234	190.00	-119.45	2.84	4.94
2	4152	Residue Compressors FG Scrubber - on 4" orifice meter	Slide valve	0.0233	75.00	57.55	3.36	1.96
3	1851	Co-Gen Building: Fuel Gas Scrubber (SW Corner of Bldg) - Plug on GTV	Threaded connection - 1"	0.0232	15.00	54.82	3.29	0.39
4	3758	Cryo System: Economizer -	Gate valve - 4"	0.0231	190.00	-58.51	0.05	5.01
3	1421	Residue Gas/N2 Comp Bldg - Comp 2	Cylinder end - flange	0.0231	400.00	-364.22	3.28	10.55
4	3598	Mole Sieve Dehy: Outlet -	Gate valve - 0.5"	0.0231	60.00	71.41	2.69	1.58
3	1179	NRU 1 - 2nd Platform - Near A2311N	Union - 1"	0.0231	100.00	-30.56	2.76	2.64
2	4263	Compressor Unit # 5 -	Threaded connection - 1.5"	0.0231	15.00	54.44	3.32	0.40
2	4030	Mole Sieve Tower C - stem packing	Gate valve - 1"	0.0228	75.00	55.02	2.79	2.00
3	1052	Mole Sieve Header - N2811N-1	Threaded connection - 0.5"	0.0227	10.00	58.39	2.72	0.27
3	1801	Fuel Gas Scrubber (V8-1720) - A1720-1	Gate valve - 0.5"	0.0227	60.00	69.26	3.23	1.61
2	4384	Compressor Unit # 6 -	Valve cover	0.0226	200.00	-131.97	3.26	5.39
3	1364	Amine Bldg: GB-2702N12A - A2702N-6	Gate valve - 12"	0.0225	595.00	-466.69	2.70	16.07
2	---	Compressor Unit # 4 -	Crank case vent - 2"	0.0224	2000.00	-1965.32	3.23	54.40
3	1401	Residue Gas/N2 Comp Bldg: Yard -	Gate valve - 0.75"	0.0224	60.00	67.26	3.18	1.63
3	1466	Residue Gas/N2 Comp Bldg - Heat Pump 4	Gate valve - 0.75"	0.0223	60.00	66.86	3.28	1.64
1	3349	Mole Sieve Tower 511B -	Threaded connection - 0.5"	0.0221	10.00	56.65	2.58	0.28
1	3244	Solar Turbines -	Gate valve - 1"	0.0221	75.00	50.97	3.19	2.06
2	3993	SCW Inlet Line - PECO brand	Pressure transmitter - 1.5"	0.0221	75.00	50.58	2.70	2.07
3	1383	Amine Bldg: Near G8-1650 - A2809N-4	Gate valve - 1"	0.0220	75.00	50.34	2.64	2.07
2	4201	Residue Compressors FG Scrubber -	Threaded connection - 0.75"	0.0220	10.00	56.30	3.17	0.28
2	4081	Common inlet lines -	Orbit valve - 8"	0.0219	350.00	-225.30	2.68	9.73
1	3470	Refrig Comp Unit 12 -	Threaded connection - 0.5"	0.0219	10.00	55.97	3.15	0.28
4	3762	Cryo System: Economizer -	Gate valve - 4"	0.0218	190.00	-65.65	0.05	5.29

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1650	Re-Compressor Building - Re-Comp 2	Threaded connection - 0.5"	0.0217	10.00	55.33	2.60	0.28
3	1795	Stab 1 Building - (De-methanizer Tower)	Gate valve - 0.75"	0.0217	60.00	63.47	0.05	1.68
4	3974	Refrigeration Compressors: Unit 2 -	Flange - 2"	0.0216	50.00	15.01	3.12	1.41
3	1173	NRU 1 - A413N-1	Gate valve - 3"	0.0216	120.00	2.68	2.58	3.39
3	1495	Residue Gas/N2 Comp Bldg - Heat Pump 2	Threaded connection - 0.5"	0.0215	10.00	54.87	3.17	0.28
3	1256	NGL Pump 2 - Near C1201N-2	Gate valve - 0.5"	0.0215	60.00	62.21	0.01	1.70
1	3371	De-ethanizer Reboiler -	Open-ended line - 0.5"	0.0214	60.00	4.41	0.04	1.71
3	1881	Amine Building - A 2806N-1 GTV stem under vessel V8-2806-2	Gate valve - 1"	0.0214	75.00	46.59	2.56	2.14
1	3043	Scrubber (PV-517) -	Gate valve - 1.5"	0.0213	75.00	46.42	2.49	2.14
2	4186	Cryo skid 101 -	Flange - 8"	0.0213	290.00	-225.77	3.07	8.28
2	4358	Compressor Yard - Centre Residue Gas Cooler -	Gate valve - 4"	0.0213	190.00	-68.95	3.07	5.44
2	4239	Compressor Unit # 8 -	Injector	0.0212	200.00	-79.15	3.06	5.73
1	3338	Mole Sieve Tower 511A -	Control valve - orbit - 8"	0.0212	353.00	-289.21	2.47	10.15
3	1095	Amine Bldg (V2806-1) - (under vessel)	Gate valve - 1"	0.0210	75.00	44.57	2.52	2.17
3	1396	Residue Gas/N2 Comp Bldg: Yard -	Gate valve - 0.75"	0.0210	60.00	59.43	2.98	1.74
2	4331	Compressor Yard - Suction/Discharge Piping -	Gate valve - 0.5"	0.0209	60.00	58.91	3.01	1.75
4	3700	Cryo System: Expander Feed Separator -	Open-ended line - 0.5"	0.0209	60.00	2.83	0.05	1.75
4	3574	Mole Sieve Dehy: Dehy Tower A/B -	Gate valve - 0.5"	0.0208	60.00	58.30	2.43	1.76
3	1394	Residue Gas/N2 Comp Bldg: Yard -	Gate valve - 0.75"	0.0208	60.00	58.13	2.95	1.76
3	1311	NGL Bullet 1 - A1101N-6	Gate valve - 0.5"	0.0207	60.00	57.85	0.01	1.76
4	3712	Cryo System: Absorber Bottoms Pumps -	Open-ended line - 0.5"	0.0206	60.00	2.15	0.05	1.77
1	3200	Solar Turbines: Unit A - Chart recorder	Tubing connection - 0.375"	0.0206	15.00	102.42	2.97	0.44
3	1007	Mole Sieve 5 - On top platform	Threaded connection - 0.75"	0.0206	10.00	52.12	2.47	0.30
1	3070	Compressor CM-9 -	Threaded connection - 0.75"	0.0206	10.00	52.05	2.40	0.30
4	3770	C3 Refrigeration: Storage - Near Refrig Compressor Building	Gate valve - 2"	0.0206	100.00	17.15	0.00	2.96
1	3154	Refrig Comp Unit 10 -	Open-ended line - 0.5"	0.0206	60.00	1.93	0.00	1.78
1	3121	Compressor CM-19 -	Threaded connection - 2"	0.0205	15.00	46.83	2.40	0.44
2	4350A	C3 Cooler -	Threaded connection - 1"	0.0205	15.00	46.79	0.00	0.45
1	3424	Refrig Comp Yard Piping -	Control valve - butterfly - 8"	0.0205	353.00	-291.26	0.00	10.48
3	1286	NGL Bullet 2 - A1101N-5	Gate valve - 0.5"	0.0205	60.00	56.65	0.01	1.78
2	4180	Cryo skid 101 -	Gate valve - 0.5"	0.0205	60.00	56.45	2.50	1.79
3	1230	NGL Bullet 6 - G306?NA	Gate valve - 0.5"	0.0204	60.00	56.11	0.01	1.79
4	3692	Cryo System: Near FV104 -	Gate valve - 6"	0.0204	245.00	-128.91	0.05	7.31
3	1516	Residue Gas/N2 Comp Bldg: Lower Level -	Gate valve - 0.75"	0.0204	60.00	55.92	2.89	1.79
4	3919B	Re-Compression: Unit 3 - FG Line 2	Plug valve - 2"	0.0203	120.00	-4.33	2.94	3.59
3	1103	NRU 3 - Base of Hot Box	Open-ended line - 0.25"	0.0203	60.00	1.04	2.43	1.80
2	4368	Compressor Unit # 1 - stem packing	Control valve - orbit - 4"	0.0203	177.00	-116.00	2.92	5.32
4	3966	Refrigeration Compressors: Unit 3 - On injector	Flange	0.0202	200.00	-139.03	2.93	6.01
4	3687	Cryo System: Product Transfer Pump -	Gate valve - 2"	0.0200	100.00	13.96	0.05	3.04
3	1251	NGL Pump 3 - Near FY1201N	Union - 1.5"	0.0200	100.00	-39.78	0.01	3.04

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
4	3532	Heat Medium Heater FG Line -	Flange - 4"	0.0200	75.00	-14.89	2.89	2.29
2	4241	Compressor Unit 3 -	Variable volume pocket stem	0.0199	400.00	-369.08	2.88	12.21
3	1869	Residue Gas/N2 Comp Bldg: Res Comp 1 -	Threaded connection - 0.5"	0.0199	75.00	49.85	2.82	0.31
3	1305	NGL Bullet 1 - A1101N-8	Gate valve - 1"	0.0199	10.00	38.12	0.01	2.30
3	1604	IR Compressor Building - IR Comp 2	Threaded connection - 0.5"	0.0198	10.00	49.71	2.37	0.31
1	3260	Solar Turbines -	Gate valve - 0.75"	0.0198	60.00	52.86	2.85	1.84
2	4342	Residue Gas Suction Scrubber - sight glass	Gate valve - 0.75"	0.0198	60.00	52.58	2.85	1.85
1	3309	Dust Filters for Regen Gas -	Needle valve - 0.25"	0.0198	60.00	52.55	2.31	1.85
3	1493	Residue Gas/N2 Comp Bld - Comp 4 (Near Suction Bottle)	Gate valve - 0.5"	0.0197	60.00	52.42	2.81	1.85
4	3724	Cryo System: De-methanizer Tower (1st Platform) - Gate valve seat	Open-ended line - 0.5"	0.0197	60.00	-0.60	0.05	1.85
1	3382	High Pressure Chiller -	Gate valve - 4"	0.0197	190.00	-77.90	0.00	5.87
1	3001	Inlet Comp Yard Piping -	Gate valve - 0.75"	0.0197	60.00	51.93	2.29	1.86
3	1271	NGL Bullet 3 - A1101N-36	Gate valve - 0.75"	0.0196	60.00	51.76	0.01	1.86
3	1244	NGL Bullet 4 - A1101N-13	Gate valve - 2"	0.0196	100.00	11.73	0.01	3.10
3	1683	Re-Compressor Building - Re-Comp 3 (Fuel Gas Line)	Governor - 2"	0.0196	200.00	-88.27	2.79	6.20
1	3198	Solar Turbines: Unit A - On skid	Gate valve - 2"	0.0195	100.00	10.76	2.80	3.13
1	3224	De-methanizer -	Gate valve - 1"	0.0194	75.00	35.71	2.80	2.35
1	3337	Mole Sieve Tower 511C -	Gate valve - 0.75"	0.0194	60.00	50.65	2.27	1.88
3	1649	Re-Compressor Building - Re-Comp 2 (WE4C-301-2)	Flange - 6"	0.0194	100.00	-41.66	2.32	3.14
4	3736	Cryo System: Dust Filter (20.002) -	Gate valve - 8"	0.0194	350.00	-239.85	0.04	11.01
3	1094	Amine Bldg: V8-2806-1 - A2806N-8	Gate valve - 1"	0.0194	75.00	35.15	2.32	2.36
3	1850	Co-Gen Building: Fuel Gas Scrubber (SW Corner of Bldg) -	Gate valve - 1"	0.0193	75.00	35.00	2.75	2.36
4	3951	Refrigeration Compressors: Unit 2 -	Valve cover	0.0193	200.00	-141.87	0.00	6.31
2	4343	Residue Gas Suction Scrubber -	Threaded connection - 0.75"	0.0192	10.00	47.70	2.76	0.32
4	3726	Cryo System: Exchanger - Gate valve seat	Open-ended line - 0.5"	0.0191	60.00	-2.39	0.04	1.91
2	4223	Compressor Unit # 9 -	Flange - 2"	0.0191	50.00	7.60	2.76	1.59
2	4026A	Mole Sieve Tower C -	Threaded connection - 1"	0.0191	15.00	42.51	2.34	0.48
4	3792	Re-Compression: Valero Discharge Scrubber -	Flange - 4"	0.0190	75.00	-17.80	2.75	2.40
3	1150	NRU 1 - Base of Hot Box	Threaded connection - 0.25"	0.0190	10.00	47.17	2.27	0.32
1	3113	Compressor CM-19 -	Threaded connection - 0.5"	0.0189	10.00	47.05	2.21	0.32
1	3444	Refrig Comp Unit 12 -	Valve cover	0.0189	200.00	-143.18	0.00	6.45
4	3594	Mole Sieve Dehy: Dehy Train B - Top of dehy tower	Gate valve - 0.75"	0.0188	60.00	47.21	2.20	1.94
4	3599	Mole Sieve Dehy: Outlet - Needle valve seat	Open-ended line - 0.25"	0.0188	60.00	-3.38	2.19	1.94
1	3389	EP Skid to Koch -	Gate valve - 4"	0.0188	190.00	-83.08	0.03	6.16
2	3999A	Inlet Line -	Gate valve - 2"	0.0188	100.00	6.89	2.30	3.24
1	3426	Refrig Comp Yard Piping -	Flange - 2"	0.0186	50.00	6.12	0.00	1.63
2	4279	Compressor Unit # 7 -	Threaded connection - 2"	0.0186	15.00	41.11	2.69	0.49
3	1644	IR Compressor Building - IR Comp 3 (Start Gas) Plug	Threaded connection - 0.5"	0.0186	10.00	45.94	2.64	0.33
3	1564	HP1 Bldg: - B111-6 (Bottom of valve).	Ball valve - 6"	0.0185	245.00	-139.46	2.22	8.04
3	1892	Hg Removal Bed V8-401-3 -	Gate valve - 0.75"	0.0185	60.00	45.31	2.22	1.97
2	4049	Mole Sieve Tower A -	Gate valve - 0.75"	0.0185	60.00	45.31	2.26	1.97

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
2	4196	Compressor Unit 2 - Injector to cylinder head	Flange - 2"	0.0185	50.00	5.68	2.66	1.65
1	3192	Solar Turbines: Unit A - Chart recorder	Needle valve - 0.375"	0.0185	60.00	45.11	2.66	1.98
4	3504	Regen Heater -	Threaded connection - 0.25"	0.0184	10.00	45.42	2.66	0.33
1	3134	Compressor CM-13 -	Valve cover	0.0184	200.00	-144.69	2.14	6.63
4	3643	Sales Gas Header -	Threaded connection - 0.5"	0.0183	10.00	45.18	2.65	0.33
4	3952	Refrigeration Compressors: Unit 2 - Stem packing	Variable volume pocket stem	0.0183	400.00	-371.68	0.00	13.32
3	1163	NRU 1 - Near TB0429	Union - 0.75"	0.0183	50.00	4.97	2.19	1.67
3	1051	Mole Sieve Header - N2811N-1	Needle valve - 0.5"	0.0182	60.00	43.79	2.18	2.00
1	3225	De-methanizer -	Gate valve - 0.5"	0.0182	60.00	43.79	2.63	2.00
3	1812	G-10-625-2 - (East Reboiler)	Union	0.0182	100.00	-45.09	2.59	3.34
3	1083	NRU 3 - A411N-78	Threaded connection - 0.5"	0.0182	10.00	44.90	2.18	0.33
4	3857	Re-Compression: Unit 4 -	Variable volume pocket stem	0.0182	400.00	-371.81	2.63	13.39
2	4133	Mole Sieve Tower C -	Flange - 4"	0.0182	75.00	-20.31	2.22	2.51
4	3666	Cryo System: Warm Gas Exchanger - Gate valve seat	Open-ended line - 0.75"	0.0181	60.00	-5.40	0.04	2.01
1	3078	West Inlet Yard Piping - On orifice meter to PV-29	Slide valve	0.0181	75.00	27.77	2.11	2.53
3	1926	Dehydration Tower # 1 west -	Tubing connection - 0.375"	0.0180	15.00	87.40	2.15	0.51
1	1946	Inlet Header -	Gate valve - 0.5"	0.0179	60.00	41.96	2.09	2.04
3	1399	Residue Gas/N2 Comp Bldg - Comp 1 (Throw 2)	Flange - 12"	0.0179	150.00	-96.19	2.54	5.11
1	3311	Dust Filters for Regen Gas - Blowdown	Needle valve - 0.25"	0.0178	60.00	41.20	2.07	2.05
1	3315	Mole Sieve Bypass Piping -	Needle valve - 0.5"	0.0177	60.00	40.66	2.06	2.07
3	1278	NGL Bullet 3 - Near A1101N-33	Gate valve - 0.75"	0.0176	60.00	40.47	0.01	2.07
1	---	CM-504 - Turbine seals vent	Turbine seals vent	0.0176	2000.00	-1972.68	2.54	69.05
4	3944B	Re-Compression: Unit 2 - FG Line 2	Union - 2"	0.0176	100.00	-46.94	2.55	3.46
3	1008	Mole Sieve 5 - On top platform	Tubing connection - 0.75"	0.0175	25.00	74.74	2.10	0.87
1	3223	De-methanizer -	Gate valve - 0.5"	0.0175	60.00	39.63	2.52	2.09
2	4108	After filter on mole sieves -	Threaded connection - 2"	0.0175	15.00	37.60	2.14	0.52
2	4361	Residue Gas Suction Scrubber -	Threaded connection - 0.5"	0.0173	10.00	42.16	2.50	0.35
4	3946A	Re-Compression: Unit 1 - FG Line 5	Threaded connection - 2"	0.0173	15.00	37.06	2.50	0.53
4	3942C	Re-Compression: Unit 2 - FG Line 1	Plug valve - 2"	0.0172	120.00	-21.96	2.49	4.24
3	1732	HHE Compressor Building - Comp HHE 8	Threaded connection - 0.5"	0.0172	10.00	41.86	2.06	0.35
2	4228	Compressor Unit 8 -	Valve cover	0.0172	200.00	-148.15	2.48	7.07
3	1043	Mole Sieve 3 -	Flange - 8"	0.0172	100.00	-48.26	2.06	3.54
3	1515	Residue Gas/N2 Comp Bldg: Lower Level - A401N-21	Gate valve - 0.75"	0.0171	60.00	37.48	2.52	2.13
3	1612	IR Compressor Building - IR Comp 1	Threaded connection - 0.5"	0.0170	10.00	41.23	2.04	0.36
1	3123	Compressor CM-14 -	Valve cover	0.0170	200.00	-148.77	1.98	7.16
4	3715	Cryo System: Absorber Tower (20.001) - Gate valve seat	Open-ended line - 0.5"	0.0170	60.00	-8.78	0.04	2.15
3	1370	Amine Bldg: Near V8-2810N - A2809N-3	Gate valve - 18"	0.0170	920.00	-823.27	2.03	32.96
1	3215	Solar Turbines: Header Outside -	Gate valve - 2"	0.0170	100.00	-3.49	2.44	3.59
3	1815	Stab 1 Building (Yard) - (NGL Vessel)	Gate valve - 0.5"	0.0169	60.00	36.38	0.04	2.16
2	4005	Mole Sieve Tower D -	Gate valve - 1"	0.0169	75.00	21.36	2.07	2.70
4	3764	C3 Refrigeration: PSV Header - Outside Refrig Comp Building (under walkway)	Gate valve - 0.5"	0.0169	60.00	36.20	0.00	2.16

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
1	3149	Refrig Comp Unit 11 - Stem packing	Variable volume pocket stem	0.0169	400.00	-373.85	0.00	14.43
3	1030	Mole Sieve 2 - On top platform	Flange - 8"	0.0169	100.00	-49.20	2.02	3.61
4	3699B	Cryo System: South Of Cold Gas Exchanger -	Gate valve - 0.75"	0.0168	60.00	35.91	0.04	2.17
4	3597	Mole Sieve Dehy: Outlet -	Gate valve - 0.5"	0.0168	60.00	35.82	1.96	2.17
1	3148	Refrig Comp Unit 11 -	Valve cover	0.0168	200.00	-149.45	0.00	7.25
3	1459	Residue Gas/N2 Comp Bldg - Heat Pump 4 (near PDI-428N-4)	Gate valve - 0.75"	0.0167	60.00	34.94	2.45	2.19
1	3295	High Pressure JT Expander -	Gate valve - 0.75"	0.0167	60.00	34.81	2.40	2.19
3	1390	Regen Gas Heater 3 (G10-280) - A2801N-2	Gate valve - 1.5"	0.0166	75.00	19.53	2.36	2.75
3	1925	Dehydration Tower # 2 east - A2802N-12	Gate valve - 10"	0.0166	500.00	-405.54	1.99	18.34
3	1586	HP1 Bldg: W20-09 - To drain.	Open-ended line - 0.375"	0.0166	60.00	-10.12	1.98	2.21
1	1973	Inlet Comp Yard Piping -	Gate valve - 4"	0.0165	190.00	-96.35	1.92	7.03
1	3388	EP Skid to Koch -	Gate valve - 0.75"	0.0164	60.00	33.63	0.03	2.22
2	4050	Mole Sieve Tower B -	Gate valve - 0.5"	0.0164	60.00	33.39	2.01	2.23
4	3904	Re-Compression: Unit 1 - Stem packing	Governor - 3"	0.0164	200.00	-106.83	2.37	7.44
2	4163	Resid gas cooler E507 -	Gate valve - 0.75"	0.0164	60.00	33.11	2.36	2.23
1	3448	Refrig Comp Unit 12 -	Threaded connection - 0.5"	0.0163	10.00	39.17	0.00	0.37
3	1149	NRU 2 - 2nd Platform - A2320-N	Gate valve - 1"	0.0163	75.00	17.87	1.95	2.80
3	1292	NGL Bullet 1 - A1101N-7	Gate valve - 0.5"	0.0162	60.00	32.25	0.00	2.25
4	3766	C3 Refrigeration: Compressors - Discharge bottle (gate valve seat)	Threaded connection - 0.75"	0.0162	10.00	38.81	0.00	0.38
3	1216	NGL Pump 4 -	Pump seal - 1"	0.0162	500.00	-474.90	0.00	18.79
2	4012	Mole Sieve Tower A -	Threaded connection - 1"	0.0162	15.00	33.75	1.98	0.56
1	3368	Inlet Gas Scrubber (PV-501) -	Gate valve - 0.75"	0.0162	60.00	32.03	1.89	2.26
4	3615	Yard North of Office -	Gate valve - 0.5"	0.0162	60.00	32.00	2.34	2.26
1	3439B	EP Skid to Koch -	Gate valve - 0.75"	0.0161	60.00	31.68	0.03	2.27
3	1231	NGL Bullet 6 - A1101N-15	Gate valve - 3"	0.0160	120.00	-28.82	0.00	4.56
4	3833	Re-Compression: Yard Piping - On pressure relief valves	Flange - 2"	0.0160	50.00	-1.77	2.32	1.90
2	4125	Mole Sieve Tower B -	Threaded connection - 0.25"	0.0160	10.00	38.19	1.96	0.38
3	1537	Residue Gas/N2 Comp Bldg - Heat Pump 3	Valve cover	0.0159	200.00	-152.07	0.00	7.65
2	4023	Mole Sieve Tower C -	Gate valve - 0.5"	0.0159	60.00	30.41	1.94	2.30
3	1071	Amine Bldg - A2801N-10	Gate valve - 2"	0.0158	100.00	-9.83	1.90	3.84
2	4374	Compressor Unit # 6 -	Threaded connection - 2"	0.0158	15.00	32.63	2.28	0.58
3	1141	NRU 2 - A415N-51	Threaded connection - 0.75"	0.0158	10.00	37.59	1.89	0.39
3	1614	IR Compressor Building - IR Comp 3	Threaded connection - 0.5"	0.0158	10.00	37.58	1.89	0.39
3	1337	Amine Bldg: Near V8-2810N - A1653N-2	Gate valve - 18"	0.0158	920.00	-830.12	1.89	35.47
4	3940A	Re-Compression: Unit 2 - FG Line 5	Threaded connection - 2"	0.0158	15.00	32.54	2.28	0.58
4	3976	Refrigeration Compressors: Unit 2 - To injector	Flange - 2"	0.0157	50.00	-2.73	2.27	1.94
1	3226	HP Expander Scrubber (PV-503) -	Gate valve - 0.75"	0.0157	60.00	29.21	2.26	2.33
4	3741	Cryo System: Absorber Bottoms Pumps -	Open-ended line - 0.5"	0.0157	60.00	-12.81	0.04	2.33
2	4017	Mole Sieve Tower D -	Flange - 4"	0.0156	75.00	-28.04	1.91	2.93
4	3855	Re-Compression: Unit 4 -	Valve cover	0.0155	200.00	-153.33	2.24	7.86
3	1243	NGL Bullet 4 - A1101N-5	Gate valve - 3"	0.0153	120.00	-32.64	0.00	4.76
1	3304	Dust Filter Header -	Tubing connection - 0.375"	0.0153	15.00	72.36	1.79	0.60
2	4156	Residue Compressors FG Scrubber -	Gate valve - 0.5"	0.0153	60.00	27.19	2.21	2.38

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
1	3155	Refrig Comp Unit 10 -	Open-ended line - 0.5"	0.0153	60.00	-14.01	0.00	2.39
1	3461	Refrig Comp Unit 12 -	Flange - 8"	0.0153	100.00	-54.01	0.00	3.99
3	1282	NGL Bullet 3 - A1101N-29	Gate valve - 0.75"	0.0153	60.00	26.88	0.00	2.39
2	4247	Compressor Unit 3 -	Threaded connection - 1"	0.0152	15.00	30.88	2.20	0.60
2	4354	Compressor Yard - Centre Residue Gas Cooler -	Gate valve - 6"	0.0152	245.00	-158.28	2.20	9.79
1	3432	EP Skid to Koch -	Threaded connection - 0.5"	0.0152	10.00	35.88	0.03	0.40
1	3302	Dust Filter Header -	Gate valve - 0.5"	0.0152	60.00	26.51	1.77	2.40
3	1217	NGL Pump 3 - A1202N-3	Gate valve - 3"	0.0151	120.00	-33.79	0.00	4.82
2	4137	Chiller E-403 - on 2" orifice meter	Grease nipple	0.0150	50.00	35.60	0.00	2.02
3	1860	Residue Gas/N2 Comp Bldg: Heat Pump 4 -	Threaded connection - 0.5"	0.0150	10.00	35.28	2.21	0.40
4	3608	Yard North of Office -	Control valve - plug - 10"	0.0149	459.00	-414.14	2.15	18.76
3	1208	NGL Sales Line - Methanol Injection Point	Threaded connection - 2"	0.0149	15.00	29.83	0.00	0.61
4	3740	Cryo System: Absorber Bottoms Pumps - Gate valve seat	Open-ended line - 0.75"	0.0149	60.00	-15.21	0.03	2.46
3	1182	NRU 1 - Top Platform - PV4101NB-1	Control valve - gate - 10"	0.0148	459.00	-414.47	1.77	18.90
2	4080	Common inlet lines - gate valve seat	Open-ended line - 0.5"	0.0148	60.00	-15.47	1.81	2.47
1	3213	Solar Turbines: Header Outside -	Flange - 2"	0.0147	50.00	-5.58	2.12	2.06
3	1638	Re-Compressor Building - Re-Comp 1 (WE4C-301-1)	Threaded connection - 0.5"	0.0147	10.00	34.39	1.76	0.41
3	1582	HP1 Bldg: E28-06 - B211-1 (BV seat).	Threaded connection - 0.5"	0.0147	10.00	34.38	1.76	0.41
4	3718	Cryo System: De-methanizer Tower (1st Platform) -	Gate valve - 0.75"	0.0147	60.00	23.87	0.03	2.48
3	1483	Residue Gas/N2 Comp Bldg: Back Wall - A301N-6	Threaded connection - 0.75"	0.0147	10.00	34.33	2.09	0.41
3	1507	Residue Gas/N2 Comp Bldg: Lower Level - Near G301N-19	Flange - 3"	0.0147	75.00	-30.81	2.09	3.11
1	---	Refrig Comp Unit 10 -	Crank case vent	0.0147	2000.00	-1977.29	0.00	83.10
3	1893	Hg Removal Bed V8-401-3 - on A401N-20 (not plug)	Threaded connection - 0.75"	0.0146	60.00	34.00	1.75	0.42
3	1306	NGL Bullet 1 - A1101N-7	Gate valve - 0.75"	0.0146	10.00	23.15	0.00	2.50
3	1641	IR Compressor Building - IR Comp 3	Threaded connection - 0.5"	0.0146	10.00	33.93	1.75	0.42
2	4028B	Mole Sieve Tower C -	Threaded connection - 1"	0.0146	15.00	28.93	1.78	0.63
4	3690	Cryo System: De-methanizer Recycle Line	Gate valve - 0.75"	0.0146	60.00	22.91	0.03	2.51
2	4109	After Filter -	Threaded connection - 1"	0.0145	15.00	28.63	1.77	0.63
4	3948A	Re-Compression: Unit 1 - FG Line 2	Threaded connection - 2"	0.0145	15.00	28.61	2.09	0.63
3	1055	Mole Sieve Header - PDISH-2867N	Tubing connection - 0.375"	0.0145	15.00	67.40	1.73	0.63
1	3085	West Inlet Yard Piping - gate valve seat on Hanna Bridgeport scrubber (PV-29)	Gate valve - 0.75"	0.0145	60.00	22.38	1.69	2.52
4	3627B	Yard North of Office - (Holes on both sides)	Orifice meter plate - 0.0625"	0.0144	150.00	-127.63	1.68	6.32
4	3917A	Re-Compression: Unit 5 - FG Line 3	Threaded connection - 2"	0.0144	15.00	28.47	2.09	0.63
3	1872	Co-Gen (Fuel Gas Scrubber SE Corner of Bldg) - Sight Glass	Gate valve - 0.75"	0.0144	120.00	22.16	2.05	2.53
3	1693	Re-Compressor Building - Associated Yard Piping (Near B9244)	Gate valve - 3"	0.0144	60.00	-37.84	2.05	5.06

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
2	4059	Scrubber -	Threaded connection - 0.5"	0.0144	10.00	33.47	1.77	0.42
2	4293	Compressor Yard - Compressor unit 4 - on 4" plug valve	Grease nipple	0.0144	50.00	32.14	2.08	2.11
3	1107	NRU 3 - Hot Box - 4155-3 On PSV	Union - 0.5"	0.0144	50.00	-6.56	1.73	2.11
2	4035A	Mole Sieve Tower C - Both sides of gate valve 4036	Threaded connection - 1"	0.0144	15.00	28.37	1.76	0.63
1	3074	West Inlet Yard Piping -	Flange - 8"	0.0144	100.00	-56.63	1.68	4.23
4	3887	Refrigeration Compression: Outside Yard Piping - Orifice meter to Unit 2	Needle valve - 0.5"	0.0143	60.00	21.38	2.07	2.55
3	1277	NGL Bullet 3 - A1101N-32	Gate valve - 0.75"	0.0143	60.00	21.18	0.00	2.56
3	1268	NGL Bullet 4 - A1101N-2	Gate valve - 3"	0.0142	120.00	-39.27	0.00	5.15
4	3515	Still Reboiler No. 1 -	Gate valve - 0.5"	0.0142	60.00	20.71	2.05	2.58
2	4099	DGA coalescer - gate valve seat	Open-ended line - 1"	0.0142	75.00	-32.32	1.73	3.22
4	3634	TEG Contactor - Inlet line	Open-ended line - 0.75"	0.0141	60.00	-17.42	1.65	2.58
2	4154	Residue Compressors FG Scrubber - on 4" orifice meter	Equilizer valve	0.0141	75.00	5.36	2.04	3.23
1	3319	Regen Gas Compressors/Blowers -	Gate valve - 4"	0.0140	190.00	-110.06	1.64	8.24
4	3769	C3 Refrigeration: Storage - Near Refrig Compressor Building	Gate valve - 2"	0.0140	100.00	-20.52	0.00	4.36
4	3546	North Heat Medium Heater - Pilot stem	Gate valve - 0.5"	0.0139	60.00	19.33	2.01	2.62
4	3751	Cryo System: Absorber Tower (20.001) - First platform: gate valve seat	Open-ended line - 0.5"	0.0139	60.00	-18.04	0.03	2.62
3	1500	Residue Gas/N2 Comp Bldg: Lower Level -	Gate valve - 6"	0.0139	245.00	-165.98	1.97	10.74
2	4376	Compressor Unit # 6 -	Cylinder end - flange	0.0138	400.00	-378.57	1.99	17.61
3	1625	IR Compressor Building - IR Comp 3	Threaded connection - 0.5"	0.0138	10.00	31.49	1.65	0.44
3	1605	IR Compressor Building - IR Comp 2	Valve cover	0.0138	200.00	-158.57	1.65	8.85
3	1726	HHE Compressor Building - Comp HHE 7	Valve cover	0.0138	200.00	-158.58	1.65	8.85
4	3680	Cryo System: Expander Feed Separator - Gate valve seat	Open-ended line - 0.5"	0.0137	60.00	-18.63	0.03	2.66
2	4150	Compressor Unit 2 Outside -	Threaded connection - 2"	0.0137	15.00	26.18	1.97	0.67
1	3169	Refrig Comp Units -	Gate valve - 0.5"	0.0136	60.00	17.51	1.96	2.68
3	1387	Regen Gas Heater 5 - Near RKJ-258	Tubing connection - 0.375"	0.0136	15.00	62.49	1.93	0.67
1	3022	Fuel Gas Scrubber (West Yard) - Gate valve seat (PV-9)	Threaded connection - 0.75"	0.0136	10.00	30.97	1.96	0.45
1	3384	High Pressure Chiller -	Gate valve - 4"	0.0136	190.00	-112.80	0.00	8.53
4	3808	Re-Compression: Inlet Scrubber - Gate valve seat	Open-ended line - 1"	0.0135	75.00	-34.31	1.95	3.38
3	1849	Co-Gen Building: Outside (CA 625 - HP FG Scrubber) - VG-27	Gate valve - 4"	0.0135	190.00	-113.24	1.92	8.58
1	---	CM-503 - Turbine seals vent	Turbine seals vent	0.0135	2000.00	-1979.12	1.94	90.34
3	1151	NRU 1 - Base of Hot Box	Tubing connection - 0.25"	0.0135	15.00	61.60	1.61	0.68
2	4064	Fuel Gas -	Gate valve - 0.5"	0.0134	60.00	16.56	1.94	2.72
2	4127	Mole Sieve Tower B - gate valve seat	Open-ended line - 0.5"	0.0134	60.00	-19.49	1.64	2.72
4	3626	Yard North of Office - On orifice meter	Gate valve - 0.5"	0.0134	60.00	16.32	1.56	2.72
3	1048	Mole Sieve Header - PDSL-2869N	Needle valve - 0.375"	0.0134	60.00	16.11	1.60	2.73
2	4264	Compressor Unit # 5 -	Threaded connection - 1.5"	0.0134	15.00	25.27	1.93	0.68
2	4356	Compressor Yard - Center Residue Gas Cooler -	Gate valve - 6"	0.0134	245.00	-168.89	1.93	11.15
1	3072	Fuel Gas Scrubber (West Yard) - PV-9	Threaded connection - 1"	0.0134	15.00	25.25	1.92	0.68
3	1712	Medium Pressure Bldg - B244-4	Ball valve - 2"	0.0133	100.00	-24.12	1.60	4.57
3	1746	HHE Compressor Building - Comp HHE 7	Valve cover	0.0133	200.00	-160.07	1.59	9.18

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1533	Residue Gas/N2 Comp Bldg - Heat Pump 3	Valve cover	0.0132	200.00	-160.19	1.94	9.21
3	1029	Mole Sieve 3 - On top platform	Flange - 2"	0.0132	50.00	-10.37	1.58	2.31
1	3207	Solar Turbines: Unit B - On orifice meter	Needle valve - 0.5"	0.0131	60.00	14.74	1.89	2.78
4	3773	C3 Refrigeration: Storage - Near Refrig Compressor Building	Open-ended line - 0.5"	0.0131	60.00	-20.69	0.00	2.80
4	3714	Cryo System: Absorber Tower (20.001) - Gate valve seat	Open-ended line - 0.5"	0.0130	60.00	-20.92	0.03	2.81
1	3328	Mole Sieve Tower 511B - Gate valve seat	Threaded connection - 0.75"	0.0129	10.00	28.94	1.51	0.47
4	3768	C3 Refrigeration: Storage - Near Refrig Compressor Building	Gate valve - 2"	0.0129	100.00	-26.63	0.00	4.72
4	3670	Cryo System: Chart Recorder -	Tubing connection - 0.5"	0.0128	15.00	57.97	0.03	0.71
1	3393	De-ethanizer Tower -	Threaded connection - 0.75"	0.0128	10.00	28.60	0.02	0.47
4	3948B	Re-Compression: Unit 1 - FG Line 2	Plug valve - 2"	0.0128	120.00	-47.11	1.85	5.70
2	4325	Compressor Unit # 1 -	Threaded connection - 0.25"	0.0128	10.00	28.44	1.84	0.48
4	3688	Cryo System: De-methanizer Feed Separator -	Gate valve - 2"	0.0128	100.00	-27.38	0.03	4.77
1	3361	Inlet Scrubber (PV-504) -	Gate valve - 6"	0.0128	245.00	-172.39	1.84	11.69
1	3363	Inlet Scrubber (PV-504) -	Gate valve - 1"	0.0126	75.00	-3.03	1.82	3.61
1	3234	Solar Turbines: Unit B - On skid	Union - 1.5"	0.0126	100.00	-61.92	1.82	4.81
3	1234	NGL Bullet 5 - A1101N-6	Gate valve - 0.75"	0.0126	60.00	11.69	0.00	2.90
1	3139	Compressor CM-13 -	Vent - 1"	0.0126	2000.00	-1980.48	1.47	96.67
3	1527	Residue Gas/N2 Comp Bldg - Heat Pump 2	Valve cover	0.0126	200.00	-162.12	1.85	9.68
4	3981	Power Generators: Unit 3 -	Union - 3"	0.0125	150.00	-112.28	1.81	7.29
2	4311	Compressor Unit # 1 -	Valve cover	0.0125	200.00	-162.34	0.00	9.74
4	3744A	Cryo System: Absorber Tower (20.001) - First platform: gate valve seat	Open-ended line - 0.75"	0.0125	60.00	-22.37	0.03	2.92
3	1725	HHE Compressor Building - Comp HHE 7	Threaded connection - 0.5"	0.0125	10.00	27.59	1.49	0.49
2	4338	Make-up Gas Suction Scrubber - sight glass	Gate valve - 0.75"	0.0125	60.00	11.03	1.80	2.93
1	3278	DEA Contactor Pumps -	Gate valve - 6"	0.0125	245.00	-174.08	1.79	11.97
2	4349F	C3 Cooler -	Threaded connection - 1"	0.0124	15.00	22.37	0.00	0.74
1	3466	Refrig Comp Unit 12 -	Threaded connection - 2"	0.0124	15.00	22.33	1.78	0.74
3	1528	Residue Gas/N2 Comp Bldg - Heat Pump 2	Valve cover	0.0124	200.00	-162.67	1.82	9.82
2	4060	Scrubber - on 6" orifice meter	Greaser	0.0124	50.00	20.47	1.51	2.46
3	1517	Residue Gas/N2 Comp Bldg - Heat Pump 2	Valve cover	0.0123	200.00	-162.89	1.81	9.88
3	1467	Residue Gas/N2 Comp Bldg - Heat Pump 4	Gate valve - 0.75"	0.0123	60.00	10.09	1.81	2.97
1	3316	Regen Gas Compressors/Blowers - Gate valve seat	Open-ended line - 1"	0.0123	75.00	-38.08	1.43	3.72
3	1451	Residue Gas/N2 Comp Bldg - Comp 3	Gate valve - 0.75"	0.0122	60.00	9.47	1.73	2.99
3	1238	NGL Bullet 5 - A1101N-11	Gate valve - 3"	0.0122	120.00	-50.58	0.00	5.99
4	3616	Yard North of Office -	Tubing connection - 0.375"	0.0122	15.00	54.27	1.76	0.75
2	4182	Cryo skid 101 -	Gate valve - 3"	0.0122	120.00	-50.80	1.75	6.01
3	1461	Residue Gas/N2 Comp Bldg - Heat Pump 4	Cylinder end - flange	0.0122	400.00	-381.16	1.79	20.03
1	3354	Mole Sieve: Inlet Separator (PV-501) -	Gate valve - 1"	0.0121	75.00	-5.85	1.42	3.76
3	1608	IR Compressor Building - IR Comp 2 (Fuel Gas)	Threaded connection - 2"	0.0121	15.00	21.50	1.72	0.75
2	4298	Compressor Yard - Suction/Discharge Piping -	Gate valve - 0.5"	0.0120	60.00	8.54	0.00	3.03
3	1933	Dehydration Tower # 2 east - onlg-2801N-2	Gate valve - 0.75"	0.0120	60.00	8.51	1.44	3.03
2	4105	Mole Sieve Tower A -	Gate valve - 0.5"	0.0120	60.00	8.51	1.47	3.03
1	3365	Inlet Gas Scrubber (PV-501) -	Gate valve - 1"	0.0120	75.00	-6.94	1.40	3.82
3	1304	NGL Bullet 1 - LG1101NB	Gate valve - 0.5"	0.0119	60.00	7.82	0.00	3.07
3	1526	Residue Gas/N2 Comp Bldg - Heat Pump 2	Valve cover	0.0119	200.00	-164.14	1.75	10.23

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1122	NRU 2 – Cold Box (Bottom on PSV485)	Threaded connection - 0.75"	0.0119	10.00	25.70	1.42	0.51
3	1736	HHE Compressor Building - Comp HHE 8	Threaded connection - 0.5"	0.0119	10.00	25.70	1.42	0.51
4	3775	Central Yard - Between C3 Compressors and Gen Building	Tubing connection - 4"	0.0118	25.00	42.44	1.71	1.28
3	1144	NRU 2 - Plug on GTV A415N-36	Threaded connection - 1"	0.0118	15.00	20.58	1.41	0.77
3	1127	NRU 2 - Base of Cold Box	Threaded connection - 0.25"	0.0118	10.00	25.55	1.41	0.52
2	4057	Scrubber - sight glass	Gate valve - 0.75"	0.0118	60.00	7.13	1.44	3.10
4	3879	Fuel Gas System: To Heaters -	Gate valve - 4"	0.0117	190.00	-123.14	1.70	9.85
3	1756	Stab 1 Building - A334-3 (West Wall)	Gate valve - 1.5"	0.0117	190.00	-8.39	0.02	3.90
3	1178	NRU 1 - A409N-1	Gate valve - 4"	0.0117	75.00	-123.39	1.40	9.88
1	3254	Solar Turbines -	Gate valve - 1"	0.0117	75.00	-8.39	1.68	3.90
2	4360	Residue Gas Suction Scrubber -	Needle valve - 0.75"	0.0117	60.00	6.59	1.69	3.12
3	1816	Stab 1 Building (Yard) - A410N-4 (NGL Vessel)	Threaded connection - 0.375"	0.0117	10.00	25.14	0.02	0.52
3	1735	HHE Compressor Building - Comp HHE 8	Valve cover	0.0116	200.00	-164.99	1.39	10.47
3	1353	Amine Bldg: G8-2702N-22B - A2702N-79 (Amine Feed/Res exchanger)	Gate valve - 0.75"	0.0116	60.00	5.97	1.39	3.15
1	3372	De-ethanizer Reboiler -	Pump seal	0.0116	500.00	-482.05	0.02	26.28
1	3286	HP Expander Scrubber (PV-503) -	Threaded connection - 0.75"	0.0115	10.00	24.79	1.66	0.53
3	1135	NRU 3 - Top Platform - A2361N	Threaded connection - 0.375"	0.0115	10.00	24.78	1.38	0.53
3	1152	NRU 1 - Base of Hot Box	Tubing connection - 0.25"	0.0115	15.00	50.60	1.38	0.79
3	1793	Stab 1 Building (Yard) - (NGL Vessel)	Gate valve - 4"	0.0114	190.00	-124.83	0.02	10.10
1	3049	Scrubber (PV-517) -	Threaded connection - 1"	0.0114	15.00	19.48	1.34	0.80
2	4170	Cryo skid north - Note: was fixed already on expander	Threaded connection - 0.5"	0.0114	10.00	24.42	1.40	0.53
3	1563	HP1 Bldg: Piping - B218-3	Orbit valve - 3"	0.0114	120.00	-55.02	1.37	6.40
3	1661	Re-Compressor Building - Re-Comp 2 (Fuel Gas Line)	Threaded connection - 2"	0.0114	15.00	19.27	1.62	0.80
2	4316	Compressor Unit # 1 -	Injector	0.0114	200.00	-135.29	1.64	10.71
1	3153	Refrig Comp Unit 10 -	Open-ended line - 0.5"	0.0113	60.00	-25.84	0.00	3.22
4	3485	Inlet Yard Piping: Pig Traps -	Plug valve - 4"	0.0113	200.00	-135.46	1.38	10.74
4	3860	Re-Compression: Unit 3 -	Threaded connection - 0.5"	0.0113	10.00	24.10	1.64	0.54
4	3646	Sales Gas Header - Stem packing on orifice meter.	Ball valve - 0.5"	0.0113	60.00	4.39	1.64	3.23
4	3491	WADD Flash Tank -	Control valve - globe - 4"	0.0113	177.00	-142.93	1.37	9.53
2	4155	Residue Compressors FG Scrubber -	Control valve - globe - 1"	0.0113	130.00	-95.94	1.63	7.00
3	1587	HP1 Bldg: W30-10 - To drain.	Open-ended line - 0.375"	0.0112	60.00	-26.13	1.35	3.25
1	3077	West Inlet Yard Piping - On orifice meter to PV-29	Valve - 0.5"	0.0112	60.00	4.02	1.31	3.25
3	1835	Co-Gen Building: Outside (CA 625 - HP FG Scrubber) - VG-155	Gate valve - 1"	0.0111	75.00	-11.56	1.58	4.10
3	1829	Co-Gen Building: Outside (CA 625 - HP FG Scrubber) - VG-151	Gate valve - 0.5"	0.0111	60.00	3.44	1.58	3.28
2	4053	Inlet Scrubber - sight glass	Gate valve - 0.75"	0.0111	60.00	3.44	1.36	3.28
2	4227	Compressor Unit 8 -	Variable volume pocket stem	0.0111	400.00	-382.73	1.61	21.85
2	4092	Process inlet separator D-208 - sight glass	Gate valve - 0.75"	0.0111	60.00	2.97	1.35	3.30

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1699	Re-Compressor Building - Associated Yard Piping (A9240)	Control valve - butterfly - 3"	0.0110	141.00	-107.77	1.32	7.78
4	3684	Cryo System: Beside Expander Feed Separator - Gate valve seat	Open-ended line - 0.5"	0.0110	60.00	-26.87	1.59	3.32
4	3708	Sales Gas Header -	Control valve - globe - 2"	0.0110	130.00	-96.89	1.59	7.20
1	3141	Compressor CM-14 - Lube oil tank	Lube oil tank vent - 0.375"	0.0109	4000.00	-3983.04	1.28	222.51
1	3036	Discharge to NG PL - In ground.	Gate valve - 1.5"	0.0109	75.00	-12.71	1.28	4.17
3	1565	HP1 Bldg: Ceiling - B219-3	Orbit valve - 3"	0.0109	120.00	-57.75	1.31	6.68
3	1415	Residue Gas/N2 Comp Bldg - Comp 1	Gate valve - 0.75"	0.0109	60.00	2.22	1.55	3.34
3	1585	HP1 Bldg: W20-09 - Near FE215-1 (NV seat).	Threaded connection - 0.25"	0.0108	10.00	22.67	1.30	0.56
3	1332	Propane Yard: V8-410-3 - (on panel)	Tubing connection - 0.5"	0.0108	15.00	46.54	0.00	0.84
3	1228	NGL Bullet 6 - A1101N	Gate valve - 1.5"	0.0107	75.00	-14.10	0.00	4.27
4	3516	Still Reboiler No. 1 -	Threaded connection - 1"	0.0107	15.00	17.19	1.55	0.85
3	1547	Residue Gas/N2 Comp Bldg - Heat Pump 2	Gate valve - 0.75"	0.0107	60.00	0.65	1.57	3.43
2	4375	Compressor Unit # 6 -	Threaded connection - 1"	0.0106	15.00	17.03	1.53	0.86
4	3962	Refrigeration Compressors: Unit 3 -	Needle valve - 0.75"	0.0106	60.00	0.54	1.54	3.43
4	3954	Refrigeration Compressors: Unit 3 -	Variable volume pocket stem	0.0106	400.00	-383.55	0.00	22.94
3	1131	NRU 1 - A411N-17	Threaded connection - 0.5"	0.0105	10.00	21.72	1.26	0.58
3	1357	Amine Bldg: V8-2701 - A2701N-43	Gate valve - 1.5"	0.0105	75.00	-15.23	1.26	4.35
1	3168	Refrig Comp Units -	Threaded connection - 2"	0.0105	15.00	16.59	1.51	0.87
4	3644	Sales Gas Header -	Flange - 3"	0.0105	75.00	-43.48	1.51	4.36
1	3143	Yard between inlet compressors and fractionation plant. -	Orbit valve - 3"	0.0105	120.00	-60.47	1.22	6.99
4	3589	Mole Sieve Dehy: Regen Piping -	Control valve - orbit - 4"	0.0105	177.00	-145.52	1.22	10.31
3	1270	NGL Bullet 3 - A1101N-2	Gate valve - 6"	0.0104	245.00	-185.60	0.00	14.29
3	1558	Residue Gas/N2 Comp Bldg - Heat Pump 3	Valve cover	0.0104	200.00	-168.69	0.00	11.71
3	1224	Propane Storage Tank V6-290 -	Threaded connection - 0.5"	0.0103	10.00	21.10	0.00	0.59
3	1257	NGL Pump 2 - A1201N-6	Gate valve - 4"	0.0103	190.00	-131.34	0.00	11.22
2	4193	Compressor Unit 2 -	Governor - 2"	0.0103	200.00	-141.34	1.49	11.81
1	3067	Compressor CM-9 -	Threaded connection - 0.5"	0.0103	10.00	21.04	1.20	0.59
4	3665	Cryo System: Warm Gas Exchanger -	Gate valve - 0.75"	0.0103	60.00	-1.39	0.02	3.55
4	3750	Cryo System: Absorber Tower (20.001) - Second platform: gate valve seat	Open-ended line - 0.5"	0.0103	60.00	-29.05	0.02	3.55
3	1068	Amine Bldg: V8-404N - A404N-1	Gate valve - 0.75"	0.0103	60.00	-1.64	1.23	3.56
2	4084	Common inlet lines -	Orifice meter plate - 6"	0.0103	150.00	-134.11	1.25	8.91
3	1168	NRU 1 - Near A411N-17	Flange - 0.5"	0.0102	25.00	5.76	1.22	1.49
1	1942	Inlet Header -	Gate valve - 0.75"	0.0102	60.00	-1.86	1.19	3.58
3	1898	Hg Removal Bed V8-401-1 - on 10" BV401N-2	Grease nipple - 0.5"	0.0102	50.00	8.13	1.22	2.98
3	1486	Residue Gas/N2 Comp Bldg: Lower Level -	Control valve - globe - 8"	0.0102	353.00	-322.25	1.50	21.05
2	4130	Mole Sieve Tower C - needle valve seat	Threaded connection - 0.5"	0.0101	10.00	20.54	1.24	0.60
1	3326	Mole Sieve Tower 511A - Gate valve seat	Threaded connection - 0.75"	0.0101	10.00	20.52	1.18	0.60
3	1715	Heater Treaters - A 453-3	Gate valve - 2"	0.0101	100.00	-42.33	1.44	6.01
1	1959	Inlet Comp Yard Piping -	Gate valve - 3"	0.0101	120.00	-62.38	1.18	7.22

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
2	4153	Residue Compressors FG Scrubber - on 4" orifice meter	Rack	0.0101	75.00	-17.69	1.45	4.53
3	1931	Mole Sieve Tower 1 - A2802N-3	Gate valve - 10"	0.0100	500.00	-442.90	1.20	30.34
2	4158	Residue Compressors FG Scrubber - sight glass	Gate valve - 0.75"	0.0100	60.00	-2.90	1.45	3.64
2	4058	Inlet Scrubber -	Threaded connection - 0.5"	0.0100	10.00	20.21	1.23	0.61
2	4149	Compressor Unit 3 Outside - Both sides of union	Union - 2"	0.0100	100.00	-69.79	1.45	6.07
4	3949A	Re-Compression: Unit 1 - FG Line 3	Threaded connection - 2"	0.0100	15.00	15.13	1.45	0.91
3	1139B	NRU 2 - A2306N	Threaded connection - 0.375"	0.0099	10.00	19.90	1.19	0.61
1	1953	Inlet Comp Yard Piping -	Threaded connection - 1"	0.0099	15.00	14.80	1.15	0.92
1	1964	Inlet Comp Yard Piping - On 10" orifice meter	Rack	0.0098	75.00	-18.98	1.15	4.64
2	4043	Mole Sieve Tower B -	Gate valve - 0.75"	0.0098	60.00	-4.06	1.20	3.72
1	3370	Stabilizer (PV-3A) -	Gate valve - 3"	0.0098	120.00	-64.17	0.02	7.45
3	1022	Mole Sieve 3 - XY2817N0	Flange - 8"	0.0098	100.00	-70.57	1.17	6.23
3	1798	Fuel Gas Scrubber (V8-1720) - A1720-11	Gate valve - 1"	0.0097	75.00	-19.63	1.38	4.69
1	3440	EP Skid to Koch -	Union - 1"	0.0097	100.00	-70.70	0.02	6.26
4	3536	North Heat Medium Heater - Fuel gas line	Union - 2"	0.0097	100.00	-70.89	1.40	6.30
3	1269	NGL Bullet 3 - A1101N-9	Gate valve - 8"	0.0097	350.00	-294.98	0.00	22.04
1	1941	Inlet Header - Bonnet	Plug valve - 8"	0.0096	300.00	-245.08	1.13	18.93
1	3435	EP Skid to Koch -	Threaded connection - 0.75"	0.0096	10.00	19.05	0.02	0.63
4	3802	Re-Compression: Yard Piping -	Ball valve - 8"	0.0096	350.00	-295.11	1.39	22.10
3	1788	Stab 1 Building (Tower) - A613-10	Gate valve - 0.75"	0.0096	60.00	-5.21	1.15	3.79
2	4103	Mole Sieve Tower A -	Gate valve - 0.75"	0.0096	60.00	-5.21	1.18	3.79
1	3433	EP Skid to Koch -	Gate valve - 0.75"	0.0096	60.00	-5.21	0.02	3.79
4	3576	Mole Sieve Dehy: Dehy Train A -	Control valve - orbit - 8"	0.0096	353.00	-324.16	1.12	22.44
1	3313	Dust Filters for Regen Gas -	Threaded connection - 0.5"	0.0096	10.00	18.81	1.12	0.64
3	1720	West Amine Contactor - PSV 2716N-1 (horn)	Pressure relief valve - 2"	0.0096	120.00	-65.58	1.14	7.64
2	4096	Pre-saturator separator - sight glass	Gate valve - 0.75"	0.0096	60.00	-5.58	1.17	3.82
3	1354	Amine Bldg: GB-2702N12A - A2792N-54	Threaded connection - 0.5"	0.0095	10.00	18.57	1.14	0.64
1	3122	Compressor CM-19 - Damaged at weld (cracked)	Damage pipe - 2"	0.0095	50.00	-21.44	1.11	3.21
4	3744B	Cryo System: Absorber Tower (20.001) - First platform	Gate valve - 0.75"	0.0095	60.00	-6.06	0.02	3.85
4	3528	South Heat Medium Heater - Pilot	Gate valve - 0.5"	0.0095	60.00	-6.08	1.37	3.86
4	3571	Mole Sieve Dehy: Dehy Tower B - Regen Gas	Control valve - orbit - 4"	0.0094	177.00	-148.62	1.10	11.44
1	3369	Low Pressure Chiller -	Gate valve - 3"	0.0094	120.00	-66.47	0.02	7.77
2	4123	Mole Sieve Tower A - gate valve seat	Threaded connection - 1"	0.0093	15.00	13.08	1.14	0.98
1	3066	Compressor CM-9 - Needle valve seat	Threaded connection - 0.75"	0.0093	10.00	18.08	1.09	0.65
1	3087	West Inlet Yard Piping - On VAW gas scrubber (PV-28)	Flange - 2"	0.0093	50.00	-21.92	1.09	3.26
1	3414	Mole Sieve Tower 511A (Top) -	Flange - 8"	0.0093	100.00	-71.93	1.09	6.53
3	1718	V2811-1 - near N2811-7	Union - 1"	0.0093	100.00	-71.96	1.32	6.54
3	1932	Dehydration Tower # 1 west - A2808N-2	Gate valve - 0.75"	0.0093	60.00	-7.05	1.11	3.93
2	4032	Mole Sieve Tower C - on 4" Orbit valve	Grease nipple - 0.5"	0.0093	50.00	2.95	1.14	3.27
1	3157	Inlet Comp Yard Piping - Horn	Pressure relief valve - 3"	0.0093	180.00	-152.00	1.08	11.79

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
4	3711	Cryo System: Expander Feed Separator - Gate valve seat	Open-ended line - 0.5"	0.0093	60.00	-32.14	0.02	3.95
1	3263	Solar Turbines -	Threaded connection - 1"	0.0092	15.00	12.86	1.33	0.99
3	1880	Amine Building - A 2806N-1 GTV seat under vessel V8-2806-2	Threaded connection - 1"	0.0092	15.00	12.83	1.11	0.99
2	4174B	Cryo skid 101 - expander K101-B on gate valve	Threaded connection - 0.5"	0.0092	10.00	17.83	1.13	0.66
3	1411	Residue Gas/N2 Comp Bldg - Comp 1	Gate valve - 0.75"	0.0092	60.00	-7.43	1.31	3.95
4	3514	Regen Heater -	Union - 1"	0.0092	100.00	-72.19	1.33	6.59
1	3253	Solar Turbines -	Gate valve - 1"	0.0092	75.00	-22.53	1.33	4.95
4	3622	Yard North of Office -	Gate valve - 0.5"	0.0092	60.00	-7.56	1.07	3.96
1	3281	HP Expander Scrubber (PV-503) - Sight glass valve	Gate valve - 0.75"	0.0092	60.00	-7.57	1.33	3.97
2	4256	Compressor Unit # 4 -	Flange - 1"	0.0091	50.00	-22.48	1.32	3.33
4	3903	Re-Compression: Unit 1 -	Plug valve - 3"	0.0091	150.00	-98.09	1.32	10.01
1	3052	Scrubber (PV-517) -	Threaded connection - 1.5"	0.0091	15.00	12.46	1.06	1.00
4	3985	Flare System - High on platform (close to yard north of office).	Gate valve - 6"	0.0091	245.00	-193.09	1.06	16.36
3	1253	NGL Pump 2 - A1201N-2	Gate valve - 1"	0.0091	75.00	-23.09	0.00	5.01
3	1108	NRU 3 - Hot Box - 4155-2 On PSV	Union - 0.5"	0.0091	50.00	-22.54	1.09	3.34
3	1154	NRU 1 - Base of Hot Box	Tubing connection - 0.25"	0.0091	15.00	36.87	1.09	1.00
3	1852	Co-Gen Building: Fuel Gas Scrubber (SW Corner of Bldg) - Packing	Gate valve - 1"	0.0091	75.00	-23.28	1.29	5.02
3	1752	Stab 1 Building - A612-7 (West Wall)	Gate valve - 3"	0.0091	120.00	-68.32	0.02	8.05
4	3837	Re-Compression: Yard Piping -	Gate valve - 2"	0.0090	100.00	-48.78	1.30	6.77
3	1666	Re-Compressor Building - Re-Comp 3	Threaded connection - 2"	0.0090	15.00	12.09	1.28	1.02
3	1739	HHE Compressor Building - Comp HHE 8	Valve cover	0.0090	200.00	-172.91	1.08	13.53
2	4214	Compressor Unit # 7 -	Gate valve - 0.5"	0.0090	60.00	-8.79	1.30	4.06
3	1757	Stab 1 Building - Near Stab Reflux Pumps: PDI-614	DP Housing	0.0089	75.00	-24.13	0.02	5.11
2	4115A	Skid 2 Inlet -	Ball valve - 2"	0.0089	100.00	-49.15	1.09	6.81
4	3583	Mole Sieve Dehy: Regen Piping -	Gate valve - 1"	0.0089	75.00	-24.24	1.04	5.12
3	1225	Propane Storage Tank V6-290 - A2901N-87	Gate valve - 0.5"	0.0089	60.00	-9.24	0.00	4.10
4	3524	South Heat Medium Heater - Fuel gas line	Union - 2"	0.0089	100.00	-73.15	1.29	6.83
3	1883	FG Piping on RES/N2/Heat Pump Bldg (outside) - A2400N-3	Gate valve - 4"	0.0089	190.00	-139.25	1.27	12.97
4	3757	Cryo System: Economizer -	Gate valve - 4"	0.0089	190.00	-139.41	0.02	13.01
4	3950A	Re-Compression: Unit 1 - FG Line 1	Threaded connection - 2"	0.0089	15.00	11.73	1.28	1.03
4	3716	Cryo System: De-methanizer Tower (1st Platform) -	Gate valve - 1.5"	0.0088	75.00	-24.63	0.02	5.16
1	3268	Solar Turbines -	Gate valve - 2"	0.0088	100.00	-49.70	1.27	6.89
1	1961	Inlet Comp Yard Piping -	Gate valve - 3"	0.0088	120.00	-69.93	1.03	8.30
3	1250	NGL Pump 3 - Near A1202N-1	Gate valve - 1.5"	0.0088	75.00	-25.16	0.00	5.21
1	3222	De-methanizer -	Tubing connection - 0.375"	0.0088	15.00	34.84	1.26	1.04
3	1556	Residue Gas/N2 Comp Bldg - Heat Pump 3	Valve cover	0.0087	200.00	-173.73	0.00	13.96
1	1938	Inlet Header -	Plug valve - 4"	0.0087	200.00	-150.40	1.02	13.97
1	3021	To Fuel Gas Scrubber (PV-9) -	Gate valve - 2"	0.0087	100.00	-50.63	1.25	7.02
2	4326	Compressor Yard - Suction/Discharge Piping -	Orbit valve - 4"	0.0087	190.00	-140.69	1.25	13.35
4	3685	Cryo System: Beside Expander Feed Separator -	Gate valve - 0.5"	0.0087	60.00	-10.75	1.25	4.22
2	4028A	Mole Sieve Tower C -	Threaded connection - 1"	0.0086	15.00	10.94	1.05	1.06

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1865	Residue Gas/N2 Comp Bldg: Heat Pump 1 -	Threaded connection - 0.5"	0.0086	10.00	15.88	1.26	0.71
1	3399	EP Skid to Koch -	Union - 0.75"	0.0086	50.00	-24.12	0.02	3.54
1	3379	De-ethanizer Accumulator (PV-10) -	Gate valve - 1.5"	0.0086	75.00	-26.09	0.02	5.31
1	1967	Inlet Comp Yard Piping -	Flange - 2"	0.0086	50.00	-24.14	1.00	3.54
3	1678	Re-Compressor Building - Associated Yard Piping (Near G8 314-1) Cooler	Gate valve - 4"	0.0086	190.00	-141.21	1.03	13.49
4	3815	Re-Compression: Yard Piping -	Union - 2"	0.0086	100.00	-74.19	1.24	7.10
1	3475	NGL/DEA Coalescer -	Gate valve - 1"	0.0085	75.00	-26.55	1.23	5.36
3	1468	Residue Gas/N2 Comp Bldg - Heat Pump 4	Valve cover	0.0085	200.00	-174.38	1.25	14.31
4	3697	Cryo System: Chiller Outlet Separator Line - Gate valve seat	Open-ended line - 0.75"	0.0085	60.00	-34.38	0.02	4.29
4	3657	Mole Sieve Dehy: Regen Fan/Blower - Off blower (pump seal)	Pump seal - 0.5"	0.0085	500.00	-486.83	1.23	35.83
2		Compressor Unit # 3 -	Crank case vent - 2"	0.0085	2000.00	-1986.83	1.22	143.30
4	3602	Yard North of Office -	Gate valve - 8"	0.0084	350.00	-301.95	1.22	25.24
3	1240	NGL Bullet 4 - A1101N-16	Gate valve - 6"	0.0084	245.00	-197.01	0.00	17.69
2	4159	Residue Compressors FG Scrubber - sight glass	Gate valve - 0.75"	0.0084	60.00	-12.01	1.22	4.33
1	3300	High Pressure JT Expander -	Gate valve - 0.5"	0.0084	60.00	-12.01	1.21	4.33
1	1989	Inlet Header -	Gate valve - 0.75"	0.0084	60.00	-12.24	0.98	4.35
2	4128	Mole Sieve Tower B -	Threaded connection - 1"	0.0084	15.00	10.17	1.02	1.09
4	3719	Cryo System: De-methanizer Tower (1st Platform) -	Gate valve - 1.5"	0.0083	75.00	-27.52	0.02	5.47
3	1915	Hg Removal Bed V8-401-2 - A401N-8	Gate valve - 0.75"	0.0083	60.00	-12.93	0.99	4.42
3	1378	Amine Bldg: MOFI - (On fuel gas line).	Gate valve - 1"	0.0082	75.00	-28.32	0.98	5.57
3	1651	Re-Compressor Building - Re-Comp 2 (WE4C-301-2)	Valve cover	0.0082	500.00	-175.34	0.98	14.87
3	1139A	NRU 2 - A2306N	Gate valve - 10"	0.0082	200.00	-453.40	0.98	37.18
4	3717	Cryo System: De-methanizer Tower (1st Platform) -	Gate valve - 1.5"	0.0082	75.00	-28.49	0.02	5.59
3	1767	Stab 1 Building - TV-612-7	Control valve - globe - 8"	0.0081	353.00	-328.59	0.02	26.51
1	3280	HP Expander Scrubber - Stem packing	Butterfly valve - 10"	0.0081	1000.00	-975.59	1.17	75.09
1	1991	Inlet Header -	Threaded connection - 0.5"	0.0081	10.00	14.41	0.95	0.75
2	4202	Residue Compressors FG Scrubber -	Threaded connection - 0.75"	0.0081	10.00	14.35	1.17	0.75
4	3610	Yard North of Office -	Control valve - globe - 12"	0.0081	560.00	-535.73	1.16	42.31
3	1406	Residue Gas/N2 Comp Bldg: Yard -	Gate valve - 1"	0.0080	75.00	-29.32	1.14	5.69
2	4274	Compressor Unit 7 -	Valve cover	0.0080	200.00	-175.84	1.16	15.17
3	1091	Amine Bldg: V8-2806-2 - Near FI2806N-2	Tubing connection - 0.375"	0.0080	15.00	30.64	0.96	1.14
1	3020	To Fuel Gas Scrubber (PV-9) -	Threaded connection - 2"	0.0080	15.00	9.14	1.15	1.14
4	3767	C3 Refrigeration: Storage - Near Refrig Compressor Building	Plug valve - 4"	0.0080	200.00	-154.69	0.00	15.29
3	1573	HP2 Bldg: W01-02 - G225-3 (Inlet Line)	Gate valve - 0.75"	0.0079	60.00	-14.78	0.95	4.60
1	3101	Compressor CM-9 -	Threaded connection - 0.25"	0.0079	10.00	13.93	0.93	0.77
3	1918	Hg Removal Bed V8-401-1 - A401N-3	Gate valve - 0.75"	0.0079	60.00	-14.96	0.95	4.62
3	1195	NRU Expander 1 -	Threaded connection - 0.375"	0.0079	10.00	13.80	0.95	0.77
2	4002	Mole Sieve Tower A -	Gate valve - 0.5"	0.0079	60.00	-15.18	0.96	4.64
1	3037	Discharge to NG PL - In ground.	Gate valve - 3"	0.0079	120.00	-75.18	0.92	9.28
1	3203	Solar Turbines: Unit B - Fuel gas filter piping	Gate valve - 2"	0.0079	100.00	-55.24	1.13	7.74

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
2	4088	Common inlet lines - gate valve seat (behind chart recorder bldg.)	Open-ended line - 0.375"	0.0078	60.00	-36.51	0.95	4.68
4	3513	Regen Heater -	Gate valve - 1"	0.0077	75.00	-31.16	1.11	5.93
4	3930	Re-Compression: Unit 5 -	Plug valve - 3"	0.0077	150.00	-106.16	1.11	11.86
1	3216	Solar Turbines: Header Outside -	Control valve - globe - 1.5"	0.0077	130.00	-106.84	1.11	10.29
4	3747	Cryo System: Absorber Tower (20.001) - First platform: pressure transmitter	Threaded connection - 0.5"	0.0077	15.00	28.60	0.02	1.19
1	3332	Mole Sieve Tower 511C -	Control valve - orbit - 8"	0.0076	353.00	-330.11	0.89	28.27
3	1118	NRU 3 - Base of Hot Box	Threaded connection - 0.25"	0.0076	10.00	12.88	0.91	0.80
3	1684	Re-Compressor Building - Re-Comp 3 (Fuel Gas Line)	Threaded connection - 2"	0.0076	15.00	7.88	1.08	1.20
3	1355	Amine Bldg: V8-2701 - A2701N-47	Gate valve - 1"	0.0076	75.00	-31.91	0.91	6.03
2		Compressor Unit # 2 -	Crank case vent - 2"	0.0076	2000.00	-1988.28	1.09	160.95
4	3648	Sales Gas Header -	Control valve - globe - 2"	0.0075	130.00	-107.27	1.09	10.49
3	1019	Mole Sieve Header - A2811N72	Tubing connection - 0.375"	0.0075	15.00	27.95	0.90	1.21
3	1884	FG Piping on RES/N2/Heat Pump Bldg (outside) - A2400N-2	Gate valve - 4"	0.0075	190.00	-147.09	1.07	15.34
1	3098A	Compressor CM-13 - Flange connection to bottom pulsation bottle.	Valve cover	0.0075	200.00	-177.29	0.88	16.15
3	1876	Amine Building - PV-2722N-1 (FG piping)	Control valve - globe - 1"	0.0075	130.00	-107.35	1.07	10.52
3	1454	Residue Gas/N2 Comp Bldg - Comp 3 (Throw 3)	Valve cover	0.0075	200.00	-177.40	1.07	16.22
1	3071	Fuel Gas Scrubber (West Yard) - PV-9	Threaded connection - 2"	0.0075	15.00	7.60	1.08	1.22
4	3734	Cryo System: Dust Filter (20.002) - Gate valve seat	Open-ended line - 1"	0.0075	75.00	-52.45	0.02	6.10
4	3888	Refrigeration Compression: Outside Yard Piping - Orifice meter to Unit 4	Gate valve - 0.5"	0.0075	60.00	-17.49	1.08	4.89
2	4124	Mole Sieve Tower B -	Flange - 4"	0.0075	75.00	-52.51	0.91	6.12
3	1602	IR Compressor Building - IR Comp 2	Cylinder end - flange	0.0075	400.00	-388.44	0.89	32.65
1	3190	Solar Turbines: Unit A - Chart recorder	Tubing connection - 0.375"	0.0075	15.00	27.45	1.07	1.22
4	3979	Power Generators: Unit 1 -	Union - 3"	0.0074	150.00	-127.58	1.08	12.27
3	1498	Residue Gas/N2 Comp Bldg - Heat Pump 2	Cylinder end - flange	0.0074	400.00	-388.48	1.09	32.77
3	1059	Mole Sieve Header - PDSL2866N	Needle valve - 0.375"	0.0074	60.00	-17.77	0.89	4.92
1	3235	Solar Turbines: Unit B - On skid	Gate valve - 0.5"	0.0074	60.00	-17.77	1.07	4.92
1	3438	EP Skid to Koch -	Gate valve - 1"	0.0074	75.00	-32.77	0.01	6.15
4	3958	Refrigeration Compressors: Unit 3 - By injector	Valve - 1"	0.0074	75.00	-32.86	1.07	6.17
3	1896	Hg Removal Bed V8-401-2 - A401N-12	Gate valve - 0.75"	0.0074	60.00	-18.01	0.88	4.95
1	3404	Mole Sieve Tower 511B -	Flange - 2"	0.0074	50.00	-27.78	0.86	4.13
3	1156	NRU 1 - Base of Hot Box	Threaded connection - 0.25"	0.0074	10.00	12.22	0.88	0.83
3	1529	Residue Gas/N2 Comp Bldg - Heat Pump 2	Valve cover	0.0074	200.00	-177.79	1.08	16.51
3	1295	NGL Pump 4 - A1202N-7	Gate valve - 3"	0.0074	120.00	-78.12	0.00	9.93
4	3677	Cryo System: Turbo Expander - Gate valve seat	Open-ended line - 0.75"	0.0073	60.00	-37.90	1.06	4.98
4	3742	Cryo System: De-methanizer Side Reboiler - Gate valve seat	Open-ended line - 0.75"	0.0073	60.00	-38.02	0.02	5.00
2	4048	Mole Sieve Tower A -	Gate valve - 1"	0.0073	75.00	-33.47	0.89	6.26
1	3264	Solar Turbines -	Threaded connection - 1"	0.0073	15.00	6.97	1.05	1.25
3	1392	Residue Gas/N2 Comp Bldg: Yard - Suction Scrubber: LC301N	Threaded connection - 0.75"	0.0073	10.00	11.97	1.04	0.83

