

TEXTOX MENU #7 - INTERMITTENT STREAM WITH PERENNIAL POOLS**HUMAN HEALTH LIMITS HAVE BEEN MULTIPLIED BY 10 FOR INCIDENTAL FRESHWATER FISH TISSUE.****IF THIS DOES NOT APPLY TO THIS FACILITY, ADJUST THE FORMULAS ACCORDINGLY.**

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:	Thomas J Carnes Lease
TPDES Permit No.:	TX0134053
Outfall No.:	001
Prepared by:	Maria Okpala
Date:	

DISCHARGE INFORMATION

Intermittent Receiving Waterbody:	Todillo Creek
Segment No.:	2107
TSS (mg/L):	13
pH (Standard Units):	7.5
Hardness (mg/L as CaCO ₃):	130
Chloride (mg/L):	242
Effluent Flow for Aquatic Life (MGD):	0.00672
Critical Low Flow [7Q2] (cfs):	0
% Effluent for Chronic Aquatic Life:	100
% Effluent for Acute Aquatic Life:	100
Effluent Flow for Human Health (MGD):	0.00672
Harmonic Mean Flow (cfs):	0.06
% Effluent for Human Health:	14.769

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

<i>Stream/River Metal</i>	<i>Intercept</i>	<i>(b)</i>	<i>Slope (m)</i>	<i>Partition Coefficient (Kp)</i>	<i>Dissolved Fraction (Cd/Ct)</i>	<i>Water Effect Ratio (WER)</i>		
Aluminum		N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Arsenic		5.68	-0.73	73590.43	0.51		1.00	Assumed
Cadmium		6.60	-1.13	219403.73	0.26		1.00	Assumed
Chromium (Total)		6.52	-0.93	304812.44	0.20		1.00	Assumed
Chromium (+3)		6.52	-0.93	304812.44	0.20		1.00	Assumed
Chromium (+6)		N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Copper		6.02	-0.74	156921.31	0.33		1.00	Assumed
Lead		6.45	-0.80	362114.00	0.18		1.00	Assumed
Mercury		N/A	N/A	N/A	1.00	Assumed	1.00	Assumed

Nickel	5.69	-0.57	113514.75	0.40		1.00	Assumed
Selenium	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Silver	6.38	-1.03	170859.19	0.31		1.00	Assumed
Zinc	6.10	-0.70	209044.94	0.27		1.00	Assumed

AQUATIC LIFE

CALCULATE DAILY AVERAGE AND DAILY MAXIMUM EFFLUENT LIMITATIONS:

