Revision of the Lake Elsinore & Canyon Lake Nutrient TMDL

CDM Smith
Team & Risk Sciences

Compliance Demonstration

October 30, 2018

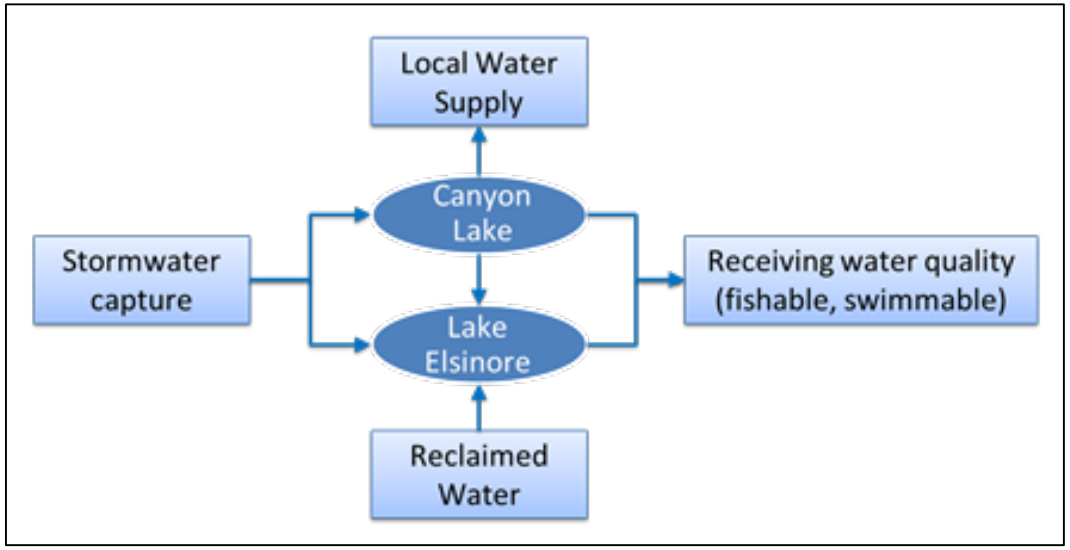
Lake Elsinore/Canyon Lake Task Force Meeting

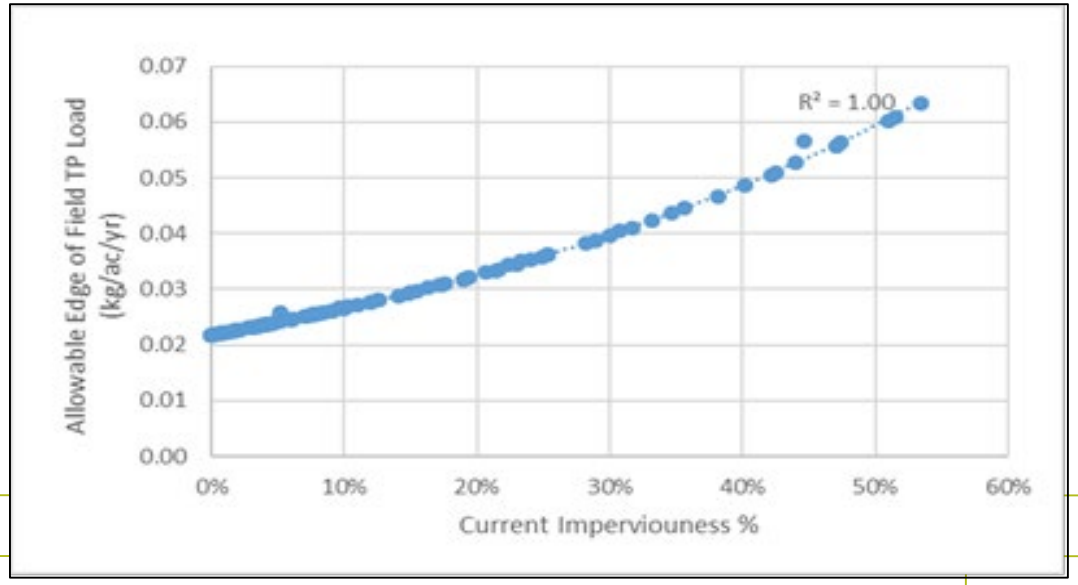
RISK SCIENCES

CDM Smith

One Water Vision

- Allocations increase with current runoff volume
- Based only on reference nutrient concentration
- Increased volume to Canyon Lake and Lake Elsinore supports MUN, REC, and WARM uses





