



Memorandum

To: Santa Ana Watershed Project Authority

From: CDM Smith

Date: October 14, 2020

Subject: 2020 Quarter 3 Report

This technical memorandum summarizes the Santa Ana River Regional Monitoring Program activities that occurred during the third quarter (July 1 through September 30) of 2020. It includes a brief description of monitoring activities from the third quarter, upcoming monitoring activities, and a summary of data resulting from monitoring activities. These monitoring activities were conducted under the Monitoring Plan and Quality Assurance Project Plan (QAPP) for the Santa Ana River Watershed Bacteria Monitoring Program, which were finalized in August 2019.

Monitoring Activities

During the third quarter of 2020, warm dry weather monitoring activities continued and concluded on the week of September 20, 2020. All Priority 1 and 2 sites are complete for the warm dry season. The five-week monitoring program for Priority 3 Groups 2, 4 and 6 sites have been completed as well. Monitoring at SAR Reach 4 (Priority 3 Group 4) is conducted weekly, per the revised Monitoring Plan (Version 2.0).

The Priority 3 Groups 2, 4 and 6 sites are listed as follows:

- Group 2 – Peters Canyon Wash, San Diego Creek Reach 1, San Diego Creek Reach 2, Borrego Creek, and Serrano Creek
- Group 4 – Santa Ana River Reach 4
- Group 6 – Warm Creek and San Timoteo Creek

Water Quality Data

Dry weather monitoring samples were analyzed for *E. coli* (**Table 1**), TSS (**Table 2**), and *Enterococcus* (**Table 4**) by Babcock Laboratories for Riverside and San Bernardino County sites and by Orange County Public Health Laboratory (OCPHL) for Orange County sites. Rolling 6-week geomeans for Priority 1 and 2 sites are presented in **Table 3**.

Table 1 – 2020 Quarter 3 Dry Weather *E. coli* Concentrations (MPN/100 mL)

Site ID	County	Site	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15	Week 16	Week 17	Week 18	Week 19	Week 20
			7/5/2020	7/12/2020	7/19/2020	7/26/2020	8/2/2020	8/9/2020	8/16/2020	8/23/2020	8/30/2020	9/6/2020	9/13/2020	9/20/2020
P1-1	Riverside	Canyon Lake at Holiday Harbor	2.0	BDL	2.0	BDL	5.2	2.0	5.1	4.1	5.1	5.2	4.1	2.0
P1-2	Riverside	Lake Elsinore	7.4	8.5	2.0	4.1	5.2	1.0	14	1.0	5.2	2.0	4.1	11
P1-3	Riverside	Lake Perris	BDL	14	BDL	BDL	BDL	BDL	8.5	3.0	BDL	4.1	2.0	13
P1-4	San Bernardino	Big Bear Lake at Swim Beach	12	5.2	1.0	1.0	2.0	BDL	130	BDL	1.0	1.0	3.1	4.1
P1-5	San Bernardino	Mill Creek Reach 2	2.0	1.0	1.0	1.0	1.0	3.1	BDL	BDL	BDL	*	*	*
P1-6	San Bernardino	Lytle Creek	18	5.2	14	46	12	32	38	25	32	27	32	26
WW-S1	Riverside	Santa Ana River Reach 3 at MWD Crossing	170	110	730	140	240	350	420	190	300	320	200	190
WW-S4	Riverside	Santa Ana River Reach 3 at Pedley Avenue	160	140	120	160	200	140	460	340	200	330	230	300
WW-C3	San Bernardino	Prado Park Lake	41	3.0	52	2.0	63	20	120	20	10	86	63	160
WW-C7	San Bernardino	Chino Creek at Central Avenue	410	26	170	18	160	470	400	500	200	500	360	280
WW-M6	San Bernardino	Mill-Cucamonga Creek below Wetlands	320	77	98	20	200	330	500	120	75	260	2100	160
WW-MISSION	San Bernardino	Santa Ana River Reach 3 at Mission Avenue	74	74	580	710	560	270	390	120	170	200	130	210
P3-SBC1	San Bernardino	Santa Ana River Reach 4	50	74	190	BDL	96	21	BDL	29	10	10	20	28
P3-ST3	San Bernardino	San Timoteo Creek Reach 2 at San Timoteo Canyon Rd.	310	260	2900	Dry	580							
P3-ST5	San Bernardino	San Timoteo Creek Reach 1A at Anderson St.	200	7.4	450	2.0	73							
P3-WC4	San Bernardino	Warm Creek below Fairway Dr.	4900	Dry	Dry	6.3	Dry							
P3-RC1	Riverside	Goldenstar Creek								580	550	440	35	35
P3-OC7	Orange	Peters Canyon Wash			169	314	154	265	159					
P3-OC8	Orange	San Diego Creek Reach 1			41	31	52	76	96					
P3-OC9	Orange	San Diego Creek Reach 2			98	201	41	218	373					
P3-OC11	Orange	Serrano Creek			2909	8164	118	1043	3281					
P4-OC1	Orange	Santa Ana Delhi Channel Upstream of Irvine Avenue											636	
P4-SBC1	San Bernardino	Cucamonga Creek at Hellman Avenue	52		810				500					860

