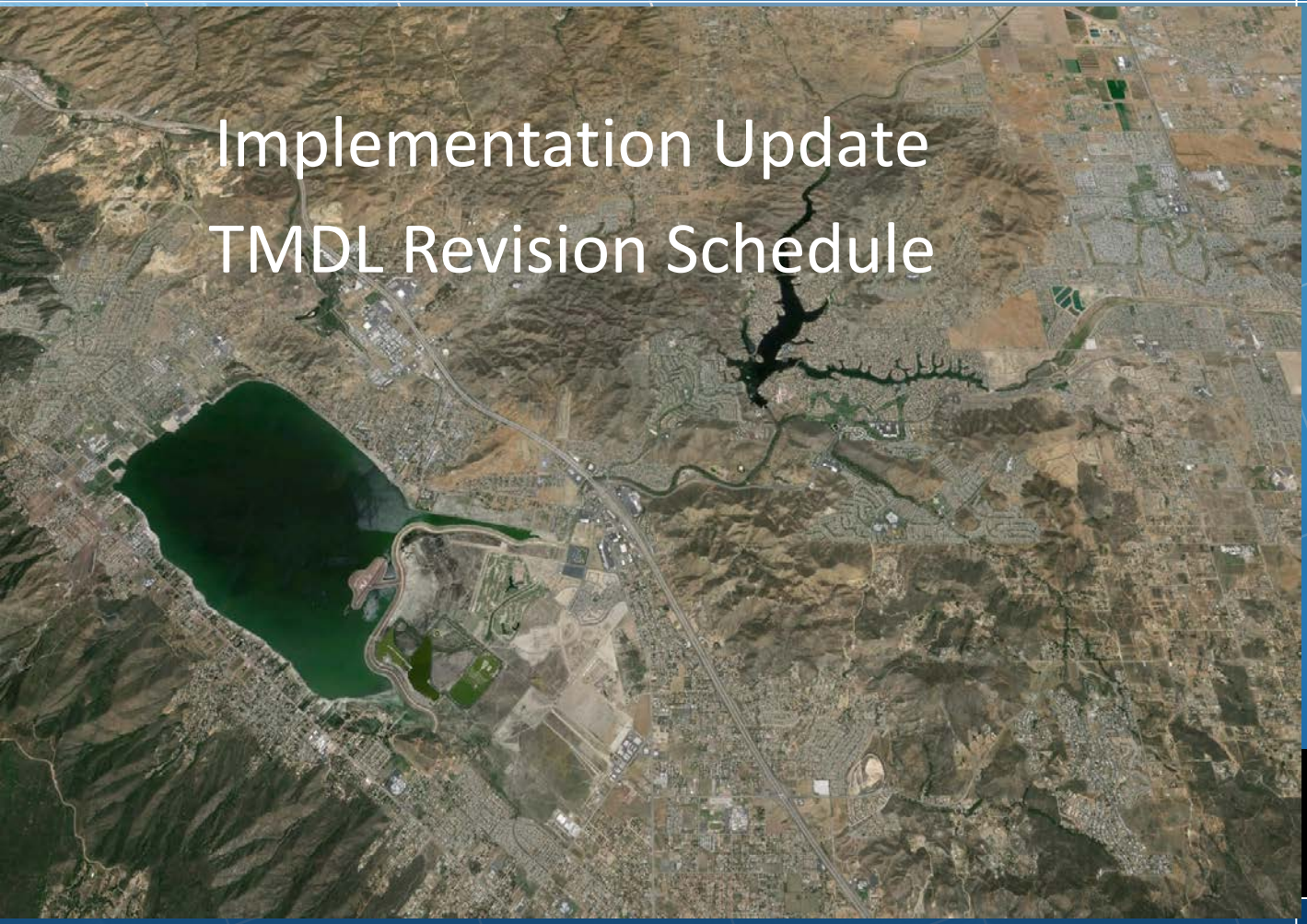
Revision of the Lake Elsinore & Canyon Lake Nutrient TMDL

CDM Smith
Team & Risk Sciences



Implementation Update
TMDL Revision Schedule

November 14, 2017

Lake Elsinore/Canyon Lake Task Force Meeting

RISK SCIENCES

CDM Smith

Presentation Outline

- Lake Elsinore Reasonable Assurance Analysis
- Upcoming Tasks and Project Schedule

