TEXTOX MENU #2 - INTERMITTENT STREAM WITHIN 3 MILES OF A FRESHWATER PERENNIAL

The water quality-based effluent limitations developed below are calculated using:

Table 1, 2014 Texas Surface Water Quality Standards (30 TAC 307) for Freshwater Aquatic Life
Table 2, 2014 Texas Surface Water Quality Standards for Human Health
"Procedures to Implement the Texas Surface Water Quality Standards," TCEQ, June 2010

PERMIT INFORMATION

Permittee Name:	JACKSON GAS PLANT
TPDES Permit No.:	TX0133998
Outfall No.:	001
Prepared by:	Maria Okpala
Date:	4/10/15

DISCHARGE INFORMATION

Intermittent Receiving Waterbody:	Sandy Creek
Perennial Stream/River within 3 Miles:	Lake Texana
Segment No.:	1604
TSS (mg/L):	7.4
pH (Standard Units):	7.4
Hardness (mg/L as $CaCO_3$):	57
Chloride (mg/L):	19
Effluent Flow for Aquatic Life (MGD):	0.179
Critical Low Flow [7Q2] (cfs) for intermittent:	0
Critical Low Flow [7Q2] (cfs) for perennial:	0.92
% Effluent for Chronic Aquatic Life (Mixing Zone):	23.14
% Effluent for Acute Aquatic Life (ZID):	100
Effluent Flow for Human Health (MGD):	0.179
Harmonic Mean Flow (cfs) for perennial:	3.87
% Effluent for Human Health:	6.678
Public Water Supply Use?	**yes**

CALCULATE DISSOLVED FRACTION (AND ENTER WATER EFFECT RATIO IF APPLICABLE):

Stream/River Metal	*Intercept (b)*	*Slope (m)*	*Partition Coefficient (Kp)*	*Dissolved Fraction (Cd/Ct)*		*Water Effect Ratio (WER)*	
Aluminum	N/A	N/A	N/A	1.00	Assumed	1	Assumed
Arsenic	5.68	-0.73	111035.24	0.55		1	Assumed
Cadmium	6.60	-1.13	414732.58	0.25		1	Assumed
Chromium (Total)	6.52	-0.93	514771.51	0.21		1	Assumed
Chromium (+3)	6.52	-0.93	514771.51	0.21		1	Assumed
Chromium (+6)	N/A	N/A	N/A	1.00	Assumed	1	Assumed
Copper	6.02	-0.74	238105.01	0.36		1	Assumed

Lead	6.45	-0.80	568348.38	0.19		1	Assumed
Mercury	N/A	N/A	N/A	1.00	Assumed	1	Assumed
Nickel	5.69	-0.57	156508.50	0.46		1	Assumed
Selenium	N/A	N/A	N/A	1.00	Assumed	1	Assumed
Silver	6.38	-1.03	305275.06	0.31		1	Assumed
Zinc	6.10	-0.70	310125.73	0.30		1	Assumed

AQUATIC LIFE

CALCULATE DAILY AVERAGE AND DAILY MAXIMUM EFFLUENT LIMITATIONS:

