

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:	CMR ENERGY - CMR 3111H
NPDES Permit No.:	TX0134062
Outfall No.:	001
Prepared by:	Maria Okpala
Date:	04/24/2018

DISCHARGE INFORMATION

Intermittent Receiving Waterbody:	Unnamed intermittent stream
Segment No.:	2105
TSS (mg/L):	5
pH (Standard Units):	7.6
Hardness (mg/L as CaCO ₃):	160
Chloride (mg/L):	49
Effluent Flow for Aquatic Life (MGD):	0.03
Critical Low Flow [7Q2] (cfs):	0
% Effluent for Chronic Aquatic Life:	100
% Effluent for Acute Aquatic Life:	100
Effluent Flow for Human Health (MGD):	0.03
Harmonic Mean Flow (cfs):	0.06
% Effluent for Human Health:	43.618

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	147826.36	0.57		1.00 Assumed
Cadmium		6.60	-1.13	645897.93	0.24		1.00 Assumed
Chromium (Total)		6.52	-0.93	741238.38	0.21		1.00 Assumed
Chromium (+3)		6.52	-0.93	741238.38	0.21		1.00 Assumed
Chromium (+6)		N/A	N/A	N/A	1.00	Assumed	1.00 Assumed
Copper		6.02	-0.74	318245.45	0.39		1.00 Assumed
Lead		6.45	-0.80	777721.31	0.20		1.00 Assumed
Mercury		N/A	N/A	N/A	1.00	Assumed	1.00 Assumed

Nickel	5.69	-0.57	195698.32	0.51		1.00	Assumed
Selenium	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Silver	6.38	-1.03	457152.29	0.30		1.00	Assumed
Zinc	6.10	-0.70	408057.15	0.33		1.00	Assumed

AQUATIC LIFE

CALCULATE DAILY AVERAGE AND DAILY MAXIMUM EFFLUENT LIMITATIONS:

Parameter	FW Chronic		WLA _a	WLA _c	LTA _a	LTA _c	Daily Avg. (ug/L)	Daily Max. (ug/L)
	FW Acute Criterion (ug/L)	Criterion (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	591.3048199	260.8697735	338.8176618	200.869726	295.2785	624.704847
Cadmium	13.55076514	0.340928366	57.31282113	1.441953	32.84024651	1.11030381	1.6321466	3.45304485
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)	837.2764388	108.9124627	3940.383578	512.5629476	2257.83979	394.67347	580.17	1227.43449
Chromium (+6)	15.7	10.6	15.7	10.6	9.00	8.16	12.0	25.4
Copper	22.11390894	14.14857667	57.30216292	36.66217709	32.83413935	28.2298764	41.497918	87.7949155
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	107.3056099	4.181545566	524.5749051	20.44193095	300.5814206	15.7402868	23.138222	48.952292
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	696.8673277	77.40044568	1378.746154	153.1361316	790.0215465	117.914821	173.33479	366.715094
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	15.943	12.231	15.943	12.231	9.135	9.418	13.429	28.410
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	11.26257116	N/A	6.453453275	N/A	9.4865763	20.0702397
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	174.5042619	175.9316996	530.5428248	534.8826434	304.0010386	411.859635	446.88153	945.44323

