
Technical Memorandum

Task 3: Evaluation of Alum, Phoslock and Modified Zeolite To Sequester Nutrients in Inflow and Improve Water Quality in Canyon Lake

Objective

The objective of this task was to evaluate the effectiveness of alum, Phoslock and an Al-modified zeolite at sequestering nutrients within inflow and estimate corresponding doses required to meet chlorophyll a target of $25 \mu\text{g L}^{-1}$ in Canyon Lake.

Approach

The DYRESM-CAEDYM model developed in task 2 was used to predict water quality in Canyon Lake under scenarios that included addition of alum, Phoslock and an Al-modified zeolite (Aqual-P) to inflows. As in task 2, the 10-yr period from 2002-2011 was simulated under both the reference (natural) condition at the lake that included strong thermal stratification and an anaerobic hypolimnion for most of the year, and with installation and operation of the PACE hypolimnetic oxygenation system (HOS). The simulations and associated calculations from task 2 demonstrated the strong linkage between the watershed and external loading of nutrients to the lake, with annual net external loading of nutrients exceeding internal loading 4 years out of 10. The simulations demonstrated that HOS, while effective at significantly reducing internal loading of P and to a lesser extent N, was unable to meet chlorophyll a and nutrient objectives in the lake owing to the annual and often very large loads of nutrients delivered from the watershed. Results from task 2 indicate that stripping of nutrients out of the inflows to Canyon Lake would also be needed to meet all TMDL water quality targets.

Numerical simulations were performed in which $\text{PO}_4\text{-P}$ concentrations in the inflows from the San Jacinto River and Salt Creek were reduced through irreversible adsorption into a particulate inorganic form that was then allowed to settle out of the water column following Stokes Law. Data describing the adsorption of $\text{PO}_4\text{-P}$ to each of these materials were taken from published studies; sorption data for alum were taken from Pilgrim et al. (2007), Phoslock data were taken from Haghseresht et al., (2009), and adsorption data for the Al-modified zeolite (Aqual-P) were taken from Gibbs and Ozkundakci (2011).

Results

Sorbent Properties

The capacity of alum, Phoslock and an Al-modified zeolite to bind $\text{PO}_4\text{-P}$ in water varies significantly, with alum sorbing a greater amount of $\text{PO}_4\text{-P}$ than Phoslock or Al-zeolite (Aqual-P) at a given equilibrium solution concentration (Fig.1). The amount of

PO₄-P sorbed onto these materials increases with increasing PO₄-P concentration in solution. For example, the concentration sorbed to Phoslock asymptotically approached its maximum value of about 10 mg PO₄-P/g (Hagherseresht et al., 2009) at equilibrium dissolved concentrations somewhat greater than 0.3 mg/L (Fig. 1a). In this case, the available sites for uptake of PO₄-P are rapidly filled, while a much higher number of sites are available with the alum floc. The Al-zeolite has lower affinity for PO₄-P over these concentration ranges than either alum or Phoslock.

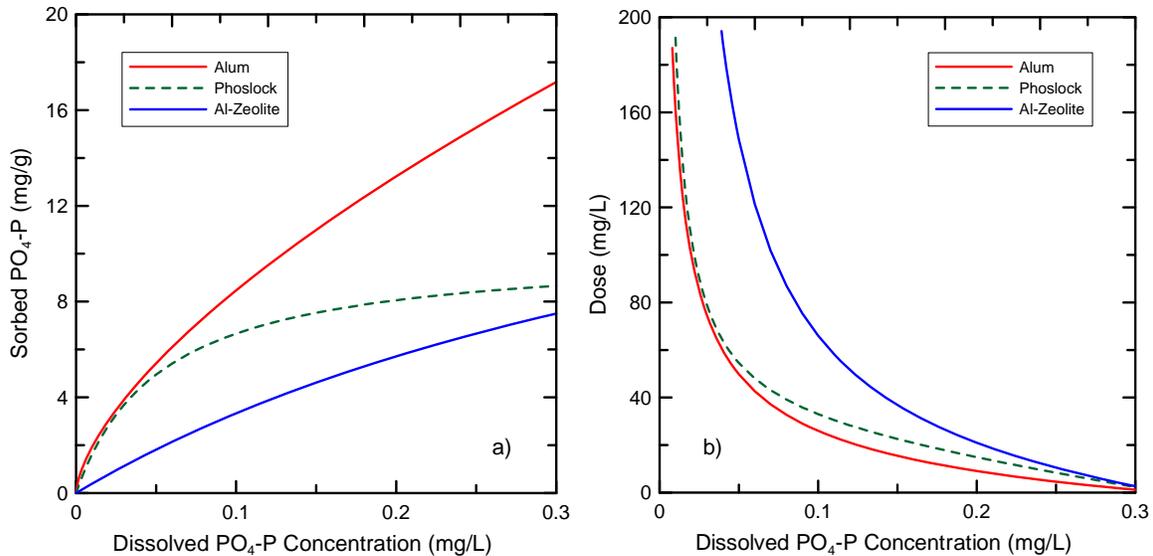


Fig. 1. Comparison of (a) PO₄-P adsorption isotherms and (b) treatment doses and corresponding equilibrium dissolved PO₄-P concentrations for liquid alum, Phoslock and Al-zeolite (Aqual-P).

As a result of the different affinities for PO₄-P, the doses required to achieve a given concentration of PO₄-P in the inflow varied as well (Fig. 1b). All sorbents exhibited a strongly non-linear increase in dose required to achieve lower equilibrium PO₄-P concentrations in solution. Alum required the smallest dose of the three materials to achieve a given equilibrium dissolved PO₄-P concentration, down to about 0.05 mg/L, below which liquid alum and Phoslock were calculated to require similar doses (Fig. 1b). Higher doses would be required to achieve similar dissolved PO₄-P concentrations using the Al-modified zeolite (Fig. 1b).

To reduce the PO₄-P concentration to, e.g., 0.20 mg/L in San Jacinto River inflow (a reduction of 0.12 mg/L from the average dissolved PO₄-P concentration (Anderson, 2012)), doses of 9.1 mg/L alum, 14.9 mg/L Phoslock, or 21.0 mg/L Aqual-P would be required. Higher doses would be needed to reduce PO₄-P in Salt Creek to 0.20 mg/L (a reduction of 0.19 mg/L from the average dissolved PO₄-P concentration in Salt Creek would require 14.4 mg/L alum, 23.6 mg/L Phoslock, or 33.3 mg/L Aqual-P). Greater doses would be needed to remove a larger fraction of the dissolved PO₄-P using any of

the materials (e.g., the required alum dose would increase from 9.1 mg/L to 26.0 mg/L to lower dissolved $\text{PO}_4\text{-P}$ concentrations from 0.20 mg/L to 0.10 mg/L in the San Jacinto River).

Effects on Water Quality

DYRESM-CAEDYM simulations for the 2002-2011 time period were conducted for the (i) reference condition (no in-lake or external treatment), (ii) reduction in dissolved $\text{PO}_4\text{-P}$ concentration in inflow through addition of alum, Phoslock or Al-zeolite, (iii) operation of the HOS following the PACE 10b design, and (iv) operation of the HOS with inflow treatment/reduction in dissolved $\text{PO}_4\text{-P}$. Simulation results for the photic zone (1 m depth) assuming a reduction in external $\text{PO}_4\text{-P}$ concentrations to 0.10 mg/L are shown in Figs. 3-5. Reduction in $\text{PO}_4\text{-P}$ concentrations in inflows to 0.10 mg/L predictably lowered the total P concentrations in the lake surface waters by a significant amount as this dissolved $\text{PO}_4\text{-P}$ was converted to a particulate inorganic form that rapidly settled out of the water column (Fig. 2a).

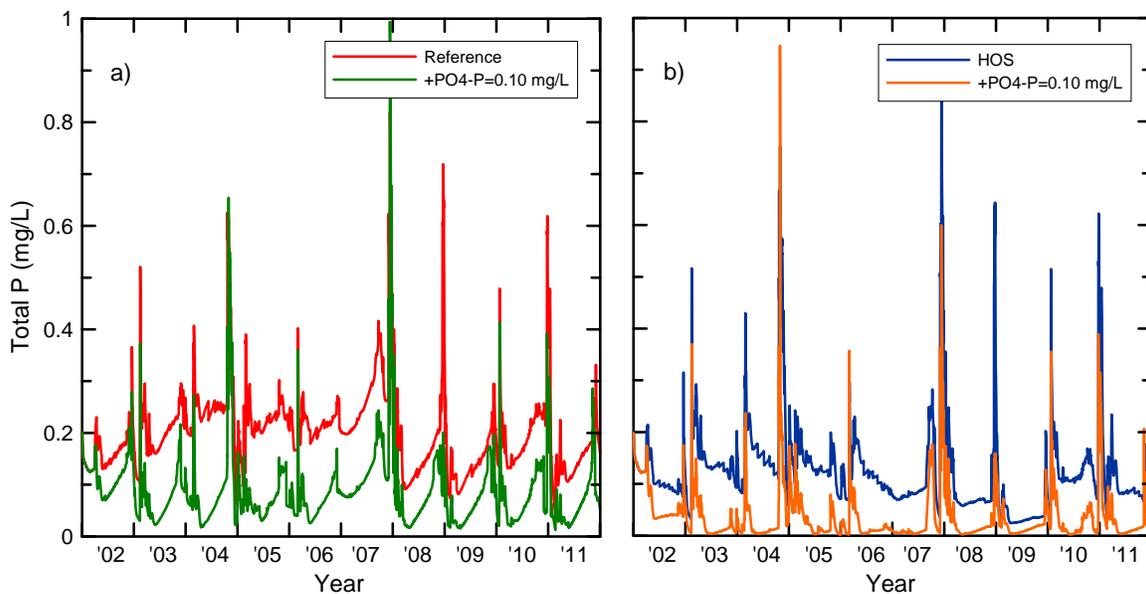


Fig. 2. Predicted total P concentrations for (a) the reference scenario and (b) operation of HOS (with and without treatment that reduced inflow $\text{PO}_4\text{-P}$ concentration to 0.10 mg/L).

This was achieved without any in-lake treatment, although we do nonetheless see increases in total P during fall mixing and winter runoff events (Fig. 3a). Installation and operation of the HOS was previously shown to have a beneficial effect on total P in the lake (Anderson, 2012), while operation of the HOS in conjunction with treatment that lowered inflow $\text{PO}_4\text{-P}$ concentration to 0.10 mg/L had the most dramatic effect, with very low total P concentrations (often <0.02 mg/L) present during the summer months (Fig. 2b).

The effects of $\text{PO}_4\text{-P}$ reductions on total N levels in the epilimnion of the lake were quite modest and, interestingly, tended to increase slightly the predicted total N concentrations relative to both the reference (no HOS) scenario (Fig. 3a) and with operation of the HOS (Fig. 3b). Reductions in $\text{PO}_4\text{-P}$ concentrations in the inflows to 0.10 mg/L moved the lake into P-limitation, such that less N was taken up by phytoplankton in the lake, less was available to be grazed by zooplankton or settled out of the water column as particulate organic N, and more consequently remained in the water column.

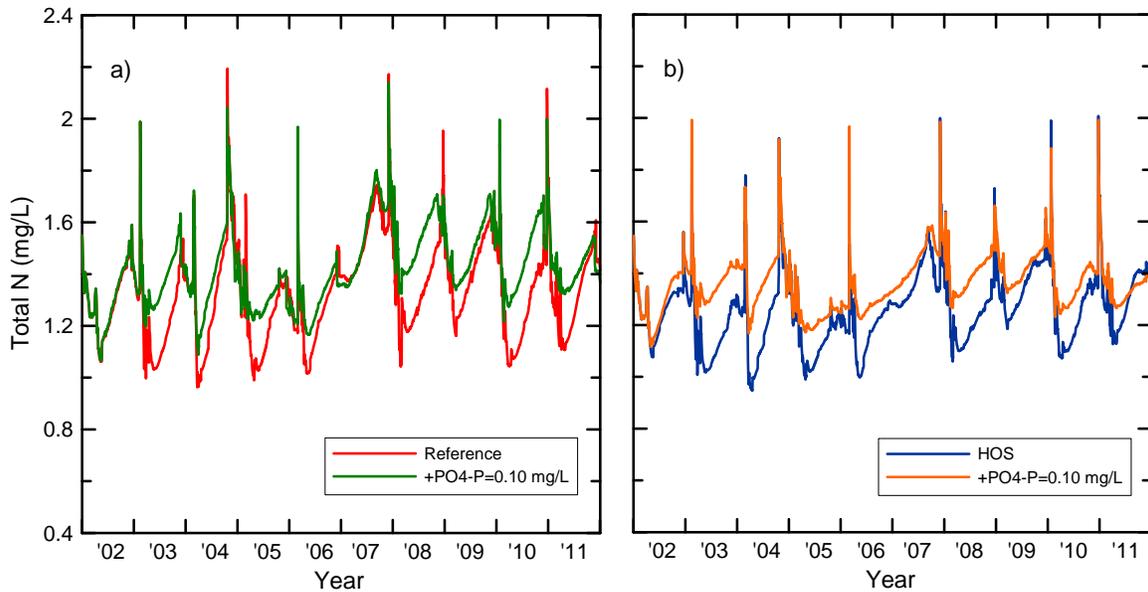


Fig. 3. Predicted total N concentrations for (a) the reference scenario and (b) operation of HOS (with and without treatment that reduced inflow $\text{PO}_4\text{-P}$ concentration to 0.10 mg/L).

Most importantly, the reduction in $\text{PO}_4\text{-P}$ concentration to 0.10 mg/L in inflows to the lake also lowered chlorophyll a concentrations (Fig. 4). While reductions in $\text{PO}_4\text{-P}$ alone (i.e., without HOS or other in-lake treatment) markedly reduced both peak and summer chlorophyll a levels relative to the reference (natural) condition, concentrations nonetheless exceeded 80-100 $\mu\text{g/L}$ late in the year owing to mixing of nutrients generated within the hypolimnion due to internal recycling (Fig. 4a). The combination of reductions in inflow $\text{PO}_4\text{-P}$ concentrations (via alum, Phoslock or zeolite) and internal nutrient control (via HOS) was predicted to have the greatest beneficial impact on water quality (Fig. 4b). Except for the beginning of 2002, when both externally and internally derived nutrients would have been present, chlorophyll a concentrations were predicted to remain <20 $\mu\text{g/L}$ essentially all of the time, and routinely <14 $\mu\text{g/L}$. While some uncertainty in these model predictions exists, simulations indicate that potentially quite dramatic improvements in water quality will likely result from the combination of HOS and $\text{PO}_4\text{-P}$ stripping from inflows.