Reasonable Assurance Analysis

Lake Elsinore Reasonable Assurance Analysis

- Multiple paths to compliance
  - Reduce/offset current loads to achieve WLA for TP, and TN if dual nutrient control is needed
  - Control water quality in lakes to meet numeric targets
- Lake Elsinore RAA based on lake water quality, future CDFs equal or better than reference condition
  - Current external loads → Linkage analysis scenario with in-lake BMPs → results plotted as CDF and overlain on numeric target CDF

Reasonable Assurance Analysis – Lake Elsinore

- Linkage Analysis scenarios
  1. Reference conditions
  2. Current runoff loads without in-lake controls
  3. Current runoff loads with implementation of all existing controls

Parameter	Scenario 1: Reference Conditions	Scenario 2: Current development, no WQ controls	Scenario 3: Current development, with existing WQ controls
Lake Elsinore Spill Elevation (ft msl)	1255	1255	1255
Hypsography	Without levee	Without levee	With levee
Inflow TP (mg/L)	0.32	0.51	0.51
Inflow TN (mg/L)	0.92	1.89	1.89
Internal TP Flux (mg/m2/day)	5.4	9.0	7.7
Internal TN Flux (mg/m2/day)	37	75	72
EVMWD discharge	None	None	Reclaimed water – 7.5 mgd w/TDS 700 mg/L, TP 0.5 mg/L, TN 3.0 mg/L
Runoff Flow	USGS gauge + local runoff estimate (1916-2016)		

Scenario 1 - Reference Conditions

- Basis for numeric targets
- External runoff loads from assumed reference concentrations and measured runoff inflows (1916-2016)
- Reference condition would generate less diffusive flux than measured in recent studies
  - Model parameter reduced to 60 percent of current levels for SRP and 50 percent for NH4-N with multiple lines of evidence in general agreement

Scenario 2 – Current without Controls

- Estimate water quality with current external runoff loads without accounting for any in-lake BMPs implemented to date
- Results show expected water quality conditions without substantial portfolio of existing projects

Scenario 3 – Current with Controls

- Basis for RAA
- Fishery management to reduce bioturbation - estimates in Anderson, 2006 with and without fishery management
- Impact of LEAMS on diffusive flux from increased mixing energy and resulting DO near lake bottom to modulate flux
- Levee reduces evaporative loss and extent of wetted lake bottom
- Supplemental water provide lake volume for dilution of TDS and internal nutrient loads, supports lakeshore macrophytes

Internal loads - Phosphorus

- Long-term average internal load estimates
- Keeping lake fuller maintains a larger wetted bottom for flux to occur
- No change in constant diffusive flux parameter for LEAMS

Total Phosphorus	Scenario 1: Reference Conditions	Scenario 2: Current development, no WQ controls	Scenario 3: Current development, with existing WQ controls
Diffusive Flux ($mg/m^2/day$)	4.2	7	7
Bioturbation ($mg/m^2/day$)	1.2	2	0.7
Combined Flux Rate ($mg/m^2/day$)	5.4	9	7.7
Modeled Internal Load (kg/yr) [1]	12,578	21,594	17,922

1) Annual average internal load is computed from daily nutrient flux model results, which accounts for differences in DO, pH, and temperature at the sediment water interface