Parameter	*FW Acute Criterion (ug/L)*	*FW Chronic Criterion (ug/L)*	*WLAa*	*WLAc*	*LTAa*	*LTAc*	*Daily Avg. (ug/L)*	*Daily Max. (ug/L)*
Aldrin	3.0	N/A	3.00	N/A	1.72	N/A	2.53	5.35
Aluminum	991	N/A	991	N/A	568	N/A	835	1766
Arsenic	340	150	619.365	1180.947	354.896	909.329	521.697	1103.726
Cadmium	4.967	0.166	20.211	2.926	11.581	2.253	3.312	7.007
Carbaryl	2.0	N/A	2.00	N/A	1.15	N/A	1.68	3.56
Chlordane	2.4	0.004	2.40	0.017	1.38	0.013	0.020	0.041
Chlorpyrifos	0.083	0.041	0.083	0.177	0.048	0.136	0.070	0.148
Chromium (+3)	359.547	46.770	1729.174	972.118	990.817	748.531	1100.340	2327.931
Chromium (+6)	15.7	10.6	15.7	45.812	9.00	35.275	13.224	27.978
Copper	8.362	5.857	23.097	69.916	13.234	53.836	19.455	41.159
Cyanide (free)	45.8	10.7	45.8	46.244	26.2	35.608	38.578	81.617
4,4'-DDT	1.1	0.001	1.10	0.004	0.630	0.003	0.005	0.010
Demeton	N/A	0.1	N/A	0.432	N/A	0.333	0.489	1.035
Diazinon	0.17	0.17	0.170	0.735	0.097	0.566	0.143	0.303
Dicofol	59.3	19.8	59.3	85.573	34.0	65.891	49.949	105.674
Dieldrin	0.24	0.002	0.240	0.009	0.138	0.007	0.010	0.021
Diuron	210	70	210	302.531	120	232.949	176.885	374.226
Endosulfan I (alpha)	0.22	0.056	0.220	0.242	0.126	0.186	0.185	0.392
Endosulfan II (beta)	0.22	0.056	0.220	0.242	0.126	0.186	0.185	0.392
Endosulfan sulfate	0.22	0.056	0.220	0.242	0.126	0.186	0.185	0.392
Endrin	0.086	0.002	0.086	0.009	0.049	0.007	0.010	0.021
Guthion	N/A	0.01	N/A	0.043	N/A	0.033	0.049	0.103
Heptachlor	0.52	0.004	0.520	0.017	0.298	0.013	0.020	0.041
Hexachlorocyclohexane (Lindane)	1.126	0.08	1.13	0.346	0.645	0.266	0.391	0.828
Lead	34.844	1.358	181.390	30.549	103.936	23.523	34.579	73.156
Malathion	N/A	0.01	N/A	0.043	N/A	0.033	0.049	0.103
Mercury	2.4	1.3	2.40	5.618	1.38	4.326	2.022	4.277
Methoxychlor	N/A	0.03	N/A	0.130	N/A	0.100	0.147	0.310
Mirex	N/A	0.001	N/A	0.004	N/A	0.003	0.005	0.010
Nickel	291.028	32.324	628.086	301.498	359.893	232.153	341.265	721.996

Nonylphenol	28	6.6	28.0	28.524	16.0	21.964	23.585	49.897
Parathion (ethyl)	0.065	0.013	0.065	0.056	0.037	0.043	0.055	0.116
Pentachlorophenol	13.040	10.004	13.040	43.237	7.472	33.292	10.983	23.237
Phenanthrene	30	30	30.0	129.656	17.2	99.835	25.269	53.461
Polychlorinated Biphenyls (PCBs)	2.0	0.014	2.00	0.061	1.15	0.047	0.068	0.145
Selenium	20	5	20.0	21.609	11.5	16.639	16.846	35.641
Silver	0.8	N/A	5.45910711	N/A	3.128	N/A	4.598	9.728
Toxaphene	0.78	0.0002	0.780	0.001	0.447	0.001	0.001	0.002
Tributyltin (TBT)	0.13	0.024	0.130	0.104	0.074	0.080	0.110	0.232
2,4,5 Trichlorophenol	136	64	136	276.600	77.9	212.982	114.554	242.356
Zinc	72.779	73.375	239.803	1044.874	137.407	804.553	201.988	427.336

HUMAN HEALTH

CALCULATE DAILY AVERAGE AND DAILY MAXIMUM EFFLUENT LIMITATIONS:

Parameter	*Water and Fish Criterion (ug/L)*	*Fish Only Criterion (ug/L)*	*WLAh*	*LTAh*	*Daily Avg. (ug/L)*	*Daily Max. (ug/L)*
Acrylonitrile	0.80	3.8	56.899	52.916	77.787	164.570
Aldrin	0.00094	0.0010	0.015	0.014	0.020	0.043
Anthracene	5,569	N/A	N/A	N/A	N/A	N/A
Antimony	6	1,071	16036.630	14914.066	21923.677	46382.745
Arsenic	10	N/A	N/A	N/A	N/A	N/A
Barium	2,000	N/A	N/A	N/A	N/A	N/A
Benzene	5	513	7681.411	7143.712	10501.257	22216.945
Benzidine	0.00086	0.0020	0.030	0.028	0.041	0.087
Benzo(a)anthracene	0.68	3.28	49.113	45.675	67.143	142.050
Benzo(a)pyrene	0.068	0.33	4.941	4.595	6.755	14.292
Bis(chloromethyl)ether	0.0024	0.44	6.588	6.127	9.007	19.055
Bis(2-chloroethyl)ether	0.57	10.06	150.634	140.089	205.931	435.677
Bis(2-ethylhexyl)phthalate	6	41	613.914	570.940	839.282	1775.623
Bromodichloromethane (Dichlorobromomethane)	10.2	322	4821.470	4483.967	6591.432	13945.139
Bromoform	69.1	2,175	32567.386	30287.669	44522.873	94194.649
Cadmium	5	N/A	N/A	N/A	N/A	N/A
Carbon Tetrachloride	4.3	30.5	456.692	424.724	624.344	1320.890
Chlordane	0.0080	0.0081	0.121	0.113	0.166	0.351
Chlorobenzene	100	5,201	77877.229	72425.823	106465.959	225244.309
Chlorodibromomethane (Dibromochloromethane)	7.6	239	3578.669	3328.162	4892.398	10350.584
Chloroform	70	7,143	106955.786	99468.881	146219.255	309348.221
Chromium (+6)	62	502	7516.702	6990.533	10276.084	21740.558
Chrysene	68.13	327	4896.338	4553.594	6693.784	14161.678
Cresols (Methylphenols)	1,041	9,301	139268.622	129519.819	190394.133	402806.636
Cyanide (free)	200	N/A	N/A	N/A	N/A	N/A