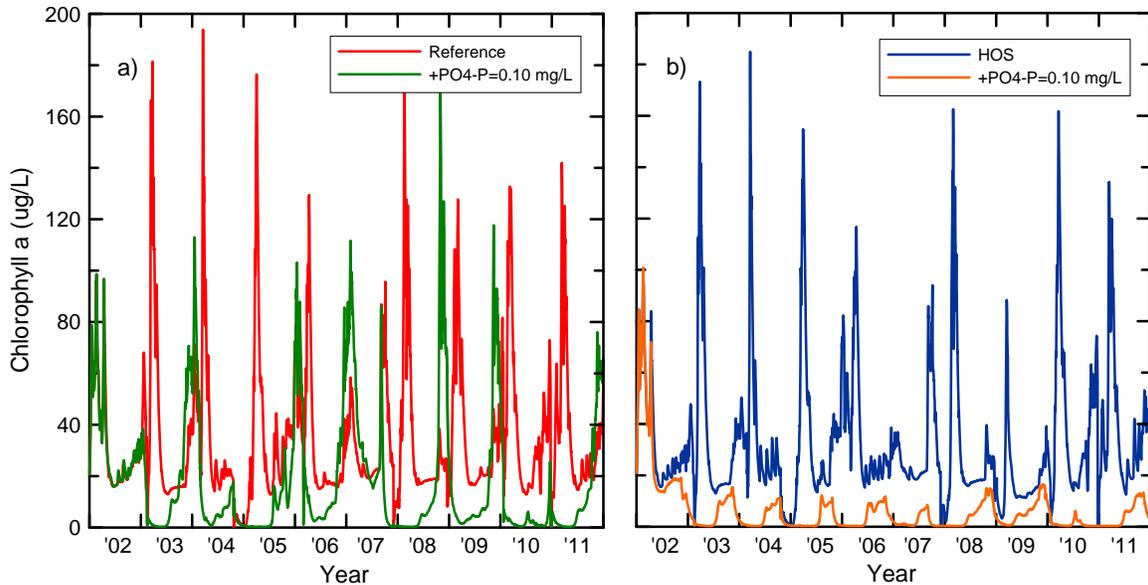


Fig. 4. Predicted chlorophyll a concentrations for (a) the reference scenario and (b) operation of HOS (with and without treatment that reduced inflow $PO_4\text{-P}$ concentration to 0.10 mg/L).

A series of additional simulations predicted water quality for several inflow $PO_4\text{-P}$ concentrations that would result from different inflow treatments, and results from simulations like those shown in Figs. 3-5 were averaged to yield the 10-yr mean total P, total N, chlorophyll a and hypolimnetic DO concentrations. Simulations thus allow comparison of both internal and external $PO_4\text{-P}$ load reductions.

Reductions in inflow $PO_4\text{-P}$ concentrations lowered the average total P concentration in the lake epilimnion assuming no in-lake treatment (i.e., no HOS) from more than 0.2 mg/L to about 0.08 mg/L with very low (0.01 mg/L) influent $PO_4\text{-P}$ concentrations (Fig. 5a). Lowering the influent $PO_4\text{-P}$ concentration to <0.16 mg/L was in fact predicted to lower the decadal average total P concentration in the epilimnion to levels below that prescribed in the TMDL, although this concentration does not reflect the accumulation within the hypolimnion (Fig. 6a).

Installation and operation of the HOS lowered the lake total P concentration by about 40% relative to the reference condition (with no external load treatment), and was predicted to require only a modest reduction in $PO_4\text{-P}$ concentration in inflows for the average total P concentration in Canyon Lake to come in under the TMDL target of 0.1 mg/L (Fig. 5a). Reductions in $PO_4\text{-P}$ concentrations in inflows below 0.2 mg/L provided comparatively little further improvements in lake total P levels however, indicating that particulate-P inputs from the watershed and remaining internal recycling of $PO_4\text{-P}$ are regulating total P levels in the lake.

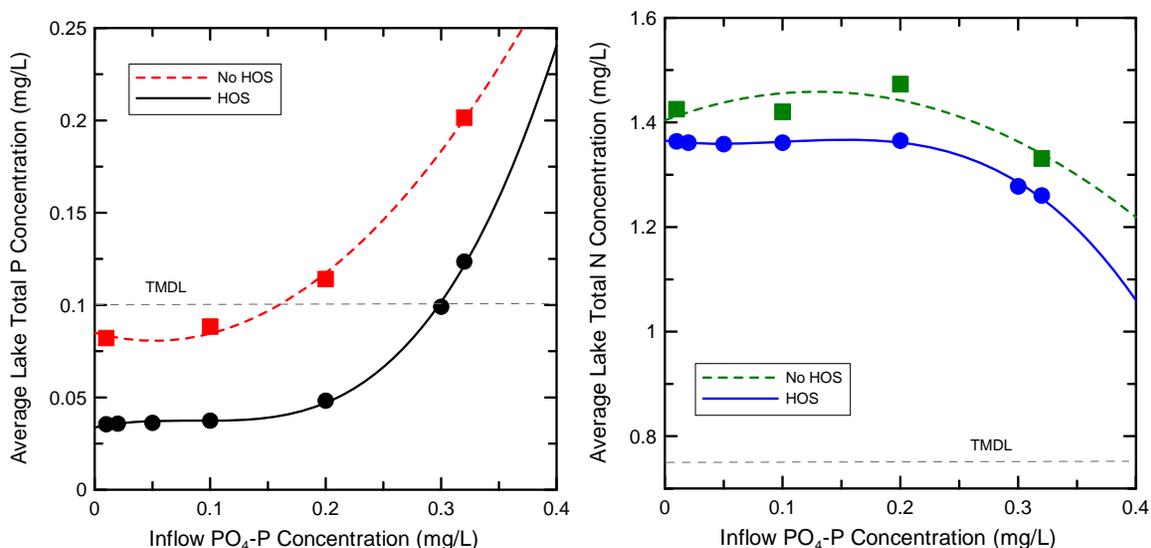


Fig. 5. Predicted average lake concentrations of (a) total P and (b) total N as a function of inflow $\text{PO}_4\text{-P}$ concentrations.

Reductions in inflow $\text{PO}_4\text{-P}$ concentrations were found to increase slightly (as shown in Fig. 3b) the average total N concentration in the upper part of the water column (e.g., reduction from 0.32 to 0.20 mg/L $\text{PO}_4\text{-P}$ in inflow yielded an *increase* in lake total N from 1.26 to 1.37 mg/L) (Fig. 5b). As previously described, this somewhat paradoxical finding is thought to result from a decrease in algal biomass and reduced settling/loss of particulate organic N from the water column, thus maintaining slightly higher dissolved concentrations contributing to higher overall total N levels in the lake. Irrespective of treatment, total N concentrations in Canyon Lake are predicted to remain well-above the TMDL target of 0.75 mg/L.

The dissolved oxygen concentration above the bottom sediments were not strongly affected by changes in inflow $\text{PO}_4\text{-P}$ concentrations, with the reference (no HOS) condition yielding a predicted 10-yr average concentration near 2 mg/L, well below the 5 mg/L target (Fig. 6a). Installation and operation of the HOS following the PACE design was predicted to yield quite high concentrations above the sediments, with a slight increase in DO with reduced external loading.

The average chlorophyll a concentration (in the epilimnion) responded favorably to reductions in external loading of $\text{PO}_4\text{-P}$, especially in combination with operation of the HOS (Fig. 6b). Simulation results indicate that a reduction in inflow $\text{PO}_4\text{-P}$ concentrations to <0.28 mg/L with HOS or <0.19 mg/L under current conditions (in both San Jacinto River and Salt Creek) would yield a 10-yr average concentration (over the 2002-2011 time period) at or below the 25 $\mu\text{g/L}$ chlorophyll a target (Fig. 6b). Greater reductions in inflow $\text{PO}_4\text{-P}$ concentrations are predicted to yield correspondingly lower average chlorophyll a concentrations.

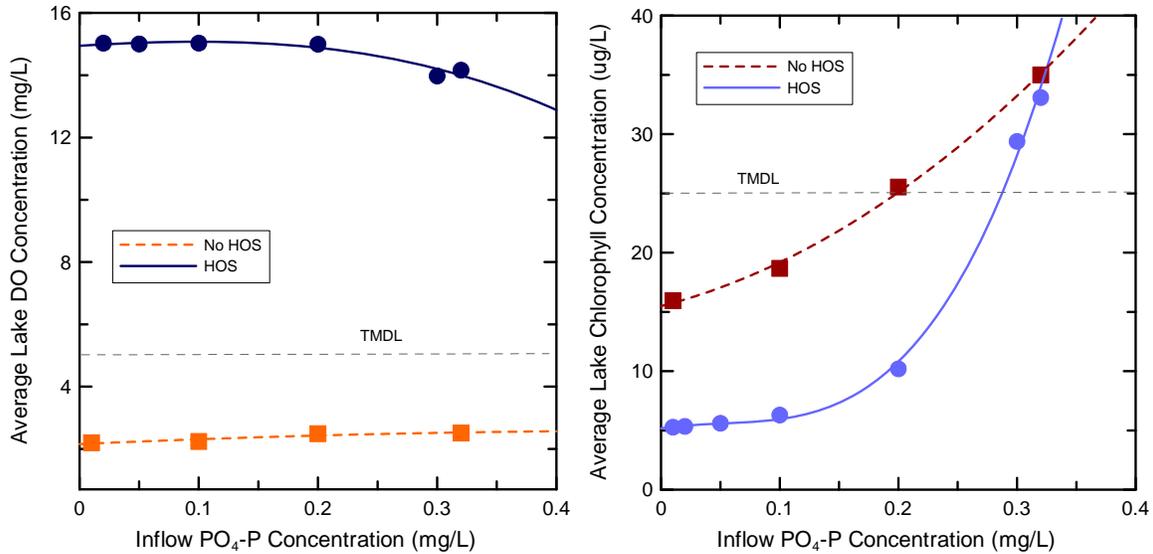


Fig. 6. Predicted average lake concentrations of (a) dissolved oxygen (1 m above bottom) and (b) chlorophyll a as a function of inflow $PO_4\text{-P}$ concentrations.

This is a noteworthy result, indicating that reductions in the most bioavailable form of P ($PO_4\text{-P}$) within the runoff, especially when coupled to reductions in internal loading through operation of the HOS, achieve strong reductions in the 10-yr average chlorophyll a concentration in the lake. This combination of actions (installation and operation of the HOS in conjunction with reductions in $PO_4\text{-P}$ within inflows to the lake) is thus predicted to meet the total P target (Fig. 5a), DO target (Fig. 6a) and chlorophyll a target (Fig. 6b). This combination of activities was not, however, predicted to approach the total N target of 0.75 mg/L (Fig. 5b), although has clearly shifted the lake to P-limitation (lake TN:TP ratio of about 27 with a reduction in inflow $PO_4\text{-P}$ concentration to 0.20 mg/L).

Costs for Treating External $PO_4\text{-P}$ Loads

The above modeling analysis was conducted assuming a fraction of $PO_4\text{-P}$ was converted to an unreactive particulate inorganic form that would settle out of the water column by gravity. The simulation results shown in Figs. 2-6 are thus not specific to alum, Phoslock or Aqual-P. The amount of sorbent, and thus cost to achieve these reductions, are specific to the material, however. The differences in sorption properties (Fig. 1a) were shown to influence the dose required to achieve a given dissolved $PO_4\text{-P}$ concentration (Fig. 1b). The modeling suggests that a reduction in $PO_4\text{-P}$ concentration to 0.20 mg/L in combination with HOS would achieve marked improvements in water quality and meet TMDL targets for total P, DO and chlorophyll with a significant margin for model uncertainty and error.

The costs for the materials vary (Table 1). The cost of liquid alum was estimated at \$200/ton delivered, or \$0.22/kg alum solution (\$4.95 per kg Al) (Table 1). An approximate cost for Phoslock of \$200 per lb of phosphorus removed was provided by SePro; based upon a claimed P capacity of 20 g P/kg Phoslock, this was converted to material cost of \$8.82 per kg (Table 1). An approximate cost for Aqual-P, the Al-modified zeolite, was requested but has not yet been received.

Material	Unit Cost
Alum	\$0.22/kg
Phoslock	\$8.82/kg
Aqual-P	NA

As previously considered in greater detail in the task 2 technical memo (Anderson, 2012), hydraulic loading and total P and total N loading to Canyon Lake has varied markedly over the past decade (Table 2).

Water Year	Total Flow In (af)	Total P Load (kg)	Total N Load (kg)
2002	1,039	965	2,635
2003	12,345	11,520	33,277
2004	3,107	2,835	8,470
2005	48,264	44,887	129,402
2006	3,347	2,933	9,002
2007	1,783	1,857	5,367
2008	7,359	5,616	17,028
2009	4,981	4,409	13,339
2010	12,688	11,462	33,982
2011	16,435	14,366	43,280

The annual quantity of materials and associated costs needed to achieve a reduction to 0.20 mg/L PO₄-P in San Jacinto River and Salt Creek inflows vary for the 3 materials and over time (due to different annual flows) (Table 3). Relatively modest amounts of alum would be needed (subject to considerations discussed below) for years with low hydraulic loading to the lake (e.g., 23,129 kg or 23.1 metric tons of liquid alum estimated for 2002), although very large quantities would be needed during years with extreme runoff volumes (e.g., 2005). Greater quantities of Phoslock and Aqual-P would be needed owing to the lower binding efficiency for PO₄-P for these materials (Fig. 1a).

Year	Mass (kg)			Cost (\$)		
	Alum	Phoslock	Aqual-P	Alum	Phoslock	Aqual-P
2002	23,129	36,106	53,377	\$5,088	\$318,451	na
2003	148,415	218,197	342,551	\$32,651	\$1,924,498	na
2004	146,466	217,849	349,443	\$32,222	\$1,921,431	na
2005	492,807	724,321	1,137,446	\$108,417	\$6,388,514	na
2006	41,841	55,743	96,585	\$9,205	\$491,649	na
2007	65,072	95,651	150,193	\$14,316	\$843,643	na
2008	89,332	119,254	206,215	\$19,653	\$1,051,822	na
2009	33,507	43,494	77,348	\$7,371	\$383,617	na
2010	329,352	457,573	772,965	\$72,457	\$4,035,793	na
2011	55,320	71,684	127,711	\$12,170	\$632,251	na

While the quantities of material needed vary within a factor of 3 or so, costs vary between materials by 2 orders of magnitude due to the very large cost differential between alum and Phoslock (Table 1) (as noted above, costs for Aqual-P have not been received, although material costs are likely to be at least broadly similar to Phoslock). Based upon this analysis, Phoslock does not appear to be an appropriate material for treating inflows such as this. Annual material costs for treating inflows with alum to a PO₄-P concentration of 0.20 mg/L ranged from an estimated low of \$5,088 in 2002 to \$108,417 in 2005. Total alum costs over the 2002-2011 time period, assuming the entirety of all San Jacinto River and Salt Creek flows were treated to 0.20 mg/L PO₄-P, are projected to have been \$313,553 (subject to considerations discussed in the next section).