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
4	3521	South Heat Medium Heater - Fuel gas line	Union - 2"	0.0073	100.00	-78.03	1.05	8.35
2	4231	Compressor Unit 8 -	Valve cover	0.0073	200.00	-178.03	1.05	16.69
4	3635	TEG Contactor - Outlet line	Gate valve - 8"	0.0072	350.00	-308.81	0.84	29.45
2	4208	Residue Compressors FG Scrubber - plug valve seat	Threaded connection - 1"	0.0072	15.00	6.79	1.04	1.26
3	1821	Stab 1 Building (Yard) - (NGL Vessel)	Gate valve - 2"	0.0072	100.00	-58.82	0.02	8.41
4	3968	Refrigeration Compressors: Unit 2 - On governor	Flange - 2"	0.0072	50.00	-28.23	1.04	4.21
2	3995B	Inlet Line -	Open-ended line - 2"	0.0072	100.00	-78.29	0.88	8.45
2	4035B	Mole Sieve Tower C - Both sides of gate valve 4036	Threaded connection - 1"	0.0072	15.00	6.66	0.88	1.27
1	3383	High Pressure Chiller -	Orbit valve - 4"	0.0071	190.00	-149.34	0.00	16.19
3	1222	NGL Pump 2 - A1202N-5	Gate valve - 1"	0.0071	75.00	-34.39	0.00	6.40
2	4122	Mole Sieve Tower A -	Gate valve - 1"	0.0071	75.00	-34.50	0.87	6.42
1	3329	Mole Sieve Tower 511C -	Threaded connection - 0.5"	0.0071	10.00	11.43	0.83	0.86
1	3478	South of Low Press Inlet Compressors -	Threaded connection - 2"	0.0071	15.00	6.43	1.02	1.28
1	1968	Inlet Comp Yard Piping - Stem packing	Orbit valve - 2"	0.0071	100.00	-59.51	0.83	8.56
2	4369	Compressor Unit # 2 - gate valve seat	Threaded connection - 0.75"	0.0071	10.00	11.36	1.02	0.86
3	1349	Regen Gas Heater 1: G10-2801-2 - LG2810N-2	Gate valve - 0.75"	0.0071	60.00	-19.65	1.01	5.15
3	1694	Re-Compressor Building - Associated Yard Piping (A9242)	Gate valve - 2"	0.0070	100.00	-59.92	1.00	8.65
3	1866	Residue Gas/N2 Comp Bldg: Res Comp 3 -	Threaded connection - 0.5"	0.0070	10.00	11.15	1.00	0.87
1	3451	Refrig Comp Unit 12 -	Valve cover	0.0070	200.00	-179.04	0.00	17.49
3	1836	Co-Gen Building: Outside (CA 625 - HP FG Scrubber) - VG-155	Gate valve - 1"	0.0070	75.00	-35.43	0.99	6.57
1	3180	Solar Turbines: Unit B - Fuel gas filter piping	Tubing connection - 0.375"	0.0070	15.00	24.57	1.00	1.31
1	3236	Solar Turbines: Unit B - On skid	Gate valve - 0.5"	0.0069	60.00	-20.55	1.00	5.27
4	3512	Regen Heater -	Gate valve - 0.5"	0.0069	60.00	-20.84	0.99	5.31
3	1360	Amine Bldg: V8-2701 - A2701N-44	Gate valve - 1"	0.0068	75.00	-36.07	0.82	6.68
3	1682	Re-Compressor Building - Re-Comp 3 (Start Gas)	Union - 2"	0.0068	100.00	-79.40	0.97	8.90
1	3412	Mole Sieve Common Piping -	Threaded connection - 1"	0.0068	15.00	5.51	0.79	1.34
3	1301	Propane Yard - Near A2404N	Gate valve - 1"	0.0068	75.00	-36.28	0.00	6.71
1	3167	Refrig Comp Unit 11 - Top of suction bottle	Threaded connection - 0.5"	0.0068	10.00	10.48	0.00	0.90
4	3659	Cryo System: Near Warm Gas Exchanger - Gate valve seat	Open-ended line - 0.75"	0.0067	60.00	-39.67	0.02	5.41
3	1214	NGL Pump 4 - A1202N-5	Gate valve - 3"	0.0067	120.00	-81.64	0.00	10.84
3	1785	Stab 1 Building - (Off Accumulator Tank)	Gate valve - 2"	0.0067	100.00	-61.93	0.80	9.10
3	1005	Mole Sieve 4 - On top platform	Tubing connection - 0.75"	0.0067	25.00	13.06	0.79	2.28
3	1352	Process Heater - (E028005A)	Threaded connection - 1"	0.0067	15.00	5.13	0.95	1.37
3	1741	HHE Compressor Building - Comp HHE 8	Valve cover	0.0067	200.00	-179.87	0.80	18.21
2	4278	Compressor Unit # 7 -	Threaded connection - 1.5"	0.0067	15.00	5.13	0.96	1.37
3	1241	NGL Bullet 4 - A1101N-11	Gate valve - 8"	0.0067	350.00	-312.05	0.00	31.95
1	3006	Inlet Comp Yard Piping - On 8" orifice meter	Slide valve	0.0067	75.00	-37.05	0.78	6.85
3	1776	Stab 1 Building - (Top of Accumulator)	Gate valve - 2"	0.0066	500.00	-62.45	0.79	9.23
3	1765	Stab 1 Building - (Near Stab Reflux Pumps)	Gate valve - 10"	0.0066	100.00	-462.45	0.01	46.14
3	1475	Residue Gas/N2 Comp Bldg: Back Wall -	Gate valve - 10"	0.0066	500.00	-462.47	0.94	46.17
3	1072	NRU 3 - A411N-15	Flange - 6"	0.0066	100.00	-80.17	0.79	9.24

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
1	3003	Inlet Comp Yard Piping -	Gate valve - 0.5"	0.0066	60.00	-22.63	0.77	5.56
1	3410	Mole Sieve Common Piping -	Gate valve - 1"	0.0065	75.00	-37.79	0.76	6.98
3	1667	Re-Compressor Building - Re-Comp 3 (Fuel Gas Line)	Threaded connection - 2"	0.0065	15.00	4.53	0.92	1.41
3	1783	Stab 1 Building - (Near Stab Reflux Pumps)	Gate valve - 4"	0.0065	190.00	-153.09	0.01	17.84
2	4045	Mole Sieve Tower B -	Flange - 8"	0.0065	100.00	-80.47	0.79	9.39
3	1412	Residue Gas/N2 Comp Bldg - Comp 1	Gate valve - 0.75"	0.0065	60.00	-23.21	0.92	5.65
2	4207	Residue Compressors FG Scrubber -	Threaded connection - 2"	0.0065	15.00	4.44	0.93	1.41
3	1609	IR Compressor Building - IR Comp 2 (Fuel Gas)	Threaded connection - 2"	0.0065	15.00	4.43	0.92	1.42
4	3660	Cryo System: Warm Gas Exchanger -	Gate valve - 0.75"	0.0064	60.00	-23.30	0.01	5.67
3	1787	Stab 1 Building - Below PV613	Gate valve - 3"	0.0064	120.00	-83.31	0.77	11.33
3	1936	near CO_GEN - A2803N-1	Gate valve - 1"	0.0064	75.00	-38.66	0.76	7.15
1	3015	Inlet Comp Yard Piping -	Threaded connection - 1"	0.0064	15.00	4.23	0.74	1.43
3	1818	Stab 1 Building (Yard) - (NGL Vessel)	Gate valve - 0.5"	0.0064	60.00	-23.66	0.01	5.72
3	1395	Residue Gas/N2 Comp Bldg: Yard -	Gate valve - 1"	0.0064	75.00	-38.67	0.91	7.15
3	1631	IR Compressor Building - Associated Yard Piping (PV-322)	Control valve - globe - 1"	0.0064	130.00	-110.78	0.76	12.40
3	1791	Stab 1 Building (Yard) -	Threaded connection - 0.5"	0.0064	120.00	9.22	0.76	0.95
3	1448	Residue Gas/N2 Comp Bldg: Lower Level -	Gate valve - 3"	0.0064	10.00	-83.68	0.91	11.45
2	4215	Compressor Unit # 9 -	Threaded connection - 0.5"	0.0064	10.00	9.20	0.92	0.95
2	4115B	Skid 2 Inlet -	Threaded connection - 2"	0.0063	15.00	4.11	0.78	1.44
1	3038	Inlet Header - Lone Star Line -	Gate valve - 0.75"	0.0063	60.00	-23.94	0.74	5.77
1	3116	Compressor CM-19 - Plug	Threaded connection - 0.75"	0.0063	10.00	9.05	0.74	0.96
1	3170	Refrig Comp Units -	Control valve - butterfly - 2"	0.0063	130.00	-110.95	0.91	12.51
3	1329	Propane Yard: V8-2906N - A2906N-8	Gate valve - 3"	0.0063	120.00	-84.01	0.00	11.55
3	1469	Residue Gas/N2 Comp Bldg - Heat Pump 4	Valve cover	0.0063	200.00	-180.96	0.93	19.26
3	1781	Stab 1 Building - Near Stab Reflux Pumps: FE613	Gate valve - 0.5"	0.0063	60.00	-24.35	0.01	5.83
3	1825	G-10-625-2 - Fe625-5 (East Reboiler)	Gate valve - 0.5"	0.0063	60.00	-24.35	0.89	5.83
4	3647	Sales Gas Header - Stem packing on orifice meter.	Ball valve - 0.5"	0.0063	60.00	-24.39	0.90	5.84
3	1359	Amine Bldg: G8-2702N-22B -	Gate valve - 0.5"	0.0062	60.00	-24.47	0.75	5.85
1	3322	Regen Gas Compressors/Blowers - Around bolts.	Compressor seal	0.0062	2000.00	-1990.34	0.73	195.34
1	1943	Inlet Header -	Threaded connection - 0.75"	0.0062	10.00	8.68	0.72	0.98
4	3859	Re-Compression: Unit 3 -	Threaded connection - 0.5"	0.0062	10.00	8.66	0.90	0.98
2	4337	Make-up Gas Suction Scrubber - sight glass	Gate valve - 0.75"	0.0062	60.00	-24.82	0.89	5.91
4	3988	Mole Sieve Dehy: Coalescing Filter Separator -	Gate valve - 12"	0.0062	595.00	-559.87	0.72	58.69
2	4238	Compressor Unit # 8 -	Injector	0.0062	200.00	-164.93	0.89	19.76
3	1262	NGL Pump 4 - A1201N-11	Gate valve - 4"	0.0061	190.00	-155.04	0.00	18.83
2	4091	Process inlet separator D-208 -	Gate valve - 4"	0.0061	190.00	-155.04	0.75	18.83
1	3416	Mole Sieve Tower 511C (Top) -	Flange - 8"	0.0061	100.00	-81.50	0.72	9.91
1	3196	Solar Turbines: Unit A - Fuel gas scrubber piping	Gate valve - 2"	0.0061	100.00	-65.04	0.88	9.91
1	3204	Solar Turbines: Unit B - Fuel gas filter piping	Gate valve - 2"	0.0061	100.00	-65.04	0.88	9.91
3	1845	Amine Yard - 2805-A	Gate valve - 0.75"	0.0061	60.00	-25.10	0.73	5.96
4	3691	Cryo System: Near FV104 -	Control valve - globe - 4"	0.0061	177.00	-158.54	0.01	17.58

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
2	4237	Compressor Unit # 8 -	Flange - 1"	0.0061	50.00	-31.63	0.88	4.99
3	1024	Mole Sieve Header - MTV-010	Gate valve - 8"	0.0061	350.00	-315.39	0.73	35.04
3	1206	NRU Expander 3 - Expander Housing	Flange - 10"	0.0061	150.00	-131.69	0.73	15.02
1	3117	Compressor CM-19 -	Threaded connection - 1"	0.0061	15.00	3.31	0.88	1.50
1	3250	Solar Turbines -	Gate valve - 3"	0.0061	120.00	-85.39	0.88	12.01
3	1577	HP2 Bldg: W29-04 - A231-2	Gate valve - 0.5"	0.0060	60.00	-25.75	0.72	6.07
3	1842	Co-Gen Building: Outside (CA 625 - HP FG Scrubber) - VG-127	Gate valve - 6"	0.0060	245.00	-210.96	0.85	24.94
3	1729	HHE Compressor Building - Comp HHE 7	Threaded connection - 0.5"	0.0060	10.00	7.95	0.71	1.02
3	1903	Hg Removal Bed V8-401-3 (stem packing)	Gate valve - 1.5"	0.0060	100.00	-41.08	0.71	7.66
3	1786	Stab 1 Building - G614-1 (Off Accumulator Tank)	Gate valve - 2"	0.0060	75.00	-66.08	0.71	10.22
3	1618	IR Compressor Building - IR Comp 1 (Start Gas)	Threaded connection - 2"	0.0060	15.00	2.94	0.85	1.53
2	4197	Compressor Unit 2 -	Threaded connection - 1"	0.0060	15.00	2.94	0.86	1.53
1	3166	Refrig Comp Unit 11 -	Threaded connection - 0.5"	0.0059	10.00	7.88	0.00	1.03
1	3182	Solar Turbines: Unit B - Chart recorder	Tubing connection - 0.375"	0.0059	15.00	18.75	0.85	1.54
3	1321	Propane Yard: V8-411 - A411N-10	Gate valve - 0.75"	0.0059	60.00	-26.37	0.00	6.18
3	1328	Propane Yard - Behind Economizer - A2904N-4	Gate valve - 7"	0.0059	245.00	-211.48	0.00	25.33
4	3678	Cryo System: PV-214A -	Gate valve - 4"	0.0059	190.00	-156.48	0.01	19.64
3	1837	Co-Gen Building: Outside (CA 625 - HP FG Scrubber) - CG-155	Gate valve - 1"	0.0059	75.00	-41.54	0.84	7.77
1	3162	Refrig Comp Unit 11 -	Valve cover	0.0058	200.00	-182.42	0.00	20.85
2	4139D	Resid gas cooler E507 - cooler plugs	Threaded connection - 1"	0.0058	15.00	2.58	0.84	1.56
2	4139F	Resid gas cooler E507 - cooler plugs	Threaded connection - 1"	0.0058	15.00	2.58	0.84	1.56
2	4328	Compressor Unit # 1 -	Gate valve - 0.25"	0.0058	60.00	-26.77	0.84	6.26
1	3118	Compressor CM-19 -	Threaded connection - 2"	0.0058	15.00	2.58	0.84	1.56
3	1560	Residue Gas/N2 Comp Bldg - Heat Pump 3:	Gate valve - 1"	0.0058	75.00	-41.79	0.00	7.83
3	1092	Amine Bldg: V8-2806-2 - Near A2806N-1	Threaded connection - 0.5"	0.0058	10.00	7.45	0.69	1.05
4	3633	Sweet Gas Cooler - Stem packing	Gate valve - 0.75"	0.0058	60.00	-27.12	0.67	6.32
3	1592	HP2 Bldg: W31-05 - Chart Recorder	Open-ended line - 0.375"	0.0058	60.00	-42.60	0.69	6.32
3	1704	Medium Pressure Bldg - V8-242	Manway - 30"	0.0058	300.00	-282.61	0.69	31.63
1	3282	HP Expander Scrubber (PV-503) -	Gate valve - 1"	0.0058	75.00	-42.23	0.83	7.93
4	3735	Cryo System: Dust Filter (20.002) -	Gate valve - 1"	0.0057	75.00	-42.29	0.01	7.95
1	1957	4th Stage Suction Scrubber (PV-47) - Gate valve seat	Open-ended line - 1"	0.0057	75.00	-57.70	0.67	7.95
2	4190	Compressor Unit 2 -	Variable volume pocket stem	0.0057	400.00	-391.12	0.00	42.47
1	3199	Solar Turbines: Unit A - On skid	Gate valve - 0.5"	0.0057	60.00	-27.41	0.82	6.38
3	1202	NRU Expander 3 - Outlet Line	Threaded connection - 0.5"	0.0057	10.00	7.21	0.68	1.07
3	1656	Re-Compressor Building - Re-Comp 2	Open-ended line - 0.75"	0.0057	60.00	-42.88	0.68	6.43
3	1773	Stab 1 Building - Near A614-10 (Top of Accumulator)	Flange - 3"	0.0057	75.00	-57.88	0.68	8.03
1	3082	West Inlet Yard Piping - On 8" orifice meter	Tubing connection - 0.375"	0.0057	15.00	17.30	0.66	1.61
4	3868	Re-Compression: Unit 2 -	Open-ended line - 0.5"	0.0057	60.00	-42.92	0.82	6.44

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1258	NGL Pump 2 - A1201N-4	Gate valve - 2"	0.0056	100.00	-68.10	0.00	10.86
2	4145	Compressor Unit 7 Outside -	Threaded connection - 0.5"	0.0056	10.00	6.85	0.81	1.09
1	3239	Solar Turbines: Unit A - On skid	Threaded connection - 1.5"	0.0056	15.00	1.85	0.81	1.63
3	1086	Amine Bldg: V8-2806-2 - On V8-2806-2	Filter cover - 20"	0.0056	200.00	-183.15	0.67	21.77
4	3520	South Heat Medium Heater - Pilot	Gate valve - 0.5"	0.0056	60.00	-28.16	0.81	6.53
3	1067	Amine Bldg: V8-404N - A404N-3	Gate valve - 0.75"	0.0056	60.00	-28.16	0.67	6.53
3	1348	Process Heater - Near B2802N-113	Threaded connection - 1"	0.0056	15.00	1.84	0.79	1.63
3	1878	Amine Building - A 2806N-6 GTV seat under vessel V8-2806-1	Threaded connection - 1"	0.0056	15.00	1.78	0.67	1.64
3	1629	IR Compressor Building - IR Comp 3	Threaded connection - 0.5"	0.0055	10.00	6.66	0.66	1.10
1	3248	Solar Turbines -	Gate valve - 1.5"	0.0055	75.00	-43.51	0.80	8.25
3	1702	Re-Compressor Building - Associated Yard Piping (Near LFI-70)	Control valve - globe - 4"	0.0055	177.00	-160.52	0.66	19.69
3	1126	NRU 2 - Top Platform - A2331N	Threaded connection - 0.375"	0.0055	10.00	6.48	0.66	1.11
3	1889	Hg Removal Bed V8-401-3 - A401N-2 plug on GTV seat	Threaded connection - 0.75"	0.0055	10.00	6.48	0.66	1.11
3	1057	Mole Sieve Header - PDSL2878N	Tubing connection - 0.375"	0.0055	15.00	16.14	0.66	1.67
3	1621	IR Compressor Building - IR Comp 3	Threaded connection - 0.5"	0.0055	10.00	6.45	0.65	1.11
2	3998	Inlet Line - ball valve seat	Open-ended line - 0.75"	0.0055	60.00	-43.56	0.67	6.69
1	3228	HP Expander Scrubber (PV-503) -	Tubing connection - 0.375"	0.0054	15.00	15.80	0.78	1.69
1	3279	HP Expander Scrubber (PV-503) - Stem packing	Butterfly valve - 10"	0.0054	1000.00	-983.76	0.78	112.90
3	1205	NRU 2 - Top Platform - G2314N	Gate valve - 3"	0.0054	120.00	-89.38	0.64	13.58
1	3256	Solar Turbines -	Threaded connection - 1"	0.0054	15.00	1.18	0.77	1.70
3	1346	Propane Yard: V8-411 - A411N-1	Gate valve - 4"	0.0054	190.00	-159.53	0.00	21.60
2	4284	Compressor Yard - Compressor unit 9 - gate valve seat	Threaded connection - 1"	0.0053	15.00	1.11	0.77	1.71
1	3115	Compressor CM-19 -	Threaded connection - 0.5"	0.0053	10.00	6.02	0.62	1.14
1	3262	Solar Turbines - Gate valve seat	Threaded connection - 0.75"	0.0053	10.00	6.02	0.77	1.14
1	3407	Mole Sieve Common Piping -	Control valve - globe - 2"	0.0053	130.00	-114.01	0.62	14.90
3	1283	NGL Bullet 3 - A1101N-28	Gate valve - 0.75"	0.0053	60.00	-29.90	0.00	6.91
1	3060	Lone Star Line -	Orbit valve - 8"	0.0053	350.00	-320.00	0.61	40.43
3	1017	Mole Sieve 2 - ZSC2812N	Orbit valve - 8"	0.0053	350.00	-320.00	0.63	40.43
1	3247	Solar Turbines -	Gate valve - 3"	0.0053	120.00	-90.00	0.76	13.86
3	1393	Residue Gas/N2 Comp Bldg: Yard -	Gate valve - 0.5"	0.0053	60.00	-30.01	0.75	6.93
1	3056	Mansfield Discharge - Ball valve seat	Open-ended line - 0.5"	0.0053	60.00	-44.13	0.61	6.93
4	3518	Still Reboiler No. 2 - On chart recorder	Tubing connection - 0.5"	0.0053	15.00	14.99	0.76	1.73
3	1003	Mole Sieve 3 - On top platform	Gate valve - 0.75"	0.0053	60.00	-30.01	0.62	6.93
4	3820	Re-Compression: Yard Piping -	Ball valve - 4"	0.0052	190.00	-160.20	0.76	22.09
4	3964	Refrigeration Compressors: Unit 3 - By injector to head	Valve - 1"	0.0052	75.00	-45.21	0.76	8.72
3	1588	HP2 Bldg: W36 - B222-6 (Upper Platform)	Orbit valve - 4"	0.0052	190.00	-160.24	0.63	22.12
1	3002	Inlet Comp Yard Piping -	Threaded connection - 0.75"	0.0052	10.00	5.75	0.61	1.16

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
1	3023	Fuel Gas Scrubber (West Yard) - PV-9	Threaded connection - 2"	0.0052	15.00	0.75	0.75	1.75
2	4061	Surge Scrubber - gate valve seat	Threaded connection - 1"	0.0052	15.00	0.72	0.64	1.75
3	1159	NRU 1 - Top Platform - C2304N	Gate valve - 3"	0.0052	120.00	-90.42	0.62	14.06
3	1687	Re-Compressor Building - Re-Comp 5 (Fuel Gas Line)	Threaded connection - 2"	0.0052	15.00	0.60	0.74	1.76
4	3689	Cryo System: De-methanizer Recycle Line	Gate valve - 3"	0.0052	120.00	-90.52	0.01	14.11
3	1143	NRU 2 - A415N-6	Flange - 8"	0.0052	100.00	-84.43	0.62	11.78
3	1875	Amine Building - on amine contactor outlet scrubber V8-2702N-11	Control valve - globe - 1"	0.0052	130.00	-114.43	0.62	15.31
1	3032	Fuel Gas to Mansfield (222) -	Threaded connection - 1.5"	0.0052	15.00	0.57	0.60	1.77
3	1662	Re-Compressor Building - Re-Comp 2 (Start Gas)	Ball valve - 2"	0.0052	100.00	-70.58	0.73	11.78
2	4112	Regen Gas Filter -	Filter cover - 10"	0.0052	100.00	-84.43	0.63	11.78
1	3392	De-ethanizer Tower -	Threaded connection - 0.75"	0.0052	10.00	5.57	0.01	1.18
1	3441	EP Skid to Koch -	Gate valve - 0.75"	0.0052	60.00	-30.58	0.01	7.07
3	1368	Regen Gas Heater 1: G10-2801-2 - A2801N-79	Threaded connection - 0.5"	0.0052	10.00	5.55	0.73	1.18
4	3630	MEA Contactor -	Gate valve - 10"	0.0051	500.00	-470.69	0.62	59.10
4	3989	Mole Sieve Dehy: Coalescing Filter Separator -	Filter cover - 36"	0.0051	400.00	-384.51	0.60	47.34
4	3844	Re-Compression: Yard Piping -	Gate valve - 0.75"	0.0051	60.00	-30.87	0.74	7.14
2	4019	Gas-Gas Exchanger -	Gate valve - 0.5"	0.0051	60.00	-30.87	0.63	7.14
2	4097	Pre-saturator separator -	Gate valve - 3"	0.0051	120.00	-90.87	0.63	14.27
1	3285	HP Expander Scrubber (PV-503) -	Gate valve - 1"	0.0051	75.00	-45.92	0.74	8.94
3	1562	HP1 Bldg: Piping - B207-3	Orbit valve - 3"	0.0051	120.00	-90.93	0.61	14.30
1	3474	NGL/DEA Coalescer -	Gate valve - 6"	0.0051	245.00	-215.93	0.74	29.21
3	1093	Amine Bldg: V8-2806-2 - A2806N-1	Gate valve - 0.5"	0.0051	60.00	-30.93	0.61	7.15
3	1449	Residue Gas/N2 Comp Bldg: Lower Level -	Gate valve - 0.75"	0.0051	60.00	-30.93	0.73	7.15
3	1603	IR Compressor Building - IR Comp 2	Threaded connection - 0.5"	0.0051	10.00	5.26	0.61	1.20
3	1770	Stab 1 Building - Near Stab Reflux Pumps: A613-1	Gate valve - 3"	0.0051	120.00	-91.16	0.01	14.42
2	4168	Cryo skid north -	Threaded connection - 0.5"	0.0050	10.00	5.17	0.62	1.21
3	1879	Amine Building - A 2806N-6 GTV stem under vessel V8-2806-1	Gate valve - 1"	0.0050	245.00	-46.39	0.60	9.08
3	1511	Residue Gas/N2 Comp Bldg: Lower Level -	Gate valve - 6"	0.0050	75.00	-216.39	0.71	29.68
2	4016	Gas-Gas Exchanger -	Gate valve - 1"	0.0050	75.00	-46.39	0.61	9.08
4	3771	C3 Refrigeration: Storage - Near Refrig Compressor Building	Threaded connection - 0.5"	0.0050	10.00	5.10	0.00	1.21
4	3631	By MEA Contactor -	Gate valve - 2"	0.0050	100.00	-71.57	0.72	12.19
3	1442	Residue Gas/N2 Comp Bldg - Heat Pump 4	Valve cover	0.0050	200.00	-184.99	0.73	24.43
2	4139C	Resid gas cooler E507 - cooler plugs	Threaded connection - 1"	0.0050	15.00	-0.04	0.72	1.84
1	3206	Solar Turbines: Unit B - Fuel gas filter piping	Gate valve - 2"	0.0050	100.00	-71.73	0.71	12.26
3	1400	Residue Gas/N2 Comp Bldg: Yard -	Gate valve - 0.5"	0.0050	60.00	-31.74	0.71	7.36
3	1416	Residue Gas/N2 Comp Bldg - Comp 1	Gate valve - 0.75"	0.0050	60.00	-31.74	0.71	7.36
1	3172	Refrig Comp Units -	Threaded connection - 0.5"	0.0049	10.00	4.90	0.71	1.23
1	3323	Mole Sieve Tower 511B -	Gate valve - 0.75"	0.0049	60.00	-31.85	0.58	7.38
1	3378	De-ethanizer Accumulator (PV-10) -	Control valve - globe - 2"	0.0049	130.00	-115.10	0.01	16.00
3	1545	Residue Gas/N2 Comp Bldg - Heat Pump 2	Threaded connection - 0.5"	0.0049	10.00	4.83	0.72	1.24
2	4184	Cryo skid 101 -	Gate valve - 0.5"	0.0049	60.00	-31.97	0.71	7.42

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
2	4162	Resid gas cooler E507 - gate valve seat	Open-ended line - 0.75"	0.0049	60.00	-45.26	0.60	7.46
3	1768	Stab 1 Building - (De-methanizer Tower)	Gate valve - 0.75"	0.0049	60.00	-32.27	0.01	7.50
4	3754	Sales Gas Header -	Threaded connection - 0.5"	0.0049	10.00	4.65	0.70	1.25
1	3347	Mole Sieve Tower 511A -	Flange - 2"	0.0049	50.00	-35.35	0.57	6.26
3	1873	Co-Gen (Fuel Gas Scrubber SE Corner of Bldg) - Plug in gate valve seat.	Gate valve - 0.5"	0.0049	75.00	-32.31	0.69	7.51
3	1380	Amine Bldg: MOFI - (On fuel gas line).	Gate valve - 1"	0.0049	60.00	-47.31	0.58	9.39
4	3902	Re-Compression: Unit 1 -	Gate valve - 0.75"	0.0049	60.00	-32.31	0.70	7.51
4	3777	Central Yard - Between C3 Compressors and Gen Building	Orifice meter plate - 14"	0.0049	150.00	-142.46	0.70	18.77
3	1342	Amine Bldg: Near V8-2810N - A2809N-1	Flange - 16"	0.0049	200.00	-185.35	0.58	25.03
2	4025	Mole Sieve Tower C -	Threaded connection - 0.5"	0.0049	10.00	4.65	0.59	1.25
4	3525	South Heat Medium Heater - Pilot	Gate valve - 0.5"	0.0049	60.00	-32.32	0.70	7.51
4	3664	Cryo System: Warm Gas Exchanger -	Flange - 6"	0.0049	100.00	-85.39	0.01	12.55
4	3600	Mole Sieve Dehy: Dehy Train A - Side of tower	Threaded connection - 0.75"	0.0049	10.00	4.61	0.57	1.25
1	3359	Cold Gas Separator (PV-505) -	Gate valve - 0.75"	0.0048	60.00	-32.54	0.56	7.57
4	3642	Sales Gas Header -	Tubing connection - 0.375"	0.0048	15.00	12.30	0.69	1.90
4	3606	Yard North of Office - Orifice meter	Open-ended line - 0.25"	0.0048	60.00	-45.58	0.69	7.63
1	3114	Compressor CM-19 -	Threaded connection - 0.5"	0.0048	10.00	4.41	0.56	1.27
2	4350D	C3 Cooler -	Threaded connection - 1"	0.0048	15.00	-0.64	0.00	1.91
3	1633	IR Compressor Building - Associated Yard Piping (A343-1)	Gate valve - 6"	0.0048	245.00	-217.95	0.57	31.38
1	3174	Refrig Comp Units -	Threaded connection - 0.5"	0.0047	10.00	4.29	0.68	1.28
1	1956	4th Stage Suction Scrubber (PV-47) -	Gate valve - 3"	0.0047	120.00	-93.00	0.55	15.40
2	4344	Residue Gas Suction Scrubber -	Gate valve - 0.75"	0.0047	60.00	-33.00	0.68	7.70
2	4140	Resid gas cooler E507 -	Gate valve - 8"	0.0047	350.00	-323.18	0.58	45.21
1	3054	Mansfield Discharge - Gate valve seat	Open-ended line - 0.5"	0.0047	60.00	-45.81	0.55	7.75
3	1338	Amine Bldg: Near V8-2810N - A1653N-2	Flange - 18"	0.0047	200.00	-185.81	0.56	25.85
2	4021	Gas-Gas Exchanger -	Flange - 16"	0.0047	200.00	-185.90	0.57	26.01
3	1607	IR Compressor Building - IR Comp 2 (Fuel Gas)	Threaded connection - 2"	0.0047	15.00	-0.91	0.66	1.95
3	1171	NRU 1 - A2305N	Gate valve - 0.5"	0.0047	60.00	-33.46	0.56	7.83
3	1706	G10-806 - on B806-1	Threaded connection - 3"	0.0047	25.00	-10.96	0.66	3.26
1	3293	High Pressure JT Expander -	Control valve - 8"	0.0046	353.00	-339.08	0.67	46.50
4	3821	Re-Compression: Yard Piping -	Gate valve - 4"	0.0046	190.00	-163.83	0.66	25.16
3	1221	NGL Pump 3 - A1202N-6	Gate valve - 0.5"	0.0045	60.00	-34.15	0.00	8.04
1	1988	Inlet Header -	Gate valve - 0.75"	0.0045	60.00	-34.15	0.53	8.04
3	1379	Amine Bldg: MOFI - (On fuel gas line).	Union - 1"	0.0045	100.00	-86.33	0.54	13.41
2	4341	Residue Gas Suction Scrubber - sight glass	Gate valve - 0.75"	0.0045	60.00	-34.16	0.65	8.05
3	1070	Amine Bldg: G2801N-1 - G2801N-1	Gate valve - 3"	0.0045	120.00	-94.32	0.54	16.19
4	3986	Mole Sieve Dehy: Coalescing Filter Separator - Gate valve seat	Open-ended line - 0.5"	0.0045	60.00	-46.43	0.53	8.11
3	1817	Stab 1 Building (Yard) - (NGL Vessel)	Threaded connection - 0.5"	0.0045	10.00	3.55	0.01	1.35
2	4212	Compressor Unit # 4 -	Threaded connection - 2"	0.0045	15.00	-1.45	0.65	2.03
1	3275	DEA Contactor Pumps -	Threaded connection - 1"	0.0045	15.00	-1.57	0.64	2.05
1	3320	Dehy Piping -	Gate valve - 0.75"	0.0045	60.00	-34.62	0.64	8.19

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1169	NRU 1 - A411N-14	Threaded connection - 0.75"	0.0045	10.00	3.43	0.53	1.37
3	1771	Stab 1 Building - (Near Stab Reflux Pumps)	Gate valve - 3"	0.0045	120.00	-94.62	0.01	16.38
4	3707	Sales Gas Header -	Gate valve - 2"	0.0045	100.00	-74.64	0.64	13.66
4	3789	Re-Compression: Clark Discharge Cooler -	Gate valve - 1"	0.0044	75.00	-49.76	0.64	10.30
4	3729	Cryo System: Exchanger -	Tubing connection - 0.375"	0.0044	15.00	10.18	0.01	2.06
4	3686	Cryo System: Beside Expander Feed Separator - To pressure relief valve	Union - 0.75"	0.0044	50.00	-36.69	0.64	6.89
3	1822	Fuel Gas Scrubber (V8-1720) - A1720-1	Gate valve - 0.5"	0.0044	60.00	-34.85	0.63	8.27
2	4280	Compressor Unit # 7 -	Threaded connection - 1.5"	0.0044	15.00	-1.69	0.64	2.07
3	1617	IR Compressor Building - IR Comp 1 (Start Gas)	Threaded connection - 0.5"	0.0044	10.00	3.28	0.63	1.38
3	1424	Residue Gas/N2 Comp Bldg - Comp 2	Flange - 6"	0.0044	100.00	-86.72	0.63	13.81
3	1117	NRU 2 - Base of Hot Box	Threaded connection - 0.25"	0.0044	10.00	3.18	0.52	1.39
1	3288	HP Expander Scrubber (PV-503) -	Gate valve - 1"	0.0044	75.00	-50.09	0.63	10.43
1	3348	Mole Sieve Tower 511B -	Open-ended line - 0.25"	0.0043	60.00	-46.94	0.51	8.42
1	1994	Inlet Header -	Threaded connection - 0.5"	0.0043	10.00	2.94	0.50	1.42
1	3277	DEA Contactor Pumps -	Gate valve - 1"	0.0043	75.00	-50.54	0.62	10.62
4	3972	Refrigeration Compressors: Unit 2 - To injector	Flange - 2"	0.0043	50.00	-37.07	0.62	7.09
1	1947	Inlet Header -	Threaded connection - 0.5"	0.0043	10.00	2.82	0.50	1.43
4	3541	North Heat Medium Heater - Pilot stem	Gate valve - 0.5"	0.0043	60.00	-35.77	0.62	8.58
2	3992	SCW Inlet Line - ball valve seat	Threaded connection - 1"	0.0043	15.00	-2.18	0.52	2.15
1	1966	Inlet Comp Yard Piping - On 10" orifice meter (stem packing)	Gate valve - 0.5"	0.0043	60.00	-35.77	0.50	8.58
4	3585	Mole Sieve Dehy: Regen Piping - Up high.	Gate valve - 0.75"	0.0043	60.00	-35.77	0.50	8.58
2	4070	S Inlet Scrubber (D202) -	Open-ended line - 0.5"	0.0043	60.00	-47.18	0.52	8.58
2	3999B	Inlet Line -	Open-ended line - 2"	0.0042	100.00	-87.23	0.52	14.36
3	1863	Residue Gas/N2 Comp Bldg: Heat Pump 3 -	Threaded connection - 0.5"	0.0042	10.00	2.70	0.62	1.44
2	4102	Mole Sieve Tower A -	Gate valve - 0.75"	0.0042	60.00	-36.00	0.52	8.66
2	4119	Skid 2 Inlet -	Tubing connection - 0.375"	0.0042	15.00	8.94	0.51	2.17
3	1472	Residue Gas/N2 Comp Bldg - Heat Pump 4	Valve cover	0.0042	200.00	-187.37	0.62	29.03
1	3191	Solar Turbines: Unit A - Chart recorder	Threaded connection - 0.375"	0.0042	10.00	2.58	0.60	1.46
2	4333	Compressor Yard - Near Engine/Heater Fuel ESD -	Gate valve - 4"	0.0041	190.00	-166.46	0.60	27.97
3	1101	NRU 3 - Base of Hot Box	Tubing connection - 0.25"	0.0041	15.00	8.53	0.50	2.21
2	4116	Skid 2 Inlet -	Tubing connection - 0.375"	0.0041	15.00	8.53	0.51	2.21
3	1385	Amine Bldg: V8-2701N-11 - A279N-1	Gate valve - 1"	0.0041	75.00	-51.47	0.49	11.05
2	4308	Compressor Unit # 1 -	Valve cover	0.0041	200.00	-187.63	0.00	29.64
3	1743	HHE Compressor Building - Comp HHE 7	Valve cover	0.0041	200.00	-187.64	0.49	29.66
2	4052	Inlet Scrubber - gate valve seat	Threaded connection - 1"	0.0041	15.00	-2.64	0.50	2.22
4	3563	Mole Sieve Dehy: Outlet - Gate valve seat	Threaded connection - 1"	0.0041	15.00	-2.67	0.48	2.23
4	3538	North Heat Medium Heater - Pilot	Gate valve - 0.5"	0.0041	60.00	-36.69	0.59	8.92
2	4041	Mole Sieve Tower B -	Gate valve - 1"	0.0041	75.00	-51.69	0.50	11.15

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
1	3080	West Inlet Yard Piping - Chart recorder	Tubing connection - 0.375"	0.0041	15.00	8.31	0.48	2.23
1	3050	Scrubber (PV-517) -	Threaded connection - 1.5"	0.0041	15.00	-2.73	0.48	2.24
3	1902	Hg Removal Bed V8-401-3 - A401N-9	Gate valve - 1.5"	0.0041	350.00	-51.92	0.49	11.26
3	1015	Mole Sieve 3 - ZSC2816N	Orbit valve - 8"	0.0041	75.00	-326.92	0.49	52.56
2	4289	Compressor Yard - Compressor unit 8	Orbit valve - 4"	0.0041	190.00	-166.92	0.58	28.53
1	3245	Solar Turbines -	Gate valve - 1.5"	0.0041	75.00	-51.92	0.58	11.26
1	3173	Refrig Comp Units -	Threaded connection - 2"	0.0041	15.00	-2.79	0.58	2.25
2	4349H	C3 Cooler -	Threaded connection - 1"	0.0040	15.00	-2.86	0.00	2.27
2	4146	Compressor Unit 6 Outside - vent off side	Three-way valve vent - 2"	0.0040	100.00	-77.15	0.58	15.17
3	1597	HP2 Bldg: W01-06 - Near N239-4	Tubing connection - 0.375"	0.0040	15.00	7.79	0.48	2.28
1	3463	Refrig Comp Unit 12 -	Valve cover	0.0040	200.00	-187.98	0.00	30.51
3	1032	Mole Sieve 4 - A2822N-49	Gate valve - 0.75"	0.0040	60.00	-37.50	0.47	9.24
3	1655	Re-Compressor Building - Re-Comp 2	Union - 2"	0.0040	100.00	-88.10	0.56	15.40
2	4165	Resid gas cooler E507 - on 8" ball valve	Grease nipple	0.0040	50.00	-27.50	0.48	7.70
3	1028	Mole Sieve 2 - On top platform	Gate valve - 0.75"	0.0040	60.00	-37.51	0.47	9.25
3	1334	Propane Yard: V8-410-3 - A410N-5	Gate valve - 0.75"	0.0039	60.00	-37.68	0.00	9.31
1	3452	Refrig Comp Unit 12 -	Valve cover	0.0039	200.00	-188.19	0.00	31.04
1	3261	Solar Turbines -	Threaded connection - 1"	0.0039	15.00	-3.26	0.56	2.34
3	1831	Co-Gen Building: Outside (CA 625 - HP FG Scrubber) - VG-151	Gate valve - 0.5"	0.0039	100.00	-37.85	0.55	9.39
3	1709	V2811-1 - near N2811-5	Union - 2"	0.0039	60.00	-88.28	0.55	15.64
2	4139B	Resid gas cooler E507 - cooler plugs	Threaded connection - 1"	0.0039	15.00	-3.29	0.56	2.35
3	1637	Re-Compressor Building - Re-Comp 1	Valve cover	0.0039	200.00	-188.40	0.46	31.61
1	3220	Solar Comp Yard Piping -	Gate valve - 0.75"	0.0039	60.00	-38.08	0.55	9.48
3	1748	HHE Compressor Building - Associated Yard Piping (On walkway PG 307+3)	Threaded connection - 0.375"	0.0038	10.00	1.60	0.46	1.58
4	3780	Re-Compression: Fuel Gas Piping -	Gate valve - 0.75"	0.0038	60.00	-38.20	0.55	9.53
4	3511	Regen Heater -	Tubing connection - 0.5"	0.0038	15.00	6.80	0.55	2.38
4	3523	South Heat Medium Heater - Pilot	Gate valve - 0.5"	0.0038	60.00	-38.20	0.55	9.54
3	1823	G-10-625-2 - A625-1	Gate valve - 3"	0.0038	120.00	-98.31	0.54	19.17
2	4056	crubber -	Gate valve - 0.75"	0.0038	60.00	-38.31	0.47	9.58
2	4275	Compressor Unit 7 -	Valve cover	0.0038	200.00	-188.53	0.55	31.96
4	3486	Inlet Yard Piping: Pig Traps - Plug valve seat	Open-ended line - 2"	0.0038	100.00	-88.59	0.46	16.07
1	3422	Refrig Comp Unit 10 - Yard Piping -	Control valve - butterfly - 6"	0.0038	282.00	-270.64	0.00	45.50
3	1794	Stab 1 Building (Yard) - (NGL Vessel)	Gate valve - 0.75"	0.0038	60.00	-38.54	0.01	9.69
3	1215	NGL Pump 4 - On Choke Valve	Flange - 3"	0.0038	75.00	-63.65	0.00	12.11
3	1207	Propane Storage Tank V6-290 -	Threaded connection - 0.5"	0.0038	10.00	1.35	0.00	1.62
2	4297	Residue Gas Suction Line -	Needle valve - 0.5"	0.0038	60.00	-38.60	0.54	9.72
3	1808	Fuel Gas Scrubber (V8-1720) - Near FE1720	Threaded connection - 0.5"	0.0037	10.00	1.29	0.53	1.62
3	1363	Amine Bldg: GB-2702N12A - A2702N-6	Gate valve - 10"	0.0037	500.00	-478.81	0.45	81.75
3	1474	Residue Gas/N2 Comp Bldg: Back Wall - A301N-5	Threaded connection - 0.75"	0.0037	10.00	1.17	0.53	1.64
2	3997	Inlet Line - ball valve seat	Threaded connection - 0.5"	0.0037	10.00	1.17	0.45	1.64
4	3638	Sales Gas Header -	Tubing connection - 0.375"	0.0037	15.00	6.08	0.54	2.47

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1381	Amine Bldg: G8-1650 - Below A1650N-3	Threaded connection - 0.75"	0.0037	10.00	1.14	0.44	1.65
4	3568	Mole Sieve Dehy: Regen Piping -	Gate valve - 0.75"	0.0037	60.00	-38.95	0.43	9.88
1	3447	Refrig Comp Unit 12 -	Valve cover	0.0037	200.00	-188.92	0.00	33.11
4	3749	Cryo System: Absorber Tower (20.001) - Second platform	Gate valve - 2"	0.0037	100.00	-79.17	0.01	16.63
2	4006	Mole Sieve Tower D -	Control valve - orbit - 8"	0.0036	353.00	-342.01	0.45	58.89
1	3229	HP Expander Scrubber (PV-503) -	Gate valve - 0.75"	0.0036	60.00	-39.23	0.53	10.01
3	1775	Stab 1 Building - PV614-1B (Top of Accumulator)	Control valve - globe - 2"	0.0036	130.00	-119.01	0.44	21.69
2	4143	Compressor Unit 8 Outside -	Threaded connection - 2"	0.0036	15.00	-4.01	0.53	2.50
3	1639	Re-Compressor Building - Re-Comp 1 (WE4C-301-1) (Fuel Gas Line)	Threaded connection - 2"	0.0036	15.00	-4.02	0.52	2.50
4	3943A	Re-Compression: Unit 2 - FG Line 3	Threaded connection - 2"	0.0036	15.00	-4.04	0.53	2.51
1	3145	Refrig Comp Unit 11 - Stem packing	Variable volume pocket stem	0.0036	400.00	-394.36	0.00	66.93
3	1921	Hg Removal Bed V8-401-1 - A401-2	Gate valve - 0.75"	0.0036	60.00	-39.46	0.43	10.12
3	1897	Hg Removal Bed V8-401-1 - on A401N-8	Tubing connection - 0.25"	0.0036	15.00	5.53	0.43	2.53
4	3531	Heat Medium Heater FG Line - End of body (vent)	Regulator - 1"	0.0036	175.00	-150.11	0.52	29.61
1	3184	Solar Turbines: Unit B - Chart recorder	Tubing connection - 0.5"	0.0036	15.00	5.42	0.52	2.54
4	3669	Cryo System: Chart Recorder -	Open-ended line - 0.25"	0.0036	60.00	-49.21	0.01	10.20
4	3614	Yard North of Office -	Gate valve - 1"	0.0036	75.00	-54.61	0.52	12.74
2	4031	Mole Sieve Tower C -	Threaded connection - 0.5"	0.0036	10.00	0.74	0.44	1.71
1	3053	Mansfield Discharge -	Gate valve - 2"	0.0036	100.00	-79.75	0.42	17.11
4	3794	Re-Compression: Valero Discharge Scrubber -	Gate valve - 0.75"	0.0035	60.00	-39.81	0.51	10.30
2	4164	Resid gas cooler E507 -	Threaded connection - 0.5"	0.0035	10.00	0.68	0.43	1.72
3	1069	Amine Bldg - A2801N-5	Gate valve - 4"	0.0035	190.00	-169.82	0.42	32.62
2	4142	Compressor Unit 9 Outside -	Threaded connection - 2"	0.0035	15.00	-4.38	0.51	2.59
4	3827D	Re-Compression: Yard Piping - on 4" plug valve	Grease nipple	0.0035	50.00	-29.98	0.51	8.65
1	3273	De-methanizer: Surge Tank (PV-508) -	Gate valve - 0.75"	0.0035	60.00	-40.10	0.50	10.45
3	1640	Re-Compressor Building - Re-Comp 1 (WE4C-301-1) (Fuel Gas Line)	Union - 2"	0.0035	100.00	-89.50	0.50	17.46
3	1766	Stab 1 Building - (Near Stab Reflux Pumps)	Flange - 30"	0.0035	300.00	-289.50	0.01	52.38
1	3308	Dust Filters for Regen Gas -	Threaded connection - 0.75"	0.0035	10.00	0.44	0.40	1.76
4	3800	Re-Compression: Unit 5 -	Threaded connection - 0.5"	0.0035	10.00	0.43	0.50	1.76
1	3146	Refrig Comp Unit 11 - Plug on cylinder body.	Threaded connection - 0.5"	0.0035	10.00	0.41	0.00	1.76
3	1209	NGL Sales Line - Flow Prover	Flange - 4"	0.0035	75.00	-64.60	0.00	13.22
4	3496	Inlet Header -	Orifice meter plate - 12"	0.0034	150.00	-144.66	0.42	26.49
3	1891	Hg Removal Bed V8-401-3 - A401N-20	Gate valve - 0.75"	0.0034	245.00	-40.39	0.41	10.60
3	1784	Stab 1 Building - (Near Stab Reflux Pumps)	Gate valve - 6"	0.0034	60.00	-225.39	0.01	43.28
1	1979	Inlet Header - Chart recorder	Tubing connection	0.0034	10.00	4.61	0.40	2.70
1	3473	Refrig Surge Tank -	Gate valve - 0.75"	0.0034	60.00	-40.40	0.00	10.61
1	3339	Mole Sieve Tower 511A - Needle valve seat	Open-ended line - 0.25"	0.0034	60.00	-49.65	0.40	10.63

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
4	3959	Refrigeration Compressors: Unit 3 -	Flange - 1"	0.0034	50.00	-39.74	0.49	8.94
1	3055	Mansfield Discharge -	Gate valve - 1"	0.0034	75.00	-55.62	0.40	13.41
4	3730	Cryo System: Exchanger -	Open-ended line - 0.5"	0.0034	60.00	-49.75	0.01	10.73
3	1260	NGL Pump 3 - A1201N-4	Gate valve - 0.75"	0.0034	60.00	-40.85	0.00	10.86
2	4144	Compressor Unit 8 Outside - vent off side	Three-way valve vent - 2"	0.0033	100.00	-80.96	0.48	18.20
2	4285	Compressor Yard - Compressor unit 8 - on 4" orbit valve	Grease nipple	0.0033	50.00	-30.97	0.48	9.10
3	1731	HHE Compressor Building - Comp HHE 7	Threaded connection - 0.5"	0.0033	10.00	0.07	0.40	1.82
4	3906	Re-Compression: Unit 2 -	Gate valve - 0.75"	0.0033	60.00	-41.08	0.48	10.99
3	1181	NRU 1 -	2 Tubing connections - 0.375"	0.0033	15.00	3.92	0.40	2.75
3	1899	Hg Removal Bed V8-401-1 - A401N-6	Gate valve - 0.75"	0.0033	60.00	-41.31	0.39	11.12
4	3503	Regen Heater - Gate valve seat	Open-ended line - 0.5"	0.0033	60.00	-50.11	0.47	11.13
3	1907	Hg Removal Bed V8-401-1 - A401N-3	Gate valve - 1.5"	0.0032	75.00	-56.54	0.39	14.08
3	1434	Residue Gas/N2 Comp Bldg - Heat Pump 1	Valve cover	0.0032	200.00	-190.24	0.48	37.55
4	3490	WADD Flash Tank - Ball valve seat	Open-ended line - 0.75"	0.0032	60.00	-50.26	0.39	11.29
3	1087	Amine Bldg: V8-2806-2 - A2806N-2	Gate valve - 1"	0.0032	75.00	-56.63	0.39	14.15
3	1769	Stab 1 Building - A612-12 (De-methanizer Tower)	Gate valve - 0.75"	0.0032	100.00	-41.65	0.01	11.33
3	1714	Heater Treaters - near A453-4	Union - 1"	0.0032	60.00	-90.29	0.46	18.89
3	1758	Stab 1 Building - Near A614-14	Gate valve - 2"	0.0032	100.00	-81.65	0.01	18.89
2	4307	Compressor Unit # 1 -	Threaded connection - 0.75"	0.0032	10.00	-0.35	0.00	1.90
1	3202	Solar Turbines: Unit B - Fuel gas filter piping	Tubing connection - 0.375"	0.0032	15.00	3.23	0.46	2.85
2	4302	Compressor Unit # 1 - flange	Cylinder body	0.0032	400.00	-395.05	0.46	76.27
2	4139G	Resid gas cooler E507 - cooler plugs	Threaded connection - 1"	0.0032	15.00	-5.39	0.46	2.86
3	1188	NRU Expander 1 - Near TB-0190	Union - 0.75"	0.0032	50.00	-40.39	0.38	9.54
2	4322	Compressor Unit # 1 - on cylinder head bolts	Flange - 3"	0.0032	75.00	-65.48	0.46	14.44
3	1063	Amine Bldg: V8-404N - A404N-5	Gate valve - 1"	0.0032	75.00	-57.01	0.38	14.44
3	1016	Mole Sieve Header - XY-2817N0	Orbit valve - 8"	0.0031	350.00	-332.10	0.38	67.74
4	3629	Yard North of Office - Needle valve seat (chart blowdown)	Open-ended line - 0.25"	0.0031	60.00	-50.58	0.37	11.67
4	3882	FG Scrubber -	Tubing connection - 0.375"	0.0031	15.00	2.65	0.45	2.94
3	1804	Fuel Gas Scrubber (V8-1720) - A1720-6	Gate valve - 1"	0.0031	75.00	-57.35	0.44	14.72
1	3403	Mole Sieve Tower 511B -	Gate valve - 0.75"	0.0031	60.00	-42.35	0.36	11.78
1	1997	Discharge Line (221) -	Gate valve - 1"	0.0031	75.00	-57.35	0.36	14.72
3	1219	NGL Pump 3 - A1202N-8	Gate valve - 1"	0.0031	75.00	-57.46	0.00	14.82
3	1066	Amine Bldg: V8-404N - Near A404N-3	Tubing connection - 0.375"	0.0031	15.00	2.53	0.37	2.96
3	1886	FG Piping on RES/N2/Heat Pump Bldg (outside) - A2400N-2	Gate valve - 3"	0.0031	120.00	-102.52	0.44	23.79
2	4330	Compressor Yard - stem packing	Plug valve - 0.5"	0.0031	60.00	-42.52	0.44	11.89
1	3230	Solar Turbines: Unit B - On skid	Gate valve - 0.75"	0.0031	60.00	-42.52	0.44	11.89
1	3267	Solar Turbines -	Gate valve - 1"	0.0031	75.00	-57.52	0.44	14.87
1	3219	Solar Turbines: Header Outside -	Control valve - butterfly - 10"	0.0031	459.00	-449.75	0.44	90.98
4	3539	North Heat Medium Heater - Pilot	Gate valve - 0.5"	0.0030	60.00	-42.69	0.44	12.01
3	1877	Amine Building - ROV - 2720N-2 gas blowdown to flare	Control valve - globe - 2"	0.0030	130.00	-120.84	0.36	26.03
2	4334	Make-up Gas Suction Scrubber -	Gate valve - 0.5"	0.0030	60.00	-42.69	0.44	12.01
3	1341	Amine Bldg: Near V8-2810N - A2809N-1	Flange - 16"	0.0030	200.00	-190.84	0.36	40.05

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1576	HP2 Bldg: W29-04 - A231-1	Gate valve - 0.5"	0.0030	60.00	-42.70	0.36	12.02
3	1595	HP2 Bldg: W36-16 - B233-3	Orbit valve - 2"	0.0030	100.00	-82.71	0.36	20.04
1	3163	Refrig Comp Unit 11 -	Threaded connection - 0.5"	0.0030	10.00	-0.89	0.00	2.01
2	4206	Residue Compressors FG Scrubber -	Needle valve - 0.5"	0.0030	60.00	-42.84	0.43	12.12
1	3455	Refrig Comp Unit 12 -	Valve cover	0.0030	200.00	-190.93	0.00	40.42
3	1826	G-10-625-2 - A625-1	Gate valve - 3"	0.0030	120.00	-102.87	0.43	24.27
1	1971	Inlet Comp Yard Piping -	Flange - 4"	0.0030	75.00	-65.93	0.35	15.17
3	1445	Residue Gas/N2 Comp Bldg: Lower Level -	Gate valve - 0.75"	0.0030	60.00	-42.87	0.43	12.14
2	4349E	C3 Cooler -	Threaded connection - 1"	0.0030	15.00	-5.98	0.00	3.05
4	3856	Re-Compression: Unit 4 -	Open-ended line - 0.5"	0.0030	60.00	-51.03	0.43	12.26
3	1599	HP2 Bldg: W31-06 - A238-4	Gate valve - 1"	0.0030	75.00	-58.14	0.35	15.42
1	3075	West Inlet Yard Piping - On 6" orifice meter	Rack	0.0030	75.00	-58.16	0.35	15.43
3	1561	HP1 Bldg: Piping - B206-3	Orbit valve - 3"	0.0029	120.00	-103.27	0.35	24.86
1	3367	Inlet Gas Scrubber (PV-501) -	Gate valve - 0.75"	0.0029	60.00	-43.39	0.34	12.51
3	1580	HP1 Bldg: E26-15 - N201-9 (BV seat).	Threaded connection - 0.5"	0.0029	10.00	-1.22	0.35	2.09
3	1830	Co-Gen Building: Outside (CA 625 - HP FG Scrubber) - VG-151	Threaded connection - 0.5"	0.0029	10.00	-1.30	0.41	2.11
1	3394	De-ethanizer Tower -	Gate valve - 0.75"	0.0029	60.00	-43.56	0.01	12.64
2	4139E	Resid gas cooler E507 - cooler plugs	Threaded connection - 1"	0.0029	15.00	-6.30	0.42	3.16
3	1119	NRU 2 - Base of Hot Box	Threaded connection - 0.25"	0.0029	10.00	-1.33	0.34	2.12
2	4067	HP Inlet EDS - on 8" plug valve	Grease nipple	0.0028	50.00	-33.85	0.35	10.73
4	3725	Cryo System: De-methanizer Tower (1st Platform) -	Open-ended line - 0.5"	0.0028	60.00	-51.45	0.01	12.87
2	4120	Free Water KO - sight glass	Gate valve - 0.5"	0.0028	60.00	-44.08	0.34	13.06
3	1908	Hg Removal Bed (T on stem packing)	Gate valve - 0.75"	0.0028	60.00	-44.14	0.33	13.11
4	3937B	Re-Compression: Unit 4 - FG Line 2	Plug valve - 2"	0.0028	120.00	-104.15	0.40	26.23
3	1226	Propane Storage Tank V6-290 -	Threaded connection - 0.5"	0.0028	10.00	-1.61	0.00	2.19
2	4349D	C3 Cooler -	Threaded connection - 1"	0.0028	15.00	-6.61	0.00	3.28
4	3975	Refrigeration Compressors: Unit 2 - To injector	Flange - 2"	0.0028	50.00	-41.67	0.40	11.00
4	3554	Glycol Reboiler: Fuel Gas -	Union - 1"	0.0028	100.00	-91.67	0.40	22.01
4	3611	Yard North of Office - Near 18" check valve	Control valve - plug - 10"	0.0028	459.00	-450.70	0.40	101.36
3	1218	NGL Pump 3 - Near A1202N-8	Flange - 4"	0.0028	75.00	-66.70	0.00	16.56
3	1540	Residue Gas/N2 Comp Bldg - Heat Pump 3	Threaded connection - 0.5"	0.0028	10.00	-1.71	0.00	2.21
3	1362	Amine Blfg: GB-2702N12A - A2702N-2	Threaded connection - 0.5"	0.0027	10.00	-1.76	0.33	2.22
3	1780	Stab 1 Building - Near Stab Reflux Pumps:	Gate valve - 3"	0.0027	120.00	-104.43	0.01	26.70
3	1102	NRU 3 - Base of Hot Box	Threaded connection - 0.25"	0.0027	10.00	-1.82	0.33	2.24
1	3232	Solar Turbines: Unit B - On skid	Threaded connection - 1.5"	0.0027	15.00	-6.82	0.39	3.36
3	1789	Stab 1 Building - Reboiler Pumps Outside	Pump seal	0.0027	500.00	-495.84	0.01	113.34
2	4098	DGA coalescer - horn	Pressure relief valve - 2"	0.0027	135.00	-126.94	0.33	30.72
3	1098	Amine Bldg: V8-2806-1 - A2806N-7	Gate valve - 1"	0.0027	75.00	-59.77	0.32	17.07
2	4083	Common inlet lines -	Tubing connection - 0.5"	0.0027	15.00	0.14	0.33	3.43
4	3788	Re-Compression: Clark Discharge Cooler -	Gate valve - 0.75"	0.0026	60.00	-44.98	0.38	13.84
1	3395	EB Skid to Chevron -	Pump seal	0.0026	500.00	-495.92	0.00	115.50

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1134	NRU 3 - Top Platform - A2368N	Threaded connection - 0.75"	0.0026	10.00	-2.06	0.32	2.31
3	1403	Residue Gas/N2 Comp Bldg: Yard - G2502N	Gate valve - 2"	0.0026	100.00	-85.00	0.37	23.10
3	1060	Mole Sieve Header - PDSL-2866N	Tubing connection - 0.375"	0.0026	15.00	-0.01	0.32	3.47
4	3560	TEG Still - Stem at burners.	Tubing connection - 0.5"	0.0026	15.00	-0.12	0.38	3.49
3	1762	Stab 1 Building - A614-17	Control valve - globe - 4"	0.0026	177.00	-169.12	0.01	41.21
3	1045	Mole Sieve 3 - A2811N-23	Gate valve - 0.75"	0.0026	60.00	-45.13	0.31	13.98
4	3791	Re-Compression: Valero Discharge Scrubber -	Gate valve - 1"	0.0026	75.00	-60.14	0.38	17.49
1	3327	Mole Sieve Tower 511B -	Gate valve - 0.75"	0.0026	60.00	-45.23	0.30	14.08
3	1763	Stab 1 Building - Near Stab Reflux Pumps: A614-5	Gate valve - 3"	0.0026	120.00	-105.23	0.01	28.16
3	1056	Mole Sieve Header - PDSL2878N	Needle valve - 0.375"	0.0026	60.00	-45.29	0.31	14.13
2	4185	Cryo skid 101 -	Threaded connection - 0.5"	0.0026	10.00	-2.22	0.37	2.36
4	3701	Sales Gas Header - Gate valve seat	Open-ended line - 0.5"	0.0026	60.00	-52.22	0.37	14.14
2	4065	Fuel Gas - on chart recorder	Tubing connection - 0.375"	0.0026	15.00	-0.46	0.37	3.58
3	1116	NRU 2 - Base of Hot Box	Threaded connection - 0.25"	0.0026	10.00	-2.31	0.31	2.38
3	1481	Residue Gas/N2 Comp Bldg: Back Wall - A301N-1	Grease nipple - 0.75"	0.0026	50.00	-35.46	0.36	11.92
4	3743	Cryo System: Absorber Tower (20.001) - First platform	Gate valve - 2"	0.0026	100.00	-85.47	0.01	23.85
3	1473	Residue Gas/N2 Comp Bldg: Back Wall -	Grease nipple - 0.75"	0.0025	50.00	-35.58	0.36	12.01
1	1998	Discharge Line (221) -	Gate valve - 1"	0.0025	75.00	-60.58	0.30	18.02
3	1589	HP2 Bldg: W01-02 - Chart Recorder (Upper Platform)	Needle valve - 0.375"	0.0025	60.00	-45.63	0.30	14.47
2	4173	Cryo skid 101 - expander K101-B	Threaded connection - 0.5"	0.0025	10.00	-2.45	0.31	2.43
1	3396	EB Skid to Chevron -	Control valve - globe - 2"	0.0025	130.00	-122.49	0.00	31.74
3	1047	Mole Sieve 3 - A2811N-18	Threaded connection - 0.75"	0.0025	10.00	-2.49	0.30	2.44
4	3723	Cryo System: De-methanizer Tower (1st Platform) -	Gate valve - 1"	0.0025	75.00	-60.87	0.01	18.39
4	3641	Sales Gas Header -	Tubing connection - 0.375"	0.0025	15.00	-0.88	0.36	3.68
3	1895	Hg Removal Bed V8-401-2 - plug on BV	Threaded connection - 0.5"	0.0025	10.00	-2.58	0.29	2.47
3	1535	Residue Gas/N2 Comp Bldg - Heat Pump 3	Valve cover	0.0025	200.00	-192.60	0.00	49.58
3	1779	Stab 1 Building - Near A611-18 (Near De-methanizer Feed Tank)	Gate valve - 0.75"	0.0024	60.00	-46.15	0.29	15.02
1	1940	Inlet Header -	Threaded connection - 0.5"	0.0024	10.00	-2.67	0.28	2.50
1	3434	EP Skid to Koch -	Gate valve - 0.75"	0.0024	60.00	-46.15	0.00	15.02
3	1584	HP1 Bldg: W20-09 - B215-7 (BV seat).	Threaded connection - 0.5"	0.0024	10.00	-2.67	0.29	2.50
2	4288	Compressor yard Unit # 6 -	Grease nipple	0.0024	50.00	-36.16	0.35	12.51
4	3495	Inlet Header -	Threaded connection - 0.5"	0.0024	10.00	-2.74	0.29	2.52
3	1530	Residue Gas/N2 Comp Bldg - Heat Pump 2	Valve cover	0.0024	200.00	-192.75	0.35	50.59
4	3493	Inlet Header -	Gate valve - 1.5"	0.0024	75.00	-61.31	0.29	18.98
4	3774	C3 Refrigeration: Storage -	Threaded connection - 0.5"	0.0024	10.00	-2.79	0.00	2.54

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
4	3673	Cryo System: Turbo Expander -	Control valve - 8"	0.0024	353.00	-345.82	0.01	90.15
3	1566	HP2 Bldg: W30-02 - B-229-3	Gate valve - 2"	0.0024	100.00	-86.48	0.28	25.62
1	1939	Inlet Header -	Gate valve - 0.75"	0.0024	60.00	-46.50	0.28	15.40
3	1120	NRU 2 - Base of Hot Box	Threaded connection - 0.25"	0.0024	10.00	-2.86	0.28	2.57
3	1006	Mole Sieve 5 - On top platform - Block valve below PRV.	Gate valve - 2"	0.0024	100.00	-86.59	0.28	25.84
1	3086	West Inlet Yard Piping - On Hanna Bridgeport scrubber (PV-29)	Threaded connection - 0.75"	0.0024	10.00	-2.92	0.27	2.59
2	4365	Compressor Unit # 2 -	Gate valve - 1"	0.0023	75.00	-61.64	0.00	19.45
2	4074	Sales Piping - on 4" orifice meter	Equilizer valve	0.0023	75.00	-61.67	0.34	19.50
1	3265	Solar Turbines -	Threaded connection - 1"	0.0023	15.00	-7.95	0.34	3.90
3	1302	Propane Yard - Near A2404N	Gate valve - 1"	0.0023	75.00	-61.70	0.00	19.55
3	1326	Propane Yard - Behind Economizer -	Control valve - globe - 6"	0.0023	282.00	-274.97	0.00	73.56
3	1579	HP2 Bldg: W30-16 - A234-1	Gate valve - 0.5"	0.0023	60.00	-46.73	0.28	15.67
3	1330	Propane Yard - G406N-1 (1st Stage Suction Scrubber)	Gate valve - 4"	0.0023	190.00	-176.84	0.00	50.02
3	1544	Residue Gas/N2 Comp Bldg - Heat Pump 3 (near PDI)	Gate valve - 0.75"	0.0023	60.00	-46.84	0.00	15.80
1	3242	Solar Turbines: Unit A - On skid	Gate valve - 0.5"	0.0023	60.00	-46.85	0.33	15.81
1	3007	Inlet Comp Yard Piping - Stem packing	Gate valve - 0.75"	0.0023	60.00	-46.85	0.27	15.81
3	1009	Mole Sieve 5 - On top platform	Tubing connection - 0.75"	0.0023	25.00	-12.02	0.27	6.67
3	1888	FG Piping on RES/N2/Heat Pump Bldg (outside) - A2400N-78	Gate valve - 0.75"	0.0023	60.00	-47.02	0.32	16.02
3	1340	Amine Bldg: V8-2810N - Near A2810N-3	Threaded connection - 0.75"	0.0023	10.00	-3.13	0.27	2.67
3	1707	G10-805 - common R vent line to outside	Open-ended line - 1.5"	0.0023	75.00	-68.14	0.32	20.03
3	1719	HHE Compressor Building - Comp HHE 7	Threaded connection - 0.5"	0.0023	177.00	-3.16	0.27	2.68
3	1701	Re-Compressor Building - Associated Yard Piping (Near G8-311-1) Cooler	Control valve - ball - 4"	0.0023	10.00	-170.16	0.27	47.46
1	3120	Compressor CM-19 -	Injector	0.0022	200.00	-187.19	0.26	54.11
1	3420	Refrig Comp Unit 11 - Yard Piping -	Gate valve - 3"	0.0022	120.00	-107.22	0.00	32.53
3	1754	Stab 1 Building - A612-45 (West Wall)	Gate valve - 0.75"	0.0022	130.00	-47.31	0.00	16.38
3	1037	Mole Sieve 3 - ROV-2852N	Control valve - globe - 2"	0.0022	60.00	-123.28	0.27	35.49
1	1951	Inlet Comp Yard Piping -	Control valve - globe - 2"	0.0022	130.00	-123.28	0.26	35.49
3	1227	NGL Bullet 6 - Near A1101N-45	Gate valve - 0.5"	0.0022	60.00	-47.31	0.00	16.38
3	1643	IR Compressor Building - IR Comp 3 (Start Gas)	Union - 1.5"	0.0022	100.00	-93.29	0.32	27.31
2	4332	C3 Filter - plug valve seat	Threaded connection - 1"	0.0022	15.00	-8.33	0.00	4.12
1	3290	High Pressure JT Expander -	Gate valve - 1.5"	0.0022	75.00	-62.42	0.32	20.66
4	3500	Yard North of Office - Needle valve seat	Open-ended line - 0.5"	0.0022	60.00	-53.38	0.32	16.61
1	3119	Compressor CM-19 -	Threaded connection - 2"	0.0022	15.00	-8.41	0.26	4.17
1	2001	Discharge Line (221) -	Gate valve - 4"	0.0022	190.00	-177.54	0.26	52.83
2	4255	Compressor Unit # 4 -	Threaded connection - 1"	0.0022	15.00	-8.41	0.32	4.17
2	4271	Compressor Unit 7 -	Valve cover	0.0022	200.00	-193.41	0.32	55.61
1	3079	West Inlet Yard Piping - On 6" orifice meter	Blowdown valve	0.0022	75.00	-62.54	0.26	20.86
4	3561	TEG Still - Stem at burners.	Gate valve - 0.5"	0.0022	60.00	-47.54	0.32	16.69

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1809	Fuel Gas Scrubber (V8-1720) - Near FE1720	Threaded connection - 0.5"	0.0022	10.00	-3.41	0.31	2.78
1	1972	Inlet Comp Yard Piping -	Gate valve - 2"	0.0022	100.00	-87.54	0.26	27.81
3	1012	Mole Sieve Header - ZSC2820N	Flange - 8"	0.0022	100.00	-93.41	0.26	27.81
4	3873	Re-Compression: Yard Piping -	Gate valve - 0.75"	0.0022	60.00	-47.55	0.32	16.70
4	3555	Glycol Reboiler: Fuel Gas -	Gate valve - 0.5"	0.0022	60.00	-47.56	0.32	16.72
4	3973	Refrigeration Compressors: Unit 2 -	Valve - 1"	0.0022	75.00	-62.56	0.32	20.90
2	4076	Sales Piping -	Gate valve - 0.75"	0.0022	60.00	-47.71	0.31	16.92
3	1001	Mole Sieve 5 - On top platform	Gate valve - 0.75"	0.0022	60.00	-47.74	0.25	16.96
1	1954	Inlet Comp Yard Piping -	Gate valve - 3"	0.0021	120.00	-107.77	0.25	34.00
2	4350F	C3 Cooler -	Threaded connection - 1"	0.0021	15.00	-8.55	0.00	4.26
3	1761	Stab 1 Building - A614-13	Gate valve - 4"	0.0021	190.00	-177.88	0.00	54.34
3	1764	Stab 1 Building - Near Stab Reflux Pumps:	Gate valve - 4"	0.0021	190.00	-177.88	0.00	54.34
2	4216	Compressor Unit # 4 - fuel gas chart recorder	Tubing connection - 0.375"	0.0021	15.00	-2.88	0.31	4.29
3	1728	HHE Compressor Building - Comp HHE 7	Threaded connection - 0.5"	0.0021	10.00	-3.59	0.25	2.86
2	4349G	C3 Cooler -	Threaded connection - 1"	0.0021	15.00	-8.61	0.00	4.30
2	4350E	C3 Cooler -	Threaded connection - 1"	0.0021	15.00	-8.61	0.00	4.30
3	1811	G-10-625-2 - XY625-12C (East Reboiler)	Threaded connection - 2"	0.0021	15.00	-8.65	0.30	4.33
3	1615	IR Compressor Building - IR Comp 1	Valve cover	0.0021	60.00	-8.65	0.25	4.33
3	1671	Re-Compressor Building - Re-Comp 4 (Fuel Gas Line)	Threaded connection - 2"	0.0021	200.00	-48.00	0.30	17.33
3	1912	Hg Removal Bed V8-401-2 - A401N-9	Gate valve - 0.75"	0.0021	15.00	-193.65	0.25	57.76
4	3497	Inlet Header - North	Threaded connection - 0.5"	0.0021	10.00	-3.72	0.25	2.92
3	1759	Stab 1 Building - Near Stab Reflux Pumps:	Gate valve - 0.5"	0.0021	60.00	-48.23	0.00	17.66
1	1950	1ST Stage Suction Scrubber (PV-1A) -	Threaded connection - 0.5"	0.0021	10.00	-3.77	0.24	2.94
3	1073	NRU 3 - A411N-71	Threaded connection - 0.5"	0.0021	10.00	-3.77	0.25	2.95
4	3609	Yard North of Office - Needle valve seat (chart blowdown)	Open-ended line - 0.25"	0.0021	60.00	-53.78	0.30	17.69
3	1316	Propane Yard: V8-411 - A407N-2	Gate valve - 0.75"	0.0021	60.00	-48.29	0.00	17.75
3	1616	IR Compressor Building - IR Comp 1	Threaded connection - 0.5"	0.0021	10.00	-3.82	0.25	2.97
3	1760	Stab 1 Building - LV614-1A	Gate valve - 4"	0.0020	190.00	-178.35	0.00	56.49
3	1810	Fuel Gas Scrubber (V8-1720) - Near FE1720	Threaded connection - 0.5"	0.0020	60.00	-3.90	0.29	3.00
3	1501	Residue Gas/N2 Comp Bldg: Lower Level - A301N-47	Gate valve - 0.75"	0.0020	10.00	-48.46	0.29	18.02
3	1909	Hg Removal Bed V8-401-3 - A401N-14	Gate valve - 0.75"	0.0020	60.00	-48.46	0.24	18.02
3	1084	NRU - Fuel Gas - 17012X	Gate valve - 0.5"	0.0020	60.00	-48.46	0.24	18.02
3	1717	G10-805 - on B805-2	Ball valve - 0.5"	0.0020	60.00	-48.46	0.29	18.02
3	1855	Amine Yard - A2700N	Gate valve - 4"	0.0020	190.00	-178.58	0.29	57.64
3	1153	NRU 1 - Base of Hot Box	Tubing connection - 0.25"	0.0020	15.00	-3.61	0.24	4.56
1	1985	Inlet Header -	Tubing connection - 0.375"	0.0020	15.00	-3.69	0.23	4.60
3	1591	HP2 Bldg: W36 - Chart Recorder (Upper Platform)	Open-ended line - 0.375"	0.0020	60.00	-54.05	0.24	18.48
2	4220	Compressor Unit # 9 -	Gate valve - 0.5"	0.0020	60.00	-48.75	0.28	18.48
2	4355	Compressor Yard - Centre Residue Gas Cooler -	Control valve - globe - 6"	0.0020	282.00	-276.05	0.28	86.86
4	3963	Refrigeration Compressors: Unit 3 -	Needle valve - 0.75"	0.0019	60.00	-48.90	0.28	18.74

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
1	3031	Inlet Header -	Threaded connection - 0.5"	0.0019	10.00	-4.14	0.23	3.13
1	3183	Solar Turbines: Unit B - Chart recorder	Needle valve - 0.375"	0.0019	60.00	-48.92	0.28	18.77
2	4161	Resid gas cooler E507 - gate valve seat	Open-ended line - 0.75"	0.0019	60.00	-54.14	0.24	18.77
3	1524	Residue Gas/N2 Comp Bldg - Heat Pump 2	Gate valve - 0.75"	0.0019	60.00	-49.01	0.00	18.91
2	4134	Gas-Gas Exchanger -	Gate valve - 0.5"	0.0019	60.00	-49.04	0.24	18.97
3	1460	Residue Gas/N2 Comp Bldg - Heat Pump 4 (near PDI-428N-4)	Gate valve - 0.75"	0.0019	60.00	-49.10	0.28	19.08
3	1782	Stab 1 Building - Near Stab Reflux Pumps:	Gate valve - 4"	0.0019	190.00	-179.27	0.00	61.35
3	1838	Co-Gen Building: Outside (CA 625 - HP FG Scrubber) - VG-155	Gate valve - 1"	0.0019	75.00	-64.27	0.27	24.22
3	1428	Residue Gas/N2 Comp Bldg - Comp 2	Threaded connection - 0.5"	0.0019	10.00	-4.33	0.27	3.23
4	3639	Sales Gas Header - Stem packing.	Gate valve - 0.75"	0.0019	60.00	-49.34	0.27	19.50
3	1632	IR Compressor Building - Associated Yard Piping (Near A321-10)	Threaded connection - 0.75"	0.0019	200.00	-4.38	0.22	3.26
3	1601	IR Compressor Building - IR Comp 2	Valve cover	0.0019	10.00	-194.38	0.22	65.28
3	1505	Residue Gas/N2 Comp Bldg: Lower Level - G301N-10	Gate valve - 3"	0.0019	120.00	-109.44	0.26	39.39
3	1665	Re-Compressor Building - Re-Comp 3 (Fuel Gas Line)	Cylinder end - flange	0.0018	400.00	-397.17	0.22	133.47
1	3177	Solar Turbines: Unit B - On skid	Open-ended line - 0.5"	0.0018	60.00	-54.51	0.26	20.02
2	4235	Compressor Unit # 8 -	Valve - 1"	0.0018	75.00	-64.62	0.26	25.03
3	1512	Residue Gas/N2 Comp Bldg: Lower Level	Gate valve - 0.75"	0.0018	120.00	-49.62	0.26	20.02
3	1506	Residue Gas/N2 Comp Bldg: Lower Level	Gate valve - 3"	0.0018	60.00	-109.62	0.26	40.05
2	4139A	Resid gas cooler E507 - cooler plugs	Threaded connection - 1"	0.0018	15.00	-9.51	0.26	5.01
4	3695	Cryo System: Chiller Outlet Separator -	Gate valve - 2"	0.0018	100.00	-89.66	0.00	33.52
1	3429	Refrig Comp Yard Piping -	Tubing connection - 0.5"	0.0018	15.00	-4.74	0.00	5.06
3	1703	Medium Pressure Bldg - B243-4	Ball valve - 2"	0.0018	100.00	-89.85	0.21	34.13
4	3969	Refrigeration Compression: Unit 2 -	Union - 0.75"	0.0018	50.00	-44.69	0.25	17.26
2	4230	Compressor Unit 8 -	Valve cover	0.0018	200.00	-194.69	0.25	69.04
1	3088	West Inlet Yard Piping - On VAW gas scrubber (PV-28)	Plug valve - 0.75"	0.0018	60.00	-49.96	0.21	20.71
3	1532	Residue Gas/N2 Comp Bldg - Heat Pump 3	Threaded connection - 0.5"	0.0017	10.00	-4.75	0.26	3.49
3	1598	HP2 Bldg: W29-12 - A236-2	Gate valve - 0.5"	0.0017	120.00	-50.14	0.21	21.08
3	1147	NRU 2 - 2nd Platform - A416N-8	Gate valve - 3"	0.0017	60.00	-110.14	0.21	42.15
4	3613	Yard North of Office -	Threaded connection - 0.25"	0.0017	10.00	-4.81	0.20	3.53
2	4250	Compressor Unit 3 -	Threaded connection - 1"	0.0017	15.00	-9.81	0.25	5.30
1	3211	Solar Turbines: Header Outside -	Gate valve - 2"	0.0017	100.00	-90.31	0.25	35.75
1	3218	Solar Turbines: Header Outside -	Control valve - globe - 2"	0.0017	130.00	-124.87	0.25	46.47
4	3550	Still Reboiler No. 2 - On orifice meter	Needle valve - 0.5"	0.0017	60.00	-50.31	0.25	21.45
3	1611	IR Compressor Building - IR Comp 1	Valve cover	0.0017	200.00	-194.87	0.20	71.51
1	1995	Inlet Header -	Open-ended line - 0.375"	0.0017	60.00	-54.96	0.20	21.84
1	3380	High Pressure Chiller -	Control valve - globe - 4"	0.0017	177.00	-171.97	0.00	64.49
3	1023	Mole Sieve Header - A2811N41	Gate valve - 0.75"	0.0017	60.00	-50.54	0.20	21.98
2	4082	Common inlet lines -	Threaded connection - 0.5"	0.0016	10.00	-5.04	0.20	3.70
1	3385	High Pressure Chiller -	Control valve - globe - 4"	0.0016	177.00	-172.09	0.00	66.04