Parameter	FW Chronic						Daily Avg. (ug/L)	Daily Max. (ug/L)
	FW Acute Criterion (ug/L)	Criterion (ug/L)	WLAa	WLAc	LTAa	LTAc		
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	665.2697098	293.5013425	381.1995437	225.996034	332.21417	702.847665
Cadmium	11.07523204	0.295170505	42.6645463	1.137070143	24.44678503	0.87554401	1.2870497	2.72294187
Carbaryl	2.0	N/A	2.00	N/A	1.15	N/A	1.68	3.56
Chlordane	2.4	0.004	2.40	0.004	1.38	0.003	0.005	0.010
Chlorpyrifos	0.083	0.041	0.083	0.041	0.048	0.032	0.046	0.098
Chromium (+3)	706.3406651	91.88040863	3505.259113	455.9621944	2008.513472	351.09089	516.10361	1091.89267
Chromium (+6)	15.7	10.6	15.7	10.6	9.00	8.16	12.0	25.4
Copper	18.18448876	11.84832128	55.28042764	36.01862422	31.67568504	27.7343406	40.769481	86.2537994
Cyanide (free)	45.8	10.7	45.8	10.7	26.2	8.24	12.1	25.6
4,4'-DDT	1.1	0.001	1.10	0.001	0.630	0.001	0.001	0.002
Demeton	N/A	0.1	N/A	0.100	N/A	0.077	0.113	0.239
Diazinon	0.17	0.17	0.170	0.170	0.097	0.131	0.143	0.303
Dicofol	59.3	19.8	59.3	19.8	34.0	15.2	22.4	47.4
Dieldrin	0.24	0.002	0.240	0.002	0.138	0.002	0.002	0.005
Diuron	210	70	210	70.0	120	53.9	79.2	168
Endosulfan I (alpha)	0.22	0.056	0.220	0.056	0.126	0.043	0.063	0.134
Endosulfan II (beta)	0.22	0.056	0.220	0.056	0.126	0.043	0.063	0.134
Endosulfan sulfate	0.22	0.056	0.220	0.056	0.126	0.043	0.063	0.134
Endrin	0.086	0.002	0.086	0.002	0.049	0.002	0.002	0.005
Guthion	N/A	0.01	N/A	0.010	N/A	0.008	0.011	0.024
Heptachlor	0.52	0.004	0.520	0.004	0.298	0.003	0.005	0.010
Hexachlorocyclohexane (Lindane)	1.126	0.08	1.13	0.080	0.645	0.062	0.091	0.192
Lead	85.83082697	3.344704105	489.8779022	19.08983856	280.700038	14.6991757	21.607788	45.7144364
Malathion	N/A	0.01	N/A	0.010	N/A	0.008	0.011	0.024
Mercury	2.4	1.3	2.40	1.30	1.38	1.00	1.47	3.11
Methoxychlor	N/A	0.03	N/A	0.030	N/A	0.023	0.034	0.072
Mirex	N/A	0.001	N/A	0.001	N/A	0.001	0.001	0.002
Nickel	584.6025078	64.93129014	1447.29559	160.7498576	829.3003731	123.77739	181.95276	384.947684
Nonylphenol	28	6.6	28	6.60	16.0	5.08	7.47	15.8
Parathion (ethyl)	0.065	0.013	0.065	0.013	0.037	0.010	0.015	0.031

Pentachlorophenol	14.418	11.062	14.418	11.062	8.262	8.518	12.145	25.694
Phenanthrene	30	30	30.0	30.0	17.2	23.1	25.3	53.5
Polychlorinated Biphenyls (PCBs)	2.0	0.014	2.00	0.014	1.15	0.011	0.016	0.034
Selenium	20	5	20.0	5.00	11.5	3.85	5.66	12.0
Silver	0.8	N/A	28.69365763	N/A	16.44146582	N/A	24.168955	51.1329587
Toxaphene	0.78	0.0002	0.780	0.0002	0.447	0.0002	0.0002	0.0005
Tributyltin (TBT)	0.13	0.024	0.130	0.024	0.074	0.018	0.027	0.057
2,4,5 Trichlorophenol	136	64	136	64.0	77.9	49.3	72.4	153
Zinc	146.3522418	147.5493971	544.0767787	548.5273045	311.7559942	422.366024	458.28131	969.561142

HUMAN HEALTH (APPLIES FOR INCIDENTAL FRESHWATER FISH TISSUE)

CALCULATE DAILY AVERAGE AND DAILY MAXIMUM EFFLUENT LIMITATIONS:

<i>Parameter</i>	<i>Fish Only Criterion (ug/L)</i>	<i>WLAh</i>	<i>LTAh</i>	<i>Daily Avg. (ug/L)</i>	<i>Daily Max. (ug/L)</i>
Acrylonitrile	3.8	25.73	23.93	351.74	744.15
Aldrin	0.0010	0.01	0.01	0.09	0.20
Anthracene	N/A	N/A	N/A	N/A	N/A
Antimony	1,071	7251.44	6743.83	99134.37	209733.25
Arsenic	N/A	N/A	N/A	N/A	N/A
Barium	N/A	N/A	N/A	N/A	N/A
Benzene	513	3473.38	3230.24	47484.53	100460.47
Benzidine	0.0020	0.01	0.01	0.19	0.39
Benzo(a)anthracene	3.28	22.21	20.65	303.60	642.32
Benzo(a)pyrene	0.33	2.23	2.08	30.55	64.62
Bis(chloromethyl)ether	0.44	2.98	2.77	40.73	86.16
Bis(2-chloroethyl)ether	10.06	68.11	63.35	931.18	1970.04
Bis(2-ethylhexyl)phthalate	41	277.60	258.17	3795.06	8029.00
Bromodichloromethane (Dichlorobromomethane)	322	2180.17	2027.56	29805.10	63057.06
Bromoform	2,175	14726.30	13695.46	201323.30	425928.88
Cadmium	N/A	N/A	N/A	N/A	N/A
Carbon Tetrachloride	30.5	206.51	192.05	2823.15	5972.80
Chlordane	0.0081	0.05	0.05	0.75	1.59
Chlorobenzene	5,201	35214.49	32749.47	481417.22	1018508.55
Chlorodibromomethane (Dibromochloromethane)	239	1618.20	1504.93	22122.42	46803.22
Chloroform	7,143	48363.21	44977.79	661173.47	1398809.18
Chromium (+6)	502	3398.90	3160.98	46466.34	98306.34
Chrysene	327	2214.02	2059.04	30267.92	64036.20
Cresols (Methylphenols)	9,301	62974.41	58566.20	860923.21	1821408.96
Cyanide (free)	N/A	N/A	N/A	N/A	N/A
4,4'-DDD	0.0059	0.04	0.04	0.55	1.16
4,4'-DDE	0.0040	0.03	0.03	0.37	0.78