Annual treatment costs vary with dose; the annual average and median costs for the 2002-2011 time period for treatment of inflows with alum to different dissolved PO₄-P concentrations are illustrated in Fig. 7a. The large treatment in 2005 significantly shifted the average annual cost up relative to the median value for the 2002-2011 time period. Treatment with a lower dose of alum, yielding a higher PO₄-P influent concentration to Canyon Lake and correspondingly higher total P and chlorophyll a concentrations there (Figs. 5a and 6b), would decrease costs. This can also be seen in Fig. 7b, where the annual cost of alum based upon the 2002-2011 time period is plotted against the average chlorophyll a concentration. The TMDL chlorophyll a target is included for reference. The alum cost to achieve a given average chlorophyll a concentration varies depending upon operation of the HOS and the cost metric (median or average annual cost for the past 10 yrs) (Fig. 7b).

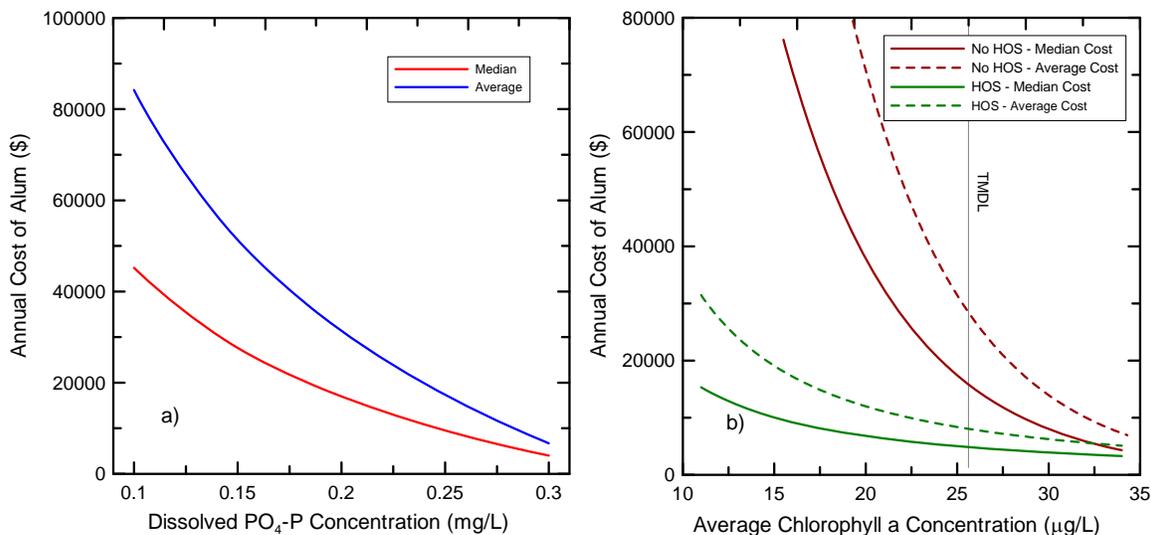


Fig. 7. Projected annual alum costs: a) average and median costs as a function of dissolved PO₄-P concentration in inflow to Canyon Lake, and b) median and average costs as a function of chlorophyll a concentration with and without operation of HOS.

Considerations for Treatment with Alum

Alum (aluminum sulfate) dissociates when added to water and dissolved Al undergoes a series hydrolysis reactions that result in the generation of acidity, decrease in pH, and the formation of an aluminum hydroxide (Al(OH)₃) floc with a high capacity for sorption of PO₄-P and/or formation of Al hydroxy-phosphates (Fig. 1a). The solubility of the Al(OH)₃ floc varies with pH, however, with minimum solubility near circumneutral pH (6-8) and markedly increased solubility at pH values above and below this range. Naturally occurring organic acid ligands derived from soil organic matter, leaf litter and other sources can also bind with Al and thus compete with sorption sites for PO₄-P, as well as inhibit formation of the floc. Dissolved Si can also potentially compete with PO₄-P and form aluminosilicates that would lower the capacity of the added alum to bind PO₄-P. The dose calculations above assume that favorable conditions will allow efficient formation of floc and binding of PO₄-P. Jar tests would be needed to confirm the removal efficiency at the doses proposed and verify low dissolved Al³⁺ concentrations present in treated San Jacinto River and Salt Creek inflow waters. Notwithstanding, Pilgrim et al. (2007) found that low doses of liquid alum (22 mg/L, about 2x that proposed here) reduced PO₄-P concentrations by 66-88% in jar tests conducted with runoff samples.

Ammonium Removal with Al-Modified Zeolite (Aqual-P)

Unlike alum or Phoslock, with which NH₄⁺ has minimal interaction, the Al-modified zeolite (Aqual-P) potentially has a high affinity and retention capacity for NH₄⁺. Published literature on the NH₄⁺ retention of Aqual-P was not found, although Nguyen and Tanner (1998) previously reported on NH₄⁺ removal from wastewaters using natural

New Zealand zeolites. Zeolites are naturally occurring minerals with relatively narrow pores through which NH_4^+ can diffuse and adsorb, and which larger, more strongly hydrated cations (such as Ca^{2+} , Mg^{2+} and Na^+) can not access. As a result, zeolites are well-known for their unique selectivity for NH_4^+ .

Although costs were not available for this material, it is expected that they would be broadly similar to Phoslock and much higher than liquid alum (Table 1), and would thus not be competitive with alum for inflow treatment of $\text{PO}_4\text{-P}$. The unique capacity for this material to retain both $\text{PO}_4\text{-P}$ and NH_4^+ could increase cost-effectiveness for improving overall water quality in Canyon Lake however. To understand the potential additional benefit, the NH_4^+ sorption properties of zeolites were considered further. Nguyen and Tanner (1998) performed laboratory sorption experiments with clinoptilolite and mordenite and developed sorption isotherms (similar to those shown in Fig. 1a for $\text{PO}_4\text{-P}$). While a high capacity for adsorption of NH_4^+ was demonstrated (6-8 mg $\text{NH}_4\text{-N/g}$ zeolite), very high solution concentrations were required to reach these levels (>200 mg/L) (Nguyen and Tanner, 1998). Adsorption could be described by the Langmuir equation, which relates adsorbed concentration (q , in mg/g) to solution concentration (C , in mg/L):

$$q = \frac{Q_{\max} K_{\text{ads}} C}{1 + K_{\text{ads}} C} \quad (1)$$

where Q_{\max} is the sorption maximum (mg/g) and K_{ads} is an energy term that defines the shape of the isotherm. Nguyen and Tanner (1998) reported Q_{\max} and K_{ads} values of 5.7 mg $\text{NH}_4\text{-N/g}$ and 0.02 L/mg for clinoptilolite, and 8.2 mg $\text{NH}_4\text{-N/g}$ and 0.034 for mordenite, respectively. We can thus calculate the concentration of $\text{NH}_4\text{-N}$ adsorbed on these zeolites in San Jacinto River or Salt Creek water by substituting the average $\text{NH}_4\text{-N}$ concentrations (0.24 and 0.30 mg/L) using these Langmuir parameters; doing so yields 0.027 and 0.034 mg $\text{NH}_4\text{-N/g}$ clinoptilolite (and 0.066 and 0.083 mg $\text{NH}_4\text{-N/g}$ mordenite). Thus we see that very little retention of $\text{NH}_4\text{-N}$ would be expected at the low concentrations of $\text{NH}_4\text{-N}$ present in these inflows and at zeolite doses of about 30 mg/L (removing only about 1% of the $\text{NH}_4\text{-N}$ and 0.3% of total inorganic N in the inflows). Based upon this, the capacity for Al-modified zeolite to also bind $\text{NH}_4\text{-N}$ is not sufficient to offset expected low $\text{PO}_4\text{-P}$ retention and high relative costs.

Conclusions

Results of these simulations indicate:

- (i) Reductions in influent $\text{PO}_4\text{-P}$ concentrations entering Canyon Lake from the San Jacinto River and Salt Creek can be achieved via addition of alum, Phoslock or Al-modified zeolite.
- (ii) Reductions in this readily bioavailable form of P can switch the lake to P-limitation and significantly lower chlorophyll a and total P concentrations in the lake.

- (iii) Inflow treatment in conjunction with operation of the HOS was found to be more effective than inflow treatment alone at reducing lake total P and chlorophyll a concentrations, and operation of the HOS was necessary to meet the DO target specified for the lake.
- (iv) Alum was found to be much more cost-effective than Phoslock at removing PO₄-P in runoff, and is also expected to be much more cost-effective than Aqual-P (although no cost estimates were available at the time of this report).
- (v) The median annual alum cost for 2002-2011, assuming treatment of inflow to a PO₄-P concentration of 0.20 mg/L, was estimated at \$16,985/yr, with annual costs that ranged from \$5,088 - \$108,417 due to variations in annual hydraulic loading from the watershed.
- (vi) Jar tests are recommended to confirm dose requirements, Al solubility and PO₄-P removal efficiencies, while algal bioassays are suggested to verify conversion to P-limitation and suppression of algal production.

References

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DRAFT 5/18/12

**AGREEMENT TO FORM
THE LAKE ELSINORE AND CANYON LAKE TMDL TASK FORCE**

This Agreement to form the Lake Elsinore and Canyon Lake TMDL Task Force (hereinafter "AGREEMENT") is made and effective this ~~18th~~ th day of ~~May~~, ~~2006-2012~~ by and among the following entities, which are hereinafter sometimes collectively referred to as "TASK FORCE AGENCIES" or individually as "TASK FORCE AGENCY":

- ~~United States Forest Service (San Bernardino and Cleveland National Forest Management Zones)~~
- US Air Force (March Air Reserve Base)
- March ~~Air Reserve Base~~ Joint Powers Authority
- California Department of Transportation
- California Department of Fish and Game
- County of Riverside
- City of Beaumont
- City of Canyon Lake
- City of Hemet
- City of Lake Elsinore
- City of Moreno Valley
- City of Murrieta
- City of Perris
- City of Riverside
- City of San Jacinto
- City of Meniffee
- City of Wildomar
- Elsinore Valley Municipal Water District
- Eastern Municipal Water District
- Western Riverside County Agriculture Coalition (on behalf of the participating Agricultural Operators in the San Jacinto River Basin)
- Western Riverside County Agriculture Coalition (on behalf of the participating Dairy Operators in the San Jacinto River Basin)
- Riverside County Flood Control and Water Conservation District

I. RECITALS

A. Whereas, in 1998, the Santa Ana Regional Water Quality Control Board (hereinafter "Regional Board") designated Lake Elsinore and Canyon Lake in the Lake Elsinore and San Jacinto Watersheds (Collectively the "Watersheds") as "impaired water bodies" pursuant to Section 303(d) of the federal Clean Water Act because of high levels of algae in both lakes and low dissolved oxygen in Lake Elsinore, attributed to excess phosphorus and nitrogen (Nutrients). As a result of said Section 303 designation, the Clean Water Act and California's Non-point Source Pollution Control Plan requires that total maximum daily loads (hereinafter "TMDLs") be established by the Regional Board for these waterbodies; and

B. Whereas, in response to the Section 303(d) designation, the Regional Board adopted a Resolution R8-2004-0037 on December 20, 2004 amending the Water Quality Control Plan for the Santa Ana River Basin (BASIN PLAN AMENDMENT) to incorporate nutrient TMDLs for Canyon Lake and Lake Elsinore. The Basin Plan Amendment specifies, among other things, an Implementation Plan, which holds specified stake holders (TASK FORCE AGENCIES) individually and/or jointly liable for complying with the TMDLs by means of specific tasks to be completed by specified dates under penalty of law. These tasks include development and implementation of a watershed-wide nutrient water quality monitoring program, development of an in-lake nutrient monitoring program for Canyon Lake and Lake Elsinore, development of a plan and schedule for in-lake sediment nutrient reduction for Lake Elsinore, development of a plan and schedule for evaluating in-lake sediment nutrient strategies for Canyon Lake, updating watershed and in-lake nutrient TMDL water quality models, developing a pollutant trading plan, and reviewing and revising the TMDL to reflect updated data and science; and

C. Whereas, the purpose of this AGREEMENT is to form a task force (hereinafter "TASK FORCE") to implement certain tasks identified in the TMDL Implementation Plan and to pursue TMDL related tasks agreed upon by TASK FORCE AGENCIES; and

D. Whereas, the TASK FORCE AGENCIES agree that the purpose of this TASK FORCE is to (1) review and develop recommendations to update the TMDL BASIN PLAN AMENDMENT based on the best available scientific information, and (2) implement TMDL Implementation Plan Tasks identified below and jointly assigned to TASK FORCE AGENCIES, and (3) propose appropriate revisions to the TMDL BASIN PLAN AMENDMENT to the Santa Ana RWQCB by June 30, 2010, and (4) allow watershed stakeholders to participate in efforts to meet appropriate water quality standards so that Canyon Lake and/or Lake Elsinore can be de-listed from the Clean Water Act 303(d) list of impaired water bodies; and

E. Whereas, hundreds of individual agricultural and dairy operators are subject to the Canyon Lake and Lake Elsinore TMDLs and its component TMDL Implementation Plan; and

F. Whereas, the Western Riverside County Agricultural Coalition(WRCAC) is a non-profit organization representing the interests of participating agricultural and dairy operators within the San Jacinto Watershed; and

G. Whereas, WRCAC's membership is open to any and all agricultural and dairy operators within the San Jacinto watershed; and

H. Whereas, March Air Reserve Base (MARB) is an installation of the United States Air Force, ~~and the San Bernardino and Cleveland National Forest are~~ on federal lands ~~under the administration and management of the Forest Service. Both are areas an agencies-agency~~ of the federal government, ~~and are it is~~ therefore subject to limitations in ~~their-its~~ ability to comply with every provision stated herein to the same extent that other non-federal TASK FORCE AGENCIES are able to comply. These limitations are based upon, but not limited to, those identified in the federal Clean Water Act, the federal Antideficiency Act, the principle of sovereign immunity and the holdings of the Supreme Court of the United States, and other binding federal court decisions, as they interpret those sources of federal law. The limitations so mentioned include, but are not limited to, the availability of federal funding to pay for participation in this program, and the ability of MARB ~~and Forest Service~~ to participate directly in sampling, research or data gathering activities which are not located on or near MARB ~~or National Forest System~~ lands or a point source of water discharge arising on MARB ~~or National Forest System~~ lands, or other activities not specifically authorized by the Federal Clean Water Act section 313. To the extent that the limitations described herein prevent MARB ~~or Forest Service~~ from fully participating in any aspect of this program, they reserve the right, in their sole discretion, to participate in the program as a matter of comity. By entering into this agreement, MARB ~~and Forest Service~~ ~~does~~ not authorize any of the TASK FORCE AGENCIES to exercise regulatory authority over them. MARB ~~and Forest Service~~ agrees that State and federal regulatory agencies that are or may become members of this TASK FORCE have regulatory authority over MARB ~~and Forest Service~~ only to the extent permitted by State or Federal Law; and

I. Whereas, the TASK FORCE AGENCIES acknowledge and agree that the effectiveness of the TASK FORCE may be improved by the inclusion of other agencies as additional TASK FORCE AGENCIES to the TASK FORCE; and

J. Whereas, the Riverside County Flood Control and Water Conservation District (RCFC&WCD) serves as the Principal Permittee for the National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System Permit (MS4) for the Santa Ana Region of Riverside County; and

K. Whereas, the County of Riverside and Cities of Beaumont, Canyon Lake, Hemet, Lake Elsinore, Moreno Valley, Murrieta, Perris, Riverside, San Jacinto, Menifee, Wildomar are MS4 CO-PERMITTEES for the NPDES MS4 Permit for the Santa Ana Region of Riverside County; and

L. Whereas, the MS4 PRINCIPAL PERMITTEE and MS4 CO-PERMITTEES collectively represent the MS4 PERMITTEES within the San Jacinto Watershed; and

Comment [r1]: Bill Schultz C Murrietta Legal Counsel
Date needs to be revised.

