CONSTRUCTED WETLAND SAMPLING RESULTS

CALTRANS BMP PILOT STUDY

Friday, September 21, 2001

CONSTRUCTED WETLAND CONSTITUENTS MONITORED

Date	CONVENTIONALS														NUTRIENTS								ORGANICS - Hydrocarbons					
	pH		Specific Conductance umhos/cm		Hardness mg/L		TSS mg/L		TDS mg/L		DOC mg/L		TOC mg/L		Ammonia mg/L		Nitrate/Nitrogen mg/L		Total Kjedahl N mg/L		Total Phosphorus mg/L		Ortho-Phospate mg/L		TPH-Oil ug/L		TPH-Gasoline		TPH-Diesel ug/L	
	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff
Location La Costa WET inflow (Baseline)																														
9/30/1999	7.5		3100		1700		1.0 U										25.00		2.20		3.70				310		50 U		1100	
10/28/1999	7.5		2900		910		2.0										11.00		0.78		3.60				200 U		50 U		100 U	
11/30/1999	7.4		2700		1100		9.0										12.00		1.50		3.00				200 U		50 U		100 U	
12/28/1999	7.5		2800		1100		44.0										20.00		2.00		4.60				100 U		50 U		100 U	
2/3/2000	7.3		2800		950		50.0										22.00		2.70		3.40				200 U		50 U		200 U	
3/1/2000	7.5		2600		1100		6.0										18.00		2.10		1.50				900		50 U		900	
3/30/2000	7.5		3000		1000		1.0 U										23.00		1.50		1.50				250 U		50 U		680	
5/3/2000	7.4		2600		850		16.0										24.00		2.70		1.80				2E+04 J		50 U		13000 J	
6/1/2000	7.6		2700		980		6.0										16.00		8.60		1.80				200 U		50 U		100 U	
7/5/2000	7.5	7.6	2900	3300	940	1000	20.0	11.0									22.00	1.10	2.00	6.30	6.60	7.00			200 U	200 U	50 U	50 U	100 U	220
8/4/2000	7.6	7.7	2800	3000	1000	1100	7.0	15.0									17.00	0.68	1.90	2.70	2.80	1.80			200 U	200 U	50 U	50 U	100 U	120
9/7/2000	7.5	8.7	3000	3000	1200	1100	1.0 U	28.0	2200	2200	8.6	11.0	4.5	12.0			11.00	3.10	1.20	2.60	1.00	1.50	0.89	0.93	200 U	200 U	50 U	50 U	100 U	100 U
10/5/2000	7.4	7.9	2500	2700	890	1100	1.0 U	10.0	1700	1900	11.0	11.0	12.0	13.0			17.00	3.30	2.10	2.10	3.00	2.40	3.00	2.10	200 U	200 U	50 U	50 U	100 U	100 U
11/8/2000	7.5	7.7	2900	1800	1100	710	18.0	4.0	2100	1200	6.7	11.0	7.3	12.0	0.14	0.20	13.00	1.50	1.20	1.40	1.40	1.20	1.10	1.20	200 U	200 U	50 U	50 U	300	100 U