Internal loads - Nitrogen

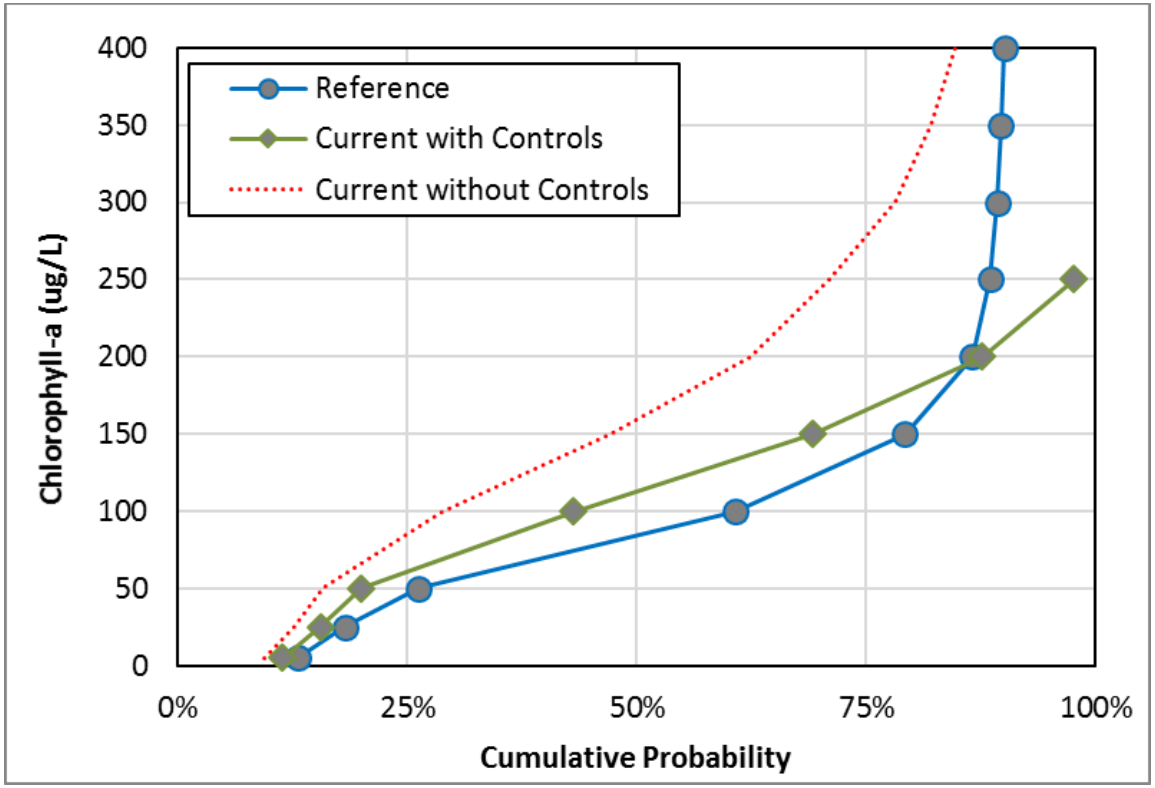
- Long-term average internal load estimates
- Keeping lake fuller maintains a larger wetted bottom for flux to occur
- No change in constant diffusive flux parameter for LEAMS

Total Nitrogen	Scenario 1: Reference Conditions	Scenario 2: Current development, no WQ controls	Scenario 3: Current development, with existing WQ controls
Diffusive Flux ($mg/m^2/day$)	35	70	70
Bioturbation ($mg/m^2/day$)	2	5	2
Combined Flux Rate ($mg/m^2/day$)	37	75	72
Modeled Internal Load (kg/yr) [1]	128,627	269,427	131,030

1) Annual average internal load is computed from daily nutrient flux model results, which accounts for differences in DO, pH, and temperature at the sediment water interface

