MSAR WATERSHED TMDL TASK FORCE

Limited Revision to MSAR TMDLs: Update on Project Status

December 9, 2024

Steven Wolosoff, *GEI Consultants*

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GEI Consultants

PROPOSED REVISIONS TO TMDLS

- Extend Wet Winter Condition compliance date 20 years – from December 31, 2025 to December 31, 2045
- Clarify applicability of Basin Plan High Flow Suspension provision to MSAR TMDLs
- Clarify applicability of REC1 use to Mill-Cucamonga Creek
- Define Phase 2 Implementation Program

PHASE 2 PROGRAM: 20-YEAR JUSTIFICATION FOR WET WEATHER COMPLIANCE

- October/November 2023 – Discussion with Regional Board staff and Task Force regarding request for additional justification for proposed 20-year extension of Wet Winter Condition TMDLs
- November 2023 – City of Riverside volunteers to be initial case example
- January 2024 – Additional justification for 20-year extension submitted to Regional Board staff
- May 31, 2024 – Regional Board staff provided comments on 20-year justification and also provided additional comments on Draft Technical Report
- July 16, 2024 – Meeting with Regional Board staff to discuss comments
- November 19, 2024 – Revised Technical Report with 20-year extension appendix sent for Task Force review

PHASE 2 PROGRAM: 20-YEAR JUSTIFICATION FOR WET WEATHER COMPLIANCE

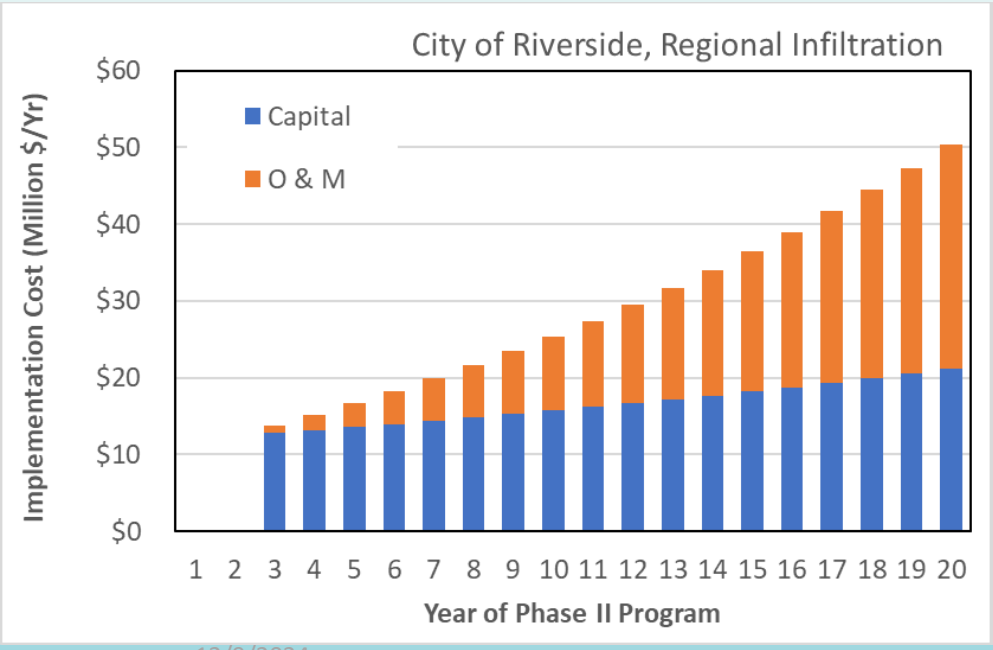
- Key area of comment involved the 20-year timeline
- Prepare pilot-level analysis of what could potentially be required to comply with TMDLs applicable to wet weather runoff, even with consideration of the HFS:
  - Focused only on implementation of treatment controls
  - Relied on the City of Riverside as the “test case” or example for the analysis
  - Estimated (a) urban runoff volume needed to be captured (considering HFS); (b) capital costs of treatment control projects; (c) O&M needs; and (d) potential time to implement multiple treatment controls across a jurisdiction