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1778	Stab 1 Building - A614-3 (Top of Accumulator)	Gate valve - 2"	0.0016	100.00	-90.77	0.19	37.54
3	1843	Co-Gen Building: Outside (CA 625 - HP FG Scrubber) - Near VG-127	Gate valve - 6"	0.0016	245.00	-235.77	0.23	91.97
3	1590	HP2 Bldg: W31-08 - Chart Recorder (Upper Platform)	Needle valve - 0.375"	0.0016	60.00	-50.77	0.19	22.53
3	1697	Re-Compressor Building - Associated Yard Piping (A9240)	Gate valve - 2"	0.0016	100.00	-90.77	0.23	37.54
2	4340	Residue Gas Suction Scrubber -	Threaded connection - 0.75"	0.0016	10.00	-5.12	0.23	3.75
3	1742	HHE Compressor Building - Comp HHE 7	Valve cover	0.0016	200.00	-195.12	0.19	75.12
3	1551	HP1 Bldg: E26-13 - Near B220-1 (NV seat).	Threaded connection - 0.25"	0.0016	10.00	-5.15	0.19	3.78
3	1578	HP2 Bldg: W36-14 - A232-1	Gate valve - 0.5"	0.0016	60.00	-50.83	0.19	22.67
3	1713	Medium Pressure Bldg - B241-1	Gate valve - 0.75"	0.0016	60.00	-50.83	0.19	22.67
3	1039	Mole Sieve 1 - On top platform	Tubing connection - 0.75"	0.0016	25.00	-15.92	0.19	9.54
2	4151	Compressor Unit 1 Outside -	Threaded connection - 0.5"	0.0016	10.00	-5.24	0.23	3.85
1	3472	Refrig Surge Tank - Sight glass (PV-25)	Gate valve - 0.75"	0.0016	60.00	-51.14	0.00	23.46
4	3640	Sales Gas Header -	Tubing connection - 0.375"	0.0016	15.00	-6.14	0.22	5.87
3	1502	Residue Gas/N2 Comp Bldg: Lower Level -	Gate valve - 0.75"	0.0016	60.00	-51.17	0.22	23.55
1	3276	DEA Contactor Pumps -	Threaded connection - 0.5"	0.0015	10.00	-5.36	0.22	3.95
2	4062	Surge Scrubber -	Gate valve - 0.75"	0.0015	60.00	-51.23	0.19	23.71
4	3671	Cryo System: Make Up - Needle valve seat	Tubing connection - 0.5"	0.0015	15.00	-6.28	0.00	5.96
3	1716	G10-805 - on B805-1	Threaded connection - 3"	0.0015	25.00	-20.42	0.22	10.01
3	1772	Stab 1 Building - (Top of Accumulator)	Gate valve - 0.75"	0.0015	60.00	-51.35	0.18	24.02
3	1890	Hg Removal Bed V8-401-3 - AS401N-19	Gate valve - 0.75"	0.0015	100.00	-51.35	0.18	24.03
3	1747	HHE Compressor Building - Associated Yard Piping (Near A308-6)	Gate valve - 2"	0.0015	60.00	-91.35	0.18	40.04
3	1388	Regen Gas Heater 4 - Near RKO-146	Gate valve - 0.5"	0.0015	60.00	-51.35	0.22	24.03
2	4095	Tower by D-208 -	Threaded connection - 0.5"	0.0015	10.00	-5.43	0.19	4.01
3	1157	NRU 1 - Top Platform - A2326N	Threaded connection - 0.75"	0.0015	10.00	-5.48	0.18	4.06
4	3696B	Cryo System: Chiller Outlet Separator Line - Stem packing	Gate valve - 0.75"	0.0015	60.00	-51.52	0.00	24.52
3	1646	IR Compressor Building - - Suction Header	Gate valve - 1.5"	0.0015	75.00	-66.69	0.17	31.28
1	3005	Inlet Comp Yard Piping - On 16" orifice meter	Rack	0.0015	75.00	-66.69	0.17	31.28
1	3336	Mole Sieve Tower 511C -	Control valve - globe - 2"	0.0015	130.00	-125.60	0.17	54.22
2	4203	Residue Compressors FG Scrubber -	Gate valve - 0.5"	0.0015	60.00	-51.70	0.21	25.04
4	4000	Mole Sieve Dehy: Coalescing Filter Separator -	Tubing connection - 0.375"	0.0014	15.00	-6.78	0.17	6.32
2	4240	Compressor Unit 7 - on valve cover	Open-ended line	0.0014	60.00	-55.70	0.21	25.60
3	1053	Mole Sieve Header - PDSL-2876N	Needle valve - 0.375"	0.0014	60.00	-51.95	0.17	25.83
4	3619A	Yard North of Office - Gate valve seat	Threaded connection - 0.5"	0.0014	10.00	-5.77	0.20	4.33
1	1984	Inlet Header -	Tubing connection - 0.375"	0.0014	15.00	-7.04	0.16	6.53
3	1374	Amine Bldg: Glycol-Gas Outlet Scrubber -	Gate valve - 0.75"	0.0014	60.00	-52.04	0.17	26.12
3	1027	Mole Sieve 2 - On top platform - Block valve below PRV.	Gate valve - 2"	0.0014	100.00	-92.07	0.17	43.69
2	4209	Compressor Unit 2 -	Gate valve - 0.5"	0.0014	60.00	-52.21	0.20	26.70

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
2	4205	Residue Compressors FG Scrubber -	Needle valve - 0.5"	0.0013	60.00	-52.36	0.19	27.21
1	3081	West Inlet Yard Piping - On 8" orifice meter	Gate valve - 0.5"	0.0013	60.00	-52.38	0.16	27.30
3	1548	Residue Gas/N2 Comp Bldg - Heat Pump 2	Gate valve - 0.75"	0.0013	60.00	-52.39	0.20	27.30
3	1688	Re-Compressor Building - Re-Comp 5 (Fuel Gas Line)	Threaded connection - 2"	0.0013	15.00	-11.03	0.19	6.93
4	3542	North Heat Medium Heater - Pilot stem	Gate valve - 0.5"	0.0013	60.00	-52.50	0.19	27.73
2	4335	Make-up Gas Suction Scrubber -	Threaded connection - 0.5"	0.0013	10.00	-6.03	0.19	4.62
3	1229	NGL Bullet 6 - LG3063NB	Gate valve - 0.5"	0.0013	60.00	-52.56	0.00	27.94
3	1097	Amine Bldg: V8-2806-1 - A2806N-10	Gate valve - 0.75"	0.0013	60.00	-52.64	0.15	28.27
3	1509	Residue Gas/N2 Comp Bldg: Lower Level	Gate valve - 3"	0.0013	120.00	-112.64	0.18	56.53
3	1478	Residue Gas/N2 Comp Bldg: Back Wall -	Gate valve - 10"	0.0013	500.00	-492.73	0.18	238.33
3	1905	Hg Removal Bed V8-401-3 - A401N-13	Gate valve - 0.75"	0.0013	200.00	-52.73	0.15	28.60
3	1423	Residue Gas/N2 Comp Bldg - Comp 2	Valve cover	0.0013	60.00	-196.15	0.18	95.34
3	1082	NRU 3 - LY480NB-3	Control valve - 4"	0.0013	177.00	-173.19	0.15	85.07
3	1648	IR Compressor Building - V8-324 (A324-3) - Suction Header	Gate valve - 1"	0.0013	75.00	-67.85	0.15	36.33
1	3421	Refrig Comp Unit 10 - Yard Piping -	Gate valve - 3"	0.0013	120.00	-112.87	0.00	58.30
3	1727	HHE Compressor Building - Comp HHE 7	Threaded connection - 0.5"	0.0012	10.00	-6.25	0.15	4.89
3	1596	HP2 Bldg: W31-06 - A238-1	Gate valve - 0.5"	0.0012	60.00	-52.96	0.15	29.54
1	3009	Inlet Comp Yard Piping -	Flange - 6"	0.0012	100.00	-96.28	0.14	49.23
4	3492	Inlet Header - Gate valve seat (Monahans)	Threaded connection - 2"	0.0012	15.00	-11.28	0.15	7.40
3	1628	IR Compressor Building - IR Comp 3	Valve cover	0.0012	200.00	-196.34	0.15	100.10
1	3034	Fuel Gas to Mansfield (222) - Gate valve seat	Threaded connection - 1"	0.0012	15.00	-11.34	0.14	7.51
3	1369	Regen Gas Heater 1: G10-2801-2 -	Threaded connection - 0.5"	0.0012	245.00	-6.34	0.17	5.01
3	1477	Residue Gas/N2 Comp Bldg: Back Wall -	Gate valve - 6"	0.0012	10.00	-238.08	0.17	122.63
2	4085	Meter bldg. -	Needle valve - 0.375"	0.0012	60.00	-53.08	0.15	30.03
4	3537	North Heat Medium Heater - Pilot	Gate valve - 0.5"	0.0012	60.00	-53.08	0.18	30.04
4	3519	South Heat Medium Heater - Pilot	Gate valve - 0.5"	0.0012	60.00	-53.08	0.18	30.04
3	1575	HP2 Bldg: W29-04 - Along Back Wall (Inlet)	Gate valve - 0.75"	0.0012	60.00	-53.31	0.14	31.07
3	1220	NGL Pump 3 - A1202N-9	Gate valve - 1"	0.0011	75.00	-68.54	0.00	40.22
4	3941A	Re-Compression: Unit 2 - FG Line 4	Threaded connection - 2"	0.0011	15.00	-11.58	0.16	8.05
3	1904	Hg Removal Bed V8-401-3 - on N401N-3	Tubing connection - 0.25"	0.0011	150.00	-8.65	0.13	8.19
3	1444	Residue Gas/N2 Comp Bldg: Lower Level -	Flange - 12"	0.0011	15.00	-146.64	0.16	81.90
2	4252	Compressor Unit 4 - VVP Stem	Variable volume pocket stem	0.0011	400.00	-398.27	0.16	218.45
2	4073	Sales Piping - on 4" orifice meter	Slide valve	0.0011	75.00	-68.68	0.16	41.14
1	1993	Inlet Header -	Tubing connection - 0.375"	0.0011	15.00	-8.71	0.13	8.26
3	1176	NRU 1 - Near G412N-5	Gate valve - 0.75"	0.0011	60.00	-53.80	0.13	33.53
3	1569	HP2 Bldg: W31-08 - A226-1	Gate valve - 0.5"	0.0011	60.00	-53.94	0.13	34.32
2	4296	Residue Gas Suction Line -	Needle valve - 0.5"	0.0011	60.00	-53.94	0.15	34.32
3	1361	Amine Bldg: V8-2701 - A2705N-1	Gate valve - 0.5"	0.0010	60.00	-54.12	0.12	35.33
3	1044	Mole Sieve 3 - A2811N-22	Gate valve - 0.75"	0.0010	60.00	-54.20	0.12	35.86
3	1832	Co-Gen Building: Outside (CA 625 - HP FG Scrubber) - VG-151	Gate valve - 0.5"	0.0010	353.00	-54.23	0.14	36.04
3	1487	Residue Gas/N2 Comp Bldg: Lower Level	Control valve - globe - 8"	0.0010	60.00	-349.95	0.15	212.02
3	1129	NRU 2 - G494N-1	Open-ended line - 0.75"	0.0010	60.00	-56.95	0.12	36.04

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
2	4148	Compressor Unit 4 Outside -	Threaded connection - 2"	0.0010	15.00	-11.95	0.15	9.01
4	3827E	Re-Compression: Yard Piping - on 4" plug valve	Grease nipple	0.0010	50.00	-44.37	0.14	30.76
4	3658	Mole Sieve Dehy: Regen Fan/Blower -	Flange - 3"	0.0010	75.00	-72.05	0.14	46.65
3	1594	HP2 Bldg: W36-16 - A233-9 (Past GTV Seat)	Threaded connection - 0.75"	0.0010	10.00	-7.07	0.12	6.26
1	3073	Fuel Gas Scrubber (West Yard) - PV-9	Threaded connection - 1"	0.0010	15.00	-12.07	0.14	9.38
3	1422	Residue Gas/N2 Comp Bldg - Comp 2	Cylinder end - flange	0.0010	400.00	-398.49	0.14	250.28
3	1213	NGL Pump 5 - A1202N-9/TB0656	Gate valve - 4"	0.0010	190.00	-184.52	0.00	120.12
3	1906	Hg Removal Bed V8-401-2 - plug on A401N-11 (GTV seat)	Threaded connection - 0.5"	0.0009	10.00	-7.16	0.11	6.46
3	1593	HP2 Bldg: W29-12 - B236-5 (Upper Platform)	Orbit valve - 4"	0.0009	190.00	-184.69	0.11	124.04
1	3292	High Pressure JT Expander -	Threaded connection - 0.5"	0.0009	10.00	-7.25	0.13	6.67
3	1681	Re-Compressor Building - Re-Comp 3	Threaded connection - 0.5"	0.0009	10.00	-7.25	0.11	6.67
3	1663	Re-Compressor Building - Re-Comp 2 (Fuel Gas Line)	Threaded connection - 2"	0.0009	15.00	-12.25	0.13	10.01
3	1503	Residue Gas/N2 Comp Bldg: Lower Level -	Gate valve - 0.75"	0.0009	60.00	-54.92	0.13	40.95
3	1049	Mole Sieve 5 - A2811N-65	Threaded connection - 0.75"	0.0009	10.00	-7.33	0.11	6.87
4	3601	Yard North of Office - Gate valve seat	Open-ended line - 0.75"	0.0009	60.00	-57.34	0.13	41.35
3	1753	Stab 1 Building - A612-60 (West Wall)	Gate valve - 0.75"	0.0009	60.00	-55.04	0.00	41.90
3	1574	HP2 Bldg: W30-16 - Along Back Wall (Inlet)	Gate valve - 0.75"	0.0009	60.00	-55.15	0.10	42.90
4	3745	Cryo System: Absorber Tower (20.001) - First platform	Gate valve - 2"	0.0009	100.00	-95.15	0.00	71.51
4	3728	Cryo System: Exchanger -	Gate valve - 6"	0.0009	245.00	-240.15	0.00	175.22
3	1443	Residue Gas/N2 Comp Bldg - Heat Pump 1	Gate valve - 0.75"	0.0009	60.00	-55.15	0.13	42.91
2	4306	Compressor Unit # 1 -	Variable volume pocket stem	0.0008	400.00	-398.68	0.00	286.94
3	1777	Stab 1 Building - A614-4 (Top of Accumulator)	Gate valve - 1.5"	0.0008	75.00	-70.21	0.10	54.27
3	1613	IR Compressor Building - IR Comp 1	Threaded connection - 0.5"	0.0008	10.00	-7.56	0.10	7.51
3	1745	HHE Compressor Building - Comp HHE 7	Valve cover	0.0008	200.00	-197.56	0.10	150.15
3	1010	Mole Sieve Header - XY2826N0	Flange - 8"	0.0008	100.00	-97.56	0.10	75.09
2	4139H	Resid gas cooler E507 - cooler plugs	Threaded connection - 1"	0.0008	15.00	-12.56	0.12	11.26
2	4166C	Resid gas cooler E507 - cooler plugs	Threaded connection - 1"	0.0008	15.00	-12.56	0.12	11.26
3	1705	Medium Pressure Bldg - PCV-242	Threaded connection - 1"	0.0008	15.00	-12.59	0.11	11.40
3	1372	Amine Bldg: V8-2810N - A2810N-3	Gate valve - 1.5"	0.0008	75.00	-70.50	0.09	57.75
3	1201	NRU Expander 3 - Near TB-0181	Union - 0.75"	0.0008	50.00	-47.65	0.09	39.00
3	1371	Amine Bldg: V8-2810N - A2810N-2	Gate valve - 1.5"	0.0008	75.00	-70.67	0.09	60.06
2	4166A	Resid gas cooler E507 - cooler plugs	Threaded connection - 1"	0.0008	15.00	-12.71	0.11	12.02
3	1522	Residue Gas/N2 Comp Bldg - Heat Pump 2	Gate valve - 0.5"	0.0007	60.00	-55.73	0.11	48.70
3	1807	Fuel Gas Scrubber (V8-1720) - Near FE1720	Gate valve - 0.5"	0.0007	60.00	-55.96	0.10	51.48
1	3324	Mole Sieve Tower 511B - Gate valve seat	Threaded connection - 0.75"	0.0007	10.00	-7.86	0.08	8.58
4	3498	Inlet Header - North	Tubing connection - 0.375"	0.0007	15.00	-10.96	0.09	12.87

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
4	3811	Re-Compression: Yard Piping -	Ball valve - 4"	0.0007	190.00	-185.96	0.10	163.09
1	3008	Inlet Comp Yard Piping - Gate valve seat	Open-ended line - 0.5"	0.0007	60.00	-57.99	0.08	54.60
4	3733	Cryo System: Dust Filter (20.002) - Gate valve seat	Open-ended line - 1"	0.0007	75.00	-73.01	0.00	69.21
3	1389	Regen Gas Heater 4 - Near RKJ-146	Tubing connection - 0.375"	0.0007	15.00	-11.25	0.09	13.86
3	1744	HHE Compressor Building - Comp HHE 7	Valve cover	0.0006	200.00	-198.05	0.08	187.70
4	3732	Cryo System: Exchanger - Off orifice meter	Gate valve - 0.5"	0.0006	60.00	-56.37	0.00	57.22
3	1806	Fuel Gas Scrubber (V8-1720) -	Gate valve - 0.5"	0.0006	60.00	-56.48	0.09	59.07
3	1847	Co-Gen Building: Fuel Gas Scrubber (SW Corner of Bldg) -	Gate valve - 0.75"	0.0006	60.00	-56.48	0.07	59.08
3	1054	Mole Sieve Header - PDISH2864N	Needle valve - 0.375"	0.0006	60.00	-56.54	0.07	60.06
3	1710	Re-Compressor Building - Associated Yard Piping (A9239)	Gate valve - 2"	0.0006	100.00	-96.54	0.09	100.11
1	3092	West Inlet Yard Piping - To PV-28	Gate valve - 0.75"	0.0006	60.00	-56.54	0.07	60.06
4	3527	South Heat Medium Heater - Pilot	Union - 0.5"	0.0006	50.00	-48.17	0.09	50.06
2	4089	Meter bldg. -	Tubing connection - 0.375"	0.0006	15.00	-11.54	0.07	15.02
2	4166B	Resid gas cooler E507 - cooler plugs	Threaded connection - 1"	0.0006	15.00	-13.17	0.09	15.02
4	3737	Cryo System: Absorber Bottoms Pumps - Gate valve seat	Open-ended line - 0.75"	0.0006	60.00	-58.17	0.00	60.22
3	1559	Residue Gas/N2 Comp Bldg - Heat Pump 3	Gate valve - 0.75"	0.0006	60.00	-56.60	0.09	61.08
3	1538	Residue Gas/N2 Comp Bldg - Heat Pump 3	Valve cover	0.0006	200.00	-198.27	0.00	212.56
3	1805	Fuel Gas Scrubber (V8-1720) - Blowdown on FE1720	Needle valve - 0.5"	0.0006	60.00	-56.77	0.08	64.35
4	3505	Regen Heater -	Threaded connection - 1"	0.0006	15.00	-13.29	0.08	16.09
3	1479	Residue Gas/N2 Comp Bldg: Back Wall -	Gate valve - 10"	0.0006	500.00	-496.77	0.08	536.28
4	3679	Cryo System: To JT Valve -	Control valve - 4"	0.0006	177.00	-175.29	0.00	189.90
3	1824	G-10-625-2 - A1720-12 (East Reboiler)	Threaded connection - 1"	0.0006	15.00	-13.31	0.08	16.24
1	3057	Mansfield Discharge - On 8" gate valve	Threaded connection - 0.5"	0.0006	10.00	-8.32	0.07	10.92
3	1738	HHE Compressor Building - Comp HHE 8	Threaded connection - 0.5"	0.0005	15.00	-8.35	0.07	11.12
3	1606	IR Compressor Building - IR Comp 2 (Fuel Gas)	Threaded connection - 2"	0.0005	10.00	-13.35	0.08	16.68
3	1011	Mole Sieve Header - ROV2819N	Orbit valve - 10"	0.0005	500.00	-497.00	0.06	577.54
1	3089	West Inlet Yard Piping - To PV-28	Gate valve - 1"	0.0005	75.00	-72.00	0.06	86.63
3	1549	HP1 Bldg: E28-12 -	Threaded connection - 0.75"	0.0005	10.00	-8.47	0.06	12.01
3	1041	Mole Sieve 3 - A2811N-35	Gate valve - 0.75"	0.0005	60.00	-57.14	0.06	72.81
1	1963	Inlet Comp Yard Piping -	Gate valve - 0.75"	0.0005	60.00	-57.23	0.06	75.07
4	3889	Refrigeration Compression: Outside Yard Piping - Orifice meter to Unit 3	Gate valve - 0.5"	0.0005	60.00	-57.27	0.07	76.28
3	1572	HP2 Bldg: W29-12 - G238-2 (Inlet Line)	Gate valve - 0.75"	0.0005	60.00	-57.35	0.06	78.34
3	1061	Mole Sieve Header - PDSL-2863N	Needle valve - 0.375"	0.0004	60.00	-57.46	0.05	81.91
3	1567	HP2 Bldg: W20-08 - Near N228-19	Gate valve - 1"	0.0004	75.00	-72.46	0.05	102.38
1	3025	Fuel Gas Scrubber (West Yard) - PV-9	Threaded connection - 0.75"	0.0004	10.00	-8.72	0.06	14.30
3	1620	IR Compressor Building - IR Comp 1 (Start Gas) B342-1	Ball valve - 2"	0.0004	100.00	-97.58	0.06	143.01
4	3612	Yard North of Office - Gate valve seat	Open-ended line - 0.75"	0.0004	60.00	-58.72	0.06	85.82
4	3620	Yard North of Office -	Gate valve - 2"	0.0004	100.00	-97.58	0.06	143.03
3	1583	HP1 Bldg: E28-06 - N211-4 (NV seat).	Threaded connection - 0.25"	0.0004	10.00	-8.73	0.05	14.47

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1733	HHE Compressor Building - Comp HHE 8	Threaded connection - 0.5"	0.0004	60.00	-8.78	0.05	15.01
3	1571	HP2 Bldg: W01-02 - G225-2 (Inlet Line)	Gate valve - 0.75"	0.0004	10.00	-57.69	0.05	90.09
1	1960	Inlet Comp Yard Piping -	Gate valve - 0.5"	0.0004	60.00	-57.92	0.04	100.10
4	3953	Refrigeration Compressors: Unit 3 -	Variable volume pocket stem	0.0004	400.00	-399.45	0.00	683.23
4	3727	Cryo System: Exchanger -	Control valve - globe - 6"	0.0003	282.00	-280.97	0.00	504.31
3	1508	Residue Gas/N2 Comp Bldg: Lower Level - Near A301N-35	Gate valve - 0.75"	0.0003	60.00	-58.21	0.04	116.24
3	1377	Amine Bldg: V8-1653N - Near A1653N-3	Flange - 4"	0.0003	75.00	-74.05	0.04	145.30
3	1568	HP2 Bldg: W20-08 - G228-2 (Inlet Line)	Gate valve - 0.75"	0.0003	60.00	-58.27	0.04	120.12
2	4312	Compressor Unit # 1 -	Valve cover	0.0003	200.00	-199.08	0.04	400.51
4	3573	Mole Sieve Dehy: Dehy Tower A - Green Gas	Control valve - orbit - 8"	0.0003	353.00	-352.15	0.03	757.27
4	3752	Sales Gas Header - Needle valve seat	Open-ended line - 0.25"	0.0003	60.00	-59.15	0.04	128.77
3	1523	Residue Gas/N2 Comp Bldg - Heat Pump 2	Gate valve - 0.5"	0.0003	60.00	-58.44	0.04	133.48
4	3661	Cryo System: Warm Gas Exchanger -	Gate valve - 10"	0.0003	500.00	-498.55	0.00	1192.
1	3152	Yard between inlet compressors and fractionation plant. - 224 - 4" Block valve - Chevron to train rack	Grease nipple - 4"	0.0003	50.00	-48.56	0.03	120.12
3	1740	HHE Compressor Building - Comp HHE 8	Valve cover	0.0002	200.00	-199.30	0.03	522.25
1	3076	West Inlet Yard Piping - On 6" orifice meter	Grease nipple	0.0002	50.00	-48.73	0.03	136.50
3	1521	Residue Gas/N2 Comp Bldg - Heat Pump 2	Threaded connection - 0.5"	0.0002	10.00	-9.36	0.03	28.60
1	3091	West Inlet Yard Piping - To PV-28 (ball valve)	Threaded connection - 2"	0.0002	15.00	-14.36	0.02	42.90
1	3083	West Inlet Yard Piping - On 8" orifice meter	Orifice meter plate - 8"	0.0002	150.00	-149.67	0.02	428.99
1	3144	Yard between inlet compressors and fractionation plant. -	Needle valve - 0.5"	0.0002	60.00	-58.85	0.02	180.18
4	3960	Refrigeration Compressors: Unit 3 - By injector	Valve - 1"	0.0002	75.00	-73.99	0.03	257.44
3	1476	Residue Gas/N2 Comp Bldg: Back Wall -	Gate valve - 10"	0.0002	500.00	-499.00	0.02	1735.
3	1570	HP2 Bldg: W31-08 - (Past NV Seat)	Gate valve - 0.375"	0.0002	60.00	-59.54	0.02	240.
4	3682	Cryo System: Expander Feed Separator - LV-118	Control valve - 2"	0.0001	130.00	-129.57	0.00	557.81
3	1376	Amine Bldg: Near Glycol-Gas Outlet Scrubber - FV-2803N	Tubing connection - 0.375"	0.0000	15.00	-14.75	0.01	204.77
4	3955	Refrigeration Compression: Unit 1 -	Valve cover	0.0000	200.00	-200.00	---	NA
4	3506	Air -	Gate valve - 0.75"	0.0000	60.00	-60.00	---	NA
4	3827A	Re-Compression: Yard Piping - on 4" plug valve	Grease nipple	0.0000	50.00	-50.00	---	NA
4	3827B	Re-Compression: Yard Piping - on 4" plug valve	Grease nipple	0.0000	50.00	-50.00	---	NA
3	1004	Mole Sieve 4 - On top platform	Gate valve - 0.75"	0.0000	60.00	-60.00	---	NA
3	1025	Mole Sieve 1 - On top platform	Tubing connection - 0.75"	0.0000	25.00	-25.00	---	NA
3	1021	Mole Sieve Header - A2811N56	Gate valve - 0.75"	0.0000	60.00	-60.00	---	NA
3	1013	Mole Sieve Header - XY2821NC	Orbit valve - 8"	0.0000	350.00	-350.00	---	NA
3	1020	Mole Sieve Header - A2811N72	Gate valve - 0.75"	0.0000	60.00	-60.00	---	NA
3	1109	NRU 3 - Hot Box - Near A483N-6 on cross-over to cold box.	Control valve	0.0000	177.00	-177.00	---	NA
3	1165	NRU 1 - Base of Cold Box - Valve 308	Control valve - 10"	0.0000	459.00	-459.00	---	NA
3	1453	Residue Gas/N2 Comp Bldg - Comp 3 (Throw 1)	Valve cover	0.0000	200.00	-200.00	---	NA
3	1441	Residue Gas/N2 Comp Bldg - Heat Pump 1	AIR	0.0000	NE	---	---	NA

Table I-1. Measured THC emissions rates, sorted by emission rate, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1485	Residue Gas/N2 Comp Bldg: Lower Level - ZSCA42N-1	AIR	0.0000	NE	---	---	NA
3	1552	HP1 Bldg: E28-12 - Fixed before Hi-Flow measurement performed.	Open-ended line - 0.375"	0.0000	60.00	-60.00	---	NA
3	1581	HP1 Bldg: E26-15 - Near N201-9 (NV seat).	Threaded connection - 0.25"	0.0000	10.00	-10.00	---	NA
3	1488	Residue Gas/N2 Comp Bldg: Lower Level - Actuator ZSC451N-3	Vent - 0.375"	0.0000	NE	---	---	NA
3	1489	Residue Gas/N2 Comp Bldg: Lower Level - Actuator ZSC451N-4	Vent - 0.375"	0.0000	NE	---	---	NA
2	4051	Inlet Scrubber - on 10" plug valve	Grease nipple	0.0000	50.00	-50.00	---	NA
2	4066	HP Inlet EDS -	AIR	0.0000	NE	---	---	NA
2	4290	Compressor Yard - FIXED	Pressure relief valve	0.0000	600.00	-600.00	---	NA
2	4195	Compressor Unit 2 -	Injector - 1"	0.0000	200.00	-200.00	---	NA
2	4090	Meter bldg. - needle valve seat	Open-ended line - 0.375"	0.0000	60.00	-60.00	---	NA
2	4178	Cryo skid 101 -	Control valve - 8"	0.0000	353.00	-353.00	---	NA
2	4287	Compressor yard Unit # 6 -	Control valve - orbit - 4"	0.0000	177.00	-177.00	---	NA
2	4301	Compressor Unit # 1 -	Open-ended line - 0.5"	0.0000	60.00	-60.00	---	NA
2	4329	Compressor Unit # 2 - stem packing	Orbit valve - 4"	0.0000	190.00	-190.00	---	NA
2	4338	Compressor Yard -	Plug valve - 2"	0.0000	120.00	-120.00	---	NA
1	3321	Regen Gas Compressors/Blowers -	Open-ended line - 1"	0.0000	75.00	-75.00	---	NA
1	3132	Compressor CM-13 -	VOID	0.0000	NE	---	---	NA

1 The presented costs do not account for the expense of finding and evaluating these reduction opportunities and therefore are potentially low.

NE Repair costs were not estimated for this component.

NA The payout period could not be calculated because the component emission rate was below the minimum measurable value of the HiFlow™ Sampler or repair costs were not estimated.

---- The net present value of could not be calculated because repair costs were not estimated for this component, or the CO_2E emissions could not be calculated.

Appendix II

Measured THC Emission Rates Sorted by Payout Period

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	Direct	400 bbl Oil/H2O Separator -	Thief hatch	160.983	NE	---	807.58	Repaired
4	3809	Re-compressors -	Threaded connection - 0.5"	9.540	10.00	28723.87	1379.28	0.001
4	3809B	Re-Compression: Yard Piping - Base of valve	Threaded connection - 0.5"	4.076	10.00	12268.08	589.37	0.001
3	1861	Residue Gas/N2 Comp Bldg: Heat Pump 4	Threaded connection - 0.5"	2.756	10.00	8291.19	405.46	0.002
1	3129	Compressor CM-14 - Damaged/cracked line	Tubing connection - 0.375"	3.718	15.00	21148.27	433.83	0.002
4	3876	Generators -	Threaded connection - 2"	2.275	15.00	6838.13	328.96	0.004
1	3481	Expander Skid - Off orifice meter	Tubing connection - 0.5"	1.713	15.00	9738.83	246.69	0.01
1	3457	Refrig Comp Unit 12 -	Threaded connection - 0.5"	1.117	10.00	3354.77	0.00	0.01
4	3910C	Re-Compression: Unit 3 - FG Line 6	Union - 2"	11.100	100.00	33334.19	1604.91	0.01
4	3779	Central Yard - Between C3 Compressors and Gen Building	Open-ended line - 0.75"	6.355	60.00	19081.87	918.85	0.01
3	1492	Residue Gas/N2 Comp Bldg - Comp 4 (Throw 5)	Threaded connection - 0.5"	0.895	10.00	2686.69	127.25	0.01
3	1322	Propane Yard: V8-410-3 - TI411N	Threaded connection - 0.5"	0.827	10.00	2479.76	0.16	0.01
3	1862	Residue Gas/N2 Comp Bldg -	Threaded connection - 0.5"	0.742	10.00	2225.61	109.19	0.01
3	1553	HP1 Bldg: E35-04 - To drain.	Open-ended line - 0.375"	4.451	60.00	13346.18	532.98	0.01
4	3872	Re-Compression: Yard Piping -	Gate valve - 0.75"	4.319	60.00	24526.40	624.44	0.01
3	1039	Mole Sieve 4 - A2811N-52	Threaded connection - 0.75"	0.700	10.00	2097.38	83.78	0.01
1	3012	Inlet Comp Yard Piping -	Threaded connection - 1.5"	0.981	15.00	2938.51	114.43	0.01
3	1088	Amine Bldg (V2806-2) - Plug on A2806N-4 (under vessel)	Threaded connection - 1"	0.974	15.00	2917.38	116.58	0.01
4	3782	Re-Compression: Piping Adjacent to Clark	Threaded connection - 0.5"	0.616	10.00	1846.11	89.10	0.01
4	3913B	Re-Compression: Unit 3 - FG Line 5	Union - 2"	6.038	100.00	18087.77	873.05	0.01
1	3205	Solar Turbines: Unit B - Fuel gas filter piping	Threaded connection - 0.75"	0.588	10.00	1760.07	84.61	0.01
2	4221	Compressor Unit # 9 -	Flange - 2"	2.906	50.00	8703.53	418.93	0.01
4	3824	Re-compressors - Leak from bottom of valve.	Plug valve - 4"	11.544	200.00	65513.56	1668.99	0.01
4	3913A	Re-Compression: Unit 3 - FG Line 5	Threaded connection - 2"	0.863	15.00	2583.47	124.73	0.01
3	1645	IR Compressor Building - IR Comp 3 (Start Gas)	Threaded connection - 2"	0.814	15.00	2436.19	115.67	0.01
4	3559	TEG Still - Stem at burners.	Needle valve - 0.5"	3.245	60.00	18411.47	469.14	0.01
4	3874	Re-Compression: Yard Piping -	Gate valve - 0.75"	3.076	60.00	17453.32	444.80	0.01
3	1894	Hg Removal Bed V8-401-2 - A401N-21 plug on GTV (seat leak)	Threaded connection - 0.75"	0.489	10.00	1463.13	58.57	0.01
4	3787	Re-Compression: Clark Discharge Cooler -	Gate valve - 0.75"	2.817	60.00	15978.18	407.34	0.01
4	3748	Cryo System: Absorber Tower (20.001) - Top patform	Threaded connection - 0.5"	0.678	15.00	3842.53	1.58	0.01
1	3458	Refrig Comp Unit 12 -	Open-ended line - 1"	3.283	75.00	9813.67	0.00	0.01

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1115	NRU 3 - Base of Cold Box - Near TB-0472	Threaded connection - 0.5"	0.433	10.00	1294.58	51.87	0.01
2	Direct	Compressor Unit # 3 -	Compressor seals vent - 2"	86.122	2000.00	131477.59	12218.29	0.01
3	1543	Residue Gas/N2 Comp Bldg - Heat Pump 3	Threaded connection - 0.5"	0.428	10.00	1279.55	0.08	0.01
4	3916A	Re-Compression: Unit 3 - FG Line 3	Threaded connection - 2"	0.632	15.00	1887.37	91.32	0.01
4	3621	Flare Line - Valve stem leak	Plug valve - 4"	8.302	200.00	47058.94	968.81	0.01
1	3476	EB Skid to Chevron -	Threaded connection - 1"	0.604	15.00	1804.03	1.06	0.02
4	3651	Mole Sieve Dehy: Regen Fan/Blower - Gate valve seat	Open-ended line - 0.75"	2.402	60.00	7175.40	347.31	0.02
1	3027	Fuel Gas to Mansfield (222) -	Tubing connection - 0.375"	0.599	15.00	3392.23	69.85	0.02
4	3603	Yard North of Office - Orifice meter rack	Valve - 1"	2.966	75.00	16806.98	428.77	0.02
3	1446	Residue Gas/N2 Comp Bldg: Lower Level - B301N-1	Threaded connection - 1"	0.592	15.00	1768.93	84.18	0.02
3	1669	IR Compressor Building - IR Comp 2	Threaded connection - 0.5"	0.380	10.00	1135.96	45.56	0.02
1	3208	Solar Turbines: Unit B - On orifice meter	Threaded connection - 0.5"	0.373	10.00	1112.57	53.66	0.02
4	3508	Regen Heater -	Threaded connection - 0.5"	0.370	10.00	1105.11	53.53	0.02
2	4305	Compressor Unit # 1 -	Valve cover	7.318	200.00	21842.90	1054.94	0.02
3	1345B	Propane Yard: V8-411 - A411N-3	Threaded connection - 1"	0.546	15.00	1630.51	0.10	0.02
4	3944A	Re-Compression: Unit 2 - FG Line 2	Threaded connection - 2"	0.532	15.00	1586.00	76.85	0.02
2	4169	Cryo skid north - Note: was fixed already on expander	Threaded connection - 0.5"	0.354	10.00	1056.11	43.29	0.02
4	3920	Re-Compression: Unit 5 - Stem packing	Governor - 3"	7.046	200.00	39912.49	1018.77	0.02
3	1333	Propane Yard: V8-410-3 - B410N-6	Threaded connection - 2"	0.508	15.00	1515.32	0.10	0.02
3	1858	Residue Gas/N2 Comp Bldg: Heat Pump 4 -	Threaded connection - 0.5"	0.333	10.00	994.43	49.06	0.02
1	3450	Refrig Comp Unit 12 -	Open-ended line - 1"	2.467	75.00	7355.17	0.00	0.02
4	3848	Re-Compression: Yard Piping -	Gate valve - 0.75"	1.951	60.00	11045.34	282.05	0.02
4	3488	Inlet Yard Piping: Pig Traps - Plug valve seat	Open-ended line - 2"	3.174	100.00	9459.32	385.16	0.02
1	3209	Solar Turbines: Header Outside - Needle valve seat	Threaded connection - 0.5"	0.312	10.00	928.27	44.85	0.02
4	3970	Refrigeration Compressors: Unit 2 -	Flange - 0.75"	0.764	25.00	2276.22	110.46	0.02
4	3938A	Re-Compression: Unit 4 - FG Line 1	Threaded connection - 2"	0.445	15.00	1325.16	64.33	0.02
3	1323	Propane Yard: V8-411 - A411N-2	Gate valve - 4"	5.501	190.00	31124.61	1.05	0.02
2	4111	After Filter - 3 tubing connections	Tubing connection - 0.375"	0.430	15.00	2432.75	52.59	0.02
1	3296	High Pressure JT Expander -	Threaded connection - 0.75"	0.285	10.00	847.45	40.99	0.02
3	1184	NRU 1 - Top Platform - G2302N	Threaded connection - 0.5"	0.277	10.00	825.70	33.22	0.02
3	1734	HHE Compressor Building - Comp HHE 8	Threaded connection - 0.5"	0.275	10.00	819.79	32.99	0.02
1	3062	HP Cooler -	Threaded connection - 0.75"	0.268	10.00	796.53	31.25	0.02
4	3842	Re-Compression: Yard Piping -	Gate valve - 2"	2.650	100.00	14984.50	383.11	0.02
1	3048	Scrubber (PV-517) - On level controller	Threaded connection - 1"	0.396	15.00	1178.98	46.26	0.02

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
2	4132	Mole Sieve Tower C -	Threaded connection - 0.5"	0.257	10.00	763.29	31.40	0.02
2	4268	Compressor Unit # 5 -	Threaded connection - 0.375"	0.256	10.00	761.44	36.92	0.02
1	1948	Inlet Header -	Threaded connection - 0.375"	0.253	10.00	750.99	29.48	0.02
2	4277	Compressor Unit # 7 - stem packing	Governor - 2"	4.909	200.00	27747.81	707.70	0.02
4	3850	Re-Compression: Yard Piping -	Gate valve - 0.75"	1.439	60.00	8130.26	208.02	0.03
4	3915A	Re-Compression: Unit 5 - FG Line 4	Threaded connection - 2"	0.352	15.00	1045.95	50.93	0.03
4	3676	Cryo System: Turbo Expander -	Threaded connection - 0.75"	0.234	10.00	695.26	33.85	0.03
4	3510	Regen Heater -	Threaded connection - 0.5"	0.233	10.00	691.96	33.70	0.03
1	3004	Inlet Comp Yard Piping -	Threaded connection - 0.5"	0.231	10.00	685.38	26.94	0.03
3	1133	NRU 3 - Top Platform - G2323N	Gate valve - 3"	2.683	120.00	15153.78	321.29	0.03
1	3374	Fuel Gas Scrubber (PV-15) -	Threaded connection - 1"	0.334	15.00	992.43	48.16	0.03
4	3933A	Re-Compression: Unit 4 - FG Line 6	Threaded connection - 2"	0.328	15.00	972.46	47.40	0.03
3	1197	NRU Expander 1 -	Flange - 10"	3.275	150.00	9713.58	392.14	0.03
4	3911A	Re-Compression: Unit 4 - FG Line 6	Plug valve - 2"	2.563	120.00	14469.05	370.53	0.03
4	3946B	Re-Compression: Unit 1 - FG Line 5	Union - 2"	2.134	100.00	6326.63	308.49	0.03
4	3937A	Re-Compression: Unit 4 - FG Line 2	Threaded connection - 2"	0.310	15.00	918.03	44.79	0.03
3	1730	HHE Compressor Building - Comp HHE 7	Threaded connection - 0.5"	0.205	10.00	606.21	24.50	0.03
4	3934A	Re-Compression: Unit 4 - FG Line 5	Threaded connection - 2"	0.296	15.00	875.39	42.74	0.03
2	4188	Cryp 101 top of exchanger E401 -	Flange - 6"	1.955	100.00	5787.94	281.79	0.03
2	3994	SCW Inlet Line - ball valve seat	Open-ended line - 2"	1.928	100.00	5707.67	235.82	0.03
2	4046	Mole Sieve Tower B -	Control valve - orbit - 8"	6.799	353.00	20124.05	831.47	0.03
3	1675	Re-Compressor Building - Re-Comp 5 (Fuel Gas Line) (Threads on Both Sides)	Union - 2"	1.913	100.00	5661.87	271.89	0.03
2	4224	Compressor Unit # 9 -	Governor - 2"	3.728	200.00	21023.88	537.43	0.03
3	1520	Residue Gas/N2 Comp Bldg - Comp 1 (Throw 4)	Open-ended line - 0.5"	1.116	60.00	3300.94	158.60	0.03
1	3317	Regen Gas Compressors/Blowers -	Threaded connection - 0.75"	0.183	10.00	542.22	21.39	0.03
3	1867	Residue Gas/N2 Comp Bldg: Res Comp 3 -	Threaded connection - 0.5"	0.183	10.00	541.21	26.01	0.03
1	3413	Mole Sieve Tower 511B (Top) -	Flange - 18"	3.560	200.00	10523.11	415.45	0.03
1	3042	Scrubber (PV-517) -	Gate valve - 1.5"	1.326	75.00	7474.18	154.75	0.03
2	4319	Compressor Unit # 1 -	Flange - 1"	0.882	50.00	2607.00	127.16	0.03
4	---	Mole Sieve Dehy: Dehy Train A - Instrument bleed	Pressure transmitter - 1"	1.319	75.00	3896.34	153.87	0.03
2	4267	Compressor Unit # 5 -	Threaded connection - 1.5"	0.259	15.00	763.75	37.27	0.04
4	3908	Re-Compression: Unit 2 - Stem packing	Governor - 3"	3.380	200.00	19041.81	488.70	0.04
4	3921A	Re-Compression: Unit 3 - FG Line 1	Threaded connection - 2"	0.253	15.00	746.61	36.56	0.04
2	4299	Compressor Yard - Suction/Discharge Piping -	Orbit valve - 3"	2.021	120.00	11387.29	291.39	0.04
2	4233	Compressor Unit 8 -	Valve cover	3.318	200.00	9795.00	478.35	0.04
4	3672	Cryo System: Turbo Expander - Gate valve seat	Open-ended line - 1"	1.238	75.00	3653.63	2.88	0.04
4	3846	Re-Compression: Yard Piping -	Gate valve - 0.75"	0.985	60.00	5549.14	142.46	0.04

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
4	3618	Yard North of Office -	Threaded connection - 0.75"	0.164	10.00	482.90	23.66	0.04
3	1382	Amine Bldg: G8-1650 - Below A1650N-4	Threaded connection - 0.75"	0.163	10.00	480.26	19.49	0.04
3	1187	NRU 3 - Top Platform - G2357N	Threaded connection - 0.375"	0.162	10.00	477.58	19.38	0.04
4	3838	Re-Compression: Yard Piping -	Gate valve - 2"	1.590	100.00	8950.12	229.85	0.04
1	3352	Low Pressure JT Expander -	Control valve - 8"	5.570	353.00	16424.59	801.97	0.04
4	3924	Re-Compression: Unit 3 -	Gate valve - 0.75"	0.921	60.00	5183.22	133.17	0.04
4	---	Mole Sieve Dehy: Dehy Train B - Instrument bleed	Pressure transmitter - 1"	1.130	75.00	3327.06	131.81	0.04
2	4248	Compressor Unit 3 -	Flange - 1"	0.736	50.00	2167.99	106.15	0.04
3	1419	Residue Gas/N2 Comp Bldg - Comp 2	Valve cover	2.926	200.00	8614.23	415.93	0.04
3	1802	Fuel Gas Scrubber (V8-1720) - On Sight Glass	Gate valve - 0.75"	0.873	60.00	4912.07	124.14	0.04
1	3051	Scrubber (PV-517) -	Gate valve - 0.5"	0.870	60.00	4891.35	101.50	0.04
1	3013	Inlet Comp Yard Piping - Gate valve seat	Threaded connection - 0.75"	0.141	10.00	415.00	16.47	0.04
2	4266	Compressor Unit # 5 -	Threaded connection - 0.375"	0.140	10.00	412.81	20.24	0.04
4	3804	Re-Compression: Yard Piping - Gate valve seat	Open-ended line - 1"	1.027	75.00	3019.18	148.53	0.04
2	4004B	Mole Sieve Tower D -	Threaded connection - 1"	0.204	15.00	600.13	24.98	0.04
1	3193	Solar Turbines: Unit A - Fuel gas scrubber piping	Threaded connection - 0.5"	0.134	10.00	393.75	19.30	0.05
4	3557	TEG Still - Located down low.	Threaded connection - 1"	0.201	15.00	589.16	29.00	0.05
4	3831	Re-Compression: Yard Piping -	Gate valve - 0.5"	0.793	60.00	4454.75	114.67	0.05
1	3016	Inlet Comp Yard Piping -	Threaded connection - 2"	0.197	15.00	579.13	23.02	0.05
3	1723	HHE Compressor Building - Comp HHE 7	Threaded connection - 0.5"	0.130	10.00	380.27	15.52	0.05
4	3932C	Re-Compression: Unit 5 - FG Line 1	Union - 2"	1.275	100.00	3739.40	184.30	0.05
4	3871	Re-Compression: Yard Piping -	Gate valve - 0.75"	0.756	60.00	4242.76	109.28	0.05
1	3158	Refrig Comp Unit 11 -	Valve cover	2.517	200.00	7380.76	0.00	0.05
3	1464	Residue Gas/N2 Comp Bldg - Heat Pump 4	Valve cover	2.507	200.00	7352.49	368.89	0.05
2	4236	Compressor Unit # 8 - stem packing	Governor - 2"	2.481	200.00	13921.32	357.58	0.05
4	3910A	Re-Compression: Unit 3 - FG Line 6	Threaded connection - 2"	0.185	15.00	541.89	26.73	0.05
1	3449	Refrig Comp Unit 12 -	Threaded connection - 0.5"	0.122	10.00	357.55	0.00	0.05
4	3649	Sales Gas Header -	Open-ended line	0.954	75.00	2798.07	137.91	0.05
4	3654	Mole Sieve Dehy: Regen Fan/Blower -	Gate valve - 6"	2.982	245.00	16729.57	431.12	0.05
4	3826A	Re-Compression: Yard Piping - on 4" plug valve	Grease nipple	0.600	50.00	3367.34	86.79	0.05
1	3096	Compressor CM-13 -	Valve cover	2.369	200.00	6934.05	276.40	0.05
4	3623	Yard North of Office - Gate valve seat	Threaded connection - 0.75"	0.118	10.00	345.13	13.76	0.05
1	3406	Mole Sieve Common Piping -	Open-ended line - 0.75"	0.701	60.00	2050.17	81.75	0.05
1	3480	South of Low Press Inlet Compressors - Leaking around bolts.	Flowmeter - 1"	1.736	150.00	2541.16	249.99	0.05
1	3415	Mole Sieve Tower 511A (Top) -	Flange - 18"	2.262	200.00	6612.64	263.94	0.05
3	Direct	Residue Gas Comp 4 - Distance piece vents and packing case drains tied to common vent stack.	Compressor Seals (4) - 4"	22.526	2000.00	32912.34	3201.64	0.05
4	3909	Re-Compression: Unit 3 -	Governor - 3"	2.218	200.00	12425.90	320.67	0.05
2	4320	Compressor Unit # 1 -	Injector	2.213	200.00	12395.94	318.96	0.06

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
4	3826B	Re-Compression: Yard Piping - on 4" plug valve	Grease nipple	0.551	50.00	3088.04	79.70	0.06
3	1114	NRU 3 - Base of Cold Box - Near TB-0481	Union - 0.5"	0.539	50.00	1572.05	64.49	0.06
4	3845	Re-Compression: Yard Piping -	Gate valve - 0.75"	0.643	60.00	3601.63	93.00	0.06
3	1324	Propane Yard: V8-411 - A411N-5	Gate valve - 1"	0.799	75.00	4474.50	0.15	0.06
2	4004C	Mole Sieve Tower D -	Threaded connection - 1"	0.160	15.00	465.50	19.51	0.06
1	3237	Solar Turbines: Unit A - On skid	Gate valve - 1.5"	0.786	75.00	4398.47	113.14	0.06
4	3925	Re-Compression: Unit 3 -	Union - 0.75"	0.523	50.00	1523.79	75.54	0.06
3	1708	V2811-1 -	Regulator - 1"	1.817	175.00	12395.78	258.18	0.06
3	1031	Mole Sieve 4 - A2811N-49	Threaded connection - 0.75"	0.259	25.00	1450.03	31.03	0.06
4	3945E	Re-Compression: Unit 1 - FG Line 6	Threaded connection - 2"	0.154	15.00	447.93	22.22	0.06
4	3699A	Cryo System: South Of Cold Gas Exchanger -	Open-ended line - 0.75"	0.613	60.00	1786.42	1.43	0.06
4	3645	Sales Gas Header -	Flange - 12"	1.531	150.00	4462.86	221.43	0.06
4	3552	Glycol Reboiler: Fuel Gas - Chart recorder	Tubing connection - 0.5"	0.153	15.00	854.73	22.09	0.06
2	4004A	Mole Sieve Tower D -	Threaded connection - 1"	0.152	15.00	444.32	18.65	0.06
3	1857	Residue Gas/N2 Comp Bldg: Heat Pump 4 -	Threaded connection - 0.5"	0.102	10.00	296.11	14.95	0.06
1	3201	Solar Turbines: Unit B - Fuel gas filter piping	Threaded connection - 0.5"	0.101	10.00	294.94	14.58	0.06
1	3381	EP Skid to Koch -	Pump seal	5.054	500.00	7332.97	8.89	0.06
1	3010	Inlet Comp Yard Piping - Gate valve seat	Threaded connection - 0.75"	0.0989	10.00	287.94	11.54	0.06
1	3437	Refrig Comp Unit 12 - Yard Piping -	Open-ended line - 2"	0.988	100.00	2876.63	1.74	0.06
2	4286	Compressor Yard - Compressor unit 7 - on body plus around bolts	Ball valve - 2"	0.986	100.00	5510.71	142.07	0.06
3	1868	Residue Gas/N2 Comp Bldg: Res Comp 3 -	Threaded connection - 0.5"	0.0978	10.00	284.54	13.90	0.06
4	3781	Re-Compression: Fuel Gas Piping -	Threaded connection - 0.25"	0.0965	10.00	280.72	13.95	0.06
3	1737	HHE Compressor Building - Comp HHE 8	Threaded connection - 0.5"	0.0965	10.00	280.58	11.55	0.06
3	1790	Stab 1 Building (Yard) - (NGL Vessel)	Threaded connection - 0.5"	0.0955	10.00	277.72	0.20	0.06
3	1659	Re-Compressor Building - Re-Comp 2	Threaded connection - 0.5"	0.0944	10.00	274.31	11.30	0.06
4	3921D	Re-Compression: Unit 3 - FG Line 1	Union - 2"	0.944	100.00	2742.58	136.45	0.06
1	3227	HP Expander Scrubber (PV-503) -	Tubing connection - 0.375"	0.142	15.00	790.58	20.37	0.06
1	1976	Inlet Header -	Gate valve - 3"	1.129	120.00	6305.70	131.72	0.06
2	4261	Compressor Unit # 5 -	Plug valve - 1.5"	0.702	75.00	3921.54	101.20	0.07
1	3058	Lone Star Line -	Threaded connection - 1"	0.140	15.00	407.06	16.35	0.07
4	3919A	Re-Compression: Unit 3 - FG Line 2	Threaded connection - 2"	0.140	15.00	405.68	20.19	0.07
1	1983	Inlet Header -	Threaded connection - 0.75"	0.0923	10.00	268.00	10.77	0.07
4	3886	Refrigeration Compression: Outside Yard Piping - Chart recorder (Unit 2)	Tubing connection - 0.375"	0.137	15.00	765.57	19.82	0.07
1	3147	Refrig Comp Unit 11 - Plug on cylinder body.	Threaded connection - 0.25"	0.0902	10.00	261.66	0.00	0.07
2	4020	Gas-Gas Exchanger -	Flange - 16"	1.793	200.00	5200.78	219.30	0.07
4	3805	Re-Compression: Yard Piping -	Gate valve - 0.5"	0.534	60.00	2978.36	77.17	0.07
4	3947D	Re-Compression: Unit 1 - FG Line 4	Union - 2"	0.887	100.00	2571.22	128.22	0.07

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
2	4249	Compressor Unit 3 -	Threaded connection - 0.5"	0.0882	10.00	255.66	12.71	0.07
3	1437	Residue Gas/N2 Comp Bldg - Heat Pump 1	Threaded connection - 0.375"	0.0879	10.00	254.73	12.93	0.07
4	3918	Re-Compression: Unit 4 - Stem packing	Governor - 3"	1.755	200.00	9791.49	253.76	0.07
2	4323	Compressor Unit # 1 -	Governor - 2"	1.749	200.00	9758.78	252.18	0.07
3	1664	Re-Compressor Building - Re-Comp 3	Threaded connection - 0.5"	0.0872	10.00	252.78	10.45	0.07
4	3878	Generators - Outside under walkway on orifice meter.	Gate valve - 0.5"	0.514	60.00	2867.69	74.36	0.07
4	3922C	Re-Compression: Unit 5 - FG Line 2	Union - 2"	0.834	100.00	2410.89	120.53	0.07
3	1266	NGL Bullet 4 - Near A1101N-41	Gate valve - 0.75"	0.500	60.00	2784.54	0.14	0.07
2	4260	Compressor Unit # 5 -	Union - 1.5"	0.827	100.00	2390.72	119.20	0.07
4	3929	Re-Compression: Unit 5 -	Gate valve - 0.75"	0.491	60.00	2737.69	71.06	0.07
1	3100	Compressor CM-13 -	Threaded connection - 0.5"	0.0815	10.00	235.48	9.51	0.07
1	3303	Dust Filter Header -	Threaded connection - 0.5"	0.0811	10.00	234.40	9.47	0.08
1	1987	Inlet Header -	Gate valve - 6"	1.988	245.00	11071.18	231.97	0.08
3	1128	NRU 2 - Top Platform - A2331N	Open-ended line - 0.375"	0.476	60.00	1372.62	56.96	0.08
3	1002	Mole Sieve 3 - On top platform	Flange - 8"	0.782	100.00	2254.76	93.62	0.08
3	1542	Residue Gas/N2 Comp Bldg - Heat Pump 3	Valve cover	1.561	200.00	4501.53	0.30	0.08
1	3298	High Pressure JT Expander -	Tubing connection - 0.5"	0.116	15.00	647.77	16.76	0.08
1	3195	Solar Turbines: Unit A - Fuel gas scrubber piping	Filter cover - 6"	0.385	50.00	1109.06	55.40	0.08
3	1325	Propane Yard - A406N	Gate valve - 6"	1.871	245.00	10403.14	0.36	0.08
3	1062	Mole Sieve Header - PDSL-2860N	Tubing connection - 0.375"	0.114	15.00	634.65	13.67	0.08
4	3591	Mole Sieve Dehy: Dehy Train C - Instrument bleed	Pressure transmitter - 0.125"	0.455	60.00	1311.27	53.13	0.08
3	1106	NRU 3 - Hot Box - G411N-19	Gate valve - 0.5"	0.454	60.00	2525.35	54.38	0.08
3	1290	NGL Bullet 2 - Near B1101N-1	Gate valve - 0.75"	0.453	60.00	2517.63	0.13	0.08
1	1981	Inlet Header - Chart recorder	Tubing connection - 0.375"	0.113	15.00	627.81	13.18	0.08
1	3028	Fuel Gas to Mansfield (222) -	Threaded connection - 0.375"	0.0752	10.00	216.56	8.78	0.08
3	1555	Residue Gas/N2 Comp Bldg - Heat Pump 3	Threaded connection - 0.5"	0.0746	10.00	214.60	0.01	0.08
3	1840	Co-Gen Building: Outside (CA 625 - HP FG Scrubber) - Stem Area	Regulator - 0.5"	1.302	175.00	8835.59	185.06	0.08
3	1199	NRU Expander 2 - Expander Housing	Flange - 10"	1.111	150.00	3197.17	133.07	0.08
4	3675	Cryo System: Turbo Expander -	Tubing connection - 0.5"	0.111	15.00	617.08	0.26	0.08
1	3097	Compressor CM-13 -	Open-ended line - 0.5"	0.432	60.00	1242.36	50.46	0.08
4	3914	Re-Compression: Unit 3 - FG Line 4	Threaded connection - 2"	0.106	15.00	304.62	15.34	0.09
3	1158	NRU 1 - Top Platform - G2314N	Threaded connection - 0.5"	0.0701	10.00	201.28	8.40	0.09
1	3024	Fuel Gas Scrubber (West Yard) - PV-9	Union - 2"	0.701	100.00	2010.17	100.87	0.09
3	1191	NRU 1 -	Block valve - 10"	3.468	500.00	19244.18	415.32	0.09
4	3652	Mole Sieve Dehy: Regen Inlet Scrubber - Gate valve seat	Open-ended line - 0.5"	0.416	60.00	1192.81	60.14	0.09
1	1965	Inlet Comp Yard Piping - On 10" orifice meter (gate valve seat)	Open-ended line - 0.5"	0.410	60.00	1175.50	47.87	0.09
3	1040	Mole Sieve 4 - A2811N-52	Gate valve - 0.75"	0.410	60.00	2273.97	49.10	0.09
3	Direct	Condensate Storage Tanks - PVSV - 2 (Centre)	Pressure relief valve	4.000	600.00	11448.50	20.07	0.09

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
2	4147	Compressor Unit 4 Outside -	Threaded connection - 2"	0.0990	15.00	283.28	14.28	0.09
4	3582	Mole Sieve Dehy: Regen Piping -	Flange - 6"	0.658	100.00	1882.03	76.79	0.09
2	4363	Compressor Unit # 3 -	Control valve - ball - 2"	0.853	130.00	2439.81	122.99	0.09
2	4110	After Filter - 4 tubing connections	Tubing connection - 0.375"	0.0979	15.00	542.53	11.98	0.09
1	3102	Compressor CM-9 -	Threaded connection - 2"	0.0973	15.00	278.22	11.36	0.09
2	4077	Sales Piping - on 6" orifice meter	Rack	0.483	75.00	2674.09	69.61	0.09
3	1634	Re-Compressor Building - Re-Comp 1 (WE4C-301-1)	Threaded connection - 0.5"	0.0635	10.00	181.28	7.60	0.10
4	3982	Power Generators: Unit 1 -	Union - 3"	0.952	150.00	2716.69	137.61	0.10
2	4222	Compressor Unit # 9 -	Injector	1.269	200.00	7021.48	182.86	0.10
3	1623	IR Compressor Building - IR Comp 3	Valve cover	1.264	200.00	3607.00	151.35	0.10
2	4258	Compressor Unit # 5 -	Threaded connection - 1.5"	0.0944	15.00	269.31	13.61	0.10
4	3694A	Cryo System: Chiller Outlet Separator -	Open-ended line - 0.75"	0.376	60.00	1071.71	0.87	0.10
4	3923	Re-Compression: Unit 3 - Stem packing and bonnet	Plug valve - 3"	0.938	150.00	5189.60	135.61	0.10
4	3551	Still Reboiler No. 2 - On orifice meter	Threaded connection - 0.5"	0.0625	10.00	178.29	9.04	0.10
4	3934B	Re-Compression: Unit 4 - FG Line 5	Plug valve - 2"	0.748	120.00	4138.17	108.15	0.10
3	1635	Re-Compressor Building - Re-Comp 1 (WE4C-301-1)	Threaded connection - 0.5"	0.0614	10.00	174.96	7.35	0.10
3	1642	IR Compressor Building - IR Comp 3 (Start Gas)	Union - 2"	0.612	100.00	1744.03	87.02	0.10
3	1900	Hg Removal Bed V8-401-3 - plug on A401N-11 GTV seat leak	Threaded connection - 0.5"	0.0611	10.00	174.18	7.32	0.10
3	1680	Re-Compressor Building - Re-Comp 3	Threaded connection - 0.5"	0.0611	10.00	173.98	7.31	0.10
2	4194	Compressor Unit 2 -	Injector - 1"	1.217	200.00	6729.85	175.48	0.10
3	1827	Fuel Gas To Co-Gen - VO-32	Gate valve - 2"	0.608	100.00	3361.99	86.44	0.10
4	3939	Re-Compression: Unit 2 - FG Line 6	Union - 2"	0.606	100.00	1724.71	87.59	0.10
2	4042	Mole Sieve Tower B -	Control valve - orbit - 8"	2.130	353.00	6062.71	260.51	0.10
1	3044	Scrubber (PV-517) - Sight glass	Gate valve - 0.75"	0.359	60.00	1982.68	41.87	0.10
2	4317	Compressor Unit # 1 -	Injector	1.195	200.00	6601.18	172.22	0.10
2	4000	Inlet Line -	Threaded connection - 2"	0.0892	15.00	253.54	10.90	0.10
4	3558	TEG Still - Located down low.	Union - 1"	0.589	100.00	1672.83	85.10	0.10
1	3110	Compressor CM-19 -	Threaded connection - 0.5"	0.0587	10.00	166.95	6.86	0.10
1	3029	Fuel Gas to Mansfield (222) -	Threaded connection - 0.375"	0.0587	10.00	166.69	6.85	0.10
4	3907	Re-Compression: Unit 2 -	Union - 0.75"	0.291	50.00	826.49	42.07	0.10
1	3417	Mole Sieve Tower 511C (Top) -	Flange - 18"	1.163	200.00	3303.24	135.73	0.10
3	1186	NRU 3 - Top Platform - G2348N	Threaded connection - 0.375"	0.0579	10.00	164.39	6.93	0.11
2	4304	Compressor Unit # 1 -	Valve cover	1.155	200.00	3279.06	166.50	0.11
1	3423	Refrig Comp Unit 12 - Yard Piping -	Control valve - butterfly - 6"	1.623	282.00	4607.47	0.00	0.11
3	1627	IR Compressor Building - IR Comp 3	Threaded connection - 0.5"	0.0575	10.00	163.33	6.89	0.11
2	4353	Compressor Yard - horizontal vessel - on horn	Pressure relief valve - 1.5"	0.731	130.00	2072.68	105.42	0.11
4	3947B	Re-Compression: Unit 1 - FG Line 4	Plug valve - 2"	0.675	120.00	3720.60	97.54	0.11
3	1366	Amine Bldg: Near V8-2701N-11 -	Gate valve - 0.5"	0.334	60.00	1840.87	39.99	0.11

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1077	NRU 3 - G412N-21	Threaded connection - 0.75"	0.0556	10.00	157.48	6.66	0.11
2	4213	Compressor Unit # 4 - around body	three-way valve - 3"	0.665	120.00	3664.85	95.84	0.11
3	1204	NRU 2 - Top Platform - A2333N	Threaded connection - 0.375"	0.0546	10.00	154.43	6.54	0.11
1	1949	Inlet Header -	Plug valve - 3"	0.819	150.00	4511.11	95.55	0.11
3	1081	NRU 3 - A2307N	Threaded connection - 0.75"	0.0545	10.00	154.22	6.53	0.11
2	4314	Compressor Unit # 1 -	Threaded connection - 0.25"	0.0545	10.00	154.20	7.86	0.11
3	1177	NRU 1 - G415N-2	Threaded connection - 0.75"	0.0545	10.00	154.12	6.52	0.11
3	1636	Re-Compressor Building - Re-Comp 1	Valve cover	1.086	200.00	3072.03	130.08	0.11
3	1670	Re-Compressor Building - Re-Comp 1 (WE4C-301-1) (Start Gas)	Threaded connection - 2"	0.0810	15.00	229.12	11.52	0.11
4	3936	Re-Compression: Unit 4 - FG Line 3	Plug valve - 2"	0.648	120.00	3568.97	93.69	0.11
4	3650	Sales Gas Header -	Open-ended line - 1"	0.404	75.00	1143.24	58.48	0.11
4	3843	Re-Compression: Yard Piping -	Gate valve - 0.75"	0.322	60.00	1775.38	46.61	0.11
3	1624	IR Compressor Building - IR Comp 3	Threaded connection - 0.5"	0.0530	10.00	149.69	6.35	0.11
2	4104	Mole Sieve Tower A -	Threaded connection - 0.5"	0.0526	10.00	148.39	6.43	0.12
4	3911C	Re-Compression: Unit 4 - FG Line 6	Union - 2"	0.524	100.00	1479.69	75.83	0.12
3	1654	Re-Compressor Building - Re-Comp 2 (WE4C-301-2) (Fuel Gas Line)	Threaded connection - 2"	0.0781	15.00	220.17	11.10	0.12
3	1155	NRU 1 - Base of Hot Box	Threaded connection - 0.25"	0.0515	10.00	145.23	6.17	0.12
3	1203	NRU 2 - Top Platform - A2344N	Threaded connection - 0.375"	0.0515	10.00	145.01	6.16	0.12
2	4189	Cryp 101 top of exchanger E401 -	Flange - 6"	0.514	100.00	1449.50	74.16	0.12
3	1657	Re-Compressor Building - Re-Comp 2	Threaded connection - 0.5"	0.0513	10.00	144.57	6.15	0.12
1	3259	Solar Turbines - Sight glass valve	Gate valve - 0.75"	0.306	60.00	1681.26	44.04	0.12
1	3040	Lone Star Line -	Threaded connection - 2"	0.0762	15.00	214.50	8.89	0.12
4	3894	Re-Compression: Unit 1 -	Valve cover	1.015	200.00	2857.57	146.77	0.12
3	1138	NRU 2 - G411N-43	Threaded connection - 0.5"	0.0507	10.00	142.76	6.07	0.12
4	3934C	Re-Compression: Unit 4 - FG Line 5	Union - 2"	0.506	100.00	1425.02	73.20	0.12
3	1350	Process Heater - Near LG2810N-2	Threaded connection - 2"	0.0759	15.00	213.61	10.79	0.12
4	3579	Mole Sieve Dehy: Dehy Tower B -	Gate valve - 0.5"	0.301	60.00	1656.13	35.18	0.12
3	1391	Residue Gas/N2 Comp Bldg: Yard - Suction Scrubber: A304N-1	Gate valve - 1.5"	0.371	75.00	2035.33	52.69	0.12
3	1275	NGL Bullet 3 - Near A1101N-38	Gate valve - 0.75"	0.294	60.00	1611.79	0.08	0.12
2	4136	Mole Sieve Pre-Filter -	Threaded connection - 0.5"	0.0483	10.00	135.33	5.90	0.13
3	Direct	Condensate Storage Tanks - PVSV - 1 (West)	Pressure relief valve	2.885	600.00	8089.62	14.47	0.13
2	4094	Tower by D-208 -	Threaded connection - 1"	0.0716	15.00	200.68	8.76	0.13
1	---	Refrig Comp Unit 12 - Common vent line for 4 cylinders.	Common compressor seals vent	9.314	2000.00	12434.70	0.00	0.13
1	3104	Compressor CM-9 -	Threaded connection - 2"	0.0696	15.00	194.73	8.13	0.13
3	Direct	Condensate Storage Tanks - PVSV-3 (East)	Pressure relief valve	2.773	600.00	7750.86	13.91	0.13
4	3586	Mole Sieve Dehy: Regen Piping - Up high.	Threaded connection - 0.5"	0.0462	10.00	129.16	5.39	0.13
2	4346	Residue Gas Suction Scrubber - stem (around greaser)	Plug valve - 6"	1.175	255.00	6432.75	169.35	0.13

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1859	Residue Gas/N2 Comp Bldg: Heat Pump 4 -	Threaded connection - 0.5"	0.0455	10.00	127.10	6.70	0.13
2	4382	Compressor Unit # 6 -	Valve cover	0.907	200.00	2532.42	130.77	0.13
3	1327	Propane Yard - Behind Economizer - PV2934N	Control valve - plug - 6"	1.278	282.00	3568.01	0.24	0.13
3	1427	Residue Gas/N2 Comp Bldg - Comp 2	Valve cover	0.895	200.00	2495.79	127.21	0.14
2	4015	Mole Sieve Tower D -	Three-way valve - 4"	0.835	190.00	4564.37	102.14	0.14
2	4047	Mole Sieve Tower B -	Control valve - orbit - 4"	0.778	177.00	2165.71	95.13	0.14
1	3150	Refrig Comp Unit 11 - Plug on cylinder body.	Threaded connection - 0.5"	0.0435	10.00	120.93	0.00	0.14
4	3942A	Re-Compression: Unit 2 - FG Line 1	Threaded connection - 2"	0.0652	15.00	181.25	9.42	0.14
1	1952	PV-1A - Sight glass	Gate valve - 0.75"	0.261	60.00	1423.44	30.41	0.14
2	4010	Mole Sieve Tower A -	Threaded connection - 0.75"	0.0433	10.00	120.43	5.30	0.14
3	1196	NRU Expander 1 - Inlet Line	Flange - 10"	0.643	150.00	1785.64	76.95	0.14
4	3984	Cryo System: Expander Feed Separator - Around body	Gate valve - 0.75"	0.257	60.00	1401.46	0.60	0.14
2	4292	Compressor Yard - Compressor unit 4	Check valve - 4"	0.681	160.00	3717.99	98.20	0.14
2	4199	Compressor Unit 3 -	Cylinder end - flange	1.702	400.00	2238.18	245.37	0.14
4	3947A	Re-Compression: Unit 1 - FG Line 4	Threaded connection - 2"	0.0636	15.00	176.44	9.19	0.14
4	3945A	Re-Compression: Unit 1 - FG Line 6	Threaded connection - 2"	0.0635	15.00	176.21	9.18	0.14
3	1841	Stab 1 Heat Medium Building -	Threaded connection - 3"	0.106	25.00	293.41	15.03	0.14
4	3483	Inlet Yard Piping: Pig Traps -	Pig trap cover - 1"	0.0631	15.00	174.95	7.65	0.14
1	2000	Fuel Gas to Mansfield (222) -	Gate valve - 2"	0.420	100.00	2292.70	49.05	0.14
3	1871	Co-Gen (Fuel Gas Scrubber SE Corner of Bldg) - Sight Glass	Gate valve - 0.75"	0.252	60.00	1371.88	35.75	0.15
3	1924	Dehydration Tower # 2 east - 1st platform	Tubing connection - 0.375"	0.0627	15.00	341.71	7.50	0.15
2	Direct	Compressor Unit # 2 -	Compressor seals vent - 2"	8.348	2000.00	10938.92	1184.40	0.15
3	1339	Amine Bldg: V8-2810N - Near PDISH-2898N	Tubing connection - 0.375"	0.0621	15.00	338.73	7.44	0.15
4	3917C	Re-Compression: Unit 5 - FG Line 3	Union - 2"	0.412	100.00	1140.27	59.54	0.15
3	1189	NRU Expander 1 -	Threaded connection - 0.5"	0.0411	10.00	113.89	4.93	0.15
2	4380	Compressor Unit # 6 -	Valve cover	0.821	200.00	2272.13	118.31	0.15
2	4315	Compressor Unit # 1 -	Injector	0.819	200.00	4463.23	118.08	0.15
2	4107	North oil heater -	Threaded connection - 2"	0.0612	15.00	169.30	7.48	0.15
4	3617	Yard North of Office -	Gate valve - 0.75"	0.238	60.00	1296.50	34.45	0.15
2	4378	Compressor Unit # 6 -	Valve cover	0.794	200.00	2190.49	114.41	0.15
3	1910	Hg Removal Bed V8-401-2 -	Flange - 3"	0.297	75.00	821.00	35.62	0.15
4	3696A	Cryo System: Chiller Outlet Separator Line - Gate valve seat	Open-ended line - 0.75"	0.237	60.00	654.56	0.55	0.15
4	3797	Re-Compression: Unit 5 -	Valve cover	0.790	200.00	2179.33	114.21	0.15
3	1439	Residue Gas/N2 Comp Bldg - Heat Pump 1	Valve cover	0.790	200.00	2178.26	116.16	0.15
2	4350B	C3 Cooler - 4 threaded connections	Threaded connection - 1"	0.0592	15.00	163.30	0.00	0.15
1	3469	Refrig Comp Unit 12 -	Gate valve - 0.5"	0.236	60.00	1284.23	34.00	0.15
1	3301	HP Expander Scrubber (PV-503) -	Gate valve - 0.75"	0.235	60.00	1280.59	33.91	0.16
1	3131	Compressor CM-13 -	Valve cover	0.784	200.00	2160.67	91.46	0.16
2	4379	Compressor Unit # 6 -	Threaded connection - 0.5"	0.0392	10.00	107.95	5.65	0.16
1	3431	EP Skid to Koch -	Pump seal	1.949	500.00	2521.10	3.43	0.16
2	4232	Compressor Unit 8 -	Valve cover	0.779	200.00	2146.06	112.28	0.16