Comment [r2]: Bill Schultz C Murrietta Legal Counsel
Sentence needs to be reworked.

Comment [r3]: Bill Schultz C Murrietta Legal Counsel
Defined term?

M. Whereas, the NPDES MS4 Permit for the Santa Ana Region of Riverside County is regulated by the Regional Board and subject to the requirements of the nutrient TMDLs for Canyon Lake and Lake Elsinore; and

N. Whereas RCFC&WCD has agreed to provide services on behalf of itself as an NPDES ~~MS4 PERMITTEE~~ and on behalf of the MS4 CO-PERMITTEES for the purposes of this AGREEMENT; and

~~O. Whereas RCFC&WCD has prepared and reviewed the MS4 CO-PERMITTEES cost share allocation with MS4 CO-PERMITTEE staff at the NPDES MS4 Permit Technical Advisory Committee Meetings and with the affected City Managers and County Executive Office, or designated representatives thereof during the NPDES MS4 Permit Management Steering Committee Meeting of February 16, 2006; and~~

P. Whereas, the TMDL assigned nutrient waste load allocations for Supplemental Water addition to Lake Elsinore to stabilize the Lake's elevation; and

Q. Whereas, the nutrient waste load allocation for Supplemental Water, which includes Island Well water, EVMWD treatment plant effluent, and other sources of non-stormwater, may reduce the TMDL waste load allocation and TMDL load allocation of other point and non-point sources because in-lake nutrient capacity was not adjusted to account for increased lake levels associated with the addition of Supplemental Water; and

R. Whereas, the assumptions regarding load allocations for Supplemental Water may not be consistent with the actual operation of Supplemental Water sources; and

S. Whereas, the City of Lake Elsinore and EVMWD previously entered into an agreement to equally share the cost of Supplemental Water addition to the Lake under the "Lake Elsinore Comprehensive Water Management Agreement", and

T. Whereas, for the purposes of this Agreement, the City of Lake Elsinore shall be acknowledged and recognized as a separate and equal contributor with EVMWD for the cost and voting rights accorded under this Agreement attributed to EVMWD for Supplemental Water addition; and

~~U. Whereas, the TASK FORCE AGENCIES have considered many alternative cost sharing methodologies based on TMDL assigned load allocation, load reduction, and permutations thereof; and~~

~~V. Whereas, certain TASK FORCE AGENCIES were strong proponents of cost sharing based on load allocation and other TASK FORCE AGENCIES were strong proponents of cost sharing based on load reduction; and~~

~~W. Whereas, these TASK FORCE AGENCIES have been unable to agree upon a methodology for distributing costs based on either an allocation or a load reduction methodology; and~~

~~X. Whereas, the TASK FORCE AGENCIES have reviewed and agreed upon an interim negotiated cost allocation methodology acceptable to all TASK FORCE AGENCIES for the purposes of initiating the TASK FORCE, based on consideration of TMDL assigned load allocations, load reductions, and permutations thereof; and~~

~~Y.U.~~ Whereas, the TASK FORCE AGENCIES agree that certain nutrient dischargers have been either inappropriately named or not named as responsible parties for various tasks in the BASIN PLAN AMENDMENT; and

~~Z.V.~~ Whereas, the TASK FORCE AGENCIES agree that agricultural and dairy lands are converting to urban and open space lands; and

~~AA.W.~~ Whereas, the TASK FORCE AGENCIES agree that an amendment to the TMDL to address, at minimum, the proper naming of responsible parties for various tasks in the TMDL Implementation Plan, to correct the load allocation and waste load allocations to properly address the impacts of Supplemental Water on Lake Elsinore, and to revise the load allocation and waste load allocations to address the ongoing conversion of

Comment [r4]: Bill Schultz C Murrietta Legal Counsel

Is this the same as the MS4 PRINCIPAL PERMITTEE referred to previously?

Comment [r5]: Item to be reviewed by RCFC&WCD Legal Counsel

agriculture and dairy lands to urban and/or open space should be addressed as part of a revision to the TMDL Implementation Plan; and

~~BB. —Whereas, the TASK FORCE AGENCIES agree that upon amendment of the existing BASIN PLAN AMENDMENT, including the TMDL Implementation Plan, by the Regional Board to address, at a minimum, the issues described in Recital Z, the TASK FORCE AGENCIES shall amend this AGREEMENT to revise the cost allocation methodology for future fiscal years to incorporate a task-specific cost sharing methodology, based on assigned load allocation or waste load allocation of TASK FORCE AGENCIES, or categories of TASK FORCE AGENCIES, responsible for each TMDL Implementation Plan task; and~~

CCX. Whereas, MARB agrees to budget for and to participate in the TASK FORCE, provided that sufficient funds are appropriated by the Congress, in FY 06-07 and future years, and on the condition that funding requirements under this AGREEMENT do not violate the Anti-deficiency Act, and provided that the TASK FORCE AGENCIES agree to relocate the proposed monitoring station from Kitching Channel to the Heacock drainage channel, and use any fees provided by MARB, for participation in this program, to establish and monitor this station.

II. COVENANTS

NOW, THEREFORE, in consideration of the foregoing recitals and mutual covenants contained herein, the TASK FORCE AGENCIES agree as follows:

1. Creation of a Task Force. There is hereby created a “Lake Elsinore and Canyon Lake TMDL Task Force” (“TASK FORCE”) ~~initially~~ consisting of the TASK FORCE AGENCIES and certain Non-Voting, Non-Funding Members as more specifically provided for in paragraph 2 below.
2. Representation on the Task Force.
 - a. Appointment. Concurrently with the execution of this Agreement, each TASK FORCE AGENCY shall, in accordance with such TASK FORCE AGENCY’s own governing provisions, appoint one primary representative to the TASK FORCE and one alternate representative to act in the absence of the primary representative ~~(hereinafter collectively referred to as “REPRESENTATIVES” or individually as “REPRESENTATIVE”)~~. The REPRESENTATIVES shall have the authority to act on behalf of its appointing TASK FORCE AGENCY. The REPRESENTATIVES shall serve at the pleasure of the appointing TASK FORCE AGENCY and may be removed at any time, with or without cause by such TASK FORCE AGENCY; provided, however, that the TASK FORCE AGENCIES acknowledge and agree the continuity of representation on the TASK FORCE is important to the overall effectiveness of the TASK FORCE, and the TASK FORCE AGENCIES further agree to ensure such continuity whenever possible.
 - b. Additional Agencies. The TASK FORCE AGENCIES acknowledge and agree that the effectiveness of the TASK FORCE may be improved by the inclusion of other agencies as additional TASK FORCE AGENCIES to the TASK FORCE. Such agencies may join the TASK FORCE on such written terms and conditions as are acceptable to all then existing TASK FORCE AGENCIES of the TASK FORCE, including, but not limited to, agreed-upon cash contributions for past, present, and/or future work, of the TASK FORCE. The inclusion of such agencies as additional TASK FORCE AGENCIES to the TASK FORCE shall be effected by a written amendment to this AGREEMENT signed by all then existing TASK FORCE AGENCIES. Such additional TASK FORCE AGENCIES shall each appoint their TASK FORCE primary REPRESENTATIVE and alternate REPRESENTATIVE as provided in Section II.2.a above or in said written amendment. The following agencies will be considered for inclusion as additional TASK FORCE AGENCIES in future amendments to this Agreement within the meaning of this section:

Any other named stakeholder in any future amendments of the BASIN PLAN AMENDMENT.

-
- c. Non-Voting, Non-Funding Members. The Regional Board, Lake Elsinore and San Jacinto Watersheds Authority and the San Jacinto River Watershed council are hereby appointed as Non-Voting, Non-Funding Members of the TASK FORCE. Additional Non-Voting, Non-Funding Members may be appointed by a majority vote of the TASK FORCE representatives. Non-Voting, Non-Funding Members appointed herein, and any appointed in the future are authorized only to make recommendations upon the functioning of this TASK FORCE and the development of this program. Federal, State and local regulatory agencies acting as Non-Voting, Non-Funding Members, now or in the future, retain authority to regulate TASK FORCE MEMBERS only to the extent that they are so authorized under State and Federal law.
- d. Dairy and Agricultural Operators. The TASK FORCE AGENCIES acknowledge that the Western Riverside County Agriculture Coalition (WRCAC) shall represent the collective interest of both participating agricultural and dairy operators in the San Jacinto River Watershed in the TASK FORCE at this time. WRCAC shall appoint two primary TASK FORCE REPRESENTATIVES and two alternate REPRESENTATIVES as provided in Section II.2.a. One set of REPRESENTATIVES shall be designated for agricultural operator interests; the other set of REPRESENTATIVES shall be designated for dairy interests for the purposes of this TASK FORCE.
- e. Committees. The TASK FORCE may establish subcommittees, consisting of REPRESENTATIVES and Non-Voting, Non-Funding Members who shall be selected by, and serve at the pleasure of, the TASK FORCE.
- f. Task Force Administrator. A TASK FORCE administrator (hereinafter "TASK FORCE ADMINISTRATOR") shall be appointed by the TASK FORCE. The TASK FORCE ADMINISTRATOR shall have the following administrative responsibilities:
- (1) Organizing and facilitating TASK FORCE meetings;
 - (2) Secretarial, clerical, and administrative services;
 - (3) Managing TASK FORCE funds and preparing annual reports of TASK FORCE assets and expenditures;
 - (4) Retaining TASK FORCE-authorized consultants; and
 - (5) Seeking funding grants to assist with achieving the work of the TASK FORCE and other goals and objectives approved by TASK FORCE AGENCIES.
 - (6) Possible administrator of future pollutant trading (water quality trading) agreements.

The TASK FORCE AGENCIES hereby appoint the Lake Elsinore and San Jacinto Watersheds Authority as the initial TASK FORCE ADMINISTRATOR.

- g. Meetings of the Task Force.
- (i) Frequency and Location. The TASK FORCE shall, by resolution or motion, agree upon the time and place for holding its regular meetings. Special meetings may be called at the request of the TASK FORCE ADMINISTRATOR or by a majority of the TASK FORCE REPRESENTATIVES.
 - (ii) Task Force Chair. The TASK FORCE REPRESENTATIVES shall select a chair and a vice-chair. The term of the chair and vice-chair shall be one year and shall

be rotated among the TASK FORCE REPRESENTATIVES interested in serving as chair.

- (iii) Quorum. One half or more of the REPRESENTATIVES of the TASK FORCE shall constitute a Quorum.
- (iv) Voting. Actions of the TASK FORCE shall be validly taken only when a Quorum is present and upon the affirmative vote of a MAJORITY of the TASK FORCE REPRESENTATIVES. A MAJORITY of the REPRESENTATIVES shall be determined as follows:

Each TASK FORCE AGENCY shall have one vote assigned for each \$1,000 increment of PRO RATA COST SHARE, as described in Paragraph II.5 below, contributed to the TASK FORCE Budget developed for a given fiscal year. A MAJORITY of the REPRESENTATIVES shall consist of greater than 50% of the total votes based on the Budget for the fiscal year during which the action is taken.

- (v) All meetings of the TASK FORCE or any of its committees shall be conducted as may be required by any applicable provisions of the Ralph M. Brown Act (California Government Code §§54950 et seq.). The provisions contained in the Ralph M. Brown Act shall prevail in the event of any conflict with provisions contained in this Agreement.

The TASK FORCE may adopt such additional rules and regulations as may be required for the conduct of its affairs so long as such rules and regulations do not conflict with this Agreement.