12/7/2000	7.5	8.0	3000	2200	1100	840	8.0	12.0	2300	1700	4.8	10.0	5.8	13.0	0.10 U	0.10 U	7.40	0.01 U	0.56	1.50	0.80	0.75	0.50	0.43	200 U	200 U	50 U	50 U	100 U	100 U
1/4/2001	7.6	7.8	2900	2900	1200	990	10.0	4.0	2100	1700	4.5	12.0	5.0	12.0	0.21	0.10	12.00	0.07	0.88	1.30	0.52	0.30	0.40	0.20	200 U	200 U	50 U	50 U	100 U	100 U
2/7/2001	7.5	8.2	3200	1800	1000	500	8.0	42.0	2200	1100					0.40	0.17	15.00	0.01 U	0.81	3.10	0.38	0.43	0.33	0.01	200 U	200 U	50 U	50 U	1000	100 U
3/15/2001	7.5	7.4	3100	1500	1200	540	8.0	8.0	2200	970	6.4	5.3	9.2	6.7	0.80	0.11	11.00	2.10	1.90	2.00	0.54	1.60	0.42	0.29	200 U	200 U	50 U	50 U	100 U	100 U
4/4/2001	7.8	7.5	2900	2900	1300	1300	18.0	8.0	2000	2000	8.6	8.2	11.0	10.0	0.10 U	0.17	3.20	9.90	2.70	1.60	0.29	0.83	0.06	0.31	250	200 U	50 U	50 U	150	130
5/9/2001	7.8	7.7	2000	2700	730	1300	22.0	14.0	1400	2000	8.8	11.0	8.8	12.0	0.24	0.17	4.30	0.65	1.40	2.50	1.20	0.57	1.00	0.27	200 U	200 U	50 U	50 U	100 U	100 U
6/6/2001	7.5	7.6	2900	2300	1100	840	50.0	16.0	2000	1500	1.7	3.8	6.5	10.0	0.13	0.20	5.00	0.01 u	1.60	2.20	0.94	0.55	0.61	0.26	200 U	200 U	50 U	50 U	100 U	100 U
7/11/2001	7.5	7.6	3000	3000	1200	1100	46.0	10.0	2100	2100	10.0	13.0	11.0	15.0	0.67	0.15	14.00	0.68	2.20	2.60	1.10	0.56	0.96	0.36	200 U	200 U	50 U	50 U	100 U	100 U
8/1/2001	7.5	7.6	3100	3100	1200	1200	28.0	14.0	2200	2100	7.4	12.0	24.0	23.0	0.13	0.13	11.00	3.50	1.80	2.50	1.60	1.50	0.92	0.87	200 U	200 U	50 U	50 U	100 U	250
Average:	7.5	7.8	2843	2586	1080.4	972.9																								
Location LaCostaWB																														
1/25/2000	7.5	8.4	310	2700	98	1000	170.0	4.0									5.70	1.10	8.10	3.10	0.64	1.50			2E+04 J	2E+04 J	50 U	50 U	12000 J	340 J
2/16/2000	8.1	9.1	190	2300	63	720	240.0	28.0									1.60	0.03	3.60	3.50	1.60	1.10			4100	600	50 U	50 U	2400 J	500 J
2/20/2000	7.7	8.8	97	1900	28	560	60.0	12.0									0.84	0.06	0.83 J	1.90 J	2.60 J	1.10 J			1800	700	50 U	50 U	1200 J	500 J
3/5/2000	7.7	8.7	79	1600	31	930	350.0 J	12.0 J									0.66	1.30	1.50	1.60	2.60	1.20								