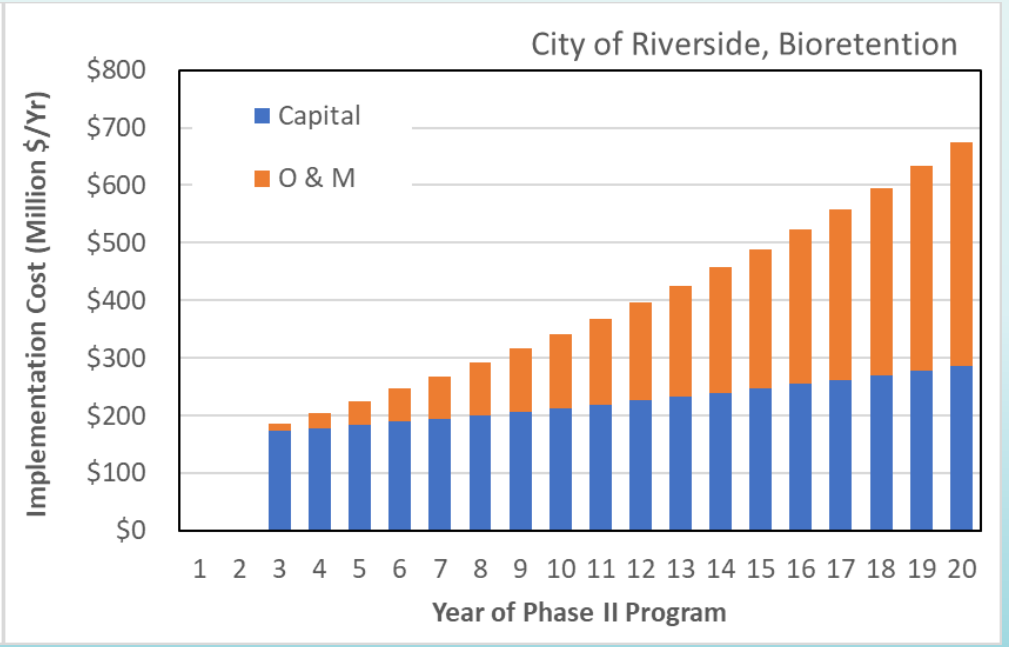
PHASE 2 PROGRAM: 20-YEAR JUSTIFICATION FOR WET WEATHER COMPLIANCE

- Assumptions:
  - *Rainfall based condition for high-flow suspension is 0.5-inch storm*
  - *No capture within existing recharge basins or post-construction WQMPs*
  - *Averaged runoff coefficient of 0.4 for all developed land use categories*
  - *Average depth of stored runoff in small bioretention of 2 feet*
  - *Average depth of stored runoff in regional infiltration of 4 feet*
  - *Average capture volume per small bioretention BMP project of 0.3 AF (~6,500 ft^2 each)*
  - *Average capture volume per regional infiltration BMP project of 3.0 AF (~0.75 acre each)*
- Analysis developed to show range of watershed plan implementation with all small bioretention or all regional infiltration

PHASE 2 PROGRAM: 20-YEAR JUSTIFICATION FOR WET WEATHER COMPLIANCE

- Calculation Results (City of Riverside example)
  - *Event volume to be captured (AF) = 500 AF*
  - *Regional infiltration ~167 projects over 20 years; 9/yr in yrs 3-20*
  - *Bioretention ~1,675 projects over 20 years; 93/yr in yrs 3-20*