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
4	3880	FG Scrubber - Central Walkway behind flow computer.	Tubing connection - 0.375"	0.0584	15.00	317.39	8.44	0.16
4	3942B	Re-Compression: Unit 2 - FG Line 1	Threaded connection - 2"	0.0583	15.00	160.61	8.43	0.16
3	1105	NRU 3 - Hot Box - Near TB0416	Open-ended line - 0.5"	0.232	60.00	639.99	27.83	0.16
4	3784	Re-Compression: Clark Discharge Cooler - PV-111B	Gate valve - 6"	0.947	245.00	5146.35	136.93	0.16
3	1499	Residue Gas/N2 Comp Bldg - Heat Pump 2	Valve cover	0.771	200.00	2122.97	113.46	0.16
4	3812	Re-Compression: Yard Piping -	Ball valve - 4"	0.732	190.00	3977.70	105.85	0.16
4	3834	Re-Compression: Yard Piping -	Gate valve - 2"	0.385	100.00	2093.22	55.70	0.16
1	3271	Solar Turbines -	Threaded connection - 2"	0.0571	15.00	157.13	8.23	0.16
1	3477	South of Low Press Inlet Compressors -	Threaded connection - 1"	0.0564	15.00	154.95	8.12	0.16
4	3916B	Re-Compression: Unit 3 - FG Line 3	Plug valve - 2"	0.448	120.00	2429.03	64.74	0.16
3	1864	Residue Gas/N2 Comp Bldg: Heat Pump 1 -	Threaded connection - 0.5"	0.0372	10.00	102.02	5.47	0.16
4	3913C	Re-Compression: Unit 3 - FG Line 5	Flange - 2"	0.185	50.00	508.18	26.79	0.16
1	3401	Mole Sieve Tower 511B -	Flange - 2"	0.185	50.00	507.52	21.60	0.16
4	3793	Re-Compression: Valero Discharge Scrubber -	Gate valve - 0.75"	0.221	60.00	1200.89	32.02	0.16
4	3916D	Re-Compression: Unit 3 - FG Line 3	Union - 2"	0.367	100.00	1005.17	53.05	0.17
4	3836	Re-Compression: Yard Piping -	Gate valve - 2"	0.367	100.00	1986.63	53.00	0.17
2	4106	After Filter -	Gate valve - 6"	0.897	245.00	4859.32	109.66	0.17
2	4033	Mole Sieve Tower C - Both sides of union	Union - 1"	0.362	100.00	990.35	44.27	0.17
4	3761	Cryo System: Economizer -	Gate valve - 4"	0.684	190.00	3705.13	1.59	0.17
2	4351	Under C3 Cooler -	Plug valve - 4"	0.703	200.00	3804.08	0.00	0.17
4	3893	Re-Compression: Unit 1 - Cylinder No. 1	Distance piece	6.985	2000.00	8825.18	1009.85	0.17
3	1440	Residue Gas/N2 Comp Bldg - Heat Pump 1	Valve cover	0.698	200.00	1902.78	102.71	0.17
2	4372	Compressor Unit # 6 -	Governor - 2"	0.696	200.00	3763.08	100.35	0.17
1	3464	Refrig Comp Unit 12 -	Open-ended line - 0.75"	0.207	60.00	564.58	29.86	0.18
2	4229	Compressor Unit 8 -	Valve cover	0.690	200.00	1878.82	99.49	0.18
1	3194	Solar Turbines: Unit A - Fuel gas scrubber piping	Gate valve - 2"	0.344	100.00	1857.76	49.51	0.18
3	1166	NRU 2 - Base of Cold Box - Valve 373	Gate valve - 1"	0.257	75.00	1388.95	30.79	0.18
4	3653	Mole Sieve Dehy: Regen Fan/Blower -	Gate valve - 6"	0.835	245.00	4506.61	120.68	0.18
3	1724	HHE Compressor Building - Comp HHE 7	Threaded connection - 0.5"	0.0338	10.00	91.69	4.04	0.18
3	1911	Hg Removal Bed V8-401-2 - A401N-11	Gate valve - 0.75"	0.202	60.00	1088.89	24.17	0.18
4	3509	Regen Heater -	Flange - 6"	0.335	100.00	909.67	48.47	0.18
1	3334	Mole Sieve Tower 511C -	Flange - 2"	0.167	50.00	452.59	19.47	0.18
2	4008	Mole Sieve Tower A -	Gate valve - 0.5"	0.200	60.00	1079.27	24.48	0.18
3	1100	NRU 3 - Base of Cold Box - Near TB-0470	Union - 0.5"	0.167	50.00	452.05	19.96	0.18
4	3790	Re-Compression: Clark Discharge Cooler -	Threaded connection - 0.5"	0.0333	10.00	90.41	4.82	0.18
4	3840	Re-Compression: Yard Piping -	Gate valve - 2"	0.328	100.00	1766.99	47.42	0.19
3	1696	Re-Compressor Building - Associated Yard Piping (Near G8-311-1) Cooler	Orbit valve - 4"	0.620	190.00	3339.79	74.25	0.19
4	3915B	Re-Compression: Unit 5 - FG Line 4	Plug valve - 2"	0.391	120.00	2105.45	56.52	0.19
4	3830	Re-Compression: Yard Piping -	Gate valve - 2"	0.325	100.00	1747.45	46.92	0.19
1	3065	Compressor CM-9 -	Threaded connection - 0.5"	0.0323	10.00	87.33	3.77	0.19
2	4204	Residue Compressors FG Scrubber -	Control valve - globe - 2"	0.420	130.00	1134.86	60.53	0.19
3	1658	Re-Compressor Building - Re-Comp 2 (Around some bolts)	Valve cover	0.639	200.00	1726.14	76.58	0.19
1	3430	Refrig Comp Yard Piping -	Gate valve - 10"	1.560	500.00	8379.63	0.00	0.20
4	3950B	Re-Compression: Unit 1 - FG Line 1	Plug valve - 2"	0.373	120.00	2003.28	53.93	0.20

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
4	3596	Mole Sieve Dehy: Dehy Tower B -	Manway - 18"	0.621	200.00	1670.39	72.47	0.20
3	1235	NGL Bullet 5 - LG3059NB	Gate valve - 0.75"	0.186	60.00	999.38	0.05	0.20
2	4191	Compressor Unit 2 -	Valve cover	0.619	200.00	1664.69	0.00	0.20
4	3807	Re-Compression: Inlet Scrubber -	Gate valve - 1"	0.231	75.00	1242.22	33.45	0.20
2	4068	SE HP Inlet - on 8" plug valve	Grease nipple	0.154	50.00	825.80	18.82	0.20
2	4321	Compressor Unit # 1 - on cylinder head bolts	Flange - 3"	0.231	75.00	619.83	33.25	0.20
2	4172	Cryo skid 101 - expander K101-B	Threaded connection - 0.5"	0.0306	10.00	82.25	3.75	0.20
1	3128	Compressor CM-14 - On governor	Threaded connection - 0.375"	0.0305	10.00	81.91	4.39	0.20
3	1630	IR Compressor Building - IR Comp 3	Threaded connection - 0.5"	0.0301	10.00	80.67	3.60	0.20
3	1814	Stab 1 Building (Yard) - (NGL Vessel)	Threaded connection - 0.5"	0.0301	10.00	80.53	0.06	0.20
2	4350C	C3 Cooler - 2 connections	Threaded connection - 1"	0.0449	15.00	120.27	0.00	0.20
1	3270	Solar Turbines - Needle valve seat	Open-ended line - 2"	0.296	100.00	791.31	42.60	0.21
3	1937	Residue Gas/N2 Comp Bldg - Comp 1	Crank case vent	5.890	2000.00	7128.79	837.16	0.21
4	3932A	Re-Compression: Unit 5 - FG Line 1	Plug valve - 2"	0.351	120.00	1875.96	50.69	0.21
3	Direct	Residue Gas Comp 3 - Distance piece vents and packing case drains tied to common vent stack.	Compressor Seals (4) - 4"	5.826	2000.00	7028.80	827.99	0.21
2	4040	Mole Sieve Tower B -	Flange - 4"	0.218	75.00	582.77	26.71	0.21
3	1514	Residue Gas/N2 Comp Bldg: Lower Level -	Gate valve - 0.75"	0.174	60.00	930.93	25.61	0.21
3	1137	NRU 2 - A411N-35	Threaded connection - 0.75"	0.0290	10.00	77.21	3.47	0.21
1	3109	Compressor CM-19 -	Threaded connection - 0.5"	0.0288	10.00	76.83	3.36	0.21
1	3258	Solar Turbines - Sight glass valve	Gate valve - 1"	0.216	75.00	1154.49	31.10	0.21
2	4034	Mole Sieve Tower C -	Threaded connection - 1"	0.0428	15.00	113.84	5.23	0.21
1	3246	Solar Turbines -	Threaded connection - 1"	0.0423	15.00	112.49	6.09	0.22
1	3098B	Compressor CM-13 - Bottom NW valve cover.	Valve cover	0.561	200.00	1490.32	65.49	0.22
4	3590	Mole Sieve Dehy: Dehy Train C -	Gate valve - 0.75"	0.168	60.00	894.07	19.56	0.22
1	1990	Inlet Header - Stem packing and 2 flanges	Control valve - butterfly - 6"	0.784	282.00	2078.92	91.47	0.22
4	3927	Re-Compression: Unit 4 -	Threaded connection - 0.75"	0.0278	10.00	73.66	4.02	0.22
2	4039	Mole Sieve Tower C -	Flange - 4"	0.208	75.00	551.40	25.44	0.22
4	3881	FG Scrubber -	Tubing connection - 0.375"	0.0415	15.00	221.43	6.00	0.22
4	3965	Refrigeration Compressors: Unit 3 -	Needle valve - 0.75"	0.166	60.00	885.21	24.01	0.22
1	3325	Mole Sieve Tower 511A -	Threaded connection - 2"	0.0414	15.00	109.75	4.83	0.22
4	3810	Re-Compression: Yard Piping -	Threaded connection - 0.75"	0.0275	10.00	72.90	3.98	0.22
3	1409	Amine Yard - Near 2700N-1	Threaded connection - 0.75"	0.0273	10.00	72.28	3.27	0.22
4	3978	Power Generators: Unit 1 -	Threaded connection - 3"	0.0683	25.00	363.77	9.87	0.22
4	3494	Inlet Header - Depressured line (open to air)	Open-ended line - 0.5"	0.163	60.00	429.57	19.73	0.22
4	3867	Re-Compression: Unit 2 -	Valve cover	0.541	200.00	1428.84	78.19	0.23
3	1058	Mole Sieve Header - PDSL-2879N	Tubing connection - 0.375"	0.0405	15.00	215.51	4.85	0.23
4	3950D	Re-Compression: Unit 1 - FG Line 1	Union - 2"	0.269	100.00	711.59	38.96	0.23

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
4	3526	South Heat Medium Heater - Pilot	Gate valve - 0.5"	0.160	60.00	853.19	23.19	0.23
3	1484	Residue Gas/N2 Comp Bldg: Back Wall - A301N-6	Threaded connection - 0.75"	0.0267	10.00	70.42	3.79	0.23
3	1096	Amine Bldg (V2806-1) - Plug on A2806N-9 (under vessel)	Threaded connection - 1"	0.0399	15.00	105.21	4.78	0.23
3	1075	NRU 3 - A412N-13	Threaded connection - 0.5"	0.0266	10.00	70.05	3.18	0.23
2	Direct	Compressor Unit # 5 -	Compressor seals vent - 2"	5.308	2000.00	6225.90	752.98	0.23
4	Direct	Re-Compressor Unit 3 -	Seals vent	5.281	2000.00	6185.21	763.57	0.23
3	1417	Residue Gas/N2 Comp Bldg - Comp 2	Threaded connection - 0.5"	0.0264	10.00	69.37	3.75	0.23
4	3885	Refrigeration Compression: Outside Yard Piping - Main fuel line orifice meter	Tubing connection - 0.375"	0.0395	15.00	210.01	5.71	0.23
1	3111	Compressor CM-19 -	Filter cover - 4"	0.0652	25.00	171.51	7.61	0.23
2	4265	Compressor Unit # 5 -	Union - 1.5"	0.260	100.00	684.53	37.55	0.23
4	3835	Re-Compression: Yard Piping -	Gate valve - 2"	0.260	100.00	1381.99	37.64	0.23
3	1471	Residue Gas/N2 Comp Bldg - Heat Pump 4	Valve cover	0.520	200.00	1366.48	76.51	0.23
1	1980	Inlet Header - Chart recorder	Tubing connection - 0.375"	0.0387	15.00	205.08	4.51	0.24
3	1236	NGL Bullet 5 - LG3059NA	Gate valve - 0.75"	0.155	60.00	820.18	0.04	0.24
1	3340	Mole Sieve Tower 511A -	Threaded connection - 0.5"	0.0257	10.00	67.51	3.00	0.24
4	3883	Refrigeration Compression: Outside Yard Piping - Main fuel line orifice meter	Gate valve - 0.5"	0.154	60.00	818.74	22.32	0.24
4	3592	Mole Sieve Dehy: Dehy Train C - Top of dehy tower	Flange - 18"	0.512	200.00	1342.09	59.75	0.24
1	3376	De-butanizer Reflux Drum -	Threaded connection - 0.5"	0.0253	10.00	66.22	0.04	0.24
4	3632	Top of MEA Contactor - Gate valve seat	Open-ended line - 1"	0.190	75.00	495.89	22.12	0.24
4	3949B	Re-Compression: Unit 1 - FG Line 3	Plug valve - 2"	0.303	120.00	1605.63	43.83	0.24
3	Direct	Residue Gas Comp 1 - Distance piece vents and packing case drains tied to common vent stack.	Compressor Seals (4) - 3"	5.041	2000.00	5813.38	716.53	0.24
4	3917B	Re-Compression: Unit 5 - FG Line 3	Plug valve - 2"	0.302	120.00	1597.82	43.63	0.24
3	1490	Residue Gas/N2 Comp Bldg - Comp 4 (Throw 4)	Threaded connection - 0.5"	0.0251	60.00	65.59	3.57	0.24
3	1130	NRU 1 - A411N-15	Threaded connection - 0.5"	0.0250	10.00	65.43	3.00	0.24
3	1854	Co-Gen Building: Fuel Gas Scrubber (SW Corner of Bldg) - Packing	Threaded connection - 1"	0.0374	15.00	97.76	5.32	0.24
1	3297	High Pressure JT Expander -	Threaded connection - 0.75"	0.0250	10.00	65.15	3.59	0.24
1	3306	Mole Sieve Bypass Piping -	Control valve - butterfly - 6"	0.688	282.00	1790.56	80.30	0.25
3	1113	NRU 3 - Base of Cold Box - Valve 132	Gate valve - 10"	1.218	500.00	6435.83	145.90	0.25
3	1335	Propane Yard: V8-410-3 - A410N-16	Threaded connection - 0.5"	0.0244	10.00	63.34	0.00	0.25
4	3698A	Cryo System: South Of Cold Gas Exchanger - Near FV-205B	Open-ended line - 0.75"	0.146	60.00	378.46	0.34	0.25
4	3941C	Re-Compression: Unit 2 - FG Line 4	Union - 2"	0.239	100.00	618.41	34.49	0.26
4	3624A	Yard North of Office - Gate valve seat	Open-ended line - 0.75"	0.143	60.00	370.41	16.68	0.26
2	4063	Surge Scrubber - sight glass	Gate valve - 0.75"	0.143	60.00	752.56	17.46	0.26
3	Direct	Re-Comp 1 (E03400-1A) - 3 Primary Seal Drains (Comp 1) & 3 Secondary Seal Drains (Comp 2)	Compressor Seal Drains - 1"	4.744	2000.00	5352.77	568.10	0.26
1	3063	HP Cooler - Packing	Plug valve - 8"	0.711	300.00	3749.19	83.00	0.26
1	3181	Solar Turbines: Unit B - Fuel gas filter piping	Tubing connection - 0.375"	0.0355	15.00	186.85	5.11	0.26

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
2	4243	Compressor Unit 3 -	Flange - 1"	0.118	50.00	304.21	16.95	0.26
1	---	Refrig Comp Unit 10 -	Compressor seals - 1"	4.703	2000.00	5288.72	0.00	0.26
4	3849	Re-Compression: Yard Piping - Needle valve seat	Open-ended line - 0.5"	0.141	60.00	364.66	20.38	0.26
3	1813	Stab 1 Building (Yard) - (NGL Vessel)	Gate valve - 3"	0.281	120.00	1481.07	0.59	0.26
2	Direct	Compressor Unit # 9 -	Compressor seals vent - 2"	4.671	2000.00	5239.26	662.67	0.26
2	4174A	Cryo skid 101 - expander K101-B on gate valve	Open-ended line - 0.5"	0.138	60.00	356.56	16.91	0.26
1	3090	West Inlet Yard Piping - On glycol dehy	Gate valve - 0.5"	0.137	60.00	719.84	15.99	0.27
3	1233	NGL Bullet 5 - LG3059B	Gate valve - 0.75"	0.137	60.00	718.98	0.04	0.27
3	1052	Mole Sieve Header - N2811N-1	Threaded connection - 0.5"	0.0227	10.00	58.39	2.72	0.27
4	3628	Yard North of Office -	Tubing connection - 0.375"	0.0340	15.00	178.62	3.97	0.27
3	1935	Mole Sieve Tower 3 - top of dehydrator	Manway - 18"	0.451	200.00	1158.90	54.03	0.27
1	3439A	EP Skid to Koch -	Open-ended line - 0.75"	0.134	60.00	344.39	0.24	0.27
2	4254	Compressor Unit # 4 -	Injector	0.447	200.00	2345.61	64.46	0.27
3	1874	Co-Gen (Fuel Gas Scrubber SE Corner of Bldg) -	Gate valve - 0.75"	0.133	60.00	699.02	18.95	0.27
1	3349	Mole Sieve Tower 511B -	Threaded connection - 0.5"	0.0221	10.00	56.65	2.58	0.28
1	3210	Solar Turbines: Header Outside -	Needle valve - 0.5"	0.133	60.00	694.97	19.09	0.28
3	1456	Residue Gas/N2 Comp Bldg - Heat Pump 4	Cylinder end - flange	0.881	400.00	965.39	129.61	0.28
2	4201	Residue Compressors FG Scrubber -	Threaded connection - 0.75"	0.0220	10.00	56.30	3.17	0.28
2	4211	Compressor Unit 3 - Body	Three-way valve - 2"	0.219	100.00	1148.16	31.61	0.28
1	3470	Refrig Comp Unit 12 -	Threaded connection - 0.5"	0.0219	10.00	55.97	3.15	0.28
4	3899	Re-Compression: Unit 1 -	Needle valve - 0.5"	0.131	60.00	687.42	18.98	0.28
3	1653	Re-Compressor Building - Re-Comp 2 (WE4C-301-2) (Drain from distance piece to sump)	Distance Piece - 2"	4.364	2000.00	4763.58	522.57	0.28
3	1650	Re-Compressor Building - Re-Comp 2 (WE4C-301-2)	Threaded connection - 0.5"	0.0217	10.00	55.33	2.60	0.28
3	1846	Amine Yard - Near Flare Valve	Gate valve - 8"	0.759	350.00	3971.08	90.89	0.28
3	1246	NGL Bullet 4 - LG3058-A	Gate valve - 0.75"	0.130	60.00	677.57	0.04	0.28
3	1495	Residue Gas/N2 Comp Bldg - Heat Pump 2	Threaded connection - 0.5"	0.0215	10.00	54.87	3.17	0.28
4	3566	Mole Sieve Dehy: Outlet -	Gate valve - 12"	1.276	595.00	6667.97	148.89	0.28
4	3919D	Re-Compression: Unit 3 - FG Line 2	Union - 2"	0.212	100.00	539.46	30.70	0.29
4	3535	North Heat Medium Heater - Pilot	Gate valve - 0.5"	0.126	60.00	658.31	18.24	0.29
3	1111	NRU 3 - Base of Cold Box - Channel Plate	Flange	0.420	200.00	1065.77	50.32	0.29
1	3046	Scrubber (PV-517) -	Gate valve - 1"	0.157	75.00	820.92	18.37	0.29
1	3272	Solar Turbines -	Threaded connection - 2"	0.0314	15.00	79.55	4.52	0.29
2	4281	Compressor Unit # 7 -	Threaded connection - 2"	0.0312	15.00	78.91	4.49	0.29
3	1373	Amine Bldg: Glycol-Gas Outlet Scrubber -	Gate valve - 1.5"	0.156	75.00	810.24	18.62	0.29
3	1293	NGL Bullet 1 - Near A1101N-7	Tubing connection - 0.375"	0.0310	15.00	161.27	0.01	0.29
3	1007	Mole Sieve 5 - On top platform	Threaded connection - 0.75"	0.0206	10.00	52.12	2.47	0.30
3	1345A	Propane Yard: V8-411 - A411N-3	Gate valve - 1"	0.155	75.00	804.57	0.03	0.30
1	3070	Compressor CM-9 -	Threaded connection - 0.75"	0.0206	10.00	52.05	2.40	0.30
3	1436	Residue Gas/N2 Comp Bldg - Heat Pump 1	Valve cover	0.412	200.00	1040.73	60.60	0.30
1	1944	Inlet Header -	Plug valve - 8"	0.617	300.00	3210.61	71.96	0.30
4	3656	Mole Sieve Dehy: Regen Fan/Blower -	Gate valve - 6"	0.503	245.00	2619.00	72.74	0.30

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
2	4171	Cryo skid 101 - expander K101-B	Control valve - 10"	0.934	459.00	2355.68	114.29	0.30
2	4273	Compressor Unit 7 -	Valve cover	0.406	200.00	1023.04	58.53	0.30
3	1079	NRU 3 - A2311N	Open-ended line - 0.5"	0.121	60.00	305.59	14.53	0.30
4	3928	Re-Compression: Unit 4 -	Union - 0.75"	0.101	50.00	254.51	14.62	0.30
3	1276	NGL Bullet 3 - A1101N-24	Gate valve - 0.5"	0.121	60.00	628.22	0.03	0.30
1	3398	EP Skid to Koch -	Pump seal	1.006	500.00	1058.58	1.77	0.30
1	3299	High Pressure JT Expander -	Control valve - 8"	0.710	353.00	1784.75	102.19	0.30
4	3783	Re-Compression: Piping Adjacent to Clark	Gate valve - 2"	0.199	100.00	1031.28	28.73	0.31
3	1869	Residue Gas/N2 Comp Bldg: Res Comp 1 -	Threaded connection - 0.5"	0.0199	75.00	49.85	2.82	0.31
3	1604	IR Compressor Building - IR Comp 2	Threaded connection - 0.5"	0.0198	10.00	49.71	2.37	0.31
2	4318	Compressor Unit # 1 -	Injector	0.394	200.00	2044.60	56.84	0.31
1	1999	Discharge Line (221) -	Gate valve - 8"	0.687	350.00	3562.89	80.21	0.31
2	4078	Sales Piping - on 6" orifice meter	Slide valve	0.147	75.00	761.37	21.18	0.31
2	4313	Compressor Unit # 1 -	Threaded connection - 1"	0.0292	15.00	73.01	4.21	0.31
1	3479	South of Low Press Inlet Compressors -	Gate valve - 1"	0.146	75.00	753.92	20.96	0.31
3	1677	Re-Compressor Building - Re-Comp 5 (Fuel Gas Line)	Threaded connection - 2"	0.0289	15.00	72.19	4.11	0.32
3	1080	Mole Sieve 3 - Ground level	Gate valve - 0.75"	0.115	60.00	595.12	13.78	0.32
2	4343	Residue Gas Suction Scrubber -	Threaded connection - 0.75"	0.0192	10.00	47.70	2.76	0.32
1	1992	Inlet Header -	Tubing connection - 0.25"	0.0287	15.00	148.29	3.35	0.32
2	4349C	C3 Cooler - 3 threaded connections	Threaded connection - 1"	0.0286	15.00	71.23	0.00	0.32
4	3822	Re-Compression: Yard Piping -	Gate valve - 0.5"	0.114	60.00	590.51	16.52	0.32
3	1150	NRU 1 - Base of Hot Box	Threaded connection - 0.25"	0.0190	10.00	47.17	2.27	0.32
4	3710	Sales Gas Header - On 4" orifice meter.	Grease nipple	0.0947	50.00	489.30	13.70	0.32
1	3113	Compressor CM-19 -	Threaded connection - 0.5"	0.0189	10.00	47.05	2.21	0.32
4	3556	TEG Still - Located down low.	Threaded connection - 1"	0.0282	15.00	69.97	4.08	0.32
4	3746	Cryo System: Absorber Tower (20.001) - First platform	Gate valve - 0.75"	0.112	60.00	579.77	0.26	0.32
3	1513	Residue Gas/N2 Comp Bldg: Lower Level - A301N-109	Gate valve - 0.75"	0.112	60.00	578.54	15.94	0.33
1	3240	Solar Turbines: Unit A - On skid	Threaded connection - 1.5"	0.0280	15.00	69.41	4.04	0.33
2	4349A	C3 Cooler -	Threaded connection - 1"	0.0280	15.00	69.20	0.00	0.33
3	1046	Mole Sieve 1 - A2811N-3	Gate valve - 0.5"	0.111	60.00	574.51	13.35	0.33
3	1644	IR Compressor Building - IR Comp 3 (Start Gas) Plug	Threaded connection - 0.5"	0.0186	10.00	45.94	2.64	0.33
4	3504	Regen Heater -	Threaded connection - 0.25"	0.0184	10.00	45.42	2.66	0.33
2	4270	North oil heater -	Threaded connection - 2"	0.0275	15.00	67.90	3.37	0.33
3	1162	NRU 1 - PSV4123-1	Union - 0.75"	0.0916	50.00	226.01	10.97	0.33
4	3643	Sales Gas Header -	Threaded connection - 0.5"	0.0183	10.00	45.18	2.65	0.33
4	3584	Mole Sieve Dehy: Regen Piping -	Gate valve - 1"	0.137	75.00	703.70	15.96	0.33
3	1083	NRU 3 - A411N-78	Threaded connection - 0.5"	0.0182	10.00	44.90	2.18	0.33
2	4026B	Mole Sieve Tower C -	Threaded connection - 1"	0.0273	15.00	67.21	3.34	0.33

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
4	3922A	Re-Compression: Unit 5 - FG Line 2	Threaded connection - 2"	0.0273	15.00	67.15	3.94	0.33
4	3961	Refrigeration Compressors: Unit 3 -	Flange - 1"	0.0905	50.00	222.72	13.09	0.34
1	3035	Discharge to NG PL - In ground.	Threaded connection - 1.5"	0.0269	15.00	66.17	3.14	0.34
2	4349B	C3 Cooler - 3 threaded connections	Threaded connection - 1"	0.0268	15.00	65.60	0.00	0.34
3	1673	Re-Compressor Building - Re-Comp 4 (Fuel Gas Manifold)	Flange - 2"	0.0884	50.00	216.25	12.56	0.34
4	3841	Re-Compression: Yard Piping -	Gate valve - 0.5"	0.106	60.00	542.80	15.31	0.34
4	3578	Mole Sieve Dehy: Dehy Tower A -	Gate valve - 0.5"	0.106	60.00	541.26	12.33	0.35
2	3996	Inlet Line - PECO brand	Pressure transmitter - 1.5"	0.132	75.00	676.52	16.15	0.35
2	4383	Compressor Unit # 6 -	Valve cover	0.352	200.00	859.75	50.72	0.35
1	3185	Refrig Comp Unit 10 -	Open-ended line - 0.25"	0.105	60.00	255.58	0.00	0.35
1	3251	Solar Turbines -	Gate valve - 2"	0.175	100.00	893.59	25.13	0.35
3	1185	NRU 3 - Top Platform - A2354N	Gate valve - 10"	0.866	500.00	4429.62	103.70	0.35
2	4361	Residue Gas Suction Scrubber -	Threaded connection - 0.5"	0.0173	10.00	42.16	2.50	0.35
4	3587	Mole Sieve Dehy: Regen Piping -	Gate valve - 1"	0.130	75.00	664.14	15.15	0.35
3	1685	Re-Compressor Building - Re-Comp 3 (Fuel Gas Line)	Ball valve - 2"	0.173	100.00	884.25	24.57	0.35
3	1732	HHE Compressor Building - Comp HHE 8	Threaded connection - 0.5"	0.0172	10.00	41.86	2.06	0.35
3	1672	Re-Compressor Building - Re-Comp 4 (Fuel Gas Line) Diaphragm	Regulator - 2"	0.300	175.00	1903.60	42.69	0.35
1	3127	Compressor CM-14 - On governor	Flange - 2"	0.0852	50.00	206.68	9.94	0.36
4	3605	Yard North of Office - Orifice meter equalizer	Valve - 1"	0.128	75.00	652.07	18.47	0.36
3	1612	IR Compressor Building - IR Comp 1	Threaded connection - 0.5"	0.0170	10.00	41.23	2.04	0.36
3	1104	NRU 3 - Hot Box - PV4169	Control valve	0.948	560.00	2294.26	113.48	0.36
1	3061	HP Cooler -	Gate valve - 0.75"	0.101	60.00	516.70	11.82	0.36
3	1358	Amine Bldg: Near V8-2701N - (stem and seat)	Gate valve - 0.5"	0.101	60.00	513.25	12.06	0.36
4	3818	Re-Compression: Yard Piping - Connection on regulator	Threaded connection - 2"	0.0252	15.00	60.75	3.64	0.36
1	3041	Lone Star Line -	Gate valve - 10"	0.837	500.00	4265.87	97.70	0.36
2	4294	Compressor Yard - common suction line	Gate valve - 10"	0.837	500.00	4263.19	120.61	0.36
4	3709	Sales Gas Header -	Orifice meter plate - 4"	0.250	150.00	237.91	36.19	0.36
2	4373	Compressor Unit # 6 -	Threaded connection - 1"	0.0249	15.00	60.15	3.60	0.37
3	1331	Propane Yard: V8-411 (On Platform) - Near N2907N-4	Tubing connection - 0.5"	0.0248	15.00	126.44	0.00	0.37
2	4385	Compressor fuel gas scrubber -	Tubing connection - 0.25"	0.0247	15.00	125.67	3.56	0.37
1	3331	Mole Sieve Tower 511C -	Gate valve - 0.75"	0.0986	60.00	501.42	11.51	0.37
4	3884	Refrigeration Compression: Outside Yard Piping - Main fuel line orifice meter	Tubing connection - 0.375"	0.0247	15.00	125.35	3.56	0.37
1	3454	Refrig Comp Unit 12 -	Open-ended line - 0.5"	0.0984	60.00	236.48	0.00	0.37
4	3565	Mole Sieve Dehy: Outlet -	Gate valve - 12"	0.976	595.00	4960.61	113.89	0.37
3	1928	Dehydration Tower # 1 west - B2802N-1	Ball valve - 1"	0.123	75.00	624.72	14.72	0.37
1	3448	Refrig Comp Unit 12 -	Threaded connection - 0.5"	0.0163	10.00	39.17	0.00	0.37
4	3935	Re-Compression: Unit 4 - FG Line 4	Plug valve - 2"	0.195	120.00	991.27	28.22	0.37
4	3766	C3 Refrigeration: Compressors - Discharge bottle (gate valve seat)	Threaded connection - 0.75"	0.0162	10.00	38.81	0.00	0.38

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
2	4179	Cryo skid 101 -	Tubing connection - 0.375"	0.0243	15.00	123.27	2.97	0.38
1	---	EP Skid to Koch -	Tubing connection - 0.375"	0.0242	15.00	123.02	0.04	0.38
3	1929	Dehydration Tower # 1 west - near B2802N-3	Gate valve - 0.75"	0.0969	60.00	491.46	11.60	0.38
2	4129	Mole Sieve Tower B - from body	Ball valve - 2"	0.161	100.00	816.35	19.69	0.38
1	3343	Mole Sieve Tower 511A -	Flange - 2"	0.0804	50.00	192.18	9.38	0.38
3	1343	Amine Bldg: Near V8-2810N - A2809N-2	Flange - 18"	0.320	200.00	764.50	38.35	0.38
4	3702	Sales Gas Header - Gate valve seat	Open-ended line - 1"	0.120	75.00	286.64	17.36	0.38
2	4125	Mole Sieve Tower B -	Threaded connection - 0.25"	0.0160	10.00	38.19	1.96	0.38
4	3625A	Yard North of Office - On orifice meter	Gate valve - 0.5"	0.0957	60.00	484.59	11.16	0.38
2	4381	Compressor Unit # 6 -	Cylinder end - flange	0.637	400.00	587.71	91.87	0.38
4	3588	Mole Sieve Dehy: Regen Piping -	Gate valve - 1"	0.119	75.00	602.94	13.90	0.38
1	3400	Cold Gas Separator (PV-505) -	Gate valve - 3"	0.190	120.00	960.63	22.15	0.38
4	3625B	Yard North of Office - On orifice meter (gate valve seat)	Open-ended line - 0.5"	0.0949	60.00	225.84	11.07	0.38
4	3637	Sales Gas Header -	Orifice meter plate - 10"	0.237	150.00	217.52	34.28	0.39
3	1141	NRU 2 - A415N-51	Threaded connection - 0.75"	0.0158	10.00	37.59	1.89	0.39
3	1614	IR Compressor Building - IR Comp 3	Threaded connection - 0.5"	0.0158	10.00	37.58	1.89	0.39
3	1351	Process Heater - B2803N-20 (E028005A)	Ball valve - 1"	0.118	75.00	598.18	16.81	0.39
2	4245	Compressor Unit 3 -	Flange - 1"	0.0788	50.00	187.32	11.36	0.39
2	4210	Compressor Unit 3 - on 3-Way 4211	Three-way valve vent - 0.5"	0.0944	60.00	477.37	13.61	0.39
4	3987	Mole Sieve Dehy: Coalescing Filter Separator - Gate valve seat	Threaded connection - 1"	0.0235	15.00	55.92	2.75	0.39
3	1294	NGL Bullet 1 - Near A1101N-8	Gate valve - 0.75"	0.0942	60.00	476.09	0.03	0.39
2	4028C	Mole Sieve Tower C -	Threaded connection - 1"	0.0235	15.00	55.90	2.88	0.39
4	3564	Mole Sieve Dehy: Outlet -	Gate valve - 0.75"	0.0932	60.00	470.41	10.87	0.39
3	1432	Residue Gas/N2 Comp Bldg - Heat Pump 1	Cylinder end - flange	0.618	400.00	558.56	90.99	0.39
3	1851	Co-Gen Building: Fuel Gas Scrubber (SW Corner of Bldg) - Plug on GTV	Threaded connection - 1"	0.0232	15.00	54.82	3.29	0.39
2	4263	Compressor Unit # 5 -	Threaded connection - 1.5"	0.0231	15.00	54.44	3.32	0.40
1	3402	Mole Sieve Tower 511B -	Flange - 2"	0.0768	50.00	181.21	8.96	0.40
1	3432	EP Skid to Koch -	Threaded connection - 0.5"	0.0152	10.00	35.88	0.03	0.40
3	1142	NRU 2 - A415N-62	Gate valve - 0.75"	0.0912	60.00	459.29	10.92	0.40
3	1619	IR Compressor Building - IR Comp 1 (Fuel Gas)	Union - 2"	0.152	100.00	357.82	21.60	0.40
1	3291	High Pressure JT Expander -	Gate valve - 4"	0.288	190.00	1446.74	41.40	0.40
3	1860	Residue Gas/N2 Comp Bldg: Heat Pump 4 -	Threaded connection - 0.5"	0.0150	10.00	35.28	2.21	0.40
3	1274	NGL Bullet 3 - A1101N-1	Gate valve - 3"	0.180	120.00	903.05	0.05	0.41
1	3312	Dust Filters for Regen Gas -	Gate valve - 0.75"	0.0890	60.00	446.50	10.38	0.41
2	4157	Residue Compressors FG Scrubber - sight glass	Gate valve - 0.75"	0.0887	60.00	444.68	12.78	0.41
3	1638	Re-Compressor Building - Re-Comp 1 (WE4C-301-1)	Threaded connection - 0.5"	0.0147	10.00	34.39	1.76	0.41
3	1582	HP1 Bldg: E28-06 - B211-1 (BV seat).	Threaded connection - 0.5"	0.0147	10.00	34.38	1.76	0.41
3	1483	Residue Gas/N2 Comp Bldg: Back Wall - A301N-6	Threaded connection - 0.75"	0.0147	10.00	34.33	2.09	0.41
4	3839	Re-Compression: Yard Piping -	Gate valve - 2"	0.147	100.00	737.26	21.26	0.41
4	3507	Regen Heater -	Gate valve - 1"	0.110	75.00	552.05	15.93	0.41

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1893	Hg Removal Bed V8-401-3 - on A401N-20 (not plug)	Threaded connection - 0.75"	0.0146	60.00	34.00	1.75	0.42
3	1641	IR Compressor Building - IR Comp 3	Threaded connection - 0.5"	0.0146	10.00	33.93	1.75	0.42
3	---	High Pressure Process Flare	Installation of vapour recovery unit	175.397	100000.00	428293.56	4829.39	0.42
2	4059	Scrubber -	Threaded connection - 0.5"	0.0144	10.00	33.47	1.77	0.42
1	1978	Inlet Header -	Gate valve - 0.75"	0.0861	60.00	430.31	10.05	0.42
3	1413	Residue Gas/N2 Comp Bldg - Comp 1	Gate valve - 0.75"	0.0856	60.00	427.49	12.17	0.43
1	3064	HP Cooler - Bonnet	Plug valve - 8"	0.428	300.00	2134.86	49.91	0.43
4	3863	Re-Compression: Unit 3 -	Variable volume pocket stem	0.570	400.00	482.92	82.36	0.43
4	3796	Re-Compression: Unit 5 -	Valve cover	0.285	200.00	657.60	41.17	0.43
2	4198	Compressor Unit # 3 -	Variable volume pocket stem	0.569	400.00	481.59	82.00	0.43
4	3720	Cryo System: De-methanizer Tower (1st Platform) -	Gate valve - 0.75"	0.0851	60.00	424.63	0.20	0.43
3	1192	NRU 1 - MA050-01	Block valve - 10"	0.708	500.00	3532.38	84.82	0.43
2	Direct	Compressor Unit # 4 -	Compressor seals vent - 2"	2.813	2000.00	2359.09	399.02	0.43
2	4113	After Filter -	Gate valve - 6"	0.341	245.00	1693.98	41.66	0.44
1	1982	Inlet Header -	Gate valve - 0.75"	0.0834	60.00	414.59	9.73	0.44
1	3335	Mole Sieve Tower 511C -	Flange - 2"	0.0694	50.00	158.90	8.09	0.44
3	1123	NRU 2 - Top Platform - A2333N	Gate valve - 0.5"	0.0831	60.00	412.94	9.95	0.44
3	1625	IR Compressor Building - IR Comp 3	Threaded connection - 0.5"	0.0138	10.00	31.49	1.65	0.44
1	3200	Solar Turbines: Unit A - Chart recorder	Tubing connection - 0.375"	0.0206	15.00	102.42	2.97	0.44
1	3121	Compressor CM-19 -	Threaded connection - 2"	0.0205	15.00	46.83	2.40	0.44
2	4350A	C3 Cooler -	Threaded connection - 1"	0.0205	15.00	46.79	0.00	0.45
1	3022	Fuel Gas Scrubber (West Yard) - Gate valve seat (PV-9)	Threaded connection - 0.75"	0.0136	10.00	30.97	1.96	0.45
1	3353	Low Pressure JT Expander -	Gate valve - 12"	0.806	595.00	3995.86	116.11	0.45
4	3694B	Cryo System: Chiller Outlet Separator - Stem packing	Gate valve - 0.75"	0.0808	60.00	400.04	0.19	0.45
3	1426	Residue Gas/N2 Comp Bldg - Comp 2	Cylinder end - flange	0.536	400.00	430.33	76.15	0.45
4	3798	Re-Compression: Unit 5 - Cylinder No. 2	Distance piece	2.668	2000.00	2134.25	385.67	0.46
3	1160	NRU 1 - Top Platform - C2302N	Gate valve - 3"	0.159	120.00	784.04	19.02	0.46
4	3569	Mole Sieve Dehy: Common Line -	Gate valve - 2"	0.132	100.00	652.45	15.43	0.46
1	3175	Solar Turbines: Unit B - On skid	Gate valve - 2"	0.132	100.00	649.06	18.94	0.46
3	1319	Propane Yard: V8-411 - A411N-4	Gate valve - 16"	1.208	920.00	5955.82	0.23	0.46
3	1121	NRU 2 - Near TB0396	Union - 1"	0.131	100.00	294.20	15.67	0.47
2	4244	Compressor Unit 3 -	Flange - 1"	0.0649	50.00	145.61	9.36	0.47
1	3459	Refrig Comp Unit 12 - Crank case vent	Crank case vent - 2"	2.589	2000.00	2012.37	0.00	0.47
1	3328	Mole Sieve Tower 511B - Gate valve seat	Threaded connection - 0.75"	0.0129	10.00	28.94	1.51	0.47
3	1014	Mole Sieve Header - XY2821NC	Flange - 8"	0.129	100.00	287.26	15.40	0.47
1	3393	De-ethanizer Tower -	Threaded connection - 0.75"	0.0128	10.00	28.60	0.02	0.47
1	3350	Mole Sieve Tower 511B -	Gate valve - 0.75"	0.0767	60.00	376.69	8.95	0.48
2	4325	Compressor Unit # 1 -	Threaded connection - 0.25"	0.0128	10.00	28.44	1.84	0.48
2	4026A	Mole Sieve Tower C -	Threaded connection - 1"	0.0191	15.00	42.51	2.34	0.48
4	3553	Glycol Reboiler: Fuel Gas -	Gate valve - 0.5"	0.0764	60.00	374.69	11.04	0.48
2	Direct	Compressor Unit # 1 -	Compressor seals vent - 2"	2.542	2000.00	1940.10	360.67	0.48

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1457	Residue Gas/N2 Comp Bldg: Heat Pump 4	Valve cover	0.254	200.00	563.63	37.30	0.48
2	Direct	Compressor Unit # 8 -	Compressor seals vent - 2"	2.526	2000.00	1914.39	358.32	0.48
1	3179	Solar Turbines: Unit B - On skid	Gate valve - 1.5"	0.0946	75.00	463.58	13.62	0.48
4	Direct	Generator 1 -	Crank case vent - 3"	2.520	2000.00	1906.12	364.39	0.48
3	1686	Re-Compressor Building - Re-Comp 5	Crank case vent - 2"	2.501	2000.00	1876.07	299.48	0.49
3	1725	HHE Compressor Building - Comp HHE 7	Threaded connection - 0.5"	0.0125	10.00	27.59	1.49	0.49
4	3577	Mole Sieve Dehy: Dehy Tower A -	Gate valve - 1.5"	0.0933	75.00	456.36	10.89	0.49
2	4279	Compressor Unit # 7 -	Threaded connection - 2"	0.0186	15.00	41.11	2.69	0.49
1	3045	Scrubber (PV-517) -	Gate valve - 0.75"	0.0742	60.00	362.46	8.66	0.49
4	3663	Cryo System: Warm Gas Exchanger -	Gate valve - 6"	0.302	245.00	1475.77	0.70	0.49
4	3901	Re-Compression: Unit 1 -	Distance piece	2.461	2000.00	1814.27	355.82	0.49
1	3033	Fuel Gas to Mansfield (222) -	Orbit valve - 3"	0.148	120.00	720.44	17.23	0.49
4	3502	Regen Heater -	Gate valve - 1.5"	0.0920	75.00	448.80	13.30	0.50
2	4324	Compressor Unit # 1 -	Needle valve - 0.25"	0.0736	60.00	358.86	10.61	0.50
3	1307	NGL Bullet 1 - LG1101-A	Gate valve - 0.75"	0.0725	60.00	352.73	0.02	0.50
2	4283	Compressor Unit 5 - VVP Stem same cylinder as 4282	Cylinder end - flange - 1"	0.483	400.00	348.96	69.66	0.50
3	1926	Dehydration Tower # 1 west - on pdi 2802N-1	Tubing connection - 0.375"	0.0180	15.00	87.40	2.15	0.51
4	3534	Heat Medium Fuel Gas Header - Stem	Needle valve - 0.5"	0.0719	60.00	349.03	10.39	0.51
3	1289	NGL Bullet 2 - A1101N-16	Gate valve - 0.75"	0.0718	60.00	348.68	0.02	0.51
3	1122	NRU 2 - ColdBox (Bottom on PSV485)	Threaded connection - 0.75"	0.0119	10.00	25.70	1.42	0.51
3	1736	HHE Compressor Building - Comp HHE 8	Threaded connection - 0.5"	0.0119	10.00	25.70	1.42	0.51
3	1127	NRU 2 - Base of Cold Box	Threaded connection - 0.25"	0.0118	10.00	25.55	1.41	0.52
2	4357	Compressor Yard - Centre Residue Gas Cooler -	Gate valve - 3"	0.140	120.00	679.11	20.24	0.52
3	1816	Stab 1 Building (Yard) - (NGL Vessel)	Threaded connection - 0.375"	0.0117	10.00	25.14	0.02	0.52
1	3019	To Fuel Gas Scrubber (PV-9) -	Gate valve - 3"	0.140	120.00	676.06	20.13	0.52
2	4108	After filter on mole sieves -	Threaded connection - 2"	0.0175	15.00	37.60	2.14	0.52
1	3286	HP Expander Scrubber (PV-503) -	Threaded connection - 0.75"	0.0115	10.00	24.79	1.66	0.53
3	1135	NRU 3 - Top Platform - A2361N	Threaded connection - 0.375"	0.0115	10.00	24.78	1.38	0.53
3	1375	Amine Bldg: Near Glycol-Gas Outlet Scrubber - A-2809N-2	Gate valve - 8"	0.404	350.00	1950.06	48.38	0.53
4	3946A	Re-Compression: Unit 1 - FG Line 5	Threaded connection - 2"	0.0173	15.00	37.06	2.50	0.53
3	1887	FG Piping on RES/N2/Heat Pump Bldg (outside) - A2400N-1	Gate valve - 3"	0.138	120.00	663.52	19.56	0.53
3	1679	IR Compressor Building - East Lobe Lift Comp (E4-322)	Crank case vent - 2"	2.287	2000.00	1543.88	273.81	0.53
2	4170	Cryo skid north - Note: was fixed already on expander	Threaded connection - 0.5"	0.0114	10.00	24.42	1.40	0.53
1	3238	Solar Turbines: Unit A - On skid	Gate valve - 1.5"	0.0851	75.00	409.34	12.25	0.54
2	4181	Cryo skid 101 -	Butterfly valve - 8"	0.794	700.00	1691.08	114.43	0.54
4	3860	Re-Compression: Unit 3 -	Threaded connection - 0.5"	0.0113	10.00	24.10	1.64	0.54
2	4253	Compressor Unit 4 -	Valve cover	0.225	200.00	477.87	32.44	0.54
4	3544	North Heat Medium Heater - Pilot stem	Gate valve - 0.5"	0.0673	60.00	322.90	9.72	0.54
3	1919	Hg Removal Bed V8-401-1 - near A401N-3	Flange - 3"	0.0839	75.00	177.62	10.04	0.54
3	1161	NRU 1 - Near A2517N (Gate valve seat).	Open-ended line - 0.75"	0.0669	60.00	141.53	8.01	0.55

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
1	Direct	Mole Sieve - Regen Gas Re-Compressor - Compressor seal vent	Compressor seals vent - 0.5"	2.219	2000.00	1438.55	308.07	0.55
4	---	Process Flare Line	Installation of vapour recovery unit	121.144	100000.00	93481.14	3335.58	0.55
1	3284	HP Expander Scrubber (PV-503) -	Gate valve - 1"	0.0828	75.00	396.43	11.92	0.55
1	3137	Compressor CM-14 - Distance piece drain	Distance piece drain - 0.75"	2.194	2000.00	1400.76	256.05	0.55
3	1585	HP1 Bldg: W20-09 - (NV seat).	Threaded connection - 0.25"	0.0108	10.00	22.67	1.30	0.56
2	4012	Mole Sieve Tower A -	Threaded connection - 1"	0.0162	15.00	33.75	1.98	0.56
4	Direct	Generator 2 -	Crank case vent - 3"	2.154	2000.00	1338.40	311.43	0.57
3	1110	NRU 3 - Base of Cold Box	Block valve - 10"	0.537	500.00	2558.04	64.33	0.57
3	1303	Propane Yard - PV458N	Control valve - globe - 6"	0.300	282.00	621.24	0.06	0.57
1	1974	Inlet Comp Yard Piping -	Plug valve - 8"	0.318	300.00	1510.14	37.11	0.57
2	4374	Compressor Unit # 6 -	Threaded connection - 2"	0.0158	15.00	32.63	2.28	0.58
3	1131	NRU 1 - A411N-17	Threaded connection - 0.5"	0.0105	10.00	21.72	1.26	0.58
4	3940A	Re-Compression: Unit 2 - FG Line 5	Threaded connection - 2"	0.0158	15.00	32.54	2.28	0.58
2	4135	Gas-Gas Exchanger -	Gate valve - 16"	0.950	920.00	4488.19	116.19	0.59
3	1224	Propane Storage Tank V6-290 - A2901N-87	Threaded connection - 0.5"	0.0103	10.00	21.10	0.00	0.59
1	3067	Compressor CM-9 -	Threaded connection - 0.5"	0.0103	10.00	21.04	1.20	0.59
3	1193	NRU 1 - to Expander	JT valve - 10"	0.515	500.00	2432.83	61.69	0.59
2	4276	Compressor Unit 7 -	Cylinder end - flange	0.412	400.00	238.41	59.38	0.59
3	1035	Mole Sieve Header - A2811N-29	Gate valve - 1"	0.0771	75.00	363.84	9.23	0.59
1	3304	Dust Filter Header -	Tubing connection - 0.375"	0.0153	15.00	72.36	1.79	0.60
3	1146	NRU 2 - 2nd Platform - G413N-17	Gate valve - 0.75"	0.0613	60.00	289.21	7.35	0.60
1	3105	Compressor CM-9 -	Filter cover - 6"	0.0510	50.00	103.69	5.95	0.60
3	1917	Hg Removal Bed V8-401-1 - near A401N-4	Flange - 3"	0.0763	75.00	154.82	9.14	0.60
3	1309	NGL Bullet 1 - A1101N-5	Gate valve - 0.75"	0.0610	60.00	287.46	0.02	0.60
2	4247	Compressor Unit 3 -	Threaded connection - 1"	0.0152	15.00	30.88	2.20	0.60
2	4130	Mole Sieve Tower C - needle valve seat	Threaded connection - 0.5"	0.0101	10.00	20.54	1.24	0.60
1	3326	Mole Sieve Tower 511A - Gate valve seat	Threaded connection - 0.75"	0.0101	10.00	20.52	1.18	0.60
3	1033	Mole Sieve 5 - Ground level	Threaded connection - 4"	0.0253	25.00	51.23	3.03	0.60
3	1923	Hg Removal Bed V8-401-3 - NV seat off A401N-15	Open-ended line - 0.25"	0.0606	60.00	122.64	7.26	0.60
3	1318	Propane Yard: V8-411 - G411N-1	Gate valve - 2"	0.101	100.00	474.94	0.02	0.60
4	3487	Inlet Yard Piping: Pig Traps -	Pig trap cover - 16"	0.151	150.00	304.30	18.30	0.61
2	4272	Compressor Unit 7 -	Valve cover	0.201	200.00	404.48	28.93	0.61
2	4058	Scrubber -	Threaded connection - 0.5"	0.0100	10.00	20.21	1.23	0.61
4	3813	Re-Compression: Yard Piping -	Gate valve - 3"	0.120	120.00	561.82	17.32	0.61
1	3344	Mole Sieve Tower 511A -	Flange - 2"	0.0497	50.00	99.75	5.80	0.61
3	1139B	NRU 2 - A2306N	Threaded connection - 0.375"	0.0099	10.00	19.90	1.19	0.61
3	1208	NGL Sales Line - Methanol Injection Point	Threaded connection - 2"	0.0149	15.00	29.83	0.00	0.61
4	3545	North Heat Medium Heater - Pilot stem	Gate valve - 0.5"	0.0591	60.00	276.48	8.55	0.62
4	3890	Re-Compression: Inlet Scrubber - Sight glass	Gate valve - 0.75"	0.0591	60.00	276.48	8.55	0.62

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1554	HP1 Bldg: E26-13 - To drain.	Open-ended line - 0.375"	0.0590	60.00	117.64	7.06	0.62
4	3895	Re-Compression: Unit 1 -	Open-ended line - 0.5"	0.0584	60.00	116.00	8.45	0.63
1	3342	Mole Sieve Tower 511A -	Flange - 8"	0.0973	100.00	192.95	11.35	0.63
2	4028B	Mole Sieve Tower C -	Threaded connection - 1"	0.0146	15.00	28.93	1.78	0.63
4	3852	Re-Compression: Unit 4 -	Valve cover	0.194	200.00	383.18	27.99	0.63
2	4109	After Filter -	Threaded connection - 1"	0.0145	15.00	28.63	1.77	0.63
4	3948A	Re-Compression: Unit 1 - FG Line 2	Threaded connection - 2"	0.0145	15.00	28.61	2.09	0.63
3	1055	Mole Sieve Header - PDISH-2867N	Tubing connection - 0.375"	0.0145	15.00	67.40	1.73	0.63
1	3435	EP Skid to Koch -	Threaded connection - 0.75"	0.0096	10.00	19.05	0.02	0.63
4	3917A	Re-Compression: Unit 5 - FG Line 3	Threaded connection - 2"	0.0144	15.00	28.47	2.09	0.63
2	4035A	Mole Sieve Tower C - Both sides of gate valve 4036	Threaded connection - 1"	0.0144	15.00	28.37	1.76	0.63
4	3763	Cryo System: Economizer -	Gate valve - 0.75"	0.0575	60.00	267.12	0.13	0.64
4	3942D	Re-Compression: Unit 2 - FG Line 1	Union - 2"	0.0958	100.00	188.40	13.84	0.64
4	Direct	Generator 3 -	Crank case vent - 3"	1.914	2000.00	966.18	276.71	0.64
1	3313	Dust Filters for Regen Gas -	Threaded connection - 0.5"	0.0096	10.00	18.81	1.12	0.64
3	Direct	Comp 8 HHE -	Blowdown Stack - 14"	4.761	5000.00	2379.30	570.15	0.64
3	1354	Amine Bldg: GB-2702N12A - A2792N-54	Threaded connection - 0.5"	0.0095	10.00	18.57	1.14	0.64
2	4075	Sales Piping - on 6" orifice meter	Rack	0.0707	75.00	327.59	10.19	0.65
3	Direct	Heat Pump 4 -	Compressor Seals (8) - 4"	1.882	2000.00	917.55	276.94	0.65
1	3366	Inlet Gas Scrubber (PV-501) -	Gate valve - 1"	0.0705	75.00	326.37	8.23	0.65
2	4087	Common inlet lines - gate valve seat (behind chart recorder bldg.)	Open-ended line - 0.375"	0.0563	60.00	109.45	6.88	0.65
1	3310	Dust Filters for Regen Gas -	Filter cover - 18"	0.140	150.00	272.83	16.38	0.65
3	1844	Co-Gen Building: Outside (CA 625 - HP FG Scrubber) - Above VG-127	Gate valve - 0.5"	0.0561	60.00	259.36	7.97	0.65
2	4336	Make-up Gas Suction Scrubber - sight glass	Gate valve - 0.75"	0.0560	60.00	259.03	8.08	0.65
1	3066	Compressor CM-9 - Needle valve seat	Threaded connection - 0.75"	0.0093	10.00	18.08	1.09	0.65
1	3221	De-methanizer -	Gate valve - 0.75"	0.0557	60.00	256.92	8.02	0.66
3	1660	Re-Compressor Building - Re-Comp 2	Crank case vent - 2"	1.851	2000.00	868.85	221.66	0.66
2	4174B	Cryo skid 101 - expander K101-B on gate valve	Threaded connection - 0.5"	0.0092	10.00	17.83	1.13	0.66
3	1796	Fuel Gas Scrubber (V8-1720) - A1720-7	Gate valve - 1"	0.0689	75.00	317.43	9.80	0.66
2	4071	Sales Piping - on 8" plug valve	Grease nipple	0.0456	50.00	209.77	6.58	0.67
2	4150	Compressor Unit 2 Outside -	Threaded connection - 2"	0.0137	15.00	26.18	1.97	0.67
4	3731	Cryo System: De-methanizer Side Reboiler - Gate valve seat	Open-ended line - 0.75"	0.0545	60.00	104.08	0.13	0.67
3	1387	Regen Gas Heater 5 - Near RKJ-258	Tubing connection - 0.375"	0.0136	15.00	62.49	1.93	0.67
1	3436	EP Skid to Koch -	Gate valve - 0.75"	0.0544	60.00	249.58	0.10	0.67
4	3825	Re-Compression: Yard Piping - Stem packing	Plug valve - 4"	0.181	200.00	831.89	26.21	0.67
4	3921B	Re-Compression: Unit 3 - FG Line 1	Plug valve - 2"	0.108	120.00	496.64	15.66	0.67
4	3581	Mole Sieve Dehy: Regen Piping -	Gate valve - 1"	0.0673	75.00	308.26	7.86	0.68
3	1151	NRU 1 - Base of Hot Box	Tubing connection - 0.25"	0.0135	15.00	61.60	1.61	0.68

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
4	3922B	Re-Compression: Unit 5 - FG Line 2	Plug valve - 2"	0.107	120.00	490.76	15.51	0.68
2	4264	Compressor Unit # 5 -	Threaded connection - 1.5"	0.0134	15.00	25.27	1.93	0.68
1	3072	Fuel Gas Scrubber (West Yard) - PV-9	Threaded connection - 1"	0.0134	15.00	25.25	1.92	0.68
4	3522	South Heat Medium Heater - Pilot	Gate valve - 0.5"	0.0534	60.00	243.99	7.72	0.68
1	3266	Solar Turbines -	Gate valve - 1"	0.0666	75.00	304.25	9.59	0.69
4	3905	Re-Compression: Unit 2 - Bonnet	Plug valve - 3"	0.133	150.00	606.27	19.21	0.69
1	3314	Dust Filters for Regen Gas -	Gate valve - 3"	0.106	120.00	484.04	12.38	0.69
4	3803	Re-Compression: Yard Piping -	Gate valve - 1"	0.0663	75.00	302.30	9.58	0.69
2	4246	Compressor Unit 3 -	Injector - 1"	0.176	200.00	801.11	25.35	0.69
3	1386	Amine Bldg: Near V8-2701N-11 -	Gate valve - 0.5"	0.0525	60.00	239.03	6.29	0.70
4	3957	Refrigeration Compressors: Unit 3 - On governor	Flange - 2"	0.0437	50.00	81.61	6.32	0.70
4	3910B	Re-Compression: Unit 3 - FG Line 6	Plug valve - 2"	0.104	120.00	469.49	14.97	0.71
3	1750	Residue Gas/N2 Comp Bldg - Comp 4 - crank case vent	Crank case vent - 2"	1.720	2000.00	665.56	244.45	0.71
3	1865	Residue Gas/N2 Comp Bldg: Heat Pump 1 -	Threaded connection - 0.5"	0.0086	10.00	15.88	1.26	0.71
1	3257	Solar Turbines -	Gate valve - 1"	0.0644	75.00	291.70	9.27	0.71
1	3330	Mole Sieve Tower 511C -	Open-ended line - 0.25"	0.0515	60.00	95.20	6.01	0.71
4	3570	Mole Sieve Dehy: Dehy Tower B - Regen Gas	Flange - 4"	0.0643	75.00	118.58	7.50	0.71
4	3670	Cryo System: Chart Recorder -	Tubing connection - 0.5"	0.0128	15.00	57.97	0.03	0.71
2	4054	Inlet Scrubber - horn	Pressure relief valve - 4"	0.183	214.00	336.27	22.34	0.71
3	1145	NRU 2 - A491N-8	Gate valve - 1"	0.0640	75.00	289.08	7.66	0.71
3	1819	Stab 1 Building (Yard) - A410N-7 (NGL Vessel)	Gate valve - 0.75"	0.0510	60.00	230.18	0.11	0.72
1	3333	Mole Sieve Tower 511C -	Flange - 8"	0.0845	100.00	154.36	9.85	0.72
3	Direct	Comp 8 HHE - 4 seals connected.	Seal Drains - 2"	1.689	2000.00	617.55	202.24	0.72
4	3593	Mole Sieve Dehy: Dehy Train A - Top of dehy tower	Flange - 18"	0.169	200.00	308.40	19.70	0.72
2	4022	Mole Sieve Tower C -	Control valve - orbit - 4"	0.148	177.00	268.21	18.08	0.73
3	1408	Residue Gas/N2 Comp Bldg: Yard -	Open-ended line - 2"	0.0835	100.00	151.48	11.87	0.73
3	1458	Residue Gas/N2 Comp Bldg: Heat Pump 4	Valve cover	0.166	200.00	300.85	24.46	0.73
3	1557	Residue Gas/N2 Comp Bldg - Heat Pump 3	Valve cover	0.166	200.00	300.55	0.03	0.73
2	4349F	C3 Cooler -	Threaded connection - 1"	0.0124	15.00	22.37	0.00	0.74
1	3466	Refrig Comp Unit 12 -	Threaded connection - 2"	0.0124	15.00	22.33	1.78	0.74
4	3912	Re-Compression: Unit 4 - FG Line 5	Plug valve - 2"	0.0985	120.00	440.88	14.25	0.74
1	3356	Mole Sieve: Inlet Separator (PV-501) - Sight glass valve	Gate valve - 0.75"	0.0492	60.00	220.30	5.75	0.74
1	3283	HP Expander Scrubber (PV-503) -	Gate valve - 1"	0.0614	75.00	274.70	8.84	0.74
4	3529	South Heat Medium Heater - Pilot	Gate valve - 0.5"	0.0491	60.00	219.57	7.10	0.74
4	3575	Mole Sieve Dehy: Dehy Tower A/B -	Union - 0.5"	0.0409	50.00	73.17	4.77	0.74
4	3616	Yard North of Office -	Tubing connection - 0.375"	0.0122	15.00	54.27	1.76	0.75
1	1991	Inlet Header -	Threaded connection - 0.5"	0.0081	10.00	14.41	0.95	0.75
2	4202	Residue Compressors FG Scrubber -	Threaded connection - 0.75"	0.0081	10.00	14.35	1.17	0.75
3	1608	IR Compressor Building - IR Comp 2 (Fuel Gas)	Threaded connection - 2"	0.0121	15.00	21.50	1.72	0.75
2	4117	Skid 2 Inlet -	Gate valve - 6"	0.198	245.00	879.93	24.17	0.75
1	3465	Refrig Comp Unit 12 -	Valve - 1.5"	0.0605	75.00	269.27	8.71	0.75

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
1	3231	Solar Turbines: Unit B - On skid	Union - 1.5"	0.0806	100.00	142.78	11.61	0.76
1	3059	Lone Star Line - T's on flapper	Check valve - 8"	0.220	275.00	977.22	25.67	0.76
3	1546	Residue Gas/N2 Comp Bldg - Heat Pump 2	Valve cover	0.160	200.00	281.00	23.49	0.76
3	1281	NGL Bullet 3 - LG1122NA	Gate valve - 0.75"	0.0478	60.00	212.34	0.01	0.76
1	3101	Compressor CM-9 -	Threaded connection - 0.25"	0.0079	10.00	13.93	0.93	0.77
4	3489	WADD Flash Tank -	Control valve - globe - 4"	0.140	177.00	245.71	17.03	0.77
3	Direct	Re-Comp 4 (E03400-4A) - 4 Seal Drains (Comp 4 & Comp 5)	Compressor Seal Drains - 2"	1.584	2000.00	454.48	189.64	0.77
3	1195	NRU Expander 1 -	Threaded connection - 0.375"	0.0079	10.00	13.80	0.95	0.77
3	1144	NRU 2 - Plug on GTV A415N-36	Threaded connection - 1"	0.0118	15.00	20.58	1.41	0.77
2	4013	After Filter -	Flange - 8"	0.0785	100.00	136.49	9.60	0.78
4	3705	Sales Gas Header - Analyzer blowdown	Orbit valve - 6"	0.192	245.00	849.72	27.80	0.78
4	3877	Generators - Outside under walkway on orifice meter.	Union - 2"	0.0781	100.00	135.17	11.29	0.78
2	4347	Compressor Yard - Near Engine/Heater Fuel ESD -	Plug valve - 2"	0.0936	120.00	412.68	13.49	0.78
1	1970	Inlet Comp Yard Piping -	Flange - 4"	0.0583	75.00	100.64	6.80	0.78
1	3345	Mole Sieve Tower 511A -	Gate valve - 0.75"	0.0466	60.00	205.09	5.43	0.78
4	3739	Cryo System: Absorber Bottoms Pumps - Gate valve seat	Open-ended line - 0.5"	0.0465	60.00	80.11	0.11	0.79
3	1398	Residue Gas/N2 Comp Bldg - Comp 1 (Suction Bottle Throw 1/2)	Flange - 10"	0.116	150.00	200.17	16.52	0.79
3	1407	Residue Gas/N2 Comp Bldg: Yard -	Filter cover - 36"	0.310	400.00	532.87	44.02	0.79
4	3543	North Heat Medium Heater - Pilot stem	Gate valve - 0.5"	0.0463	60.00	203.51	6.69	0.79
4	3931	Re-Compression: Unit 5 -	Union - 0.75"	0.0384	50.00	65.78	5.56	0.79
3	1152	NRU 1 - Base of Hot Box	Tubing connection - 0.25"	0.0115	15.00	50.60	1.38	0.79
4	3619B	Yard North of Office - Gate valve seat	Gate valve - 0.5"	0.0459	60.00	201.40	6.64	0.80
3	1550	HP1 Bldg: E35-04 - PV-216-3	Control valve - ball - 1"	0.0993	130.00	168.98	11.89	0.80
1	3049	Scrubber (PV-517) -	Threaded connection - 1"	0.0114	15.00	19.48	1.34	0.80
3	1118	NRU 3 - Base of Hot Box	Threaded connection - 0.25"	0.0076	10.00	12.88	0.91	0.80
3	1661	Re-Compressor Building - Re-Comp 2 (Fuel Gas Line)	Threaded connection - 2"	0.0114	15.00	19.27	1.62	0.80
1	3138B	Compressor CM-13 - Lube oil tank drain.	Lube oil tank vent - 1"	2.991	4000.00	636.18	349.07	0.81
1	Direct	Compressor CM-19 - Lube oil tank vent #2	Lube oil tank vent - 0.75"	2.988	4000.00	630.37	337.48	0.81
3	1536	Residue Gas/N2 Comp Bldg - Heat Pump 3	Cylinder end - flange	0.297	400.00	59.78	0.06	0.82
4	3759	C3 Refrigeration: PSV Header - Outside Refrig Comp Building	Control valve - plug - 3"	0.104	141.00	172.95	0.00	0.82
3	1156	NRU 1 - Base of Hot Box	Threaded connection - 0.25"	0.0074	10.00	12.22	0.88	0.83
4	3866	Re-Compression: Unit 2 -	Variable volume pocket stem	0.295	400.00	56.48	42.58	0.83
3	1344	Propane Yard: V8-411 - A411N-5	Gate valve - 16"	0.675	920.00	2920.07	0.13	0.83
2	4257A	Compressor Unit # 4 -	Flange - 1"	0.0366	50.00	60.24	5.28	0.83
3	1833	Co-Gen Building: Outside (CA 625 - HP FG Scrubber) -	Gate valve - 0.5"	0.0438	60.00	189.39	6.23	0.83
3	1392	Residue Gas/N2 Comp Bldg: Yard - Suction Scrubber: LC301N	Threaded connection - 0.75"	0.0073	10.00	11.97	1.04	0.83
3	1078	NRU 3 - G412N-25	Open-ended line - 0.75"	0.0436	60.00	71.33	5.22	0.84

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
4	3990	Re-Compression: Yard Piping - on 2" plug valve	Grease nipple	0.0361	50.00	155.42	5.22	0.84
3	1332	Propane Yard: V8-410-3 - (on panel)	Tubing connection - 0.5"	0.0108	15.00	46.54	0.00	0.84
4	3827C	Re-Compression: Yard Piping - on 4" plug valve	Grease nipple	0.0359	50.00	154.13	5.18	0.85
2	4069	S Inlet Scrubber (D202) - sight glass	Gate valve - 0.75"	0.0430	60.00	184.86	5.26	0.85
3	Direct	Heat Pump 2 - Vent	Compressor Seals (8) - 4"	1.434	2000.00	221.76	210.89	0.85
4	3516	Still Reboiler No. 1 -	Threaded connection - 1"	0.0107	15.00	17.19	1.55	0.85
1	3329	Mole Sieve Tower 511C -	Threaded connection - 0.5"	0.0071	10.00	11.43	0.83	0.86
1	3130	Glycol Reboiler -	Control valve - butterfly - 0.5"	0.0924	130.00	148.46	13.31	0.86
1	3252	Solar Turbines -	Gate valve - 2"	0.0711	100.00	304.81	10.24	0.86
3	1085	NRU - Fuel Gas -	Open-ended line - 0.5"	0.0426	60.00	68.37	5.10	0.86
4	3698B	Cryo System: South Of Cold Gas Exchanger -	Gate valve - 0.75"	0.0426	60.00	182.44	0.10	0.86
2	4369	Compressor Unit # 2 - gate valve seat	Threaded connection - 0.75"	0.0071	10.00	11.36	1.02	0.86
2	4375	Compressor Unit # 6 -	Threaded connection - 1"	0.0106	15.00	17.03	1.53	0.86
3	1866	Residue Gas/N2 Comp Bldg: Res Comp 3 -	Threaded connection - 0.5"	0.0070	10.00	11.15	1.00	0.87
4	3668	Cryo System: LV 120B -	Open-ended line - 0.75"	0.0421	60.00	66.77	0.10	0.87
3	1008	Mole Sieve 5 - On top platform	Tubing connection - 0.75"	0.0175	25.00	74.74	2.10	0.87
3	Direct	Heat Pump 1 - Vent	Compressor Seals (8) - 4"	1.401	2000.00	170.69	206.04	0.87
1	3168	Refrig Comp Units -	Threaded connection - 2"	0.0105	15.00	16.59	1.51	0.87
3	1647	IR Compressor Building - V8-324	Gate valve - 0.75"	0.0419	60.00	178.49	5.02	0.87
4	3703	Sales Gas Header -	Gate valve - 4"	0.132	190.00	563.95	19.15	0.87
3	1042	Mole Sieve 3 -	Flange - 8"	0.0692	100.00	108.31	8.28	0.88
2	4371	Compressor Unit # 2 - stem packing	Control valve - ball - 2"	0.0898	130.00	140.59	0.00	0.88
4	3713	Cryo System: Absorber Tower (20.001) - Gate valve seat	Open-ended line - 0.5"	0.0411	60.00	63.92	0.10	0.89
4	3704	Sales Gas Header -	Flange - 4"	0.0513	75.00	79.62	7.42	0.89
3	1148	NRU 2 - 2nd Platform - FT-4238N-2	3 Needle valves - 0.375"	0.0410	60.00	173.52	4.91	0.89
1	3108	Compressor CM-19 -	Valve cover	0.137	200.00	211.76	15.95	0.89
2	4367	Compressor Unit # 1 - stem packing	Control valve - orbit - 3"	0.0962	141.00	148.72	13.87	0.89
3	1249	NGL Bullet 4 - LG3058-A	Gate valve - 0.75"	0.0409	60.00	172.68	0.01	0.89
3	1300	Propane Coolers - VG155 or V404-004	Gate valve - 1"	0.0510	75.00	215.57	0.01	0.89
1	3482	Off De-methanizer tower - Gate valve seat	Open-ended line - 0.5"	0.0408	60.00	62.96	5.88	0.89
1	3167	Refrig Comp Unit 11 - Top of suction bottle	Threaded connection - 0.5"	0.0068	10.00	10.48	0.00	0.90
3	1913	Hg Removal Bed V8-401-2 - near A401N-9	Flange - 3"	0.0509	75.00	78.33	6.10	0.90
1	3197	Solar Turbines: Unit A - Fuel gas scrubber piping	Gate valve - 2"	0.0677	100.00	285.39	9.75	0.90
1	3375	Fuel Gas Scrubber (PV-15) -	Open-ended line - 0.5"	0.0405	60.00	62.09	5.84	0.90
4	3801	Re-Compression: Yard Piping -	Gate valve - 14"	0.527	780.00	2218.73	76.16	0.90

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
2	4014	Mole Sieve Tower A -	Control valve - orbit - 4"	0.119	177.00	181.82	14.57	0.90
1	3156	Refrig Comp Unit 11 -	Valve cover	0.134	200.00	203.63	0.00	0.91
3	1452	Residue Gas/N2 Comp Bldg - Comp 3	Gate valve - 0.75"	0.0401	60.00	168.50	5.70	0.91
4	3949A	Re-Compression: Unit 1 - FG Line 3	Threaded connection - 2"	0.0100	15.00	15.13	1.45	0.91
1	3355	Mole Sieve: Inlet Separator (PV-501) -	Gate valve - 1"	0.0499	75.00	209.34	5.83	0.91
2	4044	Mole Sieve Tower B -	Gate valve - 0.75"	0.0399	60.00	166.87	4.87	0.92
3	1405	Residue Gas/N2 Comp Bldg: Yard - JAC-33	Gate valve - 4"	0.126	190.00	527.08	17.90	0.92
4	3938B	Re-Compression: Unit 4 - FG Line 1	Union - 2"	0.0661	100.00	99.21	9.56	0.92
1	3243	Solar Turbines -	Gate valve - 1"	0.0495	75.00	206.66	7.12	0.92
1	1953	Inlet Comp Yard Piping -	Threaded connection - 1"	0.0099	15.00	14.80	1.15	0.92
3	1420	Residue Gas/N2 Comp Bldg - Comp 1 (Throw 2)	Open-ended line - 0.5"	0.0395	60.00	59.06	5.62	0.92
1	3186	Refrig Comp Unit 10 -	Open-ended line - 1.5"	0.0494	75.00	73.65	0.00	0.93
3	1089	Amine Bldg (V2806-2) - (under vessel)	Gate valve - 1"	0.0493	75.00	205.57	5.90	0.93
2	4093	Tower by D-208 - gate valve seat	Gate valve - 1"	0.0491	75.00	204.75	6.01	0.93
1	---	Refrig Comp Unit 11 -	Crank case vent	1.306	2000.00	24.39	0.00	0.93
3	1336	Propane Yard: V8-410-3 - (to V8-410-3)	Gate valve - 0.75"	0.0391	60.00	162.51	0.01	0.93
2	4121	Free Water KO - horn	Pressure relief valve - 2"	0.0879	135.00	129.66	10.75	0.94
2	4364	Compressor Unit # 2 -	Control valve - ball - 2"	0.0844	130.00	124.19	12.16	0.94
3	1347	Propane Yard - A2404N	Gate valve - 0.5"	0.0389	60.00	161.35	0.01	0.94
4	3501	Regen Heater -	Gate valve - 1.5"	0.0486	75.00	201.44	7.02	0.94
3	1610	IR Compressor Building - East Lobe Lift Comp (E4-322) G322-2	Gate valve - 2"	0.0645	100.00	266.96	7.72	0.94
1	3217	Solar Turbines: Header Outside -	Gate valve - 2"	0.0640	100.00	264.30	9.21	0.95
3	1934	Heater # 5 - RJK -240	Gate valve - 3"	0.0767	120.00	316.86	10.91	0.95
3	1791	Stab 1 Building (Yard) -	Threaded connection - 0.5"	0.0064	120.00	9.22	0.76	0.95
2	4215	Compressor Unit # 9 -	Threaded connection - 0.5"	0.0064	10.00	9.20	0.92	0.95
1	3233	Solar Comp Unit B -	Union - 1.5"	0.0637	100.00	91.99	9.18	0.95
1	3116	Compressor CM-19 - Plug	Threaded connection - 0.75"	0.0063	10.00	9.05	0.74	0.96
3	1539	Residue Gas/N2 Comp Bldg - Heat Pump 3	Cylinder end - flange	0.253	400.00	-8.42	0.05	0.96
3	1313	NGL Bullet 1 - A1101N-1	Gate valve - 4"	0.119	190.00	489.69	0.03	0.97
1	3471	Refrig Comp Unit 12 -	Needle valve - 0.25"	0.0377	60.00	154.49	5.42	0.97
3	1308	NGL Bullet 1 - Near A1101N-5	Gate valve - 0.75"	0.0375	60.00	153.45	0.01	0.97
2	4123	Mole Sieve Tower A - gate valve seat	Threaded connection - 1"	0.0093	15.00	13.08	1.14	0.98
1	1943	Inlet Header -	Threaded connection - 0.75"	0.0062	10.00	8.68	0.72	0.98
4	3859	Re-Compression: Unit 3 -	Threaded connection - 0.5"	0.0062	10.00	8.66	0.90	0.98
1	3263	Solar Turbines -	Threaded connection - 1"	0.0092	15.00	12.86	1.33	0.99
3	1880	Amine Building - A 2806N-1 GTV seat under vessel V8-2806-2	Threaded connection - 1"	0.0092	15.00	12.83	1.11	0.99
1	3124	Compressor CM-14 - Stem packing	Variable volume pocket stem	0.245	400.00	-20.15	28.60	0.99
2	4225	Compressor Unit # 9 -	Flange - 2"	0.0306	50.00	42.25	4.42	0.99
1	3030	Fuel Gas to Mansfield (222) - Stem packing	Needle valve - 0.375"	0.0367	60.00	149.15	4.29	0.99
3	1834	Co-Gen Building: Outside (CA 625 - HP FG Scrubber) - VG-155	Gate valve - 1"	0.0457	75.00	185.35	6.50	1.00