4,4'-DDD	0.0059	0.0059	0.088	0.082	0.121	0.256
4,4'-DDE	0.0040	0.0040	0.060	0.056	0.082	0.173
4,4'-DDT	0.0040	0.0040	0.060	0.056	0.082	0.173
2,4'-D	70	N/A	N/A	N/A	N/A	N/A
Danitol	262	473	7082.471	6586.698	9682.445	20484.629
1,2-Dibromoethane	0.17	4.24	63.488	59.044	86.794	183.625
m-Dichlorobenzene (1,3-Dichlorobenzene)	473	1,445	21636.723	20122.152	29579.564	62579.893
o-Dichlorobenzene (1,2-Dichlorobenzene)	600	4,336	64925.142	60380.382	88759.162	187782.988
p-Dichlorobenzene (1,4-Dichlorobenzene)	75	N/A	N/A	N/A	N/A	N/A
3,3'-Dichlorobenzidine	0.32	0.44	6.588	6.127	9.007	19.055
1,2-Dichloroethane	5	553	8280.351	7700.727	11320.068	23949.260
1,1-Dichloroethylene	7	23,916	358106.480	333039.026	489567.369	1035751.372
Dichloromethane (Methylene Chloride)	5	22,222	332741.353	309449.458	454890.704	962387.815
1,2-Dichloropropane	5	226	3384.013	3147.132	4626.285	9787.582
1,3-Dichloropropene (1,3- Dichloropropylene)	3.4	211	3159.411	2938.252	4319.230	9137.964
Dicofol	0.30	0.30	4.492	4.178	6.141	12.992
Dieldrin	0.001	0.001	0.015	0.014	0.020	0.043
2,4-Dimethylphenol	257	571	8549.875	7951.383	11688.534	24728.802
Di-n-Butyl Phthalate	1,318	3,010	45070.267	41915.348	61615.562	130356.733
Dioxins/Furans (TCDD Equivalents)	7.80E-08	7.97E-08	0.000	1.11E-06	1.63E-06	3.45E-06
Endrin	0.20	0.20	2.995	2.785	4.094	8.662
Ethylbenzene	700	7,143	106955.786	99468.881	146219.255	309348.221
Fluoride	4,000	N/A	N/A	N/A	N/A	N/A
Heptachlor	0.0015	0.0015	0.022	0.021	0.031	0.065
Heptachlor Epoxide	0.00074	0.00075	0.011	0.010	0.015	0.032
Hexachlorobenzene	0.0044	0.0045	0.067	0.063	0.092	0.195
Hexachlorobutadiene	6.5	274	4102.742	3815.550	5608.858	11866.360
Hexachlorocyclohexane (alpha)	0.050	0.093	1.393	1.295	1.904	4.028
Hexachlorocyclohexane (beta)	0.17	0.33	4.941	4.595	6.755	14.292
Hexachlorocyclohexane (gamma) (Lindane)	0.2	6.2	92.836	86.337	126.916	268.509
Hexachlorocyclopentadiene	50	N/A	N/A	N/A	N/A	N/A
Hexachloroethane	4.97	11.51	172.345	160.281	235.613	498.474
Hexachlorophene	2.05	2.90	43.423	40.384	59.364	125.593
Lead	1.15	3.83	298.544	277.646	408.139	863.478
Mercury	0.0122	0.0122	0.183	0.170	0.250	0.528
Methoxychlor	1.59	1.61	24.107	22.420	32.957	69.726
Methyl Ethyl Ketone	13,865	992,000	14853723	13813962	20306524	42961422
Nickel	332	1,140	36839.413	34260.654	50363.162	106550.635
Nitrate-Nitrogen (as Total Nitrogen)	10,000	N/A	N/A	N/A	N/A	N/A
Nitrobenzene	45	1,853	27745.915	25803.701	37931.441	80249.510
N-Nitrosodiethylamine	0.0037	2.1	31.444	29.243	42.988	90.947
N-Nitroso-di-n-Butylamine	0.119	4.2	62.889	58.487	85.975	181.893