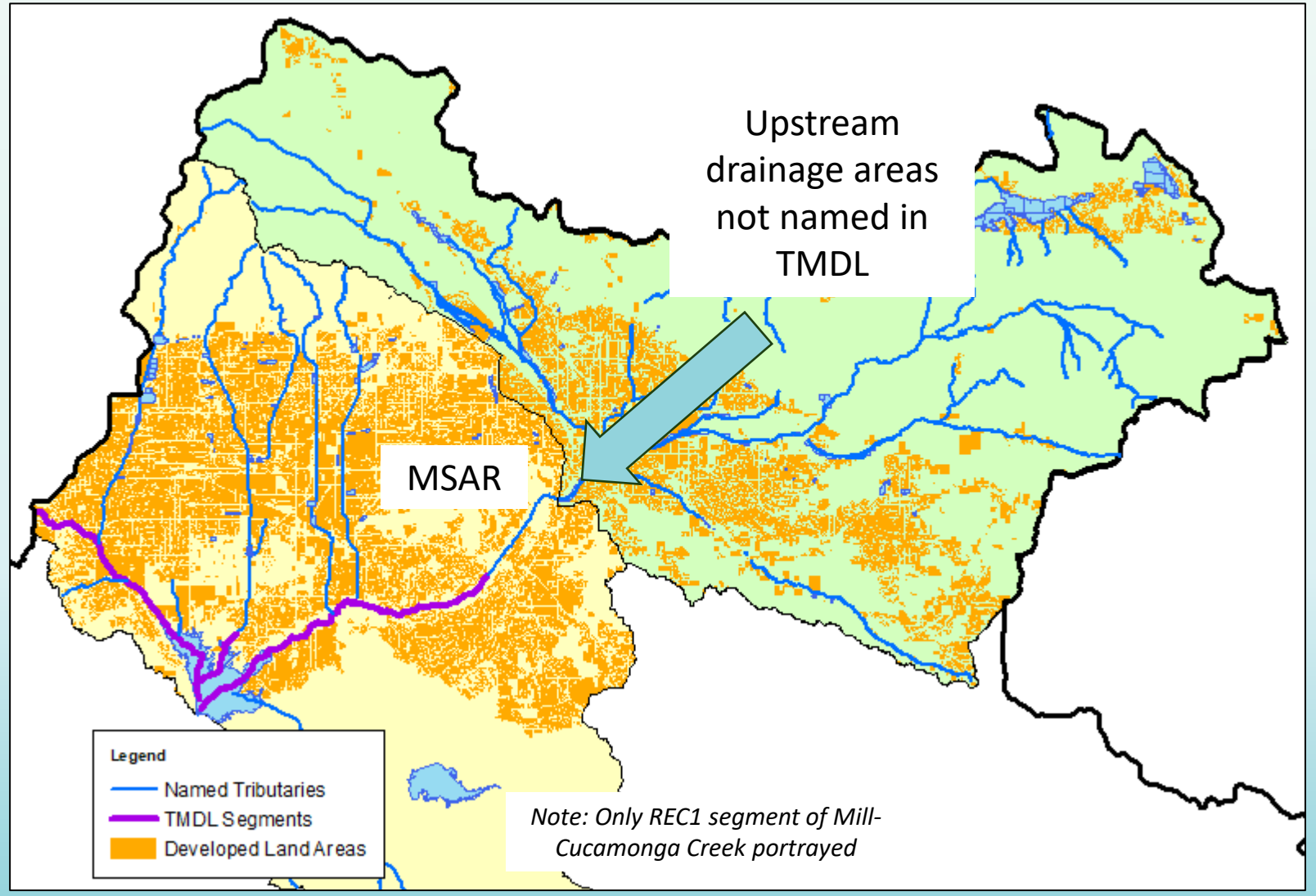




- Rise in capital reflects escalation of construction
- Rise in O&M reflects both escalation and cumulative increase in facilities to maintain