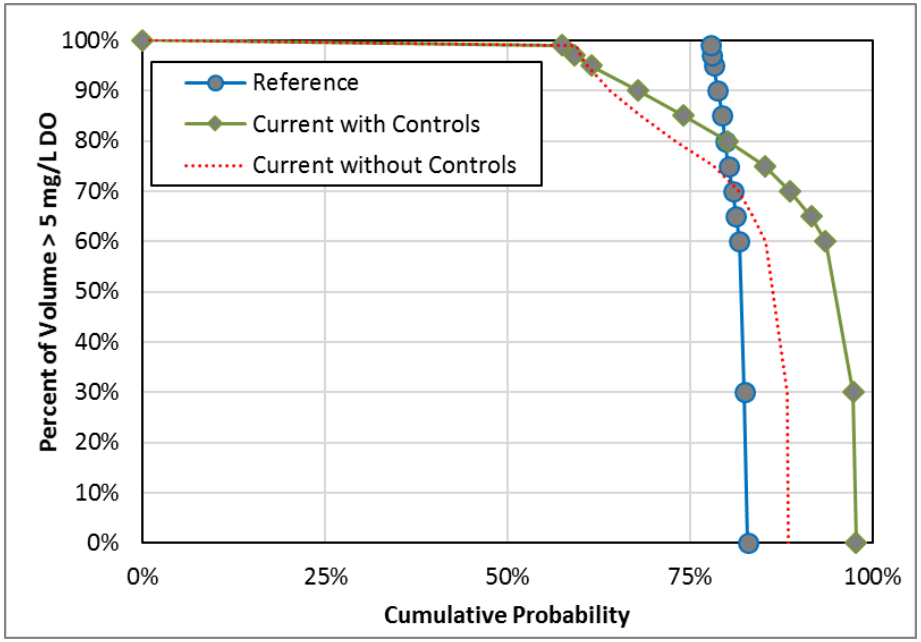
Comparison to Numeric Targets

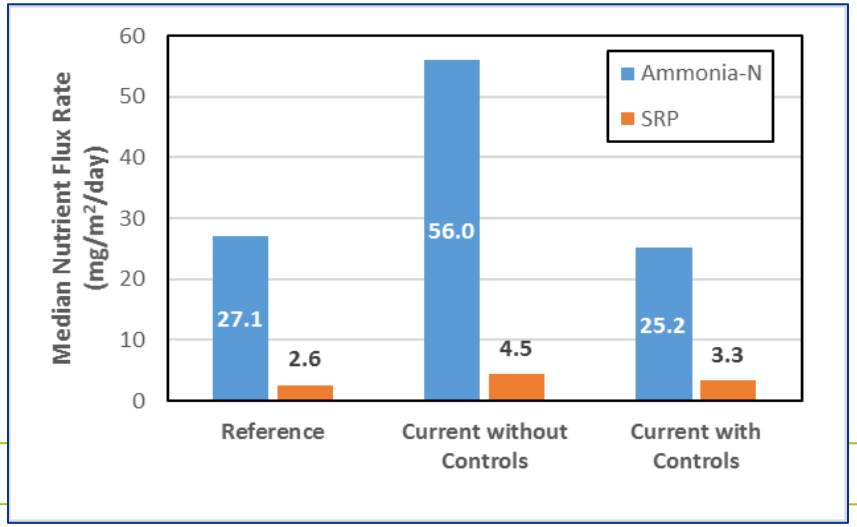
- Chlorophyll-a concentration is estimated to have been reduced substantially as a result of existing projects
- Approaching reference condition CDF



Comparison to Numeric Targets

- DO is shown to be better than reference conditions 80 percent of time with managed lake
- Ammonia flux from lake bottom returned to reference levels (CDFs under development)