Pentachlorobenzene	1.0	1.0	14.974	13.925	20.470	43.308
Pentachlorophenol	0.80	9.1	136.259	126.721	186.280	394.102
Polychlorinated Biphenyls (PCBs)	6.4E-04	6.4E-04	9.58E-03	8.91E-03	1.31E-02	2.77E-02
Pyridine	23	947	14179.915	13187.321	19385.361	41012.567
Selenium	50	N/A	N/A	N/A	N/A	N/A
1,2,4,5-Tetrachlorobenzene	0.65	0.71	10.631	9.887	14.534	30.749
1,1,2,2-Tetrachloroethane	1.7	40	598.940	557.015	818.811	1732.315
Tetrachloroethylene	5	525	7861.093	7310.817	10746.900	22736.639
Thallium	0.12	0.23	3.444	3.203	4.708	9.961
Toluene	1,000	N/A	N/A	N/A	N/A	N/A
Toxaphene	0.0053	0.0053	0.079	0.074	0.108	0.230
2,4,5-TP (Silvex)	19	21	314.444	292.433	429.876	909.466
1,1,1-Trichloroethane	200	956,663	14324604	13321881	19583166	41431051
1,1,2-Trichloroethane	5	295	4417.186	4107.983	6038.734	12775.826
Trichloroethylene	5	82	1227.828	1141.880	1678.563	3551.247
2,4,5-Trichlorophenol	1,194	2,435	36460.498	33908.263	49845.147	105454.699
TTHM (Sum of Total Trihalomethanes)	80	N/A	N/A	N/A	N/A	N/A
Vinyl Chloride	0.25	24	359.364	334.209	491.287	1039.389

CALCULATE 70% AND 85% OF DAILY AVERAGE EFFLUENT LIMITATIONS:

Aquatic Life

Parameter	***70%***	***85%***
Aldrin	1.77	2.15
Aluminum	584	710
Arsenic	365.188	443.442
Cadmium	2.319	2.815
Carbaryl	1.18	1.43
Chlordane	0.014	0.017
Chlorpyrifos	0.049	0.059
Chromium (+3)	770.238	935.289
Chromium (+6)	9.257	11.241
Copper	13.618	16.536
Cyanide (free)	27.004	32.791
4,4'-DDT	0.003	0.004
Demeton	0.342	0.416
Diazinon	0.100	0.122
Dicofol	34.964	42.457
Dieldrin	0.007	0.008
Diuron	123.820	150.352
Endosulfan (alpha)	0.130	0.158
Endosulfan (beta)	0.130	0.158

Endosulfan sulfate	0.130	0.158
Endrin	0.007	0.008
Guthion	0.034	0.042
Heptachlor	0.014	0.017
Hexachlorocyclohexane (Lindane)	0.274	0.333
Lead	24.205	29.392
Malathion	0.034	0.042
Mercury	1.415	1.718
Methoxychlor	0.103	0.125
Mirex	0.003	0.004
Nickel	238.886	290.075
Nonylphenol	16.509	20.047
Parathion (ethyl)	0.038	0.047
Pentachlorophenol	7.688	9.336
Phenanthrene	17.689	21.479
Polychlorinated Biphenyls (PCBs)	0.048	0.058
Selenium	11.792	14.319
Silver	3.219	3.909
Toxaphene	0.001	0.001
Tributyltin (TBT)	0.077	0.093
2,4,5 Trichlorophenol	80.188	97.371
Zinc	141.392	171.690