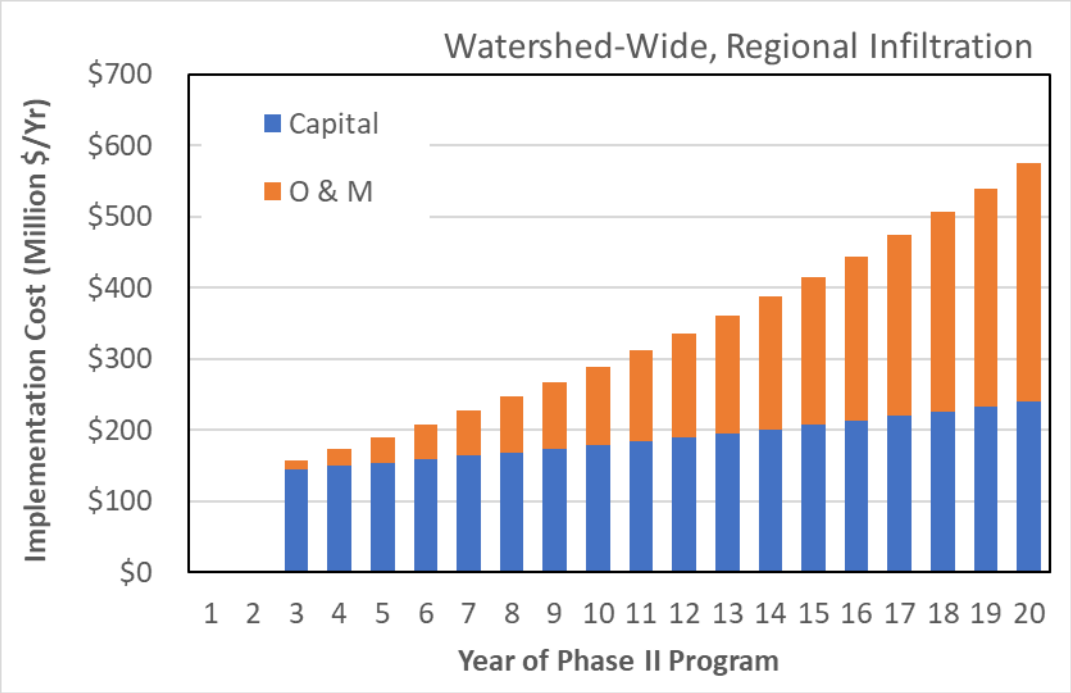
PHASE 2 PROGRAM: 20-YEAR JUSTIFICATION FOR WET WEATHER COMPLIANCE

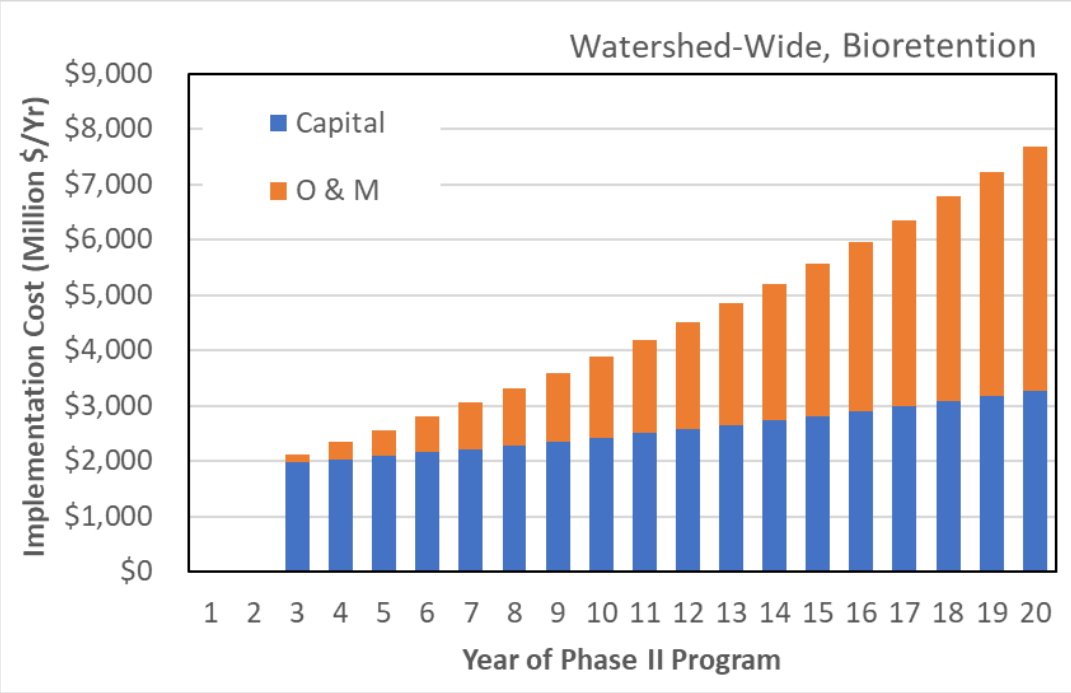
- Appendix A provides example for City of Riverside (~30,000 acres of developed land)
- Developed lands in MSAR watershed total of 223,500 acres
- Developed lands in other upstream watershed areas total of 117,600 acres
- Total developed drainage area of 341,100 acres



PHASE 2 PROGRAM: 20-YEAR JUSTIFICATION FOR WET WEATHER COMPLIANCE

- Calculation Results (Watershed-Wide)
  - *Event volume to be captured (AF) = 5,685 AF*
  - *Regional infiltration ~1,895 over 20 years; 105/yr in yrs 3-20*
  - *Bioretention ~18,950 over 20 years; 1,053/yr in yrs 3-20*





NEXT STEPS

- Comments due from Task Force on December 13
- Comments from Pat Boldt received
- Coordination with Regional Board on BPA development and adoption process to complete TMDL revision
- Get early start on Phase 2 program in 2025