- 3. Work of the Task Force. The TASK FORCE shall perform the following tasks in accordance with guidelines established by the Regional Board:
 - a. To retain consulting services to review scientific and other assumptions contained within the TMDL. Consultant(s) shall provide a report identifying preliminary TMDL opportunities such as site specific objectives, pollutant trading strategies, and integration strategies. The final scope of work shall be approved by the Task Force. The report shall specifically consider assumptions supporting the TMDL. The report should also provide preliminary analysis of the ability to achieve in-lake nutrient reductions and verify that load assignments are appropriate. Upon completion of the report, Consultant(s) shall also review work described herein, and make recommendations to ensure that work is specifically designed to resolve any deficiencies, where appropriate. Consultant(s) shall also coordinate development of BASIN PLAN AMENDMENT language, in coordination with the Regional Board, which can be used to revise the TMDLs as part of the Regional Board's Triennial Reviews at a minimum, or no later than by June 2010.
 - b. TMDL IMPLEMENTATION PLAN Task 4 - ~~Develop and~~ Implement a Watershed-wide Nutrient Monitoring Program. This program shall obtain data necessary to update the Lake Elsinore and Canyon Lake Nutrient TMDL, and to determine compliance with interim and final nitrogen and phosphorus allocations, and compliance with the nitrogen and phosphorus TMDLs. Monitoring and management of monitoring data to update the Lake Elsinore and Canyon Lake Nutrient TMDL shall commence immediately upon approval of this Agreement. An annual report summarizing the data collected for the year shall be submitted to the Regional Board by August 15 of each year ~~commencing in 2007~~.
 - c. TMDL IMPLEMENTATION PLAN Task 4 - ~~Develop and~~ Implement a Lake Elsinore and Canyon Lake Nutrient Monitoring Program. This program shall obtain data necessary to update the Lake Elsinore and Canyon Lake Nutrient TMDLs, and to determine compliance with interim and final nitrogen, phosphorus, chlorophyll A and dissolved oxygen numeric

targets. In addition, the monitoring program shall determine the relationship between ammonia toxicity and the total nitrogen allocation to ensure that the total nitrogen allocation will prevent ammonia toxicity in Lake Elsinore and Canyon Lake. ~~Monitoring and management of lake monitoring data shall be deferred based on agreement with the Regional Board until after the Canyon Lake Hypolimnetic Oxygenation System is constructed and will commence upon completion immediately upon approval of this agreement. Thereafter, An annual report summarizing the data collected for the year shall be submitted to the Regional Board by August 15 of each year commencing in 2007.~~

d. TMDL IMPLEMENTATION PLAN Tasks 9 and 10 - ~~Develop and Implement a Plan to Reduce Nutrients infrom Lake Elsinore sediments in Lake Elsinore and Canyon Lakeand develop a sediment nutrient treatment evaluation plan for Canyon Lake.~~ The ~~projects will be based on prepared~~ plans shall evaluate the efficacy of various in-lake treatment technologies to prevent the release of Nutrients from lake sediments as a long-term strategy for control of Nutrients in the sediment. The program may also include a sediment nutrient monitoring program to evaluate the effectiveness of any technologies that may be implemented. Target Date for Completion, ~~Date: July 1, 2015 (Interim TMDL targets) July 1, 2020 (Final TMDL targets)March 31, 2007.~~

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e. TMDL IMPLEMENTATION PLAN Task 11 - ~~Develop and Implement a Plan and Schedule for Updating the Existing Lake Elsinore/San Jacinto River Watershed Nutrient Model and the Canyon Lake and Lake Elsinore In-Lake Models.~~ Develop and implement a plan and schedule to update and execute Watersheds and in-lake models to track the progress of TMDL efforts. In-lake models should be analyzed as soon as sufficient data becomes available. Target Date for Completion: ~~March-December 31, 20072018.~~

f. TMDL IMPLEMENTATION PLAN Task 12 - ~~Investigate, Develop and Implement a Pollutant (Water Quality) Trading Plan.~~ Investigate the feasibility of pollutant trading in the Watersheds, and develop a feasibility plan for Regional Board review and approval. Target Date for Completion: ~~September-December 3031, 20072012.~~

g. ~~Investigate Long Term TMDL Implementation Structure, Cost Sharing Formula and Funding Sources.~~ Investigate possible long term administrative structures, cost sharing formulas and funding sources that can be used to obtain compliance with the TMDL requirements. Target Date for Completion: ~~June-December 3031, 20102012.~~

h. ~~Other Tasks.~~ The TASK FORCE may undertake such other plans, programs and studies as authorized by the TASK FORCE pursuant to II.2.g. of this Agreement.

i. ~~Limitations on MARB and Forest Service.~~ As described above in Section I.h., MARB is an agency of the federal government and is therefore unable to participate in each and every aspect of Section 3 to the same extent as other TASK FORCE MEMBERS. To the extent that it is unable to participate in any tasks under section 3, it reserves the right, in its sole discretion, to participate to the fullest extent that it is able, as a matter of comity.

4. ~~Budgets. Beginning in FY2007 2008, t~~The total Annual Budget, adjusted to remove in-kind services, grant funding and funding credits associated with this Agreement shall not exceed \$800,000, except as authorized by the TASK FORCE via two-thirds approval via votes based on the Budget for the then current fiscal year pursuant to II.2.g. of this Agreement. The TASK FORCE ADMINSTRATOR shall prepare and submit a proposed Budget for each fiscal year of this Agreement to the TASK FORCE AGENCIES by November 30th. The proposed Budget shall include all anticipated costs for the scope(s) of work developed by the TASK FORCE for the next fiscal year. The TASK FORCE Representatives shall approve the Budget by December 31st. Each

TASK FORCE AGENCY shall pay its PRO-RATA SHARE of the approved fiscal year's TASK FORCE Budget and arrears by August 31st of the following year. The Budget for ~~the eighteen (18) month period starting January 1, 2006 and extending through June 30, 2007~~ the fiscal year 2012-2013 and ~~estimated estimate for~~ fiscal year ~~Budgets through June 30, 2010 are~~ 2013-2014 is included as Attachment A to the Agreement. Approval of this Agreement shall constitute approval of the Budget ~~through June 30, 2007~~ for fiscal year 2012-2013. Payment of the ~~fiscal year 2012-2013~~ Budget ~~through June 30, 2007~~ shall be by August 31, ~~2006~~ 2012, or within 30 days of the approval of this Agreement by each TASK FORCE AGENCY, whichever is sooner.

The TASK FORCE ADMINISTRATOR shall endeavor to minimize ~~carry-over~~ fund balances to those necessary to complete work of the TASK FORCE and to maintain contingencies limited to those necessary to ensure work of the TASK FORCE is not impeded. Excess not necessary to complete budgeted work of the TASK FORCE or maintain adequate reserves shall be credited back to the TASK FORCE AGENCIES in the Budget consistent with the PRO-RATA SHARE methodology described in Paragraph II.5 below. THE TASK FORCE AGENCIES shall agree to a reasonable reserve balance as part of each year's Budget.

After September 30 of each year, the TASK FORCE ADMINSTRATOR shall provide an accounting of all PRO RATA SHARES collected via cash or in-kind contributions. If PRO RATA SHARES collected are less than Budget, the TASK FORCE shall meet with Regional Board staff to determine appropriate priorities for scheduled TASK FORCE work and revise Budget based on available funds.

5. Pro-Rata Share Calculation. The annual PRO-RATA SHARE shall be calculated in the following manner:

A. TMDL TASK FORCE costs identified within the Task Force Budget under Part A: Task Force Regulatory/Administrative Budget (see Exhibit "AX") shall be shared equally by the TASK FORCE AGENCIES.

B. TMDL TASK FORCE costs identified within the Task Force Budget under Part B: TMDL Implementation Project Budget (see Exhibit "AX") shall be shared by the TASK FORCE AGENCIES, based upon participation in the individual program or project. The PRO-RATA SHARE for each TASK FORCE AGENCIES under Part B shall be per an amount agreed upon and/or in kind services among via written agreement as detailed between the participating parties.

~~The PRO-RATA SHARE for MS4 CO-PERMITTEES, Agricultural Operators and EVMWD shall be based on the BUDGET reduced by the value of available grant funding identified in Section 1 of Attachment A and in kind services identified in Section 3 of Attachment A (LINE 1k BUDGET). The PRO-RATA SHARE for MS4 CO-PERMITTEES, and Agricultural Operators shall each be 28.5% of the LINE 1k BUDGET. Based on the prior agreement of EVMWD and the CITY OF LAKE ELSINORE involving the sharing of cost for supplemental water into Lake Elsinore, the PRO-RATE SHARE for EVMWD and the CITY OF LAKE ELSINORE shall each be 14.25% of the Line 1k Budget.~~

~~The PRO-RATA SHARE for Dairy shall be 5% of the LINE 1k BUDGET.~~

~~The PRO-RATA SHARE for RCFC&WCD shall be the cash value of the in-kind services described in Section 3 of Attachment A.~~

~~The PRO-RATA SHARE for all other TASK FORCE AGENCIES shall be as a base amount set forth in the Budget.~~

C. The PRO-RATA SHARE for additional TASK FORCE AGENCIES shall be per in-kind

Comment [r6]: Lori Moss Canyon Lake
I thought we were going to define "in kind" value and credits and how and when they can be used to?

Comment [r7]: Yung Nguyen March ARB
Same comment as Comment [AC4] on how was the cost sharing allocation calculated for non-MS4 stakeholder like MARB, MIPA, Caltrans, etc. and was the cost sharing methodology based on load allocation, load reduction or a permutation thereof?

Comment [AC8]: Adam collier March JPA
How is the calculation explained for non-MS4 Permittees such as the MIPA?

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Comment [AC9]: Adam collier March JPA
Need to define "Dischargers" earlier in the recitals. Or define as MS-4 Permittees.

DISCHARGERS has been revised to TASK FORCE AGENCIES

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services and/or an amount agreed upon via written amendment of this AGREEMENT per Section II.2.b.

If the estimated funds collected under the PRO-RATA SHARE calculations exceed the BUDGET, the contributions of MS4 CO-PERMITTEES, EVMWD, City of Lake Elsinore, Agricultural Operators, Dairy and other TASK FORCE AGENCIES contributing in excess of the base amount shall be raised or reduced proportionately based on the percentage of their PRO-RATA SHARE, until the estimated total PRO-RATA SHARES equals the BUDGET.

RCFC&WCD shall provide the TASK FORCE ADMINSTRATOR with annual individual MS4 CO-PERMITTEE cost share distribution of the MS4 CO-PERMITTEES PRO-RATA SHARE for ~~budgets following each~~ Fiscal Year ~~2006-07~~. The methodology used by RCFC&WCD to calculate the MS4 CO-PERMITTEE cost share distribution may be amended at the NPDES MS4 Management Steering Committee.

Pro rata cost shares assigned to TASK FORCE AGENCIES who are not PARTIES to this Agreement shall be considered unfunded portions of the BUDGET and are addressed in Section II.4, paragraph 3 of this Agreement.

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6. In-Kind Credits. The PRO-RATA SHARE of a TASK FORCE AGENCY shall be reduced by the value of IN-KIND CREDITS provided toward agreed-upon budgeted tasks by, or on behalf, of the TASK FORCE AGENCY(S). Credits shall be applied to each budget period and adjusted at the end of each budget year based on actual verified costs unless deferred to a future budget year among the TASK FORCE AGENCIES with credits.

Comment [AC10]: Adam collier March JPA
May want to consider reviewing WRCOG's Credit Agreement for TUMF – very effective and clear process for how cities may receive credit for work done towards certain improvements.

7. Modifications to the TASK FORCE PRO-RATA SHARE methodology. The methodology deriving the TASK FORCE PRO-RATA SHARE as provided in Section II.5 of this Agreement may be modified upon written approval of all then existing TASK FORCE AGENCIES who's PRO-RATA SHARE would be affected.

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8. The TASK FORCE AGENCIES shall cooperate fully with one another to attain the purposes of this Agreement.

9. Nothing in this Agreement, nor the work set forth in this Agreement, nor any activity approved or carried out by the TASK FORCE AGENCIES hereunder, is intended to be nor shall be interpreted as a waiver by TASK FORCE AGENCIES of the "Maximum Extent Practicable" standard set forth in the Clean Water Act (33 U.S.C. Section 1251 *et seq.*).

10. Each TASK FORCE AGENCY shall indemnify, defend, and hold each of the other TASK FORCE AGENCIES, including their special districts, officials, agents, officers, and employees, harmless from and against any and all liability and expense arising from any act or omission of such TASK FORCE AGENCY, its officials, agents, officers, and employees, in connection with this Agreement, including but not limited to defense costs, legal fees, claims, actions, and causes of action for damages of any nature whatsoever, including but not limited to bodily injury, death, personal injury, or property damage; provided, however, that no TASK FORCE AGENCY shall indemnify another TASK FORCE AGENCY for that TASK FORCE AGENCY's own negligence or willful misconduct.

~~MARB and the Forest Service~~, as an agencies-agency of the federal government, ~~are-is~~ unable to indemnify or hold harmless any other TASK FORCE AGENCY for any liability arising under this agreement. ~~MARB and the Forest Service~~ expressly does not indemnify or hold harmless any other TASK FORCE AGENCY for any injuries or liabilities, to itself, to any third party or to ~~MARB, or the Forest Service~~, or its employees under this agreement or any activities carried out

under authority of this agreement.

11. In light of the provisions of Section 895.2 of the Government Code of the State of California imposing certain tort liability jointly upon public entities solely by reason of such entities being parties to an agreement (as defined in Section 895 of said Code), each of the TASK FORCE AGENCIES hereto, pursuant to the authorization contained in Sections 895.4 and 895.6 of said Code, shall assume the full liability imposed upon it or any of its officers, agents, or employees by law for injury caused by any act or omission occurring in the performance of this Agreement to the same extent that such liability would be imposed in the absence of Section 895.2 of said Code. To achieve the above stated purpose, each of the TASK FORCE AGENCIES indemnifies, defends, and holds harmless each other TASK FORCE AGENCY for any liability, cost, or expense that may be imposed upon such other TASK FORCE AGENCY solely by virtue of said Section 895.2. The provisions of Section 2778 of the California Civil Code are made a part hereof as if incorporated herein.

MARB ~~and the Forest Service~~, as ~~an agencies-agency~~ of the federal government, ~~are-is~~ unable to indemnify or hold harmless any other TASK FORCE AGENCY for any liability arising under this agreement. MARB ~~and the Forest Service~~ expressly ~~does~~ not indemnify or hold harmless any TASK FORCE AGENCY for any injuries or liabilities, to itself, to any third party or to MARB ~~or Forest Service~~ or their employees under this agreement or any activities carried out under authority of this agreement. Tort liability for federal employees, including employees of MARB ~~and the Forest Service~~, is expressly authorized and limited by the Federal Tort Claims Act, which will control liability of MARB ~~and the Forest Service~~ and their employees under the terms of this agreement.

12. All obligations of CALTRANS under the terms of this Agreement are subject to the appropriation of the resources by the Legislature and the allocation of resources by the California Transportation Commission. This Agreement has been written before ascertaining the availability of Federal or State legislative appropriation of funds, for the mutual benefit of the TASK FORCE AGENCIES in order to avoid program and fiscal delays that would occur if the Agreement were executed after that determination was made. This Agreement is valid and enforceable as to each of the CALTRANS as if sufficient funds have been made available to CALTRANS by the United States Government or California State Legislature for the purposes set forth in this Agreement. If the United States Government or the California State Legislature does not appropriate sufficient funds for CALTRANS to participate in this Agreement, this Agreement may be amended in writing by the TASK FORCE AGENCIES to reflect any agreed-upon reduction in the percentage of funds contributed by CALTRANS to continue its participation in this Agreement. CALTRANS, however, has the option to withdraw from this Agreement in the event sufficient funds are not appropriated for CALTRANS. Should CALTRANS exercise its option to withdraw from this Agreement, CALTRANS shall remain responsible for its share of liability, if any, incurred while participating in this Agreement.
13. No TASK FORCE AGENCY shall have a financial obligation to any other TASK FORCE AGENCY under this Agreement, except as expressly provided herein.
14. Any notices, invoices, reports, correspondence, or other communication concerning this Agreement shall be directed to the TASK FORCE AGENCY REPRESENTATIVE on file with the TASK FORCE ADMINISTRATOR, except that any TASK FORCE AGENCY may change its name or address by giving the other TASK FORCE AGENCIES at least ten days written notice of the new name or address.
15. The TASK FORCE AGENCIES are, and shall at all times remain as to each other, wholly

independent entities. No TASK FORCE AGENCY to this Agreement shall have power to incur any debt, obligation, or liability on behalf of any other TASK FORCE AGENCY unless expressly provided to the contrary by this Agreement. No employee, agent, or officer of a TASK FORCE AGENCY shall be deemed for any purpose whatsoever to be an agent, employee or officer of another TASK FORCE AGENCY.