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
1	3052	Scrubber (PV-517) -	Threaded connection - 1.5"	0.0091	15.00	12.46	1.06	1.00
3	1154	NRU 1 - Base of Hot Box	Tubing connection - 0.25"	0.0091	15.00	36.87	1.09	1.00
3	1175	NRU 1 - TE411NB-1	Flange - 10"	0.0909	150.00	123.88	10.89	1.00
4	3832	Re-Compression: Yard Piping -	Gate valve - 2"	0.0606	100.00	245.03	8.76	1.00
3	1036	Mole Sieve 3 - ZSC2851N	Orbit valve - 2"	0.0606	100.00	244.87	7.25	1.00
2	4370	Compressor Unit # 2 -	Gate valve - 0.75"	0.0363	60.00	146.51	5.23	1.01
3	1700	Re-Compressor Building - Associated Yard Piping (Near G8-311-1) Cooler	Gate valve - 3"	0.0723	120.00	291.37	8.65	1.01
3	1666	Re-Compressor Building - Re-Comp 3	Threaded connection - 2"	0.0090	15.00	12.09	1.28	1.02
3	1287	NGL Bullet 2 - Near A1101N-18	Gate valve - 0.75"	0.0359	60.00	144.63	0.01	1.02
3	1210	NGL Sales Line - Filter/Vessel	Threaded connection - 12"	0.0597	100.00	79.70	0.02	1.02
3	1729	HHE Compressor Building - Comp HHE 7	Threaded connection - 0.5"	0.0060	10.00	7.95	0.71	1.02
3	1518	Residue Gas/N2 Comp Bldg - Heat Pump 2	Valve cover	0.119	200.00	157.69	17.47	1.03
1	3166	Refrig Comp Unit 11 -	Threaded connection - 0.5"	0.0059	10.00	7.88	0.00	1.03
1	3341	Mole Sieve Tower 511A -	Gate valve - 0.75"	0.0356	60.00	142.46	4.15	1.03
4	3547	Mole Sieve Dehy: Regen Heater -	Gate valve - 0.75"	0.0355	60.00	142.20	5.14	1.03
4	3950A	Re-Compression: Unit 1 - FG Line 1	Threaded connection - 2"	0.0089	15.00	11.73	1.28	1.03
1	3411	Mole Sieve Common Piping -	Gate valve - 1"	0.0443	75.00	177.07	5.17	1.03
3	1180	NRU 1 - 2nd Platform - FT4238N-1	2 Needle valves - 0.375"	0.0354	60.00	141.62	4.24	1.03
4	3722	Cryo System: De-methanizer Tower (1st Platform) - Gate valve seat	Open-ended line - 0.5"	0.0354	60.00	46.63	0.08	1.03
3	1247	NGL Bullet 4 - A1101N-33	Gate valve - 0.5"	0.0353	60.00	141.15	0.01	1.03
3	1254	NGL Pump 2 - A1201N-4	Gate valve - 4"	0.111	190.00	444.40	0.03	1.04
2	4009	Mole Sieve Tower A -	Gate valve - 0.75"	0.0351	60.00	139.63	4.29	1.04
4	3817	Re-Compression: Yard Piping -	Union - 2"	0.0584	100.00	76.02	8.45	1.04
1	3222	De-methanizer -	Tubing connection - 0.375"	0.0088	15.00	34.84	1.26	1.04
3	1099	Amine Bldg: V8-404N - Filter Cover	Filter cover - 20"	0.117	200.00	150.98	13.95	1.04
3	1285	NGL Bullet 2 - Near B1101N-2	Gate valve - 0.75"	0.0348	60.00	138.30	0.01	1.05
3	1092	Amine Bldg: V8-2806-2 - Near A2806N-1	Threaded connection - 0.5"	0.0058	10.00	7.45	0.69	1.05
2	4352	Compressor Yard - horizontal vessel - plug valve stem	Plug valve - 1"	0.0433	75.00	171.71	6.25	1.05
2	4024	Mole Sieve Tower C -	Gate valve - 0.75"	0.0345	60.00	136.60	4.22	1.06
3	Direct	IR Comp 1 (E4-342) -	Compressor Seal Drains	1.148	2000.00	-220.49	137.49	1.06
2	4028A	Mole Sieve Tower C -	Threaded connection - 1"	0.0086	15.00	10.94	1.05	1.06
2	4359	Compressor Unit # 3 -	Control valve - ball - 2"	0.0745	130.00	94.34	10.74	1.06
3	1202	NRU Expander 3 - Outlet Line	Threaded connection - 0.5"	0.0057	10.00	7.21	0.68	1.07
2	4055	Scrubber -	Flange - 6"	0.0570	100.00	71.72	6.97	1.07
4	3971	Refrigeration Compressors: Unit 2 - To injector	Flange - 2"	0.0282	50.00	34.80	4.07	1.08
1	3142A	Compressor CM-19 - Lube oil tank # 1	Lube oil tank vent - 0.75"	2.245	4000.00	-520.69	261.97	1.08
1	3405	Mole Sieve Tower 511B -	Flange - 2"	0.0281	50.00	34.52	3.27	1.08
2	4251	Compressor Unit 4 -	Valve cover	0.112	200.00	137.83	16.17	1.09
2	4145	Compressor Unit 7 Outside -	Threaded connection - 0.5"	0.0056	10.00	6.85	0.81	1.09
2	4291	Compressor Yard - Compressor unit 4	Orbit valve - 4"	0.106	190.00	413.90	15.29	1.09

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1916	Hg Removal Bed V8-401-1 - NV seat	Open-ended line - 0.25"	0.0335	60.00	40.85	4.01	1.09
2	4128	Mole Sieve Tower B -	Threaded connection - 1"	0.0084	15.00	10.17	1.02	1.09
4	3862	Re-Compression: Unit 3 - Cylinder No. 2	Open-ended line - 0.5"	0.0334	60.00	40.60	4.83	1.09
2	4018	Mole Sieve Tower C -	Flange - 4"	0.0417	75.00	50.57	5.10	1.10
3	1629	IR Compressor Building - IR Comp 3	Threaded connection - 0.5"	0.0055	10.00	6.66	0.66	1.10
2	4138	Dehydrated gas to sales -	Gate valve - 6"	0.135	245.00	522.24	19.43	1.11
3	1279	NGL Bullet 3 - A1101N-7	Gate valve - 4"	0.104	190.00	404.12	0.03	1.11
3	1126	NRU 2 - Top Platform - A2331N	Threaded connection - 0.375"	0.0055	10.00	6.48	0.66	1.11
3	1889	Hg Removal Bed V8-401-3 - plug on GTV seat	Threaded connection - 0.75"	0.0055	10.00	6.48	0.66	1.11
1	---	Compressor CM-19 - (On roof) compressor side	Crank case vent - 1.5"	1.093	2000.00	-305.33	127.60	1.11
3	1621	IR Compressor Building - IR Comp 3	Threaded connection - 0.5"	0.0055	10.00	6.45	0.65	1.11
3	1136	NRU 3 - A409N-11	Gate valve - 4"	0.103	190.00	396.41	12.34	1.12
4	3933B	Re-Compression: Unit 4 - FG Line 6	Union - 2"	0.0539	100.00	62.41	7.80	1.13
1	3386	High Pressure Chiller -	Control valve - globe - 2"	0.0698	130.00	80.22	0.00	1.13
3	1091	Amine Bldg: V8-2806-2 - Near FI2806N-2	Tubing connection - 0.375"	0.0080	15.00	30.64	0.96	1.14
1	3020	To Fuel Gas Scrubber (PV-9) -	Threaded connection - 2"	0.0080	15.00	9.14	1.15	1.14
4	3517	Still Reboiler No. 2 -	Gate valve - 0.5"	0.0320	60.00	122.19	4.63	1.14
2	4126	Mole Sieve Tower B -	Gate valve - 0.5"	0.0320	60.00	122.15	3.91	1.14
4	3819	Re-Compression: Yard Piping - on 4" plug valve	Grease nipple	0.0266	50.00	101.63	3.85	1.14
3	1242	NGL Bullet 4 - A1101N-49	Open-ended line - 0.25"	0.0320	60.00	36.25	0.01	1.14
4	3624B	Yard North of Office - Gate valve seat	Gate valve - 0.75"	0.0319	60.00	121.75	3.73	1.14
1	3115	Compressor CM-19 -	Threaded connection - 0.5"	0.0053	10.00	6.02	0.62	1.14
1	3262	Solar Turbines - Gate valve seat	Threaded connection - 0.75"	0.0053	10.00	6.02	0.77	1.14
4	3940C	Re-Compression: Unit 2 - FG Line 5	Union - 2"	0.0531	100.00	60.05	7.68	1.15
4	3926	Re-Compression: Unit 4 -	Plug valve - 3"	0.0791	150.00	300.10	11.43	1.15
1	3360	Inlet Scrubber (PV-504) -	Gate valve - 3"	0.0632	120.00	240.04	9.11	1.15
1	3373	Fuel Gas Scrubber (PV-15) -	Gate valve - 0.75"	0.0316	60.00	119.85	4.55	1.16
2	4269	Compressor Unit # 5 -	Plug valve - 1.5"	0.0393	75.00	148.98	5.67	1.16
1	3140	Compressor CM-14 - Gate valve seat	Open-ended line - 1"	0.0393	75.00	43.28	4.58	1.16
1	3002	Inlet Comp Yard Piping -	Threaded connection - 0.75"	0.0052	10.00	5.75	0.61	1.16
4	3738	Cryo System: Absorber Bottoms Pumps - Gate valve seat	Open-ended line - 0.5"	0.0313	60.00	34.42	0.07	1.16
4	3772	C3 Refrigeration: Coolers - Near Refrig Compressor Building	Grease nipple - 4"	0.0261	50.00	98.42	0.00	1.17
4	3693	Cryo System: Cold Gas Exchanger Feed Line -	Gate valve - 0.75"	0.0312	60.00	117.70	0.07	1.17
4	3778	Central Yard - Between C3 Compressors and Gen Building	Gate valve - 6"	0.127	245.00	478.93	18.39	1.17
3	1310	NGL Bullet 1 - A1101N-2	Gate valve - 1"	0.0388	75.00	146.07	0.01	1.18
3	1839	Co-Gen Building: Outside (CA 625 - HP FG Scrubber) - VG-151	Gate valve - 0.5"	0.0311	60.00	116.83	4.41	1.18
3	1172	NRU 1 - A413N-2	Gate valve - 3"	0.0621	120.00	233.26	7.43	1.18
1	3392	De-ethanizer Tower -	Threaded connection - 0.75"	0.0052	10.00	5.57	0.01	1.18

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1259	NGL Pump 3 - A1201N-7	Gate valve - 4"	0.0982	190.00	368.94	0.03	1.18
3	1368	Regen Gas Heater 1: G10-2801-2 - A2801N-79	Threaded connection - 0.5"	0.0052	10.00	5.55	0.73	1.18
3	1462	Residue Gas/N2 Comp Bldg - Heat Pump 4	Valve cover	0.103	200.00	110.75	15.18	1.18
1	3364	Inlet Gas Scrubber (PV-501) -	Gate valve - 1"	0.0387	75.00	145.13	4.51	1.18
1	3409	Mole Sieve Common Piping -	Gate valve - 3"	0.0618	120.00	231.87	7.21	1.18
1	3047	Scrubber (PV-517) -	Gate valve - 1"	0.0385	75.00	144.39	4.50	1.18
1	3084	West Inlet Yard Piping - On 8" orifice meter	Rack	0.0384	75.00	143.42	4.48	1.19
4	3747	Cryo System: Absorber Tower (20.001) - First platform: pressure transmitter	Threaded connection - 0.5"	0.0077	15.00	28.60	0.02	1.19
3	1402	Residue Gas/N2 Comp Bldg: Yard -	Gate valve - 4"	0.0968	190.00	361.31	13.76	1.19
4	3627A	Yard North of Office - On orifice meter (damaged body)	Orifice meter plate - 0.0625"	0.0763	150.00	-31.72	8.91	1.20
3	1603	IR Compressor Building - IR Comp 2	Threaded connection - 0.5"	0.0051	10.00	5.26	0.61	1.20
1	1977	Inlet Header - Buried	Gate valve - 4"	0.0962	190.00	357.88	11.23	1.20
3	1684	Re-Compressor Building - Re-Comp 3 (Fuel Gas Line)	Threaded connection - 2"	0.0076	15.00	7.88	1.08	1.20
2	4038	Mole Sieve Tower C -	Flange - 8"	0.0506	100.00	52.28	6.18	1.20
4	3755	Cryo System: De-methanizer Reboiler -	Gate valve - 4"	0.0959	190.00	356.05	0.22	1.21
2	4168	Cryo skid north -	Threaded connection - 0.5"	0.0050	10.00	5.17	0.62	1.21
3	1019	Mole Sieve Header - A2811N72	Tubing connection - 0.375"	0.0075	15.00	27.95	0.90	1.21
1	3391	EP Skid to Koch -	Gate valve - 0.75"	0.0301	60.00	111.36	0.05	1.21
4	3771	C3 Refrigeration: Storage - Near Refrig Compressor Building	Threaded connection - 0.5"	0.0050	10.00	5.10	0.00	1.21
1	3071	Fuel Gas Scrubber (West Yard) - PV-9	Threaded connection - 2"	0.0075	15.00	7.60	1.08	1.22
4	3572	Mole Sieve Dehy: Dehy Tower A - Green Gas	Flange - 8"	0.0499	100.00	50.31	5.82	1.22
3	1914	Hg Removal Bed V8-401-2 - near A401N-8	Flange - 3"	0.0374	75.00	37.60	4.48	1.22
3	1920	Hg Removal Bed V8-401-1 - Near A401-2	Flange - 3"	0.0373	75.00	37.40	4.47	1.22
1	3094	Compressor CM-13 - Stem packing	Variable volume pocket stem	0.199	400.00	-91.73	23.21	1.22
1	3190	Solar Turbines: Unit A - Chart recorder	Tubing connection - 0.375"	0.0075	15.00	27.45	1.07	1.22
1	3357	Cold Gas Separator (PV-505) - Gate valve seat	Open-ended line - 1"	0.0371	75.00	36.80	4.33	1.23
1	3172	Refrig Comp Units -	Threaded connection - 0.5"	0.0049	10.00	4.90	0.71	1.23
3	1545	Residue Gas/N2 Comp Bldg - Heat Pump 2	Threaded connection - 0.5"	0.0049	10.00	4.83	0.72	1.24
4	3829	Re-Compression: Yard Piping -	Gate valve - 2"	0.0492	100.00	180.30	7.12	1.24
3	1901	Hg Removal Bed V8-401-3 - A401N-11	Gate valve - 0.5"	0.0295	60.00	107.89	3.53	1.24
3	1927	Dehydration Tower # 1 west - on NV seat 2802N-1 1st platform	Open-ended line - 0.25"	0.0294	60.00	28.42	3.52	1.24
4	3765	C3 Refrigeration: Compressors - Discharge bottle	Open-ended line - 0.75"	0.0293	60.00	28.26	0.00	1.25
4	3754	Sales Gas Header -	Threaded connection - 0.5"	0.0049	10.00	4.65	0.70	1.25
4	3756	Cryo System: Economizer -	Gate valve - 4"	0.0924	190.00	336.11	0.21	1.25
2	4025	Mole Sieve Tower C -	Threaded connection - 0.5"	0.0049	10.00	4.65	0.59	1.25
1	3264	Solar Turbines -	Threaded connection - 1"	0.0073	15.00	6.97	1.05	1.25
3	1820	Stab 1 Building (Yard) - (NGL Vessel)	Gate valve - 3"	0.0583	120.00	211.96	0.12	1.25
4	3600	Mole Sieve Dehy: Dehy Train A - Side of tower	Threaded connection - 0.75"	0.0049	10.00	4.61	0.57	1.25

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
2	4208	Residue Compressors FG Scrubber - plug valve seat	Threaded connection - 1"	0.0072	15.00	6.79	1.04	1.26
3	1312	NGL Bullet 1 - A1101N-6	Gate valve - 0.75"	0.0289	60.00	104.58	0.01	1.26
2	4035B	Mole Sieve Tower C - Both sides of gate valve 4036	Threaded connection - 1"	0.0072	15.00	6.66	0.88	1.27
3	1284	NGL Bullet 3 - Near TB0326 On PSV	Flange - 4"	0.0360	75.00	33.29	0.01	1.27
1	3249	Solar Turbines -	Gate valve - 3"	0.0575	120.00	207.08	8.27	1.27
3	1792	Fuel Gas Scrubber (V8-1720) - A1720-3	Gate valve - 1.5"	0.0359	75.00	129.39	5.10	1.27
1	3114	Compressor CM-19 -	Threaded connection - 0.5"	0.0048	10.00	4.41	0.56	1.27
3	1200	NRU Expander 3 - Inlet Line	Control valve - 10"	0.219	459.00	200.09	26.20	1.28
1	3174	Refrig Comp Units -	Threaded connection - 0.5"	0.0047	10.00	4.29	0.68	1.28
1	3478	South of Low Press Inlet Compressors -	Threaded connection - 2"	0.0071	15.00	6.43	1.02	1.28
4	3775	Central Yard - Between C3 Compressors and Gen Building	Tubing connection - 4"	0.0118	25.00	42.44	1.71	1.28
4	3900	Re-Compression: Unit 1 -	Open-ended line - 0.5"	0.0284	60.00	25.55	4.11	1.29
3	1164	NRU 1 - Base of Cold Box - PV-4171	Control valve - 10"	0.217	459.00	194.71	25.99	1.29
3	1870	Co-Gen (Fuel Gas Scrubber SE Corner of Bldg) -	Gate valve - 0.5"	0.0283	60.00	101.35	4.03	1.29
1	3142B	Compressor CM-19 - Distance piece drain	Distance piece drain - 0.75"	0.940	2000.00	-543.67	109.65	1.30
1	3138A	Compressor CM-13 - Distance piece vent	Distance piece vent - 1"	0.939	2000.00	-545.08	109.55	1.30
1	3462	Refrig Comp Unit 12 -	Valve cover	0.0932	200.00	80.82	0.00	1.31
1	3180	Solar Turbines: Unit B - Fuel gas filter piping	Tubing connection - 0.375"	0.0070	15.00	24.57	1.00	1.31
4	3706	Sales Gas Header -	Gate valve - 1.5"	0.0346	75.00	121.97	5.00	1.32
2	4037	Mole Sieve Tower C -	Gate valve - 0.75"	0.0276	60.00	97.17	3.38	1.32
4	3567	Mole Sieve Dehy: Outlet -	Gate valve - 12"	0.272	595.00	951.61	31.71	1.33
1	3412	Mole Sieve Common Piping -	Threaded connection - 1"	0.0068	15.00	5.51	0.79	1.34
1	3106	Compressor CM-19 -	Valve cover	0.0906	200.00	72.92	10.57	1.34
2	4339	Make-up Gas Suction Scrubber - sight glass	Gate valve - 0.75"	0.0272	60.00	94.71	3.92	1.34
4	3667	Cryo System: Make Up -	Gate valve - 3"	0.0542	120.00	188.27	7.83	1.35
3	1817	Stab 1 Building (Yard) - (NGL Vessel)	Threaded connection - 0.5"	0.0045	10.00	3.55	0.01	1.35
2	4160	Residue Compressors FG Scrubber - sight glass	Gate valve - 0.75"	0.0269	60.00	93.28	3.88	1.36
4	3823	Re-Compression: Yard Piping - Half buried	Flange - 4"	0.0336	75.00	26.22	4.86	1.36
3	1291	NGL Bullet 2 - A1101N-10	Gate valve - 3"	0.0537	120.00	185.79	0.02	1.36
1	3408	Mole Sieve Common Piping -	Union - 2"	0.0446	100.00	34.35	5.21	1.36
3	1169	NRU 1 - A411N-14	Threaded connection - 0.75"	0.0045	10.00	3.43	0.53	1.37
3	1352	Process Heater - Near B2803N-20 (E028005A)	Threaded connection - 1"	0.0067	15.00	5.13	0.95	1.37
2	4278	Compressor Unit # 7 -	Threaded connection - 1.5"	0.0067	15.00	5.13	0.96	1.37
3	1510	Residue Gas/N2 Comp Bldg: Lower Level	Gate valve - 0.75"	0.0266	60.00	91.51	3.78	1.37
1	3039	Lone Star Line -	Orbit valve - 3"	0.0532	120.00	182.92	6.21	1.37
1	1986	Inlet Header -	Gate valve - 0.75"	0.0266	60.00	91.29	3.10	1.37
4	3753	Sales Gas Header -	Gate valve - 0.5"	0.0265	60.00	90.78	3.83	1.38
3	1617	IR Compressor Building - IR Comp 1 (Start Gas)	Threaded connection - 0.5"	0.0044	10.00	3.28	0.63	1.38
2	4001	Top of dehy tower A -	Flange - 8"	0.0441	100.00	32.82	5.39	1.38
3	1117	NRU 2 - Base of Hot Box	Threaded connection - 0.25"	0.0044	10.00	3.18	0.52	1.39
3	1267	NGL Bullet 4 - A1101N-3	Gate valve - 3"	0.0524	120.00	178.14	0.01	1.39

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
4	3967	Refrigeration Compressors: Unit 2 -	Governor - 2"	0.0871	200.00	295.56	12.59	1.40
3	1922	Hg Removal Bed V8-401-2 - NV seat	Open-ended line - 0.25"	0.0261	60.00	18.65	3.13	1.40
1	3026	Fuel Gas to Mansfield (222) -	Gate valve - 1"	0.0326	75.00	110.48	3.80	1.40
4	3816	Re-Compression: Yard Piping -	Gate valve - 3"	0.0520	120.00	175.93	7.52	1.41
4	3945D	Re-Compression: Unit 1 - FG Line 6	Union - 2"	0.0433	100.00	30.45	6.26	1.41
3	1667	Re-Compressor Building - Re-Comp 3 (Fuel Gas Line)	Threaded connection - 2"	0.0065	15.00	4.53	0.92	1.41
1	3418	Refrig Comp Unit 12 - Yard Piping -	Orbit valve - 6"	0.106	245.00	357.51	0.00	1.41
4	3974	Refrigeration Compressors: Unit 2 -	Flange - 2"	0.0216	50.00	15.01	3.12	1.41
3	1800	Fuel Gas Scrubber (V8-1720) - A1720-1	Gate valve - 0.75"	0.0258	60.00	87.11	3.67	1.41
2	4207	Residue Compressors FG Scrubber -	Threaded connection - 2"	0.0065	15.00	4.44	0.93	1.41
3	1609	IR Compressor Building - IR Comp 2 (Fuel Gas)	Threaded connection - 2"	0.0065	15.00	4.43	0.92	1.42
1	1994	Inlet Header -	Threaded connection - 0.5"	0.0043	10.00	2.94	0.50	1.42
3	1255	NGL Pump 2 - A1210N-6	Gate valve - 0.5"	0.0258	60.00	86.63	0.01	1.42
4	3945B	Re-Compression: Unit 1 - FG Line 6	Plug valve - 2"	0.0515	120.00	173.22	7.45	1.42
2	4003	Mole Sieve Tower D -	Gate valve - 0.75"	0.0256	60.00	85.84	3.13	1.43
2	4118	Skid 2 Inlet -	Gate valve - 0.5"	0.0256	60.00	85.83	3.13	1.43
1	1947	Inlet Header -	Threaded connection - 0.5"	0.0043	10.00	2.82	0.50	1.43
1	3015	Inlet Comp Yard Piping -	Threaded connection - 1"	0.0064	15.00	4.23	0.74	1.43
4	3721	Cryo System: De-methanizer Tower (1st Platform) - Sight glass	Gate valve - 0.75"	0.0255	60.00	85.01	0.06	1.43
1	3428	Refrig Comp Yard Piping -	Control valve - butterfly - 8"	0.150	353.00	98.34	0.00	1.43
3	1065	Amine Bldg: V8-404N - A404N-1	Gate valve - 0.5"	0.0255	60.00	84.91	3.05	1.43
2	4200	Compressor Unit # 3 -	Valve cover	0.0847	200.00	55.07	12.21	1.44
2	4115B	Skid 2 Inlet -	Threaded connection - 2"	0.0063	15.00	4.11	0.78	1.44
1	3178	Solar Turbines: Unit B - On skid	Gate valve - 1.5"	0.0317	75.00	105.40	4.56	1.44
2	4036	Mole Sieve Tower C -	Gate valve - 1"	0.0317	75.00	105.19	3.87	1.44
1	1945	Inlet Header -	Plug valve - 3"	0.0633	150.00	210.27	7.39	1.44
3	1863	Residue Gas/N2 Comp Bldg: Heat Pump 3 -	Threaded connection - 0.5"	0.0042	10.00	2.70	0.62	1.44
2	4309	Compressor Unit # 1 -	Valve cover	0.0843	200.00	53.86	0.00	1.44
2	4100	DGA coalescer -	Gate valve - 1"	0.0316	75.00	104.78	3.86	1.45
3	1418	Residue Gas/N2 Comp Bldg - Comp 2	Cylinder end - flange	0.168	400.00	-139.47	23.89	1.45
1	3453	Refrig Comp Unit 12 -	Valve cover	0.0838	200.00	52.39	0.00	1.45
4	3549	Mole Sieve Dehy: Regen Heater -	Gate valve - 8"	0.147	350.00	484.65	21.20	1.45
2	4086	Common inlet lines - needle valve seat	Open-ended line - 0.5"	0.0251	60.00	15.69	3.07	1.45
3	1288	NGL Bullet 2 - A1101N-18	Gate valve - 0.75"	0.0251	10.00	82.87	0.01	1.46
1	3191	Solar Turbines: Unit A - Chart recorder	Threaded connection - 0.375"	0.0042	10.00	2.58	0.60	1.46
3	1248	NGL Bullet 4 - Near A1101N-44	Gate valve - 0.75"	0.0250	60.00	82.48	0.01	1.46
4	3548	Mole Sieve Dehy: Regen Heater -	Pressure relief valve - 0.75"	0.0329	79.00	20.23	4.76	1.46
3	1722	East Amine Contactor - psv horn	Pressure relief valve - 2"	0.0498	120.00	163.76	5.97	1.47
1	3307	Dust Filters for Regen Gas -	Gate valve - 0.75"	0.0247	60.00	80.67	2.88	1.48
3	1168	NRU 1 - Near A411N-17	Flange - 0.5"	0.0102	25.00	5.76	1.22	1.49
3	1455	Residue Gas/N2 Comp Bldg - Heat Pump 4	Cylinder end - flange	0.162	400.00	-148.34	23.89	1.50
3	1125	NRU 2 - Top Platform - A2339N	Gate valve - 10"	0.203	500.00	653.95	24.27	1.50
1	3117	Compressor CM-19 -	Threaded connection - 1"	0.0061	15.00	3.31	0.88	1.50
3	1064	Amine Bldg: V8-404N - A404N-1	Gate valve - 1"	0.0304	75.00	97.88	3.64	1.50

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
1	3318	Regen Gas Compressors/Blowers -	Gate valve - 0.5"	0.0242	60.00	78.01	2.83	1.51
3	1774	Stab 1 Building - (Top of Accumulator)	Gate valve - 2"	0.0401	100.00	128.44	4.81	1.52
3	1183	NRU 1 - Top Platform - GDW-22	Gate valve - 10"	0.200	500.00	637.67	23.93	1.52
1	3289	HP Expander Scrubber (PV-503) -	Gate valve - 1"	0.0298	75.00	94.71	4.29	1.53
3	1618	IR Compressor Building - IR Comp 1 (Start Gas)	Threaded connection - 2"	0.0060	15.00	2.94	0.85	1.53
2	4197	Compressor Unit 2 -	Threaded connection - 1"	0.0060	15.00	2.94	0.86	1.53
4	3540	North Heat Medium Heater - Pilot stem	Gate valve - 0.5"	0.0238	60.00	75.59	3.44	1.53
4	3847	Re-Compression: Yard Piping -	Gate valve - 0.75"	0.0238	60.00	75.36	3.44	1.54
3	1356	Amine Bldg: V8-2701 - A2701N-42	Gate valve - 1.5"	0.0296	75.00	93.78	3.55	1.54
1	3182	Solar Turbines: Unit B - Chart recorder	Tubing connection - 0.375"	0.0059	15.00	18.75	0.85	1.54
3	Direct	IR Comp 3 (E4-321) -	Compressor Seal Drains	0.789	2000.00	-776.88	94.50	1.54
3	1695	Re-Compressor Building - Associated Yard Piping (Near B9244)	Union - 2"	0.0395	100.00	18.85	5.61	1.54
4	3851	Re-Compression: Unit 4 - Cylinder No. 1	Distance piece	0.788	2000.00	-778.70	113.93	1.54
3	1414	Residue Gas/N2 Comp Bldg - Comp 1	Gate valve - 0.75"	0.0236	60.00	74.55	3.36	1.55
4	3674	Cryo System: Turbo Expander -	Gate valve - 0.75"	0.0236	60.00	74.25	0.05	1.55
4	3854	Re-Compression: Unit 4 - Cylinder No. 3	Distance piece	0.783	2000.00	-786.58	113.20	1.55
2	4139D	Resid gas cooler E507 - cooler plugs	Threaded connection - 1"	0.0058	15.00	2.58	0.84	1.56
2	4139F	Resid gas cooler E507 - cooler plugs	Threaded connection - 1"	0.0058	15.00	2.58	0.84	1.56
1	3118	Compressor CM-19 -	Threaded connection - 2"	0.0058	15.00	2.58	0.84	1.56
1	3255	Solar Turbines -	Gate valve - 1"	0.0290	75.00	89.83	4.17	1.58
3	1748	HHE Compressor Building - Associated Yard Piping (On walkway PG 307+3)	Threaded connection - 0.375"	0.0038	10.00	1.60	0.46	1.58
4	3598	Mole Sieve Dehy: Outlet -	Gate valve - 0.5"	0.0231	60.00	71.41	2.69	1.58
1	---	Compressor CM-14 - Fuel gas system (FG regulator + injectors)	Fuel gas system common vent line	0.769	2000.00	-808.43	110.69	1.58
2	4223	Compressor Unit # 9 -	Flange - 2"	0.0191	50.00	7.60	2.76	1.59
4	3940B	Re-Compression: Unit 2 - FG Line 5	Plug valve - 2"	0.0458	120.00	140.45	6.61	1.60
1	3103	Compressor CM-9 - Lube oil tank - drain/vent	Lube oil tank vent - 0.75"	1.521	4000.00	-1642.31	177.52	1.60
1	3017	Inlet Comp Yard Piping -	Flange - 3"	0.0285	75.00	10.89	3.33	1.60
3	1261	NGL Pump 3 - A11201N-6	Gate valve - 1"	0.0284	75.00	86.75	0.01	1.61
2	3995A	Inlet Line -	Gate valve - 2"	0.0379	100.00	115.63	4.63	1.61
3	1801	Fuel Gas Scrubber (V8-1720) - A1720-1	Gate valve - 0.5"	0.0227	60.00	69.26	3.23	1.61
1	3082	West Inlet Yard Piping - On 8" orifice meter	Tubing connection - 0.375"	0.0057	15.00	17.30	0.66	1.61
3	1207	Propane Storage Tank V6-290 - A2901N-82	Threaded connection - 0.5"	0.0038	10.00	1.35	0.00	1.62
3	1808	Fuel Gas Scrubber (V8-1720) -	Threaded connection - 0.5"	0.0037	10.00	1.29	0.53	1.62
1	3011	Inlet Comp Yard Piping - On 2" orifice meter	Slide valve	0.0281	75.00	84.74	3.27	1.63
1	3239	Solar Turbines: Unit A - On skid	Threaded connection - 1.5"	0.0056	15.00	1.85	0.81	1.63
3	1348	Process Heater - Near B2802N-113	Threaded connection - 1"	0.0056	15.00	1.84	0.79	1.63
1	3426	Refrig Comp Yard Piping -	Flange - 2"	0.0186	50.00	6.12	0.00	1.63
4	3806	Re-Compression: Inlet Scrubber -	Gate valve - 1"	0.0279	75.00	84.08	4.04	1.63
3	1401	Residue Gas/N2 Comp Bldg: Yard -	Gate valve - 0.75"	0.0224	60.00	67.26	3.18	1.63
2	4262	Compressor Unit # 5 -	Union - 1.5"	0.0372	100.00	11.92	5.36	1.64
2		Compressor Unit # 7 -	Crank case vent - 2"	0.743	2000.00	-848.22	107.12	1.64
3	1878	Amine Building - A 2806N-6 GTV seat under vessel V8-2806-1	Threaded connection - 1"	0.0056	15.00	1.78	0.67	1.64

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1466	Residue Gas/N2 Comp Bldg - Heat Pump 4	Gate valve - 0.75"	0.0223	60.00	66.86	3.28	1.64
3	1474	Residue Gas/N2 Comp Bldg: Back Wall -	Threaded connection - 0.75"	0.0037	10.00	1.17	0.53	1.64
2	3997	Inlet Line - ball valve seat	Threaded connection - 0.5"	0.0037	10.00	1.17	0.45	1.64
3	1381	Amine Bldg: G8-1650 - Below A1650N-3	Threaded connection - 0.75"	0.0037	10.00	1.14	0.44	1.65
2	4196	Compressor Unit 2 - Injector to cylinder head	Flange - 2"	0.0185	50.00	5.68	2.66	1.65
4	3595	Mole Sieve Dehy: Dehy Train B - Top of dehy tower	Flange - 18"	0.0736	200.00	21.71	8.59	1.65
3	1676	Re-Compressor Building - Re-Comp 5 (Fuel Gas Line)	Union - 2"	0.0368	100.00	10.78	5.23	1.66
1	3442	Regen Gas Compressors/Blowers - Compressor seal	Compressor seal - 0.375"	0.735	2000.00	-860.14	85.82	1.66
3	1163	NRU 1 - Near TB0429	Union - 0.75"	0.0183	50.00	4.97	2.19	1.67
3	1198	NRU Expander 2 - Inlet Line	Control valve - 10"	0.167	459.00	45.36	20.05	1.67
3	1057	Mole Sieve Header - PDSL2878N	Tubing connection - 0.375"	0.0055	15.00	16.14	0.66	1.67
2	4101	Mole Sieve Tower A -	Flange - 6"	0.0364	100.00	9.69	4.45	1.67
3	1314	NGL Bullet 1 - A1101N-8	Gate valve - 1.5"	0.0272	75.00	80.12	0.01	1.68
3	1795	Stab 1 Building - (De-methanizer Tower)	Gate valve - 0.75"	0.0217	60.00	63.47	0.05	1.68
4	3607	Yard North of Office -	Orifice meter plate - 10"	0.0542	150.00	-66.04	7.83	1.69
1	3228	HP Expander Scrubber (PV-503) -	Tubing connection - 0.375"	0.0054	15.00	15.80	0.78	1.69
1	3445	Refrig Comp Unit 12 -	Valve cover	0.0721	200.00	17.06	0.00	1.69
2	4141	Condensate Vapour Scrubber -	Control valve - globe - 1"	0.0468	130.00	10.98	5.72	1.69
3	1280	NGL Bullet 3 - A1101N-11	Gate valve - 1"	0.0269	75.00	78.17	0.01	1.70
1	3256	Solar Turbines -	Threaded connection - 1"	0.0054	15.00	1.18	0.77	1.70
1	3214	Solar Turbines: Header Outside -	Control valve - globe - 2"	0.0465	130.00	10.15	6.70	1.70
3	1256	NGL Pump 2 - Near C1201N-2	Gate valve - 0.5"	0.0215	60.00	62.21	0.01	1.70
2	4327	Compressor Yard - Suction/Discharge Piping -	Gate valve - 3"	0.0429	120.00	124.29	6.19	1.70
2	4031	Mole Sieve Tower C -	Threaded connection - 0.5"	0.0036	10.00	0.74	0.44	1.71
2	4284	Compressor Yard - Compressor unit 9 - gate valve seat	Threaded connection - 1"	0.0053	15.00	1.11	0.77	1.71
1	3371	De-ethanizer Reboiler -	Open-ended line - 0.5"	0.0214	60.00	4.41	0.04	1.71
1	3135	Compressor CM-14 - Sight glass valve	Plug valve - 1"	0.0266	75.00	76.66	3.11	1.71
2	4164	Resid gas cooler E507 -	Threaded connection - 0.5"	0.0035	10.00	0.68	0.43	1.72
1	3390	EP Skid to Koch -	Gate valve - 1"	0.0266	75.00	76.16	0.05	1.72
4	3518	Still Reboiler No. 2 - On chart recorder	Tubing connection - 0.5"	0.0053	15.00	14.99	0.76	1.73
1	---	Compressor CM-19 - (On roof) engine side	Crank case vent - 1.5"	0.702	2000.00	-912.66	81.87	1.74
1	3126	Compressor CM-14 - Stem packing	Variable volume pocket stem	0.140	400.00	-182.86	16.35	1.74
4	3760	Cryo System: Economizer -	Gate valve - 4"	0.0664	190.00	188.22	0.15	1.74
3	1396	Residue Gas/N2 Comp Bldg: Yard -	Gate valve - 0.75"	0.0210	60.00	59.43	2.98	1.74
1	3023	Fuel Gas Scrubber (West Yard) - PV-9	Threaded connection - 2"	0.0052	15.00	0.75	0.75	1.75
2	4331	Compressor Yard - Suction/Discharge Piping -	Gate valve - 0.5"	0.0209	60.00	58.91	3.01	1.75

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
2	4061	Surge Scrubber - gate valve seat	Threaded connection - 1"	0.0052	15.00	0.72	0.64	1.75
4	3700	Cryo System: Expander Feed Separator -	Open-ended line - 0.5"	0.0209	60.00	2.83	0.05	1.75
3	1799	Fuel Gas Scrubber (V8-1720) - A1720-10	Gate valve - 1"	0.0261	75.00	73.38	3.70	1.75
2	3991	WCW Inlet Line -	Gate valve - 2"	0.0347	100.00	97.82	4.25	1.75
3	1237	NGL Bullet 5 - A1101N-?	Gate valve - 1.5"	0.0260	75.00	73.23	0.01	1.75
1	3468	Refrig Comp Unit 12 -	Union - 2"	0.0347	100.00	4.44	4.99	1.76
1	3308	Dust Filters for Regen Gas -	Threaded connection - 0.75"	0.0035	10.00	0.44	0.40	1.76
4	3604	Yard North of Office - Orifice meter slide	Valve - 1"	0.0260	75.00	72.95	3.76	1.76
1	1996	Inlet Header - Controller box	Needle valve - 1"	0.0260	75.00	72.89	3.03	1.76
4	3574	Mole Sieve Dehy: Dehy Tower A/B -	Gate valve - 0.5"	0.0208	60.00	58.30	2.43	1.76
4	3800	Re-Compression: Unit 5 -	Threaded connection - 0.5"	0.0035	10.00	0.43	0.50	1.76
3	1853	Co-Gen Building: Fuel Gas Scrubber (SW Corner of Bldg) - Plug on GTV	Gate valve - 1"	0.0259	75.00	72.70	3.69	1.76
3	1394	Residue Gas/N2 Comp Bldg: Yard -	Gate valve - 0.75"	0.0208	60.00	58.13	2.95	1.76
2	4175	Cryo skid 101 - expander K101-A	Butterfly valve - 8"	0.242	700.00	28.84	29.59	1.76
1	3146	Refrig Comp Unit 11 - Plug on cylinder body.	Threaded connection - 0.5"	0.0035	10.00	0.41	0.00	1.76
3	1687	Re-Compressor Building - Re-Comp 5 (Fuel Gas Line)	Threaded connection - 2"	0.0052	15.00	0.60	0.74	1.76
3	1311	NGL Bullet 1 - A1101N-6	Gate valve - 0.5"	0.0207	60.00	57.85	0.01	1.76
1	3032	Fuel Gas to Mansfield (222) -	Threaded connection - 1.5"	0.0052	15.00	0.57	0.60	1.77
2	4131	Mole Sieve Tower C -	Flange - 4"	0.0258	75.00	2.69	3.15	1.77
4	3712	Cryo System: Absorber Bottoms Pumps -	Open-ended line - 0.5"	0.0206	60.00	2.15	0.05	1.77
1	3160	Refrig Comp Unit 11 -	Valve cover	0.0687	200.00	7.04	0.00	1.77
1	3154	Refrig Comp Unit 10 -	Open-ended line - 0.5"	0.0206	60.00	1.93	0.00	1.78
3	1286	NGL Bullet 2 - A1101N-5	Gate valve - 0.5"	0.0205	60.00	56.65	0.01	1.78
2	4180	Cryo skid 101 -	Gate valve - 0.5"	0.0205	60.00	56.45	2.50	1.79
1	3425	Refrig Comp Yard Piping -	Gate valve - 1.5"	0.0255	75.00	70.27	0.00	1.79
1	3171	Refrig Comp Units -	Gate valve - 2"	0.0340	100.00	93.64	4.90	1.79
3	1230	NGL Bullet 6 - G306?NA	Gate valve - 0.5"	0.0204	60.00	56.11	0.01	1.79
3	1516	Residue Gas/N2 Comp Bldg: Lower Level	Gate valve - 0.75"	0.0204	60.00	55.92	2.89	1.79
1	3241	Solar Turbines: Unit A - On skid	Gate valve - 2"	0.0339	100.00	92.91	4.88	1.80
3	1103	NRU 3 - Base of Hot Box	Open-ended line - 0.25"	0.0203	60.00	1.04	2.43	1.80
3	Direct	Heat Pump 3 -	Compressor Seals (8) - 4"	0.672	2000.00	-958.22	98.89	1.81
3	1731	HHE Compressor Building - Comp HHE 7	Threaded connection - 0.5"	0.0033	10.00	0.07	0.40	1.82
3	1038	Mole Sieve 3 - Ground level	Flange - 8"	0.0333	100.00	0.45	3.99	1.83
3	1245	NGL Bullet 4 - A1101N-11	Gate valve - 6"	0.0815	245.00	218.96	0.02	1.83
2	4139C	Resid gas cooler E507 - cooler plugs	Threaded connection - 1"	0.0050	15.00	-0.04	0.72	1.84
1	3260	Solar Turbines -	Gate valve - 0.75"	0.0198	60.00	52.86	2.85	1.84
1	3269	Solar Turbines -	Gate valve - 1"	0.0247	75.00	65.77	3.56	1.85
2	4342	Residue Gas Suction Scrubber - sight glass	Gate valve - 0.75"	0.0198	60.00	52.58	2.85	1.85
1	3309	Dust Filters for Regen Gas -	Needle valve - 0.25"	0.0198	60.00	52.55	2.31	1.85
3	1493	Residue Gas/N2 Comp Bldg - Comp 4 (Near Suction Bottle)	Gate valve - 0.5"	0.0197	60.00	52.42	2.81	1.85
3	1803	Fuel Gas Scrubber (V8-1720) - A1720-5	Gate valve - 1"	0.0247	75.00	65.43	3.51	1.85
4	3724	Cryo System: De-methanizer Tower (1st Platform) - Gate valve seat	Open-ended line - 0.5"	0.0197	60.00	-0.60	0.05	1.85
1	3001	Inlet Comp Yard Piping -	Gate valve - 0.75"	0.0197	60.00	51.93	2.29	1.86
3	1271	NGL Bullet 3 - A1101N-36	Gate valve - 0.75"	0.0196	60.00	51.76	0.01	1.86

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
4	3814	Re-Compression: Yard Piping - Connection on regulator	Regulator - 2"	0.0570	175.00	219.77	8.25	1.87
1	3337	Mole Sieve Tower 511C -	Gate valve - 0.75"	0.0194	60.00	50.65	2.27	1.88
3	1252	NGL Pump 2 - A1202N-14	Gate valve - 1"	0.0241	75.00	62.14	0.01	1.90
3	1496	Residue Gas/N2 Comp Bldg - Heat Pump 2	Cylinder end - flange	0.128	400.00	-201.19	18.87	1.90
2	4307	Compressor Unit # 1 -	Threaded connection - 0.75"	0.0032	10.00	-0.35	0.00	1.90
4	3833	Re-Compression: Yard Piping - On pressure relief valves	Flange - 2"	0.0160	50.00	-1.77	2.32	1.90
4	3642	Sales Gas Header -	Tubing connection - 0.375"	0.0048	15.00	12.30	0.69	1.90
3	1050	Mole Sieve 5 - XY-2854	Control valve - globe - 2"	0.0414	130.00	-5.17	4.96	1.91
4	3726	Cryo System: Exchanger - Gate valve seat	Open-ended line - 0.5"	0.0191	60.00	-2.39	0.04	1.91
2	4259	Compressor Unit # 5 -	Union - 1.5"	0.0319	100.00	-4.05	4.59	1.91
3	1797	Fuel Gas Scrubber (V8-1720) - LV1720A	Regulator - 1.5"	0.0557	175.00	210.72	7.92	1.91
2	4350D	C3 Cooler -	Threaded connection - 1"	0.0048	15.00	-0.64	0.00	1.91
1	3358	Cold Gas Separator (PV-505) -	Gate valve - 3"	0.0381	120.00	96.76	4.44	1.92
3	1194	NRU Expander 1 - Expander Housing	Flange - 10"	0.0476	150.00	-6.71	5.70	1.92
3	1828	Fuel Gas To Co-Gen - VO-31	Gate valve - 6"	0.0774	245.00	195.81	11.01	1.93
4	3976	Refrigeration Compressors: Unit 2 - To injector	Flange - 2"	0.0157	50.00	-2.73	2.27	1.94
4	3594	Mole Sieve Dehy: Dehy Train B - Top of dehy tower	Gate valve - 0.75"	0.0188	60.00	47.21	2.20	1.94
4	3599	Mole Sieve Dehy: Outlet - Needle valve seat	Open-ended line - 0.25"	0.0188	60.00	-3.38	2.19	1.94
3	1607	IR Compressor Building - IR Comp 2 (Fuel Gas)	Threaded connection - 2"	0.0047	15.00	-0.91	0.66	1.95
2	4362	Compressor Unit # 3 -	Control valve - orbit - 2"	0.0404	130.00	-8.20	5.83	1.96
2	4152	Residue Compressors FG Scrubber - on 4" orifice meter	Slide valve	0.0233	75.00	57.55	3.36	1.96
3	1892	Hg Removal Bed V8-401-3 - near A401N-20	Gate valve - 0.75"	0.0185	60.00	45.31	2.22	1.97
2	4049	Mole Sieve Tower A -	Gate valve - 0.75"	0.0185	60.00	45.31	2.26	1.97
1	3192	Solar Turbines: Unit A - Chart recorder	Needle valve - 0.375"	0.0185	60.00	45.11	2.66	1.98
2	4030	Mole Sieve Tower C - stem packing	Gate valve - 1"	0.0228	75.00	55.02	2.79	2.00
3	1051	Mole Sieve Header - N2811N-1	Needle valve - 0.5"	0.0182	60.00	43.79	2.18	2.00
1	3225	De-methanizer -	Gate valve - 0.5"	0.0182	60.00	43.79	2.63	2.00
1	3099	Compressor CM-13 -	Cylinder end - flange	0.121	400.00	-212.45	14.12	2.01
1	3163	Refrig Comp Unit 11 -	Threaded connection - 0.5"	0.0030	10.00	-0.89	0.00	2.01
4	3666	Cryo System: Warm Gas Exchanger - Gate valve seat	Open-ended line - 0.75"	0.0181	60.00	-5.40	0.04	2.01
4	3941B	Re-Compression: Unit 2 - FG Line 4	Plug valve - 2"	0.0362	120.00	86.30	5.24	2.02
2	4137	Chiller E-403 - on 2" orifice meter	Grease nipple	0.0150	50.00	35.60	0.00	2.02
2	4212	Compressor Unit # 4 -	Threaded connection - 2"	0.0045	15.00	-1.45	0.65	2.03
3	1317	Propane Yard: V8-411 - A411N-1	Gate valve - 16"	0.275	920.00	643.51	0.05	2.04
1	1946	Inlet Header -	Gate valve - 0.5"	0.0179	60.00	41.96	2.09	2.04
3	1755	Stab 1 Building - A612-28 (West Wall)	Gate valve - 4"	0.0566	190.00	132.41	0.12	2.04
4	3681	Cryo System: Expander Feed Separator -	Gate valve - 2"	0.0298	100.00	69.46	0.07	2.04
1	3275	DEA Contactor Pumps -	Threaded connection - 1"	0.0045	15.00	-1.57	0.64	2.05
2	4345	Residue Gas Suction Scrubber -	Gate valve - 4"	0.0565	190.00	131.51	8.14	2.05
1	---	Process Flare Line to Flare Pit	Installation of vapour recovery unit	121.144	60000.00	26122.92	539.93	2.05
1	3176	Solar Turbines: Unit B - On skid	Gate valve - 2"	0.0296	100.00	68.77	4.27	2.05

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
1	3311	Dust Filters for Regen Gas - Blowdown	Needle valve - 0.25"	0.0178	60.00	41.20	2.07	2.05
3	1112	NRU 3 - Base of Cold Box	Gate valve - 4"	0.0563	190.00	130.28	6.74	2.06
1	3244	Solar Turbines -	Gate valve - 1"	0.0221	75.00	50.97	3.19	2.06
1	3213	Solar Turbines: Header Outside -	Flange - 2"	0.0147	50.00	-5.58	2.12	2.06
4	3729	Cryo System: Exchanger -	Tubing connection - 0.375"	0.0044	15.00	10.18	0.01	2.06
1	3315	Mole Sieve Bypass Piping -	Needle valve - 0.5"	0.0177	60.00	40.66	2.06	2.07
2	4079	Common inlet lines -	Gate valve - 8"	0.103	350.00	236.98	12.61	2.07
2	4280	Compressor Unit # 7 -	Threaded connection - 1.5"	0.0044	15.00	-1.69	0.64	2.07
3	1278	NGL Bullet 3 - Near A1101N-33	Gate valve - 0.75"	0.0176	60.00	40.47	0.01	2.07
2	3993	SCW Inlet Line - PECO brand	Pressure transmitter - 1.5"	0.0221	75.00	50.58	2.70	2.07
2	4114	Skid 2 Inlet -	Gate valve - 8"	0.103	350.00	235.46	12.58	2.07
4	3943B	Re-Compression: Unit 2 - FG Line 3	Union - 2"	0.0294	100.00	-11.51	4.25	2.07
3	1383	Amine Bldg: Near G8-1650 - A2809N-4	Gate valve - 1"	0.0220	75.00	50.34	2.64	2.07
1	3223	De-methanizer -	Gate valve - 0.5"	0.0175	60.00	39.63	2.52	2.09
3	1580	HP1 Bldg: E26-15 - N201-9 (BV seat).	Threaded connection - 0.5"	0.0029	10.00	-1.22	0.35	2.09
4	3580	Mole Sieve Dehy: Dehy Train A -	Control valve - orbit - 4"	0.0516	177.00	-21.62	6.02	2.09
4	3864	Re-Compression: Unit 3 - Cylinder No. 3	Distance piece	0.583	2000.00	-1096.92	84.24	2.09
2	4366	Compressor Unit # 1 - stem packing	Control valve - orbit - 4"	0.0515	177.00	-22.00	7.42	2.09
3	1830	Co-Gen Building: Outside (CA 625 - HP FG Scrubber) - VG-151	Threaded connection - 0.5"	0.0029	10.00	-1.30	0.41	2.11
2	4293	Compressor Yard - Compressor unit 4 - on 4" plug valve	Grease nipple	0.0144	50.00	32.14	2.08	2.11
3	1107	NRU 3 - Hot Box - 4155-3 On PSV	Union - 0.5"	0.0144	50.00	-6.56	1.73	2.11
3	1470	Residue Gas/N2 Comp Bldg - Heat Pump 4	Valve cover	0.0576	200.00	-26.42	8.48	2.11
3	1119	NRU 2 - Base of Hot Box	Threaded connection - 0.25"	0.0029	10.00	-1.33	0.34	2.12
4	3828	Re-Compression: Yard Piping -	Union - 2"	0.0287	100.00	-13.56	4.15	2.12
3	1515	Residue Gas/N2 Comp Bldg: Lower Level	Gate valve - 0.75"	0.0171	60.00	37.48	2.52	2.13
3	1881	Amine Building - A 2806N-1 GTV stem under vessel V8-2806-2	Gate valve - 1"	0.0214	75.00	46.59	2.56	2.14
2	4029	Mole Sieve Tower C -	Control valve - orbit - 8"	0.100	353.00	-50.47	12.28	2.14
1	3043	Scrubber (PV-517) -	Gate valve - 1.5"	0.0213	75.00	46.42	2.49	2.14
2	3992	SCW Inlet Line - ball valve seat	Threaded connection - 1"	0.0043	15.00	-2.18	0.52	2.15
4	3715	Cryo System: Absorber Tower (20.001) - Gate valve seat	Open-ended line - 0.5"	0.0170	60.00	-8.78	0.04	2.15
1	3014	Inlet Comp Yard Piping -	Gate valve - 6"	0.0694	245.00	149.87	8.09	2.15
4	3853	Re-Compression: Unit 4 - Cylinder No. 2	Distance piece	0.566	2000.00	-1123.06	81.81	2.15
3	1815	Stab 1 Building (Yard) - (NGL Vessel)	Gate valve - 0.5"	0.0169	60.00	36.38	0.04	2.16
4	3764	C3 Refrigeration: PSV Header - Outside Refrig Comp Building (under walkway)	Gate valve - 0.5"	0.0169	60.00	36.20	0.00	2.16
4	3699B	Cryo System: South Of Cold Gas Exchanger -	Gate valve - 0.75"	0.0168	60.00	35.91	0.04	2.17
4	3597	Mole Sieve Dehy: Outlet -	Gate valve - 0.5"	0.0168	60.00	35.82	1.96	2.17
2	4119	Skid 2 Inlet -	Tubing connection - 0.375"	0.0042	15.00	8.94	0.51	2.17
3	1095	Amine Bldg (V2806-1) - (under vessel)	Gate valve - 1"	0.0210	75.00	44.57	2.52	2.17
3	1226	Propane Storage Tank V6-290 -	Threaded connection - 0.5"	0.0028	10.00	-1.61	0.00	2.19
3	1459	Residue Gas/N2 Comp Bldg - Heat Pump 4 (near PDI-428N-4)	Gate valve - 0.75"	0.0167	60.00	34.94	2.45	2.19
1	3295	High Pressure JT Expander -	Gate valve - 0.75"	0.0167	60.00	34.81	2.40	2.19
1	1958	4th Stage Suction Scrubber (PV-47) -	Gate valve - 3"	0.0333	120.00	69.34	3.88	2.20

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1749	HHE Compressor Building - Associated Yard Piping (Near C307-1)	Flange - 12"	0.0415	150.00	-24.92	4.97	2.20
3	1586	HP1 Bldg: W20-09 - To drain.	Open-ended line - 0.375"	0.0166	60.00	-10.12	1.98	2.21
3	1101	NRU 3 - Base of Hot Box	Tubing connection - 0.25"	0.0041	15.00	8.53	0.50	2.21
2	4116	Skid 2 Inlet -	Tubing connection - 0.375"	0.0041	15.00	8.53	0.51	2.21
3	1540	Residue Gas/N2 Comp Bldg - Heat Pump 3	Threaded connection - 0.5"	0.0028	10.00	-1.71	0.00	2.21
2	4377	Compressor Unit # 6 -	Cylinder end - flange	0.110	400.00	-229.91	15.82	2.22
1	3388	EP Skid to Koch -	Gate valve - 0.75"	0.0164	60.00	33.63	0.03	2.22
2	4052	Inlet Scrubber - gate valve seat	Threaded connection - 1"	0.0041	15.00	-2.64	0.50	2.22
3	1362	Amine Bldg: GB-2702N12A - A2702N-2	Threaded connection - 0.5"	0.0027	10.00	-1.76	0.33	2.22
2	4050	Mole Sieve Tower B -	Gate valve - 0.5"	0.0164	60.00	33.39	2.01	2.23
4	3563	Mole Sieve Dehy: Outlet - Gate valve seat	Threaded connection - 1"	0.0041	15.00	-2.67	0.48	2.23
1	3080	West Inlet Yard Piping - Chart recorder	Tubing connection - 0.375"	0.0041	15.00	8.31	0.48	2.23
2	4282	Compressor Unit 5 - VVP Stem same cylinder as 4283	Cylinder end - flange	0.109	400.00	-230.89	15.73	2.23
2	4163	Resid gas cooler E507 -	Gate valve - 0.75"	0.0164	60.00	33.11	2.36	2.23
3	1674	Re-Compressor Building - Re-Comp 4	Crank case vent - 2"	0.545	2000.00	-1155.65	65.24	2.23
3	1102	NRU 3 - Base of Hot Box	Threaded connection - 0.25"	0.0027	10.00	-1.82	0.33	2.24
1	3050	Scrubber (PV-517) -	Threaded connection - 1.5"	0.0041	15.00	-2.73	0.48	2.24
4	Direct	Re-Compressor Unit 1 -	Seals vent	0.542	2000.00	-1160.48	78.32	2.25
4	3870	Re-Compression: Unit 2 -	Valve cover	0.0541	200.00	-36.95	7.83	2.25
1	3173	Refrig Comp Units -	Threaded connection - 2"	0.0041	15.00	-2.79	0.58	2.25
3	1292	NGL Bullet 1 - A1101N-7	Gate valve - 0.5"	0.0162	60.00	32.25	0.00	2.25
1	3368	Inlet Gas Scrubber (PV-501) -	Gate valve - 0.75"	0.0162	60.00	32.03	1.89	2.26
4	3615	Yard North of Office -	Gate valve - 0.5"	0.0162	60.00	32.00	2.34	2.26
1	1955	Inlet Comp Yard Piping -	Gate valve - 3"	0.0323	120.00	63.98	3.77	2.26
1	3159	Refrig Comp Unit 11 -	Valve cover	0.0538	200.00	-38.05	0.00	2.26
2	4349H	C3 Cooler -	Threaded connection - 1"	0.0040	15.00	-2.86	0.00	2.27
1	3439B	EP Skid to Koch -	Gate valve - 0.75"	0.0161	60.00	31.68	0.03	2.27
2		Compressor Unit # 6 -	Crank case vent - 2"	0.536	2000.00	-1169.02	77.29	2.27
3	1882	FG Piping on RES/N2/Heat Pump Bldg (outside) - A2400N-1	Gate valve - 4"	0.0509	190.00	99.56	7.23	2.27
3	1005	Mole Sieve 4 - On top platform	Tubing connection - 0.75"	0.0067	25.00	13.06	0.79	2.28
3	1597	HP2 Bldg: W01-06 - Near N239-4	Tubing connection - 0.375"	0.0040	15.00	7.79	0.48	2.28
1	3443	De-propanizer Accumulator (PV-11) -	Pump seal	0.133	500.00	-293.57	0.23	2.29
4	3532	Heat Medium Heater FG Line -	Flange - 4"	0.0200	75.00	-14.89	2.89	2.29
3	1305	NGL Bullet 1 - A1101N-8	Gate valve - 1"	0.0199	10.00	38.12	0.01	2.30
2	4023	Mole Sieve Tower C -	Gate valve - 0.5"	0.0159	60.00	30.41	1.94	2.30
3	1134	NRU 3 - Top Platform - A2368N	Threaded connection - 0.75"	0.0026	10.00	-2.06	0.32	2.31
3	1029	Mole Sieve 3 - On top platform	Flange - 2"	0.0132	50.00	-10.37	1.58	2.31
2	4167	Cryo skid north - Note: was fixed already on expander	Control valve - 10"	0.121	459.00	-95.77	14.75	2.32
3	Direct	Comp 7 HHE -	Blowdown Stack - 14"	1.307	5000.00	-2974.31	156.51	2.33
1	3226	HP Expander Scrubber (PV-503) -	Gate valve - 0.75"	0.0157	60.00	29.21	2.26	2.33

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
4	3741	Cryo System: Absorber Bottoms Pumps -	Open-ended line - 0.5"	0.0157	60.00	-12.81	0.04	2.33
1	3261	Solar Turbines -	Threaded connection - 1"	0.0039	15.00	-3.26	0.56	2.34
1	3224	De-methanizer -	Gate valve - 1"	0.0194	75.00	35.71	2.80	2.35
2	4139B	Resid gas cooler E507 - cooler plugs	Threaded connection - 1"	0.0039	15.00	-3.29	0.56	2.35
2	4185	Cryo skid 101 -	Threaded connection - 0.5"	0.0026	10.00	-2.22	0.37	2.36
3	1190	NRU Expander 1 - Valve 415-11	Control valve - 10"	0.118	459.00	-102.30	14.18	2.36
3	1094	Amine Bldg: V8-2806-1 - A2806N-8	Gate valve - 1"	0.0194	75.00	35.15	2.32	2.36
3	1850	Co-Gen Building: Fuel Gas Scrubber (SW Corner of Bldg) -	Gate valve - 1"	0.0193	75.00	35.00	2.75	2.36
3	1232	NGL Bullet 6 - A1101N-16/TB0319	Gate valve - 4"	0.0490	190.00	88.66	0.01	2.36
3	1116	NRU 2 - Base of Hot Box	Threaded connection - 0.25"	0.0026	10.00	-2.31	0.31	2.38
4	3511	Regen Heater -	Tubing connection - 0.5"	0.0038	15.00	6.80	0.55	2.38
2	4156	Residue Compressors FG Scrubber -	Gate valve - 0.5"	0.0153	60.00	27.19	2.21	2.38
1	3155	Refrig Comp Unit 10 -	Open-ended line - 0.5"	0.0153	60.00	-14.01	0.00	2.39
3	1282	NGL Bullet 3 - A1101N-29	Gate valve - 0.75"	0.0153	60.00	26.88	0.00	2.39
1	3302	Dust Filter Header -	Gate valve - 0.5"	0.0152	60.00	26.51	1.77	2.40
4	3792	Re-Compression: Valero Discharge Scrubber -	Flange - 4"	0.0190	75.00	-17.80	2.75	2.40
3	1689	Re-Compressor Building - Re-Comp 2 (WE4C-301-2) (Fuel Gas Line)	Governor - 2"	0.0506	200.00	87.83	7.19	2.41
3	1431	Residue Gas/N2 Comp Bldg - Heat Pump 1	Valve cover	0.0505	200.00	-47.78	7.43	2.41
1	3467	Refrig Comp Unit 12 -	Control valve - plug - 2"	0.0328	130.00	-31.32	4.72	2.42
2	4027	Mole Sieve Tower C - stem packing	Control valve - ball - 1"	0.0326	130.00	-31.71	3.99	2.42
2	4173	Cryo skid 101 - expander K101-B	Threaded connection - 0.5"	0.0025	10.00	-2.45	0.31	2.43
3	1047	Mole Sieve 3 - A2811N-18	Threaded connection - 0.75"	0.0025	10.00	-2.49	0.30	2.44
4	3740	Cryo System: Absorber Bottoms Pumps - Gate valve seat	Open-ended line - 0.75"	0.0149	60.00	-15.21	0.03	2.46
2	4060	Scrubber - on 6" orifice meter	Greaser	0.0124	50.00	20.47	1.51	2.46
1	3287	De-methanizer -	Gate valve - 4"	0.0470	190.00	77.44	6.76	2.46
4	3638	Sales Gas Header -	Tubing connection - 0.375"	0.0037	15.00	6.08	0.54	2.47
2	4080	Common inlet lines - gate valve seat	Open-ended line - 0.5"	0.0148	60.00	-15.47	1.81	2.47
3	1895	Hg Removal Bed V8-401-2 - plug on BV seat	Threaded connection - 0.5"	0.0025	10.00	-2.58	0.29	2.47
4	3718	Cryo System: De-methanizer Tower (1st Platform) -	Gate valve - 0.75"	0.0147	60.00	23.87	0.03	2.48
3	1306	NGL Bullet 1 - A1101N-7	Gate valve - 0.75"	0.0146	10.00	23.15	0.00	2.50
1	1940	Inlet Header -	Threaded connection - 0.5"	0.0024	10.00	-2.67	0.28	2.50
2	4143	Compressor Unit 8 Outside -	Threaded connection - 2"	0.0036	15.00	-4.01	0.53	2.50
3	1584	HP1 Bldg: W20-09 - B215-7 (BV seat).	Threaded connection - 0.5"	0.0024	10.00	-2.67	0.29	2.50
3	1639	Re-Compressor Building - Re-Comp 1 (WE4C-301-1) (Fuel Gas Line)	Threaded connection - 2"	0.0036	15.00	-4.02	0.52	2.50
3	1315	NGL Bullet 2 - A1101N-3	Gate valve - 2"	0.0243	100.00	38.27	0.01	2.51
4	3690	Cryo System: De-methanizer Recycle Line	Gate valve - 0.75"	0.0146	60.00	22.91	0.03	2.51

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
4	3943A	Re-Compression: Unit 2 - FG Line 3	Threaded connection - 2"	0.0036	15.00	-4.04	0.53	2.51
2	4133	Mole Sieve Tower C -	Flange - 4"	0.0182	75.00	-20.31	2.22	2.51
1	3085	West Inlet Yard Piping - gate valve seat on Hanna Bridgeport scrubber (PV-29)	Gate valve - 0.75"	0.0145	60.00	22.38	1.69	2.52
4	3495	Inlet Header -	Threaded connection - 0.5"	0.0024	10.00	-2.74	0.29	2.52
1	3078	West Inlet Yard Piping - On orifice meter to PV-29	Slide valve	0.0181	75.00	27.77	2.11	2.53
3	1872	Co-Gen (Fuel Gas Scrubber SE Corner of Bldg) - Sight Glass	Gate valve - 0.75"	0.0144	120.00	22.16	2.05	2.53
3	1897	Hg Removal Bed V8-401-1 - on A401N-8	Tubing connection - 0.25"	0.0036	15.00	5.53	0.43	2.53
4	3636	Sales Gas Header -	Gate valve - 3"	0.0289	120.00	44.24	4.17	2.53
4	3774	C3 Refrigeration: Storage -	Threaded connection - 0.5"	0.0024	10.00	-2.79	0.00	2.54
2	4257B	Compressor Unit # 4 -	Injector	0.0479	200.00	72.66	6.90	2.54
1	3184	Solar Turbines: Unit B - Chart recorder	Tubing connection - 0.5"	0.0036	15.00	5.42	0.52	2.54
1	3107	Compressor CM-19 -	Valve cover	0.0478	200.00	-56.04	5.58	2.55
4	3887	Refrigeration Compression: Outside Yard Piping - Orifice meter to Unit 2	Needle valve - 0.5"	0.0143	60.00	21.38	2.07	2.55
1	3212	Solar Turbines: Header Outside -	Gate valve - 2"	0.0238	100.00	35.36	3.42	2.56
3	1277	NGL Bullet 3 - A1101N-32	Gate valve - 0.75"	0.0143	60.00	21.18	0.00	2.56
3	1120	NRU 2 - Base of Hot Box	Threaded connection - 0.25"	0.0024	10.00	-2.86	0.28	2.57
4	3515	Still Reboiler No. 1 -	Gate valve - 0.5"	0.0142	60.00	20.71	2.05	2.58
3	1885	FG Piping on RES/N2/Heat Pump Bldg (outside) - pv2400n-1	GBV/CV - 2"	0.0307	130.00	-37.62	4.36	2.58
4	3634	TEG Contactor - Inlet line	Open-ended line - 0.75"	0.0141	60.00	-17.42	1.65	2.58
2	4142	Compressor Unit 9 Outside -	Threaded connection - 2"	0.0035	15.00	-4.38	0.51	2.59
1	3086	West Inlet Yard Piping - On Hanna Bridgeport scrubber (PV-29)	Threaded connection - 0.75"	0.0024	10.00	-2.92	0.27	2.59
1	3305	Mole Sieve Bypass Piping -	Gate valve - 6"	0.0570	245.00	79.45	6.65	2.62
4	3546	North Heat Medium Heater - Pilot stem	Gate valve - 0.5"	0.0139	60.00	19.33	2.01	2.62
4	3751	Cryo System: Absorber Tower (20.001) - First platform: gate valve seat	Open-ended line - 0.5"	0.0139	60.00	-18.04	0.03	2.62
3	1179	NRU 1 - 2nd Platform - Near A2311N	Union - 1"	0.0231	100.00	-30.56	2.76	2.64
4	3680	Cryo System: Expander Feed Separator - Gate valve seat	Open-ended line - 0.5"	0.0137	60.00	-18.63	0.03	2.66
3	1340	Amine Bldg: V8-2810N - Near A2810N-3	Threaded connection - 0.75"	0.0023	10.00	-3.13	0.27	2.67
2	4300	Compressor Yard - Suction/Discharge Piping -	Orbit valve - 3"	0.0273	120.00	35.22	3.93	2.68
3	1719	HHE Compressor Building - Comp HHE 7	Threaded connection - 0.5"	0.0023	177.00	-3.16	0.27	2.68
1	3169	Refrig Comp Units -	Gate valve - 0.5"	0.0136	60.00	17.51	1.96	2.68
3	1074	NRU 3 - A412N-13	Gate valve - 10"	0.113	500.00	144.18	13.55	2.69
2	4005	Mole Sieve Tower D -	Gate valve - 1"	0.0169	75.00	21.36	2.07	2.70
1	1979	Inlet Header - Chart recorder	Tubing connection	0.0034	10.00	4.61	0.40	2.70
1	1975	Inlet Header - Grease nipple plus stem packing.	Plug valve - 2"	0.0269	120.00	33.36	3.14	2.71
2	4064	Fuel Gas -	Gate valve - 0.5"	0.0134	60.00	16.56	1.94	2.72
2	4127	Mole Sieve Tower B - gate valve seat	Open-ended line - 0.5"	0.0134	60.00	-19.49	1.64	2.72
4	3626	Yard North of Office - On orifice meter	Gate valve - 0.5"	0.0134	60.00	16.32	1.56	2.72
1	3125	Compressor CM-14 -	Valve cover	0.0447	200.00	-65.49	5.21	2.73

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1504	Residue Gas/N2 Comp Bldg: Lower Level - A301N-3	Gate valve - 3"	0.0268	120.00	32.48	3.81	2.73
3	1048	Mole Sieve Header - PDSL-2869N	Needle valve - 0.375"	0.0134	60.00	16.11	1.60	2.73
3	1181	NRU 1 -	2 Tubing connections - 0.375"	0.0033	15.00	3.92	0.40	2.75
3	1390	Regen Gas Heater 3 (G10-280) - A2801N-2	Gate valve - 1.5"	0.0166	75.00	19.53	2.36	2.75
3	1212	NGL Pump 5 - ---	Pump seal	0.110	500.00	-329.33	0.03	2.76
2	4072	Sales Piping - on 4" orifice meter	Orifice meter plate - 4"	0.0329	150.00	-98.94	4.75	2.77
3	1809	Fuel Gas Scrubber (V8-1720) - Near FE1720	Threaded connection - 0.5"	0.0022	10.00	-3.41	0.31	2.78
1	3207	Solar Turbines: Unit B - On orifice meter	Needle valve - 0.5"	0.0131	60.00	14.74	1.89	2.78
3	1626	IR Compressor Building - IR Comp 3	Valve cover	0.0436	200.00	-68.67	5.22	2.79
3	1149	NRU 2 - 2nd Platform - A2320-N	Gate valve - 1"	0.0163	75.00	17.87	1.95	2.80
4	3773	C3 Refrigeration: Storage - Near Refrig Compressor Building	Open-ended line - 0.5"	0.0131	60.00	-20.69	0.00	2.80
4	3714	Cryo System: Absorber Tower (20.001) - Gate valve seat	Open-ended line - 0.5"	0.0130	60.00	-20.92	0.03	2.81
3	1223	NGL Pump 2 -	Pump seal - 1"	0.108	500.00	-332.74	0.03	2.82
1	3164	Refrig Comp Unit 11 -	Valve cover	0.0431	200.00	-70.16	0.00	2.82
2	4242	Compressor Unit 3 - front flange seam	Cylinder body	0.0861	400.00	-266.49	12.42	2.83
4	3562	Mole Sieve Dehy: Outlet - Stem packing	Gate valve - 12"	0.128	595.00	131.12	14.89	2.84
1	3202	Solar Turbines: Unit B - Fuel gas filter piping	Tubing connection - 0.375"	0.0032	15.00	3.23	0.46	2.85
3	1690	IR Compressor Building - IR Comp 3	Crank case vent - 2"	0.426	2000.00	-1339.08	51.06	2.85
3	1728	HHE Compressor Building - Comp HHE 7	Threaded connection - 0.5"	0.0021	10.00	-3.59	0.25	2.86
2	4139G	Resid gas cooler E507 - cooler plugs	Threaded connection - 1"	0.0032	15.00	-5.39	0.46	2.86
3	1234	NGL Bullet 5 - A1101N-6	Gate valve - 0.75"	0.0126	60.00	11.69	0.00	2.90
4	3497	Inlet Header - North	Threaded connection - 0.5"	0.0021	10.00	-3.72	0.25	2.92
4	3785	Re-Compression: Piping Adjacent to Clark	Gate valve - 3"	0.0250	120.00	22.37	3.62	2.92
4	3744A	Cryo System: Absorber Tower (20.001) - First platform: gate valve seat	Open-ended line - 0.75"	0.0125	60.00	-22.37	0.03	2.92
2	4338	Make-up Gas Suction Scrubber - sight glass	Gate valve - 0.75"	0.0125	60.00	11.03	1.80	2.93
1	1962	Inlet Comp Yard Piping -	Gate valve - 3"	0.0250	120.00	22.04	2.91	2.93
2	4017	Mole Sieve Tower D -	Flange - 4"	0.0156	75.00	-28.04	1.91	2.93
1	1950	1ST Stage Suction Scrubber (PV-1A) -	Threaded connection - 0.5"	0.0021	10.00	-3.77	0.24	2.94
4	3882	FG Scrubber -	Tubing connection - 0.375"	0.0031	15.00	2.65	0.45	2.94
3	1073	NRU 3 - A411N-71	Threaded connection - 0.5"	0.0021	10.00	-3.77	0.25	2.95
1	1969	Inlet Comp Yard Piping -	Gate valve - 4"	0.0392	190.00	33.26	4.58	2.95
4	3770	C3 Refrigeration: Storage - Near Refrig Compressor Building	Gate valve - 2"	0.0206	100.00	17.15	0.00	2.96
3	1066	Amine Bldg: V8-404N - Near A404N-3	Tubing connection - 0.375"	0.0031	15.00	2.53	0.37	2.96
3	1467	Residue Gas/N2 Comp Bldg - Heat Pump 4	Gate valve - 0.75"	0.0123	60.00	10.09	1.81	2.97
3	1616	IR Compressor Building - IR Comp 1	Threaded connection - 0.5"	0.0021	10.00	-3.82	0.25	2.97
3	1018	Mole Sieve 2 - XY2813N0	Orbit valve - 8"	0.0718	350.00	58.55	8.59	2.97
2	4295	Compressor Yard - common discharge line	Gate valve - 4"	0.0388	190.00	31.15	5.60	2.98
3	1519	Residue Gas/N2 Comp Bldg - Heat Pump 2	Valve cover	0.0409	200.00	-76.89	6.01	2.98
3	1898	Hg Removal Bed V8-401-1 - on 10" BV401N-2	Grease nipple - 0.5"	0.0102	50.00	8.13	1.22	2.98
3	1451	Residue Gas/N2 Comp Bldg - Comp 3	Gate valve - 0.75"	0.0122	60.00	9.47	1.73	2.99
3	1810	Fuel Gas Scrubber (V8-1720) - Near FE1720	Threaded connection - 0.5"	0.0020	60.00	-3.90	0.29	3.00