MSAR WATERSHED TMDL TASK FORCE

CBRP Implementation Activities in 2025-2026

December 12, 2024

Richard Meyerhoff, *GEI Consultants*
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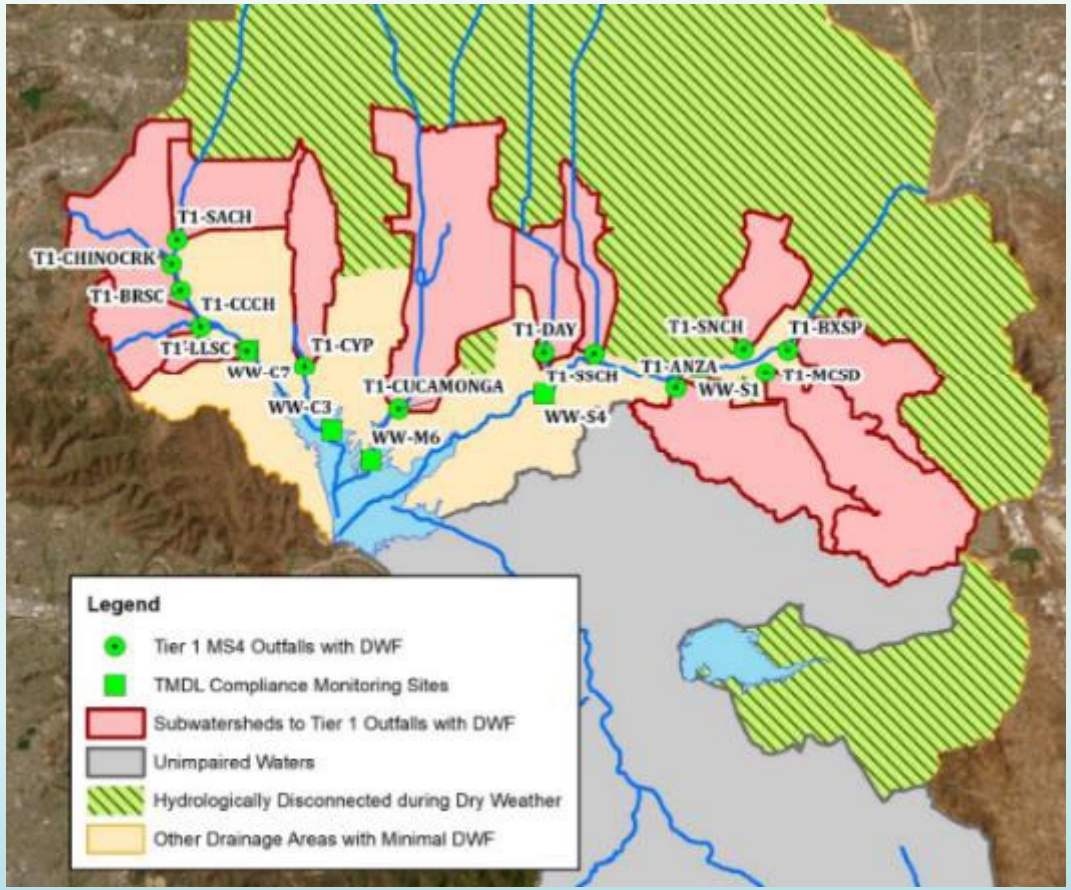
PHASE 2 PROGRAM – WHERE TO START

- Within 6 months of the Effective Date of the Revised TMDLs:
  - *Task 5: Dry Weather Bacterial Indicator Source Tracking Study*
  - *Task 6: Develop and Implement Preliminary Wet Weather Controls*
  - *Task 7: Study: Application of High Flow Suspension to TMDLs*
  - *Task 8: Study: Evaluate Controllable Sources of Bacterial Indicators in Wet Weather Conditions*
  - *Task 12: Study: Evaluate Potential to Establish Alternative Water Quality Criteria*
  - *Task 19: Implement Watershed-wide TMDL Compliance Monitoring Program (update of existing program, as needed)*
- Within 6 months of completion Task 12 (~ Year 5):
  - *Task 13: Develop Alternative Water Quality Criteria (if appropriate based on outcome of Task 12)*

DRY WEATHER BACTERIAL INDICATOR SOURCE TRACKING STUDY (TASK 5)

1. How many dry weather diversions would be needed to comply?
2. What are the proportions of key fresh sources of fecal bacteria within TMDL waters?
3. To what degree, do naturalized bacteria contribute to load in the TMDL waters?
4. Applicability of AWQC based on 2024 EPA guidance?