NOTES

1. Results for pH, Specific Conductance, and Hardness are presented as average for Influent and Effluent.
2. Data presented and results are preliminary and are subject to change.
3. Results are presented simply to interpret data and for comparison purposes only.
4. Organics to be collected by grab method.
5. Bacteria to be collected by grab method.

This report does not show numerical qualifiers, except for Fecal Coliform.

Note: Qualifiers follow Number

CONSTRUCTED WETLAND SAMPLING RESULTS

Friday, September 21, 2001

CALTRANS BMP PILOT STUDY

CONSTRUCTED WETLAND CONSTITUENTS MONITORED

TOTAL METALS														DISSOLVED METALS														BACTERIA	
Copper ug/L		Lead ug/L		Zinc ug/L		Arsenic ug/L		Cadmium ug/L		Chromium ug/L		Nickel ug/L		Copper ug/L		Lead ug/L		Zinc ug/L		Arsenic ug/L		Cadmium ug/L		Chromium ug/L		Nickel ug/L		Fecal Coliform MPN/100mL	
Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff
Location La Costa WET inflow (Baseline)														**Site ID** 111104															
130.0		3.3		56.0										130.0		2.0		52.0										200 U	
120.0		1.2		72.0										110.0		1.2		70.0										200 U	
60.0		3.8		38.0										58.0		1.8		37.0										200 U	
80.0		8.2		140.0										53.0		1.9		100.0										50	
170.0		17.0		190.0										95.0		3.2		92.0										9000	
75.0		5.2		110.0										61.0		2.1		94.0										1100	
64.0		1.5		81.0										62.0		1.3		77.0										50000	
45.0		1.0 U		88.0										39.0		1.0 U		76.0										24000	
34.0		1.9		71.0										29.0		1.0 U		61.0										240	
63.0	20.0	22.0	1.0 U	120.0	50.0									35.0	10.0	1.2	1.0 U	91.0	38.0									2200	240
31.0	7.0	3.9	1.1	74.0	29.0									21.0	5.0	1.3	1.0 U	63.0	24.0									30	30
9.3	12.0	1.4	1.1	39.0	54.0	0.8	2.3	0.2 U	0.3	1.0 U	1.0 U	2.9	3.9	9.1	9.5	1.0	1.0 U	33.0	47.0	0.7	2.1	0.2 U	0.3	1.0 U	1.0 U	2.9	4.0	30	30
15.0	5.5	1.0	1.0 U	78.0	37.0	1.4	1.6	1.0	0.5	3.8	4.0	9.6	10.0	15.0	5.2	1.1	1.0 U	71.0	30.0	1.6	1.5		0.2 U	0.9	1.9	9.3	10.0	300	27
17.0	4.9	4.3	3.0	55.0	34.0	5.0 U	5.0 U	0.3	0.2 U	3.3	2.2	6.7	5.6	12.0	4.1	1.2	2.1	52.0	27.0	5.0 U	5.0 U	0.2 U	0.2 U	2.8	2.0	6.5	5.2	500	30
10.0	5.3	2.2	1.0 U	36.0	31.0	2.2	2.2	0.2 U	0.2 U	1.5	1.4	6.9	7.0	5.1	4.5	1.0 U	1.0 U	19.0	24.0	1.1	2.2	0.2 U	0.2 U	1.2	1.0 U	6.7	5.7	50	13
9.5	3.3	2.4	1.2	35.0	19.0	0.8	0.8	0.2 U	0.2 U	1.6	1.7	5.9	5.6	6.2	3.1	1.0	1.0 U	28.0	69.0	0.8	0.7	0.2 U	0.2 U	1.0	1.1	5.5	4.9	110	2
13.0	250.0	1.0 U	1.9	44.0	23.0	0.7	0.5 U	0.6	0.2 U	1.0 U	1.0 U	6.3	5.9	9.1	3.1	1.0 U	1.0 U	43.0	16.0			0.2 U	0.2 U	1.0 U	1.0 U	5.1	3.0	2	4
11.0	4.5	2.1	1.1	38.0	18.0	0.9	2.6	0.2 U	0.2	1.0 U	1.0 U	16.0	8.0	8.4	2.8	1.0 U	2.0 U	33.0	17.0	0.9	0.5 U	0.2 U	0.2 U	1.0 U	1.0 U	15.0	7.6	50	11
6.3	12.0	1.5	1.0 U	39.0	29.0	1.2	2.0	0.2 U	0.3	1.0 U	1.0 U	14.0	12.0	4.6	16.0	3.0 U	4.0 U	36.0	40.0	0.8	1.4	0.2 U	0.2 U	1.0 U	1.0 U	13.0	18.0	500	50
12.0	5.8	1.9	1.0 U	44.0	25.0	1.6	0.9	0.2 U	0.2 U	2.2	2.9	13.0	18.0	7.1	3.6	5.0 U	6.0 U	28.0	21.0	4.2	4.1	0.2 U	0.2 U	1.0 U	1.2	12.0	16.0	30	7000
8.4	3.0	3.0	1.0 U	22.0	6.8	1.3	0.9	0.2 U	0.2 U	2.9	2.9	20.0	16.0	3.6	2.8	7.0 U	8.0 U	13.0	11.0	1.0	0.6	0.2 U	0.2 U	1.4	1.2	19.0	16.0	170	500
10.0	3.7	2.9	1.0 U	31.0	11.0	1.1	0.6	0.3	0.4	4.8	4.4	30.0	25.0	4.5	2.3	9.0 U	10.0 U	16.0	7.7	0.8	0.5	0.2	0.3	2.2	2.9	22.0	22.0	900	500
12.0	8.6	2.5	1.2	46.0	44.0	1.5	1.3	0.5	0.2	1.1	1.0 U	61.0	62.0	9.5	6.8	11.0 U	12.0 U	35.0	40.0	1.1	0.9	0.4	0.2	1.0 U	1.0 U	60.0	59.0	170	170
Location LaCostaWB														**Site ID** 111104															
100.0	18.0	170.0	1.1	360.0	41.0									40.0	16.0	39.0	1.0	120.0	40.0									700 J	8
210.0	17.0	660.0	4.0	700.0	41.0									28.0	13.0	37.0	2.0	96.0	34.0									50000 J	17 J
800.0	13.0	310.0	11.0	440.0	36.0									11.0	12.0	4.2	4.1	28.0	33.0									170 J	110 J
9500.0	14.0	2300.0	5.2	2000.0	45.0									8.0	12.0	17.0	2.2	44.0	38.0										