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	8.71	8.10	119.10	251.98
Aldrin	0.0010	0.00	0.00	0.03	0.07
Anthracene	N/A	N/A	N/A	N/A	N/A
Antimony	1,071	2455.42	2283.54	33568.01	71018.04
Arsenic	N/A	N/A	N/A	N/A	N/A
Barium	N/A	N/A	N/A	N/A	N/A
Benzene	513	1176.12	1093.80	16078.80	34017.04
Benzidine	0.0020	0.00	0.00	0.06	0.13
Benzo(a)anthracene	3.28	7.52	6.99	102.80	217.50
Benzo(a)pyrene	0.33	0.76	0.70	10.34	21.88
Bis(chloromethyl)ether	0.44	1.01	0.94	13.79	29.18
Bis(2-chloroethyl)ether	10.06	23.06	21.45	315.31	667.08
Bis(2-ethylhexyl)phthalate	41	94.00	87.42	1285.05	2718.71
Bromodichloromethane (Dichlorobromomethane)	322	738.23	686.55	10092.34	21351.83
Bromoform	2,175	4986.49	4637.44	68170.33	144224.31
Cadmium	N/A	N/A	N/A	N/A	N/A
Carbon Tetrachloride	30.5	69.93	65.03	955.95	2022.46
Chlordane	0.0081	0.02	0.02	0.25	0.54
Chlorobenzene	5,201	11924.02	11089.34	163013.29	344878.45
Chlorodibromomethane (Dibromochloromethane)	239	547.94	509.59	7490.90	15848.10
Chloroform	7,143	16376.33	15229.98	223880.77	473652.52
Chromium (+6)	502	1150.91	1070.34	15734.03	33287.63
Chrysene	327	749.69	697.21	10249.06	21683.38
Cresols (Methylphenols)	9,301	21323.84	19831.18	291518.28	616749.56
Cyanide (free)	N/A	N/A	N/A	N/A	N/A
4,4'-DDD	0.0059	0.01	0.01	0.18	0.39
4,4'-DDE	0.0040	0.01	0.01	0.13	0.27

4,4'-DDT	0.0040	0.01	0.01	0.13	0.27
2,4'-D	N/A	N/A	N/A	N/A	N/A
Danitol	473	1084.42	1008.51	14825.09	31364.64
1,2-Dibromoethane	4.24	9.72	9.04	132.89	281.15
m-Dichlorobenzene (1,3-Dichlorobenzene)	1,445	3312.86	3080.96	45290.17	95817.99
o-Dichlorobenzene (1,2-Dichlorobenzene)	4,336	9940.89	9245.02	135901.87	287520.28
p-Dichlorobenzene (1,4-Dichlorobenzene)	N/A	N/A	N/A	N/A	N/A
3,3'-Dichlorobenzidine	0.44	1.01	0.94	13.79	29.18
1,2-Dichloroethane	553	1267.83	1179.08	17332.50	36669.44
1,1-Dichloroethylene	23,916	54830.78	50992.62	749591.57	1585870.60
Dichloromethane (Methylene Chloride)	22,222	50947.05	47380.75	696497.07	1473541.41
1,2-Dichloropropane	226	518.14	481.87	7083.45	14986.07
1,3-Dichloropropene (1,3- Dichloropropylene)	211	483.75	449.88	6613.31	13991.42
Dicofol	0.30	0.69	0.64	9.40	19.89
Dieldrin	0.001	0.00	0.00	0.03	0.07
2,4-Dimethylphenol	571	1309.10	1217.46	17896.67	37863.03
Di-n-Butyl Phthalate	3,010	6900.85	6417.79	94341.47	199593.18
Dioxins/Furans (TCDD Equivalents)	7.97E-08	1.83E-07	1.70E-07	2.50E-06	5.28E-06
Endrin	0.20	0.46	0.43	6.27	13.26
Ethylbenzene	7,143	16376.33	15229.98	223880.77	473652.52
Fluoride	N/A	N/A	N/A	N/A	N/A
Heptachlor	0.0015	0.00	0.00	0.05	0.10
Heptachlor Epoxide	0.00075	0.00	0.00	0.02	0.05
Hexachlorobenzene	0.0045	0.01	0.01	0.14	0.30
Hexachlorobutadiene	274	628.18	584.21	8587.89	18168.95
Hexachlorocyclohexane (alpha)	0.093	0.21	0.20	2.91	6.17
Hexachlorocyclohexane (beta)	0.33	0.76	0.70	10.34	21.88
Hexachlorocyclohexane (gamma) (Lindane)	6.2	14.21	13.22	194.32	411.12
Hexachlorocyclopentadiene	N/A	N/A	N/A	N/A	N/A
Hexachloroethane	11.51	26.39	24.54	360.75	763.23
Hexachlorophene	2.90	6.65	6.18	90.89	192.30
Lead	3.83	42.93	39.92	586.84	1241.55
Mercury	0.0122	0.03	0.03	0.38	0.81
Methoxychlor	1.61	3.69	3.43	50.46	106.76
Methyl Ethyl Ketone	992,000	2.27E+06	2.12E+06	3.11E+07	6.58E+07
Nickel	1,140	5171.00	4809.03	70692.80	149560.97
Nitrate-Nitrogen (as Total Nitrogen)	N/A	N/A	N/A	N/A	N/A
Nitrobenzene	1,853	4248.26	3950.88	58077.99	122872.48
N-Nitrosodiethylamine	2.1	4.81	4.48	65.82	139.25
N-Nitroso-di-n-Butylamine	4.2	9.63	8.96	131.64	278.50
Pentachlorobenzene	1.0	2.29	2.13	31.34	66.31
Pentachlorophenol	9.1	20.86	19.40	285.22	603.42