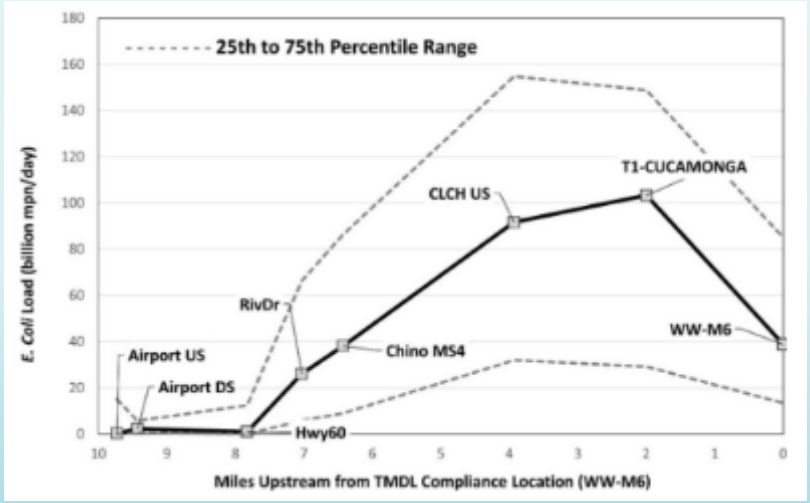


2025 DRY WEATHER SYNOPTIC SURVEY

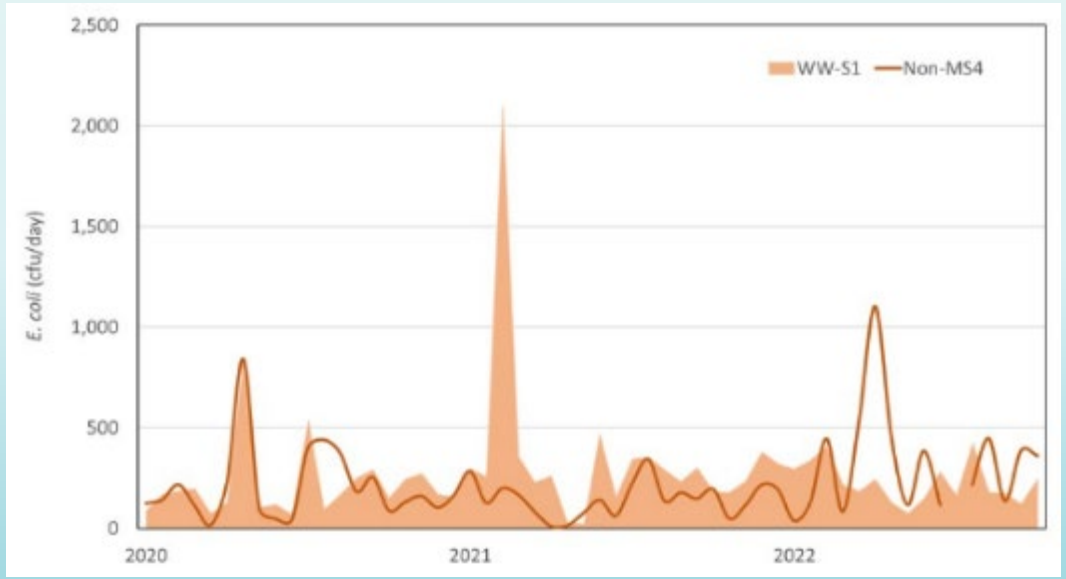
- Task 5 essentially a new iteration of the CBRP
- Build on previous source tracking studies in MSAR
- 2025 synoptic study design to leverage recent mapping updates, surveys, and EPA guidance
- New data to support 2026 Triennial TMDL Report

Total *E. coli* load at the TMDL compliance monitoring locations to be parsed into four general categories to support CBRP reduction target estimation

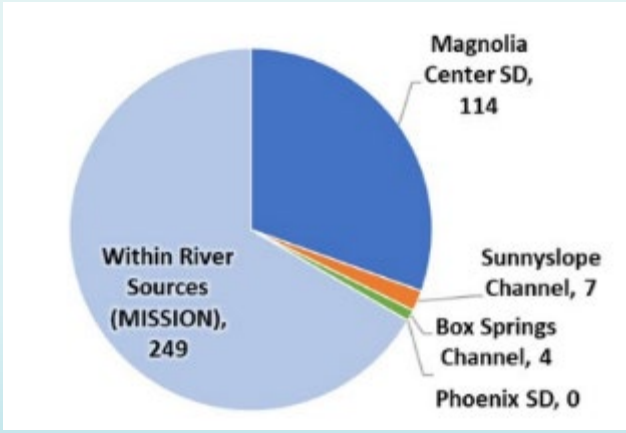
Source	MS4	Non-MS4
Controllable	1. Focus of CBRP	3. Refer to Other Entities (e.g., agriculture, state, etc.)
Uncontrollable	2. Reference System / Natural Source Exclusion	4. Reference System / Natural Source Exclusion



Cucamonga Creek



Santa Ana River Reach 3



Santa Ana River Reach 3

PREVIOUS SOURCE INVESTIGATIONS BY TASK FORCE

- SBCFCD 10-Week Surveys (2014 - 2024)
- RCFC&WCD Tier 1/2 Surveys (2014 - 2024)
- Pig Marker (2022)
- Homeless Encampments (2021-2022)

Table 4-2. Summary of Findings from Historical MST Analyses Conducted in the MSAR Watershed, 2007-2022