16. This Agreement shall be binding upon and shall inure to the benefit of the respective successors, heirs, and assigns of each TASK FORCE AGENCY.
17. This Agreement shall be governed by, interpreted under and construed and enforced in accordance with the laws of the State of California, except as to ~~the Forest Service and~~ the March Air Reserve Base to whom federal law is applicable.
18. If any provision of this Agreement shall be determined by any court to be invalid, illegal or unenforceable to any extent, the remainder of this Agreement shall not be affected and this Agreement shall be construed as if the invalid, illegal, or unenforceable provision had never been contained in this Agreement.
19. Each individual TASK FORCE AGENCY has been represented by its own separate counsel in the preparation and negotiation of this Agreement. Accordingly, this Agreement shall be construed according to its fair language and any ambiguities shall not be resolved against the drafting TASK FORCE AGENCY.
20. Each of the persons signing below on behalf of a TASK FORCE AGENCY represents and warrants that he or she is authorized to sign this Agreement on behalf of such TASK FORCE AGENCY.
21. Duration of Agreement. This Agreement shall terminate June 30, ~~2010-2017~~(unless extended by mutual agreement of all TASK FORCE AGENCIES), provided that all debts and liabilities of the TASK FORCE are satisfied. Notwithstanding the foregoing, each TASK FORCE AGENCY reserves the right to withdraw from the TASK FORCE at any time, upon sixty (60) days' prior written notice to the TASK FORCE. TASK FORCE contingency, projects and studies underway at the time of withdrawal shall continue to be fully funded by the withdrawing TASK FORCE AGENCY until the end of the fiscal year in which the TASK FORCE AGENCY gave notice to withdraw.
22. Counterparts. This Agreement may be executed simultaneously or in counterparts, each of which shall be deemed an original and together shall constitute one and the same instrument.
23. Amendment. This Agreement may not be amended except in a writing signed by all the TASK FORCE AGENCIES.
24. Effective Date. This Agreement shall become effective when it has been executed by all of the TASK FORCE AGENCIES.

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IN WITNESS WHEREOF, the TASK FORCE AGENCIES have executed this AGREEMENT on the date set forth below.

AGENCY

**UNITED STATES FOREST SERVICE
(SAN BERNARDINO AND CLEVELAND
NATIONAL FOREST MANAGEMENT ZONES)**

BY _____

AGENCY

US AIR FORCE (MARCH AIR RESERVE BASE)

BY _____

DATE _____

| DATE _____

| MARCH ~~AIR RESERVE BASE~~ JOINT POWERS AUTHORITY

BY _____

DATE _____

CALIFORNIA DEPARTMENT OF FISH AND GAME

BY _____

DATE _____

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

BY _____

DATE _____

EASTERN MUNICIPAL WATER DISTRICT

BY _____
Board Chair

DATE _____

| LAKE ELSINORE & SAN JACINTO WATERSHEDS PROJECT AUTHORITY

BY _____
Board Chair

DATE _____

CITY OF CANYON LAKE

BY _____
Mayor

DATE _____

CITY OF LAKE ELSINORE

BY _____
Mayor

CALIFORNIA DEPARTMENT OF TRANSPORTATION

BY _____

DATE _____

COUNTY OF RIVERSIDE

BY _____

DATE _____

ELSINORE VALLEY MUNICIPAL WATER DISTRICT

BY _____
Board Chair

DATE _____

WESTERN RIVERSIDE COUNTY AGRICULTURE COALITION

BY _____

DATE _____

CITY OF BEAUMONT

BY _____
Mayor

DATE _____

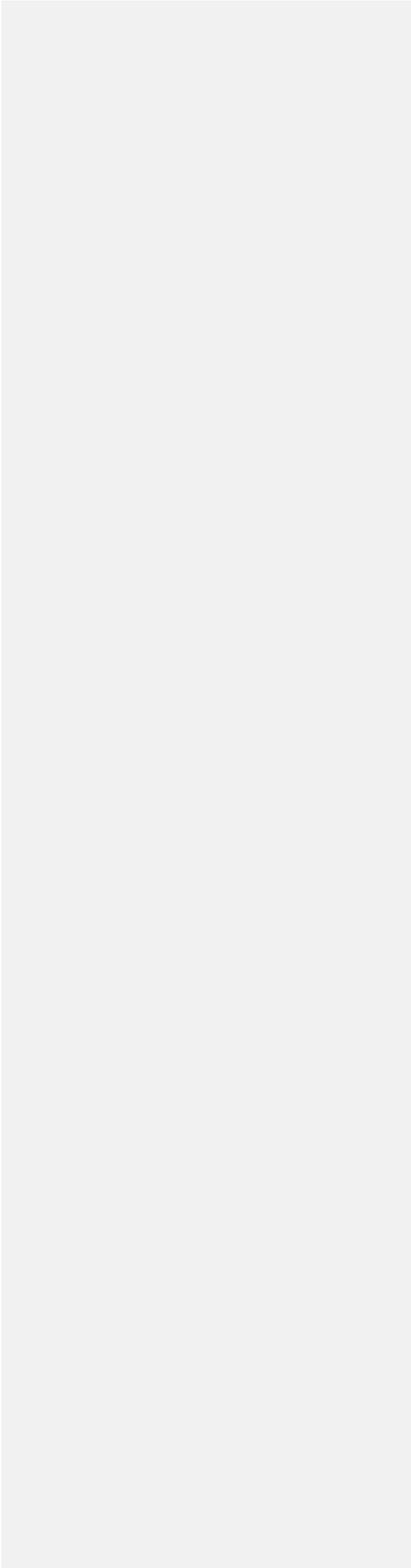
CITY OF HEMET

BY _____
Mayor

DATE _____

CITY OF MORENO VALLEY

BY _____
Mayor



DATE _____

CITY OF MURRIETA

BY _____
Mayor

DATE _____

CITY OF RIVERSIDE

BY _____
Mayor

DATE _____

DATE _____

CITY OF PERRIS

BY _____
Mayor

DATE _____

CITY OF SAN JACINTO

BY _____
Mayor

DATE _____

CITY OF WILDOMAR

BY _____
Mayor

DATE _____

CITY OF MENIFEE

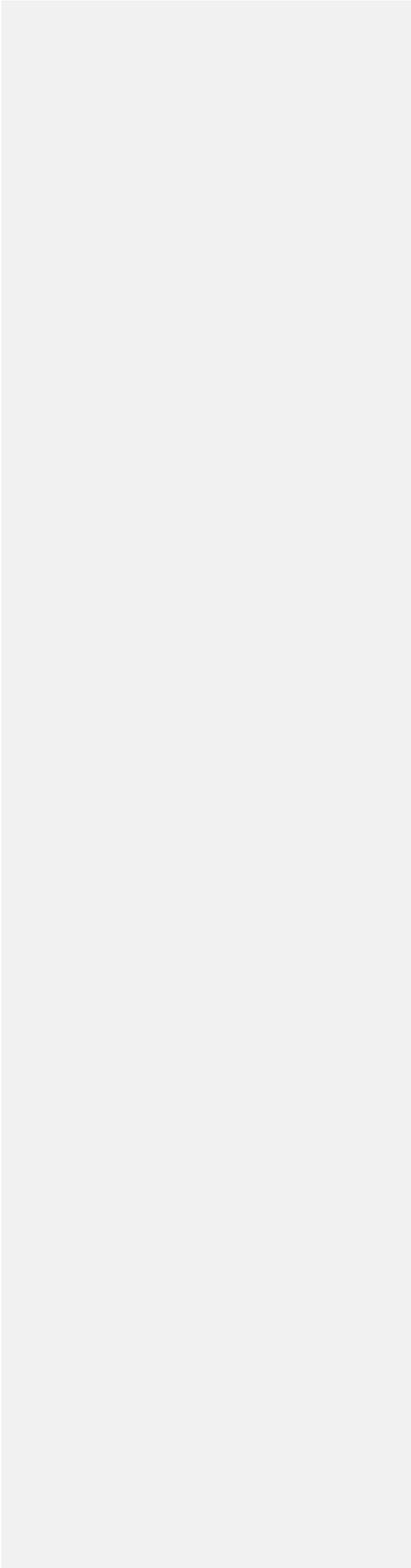
BY _____
Mayor

DATE _____

SANTA ANA REGIONAL WATER QUALITY CONTROL BOARD

BY _____

DATE _____



Approved FY 2012-13 Budget: Lake Elsinore & Canyon Lake TMDL Task Force

Summary Task Force Expenditures

Budget
2012-13

Part A: Task Force Regulatory/Administrative Budget

1. Task Force Administration	\$ 50,000
Task Force Administrator (LESJWA)	
Annual Water Quality Reporting and Database Management	
Amend Task Force Agreement	
Grant Preparation	
2. TMDL Compliance Expert	\$ 50,000
Risk Sciences	
3. Pollutant Trading Program Development	\$ 60,000
TBD	
4. Contingency (approximately 10% of direct stakeholder expenses)	\$ 16,000
TMDL Task Force Regulatory/Administrative Budget \$ 176,000	

Part B: TMDL Implementation Project Budget

1. TMDL Compliance Monitoring	
Watershed-wide Nutrient Monitoring Program	
Watershed-wide Nutrient Monitoring & Report Preparation (Weston Solutions)	\$ 85,000
Wet Year Watershed-wide Monitoring (weather dependant) (RCFC&WCD)	\$ 70,000
Lab Analysis, Watershed-wide Monitoring (RCFC&WCD)	\$ -
Stream gauge O&M (RCFC&WCD)	\$ 15,000
	\$ -
Lake Elsinore Nutrient Monitoring Program	
Lake Elsinore Nutrient Monitoring & Lab Analysis (EVMWD)	\$ -
Canyon Lake Nutrient Monitoring Program	
Canyon Lake Nutrient Monitoring & Lab Analysis (EVMWD)	\$ -
2. Lake Elsinore Project Alternatives	
Aeration & Destratification System O&M	
O&M	\$ -
Pollutant Trading Administration (3% of O&M Costs)	\$ -
Fishery Management O&M	
Carp Removal Program	\$ -
Pollutant Trading Administration (3% of O&M Costs)	\$ -
3. Canyon Lake Project Alternatives	
Hypolimnetic Oxygenation System	
Permitting	\$ 220,000
O&M Agreement	\$ 30,000
Detailed Design (15% of construction cost)	\$ 20,000
Construction	\$ 150,000
O&M	\$ -
Project Administration (10% of budgeted expenses)	\$ -
Pollutant Trading Administration (3% of O&M Costs)	\$ 20,000
	\$ -
Chemical Additions	
Chemicals & Application	\$ -
Pollutant Trading Administration (3% of O&M Costs)	\$ -
	\$ -
TMDL Task Force Implementation Budget \$ 305,000	

TMDL Task Force Budget : \$ 481,000

Stakeholder Contributions Summary

Budget
2012-13

1. Stakeholder Allocation	Administrative	Project Implementation	Total
MS4 Co-Permittees (Total)	\$ 105,600	\$ 249,988	\$ 355,588
Riverside County	\$ 18,981	\$ 44,935	\$ 63,916
City of Beaumont	\$ 2,249	\$ 5,324	\$ 7,574
City of Canyon Lake	\$ 1,958	\$ 4,636	\$ 6,595
City of Hemet	\$ 13,087	\$ 30,980	\$ 44,067
City of Lake Elsinore	\$ 6,955	\$ 16,466	\$ 23,421
City of Moreno Valley	\$ 30,284	\$ 71,691	\$ 101,974
City of Murrieta	\$ 375	\$ 888	\$ 1,263
City of Perris	\$ 9,560	\$ 22,632	\$ 32,192
City of Riverside	\$ 1,710	\$ 4,047	\$ 5,757
City of San Jacinto	\$ 6,420	\$ 15,197	\$ 21,617
City of Menifee	\$ 11,796	\$ 27,925	\$ 39,721
City of Wildomar	\$ 2,225	\$ 5,267	\$ 7,492
Elsinore Valley Municipal Water District (EVMWD)	\$ 8,800	\$ 4,250	\$ 13,050
San Jacinto Agricultural Operators	\$ 8,800	\$ 19,478	\$ 28,278
San Jacinto Dairy & CAFO Operators	\$ 8,800	\$ 10,034	\$ 18,834
CALTRANS - freeway	\$ 8,800	\$ 4,250	\$ 13,050
CA DF&G - San Jacinto Wetlands	\$ 8,800	\$ 4,250	\$ 13,050
Eastern Municipal Water District	\$ 8,800	\$ 4,250	\$ 13,050
March Air Reserve Base Joint Powers Authority	\$ 8,800	\$ 4,250	\$ 13,050
US Air Force (March Air Reserve Base)	\$ 8,800	\$ 4,250	\$ 13,050
Total Funding Required	\$ 176,000	\$ 305,000	\$ 481,000

Notes:

Task Force Administration

- Organize and facilitate TMDL TASK FORCE and TAC meetings,
- Perform secretarial, clerical and administrative services, including providing meeting summaries to TMDL TASK FORCE members,
- Manage TMDL TASK FORCE funds and prepare annual reports of TMDL TASK FORCE assets and expenditures,
- Serve as the contracting party, for the benefit of the TMDL TASK FORCE, for contracts with all consultants, contractors, vendors and other entities,
- Seek funding grants to assist with achieving goals and objectives of the TMDL TASK FORCE.
- Coordinate with other agencies and organizations as necessary to facilitate TMDL TASK FORCE work.
- Administer the preparation of quarterly and annual reports, as required by the TMDL Implementation Plan, and submit them as required by the TMDL Implementation Plan on behalf of the TMDL TASK FORCE.
- Possible administrator of future pollutant trading (water quality trading) agreements.