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
2	4234	Compressor Unit 8 -	Valve cover	0.0405	200.00	-78.01	5.84	3.01
3	1367	Amine Bldg: Near V8-2701N-11	Gate valve - 12"	0.120	595.00	87.20	14.35	3.02
2	4298	Compressor Yard - Suction/Discharge Piping -	Gate valve - 0.5"	0.0120	60.00	8.54	0.00	3.03
3	1933	Dehydration Tower # 2 east - onlg-2801N-2	Gate valve - 0.75"	0.0120	60.00	8.51	1.44	3.03
2	4105	Mole Sieve Tower A -	Gate valve - 0.5"	0.0120	60.00	8.51	1.47	3.03
4	3687	Cryo System: Product Transfer Pump -	Gate valve - 2"	0.0200	100.00	13.96	0.05	3.04
3	1251	NGL Pump 3 - Near FY1201N	Union - 1.5"	0.0200	100.00	-39.78	0.01	3.04
2	4349E	C3 Cooler -	Threaded connection - 1"	0.0030	15.00	-5.98	0.00	3.05
3	1304	NGL Bullet 1 - LG1101NB	Gate valve - 0.5"	0.0119	60.00	7.82	0.00	3.07
2	4310	Compressor Unit # 1 -	Valve cover	0.0395	200.00	-81.17	0.00	3.09
2	4057	Scrubber - sight glass	Gate valve - 0.75"	0.0118	60.00	7.13	1.44	3.10
3	1244	NGL Bullet 4 - A1101N-13	Gate valve - 2"	0.0196	100.00	11.73	0.01	3.10
3	1211	NGL Pump 5 - A1202N-6	Gate valve - 3"	0.0235	120.00	13.90	0.01	3.11
3	1507	Residue Gas/N2 Comp Bldg: Lower Level	Flange - 3"	0.0147	75.00	-30.81	2.09	3.11
2	4011	Mole Sieve Tower A -	Control valve - ball - 1"	0.0254	130.00	-53.51	3.11	3.12
2	4360	Residue Gas Suction Scrubber -	Needle valve - 0.75"	0.0117	60.00	6.59	1.69	3.12
1	3031	Inlet Header -	Threaded connection - 0.5"	0.0019	10.00	-4.14	0.23	3.13
1	3198	Solar Turbines: Unit A - On skid	Gate valve - 2"	0.0195	100.00	10.76	2.80	3.13
3	1649	Re-Compressor Building - Re-Comp 2	Flange - 6"	0.0194	100.00	-41.66	2.32	3.14
3	1353	Amine Bldg: (Amine Feed/Res exchanger)	Gate valve - 0.75"	0.0116	60.00	5.97	1.39	3.15
3	1930	Dehydration Tower # 1 west - A2802N-3	Gate valve - 10"	0.0964	500.00	49.05	11.55	3.16
2	4139E	Resid gas cooler E507 - cooler plugs	Threaded connection - 1"	0.0029	15.00	-6.30	0.42	3.16
1	3377	De-ethanizer Accumulator (PV-10) -	Control valve - globe - 3"	0.0271	141.00	-59.34	0.05	3.17
4	3799	Re-Compression: Unit 5 - Cylinder No. 3	Distance piece	0.383	2000.00	-1406.34	55.38	3.18
3	1447	Residue Gas/N2 Comp Bldg: Lower Level	Gate valve - 10"	0.0951	500.00	41.21	13.51	3.20
3	Direct	Residue Gas Comp 2 - Distance piece vents and packing case drains tied to common vent stack.	Compressor Seals (4) - 3"	0.380	2000.00	-1411.42	53.98	3.21
1	3122	Compressor CM-19 - Damaged at weld (cracked)	Damage pipe - 2"	0.0095	50.00	-21.44	1.11	3.21
1	3153	Refrig Comp Unit 10 -	Open-ended line - 0.5"	0.0113	60.00	-25.84	0.00	3.22
2	4099	DGA coalescer - gate valve seat	Open-ended line - 1"	0.0142	75.00	-32.32	1.73	3.22
4	3646	Sales Gas Header - Stem packing on orifice meter.	Ball valve - 0.5"	0.0113	60.00	4.39	1.64	3.23
3	1428	Residue Gas/N2 Comp Bldg - Comp 2	Threaded connection - 0.5"	0.0019	10.00	-4.33	0.27	3.23
4	3662	Cryo System: Warm Gas Exchanger -	Gate valve - 10"	0.0941	500.00	35.82	0.22	3.23
2	4154	Residue Compressors FG Scrubber - on 4" orifice meter	Equilizer valve	0.0141	75.00	5.36	2.04	3.23
4	3980	Power Generators: Unit 2 -	Union - 3"	0.0282	150.00	-65.17	4.07	3.24
2	3999A	Inlet Line -	Gate valve - 2"	0.0188	100.00	6.89	2.30	3.24
1	3095	Compressor CM-13 - Stem packing	Variable volume pocket stem	0.0751	400.00	-283.65	8.76	3.24
1	3133	Compressor CM-13 -	Valve cover	0.0375	200.00	-87.03	4.38	3.25
3	1587	HP1 Bldg: W30-10 - To drain.	Open-ended line - 0.375"	0.0112	60.00	-26.13	1.35	3.25
1	3077	West Inlet Yard Piping - On orifice meter to PV-29	Valve - 0.5"	0.0112	60.00	4.02	1.31	3.25
3	1170	NRU 1 - A412N-1	Gate valve - 10"	0.0937	500.00	33.46	11.22	3.25
3	1632	IR Compressor Building - Associated Yard Piping (Near A321-10)	Threaded connection - 0.75"	0.0019	200.00	-4.38	0.22	3.26
3	1706	G10-806 - on B806-1	Threaded connection - 3"	0.0047	25.00	-10.96	0.66	3.26

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
1	3087	West Inlet Yard Piping - On VAW gas scrubber (PV-28)	Flange - 2"	0.0093	50.00	-21.92	1.09	3.26
2	4032	Mole Sieve Tower C - on 4" Orbit valve	Grease nipple - 0.5"	0.0093	50.00	2.95	1.14	3.27
3	1829	Co-Gen Building: Outside (CA 625 - HP FG Scrubber) - VG-151	Gate valve - 0.5"	0.0111	60.00	3.44	1.58	3.28
2	4053	Inlet Scrubber - sight glass	Gate valve - 0.75"	0.0111	60.00	3.44	1.36	3.28
2	4349D	C3 Cooler -	Threaded connection - 1"	0.0028	15.00	-6.61	0.00	3.28
3	1272	NGL Bullet 2 - A1101N-5	Gate valve - 6"	0.0452	245.00	12.53	0.01	3.30
2	4092	Process inlet separator D-208 - sight glass	Gate valve - 0.75"	0.0111	60.00	2.97	1.35	3.30
4	3684	Cryo System: Beside Expander Feed Separator - Gate valve seat	Open-ended line - 0.5"	0.0110	60.00	-26.87	1.59	3.32
2	4256	Compressor Unit # 4 -	Flange - 1"	0.0091	50.00	-22.48	1.32	3.33
3	1108	NRU 3 - Hot Box - 4155-2 On PSV	Union - 0.5"	0.0091	50.00	-22.54	1.09	3.34
3	1812	G-10-625-2 - Near X625-12C (East Reboiler)	Union	0.0182	100.00	-45.09	2.59	3.34
3	1415	Residue Gas/N2 Comp Bldg - Comp 1	Gate valve - 0.75"	0.0109	60.00	2.22	1.55	3.34
3	1433	Residue Gas/N2 Comp Bldg - Heat Pump 1	Valve cover	0.0363	200.00	-90.79	5.33	3.36
1	3232	Solar Turbines: Unit B - On skid	Threaded connection - 1.5"	0.0027	15.00	-6.82	0.39	3.36
4	3808	Re-Compression: Inlet Scrubber - Gate valve seat	Open-ended line - 1"	0.0135	75.00	-34.31	1.95	3.38
3	1173	NRU 1 - A413N-1	Gate valve - 3"	0.0216	120.00	2.68	2.58	3.39
3	1026	NRU 3 - Base of Cold Box - A2346N	Gate valve - 10"	0.0888	500.00	5.75	10.64	3.43
3	1547	Residue Gas/N2 Comp Bldg - Heat Pump 2	Gate valve - 0.75"	0.0107	60.00	0.65	1.57	3.43
3	1711	Re-Compressor Building - Associated Yard Piping (Near A9239)	Gate valve - 4"	0.0337	190.00	2.02	4.04	3.43
2	4083	Common inlet lines -	Tubing connection - 0.5"	0.0027	15.00	0.14	0.33	3.43
4	3962	Refrigeration Compressors: Unit 3 -	Needle valve - 0.75"	0.0106	60.00	0.54	1.54	3.43
4	3944B	Re-Compression: Unit 2 - FG Line 2	Union - 2"	0.0176	100.00	-46.94	2.55	3.46
2	4007	Mole Sieve Tower D -	Control valve - orbit - 4"	0.0312	177.00	-83.09	3.81	3.46
3	1060	Mole Sieve Header - PDSL-2866N	Tubing connection - 0.375"	0.0026	15.00	-0.01	0.32	3.47
4	3560	TEG Still - Stem at burners.	Tubing connection - 0.5"	0.0026	15.00	-0.12	0.38	3.49
3	1532	Residue Gas/N2 Comp Bldg - Heat Pump 3	Threaded connection - 0.5"	0.0017	10.00	-4.75	0.26	3.49
3	1264	NGL Bullet 2 - A1101B-8	Gate valve - 4"	0.0329	190.00	-2.45	0.01	3.51
1	3151	Refrig Comp Unit 11 -	Valve cover	0.0347	200.00	-95.57	0.00	3.51
4	3613	Yard North of Office -	Threaded connection - 0.25"	0.0017	10.00	-4.81	0.20	3.53
1	3399	EP Skid to Koch -	Union - 0.75"	0.0086	50.00	-24.12	0.02	3.54
3	1043	Mole Sieve 3 -	Flange - 8"	0.0172	100.00	-48.26	2.06	3.54
1	1967	Inlet Comp Yard Piping -	Flange - 2"	0.0086	50.00	-24.14	1.00	3.54
4	3665	Cryo System: Warm Gas Exchanger -	Gate valve - 0.75"	0.0103	60.00	-1.39	0.02	3.55
4	3750	Cryo System: Absorber Tower (20.001) - Second platform: gate valve seat	Open-ended line - 0.5"	0.0103	60.00	-29.05	0.02	3.55
3	1068	Amine Bldg: V8-404N - A404N-1	Gate valve - 0.75"	0.0103	60.00	-1.64	1.23	3.56
4	3898	Re-Compression: Unit 1 -	Valve cover	0.0341	200.00	-97.40	4.92	3.57
2	4065	Fuel Gas - on chart recorder	Tubing connection - 0.375"	0.0026	15.00	-0.46	0.37	3.58
1	1942	Inlet Header -	Gate valve - 0.75"	0.0102	60.00	-1.86	1.19	3.58
1	3215	Solar Turbines: Header Outside -	Gate valve - 2"	0.0170	100.00	-3.49	2.44	3.59
4	3919B	Re-Compression: Unit 3 - FG Line 2	Plug valve - 2"	0.0203	120.00	-4.33	2.94	3.59
3	1030	Mole Sieve 2 - On top platform	Flange - 8"	0.0169	100.00	-49.20	2.02	3.61
1	3363	Inlet Scrubber (PV-504) -	Gate valve - 1"	0.0126	75.00	-3.03	1.82	3.61
1	3069	Compressor CM-9 -	Cylinder end - flange	0.0673	400.00	-295.65	7.86	3.62

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
2	4158	Residue Compressors FG Scrubber - sight glass	Gate valve - 0.75"	0.0100	60.00	-2.90	1.45	3.64
4	3641	Sales Gas Header -	Tubing connection - 0.375"	0.0025	15.00	-0.88	0.36	3.68
3	1668	Re-Compressor Building - Re-Comp 3	Gate valve - 4"	0.0313	190.00	-11.64	3.75	3.69
3	1721	East Amine Contactor - MW @ top	Manway - 18"	0.0330	200.00	-100.75	3.95	3.69
2	4082	Common inlet lines -	Threaded connection - 0.5"	0.0016	10.00	-5.04	0.20	3.70
2	4043	Mole Sieve Tower B -	Gate valve - 0.75"	0.0098	60.00	-4.06	1.20	3.72
1	3316	Regen Gas Compressors/Blowers - Gate valve seat	Open-ended line - 1"	0.0123	75.00	-38.08	1.43	3.72
2	4340	Residue Gas Suction Scrubber -	Threaded connection - 0.75"	0.0016	10.00	-5.12	0.23	3.75
2	4218	Compressor Unit # 9 - flange	Cylinder body	0.0648	400.00	-299.53	9.34	3.76
1	3354	Mole Sieve: Inlet Separator (PV-501) -	Gate valve - 1"	0.0121	75.00	-5.85	1.42	3.76
3	1480	Residue Gas/N2 Comp Bldg: Back Wall -	Gate valve - 10"	0.0808	500.00	-40.08	11.48	3.77
3	1551	HP1 Bldg: E26-13 - (NV seat).	Threaded connection - 0.25"	0.0016	10.00	-5.15	0.19	3.78
3	1788	Stab 1 Building (Tower) - A613-10	Gate valve - 0.75"	0.0096	60.00	-5.21	1.15	3.79
2	4103	Mole Sieve Tower A -	Gate valve - 0.75"	0.0096	60.00	-5.21	1.18	3.79
1	3433	EP Skid to Koch -	Gate valve - 0.75"	0.0096	60.00	-5.21	0.02	3.79
3	1541	Residue Gas/N2 Comp Bldg - Heat Pump 3	Valve cover	0.0320	200.00	-103.71	0.01	3.81
3	1430	Residue Gas/N2 Comp Bldg - Heat Pump 1	Valve cover	0.0320	200.00	-103.75	4.70	3.81
1	3365	Inlet Gas Scrubber (PV-501) -	Gate valve - 1"	0.0120	75.00	-6.94	1.40	3.82
2	4096	Pre-saturator separator - sight glass	Gate valve - 0.75"	0.0096	60.00	-5.58	1.17	3.82
3	1071	Amine Bldg - A2801N-10	Gate valve - 2"	0.0158	100.00	-9.83	1.90	3.84
4	3533	Heat Medium Heater FG Line -	Gate valve - 4"	0.0300	190.00	-18.96	4.34	3.85
2	4151	Compressor Unit 1 Outside -	Threaded connection - 0.5"	0.0016	10.00	-5.24	0.23	3.85
4	3744B	Cryo System: Absorber Tower (20.001) - First platform	Gate valve - 0.75"	0.0095	60.00	-6.06	0.02	3.85
4	3528	South Heat Medium Heater - Pilot	Gate valve - 0.5"	0.0095	60.00	-6.08	1.37	3.86
2	4217	Compressor Unit # 9 - flange	Cylinder end - flange	0.0631	400.00	-302.27	9.09	3.86
2	4192	Compressor Unit 2 - VVP Stem	Cylinder end - flange	0.0629	400.00	-302.50	9.07	3.87
1	3188	Refrig Comp Unit 10 -	Injector	0.0314	200.00	-21.00	4.53	3.87
4	3795	Re-Compression: Unit 5 - Cylinder No. 1	Distance piece	0.313	2000.00	-1514.79	45.26	3.89
1	3265	Solar Turbines -	Threaded connection - 1"	0.0023	15.00	-7.95	0.34	3.90
3	1756	Stab 1 Building - A334-3 (West Wall)	Gate valve - 1.5"	0.0117	190.00	-8.39	0.02	3.90
1	3254	Solar Turbines -	Gate valve - 1"	0.0117	75.00	-8.39	1.68	3.90
3	1932	Dehydration Tower # 1 west - A2808N-2	Gate valve - 0.75"	0.0093	60.00	-7.05	1.11	3.93
4	3530	Heat Medium Heater FG Line - Bonnet/body	Plug valve - 4"	0.0310	200.00	-23.73	4.48	3.93
4	3711	Cryo System: Expander Feed Separator - Gate valve seat	Open-ended line - 0.5"	0.0093	60.00	-32.14	0.02	3.95
1	3276	DEA Contactor Pumps -	Threaded connection - 0.5"	0.0015	10.00	-5.36	0.22	3.95
3	1411	Residue Gas/N2 Comp Bldg - Comp 1	Gate valve - 0.75"	0.0092	60.00	-7.43	1.31	3.95
4	3622	Yard North of Office -	Gate valve - 0.5"	0.0092	60.00	-7.56	1.07	3.96
1	3281	HP Expander Scrubber (PV-503) - Sight glass valve	Gate valve - 0.75"	0.0092	60.00	-7.57	1.33	3.97
1	3461	Refrig Comp Unit 12 -	Flange - 8"	0.0153	100.00	-54.01	0.00	3.99
4	3891	Re-Compression: Unit 2 - Cylinder No. 3	Distance piece	0.304	2000.00	-1528.27	44.01	4.00
1	3018	Inlet Comp Yard Piping -	Orbit valve - 4"	0.0289	190.00	-25.73	3.37	4.01
2	4095	Tower by D-208 -	Threaded connection - 0.5"	0.0015	10.00	-5.43	0.19	4.01
3	1494	Residue Gas/N2 Comp Bldg - Heat Pump 2	Valve cover	0.0300	200.00	-109.56	4.42	4.05
3	1157	NRU 1 - Top Platform - A2326N	Threaded connection - 0.75"	0.0015	10.00	-5.48	0.18	4.06
2	4214	Compressor Unit # 7 -	Gate valve - 0.5"	0.0090	60.00	-8.79	1.30	4.06

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1225	Propane Storage Tank V6-290 -	Gate valve - 0.5"	0.0089	60.00	-9.24	0.00	4.10
3	1835	Co-Gen Building: Outside (CA 625 - HP FG Scrubber) - VG-155	Gate valve - 1"	0.0111	75.00	-11.56	1.58	4.10
2	4332	C3 Filter - plug valve seat	Threaded connection - 1"	0.0022	15.00	-8.33	0.00	4.12
1	3404	Mole Sieve Tower 511B -	Flange - 2"	0.0074	50.00	-27.78	0.86	4.13
1	3119	Compressor CM-19 -	Threaded connection - 2"	0.0022	15.00	-8.41	0.26	4.17
2	4255	Compressor Unit # 4 -	Threaded connection - 1"	0.0022	15.00	-8.41	0.32	4.17
1	3036	Discharge to NG PL - In ground.	Gate valve - 1.5"	0.0109	75.00	-12.71	1.28	4.17
4	3968	Refrigeration Compressors: Unit 2 - On governor	Flange - 2"	0.0072	50.00	-28.23	1.04	4.21
1	3362	Inlet Scrubber (PV-504) -	Control valve - 6"	0.0407	282.00	-159.31	5.86	4.21
4	3685	Cryo System: Beside Expander Feed Separator -	Gate valve - 0.5"	0.0087	60.00	-10.75	1.25	4.22
1	3074	West Inlet Yard Piping -	Flange - 8"	0.0144	100.00	-56.63	1.68	4.23
4	3942C	Re-Compression: Unit 2 - FG Line 1	Plug valve - 2"	0.0172	120.00	-21.96	2.49	4.24
2	4350F	C3 Cooler -	Threaded connection - 1"	0.0021	15.00	-8.55	0.00	4.26
3	1228	NGL Bullet 6 - A1101N	Gate valve - 1.5"	0.0107	75.00	-14.10	0.00	4.27
3	1652	Re-Compressor Building - Re-Comp 2	Valve cover	0.0285	200.00	-114.24	3.41	4.28
2	4216	Compressor Unit # 4 - fuel gas chart recorder	Tubing connection - 0.375"	0.0021	15.00	-2.88	0.31	4.29
4	3697	Cryo System: Chiller Outlet Separator Line - Gate valve seat	Open-ended line - 0.75"	0.0085	60.00	-34.38	0.02	4.29
2	4349G	C3 Cooler -	Threaded connection - 1"	0.0021	15.00	-8.61	0.00	4.30
2	4350E	C3 Cooler -	Threaded connection - 1"	0.0021	15.00	-8.61	0.00	4.30
3	1811	G-10-625-2 - XY625-12C (East Reboiler)	Threaded connection - 2"	0.0021	15.00	-8.65	0.30	4.33
3	1615	IR Compressor Building - IR Comp 1	Valve cover	0.0021	60.00	-8.65	0.25	4.33
2	4159	Residue Compressors FG Scrubber - sight glass	Gate valve - 0.75"	0.0084	60.00	-12.01	1.22	4.33
1	3300	High Pressure JT Expander -	Gate valve - 0.5"	0.0084	60.00	-12.01	1.21	4.33
4	3619A	Yard North of Office - Gate valve seat	Threaded connection - 0.5"	0.0014	10.00	-5.77	0.20	4.33
3	1357	Amine Bldg: V8-2701 - A2701N-43	Gate valve - 1.5"	0.0105	75.00	-15.23	1.26	4.35
1	3427	Refrig Comp Yard Piping -	Control valve - plug - 8"	0.0494	353.00	-204.15	0.00	4.35
1	1989	Inlet Header -	Gate valve - 0.75"	0.0084	60.00	-12.24	0.98	4.35
2	4226	Compressor Unit 8 - rear flange seam	Cylinder body	0.0559	400.00	-313.37	8.06	4.36
4	3769	C3 Refrigeration: Storage - Near Refrig Compressor Building	Gate valve - 2"	0.0140	100.00	-20.52	0.00	4.36
4	3644	Sales Gas Header -	Flange - 3"	0.0105	75.00	-43.48	1.51	4.36
3	1525	Residue Gas/N2 Comp Bldg - Heat Pump 2	Valve cover	0.0278	200.00	-116.34	4.09	4.38
3	1698	Re-Compressor Building - Associated Yard Piping (A9240)	Gate valve - 4"	0.0264	190.00	-39.98	3.16	4.39
3	1915	Hg Removal Bed V8-401-2 - A401N-8	Gate valve - 0.75"	0.0083	60.00	-12.93	0.99	4.42
3	1425	Residue Gas/N2 Comp Bldg - Comp 2	Valve cover	0.0275	200.00	-117.10	3.91	4.42
1	3189	Refrig Comp Unit 10 -	Injector	0.0275	200.00	-43.33	3.96	4.42
1	3165	Refrig Comp Unit 11 - Stem packing	Variable volume pocket stem	0.0550	400.00	-314.71	0.00	4.42
1	3187	Refrig Comp Unit 10 -	Injector	0.0275	200.00	-43.49	3.96	4.43
4	3897	Re-Compression: Unit 1 -	Variable volume pocket stem	0.0549	400.00	-314.92	7.94	4.44
4	3655	Mole Sieve Dehy: Regen Fan/Blower - From Clark Discharge	Gate valve - 6"	0.0334	245.00	-54.88	4.83	4.47

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
2	4153	Residue Compressors FG Scrubber - on 4" orifice meter	Rack	0.0101	75.00	-17.69	1.45	4.53
2	4183	Cryo skid 101 -	Flange - 3"	0.0241	180.00	-107.53	3.47	4.55
3	1231	NGL Bullet 6 - A1101N-15	Gate valve - 3"	0.0160	120.00	-28.82	0.00	4.56
3	1153	NRU 1 - Base of Hot Box	Tubing connection - 0.25"	0.0020	15.00	-3.61	0.24	4.56
3	1712	Medium Pressure Bldg - B244-4	Ball valve - 2"	0.0133	100.00	-24.12	1.60	4.57
1	3068	Compressor CM-9 -	Valve cover	0.0265	200.00	-120.03	3.10	4.59
1	1985	Inlet Header -	Tubing connection - 0.375"	0.0020	15.00	-3.69	0.23	4.60
3	1573	HP2 Bldg: W01-02 - G225-3 (Inlet Line)	Gate valve - 0.75"	0.0079	60.00	-14.78	0.95	4.60
3	1918	Hg Removal Bed V8-401-1 - A401N-3	Gate valve - 0.75"	0.0079	60.00	-14.96	0.95	4.62
2	4335	Make-up Gas Suction Scrubber -	Threaded connection - 0.5"	0.0013	10.00	-6.03	0.19	4.62
2	4002	Mole Sieve Tower A -	Gate valve - 0.5"	0.0079	60.00	-15.18	0.96	4.64
1	1964	Inlet Comp Yard Piping - On 10" orifice meter	Rack	0.0098	75.00	-18.98	1.15	4.64
2	4088	Common inlet lines - gate valve seat (behind chart recorder bldg.)	Open-ended line - 0.375"	0.0078	60.00	-36.51	0.95	4.68
3	1798	Fuel Gas Scrubber (V8-1720) - A1720-11	Gate valve - 1"	0.0097	75.00	-19.63	1.38	4.69
4	3683	Cryo System: Platform -	Gate valve - 4"	0.0246	190.00	-49.74	0.06	4.69
4	3768	C3 Refrigeration: Storage - Near Refrig Compressor Building	Gate valve - 2"	0.0129	100.00	-26.63	0.00	4.72
1	3460	Refrig Comp Unit 12 -	Valve cover	0.0257	200.00	-122.46	0.00	4.73
3	1263	NGL Pump 4 - A1201N-8	Gate valve - 4"	0.0245	190.00	-50.78	0.01	4.73
3	1243	NGL Bullet 4 - A1101N-5	Gate valve - 3"	0.0153	120.00	-32.64	0.00	4.76
4	3688	Cryo System: De-methanizer Feed Separator -	Gate valve - 2"	0.0128	100.00	-27.38	0.03	4.77
3	1299	NGL Pumps - A2504N	Gate valve - 4"	0.0241	190.00	-53.04	0.01	4.81
1	3294	High Pressure JT Expander -	Gate valve - 8"	0.0443	350.00	-97.93	6.38	4.81
1	3234	Solar Turbines: Unit B - On skid	Union - 1.5"	0.0126	100.00	-61.92	1.82	4.81
3	1534	Residue Gas/N2 Comp Bldg - Heat Pump 3	Cylinder end - flange	0.0505	400.00	-321.67	7.44	4.82
3	1239	NGL Bullet 5 - A1101N-15	Gate valve - 4"	0.0240	190.00	-53.45	0.01	4.82
3	1217	NGL Pump 3 - A1202N-3	Gate valve - 3"	0.0151	120.00	-33.79	0.00	4.82
3	1438	Residue Gas/N2 Comp Bldg - Heat Pump 1	Valve cover	0.0251	200.00	-124.54	3.69	4.86
3	1727	HHE Compressor Building - Comp HHE 7	Threaded connection - 0.5"	0.0012	10.00	-6.25	0.15	4.89
4	3861	Re-Compression: Unit 3 -	Distance piece	0.249	2000.00	-1613.84	36.02	4.89
4	3888	Refrigeration Compression: Outside Yard Piping - Orifice meter to Unit 4	Gate valve - 0.5"	0.0075	60.00	-17.49	1.08	4.89
3	1059	Mole Sieve Header - PDSL2866N	Needle valve - 0.375"	0.0074	60.00	-17.77	0.89	4.92
1	3235	Solar Turbines: Unit B - On skid	Gate valve - 0.5"	0.0074	60.00	-17.77	1.07	4.92
4	3484	Inlet Yard Piping: Pig Traps - Plug valve seat	Open-ended line - 4"	0.0234	190.00	-119.45	2.84	4.94
3	1896	Hg Removal Bed V8-401-2 - A401N-12	Gate valve - 0.75"	0.0074	60.00	-18.01	0.88	4.95
2	4303	Compressor Unit # 1 -	Variable volume pocket stem	0.0492	400.00	-323.81	7.09	4.95
1	3253	Solar Turbines -	Gate valve - 1"	0.0092	75.00	-22.53	1.33	4.95
1	3446	Refrig Comp Unit 12 -	Valve cover	0.0245	200.00	-126.33	0.00	4.98
4	3677	Cryo System: Turbo Expander - Gate valve seat	Open-ended line - 0.75"	0.0073	60.00	-37.90	1.06	4.98
2	4237	Compressor Unit # 8 -	Flange - 1"	0.0061	50.00	-31.63	0.88	4.99
1	3351	Low Pressure JT Expander -	Gate valve - 8"	0.0427	350.00	-107.03	6.15	4.99
4	3742	Cryo System: De-methanizer Side Reboiler - Gate valve seat	Open-ended line - 0.75"	0.0073	60.00	-38.02	0.02	5.00
3	1369	Regen Gas Heater 1: G10-2801-2 -	Threaded connection - 0.5"	0.0012	245.00	-6.34	0.17	5.01
2	4139A	Resid gas cooler E507 - cooler plugs	Threaded connection - 1"	0.0018	15.00	-9.51	0.26	5.01
3	1253	NGL Pump 2 - A1201N-2	Gate valve - 1"	0.0091	75.00	-23.09	0.00	5.01

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
4	3758	Cryo System: Economizer -	Gate valve - 4"	0.0231	190.00	-58.51	0.05	5.01
3	1852	Co-Gen Building: Fuel Gas Scrubber (SW Corner of Bldg) - Packing	Gate valve - 1"	0.0091	75.00	-23.28	1.29	5.02
3	1435	Residue Gas/N2 Comp Bldg - Heat Pump 1	Valve cover	0.0242	200.00	-127.07	3.56	5.03
3	1693	Re-Compressor Building - Associated Yard Piping (Near B9244)	Gate valve - 3"	0.0144	60.00	-37.84	2.05	5.06
1	3429	Refrig Comp Yard Piping -	Tubing connection - 0.5"	0.0018	15.00	-4.74	0.00	5.06
3	1757	Stab 1 Building - Near Stab Reflux Pumps:	DP Housing	0.0089	75.00	-24.13	0.02	5.11
3	1399	Residue Gas/N2 Comp Bldg - Comp 1 (Throw 2)	Flange - 12"	0.0179	150.00	-96.19	2.54	5.11
4	3583	Mole Sieve Dehy: Regen Piping -	Gate valve - 1"	0.0089	75.00	-24.24	1.04	5.12
3	1273	NGL Bullet 2 - A1101N-	Gate valve - 6"	0.0291	245.00	-79.57	0.01	5.13
3	1268	NGL Bullet 4 - A1101N-2	Gate valve - 3"	0.0142	120.00	-39.27	0.00	5.15
3	1349	Regen Gas Heater 1: G10-2801-2 - LG2810N-2	Gate valve - 0.75"	0.0071	60.00	-19.65	1.01	5.15
3	1365	Amine Bldg: Near V8-2701N-11	Gate valve - 10"	0.0590	500.00	-164.15	7.06	5.16
3	1265	Amine Bldg: Near V8-2701N-11 -	Gate valve - 10"	0.0590	500.00	-164.15	7.06	5.16
4	3716	Cryo System: De-methanizer Tower (1st Platform) -	Gate valve - 1.5"	0.0088	75.00	-24.63	0.02	5.16
3	1250	NGL Pump 3 - Near A1202N-1	Gate valve - 1.5"	0.0088	75.00	-25.16	0.00	5.21
1	3236	Solar Turbines: Unit B - On skid	Gate valve - 0.5"	0.0069	60.00	-20.55	1.00	5.27
3	1465	Residue Gas/N2 Comp Bldg - Heat Pump 4	Cylinder end - flange	0.0460	400.00	-328.72	6.77	5.29
4	3762	Cryo System: Economizer -	Gate valve - 4"	0.0218	190.00	-65.65	0.05	5.29
2	4250	Compressor Unit 3 -	Threaded connection - 1"	0.0017	15.00	-9.81	0.25	5.30
4	3512	Regen Heater -	Gate valve - 0.5"	0.0069	60.00	-20.84	0.99	5.31
1	3379	De-ethanizer Accumulator (PV-10) -	Gate valve - 1.5"	0.0086	75.00	-26.09	0.02	5.31
2	4368	Compressor Unit # 1 - stem packing	Control valve - orbit - 4"	0.0203	177.00	-116.00	2.92	5.32
3	1076	NRU 3 - A2308N	Gate valve - 10"	0.0568	500.00	-176.71	6.80	5.36
1	3475	NGL/DEA Coalescer -	Gate valve - 1"	0.0085	75.00	-26.55	1.23	5.36
2	4384	Compressor Unit # 6 -	Valve cover	0.0226	200.00	-131.97	3.26	5.39
4	3659	Cryo System: Near Warm Gas Exchanger - Gate valve seat	Open-ended line - 0.75"	0.0067	60.00	-39.67	0.02	5.41
2	4358	Compressor Yard - Centre Residue Gas Cooler -	Gate valve - 4"	0.0213	190.00	-68.95	3.07	5.44
3	1622	IR Compressor Building - IR Comp 3	Cylinder end - flange	0.0446	400.00	-330.86	5.34	5.46
3	1384	Amine Bldg: On Platform - A2809N-5	Gate valve - 12"	0.0664	595.00	-217.25	7.95	5.46
4	3892	Re-Compression: Unit 2 - Cylinder No. 4	Distance piece	0.223	2000.00	-1654.58	32.22	5.46
4	3719	Cryo System: De-methanizer Tower (1st Platform) -	Gate valve - 1.5"	0.0083	75.00	-27.52	0.02	5.47
1	3003	Inlet Comp Yard Piping -	Gate valve - 0.5"	0.0066	60.00	-22.63	0.77	5.56
3	1378	Amine Bldg: MOFI - A1653N-14 (On fuel gas line).	Gate valve - 1"	0.0082	75.00	-28.32	0.98	5.57
4	3717	Cryo System: De-methanizer Tower (1st Platform) -	Gate valve - 1.5"	0.0082	75.00	-28.49	0.02	5.59
3	1848	Amine Yard - Near TB-0380 (on platform)	Gate valve - 10"	0.0542	500.00	-191.61	6.49	5.62
3	1412	Residue Gas/N2 Comp Bldg - Comp 1	Gate valve - 0.75"	0.0065	60.00	-23.21	0.92	5.65
4	3660	Cryo System: Warm Gas Exchanger -	Gate valve - 0.75"	0.0064	60.00	-23.30	0.01	5.67
3	Direct	Re-Comp 1 (E03400-1A) - Connected to same vent manifold as above stack.	Compressor Seal Drains - 2"	0.215	2000.00	-1667.36	25.70	5.67
3	1406	Residue Gas/N2 Comp Bldg: Yard -	Gate valve - 1"	0.0080	75.00	-29.32	1.14	5.69
4	3948B	Re-Compression: Unit 1 - FG Line 2	Plug valve - 2"	0.0128	120.00	-47.11	1.85	5.70
3	1818	Stab 1 Building (Yard) - (NGL Vessel)	Gate valve - 0.5"	0.0064	60.00	-23.66	0.01	5.72
2	4239	Compressor Unit # 8 -	Injector	0.0212	200.00	-79.15	3.06	5.73
1	3038	Inlet Header - Lone Star Line -	Gate valve - 0.75"	0.0063	60.00	-23.94	0.74	5.77
3	1781	Stab 1 Building - Near Stab Reflux Pumps:	Gate valve - 0.5"	0.0063	60.00	-24.35	0.01	5.83
3	1825	G-10-625-2 - Fe625-5 (East Reboiler)	Gate valve - 0.5"	0.0063	60.00	-24.35	0.89	5.83

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
4	3647	Sales Gas Header - Stem packing on orifice meter.	Ball valve - 0.5"	0.0063	60.00	-24.39	0.90	5.84
3	1359	Amine Bldg: G8-2702N-22B -	Gate valve - 0.5"	0.0062	60.00	-24.47	0.75	5.85
4	3640	Sales Gas Header -	Tubing connection - 0.375"	0.0016	15.00	-6.14	0.22	5.87
1	3382	High Pressure Chiller -	Gate valve - 4"	0.0197	190.00	-77.90	0.00	5.87
4	3869	Re-Compression: Unit 2 - Cylinder No. 2	Distance piece	0.207	2000.00	-1679.10	29.94	5.88
2	4337	Make-up Gas Suction Scrubber - sight glass	Gate valve - 0.75"	0.0062	60.00	-24.82	0.89	5.91
4	3513	Regen Heater -	Gate valve - 1"	0.0077	75.00	-31.16	1.11	5.93
3	1845	Amine Yard - 2805-A	Gate valve - 0.75"	0.0061	60.00	-25.10	0.73	5.96
4	3671	Cryo System: Make Up - Needle valve seat	Tubing connection - 0.5"	0.0015	15.00	-6.28	0.00	5.96
3	1238	NGL Bullet 5 - A1101N-11	Gate valve - 3"	0.0122	120.00	-50.58	0.00	5.99
3	1715	Heater Treaters - A 453-3	Gate valve - 2"	0.0101	100.00	-42.33	1.44	6.01
2	4182	Cryo skid 101 -	Gate valve - 3"	0.0122	120.00	-50.80	1.75	6.01
4	3966	Refrigeration Compressors: Unit 3 - On injector	Flange	0.0202	200.00	-139.03	2.93	6.01
3	1355	Amine Bldg: V8-2701 - A2701N-47	Gate valve - 1"	0.0076	75.00	-31.91	0.91	6.03
2	4149	Compressor Unit 3 Outside - Both sides of union	Union - 2"	0.0100	100.00	-69.79	1.45	6.07
3	1577	HP2 Bldg: W29-04 - A231-2	Gate valve - 0.5"	0.0060	60.00	-25.75	0.72	6.07
4	3734	Cryo System: Dust Filter (20.002) - Gate valve seat	Open-ended line - 1"	0.0075	75.00	-52.45	0.02	6.10
2	4124	Mole Sieve Tower B -	Flange - 4"	0.0075	75.00	-52.51	0.91	6.12
3	1090	Amine Bldg (V2806-2) -	Flange - 30"	0.0298	300.00	-210.22	3.57	6.13
1	3397	EB Skid to Chevron -	Pump seal	0.0496	500.00	-423.20	0.09	6.14
1	3438	EP Skid to Koch -	Gate valve - 1"	0.0074	75.00	-32.77	0.01	6.15
1	3389	EP Skid to Koch -	Gate valve - 4"	0.0188	190.00	-83.08	0.03	6.16
2	4176	Cryo skid 101 - expander K101-A	Control valve - 10"	0.0454	459.00	-322.40	5.55	6.16
4	3958	Refrigeration Compressors: Unit 3 - By injector	Valve - 1"	0.0074	75.00	-32.86	1.07	6.17
3	1321	Propane Yard: V8-411 - A411N-10	Gate valve - 0.75"	0.0059	60.00	-26.37	0.00	6.18
3	1683	Re-Compressor Building - Re-Comp 3 (Fuel Gas Line)	Governor - 2"	0.0196	200.00	-88.27	2.79	6.20
3	1491	Residue Gas/N2 Comp Bldg - Comp 4 (Throw 5)	F/Cylinder End	0.0392	400.00	-339.30	5.57	6.22
2	4177	Cryo skid 101 - expander K101-A	Flange - 8"	0.0283	290.00	-204.63	3.47	6.23
3	1022	Mole Sieve 3 - XY2817N0	Flange - 8"	0.0098	100.00	-70.57	1.17	6.23
2	4219	Compressor Unit # 9 - flange	Cylinder body	0.0390	400.00	-339.61	5.62	6.25
3	1594	HP2 Bldg: W36-16 - (Past GTV Seat)	Threaded connection - 0.75"	0.0010	10.00	-7.07	0.12	6.26
1	3347	Mole Sieve Tower 511A -	Flange - 2"	0.0049	50.00	-35.35	0.57	6.26
2	4048	Mole Sieve Tower A -	Gate valve - 1"	0.0073	75.00	-33.47	0.89	6.26
2	4328	Compressor Unit # 1 -	Gate valve - 0.25"	0.0058	60.00	-26.77	0.84	6.26
1	3440	EP Skid to Koch -	Union - 1"	0.0097	100.00	-70.70	0.02	6.26
4	3865	Re-Compression: Unit 2 - Cylinder No. 1	Distance piece	0.194	2000.00	-1699.00	28.08	6.27
4	3536	North Heat Medium Heater - Fuel gas line	Union - 2"	0.0097	100.00	-70.89	1.40	6.30
4	3951	Refrigeration Compressors: Unit 2 -	Valve cover	0.0193	200.00	-141.87	0.00	6.31
1	3274	DEA Contactor Pumps -	Gate valve - 6"	0.0236	245.00	-110.63	3.40	6.32
3	1410	Residue Gas/N2 Comp Bldg - Comp 1 (Throw 1)	Cylinder end - flange	0.0385	400.00	-340.32	5.47	6.32
4	3633	Sweet Gas Cooler - Stem packing	Gate valve - 0.75"	0.0058	60.00	-27.12	0.67	6.32
3	1592	HP2 Bldg: W31-05 - Chart Recorder	Open-ended line - 0.375"	0.0058	60.00	-42.60	0.69	6.32
4	4000	Mole Sieve Dehy: Coalescing Filter Separator -	Tubing connection - 0.375"	0.0014	15.00	-6.78	0.17	6.32
4	3627B	Yard North of Office - (Holes on both sides)	Orifice meter plate - 0.0625"	0.0144	150.00	-127.63	1.68	6.32
3	1124	NRU 2 - Top Platform - PV4101N8-2	Control valve - globe - 12"	0.0535	560.00	-398.79	6.41	6.37

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
1	3199	Solar Turbines: Unit A - On skid	Gate valve - 0.5"	0.0057	60.00	-27.41	0.82	6.38
3	1563	HP1 Bldg: Piping - B218-3	Orbit valve - 3"	0.0114	120.00	-55.02	1.37	6.40
3	1222	NGL Pump 2 - A1202N-5	Gate valve - 1"	0.0071	75.00	-34.39	0.00	6.40
2	4122	Mole Sieve Tower A -	Gate valve - 1"	0.0071	75.00	-34.50	0.87	6.42
3	1656	Re-Compressor Building - Re-Comp 2	Open-ended line - 0.75"	0.0057	60.00	-42.88	0.68	6.43
4	3868	Re-Compression: Unit 2 -	Open-ended line - 0.5"	0.0057	60.00	-42.92	0.82	6.44
1	3444	Refrig Comp Unit 12 -	Valve cover	0.0189	200.00	-143.18	0.00	6.45
3	1906	Hg Removal Bed V8-401-2 - plug on GTV seat	Threaded connection - 0.5"	0.0009	10.00	-7.16	0.11	6.46
1	1984	Inlet Header -	Tubing connection - 0.375"	0.0014	15.00	-7.04	0.16	6.53
4	3520	South Heat Medium Heater - Pilot	Gate valve - 0.5"	0.0056	60.00	-28.16	0.81	6.53
3	1067	Amine Bldg: V8-404N - A404N-3	Gate valve - 0.75"	0.0056	60.00	-28.16	0.67	6.53
1	3414	Mole Sieve Tower 511A (Top) -	Flange - 8"	0.0093	100.00	-71.93	1.09	6.53
3	1718	V2811-1 - near N2811-7	Union - 1"	0.0093	100.00	-71.96	1.32	6.54
3	1836	Co-Gen Building: Outside (CA 625 - HP FG Scrubber) - VG-155	Gate valve - 1"	0.0070	75.00	-35.43	0.99	6.57
1	3093	West Inlet Yard Piping - To PV-28	Control valve - plug - 8"	0.0326	353.00	-254.68	3.81	6.58
4	3514	Regen Heater -	Union - 1"	0.0092	100.00	-72.19	1.33	6.59
3	1450	Residue Gas/N2 Comp Bldg - Comp 3 (Throw 4)	Cylinder end - flange	0.0368	400.00	-342.98	5.23	6.62
3	1463	Residue Gas/N2 Comp Bldg - Heat Pump 4	Cylinder end - flange	0.0367	400.00	-343.05	5.41	6.63
1	3134	Compressor CM-13 -	Valve cover	0.0184	200.00	-144.69	2.14	6.63
2	4187	Inlet gas to cryo skid 101 -	Control valve - butterfly - 6"	0.0258	282.00	-204.20	3.16	6.65
1	3346	Mole Sieve Tower 511B -	Control valve - orbit - 8"	0.0323	353.00	-255.74	3.77	6.65
1	3292	High Pressure JT Expander -	Threaded connection - 0.5"	0.0009	10.00	-7.25	0.13	6.67
3	1681	Re-Compressor Building - Re-Comp 3	Threaded connection - 0.5"	0.0009	10.00	-7.25	0.11	6.67
3	1009	Mole Sieve 5 - On top platform	Tubing connection - 0.75"	0.0023	25.00	-12.02	0.27	6.67
3	1360	Amine Bldg: V8-2701 - A2701N-44	Gate valve - 1"	0.0068	75.00	-36.07	0.82	6.68
3	1565	HP1 Bldg: Ceiling - B219-3	Orbit valve - 3"	0.0109	120.00	-57.75	1.31	6.68
2	3998	Inlet Line - ball valve seat	Open-ended line - 0.75"	0.0055	60.00	-43.56	0.67	6.69
4	Direct	Refrigerant Compressor Unit 4 -	Crank case vent - 4"	0.182	2000.00	-1718.57	0.00	6.70
3	1301	Propane Yard - Near A2404N	Gate valve - 1"	0.0068	75.00	-36.28	0.00	6.71
4	Direct	Re-Compressor Unit 5 -	Seals vent	0.181	2000.00	-1719.67	26.15	6.73
4	3837	Re-Compression: Yard Piping -	Gate valve - 2"	0.0090	100.00	-48.78	1.30	6.77
2	4115A	Skid 2 Inlet -	Ball valve - 2"	0.0089	100.00	-49.15	1.09	6.81
4	3524	South Heat Medium Heater - Fuel gas line	Union - 2"	0.0089	100.00	-73.15	1.29	6.83
3	1429	Residue Gas/N2 Comp Bldg - Heat Pump 1	Cylinder end - flange	0.0356	400.00	-344.88	5.23	6.85
1	3006	Inlet Comp Yard Piping - On 8" orifice meter	Slide valve	0.0067	75.00	-37.05	0.78	6.85
3	1049	Mole Sieve 5 - A2811N-65	Threaded connection - 0.75"	0.0009	10.00	-7.33	0.11	6.87
4	3686	Cryo System: Beside Expander Feed Separator - To pressure relief valve	Union - 0.75"	0.0044	50.00	-36.69	0.64	6.89
1	3268	Solar Turbines -	Gate valve - 2"	0.0088	100.00	-49.70	1.27	6.89
1	3456	Refrig Comp Unit 12 -	Cylinder end - flange	0.0353	400.00	-345.27	0.00	6.89
3	1283	NGL Bullet 3 - A1101N-28	Gate valve - 0.75"	0.0053	60.00	-29.90	0.00	6.91
3	1688	Re-Compressor Building - Re-Comp 5 (Fuel Gas Line)	Threaded connection - 2"	0.0013	15.00	-11.03	0.19	6.93
3	1393	Residue Gas/N2 Comp Bldg: Yard -	Gate valve - 0.5"	0.0053	60.00	-30.01	0.75	6.93

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
1	3056	Mansfield Discharge - Ball valve seat	Open-ended line - 0.5"	0.0053	60.00	-44.13	0.61	6.93
3	1003	Mole Sieve 3 - On top platform	Gate valve - 0.75"	0.0053	60.00	-30.01	0.62	6.93
3	1320	Propane Yard: V8-411 - A411N-3	Gate valve - 16"	0.0807	920.00	-460.41	0.02	6.94
1	3387	EB Skid to Chevron -	Pump seal	0.0438	500.00	-432.18	0.08	6.96
1	3410	Mole Sieve Common Piping -	Gate valve - 1"	0.0065	75.00	-37.79	0.76	6.98
1	3143	Yard between inlet compressors and fractionation plant. -	Orbit valve - 3"	0.0105	120.00	-60.47	1.22	6.99
2	4155	Residue Compressors FG Scrubber -	Control valve - globe - 1"	0.0113	130.00	-95.94	1.63	7.00
4	3977	Refrigeration Compressors: Unit 2 - Common line	Packing case drains	0.173	2000.00	-1732.07	0.00	7.00
1	3021	To Fuel Gas Scrubber (PV-9) -	Gate valve - 2"	0.0087	100.00	-50.63	1.25	7.02
1	1973	Inlet Comp Yard Piping -	Gate valve - 4"	0.0165	190.00	-96.35	1.92	7.03
1	3441	EP Skid to Koch -	Gate valve - 0.75"	0.0052	60.00	-30.58	0.01	7.07
2	4228	Compressor Unit 8 -	Valve cover	0.0172	200.00	-148.15	2.48	7.07
1	3161	Refrig Comp Unit 11 -	Cylinder end - flange	0.0344	400.00	-346.76	0.00	7.09
4	3972	Refrigeration Compressors: Unit 2 - To injector	Flange - 2"	0.0043	50.00	-37.07	0.62	7.09
4	3815	Re-Compression: Yard Piping -	Union - 2"	0.0086	100.00	-74.19	1.24	7.10
4	3786	Re-Compression: Clark Discharge Cooler -	Control valve - globe - 6"	0.0242	282.00	-209.25	3.49	7.11
4	3844	Re-Compression: Yard Piping -	Gate valve - 0.75"	0.0051	60.00	-30.87	0.74	7.14
2	4019	Gas-Gas Exchanger -	Gate valve - 0.5"	0.0051	60.00	-30.87	0.63	7.14
3	1936	near CO_GEN - A2803N-1	Gate valve - 1"	0.0064	75.00	-38.66	0.76	7.15
3	1395	Residue Gas/N2 Comp Bldg: Yard -	Gate valve - 1"	0.0064	75.00	-38.67	0.91	7.15
3	1093	Amine Bldg: V8-2806-2 - A2806N-1	Gate valve - 0.5"	0.0051	60.00	-30.93	0.61	7.15
3	1449	Residue Gas/N2 Comp Bldg: Lower Level -	Gate valve - 0.75"	0.0051	60.00	-30.93	0.73	7.15
1	3123	Compressor CM-14 -	Valve cover	0.0170	200.00	-148.77	1.98	7.16
4	3708	Sales Gas Header -	Control valve - globe - 2"	0.0110	130.00	-96.89	1.59	7.20
1	1959	Inlet Comp Yard Piping -	Gate valve - 3"	0.0101	120.00	-62.38	1.18	7.22
3	1497	Residue Gas/N2 Comp Bldg - Heat Pump 2	Cylinder end - flange	0.0337	400.00	-347.81	4.95	7.23
1	3148	Refrig Comp Unit 11 -	Valve cover	0.0168	200.00	-149.45	0.00	7.25
4	3981	Power Generators: Unit 3 -	Union - 3"	0.0125	150.00	-112.28	1.81	7.29
4	3692	Cryo System: Near FV104 -	Gate valve - 6"	0.0204	245.00	-128.91	0.05	7.31
3	1400	Residue Gas/N2 Comp Bldg: Yard -	Gate valve - 0.5"	0.0050	60.00	-31.74	0.71	7.36
3	1416	Residue Gas/N2 Comp Bldg - Comp 1	Gate valve - 0.75"	0.0050	60.00	-31.74	0.71	7.36
1	3323	Mole Sieve Tower 511B -	Gate valve - 0.75"	0.0049	60.00	-31.85	0.58	7.38
4	3492	Inlet Header - Gate valve seat	Threaded connection - 2"	0.0012	15.00	-11.28	0.15	7.40
2	4184	Cryo skid 101 -	Gate valve - 0.5"	0.0049	60.00	-31.97	0.71	7.42
4	3904	Re-Compression: Unit 1 - Stem packing	Governor - 3"	0.0164	200.00	-106.83	2.37	7.44
1	3370	Stabilizer (PV-3A) -	Gate valve - 3"	0.0098	120.00	-64.17	0.02	7.45
2	4162	Resid gas cooler E507 - gate valve seat	Open-ended line - 0.75"	0.0049	60.00	-45.26	0.60	7.46
3	1768	Stab 1 Building - (De-methanizer Tower)	Gate valve - 0.75"	0.0049	60.00	-32.27	0.01	7.50
1	3034	Fuel Gas to Mansfield (222) - Gate valve seat	Threaded connection - 1"	0.0012	15.00	-11.34	0.14	7.51
3	1613	IR Compressor Building - IR Comp 1	Threaded connection - 0.5"	0.0008	10.00	-7.56	0.10	7.51
3	1873	Co-Gen (Fuel Gas Scrubber SE Corner of Bldg) - Plug in gate valve seat.	Gate valve - 0.5"	0.0049	75.00	-32.31	0.69	7.51
4	3902	Re-Compression: Unit 1 -	Gate valve - 0.75"	0.0049	60.00	-32.31	0.70	7.51
4	3525	South Heat Medium Heater - Pilot	Gate valve - 0.5"	0.0049	60.00	-32.32	0.70	7.51
1	3359	Cold Gas Separator (PV-505) -	Gate valve - 0.75"	0.0048	60.00	-32.54	0.56	7.57
4	3606	Yard North of Office - Orifice meter	Open-ended line - 0.25"	0.0048	60.00	-45.58	0.69	7.63

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1720	West Amine Contactor - PSV 2716N-1 (horn)	Pressure relief valve - 2"	0.0096	120.00	-65.58	1.14	7.64
3	1537	Residue Gas/N2 Comp Bldg - Heat Pump 3	Valve cover	0.0159	200.00	-152.07	0.00	7.65
3	1903	Hg Removal Bed V8-401-3 - (stem packing)	Gate valve - 1.5"	0.0060	100.00	-41.08	0.71	7.66
2	4344	Residue Gas Suction Scrubber -	Gate valve - 0.75"	0.0047	60.00	-33.00	0.68	7.70
2	4165	Resid gas cooler E507 - on 8" ball valve	Grease nipple	0.0040	50.00	-27.50	0.48	7.70
3	1482	Residue Gas/N2 Comp Bldg: Back Wall -	Gate valve - 10"	0.0394	500.00	-275.55	5.60	7.72
1	3203	Solar Turbines: Unit B - Fuel gas filter piping	Gate valve - 2"	0.0079	100.00	-55.24	1.13	7.74
1	3054	Mansfield Discharge - Gate valve seat	Open-ended line - 0.5"	0.0047	60.00	-45.81	0.55	7.75
3	1837	Co-Gen Building: Outside (CA 625 - HP FG Scrubber) - CG-155	Gate valve - 1"	0.0059	75.00	-41.54	0.84	7.77
1	3369	Low Pressure Chiller -	Gate valve - 3"	0.0094	120.00	-66.47	0.02	7.77
3	1699	Re-Compressor Building - Associated Yard Piping (A9240)	Control valve - butterfly - 3"	0.0110	141.00	-107.77	1.32	7.78
3	1560	Residue Gas/N2 Comp g - Heat Pump 3:	Gate valve - 1"	0.0058	75.00	-41.79	0.00	7.83
3	1171	NRU 1 - A2305N	Gate valve - 0.5"	0.0047	60.00	-33.46	0.56	7.83
4	3855	Re-Compression: Unit 4 -	Valve cover	0.0155	200.00	-153.33	2.24	7.86
1	3282	HP Expander Scrubber (PV-503) -	Gate valve - 1"	0.0058	75.00	-42.23	0.83	7.93
4	Direct	Refrigerant Compressor Unit 3 -	Crank case vent - 4"	0.153	2000.00	-1762.52	0.00	7.95
4	3735	Cryo System: Dust Filter (20.002) -	Gate valve - 1"	0.0057	75.00	-42.29	0.01	7.95
1	1957	4th Stage Suction Scrubber - Gate valve seat	Open-ended line - 1"	0.0057	75.00	-57.70	0.67	7.95
3	1773	Stab 1 Building - (Top of Accumulator)	Flange - 3"	0.0057	75.00	-57.88	0.68	8.03
3	1564	HP1 Bldg: - B111-6 (Bottom of valve).	Ball valve - 6"	0.0185	245.00	-139.46	2.22	8.04
3	1221	NGL Pump 3 - A1202N-6	Gate valve - 0.5"	0.0045	60.00	-34.15	0.00	8.04
1	1988	Inlet Header -	Gate valve - 0.75"	0.0045	60.00	-34.15	0.53	8.04
3	1752	Stab 1 Building - A612-7 (West Wall)	Gate valve - 3"	0.0091	120.00	-68.32	0.02	8.05
2	4341	Residue Gas Suction Scrubber - sight glass	Gate valve - 0.75"	0.0045	60.00	-34.16	0.65	8.05
4	3941A	Re-Compression: Unit 2 - FG Line 4	Threaded connection - 2"	0.0011	15.00	-11.58	0.16	8.05
3	1531	Residue Gas/N2 Comp Bldg - Heat Pump 3	Cylinder end - flange	0.0301	400.00	-353.41	4.42	8.10
4	3986	Mole Sieve Dehy: Coalescing Filter Separator - Gate valve seat	Open-ended line - 0.5"	0.0045	60.00	-46.43	0.53	8.11
3	1904	Hg Removal Bed V8-401-3 - on N401N-3	Tubing connection - 0.25"	0.0011	150.00	-8.65	0.13	8.19
1	3320	Dehy Piping -	Gate valve - 0.75"	0.0045	60.00	-34.62	0.64	8.19
1	3319	Regen Gas Compressors/Blowers -	Gate valve - 4"	0.0140	190.00	-110.06	1.64	8.24
1	3248	Solar Turbines -	Gate valve - 1.5"	0.0055	75.00	-43.51	0.80	8.25
1	1993	Inlet Header -	Tubing connection - 0.375"	0.0011	15.00	-8.71	0.13	8.26
3	1822	Fuel Gas Scrubber (V8-1720) - A1720-1	Gate valve - 0.5"	0.0044	60.00	-34.85	0.63	8.27
2	4186	Cryo skid 101 -	Flange - 8"	0.0213	290.00	-225.77	3.07	8.28
1	1961	Inlet Comp Yard Piping -	Gate valve - 3"	0.0088	120.00	-69.93	1.03	8.30
4	3521	South Heat Medium Heater - Fuel gas line	Union - 2"	0.0073	100.00	-78.03	1.05	8.35
3	1821	Stab 1 Building (Yard) - (NGL Vessel)	Gate valve - 2"	0.0072	100.00	-58.82	0.02	8.41
1	3348	Mole Sieve Tower 511B -	Open-ended line - 0.25"	0.0043	60.00	-46.94	0.51	8.42
3	1167	NRU 2 - Base of Cold Box - Valve 139	Gate valve - 10"	0.0361	500.00	-294.58	4.32	8.43
2	3995B	Inlet Line -	Open-ended line - 2"	0.0072	100.00	-78.29	0.88	8.45
1	3384	High Pressure Chiller -	Gate valve - 4"	0.0136	190.00	-112.80	0.00	8.53
1	1968	Inlet Comp Yard Piping - Stem packing	Orbit valve - 2"	0.0071	100.00	-59.51	0.83	8.56
3	1849	Co-Gen Building: Outside (CA 625 - HP FG Scrubber) - VG-27	Gate valve - 4"	0.0135	190.00	-113.24	1.92	8.58
1	3324	Mole Sieve Tower 511B - Gate valve seat	Threaded connection - 0.75"	0.0007	10.00	-7.86	0.08	8.58
4	3541	North Heat Medium Heater - Pilot stem	Gate valve - 0.5"	0.0043	60.00	-35.77	0.62	8.58

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
1	1966	Inlet Comp Yard Piping - On 10" orifice meter (stem packing)	Gate valve - 0.5"	0.0043	60.00	-35.77	0.50	8.58
4	3585	Mole Sieve Dehy: Regen Piping - Up high.	Gate valve - 0.75"	0.0043	60.00	-35.77	0.50	8.58
2	4070	S Inlet Scrubber (D202) -	Open-ended line - 0.5"	0.0043	60.00	-47.18	0.52	8.58
3	1694	Re-Compressor Building - Associated Yard Piping (A9242)	Gate valve - 2"	0.0070	100.00	-59.92	1.00	8.65
4	3827D	Re-Compression: Yard Piping - on 4" plug valve	Grease nipple	0.0035	50.00	-29.98	0.51	8.65
2	4102	Mole Sieve Tower A -	Gate valve - 0.75"	0.0042	60.00	-36.00	0.52	8.66
3	1751	Residue Gas/N2 Comp Bldg - Comp 3 - crank case vent	Crank case vent - 2"	0.140	2000.00	-1782.43	19.95	8.67
4	3964	Refrigeration Compressors: Unit 3 - By injector to head	Valve - 1"	0.0052	75.00	-45.21	0.76	8.72
3	1605	IR Compressor Building - IR Comp 2	Valve cover	0.0138	200.00	-158.57	1.65	8.85
3	1726	HHE Compressor Building - Comp HHE 7	Valve cover	0.0138	200.00	-158.58	1.65	8.85
3	1682	Re-Compressor Building - Re-Comp 3 (Start Gas)	Union - 2"	0.0068	100.00	-79.40	0.97	8.90
2	4084	Common inlet lines -	Orifice meter plate - 6"	0.0103	150.00	-134.11	1.25	8.91
4	3538	North Heat Medium Heater - Pilot	Gate valve - 0.5"	0.0041	60.00	-36.69	0.59	8.92
1	3285	HP Expander Scrubber (PV-503) -	Gate valve - 1"	0.0051	75.00	-45.92	0.74	8.94
4	3959	Refrigeration Compressors: Unit 3 -	Flange - 1"	0.0034	50.00	-39.74	0.49	8.94
1	3419	Refrig Comp Unit 11 - Yard Piping -	Orbit valve - 8"	0.0238	350.00	-214.49	0.00	8.95
2	4148	Compressor Unit 4 Outside -	Threaded connection - 2"	0.0010	15.00	-11.95	0.15	9.01
3	1879	Amine Building - GTV stem under vessel V8-2806-1	Gate valve - 1"	0.0050	245.00	-46.39	0.60	9.08
2	4016	Gas-Gas Exchanger -	Gate valve - 1"	0.0050	75.00	-46.39	0.61	9.08
3	1785	Stab 1 Building - (Off Accumulator Tank)	Gate valve - 2"	0.0067	100.00	-61.93	0.80	9.10
2	4285	Compressor Yard - Compressor unit 8 - on 4" orbit valve	Grease nipple	0.0033	50.00	-30.97	0.48	9.10
3	1746	HHE Compressor Building - Comp HHE 7	Valve cover	0.0133	200.00	-160.07	1.59	9.18
3	1533	Residue Gas/N2 Comp Bldg - Heat Pump 3	Valve cover	0.0132	200.00	-160.19	1.94	9.21
3	1776	Stab 1 Building - A614-6 (Top of Accumulator)	Gate valve - 2"	0.0066	500.00	-62.45	0.79	9.23
3	1032	Mole Sieve 4 - A2822N-49	Gate valve - 0.75"	0.0040	60.00	-37.50	0.47	9.24
3	1072	NRU 3 - A411N-15	Flange - 6"	0.0066	100.00	-80.17	0.79	9.24
3	1028	Mole Sieve 2 - On top platform	Gate valve - 0.75"	0.0040	60.00	-37.51	0.47	9.25
1	3136	Compressor CM-14 -	Cylinder end - flange - 0.75"	0.0263	400.00	-359.29	3.07	9.27
1	3037	Discharge to NG PL - In ground.	Gate valve - 3"	0.0079	120.00	-75.18	0.92	9.28
3	1334	Propane Yard: V8-410-3 - A410N-5	Gate valve - 0.75"	0.0039	60.00	-37.68	0.00	9.31
1	3073	Fuel Gas Scrubber (West Yard) - PV-9	Threaded connection - 1"	0.0010	15.00	-12.07	0.14	9.38
3	1831	Co-Gen Building: Outside (CA 625 - HP FG Scrubber) - VG-151	Gate valve - 0.5"	0.0039	100.00	-37.85	0.55	9.39
3	1380	Amine Bldg: MOFI - (On fuel gas line).	Gate valve - 1"	0.0049	60.00	-47.31	0.58	9.39
2	4045	Mole Sieve Tower B -	Flange - 8"	0.0065	100.00	-80.47	0.79	9.39
1	3220	Solar Comp Yard Piping -	Gate valve - 0.75"	0.0039	60.00	-38.08	0.55	9.48
4	3491	WADD Flash Tank -	Control valve - globe - 4"	0.0113	177.00	-142.93	1.37	9.53
4	3780	Re-Compression: Fuel Gas Piping -	Gate valve - 0.75"	0.0038	60.00	-38.20	0.55	9.53
4	3523	South Heat Medium Heater - Pilot	Gate valve - 0.5"	0.0038	60.00	-38.20	0.55	9.54
3	1039	Mole Sieve 1 - On top platform	Tubing connection - 0.75"	0.0016	25.00	-15.92	0.19	9.54
3	1188	NRU Expander 1 - Near TB-0190	Union - 0.75"	0.0032	50.00	-40.39	0.38	9.54
2	4056	Scrubber -	Gate valve - 0.75"	0.0038	60.00	-38.31	0.47	9.58
3	1527	Residue Gas/N2 Comp Bldg - Heat Pump 2	Valve cover	0.0126	200.00	-162.12	1.85	9.68
3	1794	Stab 1 Building (Yard) - (NGL Vessel)	Gate valve - 0.75"	0.0038	60.00	-38.54	0.01	9.69

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
2	4297	Residue Gas Suction Line -	Needle valve - 0.5"	0.0038	60.00	-38.60	0.54	9.72
2	4081	Common inlet lines -	Orbit valve - 8"	0.0219	350.00	-225.30	2.68	9.73
2	4311	Compressor Unit # 1 -	Valve cover	0.0125	200.00	-162.34	0.00	9.74
2	4354	Compressor Yard - Centre Residue Gas Cooler -	Gate valve - 6"	0.0152	245.00	-158.28	2.20	9.79
3	1528	Residue Gas/N2 Comp Bldg - Heat Pump 2	Valve cover	0.0124	200.00	-162.67	1.82	9.82
4	3879	Fuel Gas System: To Heaters -	Gate valve - 4"	0.0117	190.00	-123.14	1.70	9.85
4	3568	Mole Sieve Dehy: Regen Piping -	Gate valve - 0.75"	0.0037	60.00	-38.95	0.43	9.88
3	1517	Residue Gas/N2 Comp Bldg - Heat Pump 2	Valve cover	0.0123	200.00	-162.89	1.81	9.88
3	1178	NRU 1 - A409N-1	Gate valve - 4"	0.0117	75.00	-123.39	1.40	9.88
1	3416	Mole Sieve Tower 511C (Top) -	Flange - 8"	0.0061	100.00	-81.50	0.72	9.91
1	3196	Solar Turbines: Unit A - Fuel gas scrubber piping	Gate valve - 2"	0.0061	100.00	-65.04	0.88	9.91
1	3204	Solar Turbines: Unit B - Fuel gas filter piping	Gate valve - 2"	0.0061	100.00	-65.04	0.88	9.91
3	1295	NGL Pump 4 - A1202N-7	Gate valve - 3"	0.0074	120.00	-78.12	0.00	9.93
3	1716	G10-805 - on B805-1	Threaded connection - 3"	0.0015	25.00	-20.42	0.22	10.01
1	3229	HP Expander Scrubber (PV-503) -	Gate valve - 0.75"	0.0036	60.00	-39.23	0.53	10.01
3	1663	Re-Compressor Building - Re-Comp 2 (Fuel Gas Line)	Threaded connection - 2"	0.0009	15.00	-12.25	0.13	10.01
4	3903	Re-Compression: Unit 1 -	Plug valve - 3"	0.0091	150.00	-98.09	1.32	10.01
3	1793	Stab 1 Building (Yard) - (NGL Vessel)	Gate valve - 4"	0.0114	190.00	-124.83	0.02	10.10
3	1921	Hg Removal Bed V8-401-1 - A401-2	Gate valve - 0.75"	0.0036	60.00	-39.46	0.43	10.12
1	3338	Mole Sieve Tower 511A -	Control valve - orbit - 8"	0.0212	353.00	-289.21	2.47	10.15
4	3669	Cryo System: Chart Recorder -	Open-ended line - 0.25"	0.0036	60.00	-49.21	0.01	10.20
3	1786	Stab 1 Building - (Off Accumulator Tank)	Gate valve - 2"	0.0060	75.00	-66.08	0.71	10.22
3	1526	Residue Gas/N2 Comp Bldg - Heat Pump 2	Valve cover	0.0119	200.00	-164.14	1.75	10.23
1	3216	Solar Turbines: Header Outside -	Control valve - globe - 1.5"	0.0077	130.00	-106.84	1.11	10.29
4	3789	Re-Compression: Clark Discharge Cooler -	Gate valve - 1"	0.0044	75.00	-49.76	0.64	10.30
4	3794	Re-Compression: Valero Discharge Scrubber -	Gate valve - 0.75"	0.0035	60.00	-39.81	0.51	10.30
4	3589	Mole Sieve Dehy: Regen Piping -	Control valve - orbit - 4"	0.0105	177.00	-145.52	1.22	10.31
1	3288	HP Expander Scrubber (PV-503) -	Gate valve - 1"	0.0044	75.00	-50.09	0.63	10.43
1	3273	De-methanizer: Surge Tank (PV-508) -	Gate valve - 0.75"	0.0035	60.00	-40.10	0.50	10.45
3	1735	HHE Compressor Building - Comp HHE 8	Valve cover	0.0116	200.00	-164.99	1.39	10.47
1	3424	Refrig Comp Yard Piping -	Control valve - butterfly - 8"	0.0205	353.00	-291.26	0.00	10.48
4	3648	Sales Gas Header -	Control valve - globe - 2"	0.0075	130.00	-107.27	1.09	10.49
3	1876	Amine Building - PV-2722N-1 (FG piping)	Control valve - globe - 1"	0.0075	130.00	-107.35	1.07	10.52
3	1404	Residue Gas/N2 Comp Bldg: Yard -	Gate valve - 12"	0.0344	595.00	-399.43	4.88	10.54
3	1421	Residue Gas/N2 Comp Bldg - Comp 2	Cylinder end - flange	0.0231	400.00	-364.22	3.28	10.55
3	1891	Hg Removal Bed V8-401-3 - A401N-20	Gate valve - 0.75"	0.0034	245.00	-40.39	0.41	10.60
3	1140	NRU 2 - A2305N	Gate valve - 10"	0.0287	500.00	-336.67	3.44	10.61
1	3473	Refrig Surge Tank -	Gate valve - 0.75"	0.0034	60.00	-40.40	0.00	10.61
1	3277	DEA Contactor Pumps -	Gate valve - 1"	0.0043	75.00	-50.54	0.62	10.62
1	3339	Mole Sieve Tower 511A - Needle valve seat	Open-ended line - 0.25"	0.0034	60.00	-49.65	0.40	10.63
2	4316	Compressor Unit # 1 -	Injector	0.0114	200.00	-135.29	1.64	10.71
2	4067	HP Inlet EDS - on 8" plug valve	Grease nipple	0.0028	50.00	-33.85	0.35	10.73
4	3730	Cryo System: Exchanger -	Open-ended line - 0.5"	0.0034	60.00	-49.75	0.01	10.73
4	3485	Inlet Yard Piping: Pig Traps -	Plug valve - 4"	0.0113	200.00	-135.46	1.38	10.74
3	1500	Residue Gas/N2 Comp Bldg: Lower Level -	Gate valve - 6"	0.0139	245.00	-165.98	1.97	10.74