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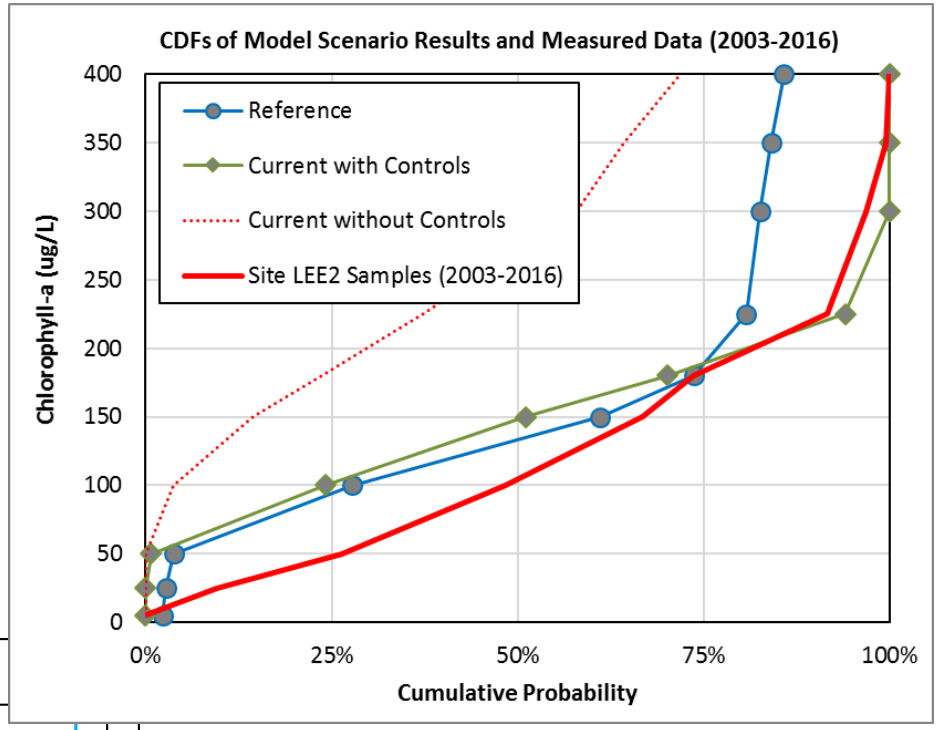
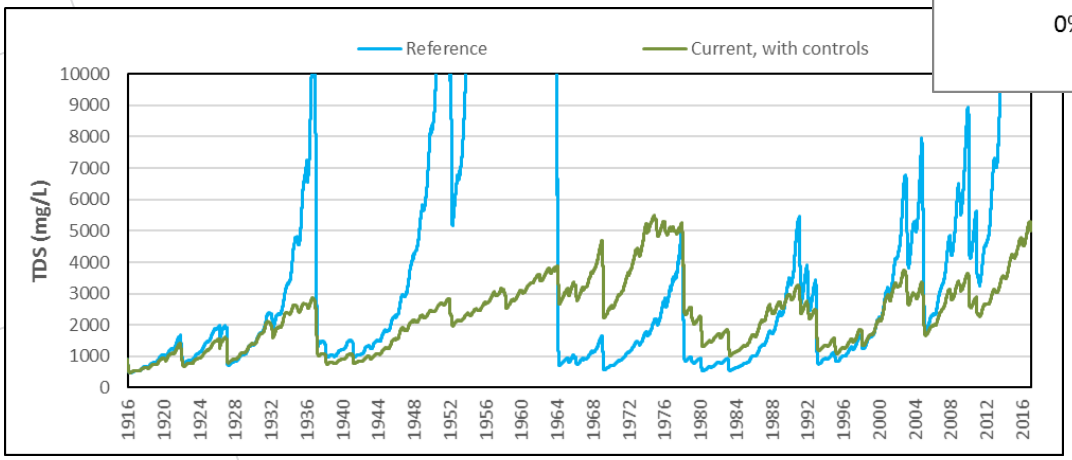
Reasonable Assurance Analysis – Lake Elsinore

- Conduct assessment to evaluate progress towards TMDL compliance - example for 2003 to 2016
- Higher modeled TDS in reference condition in 2003-2016