TMDL Compliance Expert

- Support stakeholders as a Regulatory Strategist and Compliance Expert .
- Develop implementation strategy to address TMDL compliance with nutrient targets
- Plan and prepare Basin Plan Amendment for TMDL
- Sub-contract out pollutant trading agreement preparation by consultant

Stakeholder Contributions Detailed Tables

Task Force Regulatory/Administrative Budget

<i>Task Force Regulatory/Administrative Expenses</i>	<i>Task Force</i>	<i>Allocation</i>
MS4 Co-Permittees	(Total)	\$ 105,600
Riverside County	(equal share partner)	\$ 18,981
City of Beaumont	(equal share partner)	\$ 2,249
City of Canyon Lake	(equal share partner)	\$ 1,958
City of Hemet	(equal share partner)	\$ 13,087
City of Lake Elsinore	(equal share partner)	\$ 6,955
City of Moreno Valley	(equal share partner)	\$ 30,284
City of Murrieta	(equal share partner)	\$ 375
City of Perris	(equal share partner)	\$ 9,560
City of Riverside	(equal share partner)	\$ 1,710
City of San Jacinto	(equal share partner)	\$ 6,420
City of Menifee	(equal share partner)	\$ 11,796
City of Wildomar	(equal share partner)	\$ 2,225
Elsinore Valley Municipal Water District (EVMWD)	(equal share partner)	\$ 8,800
San Jacinto Agricultural Operators	(equal share partner)	\$ 8,800
San Jacinto Dairy & CAFO Operators	(equal share partner)	\$ 8,800
CALTRANS - freeway	(equal share partner)	\$ 8,800
CA DF&G - San Jacinto Wetlands	(equal share partner)	\$ 8,800
Eastern Municipal Water District	(equal share partner)	\$ 8,800
March Air Reserve Base Joint Powers Authority	(equal share partner)	\$ 8,800
US Air Force (March Air Reserve Base)	(equal share partner)	\$ 8,800
	Funding Required	\$ 176,000

TMDL Implementation Project Budget

TMDL Compliance Monitoring Expenses

<i>Watershed-wide Nutrient Monitoring Program</i>	<i>Task Force</i>	<i>Allocation</i>
MS4 Co-Permittees	(Total)	\$ 51,000
Riverside County	(equal share partner)	\$ 9,167
City of Beaumont	(equal share partner)	\$ 1,086
City of Canyon Lake	(equal share partner)	\$ 946
City of Hemet	(equal share partner)	\$ 6,320
City of Lake Elsinore	(equal share partner)	\$ 3,359
City of Moreno Valley	(equal share partner)	\$ 14,626
City of Murrieta	(equal share partner)	\$ 181
City of Perris	(equal share partner)	\$ 4,617
City of Riverside	(equal share partner)	\$ 826
City of San Jacinto	(equal share partner)	\$ 3,100
City of Menifee	(equal share partner)	\$ 5,697
City of Wildomar	(equal share partner)	\$ 1,075
Elsinore Valley Municipal Water District (EVMWD)	(equal share partner)	\$ 4,250
San Jacinto Agricultural Operators	(equal share partner)	\$ 4,250
San Jacinto Dairy & CAFO Operators	(equal share partner)	\$ 4,250
CALTRANS - freeway	(equal share partner)	\$ 4,250
CA DF&G - San Jacinto Wetlands	(equal share partner)	\$ 4,250
Eastern Municipal Water District	(equal share partner)	\$ 4,250
March Air Reserve Base Joint Powers Authority	(equal share partner)	\$ 4,250
US Air Force (March Air Reserve Base)	(equal share partner)	\$ 4,250
	Funding Required	\$ 85,000

Lake Elsinore Nutrient Monitoring Program	Task Force	Allocation
MS4 Co-Permittees	(Total)	\$ -
Riverside County	(equal share partner)	\$ -
City of Beaumont	(equal share partner)	\$ -
City of Canyon Lake	(equal share partner)	\$ -
City of Hemet	(equal share partner)	\$ -
City of Lake Elsinore	(equal share partner)	\$ -
City of Moreno Valley	(equal share partner)	\$ -
City of Murrieta	(equal share partner)	\$ -
City of Perris	(equal share partner)	\$ -
City of Riverside	(equal share partner)	\$ -
City of San Jacinto	(equal share partner)	\$ -
City of Menifee	(equal share partner)	\$ -
City of Wildomar	(equal share partner)	\$ -
Elsinore Valley Municipal Water District (EVMWD)	(equal share partner)	\$ -
San Jacinto Agricultural Operators	(equal share partner)	\$ -
San Jacinto Dairy & CAFO Operators	(equal share partner)	\$ -
CALTRANS - freeway	(equal share partner)	\$ -
CA DF&G - San Jacinto Wetlands	(equal share partner)	\$ -
Eastern Municipal Water District	(equal share partner)	\$ -
March Air Reserve Base Joint Powers Authority	(equal share partner)	\$ -
US Air Force (March Air Reserve Base)	(equal share partner)	\$ -
Funding Required		\$ -

Canyon Lake Nutrient Monitoring Program	Participants	Allocation
MS4 Co-Permittees	(Total)	\$ -
Riverside County	(equal share partner)	\$ -
City of Beaumont	(equal share partner)	\$ -
City of Canyon Lake	(equal share partner)	\$ -
City of Hemet	(equal share partner)	\$ -
City of Lake Elsinore	(equal share partner)	\$ -
City of Moreno Valley	(equal share partner)	\$ -
City of Murrieta	(equal share partner)	\$ -
City of Perris	(equal share partner)	\$ -
City of Riverside	(equal share partner)	\$ -
City of San Jacinto	(equal share partner)	\$ -
City of Menifee	(equal share partner)	\$ -
City of Wildomar	(equal share partner)	\$ -
Elsinore Valley Municipal Water District (EVMWD)	(equal share partner)	\$ -
San Jacinto Agricultural Operators	(equal share partner)	\$ -
San Jacinto Dairy & CAFO Operators	(equal share partner)	\$ -
CALTRANS - freeway	(equal share partner)	\$ -
CA DF&G - San Jacinto Wetlands	(equal share partner)	\$ -
Eastern Municipal Water District	(equal share partner)	\$ -
March Air Reserve Base Joint Powers Authority	(equal share partner)	\$ -
US Air Force (March Air Reserve Base)	(equal share partner)	\$ -
Funding Required		\$ -

Lake Elsinore Project Alternatives

Aeration & Destratification System O&M	Participants	Allocation
MS4 Co-Permittees	<i>(equal share partner)</i>	\$ -
Riverside County	<i>(equal share partner)</i>	\$ -
City of Beaumont	<i>(TBD)</i>	\$ -
City of Canyon Lake	<i>(TBD)</i>	\$ -
City of Hemet	<i>(TBD)</i>	\$ -
City of Lake Elsinore	<i>(equal share partner)</i>	\$ -
City of Moreno Valley	<i>(TBD)</i>	\$ -
City of Murrieta	<i>(TBD)</i>	\$ -
City of Perris	<i>(TBD)</i>	\$ -
City of Riverside	<i>(TBD)</i>	\$ -
City of San Jacinto	<i>(TBD)</i>	\$ -
City of Menifee	<i>(TBD)</i>	\$ -
City of Wildomar	<i>(TBD)</i>	\$ -
Elsinore Valley Municipal Water District (EVMWD)	<i>(equal share partner)</i>	\$ -
San Jacinto Agricultural Operators	<i>(TBD)</i>	\$ -
San Jacinto Dairy & CAFO Operators	<i>(TBD)</i>	\$ -
CALTRANS - freeway	<i>(TBD)</i>	\$ -
CA DF&G - San Jacinto Wetlands	<i>(TBD)</i>	\$ -
Eastern Municipal Water District	<i>(TBD)</i>	\$ -
March Air Reserve Base Joint Powers Authority	<i>(TBD)</i>	\$ -
US Air Force (March Air Reserve Base)	<i>(TBD)</i>	\$ -
Funding Required		\$ -

Lake Elsinore Project Alternatives

Fishery Management O&M	Participants	Allocation
MS4 Co-Permittees	<i>(Total)</i>	\$ -
Riverside County	<i>(TBD)</i>	\$ -
City of Beaumont	<i>(TBD)</i>	\$ -
City of Canyon Lake	<i>(TBD)</i>	\$ -
City of Hemet	<i>(TBD)</i>	\$ -
City of Lake Elsinore	<i>(TBD)</i>	\$ -
City of Moreno Valley	<i>(TBD)</i>	\$ -
City of Murrieta	<i>(TBD)</i>	\$ -
City of Perris	<i>(TBD)</i>	\$ -
City of Riverside	<i>(TBD)</i>	\$ -
City of San Jacinto	<i>(TBD)</i>	\$ -
City of Menifee	<i>(TBD)</i>	\$ -
City of Wildomar	<i>(TBD)</i>	\$ -
Elsinore Valley Municipal Water District (EVMWD)	<i>(TBD)</i>	\$ -
San Jacinto Agricultural Operators	<i>(TBD)</i>	\$ -
San Jacinto Dairy & CAFO Operators	<i>(TBD)</i>	\$ -
CALTRANS - freeway	<i>(TBD)</i>	\$ -
CA DF&G - San Jacinto Wetlands	<i>(TBD)</i>	\$ -
Eastern Municipal Water District	<i>(TBD)</i>	\$ -
March Air Reserve Base Joint Powers Authority	<i>(TBD)</i>	\$ -
US Air Force (March Air Reserve Base)	<i>(TBD)</i>	\$ -
Funding Required		\$ -

Canyon Lake Project Alternatives

Hypolimnetic Oxygenation System

	Participants	Allocation
MS4 Co-Permittees	(Total)	\$ 198,988
Riverside County	<i>(Cost Formula* Allocation)</i>	\$ 35,767
City of Beaumont	<i>(not included)</i>	\$ 4,238
City of Canyon Lake	<i>(Cost Formula* Allocation)</i>	\$ 3,690
City of Hemet	<i>(Cost Formula* Allocation)</i>	\$ 24,660
City of Lake Elsinore	<i>(Cost Formula* Allocation)</i>	\$ 13,106
City of Moreno Valley	<i>(Cost Formula* Allocation)</i>	\$ 57,065
City of Murrieta	<i>(not included)</i>	\$ 707
City of Perris	<i>(Cost Formula* Allocation)</i>	\$ 18,015
City of Riverside	<i>(Cost Formula* Allocation)</i>	\$ 3,221
City of San Jacinto	<i>(not included)</i>	\$ 12,097
City of Menifee	<i>(Cost Formula* Allocation)</i>	\$ 22,228
City of Wildomar	<i>(not included)</i>	\$ 4,193
Elsinore Valley Municipal Water District (EVMWD)	<i>(not included)</i>	\$ -
San Jacinto Agricultural Operators	<i>(Cost Formula* Allocation)</i>	\$ 15,228
San Jacinto Dairy & CAFO Operators	<i>(Cost Formula* Allocation)</i>	\$ 5,784
CALTRANS - freeway	<i>(TBD)</i>	\$ -
CA DF&G - San Jacinto Wetlands	<i>(TBD)</i>	\$ -
Eastern Municipal Water District	<i>(not included)</i>	\$ -
March Air Reserve Base Joint Powers Authority	<i>(TBD)</i>	\$ -
US Air Force (March Air Reserve Base)	<i>(TBD)</i>	\$ -
		\$ 220,000

Cost formula: based upon the 1:1 ratio of TP to TN contributions from urban and agricultural runoff as projected in the respective Riverside County Comprehensive Nutrient Reduction Plan and San Jacinto Agricultural Nutrient Reduction Plan

Canyon Lake Project Alternatives

Chemical Additions

	Participants	Allocation
MS4 Co-Permittees (Total)	(Total)	\$ -
Riverside County	<i>(TBD)</i>	\$ -
City of Beaumont	<i>(not included)</i>	\$ -
City of Canyon Lake	<i>(TBD)</i>	\$ -
City of Hemet	<i>(TBD)</i>	\$ -
City of Lake Elsinore	<i>(TBD)</i>	\$ -
City of Moreno Valley	<i>(TBD)</i>	\$ -
City of Murrieta	<i>(not included)</i>	\$ -
City of Perris	<i>(TBD)</i>	\$ -
City of Riverside	<i>(TBD)</i>	\$ -
City of San Jacinto	<i>(not included)</i>	\$ -
City of Menifee	<i>(TBD)</i>	\$ -
City of Wildomar	<i>(not included)</i>	\$ -
Elsinore Valley Municipal Water District (EVMWD)	<i>(not included)</i>	\$ -
San Jacinto Agricultural Operators	<i>(TBD)</i>	\$ -
San Jacinto Dairy & CAFO Operators	<i>(TBD)</i>	\$ -
CALTRANS - freeway	<i>(TBD)</i>	\$ -
CA DF&G - San Jacinto Wetlands	<i>(TBD)</i>	\$ -
Eastern Municipal Water District	<i>(not included)</i>	\$ -
March Air Reserve Base Joint Powers Authority	<i>(TBD)</i>	\$ -
US Air Force (March Air Reserve Base)	<i>(TBD)</i>	\$ -
	Funding Required	\$ -

Stakeholder Contributions Detailed Tables

Task Force Regulatory/Administrative Budget

	Participant	Allocation
MS4 Co-Permittees (Total)		\$ 355,588
Task Force Regulatory/Administrative Expenses	<i>(all equal share partners)</i>	\$ 105,600
TMDL Compliance Monitoring Expenses		
Watershed-wide Nutrient Monitoring Program	<i>(all equal share partners)</i>	\$ 51,000
Lake Elsinore Nutrient Monitoring Program	<i>(all equal share partners)</i>	\$ -
Canyon Lake Nutrient Monitoring Program	<i>(many equal share partners)</i>	\$ -
Lake Elsinore Project Alternatives		
Aeration & Destratification System O&M	<i>(many equal share partners)</i>	\$ -
Fishery Management O&M	<i>(TBD)</i>	\$ -
Canyon Lake Project Alternatives		
Hypolimnetic Oxygenation System	<i>(many equal share partners)</i>	\$ 198,988
Chemical Additions	<i>(TBD)</i>	\$ -
Riverside County		\$ 63,916
Task Force Regulatory/Administrative Expenses	<i>(equal share partner)</i>	\$ 18,981
TMDL Compliance Monitoring Expenses		
Watershed-wide Nutrient Monitoring Program	<i>(equal share partner)</i>	\$ 9,167
Lake Elsinore Nutrient Monitoring Program	<i>(equal share partner)</i>	\$ -
Canyon Lake Nutrient Monitoring Program	<i>(equal share partner)</i>	\$ -
Lake Elsinore Project Alternatives		
Aeration & Destratification System O&M	<i>(equal share partner)</i>	\$ -
Fishery Management O&M	<i>(TBD)</i>	\$ -
Canyon Lake Project Alternatives		
Hypolimnetic Oxygenation System	<i>(Cost Formula* Allocation)</i>	\$ 35,767
Chemical Additions	<i>(TBD)</i>	\$ -
City of Beaumont		\$ 7,574
Task Force Regulatory/Administrative Expenses	<i>(equal share partner)</i>	\$ 2,249
TMDL Compliance Monitoring Expenses		
Watershed-wide Nutrient Monitoring Program	<i>(equal share partner)</i>	\$ 1,086
Lake Elsinore Nutrient Monitoring Program	<i>(equal share partner)</i>	\$ -
Canyon Lake Nutrient Monitoring Program	<i>(equal share partner)</i>	\$ -
Lake Elsinore Project Alternatives		
Aeration & Destratification System O&M	<i>(TBD)</i>	\$ -
Fishery Management O&M	<i>(TBD)</i>	\$ -
Canyon Lake Project Alternatives		
Hypolimnetic Oxygenation System	<i>(not included)</i>	\$ 4,238
Chemical Additions	<i>(not included)</i>	\$ -
City of Canyon Lake		\$ 6,595
Task Force Regulatory/Administrative Expenses	<i>(equal share partner)</i>	\$ 1,958
TMDL Compliance Monitoring Expenses		
Watershed-wide Nutrient Monitoring Program	<i>(equal share partner)</i>	\$ 946
Lake Elsinore Nutrient Monitoring Program	<i>(equal share partner)</i>	\$ -
Canyon Lake Nutrient Monitoring Program	<i>(equal share partner)</i>	\$ -
Lake Elsinore Project Alternatives		
Aeration & Destratification System O&M	<i>(TBD)</i>	\$ -
Fishery Management O&M	<i>(TBD)</i>	\$ -
Canyon Lake Project Alternatives		
Hypolimnetic Oxygenation System	<i>(Cost Formula* Allocation)</i>	\$ 3,690
Chemical Additions	<i>(TBD)</i>	\$ -