Study (Reference)	Period of Data Collection	Host Species	Method	No. of Sites	No./Type of Events	Key Findings
2022 Pig Marker Sampling (this report)	May – September 2022	Pig	qPCR	4	10 Dry	• Detection in 9 of 10 samples at WW-S1, WW-S4; detections range from 300 to 5300 gc/100 mL • All non-detect at WW-M6 • 1 detection of WW-MISSION
Homeless Encampment Study (SAWPA 2022c)	September – January, 2021-2022	Human	qPCR	6	4 Dry	• 6 of 24 samples with amplification below detection (< 100 gc/100 mL) • Field observation of human feces on ground within riparian area
		Pig	qPCR	6	2 Dry	• Persistent detections downstream of Mission Boulevard Bridge and upstream downstream of Van Buren Bridge sites; detections range from 100 to 27,000 gc/100 mL • All samples non-detect at Market Street Bridge site
		Dog	qPCR	6	2 Dry	• 1 of 12 samples with amplification below detection (< 100 gc/100 mL)
Magnolia Center Storm Drain Tier 2 Investigation (this report)	2020	Human	qPCR	11	5 Dry	• 27 of 50 samples detected above 100 gc/100 mL • Results facilitated focus Tier 2 follow-up via a bottom-up investigative strategy
Synoptic Study (SAWPA 2020a)	July – September, 2019	Human	qPCR	23	6 Dry	• Amplification below detection in 22 of 42 samples from 7 sites within impaired waters, one sample at WW-MISSION above detection at 100 gc/100 mL • Of the 85 samples in the synoptic study (collected from 16 Tier 1 or Tier 2 sites): – Amplification below detection observed in 17 of 85 samples – Detection with quantification above 10 gc/100 mL in 8 of 85 samples. These 8 samples included: o 6 of 6 samples collected at T1-MCSD o 2 of 6 samples collected at T1-BXSP – Quantification above 525 gc/100 mL[1] in 2 of 85 samples – both collected at T1-MCSD • No correlation to *E. coli* concentration for samples within impaired waters • Significantly higher *E. coli* concentration in Tier 1 or 2 samples with presence of human marker than without
University California Fullerton Study (Gedalanga et al. 2019)	2018-2019	Human	qPCR	5	3 Dry; 2 Wet	• Frequent detection • Range 100 to 10,000 gc/100 mL

PREVIOUS SOURCE INVESTIGATIONS BY TASK FORCE

- Synoptic Study Round 3 (2019)
- Fullerton (2019)
- Uncontrollable sources study (2016)
- Synoptic Study Round 2 (2012)
- Synoptic Study Round 1 (2007)

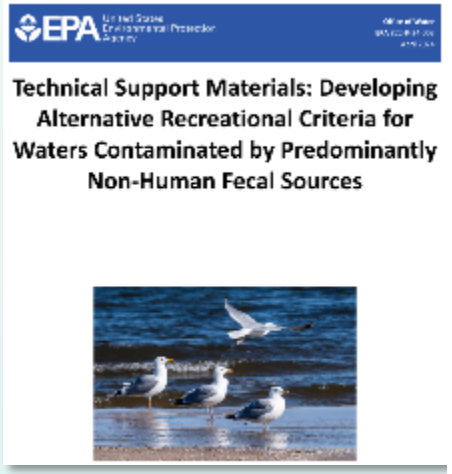
Table 4-2. Summary of Findings from Historical MST Analyses Conducted in the MSAR Watershed, 2007-2022

Study (Reference)	Period of Data Collection	Host Species	Method	No. of Sites	No./Type of Events	Key Findings
Transient Encampment Cleanup at Market St (RCFC&WCD 2016)	2015	Human	PCR	2	3 Dry	All non-detect
		Dog	PCR	2	3 Dry	Detected in 2 of 6 samples; detections occurred in samples with < 10 MPN/100 mL *E. coli*
Uncontrollable Source Study (RCFC&WCD 2016)	2015	Human	PCR	6	13 Dry	All results non-detect
		Bird	PCR	16	8 Dry	• Detection in 24 of 40 samples from focused bird study • Detection in 12 of 24 samples collected from within SAR Reach 4 downstream from RIX discharge (non-MS4 segment) • No correlation to *E. coli* in either bird or natural focus studies
		Dog	PCR	6	7 Dry	Detected in only 1 of 60 samples
		Rumen	PCR	4	3 Dry	All non-detect
		Horse	PCR	6	2 Dry	All non-detect
Tier 2 Source Assessment (SAWPA 2014)	2013	Human	PCR	53	20 Dry	Detected in 6 of 135 samples from within MS4 systems of various cities (Eastvale, Riverside, Jurupa Valley, Chino, Chino Hills, Ontario, Fontana, Pomona, Claremont)
		Dog	PCR	11	3 Dry	Detected in 8 of 18 samples from Chino and Chino Hills MS4
		Cow, bird, horse, chicken, rumen	PCR	3	1 Dry	Fontana MS4 samples; all non-detect
Tier 1 Source Evaluation (SAWPA 2013)	2012	Human	PCR	34	10 Dry	• 41 of 196 samples at MS4 outfalls with presence of human *Bacteroides*, results used to support prioritization of Tier 1 sites • Significantly higher *E. coli* concentration in Tier 1 MS4 outfall samples with presence of human marker than without
Bacterial Indicator TMDL Analysis (SAWPA 2009)	2007-2008	Human	PCR	13	217 Dry	• 39 of 217 samples at MS4 outfalls with presence of human *Bacteroides*, no correlation to *E. coli* concentration • Results used to support first prioritization of sites in CBRP
		Dog	PCR	13	217 Dry	Detection in 73 of 217 samples, no correlation to *E. coli* concentration
		Rumen	PCR	13	217 Dry	Detection in 45 of 217 samples, no correlation to *E. coli* concentration