Notes: BDL = below detection limit
* = Samples not collected due to unsafe conditions caused by proximity of sampling location to El Dorado fire

Table 2 – 2020 Quarter 3 Dry Weather TSS Concentrations (mg/L)

Site ID	County	Site	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15	Week 16	Week 17	Week 18	Week 19	Week 20
			7/5/2020	7/12/2020	7/19/2020	7/26/2020	8/2/2020	8/9/2020	8/16/2020	8/23/2020	8/30/2020	9/6/2020	9/13/2020	9/20/2020
P1-1	Riverside	Canyon Lake at Holiday Harbor	5	3	5	6	6	4	6	2	3	2	2	5
P1-2	Riverside	Lake Elsinore	27	46	36	19	20	27	22	21	18	19	18	18
P1-3	Riverside	Lake Perris	8	4	3	4	4	BDL	4	2	BDL	BDL	2	2
P1-4	San Bernardino	Big Bear Lake at Swim Beach	40	16	16	10	49	12	10	20	8	4	BDL	14
P1-5	San Bernardino	Mill Creek Reach 2	BDL	BDL	BDL	BDL	BDL	2	BDL	BDL	BDL	*	*	*
P1-6	San Bernardino	Lytle Creek	BDL	2	BDL	BDL	BDL	2	BDL	BDL	BDL	BDL	9	BDL
WW-S1	Riverside	Santa Ana River Reach 3 at MWD Crossing	16	13	18	8	18	6	4	4	3	6	3	6
WW-S4	Riverside	Santa Ana River Reach 3 at Pedley Avenue	11	6	12	5	12	6	4	8	6	4	4	4
WW-C3	San Bernardino	Prado Park Lake	20	18	28	30	23	18	30	22	24	14	18	30
WW-C7	San Bernardino	Chino Creek at Central Avenue	35	14	14	5	6	3	9	4	3	4	4	7
WW-M6	San Bernardino	Mill-Cucamonga Creek below Wetlands	6	10	8	8	5	5	12	8	3	9	33	10
WW-MISSION	San Bernardino	Santa Ana River Reach 3 at Mission Avenue	18	18	33	24	41	18	18	21	30	25	16	12
P3-SBC1	San Bernardino	Santa Ana River Reach 4	2	2	BDL	BDL	3	2	BDL	2	BDL	2	2	10
P3-ST3	San Bernardino	San Timoteo Creek Reach 2 at San Timoteo Canyon Rd.	26	88	6	Dry	4							
P3-ST5	San Bernardino	San Timoteo Creek Reach 1A at Anderson St.	8	10	110	8	8							
P3-WC4	San Bernardino	Warm Creek below Fairway Dr.	24	Dry	Dry	22	Dry							
P3-RC1	Riverside	Goldenstar Creek								2	4	2	BDL	4
P3-SBC1	San Bernardino	Santa Ana River Reach 4	2	2	BDL	BDL	3	2	BDL	2	BDL	2	2	10
P3-OC7	Orange	Peters Canyon Wash			NA	NA	NA	NA	NA					
P3-OC8	Orange	San Diego Creek Reach 1			NA	NA	NA	NA	NA					
P3-OC9	Orange	San Diego Creek Reach 2			NA	NA	NA	NA	NA					
P3-OC11	Orange	Serrano Creek			NA	NA	NA	NA	NA					
P4-OC1	Orange	Santa Ana Delhi Channel Upstream of Irvine Avenue												NA
P4-SBC1	San Bernardino	Cucamonga Creek at Hellman Avenue	18		20				3					2

Notes: BDL = below detection limit
NA = Sample collected but data not available from lab yet
* = Samples not collected due to unsafe conditions caused by proximity of sampling location to El Dorado fire

Table 3 – 2020 Quarter 3 Dry Weather E.coli Geomean Concentrations (MPN/100mL

Site ID	County	Site	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15	Week 16	Week 17	Week 18	Week 19	Week 20
			7/5/2020	7/12/2020	7/19/2020	7/26/2020	8/2/2020	8/9/2020	8/16/2020	8/23/2020	8/30/2020	9/6/2020	9/13/2020	9/20/2020
P1-1	Riverside	Canyon Lake at Holiday Harbor					1.4	1.4	2.2	2.6	4.1	4.1	4.7	3.9
P1-2	Riverside	Lake Elsinore					4.8	3.2	3.6	3.1	3.3	2.7	3.6	3.4
P1-3	Riverside	Lake Perris					1.0	1.0	0.9	1.3	1.3	1.9	2.5	2.8
P1-4	San Bernardino	Big Bear Lake at Swim Beach					2.6	1.4	2.6	2.3	2.3	2.0	2.9	1.4
P1-5	San Bernardino	Mill Creek Reach 2					1.1	1.3	1.1	1.0	0.8	*	*	*
P1-6	San Bernardino	Lytle Creek					14.9	16.7	24.8	27.9	25.9	30.5	30.5	28.2
WW-S1	Riverside	Santa Ana River Reach 3 at MWD Crossing					214.9	248.3	324.6	248.0	288.9	306.0	273.6	233.4
WW-S4	Riverside	Santa Ana River Reach 3 at Pedley Avenue					153.8	149.7	190.0	233.9	244.6	270.4	298.6	274.1
WW-C3	San Bernardino	Prado Park Lake					15.2	13.1	27.5	22.7	31.3	33.4	42.0	44.4
WW-C7	San Bernardino	Chino Creek at Central Avenue					87.8	90.2	155.9	193.4	313.1	393.2	372.8	347.1
WW-M6	San Bernardino	Mill-Cucamonga Creek below Wetlands					99.3	99.9	145.3	151.3	197.0	207.7	300.7	239.4
WW-MISSION	San Bernardino	Santa Ana River Reach 3 at Mission Avenue					263.2	341.0	475.4	346.9	260.6	212.1	183.3	161.9