Polychlorinated Biphenyls (PCBs)	6.4E-04	0.00	0.00	0.02	0.04
Pyridine	947	2171.13	2019.15	29681.52	62795.60
Selenium	N/A	N/A	N/A	N/A	N/A
1,2,4,5-Tetrachlorobenzene	0.71	1.63	1.51	22.25	47.08
1,1,2,2-Tetrachloroethane	40	91.71	85.29	1253.71	2652.40
Tetrachloroethylene	525	1203.64	1119.38	16454.91	34812.76
Thallium	0.23	0.53	0.49	7.21	15.25
Toluene	N/A	N/A	N/A	N/A	N/A
Toxaphene	0.0053	0.01	0.01	0.17	0.35
2,4,5-TP (Silvex)	21	48.15	44.78	658.20	1392.51
1,1,1-Trichloroethane	956,663	2193283.86	2039753.99	29984383.65	63436349.09
1,1,2-Trichloroethane	295	676.33	628.99	9246.09	19561.46
Trichloroethylene	82	188.00	174.84	2570.10	5437.42
2,4,5-Trichlorophenol	2,435	5582.58	5191.80	76319.43	161464.92
TTHM (Sum of Total Trihalomethanes)	N/A	N/A	N/A	N/A	N/A
Vinyl Chloride	24	55.02	51.17	752.22	1591.44

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

Aquatic Life

<i>Parameter</i>	<i>70%</i>	<i>85%</i>
Aldrin	1.77	2.15
Aluminum	584	710
Arsenic	206.695	250.987
Cadmium	1.143	1.387
Carbaryl	1.18	1.43
Chlordane	0.0032	0.0038
Chlorpyrifos	0.032	0.039
Chromium (+3)	406.119	493.145
Chromium (+6)	8.40	10.2
Copper	29.049	35.273
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

33.8

Guthion	0.0079	0.0096
Heptachlor	0.0032	0.0038
Hexachlorocyclohexane (Lindane)	0.063	0.077
Lead	16.197	19.667
Malathion	0.0079	0.0096
Mercury	1.03	1.25
Methoxychlor	0.024	0.029
Mirex	0.0008	0.0010
Nickel	121.334	147.335
Nonylphenol	5.23	6.35
Parathion (ethyl)	0.010	0.013
Pentachlorophenol	9.4001	11.4144
Phenanthrene	17.7	21.5
Polychlorinated Biphenyls (PCBs)	0.011	0.013
Selenium	3.96	4.81
Silver	6.641	8.064
Toxaphene	0.00016	0.00019
Tributyltin (TBT)	0.019	0.023
2,4,5 Trichlorophenol	50.7	61.6
Zinc	312.817	379.849

9.9

Human Health

<i>Parameter</i>	<i>70%</i>	<i>85%</i>
Acrylonitrile	83.372	101.237
Aldrin	0.022	0.027
Anthracene	N/A	N/A
Antimony	23497.608	28532.810
Arsenic	N/A	N/A
Barium	N/A	N/A
Benzene	11255.157	13666.976
Benzidine	0.044	0.053
Benzo(a)anthracene	71.963	87.383
Benzo(a)pyrene	7.240	8.792
Bis(chloromethyl)ether	9.654	11.722
Bis(2-chloroethyl)ether	220.715	268.011
Bis(2-ethylhexyl)phthalate	899.535	1092.292
Bromodichloromethane (Dichlorobromomethane)	7064.640	8578.492
Bromoform	47719.232	57944.782
Cadmium	N/A	N/A
Carbon Tetrachloride	669.166	812.559
Chlordane	0.178	0.216
Chlorobenzene	114109.300	138561.293