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
2	Direct	Compressor Unit # 6 -	Compressor seals vent - 2"	0.112	2000.00	-1825.81	15.94	10.83
3	1214	NGL Pump 4 - A1202N-5	Gate valve - 3"	0.0067	120.00	-81.64	0.00	10.84
3	1260	NGL Pump 3 - A1201N-4	Gate valve - 0.75"	0.0034	60.00	-40.85	0.00	10.86
3	1258	NGL Pump 2 - A1201N-4	Gate valve - 2"	0.0056	100.00	-68.10	0.00	10.86
1	3057	Mansfield Discharge - On 8" gate valve	Threaded connection - 0.5"	0.0006	10.00	-8.32	0.07	10.92
4	3906	Re-Compression: Unit 2 -	Gate valve - 0.75"	0.0033	60.00	-41.08	0.48	10.99
4	3975	Refrigeration Compressors: Unit 2 - To injector	Flange - 2"	0.0028	50.00	-41.67	0.40	11.00
4	3736	Cryo System: Dust Filter (20.002) -	Gate valve - 8"	0.0194	350.00	-239.85	0.04	11.01
3	1385	Amine Bldg: V8-2701N-11 - A279N-1	Gate valve - 1"	0.0041	75.00	-51.47	0.49	11.05
4	3776	Central Yard - Between C3 Compressors and Gen Building	Gate valve - 14"	0.0427	780.00	-536.79	6.18	11.11
1	---	Refrig Comp Unit 11 -	Compressor seals - 1"	0.109	2000.00	-1830.31	0.00	11.12
3	1738	HHE Compressor Building - Comp HHE 8	Threaded connection - 0.5"	0.0005	15.00	-8.35	0.07	11.12
3	1899	Hg Removal Bed V8-401-1 - A401N-6	Gate valve - 0.75"	0.0033	60.00	-41.31	0.39	11.12
4	3503	Regen Heater - Gate valve seat	Open-ended line - 0.5"	0.0033	60.00	-50.11	0.47	11.13
2	4041	Mole Sieve Tower B -	Gate valve - 1"	0.0041	75.00	-51.69	0.50	11.15
2	4356	Compressor Yard - Centre Residue Gas Cooler -	Gate valve - 6"	0.0134	245.00	-168.89	1.93	11.15
3	1257	NGL Pump 2 - A1201N-6	Gate valve - 4"	0.0103	190.00	-131.34	0.00	11.22
3	1902	Hg Removal Bed V8-401-3 - A401N-9	Gate valve - 1.5"	0.0041	350.00	-51.92	0.49	11.26
1	3245	Solar Turbines -	Gate valve - 1.5"	0.0041	75.00	-51.92	0.58	11.26
2	4139H	Resid gas cooler E507 - cooler plugs	Threaded connection - 1"	0.0008	15.00	-12.56	0.12	11.26
2	4166C	Resid gas cooler E507 - cooler plugs	Threaded connection - 1"	0.0008	15.00	-12.56	0.12	11.26
4	3896	Re-Compression: Unit 1 - Cylinder No. 2	Distance piece	0.108	2000.00	-1832.72	15.61	11.28
4	3490	WADD Flash Tank - Ball valve seat	Open-ended line - 0.75"	0.0032	60.00	-50.26	0.39	11.29
3	1769	Stab 1 Building - A612-12 (De-methanizer Tower)	Gate valve - 0.75"	0.0032	100.00	-41.65	0.01	11.33
3	1787	Stab 1 Building - Below PV613	Gate valve - 3"	0.0064	120.00	-83.31	0.77	11.33
3	1705	Medium Pressure Bldg - PCV-242	Threaded connection - 1"	0.0008	15.00	-12.59	0.11	11.40
4	3571	Mole Sieve Dehy: Dehy Tower B - Regen Gas	Control valve - orbit - 4"	0.0094	177.00	-148.62	1.10	11.44
3	1448	Residue Gas/N2 Comp Bldg: Lower Level -	Gate valve - 3"	0.0064	10.00	-83.68	0.91	11.45
3	1329	Propane Yard: V8-2906N - A2906N-8	Gate valve - 3"	0.0063	120.00	-84.01	0.00	11.55
4	3629	Yard North of Office - Needle valve seat (chart blowdown)	Open-ended line - 0.25"	0.0031	60.00	-50.58	0.37	11.67
1	3361	Inlet Scrubber (PV-504) -	Gate valve - 6"	0.0128	245.00	-172.39	1.84	11.69
3	1558	Residue Gas/N2 Comp Bldg - Heat Pump 3	Valve cover	0.0104	200.00	-168.69	0.00	11.71
1	3403	Mole Sieve Tower 511B -	Gate valve - 0.75"	0.0031	60.00	-42.35	0.36	11.78
3	1143	NRU 2 - A415N-6	Flange - 8"	0.0052	100.00	-84.43	0.62	11.78
3	1662	Re-Compressor Building - Re-Comp 2 (Start Gas)	Ball valve - 2"	0.0052	100.00	-70.58	0.73	11.78
2	4112	Regen Gas Filter -	Filter cover - 10"	0.0052	100.00	-84.43	0.63	11.78
1	3157	Inlet Comp Yard Piping - Horn	Pressure relief valve - 3"	0.0093	180.00	-152.00	1.08	11.79
2	4193	Compressor Unit 2 -	Governor - 2"	0.0103	200.00	-141.34	1.49	11.81
4	3930	Re-Compression: Unit 5 -	Plug valve - 3"	0.0077	150.00	-106.16	1.11	11.86
2	4330	Compressor Yard - stem packing	Plug valve - 0.5"	0.0031	60.00	-42.52	0.44	11.89
1	3230	Solar Turbines: Unit B - On skid	Gate valve - 0.75"	0.0031	60.00	-42.52	0.44	11.89
3	1481	Residue Gas/N2 Comp Bldg: Back Wall -	Grease nipple - 0.75"	0.0026	50.00	-35.46	0.36	11.92
1	3278	DEA Contactor Pumps -	Gate valve - 6"	0.0125	245.00	-174.08	1.79	11.97

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1549	HP1 Bldg: E28-12 -	Threaded connection - 0.75"	0.0005	10.00	-8.47	0.06	12.01
4	3539	North Heat Medium Heater - Pilot	Gate valve - 0.5"	0.0030	60.00	-42.69	0.44	12.01
2	4334	Make-up Gas Suction Scrubber -	Gate valve - 0.5"	0.0030	60.00	-42.69	0.44	12.01
1	3250	Solar Turbines -	Gate valve - 3"	0.0061	120.00	-85.39	0.88	12.01
3	1473	Residue Gas/N2 Comp Bldg: Back Wall -	Grease nipple - 0.75"	0.0025	50.00	-35.58	0.36	12.01
2	4166A	Resid gas cooler E507 - cooler plugs	Threaded connection - 1"	0.0008	15.00	-12.71	0.11	12.02
3	1576	HP2 Bldg: W29-04 - A231-1	Gate valve - 0.5"	0.0030	60.00	-42.70	0.36	12.02
3	1215	NGL Pump 4 - On Choke Valve	Flange - 3"	0.0038	75.00	-63.65	0.00	12.11
2	4206	Residue Compressors FG Scrubber -	Needle valve - 0.5"	0.0030	60.00	-42.84	0.43	12.12
3	1445	Residue Gas/N2 Comp Bldg: Lower Level -	Gate valve - 0.75"	0.0030	60.00	-42.87	0.43	12.14
4	3631	By MEA Contactor -	Gate valve - 2"	0.0050	100.00	-71.57	0.72	12.19
2	4241	Compressor Unit 3 -	Variable volume pocket stem	0.0199	400.00	-369.08	2.88	12.21
1	3206	Solar Turbines: Unit B - Fuel gas filter piping	Gate valve - 2"	0.0050	100.00	-71.73	0.71	12.26
4	3856	Re-Compression: Unit 4 -	Open-ended line - 0.5"	0.0030	60.00	-51.03	0.43	12.26
4	3979	Power Generators: Unit 1 -	Union - 3"	0.0074	150.00	-127.58	1.08	12.27
3	1631	IR Compressor Building - Associated Yard Piping (PV-322)	Control valve - globe - 1"	0.0064	130.00	-110.78	0.76	12.40
1	3367	Inlet Gas Scrubber (PV-501) -	Gate valve - 0.75"	0.0029	60.00	-43.39	0.34	12.51
2	4288	Compressor yard Unit # 6 -	Grease nipple	0.0024	50.00	-36.16	0.35	12.51
1	3170	Refrig Comp Units -	Control valve - butterfly - 2"	0.0063	130.00	-110.95	0.91	12.51
4	3664	Cryo System: Warm Gas Exchanger -	Flange - 6"	0.0049	100.00	-85.39	0.01	12.55
1	3394	De-ethanizer Tower -	Gate valve - 0.75"	0.0029	60.00	-43.56	0.01	12.64
3	1132	NRU 3 - Top Platform - A2347N	Gate valve - 10"	0.0239	500.00	-363.94	2.86	12.73
4	3614	Yard North of Office -	Gate valve - 1"	0.0036	75.00	-54.61	0.52	12.74
4	3498	Inlet Header - North	Tubing connection - 0.375"	0.0007	15.00	-10.96	0.09	12.87
4	3725	Cryo System: De-methanizer Tower (1st Platform) -	Open-ended line - 0.5"	0.0028	60.00	-51.45	0.01	12.87
3	1883	FG Piping on RES/N2/Heat Pump Bldg (outside) - A2400N-3	Gate valve - 4"	0.0089	190.00	-139.25	1.27	12.97
4	3757	Cryo System: Economizer -	Gate valve - 4"	0.0089	190.00	-139.41	0.02	13.01
2	4120	Free Water KO - sight glass	Gate valve - 0.5"	0.0028	60.00	-44.08	0.34	13.06
3	1908	Hg Removal Bed (T on stem packing)	Gate valve - 0.75"	0.0028	60.00	-44.14	0.33	13.11
3	1209	NGL Sales Line - Flow Prover	Flange - 4"	0.0035	75.00	-64.60	0.00	13.22
4	3952	Refrigeration Compressors: Unit 2 - Stem packing	Variable volume pocket stem	0.0183	400.00	-371.68	0.00	13.32
2	4326	Compressor Yard - Suction/Discharge Piping -	Orbit valve - 4"	0.0087	190.00	-140.69	1.25	13.35
4	3857	Re-Compression: Unit 4 -	Variable volume pocket stem	0.0182	400.00	-371.81	2.63	13.39
1	3055	Mansfield Discharge -	Gate valve - 1"	0.0034	75.00	-55.62	0.40	13.41
3	1379	Amine Bldg: MOFI - (On fuel gas line).	Union - 1"	0.0045	100.00	-86.33	0.54	13.41
3	1692	Re-Compressor Building - Re-Comp 3 (Distance Piece to Drain)	Distance Piece - 1"	0.0906	2000.00	-1859.56	10.85	13.44
3	1678	Re-Compressor Building - Associated Yard Piping (Near G8 314-1) Cooler	Gate valve - 4"	0.0086	190.00	-141.21	1.03	13.49
4	3858	Re-Compression: Unit 3 - Cylinder No. 1	Distance piece	0.0900	2000.00	-1860.53	13.01	13.53
3	1739	HHE Compressor Building - Comp HHE 8	Valve cover	0.0090	200.00	-172.91	1.08	13.53
3	1205	NRU 2 - Top Platform - G2314N	Gate valve - 3"	0.0054	120.00	-89.38	0.64	13.58
4	3707	Sales Gas Header -	Gate valve - 2"	0.0045	100.00	-74.64	0.64	13.66
3	1424	Residue Gas/N2 Comp Bldg - Comp 2	Flange - 6"	0.0044	100.00	-86.72	0.63	13.81
4	3788	Re-Compression: Clark Discharge Cooler -	Gate valve - 0.75"	0.0026	60.00	-44.98	0.38	13.84
3	1389	Regen Gas Heater 4 - Near RKJ-146	Tubing connection - 0.375"	0.0007	15.00	-11.25	0.09	13.86

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
1	3247	Solar Turbines -	Gate valve - 3"	0.0053	120.00	-90.00	0.76	13.86
3	1556	Residue Gas/N2 Comp Bldg - Heat Pump 3	Valve cover	0.0087	200.00	-173.73	0.00	13.96
1	1938	Inlet Header -	Plug valve - 4"	0.0087	200.00	-150.40	1.02	13.97
3	1045	Mole Sieve 3 - A2811N-23	Gate valve - 0.75"	0.0026	60.00	-45.13	0.31	13.98
3	1159	NRU 1 - Top Platform - C2304N	Gate valve - 3"	0.0052	120.00	-90.42	0.62	14.06
1	3327	Mole Sieve Tower 511B -	Gate valve - 0.75"	0.0026	60.00	-45.23	0.30	14.08
3	1907	Hg Removal Bed V8-401-1 - A401N-3	Gate valve - 1.5"	0.0032	75.00	-56.54	0.39	14.08
4	3689	Cryo System: De-methanizer Recycle Line	Gate valve - 3"	0.0052	120.00	-90.52	0.01	14.11
3	1056	Mole Sieve Header - PDSL2878N	Needle valve - 0.375"	0.0026	60.00	-45.29	0.31	14.13
4	3701	Sales Gas Header - Gate valve seat	Open-ended line - 0.5"	0.0026	60.00	-52.22	0.37	14.14
3	1087	Amine Bldg: V8-2806-2 - A2806N-2	Gate valve - 1"	0.0032	75.00	-56.63	0.39	14.15
2	4097	Pre-saturator separator -	Gate valve - 3"	0.0051	120.00	-90.87	0.63	14.27
3	1270	NGL Bullet 3 - A1101N-2	Gate valve - 6"	0.0104	245.00	-185.60	0.00	14.29
1	3025	Fuel Gas Scrubber (West Yard) - PV-9	Threaded connection - 0.75"	0.0004	10.00	-8.72	0.06	14.30
3	1562	HP1 Bldg: Piping - B207-3	Orbit valve - 3"	0.0051	120.00	-90.93	0.61	14.30
3	1468	Residue Gas/N2 Comp Bldg - Heat Pump 4	Valve cover	0.0085	200.00	-174.38	1.25	14.31
2	3999B	Inlet Line -	Open-ended line - 2"	0.0042	100.00	-87.23	0.52	14.36
3	1770	Stab 1 Building - Near Stab Reflux Pumps:	Gate valve - 3"	0.0051	120.00	-91.16	0.01	14.42
1	3149	Refrig Comp Unit 11 - Stem packing	Variable volume pocket stem	0.0169	400.00	-373.85	0.00	14.43
2	4322	Compressor Unit # 1 - on cylinder head bolts	Flange - 3"	0.0032	75.00	-65.48	0.46	14.44
3	1063	Amine Bldg: V8-404N - A404N-5	Gate valve - 1"	0.0032	75.00	-57.01	0.38	14.44
3	1583	HP1 Bldg: E28-06 - N211-4 (NV seat).	Threaded connection - 0.25"	0.0004	10.00	-8.73	0.05	14.47
3	1589	HP2 Bldg: W01-02 - Chart Recorder (Upper Platform)	Needle valve - 0.375"	0.0025	60.00	-45.63	0.30	14.47
3	1804	Fuel Gas Scrubber (V8-1720) - A1720-6	Gate valve - 1"	0.0031	75.00	-57.35	0.44	14.72
1	1997	Discharge Line (221) -	Gate valve - 1"	0.0031	75.00	-57.35	0.36	14.72
3	1219	NGL Pump 3 - A1202N-8	Gate valve - 1"	0.0031	75.00	-57.46	0.00	14.82
1	3267	Solar Turbines -	Gate valve - 1"	0.0031	75.00	-57.52	0.44	14.87
3	1651	Re-Compressor Building - Re-Comp 2	Valve cover	0.0082	500.00	-175.34	0.98	14.87
1	3407	Mole Sieve Common Piping -	Control valve - globe - 2"	0.0053	130.00	-114.01	0.62	14.90
3	1733	HHE Compressor Building - Comp HHE 8	Threaded connection - 0.5"	0.0004	60.00	-8.78	0.05	15.01
3	1779	Stab 1 Building (Near De-methanizer Feed Tank)	Gate valve - 0.75"	0.0024	60.00	-46.15	0.29	15.02
1	3434	EP Skid to Koch -	Gate valve - 0.75"	0.0024	60.00	-46.15	0.00	15.02
3	1206	NRU Expander 3 - Expander Housing	Flange - 10"	0.0061	150.00	-131.69	0.73	15.02
2	4089	Meter bldg. -	Tubing connection - 0.375"	0.0006	15.00	-11.54	0.07	15.02
2	4166B	Resid gas cooler E507 - cooler plugs	Threaded connection - 1"	0.0006	15.00	-13.17	0.09	15.02
1	1971	Inlet Comp Yard Piping -	Flange - 4"	0.0030	75.00	-65.93	0.35	15.17
2	4146	Compressor Unit 6 Outside - vent off side	Three-way valve vent - 2"	0.0040	100.00	-77.15	0.58	15.17
2	4274	Compressor Unit 7 -	Valve cover	0.0080	200.00	-175.84	1.16	15.17
4	3767	C3 Refrigeration: Storage - Near Refrig Compressor Building	Plug valve - 4"	0.0080	200.00	-154.69	0.00	15.29
3	1875	Amine Building - on amine contactor outlet scrubber V8-2702N-11	Control valve - globe - 1"	0.0052	130.00	-114.43	0.62	15.31
3	1884	FG Piping on RES/N2/Heat Pump Bldg (outside) - A2400N-2	Gate valve - 4"	0.0075	190.00	-147.09	1.07	15.34
1	1939	Inlet Header -	Gate valve - 0.75"	0.0024	60.00	-46.50	0.28	15.40
1	1956	4th Stage Suction Scrubber (PV-47) -	Gate valve - 3"	0.0047	120.00	-93.00	0.55	15.40
3	1655	Re-Compressor Building - Re-Comp 2	Union - 2"	0.0040	100.00	-88.10	0.56	15.40
3	1599	HP2 Bldg: W31-06 - A238-4	Gate valve - 1"	0.0030	75.00	-58.14	0.35	15.42

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
1	3075	West Inlet Yard Piping - On 6" orifice meter	Rack	0.0030	75.00	-58.16	0.35	15.43
3	1691	IR Compressor Building - IR Comp 1	Crank case vent - 2"	0.0783	2000.00	-1878.61	9.38	15.54
3	1709	V2811-1 - near N2811-5	Union - 2"	0.0039	60.00	-88.28	0.55	15.64
3	1579	HP2 Bldg: W30-16 - A234-1	Gate valve - 0.5"	0.0023	60.00	-46.73	0.28	15.67
4	3983	Cryo System: Near FV104 -	Gate valve - 16"	0.0356	920.00	-717.37	0.08	15.73
4	Direct	Re-Compressor Unit 2 -	Seals vent	0.0771	2000.00	-1880.56	11.14	15.80
3	1544	Residue Gas/N2 Comp Bldg - Heat Pump 3	Gate valve - 0.75"	0.0023	60.00	-46.84	0.00	15.80
1	3242	Solar Turbines: Unit A - On skid	Gate valve - 0.5"	0.0023	60.00	-46.85	0.33	15.81
1	3007	Inlet Comp Yard Piping - Stem packing	Gate valve - 0.75"	0.0023	60.00	-46.85	0.27	15.81
1	3378	De-ethanizer Accumulator (PV-10) -	Control valve - globe - 2"	0.0049	130.00	-115.10	0.01	16.00
3	1888	FG Piping on RES/N2/Heat Pump Bldg (outside) - A2400N-78	Gate valve - 0.75"	0.0023	60.00	-47.02	0.32	16.02
3	1364	Amine Bldg: GB-2702N12A - A2702N-6	Gate valve - 12"	0.0225	595.00	-466.69	2.70	16.07
4	3486	Inlet Yard Piping: Pig Traps - Plug valve seat	Open-ended line - 2"	0.0038	100.00	-88.59	0.46	16.07
4	3505	Regen Heater -	Threaded connection - 1"	0.0006	15.00	-13.29	0.08	16.09
1	3098A	Compressor CM-13 - Flange connection to bottom pulsation bottle.	Valve cover	0.0075	200.00	-177.29	0.88	16.15
3	1070	Amine Bldg: G2801N-1 - G2801N-1	Gate valve - 3"	0.0045	120.00	-94.32	0.54	16.19
1	3383	High Pressure Chiller -	Orbit valve - 4"	0.0071	190.00	-149.34	0.00	16.19
3	1454	Residue Gas/N2 Comp Bldg - Comp 3 (Throw 3)	Valve cover	0.0075	200.00	-177.40	1.07	16.22
3	1824	G-10-625-2 - A1720-12 (East Reboiler)	Threaded connection - 1"	0.0006	15.00	-13.31	0.08	16.24
4	3985	Flare System - High on platform (close to yard north of office).	Gate valve - 6"	0.0091	245.00	-193.09	1.06	16.36
3	1754	Stab 1 Building - A612-45 (West Wall)	Gate valve - 0.75"	0.0022	130.00	-47.31	0.00	16.38
3	1227	NGL Bullet 6 - Near A1101N-45	Gate valve - 0.5"	0.0022	60.00	-47.31	0.00	16.38
3	1771	Stab 1 Building - (Near Stab Reflux Pumps)	Gate valve - 3"	0.0045	120.00	-94.62	0.01	16.38
3	1529	Residue Gas/N2 Comp Bldg - Heat Pump 2	Valve cover	0.0074	200.00	-177.79	1.08	16.51
3	1218	NGL Pump 3 - Near A1202N-8	Flange - 4"	0.0028	75.00	-66.70	0.00	16.56
4	3500	Yard North of Office - Needle valve seat	Open-ended line - 0.5"	0.0022	60.00	-53.38	0.32	16.61
4	3749	Cryo System: Absorber Tower (20.001) - Second platform	Gate valve - 2"	0.0037	100.00	-79.17	0.01	16.63
3	1606	IR Compressor Building - IR Comp 2 (Fuel Gas)	Threaded connection - 2"	0.0005	10.00	-13.35	0.08	16.68
4	3561	TEG Still - Stem at burners.	Gate valve - 0.5"	0.0022	60.00	-47.54	0.32	16.69
2	4231	Compressor Unit 8 -	Valve cover	0.0073	200.00	-178.03	1.05	16.69
4	3873	Re-Compression: Yard Piping -	Gate valve - 0.75"	0.0022	60.00	-47.55	0.32	16.70
4	3555	Glycol Reboiler: Fuel Gas -	Gate valve - 0.5"	0.0022	60.00	-47.56	0.32	16.72
2	4076	Sales Piping -	Gate valve - 0.75"	0.0022	60.00	-47.71	0.31	16.92
3	1600	HP2 Bldg: Ouside - (Up on Platform)	Gate valve - 18"	0.0330	920.00	-731.94	3.96	16.95
3	1001	Mole Sieve 5 - On top platform	Gate valve - 0.75"	0.0022	60.00	-47.74	0.25	16.96
3	1098	Amine Bldg: V8-2806-1 - A2806N-7	Gate valve - 1"	0.0027	75.00	-59.77	0.32	17.07
1	3053	Mansfield Discharge -	Gate valve - 2"	0.0036	100.00	-79.75	0.42	17.11
4	3969	Refrigeration Compression: Unit 2 -	Union - 0.75"	0.0018	50.00	-44.69	0.25	17.26
3	1671	Re-Compressor Building - Re-Comp 4 (Fuel Gas Line)	Threaded connection - 2"	0.0021	200.00	-48.00	0.30	17.33
3	1640	Re-Compressor Building - Re-Comp 1 (WE4C-301-1) (Fuel Gas Line)	Union - 2"	0.0035	100.00	-89.50	0.50	17.46
4	3791	Re-Compression: Valero Discharge Scrubber -	Gate valve - 1"	0.0026	75.00	-60.14	0.38	17.49
1	3451	Refrig Comp Unit 12 -	Valve cover	0.0070	200.00	-179.04	0.00	17.49
4	3691	Cryo System: Near FV104 -	Control valve - globe - 4"	0.0061	177.00	-158.54	0.01	17.58
2	4376	Compressor Unit # 6 -	Cylinder end - flange	0.0138	400.00	-378.57	1.99	17.61

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1759	Stab 1 Building - Near Stab Reflux Pumps:	Gate valve - 0.5"	0.0021	60.00	-48.23	0.00	17.66
3	1240	NGL Bullet 4 - A1101N-16	Gate valve - 6"	0.0084	245.00	-197.01	0.00	17.69
4	3609	Yard North of Office - Needle valve seat (chart blowdown)	Open-ended line - 0.25"	0.0021	60.00	-53.78	0.30	17.69
3	1316	Propane Yard: V8-411 - A407N-2	Gate valve - 0.75"	0.0021	60.00	-48.29	0.00	17.75
3	1783	Stab 1 Building - (Near Stab Reflux Pumps)	Gate valve - 4"	0.0065	190.00	-153.09	0.01	17.84
3	1501	Residue Gas/N2 Comp Bldg: Lower Level -	Gate valve - 0.75"	0.0020	10.00	-48.46	0.29	18.02
3	1909	Hg Removal Bed V8-401-3 - A401N-14	Gate valve - 0.75"	0.0020	60.00	-48.46	0.24	18.02
1	1998	Discharge Line (221) -	Gate valve - 1"	0.0025	75.00	-60.58	0.30	18.02
3	1084	NRU - Fuel Gas - 17012X	Gate valve - 0.5"	0.0020	60.00	-48.46	0.24	18.02
3	1717	G10-805 - on B805-2	Ball valve - 0.5"	0.0020	60.00	-48.46	0.29	18.02
2	4144	Compressor Unit 8 Outside - vent off side	Three-way valve vent - 2"	0.0033	100.00	-80.96	0.48	18.20
3	1741	HHE Compressor Building - Comp HHE 8	Valve cover	0.0067	200.00	-179.87	0.80	18.21
3	1925	Dehydration Tower # 2 east - A2802N-12	Gate valve - 10"	0.0166	500.00	-405.54	1.99	18.34
4	3723	Cryo System: De-methanizer Tower (1st Platform) -	Gate valve - 1"	0.0025	75.00	-60.87	0.01	18.39
3	1591	HP2 Bldg: W36 - Chart Recorder (Upper Platform)	Open-ended line - 0.375"	0.0020	60.00	-54.05	0.24	18.48
2	4220	Compressor Unit # 9 -	Gate valve - 0.5"	0.0020	60.00	-48.75	0.28	18.48
4	3963	Refrigeration Compressors: Unit 3 -	Needle valve - 0.75"	0.0019	60.00	-48.90	0.28	18.74
4	3608	Yard North of Office -	Control valve - plug - 10"	0.0149	459.00	-414.14	2.15	18.76
1	3183	Solar Turbines: Unit B - Chart recorder	Needle valve - 0.375"	0.0019	60.00	-48.92	0.28	18.77
2	4161	Resid gas cooler E507 - gate valve seat	Open-ended line - 0.75"	0.0019	60.00	-54.14	0.24	18.77
4	3777	Central Yard - Between C3 Compressors and Gen Building	Orifice meter plate - 14"	0.0049	150.00	-142.46	0.70	18.77
3	1216	NGL Pump 4 -	Pump seal - 1"	0.0162	500.00	-474.90	0.00	18.79
3	1262	NGL Pump 4 - A1201N-11	Gate valve - 4"	0.0061	190.00	-155.04	0.00	18.83
2	4091	Process inlet separator D-208 -	Gate valve - 4"	0.0061	190.00	-155.04	0.75	18.83
3	1714	Heater Treaters - near A453-4	Union - 1"	0.0032	60.00	-90.29	0.46	18.89
3	1758	Stab 1 Building - Near A614-14	Gate valve - 2"	0.0032	100.00	-81.65	0.01	18.89
3	1182	NRU 1 - Top Platform - PV4101NB-1	Control valve - gate - 10"	0.0148	459.00	-414.47	1.77	18.90
3	1524	Residue Gas/N2 Comp Bldg - Heat Pump 2	Gate valve - 0.75"	0.0019	60.00	-49.01	0.00	18.91
1	1941	Inlet Header - Bonnet	Plug valve - 8"	0.0096	300.00	-245.08	1.13	18.93
2	4134	Gas-Gas Exchanger -	Gate valve - 0.5"	0.0019	60.00	-49.04	0.24	18.97
4	3493	Inlet Header - Panemans	Gate valve - 1.5"	0.0024	75.00	-61.31	0.29	18.98
3	1460	Residue Gas/N2 Comp Bldg - Heat Pump 4	Gate valve - 0.75"	0.0019	60.00	-49.10	0.28	19.08
3	1823	G-10-625-2 - A625-1	Gate valve - 3"	0.0038	120.00	-98.31	0.54	19.17
3	1469	Residue Gas/N2 Comp Bldg - Heat Pump 4	Valve cover	0.0063	200.00	-180.96	0.93	19.26
2	4365	Compressor Unit # 2 -	Gate valve - 1"	0.0023	75.00	-61.64	0.00	19.45
2	4074	Sales Piping - on 4" orifice meter	Equilizer valve	0.0023	75.00	-61.67	0.34	19.50
4	3639	Sales Gas Header - Stem packing.	Gate valve - 0.75"	0.0019	60.00	-49.34	0.27	19.50
3	1302	Propane Yard - Near A2404N	Gate valve - 1"	0.0023	75.00	-61.70	0.00	19.55
4	3678	Cryo System: PV-214A -	Gate valve - 4"	0.0059	190.00	-156.48	0.01	19.64
3	1702	Re-Compressor Building - Associated Yard Piping (Near LFI-70)	Control valve - globe - 4"	0.0055	177.00	-160.52	0.66	19.69
2	4238	Compressor Unit # 8 -	Injector	0.0062	200.00	-164.93	0.89	19.76
1	3177	Solar Turbines: Unit B - On skid	Open-ended line - 0.5"	0.0018	60.00	-54.51	0.26	20.02
3	1512	Residue Gas/N2 Comp Bldg: Lower Level -	Gate valve - 0.75"	0.0018	120.00	-49.62	0.26	20.02
3	1707	G10-805 - common R vent line to outside	Open-ended line - 1.5"	0.0023	75.00	-68.14	0.32	20.03
3	1461	Residue Gas/N2 Comp Bldg - Heat Pump 4	Cylinder end - flange	0.0122	400.00	-381.16	1.79	20.03
3	1595	HP2 Bldg: W36-16 - B233-3	Orbit valve - 2"	0.0030	100.00	-82.71	0.36	20.04
1	3112	Compressor CM-9 -	Crank case vent - 2"	0.0601	2000.00	-1906.78	7.02	20.24
1	3290	High Pressure JT Expander -	Gate valve - 1.5"	0.0022	75.00	-62.42	0.32	20.66

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
1	3088	West Inlet Yard Piping - On VAW gas scrubber (PV-28)	Plug valve - 0.75"	0.0018	60.00	-49.96	0.21	20.71
1	3162	Refrig Comp Unit 11 -	Valve cover	0.0058	200.00	-182.42	0.00	20.85
1	3079	West Inlet Yard Piping - On 6" orifice meter	Blowdown valve	0.0022	75.00	-62.54	0.26	20.86
4	3973	Refrigeration Compressors: Unit 2 -	Valve - 1"	0.0022	75.00	-62.56	0.32	20.90
3	1486	Residue Gas/N2 Comp Bldg: Lower Level -	Control valve - globe - 8"	0.0102	353.00	-322.25	1.50	21.05
3	1598	HP2 Bldg: W29-12 - A236-2	Gate valve - 0.5"	0.0017	120.00	-50.14	0.21	21.08
4	3550	Still Reboiler No. 2 - On orifice meter	Needle valve - 0.5"	0.0017	60.00	-50.31	0.25	21.45
3	1346	Propane Yard: V8-411 - A411N-1	Gate valve - 4"	0.0054	190.00	-159.53	0.00	21.60
3	1775	Stab 1 Building - (Top of Accumulator)	Control valve - globe - 2"	0.0036	130.00	-119.01	0.44	21.69
3	1086	Amine Bldg: V8-2806-2 - On V8-2806-2	Filter cover - 20"	0.0056	200.00	-183.15	0.67	21.77
1	1995	Inlet Header -	Open-ended line - 0.375"	0.0017	60.00	-54.96	0.20	21.84
2	4227	Compressor Unit 8 -	Variable volume pocket stem	0.0111	400.00	-382.73	1.61	21.85
3	1023	Mole Sieve Header - A2811N41	Gate valve - 0.75"	0.0017	60.00	-50.54	0.20	21.98
4	3554	Glycol Reboiler: Fuel Gas -	Union - 1"	0.0028	100.00	-91.67	0.40	22.01
3	1269	NGL Bullet 3 - A1101N-9	Gate valve - 8"	0.0097	350.00	-294.98	0.00	22.04
4	3820	Re-Compression: Yard Piping -	Ball valve - 4"	0.0052	190.00	-160.20	0.76	22.09
4	3802	Re-Compression: Yard Piping -	Ball valve - 8"	0.0096	350.00	-295.11	1.39	22.10
3	1588	HP2 Bldg: W36 - B222-6 (Upper Platform)	Orbit valve - 4"	0.0052	190.00	-160.24	0.63	22.12
4	3576	Mole Sieve Dehy: Dehy Train A -	Control valve - orbit - 8"	0.0096	353.00	-324.16	1.12	22.44
3	1590	HP2 Bldg: W31-08 - Chart Recorder (Upper Platform)	Needle valve - 0.375"	0.0016	60.00	-50.77	0.19	22.53
3	1578	HP2 Bldg: W36-14 - A232-1	Gate valve - 0.5"	0.0016	60.00	-50.83	0.19	22.67
3	1713	Medium Pressure Bldg - B241-1	Gate valve - 0.75"	0.0016	60.00	-50.83	0.19	22.67
4	3954	Refrigeration Compressors: Unit 3 -	Variable volume pocket stem	0.0106	400.00	-383.55	0.00	22.94
3	1403	Residue Gas/N2 Comp Bldg: Yard - G2502N	Gate valve - 2"	0.0026	100.00	-85.00	0.37	23.10
1	3472	Refrig Surge Tank - Sight glass (PV-25)	Gate valve - 0.75"	0.0016	60.00	-51.14	0.00	23.46
3	1502	Residue Gas/N2 Comp Bldg: Lower Level -	Gate valve - 0.75"	0.0016	60.00	-51.17	0.22	23.55
2	4062	Surge Scrubber -	Gate valve - 0.75"	0.0015	60.00	-51.23	0.19	23.71
3	1886	FG Piping on RES/N2/Heat Pump Bldg (outside) - A2400N-2	Gate valve - 3"	0.0031	120.00	-102.52	0.44	23.79
4	3743	Cryo System: Absorber Tower (20.001) - First platform	Gate valve - 2"	0.0026	100.00	-85.47	0.01	23.85
3	1772	Stab 1 Building - Near A614-10 (Top of Accumulator)	Gate valve - 0.75"	0.0015	60.00	-51.35	0.18	24.02
3	1890	Hg Removal Bed V8-401-3 - AS401N-19	Gate valve - 0.75"	0.0015	100.00	-51.35	0.18	24.03
3	1388	Regen Gas Heater 4 - Near RKO-146	Gate valve - 0.5"	0.0015	60.00	-51.35	0.22	24.03
3	1838	Co-Gen Building: Outside (CA 625 - HP FG Scrubber) - VG-155	Gate valve - 1"	0.0019	75.00	-64.27	0.27	24.22
3	1826	G-10-625-2 - A625-1	Gate valve - 3"	0.0030	120.00	-102.87	0.43	24.27
3	1442	Residue Gas/N2 Comp Bldg - Heat Pump 4	Valve cover	0.0050	200.00	-184.99	0.73	24.43
4	3696B	Cryo System: Chiller Outlet Separator Line - Stem packing	Gate valve - 0.75"	0.0015	60.00	-51.52	0.00	24.52
3	1561	HP1 Bldg: Piping - B206-3	Orbit valve - 3"	0.0029	120.00	-103.27	0.35	24.86
3	1842	Co-Gen Building: Outside (CA 625 - HP FG Scrubber) - VG-127	Gate valve - 6"	0.0060	245.00	-210.96	0.85	24.94
2	4235	Compressor Unit # 8 -	Valve - 1"	0.0018	75.00	-64.62	0.26	25.03
3	1342	Amine Bldg: Near V8-2810N - A2809N-1	Flange - 16"	0.0049	200.00	-185.35	0.58	25.03
2	4203	Residue Compressors FG Scrubber -	Gate valve - 0.5"	0.0015	60.00	-51.70	0.21	25.04
4	3821	Re-Compression: Yard Piping -	Gate valve - 4"	0.0046	190.00	-163.83	0.66	25.16
4	3602	Yard North of Office -	Gate valve - 8"	0.0084	350.00	-301.95	1.22	25.24
3	1328	Propane Yard - Behind Economizer -	Gate valve - 7"	0.0059	245.00	-211.48	0.00	25.33

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
2	4240	Compressor Unit 7 - on valve cover	Open-ended line	0.0014	60.00	-55.70	0.21	25.60
3	1566	HP2 Bldg: W30-02 - B-229-3	Gate valve - 2"	0.0024	100.00	-86.48	0.28	25.62
3	1053	Mole Sieve Header - PDSL-2876N	Needle valve - 0.375"	0.0014	60.00	-51.95	0.17	25.83
3	1006	Mole Sieve 5 - On top platform - Block valve below PRV.	Gate valve - 2"	0.0024	100.00	-86.59	0.28	25.84
3	1338	Amine Bldg: Near V8-2810N - A1653N-2	Flange - 18"	0.0047	200.00	-185.81	0.56	25.85
2	4021	Gas-Gas Exchanger -	Flange - 16"	0.0047	200.00	-185.90	0.57	26.01
3	1877	Amine Building - ROV - 2720N-2 gas blowdown to flare	Control valve - globe - 2"	0.0030	130.00	-120.84	0.36	26.03
3	1374	Amine Bldg: Glycol-Gas Outlet Scrubber -	Gate valve - 0.75"	0.0014	60.00	-52.04	0.17	26.12
4	3937B	Re-Compression: Unit 4 - FG Line 2	Plug valve - 2"	0.0028	120.00	-104.15	0.40	26.23
1	3372	De-ethanizer Reboiler -	Pump seal	0.0116	500.00	-482.05	0.02	26.28
4	3496	Inlet Header - Monahans	Orifice meter plate - 12"	0.0034	150.00	-144.66	0.42	26.49
3	1767	Stab 1 Building - TV-612-7	Control valve - globe - 8"	0.0081	353.00	-328.59	0.02	26.51
2	4209	Compressor Unit 2 -	Gate valve - 0.5"	0.0014	60.00	-52.21	0.20	26.70
3	1780	Stab 1 Building - Near Stab Reflux Pumps: A614-10	Gate valve - 3"	0.0027	120.00	-104.43	0.01	26.70
2	4205	Residue Compressors FG Scrubber -	Needle valve - 0.5"	0.0013	60.00	-52.36	0.19	27.21
1	3081	West Inlet Yard Piping - On 8" orifice meter	Gate valve - 0.5"	0.0013	60.00	-52.38	0.16	27.30
3	1548	Residue Gas/N2 Comp Bldg - Heat Pump 2	Gate valve - 0.75"	0.0013	60.00	-52.39	0.20	27.30
3	1643	IR Compressor Building - IR Comp 3 (Start Gas)	Union - 1.5"	0.0022	100.00	-93.29	0.32	27.31
4	3542	North Heat Medium Heater - Pilot stem	Gate valve - 0.5"	0.0013	60.00	-52.50	0.19	27.73
1	1972	Inlet Comp Yard Piping -	Gate valve - 2"	0.0022	100.00	-87.54	0.26	27.81
3	1012	Mole Sieve Header - ZSC2820N	Flange - 8"	0.0022	100.00	-93.41	0.26	27.81
3	1229	NGL Bullet 6 - LG3063NB	Gate valve - 0.5"	0.0013	60.00	-52.56	0.00	27.94
2	4333	Compressor Yard - Near Engine/Heater Fuel ESD -	Gate valve - 4"	0.0041	190.00	-166.46	0.60	27.97
3	1763	Stab 1 Building - Near Stab Reflux Pumps:	Gate valve - 3"	0.0026	120.00	-105.23	0.01	28.16
3	1097	Amine Bldg: V8-2806-1 - A2806N-10	Gate valve - 0.75"	0.0013	60.00	-52.64	0.15	28.27
1	3332	Mole Sieve Tower 511C -	Control valve - orbit - 8"	0.0076	353.00	-330.11	0.89	28.27
2	4289	Compressor Yard - Compressor unit 8	Orbit valve - 4"	0.0041	190.00	-166.92	0.58	28.53
3	1521	Residue Gas/N2 Comp Bldg - Heat Pump 2	Threaded connection - 0.5"	0.0002	10.00	-9.36	0.03	28.60
3	1905	Hg Removal Bed V8-401-3 - A401N-13	Gate valve - 0.75"	0.0013	200.00	-52.73	0.15	28.60
3	1472	Residue Gas/N2 Comp Bldg - Heat Pump 4	Valve cover	0.0042	200.00	-187.37	0.62	29.03
1	3474	NGL/DEA Coalescer -	Gate valve - 6"	0.0051	245.00	-215.93	0.74	29.21
4	3635	TEG Contactor - Outlet line	Gate valve - 8"	0.0072	350.00	-308.81	0.84	29.45
3	1596	HP2 Bldg: W31-06 - A238-1	Gate valve - 0.5"	0.0012	60.00	-52.96	0.15	29.54
4	3531	Heat Medium Heater FG Line - End of body (vent)	Regulator - 1"	0.0036	175.00	-150.11	0.52	29.61
2	4308	Compressor Unit # 1 -	Valve cover	0.0041	200.00	-187.63	0.00	29.64
3	1743	HHE Compressor Building - Comp HHE 7	Valve cover	0.0041	200.00	-187.64	0.49	29.66
3	1511	Residue Gas/N2 Comp Bldg: Lower Level -	Gate valve - 6"	0.0050	75.00	-216.39	0.71	29.68
2	4085	Meter bldg. -	Needle valve - 0.375"	0.0012	60.00	-53.08	0.15	30.03
4	3537	North Heat Medium Heater - Pilot	Gate valve - 0.5"	0.0012	60.00	-53.08	0.18	30.04
4	3519	South Heat Medium Heater - Pilot	Gate valve - 0.5"	0.0012	60.00	-53.08	0.18	30.04
3	1931	Mole Sieve Tower 1 - A2802N-3	Gate valve - 10"	0.0100	500.00	-442.90	1.20	30.34
1	3463	Refrig Comp Unit 12 -	Valve cover	0.0040	200.00	-187.98	0.00	30.51
2	4098	DGA coalescer - horn	Pressure relief valve - 2"	0.0027	135.00	-126.94	0.33	30.72
4	3827E	Re-Compression: Yard Piping - on 4" plug valve	Grease nipple	0.0010	50.00	-44.37	0.14	30.76
3	1397	RefrigerantComp Bldg: - Comp E028007A	Compressor seal	0.0395	2000.00	-1938.78	0.01	30.82
1	3452	Refrig Comp Unit 12 -	Valve cover	0.0039	200.00	-188.19	0.00	31.04

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1575	HP2 Bldg: W29-04 - Along Back Wall (Inlet)	Gate valve - 0.75"	0.0012	60.00	-53.31	0.14	31.07
3	1646	IR Compressor Building - V8-324 (A324-2) - Suction Header	Gate valve - 1.5"	0.0015	75.00	-66.69	0.17	31.28
1	3005	Inlet Comp Yard Piping - On 16" orifice meter	Rack	0.0015	75.00	-66.69	0.17	31.28
3	1633	IR Compressor Building - Associated Yard Piping (A343-1)	Gate valve - 6"	0.0048	245.00	-217.95	0.57	31.38
3	1637	Re-Compressor Building - Re-Comp 1 (WE4C-301-1)	Valve cover	0.0039	200.00	-188.40	0.46	31.61
3	1704	Medium Pressure Bldg - V8-242	Manway - 30"	0.0058	300.00	-282.61	0.69	31.63
1	3396	EB Skid to Chevron -	Control valve - globe - 2"	0.0025	130.00	-122.49	0.00	31.74
3	1241	NGL Bullet 4 - A1101N-11	Gate valve - 8"	0.0067	350.00	-312.05	0.00	31.95
2	4275	Compressor Unit 7 -	Valve cover	0.0038	200.00	-188.53	0.55	31.96
1	3420	Refrig Comp Unit 11 - Yard Piping -	Gate valve - 3"	0.0022	120.00	-107.22	0.00	32.53
3	1069	Amine Bldg - A2801N-5	Gate valve - 4"	0.0035	190.00	-169.82	0.42	32.62
3	1602	IR Compressor Building - IR Comp 2	Cylinder end - flange	0.0075	400.00	-388.44	0.89	32.65
3	1498	Residue Gas/N2 Comp Bldg - Heat Pump 2	Cylinder end - flange	0.0074	400.00	-388.48	1.09	32.77
3	1370	Amine Bldg: Near V8-2810N - A2809N-3	Gate valve - 18"	0.0170	920.00	-823.27	2.03	32.96
1	3447	Refrig Comp Unit 12 -	Valve cover	0.0037	200.00	-188.92	0.00	33.11
4	3695	Cryo System: Chiller Outlet Separator -	Gate valve - 2"	0.0018	100.00	-89.66	0.00	33.52
3	1176	NRU 1 - Near G412N-5	Gate valve - 0.75"	0.0011	60.00	-53.80	0.13	33.53
1	1954	Inlet Comp Yard Piping -	Gate valve - 3"	0.0021	120.00	-107.77	0.25	34.00
3	1703	Medium Pressure Bldg - B243-4	Ball valve - 2"	0.0018	100.00	-89.85	0.21	34.13
3	1569	HP2 Bldg: W31-08 - A226-1	Gate valve - 0.5"	0.0011	60.00	-53.94	0.13	34.32
2	4296	Residue Gas Suction Line -	Needle valve - 0.5"	0.0011	60.00	-53.94	0.15	34.32
3	1024	Mole Sieve Header - MTV-010	Gate valve - 8"	0.0061	350.00	-315.39	0.73	35.04
3	1361	Amine Bldg: V8-2701 - A2705N-1	Gate valve - 0.5"	0.0010	60.00	-54.12	0.12	35.33
3	1337	Amine Bldg: Near V8-2810N - A1653N-2	Gate valve - 18"	0.0158	920.00	-830.12	1.89	35.47
3	1037	Mole Sieve 3 - ROV-2852N	Control valve - globe - 2"	0.0022	60.00	-123.28	0.27	35.49
1	1951	Inlet Comp Yard Piping -	Control valve - globe - 2"	0.0022	130.00	-123.28	0.26	35.49
1	3211	Solar Turbines: Header Outside -	Gate valve - 2"	0.0017	100.00	-90.31	0.25	35.75
4	3657	Mole Sieve Dehy: Regen Fan/Blower - Off blower (pump seal)	Pump seal - 0.5"	0.0085	500.00	-486.83	1.23	35.83
3	1044	Mole Sieve 3 - A2811N-22	Gate valve - 0.75"	0.0010	60.00	-54.20	0.12	35.86
3	1832	Co-Gen Building: Outside (CA 625 - HP FG Scrubber) - VG-151	Gate valve - 0.5"	0.0010	353.00	-54.23	0.14	36.04
3	1129	NRU 2 - G494N-1	Open-ended line - 0.75"	0.0010	60.00	-56.95	0.12	36.04
3	1648	IR Compressor Building - V8-324 - Suction Header	Gate valve - 1"	0.0013	75.00	-67.85	0.15	36.33
3	1139A	NRU 2 - A2306N	Gate valve - 10"	0.0082	200.00	-453.40	0.98	37.18
3	1778	Stab 1 Building - A614-3 (Top of Accumulator)	Gate valve - 2"	0.0016	100.00	-90.77	0.19	37.54
3	1697	Re-Compressor Building - Associated Yard Piping (A9240)	Gate valve - 2"	0.0016	100.00	-90.77	0.23	37.54
3	1434	Residue Gas/N2 Comp Bldg - Heat Pump 1	Valve cover	0.0032	200.00	-190.24	0.48	37.55
4	Direct	Re-Compressor Unit 4 -	Seals vent	0.0315	2000.00	-1951.24	4.55	38.70
3	1201	NRU Expander 3 - Near TB-0181	Union - 0.75"	0.0008	50.00	-47.65	0.09	39.00
3	1505	Residue Gas/N2 Comp Bldg: Lower Level -	Gate valve - 3"	0.0019	120.00	-109.44	0.26	39.39
3	1747	HHE Compressor Building - Associated Yard Piping (Near A308-6)	Gate valve - 2"	0.0015	60.00	-91.35	0.18	40.04
3	1506	Residue Gas/N2 Comp Bldg: Lower Level -	Gate valve - 3"	0.0018	60.00	-109.62	0.26	40.05
3	1341	Amine Bldg: Near V8-2810N - A2809N-1	Flange - 16"	0.0030	200.00	-190.84	0.36	40.05
3	1220	NGL Pump 3 - A1202N-9	Gate valve - 1"	0.0011	75.00	-68.54	0.00	40.22
1	3455	Refrig Comp Unit 12 -	Valve cover	0.0030	200.00	-190.93	0.00	40.42
1	3060	Lone Star Line -	Orbit valve - 8"	0.0053	350.00	-320.00	0.61	40.43

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1017	Mole Sieve 2 - ZSC2812N	Orbit valve - 8"	0.0053	350.00	-320.00	0.63	40.43
3	1503	Residue Gas/N2 Comp Bldg: Lower Level -	Gate valve - 0.75"	0.0009	60.00	-54.92	0.13	40.95
2	4073	Sales Piping - on 4" orifice meter	Slide valve	0.0011	75.00	-68.68	0.16	41.14
3	1762	Stab 1 Building - A614-17	Control valve - globe - 4"	0.0026	177.00	-169.12	0.01	41.21
4	3601	Yard North of Office - Gate valve seat	Open-ended line - 0.75"	0.0009	60.00	-57.34	0.13	41.35
3	1753	Stab 1 Building - A612-60 (West Wall)	Gate valve - 0.75"	0.0009	60.00	-55.04	0.00	41.90
3	1147	NRU 2 - 2nd Platform - A416N-8	Gate valve - 3"	0.0017	60.00	-110.14	0.21	42.15
4	3610	Yard North of Office -	Control valve - globe - 12"	0.0081	560.00	-535.73	1.16	42.31
2	4190	Compressor Unit 2 -	Variable volume pocket stem	0.0057	400.00	-391.12	0.00	42.47
1	3091	West Inlet Yard Piping - To PV-28 (ball valve)	Threaded connection - 2"	0.0002	15.00	-14.36	0.02	42.90
3	1574	HP2 Bldg: W30-16 - Along Back Wall (Inlet)	Gate valve - 0.75"	0.0009	60.00	-55.15	0.10	42.90
3	1443	Residue Gas/N2 Comp Bldg - Heat Pump 1 (A401N-27)	Gate valve - 0.75"	0.0009	60.00	-55.15	0.13	42.91
3	1784	Stab 1 Building - (Near Stab Reflux Pumps)	Gate valve - 6"	0.0034	60.00	-225.39	0.01	43.28
3	1027	Mole Sieve 2 - On top platform - Block valve below PRV.	Gate valve - 2"	0.0014	100.00	-92.07	0.17	43.69
2	4140	Resid gas cooler E507 -	Gate valve - 8"	0.0047	350.00	-323.18	0.58	45.21
1	3422	Refrig Comp Unit 10 - Yard Piping -	Control valve - butterfly - 6"	0.0038	282.00	-270.64	0.00	45.50
3	1765	Stab 1 Building - (Near Stab Reflux Pumps)	Gate valve - 10"	0.0066	100.00	-462.45	0.01	46.14
3	1475	Residue Gas/N2 Comp Bldg: Back Wall -	Gate valve - 10"	0.0066	500.00	-462.47	0.94	46.17
1	3218	Solar Turbines: Header Outside -	Control valve - globe - 2"	0.0017	130.00	-124.87	0.25	46.47
1	3293	High Pressure JT Expander -	Control valve - 8"	0.0046	353.00	-339.08	0.67	46.50
4	3658	Mole Sieve Dehy: Regen Fan/Blower -	Flange - 3"	0.0010	75.00	-72.05	0.14	46.65
4	3989	Mole Sieve Dehy: Coalescing Filter Separator -	Filter cover - 36"	0.0051	400.00	-384.51	0.60	47.34
3	1701	Re-Compressor Building - Associated Yard Piping (Near G8-311-1) Cooler	Control valve - ball - 4"	0.0023	10.00	-170.16	0.27	47.46
3	1522	Residue Gas/N2 Comp Bldg - Heat Pump 2	Gate valve - 0.5"	0.0007	60.00	-55.73	0.11	48.70
1	3009	Inlet Comp Yard Piping -	Flange - 6"	0.0012	100.00	-96.28	0.14	49.23
3	1535	Residue Gas/N2 Comp Bldg - Heat Pump 3	Valve cover	0.0025	200.00	-192.60	0.00	49.58
3	1330	Propane Yard - G406N-1 (1st Stage Suction Scrubber)	Gate valve - 4"	0.0023	190.00	-176.84	0.00	50.02
4	3527	South Heat Medium Heater - Pilot	Union - 0.5"	0.0006	50.00	-48.17	0.09	50.06
3	1530	Residue Gas/N2 Comp Bldg - Heat Pump 2	Valve cover	0.0024	200.00	-192.75	0.35	50.59
3	1807	Fuel Gas Scrubber (V8-1720) - Near FE1720	Gate valve - 0.5"	0.0007	60.00	-55.96	0.10	51.48
3	1766	Stab 1 Building - (Near Stab Reflux Pumps)	Flange - 30"	0.0035	300.00	-289.50	0.01	52.38
3	1015	Mole Sieve 3 - ZSC2816N	Orbit valve - 8"	0.0041	75.00	-326.92	0.49	52.56
1	2001	Discharge Line (221) -	Gate valve - 4"	0.0022	190.00	-177.54	0.26	52.83
1	3120	Compressor CM-19 -	Injector	0.0022	200.00	-187.19	0.26	54.11
1	3336	Mole Sieve Tower 511C -	Control valve - globe - 2"	0.0015	130.00	-125.60	0.17	54.22
3	1777	Stab 1 Building - (Top of Accumulator)	Gate valve - 1.5"	0.0008	75.00	-70.21	0.10	54.27
3	1761	Stab 1 Building - A614-13	Gate valve - 4"	0.0021	190.00	-177.88	0.00	54.34
3	1764	Stab 1 Building - Near Stab Reflux Pumps:	Gate valve - 4"	0.0021	190.00	-177.88	0.00	54.34
2	---	Compressor Unit # 4 -	Crank case vent - 2"	0.0224	2000.00	-1965.32	3.23	54.40
1	3008	Inlet Comp Yard Piping - Gate valve seat	Open-ended line - 0.5"	0.0007	60.00	-57.99	0.08	54.60
2	4271	Compressor Unit 7 -	Valve cover	0.0022	200.00	-193.41	0.32	55.61
3	1760	Stab 1 Building - LV614-1A	Gate valve - 4"	0.0020	190.00	-178.35	0.00	56.49
3	1509	Residue Gas/N2 Comp Bldg: Lower Level -	Gate valve - 3"	0.0013	120.00	-112.64	0.18	56.53
4	3732	Cryo System: Exchanger - Off orifice meter	Gate valve - 0.5"	0.0006	60.00	-56.37	0.00	57.22

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1855	Amine Yard - A2700N	Gate valve - 4"	0.0020	190.00	-178.58	0.29	57.64
3	1372	Amine Bldg: V8-2810N - A2810N-3	Gate valve - 1.5"	0.0008	75.00	-70.50	0.09	57.75
3	1912	Hg Removal Bed V8-401-2 - A401N-9	Gate valve - 0.75"	0.0021	15.00	-193.65	0.25	57.76
1	3421	Refrig Comp Unit 10 - Yard Piping -	Gate valve - 3"	0.0013	120.00	-112.87	0.00	58.30
4	3988	Mole Sieve Dehy: Coalescing Filter Separator -	Gate valve - 12"	0.0062	595.00	-559.87	0.72	58.69
2	4006	Mole Sieve Tower D -	Control valve - orbit - 8"	0.0036	353.00	-342.01	0.45	58.89
3	1806	Fuel Gas Scrubber (V8-1720) - Near FE1720	Gate valve - 0.5"	0.0006	60.00	-56.48	0.09	59.07
3	1847	Co-Gen Building: Fuel Gas Scrubber (SW Corner of Bldg) -	Gate valve - 0.75"	0.0006	60.00	-56.48	0.07	59.08
4	3630	MEA Contactor -	Gate valve - 10"	0.0051	500.00	-470.69	0.62	59.10
3	1054	Mole Sieve Header - PDISH2864N	Needle valve - 0.375"	0.0006	60.00	-56.54	0.07	60.06
3	1371	Amine Bldg: V8-2810N - A2810N-2	Gate valve - 1.5"	0.0008	75.00	-70.67	0.09	60.06
1	3092	West Inlet Yard Piping - To PV-28	Gate valve - 0.75"	0.0006	60.00	-56.54	0.07	60.06
4	3737	Cryo System: Absorber Bottoms Pumps - Gate valve seat	Open-ended line - 0.75"	0.0006	60.00	-58.17	0.00	60.22
3	1559	Residue Gas/N2 Comp Bldg - Heat Pump 3	Gate valve - 0.75"	0.0006	60.00	-56.60	0.09	61.08
3	1782	Stab 1 Building - Near Stab Reflux Pumps:	Gate valve - 4"	0.0019	190.00	-179.27	0.00	61.35
3	1805	Fuel Gas Scrubber (V8-1720) - Blowdown	Needle valve - 0.5"	0.0006	60.00	-56.77	0.08	64.35
1	3380	High Pressure Chiller -	Control valve - globe - 4"	0.0017	177.00	-171.97	0.00	64.49
3	1601	IR Compressor Building - IR Comp 2	Valve cover	0.0019	10.00	-194.38	0.22	65.28
1	3385	High Pressure Chiller -	Control valve - globe - 4"	0.0016	177.00	-172.09	0.00	66.04
1	3145	Refrig Comp Unit 11 - Stem packing	Variable volume pocket stem	0.0036	400.00	-394.36	0.00	66.93
3	1016	Mole Sieve Header - XY-2817N0	Orbit valve - 8"	0.0031	350.00	-332.10	0.38	67.74
2	4230	Compressor Unit 8 -	Valve cover	0.0018	200.00	-194.69	0.25	69.04
1	---	CM-504 - Turbine seals vent	Turbine seals vent	0.0176	2000.00	-1972.68	2.54	69.05
4	3733	Cryo System: Dust Filter (20.002) - Gate valve seat	Open-ended line - 1"	0.0007	75.00	-73.01	0.00	69.21
4	3745	Cryo System: Absorber Tower (20.001) - First platform	Gate valve - 2"	0.0009	100.00	-95.15	0.00	71.51
3	1611	IR Compressor Building - IR Comp 1	Valve cover	0.0017	200.00	-194.87	0.20	71.51
3	1041	Mole Sieve 3 - A2811N-35	Gate valve - 0.75"	0.0005	60.00	-57.14	0.06	72.81
3	1326	Propane Yard - Behind Economizer - FV2912N	Control valve - globe - 6"	0.0023	282.00	-274.97	0.00	73.56
1	1963	Inlet Comp Yard Piping -	Gate valve - 0.75"	0.0005	60.00	-57.23	0.06	75.07
3	1010	Mole Sieve Header - XY2826N0	Flange - 8"	0.0008	100.00	-97.56	0.10	75.09
1	3280	HP Expander Scrubber (PV-503) - Stem packing	Butterfly valve - 10"	0.0081	1000.00	-975.59	1.17	75.09
3	1742	HHE Compressor Building - Comp HHE 7	Valve cover	0.0016	200.00	-195.12	0.19	75.12
2	4302	Compressor Unit # 1 - flange	Cylinder body	0.0032	400.00	-395.05	0.46	76.27
4	3889	Refrigeration Compression: Outside Yard Piping - Orifice meter to Unit 3	Gate valve - 0.5"	0.0005	60.00	-57.27	0.07	76.28
3	1572	HP2 Bldg: W29-12 - G238-2 (Inlet Line)	Gate valve - 0.75"	0.0005	60.00	-57.35	0.06	78.34
3	1363	Amine Bldg: GB-2702N12A - A2702N-6	Gate valve - 10"	0.0037	500.00	-478.81	0.45	81.75
3	1444	Residue Gas/N2 Comp Bldg: Lower Level -	Flange - 12"	0.0011	15.00	-146.64	0.16	81.90
3	1061	Mole Sieve Header - PDSL-2863N	Needle valve - 0.375"	0.0004	60.00	-57.46	0.05	81.91
1	---	Refrig Comp Unit 10 -	Crank case vent	0.0147	2000.00	-1977.29	0.00	83.10
3	1082	NRU 3 - LY480NB-3	Control valve - 4"	0.0013	177.00	-173.19	0.15	85.07
4	3612	Yard North of Office - Gate valve seat	Open-ended line - 0.75"	0.0004	60.00	-58.72	0.06	85.82
1	3089	West Inlet Yard Piping - To PV-28	Gate valve - 1"	0.0005	75.00	-72.00	0.06	86.63
2	4355	Compressor Yard - Centre Residue Gas Cooler -	Control valve - globe - 6"	0.0020	282.00	-276.05	0.28	86.86
3	1571	HP2 Bldg: W01-02 - G225-2 (Inlet Line)	Gate valve - 0.75"	0.0004	10.00	-57.69	0.05	90.09
4	3673	Cryo System: Turbo Expander -	Control valve - 8"	0.0024	353.00	-345.82	0.01	90.15

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
1	---	CM-503 - Turbine seals vent	Turbine seals vent	0.0135	2000.00	-1979.12	1.94	90.34
1	3219	Solar Turbines: Header Outside -	Control valve - butterfly - 10"	0.0031	459.00	-449.75	0.44	90.98
3	1843	Co-Gen Building: Outside (CA 625 - HP FG Scrubber) - Near VG-127	Gate valve - 6"	0.0016	245.00	-235.77	0.23	91.97
3	1423	Residue Gas/N2 Comp Bldg - Comp 2	Valve cover	0.0013	60.00	-196.15	0.18	95.34
1	3139	Compressor CM-13 -	Vent - 1"	0.0126	2000.00	-1980.48	1.47	96.67
1	1960	Inlet Comp Yard Piping -	Gate valve - 0.5"	0.0004	60.00	-57.92	0.04	100.10
3	1628	IR Compressor Building - IR Comp 3	Valve cover	0.0012	200.00	-196.34	0.15	100.10
3	1710	Re-Compressor Building - Associated Yard Piping (A9239)	Gate valve - 2"	0.0006	100.00	-96.54	0.09	100.11
4	3611	Yard North of Office - Near 18" check valve	Control valve - plug - 10"	0.0028	459.00	-450.70	0.40	101.36
3	1567	HP2 Bldg: W20-08 - Near N228-19	Gate valve - 1"	0.0004	75.00	-72.46	0.05	102.38
1	3279	HP Expander Scrubber (PV-503) - Stem packing	Butterfly valve - 10"	0.0054	1000.00	-983.76	0.78	112.90
3	1789	Stab 1 Building - Reboiler Pumps Outside	Pump seal	0.0027	500.00	-495.84	0.01	113.34
1	3395	EB Skid to Chevron -	Pump seal	0.0026	500.00	-495.92	0.00	115.50
3	1508	Residue Gas/N2 Comp Bldg: Lower Level - Near A301N-35	Gate valve - 0.75"	0.0003	60.00	-58.21	0.04	116.24
3	1568	HP2 Bldg: W20-08 - G228-2 (Inlet Line)	Gate valve - 0.75"	0.0003	60.00	-58.27	0.04	120.12
1	3152	Yard between inlet compressors and fractionation plant. - 224 - 4" Block valve - Chevron to train rack	Grease nipple - 4"	0.0003	50.00	-48.56	0.03	120.12
3	1213	NGL Pump 5 - A1202N-9/TB0656	Gate valve - 4"	0.0010	190.00	-184.52	0.00	120.12
3	1477	Residue Gas/N2 Comp Bldg: Back Wall -	Gate valve - 6"	0.0012	10.00	-238.08	0.17	122.63
3	1593	HP2 Bldg: W29-12 - (Upper Platform)	Orbit valve - 4"	0.0009	190.00	-184.69	0.11	124.04
4	3752	Sales Gas Header - Needle valve seat	Open-ended line - 0.25"	0.0003	60.00	-59.15	0.04	128.77
3	1665	Re-Compressor Building - Re-Comp 3 (Fuel Gas Line)	Cylinder end - flange	0.0018	400.00	-397.17	0.22	133.47
3	1523	Residue Gas/N2 Comp Bldg - Heat Pump 2	Gate valve - 0.5"	0.0003	60.00	-58.44	0.04	133.48
1	3076	West Inlet Yard Piping - On 6" orifice meter	Grease nipple	0.0002	50.00	-48.73	0.03	136.50
3	1620	IR Compressor Building - IR Comp 1 (Start Gas) B342-1	Ball valve - 2"	0.0004	100.00	-97.58	0.06	143.01
4	3620	Yard North of Office -	Gate valve - 2"	0.0004	100.00	-97.58	0.06	143.03
2		Compressor Unit # 3 -	Crank case vent - 2"	0.0085	2000.00	-1986.83	1.22	143.30
3	1377	Amine Bldg: V8-1653N - Near A1653N-3	Flange - 4"	0.0003	75.00	-74.05	0.04	145.30
3	1745	HHE Compressor Building - Comp HHE 7	Valve cover	0.0008	200.00	-197.56	0.10	150.15
2		Compressor Unit # 2 -	Crank case vent - 2"	0.0076	2000.00	-1988.28	1.09	160.95
4	3811	Re-Compression: Yard Piping -	Ball valve - 4"	0.0007	190.00	-185.96	0.10	163.09
4	3728	Cryo System: Exchanger -	Gate valve - 6"	0.0009	245.00	-240.15	0.00	175.22
1	3144	Yard between inlet compressors and fractionation plant. -	Needle valve - 0.5"	0.0002	60.00	-58.85	0.02	180.18
3	1744	HHE Compressor Building - Comp HHE 7	Valve cover	0.0006	200.00	-198.05	0.08	187.70
4	3679	Cryo System: To JT Valve -	Control valve - 4"	0.0006	177.00	-175.29	0.00	189.90
1	3322	Regen Gas Compressors/Blowers - Around bolts.	Compressor seal	0.0062	2000.00	-1990.34	0.73	195.34
3	1376	Amine Bldg: Near Glycol-Gas Outlet Scrubber - FV-2803N	Tubing connection - 0.375"	0.0000	15.00	-14.75	0.01	204.77
3	1487	Residue Gas/N2 Comp Bldg: Lower Level -	Control valve - globe - 8"	0.0010	60.00	-349.95	0.15	212.02
3	1538	Residue Gas/N2 Comp Bldg - Heat Pump 3	Valve cover	0.0006	200.00	-198.27	0.00	212.56
2	4252	Compressor Unit 4 - VVP Stem	Variable volume pocket stem	0.0011	400.00	-398.27	0.16	218.45
1	3141	Compressor CM-14 - Lube oil tank	Lube oil tank vent - 0.375"	0.0109	4000.00	-3983.04	1.28	222.51
3	1478	Residue Gas/N2 Comp Bldg: Back Wall -	Gate valve - 10"	0.0013	500.00	-492.73	0.18	238.33
3	1570	HP2 Bldg: W31-08 - (Past NV Seat)	Gate valve - 0.375"	0.0002	60.00	-59.54	0.02	240.24

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
3	1422	Residue Gas/N2 Comp Bldg - Comp 2	Cylinder end - flange	0.0010	400.00	-398.49	0.14	250.28
4	3960	Refrigeration Compressors: Unit 3 - By injector	Valve - 1"	0.0002	75.00	-73.99	0.03	257.44
2	4306	Compressor Unit # 1 -	Variable volume pocket stem	0.0008	400.00	-398.68	0.00	286.94
2	4312	Compressor Unit # 1 -	Valve cover	0.0003	200.00	-199.08	0.04	400.51
1	3083	West Inlet Yard Piping - On 8" orifice meter	Orifice meter plate - 8"	0.0002	150.00	-149.67	0.02	428.99
4	3727	Cryo System: Exchanger -	Control valve - globe - 6"	0.0003	282.00	-280.97	0.00	504.31
3	1740	HHE Compressor Building - Comp HHE 8	Valve cover	0.0002	200.00	-199.30	0.03	522.25
3	1479	Residue Gas/N2 Comp Bldg: Back Wall -	Gate valve - 10"	0.0006	500.00	-496.77	0.08	536.28
4	3682	Cryo System: Expander Feed Separator -	Control valve - 2"	0.0001	130.00	-129.57	0.00	557.81
3	1011	Mole Sieve Header - ROV2819N	Orbit valve - 10"	0.0005	500.00	-497.00	0.06	577.54
4	3953	Refrigeration Compressors: Unit 3 -	Variable volume pocket stem	0.0004	400.00	-399.45	0.00	683.23
4	3573	Mole Sieve Dehy: Dehy Tower A - Green Gas	Control valve - orbit - 8"	0.0003	353.00	-352.15	0.03	757.27
4	3661	Cryo System: Warm Gas Exchanger -	Gate valve - 10"	0.0003	500.00	-498.55	0.00	1192.
3	1476	Residue Gas/N2 Comp Bldg: Back Wall -	Gate valve - 10"	0.0002	500.00	-499.00	0.02	1735.
3	---	Low Pressure Process Flare	Installation of vapour recovery unit	121.144	NE	---	306.88	NA
2	Direct	12" Flare Stack -	Flare stack / blowdown - 12"	6.869	NE	---	990.13	NA
3	Direct	NRU-N2 Vent Cold Can 1 -	NRU vent - 16"	2.769	NE	---	331.61	NA
3	Direct	NRU-N2 Vent Cold Can 3 -	NRU vent - 16"	0.909	NE	---	108.83	NA
3	Direct	NRU-N2 Vent Cold Can 2 -	NRU vent - 16"	0.449	NE	---	53.81	NA
3	1856	Amine Bldg - Analyzer AX-2300 Vent	Vent - 0.375"	0.0838	NE	---	10.04	NA
4	3955	Refrigeration Compression: Unit 1 -	Valve cover	0.0000	200.00	-200.00	---	NA
4	3506	Air -	Gate valve - 0.75"	0.0000	60.00	-60.00	---	NA
4	3827A	Re-Compression: Yard Piping - on 4" plug valve	Grease nipple	0.0000	50.00	-50.00	---	NA
4	3827B	Re-Compression: Yard Piping - on 4" plug valve	Grease nipple	0.0000	50.00	-50.00	---	NA
3	1004	Mole Sieve 4 - On top platform	Gate valve - 0.75"	0.0000	60.00	-60.00	---	NA
3	1025	Mole Sieve 1 - On top platform	Tubing connection - 0.75"	0.0000	25.00	-25.00	---	NA
3	1021	Mole Sieve Header - A2811N56	Gate valve - 0.75"	0.0000	60.00	-60.00	---	NA
3	1013	Mole Sieve Header - XY2821NC	Orbit valve - 8"	0.0000	350.00	-350.00	---	NA
3	1020	Mole Sieve Header - A2811N72	Gate valve - 0.75"	0.0000	60.00	-60.00	---	NA
3	1109	NRU 3 - Hot Box - Near A483N-6 on cross-over to cold box.	Control valve	0.0000	177.00	-177.00	---	NA
3	1165	NRU 1 - Base of Cold Box - Valve 308	Control valve - 10"	0.0000	459.00	-459.00	---	NA
3	1453	Residue Gas/N2 Comp Bldg - Comp 3 (Throw 1)	Valve cover	0.0000	200.00	-200.00	---	NA
3	1441	Residue Gas/N2 Comp Bldg - Heat Pump 1	0	0.0000	NE	---	---	NA
3	1485	Residue Gas/N2 Comp Bldg: Lower Level -	AIR	0.0000	NE	---	---	NA
3	1552	HP1 Bldg: E28-12 - Fixed before Hi-Flow measurement performed.	Open-ended line - 0.375"	0.0000	60.00	-60.00	---	NA
3	1581	HP1 Bldg: E26-15 (NV seat).	Threaded connection - 0.25"	0.0000	10.00	-10.00	---	NA
3	1488	Residue Gas/N2 Comp Bldg: Lower Level - Actuator ZSC451N-3	Vent - 0.375"	0.0000	NE	---	---	NA
3	1489	Residue Gas/N2 Comp Bldg: Lower Level - Actuator ZSC451N-4	Vent - 0.375"	0.0000	NE	---	---	NA
2	4051	Inlet Scrubber - on 10" plug valve	Grease nipple	0.0000	50.00	-50.00	---	NA
2	4066	HP Inlet EDS -	AIR	0.0000	NE	---	---	NA
2	4290	Compressor Yard - FIXED	Pressure relief valve	0.0000	600.00	-600.00	---	NA
2	4195	Compressor Unit 2 -	Injector - 1"	0.0000	200.00	-200.00	---	NA

Table II-1. Measured THC emissions rates, sorted by payout period, from leaking equipment components at surveyed gas plants, October to December, 2000.

Site #	Tag #	Process Unit	Component Description	Emission Rate (mscfd)	Estimated Repair Cost ($)	Net Present Value of Repair ($)[1]	CO_2E Emissions (t/y)	Payout Period (years)
2	4090	Meter bldg. - needle valve seat	Open-ended line - 0.375"	0.0000	60.00	-60.00	---	NA
2	4178	Cryo skid 101 -	Control valve - 8"	0.0000	353.00	-353.00	---	NA
2	4287	Compressor yard Unit # 6 -	Control valve - orbit - 4"	0.0000	177.00	-177.00	---	NA
2	4301	Compressor Unit # 1 -	Open-ended line - 0.5"	0.0000	60.00	-60.00	---	NA
2	4329	Compressor Unit # 2 - stem packing	Orbit valve - 4"	0.0000	190.00	-190.00	---	NA
2	4338	Compressor Yard -	Plug valve - 2"	0.0000	120.00	-120.00	---	NA
1	3321	Regen Gas Compressors/Blowers -	Open-ended line - 1"	0.0000	75.00	-75.00	---	NA
1	3132	Compressor CM-13 -	VOID	0.0000	NE	---	---	NA

1 The presented costs do not account for the expense of finding and evaluating these reduction opportunities and therefore are potentially low.

NE Repair costs were not estimated for this component.

NA The payout period could not be calculated because the component emission rate was below the minimum measurable value of the HiFlow™ Sampler or repair costs were not estimated.

---- The net present value of could not be calculated because repair costs were not estimated for this component, or the CO_2E emissions could not be calculated.

Appendix III

Combustion Analysis and Efficiency Testing Results

The compiled combustion data were input into a database to facilitate the calculation of the required parameters. Measured fuel and exhaust gas compositions were used to determine the air-to-fuel and exhaust-to-fuel ratios. Species mole balances and the following simple combustion relation were used:

$$Fuel + a \cdot Air \rightarrow b \cdot Flue + d \cdot H_2O$$

A carbon mole balance was used to determine *b*, a nitrogen balance to determine *a* and a hydrogen balance to determine *d*. These coefficients were then used to determine the flow rates of the unknown streams from the known flow.

Combustion efficiency is defined as the total enthalpy contained in the reactants minus the total enthalpy contained in the products divided by the energy content of the fuel. This may be written as follows:

$$\frac{\left(\dot{m}_{FUEL} \cdot h^f_{FUEL} + \dot{m}_{AIR} \cdot h^f_{AIR} - \dot{m}_{FLUE} \cdot h^f_{FLUE}\right)}{\dot{m}_{FUEL} \cdot LHV}$$

$\dot{m}$ is the molar flow rate of the stream (i.e., fuel, air, or flue gas) (kmole/h),
h^f is the heat of formation of the stream (MJ/kmole), and
LHV is the lower heating value of the fuel gas stream (MJ/kmole)

For ideal operation, combustion efficiencies calculated with this equation are expected to be in the range of 95 to 98 percent.

While combustion efficiency is useful in demonstrating how much of the energy in the fuel is converted to heat, it does not provide a complete description of how effectively the equipment is utilizing this energy. An energy balance on a typical reciprocating engine yields the following (based on manufacturers' heat load data):

- Energy from Fuel 100 %
- Useful Work 30 to 35 %
- Jacket Water and Oil Cooler 15 to 40 %
- Radiation 3.5 to 7.5 %
- Turbocharger After Cooler 1 to 6 %
- Exhaust 20 to 35 %

The heat loads for jacket water, oil cooler, turbocharger after cooler and radiation are typically determined by design or safe operating conditions. Heat lost to exhaust is a function of combustion efficiency and the quantity of combustion air that is required for efficient operation. Useful work is whatever is left over after all losses have been accounted. Since heat losses to jacket water, oil cooler, turbocharger after cooler and radiation are typically fixed by design, the amount of heat lost up the stack is a good indication of whether or not the unit is being operated in an efficient manner.

The situation is similar, although less complicated, for heaters/boilers and gas turbine engines. For heaters and boilers:

- Energy from Fuel 100 %
- Useful Work 70 to 85 %
- Radiation 2 to 5 %
- Exhaust 15 to 25 %

And for gas turbines:

- Energy from Fuel 100 %
- Useful Work 30 to 40 %
- Radiation 2 to 5 %
- Exhaust 60 to 70 %

Stack heat losses have been calculated using a simplified heat balance. The equation used is:

$$Fraction\ of\ Heat\ Lost = \frac{Stack\ Losses}{Heat\ Input}$$

where

$$\begin{aligned} Heat\ Input = {} & Energy\ Content\ of\ Fuel + Sensible\ Heat\ in\ Fuel \\ & + Sensible\ Heat\ in\ Combustion\ Air \end{aligned}$$

$$\begin{aligned} Stack\ Losses = {} & Energy\ Content\ of\ the\ Exhaust\ Gas \\ & + Convective\ Stack\ Losses \\ & + Sensible\ Heat\ in\ the\ Exhaust\ Gas \end{aligned}$$

The costs associated with the improper operation of combustion units are made up of two components: the value of any unburned fuel in the exhaust gas and the incremental fuel associated with operating at excessive air-to-fuel ratios. The former is determined by calculating the heating value of the unburned or partially burned components of the exhaust gas and assigning a value per GJ of energy equal to that of natural gas.

The cost associated with too much excess air is determined by comparing the measured air-to-fuel ratio with typical manufacturers' values. The loss is then calculated by determining the amount of heat required to heat the excess air from ambient temperature to the exhaust stack temperature.

The optimum air-to-fuel ratio varies significantly for reciprocating engines according to make and model of unit. Accordingly, specific manufacturers' values were used wherever possible. In the absence of manufactures' data, average values for the types of units tested were used. For heaters and boilers, 15 percent excess air was assumed to be sufficient for proper operation.