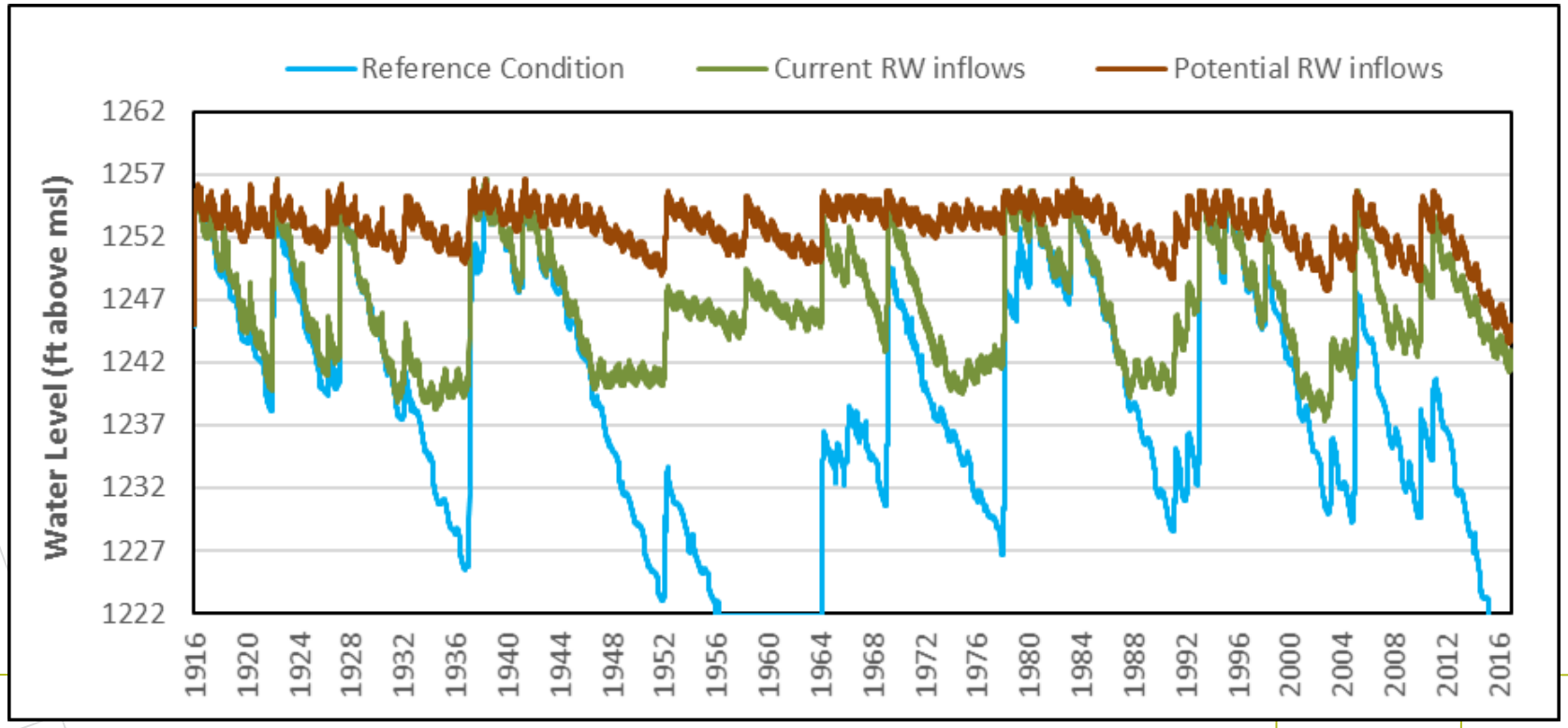




Supplemental Project - Recycled Water

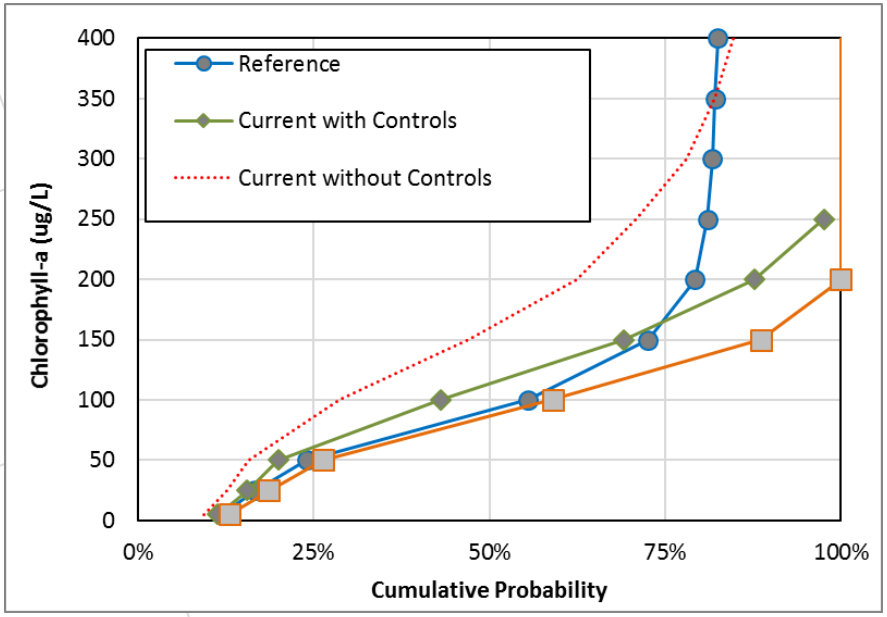
Reasonable Assurance Analysis – Lake Elsinore