Chlorodibromomethane (Dibromochloromethane)	5243.631	6367.266
Chloroform	156716.541	190298.657
Chromium (+6)	11013.818	13373.922
Chrysene	7174.340	8711.698
Cresols (Methylphenols)	204062.80	247790.54
Cyanide (free)	N/A	N/A
4,4'-DDD	0.129	0.157
4,4'-DDE	0.088	0.107
4,4'-DDT	0.088	0.107
2,4'-D	N/A	N/A
Danitol	10377.562	12601.325
1,2-Dibromoethane	93.025	112.959
m-Dichlorobenzene (1,3-Dichlorobenzene)	31703.122	38496.648
o-Dichlorobenzene (1,2-Dichlorobenzene)	95131.307	115516.587
p-Dichlorobenzene (1,4-Dichlorobenzene)	N/A	N/A
3,3'-Dichlorobenzidine	9.654	11.722
1,2-Dichloroethane	12132.752	14732.627
1,1-Dichloroethylene	524714.099	637152.834
Dichloromethane (Methylene Chloride)	487547.947	592022.507
1,2-Dichloropropane	4958.412	6020.929
1,3-Dichloropropene (1,3- Dichloropropylene)	4629.314	5621.310
Dicofol	6.582	7.992
Dieldrin	0.022	0.027
2,4-Dimethylphenol	12527.670	15212.170
Di-n-Butyl Phthalate	66039.030	80190.250
Dioxins/Furans (TCDD Equivalents)	1.75E-06	2.12E-06
Endrin	4.388	5.328
Ethylbenzene	156716.541	190298.657
Fluoride	N/A	N/A
Heptachlor	0.033	0.040
Heptachlor Epoxide	0.016	0.020
Hexachlorobenzene	0.099	0.120
Hexachlorobutadiene	6011.526	7299.711
Hexachlorocyclohexane (alpha)	2.040	2.478
Hexachlorocyclohexane (beta)	7.240	8.792
Hexachlorocyclohexane (gamma) (Lindane)	136.027	165.176
Hexachlorocyclopentadiene	N/A	N/A
Hexachloroethane	252.528	306.641
Hexachlorophene	63.626	77.260
Lead	410.788	498.814
Mercury	0.268	0.325
Methoxychlor	35.323	42.892

Methyl Ethyl Ketone	2.18E+07	2.64E+07
Nickel	49484.963	60088.884
Nitrate-Nitrogen (as Total Nitrogen)	N/A	N/A
Nitrobenzene	40654.592	49366.290
N-Nitrosodiethylamine	46.074	55.947
N-Nitroso-di-n-Butylamine	92.147	111.893
Pentachlorobenzene	21.940	26.641
Pentachlorophenol	199.653	242.436
Polychlorinated Biphenyls (PCBs)	0.014	0.017
Pyridine	20777.064	25229.291
Selenium	N/A	N/A
1,2,4,5-Tetrachlorobenzene	15.577	18.915
1,1,2,2-Tetrachloroethane	877.595	1065.651
Tetrachloroethylene	11518.435	13986.672
Thallium	5.046	6.127
Toluene	N/A	N/A
Toxaphene	0.116	0.141
2,4,5-TP (Silvex)	460.737	559.467
1,1,1-Trichloroethane	20989068.558	25486726.106
1,1,2-Trichloroethane	6472.264	7859.177
Trichloroethylene	1799.070	2184.585
2,4,5-Trichlorophenol	53423.601	64871.515
TTHM (Sum of Total Trihalomethanes)	N/A	N/A
Vinyl Chloride	526.557	639.391