Summary of Phosphorus and Nitrogen Offset Credits for the Lake Elsinore Aeration and Mixing System (LEAMS) from 1/16 thru 12/20

1. How many PHOSPHORUS offset credits are generated by LEAMS?

Phosphorus	Without LEAMS	With LEAMS
A) Total Maximum Daily Load (TMDL)	28,584 kg/yr	28,584 kg/yr
B) Sediment Releases*	33,160 kg/yr	21,554 kg/yr
C) Offset Credits Available (Line A – Line B)	-4,576 kg/yr	**7,030 kg/yr**

** The approved TMDL stipulates that LEAMS will reduce phosphorus loads released from lake bottom sediments by 35%; therefore, 65% of 33,160 = 21,554 kg/yr.*

2. How many NITROGEN credits are generated by LEAMS?

52,616 kg/yr TN offset based on 2,340 hours of operation (Dr. Alex Horne; Dec., 2012)

65,310 kg/yr TN offset based on 4,824 hours of operation (Dr. Alex Horne; Mar., 2015)

For purposes of developing the cost-sharing agreement, stakeholders will assume that **44,000 kg/yr of TN offset credits** are generated if LEAMS is operated for 2,000 hrs/yr.

3. How many offset credits are generated per hour of operation?

A) LEAMS must operate for a minimum of 2,000 hours/year.

B) Each hour of LEAMS operation generates:

i. 3.5 kg/hr of TP offset credit (7,030 kg / 2,000 hrs)

ii. 22 kg/hr of TN offset credit (44,000 kg / 2,000 hrs)

4. **How many credits are needed to offset TP & TN in recycled water?**

Parameter	Est. Annual Avg. (2016-2020)	Est. Annual Avg. (2021+)
EVMWD's Est. Daily Discharge to Lake Elsinore	7.05 mgd	9.0 mgd
Total Phosphorus Discharged (@ 0.5 mg/L)	4,870 kg/yr	6,218 kg/yr
TMDL Target Mass for TP (@ 0.1 mg/L)	974 kg/yr	1,244 kg/yr
Annual Offset Needed for TP (Interim & Final)	3,896 kg/yr	4,974 kg/yr
Total Nitrogen Discharged (@ 3.0 mg/L)	29,222 kg/yr	37,305 kg/yr
Mass Limit for TN in EVMWD's NPDES Permit*	7,426 kg/yr	7,426 kg/yr
Annual Offset Needed for TN (Interim & Final)	21,796 kg/yr	29,879 kg/yr

*mass limited calculated based on 5.335 mgd discharge flow * 1.0 mg/L TN

5. **How many unassigned phosphorus offset credits are available?**

Phosphorus Credits	2016-2020	2021+
A) TP Offset Credits Generated by LEAMS	7,030 kg/yr	7,030 kg/yr
B) TP Credits Assigned to Recycled Water**	3,896 kg/yr	4,974 kg/yr
C) TP Credits Available to Others (Line A – Line B)	3,134 kg/yr	2,056 kg/yr
D) Oper. Hours Required for Recycled Water	1,113 hrs./yr.	1,421 hrs./yr.
E) Oper. Hours Not Yet Assigned	887 hrs./yr.	579 hrs./yr.

*** Sufficient to offset the difference between EVMWD's current effluent limit (0.5 mg/L) and the TMDL target for TP (0.1 mg/L).*

6. **How many unassigned nitrogen offset credits are available?**

Nitrogen Credits	2016-2020	2021+
A) TN Offset Credits Generated by LEAMS	44,000 kg/yr.	44,000 kg/yr.
B) TN Credits Assigned to Recycled Water	21,796 kg/yr.	29,879 kg/yr.
C) TN Credits Not Yet Assigned (Line A – Line B)	22,204 kg/yr.	14,121 kg/yr.
D) Oper. Hours Required for Recycled Water	991 hrs./yr.	1,358 hrs./yr.
E) Oper. Hours Not Yet Assigned***	1,009 hrs./yr.	642 hrs./yr.

***Since there are only 887 TP hours available, this also limits the total TN hours available to 887 hours and TN credits to just 19,514 kg/yr (887 hrs *22 kg/hr).

7. What is the potential demand for unassigned offset credits (1/1/16 to 12/31/20)?

Source of Runoff	TP Load[1] (kg/yr)	TP Hours[2] (annual)	TN Load[1] (kg/yr)	TN Hours[3] (annual)	Max. Hrs.[4] (annual)
Riverside Co. (unincorp.)	509	146	3,059	139	146
City of Moreno Valley	436	125	4,376	199	199
City of Menifee	210	60	1,954	89	89
City of Lake Elsinore	195	56	1,415	65	65
City of Wildomar	177	51	822	38	51
City of Perris	133	38	1,247	57	57
City of Canyon Lake	70	20	547	25	25
City of Hemet	47	14	766	35	35
City of Riverside	5	2	134	6	6
March Joint Powers Agcy.	2	1	22	1	1
City of San Jacinto	1	1	1	1	1
City of Murrieta	0	0	0	0	0
CWAD Enrollees (WRCAC?)	318	91	806	37	91
U.S. Forest Service	67	20	201	10	20
March Air Reserve Base	36	11	319	15	15
Other Federal Agencies	19	6	87	4	6
Caltrans	41	12	306	14	14
CA Fish & Game	14	4	58	3	4
Other State Agencies	26	8	140	7	8
TOTAL	**2,306 kg/yr.**	**666 hrs.**	**16,260 kg/yr.**	**745 hrs.**	**833 hrs.[5]**

[1] Based on CDM-Smith's estimate of average annual phosphorus loads to Lake Elsinore including both urban runoff and septic systems (Feb., 2015).

[2] # of hours required to offset 100% of TP Load (rounded up to nearest whole hour).

[3] # of hours required to offset 100% of TN Load (rounded up to nearest whole hour).

[4] Max. Hours = highest of the two values shown for TP Hours and TN Hours.

[5] Max. credit demand = 833 hrs/yr.; max. hours available = 887 hrs/yr. There are sufficient TP/TN credits and operating hours available to meet maximum potential demand during the five-year period commencing 1/1/2016 and ending 12/31/2020. Potential demand does **not** constitute an actual commitment to participate in LEAMS.