4,4'-DDT	0.0040	0.03	0.03	0.37	0.78
2,4'-D	N/A	N/A	N/A	N/A	N/A
Danitol	473	3202.55	2978.37	43782.03	92627.29
1,2-Dibromoethane	4.24	28.71	26.70	392.46	830.32
m-Dichlorobenzene (1,3-Dichlorobenzene)	1,445	9783.68	9098.82	133752.72	282973.44
o-Dichlorobenzene (1,2-Dichlorobenzene)	4,336	29357.82	27302.77	401350.72	849116.15
p-Dichlorobenzene (1,4-Dichlorobenzene)	N/A	N/A	N/A	N/A	N/A
3,3'-Dichlorobenzidine	0.44	2.98	2.77	40.73	86.16
1,2-Dichloroethane	553	3744.21	3482.11	51187.03	108293.64
1,1-Dichloroethylene	23,916	161928.40	150593.41	2213723.20	4683455.20
Dichloromethane (Methylene Chloride)	22,222	150458.81	139926.70	2056922.43	4351720.24
1,2-Dichloropropane	226	1530.18	1423.07	20919.11	44257.44
1,3-Dichloropropene (1,3- Dichloropropylene)	211	1428.62	1328.62	19530.67	41320.00
Dicofol	0.30	2.03	1.89	27.77	58.75
Dieldrin	0.001	0.01	0.01	0.09	0.20
2,4-Dimethylphenol	571	3866.08	3595.45	52853.15	111818.57
Di-n-Butyl Phthalate	3,010	20379.85	18953.26	278612.93	589446.40
Dioxins/Furans (TCDD Equivalents)	7.97E-08	5.40E-07	5.02E-07	7.38E-06	1.56E-05
Endrin	0.20	1.35	1.26	18.51	39.17
Ethylbenzene	7,143	48363.21	44977.79	661173.47	1398809.18
Fluoride	N/A	N/A	N/A	N/A	N/A
Heptachlor	0.0015	0.01	0.01	0.14	0.29
Heptachlor Epoxide	0.00075	0.01	0.00	0.07	0.15
Hexachlorobenzene	0.0045	0.03	0.03	0.42	0.88
Hexachlorobutadiene	274	1855.18	1725.31	25362.11	53657.25
Hexachlorocyclohexane (alpha)	0.093	0.63	0.59	8.61	18.21
Hexachlorocyclohexane (beta)	0.33	2.23	2.08	30.55	64.62
Hexachlorocyclohexane (gamma) (Lindane)	6.2	41.98	39.04	573.89	1214.14
Hexachlorocyclopentadiene	N/A	N/A	N/A	N/A	N/A
Hexachloroethane	11.51	77.93	72.48	1065.39	2254.00
Hexachlorophene	2.90	19.64	18.26	268.43	567.91
Lead	3.83	148.01	137.65	2023.38	4280.76
Mercury	0.0122	0.08	0.08	1.13	2.39
Methoxychlor	1.61	10.90	10.14	149.03	315.29
Methyl Ethyl Ketone	992,000	6.72E+06	6.25E+06	9.18E+07	1.94E+08
Nickel	1,140	19108.91	17771.29	261237.90	552686.99
Nitrate-Nitrogen (as Total Nitrogen)	N/A	N/A	N/A	N/A	N/A
Nitrobenzene	1,853	12546.13	11667.90	171518.19	362871.82
N-Nitrosodiethylamine	2.1	14.22	13.22	194.38	411.24
N-Nitroso-di-n-Butylamine	4.2	28.44	26.45	388.76	822.48
Pentachlorobenzene	1.0	6.77	6.30	92.56	195.83
Pentachlorophenol	9.1	61.61	57.30	842.32	1782.05