City of Hemet		\$ 44,067
Task Force Regulatory/Administrative Expenses	(equal share partner)	\$ 13,087
TMDL Compliance Monitoring Expenses		
Watershed-wide Nutrient Monitoring Program	(equal share partner)	\$ 6,320
Lake Elsinore Nutrient Monitoring Program	(equal share partner)	\$ -
Canyon Lake Nutrient Monitoring Program	(equal share partner)	\$ -
Lake Elsinore Project Alternatives		
Aeration & Destratification System O&M	(TBD)	\$ -
Fishery Management O&M	(TBD)	\$ -
Canyon Lake Project Alternatives		
Hypolimnetic Oxygenation System	(Cost Formula* Allocation)	\$ 24,660
Chemical Additions	(TBD)	\$ -
City of Lake Elsinore		\$ 23,421
Task Force Regulatory/Administrative Expenses	(equal share partner)	\$ 6,955
TMDL Compliance Monitoring Expenses		
Watershed-wide Nutrient Monitoring Program	(equal share partner)	\$ 3,359
Lake Elsinore Nutrient Monitoring Program	(equal share partner)	\$ -
Canyon Lake Nutrient Monitoring Program	(equal share partner)	\$ -
Lake Elsinore Project Alternatives		
Aeration & Destratification System O&M	(equal share partner)	\$ -
Fishery Management O&M	(TBD)	\$ -
Canyon Lake Project Alternatives		
Hypolimnetic Oxygenation System	(Cost Formula* Allocation)	\$ 13,106
Chemical Additions	(TBD)	\$ -
City of Moreno Valley		\$ 101,974
Task Force Regulatory/Administrative Expenses	(equal share partner)	\$ 30,284
TMDL Compliance Monitoring Expenses		
Watershed-wide Nutrient Monitoring Program	(equal share partner)	\$ 14,626
Lake Elsinore Nutrient Monitoring Program	(equal share partner)	\$ -
Canyon Lake Nutrient Monitoring Program	(equal share partner)	\$ -
Lake Elsinore Project Alternatives		
Aeration & Destratification System O&M	(TBD)	\$ -
Fishery Management O&M	(TBD)	\$ -
Canyon Lake Project Alternatives		
Hypolimnetic Oxygenation System	(Cost Formula* Allocation)	\$ 57,065
Chemical Additions	(TBD)	\$ -
City of Murrieta		\$ 1,263
Task Force Regulatory/Administrative Expenses	(equal share partner)	\$ 375
TMDL Compliance Monitoring Expenses		
Watershed-wide Nutrient Monitoring Program	(equal share partner)	\$ 181
Lake Elsinore Nutrient Monitoring Program	(equal share partner)	\$ -
Canyon Lake Nutrient Monitoring Program	(equal share partner)	\$ -
Lake Elsinore Project Alternatives		
Aeration & Destratification System O&M	(TBD)	\$ -
Fishery Management O&M	(TBD)	\$ -
Canyon Lake Project Alternatives		
Hypolimnetic Oxygenation System	(not included)	\$ 707
Chemical Additions	(TBD)	\$ -

City of Perris		\$ 32,192
Task Force Regulatory/Administrative Expenses	(equal share partner)	\$ 9,560
TMDL Compliance Monitoring Expenses		
Watershed-wide Nutrient Monitoring Program	(equal share partner)	\$ 4,617
Lake Elsinore Nutrient Monitoring Program	(equal share partner)	\$ -
Canyon Lake Nutrient Monitoring Program	(equal share partner)	\$ -
Lake Elsinore Project Alternatives		
Aeration & Destratification System O&M	(TBD)	\$ -
Fishery Management O&M	(TBD)	\$ -
Canyon Lake Project Alternatives		
Hypolimnetic Oxygenation System	(Cost Formula* Allocation)	\$ 18,015
Chemical Additions	(TBD)	\$ -
City of Riverside		\$ 5,757
Task Force Regulatory/Administrative Expenses	(equal share partner)	\$ 1,710
TMDL Compliance Monitoring Expenses		
Watershed-wide Nutrient Monitoring Program	(equal share partner)	\$ 826
Lake Elsinore Nutrient Monitoring Program	(equal share partner)	\$ -
Canyon Lake Nutrient Monitoring Program	(equal share partner)	\$ -
Lake Elsinore Project Alternatives		
Aeration & Destratification System O&M	(TBD)	\$ -
Fishery Management O&M	(TBD)	\$ -
Canyon Lake Project Alternatives		
Hypolimnetic Oxygenation System	(Cost Formula* Allocation)	\$ 3,221
Chemical Additions	(TBD)	\$ -
City of San Jacinto		\$ 21,617
Task Force Regulatory/Administrative Expenses	(equal share partner)	\$ 6,420
TMDL Compliance Monitoring Expenses		
Watershed-wide Nutrient Monitoring Program	(equal share partner)	\$ 3,100
Lake Elsinore Nutrient Monitoring Program	(equal share partner)	\$ -
Canyon Lake Nutrient Monitoring Program	(equal share partner)	\$ -
Lake Elsinore Project Alternatives		
Aeration & Destratification System O&M	(TBD)	\$ -
Fishery Management O&M	(TBD)	\$ -
Canyon Lake Project Alternatives		
Hypolimnetic Oxygenation System	(not included)	\$ 12,097
Chemical Additions	(TBD)	\$ -
City of Menifee		\$ 39,721
Task Force Regulatory/Administrative Expenses	(equal share partner)	\$ 11,796
TMDL Compliance Monitoring Expenses		
Watershed-wide Nutrient Monitoring Program	(equal share partner)	\$ 5,697
Lake Elsinore Nutrient Monitoring Program	(equal share partner)	\$ -
Canyon Lake Nutrient Monitoring Program	(equal share partner)	\$ -
Lake Elsinore Project Alternatives		
Aeration & Destratification System O&M	(TBD)	\$ -
Fishery Management O&M	(TBD)	\$ -
Canyon Lake Project Alternatives		
Hypolimnetic Oxygenation System	(Cost Formula* Allocation)	\$ 22,228
Chemical Additions	(TBD)	\$ -

City of Wildomar		\$ 7,492
Task Force Regulatory/Administrative Expenses	(equal share partner)	\$ 2,225
TMDL Compliance Monitoring Expenses		
Watershed-wide Nutrient Monitoring Program	(equal share partner)	\$ 1,075
Lake Elsinore Nutrient Monitoring Program	(equal share partner)	\$ -
Canyon Lake Nutrient Monitoring Program	(equal share partner)	\$ -
Lake Elsinore Project Alternatives		
Aeration & Destratification System O&M	(TBD)	\$ -
Fishery Management O&M	(TBD)	\$ -
Canyon Lake Project Alternatives		
Hypolimnetic Oxygenation System	(not included)	\$ 4,193
Chemical Additions	(TBD)	\$ -
Elsinore Valley Municipal Water District (EVMWD)		\$ 13,050
Task Force Regulatory/Administrative Expenses	(equal share partner)	\$ 8,800
TMDL Compliance Monitoring Expenses		
Watershed-wide Nutrient Monitoring Program	(equal share partner)	\$ 4,250
Lake Elsinore Nutrient Monitoring Program	(equal share partner)	\$ -
Canyon Lake Nutrient Monitoring Program	(not included)	\$ -
Lake Elsinore Project Alternatives		
Aeration & Destratification System O&M	(equal share partner)	\$ -
Fishery Management O&M	(TBD)	\$ -
Canyon Lake Project Alternatives		
Hypolimnetic Oxygenation System	(not included)	\$ -
Chemical Additions	(not included)	\$ -
San Jacinto Agricultural Operators		\$ 28,278
Task Force Regulatory/Administrative Expenses	(equal share partner)	\$ 8,800
TMDL Compliance Monitoring Expenses		
Watershed-wide Nutrient Monitoring Program	(equal share partner)	\$ 4,250
Lake Elsinore Nutrient Monitoring Program	(equal share partner)	\$ -
Canyon Lake Nutrient Monitoring Program	(equal share partner)	\$ -
Lake Elsinore Project Alternatives		
Aeration & Destratification System O&M	(TBD)	\$ -
Fishery Management O&M	(TBD)	\$ -
Canyon Lake Project Alternatives		
Hypolimnetic Oxygenation System	(Cost Formula* Allocation)	\$ 15,228
Chemical Additions	(TBD)	\$ -
San Jacinto Dairy & CAFO Operators		\$ 18,834
Task Force Regulatory/Administrative Expenses	(equal share partner)	\$ 8,800
TMDL Compliance Monitoring Expenses		
Watershed-wide Nutrient Monitoring Program	(equal share partner)	\$ 4,250
Lake Elsinore Nutrient Monitoring Program	(equal share partner)	\$ -
Canyon Lake Nutrient Monitoring Program	(equal share partner)	\$ -
Lake Elsinore Project Alternatives		
Aeration & Destratification System O&M	(TBD)	\$ -
Fishery Management O&M	(TBD)	\$ -
Canyon Lake Project Alternatives		
Hypolimnetic Oxygenation System	(Cost Formula* Allocation)	\$ 5,784
Chemical Additions	(TBD)	\$ -

CALTRANS - freeway		\$ 13,050
Task Force Regulatory/Administrative Expenses	(equal share partner)	\$ 8,800
TMDL Compliance Monitoring Expenses		
Watershed-wide Nutrient Monitoring Program	(equal share partner)	\$ 4,250
Lake Elsinore Nutrient Monitoring Program	(equal share partner)	\$ -
Canyon Lake Nutrient Monitoring Program	(equal share partner)	\$ -
Lake Elsinore Project Alternatives		
Aeration & Destratification System O&M	(TBD)	\$ -
Fishery Management O&M	(TBD)	\$ -
Canyon Lake Project Alternatives		
Hypolimnetic Oxygenation System	(TBD)	\$ -
Chemical Additions	(TBD)	\$ -
CA DF&G - San Jacinto Wetlands		\$ 13,050
Task Force Regulatory/Administrative Expenses	(equal share partner)	\$ 8,800
TMDL Compliance Monitoring Expenses		
Watershed-wide Nutrient Monitoring Program	(equal share partner)	\$ 4,250
Lake Elsinore Nutrient Monitoring Program	(equal share partner)	\$ -
Canyon Lake Nutrient Monitoring Program	(equal share partner)	\$ -
Lake Elsinore Project Alternatives		
Aeration & Destratification System O&M	(TBD)	\$ -
Fishery Management O&M	(TBD)	\$ -
Canyon Lake Project Alternatives		
Hypolimnetic Oxygenation System	(TBD)	\$ -
Chemical Additions	(TBD)	\$ -
Eastern Municipal Water District		\$ 13,050
Task Force Regulatory/Administrative Expenses	(equal share partner)	\$ 8,800
TMDL Compliance Monitoring Expenses		
Watershed-wide Nutrient Monitoring Program	(equal share partner)	\$ 4,250
Lake Elsinore Nutrient Monitoring Program	(equal share partner)	\$ -
Canyon Lake Nutrient Monitoring Program	(equal share partner)	\$ -
Lake Elsinore Project Alternatives		
Aeration & Destratification System O&M	(TBD)	\$ -
Fishery Management O&M	(TBD)	\$ -
Canyon Lake Project Alternatives		
Hypolimnetic Oxygenation System	(not included)	\$ -
Chemical Additions	(not included)	\$ -
March Air Reserve Base Joint Powers Authority		\$ 13,050
Task Force Regulatory/Administrative Expenses	(equal share partner)	\$ 8,800
TMDL Compliance Monitoring Expenses		
Watershed-wide Nutrient Monitoring Program	(equal share partner)	\$ 4,250
Lake Elsinore Nutrient Monitoring Program	(equal share partner)	\$ -
Canyon Lake Nutrient Monitoring Program	(equal share partner)	\$ -
Lake Elsinore Project Alternatives		
Aeration & Destratification System O&M	(TBD)	\$ -
Fishery Management O&M	(TBD)	\$ -
Canyon Lake Project Alternatives		
Hypolimnetic Oxygenation System	(TBD)	\$ -
Chemical Additions	(TBD)	\$ -
US Air Force (March Air Reserve Base)		\$ 13,050
Task Force Regulatory/Administrative Expenses	(equal share partner)	\$ 8,800
TMDL Compliance Monitoring Expenses		
Watershed-wide Nutrient Monitoring Program	(equal share partner)	\$ 4,250
Lake Elsinore Nutrient Monitoring Program	(equal share partner)	\$ -
Canyon Lake Nutrient Monitoring Program	(equal share partner)	\$ -
Lake Elsinore Project Alternatives		
Aeration & Destratification System O&M	(TBD)	\$ -
Fishery Management O&M	(TBD)	\$ -
Canyon Lake Project Alternatives		
Hypolimnetic Oxygenation System	(TBD)	\$ -
Chemical Additions	(TBD)	\$ -
Total:		\$ 481,000

PROJECTED - Stakeholder Contributions through FY 2010-11Cummulative
Credit / (Debit)

	Cummulative Credit / (Debit)
MS4 Co-Permittees (Total)	\$ 359,205
Riverside County	\$ 72,513
City of Beaumont	\$ 5,009
City of Canyon Lake	\$ 5,384
City of Hemet	\$ 33,909
City of Lake Elsinore	\$ 106,017
City of Moreno Valley	\$ 77,550
City of Murrieta	\$ 2,247
City of Perris	\$ 23,561
City of Riverside	\$ 3,642
City of San Jacinto	\$ 15,348
City of Menifee	\$ 11,798
City of Wildomar	\$ 2,225
Elsinore Valley Municipal Water District (EVMWD)	\$ 91,830
San Jacinto Agricultural Operators	\$ 28,985
San Jacinto Dairy & CAFO Operators	\$ 16,452
CALTRANS - freeway	\$ -
CA DF&G - San Jacinto Wetlands	\$ -
US Forest Service (USFS)	\$ -
Eastern Municipal Water District	\$ -
March Air Reserve Base Joint Powers Authority	\$ -
US Air Force (March Air Reserve Base)	\$ -
Total Credits	\$ 855,677

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