Watershed Compliance Demonstration

- Approach 3: Average concentration (10 yrs) of watershed runoff samples
- Limited value for watershed BMPs that retain volume on-site

Step 1. Compile 10 years of wet weather compsoite sample concentrations

Year	Storm 1 TP (mg/L)	Storm 2 TP (mg/L)	Storm 3 TP (mg/L)	Storm 1 TN (mg/L)	Storm 2 TN (mg/L)	Storm 3 TN (mg/L)
Year 1	0.27	0.51	0.21	2.00	1.60	0.93
Year 2	0.20	0.43	0.33	2.40	2.30	1.65
Year 3	0.18	0.32	0.90	4.20	2.10	1.34
Year 4	0.16	0.44	0.32	4.30	2.70	1.84
Year 5	0.10	0.14	0.14	2.10	3.77	3.28
Year 6	0.11	0.21	0.11	1.40	4.12	2.89
Year 7	0.33	0.24	2.88 *	1.20	2.11	6.02 *
Year 8	0.29	0.37	0.20	0.80	2.36	0.68
Year 9	0.42	0.53	0.21	0.96	0.78	0.83
Year 10	0.68	0.32	0.32	3.40	0.91	1.03
Step 2. Compute 10-yr Average		**0.31**			**2.07**	

* Sample removed from average calculation because of influence of burned hillside erosion (TSS = 3163 mg/L)

Step 3. Determine whether one or both nutrients are reduced to reference concentration	**Compliance √ - TP only**

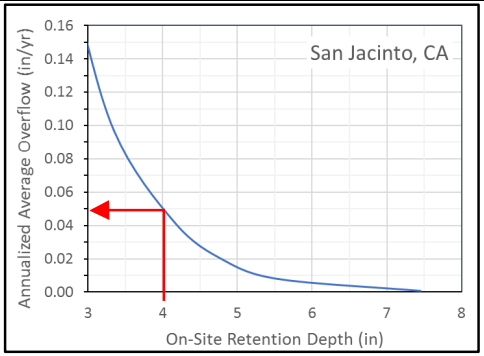
Watershed Compliance Demonstration

- Approach 5: Estimated overflow load below reference condition load for zero imperviousness land
- Applied for CAFOs that retain on-site
- What about other land uses?

Step 1. Confirm on-site rainfall retention depth 4.0 inches from site plan

Step 2. Use statistical analysis tool to approximate annualized overflow runoff depth (in/yr)

Annualized excess runoff (in/yr)	0.05
Site acres	70.00
Annualized excess runoff (AF/yr)	0.29



Step 3. Extract area-weighted land use nutrient concentrations in site runoff (see Table 4-7)

	TP (mg/L)	TN (mg/L)
Example: 100% dairy	9.10	14.90

Step 4. Compute annualized overflow nutrient load (Step 2 * Step 3)

	TP (kg/yr)	TN (kg/yr)
Example: 100% dairy	3.27	5.36

Step 5. Compute Allowable Nutrient Load (Average Rainfall * 0.065 * Ref Conc)

		TP (kg/yr)	TN (kg/yr)
Average Rainfall (in/yr)	12		
Undeveloped runoff coefficient	0.055	1.48	4.26

Step 6. Compute Nutrient Offset	TP (kg/yr)	TN (kg/yr)
Offset to be demonstrated with in-lake BMPs (Step 4 - Step 5)	1.79	1.10

Step 7. Credits from project specfic in-lake BMP effectiveness demonstration:	**2 kg/yr TP 3 kg/yr TN**	**Compliance √**

CDM Smith

Hypothetical example 100-acre commercial site

- On-site retention versus regional in-lake BMPs
- Compliance can be achieved with on-site retention to reduce remaining overflow to reference load
  - Acreage would be removed from regional BMP cost shares based on downstream mass emissions
- Compliance by in-lake offsets yields greater runoff volume to lakes and support enhanced or supplemental controls

Condition	Volume (AFY)	TP (mg/L)	TP (kg/yr)	Excess TP Load for Offset with In-Lake BMPs (negative indicates credit)
Reference Condition	5.5	0.3	2.2	n/a
Commercial with On-Site Retention LID	2.2	0.5	1.5	-0.7
Commercial with Participation in Regional Controls	11.0	0.5	7.3	5.2

Estimates by Land Use

- Negative values (shown as stars) indicate land uses with loads below reference conditions and a potential for credits