Gas Processing Plant 1

Equipment Information

Unit Identifier: Refrigerant Compressor 10
Engine Make and Model: Clark – HRA 8
Compressor Cylinders: 4 Stages: 2
Driver Cylinders: 8 Rated Power:

NOTE: Refrigeration Compressor Unit 10 is operated but a few days per year for peak shaving during the summer months, therefore, the cost of improper operation is expressed in $ per day rather than $ per year to reflect the limited number days per year the unit is in operation.

Measured Exhaust Gas Composition

Pollutant	Concentration (ppm)
Carbon Dioxide (CO_2)	50 000
Oxygen (O_2)	123 000
Carbon Monoxide (CO)	967
Nitrous Oxide (NO)	1 415
Nitrogen Dioxide (NO_2)	609
Oxides of Nitrogen (NO_x)	2 024
Hydrocarbons (THC)	0

Stream Flows at 15ºC and 101.325 kPa

Fuel Consumption (m^3/h)	259
Air Flow (m^3/h)	5 167
Exhaust Flow (m^3/h)	5 381
Combustion Efficiency[1] (%)	97.3
Stack Heat Losses[2] (%)	45.65
Unburned Fuel (%)	1.24

1 Air-to-fuel ratio of 10.5.
2 For well-tuned compressor engines stack heat losses should be in the range of 20 to 35 percent.

Combustion Emission Factors

Pollutant	kg/10^3 m^3 of Fuel Input	ng/J of Fuel Input
Carbon Dioxide (CO_2)	1 827	48 806
Carbon Monoxide (CO)	20.1	738
Oxides of Nitrogen (NO_x)	0.251	6.80
Hydrocarbons (THC)	0.00	0

Cost of Unnecessary Excess Air: $163
Value of Unburned Fuel: $6
Total Cost of Improper Operation: $169
Volume of Unnecessary Fuel Consumption: N/A

Gas Processing Plant 1

Equipment Information

Unit Identifier: Refrigerant Compressor 11
Engine Make and Model: Ingersol Rand – KVG
Compressor Cylinders: 4 Stages: 2
Driver Cylinders: 10 Rated Power:

Measured Exhaust Gas Composition

Pollutant	Concentration (ppm)
Carbon Dioxide (CO_2)	114 000
Oxygen (O_2)	11 000
Carbon Monoxide (CO)	2663
Nitrous Oxide (NO)	961
Nitrogen Dioxide (NO_2)	31
Oxides of Nitrogen (NO_x)	991
Hydrocarbons (THC)	9 400

Stream Flows at 15ºC and 101.325 kPa

Fuel Consumption (m^3/h)	259
Air Flow (m^3/h)	2 513
Exhaust Flow (m^3/h)	2 753
Combustion Efficiency[1] (%)	96.7
Stack Heat Losses[2] (%)	26.01
Unburned Fuel (%)	2.25

1 Air-to-fuel ratio of 10.5.
2 For well-tuned compressor engines stack heat losses should be in the range of 20 to 35 percent.

Combustion Emission Factors

Pollutant	kg/10^3 m^3 of Fuel Input	ng/J of Fuel Input
Carbon Dioxide (CO_2)	1 799	48 637
Carbon Monoxide (CO)	24.35	658.1
Oxides of Nitrogen (NO_x)	9.88	267.0
Hydrocarbons (THC)	5.55	150.0

Cost of Unnecessary Excess Air: $0
Value of Unburned Fuel: $4 877
Total Cost of Improper Operation: $4 877
Volume of Unnecessary Fuel Consumption: 5.037 mscfd

Gas Processing Plant 1

Equipment Information

Unit Identifier: Refrigerant Compressor 12
Engine Make and Model: Waukesha
Compressor Cylinders: 4 Stages: 2
Driver Cylinders: 12 Rated Power:

Measured Exhaust Gas Composition

Pollutant	Concentration (ppm)
Carbon Dioxide (CO_2)	120 000
Oxygen (O_2)	0
Carbon Monoxide (CO)	2 428
Nitrous Oxide (NO)	1 124
Nitrogen Dioxide (NO_2)	0
Oxides of Nitrogen (NO_x)	0
Hydrocarbons (THC)	1 124

Stream Flows at 15ºC and 101.325 kPa

Fuel Consumption (m^3/h)	259
Air Flow (m^3/h)	2 370
Exhaust Flow (m^3/h)	2 611
Combustion Efficiency[1] (%)	95.2
Stack Heat Losses[2] (%)	19.86
Unburned Fuel (%)	3.56

1 Air-to-fuel ratio of 10.5.
2 For well-tuned compressor engines stack heat losses should be in the range of 20 to 35 percent.

Combustion Emission Factors

Pollutant	kg/10^3 m^3 of Fuel Input	ng/J of Fuel Input
Carbon Dioxide (CO_2)	1 775	47 975
Carbon Monoxide (CO)	20.8	561
Oxides of Nitrogen (NO_x)	10.30	278
Hydrocarbons (THC)	16.43	444

Cost of Unnecessary Excess Air: $0
Value of Unburned Fuel: $9 420
Total Cost of Improper Operation: $9 420
Volume of Unnecessary Fuel Consumption: 7.951 mscfd

Gas Processing Plant 1

Equipment Information

Unit Identifier: Solar Turbine CM-503
Engine Make and Model: Solar Turbine
Rated Power:

Measured Exhaust Gas Composition

Pollutant	Concentration (ppm)
Carbon Dioxide (CO_2)	24 000
Oxygen (O_2)	168 000
Carbon Monoxide (CO)	51
Nitrous Oxide (NO)	71
Nitrogen Dioxide (NO_2)	0
Oxides of Nitrogen (NO_x)	71
Hydrocarbons (THC)	0

Stream Flows at 15ºC and 101.325 kPa

Fuel Consumption (m^3/h)	1 053
Air Flow (m^3/h)	40 463
Exhaust Flow (m^3/h)	40 848
Combustion Efficiency[1] (%)	98.2
Stack Heat Losses[2] (%)	52.69
Unburned Fuel (%)	0.13

1 Air-to-fuel ratio of 40.
2 In the absence of heat recovery, turbine stack heat losses should be in the range of 60 to 70 percent.

Combustion Emission Factors

Pollutant	kg/10^3 m^3 of Fuel Input	ng/J of Fuel Input
Carbon Dioxide (CO_2)	1 867	50 464
Carbon Monoxide (CO)	2.17	58.5
Oxides of Nitrogen (NO_x)	3.23	87.3
Hydrocarbons (THC)	0	0

Cost of Unnecessary Excess Air: $0
Value of Unburned Fuel: $860
Total Cost of Improper Operation: $860
Volume of Unnecessary Fuel Consumption: 1.193 mscfd

Gas Processing Plant 1

Equipment Information

Unit Identifier: Solar Turbine CM-504
Engine Make and Model: Solar Turbine
Rated Power:

Measured Exhaust Gas Composition

Pollutant	Concentration (ppm)
Carbon Dioxide (CO_2)	23 000
Oxygen (O_2)	170 000
Carbon Monoxide (CO)	21
Nitrous Oxide (NO)	50
Nitrogen Dioxide (NO_2)	0
Oxides of Nitrogen (NO_x)	50
Hydrocarbons (THC)	0

Stream Flows at 15ºC and 101.325 kPa

Fuel Consumption (m^3/h)	1 053
Air Flow (m^3/h)	41 997
Exhaust Flow (m^3/h)	42 664
Combustion Efficiency[1] (%)	98.2
Stack Heat Losses[2] (%)	52.17
Unburned Fuel (%)	0.06

1 Air-to-fuel ratio of 40.
2 In the absence of heat recovery, turbine stack heat losses should be in the range of 60 to 70 percent.

Combustion Emission Factors

Pollutant	kg/10^3 m^3 of Fuel Input	ng/J of Fuel Input
Carbon Dioxide (CO_2)	1 870	50 545
Carbon Monoxide (CO)	0.934	25.3
Oxides of Nitrogen (NO_x)	2.38	64.4
Hydrocarbons (THC)	0	0

Cost of Unnecessary Excess Air: $0
Value of Unburned Fuel: $371
Total Cost of Improper Operation: $371
Volume of Unnecessary Fuel Consumption: 0.515 mscfd

Gas Processing Plant 1

Equipment Information

Unit Identifier: High Pressure Inlet Compressor CM-19
Engine Make and Model:
Compressor Cylinders: Stages:
Driver Cylinders: Rated Power:

Measured Exhaust Gas Composition

Pollutant	Concentration (ppm)
Carbon Dioxide (CO_2)	120 000
Oxygen (O_2)	0
Carbon Monoxide (CO)	12
Nitrous Oxide (NO)	1499
Nitrogen Dioxide (NO_2)	8
Oxides of Nitrogen (NO_x)	1507
Hydrocarbons (THC)	900

Stream Flows at 15ºC and 101.325 kPa

Fuel Consumption (m^3/h)	267
Air Flow (m^3/h)	2 501
Exhaust Flow (m^3/h)	2 7471
Combustion Efficiency[1] (%)	97.5
Stack Heat Losses[2] (%)	24.32
Unburned Fuel (%)	0.60

1 Air-to-fuel ratio of 10.5.
2 For well-tuned compressor engines stack heat losses should be in the range of 20 to 35 percent.

Combustion Emission Factors

Pollutant	kg/10^3 m^3 of Fuel Input	ng/J of Fuel Input
Carbon Dioxide (CO_2)	1 841	49 760
Carbon Monoxide (CO)	104.6	2.83
Oxides of Nitrogen (NO_x)	14.1	381
Hydrocarbons (THC)	4.23	114

Cost of Unnecessary Excess Air: $0
Value of Unburned Fuel: $1 972
Total Cost of Improper Operation: $1 972
Volume of Unnecessary Fuel Consumption: 1.378 mscfd

Gas Processing Plant 1

Equipment Information

Unit Identifier: Low Pressure Inlet Compressor CM-13
Engine Make and Model: White Superior 825GTL
Compressor Cylinders: Stages:
Driver Cylinders: Rated Power:

Measured Exhaust Gas Composition

Pollutant	Concentration (ppm)
Carbon Dioxide (CO_2)	73 000
Oxygen (O_2)	83 000
Carbon Monoxide (CO)	207
Nitrous Oxide (NO)	1 246
Nitrogen Dioxide (NO_2)	272
Oxides of Nitrogen (NO_x)	1 518
Hydrocarbons (THC)	3 200

Stream Flows at 15ºC and 101.325 kPa

Fuel Consumption (m^3/h)	267
Air Flow (m^3/h)	3 704
Exhaust Flow (m^3/h)	3 939
Combustion Efficiency[1] (%)	95.0
Stack Heat Losses[2] (%)	29.16
Unburned Fuel (%)	3.01

1 Air-to-fuel ratio of 28.
2 For well-tuned compressor engines stack heat losses should be in the range of 20 to 35 percent.

Combustion Emission Factors

Pollutant	kg/10^3 m^3 of Fuel Input	ng/J of Fuel Input
Carbon Dioxide (CO_2)	1 795	48 527
Carbon Monoxide (CO)	2.92	78.8
Oxides of Nitrogen (NO_x)	25.1	678
Hydrocarbons (THC)	20.2	547

Cost of Unnecessary Excess Air: $0
Value of Unburned Fuel: $9 679
Total Cost of Improper Operation: $9 679
Volume of Unnecessary Fuel Consumption: 6.929 mscfd

Gas Processing Plant 1

Equipment Information

Unit Identifier: Low Pressure Inlet Compressor CM-14
Engine Make and Model: White Superior 825GTL
Compressor Cylinders: Stages:
Driver Cylinders: Rated Power:

Measured Exhaust Gas Composition

Pollutant	Concentration (ppm)
Carbon Dioxide (CO_2)	67 000
Oxygen (O_2)	94 000
Carbon Monoxide (CO)	189
Nitrous Oxide (NO)	357
Nitrogen Dioxide (NO_2)	30
Oxides of Nitrogen (NO_x)	387
Hydrocarbons (THC)	3 300

Stream Flows at 15ºC and 101.325 kPa

Fuel Consumption (m^3/h)	267
Air Flow (m^3/h)	3 969
Exhaust Flow (m^3/h)	4 201
Combustion Efficiency[1] (%)	94.7
Stack Heat Losses[2] (%)	31.88
Unburned Fuel (%)	3.43

1 Air-to-fuel ratio of 28.
2 For well-tuned compressor engines stack heat losses should be in the range of 20 to 35 percent.

Combustion Emission Factors

Pollutant	kg/10^3 m^3 of Fuel Input	ng/J of Fuel Input
Carbon Dioxide (CO_2)	1 788	48 319
Carbon Monoxide (CO)	2.89	78.0
Oxides of Nitrogen (NO_x)	6.59	178
Hydrocarbons (THC)	23.29	629

Cost of Unnecessary Excess Air: $0
Value of Unburned Fuel: $11 085
Total Cost of Improper Operation: $11 085
Volume of Unnecessary Fuel Consumption: 7.904 mscfd

Gas Processing Plant 1

Equipment Information

Unit Identifier: TEG Reboiler
Boiler Make and Model:
Rated Power:

Measured Exhaust Gas Composition

Pollutant	Concentration (ppm)
Carbon Dioxide (CO_2)	72 000
Oxygen (O_2)	34 000
Carbon Monoxide (CO)	9
Nitrous Oxide (NO)	60
Nitrogen Dioxide (NO_2)	0
Oxides of Nitrogen (NO_x)	60
Hydrocarbons (THC)	0

Stream Flows at 15ºC and 101.325 kPa

Fuel Consumption (m^3/h)	15.3
Air Flow (m^3/h)	165.1
Exhaust Flow (m^3/h)	178.9
Combustion Efficiency[1] (%)	98.3
Stack Heat Losses (%)	33.50
Unburned Fuel (%)	0.01
Thermal Efficiency (%)	66.5

1 Typical excess air of 15 percent.

Combustion Emission Factors

Pollutant	kg/10^3 m^3 of Fuel Input	ng/J of Fuel Input
Carbon Dioxide (CO_2)	1 853	50 098
Carbon Monoxide (CO)	93.6	2.53
Oxides of Nitrogen (NO_x)	0.669	18.1
Hydrocarbons (THC)	0	0

Cost of Unnecessary Excess Air: $519
Value of Unburned Fuel: $1
Total Cost of Improper Operation: $520
Volume of Unnecessary Fuel Consumption: 0.317 mscfd

Gas Processing Plant 3

Equipment Information

Unit Identifier: IR Compressor – Unit #1 G-41066/352587
Engine Make and Model: Waukesha – L7042GSIU
Compressor Cylinders: 4 Stages: 3
Driver Cylinders: 12 Rated Power: 1100 kW

Measured Exhaust Gas Composition

Pollutant	Concentration (ppm)
Carbon Dioxide (CO_2)	120 000
Oxygen (O_2)	0
Carbon Monoxide (CO)	3 137
Nitrous Oxide (NO)	27
Nitrogen Dioxide (NO_2)	0
Oxides of Nitrogen (NO_x)	27
Hydrocarbons (THC)	0

Stream Flows at 15ºC and 101.325 kPa

Fuel Consumption (m^3/h)	229
Air Flow (m^3/h)	2 124
Exhaust Flow (m^3/h)	2 339
Combustion Efficiency[1] (%)	97.5
Stack Heat Losses[2] (%)	23.05
Unburned Fuel (%)	1.66

1 Air-to-fuel ratio of 10.5.
2 For well-tuned compressor engines stack heat losses should be in the range of 20 to 35 percent.

Combustion Emission Factors

Pollutant	kg/10^3 m^3 of Fuel Input	ng/J of Fuel Input
Carbon Dioxide (CO_2)	1 801	48 806
Carbon Monoxide (CO)	27.2	738
Oxides of Nitrogen (NO_x)	0.251	6.80
Hydrocarbons (THC)	0.00	0

Cost of Unnecessary Excess Air: $0
Value of Unburned Fuel: $2 346
Total Cost of Improper Operation: $2 346
Volume of Unnecessary Fuel Consumption: 3.155 mscfd

Gas Processing Plant 3

Equipment Information

Unit Identifier: IR Compressor – Unit #2 G-42003/352241
Engine Make and Model: Waukesha – L7042GSIU
Compressor Cylinders: 4 Stages: 3
Driver Cylinders: 12 Rated Power: 1100 kW

Measured Exhaust Gas Composition

Pollutant	Concentration (ppm)
Carbon Dioxide (CO_2)	120 000
Oxygen (O_2)	0
Carbon Monoxide (CO)	164
Nitrous Oxide (NO)	96
Nitrogen Dioxide (NO_2)	0
Oxides of Nitrogen (NO_x)	96
Hydrocarbons (THC)	1 288

Stream Flows at 15ºC and 101.325 kPa

Fuel Consumption (m^3/h)	183
Air Flow (m^3/h)	1 690
Exhaust Flow (m^3/h)	1 860
Combustion Efficiency[1] (%)	97.3
Stack Heat Losses[2] (%)	20.61
Unburned Fuel (%)	0.95

1 Air-to-fuel ratio of 10.5.
2 For well-tuned compressor engines stack heat losses should be in the range of 20 to 35 percent.

Combustion Emission Factors

Pollutant	kg/10^3 m^3 of Fuel Input	ng/J of Fuel Input
Carbon Dioxide (CO_2)	1 824	49 439
Carbon Monoxide (CO)	1.42	38.4
Oxides of Nitrogen (NO_x)	0.888	24.1
Hydrocarbons (THC)	6.26	170

Cost of Unnecessary Excess Air: $0
Value of Unburned Fuel: $2 053
Total Cost of Improper Operation: $2 053
Volume of Unnecessary Fuel Consumption: 1.459 mscfd

Gas Processing Plant 3

Equipment Information

Unit Identifier: IR Compressor – Unit #3 G-48897/365094
Engine Make and Model: Waukesha – L7042GSIU
Compressor Cylinders: 4 Stages: 2
Driver Cylinders: 12 Rated Power: 1100 kW

Measured Exhaust Gas Composition

Pollutant	Concentration (ppm)
Carbon Dioxide (CO_2)	120 000
Oxygen (O_2)	0
Carbon Monoxide (CO)	3 793
Nitrous Oxide (NO)	69
Nitrogen Dioxide (NO_2)	0
Oxides of Nitrogen (NO_x)	69
Hydrocarbons (THC)	0

Stream Flows at 15ºC and 101.325 kPa

Fuel Consumption (m^3/h)	226
Air Flow (m^3/h)	2 101
Exhaust Flow (m^3/h)	2 315
Combustion Efficiency[1] (%)	97.3
Stack Heat Losses[2] (%)	21.48
Unburned Fuel (%)	2.00

1 Air-to-fuel ratio of 10.5.
2 For well-tuned compressor engines stack heat losses should be in the range of 20 to 35 percent.

Combustion Emission Factors

Pollutant	kg/10^3 m^3 of Fuel Input	ng/J of Fuel Input
Carbon Dioxide (CO_2)	1 792	48 546
Carbon Monoxide (CO)	32.9	892
Oxides of Nitrogen (NO_x)	0.641	17.4
Hydrocarbons (THC)	0.00	0

Cost of Unnecessary Excess Air: $0
Value of Unburned Fuel: $2 808
Total Cost of Improper Operation: $2 808
Volume of Unnecessary Fuel Consumption: 3.764 mscfd

Gas Processing Plant 3

Equipment Information

Unit Identifier: Re-Compressor – Unit #1 G-42002/362292
Engine Make and Model: Waukesha – L7042GSIU
Compressor Cylinders: 3 Stages: 2
Driver Cylinders: 12 Rated Power: 1100 kW

Measured Exhaust Gas Composition

Pollutant	Concentration (ppm)
Carbon Dioxide (CO_2)	120 000
Oxygen (O_2)	0
Carbon Monoxide (CO)	85
Nitrous Oxide (NO)	61
Nitrogen Dioxide (NO_2)	0
Oxides of Nitrogen (NO_x)	61
Hydrocarbons (THC)	1 134

Stream Flows at 15ºC and 101.325 kPa

Fuel Consumption (m^3/h)	142
Air Flow (m^3/h)	1 314
Exhaust Flow (m^3/h)	1 446
Combustion Efficiency[1] (%)	97.5
Stack Heat Losses[2] (%)	19.64
Unburned Fuel (%)	0.81

1 Air-to-fuel ratio of 10.5.
2 For well-tuned compressor engines stack heat losses should be in the range of 20 to 35 percent.

Combustion Emission Factors

Pollutant	kg/10^3 m^3 of Fuel Input	ng/J of Fuel Input
Carbon Dioxide (CO_2)	1 827	49 523
Carbon Monoxide (CO)	0.734	19.9
Oxides of Nitrogen (NO_x)	0.565	15.3
Hydrocarbons (THC)	5.52	150

Cost of Unnecessary Excess Air: $0
Value of Unburned Fuel: $1 379
Total Cost of Improper Operation: $1 379
Volume of Unnecessary Fuel Consumption: 0.963 mscfd

Gas Processing Plant 3

Equipment Information

Unit Identifier: Re-Compressor – Unit #2 210598
Engine Make and Model: Waukesha – L7042GSIU
Compressor Cylinders: 3 Stages: 2
Driver Cylinders: 12 Rated Power: 1100 kW

Measured Exhaust Gas Composition

Pollutant	Concentration (ppm)
Carbon Dioxide (CO_2)	57 000
Oxygen (O_2)	111 000
Carbon Monoxide (CO)	556
Nitrous Oxide (NO)	36
Nitrogen Dioxide (NO_2)	0
Oxides of Nitrogen (NO_x)	36
Hydrocarbons (THC)	1 563

Stream Flows at 15ºC and 101.325 kPa

Fuel Consumption (m^3/h)	141
Air Flow (m^3/h)	2 412
Exhaust Flow (m^3/h)	2 534
Combustion Efficiency[1] (%)	95.7
Stack Heat Losses[2] (%)	22.95
Unburned Fuel (%)	2.79

1 Air-to-fuel ratio of 10.5.
2 For well-tuned compressor engines stack heat losses should be in the range of 20 to 35 percent.

Combustion Emission Factors

Pollutant	kg/10^3 m^3 of Fuel Input	ng/J of Fuel Input
Carbon Dioxide (CO_2)	1 789	48 497
Carbon Monoxide (CO)	9.96	270
Oxides of Nitrogen (NO_x)	0.691	18.7
Hydrocarbons (THC)	15.8	427

Cost of Unnecessary Excess Air: $11 615
Value of Unburned Fuel: $4 334
Total Cost of Improper Operation: $15 949
Volume of Unnecessary Fuel Consumption: 10.304 mscfd

Gas Processing Plant 3

Equipment Information

Unit Identifier: Re-Compressor – Unit #3
Engine Make and Model: Waukesha – L7042GSIU
Compressor Cylinders: 3 Stages: 2
Driver Cylinders: 12 Rated Power: 1100 kW

Measured Exhaust Gas Composition

Pollutant	Concentration (ppm)
Carbon Dioxide (CO_2)	59 000
Oxygen (O_2)	107 000
Carbon Monoxide (CO)	608
Nitrous Oxide (NO)	32
Nitrogen Dioxide (NO_2)	0
Oxides of Nitrogen (NO_x)	32
Hydrocarbons (THC)	1 400

Stream Flows at 15ºC and 101.325 kPa

Fuel Consumption (m^3/h)	171
Air Flow (m^3/h)	2 834
Exhaust Flow (m^3/h)	2 991
Combustion Efficiency[1] (%)	96.0
Stack Heat Losses[2] (%)	22.55
Unburned Fuel (%)	2.52

1 Air-to-fuel ratio of 10.5.
2 For well-tuned compressor engines stack heat losses should be in the range of 20 to 35 percent.

Combustion Emission Factors

Pollutant	kg/10^3 m^3 of Fuel Input	ng/J of Fuel Input
Carbon Dioxide (CO_2)	1 794	48 624
Carbon Monoxide (CO)	10.5	285
Oxides of Nitrogen (NO_x)	0.592	16.1
Hydrocarbons (THC)	13.6	369

Cost of Unnecessary Excess Air: $13 317
Value of Unburned Fuel: $4 678
Total Cost of Improper Operation: $17 995
Volume of Unnecessary Fuel Consumption: 11.681 mscfd

Gas Processing Plant 3

Equipment Information

Unit Identifier: Re-Compressor – Unit #4 400400
Engine Make and Model: Waukesha – L7042GSIU
Compressor Cylinders: 2 Stages: 2
Driver Cylinders: 12 Rated Power: 1100 kW

Measured Exhaust Gas Composition

Pollutant	Concentration (ppm)
Carbon Dioxide (CO_2)	59 000
Oxygen (O_2)	106 000
Carbon Monoxide (CO)	572
Nitrous Oxide (NO)	12
Nitrogen Dioxide (NO_2)	0
Oxides of Nitrogen (NO_x)	12
Hydrocarbons (THC)	1 913

Stream Flows at 15ºC and 101.325 kPa

Fuel Consumption (m^3/h)	133
Air Flow (m^3/h)	2 165
Exhaust Flow (m^3/h)	2 280
Combustion Efficiency[1] (%)	95.3
Stack Heat Losses[2] (%)	23.87
Unburned Fuel (%)	3.13

1 Air-to-fuel ratio of 10.5.
2 For well-tuned compressor engines stack heat losses should be in the range of 20 to 35 percent.

Combustion Emission Factors

Pollutant	kg/10^3 m^3 of Fuel Input	ng/J of Fuel Input
Carbon Dioxide (CO_2)	1 782	48 303
Carbon Monoxide (CO)	9.73	264
Oxides of Nitrogen (NO_x)	0.219	5.93
Hydrocarbons (THC)	18.3	497

Cost of Unnecessary Excess Air: $10 399
Value of Unburned Fuel: $4 644
Total Cost of Improper Operation: $15 043
Volume of Unnecessary Fuel Consumption: 9.735 mscfd

Gas Processing Plant 3

Equipment Information

Unit Identifier: Re-Compressor – Unit #5 400442
Engine Make and Model: Waukesha – L7042GSIU
Compressor Cylinders: 2 Stages: 2
Driver Cylinders: 12 Rated Power: 1100 kW

Measured Exhaust Gas Composition

Pollutant	Concentration (ppm)
Carbon Dioxide (CO_2)	57 000
Oxygen (O_2)	111 000
Carbon Monoxide (CO)	479
Nitrous Oxide (NO)	35
Nitrogen Dioxide (NO_2)	0
Oxides of Nitrogen (NO_x)	35
Hydrocarbons (THC)	4 303

Stream Flows at 15ºC and 101.325 kPa

Fuel Consumption (m^3/h)	133
Air Flow (m^3/h)	2 211
Exhaust Flow (m^3/h)	2 328
Combustion Efficiency[1] (%)	91.1
Stack Heat Losses[2] (%)	25.71
Unburned Fuel (%)	6.31

1 Air-to-fuel ratio of 10.5.
2 For well-tuned compressor engines stack heat losses should be in the range of 20 to 35 percent.

Combustion Emission Factors

Pollutant	kg/10^3 m^3 of Fuel Input	ng/J of Fuel Input
Carbon Dioxide (CO_2)	1 720	46 608
Carbon Monoxide (CO)	8.29	225
Oxides of Nitrogen (NO_x)	0.649	17.6
Hydrocarbons (THC)	41.9	1 137

Cost of Unnecessary Excess Air: $9 851
Value of Unburned Fuel: $10 056
Total Cost of Improper Operation: $19 907
Volume of Unnecessary Fuel Consumption: 12.743 mscfd

Gas Processing Plant 3

Equipment Information

Unit Identifier: Co-Gen #1 (West)
Engine Make and Model:
Rated Power:

Measured Exhaust Gas Composition

Pollutant	Concentration (ppm)
Carbon Dioxide (CO_2)	33 000
Oxygen (O_2)	153 000
Carbon Monoxide (CO)	31
Nitrous Oxide (NO)	132
Nitrogen Dioxide (NO_2)	13
Oxides of Nitrogen (NO_x)	144
Hydrocarbons (THC)	0

Stream Flows at 15ºC and 101.325 kPa

Fuel Consumption (m^3/h)	7 097
Air Flow (m^3/h)	175 027
Exhaust Flow (m^3/h)	180 593
Combustion Efficiency[1] (%)	98.2
Stack Heat Losses[2] (%)	27.90
Unburned Fuel (%)	0.06

1 Air-to-fuel ratio of 35.
2 In the absence of heat recovery, turbine stack heat losses should be in the range of 60 to 70 percent.

Combustion Emission Factors

Pollutant	kg/10^3 m^3 of Fuel Input	ng/J of Fuel Input
Carbon Dioxide (CO_2)	1 563	50 255
Carbon Monoxide (CO)	0.844	27.1
Oxides of Nitrogen (NO_x)	4.40	142
Hydrocarbons (THC)	0	0

Cost of Unnecessary Excess Air: $0
Value of Unburned Fuel: $2 257
Total Cost of Improper Operation: $2 257
Volume of Unnecessary Fuel Consumption: 3.660 mscfd

Gas Processing Plant 3

Equipment Information

Unit Identifier: Co-Gen #2 (East)
Engine Make and Model:
Rated Power:

Measured Exhaust Gas Composition

Pollutant	Concentration (ppm)
Carbon Dioxide (CO_2)	35 000
Oxygen (O_2)	149 000
Carbon Monoxide (CO)	28
Nitrous Oxide (NO)	122
Nitrogen Dioxide (NO_2)	15
Oxides of Nitrogen (NO_x)	136
Hydrocarbons (THC)	0

Stream Flows at 15ºC and 101.325 kPa

Fuel Consumption (m^3/h)	7 097
Air Flow (m^3/h)	164 481
Exhaust Flow (m^3/h)	170 141
Combustion Efficiency[1] (%)	98.2
Stack Heat Losses[2] (%)	22.65
Unburned Fuel (%)	0.05

1 Air-to-fuel ratio of 35.
2 In the absence of heat recovery, turbine stack heat losses should be in the range of 60 to 70 percent.

Combustion Emission Factors

Pollutant	kg/10^3 m^3 of Fuel Input	ng/J of Fuel Input
Carbon Dioxide (CO_2)	1 562	50 232
Carbon Monoxide (CO)	0.713	22.9
Oxides of Nitrogen (NO_x)	3.96	127
Hydrocarbons (THC)	0	0

Cost of Unnecessary Excess Air: $0
Value of Unburned Fuel: $1 908
Total Cost of Improper Operation: $1 908
Volume of Unnecessary Fuel Consumption: 3.094 mscfd

Gas Processing Plant 3

Equipment Information

Unit Identifier: Glycol Reboiler (East) E2801/311-5-02
Boiler Make and Model: Taylor Forge Engineering Systems
Rated Power: 350 kW

Measured Exhaust Gas Composition

Pollutant	Concentration (ppm)
Carbon Dioxide (CO_2)	55 000
Oxygen (O_2)	113 000
Carbon Monoxide (CO)	0
Nitrous Oxide (NO)	31
Nitrogen Dioxide (NO_2)	0
Oxides of Nitrogen (NO_x)	31
Hydrocarbons (THC)	0

Stream Flows at 15ºC and 101.325 kPa

Fuel Consumption (m^3/h)	56
Air Flow (m^3/h)	1 008
Exhaust Flow (m^3/h)	1 056
Combustion Efficiency[1] (%)	98.3
Stack Heat Losses (%)	23.51
Unburned Fuel (%)	0.00
Thermal Efficiency (%)	76.49

1 Typical excess air of 15 percent.

Combustion Emission Factors

Pollutant	kg/10^3 m^3 of Fuel Input	ng/J of Fuel Input
Carbon Dioxide (CO_2)	1 849	50 108
Carbon Monoxide (CO)	0	0
Oxides of Nitrogen (NO_x)	0.620	16.8
Hydrocarbons (THC)	0	0

Cost of Unnecessary Excess Air: $6 539
Value of Unburned Fuel: $0
Total Cost of Improper Operation: $6 539
Volume of Unnecessary Fuel Consumption: 3.980 mscfd

Gas Processing Plant 3

Equipment Information

Unit Identifier: Glycol Reboiler (West) E2802/803790-2
Boiler Make and Model: Taylor Forge Engineering Systems
Rated Power: 350 kW

Measured Exhaust Gas Composition

Pollutant	Concentration (ppm)
Carbon Dioxide (CO_2)	90 000
Oxygen (O_2)	53 000
Carbon Monoxide (CO)	2
Nitrous Oxide (NO)	63
Nitrogen Dioxide (NO_2)	0
Oxides of Nitrogen (NO_x)	63
Hydrocarbons (THC)	0

Stream Flows at 15ºC and 101.325 kPa

Fuel Consumption (m^3/h)	103
Air Flow (m^3/h)	1 200
Exhaust Flow (m^3/h)	1 293
Combustion Efficiency[1] (%)	98.3
Stack Heat Losses (%)	17.95
Unburned Fuel (%)	0.00
Thermal Efficiency (%)	82.05

1 Typical excess air of 15 percent.

Combustion Emission Factors

Pollutant	kg/10^3 m^3 of Fuel Input	ng/J of Fuel Input
Carbon Dioxide (CO_2)	1 845	50 002
Carbon Monoxide (CO)	0.069	1.86
Oxides of Nitrogen (NO_x)	0.774	21.0
Hydrocarbons (THC)	0	0

Cost of Unnecessary Excess Air: $3 280
Value of Unburned Fuel: $3
Total Cost of Improper Operation: $3 283
Volume of Unnecessary Fuel Consumption: 1.999 mscfd

Gas Processing Plant 3

Equipment Information

Unit Identifier: Heat Medium Heater (East) L-73026
Boiler Make and Model: Cleaver Brooks CB700x-250
Rated Power: 3072 kW

Measured Exhaust Gas Composition

Pollutant	Concentration (ppm)
Carbon Dioxide (CO_2)	81 000
Oxygen (O_2)	69 000
Carbon Monoxide (CO)	0
Nitrous Oxide (NO)	38
Nitrogen Dioxide (NO_2)	5
Oxides of Nitrogen (NO_x)	42
Hydrocarbons (THC)	900

Stream Flows at 15ºC and 101.325 kPa

Fuel Consumption (m^3/h)	628
Air Flow (m^3/h)	8 054
Exhaust Flow (m^3/h)	8 618
Combustion Efficiency[1] (%)	97.3
Stack Heat Losses (%)	6.99
Unburned Fuel (%)	0.00
Thermal Efficiency (%)	93.01

1 Typical excess air of 15 percent.

Combustion Emission Factors

Pollutant	kg/10^3 m^3 of Fuel Input	ng/J of Fuel Input
Carbon Dioxide (CO_2)	1 828	49 541
Carbon Monoxide (CO)	0	0
Oxides of Nitrogen (NO_x)	0.627	17.0
Hydrocarbons (THC)	6.49	176

Cost of Unnecessary Excess Air: $9 713
Value of Unburned Fuel: $6 984
Total Cost of Improper Operation: $16 697
Volume of Unnecessary Fuel Consumption: 10.652 mscfd

Gas Processing Plant 3

Equipment Information

Unit Identifier: Heat Medium Heater (West) L-73025
Boiler Make and Model: Cleaver Brooks CB700x-250
Rated Power: 3072 kW

Measured Exhaust Gas Composition

Pollutant	Concentration (ppm)
Carbon Dioxide (CO_2)	81 000
Oxygen (O_2)	69 000
Carbon Monoxide (CO)	0
Nitrous Oxide (NO)	43
Nitrogen Dioxide (NO_2)	7
Oxides of Nitrogen (NO_x)	50
Hydrocarbons (THC)	500

Stream Flows at 15ºC and 101.325 kPa

Fuel Consumption (m^3/h)	533
Air Flow (m^3/h)	6 855
Exhaust Flow (m^3/h)	7 332
Combustion Efficiency[1] (%)	97.7
Stack Heat Losses (%)	7.31
Unburned Fuel (%)	0.50
Thermal Efficiency (%)	92.69

1 Typical excess air of 15 percent.

Combustion Emission Factors

Pollutant	kg/10^3 m^3 of Fuel Input	ng/J of Fuel Input
Carbon Dioxide (CO_2)	1 836	49 755
Carbon Monoxide (CO)	0	0
Oxides of Nitrogen (NO_x)	0.740	20.1
Hydrocarbons (THC)	3.619	98.1

Cost of Unnecessary Excess Air: $9 389
Value of Unburned Fuel: $3 301
Total Cost of Improper Operation: $12 690
Volume of Unnecessary Fuel Consumption: 7.963 mscfd

Gas Processing Plant 3

Equipment Information

Unit Identifier: Heater Treater (East)
Boiler Make and Model:
Rated Power:

Measured Exhaust Gas Composition

Pollutant	Concentration (ppm)
Carbon Dioxide (CO_2)	26 000
Oxygen (O_2)	165 000
Carbon Monoxide (CO)	140
Nitrous Oxide (NO)	4
Nitrogen Dioxide (NO_2)	7
Oxides of Nitrogen (NO_x)	10
Hydrocarbons (THC)	0

Stream Flows at 15ºC and 101.325 kPa

Fuel Consumption (m^3/h)	24
Air Flow (m^3/h)	856
Exhaust Flow (m^3/h)	872
Combustion Efficiency[1] (%)	98.1
Stack Heat Losses (%)	27.64
Unburned Fuel (%)	0.34
Thermal Efficiency (%)	72.36

1 Typical excess air of 15 percent.

Combustion Emission Factors

Pollutant	kg/10^3 m^3 of Fuel Input	ng/J of Fuel Input
Carbon Dioxide (CO_2)	1 851	50 168
Carbon Monoxide (CO)	5.54	150
Oxides of Nitrogen (NO_x)	0.624	16.9
Hydrocarbons (THC)	0	0

Cost of Unnecessary Excess Air: $5 855
Value of Unburned Fuel: $50
Total Cost of Improper Operation: $5 905
Volume of Unnecessary Fuel Consumption: 3.632 mscfd

Gas Processing Plant 3

Equipment Information

Unit Identifier: Heater Treater (West)
Boiler Make and Model:
Rated Power:

Measured Exhaust Gas Composition

Pollutant	Concentration (ppm)
Carbon Dioxide (CO_2)	23 000
Oxygen (O_2)	170 000
Carbon Monoxide (CO)	9
Nitrous Oxide (NO)	4
Nitrogen Dioxide (NO_2)	5
Oxides of Nitrogen (NO_x)	8
Hydrocarbons (THC)	0

Stream Flows at 15ºC and 101.325 kPa

Fuel Consumption (m^3/h)	24
Air Flow (m^3/h)	938
Exhaust Flow (m^3/h)	953
Combustion Efficiency[1] (%)	98.3
Stack Heat Losses (%)	29.61
Unburned Fuel (%)	0.02
Thermal Efficiency (%)	70.39

1 Typical excess air of 15 percent.

Combustion Emission Factors

Pollutant	kg/10^3 m^3 of Fuel Input	ng/J of Fuel Input
Carbon Dioxide (CO_2)	1 861	50 455
Carbon Monoxide (CO)	0.399	10.8
Oxides of Nitrogen (NO_x)	0.554	15.0
Hydrocarbons (THC)	0	0

Cost of Unnecessary Excess Air: $6 464
Value of Unburned Fuel: $4
Total Cost of Improper Operation: $6 468
Volume of Unnecessary Fuel Consumption: 3.940 mscfd

Gas Processing Plant 4

Equipment Information

Unit Identifier: Re-Compressor 1
Engine Make and Model: BA Clark – Integral HBA-T
Compressor Cylinders: 4 Stages: 2
Driver Cylinders: 6 Rated Power:

Measured Exhaust Gas Composition

Pollutant	Concentration (ppm)
Carbon Dioxide (CO_2)	51 000
Oxygen (O_2)	121 000
Carbon Monoxide (CO)	360
Nitrous Oxide (NO)	265
Nitrogen Dioxide (NO_2)	57
Oxides of Nitrogen (NO_x)	322
Hydrocarbons (THC)	0

Stream Flows at 15ºC and 101.325 kPa

Fuel Consumption (m^3/h)	255
Air Flow (m^3/h)	4 999
Exhaust Flow (m^3/h)	5 210
Combustion Efficiency[1] (%)	98.0
Stack Heat Losses[2] (%)	35.00
Unburned Fuel (%)	0.44

1 Air-to-fuel ratio of 30.
2 For well-tuned compressor engines stack heat losses should be in the range of 20 to 35 percent.

Combustion Emission Factors

Pollutant	kg/10^3 m^3 of Fuel Input	ng/J of Fuel Input
Carbon Dioxide (CO_2)	1 864	49 615
Carbon Monoxide (CO)	7.42	198
Oxides of Nitrogen (NO_x)	7.79	207
Hydrocarbons (THC)	0.00	0

Cost of Unnecessary Excess Air: $0
Value of Unburned Fuel: $715
Total Cost of Improper Operation: $715
Volume of Unnecessary Fuel Consumption: 0.978 mscfd

Gas Processing Plant 4

Equipment Information

Unit Identifier: Re-Compressor 2
Engine Make and Model: BA Clark – Integral HBA-T
Compressor Cylinders: 4 Stages: 2
Driver Cylinders: 6 Rated Power:

Measured Exhaust Gas Composition

Pollutant	Concentration (ppm)
Carbon Dioxide (CO_2)	49 000
Oxygen (O_2)	125 000
Carbon Monoxide (CO)	243
Nitrous Oxide (NO)	151
Nitrogen Dioxide (NO_2)	15
Oxides of Nitrogen (NO_x)	166
Hydrocarbons (THC)	0

Stream Flows at 15ºC and 101.325 kPa

Fuel Consumption (m^3/h)	255
Air Flow (m^3/h)	5 203
Exhaust Flow (m^3/h)	5 413
Combustion Efficiency[1] (%)	98.1
Stack Heat Losses[2] (%)	35.03
Unburned Fuel (%)	0.31

1 Air-to-fuel ratio of 30.
2 For well-tuned compressor engines stack heat losses should be in the range of 20 to 35 percent.

Combustion Emission Factors

Pollutant	kg/10^3 m^3 of Fuel Input	ng/J of Fuel Input
Carbon Dioxide (CO_2)	1 868	49 720
Carbon Monoxide (CO)	5.24	140
Oxides of Nitrogen (NO_x)	4.02	107
Hydrocarbons (THC)	0.00	0

Cost of Unnecessary Excess Air: $0
Value of Unburned Fuel: $505
Total Cost of Improper Operation: $505
Volume of Unnecessary Fuel Consumption: 0.690 mscfd

Gas Processing Plant 4

Equipment Information

Unit Identifier: Re-Compressor 3
Engine Make and Model: BA Clark – Integral HBA-T
Compressor Cylinders: 4 Stages: 2
Driver Cylinders: 6 Rated Power:

Measured Exhaust Gas Composition

Pollutant	Concentration (ppm)
Carbon Dioxide (CO_2)	49 000
Oxygen (O_2)	126 000
Carbon Monoxide (CO)	253
Nitrous Oxide (NO)	302
Nitrogen Dioxide (NO_2)	59
Oxides of Nitrogen (NO_x)	361
Hydrocarbons (THC)	0

Stream Flows at 15ºC and 101.325 kPa

Fuel Consumption (m^3/h)	255
Air Flow (m^3/h)	5 265
Exhaust Flow (m^3/h)	5 473
Combustion Efficiency[1] (%)	98.1
Stack Heat Losses[2] (%)	34.51
Unburned Fuel (%)	0.33

1 Air-to-fuel ratio of 30.
2 For well-tuned compressor engines stack heat losses should be in the range of 20 to 35 percent.

Combustion Emission Factors

Pollutant	kg/10^3 m^3 of Fuel Input	ng/J of Fuel Input
Carbon Dioxide (CO_2)	1 867	49 712
Carbon Monoxide (CO)	5.53	147
Oxides of Nitrogen (NO_x)	9.19	245
Hydrocarbons (THC)	0.00	0

Cost of Unnecessary Excess Air: $0
Value of Unburned Fuel: $532
Total Cost of Improper Operation: $532
Volume of Unnecessary Fuel Consumption: 0.728 mscfd

Gas Processing Plant 4

Equipment Information

Unit Identifier: Re-Compressor 4
Engine Make and Model: BA Clark – Integral HBA-T
Compressor Cylinders: 4 Stages: 2
Driver Cylinders: 6 Rated Power:

Measured Exhaust Gas Composition

Pollutant	Concentration (ppm)
Carbon Dioxide (CO_2)	51 000
Oxygen (O_2)	121 000
Carbon Monoxide (CO)	449
Nitrous Oxide (NO)	265
Nitrogen Dioxide (NO_2)	186
Oxides of Nitrogen (NO_x)	451
Hydrocarbons (THC)	0

Stream Flows at 15ºC and 101.325 kPa

Fuel Consumption (m^3/h)	255
Air Flow (m^3/h)	5 003
Exhaust Flow (m^3/h)	5 215
Combustion Efficiency[1] (%)	97.9
Stack Heat Losses[2] (%)	32.94
Unburned Fuel (%)	0.55

1 Air-to-fuel ratio of 30.
2 For well-tuned compressor engines stack heat losses should be in the range of 20 to 35 percent.

Combustion Emission Factors

Pollutant	kg/10^3 m^3 of Fuel Input	ng/J of Fuel Input
Carbon Dioxide (CO_2)	1 861	49 538
Carbon Monoxide (CO)	9.28	247
Oxides of Nitrogen (NO_x)	12.18	324
Hydrocarbons (THC)	0.00	0

Cost of Unnecessary Excess Air: $0
Value of Unburned Fuel: $893
Total Cost of Improper Operation: $893
Volume of Unnecessary Fuel Consumption: 1.221 mscfd

Gas Processing Plant 4

Equipment Information

Unit Identifier: Re-Compressor 5
Engine Make and Model: BA Clark – Integral HBA-T
Compressor Cylinders: 4 Stages: 2
Driver Cylinders: 6 Rated Power:

Measured Exhaust Gas Composition

Pollutant	Concentration (ppm)
Carbon Dioxide (CO_2)	47 000
Oxygen (O_2)	127 000
Carbon Monoxide (CO)	438
Nitrous Oxide (NO)	326
Nitrogen Dioxide (NO_2)	167
Oxides of Nitrogen (NO_x)	493
Hydrocarbons (THC)	0

Stream Flows at 15ºC and 101.325 kPa

Fuel Consumption (m^3/h)	255
Air Flow (m^3/h)	5 324
Exhaust Flow (m^3/h)	5 533
Combustion Efficiency[1] (%)	97.9
Stack Heat Losses[2] (%)	34.44
Unburned Fuel (%)	0.58

1 Air-to-fuel ratio of 30.
2 For well-tuned compressor engines stack heat losses should be in the range of 20 to 35 percent.

Combustion Emission Factors

Pollutant	kg/10^3 m^3 of Fuel Input	ng/J of Fuel Input
Carbon Dioxide (CO_2)	1 861	49 541
Carbon Monoxide (CO)	9.70	258
Oxides of Nitrogen (NO_x)	13.80	368
Hydrocarbons (THC)	0.00	0

Cost of Unnecessary Excess Air: $0
Value of Unburned Fuel: $933
Total Cost of Improper Operation: $933
Volume of Unnecessary Fuel Consumption: 1.276 mscfd

Gas Processing Plant 4

Equipment Information

Unit Identifier: Generator 1
Engine Make and Model:
Driver Cylinders: 12 Rated Power:

Measured Exhaust Gas Composition

Pollutant	Concentration (ppm)
Carbon Dioxide (CO_2)	110 000
Oxygen (O_2)	12 000
Carbon Monoxide (CO)	984
Nitrous Oxide (NO)	39
Nitrogen Dioxide (NO_2)	10
Oxides of Nitrogen (NO_x)	49
Hydrocarbons (THC)	0

Stream Flows at 15ºC and 101.325 kPa

Fuel Consumption (m^3/h)	223
Air Flow (m^3/h)	2 219
Exhaust Flow (m^3/h)	2 424
Combustion Efficiency[1] (%)	98.0
Stack Heat Losses[2] (%)	27.25
Unburned Fuel (%)	0.55

1 Air-to-fuel ratio of 10.5.
2 For well-tuned compressor engines stack heat losses should be in the range of 20 to 35 percent.

Combustion Emission Factors

Pollutant	kg/10^3 m^3 of Fuel Input	ng/J of Fuel Input
Carbon Dioxide (CO_2)	1 855	49 384
Carbon Monoxide (CO)	9.20	245
Oxides of Nitrogen (NO_x)	0.544	14.5
Hydrocarbons (THC)	0.00	0

Cost of Unnecessary Excess Air: $0
Value of Unburned Fuel: $773
Total Cost of Improper Operation: $773
Volume of Unnecessary Fuel Consumption: 1.057 mscfd

Gas Processing Plant 4

Equipment Information

Unit Identifier: Generator 2
Engine Make and Model:
Driver Cylinders: 12 Rated Power:

Measured Exhaust Gas Composition

Pollutant	Concentration (ppm)
Carbon Dioxide (CO_2)	111 000
Oxygen (O_2)	11 000
Carbon Monoxide (CO)	832
Nitrous Oxide (NO)	447
Nitrogen Dioxide (NO_2)	14
Oxides of Nitrogen (NO_x)	461
Hydrocarbons (THC)	0

Stream Flows at 15ºC and 101.325 kPa

Fuel Consumption (m^3/h)	233
Air Flow (m^3/h)	2 213
Exhaust Flow (m^3/h)	2 418
Combustion Efficiency[1] (%)	98.0
Stack Heat Losses[2] (%)	24.76
Unburned Fuel (%)	0.46

1 Air-to-fuel ratio of 10.5.
2 For well-tuned compressor engines stack heat losses should be in the range of 20 to 35 percent.

Combustion Emission Factors

Pollutant	kg/10^3 m^3 of Fuel Input	ng/J of Fuel Input
Carbon Dioxide (CO_2)	1 857	49 444
Carbon Monoxide (CO)	7.75	206
Oxides of Nitrogen (NO_x)	4.67	124
Hydrocarbons (THC)	0.00	0

Cost of Unnecessary Excess Air: $0
Value of Unburned Fuel: $651
Total Cost of Improper Operation: $651
Volume of Unnecessary Fuel Consumption: 0.890 mscfd

Gas Processing Plant 4

Equipment Information

Unit Identifier: Generator 3
Engine Make and Model:
Driver Cylinders: 12 Rated Power:

Measured Exhaust Gas Composition

Pollutant	Concentration (ppm)
Carbon Dioxide (CO_2)	111 000
Oxygen (O_2)	11 000
Carbon Monoxide (CO)	332
Nitrous Oxide (NO)	198
Nitrogen Dioxide (NO_2)	7
Oxides of Nitrogen (NO_x)	205
Hydrocarbons (THC)	0

Stream Flows at 15ºC and 101.325 kPa

Fuel Consumption (m^3/h)	233
Air Flow (m^3/h)	2 214
Exhaust Flow (m^3/h)	2 419
Combustion Efficiency[1] (%)	98.2
Stack Heat Losses[2] (%)	25.97
Unburned Fuel (%)	0.18

1 Air-to-fuel ratio of 10.5.
2 For well-tuned compressor engines stack heat losses should be in the range of 20 to 35 percent.

Combustion Emission Factors

Pollutant	kg/10^3 m^3 of Fuel Input	ng/J of Fuel Input
Carbon Dioxide (CO_2)	1 865	49 639
Carbon Monoxide (CO)	3.09	82.6
Oxides of Nitrogen (NO_x)	2.08	55.4
Hydrocarbons (THC)	0.00	0

Cost of Unnecessary Excess Air: $0
Value of Unburned Fuel: $260
Total Cost of Improper Operation: $260
Volume of Unnecessary Fuel Consumption: 0.355 mscfd

Gas Processing Plant 4

Equipment Information

Unit Identifier: Refrigerant Compressor 3
Engine Make and Model:
Compressor Cylinders: 5 Stages: 2
Driver Cylinders: 10 Rated Power:

Measured Exhaust Gas Composition

Pollutant	Concentration (ppm)
Carbon Dioxide (CO_2)	36 000
Oxygen (O_2)	145 000
Carbon Monoxide (CO)	89
Nitrous Oxide (NO)	1 514
Nitrogen Dioxide (NO_2)	631
Oxides of Nitrogen (NO_x)	2 145
Hydrocarbons (THC)	0

Stream Flows at 15ºC and 101.325 kPa

Fuel Consumption (m^3/h)	342
Air Flow (m^3/h)	9 026
Exhaust Flow (m^3/h)	9 284
Combustion Efficiency[1] (%)	97.7
Stack Heat Losses[2] (%)	35.93
Unburned Fuel (%)	0.15

1 Air-to-fuel ratio of 30.
2 For well-tuned compressor engines stack heat losses should be in the range of 20 to 35 percent.

Combustion Emission Factors

Pollutant	kg/10^3 m^3 of Fuel Input	ng/J of Fuel Input
Carbon Dioxide (CO_2)	1 875	49 931
Carbon Monoxide (CO)	2.55	67.8
Oxides of Nitrogen (NO_x)	76.07	2 025
Hydrocarbons (THC)	0	0

Cost of Unnecessary Excess Air: $0
Value of Unburned Fuel: $328
Total Cost of Improper Operation: $328
Volume of Unnecessary Fuel Consumption: 0.449 mscfd

Gas Processing Plant 4

Equipment Information

Unit Identifier: Refrigerant Compressor 4
Engine Make and Model:
Compressor Cylinders: 5 Stages: 2
Driver Cylinders: 10 Rated Power:

Measured Exhaust Gas Composition

Pollutant	Concentration (ppm)
Carbon Dioxide (CO_2)	38 000
Oxygen (O_2)	141 000
Carbon Monoxide (CO)	781
Nitrous Oxide (NO)	1 149
Nitrogen Dioxide (NO_2)	333
Oxides of Nitrogen (NO_x)	1 482
Hydrocarbons (THC)	0

Stream Flows at 15ºC and 101.325 kPa

Fuel Consumption (m^3/h)	342
Air Flow (m^3/h)	8 469
Exhaust Flow (m^3/h)	8 737
Combustion Efficiency[1] (%)	97.3
Stack Heat Losses[2] (%)	33.83
Unburned Fuel (%)	1.25

1 Air-to-fuel ratio of 30.
2 For well-tuned compressor engines stack heat losses should be in the range of 20 to 35 percent.

Combustion Emission Factors

Pollutant	kg/10^3 m^3 of Fuel Input	ng/J of Fuel Input
Carbon Dioxide (CO_2)	1 846	49 137
Carbon Monoxide (CO)	20.88	556
Oxides of Nitrogen (NO_x)	47.54	1 265
Hydrocarbons (THC)	0	0

Cost of Unnecessary Excess Air: $0
Value of Unburned Fuel: $2 693
Total Cost of Improper Operation: $2 693
Volume of Unnecessary Fuel Consumption: 3.681 mscfd

Appendix IV

Average Equipment Component Schedules for Natural Gas Processing Plants

Table IV-1. Summary of average equipment component schedules for processes at natural gas processing plants.

Process	Number of Emission Sources Associated with the Process																
	Gas Service											Light Liquid Service					
	V	CV	C	R	PRV	OEL	OM	Other Meter	BD	CS	CCV	V	CV	C	PRV	OEL	PS
Claus Plant	19	2	119	1	-	4	-	-	-	-	-	-	-	-	-	-	-
Cogeneration: Reciprocating	9	2	71	1	-	-	-	-	-	-	1	-	-	-	-	-	-
Cogeneration: Turbine	89	2	234	3	1	5	1	-	-	-	-	-	-	-	-	-	-
Compressor: Electric	142	8	866	-	6	2	-	-	1	9	1	8	1	5	-	-	-
Compressor: Reciprocating	67	21	623	2	4	19	-	-	-	6	1	2	-	3	-	1	-
Compressor: Turbine	100	10	646	1	3	11	16	-	-	1	-	-	-	-	-	-	-
Dehydration: Mole Sieve	141	19	825	1	5	13		-	-	1	-	-	-	-	-	-	-
Dehydration: TEG	77	4	338	4	2	5	1	-	-	-	-	5	-	13	-	-	-
Flare	130	12	392	1	-	20	9	1	-	-	-	-	-	-	-	-	-
Fractionation: De-methanizer	38	1	77	-	-	7	-	-	-	-	-	15	1	77	1	2	1
Fractionation: De-ethanizer	52	3	211	-	2	7	1	-	-	-	-	56	4	197	-	14	2
Fractionation: De-propanizer	42	2	152	-	-	1	-	-	-	-	-	17	1	51	-	2	3
Fractionation:	23	1	69	-	-	6	-	-	-	-	-	3	-	3	-	1	1

Table IV-1. Summary of average equipment component schedules for processes at natural gas processing plants.

Process	Number of Emission Sources Associated with the Process																
	Gas Service											Light Liquid Service					
	V	CV	C	R	PRV	OEL	OM	Other Meter	BD	CS	CCV	V	CV	C	PRV	OEL	PS
De-butanizer																	
Hg Removal	98		262	-	3	9	-	-	-	-	-	-	-	-	-	-	-
Inlet: Header	27	1	88	-	-	2	1	-	-	-	-	5	-	16	-	-	-
Inlet: Separation	46	2	175		1	2	1	-	-	-	-	14	1	56	-	-	-
NRU	83	12	189	-	5	9	1	-	-	-	-	-	-	-	-	-	-
Refrigeration: Propane	323	40	2631	1	8	44	4	1	-	8	2	36	2	57	-	2	-
Refrigeration: Turbo Expansion	77	8	242	1	2	8	-	-	-	1	-	15	2	48	1	2	-
Sales: NG	113	5	490	-	-	17	4	-	-	-	-	-	-	-	-	-	-
Sales: NGL	35	1	105	-	1	2		-	-	-	-	107	4	418	5	16	18
Stabilization	116	6	485	3	2	4	6	1	-	-	-	137	6	406	-	2	6
Storage: C5				-	3	-	-	-	-	-	-	-	-	-	-	-	-
Storage: NGL	63	2	125	-	1	1	-	-	-	-	-	12	-	1	-	-	2
Sweetening: Amine	177	7	541	1	8	7	2	-	-	-	-	4	1	15	-	1	-
Utilities	141	9	789	13	2	3	3	-	-	-	-	6	1	18	-	1	-
VRU: Electric	23	2	184	4	3	-	-	-	-	-	-	-	-	-	-	-	-

Appendix V

Financial Considerations and Assumptions

Financial Discount Rate

The discount rate and opportunity cost of equity in the gas industry is arbitrarily taken to be six percent. Most oil and gas ventures are expected to yield better than bank interest to compensate for the added risk involved.

Net Present Value (NPV)

The net present value of each target control option is the present value of benefits minus the present value of costs. The analysis period in each case is the expected life of the control measure (e.g., the average repair life or mean time between leak occurrences).

Payout Period

The payout period of each target control option is the number of periods (years) required to payout the net present value of the repair costs based on annual payments equal to the value of the net benefit of repairs.

Equalized Annual Value

The equalized annual value of each control option is the total value of the option (after capital and operating costs) expressed as an equivalent series of equal annual payments spread over the life of the project. Negative values indicate a net cost.

Value of GHG Reduction

The value of a GHG emission reduction option is simply calculated as the equalized annual value divided by the average annual CO_2-equivalent reduction.

Appendix VI

Basic Component Repair Costs and Mean Repair Life

Table VI-1. Summary of repair costs and mean life of repair for equipment components in natural gas and non-methane hydrocarbon service.

Source	Category	Size (inches)	Basic Repair Cost ($/source)	Mean Repair Life (years)
Compressor Seals	Reciprocating	-	2 000	1
	Centrifugal	-	2 000	1
Compressor Valve Covers	All	-	200	1
Compressor Variable Volume Pocket Stem	All	-	400	1
Compressor Cylinder End	All	-	400	1
Flanges	All	0.5 - 0.75	25	2
		1 - 2.5	50	
		3 - 4	75	
		6 - 8	100	
		10 - 14	150	
		16 - 20	200	
		24 - 30	300	
		32	400	
Lube Oil Vent	-	-	4 000	1
Open-Ended Lines	All	0.5 - 0.75	60	2
		1 - 1.5	75	
		2	100	
		3	120	
		4	190	
		6	245	
		8	350	
		10	500	
		12	595	
		14	780	
		16	890	
		20	1 115	
		24	1 340	
		30	1 670	
Orifice Meters	All	-	150	1
Other Flowmeters	All	-	150	5
Pressure Relief Valves	Threaded	0.5 - 0.75	79	2
		1 – 2	84	
		2.5	95	
		3	107	
		4	135	
		6	203	
		8	270	
		10	338	
		12	405	

Continued …

Table VI-1. Summary of repair costs and mean life of repair for equipment components in natural gas and non-methane hydrocarbon service (continued).

Source	Category	Size (inches)	Basic Repair Cost ($/source)	Mean Repair Life (years)
Pressure Relief Valves	Flanged	1	124	2
		1.5	130	
		2	135	
		2.5	146	
		3	180	
		4	214	
		6	253	
		8	290	
		10	363	
		12	435	
		16	580	
		20	725	
Pump Seal	All	-	500	1
Regulators	All	-	175	5
Threaded Connections	Pipe Thread	0.125 - 0.75	10	2
		1 - 2.5	15	
		3 - 4	25	
		6 - 8	50	
		10 - 14	100	
		16 - 20	150	
		24 - 30	200	
		32	300	
	Union	0.5 - 0.75	50	2
		1 - 2.5	100	
		3 - 6	150	
Tubing Connections	All	0.5 - 0.75	15	4
		1 - 2.5	25	
Valves	Ball	0.5 - 0.75	60	4
		1 - 1.5	75	
		2	100	
		3	120	
		4	190	
		6	245	
		8	350	
		10	500	
		12	595	
		14	780	
		16	891	
		20	1 114	

Continued …

Table VI-1. Summary of repair costs and mean life of repair for equipment components in natural gas and non-methane hydrocarbon service (continued).

Source	Category	Size (inches)	Basic Repair Cost ($/source)	Mean Repair Life (years)
Valves	Butterfly	0.5 - 0.75	120	2
		1 - 1.5	150	
		2	200	
		3	240	
		4	380	
		6	490	
		8	700	
		10	1 000	
		12	1 190	
		14	1 560	
		16	1 783	
		20	2 229	
	Control (all types)	0.5 - 2	130	2
		3	141	
		4	177	
		6	282	
		8	353	
		10	459	
		12	560	
		14	653	
		16	747	
		20	933	
		24	1120	
	Gate	0.5 - 0.75	60	4
		1 - 1.5	75	
		2	100	
		3	120	
		4	190	
		6	245	
		8	350	
		10	500	
		12	595	
		14	780	
		16	920	
		20	1 000	

Continued …

Table VI-1. Summary of repair costs and mean life of repair for equipment components in natural gas and non-methane hydrocarbon service (concluded).

Source	Category	Size (inches)	Basic Repair Cost ($/source)	Mean Repair Life (years)
Valves	Globe	1 - 1.5	75	4
		2	100	
		3	120	
		4	190	
		6	245	
		8	350	
		10	500	
		12	600	
		16	800	
		20	1 000	
		24	1 200	
	Governor	All	200	4
	Injector (fuel gas)	All	200	4
	Needle	0.125 - 0.75	60	4
		1 - 1.5	75	
		2	100	
		2.5	125	
		3	150	
		4	200	
	Orbit	0.5 - 0.75	60	4
		1 - 1.5	75	
		2	100	
		3	120	
		4	190	
		6	245	
		8	350	
		10	500	
		12	595	
		14	780	
	Plug	0.5 - 0.75	60	4
		1 - 1.5	75	
		2	120	
		3	150	
		4	200	
		6	255	
		8	300	
		10	394	
		12	480	
		14	560	
		16	640	
		20	800	
		24	960	
		30	1 200	
Vents		1 - 4	2 000	1
		6 - 30	5 000	

Appendix VII

WORK PRACTICE ***(DRAFT)***
Alternative Means for Leak Detection and Repair in Natural Gas Processing
(High Flow Sampler Procedure)

1.0 Scope and Application.

1.1 Analytes.

Analyte	CAS No.
Volatile Organic Compounds (VOC)	No CAS number assigned

1.2 Scope. This work practice is applicable for the determination of VOC leaks from process equipment. These sources include, but are not limited to, valves, flanges and other connections, pumps and compressors, pressure relief devices, process drains, open-ended valves, pump and compressor seal system degassing vents, accumulator vessel vents, agitator seals, and access door seals.

1.3 Data Quality Objectives. Adherence to the requirements of this method will enhance the quality of the data obtained from air pollutant sampling methods.

2.0 Summary of Work Practice.

2.1 The work practice involves pre-screening using soap bubble testing (alternative screening procedure of Method 21) and, where the soap bubble procedure cannot be used, Method 21. If concentrations above the leak definition of 500 ppm are detected, the Hi-Flow~~9~~ sampler is used to determine the mass emission rate. This determination differs from Method 21, which measures concentrations only. ***(Question: why not 5000 or 10,000 ppm?)***

2.2 Components with mass emissions equal to or greater than the equivalent leak definition in ppm are repaired. The equivalent mass rates are listed in Table 1 in Section 3.0.

3.0 *Definitions.*

3.1 The definitions listed in Method 21 also applies to this work practice.

3.2 *Leak definition mass rate* means the local VOC mass rate that is equivalent to the *leak definition concentration* that indicates that a VOC emission (leak) is present. These equivalent mass rates were based on the *1995 Protocol for Equipment Leaks Emission Estimation* and *Demonstrating Alternative Work Practices for Fugitive*

Leak Detection and Repair Programs.. The equivalent emission mass rates of methane in terms of "scfm" are presented in Table 1.

Table 1. Equivalent Mass Rate Leak Definition

Component/Service Leak Definition	Valves/LL&G	Pump Seals/LL	Pressure Relief Devices/G
NSPS, ppm CH_4	10,000	10,000	10,000
scfm of CH_4	0.0018	0.0115	0.0026

4.0 Interferences. **[Reserved]**

5.0 Safety.

5.1 Disclaimer. This work practice may involve hazardous materials, operations, and equipment. This work practice may not address all of the safety problems associated with its use. It is the responsibility of the user of this test method to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to performing this test method.

5.2 Hazardous Pollutants. Several of the compounds, leaks of which may be determined by this method, may be irritating or corrosive to tissues (e.g., heptane) or may be toxic (e.g., benzene, methyl alcohol). Nearly all are fire hazards. Compounds in emissions should be determined through familiarity with the source. Appropriate precautions can be found in reference documents, such as reference No. 4 in Section 16.0. ***(are there some compounds that should be mentioned***

6.0 Equipment and Supplies.

A VOC monitoring instrument meeting the following specifications is required:

6.1 *Detector*. The VOC instrument detector shall respond to the compounds being processed. Detector types that may meet this requirement include, but are not limited to, catalytic oxidation, flame ionization, conductivity, infrared absorption, and photoionization.

Note: Two detectors may be used to shorten sampling time by simultaneously analyzing the source and the background air.

6.1.1 The instrument shall be capable of measuring the leak definition concentration specified in the regulation.

6.1.2 The scale of the instrument meter shall be readable to ±2.5 percent of the specified leak definition concentration or its equivalent (see ____).

6.2 *Pump.* A 10-scfm battery-powered pump. An electric or pneumatic pump with a capacity of 10 scfm or greater to provide good capture efficiency may also be used. (***Note:*** Several pumps in parallel may be used to provide the capacity.)

6.3 *Flow Meter.* An intrinsically safe thermal anemometer capable of measuring flow rates over the full range with an accuracy of ±10 percent for air. Other flow meters, such as rotameters, turbine meters, venturi meters, orifices, and pitot tubes, may also be used.

6.4 *Flow Regulator.* Throttling valve, a bypass valve, or different number of pumps in parallel may be used to control the sample flow rate.

6.5 *Sampling Hoses.* An 8-ft primary sampling hose and a 12-ft extension hose made of a smooth-bore flexible urethane with a conductive wire (grounded) braided into the coils, approximately 1.5-inch inside diameter, and for collecting background air, a 1/4 inch polyvinyl plastic tubing "piggy-backed" on the hoses. Other flexible plastic hoses that are formulated and constructed to prevent static charge build up may also be used.

6.6 *Probe Tip/Extensions.* Probe or probe extension with outside diameter not to exceed 6.4 mm (1/4 inch), with a single end opening for admission of sample, for use in Method 21 sampling mode.

6.7 *Probe Tip Attachments.* Attachments that aid in the total capture of emissions from leaks. Some attachments that have been used successfully in developmental tests are: (a) a cone-shaped attachment that is split down one side for most valve sampling; (b) a long strap of Mylar plastic with Velcro to wrap around flange faces; and (c) a large sheet of anti-static plastic with patches of Velcro around the edges for large or odd shaped components. A tight fit is not necessary in these attachments. However, the areas open to the atmosphere must be small enough to provide leaking VOC from escaping the attachment.

6.8 *Intrinsically Safe Equipment.* The instrument shall be intrinsically safe for operation in explosive atmospheres as defined by the National Electrical Code by the National Fire Prevention Association or other applicable regulatory code for operation in any explosive atmospheres that may be encountered in its use. The instrument shall, at a minimum, be intrinsically safe for Class 1, Division 1 conditions, and/or Class 2, Division 1 conditions, as appropriate, as defined by the example code. The instrument shall not be operated with any safety device, such as an exhaust flame arrestor, removed.

7.0 Reagents and Standards.

7.1 *Calibration and Performance Evaluation.*

7.1.1 Zero Gas. Air, less than 10 parts per million by volume (ppmv) VOC.

7.1.2 Calibration Gas. Methane, ____ ppmv, certified by the manufacturer to be within ±2 percent accuracy and with a specified shelf life. Cylinder standards must be either reanalyzed or replaced at the end of the specified shelf life.

7.2 Soap Solution. Obtain commercially leak detection solution, or prepare by using concentrated detergent and water. Place in pressure sprayer or squeeze bottle.

8.0 Sample Collection, Preservation, Storage, and Transport.

8.1 *Instrument Performance Evaluation*.

8.1.1 Prepare the VOC instrument according to the procedures in Method 21, except that a response factor need not be determined. The gas being measured is natural gas and the instrument is being calibrated with methane, the principal component of natural gas.

8.1.2 Calibrate the instrument with methane. Introduce the calibration gas mixture to the analyzer and record the observed meter reading. Introduce zero gas until a stable reading is obtained. Make a total of three measurements by alternating between the calibration gas and zero gas.

8.1.3 Calibration Precision. The calibration precision test must be completed prior to placing the analyzer into service and at subsequent 3-month intervals or at the next use, whichever is later.

8.1.3.1 Make a total of three measurements by alternately using zero gas and the specified calibration gas. Record the meter readings. Calculate the average algebraic difference between the meter readings and the known value. Divide this average difference by the known calibration value and multiply by 100 to express the resulting calibration precision as a percentage.

8.1.3.2 The calibration precision shall be equal to or less than 10 percent of the calibration gas value.

8.1.4 Response Time. The response time test is required before placing the instrument into service. If a modification to the sample pumping system or flow configuration is made that would change the response time, a new test is required before further use.

8.1.4.1 Introduce zero gas into the instrument sample probe. When the meter reading has stabilized, switch quickly to the specified calibration gas. After switching,

measure the time required to attain 90 percent of the final stable reading. Perform this test sequence three times and record the results. Calculate the average response time.

8.1.4.2 The instrument response time shall be equal to or less than 30 seconds. The instrument pump, dilution probe (if any), sample probe, and probe filter that will be used during testing shall all be in place during the response time determination.

8.2 *Pre-Screening Using Soap Solution.* Use the following procedure for those sources that do not have:

- Continuously moving parts, e.g., rotating shaft seals where soap solution is slung off.
- Very hot components (above boiling point of soap solution)
- Very cold components (below the freezing point of the soap solution)
- Components with seal area facing down (where soap solution will not readily pool)
- Components that process fluids that are liquid at ambient conditions (where liquid can leak through and float to the top of the soap solution before evaporating)
- Components with seal areas not easily accessible for observation.

8.2.1 Spray the soap solution over potential leak source and observe for soap bubbles.

8.2.2 If soap bubbles are not observed, the source is presumed to have no detectable emissions or leaks. If soap bubbles are observed, use the procedure in Section 8.2.

8.3 *Pre-Screening Using Method 21.* Use the following procedure for the following sources:

- All applicable sources.
- Those sources listed under Section 8.1.
- Those sources where soap bubbles are observed.

8.3.1 Use Method 21 to determine VOC concentration.

8.3.2 If the concentration is ≤500 ppm, the source is presumed to have no leaks. If the concentration is >500 ppm, use the procedure in Section 8. to determine whether corrective action should be taken.

(It would seem that Method 21 could be omitted or the Hi-Flow Sampler could be used in the Method 21 mode, i.e., with probe tip attachments.

8.4 *Determination of Mass Emission Rate.* Use the following procedure whenever the Method 21 prescreening results indicate a concentration of >500 ppm.

8.4.1 Use the Hi-Flow~~9~~ to determine the mass emission rate

8.4.2 Attach the probe tip attachments suitable for the applicable source.

8.4.3 Turn on the pump, set the flow rate to 2 scfm, and record the concentration in ppm.

8.4.4 Reset the flow rate to 3 scfm, and record the concentration in ppm.

8.4.5 Measure the background concentration.

8.4.6 Calculate the mass emission rate according to the equation in Section 12. Compare the mass emission rates at each flow rate. If the difference is greater than 10 percent, do one of the following until the mass emission rates at two flow rates agree to within ±10 percent.

- check the probe attachment for tightness of fit and repeat the test,
- repeat the test at higher flow rates,

8.4.7 When the mass emission flow rates agree to within ±10 percent, average the results and compare the results to the criteria in Section 3. If greater, repair the leak.

9.0 Quality Control.

10.0 Calibration and Standardization.

10.1 *VOC Monitoring Instrument.* Calibrate the VOC monitoring instrument as follows. After the appropriate warm-up period and zero internal calibration procedure, introduce the calibration gas into the instrument sample probe. Adjust the instrument meter readout to correspond to the calibration gas value.

Note: If the meter readout cannot be adjusted to the proper value, a malfunction of the analyzer is indicated and corrective actions are necessary before use.

10.2 *Flow Meter.* Calibrate the thermal anemometer according to the procedure in Method 2, except use the thermal anemometer in place of the Type S pitot tube. ***What was the procedure used in calibrating thermal anemometer in the study? It would seem that a DGM rather than a wind tunnel would suffice.*** Measure the cross-sectional area of the manifold.

What are the CF for the various methane concentrations. This section needs further work.

11.0 Analytical Procedures. [Reserved]

12.0 Data Analyses and Calculations.

12.1 *Mass Emissions.* Calculate the mass emissions by the following equation:

$$ER = FR * (SC - BC) * 10^{-6}$$

where:

ER = emission rate, scfm of CH_4
FR = sampling flow rate, scfm
SC = sample concentration, ppm
BC = background concentration, ppm

13.0 Method Performance.

13.1 *Lower Detection Limit.* The lower detection limit shall be at 100 ppm at a flow rate of 2 scfm.

13.2

14.0 Pollution Prevention. [Reserved]

15.0 Waste Management. [Reserved]

16.0 References.

1. Dubose, D.A., and G.E. Harris. Response Factors of VOC Analyzers at a Meter Reading of 10,000 ppmv for Selected Organic Compounds. U.S. Environmental Protection Agency, Research Triangle Park, NC. Publication No. EPA 600/2-81051. September 1981.

2. Brown, G.E., et al. Response Factors of VOC Analyzers Calibrated with Methane for Selected Organic Compounds. U.S. Environmental Protection Agency, Research Triangle Park, NC. Publication No. EPA 600/2-81-022. May 1981.

3. DuBose, D.A. et al. Response of Portable VOC Analyzers to Chemical Mixtures. U.S. Environmental Protection Agency, Research Triangle Park, NC. Publication No. EPA 600/2-81-110. September 1981.

4. Handbook of Hazardous Materials: Fire, Safety, Health. Alliance of American Insurers. Schaumberg, IL. 1983.

17.0 Tables, Diagrams, Flowcharts, and Validation Data. [Reserved]