Polychlorinated Biphenyls (PCBs)	6.4E-04	0.00	0.00	0.06	0.13
Pyridine	947	6411.87	5963.04	87656.63	185450.41
Selenium	N/A	N/A	N/A	N/A	N/A
1,2,4,5-Tetrachlorobenzene	0.71	4.81	4.47	65.72	139.04
1,1,2,2-Tetrachloroethane	40	270.83	251.87	3702.50	7833.17
Tetrachloroethylene	525	3554.63	3305.80	48595.28	102810.42
Thallium	0.23	1.56	1.45	21.29	45.04
Toluene	N/A	N/A	N/A	N/A	N/A
Toxaphene	0.0053	0.04	0.03	0.49	1.04
2,4,5-TP (Silvex)	21	142.19	132.23	1943.81	4112.42
1,1,1-Trichloroethane	956,663	6477291.84	6023881.41	88551056.75	187342711.91
1,1,2-Trichloroethane	295	1997.36	1857.55	27305.92	57769.66
Trichloroethylene	82	555.20	516.33	7590.12	16058.01
2,4,5-Trichlorophenol	2,435	16486.69	15332.62	225389.53	476844.51
TTHM (Sum of Total Trihalomethanes)	N/A	N/A	N/A	N/A	N/A
Vinyl Chloride	24	162.50	151.12	2221.50	4699.90

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

Aquatic Life

Parameter	70%	85%
Aldrin	1.77	2.15
Aluminum	584	710
Arsenic	232.550	282.382
Cadmium	0.901	1.094
Carbaryl	1.18	1.43
Chlordane	0.0032	0.0038
Chlorpyrifos	0.032	0.039
Chromium (+3)	361.273	438.688
Chromium (+6)	8.40	10.2
Copper	28.539	34.654
Cyanide (free)	8.48	10.3
4,4'-DDT	0.0008	0.0010
Demeton	0.079	0.096
Diazinon	0.100	0.122
Dicofol	15.7	19.0
Dieldrin	0.0016	0.0019
Diuron	55.5	67.3
Endosulfan (alpha)	0.044	0.054
Endosulfan (beta)	0.044	0.054
Endosulfan sulfate	0.044	0.054
Endrin	0.0016	0.0019

Guthion	0.0079	0.0096
Heptachlor	0.0032	0.0038
Hexachlorocyclohexane (Lindane)	0.063	0.077
Lead	15.125	18.367
Malathion	0.0079	0.0096
Mercury	1.03	1.25
Methoxychlor	0.024	0.029
Mirex	0.0008	0.0010
Nickel	127.367	154.660
Nonylphenol	5.23	6.35
Parathion (ethyl)	0.010	0.013
Pentachlorophenol	8.5013	10.3230
Phenanthrene	17.7	21.5
Polychlorinated Biphenyls (PCBs)	0.011	0.013
Selenium	3.96	4.81
Silver	16.918	20.544
Toxaphene	0.00016	0.00019
Tributyltin (TBT)	0.019	0.023
2,4,5 Trichlorophenol	50.7	61.6
Zinc	320.797	389.539