Note: For calculation purposes, samples that were below detection limit were assumed to be half of the reporting limit
* = Samples not collected due to unsafe conditions caused by proximity of sampling location to El Dorado fire

Table 4 – 2019 Quarter 3 Enterococcus Concentrations (MPN/100mL)

Site ID	County	Site	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15	Week 16	Week 17	Week 18	Week 19	Week 20
			7/5/2020	7/12/2020	7/19/2020	7/26/2020	8/2/2020	8/9/2020	8/16/2020	8/23/2020	8/30/2020	9/6/2020	9/13/2020	9/20/2020
P1-2	Riverside	Lake Elsinore	3.0	8.5	2400	11	4.1	1.0	20	15	2.0	3.0	2.0	4.1
P4-OC2	Orange	Santa Ana Delhi Channel in Tidal Prism											84	
P4-OC3	Orange	Greenville-Banning Channel in Tidal Prism											235	



QA/QC

No QA/QC concerns were reported during the third quarter of 2020.

Upcoming Activities

Upcoming activities for the fourth quarter of 2020 include:

- Five weeks of cool dry season monitoring at all Priority 1 and 2 sites.
- Five weeks of monitoring at Bolsa Chica channel by OCPW.
- Cucamonga creek (P4-SBC1) will continue to be monitored monthly.
- One storm event will also be monitored during the wet weather season (November 1 through March 31) per MSAR Bacteria TMDL requirements.
- CDM Smith will continue to coordinate with Babcock Laboratories and CWE sampling personnel regarding all sites located in Riverside and San Bernardino Counties.
- The OCPW Monitoring Manager will continue to coordinate with OCPHL and Orange County sampling personnel regarding Priority 3 sites located in their jurisdiction.

Accessibility Report

Filename: 2020 Q3 Report.pdf

Report created by: [Enter personal and organization information through the Preferences > Identity dialog.]

Organization:

Summary

The checker found no problems in this document.

- Needs manual check: 2
- Passed manually: 0
- Failed manually: 0
- Skipped: 1
- Passed: 29
- Failed: 0

Detailed Report

Document

Rule Name	Status	Description
Accessibility permission flag	Passed	Accessibility permission flag must be set
Image-only PDF	Passed	Document is not image-only PDF
Tagged PDF	Passed	Document is tagged PDF
Logical Reading Order	Needs manual check	Document structure provides a logical reading order
Primary language	Passed	Text language is specified
Title	Passed	Document title is showing in title bar
Bookmarks	Passed	Bookmarks are present in large documents
Color contrast	Needs manual check	Document has appropriate color contrast

Page Content

Rule Name	Status	Description
Tagged content	Passed	All page content is tagged
Tagged annotations	Passed	All annotations are tagged
Tab order	Passed	Tab order is consistent with structure order
Character encoding	Passed	Reliable character encoding is provided
Tagged multimedia	Passed	All multimedia objects are tagged
Screen flicker	Passed	Page will not cause screen flicker
Scripts	Passed	No inaccessible scripts
Timed responses	Passed	Page does not require timed responses
Navigation links	Passed	Navigation links are not repetitive

Forms

Rule Name	Status	Description
Tagged form fields	Passed	All form fields are tagged
Field descriptions	Passed	All form fields have description

Alternate Text

Rule Name	Status	Description
Figures alternate text	Passed	Figures require alternate text
Nested alternate text	Passed	Alternate text that will never be read
Associated with content	Passed	Alternate text must be associated with some content
Hides annotation	Passed	Alternate text should not hide annotation
Other elements alternate text	Passed	Other elements that require alternate text

Tables

Rule Name	Status	Description
Rows	Passed	TR must be a child of Table, THead, TBody, or TFoot

TH and TD	Passed	TH and TD must be children of TR
Headers	Passed	Tables should have headers
Regularity	Passed	Tables must contain the same number of columns in each row and rows in each column
Summary	Skipped	Tables must have a summary

Lists

Rule Name	Status	Description
List items	Passed	LI must be a child of L
Lbl and LBody	Passed	Lbl and LBody must be children of LI

Headings

Rule Name	Status	Description
Appropriate nesting	Passed	Appropriate nesting

[Back to Top](#)