Human Health

Parameter	***70%***	***85%***
Acrylonitrile	54.451	66.119
Aldrin	0.014	0.017
Anthracene	N/A	N/A
Antimony	15346.574	18635.125
Arsenic	N/A	N/A
Barium	N/A	N/A
Benzene	7350.880	8926.068
Benzidine	0.029	0.035
Benzo(a)anthracene	47.000	57.071
Benzo(a)pyrene	4.729	5.742
Bis(chloromethyl)ether	6.305	7.656
Bis(2-chloroethyl)ether	144.152	175.041
Bis(2-ethylhexyl)phthalate	587.497	713.389
Bromodichloromethane (Dichlorobromomethane)	4614.003	5602.717
Bromoform	31166.011	37844.442
Cadmium	N/A	N/A
Carbon Tetrachloride	437.041	530.692

Chlordane	0.116	0.141
Chlorobenzene	74526.172	90496.065
Chlorodibromomethane (Dibromochloromethane)	3424.679	4158.539
Chloroform	102353.479	124286.367
Chromium (+6)	7193.259	8734.671
Chrysene	4685.649	5689.716
Cresols (Methylphenols)	133275.893	161835.013
Cyanide (free)	N/A	N/A
4,4'-DDD	0.085	0.103
4,4'-DDE	0.057	0.070
4,4'-DDT	0.057	0.070
2,4'-D	N/A	N/A
Danitol	6777.712	8230.079
1,2-Dibromoethane	60.756	73.775
m-Dichlorobenzene (1,3-Dichlorobenzene)	20705.695	25142.629
o-Dichlorobenzene (1,2-Dichlorobenzene)	62131.413	75445.287
p-Dichlorobenzene (1,4-Dichlorobenzene)	N/A	N/A
3,3'-Dichlorobenzidine	6.305	7.656
1,2-Dichloroethane	7924.048	9622.058
1,1-Dichloroethylene	342697.158	416132.263
Dichloromethane (Methylene Chloride)	318423.492	386657.098
1,2-Dichloropropane	3238.399	3932.342
1,3-Dichloropropene (1,3- Dichloropropylene)	3023.461	3671.346
Dicofol	4.299	5.220
Dieldrin	0.014	0.017
2,4-Dimethylphenol	8181.973	9935.253
Di-n-Butyl Phthalate	43130.893	52373.228
Dioxins/Furans (TCDD Equivalents)	1.14E-06	1.39E-06
Endrin	2.866	3.480
Ethylbenzene	102353.479	124286.367
Fluoride	N/A	N/A
Heptachlor	0.021	0.026
Heptachlor Epoxide	0.011	0.013
Hexachlorobenzene	0.064	0.078
Hexachlorobutadiene	3926.201	4767.530
Hexachlorocyclohexane (alpha)	1.333	1.618
Hexachlorocyclohexane (beta)	4.729	5.742
Hexachlorocyclohexane (gamma) (Lindane)	88.841	107.878
Hexachlorocyclopentadiene	N/A	N/A
Hexachloroethane	164.929	200.271
Hexachlorophene	41.555	50.459
Lead	285.697	346.918

Mercury	0.175	0.212
Methoxychlor	23.070	28.014
Methyl Ethyl Ketone	14214567	17260545
Nickel	35254.213	42808.687
Nitrate-Nitrogen (as Total Nitrogen)	N/A	N/A
Nitrobenzene	26552.008	32241.725
N-Nitrosodiethylamine	30.091	36.539
N-Nitroso-di-n-Butylamine	60.183	73.079
Pentachlorobenzene	14.329	17.400
Pentachlorophenol	130.396	158.338
Polychlorinated Biphenyls (PCBs)	9.17E-03	1.11E-02
Pyridine	13569.753	16477.557
Selenium	N/A	N/A
1,2,4,5-Tetrachlorobenzene	10.174	12.354
1,1,2,2-Tetrachloroethane	573.168	695.990
Tetrachloroethylene	7522.830	9134.865
Thallium	3.296	4.002
Toluene	N/A	N/A
Toxaphene	0.076	0.092
2,4,5-TP (Silvex)	300.913	365.395
1,1,1-Trichloroethane	13708216	16645691
1,1,2-Trichloroethane	4227.114	5132.924
Trichloroethylene	1174.994	1426.779
2,4,5-Trichlorophenol	34891.603	42368.375
TTHM (Sum of Total Trihalomethanes)	N/A	N/A
Vinyl Chloride	343.901	417.594