Human Health

<i>Parameter</i>	<i>70%</i>	<i>85%</i>
Acrylonitrile	246.216	298.977
Aldrin	0.065	0.079
Anthracene	N/A	N/A
Antimony	69394.058	84264.213
Arsenic	N/A	N/A
Barium	N/A	N/A
Benzene	33239.170	40361.850
Benzidine	0.130	0.157
Benzo(a)anthracene	212.523	258.064
Benzo(a)pyrene	21.382	25.964
Bis(chloromethyl)ether	28.509	34.618
Bis(2-chloroethyl)ether	651.825	791.501
Bis(2-ethylhexyl)phthalate	2656.542	3225.801
Bromodichloromethane (Dichlorobromomethane)	20863.573	25334.338
Bromoform	140926.307	171124.802
Cadmium	N/A	N/A
Carbon Tetrachloride	1976.208	2399.681
Chlordane	0.525	0.637
Chlorobenzene	336992.057	409204.641

Chlorodibromomethane (Dibromochloromethane)	15485.695	18804.059
Chloroform	462821.431	561997.452
Chromium (+6)	32526.440	39496.391
Chrysene	21187.541	25727.729
Cresols (Methylphenols)	602646.25	731784.73
Cyanide (free)	N/A	N/A
4,4'-DDD	0.382	0.464
4,4'-DDE	0.259	0.315
4,4'-DDT	0.259	0.315
2,4'-D	N/A	N/A
Danitol	30647.422	37214.727
1,2-Dibromoethane	274.725	333.595
m-Dichlorobenzene (1,3-Dichlorobenzene)	93626.903	113689.811
o-Dichlorobenzene (1,2-Dichlorobenzene)	280945.503	341148.110
p-Dichlorobenzene (1,4-Dichlorobenzene)	N/A	N/A
3,3'-Dichlorobenzidine	28.509	34.618
1,2-Dichloroethane	35830.919	43508.973
1,1-Dichloroethylene	1549606.237	1881664.716
Dichloromethane (Methylene Chloride)	1439845.701	1748384.066
1,2-Dichloropropane	14643.377	17781.244
1,3-Dichloropropene (1,3- Dichloropropylene)	13671.472	16601.073
Dicofol	19.438	23.603
Dieldrin	0.065	0.079
2,4-Dimethylphenol	36997.205	44925.178
Di-n-Butyl Phthalate	195029.051	236820.990
Dioxins/Furans (TCDD Equivalents)	5.16E-06	6.27E-06
Endrin	12.959	15.736
Ethylbenzene	462821.431	561997.452
Fluoride	N/A	N/A
Heptachlor	0.097	0.118
Heptachlor Epoxide	0.049	0.059
Hexachlorobenzene	0.292	0.354
Hexachlorobutadiene	17753.475	21557.791
Hexachlorocyclohexane (alpha)	6.026	7.317
Hexachlorocyclohexane (beta)	21.382	25.964
Hexachlorocyclohexane (gamma) (Lindane)	401.721	487.804
Hexachlorocyclopentadiene	N/A	N/A
Hexachloroethane	745.776	905.585
Hexachlorophene	187.902	228.166
Lead	1416.368	1719.876
Mercury	0.790	0.960
Methoxychlor	104.318	126.672

Methyl Ethyl Ketone	6.43E+07	7.80E+07
Nickel	182866.531	222052.217
Nitrate-Nitrogen (as Total Nitrogen)	N/A	N/A
Nitrobenzene	120062.734	145790.463
N-Nitrosodiethylamine	136.067	165.224
N-Nitroso-di-n-Butylamine	272.134	330.448
Pentachlorobenzene	64.794	78.678
Pentachlorophenol	589.623	715.970
Polychlorinated Biphenyls (PCBs)	0.041	0.050
Pyridine	61359.638	74508.132
Selenium	N/A	N/A
1,2,4,5-Tetrachlorobenzene	46.004	55.861
1,1,2,2-Tetrachloroethane	2591.748	3147.123
Tetrachloroethylene	34016.695	41305.987
Thallium	14.903	18.096
Toluene	N/A	N/A
Toxaphene	0.343	0.417
2,4,5-TP (Silvex)	1360.668	1652.239
1,1,1-Trichloroethane	61985739.728	75268398.241
1,1,2-Trichloroethane	19114.143	23210.031
Trichloroethylene	5313.084	6451.602
2,4,5-Trichlorophenol	157772.670	191581.100
TTHM (Sum of Total Trihalomethanes)	N/A	N/A
Vinyl Chloride	1555.049	1888.274