Date	CONVENTIONALS														NUTRIENTS										ORGANICS - Hydrocarbons					
	pH		Specific Conductance umhos/cm		Hardness mg/L		TSS mg/L		TDS mg/L		DOC mg/L		TOC mg/L		Ammonia mg/L		Nitrate/Nitrogen mg/L		Total Kjedahl N mg/L		Total Phosphorus mg/L		Ortho-Phospate mg/L		TPH-Oil ug/L		TPH-Gasoline		TPH-Diesel ug/L	
	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff
4/17/2000	7.8	8.0	140	2600	57	910	230.0	4.0									1.80	8.20	4.90	1.70	0.68	1.10								
10/26/2000		8.1		2500		1200		22.0		1800		13.0		15.0				0.12		2.40		1.90		1.50		200 U		50 U		160
1/8/2001	7.4	7.9	230	2600	80	930	300.0	10.0	200	1800	41.0	20.0	46.0	24.0	3.90	1.50	0.01	0.23	5.00	1.60	0.78	0.36	0.21	0.15						
1/10/2001	8.1	8.0	100	2100	38	860	240.0	10.0	86	1600	11.0	13.0	11.0	17.0	0.45	0.10 U	1.40	0.24	1.70	1.40			0.08	0.16	1100	200 U	50 U	50 U	390	100 U
1/26/2001	7.9	8.0	110	1800	27	550	240.0	12.0	88	1200	10.0	12.0	11.0	13.0	0.70	0.29	1.40	0.01 U	1.80	2.30	0.51	0.28	0.08	0.08	990	250	50 U	50 U	380	100 U
2/12/2001	8.1	8.0	92	1900	50	690	170.0	28.0	60	1300	6.8	10.0	7.2	11.0	0.50	0.30	0.70		1.00	2.20	0.20	0.90	0.07							
2/25/2001	7.4	7.6	90	1100	48	390	68.0	2.0	62	680	22.0	7.6	15.0	13.0	0.30	0.20	0.80	0.30	1.00	1.50	0.40	0.50	0.07	0.31						
3/6/2001	7.5	7.7	80	760	41	380	110.0	1.0 U	64	530	483.0	10.0	530.0	11.0	0.50	0.10	0.60	0.10	1.10	1.10	0.40	0.50	0.08	0.37						
4/7/2001	7.5	7.8	160	2700	55	1000	270.0	18.0	140	1900	24.0	27.0	25.0	27.0	1.10	0.20	2.70	1.50	3.20	2.30	0.40	0.20	0.19	0.07						
4/21/2001	7.6	7.8	240	2600	52	990	190.0	12.0	190	1900	30.0	13.0	33.0	14.0	1.20	0.20	1.90	0.50	4.40	4.10	0.20	0.20	0.15	0.01						
Average:	7.7	8.1	148	2083	51.4	793.6																								

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Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff	Inf	Eff
71.0	31.0	270.0	5.4	330.0	92.0									17.0	27.0	9.4	2.5	43.0	85.0										
	5.7		14.0		41.0		1.4		0.2 U		3.3		5.8		3.5		7.2		36.0		1.1		0.2		2.8		5.1		50
120.0	5.1	190.0	2.8	520.0	19.0	3.8	0.8	1.8	0.2 U	10.0	2.1	21.0	6.1	38.0	3.5	3.0	1.0 U	120.0	16.0	1.2	0.5 U	0.3	0.2 U	2.8	1.0	11.0	5.4		
66.0	7.1	250.0	9.2	280.0	28.0	1.0	1.3	1.3	0.2 U	3.7	1.1	7.7	5.0	14.0	4.6	2.3	1.0 U	23.0	18.0	0.9	0.5 U	0.2 U	0.2 U	1.4	1.0 U	2.9	4.4	2600	30
72.0	4.2	330.0	4.7	460.0	18.0	3.0	0.7	1.7	0.2 U	7.6	1.0 U	9.3	5.5	38.0	3.6	2.8	1.0 U	22.0	14.0	1.1	0.5 U	0.2 U	0.2 U	2.0	1.0 U	2.0 U	2.2	5000	240
43.0	13.0	150.0	6.6	200.0	37.0	1.5	0.5 U	0.6	0.2 U	3.7	1.0 U	5.1	2.5	6.5	11.0	3.4	1.6	23.0	32.0	0.5 U	0.6	0.2 U	0.2 U	1.0 U	1.0 U	2.0 U	2.4		
77.0	7.0	290.0	8.6	270.0	37.0	1.2	0.5 U	1.0	0.4	9.7	1.0 U	8.1	4.3	8.4	5.7	1.8	4.2	34.0	30.0	0.5	0.7	0.2 U	0.2 U	1.5	1.0 U	2.0	3.7		
35.0	3.4	450.0	2.4	190.0	21.0	1.6	0.6	0.6	0.2 U	12.0	1.0 U	5.3	3.1	7.5	2.2	2.1	1.0 U	30.0	13.0	0.8	0.5 U	0.2 U	0.2 U	6.0	1.0 U	2.0 U	2.9		
200.0	6.6	320.0	2.4	850.0	37.0	2.7	0.5 U	1.9	0.2 U	9.5	1.0 U	18.0	11.0	23.0	5.0	2.7	1.0 U	62.0	41.0	0.9	0.5 U	0.3	0.2 U	2.6	1.0 U	3.9	9.9		
62.0	3.8	100.0	1.0 U	340.0	31.0	2.0	0.5 U	0.9	0.2	4.0	1.0 U	12.0	7.2	20.0	2.8	1.7	1.0 U	74.0	30.0	0.8	0.9	0.5	0.2 U	1.1	1.0 U	5.2	6.9		