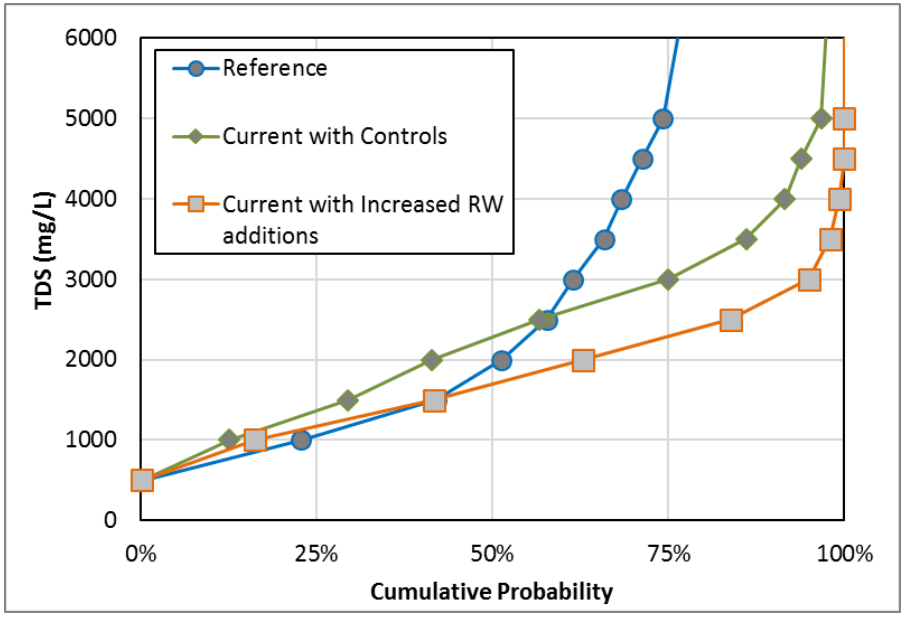
- Reclaimed water additions
  - Current 7.5 MGD when lake levels are below 1240’
  - Potential up to 9.0 MGD all of the time (supplemental project)



Reasonable Assurance Analysis – Lake Elsinore

- Reduction in TDS with current and potential increased additions of recycled water
- Brings expected chlorophyll-a CDF to below reference curve





TMDL Revision Schedule

CDM Smith Team Task Order Status

- Task orders 1 and 2 (through 2017)
  - Completed chapters 1-6 in August 2017
  - Chapters 7 Implementation and 8 Monitoring are drafted, submittal planned for Nov 30, 2017
  - Development of CEQA substitute environmental document (SED) and economic analysis
- Task order 3 for 2018-2019 for CDM Smith team
  - Complete SED
  - Complete economic analysis
  - Continue ongoing tasks – administrative record, meetings and coordination, technical support
  - Finalize all documentation for Basin Plan amendment

Overall Schedule for TMDL Revision

Description	Deadline	Key Responsibility
1st Draft of Chapter 7 (Implementation Plan) and 8 (Monitoring Requirements)	November 30, 2017	CDM Smith, AMEC, GEI
Final Version of TMDL Technical Document (Ch 1-9)	February 12, 2018	CDM Smith, GEI
1st Draft of Substitute Environmental Document (SED)	February 26, 2018	CDM Smith
1st Draft of Economic Analysis	March 26, 2018	CDM Smith, Risk Sciences
Independent Scientific Peer Review	March 2018	Regional Board
Final Version of SED and CEQA Checklist	April 30, 2018	CDM Smith
Final Version of Economic Analysis	May 28, 2018	CDM Smith
Regional Board Staff Report	June 2018	Regional Board
Basin Plan Amendment Package	July 2018	CDM Smith, GEI

Overall Schedule for TMDL Revision

Description	Deadline	Key Responsibility
Regional Board Workshop and Request for Public Comments	August 2018	Regional Board
Prepare Response to Public Comments submitted to Regional Board	October 2018	Regional Board
Regional Board Hearing to Consider Adopting Basin Plan Amendment	November 2018	Regional Board
Prepare Response to Public Comments Submitted to SWRCB	May 2019	Regional Board
SWRCB Hearing for Basin Plan Amendment	July 2019	Regional Board
Final Compilation of Administrative Record (for submission to Office of Administrative Law [OAL])	August 2019	CG, GEI
Submit Basin Plan Amendment and Administrative Record to OAL	September 2019	Regional Board
OAL Review Complete	December 2019	Regional Board
Submit Basin Plan Amendment to U.S. EPA for Review and Approval	January 2020	Regional Board

Next steps

- Approve Task order 3 for 2018-2019 for CDM Smith team to complete technical tasks and prepare BPA documentation
- Timely completion of BPA for public review by July 2018
- Coordinate process of public review and multiple agency reviews to meet target submittal for EPA approval in January 2020