[1] Estimated concentration of HF183 gene/copies per 100 mL that may relate to 32 per 1000 risk of illness for swimmers - based on laboratory studies of samples spiked with raw sewage of unknown age (Boehm and Soller 2020)

2025 DRY WEATHER SYNOPTIC SURVEY

- EPA (2024) guidance for alternative criteria in predominantly non-human impacted streams
- Previous studies suggest Santa Ana River Reach 3 could be a candidate
- Data collection in 2025 to assess applicability according to EPA guidance



From Regional Board Audit Findings (2018)

> *"...However, there are other factors that may need to be considered before determining that the MSAR permittees have met the waste load allocation. These include determining if the source is anthropogenic versus natural, if the source is controllable, and if the source is from an MS4. There is no consensus process for reaching conclusions on these other factors and for supporting a conclusive, transparent determination regarding compliance with waste load allocations. A process should be developed and subjected to public comments after the update of bacterial TMDL has taken place."*

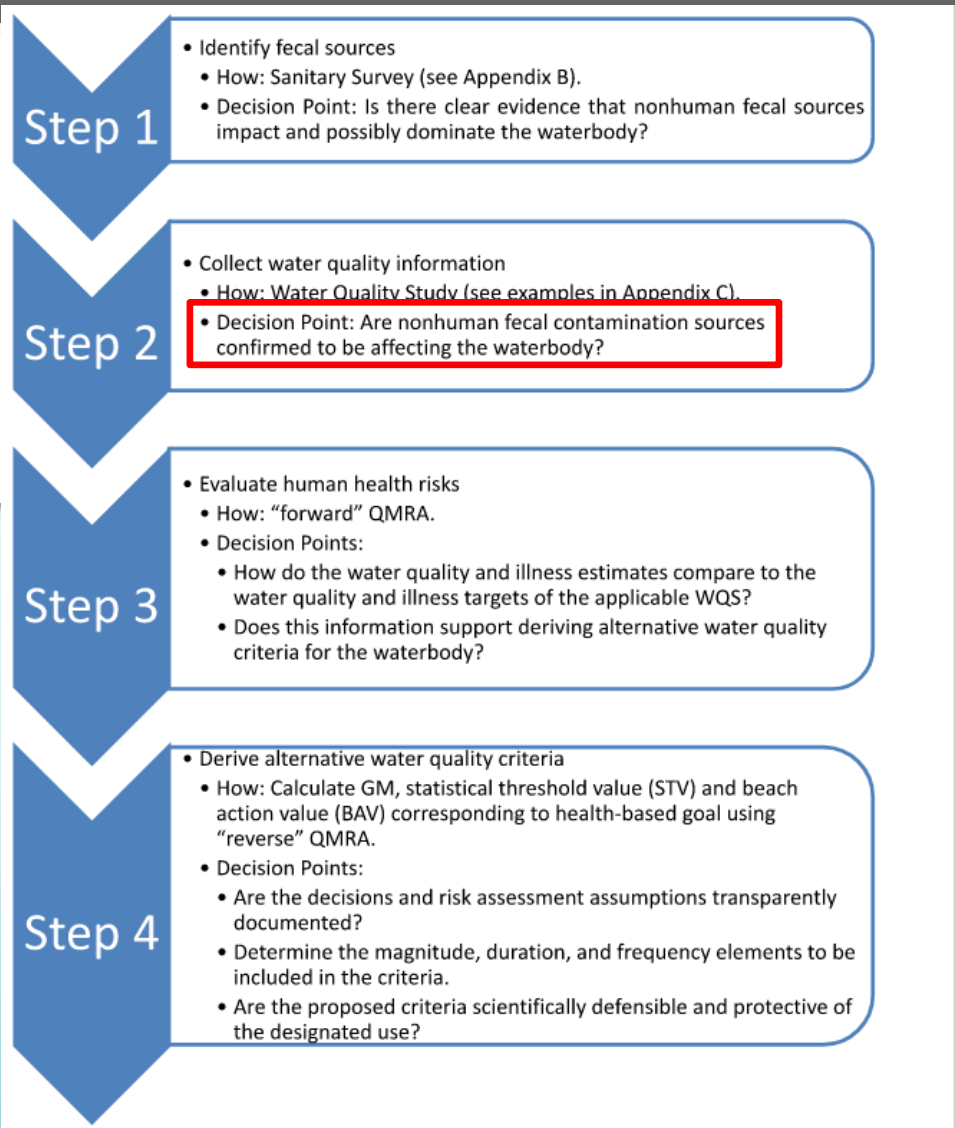


Figure 1-1. Flow diagram for considering QMRA in developing site-specific alternative criteria.