#233

PSNH Merrimack - Maximum Daily Limits at Outfall 003 to Protect Acute Criteria

	Parameter	Acute W.Q. Std (total) mg/l	7Q10 mgd	003A Max Q mgd	003A Max Weir mg/l	003D Max Day Q mgd	003D River x 5 (COC) or Limit mg/l	003A and 003D Mix Q mgd	003A and 003D Mix Conc. mg/l
	Aluminum	0.75	379.69	13	0.65	1.19	0.2268	14.19	0.614509655
	Antimony	9	379.69	13	0.000158	1.19	0.00023	14.19	0.000164038
	Arsenic	0.34	379.69	13	0.00227	1.19	0.00182	14.19	0.002232262
	Beryllium	0.13	379.69	13	0.000131	1.19	0.0003	14.19	0.000145173
	Cadmium (exist.)	0.000948	379.69	13	0.000192	1.19	0.0001052	14.19	0.000184721
Ignore	Cadmium (prop.)	0.52	379.69	13	1	1.19	0.0001052	14.19	0.916146948
	Chromium +3	0.579	379.69	13	0.00189	1.19	0.2	14.19	0.018503876
	Copper	0.00375	379.69	13	0.05	1.19	0.002688	14.19	0.046032327
	Lead	0.0141	379.69	13	0.00107	1.19	0.000596	14.19	0.001030249
	Mercury	0.00165	379.69	13	0.0000072	1.19	0.000005	14.19	7.0155E-06
	Nickel	0.145	379.69	13	0.0022	1.19	0.001296	14.19	0.002124189
	Selenium	12	379.69	13	0.0015	1.19	0.0026	14.19	0.001592248
	Silver	0.000376	379.69	13	0.00004	1.19	0.000102	14.19	4.51994E-05
	Thallium	1.4	379.69	13	0.000289	1.19	0.000045	14.19	0.000268538
	Zinc	0.037	379.69	13	0.019	1.19	1	14.19	0.101268499
	Iron (Chronic)	1	379.69	13	1	1.19	1.36	14.19	1.030190275
	Ammonia	28.1	379.69	13	2.6	1.19	0.4	14.19	2.415503876
	Chloride	860	379.69	13	27	1.19	85	14.19	31.86398872
	chlorine	0.019	379.69	13	0.001	1.19	1.39	14.19	0.117484144

Chromium x COC = 0.0009115 mg/l (DF needed only 0.003) but EPA tech based limit = 0.2 mg/l
Zinc x COC = 0.000954 mg/l (DF needed only 0.5) but EPA tech based limit = 1.0 mg/l
TRC x COC = 0.005 mg/l (DF needed only 0.1) but EPA tech based limit = 0.5 mg/l

003A and OO3D Mix Conc. = [(Col E x Col F) + (Col G x Col H)] / [(Col I)]

Mix Conc. > Acute WQ Std?	DF Needed to Meet Acute Crit	Actual Dilution Factor	Background River Conc. (total) mg/l	003A Max Weir Conc. (mg/l)	Outfall 003 Max Day Limit with zero background mg/l	Outfall 003 Max Day Limit based on mass balance equation mg/l	Reasonable Potential Multiplying Factor 003A	Mix 003A + 003D Times Factor
NO	0.9	24.08	0.04536	0.65	18.06	17.52	3.8	2.34
NO	0.0	24.08	0.000046	0.000158	216.74	224.84	3.8	0.00
NO	0.01	24.08	0.000364	hold lbs = .00227	8.19	8.48	3.8	0.01
NO	0.0	24.08	0.00006	0.000131	3.131	3.25	3.8	0.00
NO	0.2	24.08	0.00002104	0.000192	0.023	0.02	3.8	0.00
YES	2.0	24.08	0.00002104	0.01	12.523	12.99	3.8	3.48
NO	0.036	24.08	0.0001823	0.00189	13.94	14.46	3.8	0.07
YES	13.6	24.08	0.0005376	0.05	0.09	0.08	3.3	0.15
NO	0.1	24.08	0.0001192	0.00107	0.340	0.35	3.8	0.00
NO	0.005	24.08	0.000001	hold lbs = .0000072	0.040	0.04	3.8	0.00
NO	0.0	24.08	0.0002592	0.0022	3.49	3.62	3.8	0.01
NO	0.000	24.08	0.00052	0.0015	288.98	299.77	3.8	0.01
NO	0.1	24.08	0.0000204	0.00004	0.0091	0.01	3.8	0.00
NO	0.0	24.08	0.000009	0.000289	33.715	34.97	3.8	0.00
YES	3.0	24.08	0.0019079	0.019	0.89	0.87	3.8	0.38
YES	1.1	24.08	0.272	1	24.08	17.70	3.3	3.40
NO	0.1	24.08	0.08	2.6	676.70	699.85	3.8	9.18
NO	0.0	24.08	17	27	20710.36	21029.48	3.8	121.08
YES	6.9	24.08	0.001	0.001	0.46	0.4479	3.8	0.4464

DF = Qs/Qd x 0.9 = (7Q10/Qmix 003A+D) x 0.9 = (Col D / Col I) x 0.9
(river is water supply for both slag and CT make up)

Mass Balance Eqn. for Outfall 003:
003 limit = [(0.9xacute WQstd)(7Q10 + Q003) - (7Q10)(Background)] / Q003

Reas. Potential	
Yes/No	
No	Al
No	Sb
No	As
No	Be
No	Cd
No	Ignore new Cd
No	Cr
Yes	Cu
No	Pb
No	Hg
No	Ni
No	Se
No	Ag
No	Tl
No	Zn
No	Fe
No	ammonia
No	chloride
No	chlorine